LG

MULTI V™

Hydro Kit

R410A/R32(50Hz/60Hz)

0CVG0-02F(Replaces 0CVG0-02E)

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)

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

◆ Floor Standing

Category	Operating Temperature	Chassis Name	4 HP	8 HP	10 HP
Floor standing	Medium	K2	ARNH04GK2A4	-	ARNH10GK2A4
	High	K3	ARNH04GK3A4 ARNH04LK3A4	ARNH08GK3A4 ARNH08LK3A4	-

■ External Appearance

Category	Operating Temperature	Chassis Name	Model Name	Phase	Refrigerant	Model
Floor standing	Medium	K2	ARNH04GK2A4 ARNH10GK2A4	1Ø	R410A / R32	
	High	K3	ARNH04GK3A4 ARNH08GK3A4	1Ø	R410A / R32	
			ARNH04LK3A4 ARNH08LK3A4	3Ø		

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** Wall Mounted Unit : Btu/h Floor Standing : HP Ex) Wall Mounted Unit 10 Btu/h → '10', Floor Standing 8 HP→ ‘08’
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 L : 3Ø, 380-415V, 50Hz / 3Ø, 380V, 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

◆ Floor Standing

Model	ARNH04GK2A4 ARNH04GK3A4 ARNH04LK3A4	ARNH08GK3A4 ARNH08LK3A4	ARNH10GK2A4
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.

■ ODU-IDU Compatibility

O : Compatible, X : Not Compatible

Line up	Outdoor Unit Type	Normal Indoor Units	Special Indoor Units[1]						
			Hydro Kit[2]			Fresh Air Intake Unit(FAU)	ERV DX	AHU. Comm. Kit & EEV Kit	
			Floor standing		Wall Mounted			Return (Room) air	Discharge (Supply) air
			Med. Temp	High Temp					
Multi V i	Heat Pump & Heat Recovery	O	O	O	O	O	O	O	O (HP* only)
Multi V 5	Heat Pump & Heat Recovery	O	O	O	O	O	O	O	O (HP* only)
Multi V S	R410A Heat Pump	O	O	O	O	O	O	O	O
	R410A Heat Recovery	O	O	O	O	X	O	O	X
	R32 Heat Pump	O	O	O	O	X	X	O	O
Multi V Water IV	Heat Pump	O	O	O	X	O	O	O	O
	Heat Recovery	O	O	O	X	X	O	O	X
Multi V Water 5	Heat Pump & Heat Recovery	O	O	O	O	O (HP* only)	O	O	O (HP* only)
Multi V M	MULTI V M[3]	O	X	X	X	X	X	X	X

■ Combination Ratio for System with Special Indoor Units

Type		Hydro Kit[2]	ERV DX	Fresh Air Intake Unit (FAU)	AHU Comm. Kit & EEV Kit[4]	
					in Heat Recovery AHU	in Fresh Air AHU
1 ODU : 1 IDU		50 ~ 105%				
One ODU with normal IDUs and Special IDUs	Total (Normal IDUs + Special IDUs)	Refer to 'Combination Ratio for System with Normal Indoor Units' in outdoor unit PDB	50 ~ 130%	50 ~105%	50 ~ 130 %	50 ~ 105%
	Max. Special IDUs	~105%	~50%	~ 30% (Max 4 Units)	~ 50% (~100% : With cooling only ODU)	~ 50%
One ODU with Multiple Special IDUs only (no normal IDUs)		50 ~105%	50 ~ 130 %	50 ~ 105%	50 ~ 130 %	50 ~ 105%

Note

1. Special Indoor Unit : Hydro Kit, FAU, ERV DX, AHU Comm. Kit & EEV kit, Water. Comm. Module & EEV Kit.
   If more than 2 types of special IDUs are connected, total combination ratio follows the small one.
2. Hydro Kit cannot be combined with Multi V quadruple frame (4 units) system.
3. Special Indoor Units cannot be combined with Multi V M.
4. The combination ratio for systems with AHU Comm. Kit& EEV kit is determined by: (heat exchanger capacity + indoor unit nominal capacity index) / outdoor unit nominal cooling capacity. The on-coil temperature (i,e. coil inlet temperature) of Heat Recovery AHU should be within the operation range of the indoor units.
   For more detail about AHU comm. Kit application, please refer to AHU Comm. Kit PDB.
5. * : Heat Pump

MULTI V™

Hydro Kit

Floor Standing (Medium Temperature)

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 (for heating operation)	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	X
	ODU Cycle Priority (Heating Priority)	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
	Multi-Tenant Power Module	PINPMB001	-	O
	Refrigerant Leakage Detector	PRLDNVS0	For R410A	O
		PLDRNV1S	For R32	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. * : Some advanced functions controlled by individual controller cannot be operated.
3. If you need more detail, please refer to the BECON PDB or the manual of product.
   (http://partner.lge.com> Select Your Region : Home> Doc.Library> Product > Control(BECON))

2. Specifications

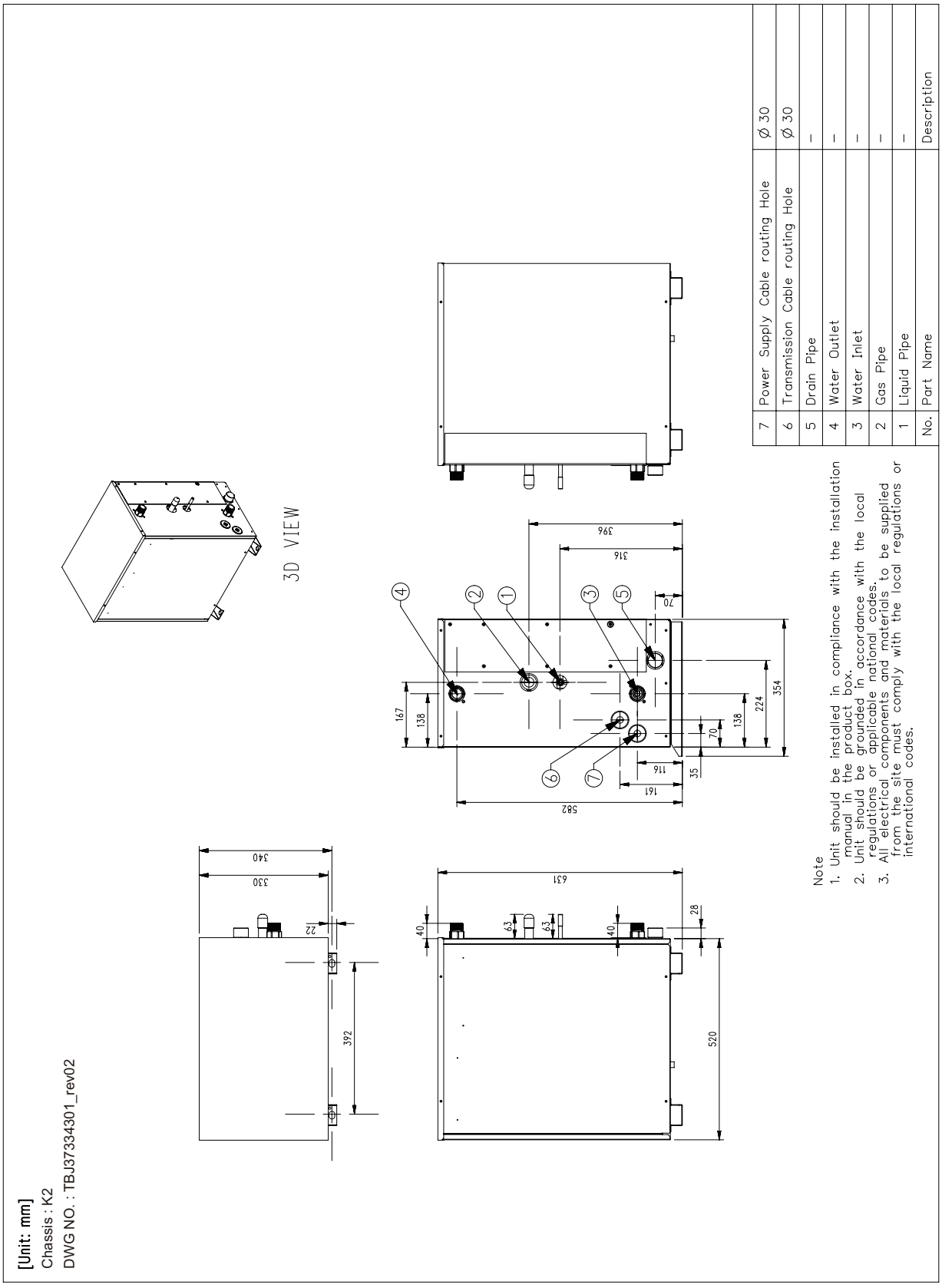
Model			Unit	ARNH04GK2A4	ARNH10GK2A4
Capacity (Rated)		Cooling	kW	12.3	28.0
			kcal/h	10,580	24,100
			Btu/h	42,000	95,900
		Heating	kW	13.8	31.5
			kcal/h	11,870	27,100
			Btu/h	47,000	107,500
Input (Rated)		Cooling	kW	0.01	0.01
		Heating	kW	0.01	0.01
Casing		Material	-	Painted Steel Plate	Painted Steel Plate
		Color (RAL code)	-	RAL 7038	
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)	30.5(67.2)	35.5(78.3)
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 / R32	R410A / R32
		Precharged Amount	kg (lbs)	-	-
		Additional Refrigerant Charge Amount	kg (lbs)	0.80(1.76) / 0.66(1.46)	1.60(3.53) / 1.32(2.91)
		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

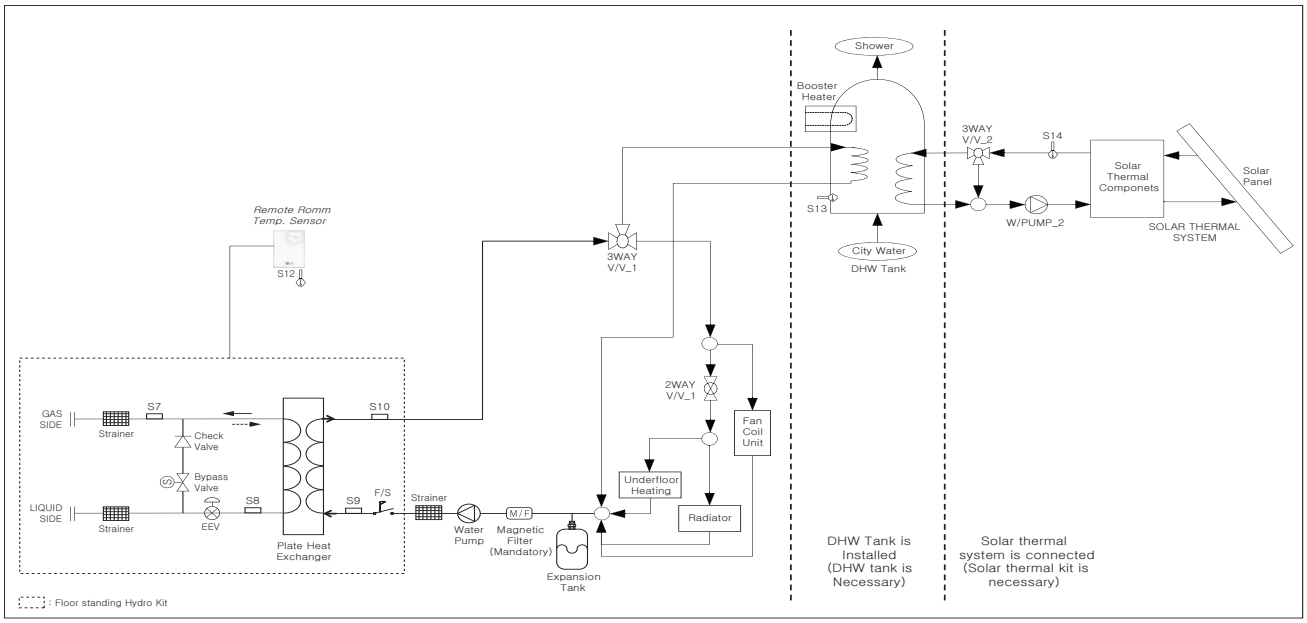


No.	Part Name	Description
7	Power Supply Cable routing Hole	Ø 30
6	Transmission Cable routing Hole	Ø 30
5	Drain Pipe	–
4	Water Outlet	–
3	Water Inlet	–
2	Gas Pipe	–
1	Liquid Pipe	–

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.

4. Piping diagrams

■ ARNH04GK2A4 / ARNH10GK2A4



Note

The schematic diagram above is given for reference only.

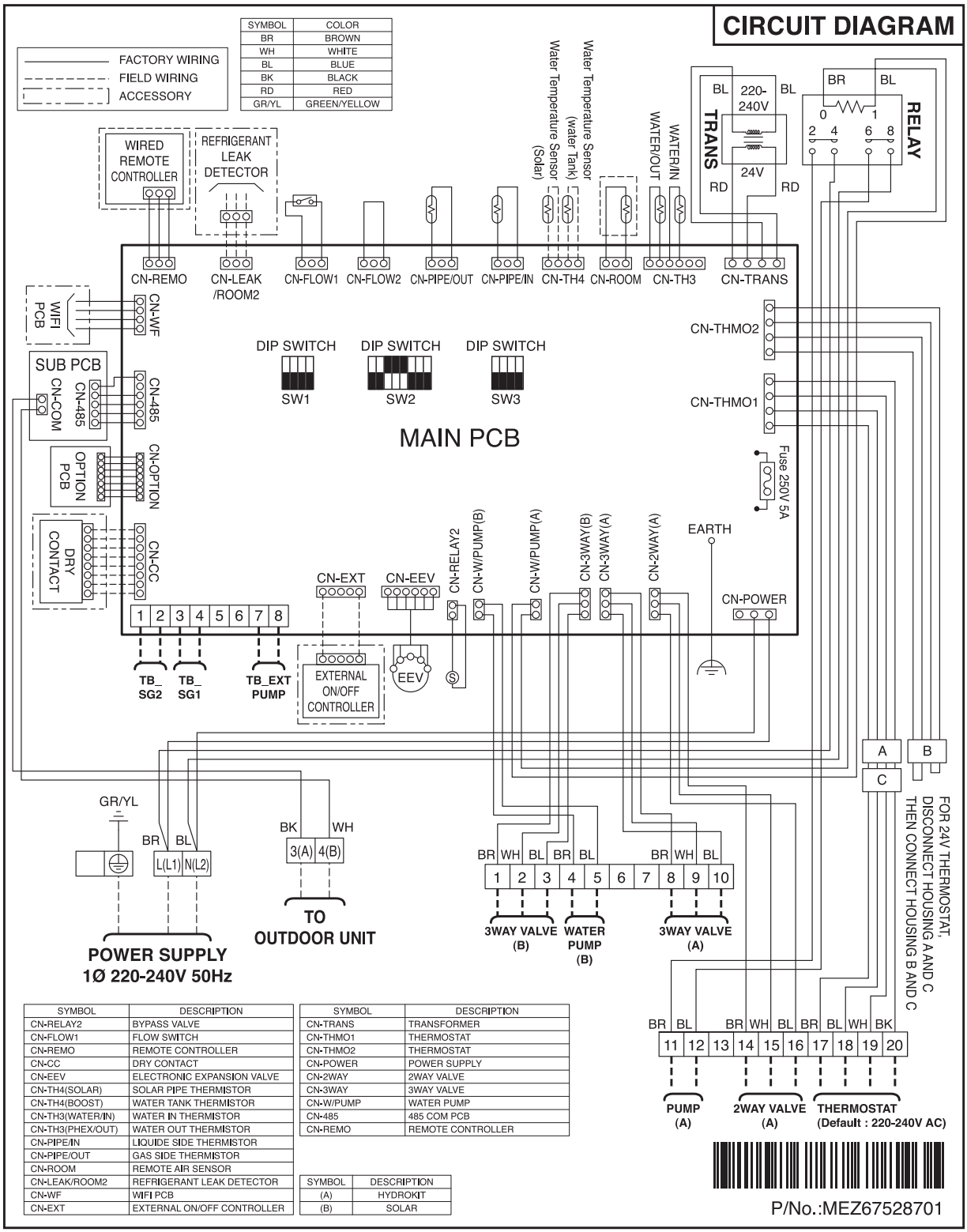
Actual schematic diagram may be different depending on the project requirement.

4. Piping diagrams

Category	Symbol	Meaning	PCB Connector	Remarks
Indoor Unit	S7	Refrigerant temperature sensor (Gas side)	CN_PIPE/OUT	- Meaning is expressed based on Cooling mode.
	S8	Refrigerant temperature sensor (Liquid side)	CN_PIPE/IN	
	S9	Entering Water temperature sensor	CN_TH3 (WATER IN) (PHEX OUT) (WATER OUT)	- S9, S10 are connected at 6 pin type connector CN_TH3.
	S10	Leaving Water temperature sensor		
	F/S	Flow Switch	CN_FLOW1	- To monitor water flow in the system.
	S12	Remote Air sensor (Room 1/Direct circuit)	CN_ROOM	- Optional accessory (sold separately)
	CTR/PNL	Control Panel (or 'Remote Controller')	CN_REMO	- Pre built-in at indoor unit
Space Heating/ Cooling	2WAYV/V_1	To block underfloor heating from cooling water	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately) -2wire NO or NC type 2way valve is supported.
DHWHeating	DHW TANK	Water TANK	(no connector)	- Accessory and Field installation (sold separately)- Generating and storing DHW by Hydro kit or built-in backup heater
	Cold WATER	Water to be heated by Indoor unit and Booster Heater of W/TANK	(no connector)	- Field installation
	SHOWER	Water supplied to end-user	(no connector)	- Field installation
	S13	W/TANK water temperature sensor	CN_TH4	- S13 and S15 are connected at 4 pin type connector CN_TH4.- S13 is a part of DHW tank kit.- S14 is a part of solar thermal kit
Solar Heating	S14	Solar-heated water temperature sensor		
	3WAYV/V_2	- Flow control for water which is heated and circulated by SOLAR THERMAL SYSTEM.- Flow direction switching between SOLAR THERMAL SYSTEM and W/TANK	CN_3WAY_B	- 3rd party accessory and Field installation (sold separately)- SPDT type 3way valve is supported.
	W_PUMP/2	External Water Pump	CN_W/PUMP_B	- 3rd party accessory and Field installation (sold separately)- If water pump of SOLAR THERMAL SYSTEM is incapable of circulation, external water pump can be used.
	SOLAR THERMAL SYSTEM	- This system can include following components : Solar panel, Sensors, Thermostats, Interim heat exchanger, Water pump, etc.- To utilized hot water heated by SOLAR THERMAL SYSTEM, end-user must install Solar-Kit accessory provided by LG.	(no connector)	- 3rd party accessory and Field installation (sold separately)
Common	Expansion Tank	Expansion Tank	(no connector)	- Absorb volume change of heated water,
	M / F	Magnetic Filter	(no connector)	- 3rd party accessory and Field installation (sold separately)
	3WAYV/V_1	- Flow control for water which is leaving from indoor unit.- Flow direction switching between underfloor and water tank	CN_3WAY_A	- 3rd party accessory and Field installation (sold separately)- SPDT type 3way valve is supported.
	Water Pump	Water Pump	Pump(A)	-Sold separately
	Strainer	Strainer	(no connector)	-Included in the product package

5. Wiring diagrams

■ ARNH04GK2A4 / ARNH10GK2A4



SYMBOL	DESCRIPTION
CN-RELAY2	BYPASS VALVE
CN-FLOW1	FLOW SWITCH
CN-REMO	REMOTE CONTROLLER
CN-CC	DRY CONTACT
CN-EEV	ELECTRONIC EXPANSION VALVE
CN-TH4(SOLAR)	SOLAR PIPE THERMISTOR
CN-TH4(BOOST)	WATER TANK THERMISTOR
CN-TH3(WATER/IN)	WATER IN THERMISTOR
CN-TH3(PHEX/OUT)	WATER OUT THERMISTOR
CN-PIPE/IN	LIQUIDE SIDE THERMISTOR
CN-PIPE/OUT	GAS SIDE THERMISTOR
CN-ROOM	REMOTE AIR SENSOR
CN-LEAK/ROOM2	REFRIGERANT LEAK DETECTOR
CN-WF	WIFI PCB
CN-EXT	EXTERNAL ON/OFF CONTROLLER

SYMBOL	DESCRIPTION
CN-TRANS	TRANSFORMER
CN-THMO1	THERMOSTAT
CN-THMO2	THERMOSTAT
CN-POWER	POWER SUPPLY
CN-2WAY	2WAY VALVE
CN-3WAY	3WAY VALVE
CN-W/PUMP	WATER PUMP
CN-485	485 COM PCB
CN-REMO	REMOTE CONTROLLER

SYMBOL	DESCRIPTION
(A)	HYDROKIT
(B)	SOLAR

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_{HK} x F_{TC,T_HK} x F_{TC,W_HK}x F_{TC,P_ODU} x F_{TC,D_ODU}

Q_{HK} =	Hydro Kit capacity at rated condition. (kW)	..... Refer to *Specification of this 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,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*

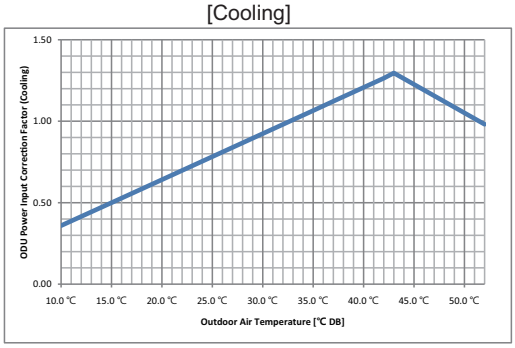
Total Power Input = Hydro Kit Power Input + Indoor Unit Power Input

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

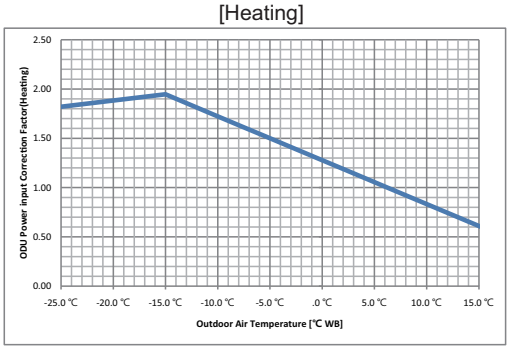
PI_{ODU}= Outdoor Unit Power Input by outdoor air (outside inlet water) temp. and capacity ratio at standard indoor temp. ..... Refer to *Capacity tables of outdoor unit PDB*

* Standard indoor temperature is 27/19℃ DB/WB on cooling mode, 20℃ DB on heating mode.
** PI ODU pattern by outdoor air temp.(It is reference data.This data would be different depending on outdoor unit)

[Cooling]



[Heating]



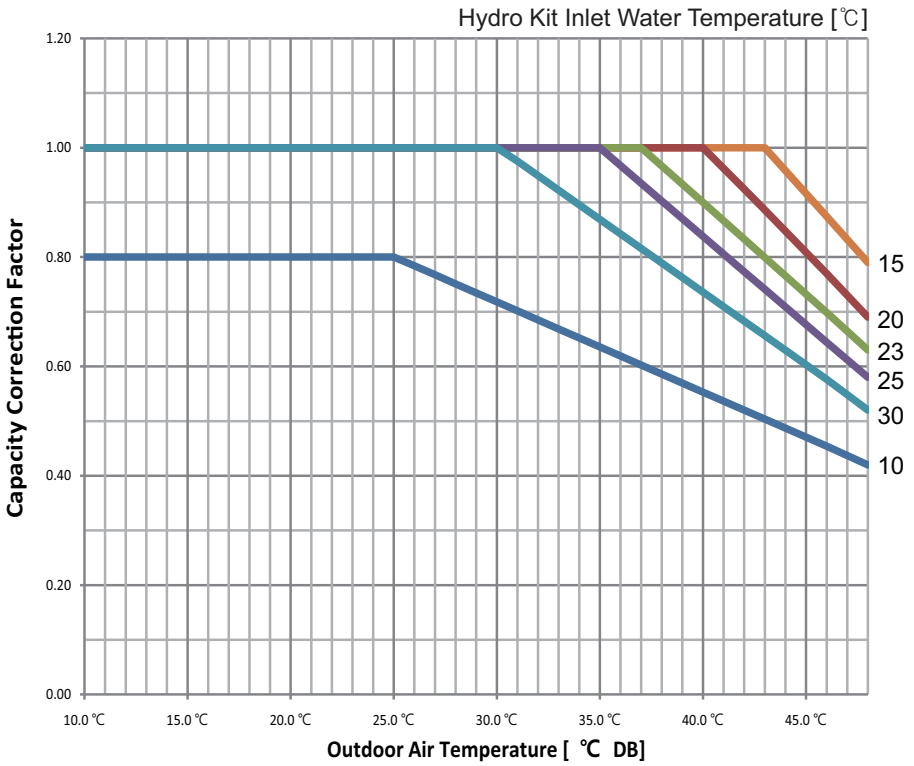
F_{PI,T_HK} =	Power Input correction factor [Outdoor Unit] by Outdoor and water inlet temperature.	.... Refer to *following Graph of this PDB*
F_{PI,W_HK} =	Power Input correction factor [Outdoor Unit] by Water flow rate	..... Refer to *following Graph of this PDB*
I_{HK} =	Capacity index for Hydro Kit	..... 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*

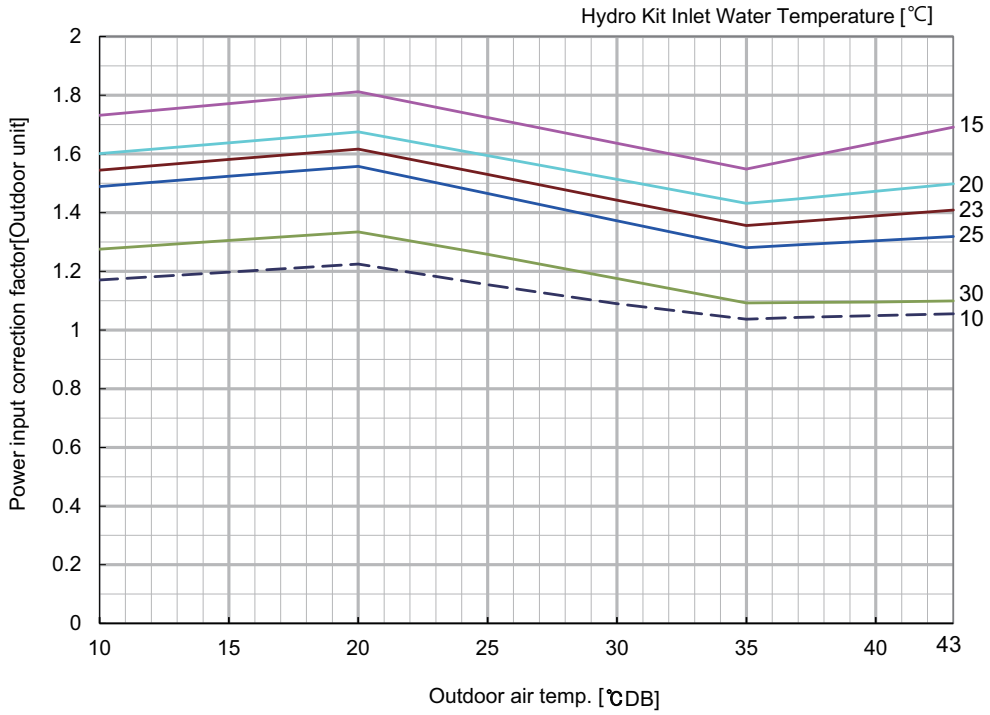
Note

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)



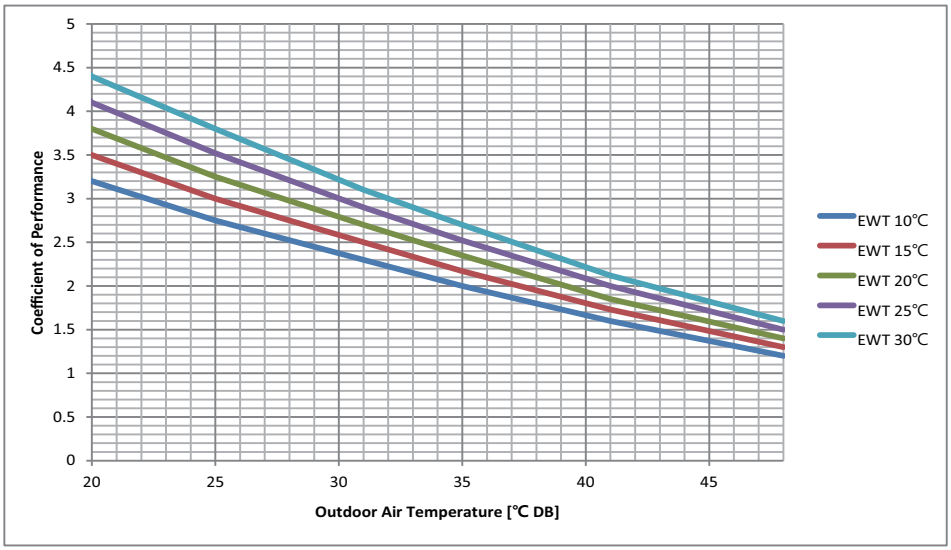


Note

- Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.
- Leaving water temperature changes per pipe length of the system.
  Please check 'Minimum Leaving Water Temperature by Pipe Length' table in this PDB

6. Capacity Correction Factor

◆ COP Pattern by outdoor air temp.(Reference Data)

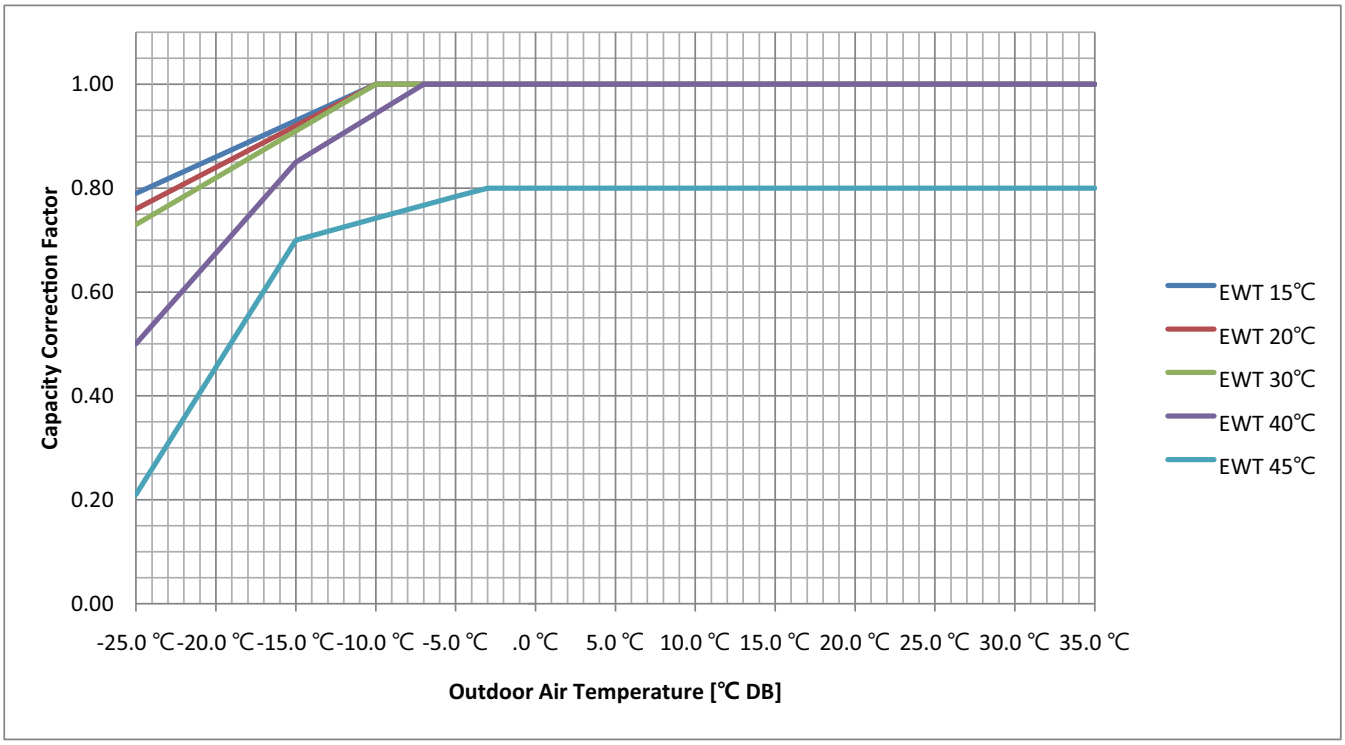


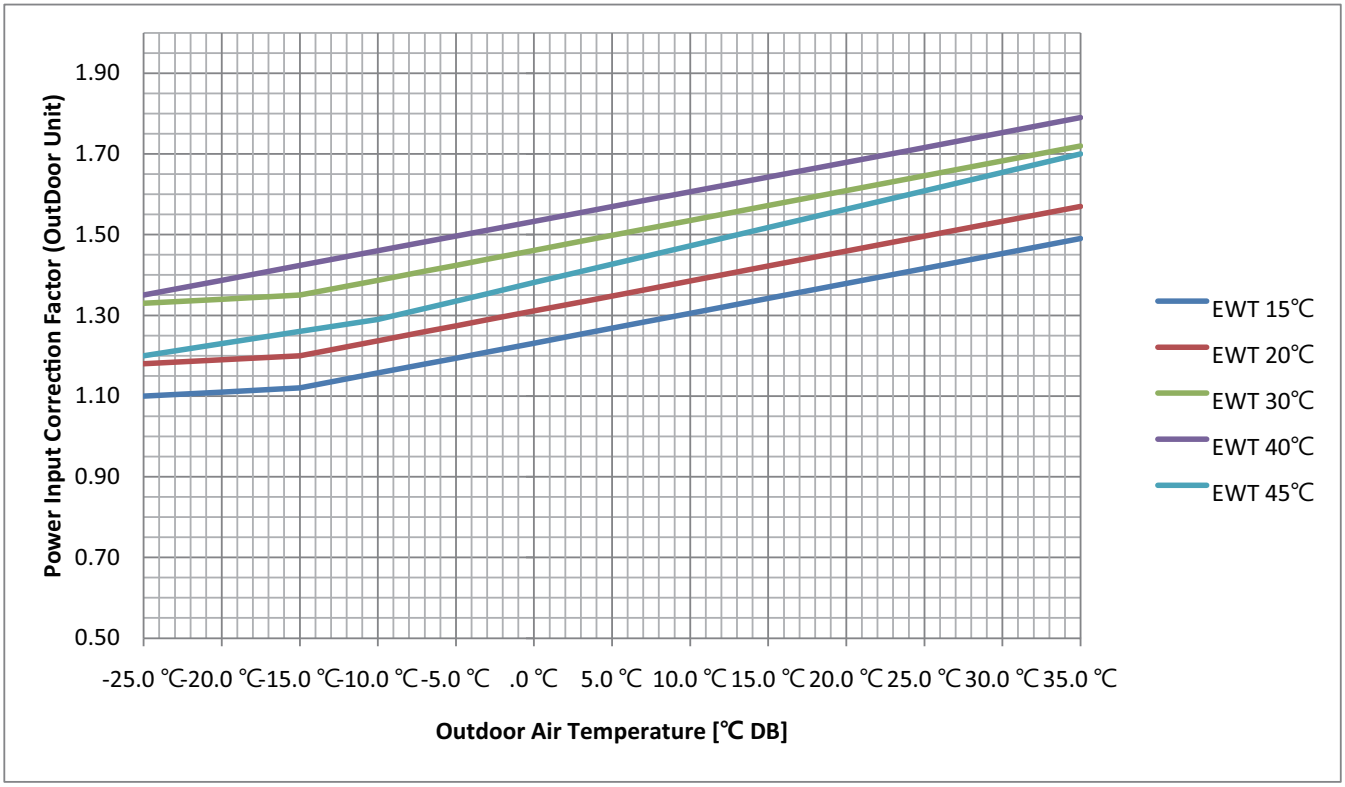
Note

COP Pattern by outdoor air temp. is a reference graph assuming a design with 10HP Multi V i Product.
If you would like to know the COP in a real project, Please contact to LG engineers.

6. Capacity Correction Factor

■ ARNH04GK2A4 / ARNH10GK2A4 (Heating)



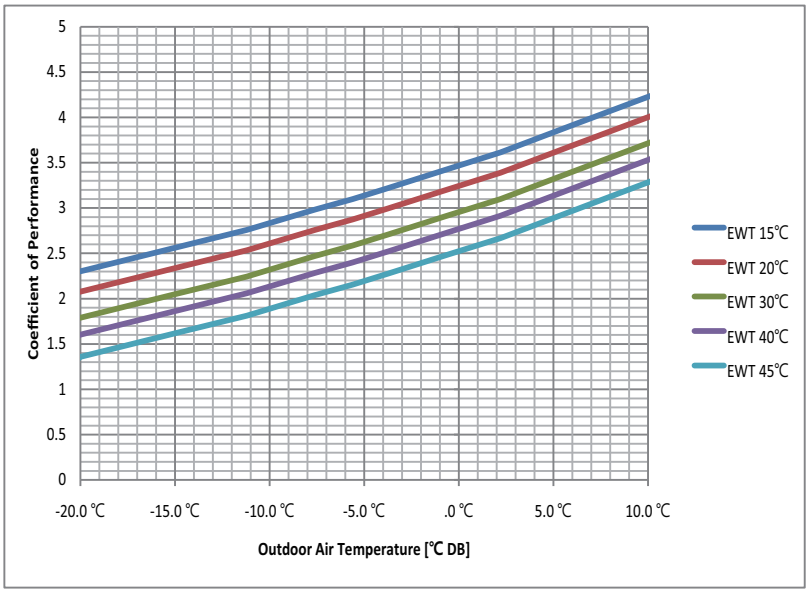


Note

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

6. Capacity Correction Factor

◆ **COP Pattern by outdoor air temp.(Reference Data)**



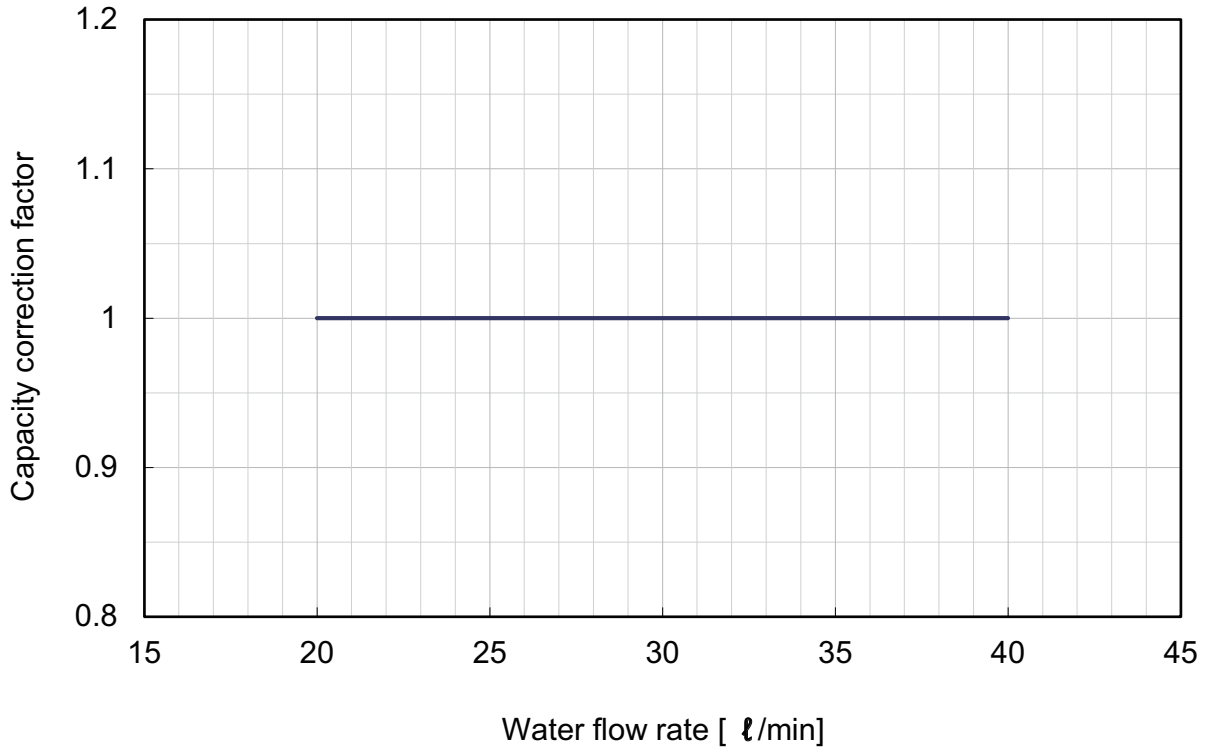
Note

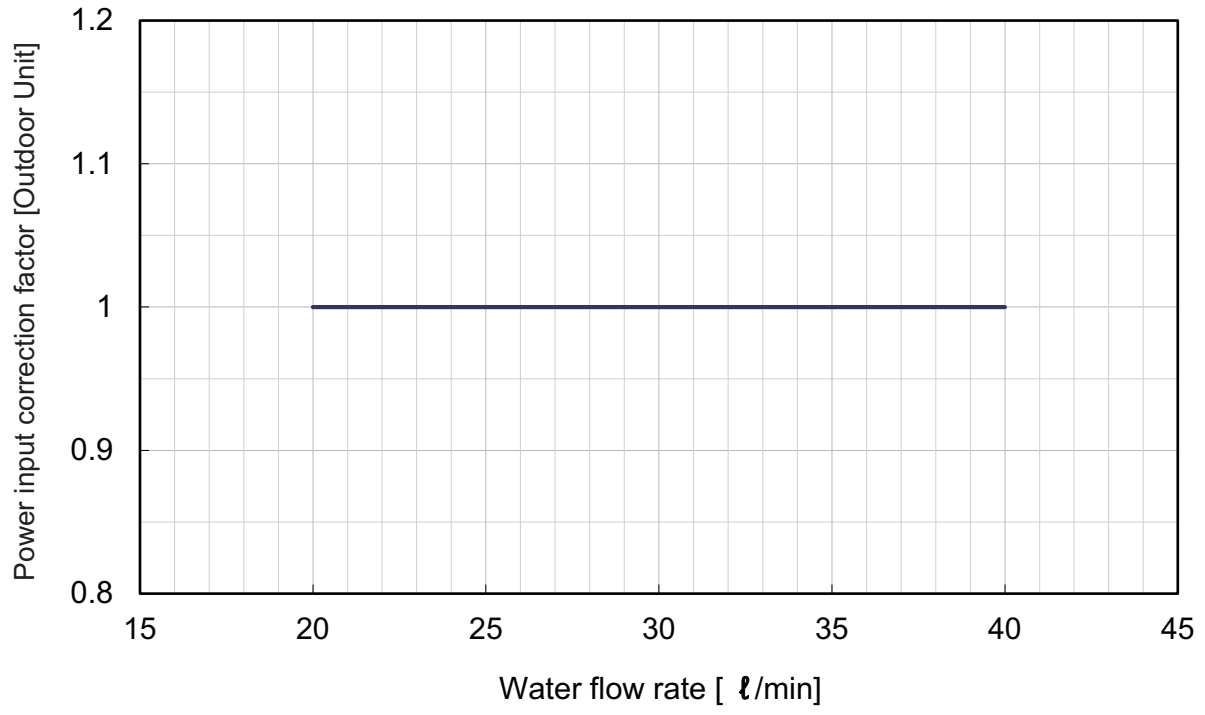
COP Pattern by outdoor air temp. is a reference graph assuming a design with 10HP Multi V i Product.
If you would like to know the COP in a real project, Please contact to LG engineers.

6. Capacity Correction Factor

6.2 Capacity Correction Factor by Water Flow Rate

■ ARNH04GK2A4 (Cooling)



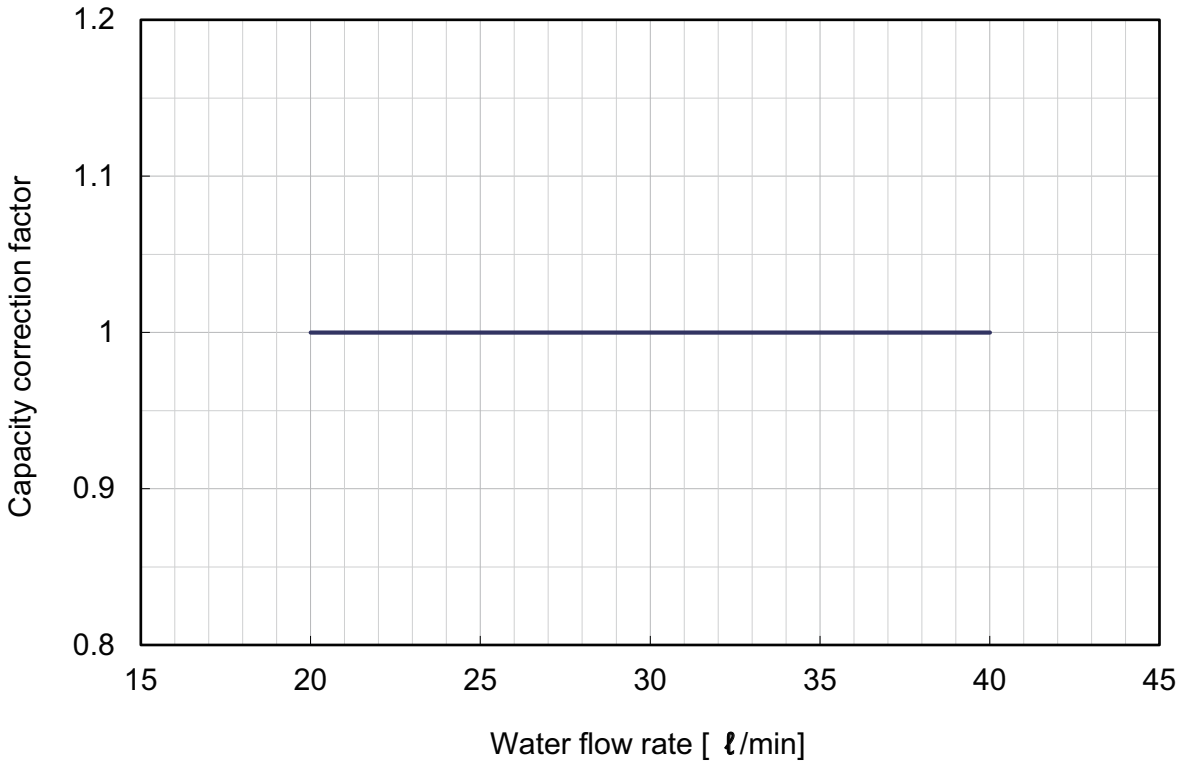


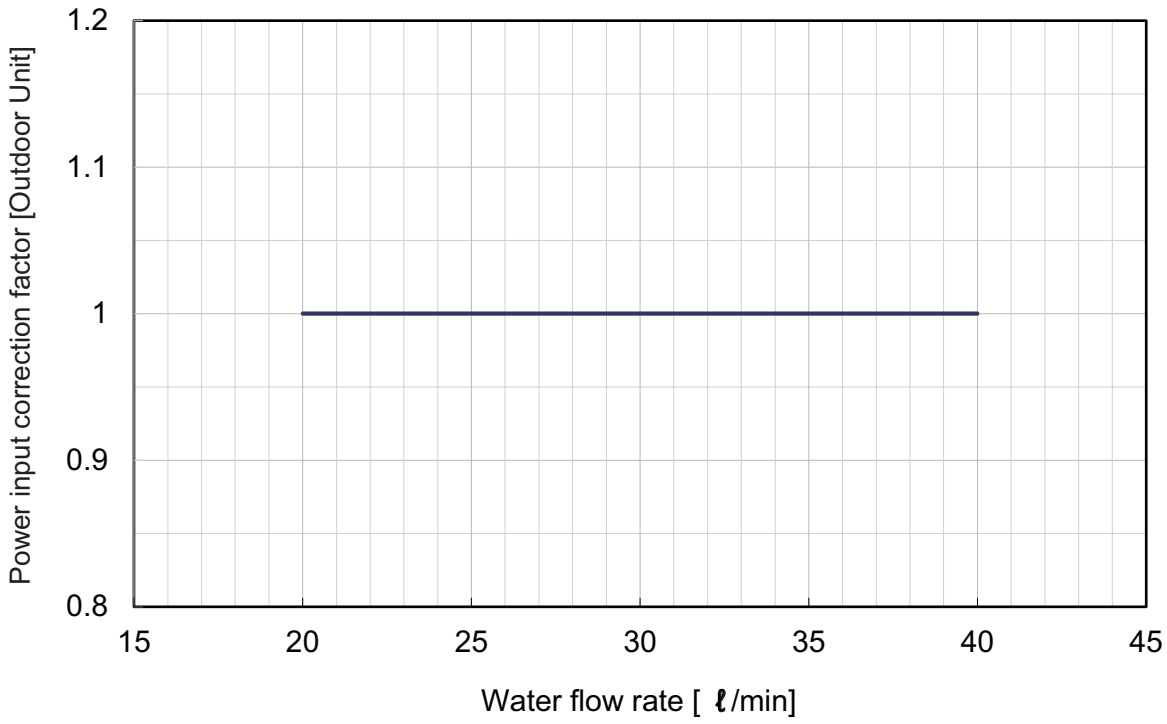
⚠ WARNING

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

6. Capacity Correction Factor

■ ARNH04GK2A4 (Heating)



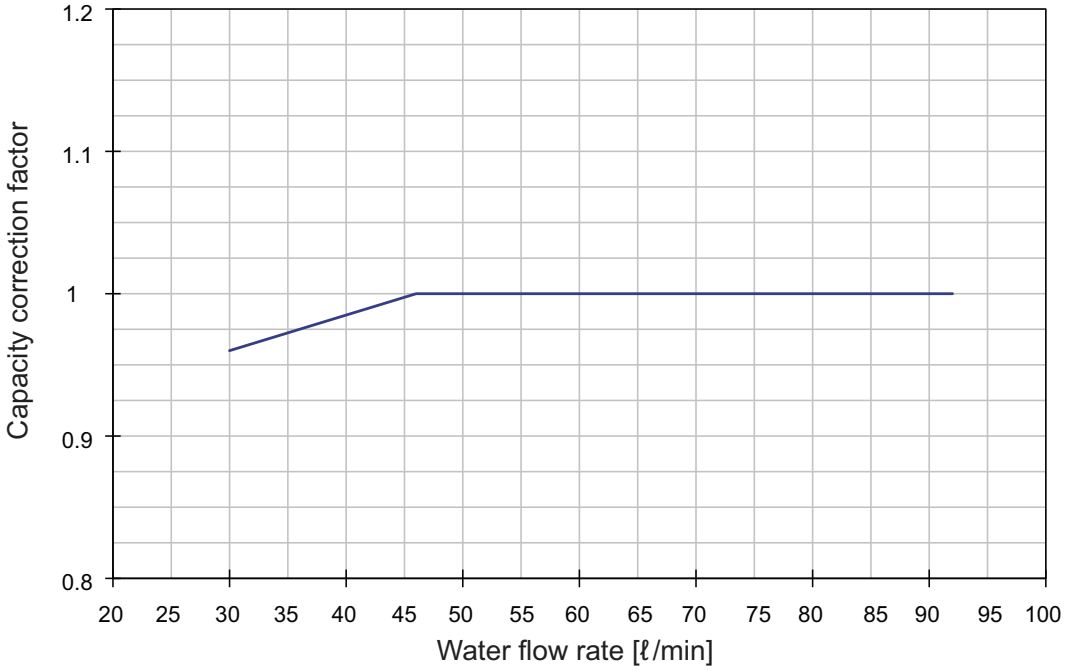


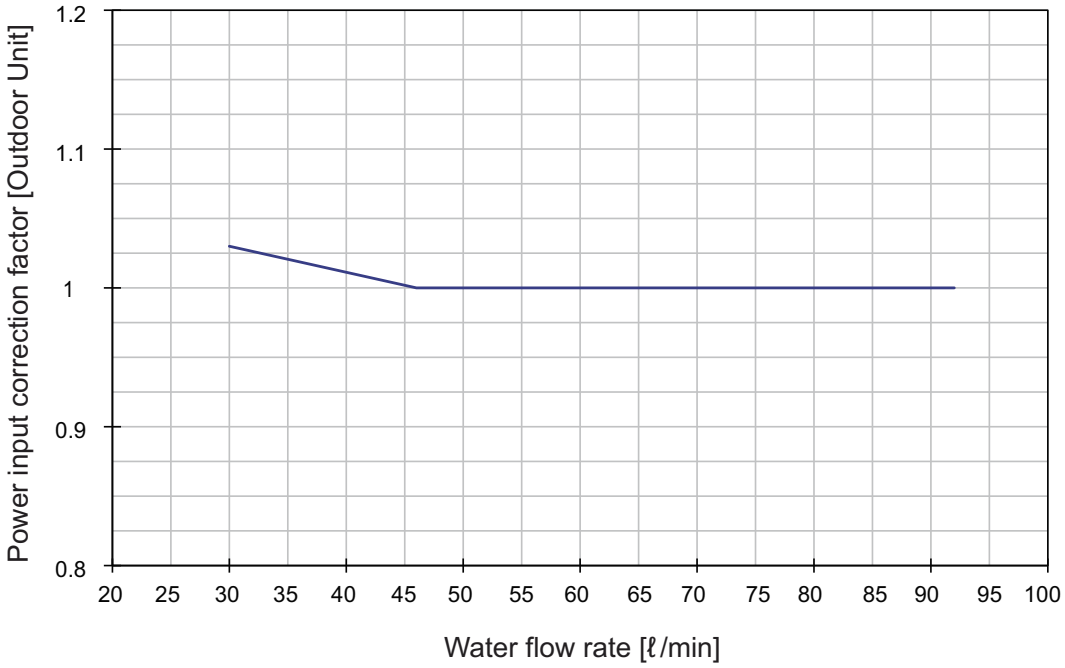
⚠ WARNING

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

6. Capacity Correction Factor

■ ARNH10GK2A4 (Cooling)



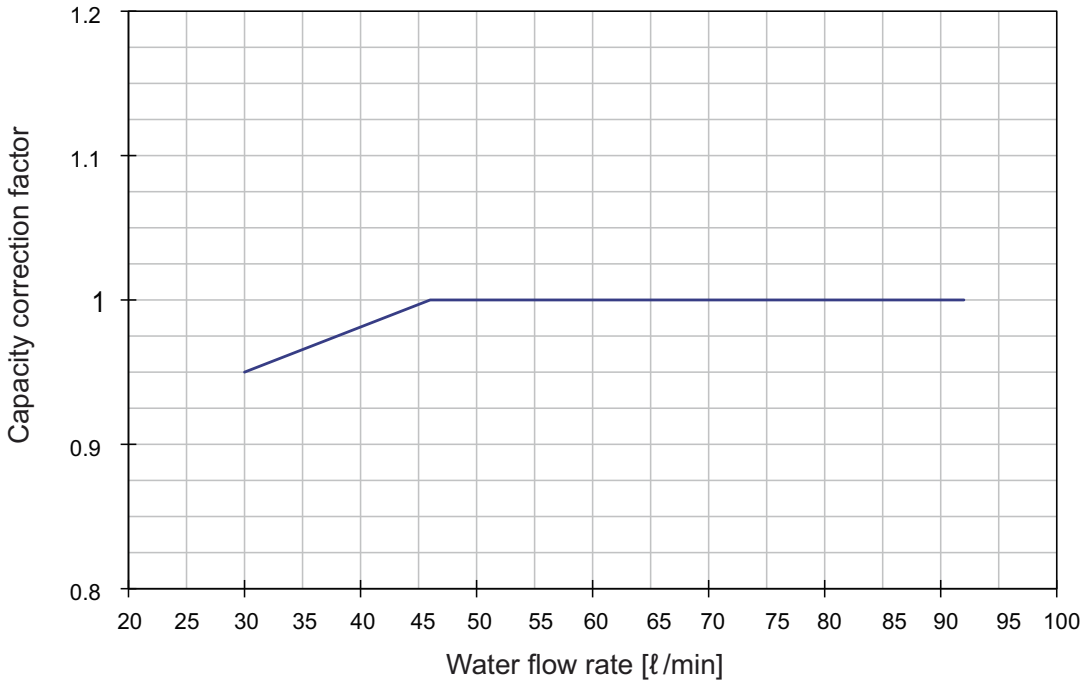


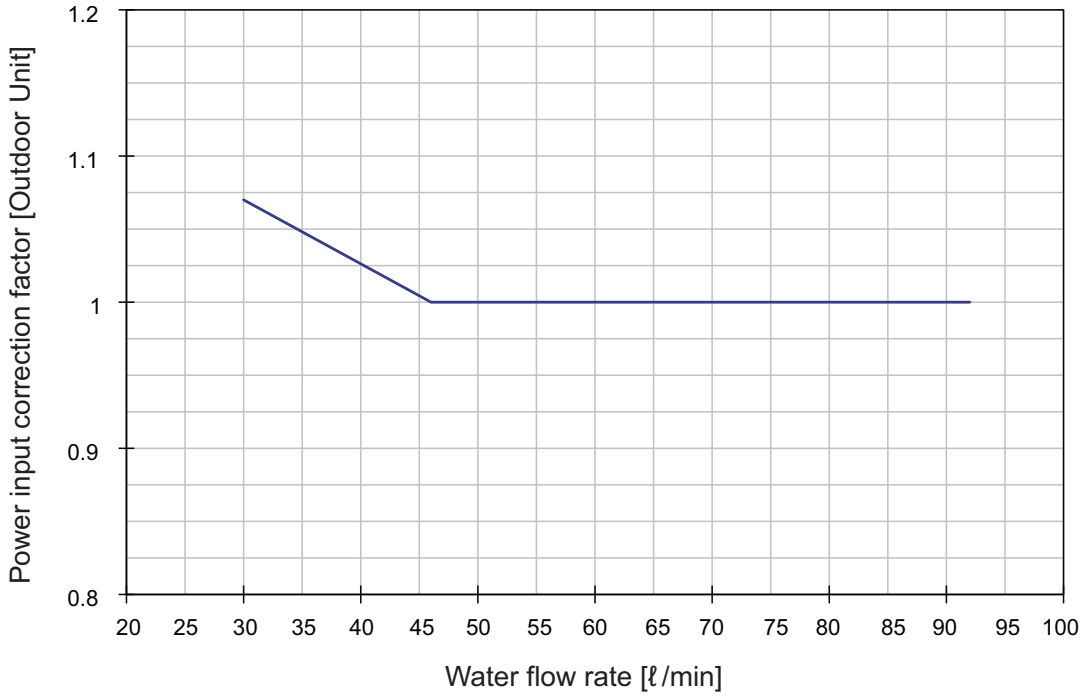
⚠ WARNING

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

6. Capacity Correction Factor

■ ARNH10GK2A4 (Heating)





⚠ WARNING

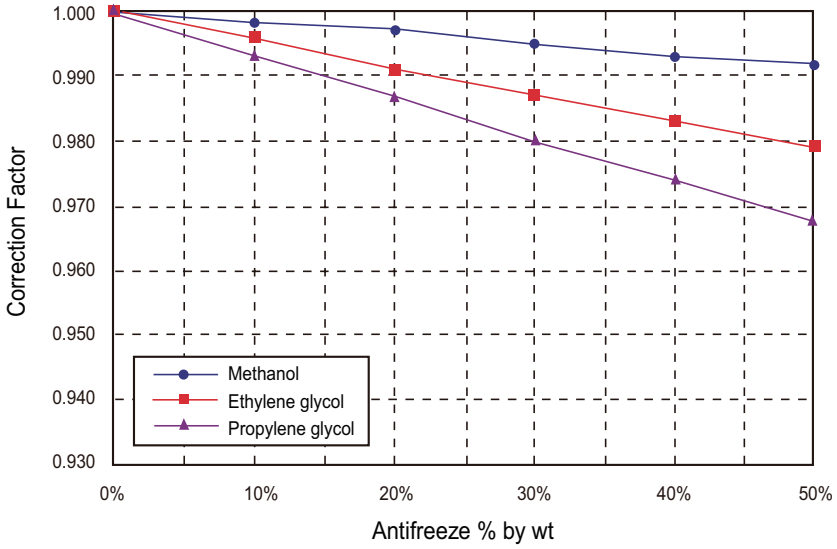
Water Flow Rate Range (recommended) : ARNH10GK2A4 45 ~ 92 (ℓ/min)

6. Capacity Correction Factor

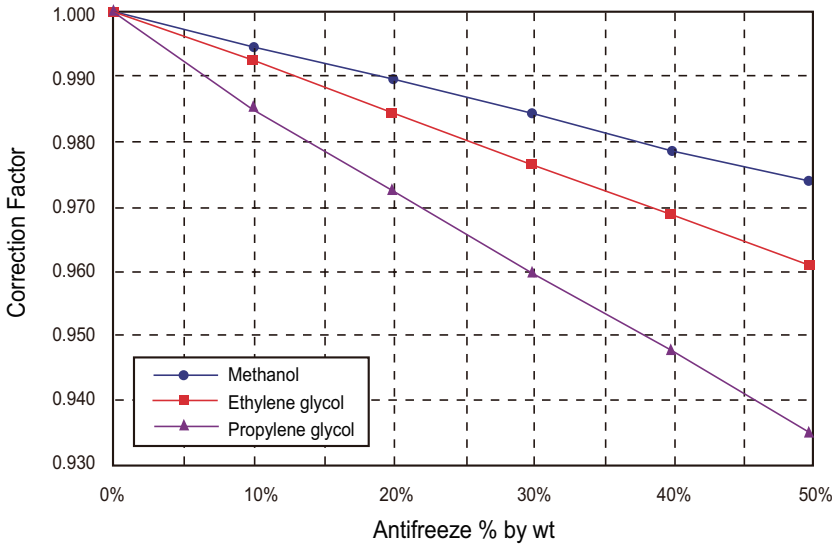
6.3 Capacity Correction Factor by Antifreeze

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.

6. Capacity Correction Factor

6.4 Minimum Leaving Temperature by Piping Length

◆ For Cooling Operation

HU (m)	110	-	-	-	-	-	-	-	-	-	-	-	12.9	13.1	13.4	13.6	13.8	14.1	14.3	14.6	14.8	15.1	15.3	15.5	15.7
	100	-	-	-	-	-	-	-	-	-	-	12.5	12.8	13.1	13.3	13.5	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.5	15.6
	90	-	-	-	-	-	-	-	-	-	12.0	12.5	12.8	13.0	13.3	13.5	13.8	14.0	14.3	14.5	14.8	15.0	15.2	15.5	15.6
	80	-	-	-	-	-	-	-	-	11.4	11.9	12.4	12.7	13.0	13.2	13.5	13.7	14.0	14.2	14.5	14.7	15.0	15.2	15.5	15.6
	70	-	-	-	-	-	-	-	10.9	11.4	11.9	12.4	12.7	12.9	13.2	13.4	13.7	13.9	14.2	14.4	14.7	14.9	15.2	15.4	15.6
	60	-	-	-	-	-	-	10.3	10.8	11.3	11.8	12.3	12.6	12.8	13.1	13.4	13.6	13.9	14.1	14.4	14.7	14.9	15.2	15.4	15.5
	50	-	-	-	-	-	9.7	10.2	10.7	11.2	11.7	12.2	12.5	12.8	13.1	13.3	13.6	13.9	14.1	14.4	14.6	14.9	15.1	15.4	15.5
	40	-	-	-	-	9.1	9.7	10.2	10.7	11.2	11.7	12.2	12.5	12.7	13.0	13.3	13.5	13.8	14.1	14.3	14.6	14.9	15.1	15.4	15.5
	30	-	-	-	8.6	9.1	9.6	10.1	10.6	11.1	11.6	12.1	12.4	12.7	13.0	13.2	13.5	13.8	14.0	14.3	14.6	14.8	15.1	15.3	15.5
	20	-	-	8.0	8.5	9.0	9.5	10.0	10.6	11.1	11.6	12.1	12.4	12.6	12.9	13.2	13.5	13.7	14.0	14.3	14.5	14.8	15.1	15.3	15.4
	10	-	7.4	7.9	8.4	8.9	9.5	10.0	10.5	11.0	11.5	12.0	12.3	12.6	12.9	13.1	13.4	13.7	14.0	14.2	14.5	14.8	15.0	15.3	15.4
	7.5	7.0	7.3	7.9	8.4	8.9	9.5	10.0	10.5	11.0	11.5	12.0	12.3	12.6	12.9	13.1	13.4	13.7	14.0	14.2	14.5	14.8	15.0	15.3	15.4
	0	7.0	7.3	7.8	8.4	8.9	9.4	9.9	10.4	10.9	11.4	11.9	12.2	12.5	12.8	13.1	13.4	13.7	13.9	14.2	14.5	14.7	15.0	15.3	15.4
Equivalent Length (m)		7.5	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	225
HL(m)	0	7.0	7.3	7.8	8.4	8.9	9.4	9.9	10.4	10.9	11.4	11.9	12.2	12.5	12.8	13.1	13.4	13.7	13.9	14.2	14.5	14.7	15.0	15.3	15.4
	7.5	7.0	7.3	7.8	8.3	8.8	9.4	9.9	10.4	10.9	11.4	11.9	12.2	12.5	12.8	13.1	13.3	13.6	13.9	14.2	14.4	14.7	15.0	15.2	15.4
	10	-	7.3	7.8	8.3	8.8	9.4	9.9	10.4	10.9	11.4	11.9	12.2	12.5	12.8	13.1	13.3	13.6	13.9	14.2	14.4	14.7	15.0	15.2	15.4
	20	-	-	7.8	8.3	8.8	9.3	9.8	10.3	10.8	11.3	11.8	12.1	12.4	12.7	13.0	13.3	13.6	13.9	14.1	14.4	14.7	14.9	15.2	15.3
	30	-	-	-	8.2	8.7	9.2	9.8	10.3	10.8	11.3	11.8	12.1	12.4	12.7	13.0	13.3	13.5	13.8	14.1	14.4	14.6	14.9	15.2	15.3
	40	-	-	-	-	8.7	9.2	9.7	10.2	10.7	11.2	11.7	12.0	12.3	12.6	12.9	13.2	13.5	13.8	14.1	14.3	14.6	14.9	15.1	15.3
	50	-	-	-	-	-	9.1	9.7	10.2	10.7	11.2	11.7	12.0	12.3	12.6	12.9	13.2	13.5	13.7	14.0	14.3	14.6	14.9	15.1	15.3
	60	-	-	-	-	-	-	9.6	10.1	10.6	11.1	11.6	11.9	12.2	12.5	12.8	13.1	13.4	13.7	14.0	14.3	14.6	14.8	15.1	15.2
	70	-	-	-	-	-	-	-	10.0	10.6	11.1	11.6	11.8	12.1	12.5	12.8	13.1	13.4	13.7	14.0	14.2	14.5	14.8	15.1	15.2
	80	-	-	-	-	-	-	-	-	10.5	11.0	11.5	11.8	12.1	12.4	12.7	13.0	13.3	13.6	13.9	14.2	14.5	14.8	15.0	15.2
	90	-	-	-	-	-	-	-	-	-	10.9	11.4	11.7	12.0	12.4	12.7	13.0	13.3	13.6	13.9	14.2	14.5	14.7	15.0	15.1
	100	-	-	-	-	-	-	-	-	-	-	11.4	11.7	12.0	12.3	12.6	13.0	13.3	13.6	13.9	14.1	14.4	14.7	15.0	15.1
	110	-	-	-	-	-	-	-	-	-	-	-	11.6	11.9	12.3	12.6	12.9	13.2	13.5	13.8	14.1	14.4	14.7	15.0	15.1

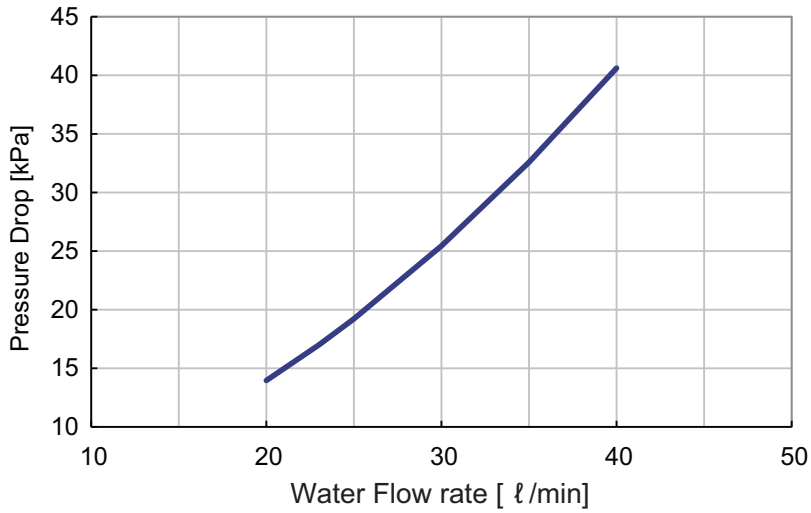
Note

Maximum height and pipe length may vary per outdoor unit.

For each piping limit, please check 'Refrigerant Piping System' section from the outdoor unit PDB.

7. Water pressure drop

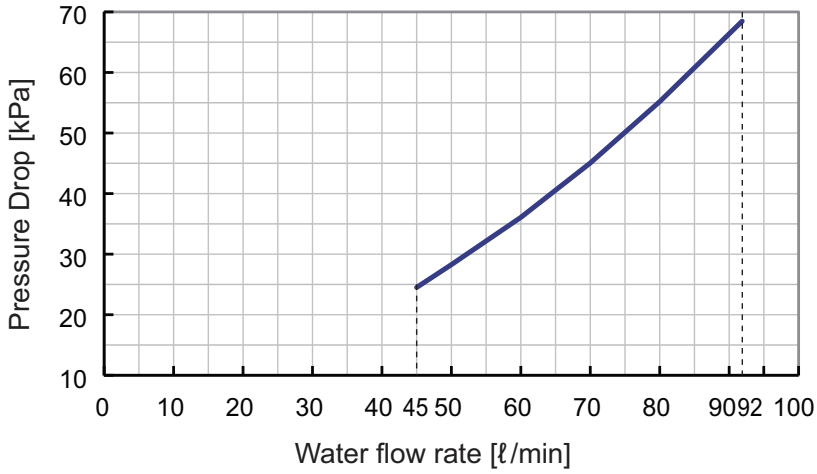
■ ARNH04GK2A4



⚠ CAUTION

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

■ ARNH10GK2A4



⚠ CAUTION

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

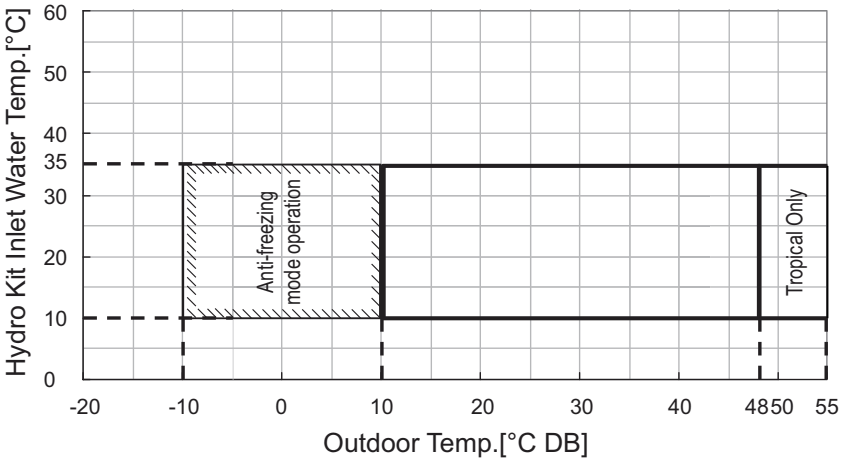
Note

- 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)

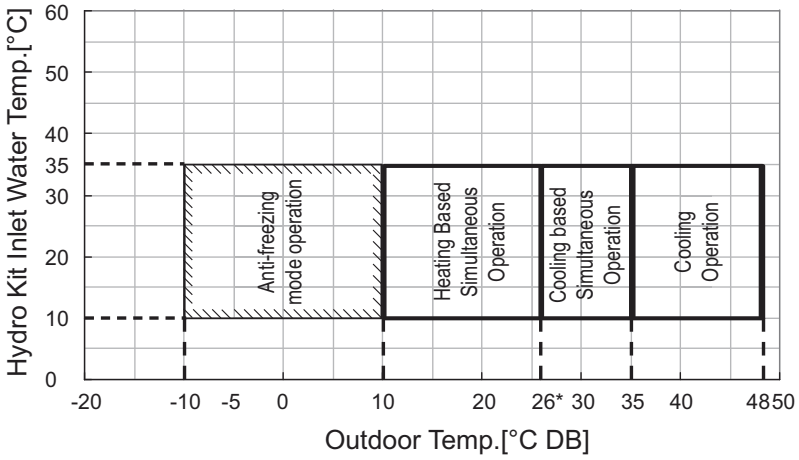
8. Operation limits

■ Cooling

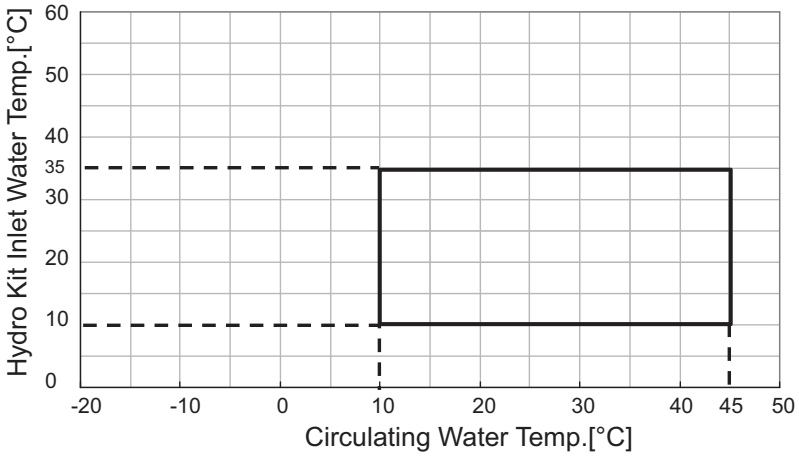
◆ -RUM------5,6(Heat Pump), ARUN------5, ARUN------0



◆ -RUM------5,6 (Heat Recovery), ARUB------0(Heat Recovery)



◆ ARWN-series, ARWB-series



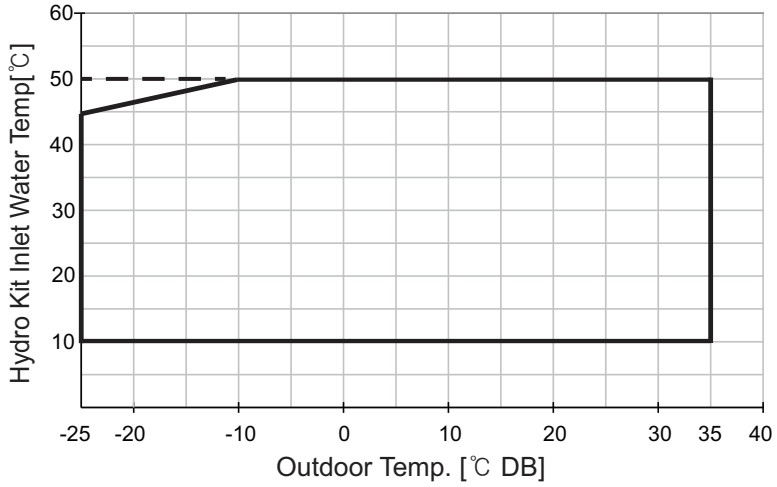
Note

1. Operation limit follows the outdoor unit operation range and cannot operate outside the operating range.
   Also operation limit depends on product type and target region.
2. 'Simultaneous Operation' means other Indoor units are operating on heating mode.
3. * : 26℃ DB corresponds to the 16℃ WB .

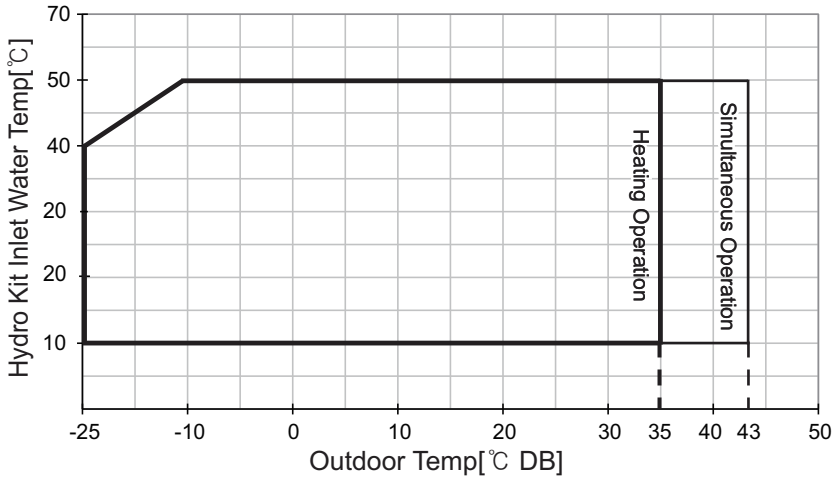
8. Operation limits

■ Heating

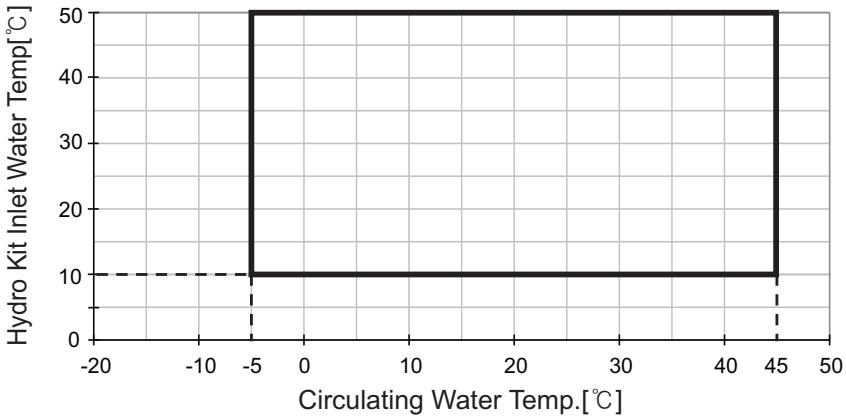
◆ -RUM------5,6(Heat Pump), ARUN------5, ARUN------0



◆ -RUM------5,6 (Heat Recovery), ARUB------0(Heat Recovery)



◆ ARWB- series, ARWN-series



Note

1. For only Hydro Kit combination, Maximum operation limit in heating is outdoor temperature 35℃ DB / 24℃ WB.
2. Operation limit follows the outdoor unit operation range and cannot operate outside the operating range.
   Also operation limit depends on product type and target region.
3. 'Simultaneous Operation' means other Indoor units are operating on cooling mode.

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)

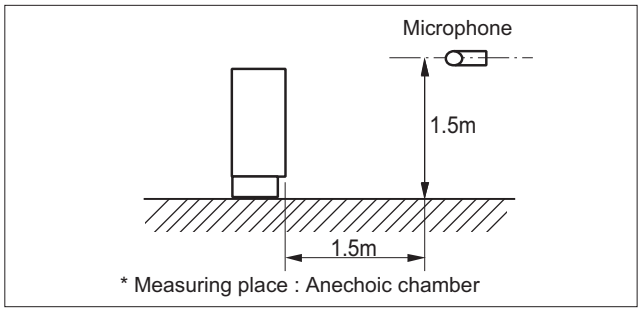
Note

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 = 1.1 x MCA, MFA≤ 4 x FLA
   (If MFA is smaller than minimum standard value, Use minimum standard value in region for selecting circuit breaker.)
4. Select wire size based on the MCA
5. Instead of fuse, use Circuit Breaker.

10. Sound levels

10.1 Sound pressure level

■ Overall

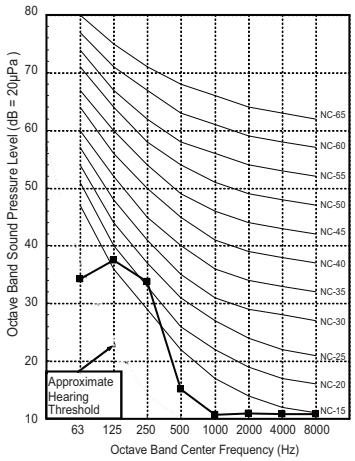


Note

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



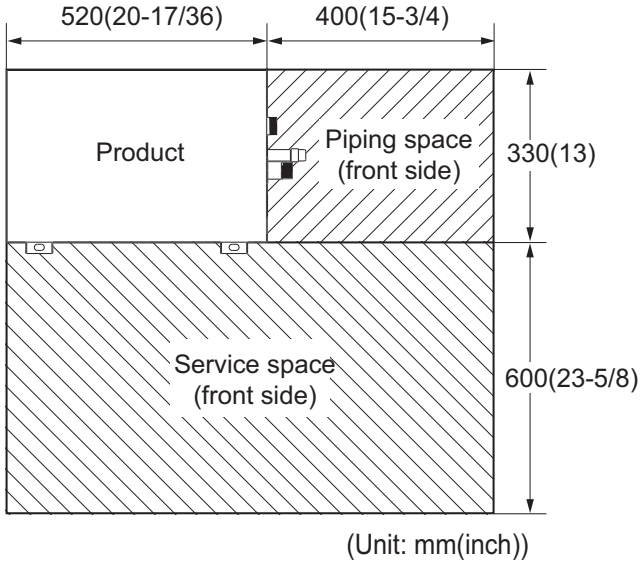
11. Installation

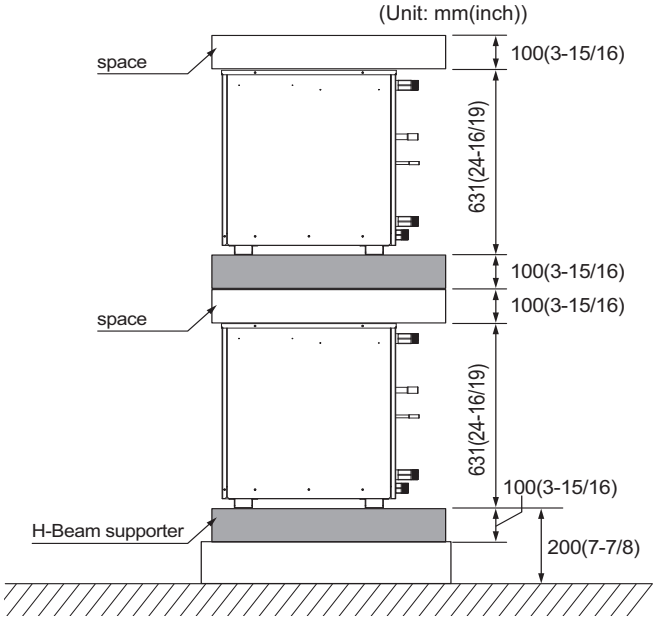
11.1 Installation Information

11.1.1 Selection of the best location

■ Installation Space

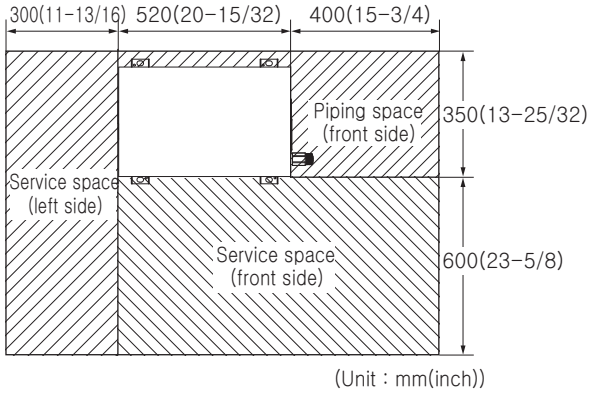
- The following values are the least space for installation. If any service area is needed for service according to field circumstance, obtain enough service space.

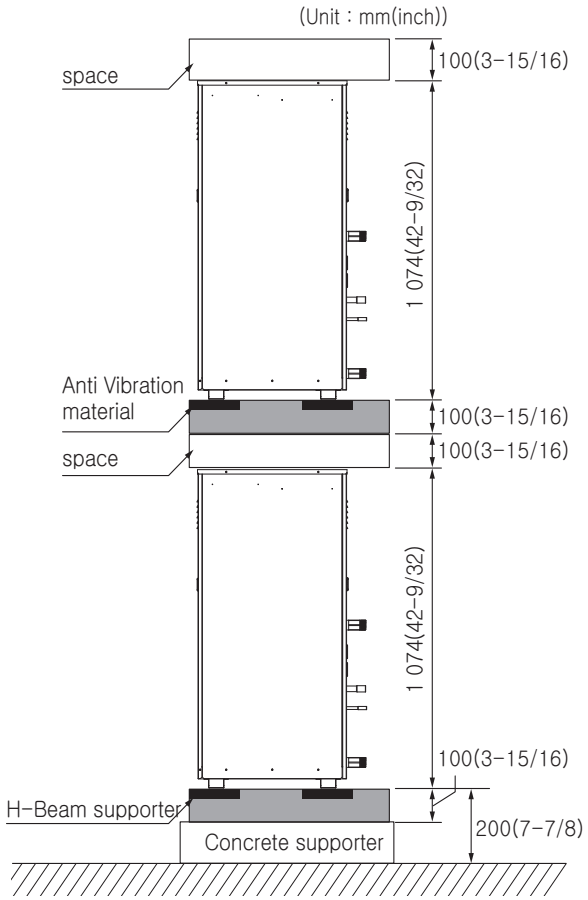




< Medium Temperature >

11. Installation



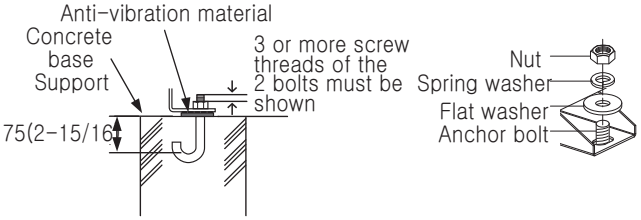


< High Temperature >

11. Installation

■ Foundation for Installation (Floor standing type)

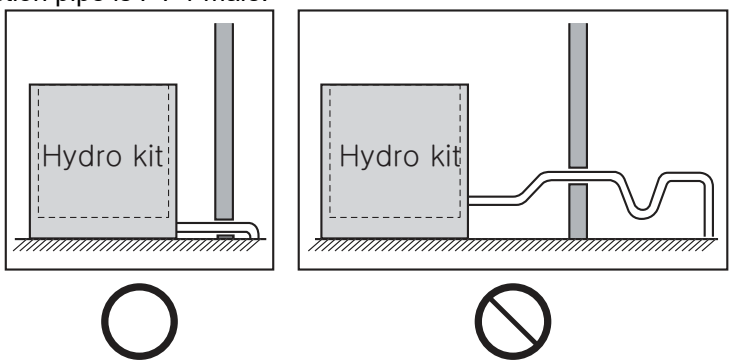
- Fix the unit tightly with bolts as shown below so that the unit will not fall down due to earthquake.
- Noise and vibration may occur from the floor or wall since vibration is transferred through the installation part depending on installation status. Thus, use anti-vibration materials (cushion pad)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



11. 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.

11.1.2 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.

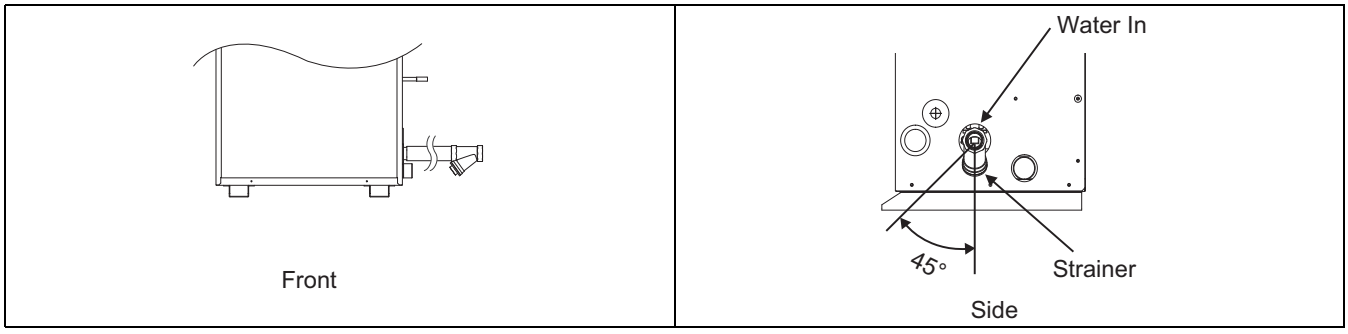
■ Water Piping and Water Circuit Connection

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

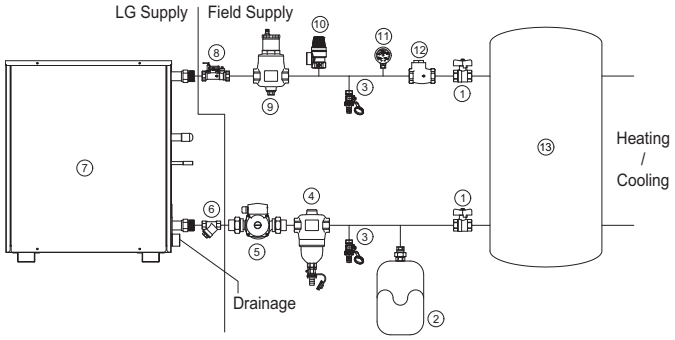
- The strainer included with product has a 28-mesh filter.

11. 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.

11. 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.

11.1.3 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

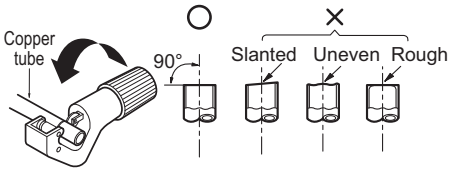
- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can occur.
- If one of antifreezes is used, corrosion can occur. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to keep same concentration.
- 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.

11. Installation

11.1.4 Refrigerant Piping

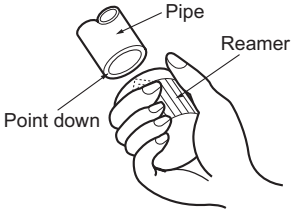
◆ Cut the pipes and the cable

- 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.



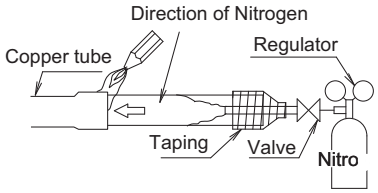
◆ Burrs removal

- 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.



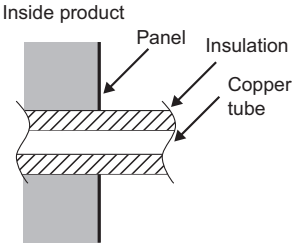
◆ Pipe welding

- 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.



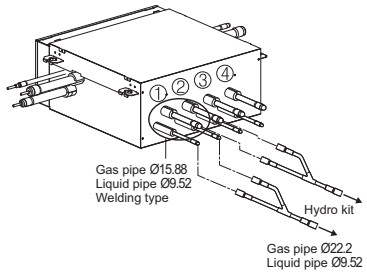
Classification	Thickness
Liquid pipe	t9 or above
Gas pipe	t19 or above

* 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.

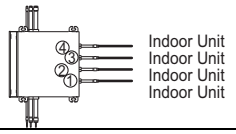
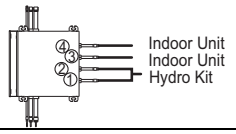
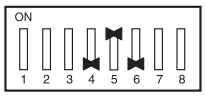
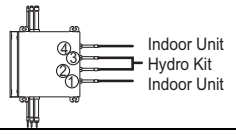
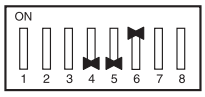
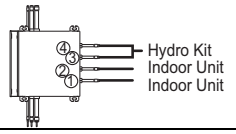
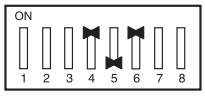
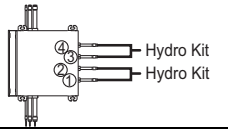
11. Installation

■ 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.

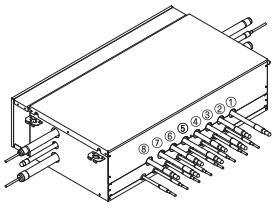
Notice

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

11. 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.

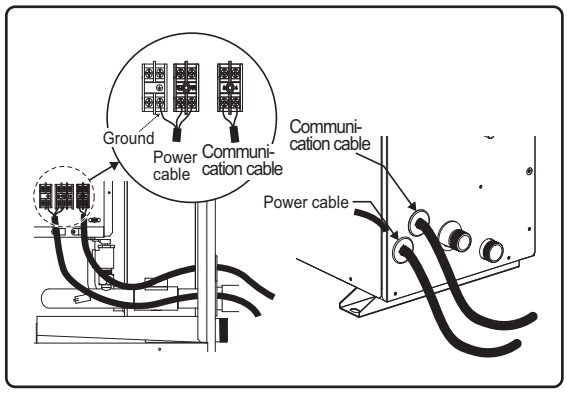
Notice

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

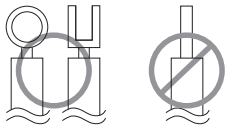
11.1.5 Electrical Wirings

■ How to connect wirings

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

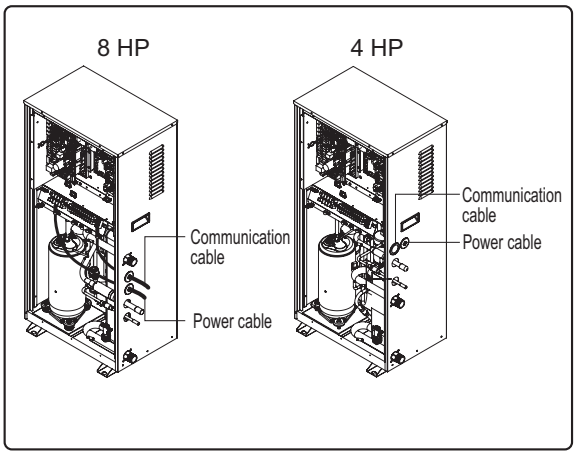


CAUTION:
When connecting the power and communication cable, always use the terminal connector (O-ring, Y-ring).

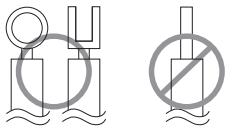


Make sure to tighten so that the screw of the terminal does not get loose.

- 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).



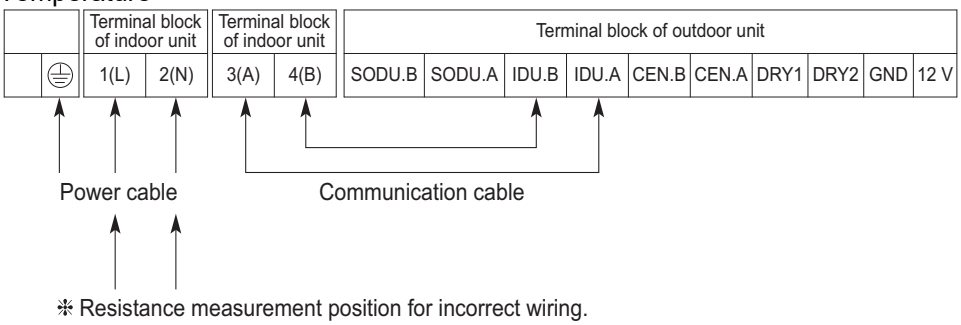
Make sure to tighten so that the screw of the terminal does not get loose.

11. Installation

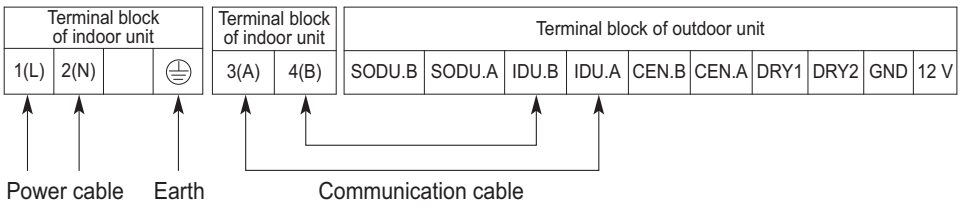
■ Wiring Connection

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

11. 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

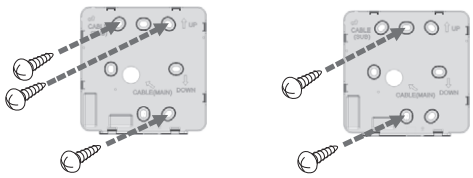
- Are all of the indoor units and outdoor units grounded?
- If grounding is not properly done, there is a risk of electric shock. Grounding must be done by a qualified technician.
- Consider the surrounding conditions(surrounding temperature, direct sunlight, rain water, etc.) when wiring the cable.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

11. 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.

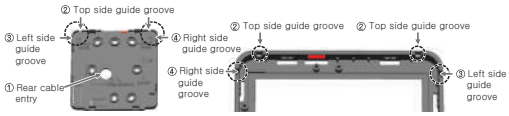


2. The wired remote controller cable can be installed in 4 directions. Install to the suitable direction according to the installation environment.

- 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.

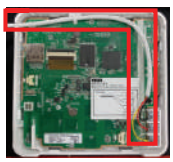
3. After removing the hole, trim the cut surface neatly.



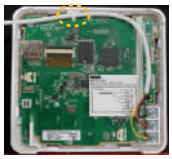
4. When installing the remote control cable on the left side, be sure to install it in the following guide.

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

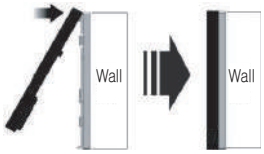


The Upper center boss for fixing the bent cable

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>



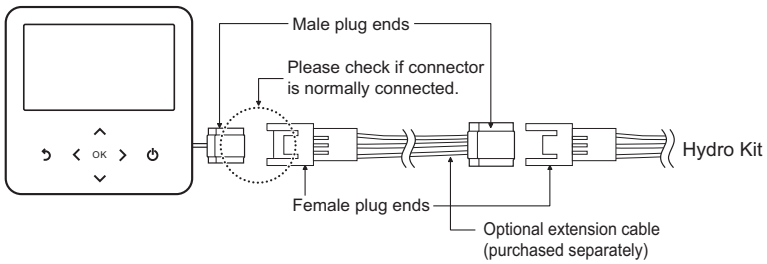
6.When you remove the remote controller from the installation plate, insert a small flat head screwdriver into the bottom side separation hole and turn clockwise to separate the remote controller.

- 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>

11. 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.

11. 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

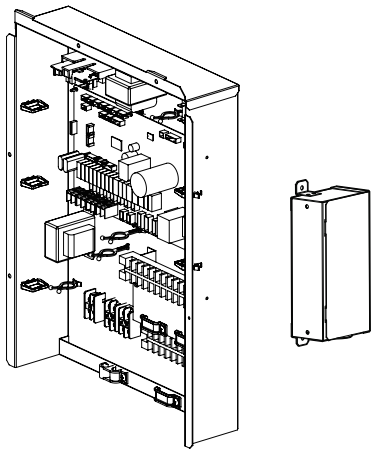
- Non installation of IPM cause the serious problem of its heat exchanger when electricity cut off during product operation.

Notice

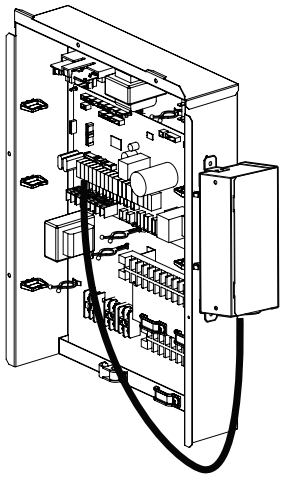
Please refer to the function list or accessories compatibility table for availability of Independent Power Module.

How to install Independent Power Module

1. Open the front panel of the control box



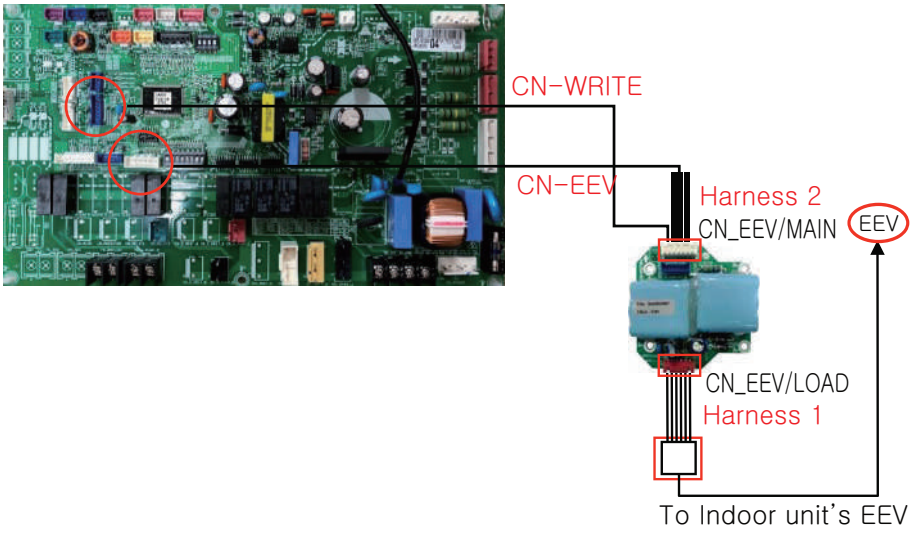
2. Assemble the cover of independent power module, fix it tightly with bolts and connect wires.



11. 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.

MULTI V™

Hydro Kit

Floor Standing (High Temperature)

1. List of functions

■ Basic function of Units

Category	Functions	ARNH04GK3A4 / ARNH08GK3A4 ARNH04LK3A4 / ARNH08LK3A4
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 (for heating operation)	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	X
	ODU Cycle Priority (Heating Priority)	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 ARNH04LK3A4 ARNH08LK3A4
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
	Multi-Tenant Power Module	PINPMB001	-	X
	Refrigerant Leakage Detector	PRLDNVS0	For R410A	O
		PLDRNV1S	For R32	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. * : Some advanced functions controlled by individual controller cannot be operated.
3. If you need more detail, please refer to the BECON PDB or the manual of product.
   (http://partner.lge.com> Select Your Region : 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 / R32	R410A / R32
		Additional Refrigerant Charge Amount	kg (lbs)	0.80 (1.8) / 0.66(1.5)	1.00 (2.2) / 0.83(1.8)
		Control	-	Electronic Expansion Valve	
	Refrigerant to Water	Refrigerant name	-	R134a	R134a
		Precharged Amount	kg (lbs)	2.3 (5.1)	3.0 (6.6)
		t-CO2 eq	-	3.289	4.290
		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					

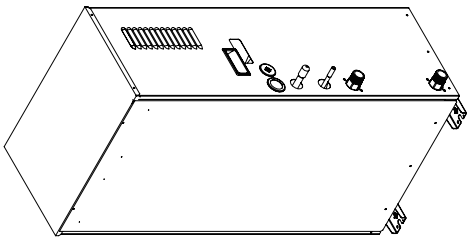
Model			Unit	ARNH04LK3A4	ARNH08LK3A4
Capacity (Rated)		Heating	kW	13.8	25.2
			kcal/h	11,870	21,700
			Btu/h	47,000	86,000
Input (Rated)		Heating	kW	2.30	5.00
Casing		Material	-	Painted Steel Plate	Painted Steel Plate
		Color (RAL code)	-	RAL 7030	
Dimensions	Net	Body(W x H x D)	mm	520 x1,074 x 330	520 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)	84.0(185.2)	90.0(198.4)
Note					

2. Specifications

Model			Unit	ARNH04LK3A4	ARNH08LK3A4
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 / R32	R410A / R32
		Additional Refrigerant Charge Amount	kg (lbs)	0.80 (1.8) / 0.66(1.5)	1.00 (2.2) / 0.83(1.8)
		Control	-	Electronic Expansion Valve	
	Refrigerant to Water	Refrigerant name	-	R134a	R134a
		Precharged Amount	kg (lbs)	2.3 (5.1)	3.0 (6.6)
		t-CO2 eq	-	3.289	4.290
		Control	-	Electronic Expansion Valve	
Power Supply			V, Ø, Hz	380-400-415, 3, 50/60	380-400-415, 3, 50/60
Running Current		Heating	A	6.05 - 5.75 - 5.54	13.16 - 12.50 - 12.05
Note					

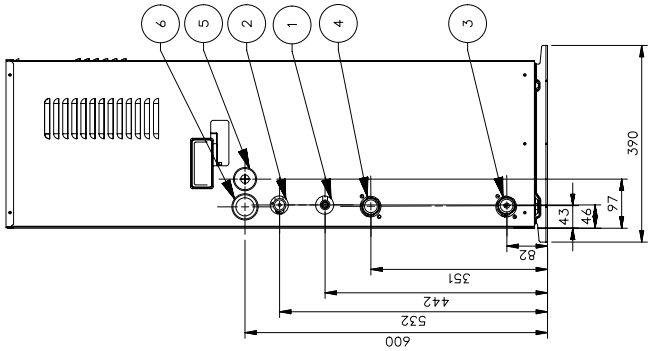
3. Dimensions

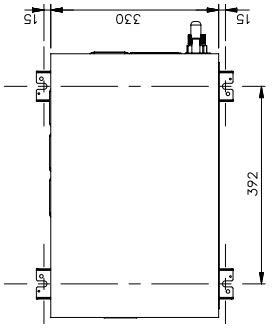
■ ARNH04GK3A4 / ARNH04LK3A4

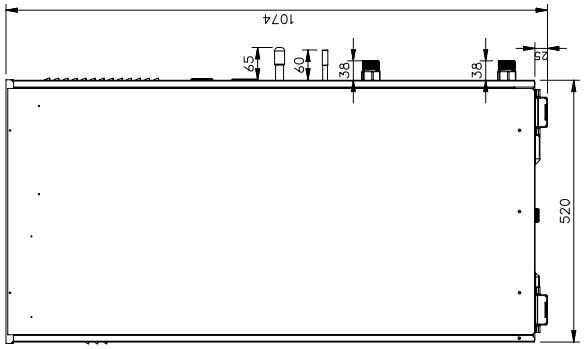


Note
1. Unit should be installed in compliance with the installation manual in the product box.
2. Unit should be grounded in accordance with the local regulations or applicable national codes.
3. All electrical components and materials to be supplied from the site must comply with the local regulations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

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



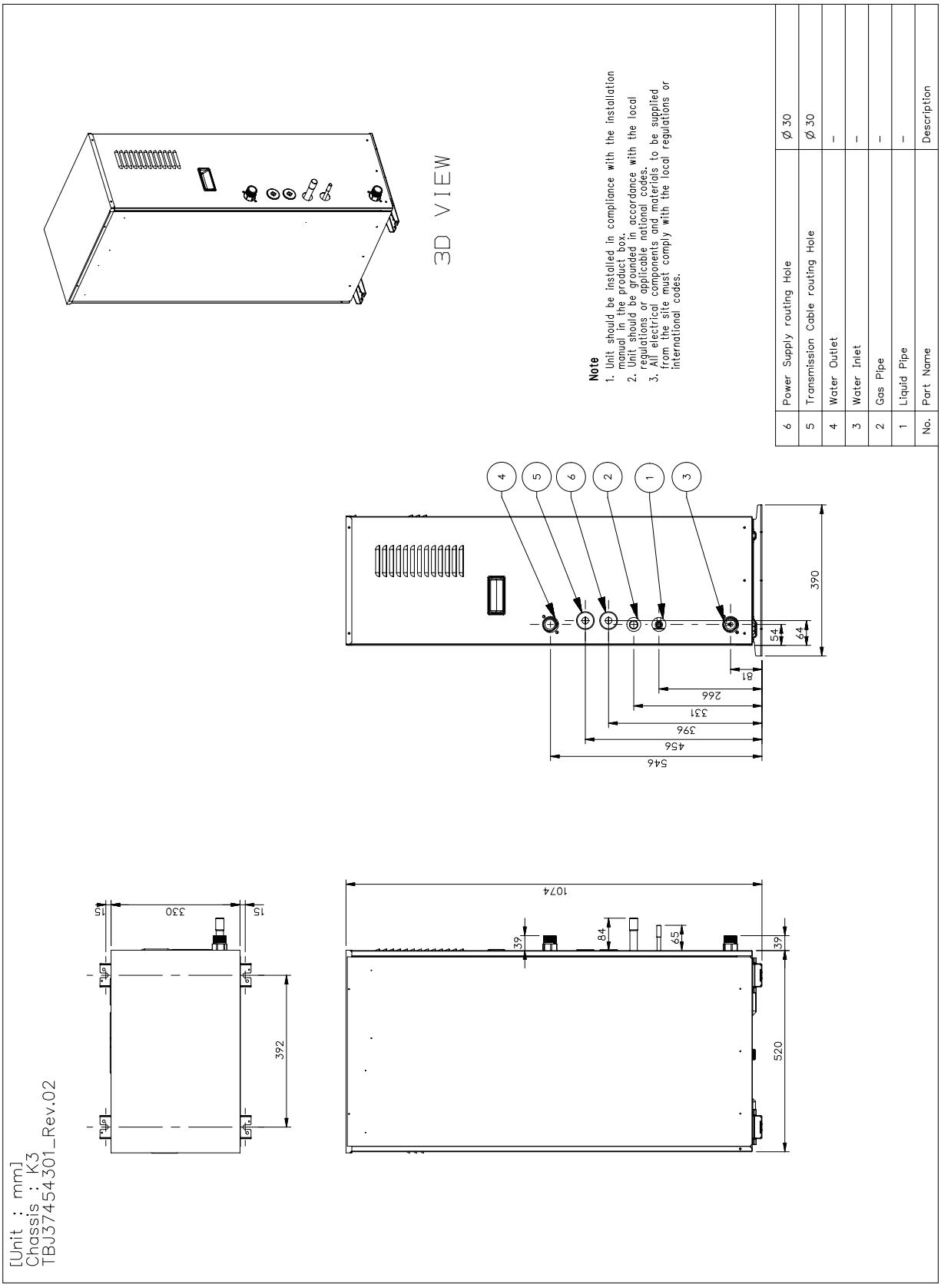




[Unit: mm]
Chassis : K3
TBJ37454401_Rev.02

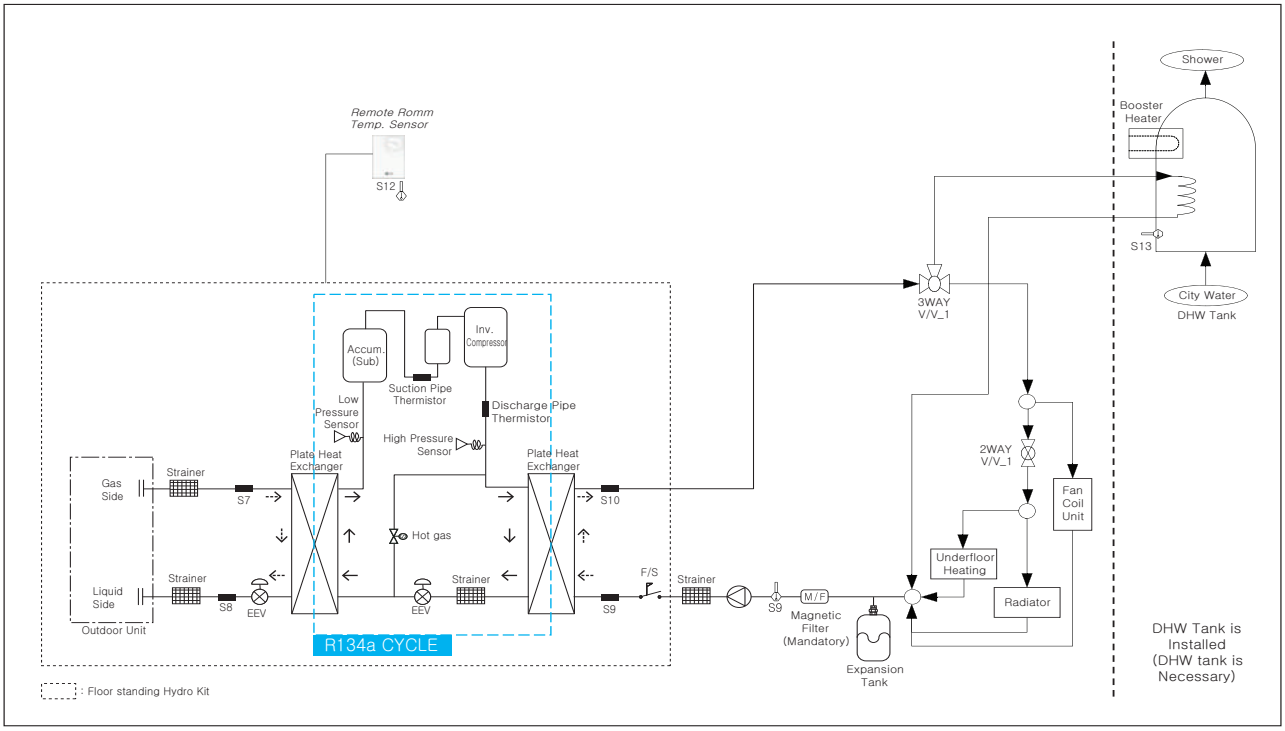
3. Dimensions

■ ARNH08GK3A4 / ARNH08LK3A4



4. Piping diagrams

■ ARNH04GK3A4 / ARNH04LK3A4 / ARNH08GK3A4 / ARNH08LK3A4



Note

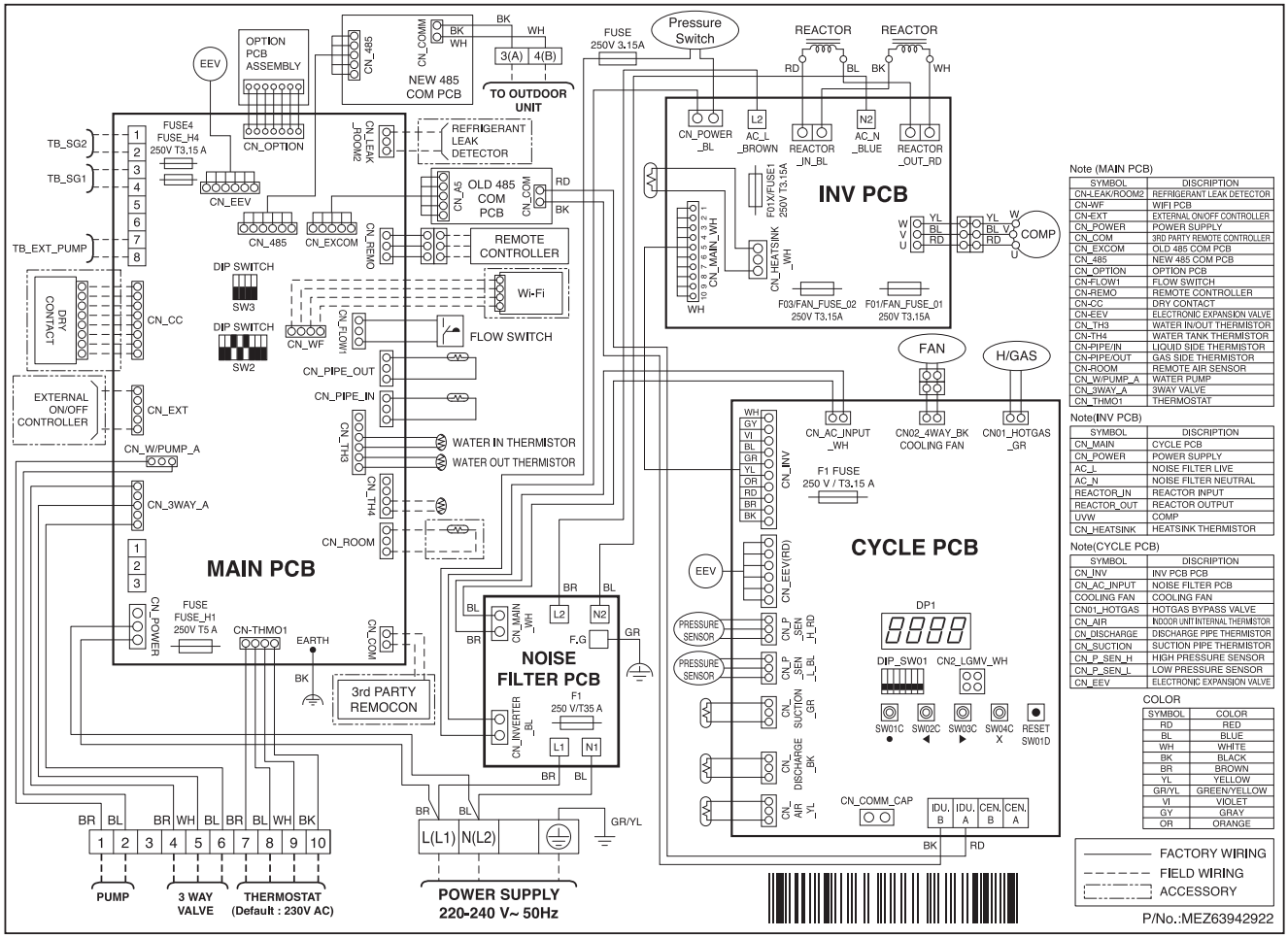
The schematic diagram above is given for reference only.

Actual schematic diagram may be different depending on the project requirement.

Category	Symbol	Meaning	PCB Connector	Remarks
Indoor Unit	S7	Refrigerant temperature sensor (Gas side)	CN_PIPE/OUT	- Meaning is expressed based on Cooling mode.
	S8	Refrigerant temperature sensor (Liquid side)	CN_PIPE/IN	
	S9	Entering Water temperature sensor	CN_TH3 (WATER IN) (PHEX OUT) (WATER OUT)	- S9, S10 are connected at 6 pin type connector CN_TH3.
	S10	Leaving Water temperature sensor		
	F/S	Flow switch	CN_FLOW1	- To monitor water flow in the system.
	S12	Remote Air sensor (Room 1/Direct circuit)	CN_ROOM	- Optional accessory (sold separately)
	CTR/PNL	Control Panel (or 'Remote Controller')	CN_REMO	- Pre built-in at indoor unit
Space Heating	2WAYV/V_1	Flow direction switching between Fan coil unit and floor heating/radiator	CN_2WAY_A	- 3rd party accessory and Field installation (sold separately)- 2 wire NO or NC type 2way valve is supported.
DHWHeating	DHW TANK	Water TANK	(no connector)	- Accessory and Field installation (sold separately)- Generating and storing DHW by Hydro kit or built-in backup heater
	Cold WATER	Water to be heated by Indoor unit and Booster Heater of W/TANK	(no connector)	- Field installation
	SHOWER	Water supplied to end-user	(no connector)	- Field installation
	S13	W/TANK water temperature sensor	CN_TH4	- S13 and S15 are connected at 4 pin type connector CN_TH4.- S13 is a part of DHW tank kit.- S14 is a part of solar thermal kit
Common	Expansion Tank	Expansion Tank	(no connector)	- Absorb volume change of heated water.
	M / F	Magnetic Filter	(no connector)	- 3rd party accessory and Field installation (sold separately)
	3WAYV/V_1	- Flow control for water which is leaving from indoor unit.- Flow direction switching between un- derfloor and water tank	CN_3WAY_A	- 3rd party accessory and Field installa- tion (sold separately)- SPDT type 3way valve is supported.
	Water Pump	Water Pump	Pump(A)	- Sold separately
	Strainer	Strainer	(no connector)	- Included in the product package

5. Wiring diagrams

■ ARNH04GK3A4 / ARNH08GK3A4



Note (MAIN PCB)

SYMBOL	DISCRIPTION
CN-LEAK/ROOM2	REFRIGERANT LEAK DETECTOR
CN-WIF	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)

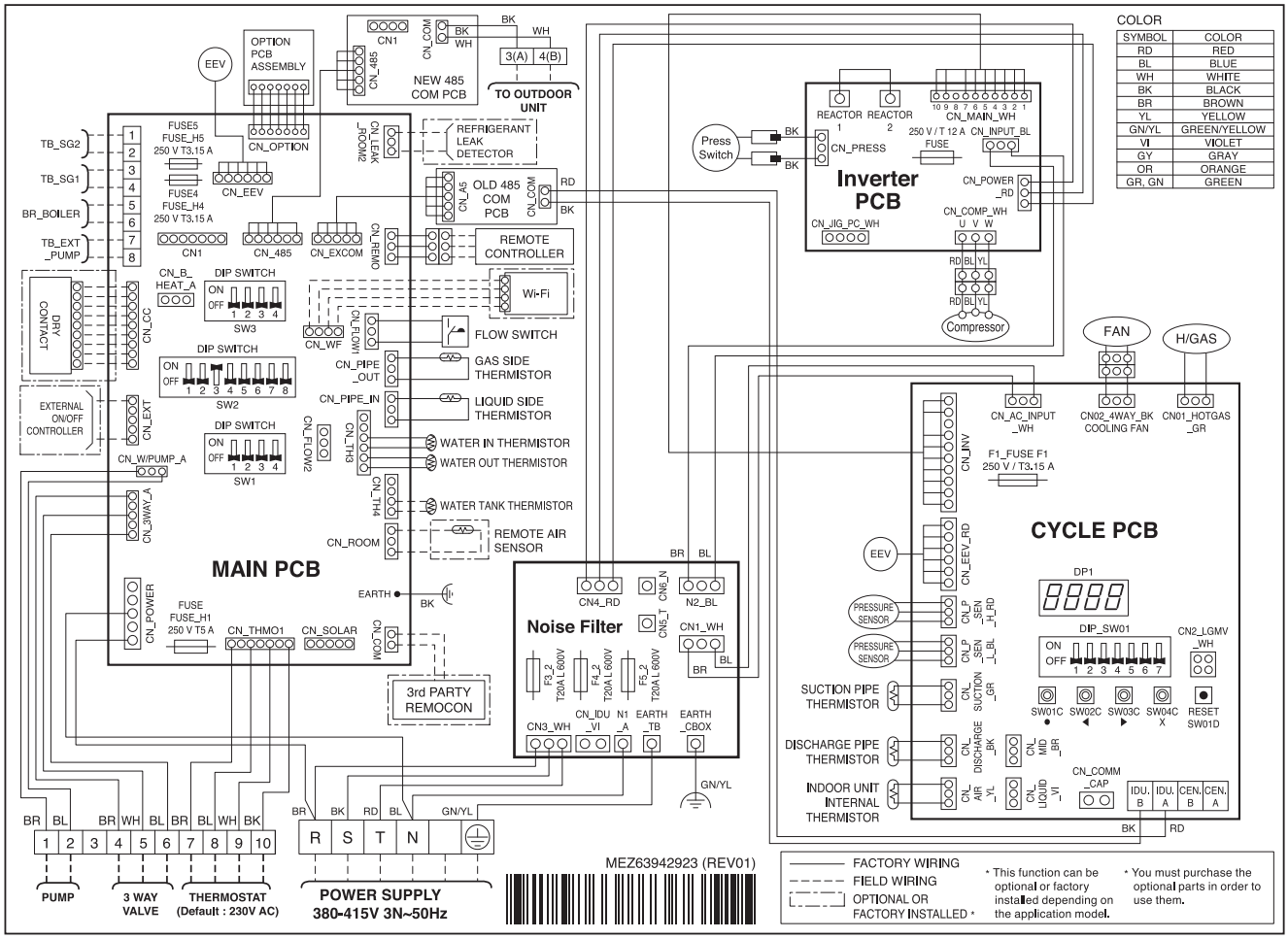
SYMBOL	DISCRIPTION
CN_INV	INV PCB PCB
CN_AC_INPUT	NOISE FILTER PCB
COOLING FAN	COOLING FAN
CN01_HOTGAS	HOTGAS BYPASS VALVE
CN_AIR	INDOOR UNIT INTERNAL THERMISTOR
CN_DISCHARGE	DISCHARGE PIPE THERMISTOR
CN_SUCTION	SUCTION PIPE THERMISTOR
CN_P_SEN_H	HIGH PRESSURE SENSOR
CN_P_SEN_L	LOW PRESSURE SENSOR
CN_EEV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

5. Wiring diagrams

■ ARNH04LK3A4 / ARNH08LK3A4



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_{HK} x F_{TC,T_HK} x F_{TC,W_HK}x F_{TC,P_ODU} x F_{TC,D_ODU}

Q_{HK} =	Hydro Kit capacity at rated condition.(kW)	..... 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,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*

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

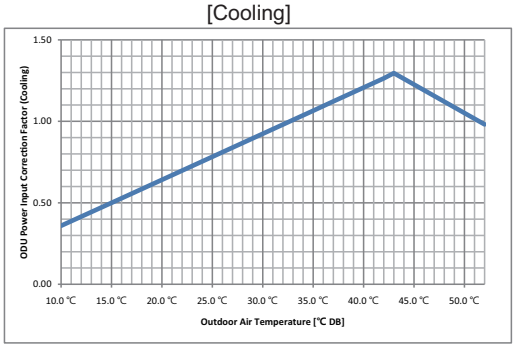
Hydro Kit Power Input = [PI_{ODU} x (I_{HK} / I_{TOTAL}) x $F_{PI,T\_HK(O)}$ x $F_{PI,W\_HK(O)}$]

+ [PI_{HK} x $F_{PI,T\_HK(H)}$ x $F_{PI,W\_HK(H)}$]

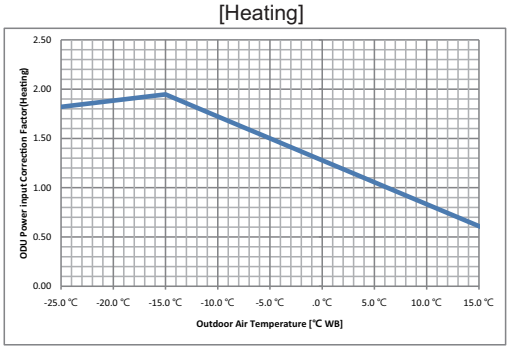
PI_{ODU}= Outdoor Unit Power Input by outdoor air (outside inlet water) temp. and capacity ratio at standard indoor temp. ..... Refer to *Capacity tables of outdoor unit PDB*

* Standard indoor temperature is 27/19℃ DB/WB on cooling mode, 20℃ DB on heating mode.
** PI ODU pattern by outdoor air temp.(It is reference data.This data would be different depending on outdoor unit)

[Cooling]



[Heating]



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*
$F_{PI,T\_HK(H)}$ =	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*
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*

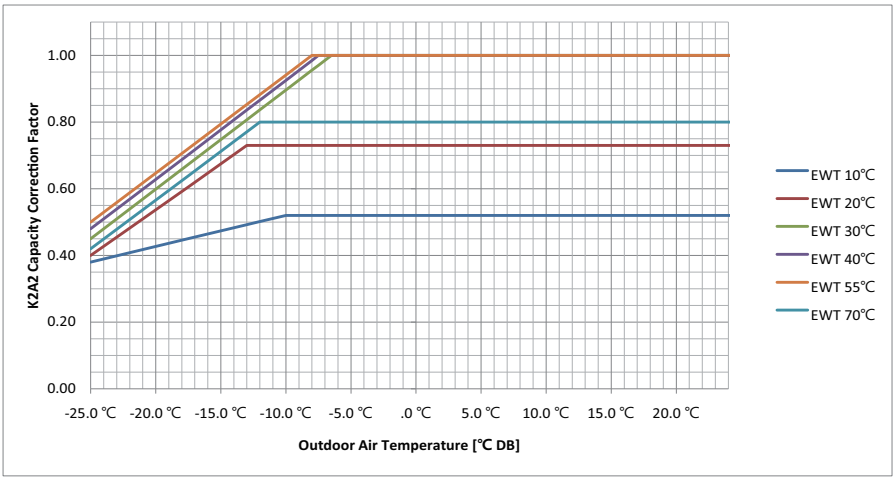
Note

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.

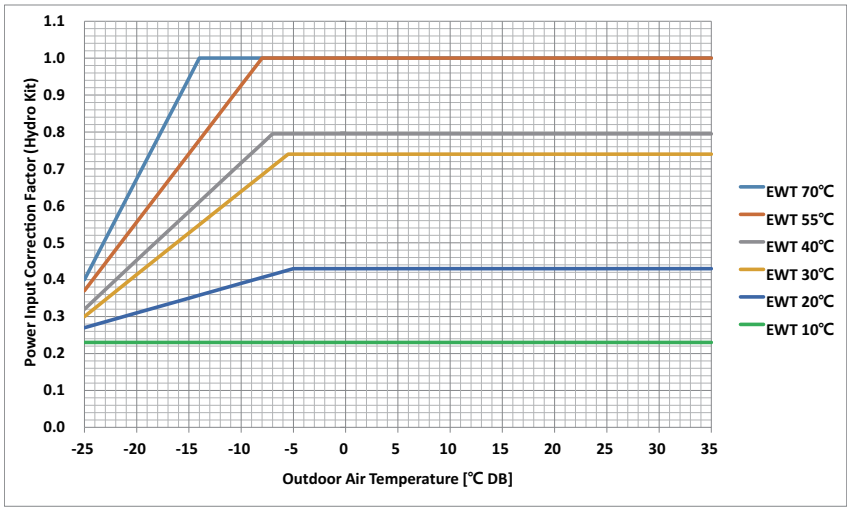
6. Capacity correction factor

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

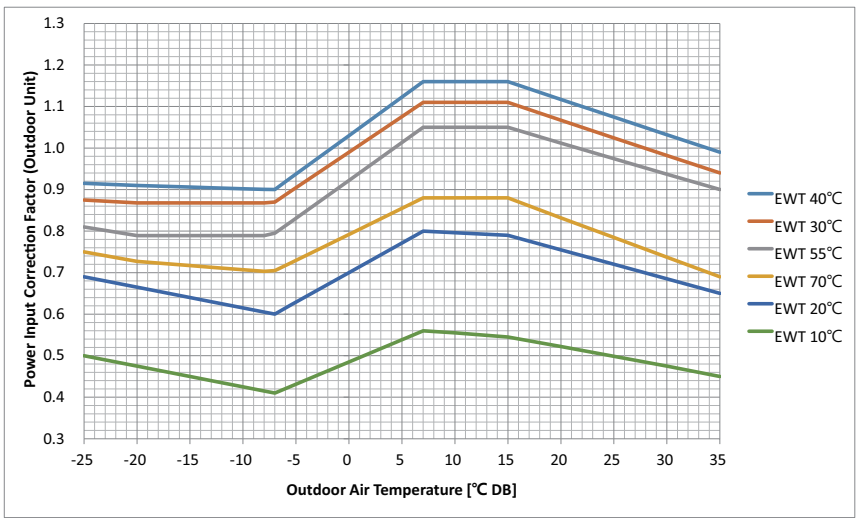
◆ Capacity correction factor



◆ Power Input correction factor (Hydro Kit)



◆ Power Input correction factor (Outdoor unit)



Note

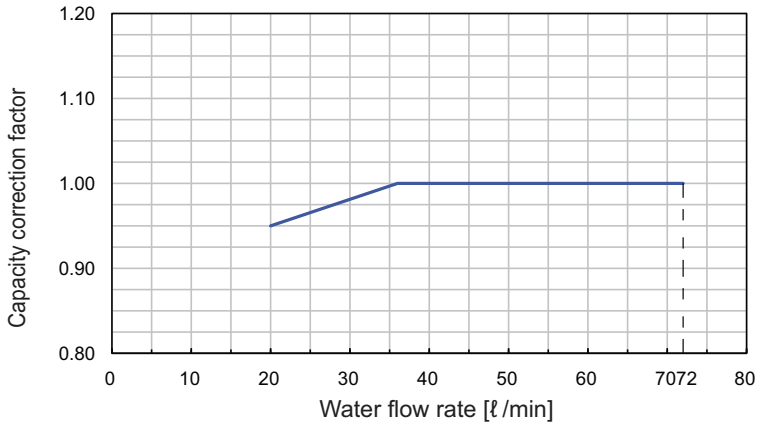
Correction factor follows the outdoor unit operation range and cannot operate outside the operating range.

6. Capacity correction factor

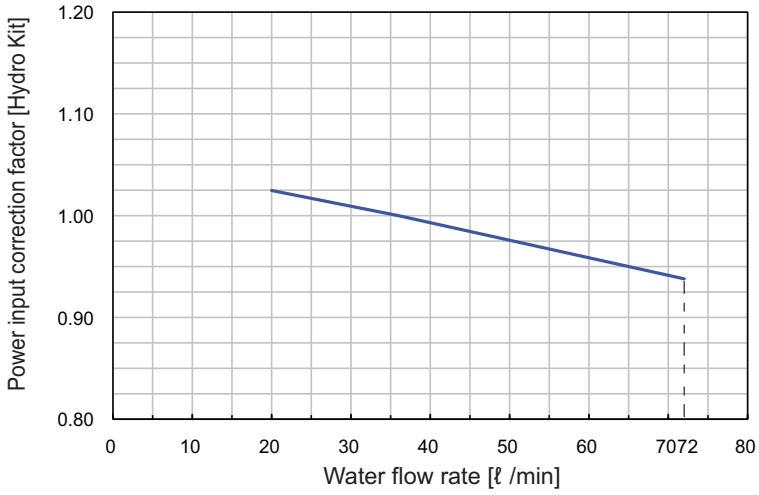
6.2 Capacity correction factor by water flow rate

■ Heating

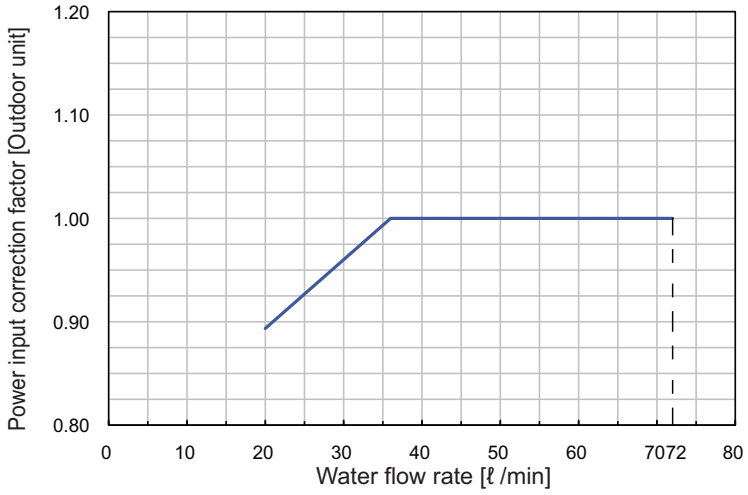
◆ Capacity correction factor



◆ Power Input correction factor (Hydro Kit)



◆ Power Input correction factor (Outdoor unit)



⚠ CAUTION

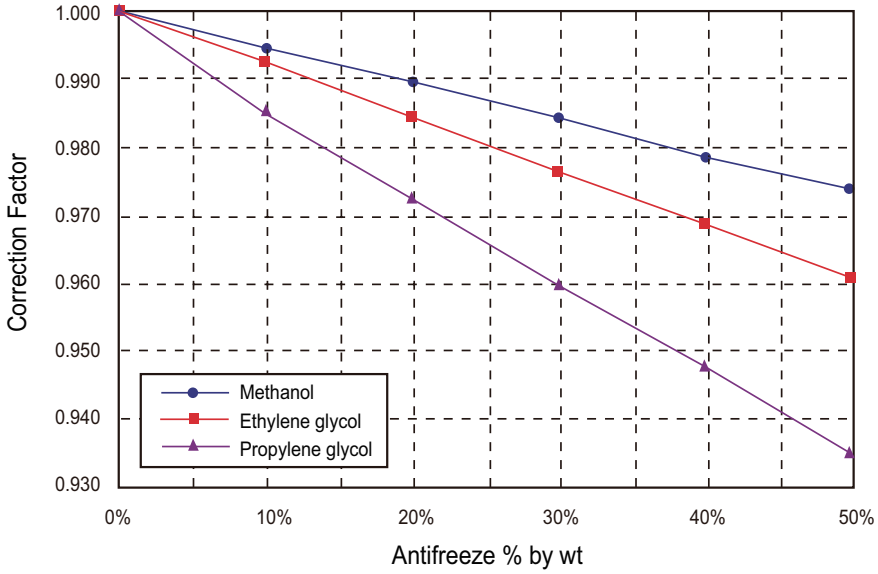
Water Flow Rate Range (recommended) : ARNH04GK3A4 19.8 ~ 40 (ℓ/min), ARNH08GK3A4 20 ~ 72 (ℓ/min)

6. Capacity correction factor

6.3 Capacity correction factor by 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**

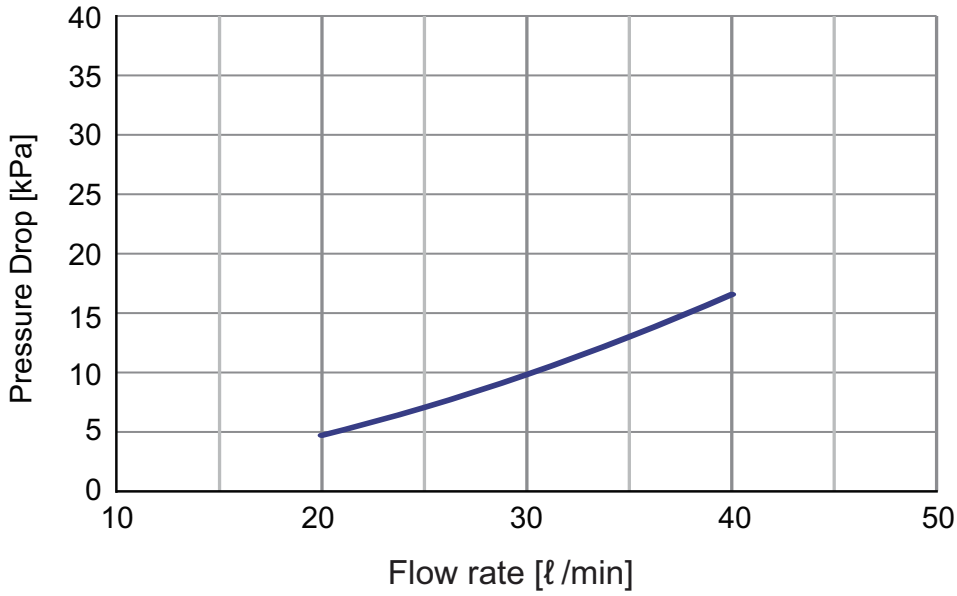


CAUTION

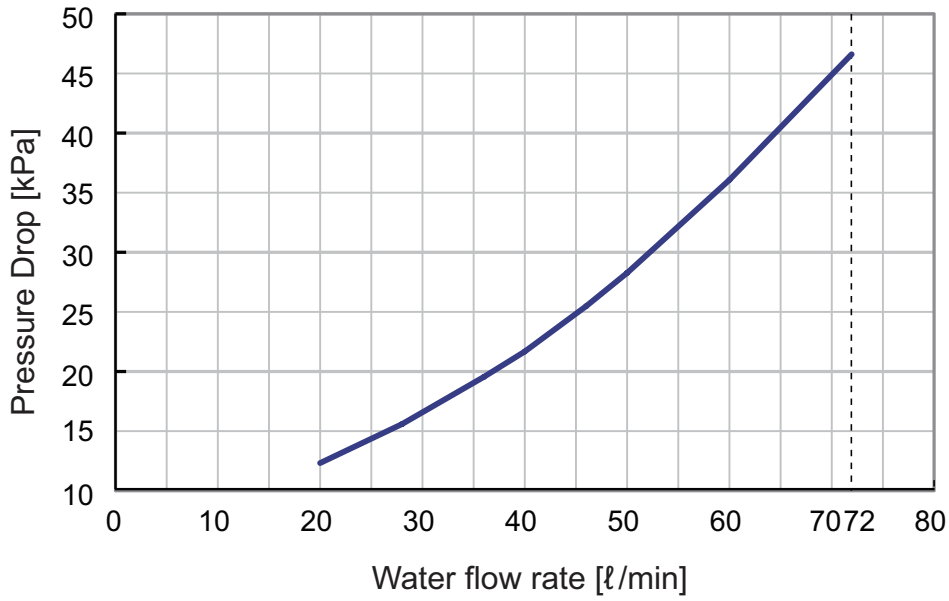
Please apply antifreeze according to local regulation.

7. Water pressure drop

■ ARNH04GK3A4 / ARNH04LK3A4



■ ARNH08GK3A4 / ARNH08LK3A4



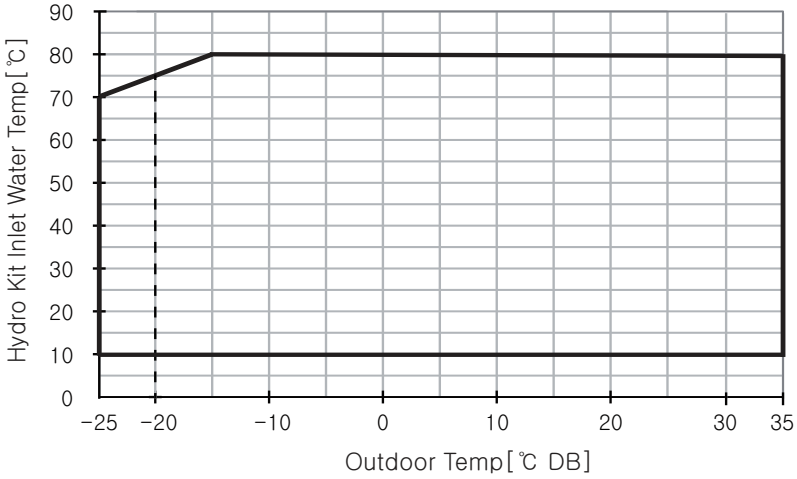
⚠ CAUTION

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

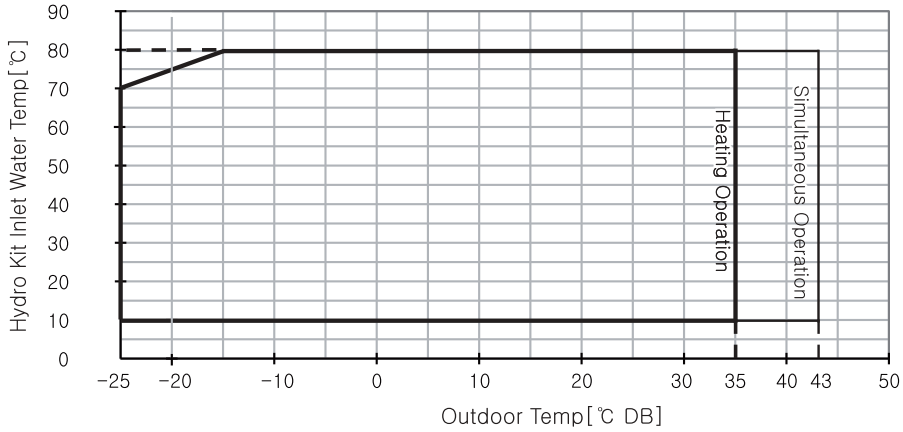
8. Operation limits

■ ARNH04GK3A4 / ARNH04LK3A4 / ARNH08GK3A4 / ARNH08LK3A4

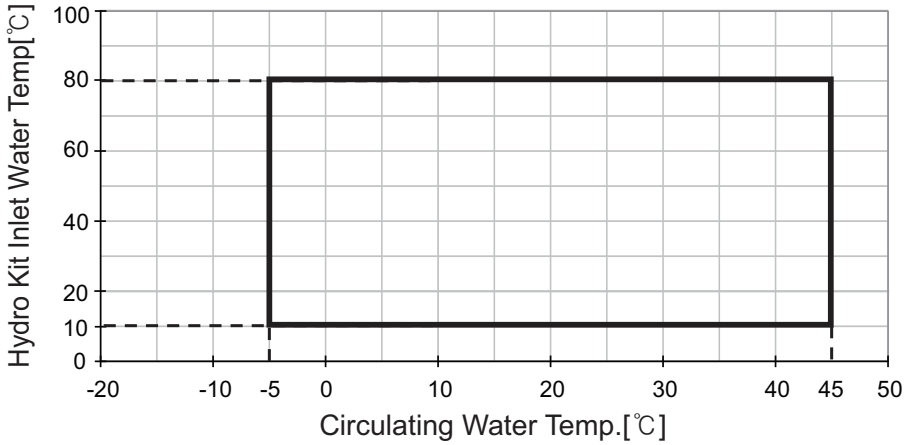
◆ -RUM------5,6(Heat Pump), ARUN------5, ARUN------0



◆ -RUM------5,6(Heat Recovery), ARUB------0(Heat Recovery)



◆ ARWN-series, ARWB-series



Note

1. For only Hydro Kit combination, Maximum operation limit in heating is outdoor temperature 35℃ DB / 24℃ WB.
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.
   Also operation limit depends on product type and target region.

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

■ 1 Phase

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

■ 3 Phase

Model	Type	Hz	Volts	Voltage Range	Power Supply			Compressor	
					MCA(A)	TOCA(A)	MFA(A)	MSC(A)	RLA(A)
ARNH04LK3A4	K3	50	380-415	Max : 456 Min : 342	16.1	17.7	20	-	5.00
	K3	60	380	Max : 456 Min : 342	16.1	17.7	20	-	5.00
ARNH08LK3A4	K3	50	380-415	Max : 456 Min : 342	16.1	17.7	20	-	11.50
	K3	60	380	Max : 456 Min : 342	16.1	17.7	20	-	11.50

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

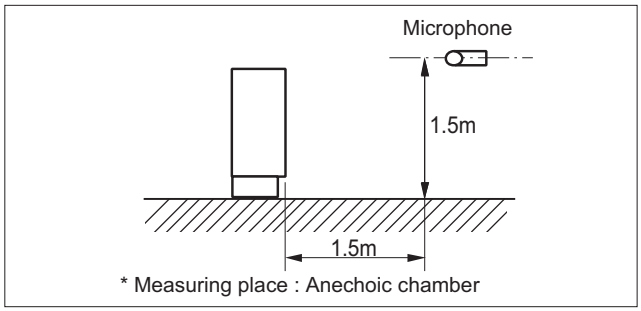
1. Voltage supplied to the unit terminals should be within the minimum and maximum range.
2. Maximum allowable voltage unbalance between phase is 2%.
3. MSC means the Max. current during the starting of compressor.
4. MSC and RLA are measured as the compressor only test condition.
5. OFM are measured 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 recommended fuse amps.
9. TOCA is minimum required amperes for selecting the circuit breaker and ground fault circuit interrupter. Please select the circuit breaker size equal or greater than TOCA.

   All installation site must require attachment of an earth leakage breaker.[Circuit breaker type is ELCB (Earth Leakage Circuit Breaker)].
10. Select the electrical equipment of combination unit according to the electrical characteristics of individual unit.

10. Sound levels

10.1 Sound Pressure Level

■ Overall

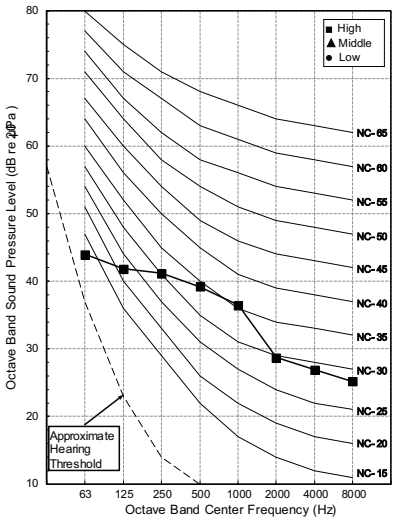


Note

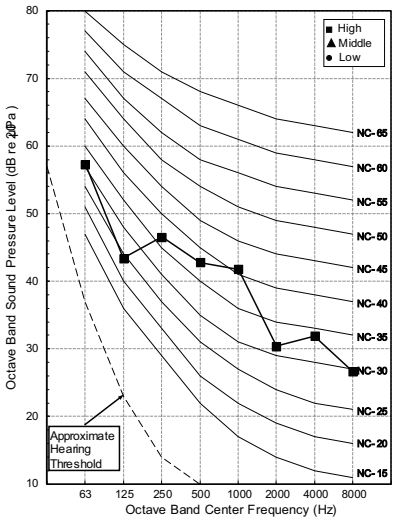
1. Sound measured at some distance away from the center of the unit.
2. Data is valid at free field condition.
3. Reference accoustic pressure 0dB = 20μPa.
4. Data is valid at nominal operation condition.
   Refer to the Model Specifications for nominal conditions(Power source and Ambient temperature, 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 / ARNH04LK3A4	44
ARNH08GK3A4 / ARNH08LK3A4	46

ARNH04GK3A4 / ARNH04LK3A4



ARNH08GK3A4 / ARNH08LK3A4



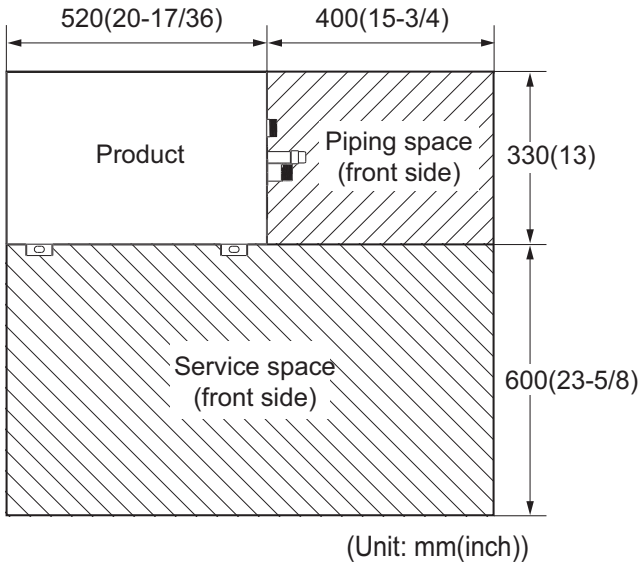
11. Installation

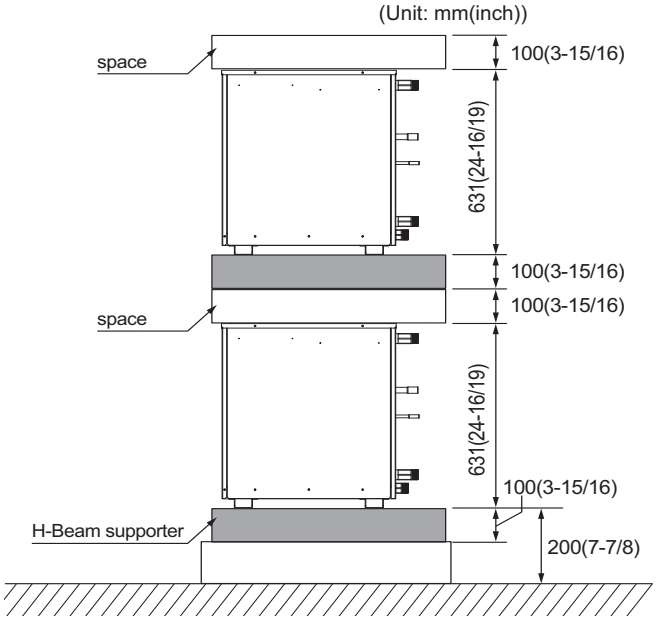
11.1 Installation Information

11.1.1 Selection of the best location

■ Installation Space

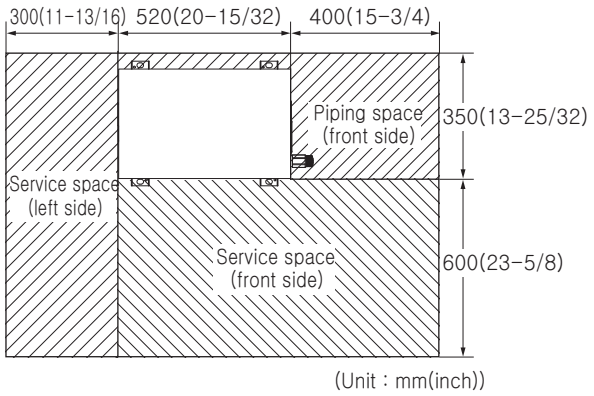
- The following values are the least space for installation. If any service area is needed for service according to field circumstance, obtain enough service space.

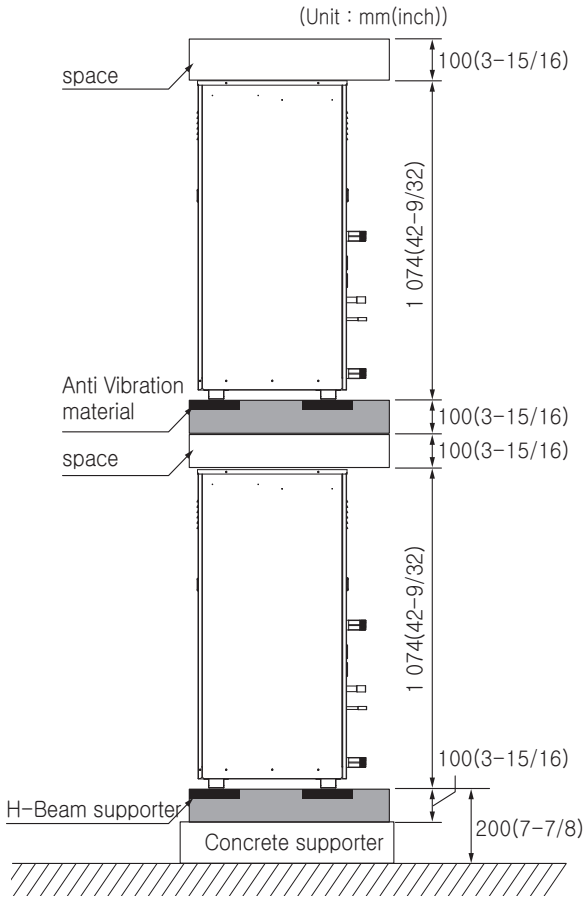




< Medium Temperature >

11. Installation



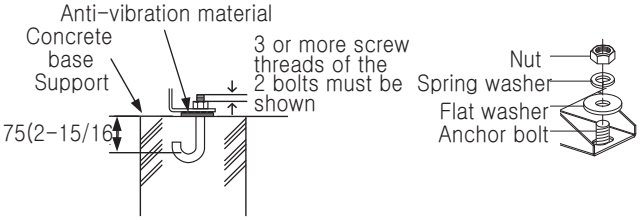


< High Temperature >

11. Installation

■ Foundation for Installation (Floor standing type)

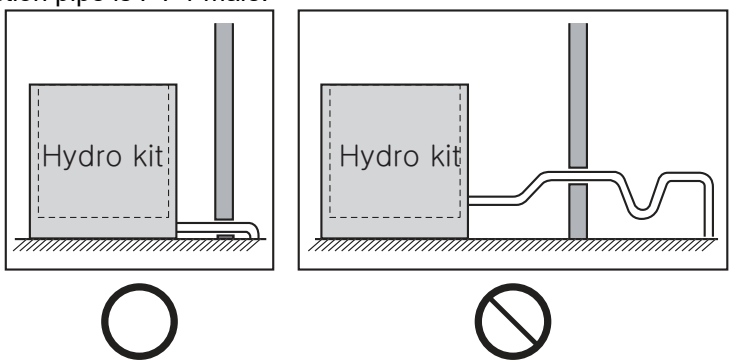
- Fix the unit tightly with bolts as shown below so that the unit will not fall down due to earthquake.
- Noise and vibration may occur from the floor or wall since vibration is transferred through the installation part depending on installation status. Thus, use anti-vibration materials (cushion pad)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



11. 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.

11. Installation

11.1.2 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.

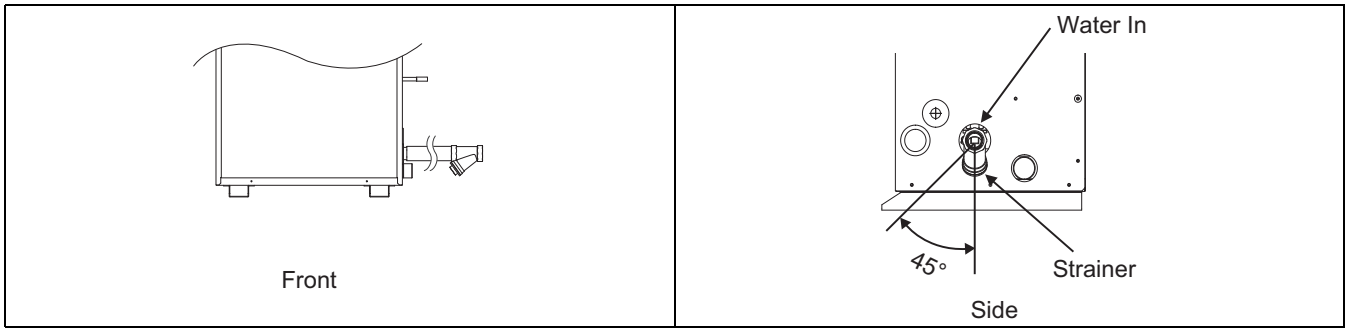
■ Water Piping and Water Circuit Connection

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

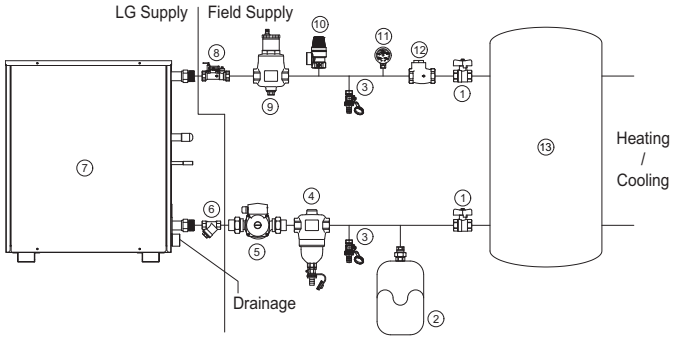
- The strainer included with product has a 28-mesh filter.

11. 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.

11. 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.

11.1.3 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

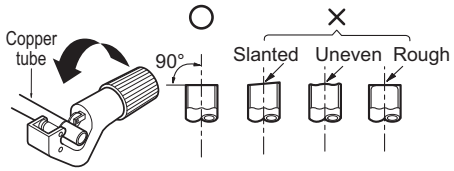
- Use only one of the above antifreeze.
- If a antifreeze is used, pressure drop and capability degradation of the system can occur.
- If one of antifreezes is used, corrosion can occur. So please add corrosion inhibitor.
- Please check the concentration of the antifreeze periodically to keep same concentration.
- 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.

11. Installation

11.1.4 Refrigerant Piping

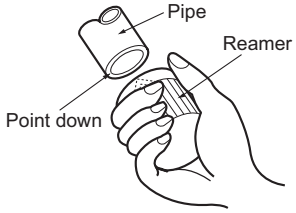
◆ Cut the pipes and the cable

- 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.



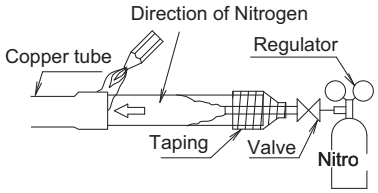
◆ Burrs removal

- 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.



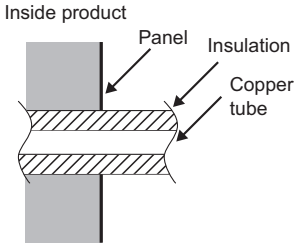
◆ Pipe welding

- 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.



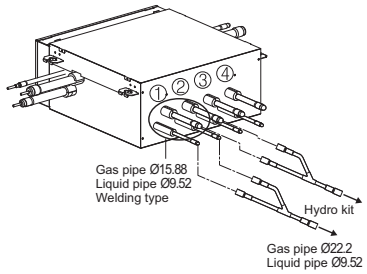
Classification	Thickness
Liquid pipe	t9 or above
Gas pipe	t19 or above

* 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.

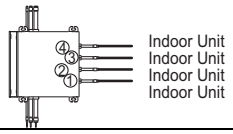
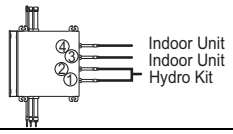
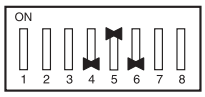
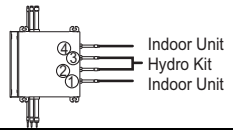
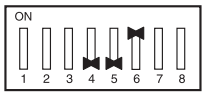
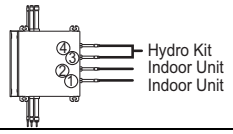
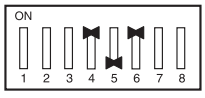
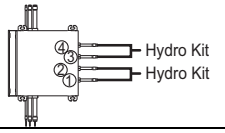
11. Installation

■ 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.

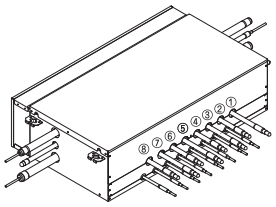
Notice

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

11. 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

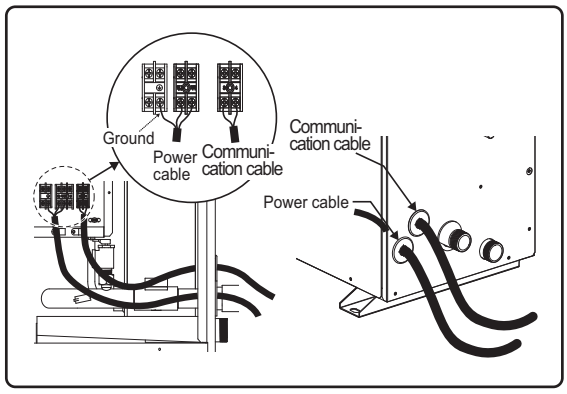
For more detailed information, refer to the installation manual of Heat Recovery Unit.

11. Installation

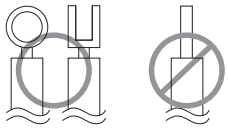
11.1.5 Electrical Wirings

■ How to connect wirings

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

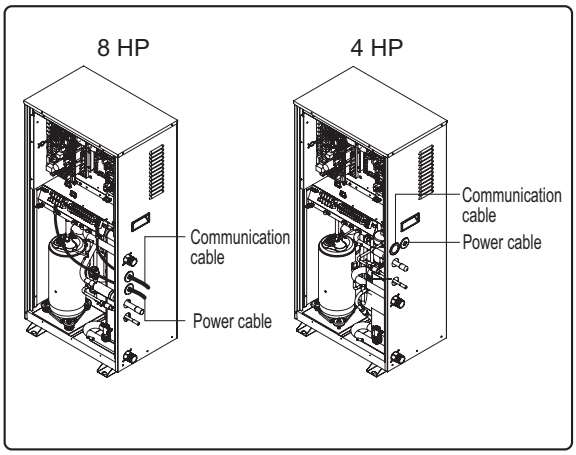


CAUTION:
When connecting the power and communication cable, always use the terminal connector (O-ring, Y-ring).

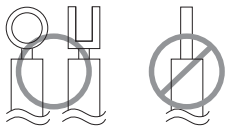


Make sure to tighten so that the screw of the terminal does not get loose.

- 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).



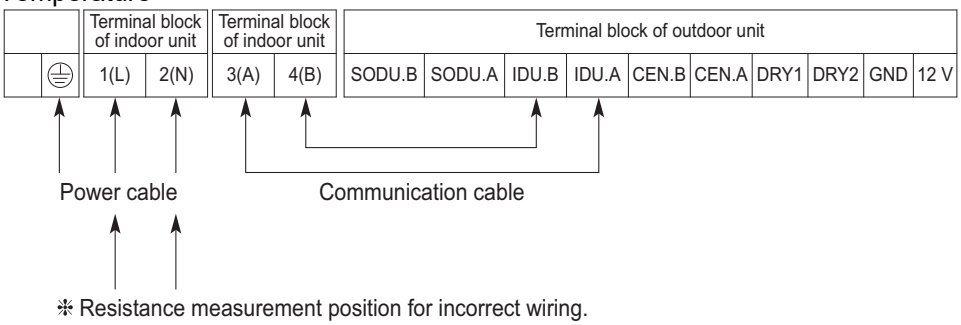
Make sure to tighten so that the screw of the terminal does not get loose.

11. Installation

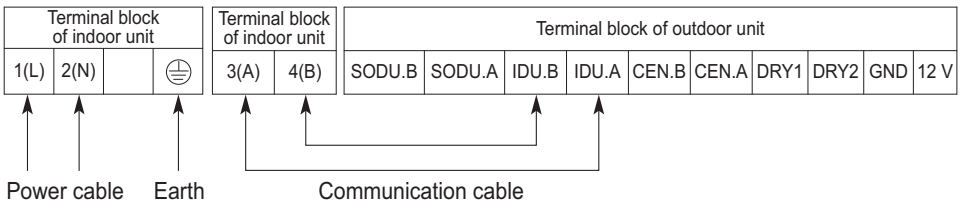
■ Wiring Connection

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

11. 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

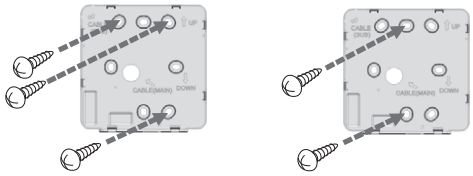
- Are all of the indoor units and outdoor units grounded?
- If grounding is not properly done, there is a risk of electric shock. Grounding must be done by a qualified technician.
- Consider the surrounding conditions(surrounding temperature, direct sunlight, rain water, etc.) when wiring the cable.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

11. 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.

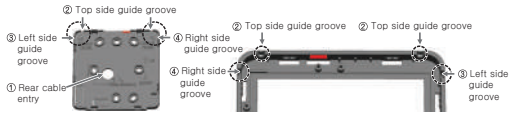


2. The wired remote controller cable can be installed in 4 directions. Install to the suitable direction according to the installation environment.

- 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.

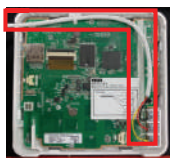
3. After removing the hole, trim the cut surface neatly.



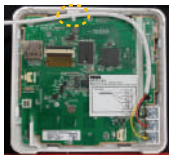
4. When installing the remote control cable on the left side, be sure to install it in the following guide.

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

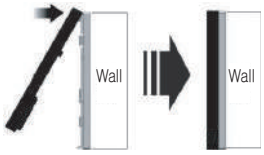


The Upper center boss for fixing the bent cable

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>



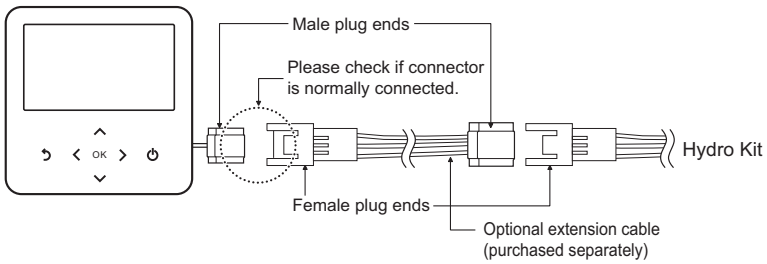
6.When you remove the remote controller from the installation plate, insert a small flat head screwdriver into the bottom side separation hole and turn clockwise to separate the remote controller.

- 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>

11. 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.

11. 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

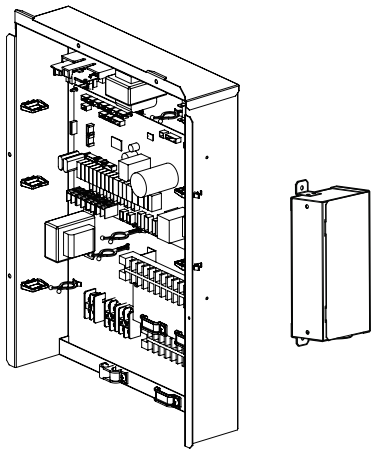
- Non installation of IPM cause the serious problem of its heat exchanger when electricity cut off during product operation.

Notice

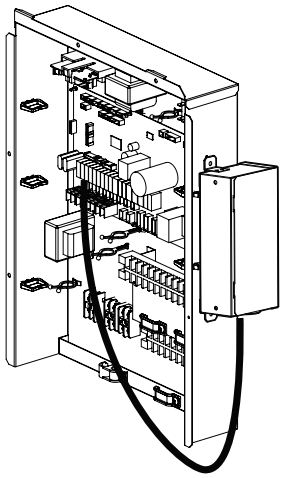
Please refer to the function list or accessories compatibility table for availability of Independent Power Module.

How to install Independent Power Module

1. Open the front panel of the control box



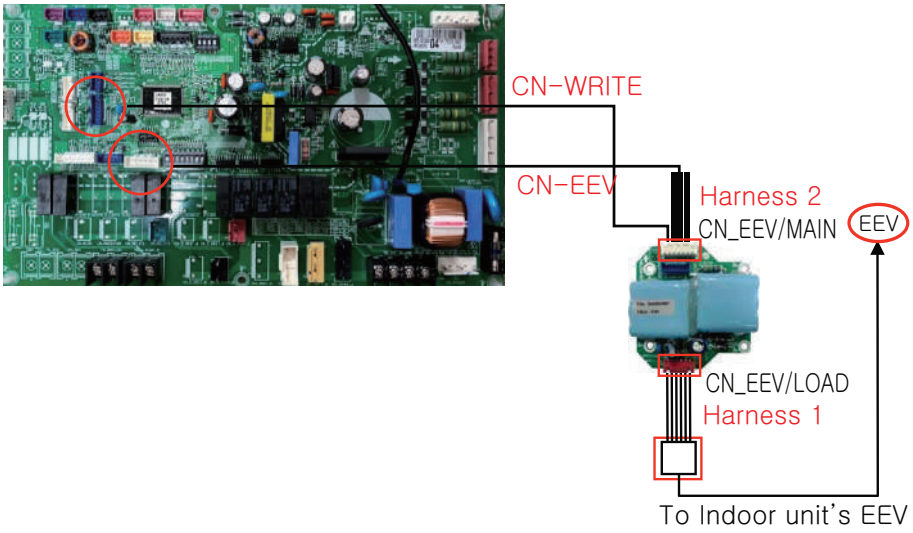
2. Assemble the cover of independent power module, fix it tightly with bolts and connect wires.



11. 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.

LG
Life's Good

LG Electronics

Air Solution
LG Electronics Inc, 128, Yeoui-daero,
Yeongdeungpo-gu, Seoul, Korea
(07336)
http://partner.lge.com

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The air conditioners manufactured by LG have received ISO9001 certificate for quality assurance and ISO14001 certificate for environmental management system.
The specifications, designs, and information in this brochure are subject to change without notice.