LG

MULTI V™

Hydro Kit

R410A(50Hz/60Hz)

0CVG0-01F(Replaces 0CVG0-01E)

TOTAL HVAC SOLUTION PROVIDER

ENGINEERING PRODUCT DATA BOOK

LG Life's Good

P/No. : MFL61741643

MULTI V™

Hydro Kit

General information

Floor Standing (Medium Temperature)

Floor Standing (High Temperature)

Installation

MULTI V™

Hydro Kit

General information

1. Model Names & External Appearance
2. Nomenclature
3. Indoor Unit Capacity Index & Combination Ratio

1. Model Names & External Appearance

■ Model Names

Category	Operating Temperature	Chassis Name	4 HP	8 HP	10 HP
Floor standing	Medium	K2	ARNH04GK2A4	-	ARNH10GK2A4
	High	K3	ARNH04GK3A4	ARNH08GK3A4	-

■ External Appearance

Category	Operating Temperature	Chassis Name	Model Name	Refrigerant	Model
Floor standing	Medium	K2	ARNH04GK2A4 ARNH10GK2A4	R410A	
	High	K3	ARNH04GK3A4 ARNH08GK3A4	R410A	

2. Nomenclature

Model Name	ARN	H	10	G	K2	A	4
No.	1	2	3	4	5	6	7

No.	Signification
1	**Indoor Unit for Multi V System using R410a**
2	**Type of indoor unit** U : Regular indoor H : Hydro Kit
3	**Capacity (HP)** Ex) 4 HP → '04', 8 HP→ ‘8’
4	**Electrical Ratings** 1 :1Ø, 115V, 60Hz 2 : 1Ø, 220V, 60Hz 3 :1Ø, 208/230V, 60Hz 6 :1Ø, 220 - 240V, 50Hz 7 : 1Ø, 100V, 50/60Hz G: 1Ø, 220-240V, 50Hz / 1Ø, 220V, 60Hz
5	**Chassis Name**
6	**Combinations of functions** A: Basic function
7	**Serial Number**

3. Indoor Unit Capacity Index & Combination Ratio

■ Indoor Unit Capacity Index

Model	4HP	8HP	10HP
Unit Capacity (Btu/h)	42k	76k	96k
Capacity Index	12.3	22.4	28.0

Note

- Capacity Index is based on cooling capacity(kW).
- High Temperature Hydro kit Capacity index is different from the heating capacity.

■ Indoor Unit Combination Ratio

Outdoor Unit Type	Number of Outdoor Unit	Maximum Combination Ratio	
		Hydro Kit	Total (Hydro Kit + Indoor Unit)
Multi V 5 * (Heat Pump, Heat Recovery) Multi V Water IV * (Heat Pump, Heat Recovery)	Single	105%	200% (Recommended 130%)
	2 Units	105%	160% (Recommended 130%)
	3 Units	105%	130%
	4 Units	X	X
Multi V S * (Heat Pump, Heat Recovery)	Single	105%	160% (Recommended 130%)

Note

1. In case that the number of outdoor units is 4 units combination model, Hydro Kit can not be combined with that.
2. In case that operating indoor units ratio to rated capacity of outdoor unit is more than 130%, the airflow or capacity of indoorunits and hydro kit will be operated as low step in the all indoor units.
3. Sum of capacity index of indoor units and hydro kits is corresponding to the maximum combination ratio of outdoor units.But capacity index of hydro kit can not be over than 105% capacity index of outdoor unit.
4. Hydro Kit can not be combined with Multi V S Type 4HP(ARU-04-), Multi V S Type 5HP Compact model(ARUN050GSL0).

Important

* : ARNH-A4 model can be used in 9600 bps communication with outdoor units manufactured after April 2019, prior to this date required setting is 1200 bps communication in outdoor unit. For the method on how to set up communication type, refer to installation manual of outdoor units.

MULTI V™

Hydro Kit

Floor Standing (Medium Temperature)

1. List of functions
2. Specifications
3. Dimensions
4. Piping diagrams
5. Wiring diagrams
6. Capacity correction factor
7. Water pressure drop
8. Operation limits
9. Electric characteristics
10. Sound levels

1. List of functions

■ Basic functions of Unit

Category	Functions	ARNH04GK2A4 / ARNH10GK2A4
Installation	Drain pump	X
	E.S.P. control	X
	Electric heater (operation)	X
	High ceiling operation	X
Reliability	Hot start	X
	Self diagnosis	O
	Soft dry operation	X
Convenience	Auto changeover	X
	Auto cleaning	X
	Auto operation (artificial intelligence)	X
	Auto restart operation	O
	Child lock	O
	Forced operation	X
	Group control	O
	Sleep mode	X
	Timer (on/off)	O
	Timer (weekly)	O
	Two thermistor control	X
Individual control	Standard wired remote controller	O
	Premium wired remote controller	X
	Simple wired remote controller	X
	Simple Wired remote controller(for hotel use)	X
	Wireless remote controller(simple)	X
Network function	General central controller (Non LGAP)	X
	Network Solution (LGAP)	O
Hydro Kit Functions	Anti-Condensation on floor (cooling)	O
	Water Pump ON / OFF Control	O
	Water Flow Detection	O
	Thermostat Interface (230V AC)	O
	Thermostat Interface (24V AC)	O
	DHW(Domestic Hot Water) tank kit	X
	PHEX Anti-Freezing Control	O
	Water Pump Forced Operation	O
	Autosetting according to Ambient Temperature	O
	Silent Operation	X
	Anti-overheating of Water Pipe	O
	Emergency Operation	O
	Weather Dependent Operation with Thermostat	X
	Scheduler (Domestic Hot Water Tank Heater)	X
	Timer (Domestic Hot Water Tank Heater)	X
	Quick Domestic Hot Water Tank Heating	O
	Electric Heater Capacity Control	X
	Screed Drying Mode	X
	Sump Heater	X
	One Point Dry Contact Input(CN-EXT)	O
	Tank Disinfection	X
	Pump Frequency	O
	SG Ready	O

Note

1. O : Applied, X : Not applied
   Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.
   Accessory line-ups varies by region, so check your local catalogue or local sales material.

1. List of functions

■ Accessory Compatibility List

Category		Product	ETC	ARNH04GK2A4 ARNH10GK2A4
Central Controller	Simple	PQCSZ250S0	AC EZ	X
	AC Ez Touch	PACEZA000	AC Ez Touch	O
	AC Smart	PACS4B000	AC Smart IV	O
		PACS5A000	AC Smart 5	O
	ACP	PACP4B000	ACP IV	O
		PACP5A000	ACP 5	O
	AC Manager	PACM4B000	AC Manager IV	O
		PACM5A000	AC Manager 5	O
Gateway	BACnet	PQNFB17C0	ACP BACnet	O
	Lonworks	PLNWKB000	ACP Lonworks	O
	Modbus	PMBUSB00A	Modbus Gateway	O
Dry contact	Simple Contact	PDRYCB000 PDRYCB100	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	X
		PDRYCB300	Dry Contact For 3rd Party Thermostat	O
		PDRYCB500	Dry Contact For Modbus	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	Group control wire	PZCWRCG3	0.25m	O
	Wi-Fi Controller	PWFMDD200	-	O
	Independent Power Module	PRIP0	-	O
	Refrigerant Leakage Detector	PRLDNVS0	-	O
	PDI	PPWRDB000	PDI Standard	O
		PQNUD1S40	PDI Premium	O
Special Kit for Hydrokit	Solar-Thermal Interface kit with DHW Tank	PHLLA	Limit Temperature : 96℃	O
	Indoor Drain Pan	PHDPB	-	X

Note

1. O : Applied, X : Not applied
   Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separated package.
2. If you need more detail, please refer to the BECON PDB or the manual of product.
   (http://partner.lge.com/global : Home> Doc.Library> Product > Control(BECON))

2. Specifications

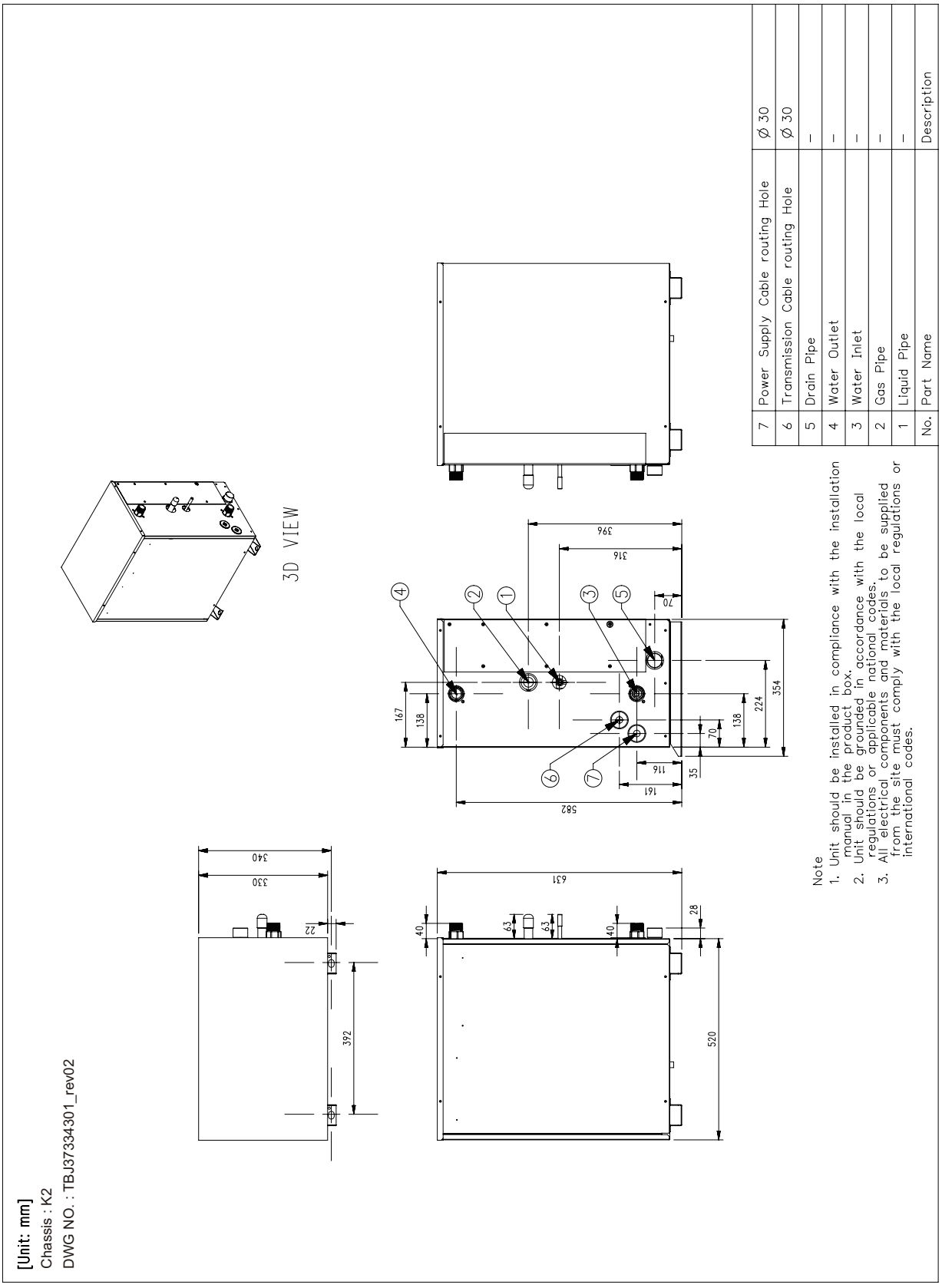
Model			Unit	ARNH04GK2A4	ARNH10GK2A4
Capacity (Rated)		Cooling	kW	12.3	28.0
			kcal/h	10,580	24,100
			Btu/h	42,000	95,900
		Heating	kW	13.8	31.5
			kcal/h	11,870	27,100
			Btu/h	47,000	107,500
Input (Rated)		Cooling	kW	0.01	0.01
		Heating	kW	0.01	0.01
Casing		Material	-	Painted Steel Plate	Painted Steel Plate
		Color (RAL code)	-	RAL 7030	
Dimensions	Net	Body (W x H x D)	mm	520 x 631 x 330	520 x 631 x 330
			inch	20-15/32 x 24-27/32 x 13	20-15/32 x 24-27/32 x 13
Weight	Net	Body	kg (lbs)	29.2(64.4)	33.7(74.3)
Heat Exchanger	Refrigerant to Water	Type	-	Brazed Plate HEX	Brazed Plate HEX
		Quantity	EA	1	1
		Number of Plate	EA	26	48
		Rated Water Flow	ℓ / min	39.6	92.0
		Head Loss	kPa	41.0	69.0
Temperature Control			-	Microprocessor, Thermostat for cooling and heating	
Water Tank Temperature Sensor		Type(Sensor Holder)	inch	Male PT 1/2	
		Length	m	12	
Sound Absorbing Thermal Insulation Material			-	Foamed polystrene	Foamed polystrene
Safety Device			-	Fuse	Fuse
Piping Connections	Water Side	Inlet	inch	Male PT 1	Male PT 1
		Outlet	inch	Male PT 1	Male PT 1
	Refrigerant Side	Liquid	mm(inch)	Ø 9.52(3/8)	Ø 9.52(3/8)
		Gas	mm(inch)	Ø 15.88(5/8)	Ø 22.2(7/8)
Drain Piping Connection			inch	Male PT 1	Male PT 1
Sound Pressure Level		Cooling	dB(A)	26	26
		Heating	dB(A)	26	26
Transmission Cable			mm²	1.0~1.5 × 2C	1.0~1.5 × 2C
Refrigerant	Refrigerant to Water	Refrigerant name	-	R410A	R410A
		Precharged Amount	kg (lbs)	-	-
		Additional Refrigerant Charge Amount	kg (lbs)	0.8(1.8)	1.6 (3.5)
		GWP (Global Warming Potential)	-	2,087.5	2,087.5
		t-CO2 eq	-	-	-
		Control	-	Electronic Expansion Valve	Electronic Expansion Valve
Power Supply			V, Ø, Hz	220-230-240, 1, 50/60	220-230-240, 1, 50/60
Running Current		Cooling / Heating	A	0.05 - 0.05 - 0.05	0.05 - 0.05 - 0.05

Note

1. Capacities are based on the following conditions:
   - Cooling Temperature : Outdoor 35°C(95°F) DB / 24°C(75.2°F) WB, Water Inlet 23℃(73.4˚F) / Outlet18℃(64.4˚F)
   - Heating Temperature : Outdoor 7°C(44.6°F) DB / 6°C(42.8°F) WB, Water Inlet 30℃(86˚F) / Outlet 35℃(95˚F)
   - Difference Limit of Elevation (Outdoor ~ Indoor Unit) is 0m.
   - Piping Length : Interconnected Pipe Length = 7.5m
2. Wiring cable size must comply with the applicable local and national code
3. Due to our policy of innovation, some specifications may be changed without notification.
4. Sound pressure level is measured on the rated condition in the anechoic rooms by ISO 3745 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.
5. This product contains Fluorinated greenhouse gases.(R410A,GWP(Global warming potential) = 2087.5)

3. Dimensions

■ ARNH04GK2A4 / ARNH10GK2A4



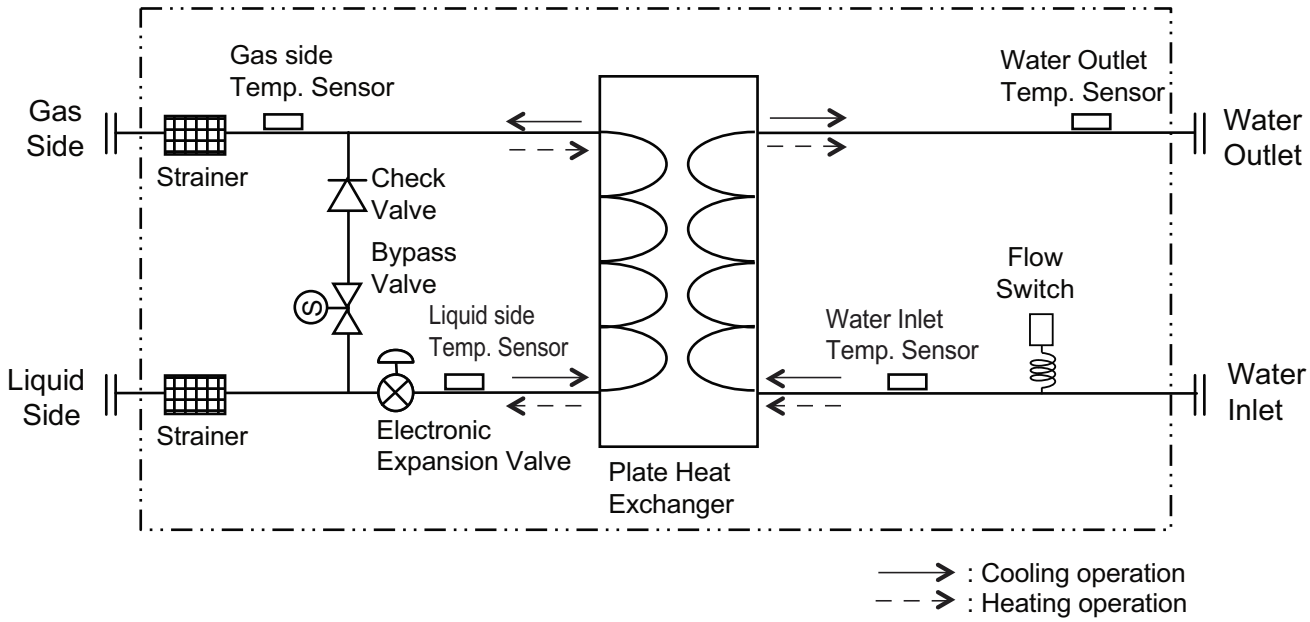
No.	Part Name	Description
7	Power Supply Cable routing Hole	Ø 30
6	Transmission Cable routing Hole	Ø 30
5	Drain Pipe	–
4	Water Outlet	–
3	Water Inlet	–
2	Gas Pipe	–
1	Liquid Pipe	–

Note
1. Unit should be installed in compliance with the installation manual in the product box.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials to be supplied from the site must comply with the local regulations or international codes.

[Unit: mm]
Chassis : K2
DWG NO. : TBJ37334301_rev02

4. Piping diagrams

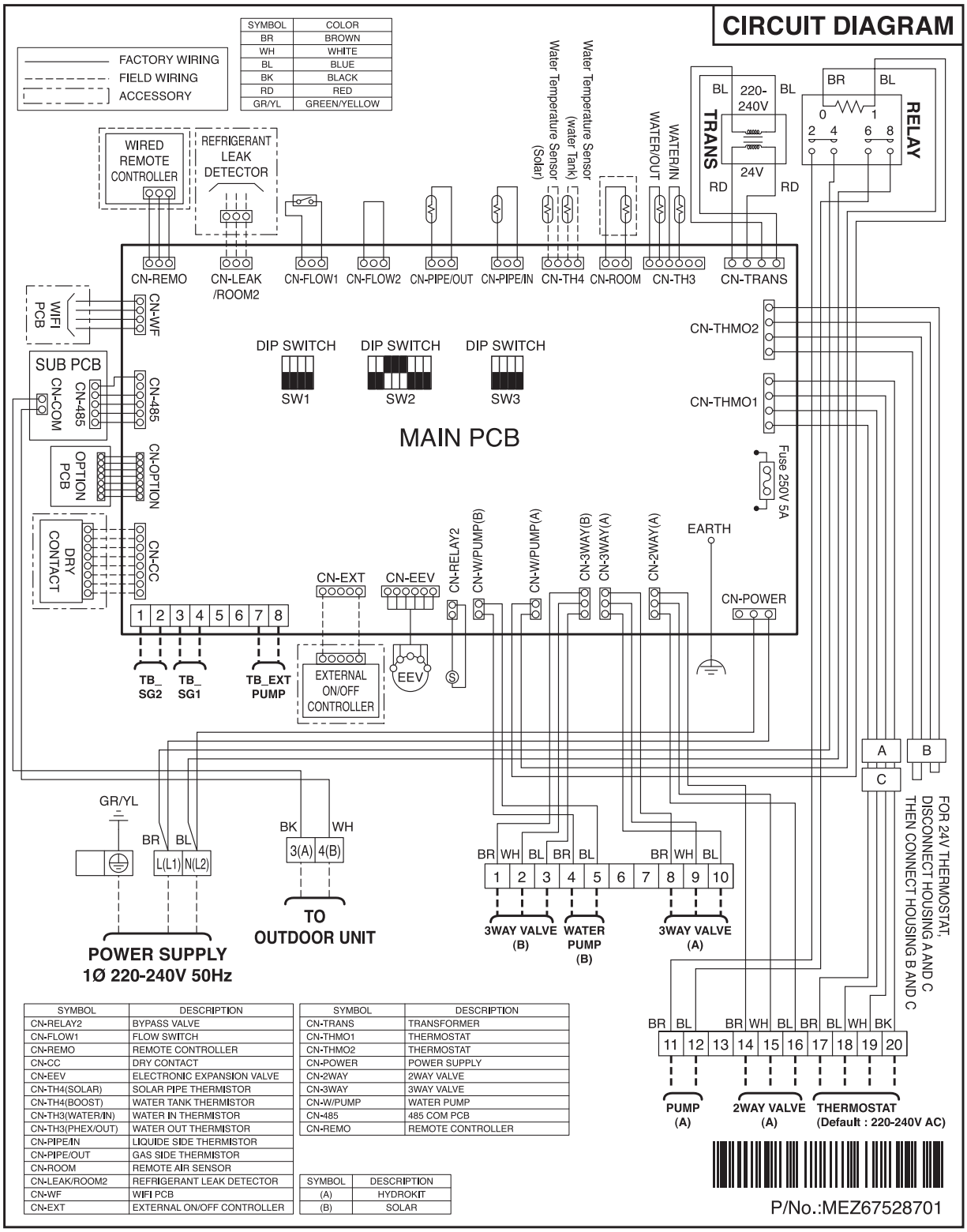
■ ARNH04GK2A4 / ARNH10GK2A4



Description	PCB Connector	Remarks
Air Temperature Sensor	CN_ROOM	- Optional Accessory(being sold separately) - Not shown in diagram
Gas side Temperature Sensor	CN_PIPE/OUT	
Liquid side Temperature Sensor	CN_PIPE/IN	
Water Inlet Temperature Sensor	CN_TH3	- Water Inlet and Water Outlet sensors connected to 4 pin type connector CN_TH3
Water Outlet Temperature Sensor		
Flow Switch	CN-FLOW1	

5. Wiring diagrams

■ ARNH04GK2A4 / ARNH10GK2A4



6. Capacity correction factor

6.1 Capacity correction factor by temperature

■ Capacity/Power Input Calculation method

Total Capacity = Hydro Kit Capacity + Indoor Unit Capacity

Hydro Kit Capacity = Q_{ODU} x (I_{HK} / I_{TOTAL}) x F_{TC,T_HK} x F_{TC,W_HK}x F_{TC,C_HK} x F_{TC,P_ODU} x F_{TC,D_ODU}

Q_{ODU} =	Outdoor Unit capacity by outdoor air (outside inlet water) temp. and capacity ratio at standard indoor temp. * Standard indoor temperature is 27/19℃ DB/WB on cooling mode, 20℃ DB on heating mode.	..... Refer to *Capacity tables of outdoor unit PDB*
F_{TC,T_HK} =	Capacity correction factor by Outdoor and water inlet temperature.	..... Refer to *following Graph of this PDB*
F_{TC,W_HK} =	Capacity correction factor by Water flow rate.	..... Refer to *following Graph of this PDB*
F_{TC,C_HK} =	Capacity correction factor by Combination ratio.	..... Refer to *following Graph of this PDB*
F_{TC,P_ODU} =	Capacity correction factor by Refrigerant Piping length.	..... Refer to *correction factors of outdoor unit PDB*
F_{TC,D_ODU} =	Capacity correction factor by Defrosting operation.	..... Refer to *correction factors of outdoor unit PDB*
I_{HK} =	Capacity index for Hydro Kit	..... Refer to *index table of this PDB*
I_{TOTAL} =	Sum of Capacity index for combined indoor units and hydro kit	..... Refer to *index table of outdoor unit PDB*

Total Power Input = Hydro Kit Power Input + Indoor Unit Power Input

Hydro Kit Power Input = PI_{ODU} x (I_{HK} / I_{TOTAL}) x F_{PI,T_HK} x F_{PI,W_HK} x F_{PI,C_HK}

PI_{ODU}=	Outdoor Unit Power Input by outdoor air (outside inlet water) temp. and capacity ratio at standard indoor temp. * Standard indoor temperature is 27/19℃ DB/WB on cooling mode, 20℃ DB on heating mode.	..... Refer to *Capacity tables of outdoor unit PDB*
F_{PI,T_HK} =	Power Input correction factor [Outdoor Unit] by Outdoor and water inlet temperature.	.... Refer to *following Graph of this PDB*
F_{PI,W_HK} =	Power Input correction factor [Outdoor Unit] by Water flow rate	..... Refer to *following Graph of this PDB*
F_{PI,C_HK} =	Power Input correction factor [Outdoor Unit] by Combination ratio	..... Refer to *following Graph of this PDB*
I_{HK} =	Capacity index for Hydro Kit	..... Refer to *index table of this PDB*
I_{TOTAL} =	Sum of Capacity index for combined indoor units and hydro kit	..... Refer to *index table of outdoor unit PDB*

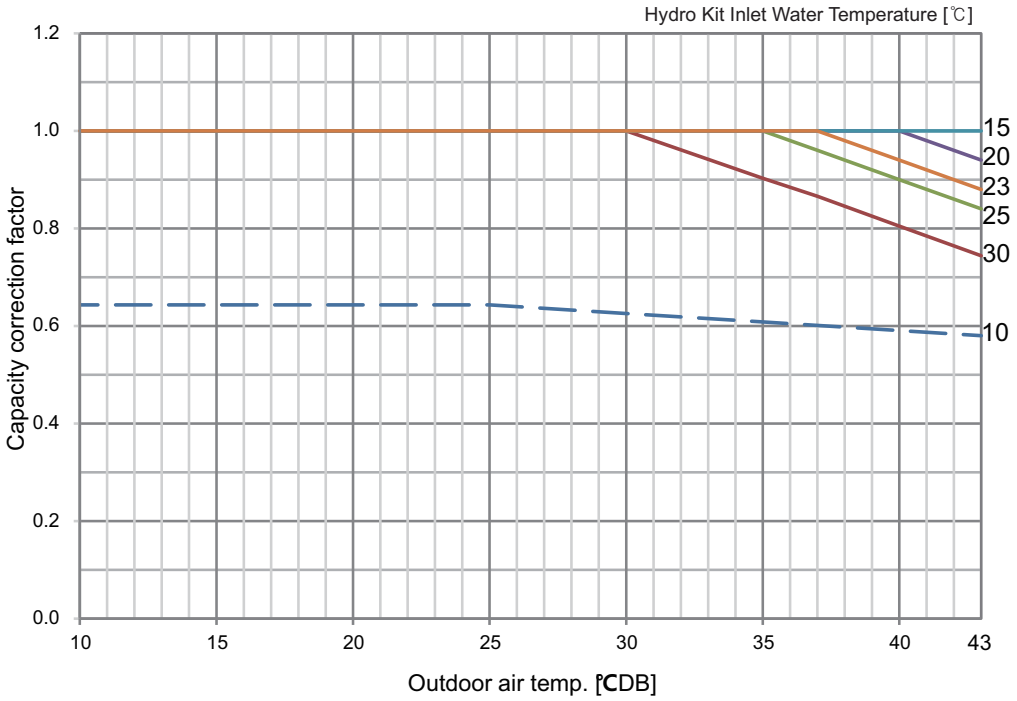
Note

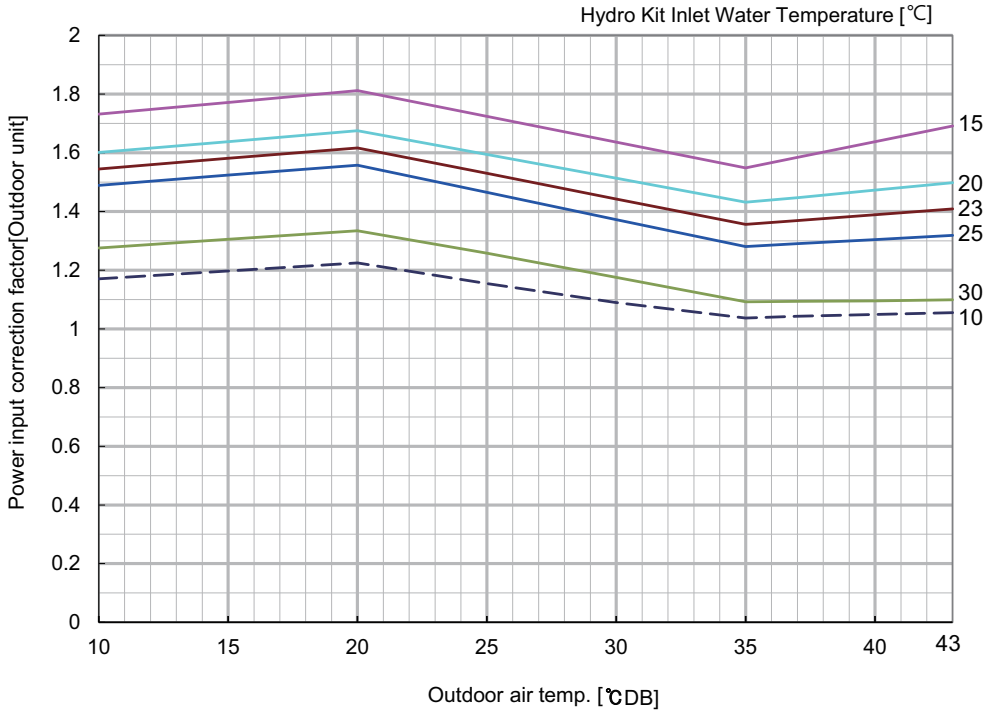
1. When calculating at upper or lower temperature than the range of Outdoor unit capacity table, use the same value with the boundary value of that. For example, when calculating Heating PI with capacity table of Outdoor unit at upper temperature than 15℃DB, use the same value of PI at 15℃ DB.

6. Capacity correction factor

■ ARNH04GK2A4 / ARNH10GK2A4 (Cooling)

- **Combination with Multi V 5 system (ARU-5) and Multi V S system (ARU-S*0)**





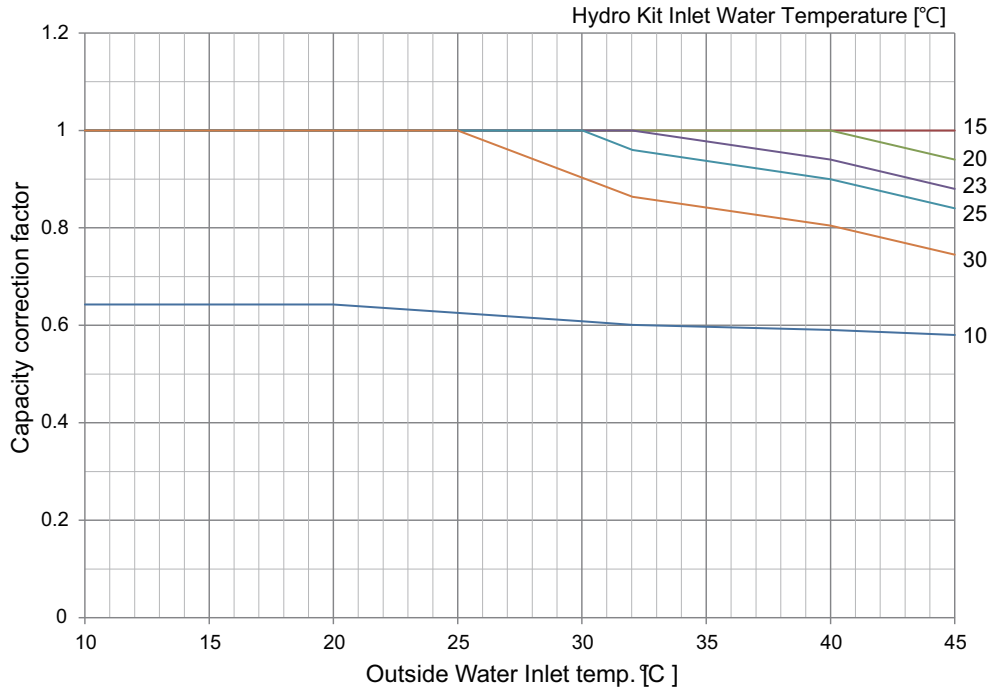
Note

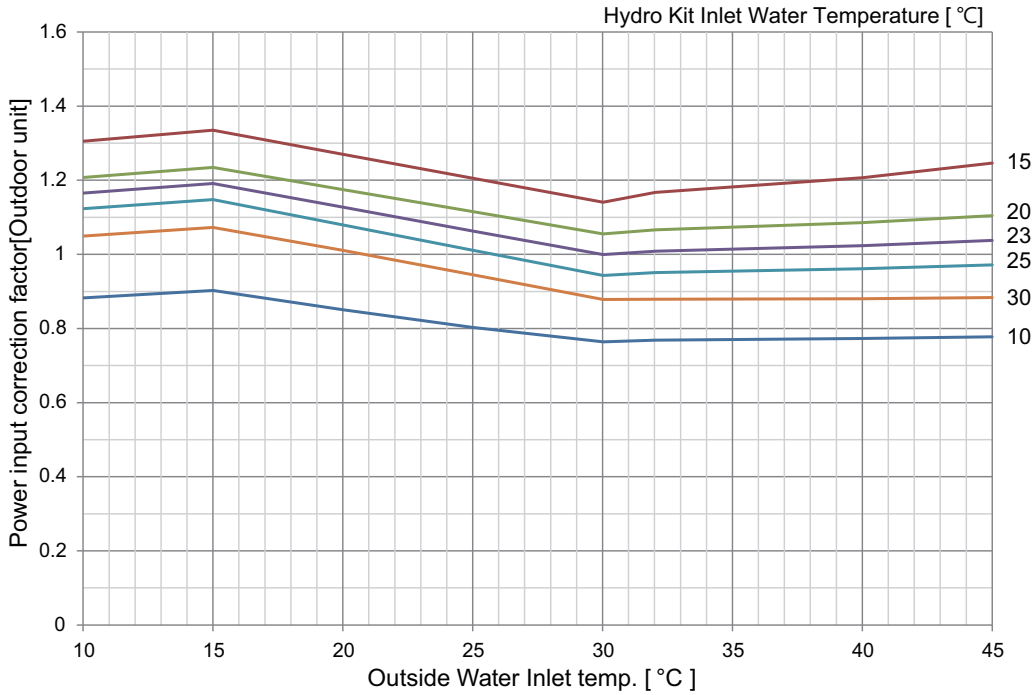
Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

6. Capacity correction factor

■ ARNH04GK2A4 / ARNH10GK2A4 (Cooling)

- **Combination with Multi V Water system (ARW-)**





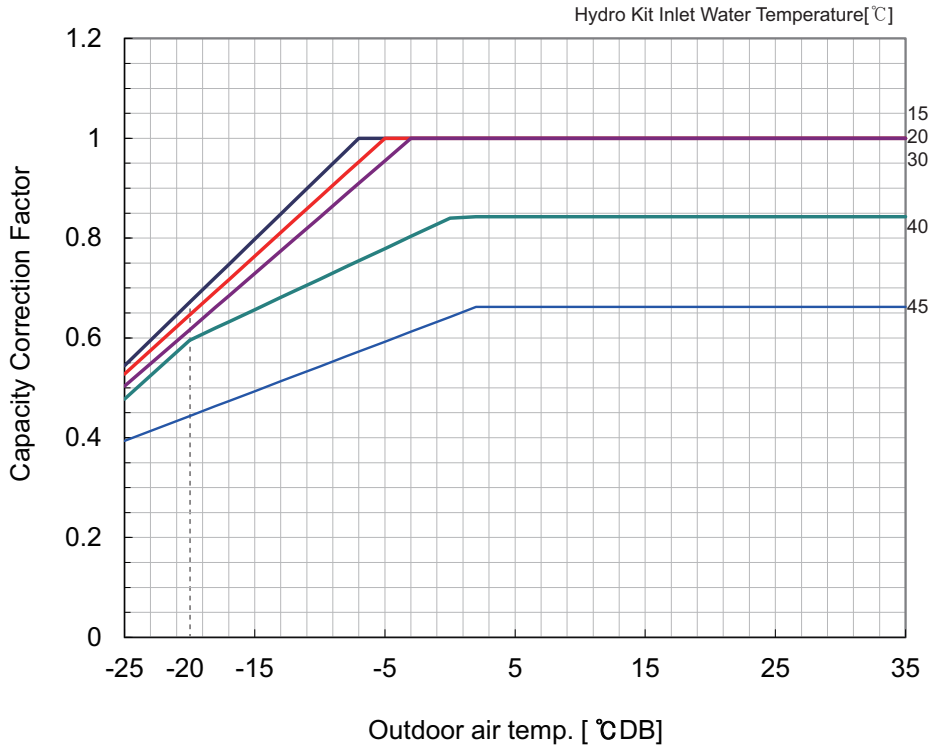
Note

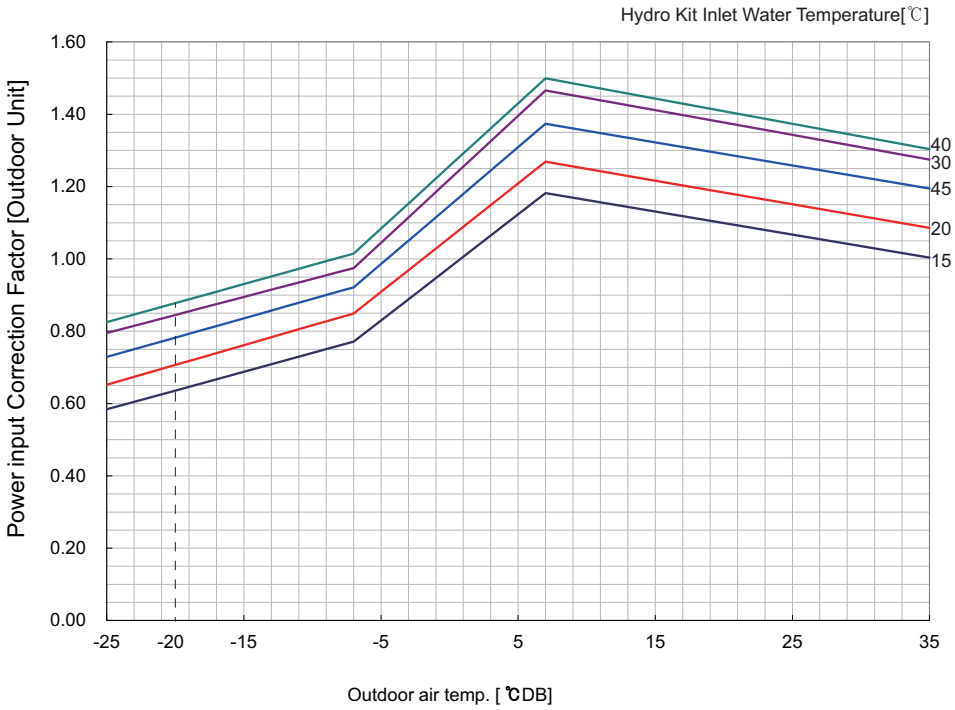
Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

6. Capacity correction factor

■ ARNH04GK2A4 / ARNH10GK2A4 (Heating)

- **Combination with Multi V 5 system (ARU-5) and Multi V S system (ARU-S*0)**





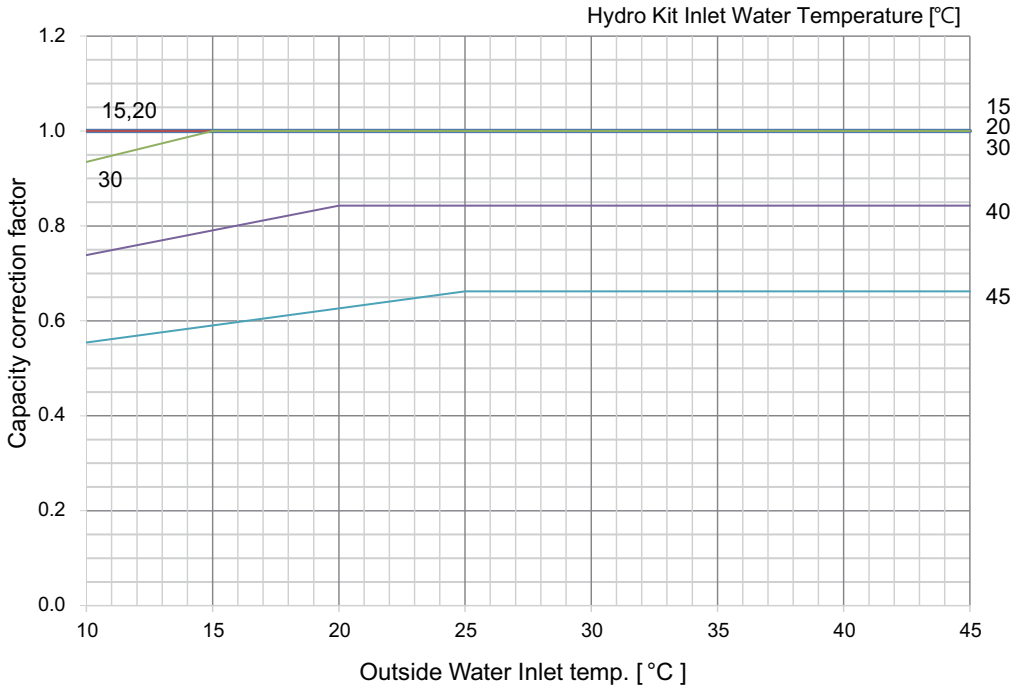
Note

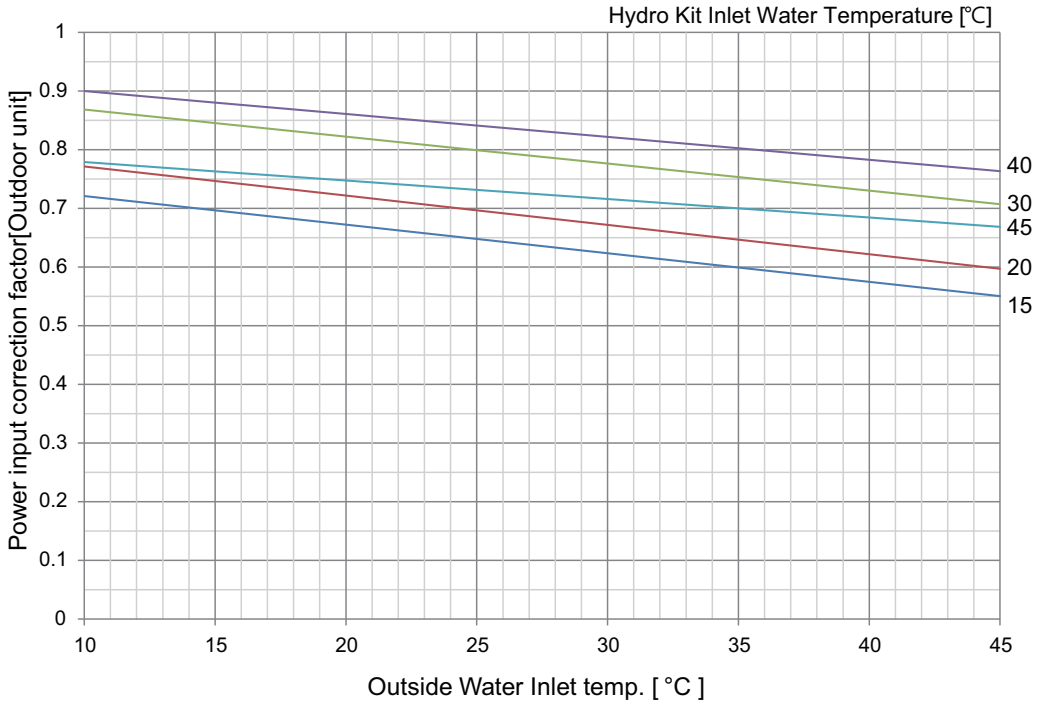
Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

6. Capacity correction factor

■ ARNH04GK2A4 / ARNH10GK2A4 (Heating)

- **Combination with Multi V Water system (ARW-)**





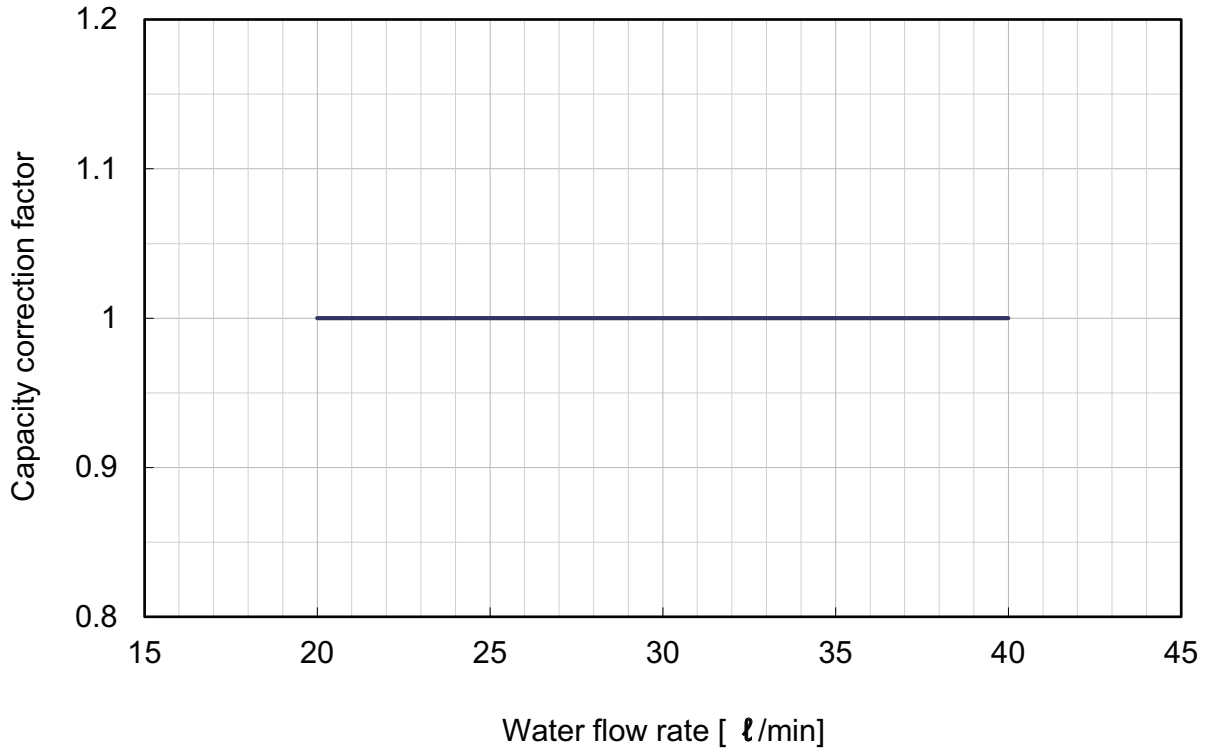
Note

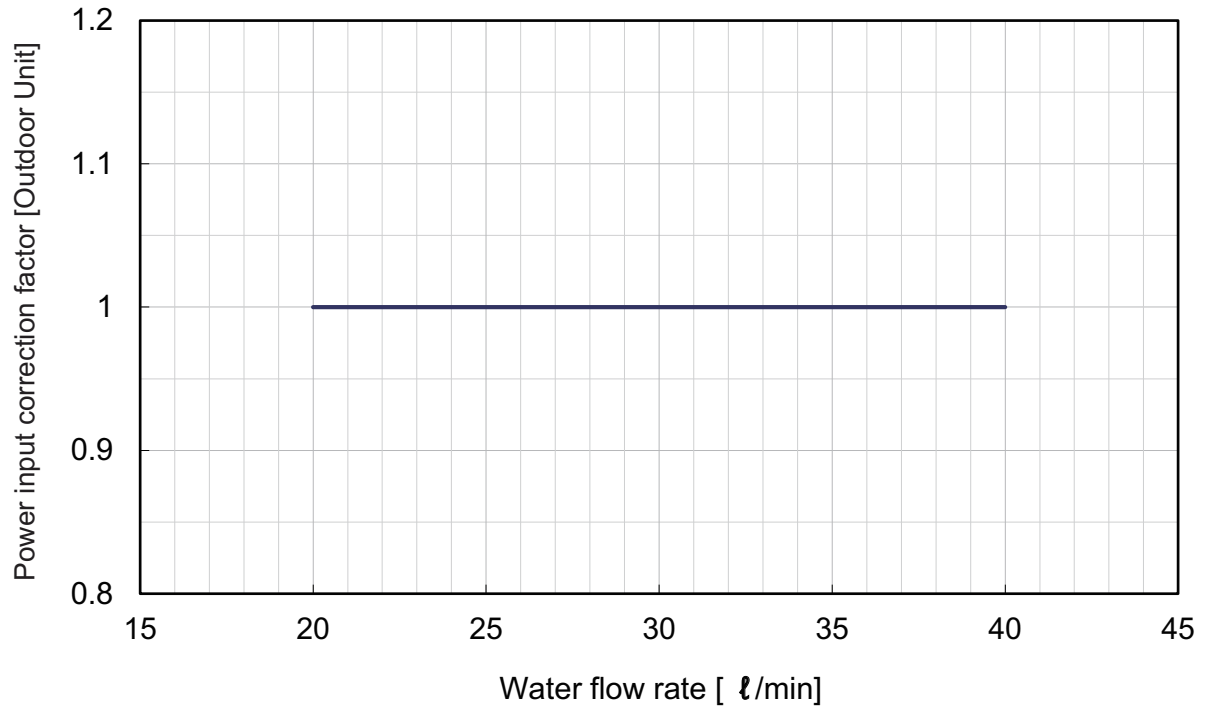
Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

6. Capacity correction factor

6.2 Capacity correction factor by water flow rate

■ ARNH04GK2A4 (Cooling)



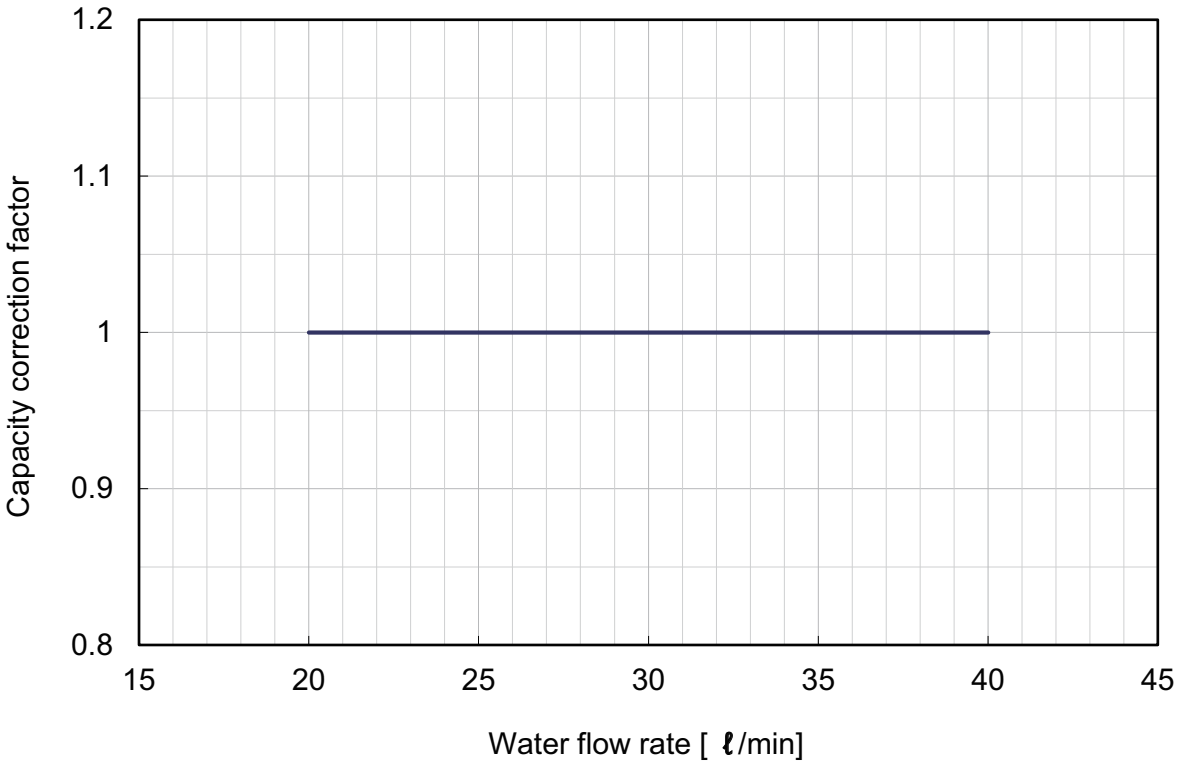


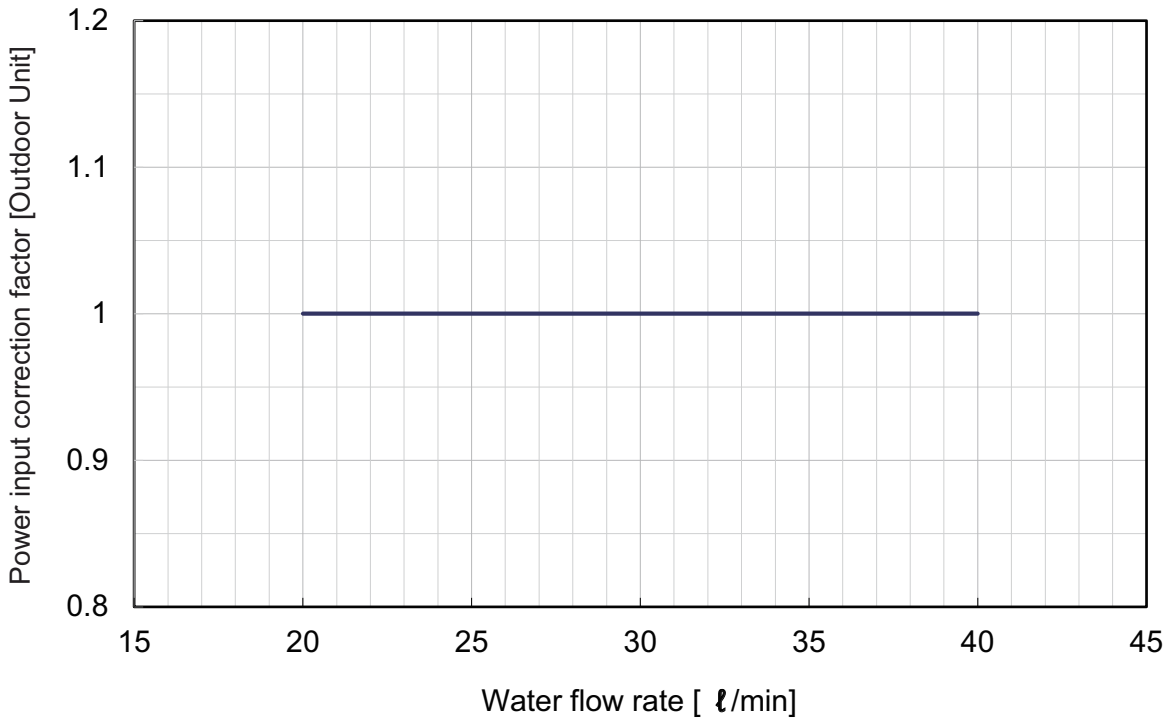
⚠ WARNING

Water Flow Rate Range (recommended) : ARNH04GK2A4 20 ~ 40 (ℓ/min)

6. Capacity correction factor

■ ARNH04GK2A4 (Heating)



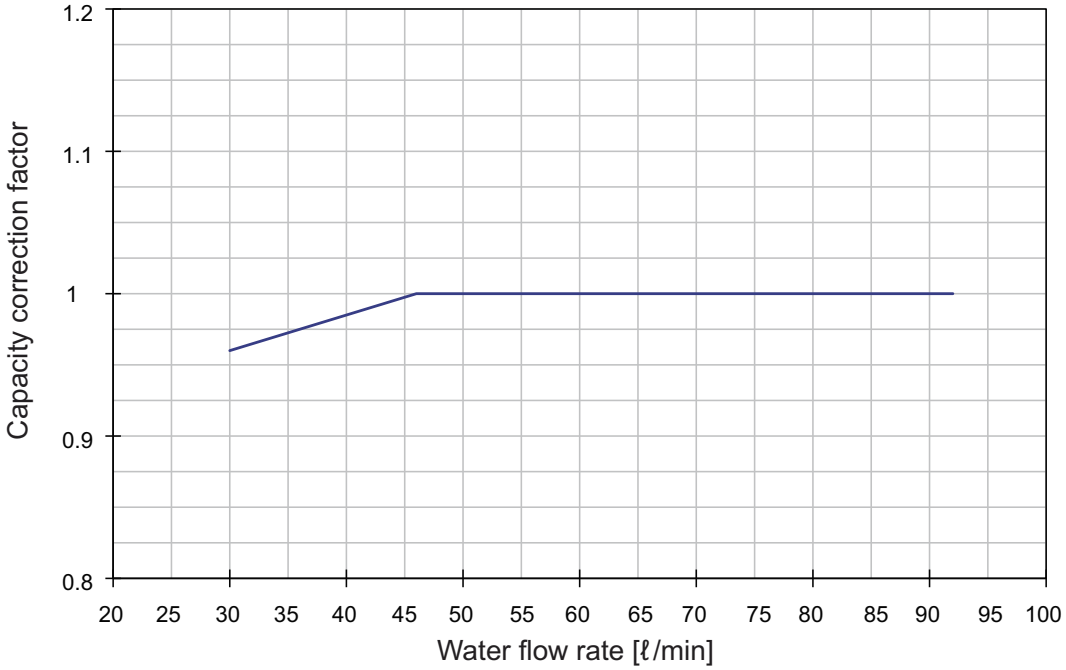


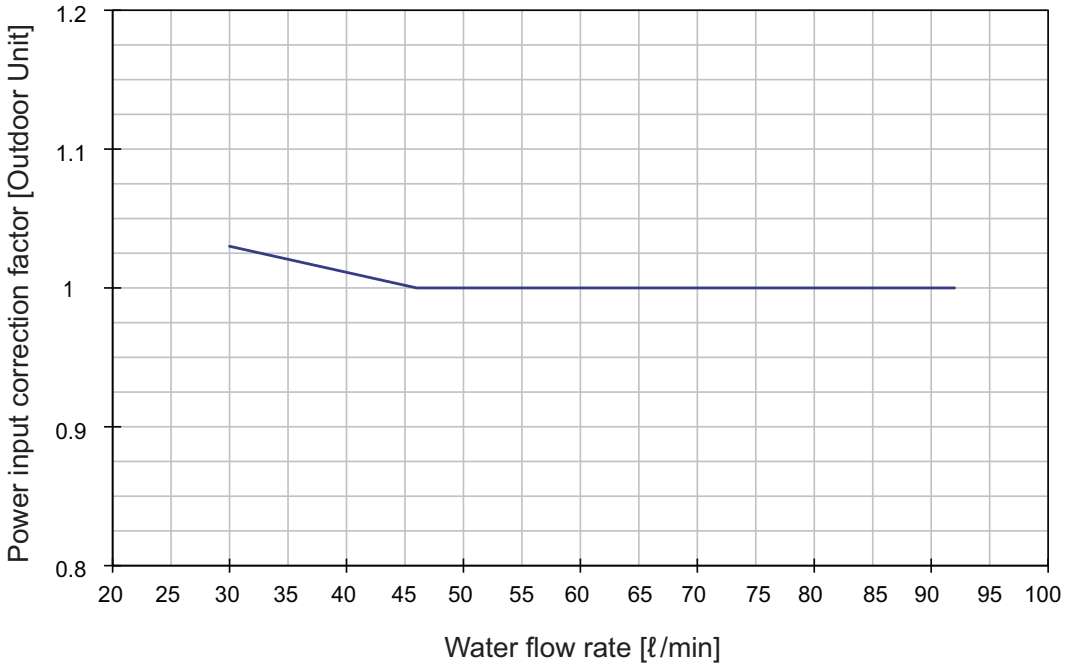
⚠ WARNING

Water Flow Rate Range (recommended) : ARNH04GK2A4 20 ~ 40 (ℓ/min)

6. Capacity correction factor

■ ARNH10GK2A4 (Cooling)



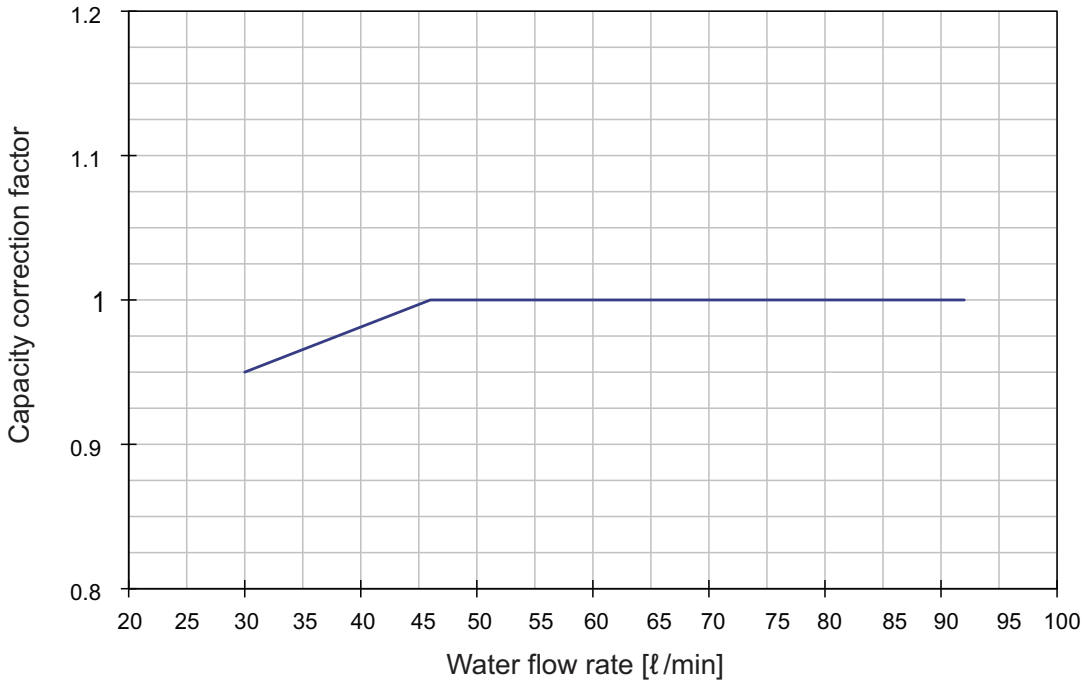


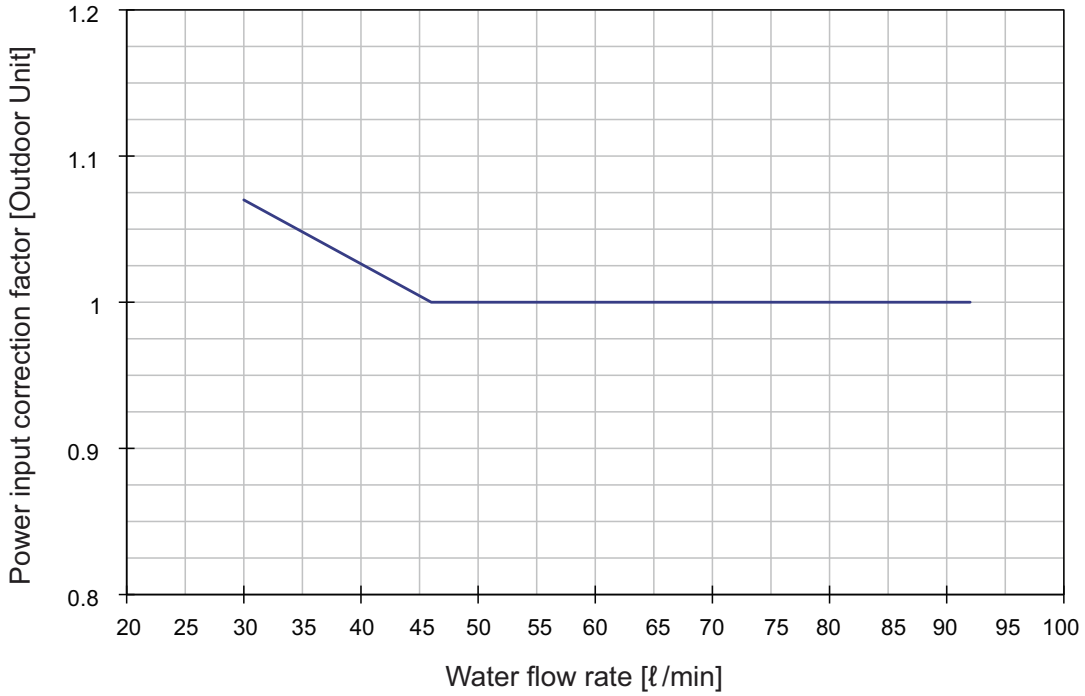
⚠ WARNING

Water Flow Rate Range (recommended) : ARNH10GK2A4 45 ~ 92 (ℓ/min)

6. Capacity correction factor

■ ARNH10GK2A4 (Heating)





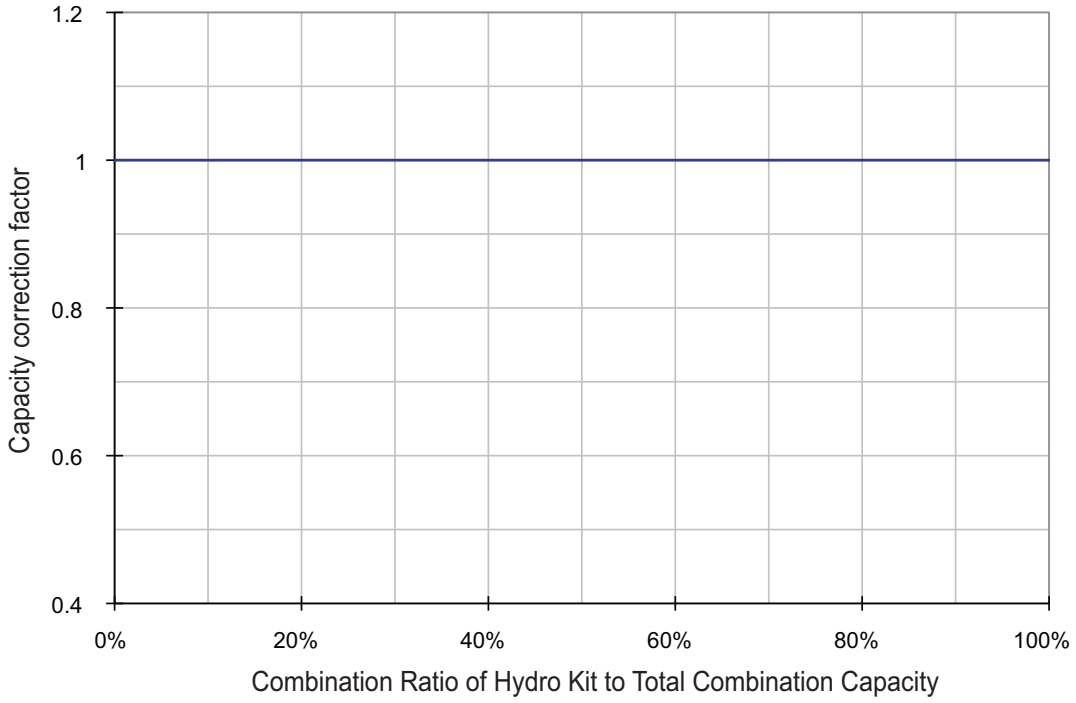
⚠ WARNING

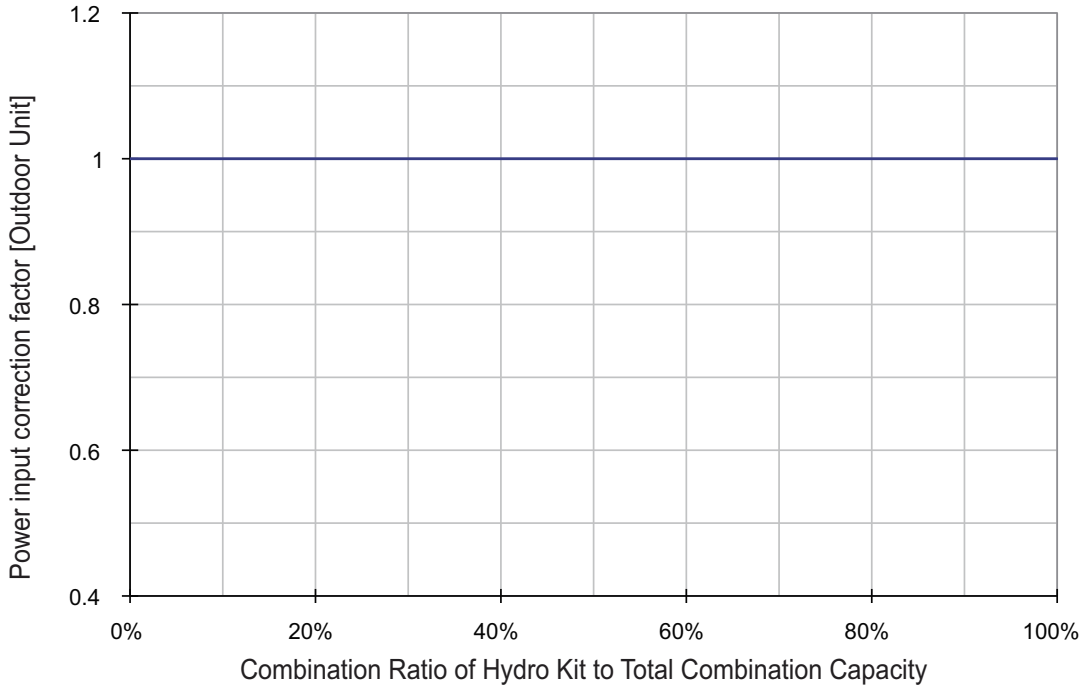
Water Flow Rate Range (recommended) : ARNH10GK2A4 45 ~ 92 (ℓ/min)

6. Capacity correction factor

6.3 Capacity correction factor by combination ratio

■ ARNH04GK2A4 / ARNH10GK2A4



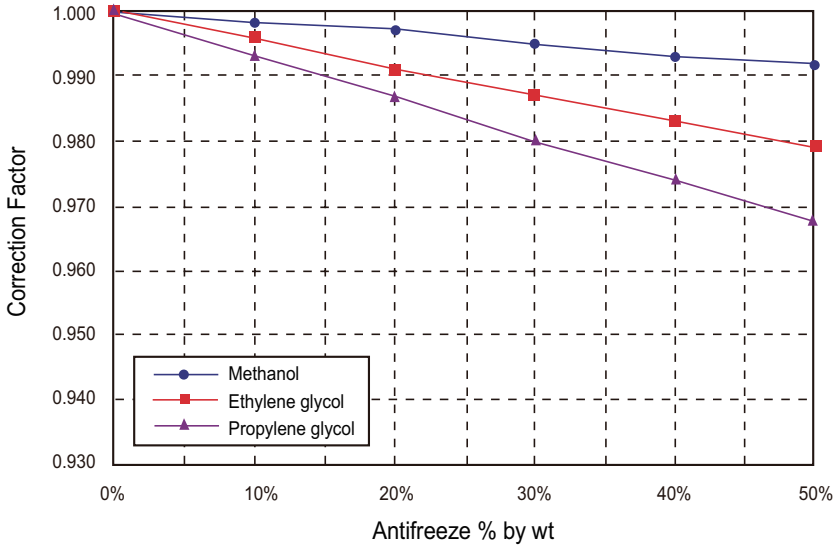


6. Capacity correction factor

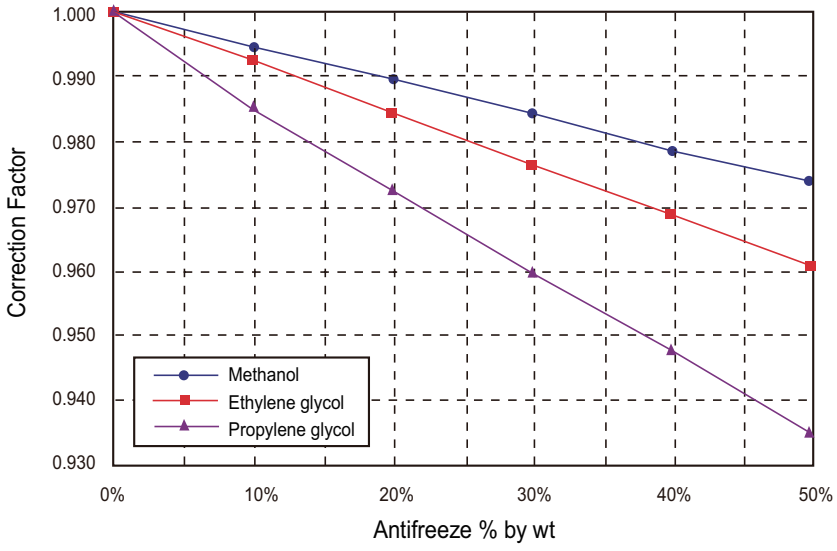
6.4 Capacity correction factor by antifreeze

Antifreeze Type	Item	Antifreeze % by wt				
		10%	20%	30%	40%	50%
Methanol	Cooling	0.998	0.997	0.995	0.993	0.992
	Heating	0.995	0.990	0.985	0.979	0.974
	Pressure Drop	1.023	1.057	1.091	1.122	1.160
Ethylene glycol	Cooling	0.996	0.991	0.987	0.983	0.979
	Heating	0.993	0.985	0.977	0.969	0.961
	Pressure Drop	1.024	1.068	1.124	1.188	1.263
Propylene glycol	Cooling	0.993	0.987	0.980	0.974	0.968
	Heating	0.966	0.973	0.960	0.948	0.935
	Pressure Drop	1.040	1.098	1.174	1.273	1.405

◆ **Correction factor of cooling capacity**



◆ **Correction factor of heating capacity**

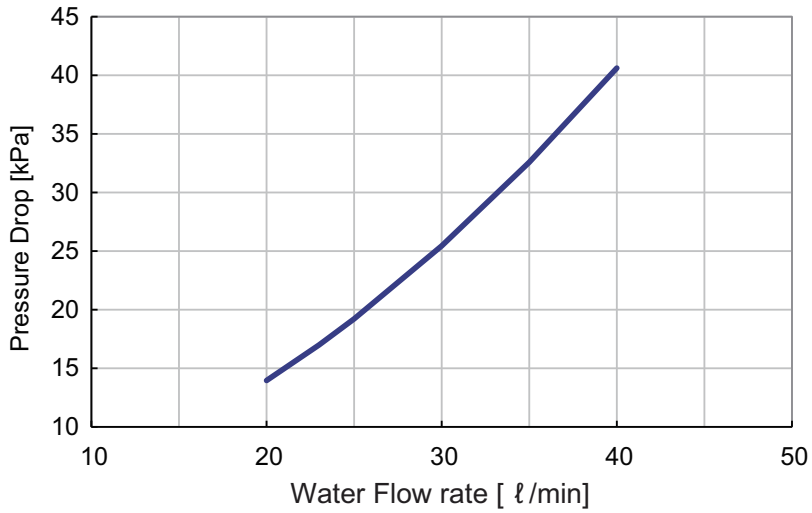


CAUTION

Please apply antifreeze according to local regulation.

7. Water pressure drop

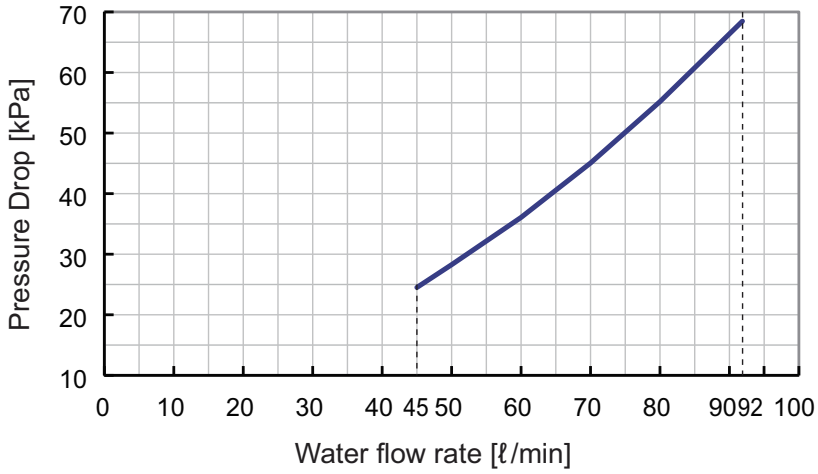
■ ARNH04GK2A4



⚠ CAUTION

Water Flow Rate Range (recommended) : ARNH04GK2A4 20 ~ 40 (ℓ/min)

■ ARNH10GK2A4



⚠ CAUTION

Water Flow Rate Range (recommended) : ARNH10GK2A4 45 ~ 92 (ℓ/min)

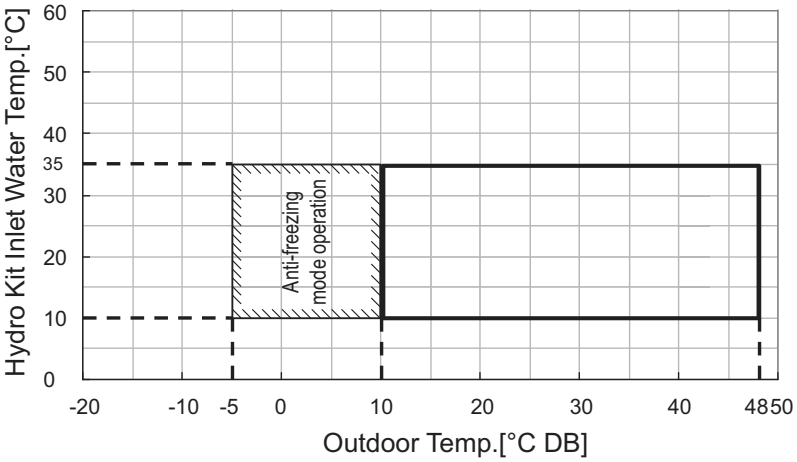
Note

- The Flow Factor (Kv) is used for water devices without integrated pumps.
- Flow Factor is calculated using metric units : Kv = Q x (SG / ΔP) ^ (1/2)
  - Q : Rated Water Flow (m^3/hr)
  - ΔP : Head loss (bar)
  - SG is the specific gravity of the fluid (for water = 1)

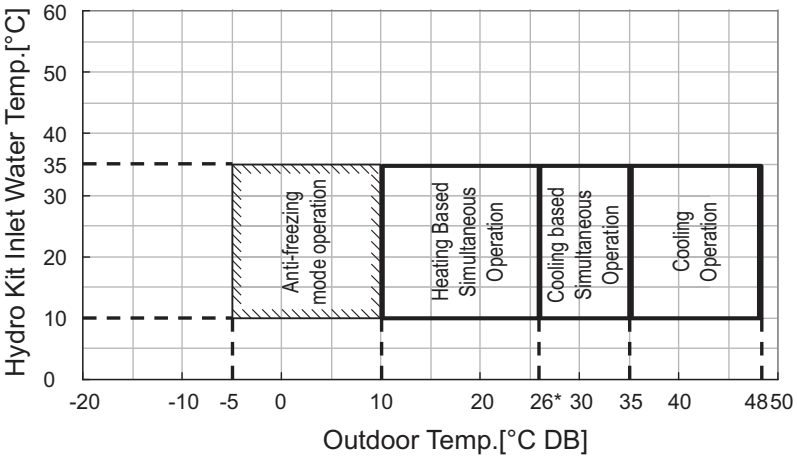
8. Operation limits

■ Cooling

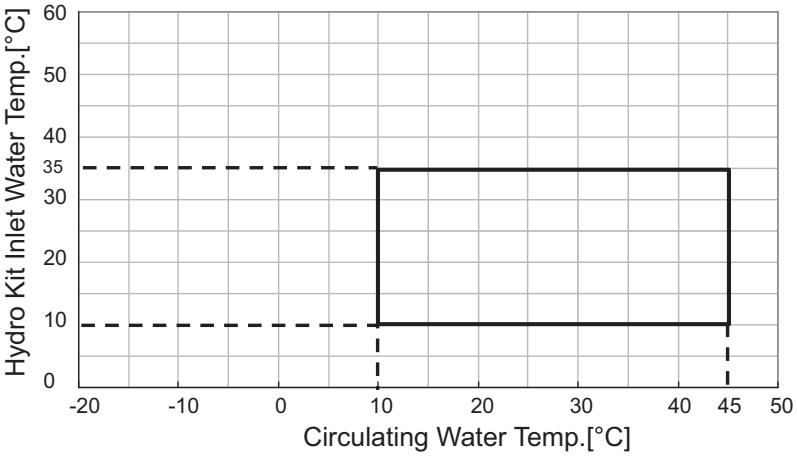
◆ ARUM------5(Heat Pump), ARUN------5, ARUN------0



◆ ARUM------5 (Heat Recovery), ARUB------0(Heat Recovery)



◆ ARWN-series, ARWB-series



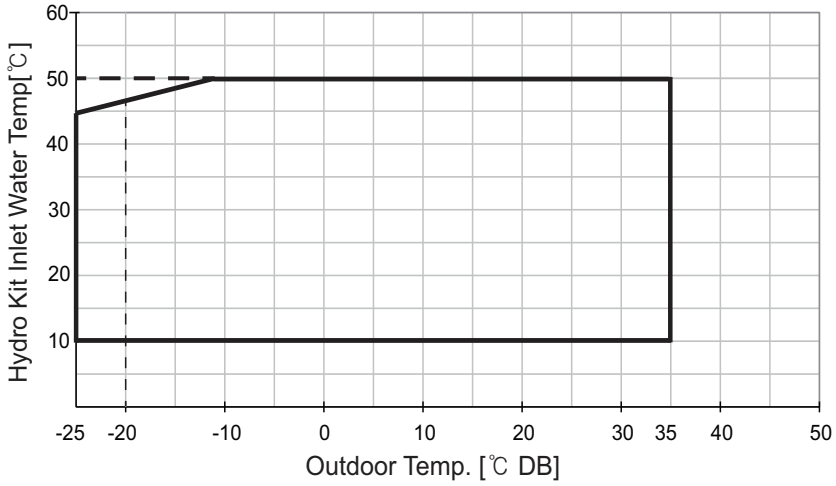
Note

1. For only Hydro Kit combination, maximum operation limits is outdoor temp. 35℃ DB.
2. 'Simultaneous Operation' means other Indoor units are operating on heating mode.
3. Operation limit follows the outdoor unit operation range and cannot operate outside the operating range.
4. * : 26℃ DB corresponds to the 16℃ WB .

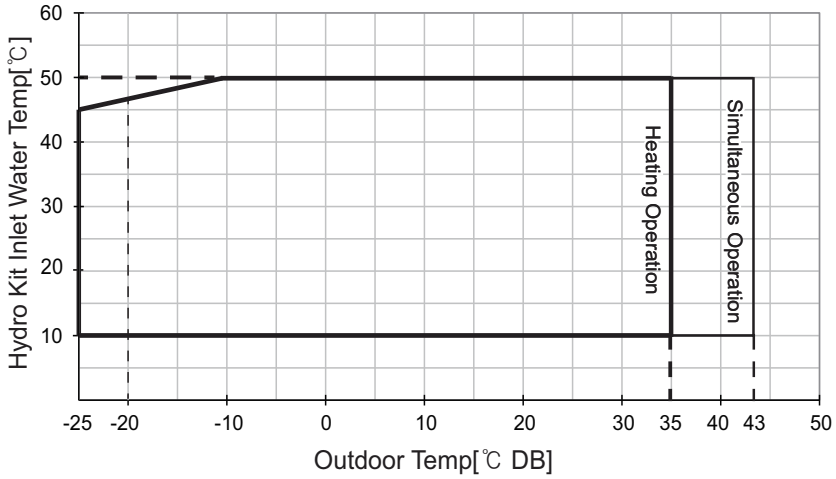
8. Operation limits

■ Heating

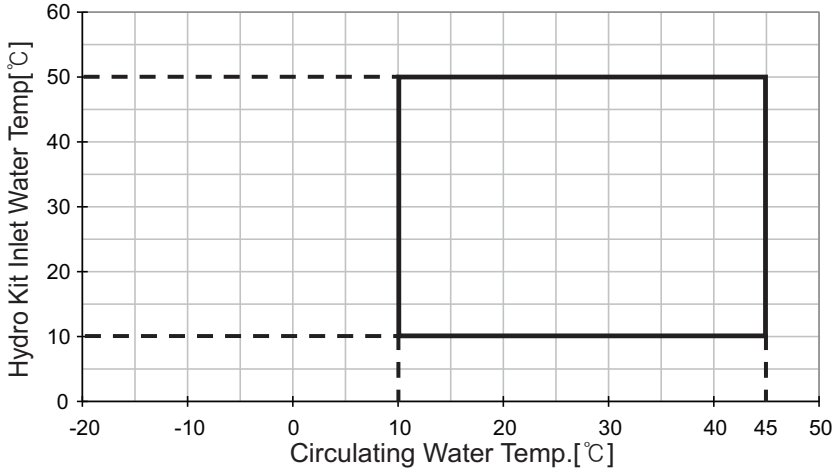
◆ ARUM------5(Heat Pump), ARUN------5, ARUN------0



◆ ARUM------5 (Heat Recovery), ARUB------0(Heat Recovery)



◆ ARWB- series, ARWN-series



Note

1. For only Hydro Kit combination, maximum operation limits is outdoor temp. 35℃ DB.
2. 'Simultaneous Operation' means other Indoor units are operating on cooling mode.
3. Operation limit follows the outdoor unit operation range and cannot operate outside the operating range.

9. Electric characteristics

■ Wiring of Main Power Supply and Equipment Capacity

1. The power supply work is needed only to the outdoor unit. The power supply to the indoor unit or the BD unit is conducted through the transmission wiring. Therefore, the power supply work can be carried out at just one place of the outdoor unit. It will contribute to simplify the work procedure and to save cost.
2. Bear in mind ambient conditions (ambient temperature,direct sunlight, rain liquid,etc.) when proceeding with the wiring and connections
3. The wire size is the minimum value for metal conduit wiring. The power cord size should be 1 rank thicker taking into account the line voltage drops. Make sure the power-supply voltage does not drop more than 10%.
4. Specific wiring requirements should adhere to the wiring regulations of the region.
5. Power supply cords of parts of appliances for outdoor use should not be lighter than polychloroprene sheathed flexible cord.
6. Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.

⚠ WARNING

- **Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations and guidance of each electric power company.**
- **Make sure to use specified wires for connections so that no external force is imparted to terminal connections. If connections are not fixed firmly, it may cause heating or fire.**
- **Make sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.**

⚠ CAUTION

- **All installation site must require attachment of an earth leakage breaker. If no earth leakage breaker is installed, it may cause an electric shock.**
- **Do not use anything other than breaker and fuse with correct capacity. Using fuse and wire or copper wire with too large capacity may cause a malfunction of unit or fire.**

Model	Type	Hz	Volts	Voltage Range	Power Supply			Input(W)	
					MCA(A)	MFA(A)	FLA(A)	Cooling(W)	Heating(W)
ARNH04GK2A4 ARNH10GK2A4	K2	50	220-240	Max:264 Min:198	0.06	15	0.05	10	10
	K2	60	220	Max:242 Min:198	0.06	15	0.05	10	10

Symbols

MCA : Minimum Circuit Amperes (A)

MFA : Maximum Fuse Amperes (A)

W : Rated input (W)

FLA : Full Load Amperes (A)

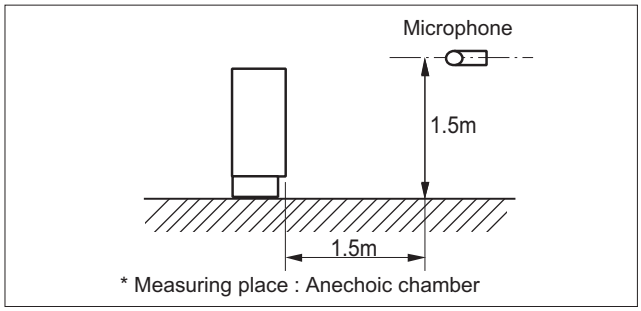
Note

1. Voltage range
   Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above the listed range limits.
2. Maximum allowable voltage unbalance between phases is 2%.
3. MCA/MFA
   MCA=1.25 x FLA
   MFA≤ 4 x FLA
   (Next lower standard fuse rating. Minimum 15A)
4. Select wire size based on the MCA
5. Instead of fuse, use Circuit Breaker.

10. Sound levels

10.1 Sound pressure level

■ Overall

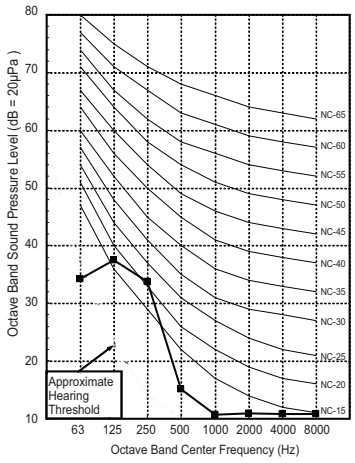


Note

1. Sound measured at some distance away from the center of the unit.
2. Data is valid at free field condition.
3. Reference accoustic pressure 0dB = 20μPa.
4. Data is valid at nominal operation condition.
   Refer to the Model Specifications for nominal conditions(Power source and Ambient temperature, etc)
5. Sound level will vary depending on a range of factors such as the construction(acoustic absorption coefficient) of particular room in which the equipment in installed.
6. Sound pressure level is measured on the rated condition in the anechoic rooms by ISO 3745 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.

Model	Sound Level (dB(A))
ARNH04GK2A4	26
ARNH10GK2A4	

ARNH04GK2A4 / ARNH10GK2A4



MULTI V™

Hydro Kit

Floor Standing (High Temperature)

1. List of functions
2. Specifications
3. Dimensions
4. Piping diagrams
5. Wiring diagrams
6. Capacity correction factor
7. Water pressure drop
8. Operation limits
9. Electric characteristics
10. Sound levels

1. List of functions

■ Basic function of Units

Category	Functions	ARNH04GK3A4 / ARNH08GK3A4
Installation	Drain pump	X
	E.S.P. control	X
	Electric heater (operation)	X
	High ceiling operation	X
Reliability	Hot start	X
	Self diagnosis	O
	Soft dry operation	X
Convenience	Auto changeover	X
	Auto cleaning	X
	Auto operation (artificial intelligence)	X
	Auto restart operation	O
	Child lock	O
	Forced operation	X
	Group control	O
	Sleep mode	X
	Timer (on/off)	O
	Timer (weekly)	O
	Two thermistor control	X
Individual control	Standard wired remote controller	O
	Premium wired remote controller	X
	Simple wired remote controller	X
	Simple Wired remote controller(for hotel use)	X
	Wireless remote controller(simple)	X
Network function	General central controller (Non LGAP)	X
	Network Solution (LGAP)	O
Hydro Kit Functions	Anti-Condensation on floor (cooling)	X
	Water Pump ON / OFF Control	O
	Water Flow detection	O
	Thermostat Interface (230V AC)	O
	Thermostat Interface (24V AC)	X
	DHW(Domestic Hot Water) tank kit	X
	PHEX Anti-Freezing Control	O
	Water Pump Forced Operation	O
	Autosetting according to Ambient Temperature	O
	Silent Operation	X
	Anti-overheating of Water Pipe	O
	Emergency Operation	O
	Weather Dependent Operation with Thermostat	X
	Scheduler (Domestic Hot Water Tank Heater)	X
	Timer (Domestic Hot Water Tank Heater)	X
	Quick Domestic Hot Water Tank Heating	O
	Electric Heater Capacity Control	X
	Screed Drying Mode	X
	Sump Heater	X
	One Point Dry Contact Input (CN-EXT)	O
	Tank Disinfection	O
	Pump Frequency	X
	SG Ready	O

Note

1. O : Applied, X : Not applied
   Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.
   Accessory line-ups varies by region, so check your local catalogue or local sales material.

1. List of functions

■ Accessory Compatibility List

Category		Product	ETC	ARNH04GK3A4 ARNH08GK3A4
Central Controller	Simple	PQCSZ250S0	AC EZ	X
	AC Ez Touch	PACEZA000	AC Ez Touch	O
	AC Smart	PACS4B000	AC Smart IV	O
		PACS5A000	AC Smart 5	O
	ACP	PACP4B000	ACP IV	O
		PACP5A000	ACP 5	O
	AC Manager	PACM4B000	AC Manager IV	O
		PACM5A000	AC Manager 5	O
Gateway	BACnet	PQNFB17C0	ACP BACnet	O
	Lonworks	PLNWKB000	ACP Lonworks	O
	Modbus	PMBUSB00A	Modbus Gateway	O
Dry contact	Simple Contact	PDRYCB000 PDRYCB100	Simple Dry Contact	O
	Communication type	PDRYCB400	2 Points Dry Contact (For Setback)	X
		PDRYCB300	Dry Contact For 3rd Party Thermostat	O
		PDRYCB500	Dry Contact For Modbus	X
ETC	Remote temperature sensor	PQRSTA0	-	O
	Zone controller	ABZCA	-	X
	Group control wire	PZCWRCG3	0.25m	O
	Wi-Fi Controller*	PWFMDD200	-	O
	Independent Power Module	PRIP0	-	X
	Refrigerant Leakage Detector	PRLDNVS0	-	O
	PDI	PPWRDB000	PDI Standard	O
		PQNUD1S40	PDI Premium	O
Special Kit for Hydrokit	Solar-Thermal Interface kit with DHW Tank	PHLLA	Limit Temperature : 96℃	X
	Indoor Drain Pan	PHDPB	-	X

Note

1. O : Applied, X : Not applied
   Accessory model name : Installed at field, ordered and purchased separately by the corresponding model name, supplied with separated package.
2. If you need more detail, please refer to the BECON PDB or the manual of product.
   (http://partner.lge.com/global : Home> Doc.Library> Product > Control(BECON))

2. Specifications

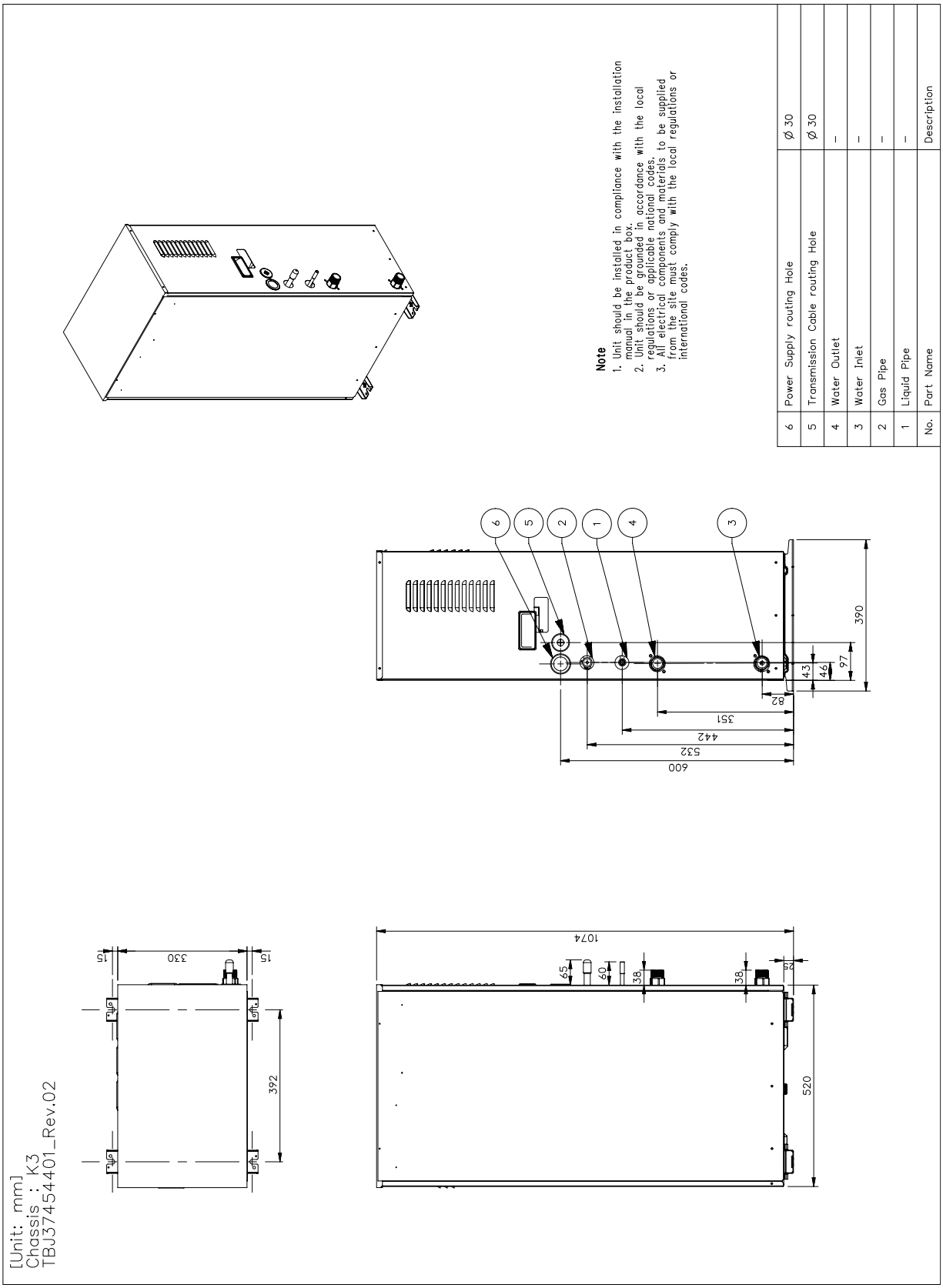
Model			Unit	ARNH04GK3A4	ARNH08GK3A4
Capacity (Rated)		Heating	kW	13.8	25.2
			kcal/h	11,870	21,700
			Btu/h	47,000	86,000
Input (Rated)		Heating	kW	2.30	5.00
Casing		Material	-	Painted Steel Plate	Painted Steel Plate
		Color (RAL code)	-	RAL 7030	
Dimensions	Net	Body(W x H x D)	mm	520 x1,074 x 330	520 x1,074 x 330
			inch	20-15/32 x 42-9/32 x 13	20-15/32 x 42-9/32 x 13
Weight	Net	Body	kg (lbs)	86.0(189.6)	90.0(198.4)
Heat Exchanger	Refrigerant to Refrigerant	Type	-	Brazed Plate HEX	Brazed Plate HEX
		Quantity	EA	1	1
		Number of Plate	EA	50	60
	Refrigerant to Water	Type	-	Brazed Plate HEX	Brazed Plate HEX
		Quantity	EA	1	1
		Number of Plate	EA	76	48
		Rated Water Flow	l / min	19.8	36
		Head Loss	kPa	5	20
Compressor		Type	-	Twin Rotary inverter	Twin Rotary inverter
		Piston Displacement	cm^2/rev	52.5	52.5
		Number of Revolution	rev/min	3,600	3,600
		Motor Output x Number	W x No.	4,000 x 1	4,000 x 1
		Starting Method	-	Direct On Line	Direct On Line
		Oil Type	-	FVC68D(PVE)	FVC68D(PVE)
		Oil Charge	cc	1,300	1,300
Temperature Control			-	Microprocessor, Thermostat for heating	
Water Tank Temperature Sensor		Type(Sensor Holder)	inch	Male PT 1/2	
		Length	m	12	
Sound Absorbing Thermal Insulation Material			-	Foamed polystrene	
Safety Device			-	Fuse, High Pressure Switch	
Piping Connections	Water Side	Inlet	inch	Male PT1	Male PT 1
		Outlet	inch	Male PT1	Male PT 1
	Refrigerant Side	Liquid	mm(inch)	Ø 9.52(3/8)	Ø 9.52(3/8)
		Gas	mm(inch)	Ø 15.88(5/8)	Ø 19.05(3/4)
Drain Piping Connection			inch	Male PT1	Male PT 1
Sound Pressure Level		Cooling	dB(A)	-	-
		Heating	dB(A)	44	46
Transmission cable			No. x mm²	2C x 1.0~1.5	2C x 1.0~1.5
Refrigerant	Refrigerant to Refrigerant	Refrigerant name	-	R410A	R410A
		Control	-	Electronic Expansion Valve	
	Refrigerant to Water	Refrigerant name	-	R134a	R134a
		Precharged Amount	kg (lbs)	2.3 (5.1)	3.0 (6.6)
		Additional Refrigerant Charge Amount	kg (lbs)	0.8 (1.8)	1.0 (2.2)
		t-CO2 eq	-	3.29	4.29
		Control	-	Electronic Expansion Valve	
Power Supply			V, Ø, Hz	220-230-240, 1, 50/60	220-230-240, 1, 50/60
Running Current		Heating	A	10.56 - 10.10 - 9.68	23.00 - 22.00 - 21.08

Note

1. Capacities are based on the following conditions:
   - Heating Temperature :Outdoor 7°C(44.6°F) DB / 6°C(42.8°F) WB, Water Inlet 55°C(131°F) / Outlet 65°C(149°F)
   - Difference Limit of Elevation (Outdoor ~ Indoor Unit) is 0m.
   - Piping Length : Interconnected Pipe Length = 7.5m
2. Wiring cable size must comply with the applicable local and national code
3. Due to our policy of innovation, some specifications may be changed without notification.
4. Sound pressure level is measured on the rated condition in the anechoic rooms by ISO 3745 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.
5. This product contains Fluorinated greenhouse gases. (R410A,GWP(Global warming potential) = 2087.5)

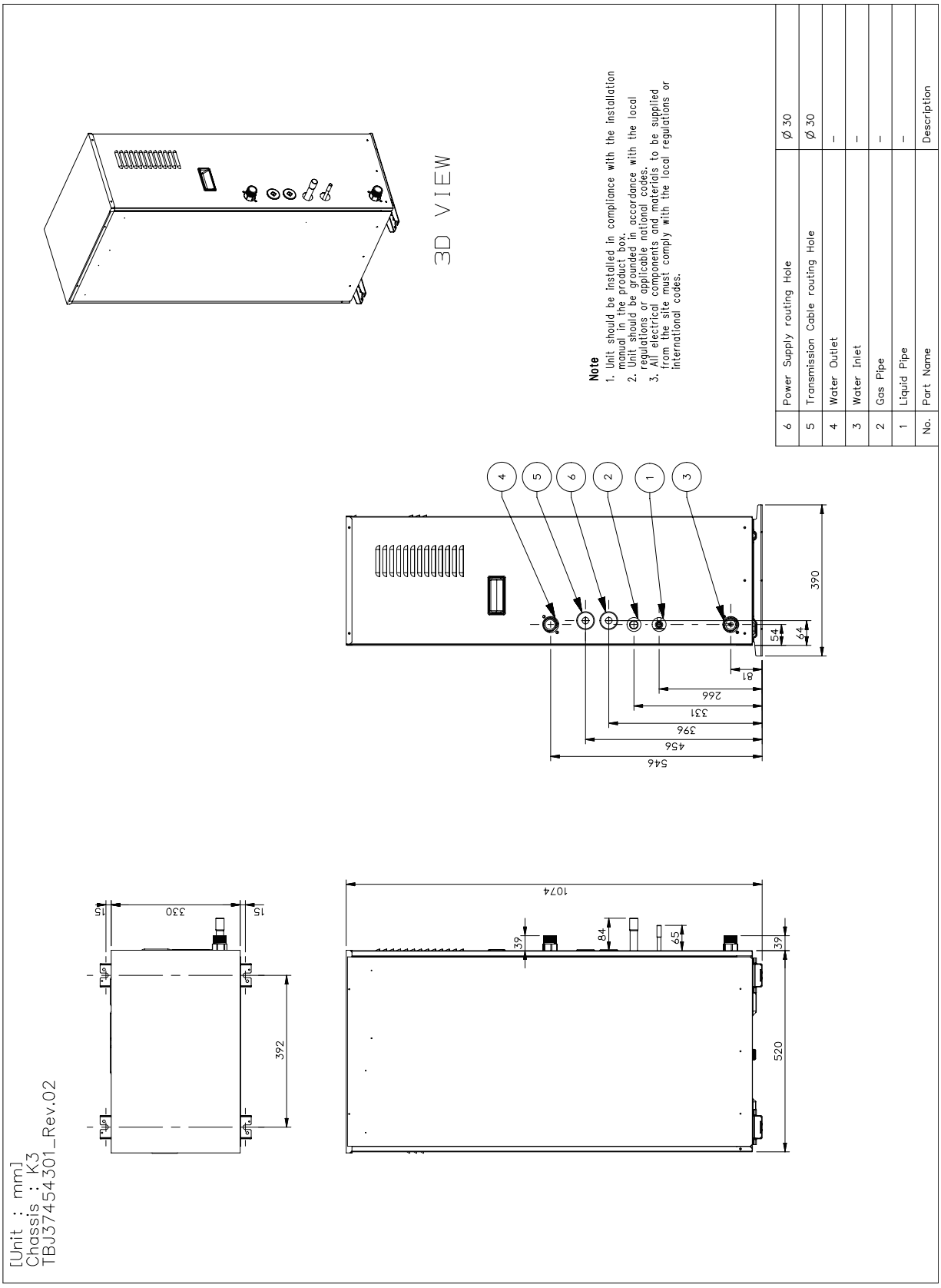
3. Dimensions

■ ARNH04GK3A4



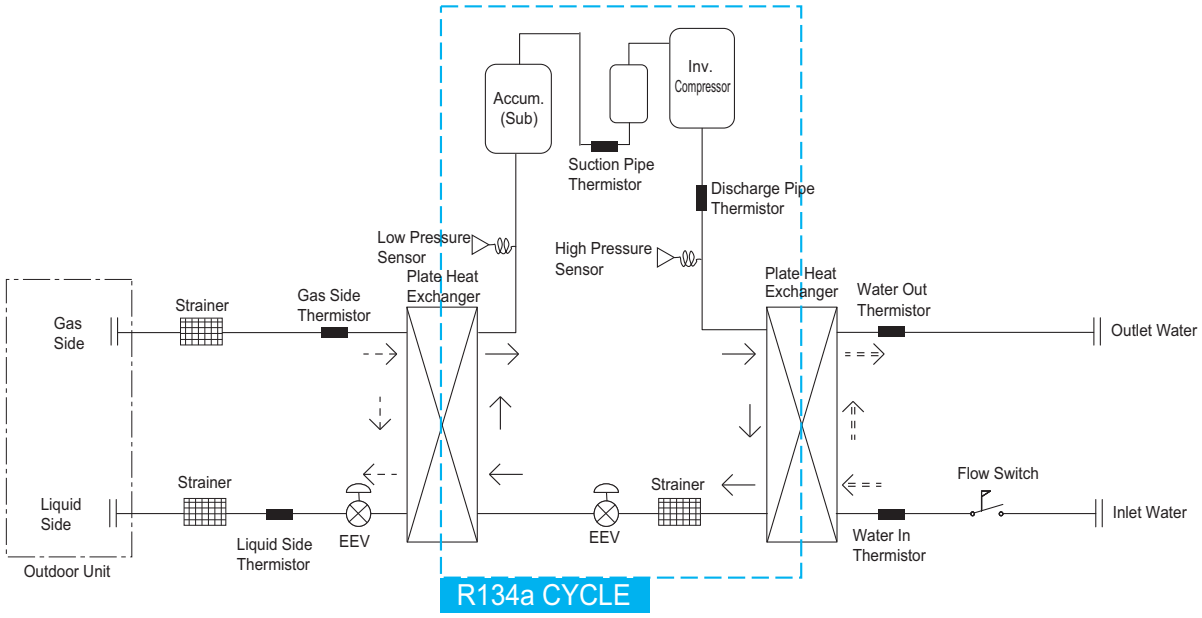
3. Dimensions

■ ARNH08GK3A4



4. Piping diagrams

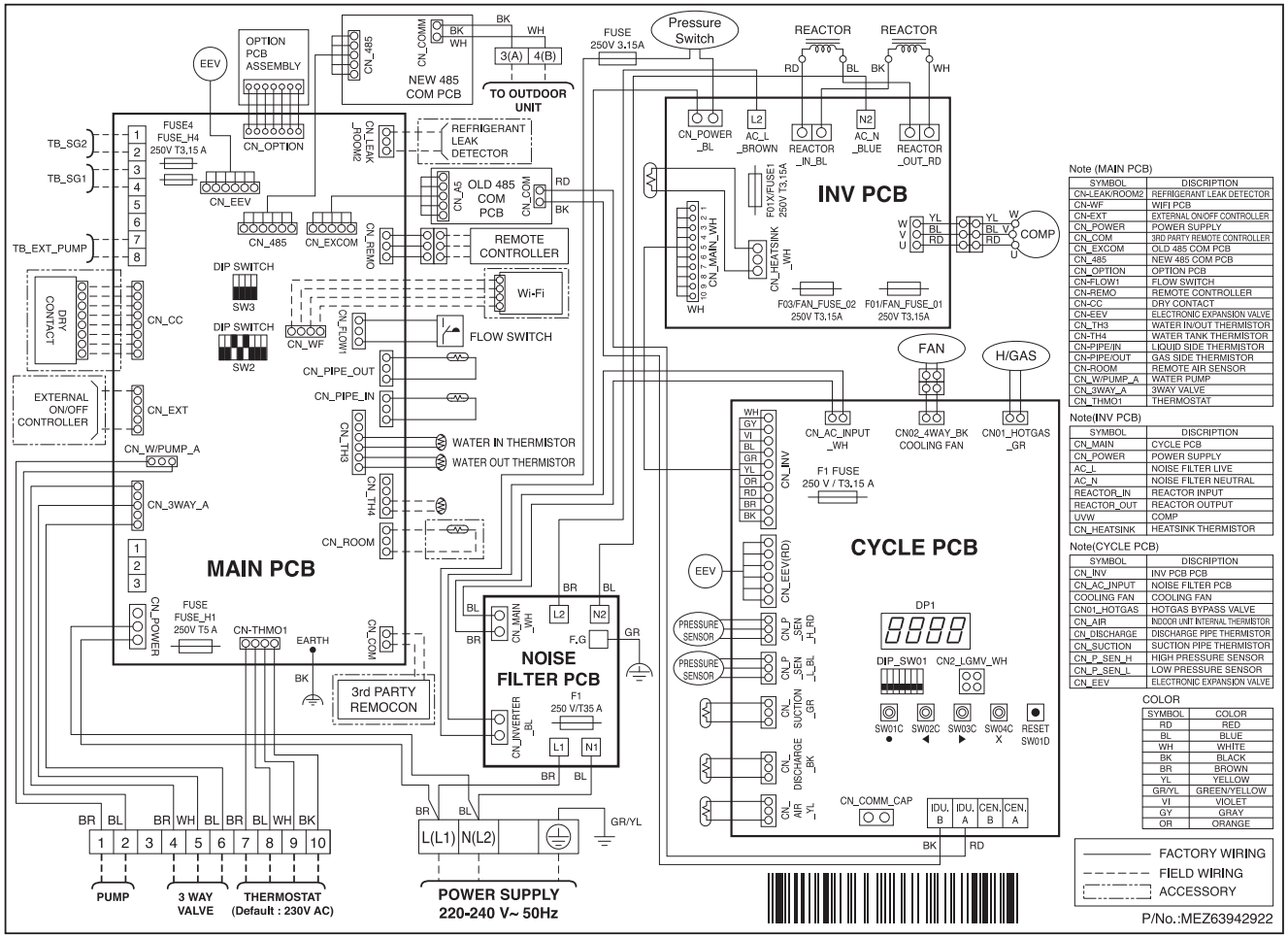
■ ARNH04GK3A4 / ARNH08GK3A4



Description	PCB Connector	Remarks
Air Temperature Sensor	CN-ROOM	* Optional accessory (being sold separately) * Not shown in diagram
Liquid Side Temperature Sensor	CN-PIPE/IN	
Gas Side Temperature Sensor	CN-PIPE/OUT	
Water Inlet Temperature Sensor	CN-TH3	* Th4 / Th5 are connected to 4 pin type connector CN-TH3 (Black)
Water Outlet Temperature Sensor		
Flow Switch	CN-FLOW1	

5. Wiring diagrams

■ ARNH04GK3A4 / ARNH08GK3A4



Note (MAIN PCB)

SYMBOL	DISCRIPTION
CN-LEAK/ROOM2	REFRIGERANT LEAK DETECTOR
CN-WF	WIFI PCB
CN-EXT	EXTERNAL ON/OFF CONTROLLER
CN_POWER	POWER SUPPLY
CN_COM	3RD PARTY REMOTE CONTROLLER
CN_EXCOM	OLD 485 COM PCB
CN_485	NEW 485 COM PCB
CN_OPTION	OPTION PCB
CN-FLOW1	FLOW SWITCH
CN-REMO	REMOTE CONTROLLER
CN-CC	DRY CONTACT
CN-EEV	ELECTRONIC EXPANSION VALVE
CN_TH3	WATER IN/OUT THERMISTOR
CN-TH4	WATER TANK THERMISTOR
CN-PIPE/IN	LIQUID SIDE THERMISTOR
CN-PIPE/OUT	GAS SIDE THERMISTOR
CN-ROOM	REMOTE AIR SENSOR
CN_W/PUMP_A	WATER PUMP
CN_3WAY_A	3WAY VALVE
CN_THMO1	THERMOSTAT

Note(INV PCB)

SYMBOL	DISCRIPTION
CN_MAIN	CYCLE PCB
CN_POWER	POWER SUPPLY
AC_L	NOISE FILTER LIVE
AC_N	NOISE FILTER NEUTRAL
REACTOR_IN	REACTOR INPUT
REACTOR_OUT	REACTOR OUTPUT
UVW	COMP
CN_HEATSINK	HEATSINK THERMISTOR

Note(CYCLE PCB)

SYMBOL	DISCRIPTION
CN_INV	INV PCB PCB
CN_AC_INPUT	NOISE FILTER PCB
COOLING FAN	COOLING FAN
CN01_HOTGAS	HOTGAS BYPASS VALVE
CN_AIR	INDOOR UNIT INTERNAL THERMISTOR
CN_DISCHARGE	DISCHARGE PIPE THERMISTOR
CN_SUCTION	SUCTION PIPE THERMISTOR
CN_P_SEN_H	HIGH PRESSURE SENSOR
CN_P_SEN_L	LOW PRESSURE SENSOR
CN_EEV	ELECTRONIC EXPANSION VALVE

COLOR

SYMBOL	COLOR
RD	RED
BL	BLUE
WH	WHITE
BK	BLACK
BR	BROWN
YL	YELLOW
GR/YL	GREEN/YELLOW
VI	VIOLET
GY	GRAY
OR	ORANGE

6. Capacity correction factor

6.1 Capacity correction factor by temperature

■ Capacity/Power Input Calculation method

Total Capacity = Hydro Kit Capacity + Indoor Unit Capacity

Hydro Kit Capacity = Q_{ODU} x (I_{HK} / I_{TOTAL}) x F_{TC,T_HK} x F_{TC,W_HK}x F_{TC,C_HK} x F_{TC,P_ODU} x F_{TC,D_ODU}

Q_{ODU} =	Outdoor Unit capacity by outdoor air (outside inlet water) temp. and capacity ratio at standard indoor temp. * Standard indoor temperature is 27/19℃ DB/WB on cooling mode, 20℃ DB on heating mode.	..... Refer to *Capacity tables of outdoor unit PDB*
F_{TC,T_HK} =	Capacity correction factor by Outdoor and water inlet temperature.	..... Refer to *following Graph of this PDB*
F_{TC,W_HK} =	Capacity correction factor by Water flow rate.	..... Refer to *following Graph of this PDB*
F_{TC,C_HK} =	Capacity correction factor by Combination ratio.	..... Refer to *following Graph of this PDB*
F_{TC,P_ODU} =	Capacity correction factor by Refrigerant Piping length.	..... Refer to *correction factors of outdoor unit PDB*
F_{TC,D_ODU} =	Capacity correction factor by Defrosting operation.	..... Refer to *correction factors of outdoor unit PDB*
I_{HK} =	Capacity index for Hydro Kit	..... Refer to *index table of this PDB*
I_{TOTAL} =	Sum of Capacity index for combined indoor units and hydro kit	..... Refer to *index table of outdoor unit PDB*

Total Power Input = Hydro Kit Power Input + Indoor Unit Power Input

Hydro Kit Power Input = [PI_{ODU} x (I_{HK} / I_{TOTAL}) x $F_{PI,T\_HK(O)}$ x $F_{PI,W\_HK(O)}$ x $F_{PI,C\_HK(O)}$]
+ [PI_{HK} x $F_{PI,T\_HK(H)}$ x $F_{PI,W\_HK(H)}$]

PI_{ODU}=	Outdoor Unit Power Input by outdoor air (outside inlet water) temp. and capacity ratio at standard indoor temp. * Standard indoor temperature is 27/19℃ DB/WB on cooling mode, 20℃ DB on heating mode.	..... Refer to *Capacity tables of outdoor unit PDB*
PI_{HK}=	Hydro Kit Nominal Power Input	.... Refer to *Specifications of this PDB*
$F_{PI,T\_HK(O)}$ =	Power Input correction factor [Outdoor Unit] by Outdoor and water inlet temperature.	.... Refer to *following Graph of this PDB*
$F_{PI,W\_HK(O)}$ =	Power Input correction factor [Outdoor Unit] by Water flow rate	..... Refer to *following Graph of this PDB*
$F_{PI,C\_HK(O)}$ =	Power Input correction factor [Outdoor Unit] by Combination ratio	..... Refer to *following Graph of this PDB*
$F_{PI,T\_HK(H)}$ =	Power Input correction factor [Hydro Kit] by Outdoor and water inlet temperature.	.... Refer to *following Graph of this PDB*
$F_{PI,W\_HK(H)}$ =	Power Input correction factor [Hydro Kit] by Water flow rate	..... Refer to *following Graph of this PDB*
$F_{PI,C\_HK(H)}$ =	Power Input correction factor [Hydro Kit] by Combination ratio	..... Refer to *following Graph of this PDB*
I_{HK} =	Capacity index for Hydro Kit	..... Refer to *index table of this PDB*
I_{TOTAL} =	Sum of Capacity index for combined indoor units and hydro kit	..... Refer to *index table of outdoor unit PDB*

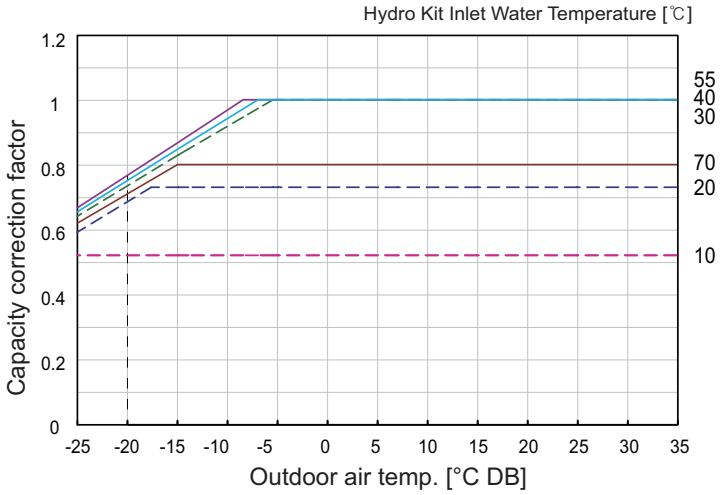
Note

1. When calculating at upper or lower temperature than the range of Outdoor unit capacity table, use the same value with the boundary value of that. For example, when calculating Heating PI with capacity table of Outdoor unit at upper temperature than 15℃DB, use the same value of PI at 15℃ DB.

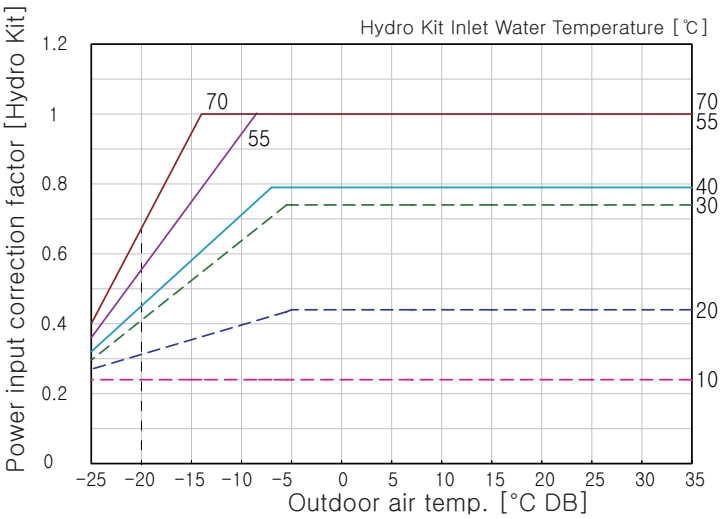
6. Capacity correction factor

■ Combination with Multi V 5 system(ARU-5) and Multi V S system(ARU-S*0) for Heating

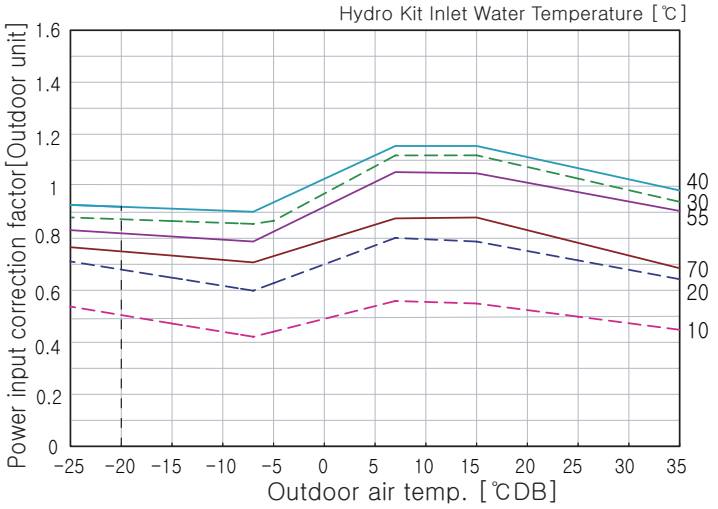
◆ Capacity correction factor



◆ Power Input correction factor (Hydro Kit)



◆ Power Input correction factor (Outdoor unit)



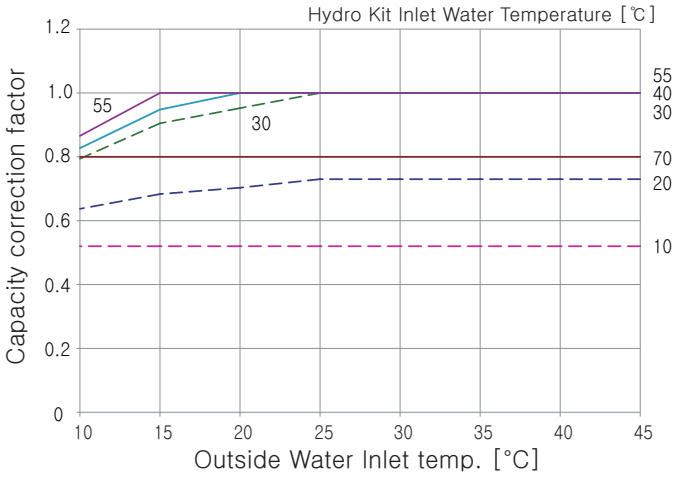
Note

Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

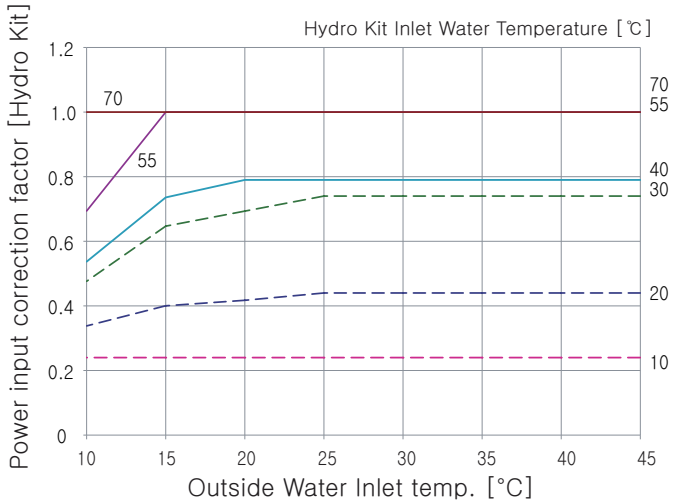
6. Capacity correction factor

■ Combination with Multi V Water system (ARW-) for Heating

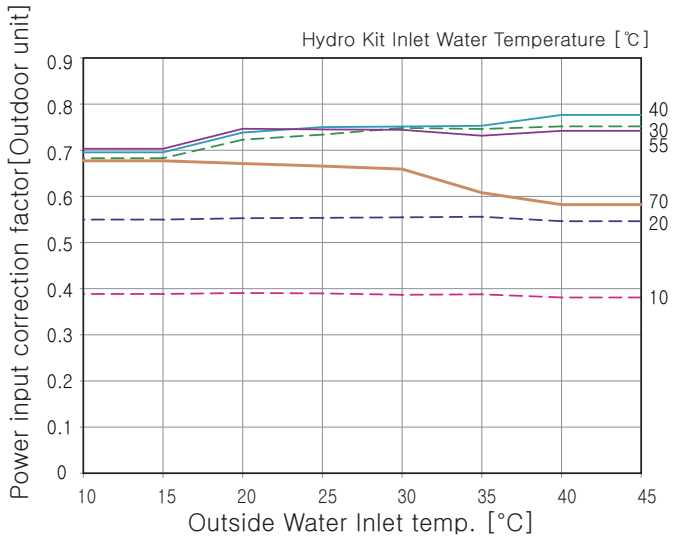
◆ Capacity correction factor



◆ Power Input correction factor (Hydro Kit)



◆ Power Input correction factor (Outdoor unit)



Note

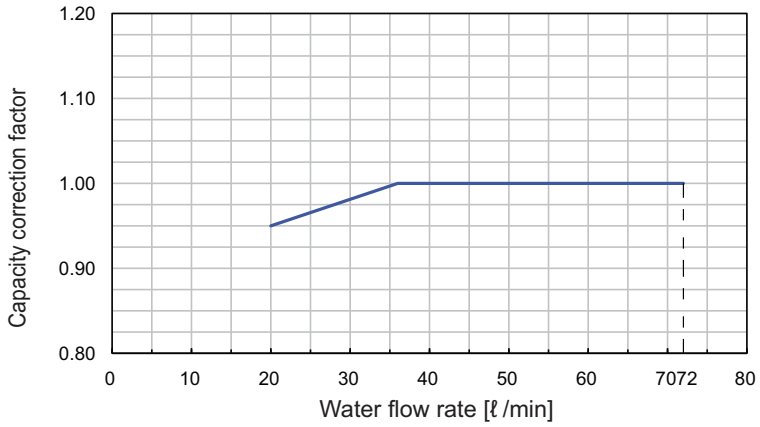
Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

6. Capacity correction factor

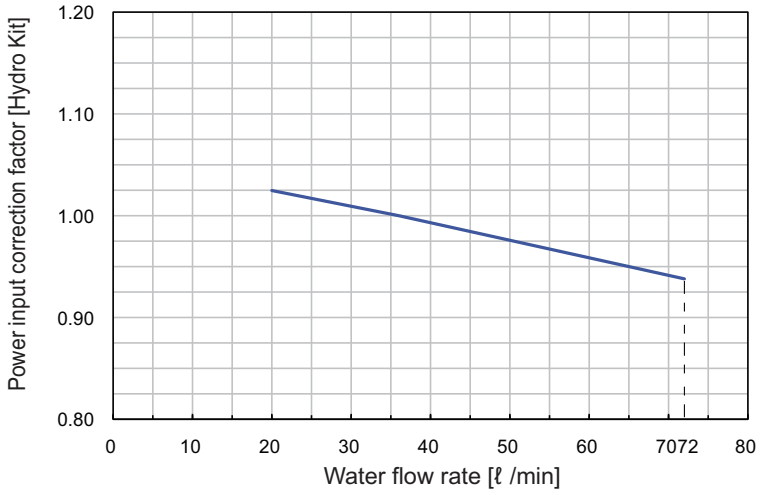
6.2 Capacity correction factor by water flow rate

■ Heating

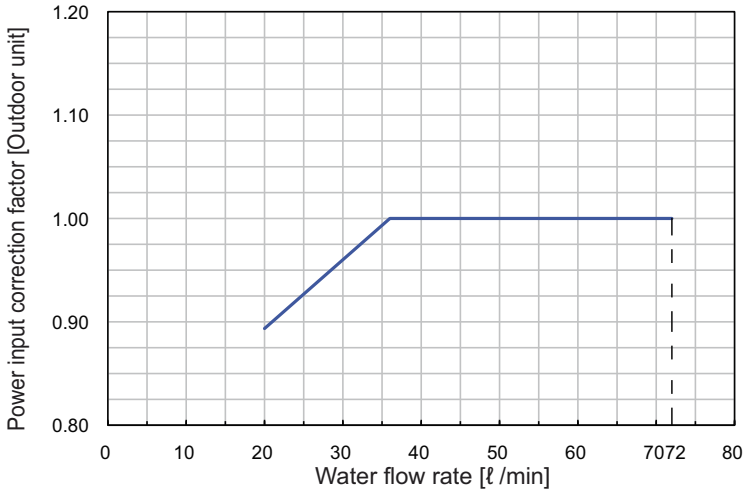
◆ Capacity correction factor



◆ Power Input correction factor (Hydro Kit)



◆ Power Input correction factor (Outdoor unit)



⚠ CAUTION

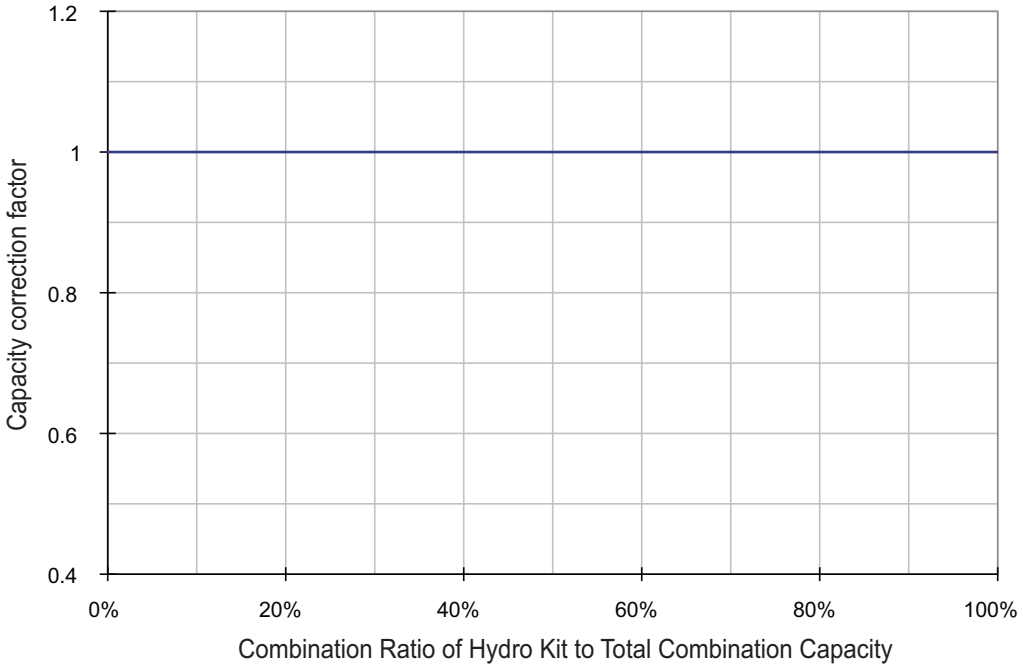
Water Flow Rate Range (recommended) : ARNH04GK3A4 19.8 ~ 40 (ℓ/min), ARNH08GK3A4 20 ~ 72 (ℓ/min)

6. Capacity correction factor

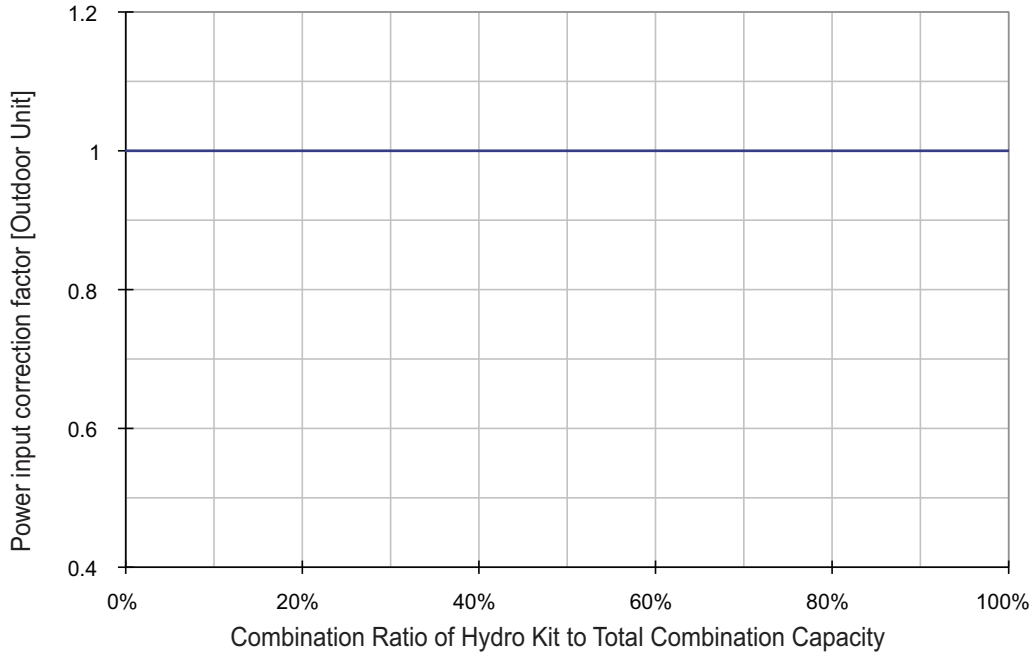
6.3 Capacity correction factor by combination ratio

■ Heating

◆ Capacity correction factor



◆ Power Input correction factor (Outdoor unit)

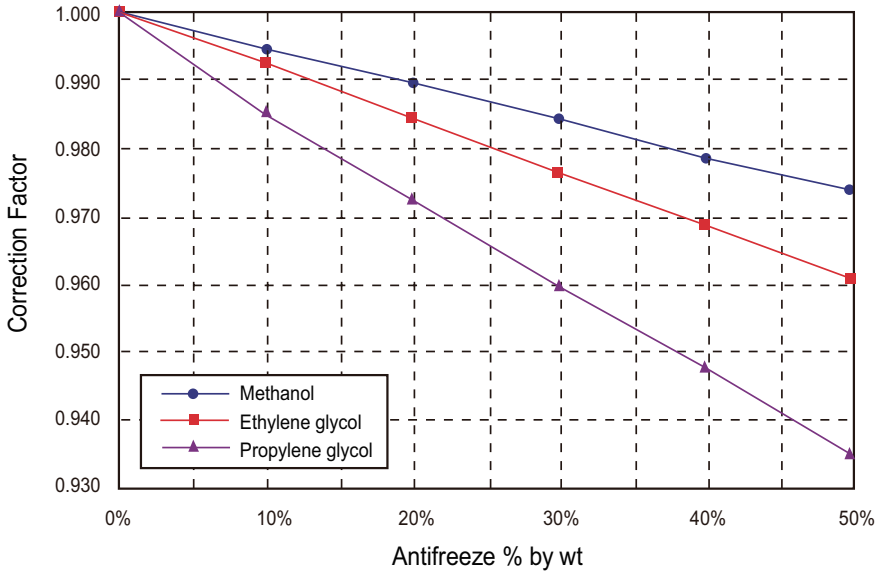


6. Capacity correction factor

6.4 Capacity correction factor by antifreeze

Antifreeze Type	Item	Antifreeze % by wt				
		10%	20%	30%	40%	50%
Methanol	Heating	0.995	0.990	0.985	0.979	0.974
	Pressure Drop	1.023	1.057	1.091	1.122	1.160
Ethylene glycol	Heating	0.993	0.985	0.977	0.969	0.961
	Pressure Drop	1.024	1.068	1.124	1.188	1.263
Propylene glycol	Heating	0.966	0.973	0.960	0.948	0.935
	Pressure Drop	1.040	1.098	1.174	1.273	1.405

◆ **Correction factor of heating capacity**

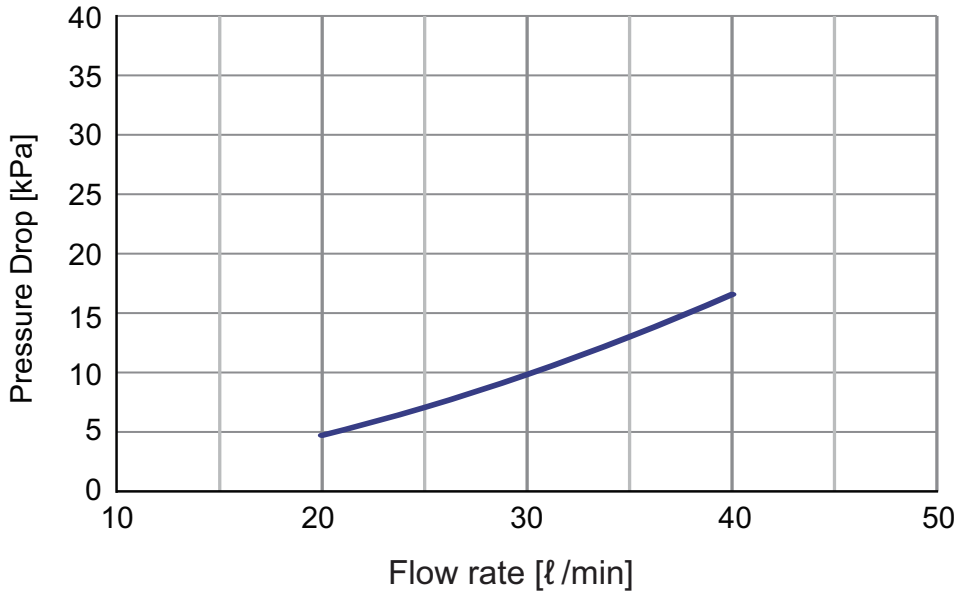


CAUTION

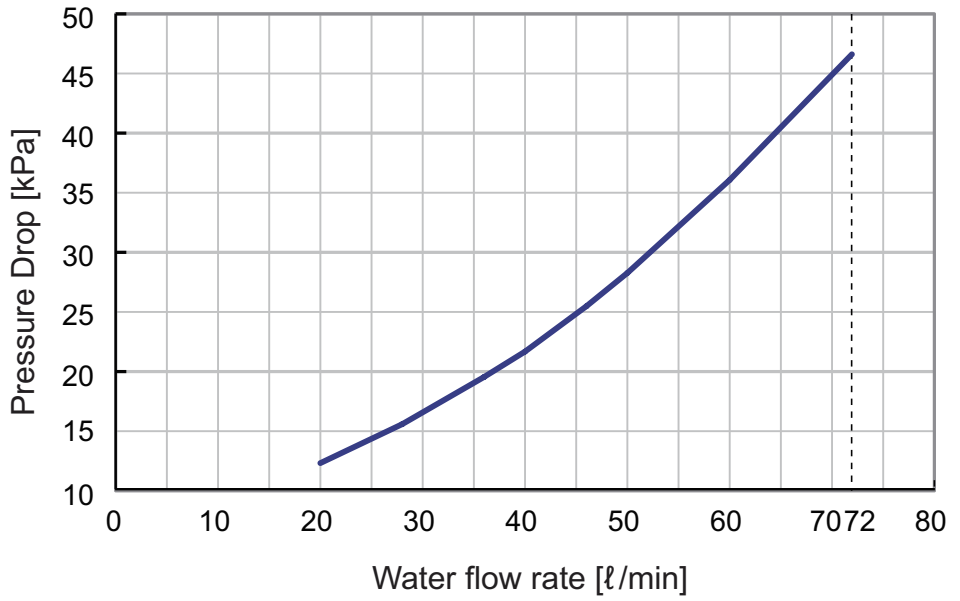
Please apply antifreeze according to local regulation.

7. Water pressure drop

■ ARNH04GK3A4



■ ARNH08GK3A4



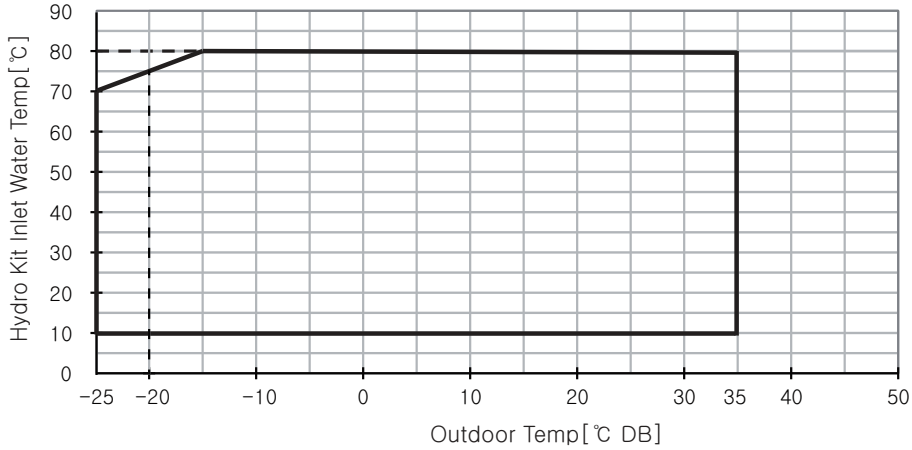
⚠ CAUTION

Water Flow Rate Range (recommended) : ARNH04GK3A4 19.8 ~ 40 (ℓ/min), ARNH08GK3A4 20 ~ 72 (ℓ/min)

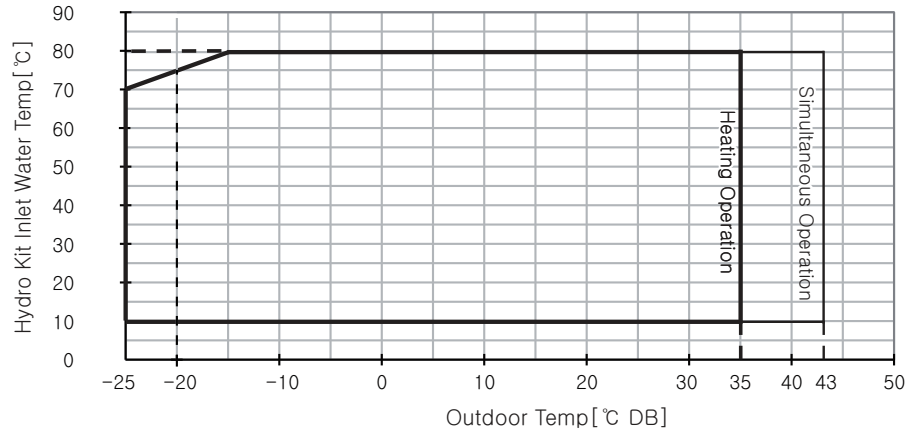
8. Operation limits

■ ARNH04GK3A4 / ARNH08GK3A4

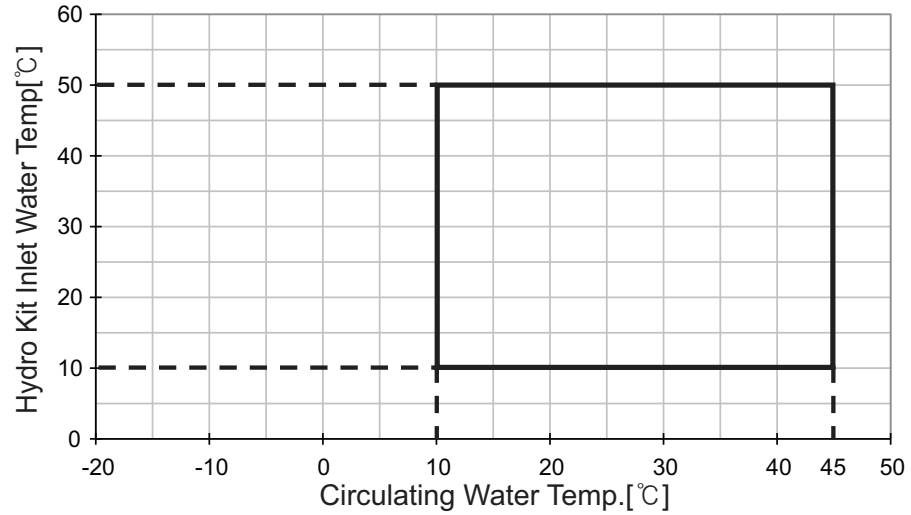
◆ ARUM------5(Heat Pump), ARUN------5, ARUN------0



◆ ARUM------5 (Heat Recovery), ARUB------0(Heat Recovery)



◆ ARWN-series, ARWB-series



Note

1. For only Hydro Kit combination, maximum operation limits is outdoor temp. 35℃ DB.
2. 'Simultaneous Operation' means other Indoor units are operating on Cooling mode.
3. Operation limit follows the outdoor unit operation range and cannot operate outside the operating range.

9. Electric characteristics

■ Wiring of Main Power Supply and Equipment Capacity

1. The power supply work is needed only to the outdoor unit. The power supply to the indoor unit or the BD unit is conducted through the transmission wiring. Therefore, the power supply work can be carried out at just one place of the outdoor unit. It will contribute to simplify the work procedure and to save cost.
2. Bear in mind ambient conditions (ambient temperature,direct sunlight, rain liquid,etc.) when proceeding with the wiring and connections
3. The wire size is the minimum value for metal conduit wiring. The power cord size should be 1 rank thicker taking into account the line voltage drops. Make sure the power-supply voltage does not drop more than 10%.
4. Specific wiring requirements should adhere to the wiring regulations of the region.
5. Power supply cords of parts of appliances for outdoor use should not be lighter than polychloroprene sheathed flexible cord.
6. Don't install an individual switch or electrical outlet to disconnect each of indoor unit separately from the power supply.

⚠ WARNING

- **Follow ordinance of your governmental organization for technical standard related to electrical equipment, wiring regulations and guidance of each electric power company.**
- **Make sure to use specified wires for connections so that no external force is imparted to terminal connections. If connections are not fixed firmly, it may cause heating or fire.**
- **Make sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.**

⚠ CAUTION

- **All installation site must require attachment of an earth leakage breaker. If no earth leakage breaker is installed, it may cause an electric shock.**
- **Do not use anything other than breaker and fuse with correct capacity. Using fuse and wire or copper wire with too large capacity may cause a malfunction of unit or fire.**

9. Electric characteristics

Model	Type	Hz	Volts	Voltage Range	Power Supply			Compressor	
					MCA(A)	TOCA(A)	MFA(A)	MSC(A)	RLA(A)
ARNH04GK3A4	K3	50	220-240	Max:264 Min:198	18.2	20	25	-	10.56
	K3	60	220	Max:242 Min:198	18.2	20	25	-	10.56
ARNH08GK3A4	K3	50	220-240	Max:264 Min:198	26.2	27	30	-	23.00
	K3	60	220	Max:242 Min:198	26.2	27	30	-	23.00

Symbols

MCA : Minimum Circuit Amperes (A)

TOCA : Total Over Current Amperes (A)

MFA : Maximum Fuse Amperes (A)

MSC : Maximum Starting Current (A)

RLA : Rated Load Amperes (A)

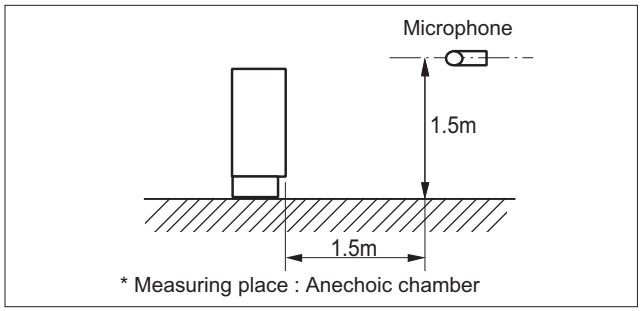
Note

1. Voltage supplied to the unit terminals should be within the minimum and maximum range.
2. Maximum allowable voltage unbalance between phase is 2%.
3. MSC means the Max. current during the starting of compressor.
4. MSC and RLA are measured as the compressor only test condition.
5. OFM are measured as the outdoor unit test condition.
6. TOCA means the total over current value of each outdoor unit.
7. Select the wire size based on the larger value among MCA or TOCA.
8. MFA is used to select the circuit breaker and ground fault circuit interrupter, and all installation site must require attachment of an earth leakage breaker. [circuit breaker type is ELCB(Earth Leakage Circuit Breaker)].
9. Select the electrical equipment of combination unit according to the electrical characteristics of individual unit.

10. Sound levels

10.1 Sound Pressure Level

■ Overall

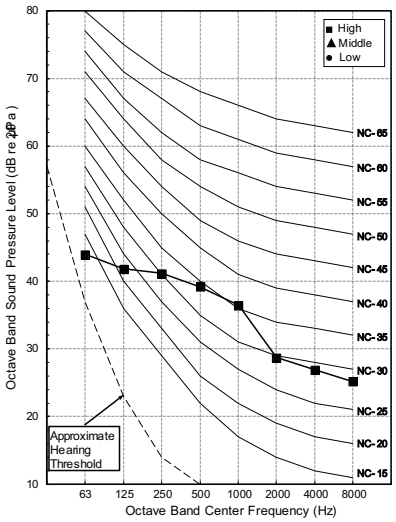


Note

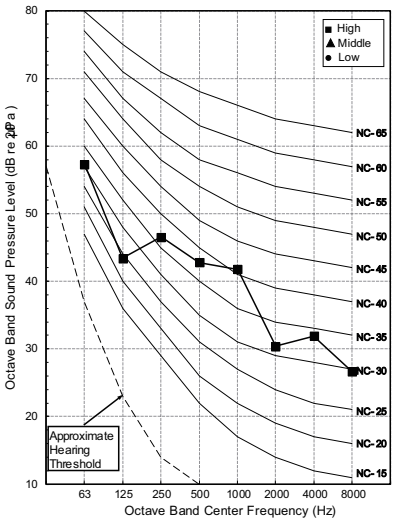
1. Sound measured at some distance away from the center of the unit.
2. Data is valid at free field condition.
3. Reference accoustic pressure 0dB = 20μPa.
4. Data is valid at nominal operation condition.
   Refer to the Model Specifications for nominal conditions(Power source and Ambient temperature, etc)
5. Sound level will vary depending on a range of factors such as the construction(acoustic absorption coefficient) of particular room in which the equipment in installed.
6. Sound pressure level is measured on the rated condition in the anechoic rooms by ISO 3745 standard.
   Therefore, these values can be increased owing to ambient conditions during operation.

Model	Sound Level (dB(A))
ARNH04GK3A4	44
ARNH08GK3A4	46

ARNH04GK3A4



ARNH08GK3A4



MULTI V™

Hydro Kit

Installation

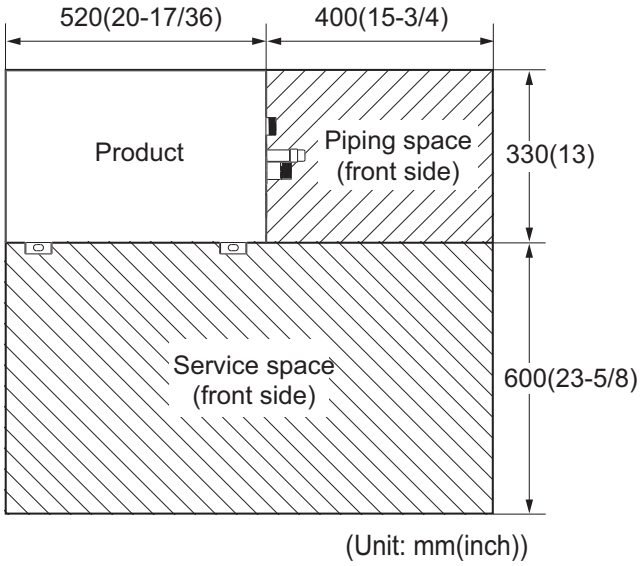
1. Installation
2. Accessories Installation
3. System Setup
4. Test Run

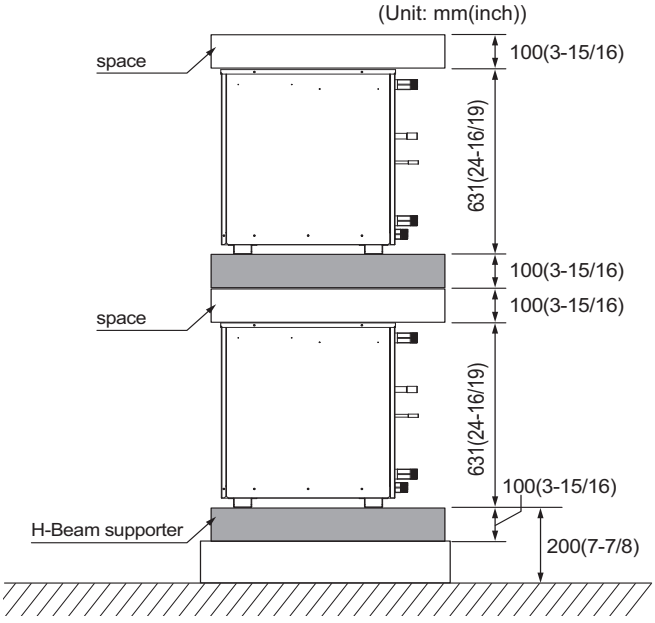
1. Installation

1.1 Selection of the best location

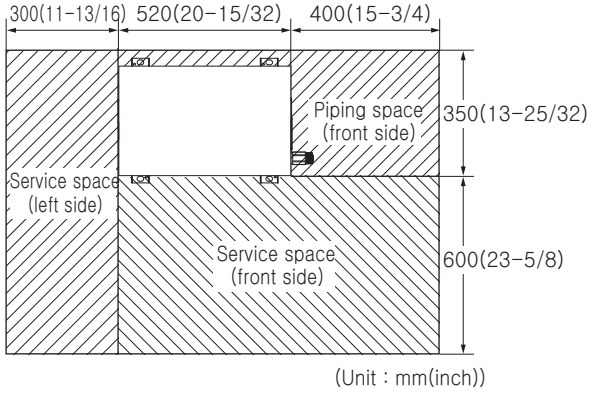
■ Installation Space

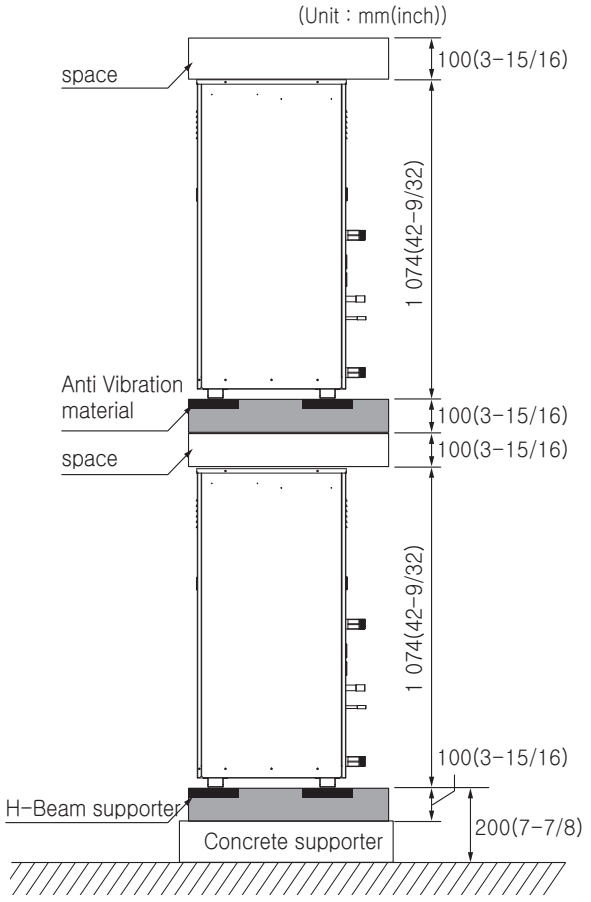
- The following values are the least space for installation. If any service area is needed for service according to field circumstance, obtain enough service space.





< Medium Temperature >



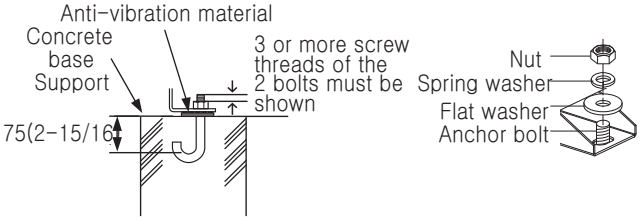


< High Temperature >

1. Installation

■ Foundation for Installation (Floor standing type)

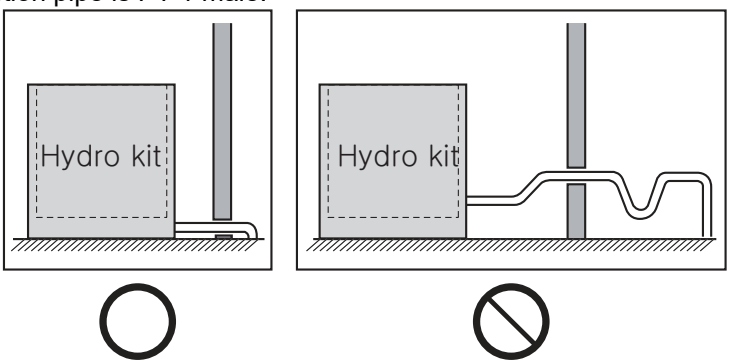
- Fix the unit tightly with bolts as shown below so that the unit will not fall down due to earthquake.
- Noise and vibration may occur from the floor or wall since vibration is transferred through the installation part depending on installation status. Thus, use anti-vibration materials (cushion pad) fully.
  (The base pad shall be more than 200 mm (7-7/8inch).)



1. Installation

■ Drain pipe connection

- Hydro Kit does not use the drain pump.
- Do not install in upward direction.
- Install the drain pipe in downward direction (1/50-1/100).
- Hydro Kit drain connection pipe is PT 1 male.



■ Selection of best location

Select space for installing the unit, which will meet the following conditions :

- The place shall easily bear a load exceeding four times of the unit weight.
- The place where the unit shall be leveled.
- The place shall allow easy water drainage.
- The place where the unit shall be connected to the outdoor unit.
- The place where the unit is not affected by an electrical noise.
- The place where there should not be any heat source or steam near the unit.

Important

- The place is where the unit shall be installed only inside and protected from outdoor weather events.

1. Installation

1.2 Water Piping and Water Circuit Connection

■ General Considerations

Followings should be considered before beginning water circuit connection

- Service space should be secured.
- Water pipes and connections should be cleaned using water.
- Space for installing external water pump should be provided.
- Never connect electric power while proceeding water charging.

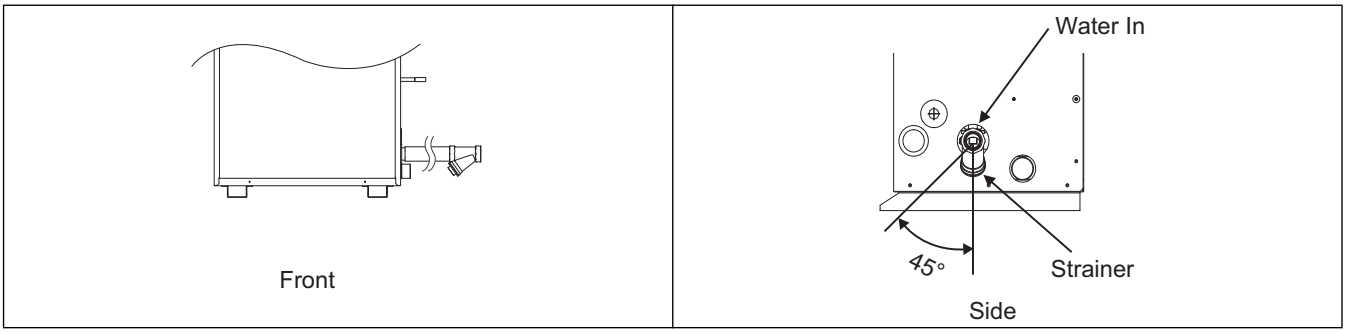
■ Water Piping and Water Circuit Connection

While installing water pipes, followings should be considered :

- While inserting or putting water pipes, close the end of the pipe with pipe cap to avoid dust entering.
- When cutting or welding the pipe, always be careful that inner section of the pipe should not be defective. For example, no weldments or no burrs are found inside the pipe.
- Pipe fittings (e.g. L-shape elbow, T-shape tee, diameter reducer, etc) should be tightened strongly to be free from water leakage.
- Connected sections should be leakage-proof treatment by applying tefron tape, rubber bushing, sealant solution, etc.
- Appropriate tools and tooling methods should be applied to prevent mechanical breakage of the connections.
- Operation time of flow valve(e.g. 3way valve or 2way valve) should be less than 90 seconds.
- Pipe is insulated to prevent heat loss to external environment.

■ Strainer (Floor standing type)

- Use the 30 mesh strainer. (Exclude scale diameter of 0.8mm or less and other net)
- Check the strainer direction and assemble on the inlet hole (Refer to picture)
- Wrap the Teflon tape on the screw thread of the water pipe for more than 15 times for assembly.
- Install the service port facing downward. (Within left/right 45 degrees)
- Check if there is any leakage on the connecting part.
- Clean the strainer periodically. (Once a year or more frequent)



Note

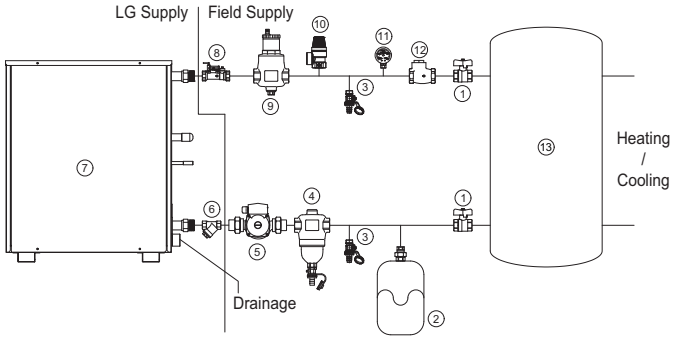
- The strainer included with product has a 28-mesh filter.

1. Installation

■ Water Cycle minimum requirements

1. For selecting the components of the hydraulic system, be sure they are above the design waterpressure.
2. For the water pipe, diffusely tight water pipes are recommended instead of steel pipes.
3. For the drain pipe size, use the same diameter as the product connected or larger. Always install a natural drainage so that the drained water does not flows back
4. Install insulated material across the total hydraulic piping to prevent condensation and to prevent low cooling or heating capacity during heat transfer losses. If the temperature is higher than 30 °C and the humidity is higher than 80 % the insulation material must be minimum 20 mm thick to prevent condensation.
5. Install the shut-off valve (1) to block the water by closing the valve when replacing the component or cleaning.
6. Install an expansion tank (2) based on the water volume of the hydraulic system.
7. Install the drain valve (3) that can be used for draining the water inside when replacing the component or providing service.
8. Install a magnetic dirt separator (4) at the inlet water pipe If the air separator is not installed there can be formed air bubbles inside the hydraulic system. Flow error will be showed first on remote controller, however finally a plate heat exchanger may burst during combined circumstances.
9. Install a circulation pump (5) which meets the water flow specifications mentioned inside product data book.
10. Install the strainer (6) at the inlet water pipe connection to protect the PHE. Do not charge water into the water pipe directly during Hydro Kit operation. If the strainer is not installed, component malfunction of Hydro Kit may occur.
- For the strainer, use one with 30 mesh or above with measurement diameter of 0.8 mm or less.
- Always install the strainer on the horizontal pipe.
11. Install a balancing valve (with flow meter) (8)
12. Install an automatic air separator in the outlet water pipe (9)
13. Install pressure safety relief valve (10) in vertical upright position that meets the design water pressure to prevent unit or water pipe damage during pressure increase inside the water pipe system.
14. Install a pressure meter (11) in the outlet water pipe.
15. Install in case of cascade hydraulic systems or bivalent systems a flow-check valve (12) at each outlet water pipe.
16. Install a buffer tank (13) of at least 10L/kW heating capacity in order to have a correct defrost cycle, if there is no knowledge about the type and dimensions of the heating system. If there is no buffer tank installed, the product can be damaged during normal operation or defrost operation.
17. After product operation for 2 weeks in case of new installation, clean the water filter. In the beginning of operation small particular dirt from installing process can block the filter which can lead to damage of the product.

1. Installation



1	Shut-Off valve	8	Balancing valve with flow meter
2	Expansion tank	9	Automatic air separator
3	Service port(Drain valve)	10	Pressure safety relief valve
4	Magnetic filter(Recommended)	11	Pressure meter
5	Water Pump	12	Check valve
6	Strainer	13	Buffer tank / DHW[1)] (Sanitary Water) Tank
7	Flow switch (included in product)		

Notice

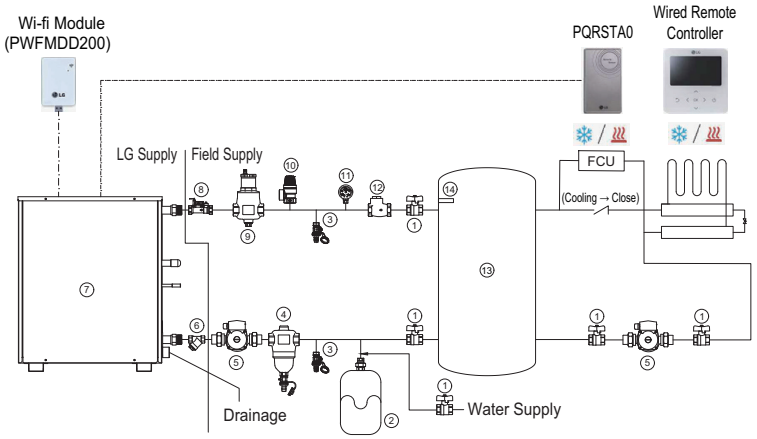
- Install the closed loop type water pipe system.
- Balancing valve with flow meter is recommended to ensure 100% of the nominal flow.
- 1) DHW : Domestic Hot Water.

1. Installation

1.3 Installation Scenes

Installation scenes are presented for example.
Installer should optimize the installation scene according to the installation conditions and local/national regulation. i.e. Shut-off valves position for spare water pump and water pump service, Flexible joint installation to prevent noise and vibration.

1.3.1 Space Heating/Cooling[1)] Installation



1	Shut-Off valve	8	Balancing valve with flow meter
2	Expansion tank	9	Automatic air separator
3	Service port(Drain valve)	10	Pressure safety relief valve
4	Magnetic filter(Mandatory with Corrosive material of pipe)	11	Pressure meter
5	Water Pump	12	Check valve
6	Strainer	13	Buffer tank
7	Flow switch (included in product)	14	Water Tank Temperature Sensor (12m)

- For space heating / cooling, 'Dip switch #2' should be set correctly.
- For sensing air temperature at specific area, remote temperature sensor(PQRSTA0) or wired remote controller could be choose, depending on the 'Dip switch #3' setting.
  *please refer the "System Set-Up, Dip Switch Setting".
- Wi-Fi module(PWFMDD200/105 cm) connected to 'CN-WF' on Hydro kit PCB. To increase the length between Wi-Fi modem and Hydro Kit, please purchase USB Extension Cable(PWYREW000, 10 m).
- In case of floor cooling, please make sure to set cooling cut off temperature for preventing condensation on the floor.
- For 2 way valve control, please refer the "Accessories Installation, 2 Way valve"

Mode	Condition	2-way valve
Cooling	FCU - 'Not use'	Open
	FCU - 'Use'	Close
Heating	None	No control

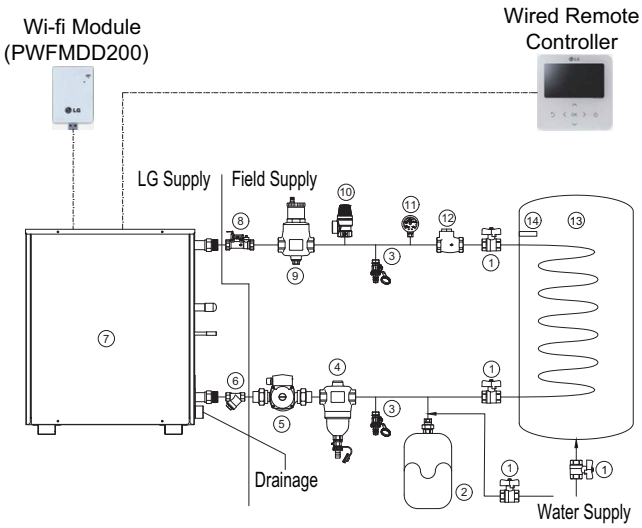
Notice

- Balancing valve with flow meter is recommended to ensure 100 % of the nominal flow. If the water flow rate is too low or High, PHEX could be frozen and burst or capacity could be reduced.

[1)]Cooling operation is only available for Medium temperature Hydro Kit.

1. Installation

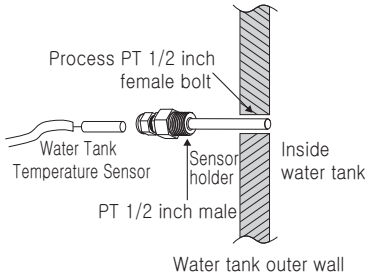
1.3.2 Water Tank(DHW) Installation



1	Shut-Off valve	8	Balancing valve with flow meter
2	Expansion tank	9	Automatic air separator
3	Service port(Drain valve)	10	Pressure safety relief valve
4	Magnetic filter(Mandatory with Corrosive material of pipe)	11	Pressure meter
5	Water Pump	12	Check valve
6	Strainer	13	Buffer tank
7	Flow switch (included in product)	14	Water Tank Temperature Sensor (12m)

- For water tank(DHW) operation, dip switch #2 in Hydro Kit PCB should be set correctly, please refer the “System Set-Up, Dip Switch Setting”
- Wi-Fi module(PWFMDD200, 105 cm) is connected to ‘CN-WF” on Hydro Kit PCB. To increase the length between Wi-Fi modem and Hydro Kit, please purchase USB Extension Cable(PWYREW000, 10 m)
- DHW(Sanitary water) tank should be located at the flat place.
- Water quality should comply with EN 98/83 EC Directives.
- DHW(Sanitary water) tank (indirect heat exchange), do not use anti water-freezing treatment like ethylene glycol.
- It is highly recommend to wash out inside of the DHW(Sanitary water) tank after installation for clean hot water.
- Near the DHW(Sanitary water) tank , there should be water supply and water drain for easy access and maintenance.

■ Water tank temperature sensor(14) connection

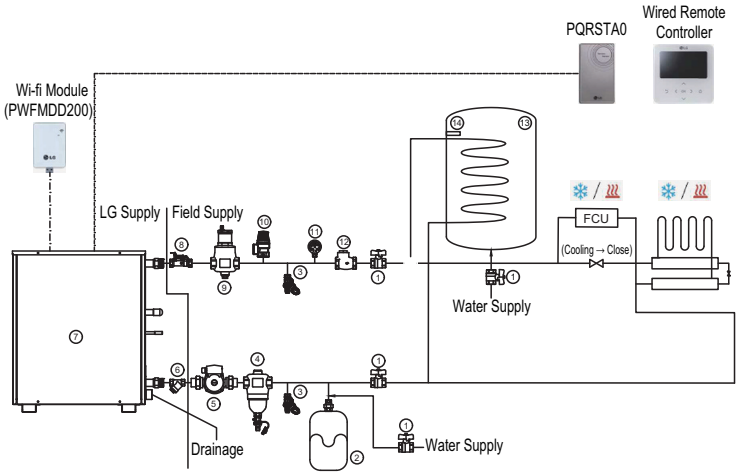


If hot water mode is used, make sure to install sensor to water tank.

- Make PT 1/2inch female bolt hole in the water tank and install sensor
  in the water tank.
- Push the sensor into the hole of the sensor holder cap.
- Lock the sensor holder cap.
- Maximum length of water tank temperature sensor is 12 m.

1. Installation

1.3.3 Water Tank(DHW) + Floor Heating Installation(Default)



1	Shut-Off valve	8	Balancing valve with flow meter
2	Expansion tank	9	Automatic air separator
3	Service port(Drain valve)	10	Pressure safety relief valve
4	Magnetic filter(Recommended)	11	Pressure meter
5	Water Pump	12	Check valve
6	Strainer	13	DHW[1)](Sanitary Water) Tank
7	Flow switch (included in product)	14	Water Tank Temperature Sensor (12m)

- For DHW / Floor Heating operation , ‘Dip switch #2’ should be set correctly.
- For sensing air temperature at specific area, remote temperature sensor(PQRSTA0) or wired remote controller could be choose, depending on the ‘Dip switch #3’ setting.
  * please refer the “System Set-Up, Dip Switch Setting”.
- Wi-Fi module(PWFMDD200/105 cm) connected to ‘CN-WF’ on Hydro kit PCB. To increase the length between Wi-Fi modem and Hydro Kit, please purchase USB Extension Cable(PWYREW000, 10 m).
- In case of floor cooling, please make sure to set cooling cut off temperature for preventing condensation on the floor.
- For 3-way, 2-way valve control, please refer the “Accessories Installation”

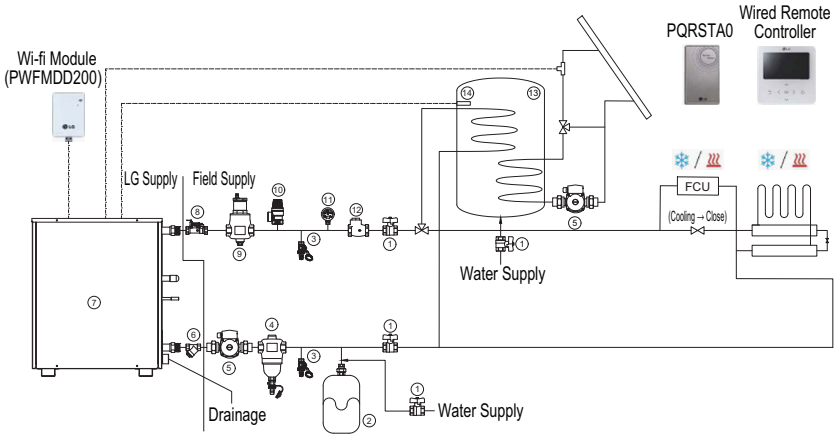
Mode	Condition	3-way valve direction	2-way valve
Cooling	FCU - 'Not use'	Under Floor	Open
	FCU - 'Use'	Under Floor	Close
Heating	Priority - 'DHW'	DHW / Sanitary Water Tank	No control
	Priority - 'UFH'	Under Floor	No control

Notice

- The Heating operation mode of the hot water tank is not a mode selection by the remote controller, it changes the 3-way valve direction to Water Tank base on the water tank temperature.
- It is impossible to operate Hot water(DHW) during cooling mode.

1. Installation

1.3.4 Water Tank(DHW) + Floor Heating + Solar booster Installation



1	Shut-Off valve	8	Balancing valve with flow meter
2	Expansion tank	9	Automatic air separator
3	Service port(Drain valve)	10	Pressure safety relief valve
4	Magnetic filter(Recommended)	11	Pressure meter
5	Water Pump	12	Check valve
6	Strainer	13	DHW[1)](Sanitary Water) Tank
7	Flow switch (included in product)	14	Water Tank Temperature Sensor (12m)
		15	Solar panel

- For DHW / Floor Heating and Solar booster operation , ‘Dip switch #2’ should be set correctly.
- For sensing air temperature at specific area, remote temperature sensor(PQRSTA0) or wired remote controller could be choose, depending on the ‘Dip switch #3’ setting.
  * please refer the “System Set-Up, Dip Switch Setting”
- Wi-Fi module(PWFMDD200/105cm) connected to ‘CN-WF’ on Hydro kit PCB. To increase the length between Wi-Fi modem and Hydro Kit, please purchase USB Extension Cable(PWYREW000, 10 m).
- In case of floor cooling, please make sure to set cooling cut off temperature for preventing condensation on the floor.
- DHW(Sanitary water) tank should be located at the flat place.
- Water quality should comply with EN 98/83 EC Directives.
- DHW(Sanitary water) tank (indirect heat exchange), do not use anti water-freezing treatment like ethylene glycol.
- It is highly recommend to wash out inside of the DHW(Sanitary water) tank after installation for clean hot water.
- Near the DHW(Sanitary water) tank , there should be water supply and water drain for easy access and maintenance.
- For 2-way or 3-way valve control, please refer the “Accessories Installation”.

1. Installation

1.3.5 How to install Solar Thermal Kit(PHLLA)

Step 1. Check the diameter of pre-installed pipes.
Step 2. If the diameter of pre-installed pipes is different from diameter of solar thermal kit, it is necessary to reduce or extend of pipe diameter.
Step 3. After Step 2, connect the pipe and solar thermal kit.
Step 4. Connect solar thermal sensor to ‘CN_TH4’(Red connector) of the indoor unit PCB.
If the water tank sensor is connected, disconnect the sensor from PCB first.

1. Installation

1.4 Water Control

■ Freezing Protection

- For Medium Temperature

  In areas of the country where entering water temperatures drop below 15℃(59˚F), the water pipe must be protected by using an approved antifreeze solution. Consult your Hydro Kit unit supplier for locally approved solutions in your area. Calculate the approximate volume of water in the system. (Except the Hydro Kit unit.) And add antifreeze solution to the total volume to allow for the water contained in Hydro Kit unit.

Type of Antifreeze	Minimum Temperature for Freeze Pretection				
	15℃(59˚F) ~ -5°C(23°F)	**-10℃(14˚F)**	**-15℃(5˚F)**	**-20℃(-4˚F)**	**-25℃(-13˚F)**
Ethylene glycol	12%	20%	30%	-	-
Propylene glycol	17%	25%	33%	-	-
Methanol	6%	12%	16%	24%	30%

- For High Temperature

  In areas of the country where entering water temperatures drop below 0℃(32˚F), the water pipe must be protected by using an approved antifreeze solution. Consult your Hydro Kit unit supplier for locally approved solutions in your area. Calculate the approximate volume of water in the system. (Except the Hydro Kit unit.) And add antifreeze solution to the total volume to allow for the water contained in Hydro Kit unit.

Type of Antifreeze	Minimum Temperature for Freeze Protection					
	0 ℃(32 ˚F)	**-5 ℃(23 ˚F)**	**-10 ℃(14 ˚F)**	**-15 ℃(5 ˚F)**	**-20 ℃(-4 ˚F)**	**-25 ℃(-13 ˚F)**
Ethylene glycol	0 %	12 %	20 %	30 %	-	-
Propylene glycol	0 %	17 %	25 %	33 %	-	-
Methanol	0 %	6 %	12 %	16 %	24 %	30 %

⚠ CAUTION

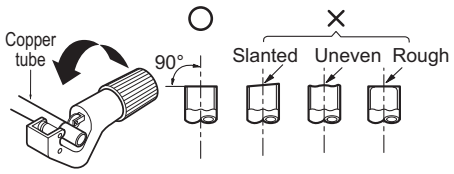
- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can occur.
- If one of antifreezes is used, corrosion can occur. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to keep same concentration.
- When the antifreeze is used (for installation or operation), take care to ensure that antifreeze must not be touched.
- Ensure to respect all laws and norms of your country about Anti-freeze usage.
- When hydro kit is applied for cooling, the antifreeze must be added in the water circuit to prevent freezing.
- Set the DIP S/W and short key to Anti Freeze mode only after the addition of brine(Anti-freeze). Or else the product may get damage due to freezing and bursting.
- Do not add brine(Anti-freeze) to the water circuit when it is used for hot water.

1. Installation

1.5 Refrigerant Piping

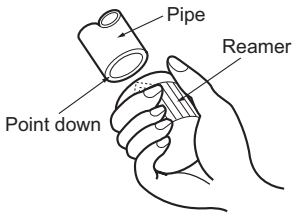
◆ Cut the pipes and the cable

- Use the accessory piping kit or the pipes purchased locally.
- Measure the distance between the indoor and the outdoor unit.
- Cut the pipes a little longer than measured distance.
- Cut the cable 1.5m longer than the pipe length.



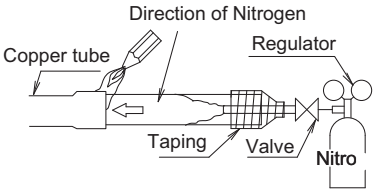
◆ Burrs removal

- Completely remove all burrs from the cut cross section of pipe/tube.
- Put the end of the copper tube/pipe to downward direction as you remove burrs in order to avoid to let burrs drop in the tubing.



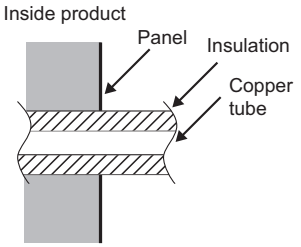
◆ Pipe welding

- Insert and weld the pipe.
- Always make sure to flow Nitrogen at 0.2kgf/cm2 within the pipe when welding.
- If the welding is done without flowing Nitrogen, it can generate a thick oxidized coating within the pipe to interfere with normal operation of valve and compressor etc.



◆ Insulation

- Use rubber foamed insulation material (EPDM, NBR) with high thermal resistance.
- When installed in humid environment, use thicker insulation material than usual.
- Insert the insulation material within the product as deep as possible.



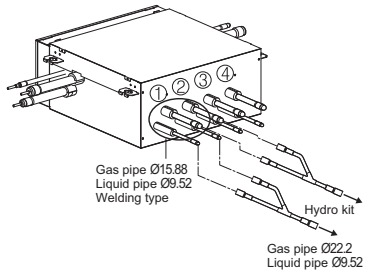
Classification	Thickness
Liquid pipe	t9 or above
Gas pipe	t19 or above

* The thickness of the above insulation material is based on thermal conduction rate of 0.036W/m °C. When installing independent power module, refrigerant piping should be installed in accordance with the manual of independent power module.

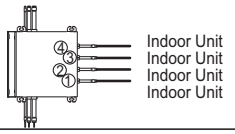
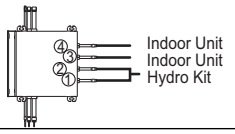
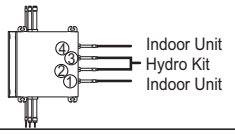
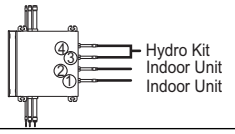
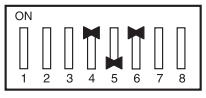
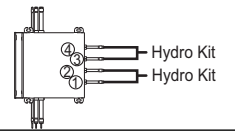
1. Installation

■ Connecting Heat Recovery systems

PRHR042 / PRHR032 / PRHR022



- One connection of refrigerant pipe for HR unit is insufficient for the flow of refrigerant to connect "Big" capacity indoor units. Join two pipes with a branch pipe when connected indoor units' capacity is over then 54kBtu/h. (In case of Hydro Kit, over 10HP).
- The pipe number of the connected gas pipe and liquid pipe must be same.
- Flow water in the Hydro Kit when pipe-searching process is performed
- Pipe-searching process error may occur if the pipe temperature does not increase.
- It is recommended that Hydro Kit (10HP model) is connected to No.1 valve and No.2 valve.

	DIP S/W setting	Example	
Not control			
No.1, 2 Valve Control			
No.2, 3 Valve Control			
No.3, 4 Valve Control			
No.1, 2 Valve Control / No.3, 4 Valve Control			(When two Hydro Kit are installed)

■ Precaution on pipe searching process

1. Please choose the ‘Mode’ according to the water temperature.
   - Use ‘Mode 1’ if water temperature is higher than 30℃(86˚F)
   - Use ‘Mode 2’ if water temperature is lower than 30℃(86˚F)
2. Be sure that water pump is operating during the pipe searching process.
   - If the water circulation is not detected by water flow switch, ‘CH14’ error will occur.

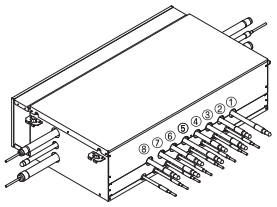
Notice

For more detailed information, refer to the installation manual of Heat Recovery Unit.

1. Installation

■ Connecting Heat Recovery systems

PRHR083 / PRHR063 / PRHR043 / PRHR033 / PRHR023



- One connection of refrigerant pipe for HR unit is insufficient for the flow of refrigerant to connect "Big" capacity indoor units. Join two pipes with a branch pipe when connected indoor units' capacity is over then 61 kBtu/h. (In case of Hydro Kit, over 10HP).
- The pipe number of the connected gas pipe and liquid pipe must be same.
- Flow water in the Hydro Kit when pipe-searching process is performed.
- Pipe-searching process error may occur if the pipe temperature does not increase.
- It is recommended that Hydro Kit (10HP model) is connected to No.1 valve and No.2 valve.

Valve Group	SW01DSetting	Valve Group	SW01DSetting
Not control	0	No. 5,6/7,8 Valve Control	8
No. 1,2 Valve Control	1	No. 1,2/5,6 Valve Control	9
No. 2,3 Valve Control	2	No. 1,2/7,8 Valve Control	A
No. 3,4 Valve Control	3	No. 3,4/5,6 Valve Control	B
No. 5,6 Valve Control	4	No. 3,4/7,8 Valve Control	C
No. 6,7 Valve Control	5	No. 1,2/3,4/5,6 Valve Control	D
No. 7,8 Valve Control	6	No. 1,2/3,4/6,7 Valve Control	E
No. 1,2/3,4 Valve Control	7	No. 1,2/3,4/7,8 Valve Control	F

Note

SW01D(Rotary SW) : Selection of the Valve Group Control.

■ Precaution on pipe searching process

1. Please choose the ‘Mode’ according to the water temperature.
   - Use ‘Mode 1’ if water temperature is higher than 30℃(86˚F)
   - Use ‘Mode 2’ if water temperature is lower than 30℃(86˚F)
2. Be sure that water pump is operating during the pipe searching process.
   - If the water circulation is not detected by water flow switch, ‘CH14’ error will occur.

Notice

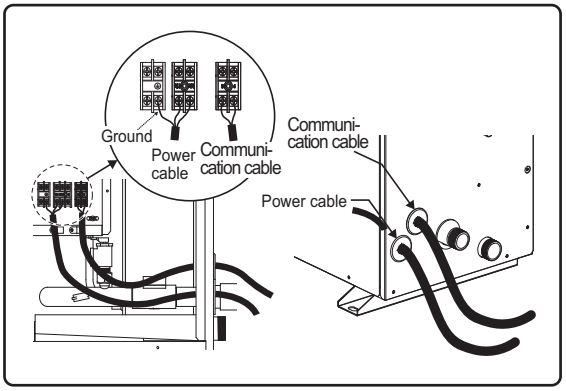
For more detailed information, refer to the installation manual of Heat Recovery Unit.

1. Installation

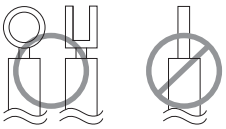
1.6 Electrical Wirings

■ How to connect wirings

- For Medium Temperature
  Remove the box cover of electric parts and connect the wiring.

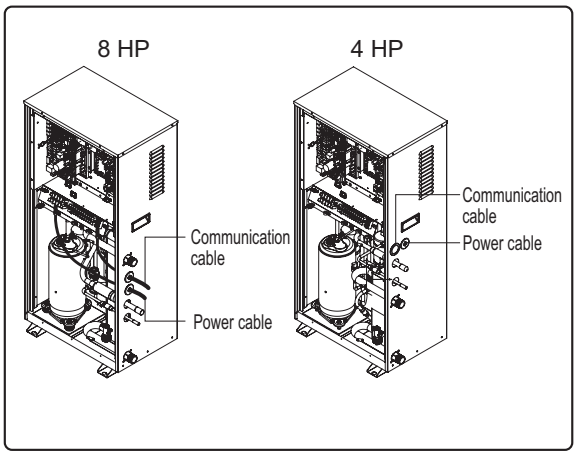


CAUTION:
When connecting the power and communication cable, always use the terminal connector (O-ring, Y-ring).

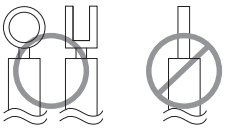


Make sure to tighten so that the screw of the terminal does not get loose.

- For High Temperature
  Remove the box cover of electric parts and connect the wiring.



CAUTION:
When connecting the power and communication cable, always use the terminal connector (O-ring, Y-ring).



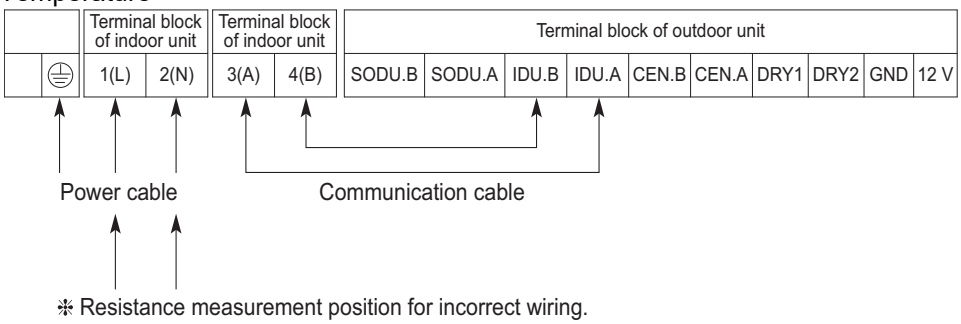
Make sure to tighten so that the screw of the terminal does not get loose.

1. Installation

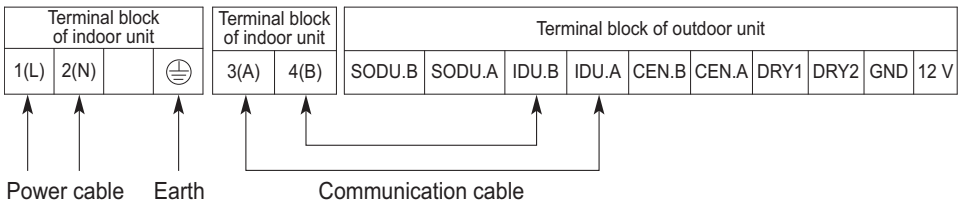
■ Wiring Connection

Connect the wires to the terminals on the control board individually according to the outdoor unit connection.

- Ensure that the wire color of the outdoor unit and terminal No. are same as those of the indoor unit respectively.
- For Medium Temperature



- For High Temperature



⚠ CAUTION

- Make sure that the screws of the terminal are free from looseness.
- Be sure to test the power line and communication line for incorrect wiring before power is applied.
  1) If the power line and communication line are swapped over, the product will be damaged.
  2) Incorrect wiring confirmation test method
     : Measure the resistance across the power terminals (L,N) using a multi meter.
     - Resistance value of a normal connection: 1MΩ or more
     - Incorrect wiring resistance value: 500MΩ or less

1. Installation

⚠ CAUTION

After the confirmation of the above conditions, prepare the wiring as follows:

1. Use a separate power source only for the air conditioner.
   For the method of wiring, follow the circuit diagram on the inner side of control box cover.
2. Install a circuit breaker between power source and the unit.
3. Make sure that wiring screws are fastened. Screw could be loose by vibration during transportation.
   (If screws are loose, wires could be burnt-out.)
4. Check the specification of power source.
5. Make sure that electrical capacity is sufficient.
6. Starting voltage should be maintained above 90 percent of the rated voltage marked on the name plate.
7. Make sure the cable thickness matches the power sources specification.
   (Please note the relation between cable length and thickness.)
8. Do not install the earth leakage breaker in a place which is wet or moist.
   Water or moist may cause short circuit.
9. The following troubles could be caused by voltage drop-down.
   - Vibration of a magnetic switch, damage on the contact point there of, (fuse breaking), disturbance to the normal function of an overload protection device.
   - Proper starting power is not given to the compressor.
10. Before supplying power to the indoor unit, please check the wiring of the power and communication lines.
11. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazrd.

■ Connecting Cables

Classification	types	Cable cross section
Power cable(CV)	mm^2x cores	4.0 x 3
Communication cable(VCTF-SB)	mm^2x cores	1.0~1.5 x 2

The distance between communication cable and power cable

- If the power cable and communication cable are tied together, system malfunction may occur with electrostatic, electromagnetic combination effect causing the interference signal. If communication cable is connected along with power cable, secure at least 50mm distance between indoor unit power cable and communication cable.

- It is the value with the assumption of the length of the parallel cable as 100 m. If it is longer than 100m, it shall be calculated again with proportional to the added length.
  If the distortion in the waveform of the power still occurs despite securing the distance, increase the distance.
  * When several power cables are inserted into the transmission line, or tied together, make sure to consider the following issues.
  - Power cables and communication cable shall not be in the same transmission line.
  - Power cables and communication cable shall not be tied together.

⚠ WARNING

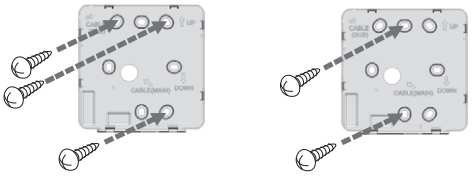
- Are all of the indoor units and outdoor units grounded?
- If grounding is not properly done, there is a risk of electric shock. Grounding must be done by a qualified technician.
- Consider the surrounding conditions(surrounding temperature, direct sunlight, rain water, etc.) when wiring the cable.
- The thickness of the power cable is the minimum thickness of metal conductor cable. Use thicker cable considering the voltage drop.

1. Installation

■ Installation of Wired Remote Controller

1.After fixing the remote controller installation plate on the desired location, fix it firmly with the provided screws.

- If the installation plate is not flat on the surface, it may result in the controller being twisted and cause a defect.
- If there is a mounting box, install the remote controller installation plate using the fixings holes which suit, as in the right diagrams.
- Do not leave a gap with the wall or product loose after the installation.

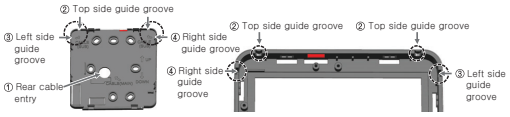


2. The wired remote controller cable can be installed in 4 directions. Install to the suitable direction according to the installation environment.

- Installation direction: Rear entry, top side, right side, left side.
- When you install the remote controller cable at the top, right and left side, remove the remote controller cable guide hole before the installation.

  * Use a long nose pliers to remove the guide hole.

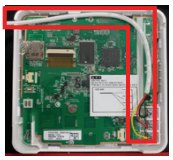
3. After removing the hole, trim the cut surface neatly.



4. When installing the remote control cable on the left side, be sure to install it in the following guide.

1) Make the cable to "ㄱ" shape as shown below.
2) Fit the bent "ㄱ" cable into the upper center piece of case.
3) Tighten the installation plate with preventing interference with the surrounding guide structure.

* If the cable is assembled in a shape other than "ㄱ", it may not be fastened to the installation plate due to interference with the structure of case.



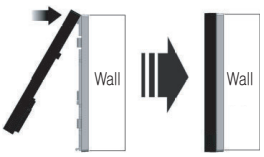
Reference. the bent cable shape

The Upper center boss for fixing the bent cable

5. After fixing the remote controller top side on the installation plate attached to the wall as in the following figure, press the bottom side to combine with the installation plate.

- Do not leave a gap in the top, bottom, left, and right side of the remote controller and the installation plate after combining them.
- Before combining with the installation plate, arrange the cables to avoid interference with the circuit parts.

<Order of Combining>



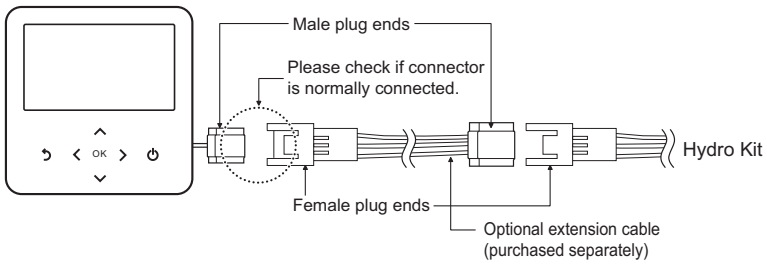
6.When you remove the remote controller from the installation plate, insert a small flat head screwdriver into the bottom side separation hole and turn clockwise to separate the remote controller.

- There are 2 separation holes at the bottom part. Slowly separate one by one.
- Be careful not to damage the internal parts during the removal.

<Order of Separation>

1. Installation

7.Use the connection cables to connect the indoor unit with the remote controller.



8. For the following cases, separately purchase and use the cables suitable for the situation.

- Do not install the cable over 50 m. (It may cause communication issues.)
- If the distance between the wired remote controller and the indoor unit is 10 m or more : 10m extension cable (model name: PZCWRC1)
- If you control several indoor unit products with one wired remote controller : Group controlcable (model name: PZCWRCG3)

⚠ CAUTION

- When installing the wired remote controller, do not bury it in the wall. (It can cause damage in the temperature sensor.)
- Do not install the cable to be 50m or above. (It can cause communication error.)
- When installing the extension cable, check the connecting direction of the connector of the remote controller side and the product side for correct installation.
- If you install the extension cable in the opposite direction, the connector will not be connected.
- Specification of extension cable: AWG 24, 3 conductor or above.

1. Installation

■ Independent Power Module

Independent power module is required to protect a plate heat exchanger burst. When the outdoor unit is operating, if Hydro Kit is suddenly powered off, a plate heat exchanger burst may happen during oil-return and defrosting cycle in cooling mode.

⚠ CAUTION

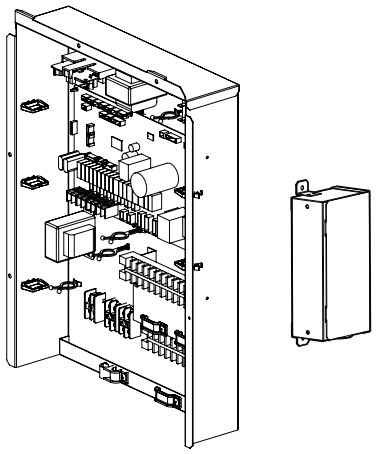
- Non installation of IPM cause the serious problem of its heat exchanger when electricity cut off during product operation.

Notice

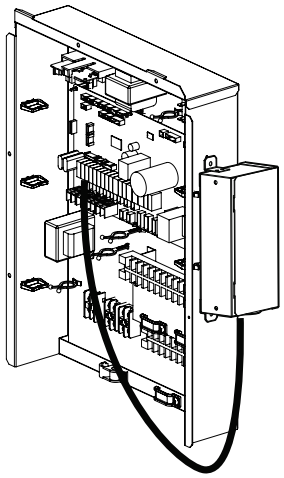
Please refer to the function list or accessories compatibility table for availability of Independent Power Module.

How to install Independent Power Module

1. Open the front panel of the control box



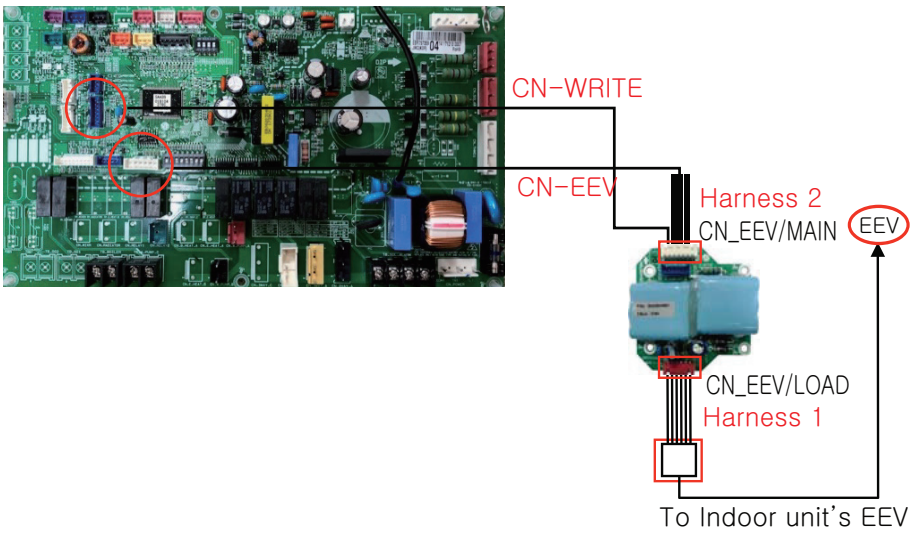
2. Assemble the cover of independent power module, fix it tightly with bolts and connect wires.



1. Installation

How to wire Independent Power Module

Step 1. Turn the power off using circuit breaker.
Step 2. Disconnect the EEV cable of the indoor units PCB(CN-EEV)
Step 3. Connect the independent power kit(CN-EEV/LOAD) to the indoor units EEV, using harness 1.
Step 4. Connect the independent power kit(CN-EEV/MAIN) to the indoor units PCB
(CN-EEV / CN-WRITE), using harness 2.
Step 5. Supply the power.



⚠ WARNING

- The wire should not be exposed to the outside otherwise it may leads to the malfunction of the independent power kit due to wire damage.
- Wrong wiring also causes the malfunction of the independent power kit or damage to it.
- Power should be supplied more than 20 minutes continuously in order to operate the independent power kit correctly.
  Otherwise, the independent power kit can not fully close the EEV due to the lack of the charging power.

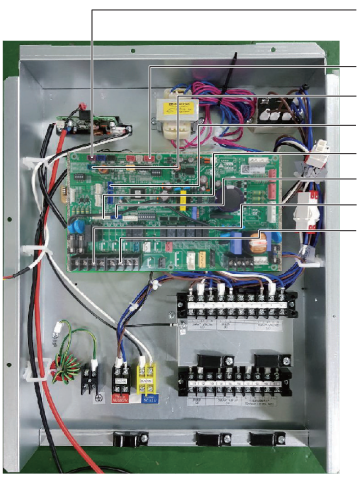
Note

For more detailed information, refer to the installation manual of Independent Power Module.

2. Accessories Installation

2.1 Location of Accessories and External Parts Connection

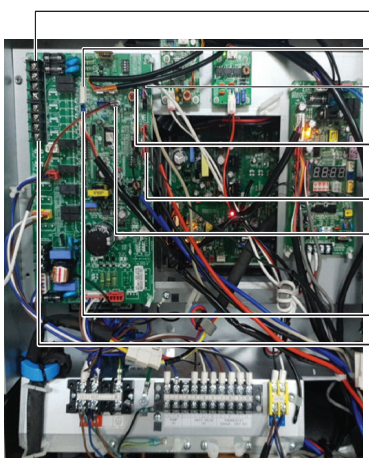
◆ Medium Temperature



3WAY VALVE (Solar)			PUMP (Solar)				3WAY VALVE (Hydro kit)		
1 L	2 L1	3 N	4 L	5 N	6	7	8 L	9 L1	10 N
BR	WH	BL	BR	BL			BR	WH	BL

PUMP (Hydrokit)			2WAY VALVE (Hydro kit)			THERMOSTAT(Default : 230V AC)			
11 L	12 N	13	14 L1	15 L2	16 N	17 L	18 N	19 L1	20 L2
BR	BL		BR	WH	BL	BR	BL	WH	BK

◆ High Temperature



PUMP(Hydro kit)			3 WAY VALVE(Hydro kit)			THERMOSTAT(Default : 230V AC)			
1 L	2 N	3	4 L	5 L1	6 N	7 L	8 N	9 L1	10 L2
BR	BL		BR	WH	BL	BR	BL	WH	BK

2. Accessories Installation

Name	Port	Electrical Spec	Function
3Way Valve (Hydro Kit)	Terminal Block - Mid Temp : #8 / #9 / #10 - High Temp : #4 / #5 / #6	230V (Output) - Live : #8 / #9 (#4 /#5) - Neutral : #10 (#6)	Change the water flow to Water Tank or Floor Circuit
2Way Valve (Hydro Kit)	Terminal Block - Mid Temp : #14 / #15 / #16	230V (Output) - Live : #14 / #15 - Neutral : #16	Change water flow to FCU or Floor Circuit
Pump (Hydro Kit)	Terminal Block - Mid Temp : #11 / #12 - High Temp : #1 / #2	230V (Output) - Live : #11 (#1) - Neutral : #12 (#2)	Water Circulation
3Way Valve (Solar)	Terminal Block - Mid Temp : #1 / #2 / #3	230V (Output) - Live : #1 / #2 - Neutral : #3	Change the water flow to Solar or Water Tank Circuit
Water Pump (Solar)	Terminal Block - Mid Temp : #4 / #5	230V (Output) - Live #4 - Neutral : #5	Water circulation for solar water piping system
Thermostat	Terminal Block - Mid Temp : #17 / #18 / #19 / #20 - High Temp : #7 / #8 / #10	230V or 24V - Live : #17 (#7) - Neutral : #18 (#8) - Signal : #19 / #20 (#10)	Operating with Thermostat(Mechnical)
Water Tank Temp. Sensor	CN_TH4	NTC 5kΩ, 12m	Detect water temperature in Water tank
Remote Room Temp. Sensor (PQRSTA0)	CN_ROOM	NTC 10kΩ, 15m	Detect Air temperature in room
Wi-Fi (PWFMDD200)	CN_WF	DC 12V, 5m	Control with Mobile App
External On/Off Control	CN_EXT	Non-Voltage (Digital input)	Operation on/off with external device
Dry Contact	CN_CC	Non-Voltage (input)	Dry contact connection point
Refrigerant Leak Detection	CN_LEAK_ROOM2	DC 5V, 35mA, 10m	Detect refrigerant leakage
Smart Grid	TB SG1 / TB SG2	220 ~ 240V AC (input)	
External Pump	TB EXT_PUMP	Non-Voltage(Output) /1A	Interlock with external pump by relay

- Connect 3way valve, if both floor heating and hot water is used.
- Connect the separately purchased thermostat.
- Dry contact is an accessory supplied by LG and installed by referring to the attached installation manual.
- 3way valve, thermostat and pump are external parts for installation, which are not supplied by LG.
  After checking each part carefully, install external parts respectively.
- Connect the cable of each accessory to the terminal block of the control box in the Hydro Kit.
- Check the label attached on the terminal block to prevent wrong connection.
- Use the pump of 220 voltage and maximum operation current of 3A or less.
- Select a suitable relay for pump capacity when connecting the pump to the unit.

⚠ WARNING

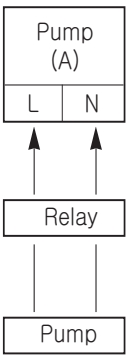
- Install the unit after turning off the main power.
- Do not connect the products out of range specified in the manual.
- Do not work with wet hand.

Notice

The allowable current of the total load that can be connected to the PCB is 3A. If exceed, PCB may not work.

2. Accessories Installation

2.2 Main Pump Connection



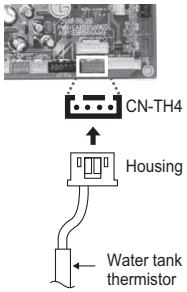
- Select the suitable pump by referring to the flow rate table with water temperature difference between the entrance and the exit.
- It is recommended that the flow rate is Rated water flow (refer to the specification of PDB)
- Use the pump with enough capacity to guarantee the loss of entire water pressure and to supply the **Hydro Kit** with water.
- Select a suitable relay for pump capacity when connecting the pump to the unit.
- Connect the relay to the terminal block Pump(A) of the control box.

CAUTION

- Make sure to supply external power with the pump.

2. Accessories Installation

2.3 Water tank temperature sensor Connection



- Water tank temperature sensor is needed for hot water mode.
- Connect sensor housing to PCB ‘CN-TH4’ connector(red).
- To activate hot water mode, DIP S/W should be set #2, #3 according to “Dip Switch Setting”.

⚠ CAUTION

- When the water tank temperature sensor is disconnected or shorted, CH08 error will occur.
  In case of ‘floor heating’ mode water tank temperature does not need to be connected.

2. Accessories Installation

2.4 Thermostat

Thermostat is generally used to control the unit by air temperature. When thermostat is connected to the unit, the unit operation is controlled by the thermostat.

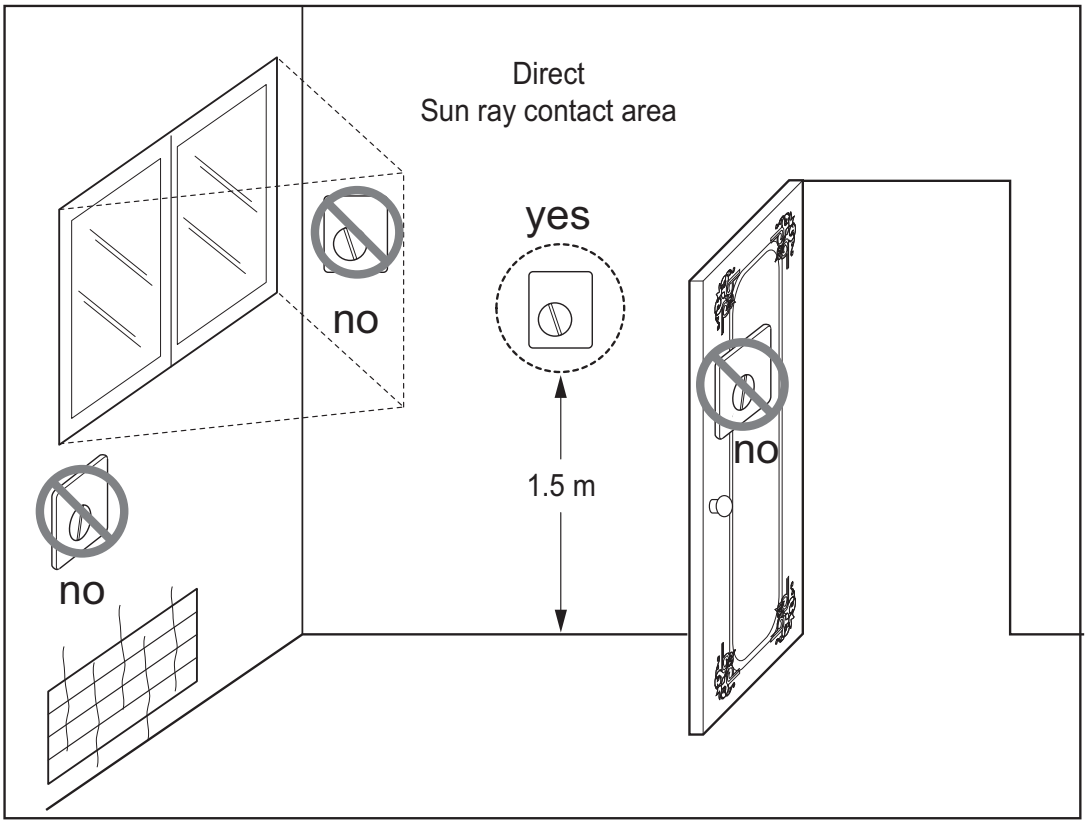
■ Installation Condition

Notice

1. Use 230 V Thermostat.
2. Some electro-mechanical type thermostat has internal delay time to protect compressor.
   In that case, mode change can take time more than user's expectation. Please read thermostat manual carefully if the unit does not response quickly.
3. Setting temperature range by thermostat can be different with that of the unit.
   The heating set temperature should be chosen within the setting temperature range of the unit.
4. It is highly recommended that the thermostat should be installed where space heating is mainly applied.

*** Following location should be avoid to secure proper operation :**

- Height from floor is approximately 1.5 m.
- Thermostat can not be located where the area may be hidden when door is open.
- Thermostat can not be located where external thermal influence may be applied. (such as above heating radiator or open window)



2. Accessories Installation

■ General Information

Hydro Kit supports following thermostats.

Type	Power	Operating Mode	Supported (Medium Temperature)	Supported (High Temperature)
Mechanical (1)	230 V AC	Heating Only (3)	Yes	Yes
		Heating / Cooling (4)	Yes	No
	24 V AC	Heating Only (3)	Yes	No
		Heating / Cooling (4)	Yes	No
Electrical (2)	230 V AC	Heating Only (3)	Yes	Yes
		Heating / Cooling (4)	Yes	No
	24 V AC	Heating Only (3)	Yes	No
		Heating / Cooling (4)	Yes	No

1. There is no electric circuit inside the thermostat and electric power supply to the thermostat is not required.
2. Electric circuit such as display, LED, buzzer, etc is included in the thermostat and electric power supply is required.
3. Thermostat generates "Heating ON or Heating OFF" signal according to user"s heating target temperature.
4. Thermostat generates both "Heating ON or Heating OFF" and "Cooling ON or Cooling OFF" signal according to user"s heating and cooling target temperature.

⚠ CAUTION

Choosing Heating / Cooling Thermostat

- Heating / Cooling Thermostat must have "Mode Selection" feature to distinguish operation mode.
- Heating / Cooling Thermostat must be able to assign heating target temperature and cooling target temperature differently.
- If above conditions are not kept, the unit can not operation properly.
- Heating / Cooling Thermostat must send cooling or heating signal immediately when temperature condition is satisfied. No delay time while sending cooling or heating signal is permitted.

2. Accessories Installation

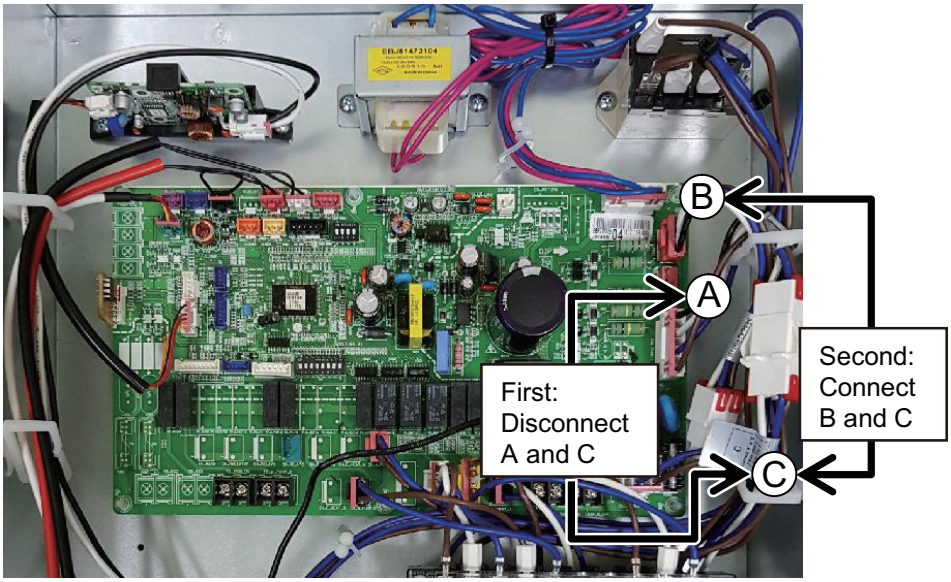
■ How to Wire Thermostat

Follow below procedures Step 1 ~ Step 6.

Step 1. Uncover front cover of the unit and open the control box.

Step 2. Identify the power specification of the thermostat. If it is 1~ 230 V, go to Step 4.
Otherwise, if it is 1~ 24 V, go to step 3.

Step 3. Find thermostat connecting cable A and C. Disconnect cable A and C, then connect cable B and C.



Step 4. If it is Heating Only Thermostat, go to step 5. Otherwise, if it is Heating / Cooling Thermostat, go to step 6.

Step 5. Find terminal block and connect wire as below. After connecting, go to step 6.

THERMOSTAT (Default : 1~ 230 V)			
1	2	3	4
L	N	L1	L2
BR	BL	WH	BK

(L) (N) (H)

Thermostat

(L) : Live signal from PCB to Thermostat
(N) : Neutral signal from PCB to Thermostat
(H) : Heating signal from Thermostat to PCB

⚠ WARNING

Mechanical type Thermostat.

- Do not connect wire (N) as mechanical type thermostat does not require electric power supply.

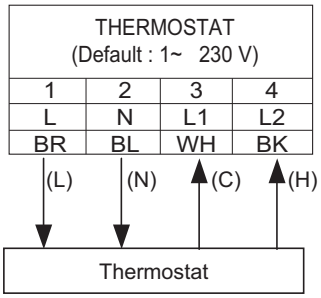
⚠ CAUTION

Do not connect external electric loads.

- Wire (L) and (N) should be used only for operation Electric type thermostat.
- Never connect external electric loads such as valves, fan coil units, etc. If connected, Main PCB Assembly 1 can be seriously damaged.

2. Accessories Installation

Step 6. Find terminal block and connect wire as below.



⚠ WARNING

Mechanical type Thermostat.

- Do not connect wire (N) as mechanical type thermostat does not require electric power supply.

⚠ CAUTION

Do not connect external electric loads.

- Wire (L) and (N) should be used only for operation Electric type thermostat.
- Never connect external electric loads such as valves, fan coil units, etc. If connected, Main PCB Assembly 1 can be seriously damaged.

(L) : Live signal from PCB to Thermostat
(N) : Neutral signal from PCB to Thermostat
(C) : Cooling signal from Thermostat to PCB
(H) : Heating signal from Thermostat to PCB

■ Final Check

- DIP switch setting :
  Set DIP switch No. 8 to ‘ON’ (Check the system set-up of Chapter 7). Otherwise, the unit can not recognize the thermostat.
- Remote Controller :
  - ‘Thermostat’ text is displayed on the remote controller.
  - Button input is prohibited.

2. Accessories Installation

2.5 3 Way Valve

3 way valve is required to operate sanitary water tank. Role of 3 way valve is flow switching between under floor heating loop and water tank heating loop.

■ General Information

Hydro Kit supports following 3way valve.

Type	Power	Operating Mode	Supported
SPDT 3-wire(1)	1~ 230 V	Selecting "Flow A" between "Flow A" and "Flow B" (2)	Yes
		Selecting "Flow B" between "Flow A" and "Flow B" (3)	Yes

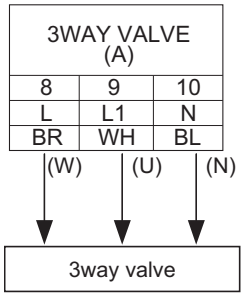
(1) SPDT = Single Pole Double Throw. Three wires consist of Live (for selecting Flow A), Live 1 (for selecting Flow B), and Neutral (for common).
(2) Flow A means 'water flow from the unit to sanitary water tank'
(3) Flow B means 'water flow from the unit to under floor water circuit'

■ How to Wire 3 Way Valve

Follow below procedures Step 1 ~ Step 2.

Step 1. Uncover front cover of the unit and open the control box.

Step 2. Find terminal block and connect wire as below.



⚠ WARNING

- 3 way valve should select water tank loop when electric power is supplied to wire (W) and wire (N).
- 3 way valve should select under floor loop when electric power is supplied to wire (U) and wire (N).

(W) : Live signal (Water tank heating) from PCB to 3 way valve
(U) : Live signal (Under floor heating) from PCB to 3 way valve
(N) : Neutral signal from PCB to 3 way valve

⚠ WARNING

- Mice can not be appeared to prevent entering the unit or attacking wires.

2. Accessories Installation

■ Final Check

- Flow direction :
  - Water should flow from water outlet of the unit to sanitary tank water inlet when sanitary tank heating is selected.
  - To verify the flow direction, check temperature at the water outlet of the unit and water inlet of sanitary water tank.
  - If correctly wired, these temperatures should be almost equivalent if thermal insulation of water pipe is well performed.
- Noise or water pipe vibration while 3way valve operation
  - Due to surging effect or cavitation effect, noise or water pipe vibration can be occurred while 3way valve is operating.
  - In that case, check followings :
  1. Is water circuit (both under floor water loop and sanitary water tank loop) fully charged? If not, additional water charging is required.
  2. Fast valve operation yields noise and vibration. Appropriated valve operating time is 60~90 seconds.

3. System Setup

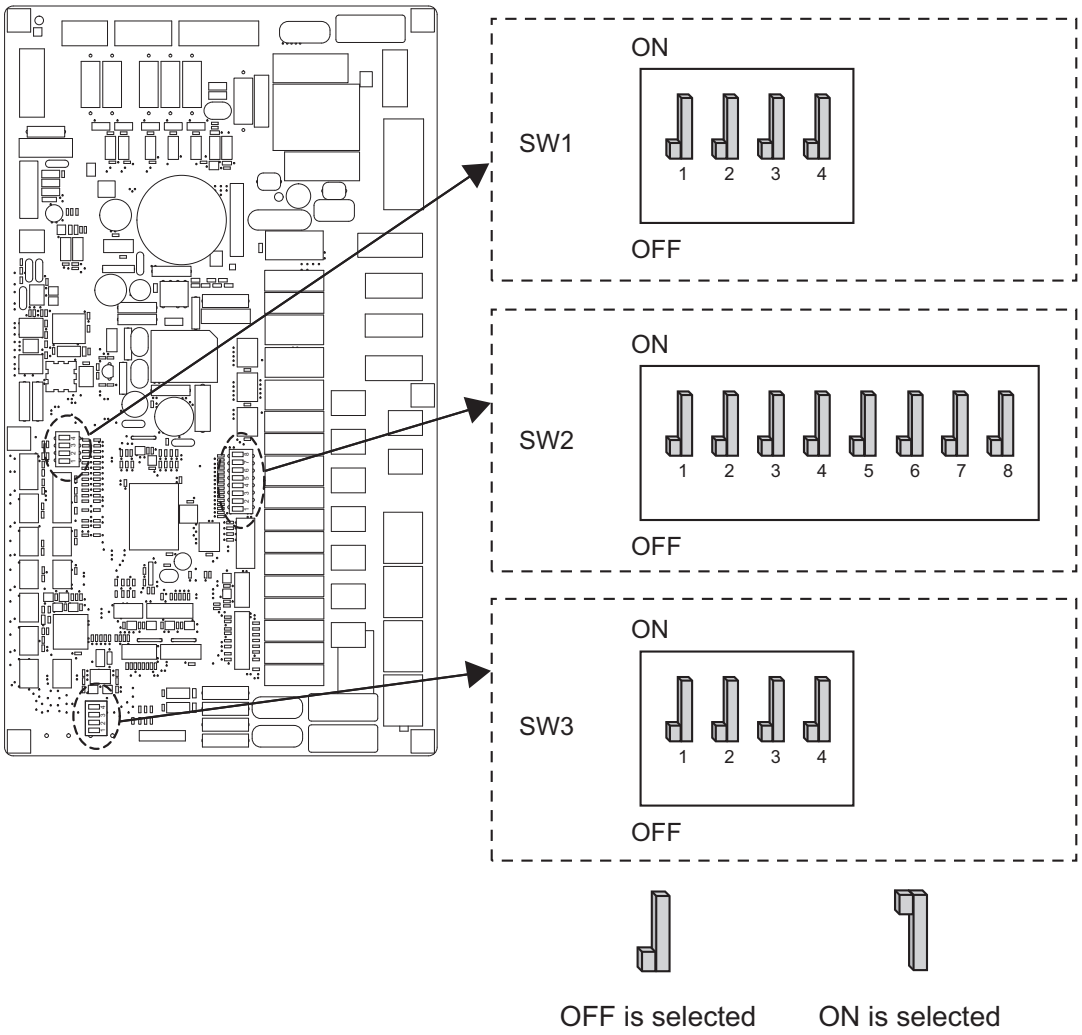
As **Hydro Kit** (For Medium Temperature) is designed to satisfy various installation environment, it is important to set up system correctly. If not configured correctly, improper operation or degrade of performance can be expected.

3.1 DIP Switch Setting

Note

- Turn off electric power supply before setting DIP switch
  Whenever adjusting DIP switch, turn off electric power supply to avoid electric shock.

◆ **General Information - Indoor PCB**



3. System Setup

■ Floor standing (Medium Temperature)

◆ Option Switch 2

O : On X : OFF

Description	DIP switch setting								Function	Default
	1	2	3	4	5	6	7	8		
Group Control	X								Master	O
	O								Slave	
Installation Scene		X	X						Floor Heating	
		X	O						Floor Heating + Hot Water	O
		O	X						Floor Heating + Hot Water + Solar	
		O	O						Hot Water	
Operation Mode Setting				X					Heating Only	
				O					Heating / Cooling	O
Flow Switch Detection					X				Always	
					O				While water pump is on	O
Electric Heater Setup						X	X		Not Use	O
						X	O		Reserved (Don't Select)	
						O	X			
						O	O			
Thermostat Connection								X	Not installed	O
								O	Installed	

◆ Option Switch 3

O : On X : OFF

Description	DIP switch setting				Function	Default
	1	2	3	4		
Sensor Selection	X				Sensor(Air) in Hydro kit (RS3)	O
	O				Air Sensor (PQRSTA0)	
Antifreeze mode		X			Not Use (connect short key)	O
		O			Use (disconnect short key)	

3. System Setup

■ Floor standing (High Temperature)

◆ Option Switch 2

O : On X : OFF

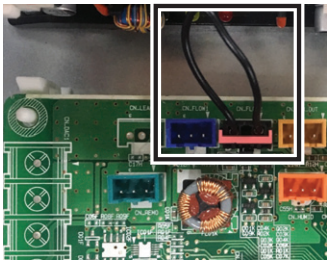
Description	DIP switch setting								Function	Default
	1	2	3	4	5	6	7	8		
Group Control	X								Master	O
	O								Slave	
Installation Scene		X	X						Floor heating only	
		X	O						Floor heating + Hot water	O
		O	X						Reserved (Don't select)	
		O	O						Hot Water	
Operation Mode Setting				X					Heating only	O
				O					Reserved (Don't select)	
Flow Switch Detection					X				Always	
					O				While water pump is on	O
Electric Heater Setup						X	X		Not use	O
						X	O		Reserved (Don't select)	
						O	X			
						O	O			
Thermostat conncetion								X	NOT installed	O
								O	Installed	

◆ Option Switch 3

O : On X : OFF

Description	DIP switch setting				Function	Default
	1	2	3	4		
Sensor Selection	X				Sensor(Air) in Hydro kit(RS3)	O
	O				Air Sensor(PQRSTA0)	

◆ Short key



- Medium Temp. : CN_FLOW2
- High Temp. : Not available

⚠ CAUTION

- After adding brine(Anti-freeze) only the Water circuit can be set to Anti Freeze mode.
- Otherwise the product may malfunction due to freezing and bursting.

⚠ WARNING

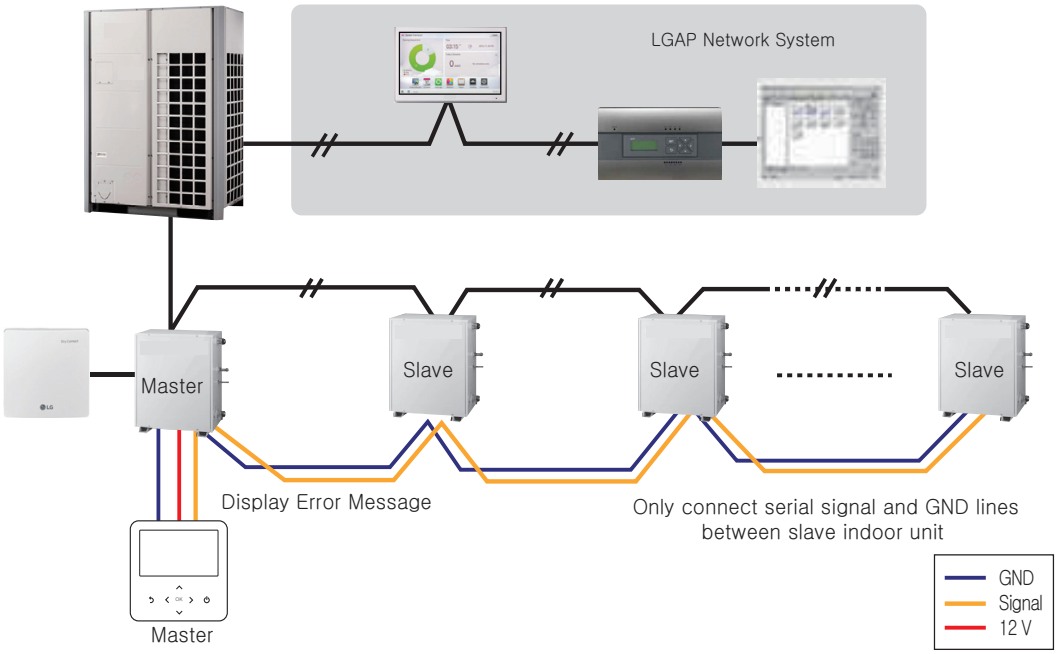
- Do not add brine(Anti-freeze) during Hot water mode.

3. System Setup

3.2 Group Control Setting

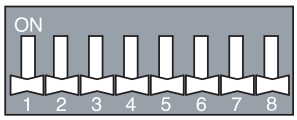
■ Group Control

◆ Wired remote controller 1 + Many of Hydro Kit

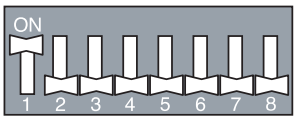


◆ DIP Switch in PCB

Master Setting - No. 1 Off



Slave Setting - No. 1 On



1. It is possible to connect 16 indoor units(Max) by one wired remote controller.
   Set only one indoor unit to Master, set the others to Slave.
2. It is possible to connect Dry Contact and Central controller at the same time.
   - The Master indoor unit is possible to recognize Dry Contact and Central Controller only.
   - In case of Central controller and Group controller at the same time, it is possible to connect only the address of master indoor unit.
   - Slave indoor unit will be operated like master indoor unit.
   - Slave indoor unit can not be individually controlled by Central controller.
   - Some remote controller can't perform with Dry Contact and Central controller at the same time.
3. When using 'Hot Water' Mode, it is possible to operate by inserting temperature sensor only on the Mater.

⚠ CAUTION

- Indoor unit(Hydro Kit)'s group setting is possible which connected same outdoor unit.
- To install Master and Slave indoor unit, the DIP Switch setting should be same.
- Group control is not possible between hydro kit and air conditioner.
- Group control is not possible between different type of hydro kit.

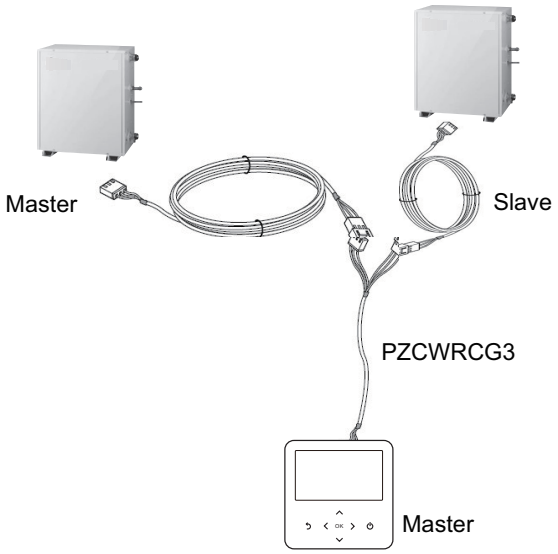
4. In case that the indoor unit has an abnormal problem an error code will be displayed on the wired remote controller. With the exception of the indoor unit with the error, you can control each indoor unit individually.

3. System Setup

5. In case of Group Control, it is possible to use following functions.
   - Selection of operation options (operation/ stop/ mode/ set temperature)
   - It is not possible at some functions
   * Master/Slave setting of indoor units be set possible using a PCB DIP Switch.
   * It can be the cause of malfunctions when there is no setting of master and slave.

■ Accessories for group control setting

Indoor unit 2 EA + Wired remote controller



* PZCWRCG3 cable used for connection

3. System Setup

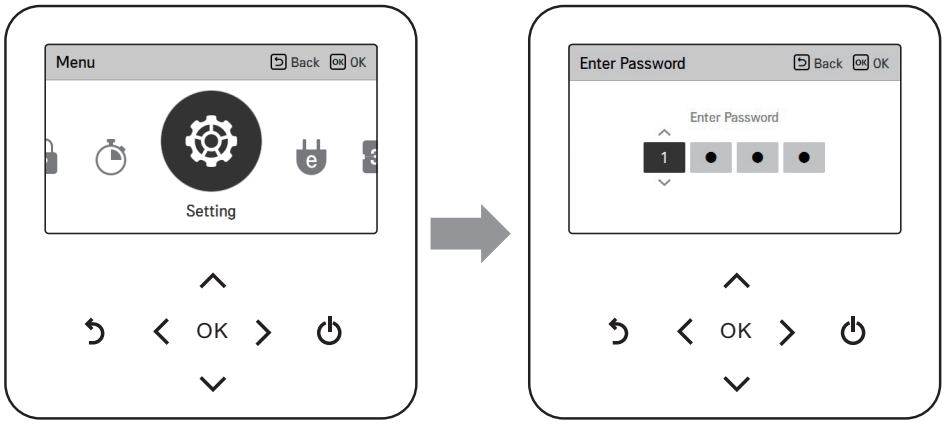
3.3 Installer Setting

■ How to enter installer setting mode

- In the menu screen, press [< , > (left / right)] button to select the setting category, and press [∧(up)]button for 3 seconds to enter the password input screen for the installer setting.
- Input the password and press [OK] button to move to the installer setting list.

⚠ CAUTION

The installer setting mode is the mode to set the remote controller's detail function.
If the installer setting mode is incorrectly set, it may cause product failure, user's injury, or property damage.
It must be set by the installation specialist with the installation license, and if it is installed or changed without installation license, all problems caused will be the responsibility of the installer, and may void the LG warrenty.



* Installer setting password

- Main screen → menu → setting → service → RMC version information → SW Version
- Example) SW version : 1.00.1 a
- In the above case, the password is 1001.

Note

Some categories of the installer setting menu may not be available depending on the product function or the menu name may be different.

3. System Setup

■ Summary (Floor standing type)

- You can set the product user functions.
- Some functions may not be displayed/operated in some product types.

Function text inside remote	Range		Short explanation
	Mid Temp.	High Temp.	
Test Run	Cool test run	N / A	Test run operates Multi V in cooling mode for max 18 minutes.
3 Minutes delay	N / A		Only for factory testing, cannot change standby timer compressor restart after Thermo-Off
Select Temperature Sensor	Control Standard - Air temperature (Air) - Leaving water temp. (Water) (Default) Sensor Location - Remote control - Indoor unit		Selecting the reference sensor (Air / Water) for control.
Dry Contact Mode	- Manual - Auto (default)		Selecting the initial state of the product when a dry contact signal is input.
Central Control Address	Hexa-decimal address - 00-FF (Default : 00)		When Central Controller is installed, address assigning is set by this function.
Override Master/Slave	- Master - Slave (Default)		Override master/slave selection function is to prevent the unit's different mode operation. If the unit is set as the slave, it is blocked to a change of opposite operation mode (cooling / heating)
Pump test run	Test run		Checking whether water circulation is normal.
Air cooling set temp.	-Upper Limit : 24℃ ~ 30℃(Default : 30℃) -Lower Limit : 16℃ ~ 22℃(Default : 16℃)	N / A	Adjusting range of 'Setting Air Temperature' in cooling mode.
Water cooling set temp.	FCU is not installed - Upper limit : 20℃ ~ 25℃(Default : 24℃) -Lower Limit : 16℃ ~ 20℃(Default : 16℃) FCU is installed -Upper Limit : 20℃ ~ 25℃(Default : 24℃) -Lower Limit : 5℃ ~ 20℃(Default : 5℃)	N / A	Adjusting range of 'Setting Leaving Water Temperature' in cooling mode.
Air heating set temp.	-Upper Limit : 24℃ ~ 30℃(Default : 30℃) -Lower Limit : 16℃ ~ 22℃(Default : 16℃)	-Upper Limit : 24℃ ~ 30℃(Default : 30℃) -Lower Limit : 16℃ ~ 22℃(Default : 16℃)	Adjusting range of 'Setting Air Temperature' in heating mode.
Water heating set temp.	-Upper Limit : 35℃ ~ 50℃(Default : 50℃) -Lower Limit : 20℃ ~ 34℃(Default : 20℃)	-Upper Limit : 50℃ ~ 80℃(Default : 80℃) -Lower Limit : 30℃ ~ 46℃(Default : 46℃)	Adjusting range of 'Setting Heating Flow Temperature' in heating mode.
DHW set temp.	-Upper Limit : 50℃(Default : 50℃) -Lower Limit : 30℃ ~ 40℃(Default : 40℃)	-Upper Limit : 50℃ ~ 80℃(Default : 80℃) -Lower Limit : 30℃ ~ 45℃(Default : 45℃)	Adjusting range of 'Setting DHW tank Heating Flow Temperature' in domestic hot water tank heating mode.
Cooling / Heating only mode	- Set - Release (Default) - Oil recovery option Type 0,1 (Default : 0)		Setting the operation mode lock function.
Water supply off temp. during cooling	-Water stop temperature 16℃ ~ 25℃ (Default : 16℃) - FCU use / not use (Default : use)	N / A	When cooling the floor, it is necessary to stop the supply of cold water to prevent bottom dew.
Outdoor temp. for auto mode	-Upper Limit : 10℃ ~ 20℃(Default : 15℃) -Lower Limit : -20℃ ~ -5℃(Default : -10℃)	-Upper Limit : 10℃ ~ 20℃(Default : 15℃) -Lower Limit : -20℃ ~ -5℃(Default : -10℃)	Setting outdoor Min/Max temperature for auto mode.
Indoor air temp. for auto mode	-Upper Limit : 20℃ ~ 30℃(Default : 21℃) -Lower Limit : 16℃ ~ 19℃(Default : 16℃)	-Upper Limit : 20℃ ~ 30℃(Default : 21℃) -Lower Limit : 16℃ ~ 19℃(Default : 16℃)	Setting indoor Min/Max temperature for auto mode.
LWT for auto mode	-Upper Limit : 35℃ ~ 50℃(Default : 50℃) -Lower Limit : 20℃ ~ 34℃(Default : 20℃)	-Upper Limit : 65℃ ~ 80℃(Default : 80℃) -Lower Limit : 40℃ ~ 54℃(Default : 50℃)	Setting heating flow Min/Max temperature for auto mode.
Tank disinfection setting 1	N / A	- Disable (1), Enable (2), (Default : Disable)	Setting start/maintain time for pasteurisation
	N / A	- Sun, Mon, ... ,Fri, Sat. (Default : Fri.)	Setting start/maintain dayfor pasteurisation
	N / A	- Start time : 00 ~ 23 (Default : 23)	Setting start/maintain time for pasteurisation
Tank disinfection setting 2	N / A	- 40℃ ~ 80℃ (Default : 70℃)	The temperature set point during disinfection operation.
	N / A	- 5min ~ 60min (Default : 10 min)	When the disinfection tank temperature is reached, the BSH continue to operate regarding this timer.
	N / A	- 1 ~ 12hours (Default : 1hour)	When the disinfection tank temperature is not reached, stop disinfect regarding this timer.
Tank setting1	N / A	N / A	Function for AWHP except for Hydro Kit. When it is necessary to change the weight of heating water source in the hot water tank depending on the user's environment. The value for determining the minimum temperature for maintaining the hot water.
	N / A	N / A	Function for AWHP except for Hydro Kit. When it is necessary to change the weight of heating water source in the hot water tank depending on the user's environment. Upper temperature limit for outdoor unit.

3. System Setup

Function text inside remote	Range		Short explanation
	Mid Temp.	High Temp.	
Tank setting2	N / A		Function for AWHP except for Hydro kit. Hysterisis value to maintain the desired temperature of hot water.
	- 00 : Perform hot water - 01 : Perform heating floor		Setting heating demand priority.
DHW time setting	- Operation Holding Time 5min ~ 95min (Default : 30min) - Stop Holding Time 0min ~ 600min (Default : 180min)	- Operation Holding Time 5min ~ 95min (Default : 30min) - Stop Holding Time 0min ~ 600min (Default : 30min)	Set the hot water maintenance / suppression time.
Pump frequency setting (LPM)	- 15LPM ~ 92LPM (Default : 46LPM)	N / A	Setting for water flow rate in water piping.
TH on/off Variable, heating air	- Type : 0, 1, 2, 3 (Default : 0)		The temperature of the heating air can be adjusted according to the field environment preparing for heating claims.
TH on/off Variable, heating water	- Type : 0, 1, 2, 3 (Default : 0)		The temperature of the heating water can be adjusted according to the field environment preparing for heating claims.
TH on/off Variable, cooling air	- Type : 0, 1, 2, 3 (Default : 0)	N / A	The temperature of the cooling air can be adjusted according to the field environment preparing for heating claims.
TH on/off Variable, cooling water	- Type : 0, 1, 2, 3 (Default : 0)	N / A	The temperature of the cooling water can be adjusted according to the field environment preparing for heating claims.
TH on/off Variable, DHW	- Type : 0, 1, 2, 3 (Default : 0)		It is a function to set the step value to adjust the hot water temperature themal on / off according to the field environment.
Heating temp. setting	- 00 : Outlet(Default) - 01 : Inlet		It is a function to set the water pipe temperature control standard for heating in accordance with the field environment.
Cooling temp. setting	- 00 : Outlet(Default) - 01 : Inlet	N / A	It is a function to set the water pipe temperature control standard for cooling in accordance with the field environment.
Pump setting in heating	- Type : Time, Always (Default : Time) - OFF Time : 1min ~ 60min (Default : 1min) - On Time : 1min ~ 60min (Default : 2min)		It is a function to set water pump operation / delay time option for heating.
Pump setting in cooling	- Type : Time, Always (Default : Always) - OFF Time : 1min ~ 60min (Default : 1min) - On Time : 1min ~ 60min (Default : 2min)	N / A	It is a function to set water pump operation / delay time option for cooling.
Forced operation	- Value 1 : ON, OFF (Default : ON) - Value 2 Forced Period : 20 ~ 180hr (Default : 20hr) - Value 3 Pump Operating Time : 1 ~ 10min (Default : 10min)		It is a function to deactivate the logic that drives the water pump itself.
CN_CC	- D/C(Dry Contact) Automatic (Default) - D/C(Dry Contact) Not Installed - D/C(Dry Contact) Installed		Function should be set correct depending on optional Dry-Contact.
Smart Grid(SG)	- Not Use (Default) - Use - Step0, Step1, Step2 (Mode Selection)		The function to enable/disable the SG Ready function and to set the reference value at the step 2.
Data logging			The error history of the connected indoor unit can be inquired.
Password Initialization			If you forget the user setting password, you can initialize it in the installer settings.
Refrigerant Leak Sensor	- Not installed (Default) - Installed		The installation of the flare coupling part and the welding part leakage sensor of the indoor unit is set.
IDU Address Verification			Check the result of Auto Addressing of outdoor unit with remote control.
CN_EXT	- Not use (Default) - Simple Operation - Simple Dry Contact - Single emergency stop - All emergency stop		Depending on DI/DO set by customer using dry contact port of indoor unit function to set external input and output control.
ODU Function Master	- Master - Slave(Default)		Setting of outdoor function Master / Slave.
Low Noise Mode Priority	- ODU (Default) - RMC		Function to set low noise mode control subject.
ODU cycle priority	- Not use (Default) - Standby		Function to enable or disable the standby mode of the indoor unit.
Use External Pump	- Not use (Default) - Use		Function to set the control of external water pump.
Pump Prerun/Overrun	- Prerun : 1 ~ 10min (Default : 1min) - Overrun : 1 ~ 10min (Default : 1min)		Function to circulate the heating water with a water pump before heat exchange and set it to reach the appropriate flow rate.
Estimated energy display	- Clear (Default) - Set		Wired remote control The function to set whether to display the estimated amount of power calculated by the product on the screen.
Pump operation time	-		Indicates the operation time of the water pump installed in the indoor unit, and measures the life of the motor.
IDU operation time	-		The function to display the operating time and to measure the life of the product.

3. System Setup

CAUTION

There is no disinfection function in Medium Temperature Hydro kit.
So, external control equipment should be installed for disinfection function.

3. System Setup

■ Common Setting

- **Test Run**

  Test run should be performed when charging the additional refrigerant is required. The unit must be operated in Cooling mode when the refrigerant is being charged. Test run instantly makes the unit operate in Cooling mode for 18 minutes.

Note

- If you press any kind of button during this mode, Test Run mode will be finished.
- After the unit operates under Test run mode for 18 minutes, it will be turned off automatically

- **3 Minutes Delay**

  Temporarily eliminates the 3-minute delay function of the outdoor unit Comp.
  Factory use only.

- **Select Temperature Sensor**

  The product can be operated according to air temperature or leaving water temperature. The selection for setting temperature as air temperature or leaving water temperature is determined.

Note

Air temperature as setting temperature is ONLY available when Remote Air Sensor
Connection is enabled and Remote Air Sensor Connection is set as Air temperature.
After selecting Air Temperature, select Remote control and Indoor Unit.

- **Dry Contact Mode**

  This function allows the Dry contact-indoor unit operate under Auto Run mode or Manual mode with remote control panel. For dry contact mode related detail functions, refer to the individual dry contact manual.
  – What is dry contact?
  It means the contact point signal input when the hotel card key, human body detection sensor, etc. are interfacing with the air conditioner.
  Added system functionality by using external inputs (dry contacts and wet contacts).

- **Central Control Address**

  When Central Controller is installed, address assigning is set by this function. - Setting value: 00 ~ FF (Hex)
  first two digits: Central control group number
  last two digits: Central control indoor unit number

- **Override Master/Slave**

  Override master/slave selection function is to prevent the unit's different mode operation. If the unit is set as the slave, it blocks a change of opposite operating mode(cooling/heating).
  * To use override master/slave selection function is only possible when units are connected in series to the outdoor unit.

- **Pump test run**

  The pump test run is the function to test run by operating the water pump.
  This function can be used for air vents / flow sensors and others.

3. System Setup

■ Temperature Range Setting

- **Air cooling set temp.**
  Determine cooling setting temperature range when air temperature is selected as setting temperature.

Notice

Only available when remote air temperature sensor is connected.
- Accessory PQRSTA0 should be installed.
- Also, Remote air sensor connection should be set properly.

- **Water cooling set temp.**
  Determine cooling setting temperature range when leaving water temperature is selected as setting temperature.

Notice

1. Water condensation on the floor
   - While cooling operation, it is very important to keep leaving water temperature higher than 16 °C. Otherwise, dew condensation can be occurred on the floor.
   - If floor is in humid environment, do not set leaving water temperature below 18 °C.
2. Water condensation on the radiator
   - While cooling operation, cold water may not flow to the radiator. If cold water enters to the radiator, dew generation on the surface of the radiator can be occurred.

- **Air heating set temp.**
  Determine heating setting temperature range when air temperature is selected as setting temperature.

⚠ CAUTION

Only available when remote air temperature sensor is connected.
- Accessory PQRSTA0 should be installed.
- Also, Remote air sensor connection should be set properly.

- **Water heating set temp.**
  Determine heating setting temperature range when leaving water temperature is selected as setting temperature.

- **DHW set temp.**
  Determine heating setting temperature range of water tank leaving water.

Notice

Only available when DHW tank feature is installed.
- DHW tank and DHW tank kit should be installed.
- DIP switch No. 2 and 3 should be set properly.

3. System Setup

■ Temperature Control Parameter Setting

• Water supply off temp. during cooling

Determine leaving water temperature when the product is turned off.
This function is used for preventing condensation on the floor in cooling mode.
- Stop temp. : cut-off temperature. Stop temp. is valid when FCU is installed.
- FCU : determines if FCU is installed or not.
- Example : If Stop temp. is set as ‘16’ and FCU is ’Use’ and actually FCU is NOT installed in the water loop, the unit stop operation in cooling mode when the leaving water temperature is below 16 °C.
- Example : If Stop temp. is set as ‘16’ and FCU is ’Not use’ and actually FCU is installed in the water loop, the Stop temp. is not used and the unit do NOT stop operation in cooling mode when the leaving water temperature is below 16 °C.

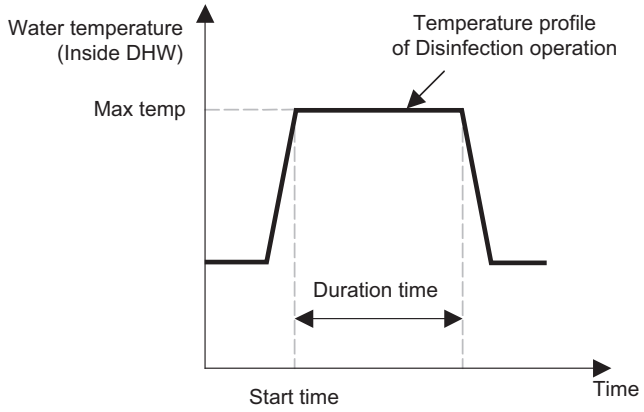
Notice

FCU Installation

– If FCU is used, related 2way valve should be installed and connected to the indoor unit PCB.
– If FCU is set as ‘Not use’ but FCU or 2way valve is NOT installed, the unit can do abnormal operation.

• Tank disinfection setting 1, 2

Disinfection operation is special DHW tank operation mode to kill and to prevent growth of viruses inside the tank.
- Disinfection active : Selecting enable or disable of disinfection operation.
- Start date : Determining the date when the disinfection mode is running.
- Start time : Determining the time when the disinfection mode is running.
- Max temp. : Target temperature of disinfection mode.
- Duration time : Duration of disinfection mode.



Notice

Please refer to the function list or accessories compatibility table for availability of Tank disinfection.

Notice

DHW heating should be enable

– If Disinfection active is set as ’ Not use’, that is ‘disable disinfection mode’, Start date and Start time is not used.
– When Disinfection active is set as ’Use’, that is ‘enable disinfection mode’, Start date is displayed at the position of Disinfection active and Start time is displayed at the position of Start date.

3. System Setup

- **Tank setting 1, 2**

  Descriptions for each parameters are as following.

  – Min temp. : temperature gap from Max outdoor temp.

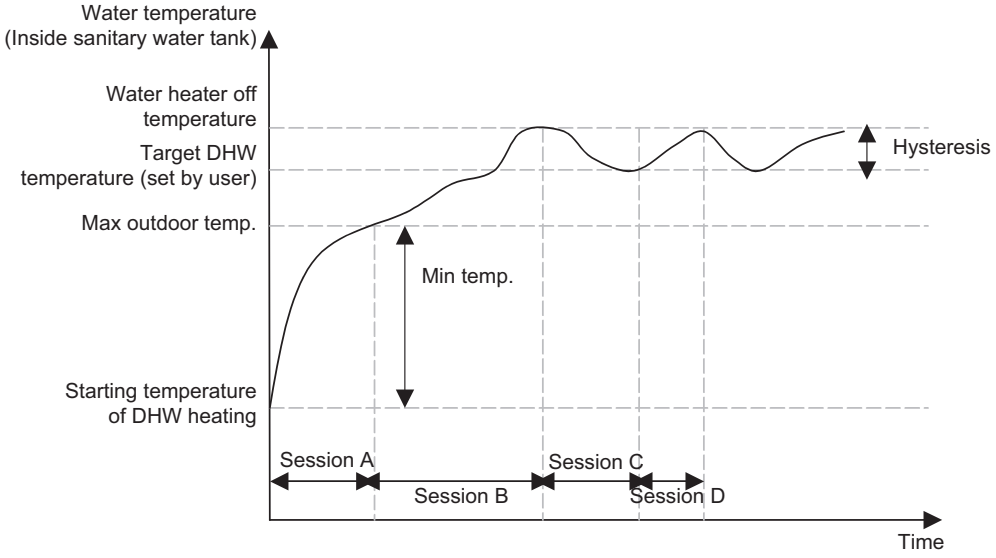
  – Max outdoor temp. : maximum temperature generated by AWHP compressor cycle.

  ex) If Min temp. is set as ‘5’ and Max outdoor temp. is set as ’48’, then Session A (see the graph) will be started when the water tank temperature is below 45 °C…. If temperature is above 48 °C…, then Session B will be started.

  – Hysteresis : temperature gap from target DHW temperature. This value is required to frequent On and Off of water tank heater.

  – Heating priority : Determining heating demand priority between DHW tank heating and under floor heating.

  ex) If user’s target temperature is set as ’70’ and Hysteresis is set as ‘3’, then the water tank heater will be turned off when the water temperature is above 73 °C. The water tank heater will be turned on when the water temperature is below 70 °C. ex) If Heating priority is set as ‘DHW’, that means heating priority is on DHW heating, DHW is heated by AWHP compressor cycle and water heater. In this case the under floor can not be heated while DHW heating. On the other hand, if the Heating priority is set as ‘Floor heating’, that means heating priority is on under floor heating, DHW tank is ONLY heated by water heater. In this case the under floor heating is not stopped while DHW is heated.



Session A : Heating by AWHP compressor cycle and water heater
Session B : Heating by water heater
Session C : No heating (Water heater is Off)
Session D : Heating by water heater

Notice

– DHW heating does not operate when it is disabled.

– Hydrokit only performs the heating prioirty function.

3. System Setup

- **DHW time setting**

  Determine following time duration : operation time of DHW tank heating, stop time of DHW tank heating, and delay time of DHW tank heater operating.
  - Active time : This time duration defines how long time DHW tank heating can be continued.
  - Stop time : This time duration defines how long time DHW tank heating can be stopped. It is also turned on in DHW heating operation.

- **TH on/off Variable, heating air**

  Setting Thermal on/off Air Temperature gap in heating mode

Type	Th On	Th Off
0	-0.5 °C	1.5 °C
1	-1 °C	2 °C
2	-2 °C	3 °C
3	-3 °C	4 °C

- **TH on/off Variable, heating water**

  Setting Thermal on/off Water Temperature gap in heating mode

Type	Th On	Th Off
0	-2 °C	2 °C
1	-3 °C	3 °C
2	-4 °C	4 °C
3	-1 °C	1 °C

- **TH on/off Variable, cooling air**

  Setting the step value to adjust air temperature gap in cooling mode

Type	Th On	Th Off
0	0.5 °C	-0.5 °C
1	1 °C	-1 °C
2	2 °C	-2 °C
3	3 °C	-3 °C

- **TH on/off Variable, cooling water**

  Setting the step value to adjust water temperature gap in cooling mode

Type	Th On	Th Off
0	0.5 °C	-0.5 °C
1	1 °C	-1 °C
2	2 °C	-2 °C
3	3 °C	-3 °C

- **TH on/off Variable, DHW**

  Setting the step value to adjust DHW temperature gap in heating mode

Type	Th On	Th Off
0	-2 °C	2 °C
1	-6 °C	4 °C
2	-2 °C	4 °C
3	-1 °C	1 °C

3. System Setup

- **Forced operation**
  If the product is not used for a long time, the product will be forced to operate to prevent pump failure and PHEX freezing.
  Water pump off After 20 consecutive hours, disable / enable the logic that drives the water pump by itself.

- **Pump frequency setting (LPM, For Medium Temperature)**
  Setting water flow rate.
  Determine the difference between target inlet water temperature and target outlet water temperature from water flow rate.

Setting value	Water Flow Rate (l/min)	
	4 HP	10 HP
50	20~22	45~50
55	23~24	51~55
60	25~26	56~60
65	27~28	61~65
70	29~30	66~70
75	31~32	71~75
80	33~34	76~80
85	35~37	81~85
90	38~39	86~90
92	40	91~92

Notice

Whether the 'Pump frequency setting' function is applied depends on the model.
Please refer to the function list or accessories compatibility table for availability of Pump frequency.

- **CN_EXT**
  Determining the purpose of CN_EXT. (Setting value: 0 ~ 5 step Indoor CN-EXT port setting)
  - 0: default
  - 1: Simple operation on / off
  - 2: Dry contact (simple contact)
  - 3: Emergency stop only for indoor unit
  - 4: Emergency stop of all indoor units (It can be set only when indoor unit has emergency stop function)
- **ODU Function Master**
  1. Setting of outdoor unit function Master status
     - Low noise operation control subject can be set
     - Low noise operation time setting
     - Defrost mode can be set
  2. Setting of outdoor unit function Slave status
     - No noise operation control subject setting
     - No noise operation time setting
     - No defrost mode setting
- **Low Noise Mode Priority**
  Setting whether to control in IDU or in ODU
  1. Setting outdoor management of low noise operation
     It is controlled by outdoor unit according to switch setting value of low noise operation of outdoor unit PCB.
     Function Setting - Low noise operation time menu is inactivated
  2. Setting remote control management of low noise operation
     Low noise operation switch setting of outdoor unit PCB is ignored.
     Function Setting - Low noise operation time menu is activated.

4. Test Run

4.1 Caution before Operation Test

- Check whether water flow is smoothly supplied.
- Check whether the flow switch properly operates.
- Check whether the connection status is good.
- Check whether the power cable and communication cable are completely connected.
- Check whether it is 2.0 mΩ or above, when insulation resistance between the terminal block and ground is measured with DC mega tester (DC 500V).
- Never check insulation resistance for the connector of the control board.

4.2 Operation Test of Water Pipe

Category	Status	Check point
Flow Switch Error	CH14	Check whether operation of water pump is normal.
		Check for the block inside water pipe.(Strainer cleaning, valve locked, valve malfunction, air remaining, etc.)
		Check problem with flow switch.(Flow switch disorder, untold operation, disconnection, etc.)

4.3 Troubleshooting

If **Hydro Kit** operates not properly or it does not start operation, please check following list.

Error No.	Error Type	Main Reasons
01	Air temperature sensor error	Air temperature sensor disconnection or short circuit
02	Gas side temperature sensor error	Gas side temperature sensor disconnection or short circuit
03	No communication between wired remote controller & indoor unit	The remote controller does not receive the signal from indoor unit during specific time
05	Indoor unit & outdoor unit communication error	No signal communication between indoor unit & outdoor unit
06	Liquid side temperature sensor error	Liquid side temperature sensor disconnection or short circuit
08	Water tank temperature sensor error	Water tank temperature sensor disconnection or short circuit
09	Indoor unit EEPROM error	Communication between the micro-processor & the EEPROM / Error due to EEPROM damage
11	Indoor unit & inverter PCB communication error	No signal communication between indoor unit & inverter PCB
12	Inverter PDB error	Error occurrence in inverter PCB
13	Solar thermal temperature sensor error	Solar thermal temperature sensor disconnection or short circuit
14	Flow switch error	Abnormal working of flow switch
15	Water pipe overheated	Water outlet temperature is above 85℃ (185°F)
16	Water inlet & outlet temperature sensor error	Water inlet & outlet temperature sensor disconnection or short circuit simultaneously
17	Water inlet temperature sensor error	Water inlet temperature sensor disconnection or short circuit
18	Water outlet temperature sensor error	Water outlet temperature sensor disconnection or short circuit
187	Hydro-Kit P.HEX bursting error	Inlet water temperature is below 5 degree or water temperature error during defrosting operation

4. Test Run

Inverter PCB error (BC *** displayed in Remote Controller)

Error No.	Error Type	Main Reasons
21	Inverter compressor IPM defect	Inverter compressor drive IPM defect / inverter compressor defect
22	Inverter compressor overcurrent	Increase of inverter compressor CT value
23	Inverter compressor DC Link low voltage	After inverter activation relay is ON, DC voltage recharge defect
25	High/low Inverter input voltage	Inverter input voltage exceeds the unit limit and lasts for 4 s (173 V ~ 289 V)
26	Inverter compressor activation failure	Inverter compressor error, causing initial activation failure
27	Inverter PSC/PFC Fault Error	Error by overcurrent at inverter input
28	Inverter DC Link high voltage error	Inverter DC voltage recharge, causing compressor OFF
29	Inverter compressor overcurrent	Inverter compressor activation failure or increase of CT value
32	Excessive rise of inverter compressor discharge temperature	Excessive rise of inverter compressor discharge temperature, causing compressor OFF
34	Excessive rise of high pressure of inverter compressor	Excessive rise of high pressure of inverter compressor, causing compressor OFF
35	Excessive drop of low pressure of inverter compressor	Excessive drop of low pressure of inverter compressor, causing compressor OFF
36	Low pressure ratio error of inverter compressor	High pressure/low pressure ratio of inverter compressor is maintained at below 1.8 for 3 min. or more
40	Inverter compressor CT sensor defect	Inverter compressor CT sensor defect
41	Inverter compressor discharge pipe temperature sensor defect	Inverter compressor discharge temperature sensor disconnection or short circuit
42	Low pressure sensor defect of inverter compressor	Low pressure sensor disconnection or short circuit of inverter compressor
43	High pressure sensor defect of inverter compressor	High pressure sensor disconnection or short circuit of inverter compressor
44	Inverter inside air temperature sensor defect	Inverter inside air temperature sensor disconnection or short circuit
46	Inverter compressor suction pipe temperature sensor defect	Inverter compressor suction temperature sensor disconnection or short circuit
53	Communication error(indoor unit → outdoor unit main PCB)	Outdoor unit does not receive signal from indoor unit
60	Inverter PCB EEPROM error	Inverter PCB EEPROM error
62	Excessive rise of inverter heatsink temperature	Inverter PCB heat generation, causing the rise of heatsink temperature
65	Inverter heatsink temperature sensor defect	Inverter heatsink temperature sensor disconnection or short circuit
73	Overcurrent (Peak) detected at inverter input	Error by overcurrent detection at inverter input

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