

# Electronics<br/>EHSTank Integrated<br/>Hydro UnitHydro UnitDesign & Installation

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#### **Modification history**

Date	Ver.	Modifier	Modified detail	Remarks
22 Apr 16	0.0	Sungtae Kim	Made the original version of installation training materials	

# Content

S



- Tank Integrated Hydro unit
- Split outdoor unit
- Mono outdoor unit
- External wiring and set up with Hydro unit
- Switches & Keys' functions
- Field Setting Value

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# Proces

# S Before start

- What is EHS
- Nomenclature
- Preparation of installation
- General guide of pipe drawing
- Installation tip
- Required tool

#### **Before start**

- Things what should be checked before installation
- ► Read Installation Manual carefully to guarantee the proper installation
- Every information which is related to proper installation is in Installation Manual and Technical Data

#### Book

- Proper installation will improve the reliability & performance of the system
- ► Keep safety at 1st place while working at site
- ► Right tool, enough material & well-trained workers should be on site

When you have any technical question or support is required please access BTSP.

https://btsp.samsunggsbn.com

#### What is EHS

#### What is EHS



- Heating or Cooling can be used with Hot or Cold Water
- ✔ High Efficiency than convential boiler
- ✓ Inverter compressor & R-32 refrigerant
- ✔ 3Type in EHS

Split : R-32 Outdoor Unit + Hydro Unit (Including PHE)

Mono : R-32 Outdoor Unit (Including PHE)

TDM : R-32 Outdoor Unit+Hydro Unit + Aircon Indoor Unit





■ TDM



#### What is EHS

- System Types Tank Integrated Split
- Both water heating and hot water supply
- Reversible (water cooling enable)
- Outdoor Unit + Hydro Unit + DHW Tank
- Hybrid Energy Source : Solar Collector (field supply)



#### What is EHS

- System Types Tank Integrated Mono
- Both water heating and hot water supply
- Reversible (water cooling enable)
- Mono Unit + DHW Tank
- Hybrid Energy Source : Solar Collector (field supply)



#### Nomenclature



(3) Year						
R	2019					

(4) Type						
Ν	Indoor unit					
Х	Outdoor Unit					

#### Precautions

**IMPORTANT:** When installing the unit, always remember to connect first the refrigerant tubes, then the electrical lines. Always disassemble the electric lines before the refrigerant tubes.

▶ Upon receipt, inspect the product to verify that it has not been damaged during transport. If the product appears damaged, DO NOT INSTALL it and immediately report the damage to the carrier or retailer (if the installer or the authorized technician has collected the material from the retailer.)

After completing the installation, always carry out a functional test and provide the instructions on how to operate the air to water heat pump to the user.

► Do not use the air to water heat pump in environments with hazardous substances or close to equipment that release free flames to avoid the occurrence of fires, explosions or injuries.

▶ While in installation or relocation of the product, do not mix the refrigerant with other gases including air or unspecified refrigerant. Failure to do so may cause pressure increase to result in rupture or injury.

Do not cut or burn the refrigerant container or pipings.

Use clean parts such as manifold gauge, vacuum pump, and charging hose for the refrigerant.

▶ Installation must be carried out by qualified personnel for handling the refrigerant. Additionally, reference the regulations and laws.

▶ Be careful not to let foreign substances (lubricating oil, refrigerant other than R-32, water, etc.) enter the pipings.

When mechanical ventilation is required, ventilation openings shall be kept clear of obstruction.

- ► For disposal of the product, follow the local laws and regulations.
- ► Do not work in a confined place.
- ► The work area shall be blocked.

► The refrigerant pipings shall be installed in the position where there are no substances that may result in corrosion.

- ► The following checks shall be performed for installation:
  - The ventilation devices and outlets are operating normally and are not obstructed.
  - Markings and signs on the equipment shall be visible and legible.

#### Precautions

▶ Upon leakage of the refrigerant, ventilate the room.When the leaked refrigerant is exposed to flame, it may cause generation of toxic gases.

- Make sure that the work area is safe from flammable substances.
- ► To purge air in the refrigerant, be sure to use a vacuum pump.
- Note that the refrigerant has no odour.
- ▶ The units are not explosion proof so they must be installed with no risk of explosion.

This product contains fluorinated gases that contribute to global greenhouse effect. Accordingly, do not vent gases into the atmosphere.

- ▶ For installation with handling the refrigerant(R-32), use dedicated tools and piping materials.
- Servicing and installation shall be performed as recommended by the manufacturer. In case other skilled persons are joined for servicing, it shall be carried out under supervision of the person who is competent in handling flammable refrigerants.

► For servicing the units containing flammable refrigerants, safety checks are required to minimise the risk of ignition.

Servicing shall be performed following the controlled procedure to minimize the risk of flammable refrigerant or gases.

▶ Do not install where there is a risk of combustible gas leakage.

Do not place heat sources.

Be cautious not to generate a spark as follows: Do not remove the fuses with power on.

Do not disconnect the power plug from the wall outlet with power on.

It is recommended to locate the outlet in a high position. Place the cords so that they are not tangled.

▶ If the indoor unit is not R-32 compatible, an error signal appears and the unit will not operate.

► After installation, check for leakage.Toxic gas may be generated and if it comes into contact with an ignition source such as fan heater, stove, and cooker.cylinders, make sure that only the refrigerant recovery cylinders are used.

Never directly touch any accidental leaking refrigerant.

This could result in severe wounds caused by frostbite.

#### Indoor unit / Outdoor unit compatibility

				Indoor Unit											
				Tank integrated (Split)			Tank integrated (Mono)			Wall-mounted type					
Туре		Power		0	200L(1Φ)	260L(1Φ)	260L(3Φ)	200L(1Φ)	260L(1Φ)	260L(3Φ)	Split(1Φ)	Split(3Φ)	MONO		
		Source	Model Name	Сара.	AE200RNWSEG	AE260RNWSEG	AE260RNWSGG	AE200RNWMEG	AE260RNWMEG	AE260RNWMG G	AE090RNYDEG (W43)	AE090RNYDEG (W43)	MIM-E03CN (W31)		
			AE040RXEDEG	4kW	•	•					•				
	Split	1Φ	AE060RXEDEG	6kW	•	•					•				
			AE090RXEDEG	9kW	•	•					•				
		3Ф	AE090RXEDGG	9kW			•				•	•			
			AE050RXYDEG	5kW				•					٠		
Outdoor unit			AE080RXYDEG	8kW				•	•				٠		
		ΙΨ	AE120RXYDEG	12kW				•	•				٠		
	Mono		AE160RXYDEG	16kW				•	•				٠		
			AE080RXYDGG	8kW						•			٠		
		3Ф	AE120RXYDGG	12kW						●			٠		
					AE160RXYDGG	16kW						●			٠

#### **Preparation of installation**

#### Move the unit

#### Moving the indoor unit with a fork lift

- elect the moving route in advance.
- Be sure that moving route is safe from weight of the indoor unit.

#### Moving the indoor unit with a fork lift

- Insert the fork into the wooden pallet at the bottom of the outdoor unit carefully.
  - Be careful that the fork does not damage the outdoor unit.
- A minimum of two people should lift the unit by the handles



- Moving the outdoor unit with a fork lift
- Insert the fork into the wooden pallet at the bottom of the outdoor unit carefully.

Be careful that the fork does not damage the outdoor unit.



#### Moving the outdoor unit by wire rope

- Fasten the outdoor unit by two 8m or longer wire ropes as shown at the figure. To prevent from damage or scratches, insert a piece of cloth between the outdoor unit and rope, then move the unit.



\* The appearance of the unit may be different from the picture depending on the model.

#### General guide of pipe drawing

Pipe limitation – 4/6/9 kW 1 fan Split outdoor unit



% Check installation manuals to find more information

#### Additional refrigerant charging

[SPLIT]

Outdoor unit	Liquid Pipe [mm]	Gas Pipe [mm]	Factory charge [kg]
AE040RXEDEG	ø6.35	ø15.88	1.2
AE060RXEDEG	ø6.35	ø15.88	1.2
AE090RXEDEG	ø6.35	ø15.88	1.4
AE090RXEDGG	ø6.35	ø15.88	1.4

Additional Charge[g] =  $(L-15) \times 20$ 

#### **Copper pipe**

#### Copper pipe

- ✓ ASTM standard copper pipe
- Follow the minimum thickness & temper grade.
   Otherwise pipe may be broken due to high pressure
- ✓ Use proper tool

Pipe size mm(inch)	Minimum thickness(mm)	Temper grade
Φ 6.35(1/4")	0.7	Annealed
Φ 9.52(3/8")	0.7	type
Ф12.70(1/2")	0.8	
Ф15.88(5/8")	1.0	C1220T-O



#### Nitrogen gas blowing

- To prevent buildup of non-condensable substances in the refrigerant pipes, nitrogen blowing must be used during brazing of copper connections

- Failure to use nitrogen while brazing will cause accumulation of oxides at the compressor, various strainers, and expansion valves impacting performance and causing premature failure



#### Nitrogen gas blowing

#### Nitrogen gas blowing



- Connect a nitrogen tank <u>near the point that will be brazed</u>
- Using a flow regulator, maintain 5.0l/min [1.76 ft³/hr] of dry nitrogen
- ✓ If flow is too low, it will not effectively prevent oxide formation
  - If flow is too high, it will be difficult to make a quality brazed connection
  - Maintain flow after brazing is complete until pipe is no longer hot







#### Brazing

#### Brazing

- Make sure that there are no foreign materials and impurities inside the pipe.
- Use socket when need brazing for connecting pipes.







#### Mounting

#### Mounting

1) Installing the hanger bolt(or others like ladder tray )

- $\Phi$ 12.7 or less : 1.5m or less
- $\Phi$ 15.88 or more : 2m or less
- \* If the distance is longer, pipe might be sagged by its weight
- 2) Insulating the pipe (Refer to Insulation work)
  - Keep the tape or cap end of each side

- 3) Hanging the pipe
  - Insert Insulation pad between pipe & hanger to prevent insulation being pressed







#### **Airtight Test**

- Airtight Test
- ✓ Perform the air Tight Test to check leakage with Nitrogen gas
  - Block end of each pipe by Pinching & brazing
  - Connect one of Gas & Liquid pipe , Install Pressure gage.
  - Pressurize nitrogen gas
    - HP : Gas & Liquid
    - HR : Gas & Liquid & High pressure

Factory setting

- EEV : Full Open
- Sol. valve : Normally Close

If outdoor unit is connected & manifold gauge is not enough then charge through **low pressure** gas service valve for both HP & HR



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#### **Airtight Test**

#### Airtight Test

※ Test Pressure

- R-32 : 46.9kgf/cm2 = 4.6Mpa = 667.2psi



#### Nitrogen pressurization

- 1. Maintains 4.6MPa for 24 hours. If no leakage, then pressure down to 1MPa.
- 2. If there is pressure drop then find leak point and
- 3. Maintain 1MPa(145psi) until connecting the outdoor/indoor units to prevent corrosion in the copper pipes.



#### Insulation

#### I Insulation of pipe

1) Insulate the refrigerant pipe based on the proper thickness of insulator for each pipe size.

The standard condition is 30 °C & less than humidity 85%.

(If the condition is in high humidity, use one grade thicker)

2) Use EPDM insulation which meets the following condition.

\* Seaside, Hot spring, Swimming pool, etc should be be treated as high humidity condition

		Insulator(Cod	Insulator(Cooling, Heating)		<epdm spec=""></epdm>					
					Item	Unit	Standard			
Pipe	Pipe Size(mm)	Standard	[30°C,over	Remark	Density	g/cm <sup>3</sup>	0.048~0.096			
		[30 C,05 %]	85%]	-	Dimension change route by	%	Below -5			
		EPDM			heat	,,,				
	Ø6.35~Ø9.52	9mm	←		Water absorption rate	g/cm <sup>3</sup>	Below 0.005			
Liquid	Ø12.70~Ø50.80	13mm	←	Heat	Thermal conductivity	Kcal/m·h·°C	Below 0.037			
	Ø6.35	13mm	19mm	resisting	Moisture transpiration factor	ng/(m²·s·Pa)	Below 15			
	Ø9 52~Ø25 40		25mm	res	Moisture transpiration grade	g/(m <sup>2.</sup> 24h)	Below 15			
Gas		19mm	19mm		Formeldebyde dispersion		There should			
	Ø28.58~Ø44.45		32mm	120°C	Formaldenyde dispersion	mg/L	be none			
	Ø50.80	25mm	38mm		Oxygen rate	%	Over 25			

#### Insulation

#### Insulation of pipe

- All the refrigerant pipe & Drainpipe should be insulated to prevent dewing on the pipe.



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#### Insulation

#### Insulation of indoor unit's pipe

Refrigerant pipe before EEV kit or without EEV kit
You can contact the gas side and liquid side pipes
The pipes should not be pressed.
When contacting the gas side and gas side pipe
Use 1 grade thicker insulator.

#### - Refrigerant pipe after EEV kit

After EEV kit leave 10mm space between gas and liquid pipe.
When contacting the gas side and liquid side pipe
□ Use 1 grade thicker insulator otherwise dewing may occur.





#### Wire pipe (tube)

✓ Install the pipe (tube) for power and communication wires separately.

\* Piping work can be different in compliance with the regulation in local area





#### Example)

Name	Temper grade	Applicable conditions		
Flexible PVC conduit	PVC	Tube is installed <b>indoor</b> and not exposed to outside Ex) it is embedded in concrete structure		
Class 1 flexible conduit	Galvanized steel sheet	Tube is installed <b>indoor</b> but exposed to <b>outside</b> so there are risk of <b>damage</b> to the protection tube		
Class 1 PVC coated flexible conduit	Galvanized steel sheet and Soft PVC compound	Tube is installed <b>outdoor</b> and exposed to <b>outside</b> so there are risk of <b>damage</b> to the protection tube and extra <b>waterproof</b> is needed		

#### Selection of wire and circuit breaker

#### Solderless ring terminal

- Select a solderless ring terminal for a power cable according to the nominal dimensions of cable.
- Apply insulation coating to the connection part of the solderless ring terminal and the power cable.





\* Do not use Y-shape for power cable.







No	Nominal dimensions for cable (mm²)		4/6		16	2	5	35		50	70				
No	minal dimensions for screw (mm)	4	8	8	8	8	8	8	8	8	8				
D	Standard dimension (mm)	9.5	15	15	16	12	16.5	16	22	22	24				
В	Allowance (mm)	±(	±0.2		±0.2	±	0.3	±0.3		±0.3	±0.4				
	Standard dimension (mm)		.6	7.1	9	11	.5	13.3		13.5	17.5				
D	Allowance (mm)	+0.3		+0.3	+0.3	+0.5		+0.5		+0.5	+0.5				
		-0.2		-0.2	-0.2	-0.2		- <mark>0.</mark> 2		-0.2	-0.4				
41	Standard dimension (mm)	3.4		4.5	5.8	7.7		9.4		11.4	13.3				
aı	Allowance (mm)	±0.2		±0.2	±0.2	±0.2		±0.2		±0.3	±0.4				
E	Min. (mm)	(	5	7.9	9.5	1	11		11		2.5	17.5	18.5		
F	Min. (mm)	5	9	9	13	15	13	13	13	14	20				
L	Max. (mm)	20	28.5	30	33	3	4	38	43	50	51				
	Standard dimension (mm)	4.3	8.4	8.4	8.4	8.4	8.4	<mark>8.4</mark>	<mark>8.4</mark>	8.4	<mark>8.4</mark>				
d2	Allowance (mm)	+ 0.2	+ 0.4	+ 0.4	+ 0.4	+ 0.4		+ 0.4		+ 0.4	+ 0.4				
	Anowance (mm)	0	0	0	0	(	0	3	0	0	0				
t	Min. (mm)	0	.9	1.15	1.45	1.7		1.7		1.7		1	.8	1.8	2.0

#### Selection of wire and circuit breaker

#### Wire selection

1. Let your electrical engineer the MCA value

(they will care about country regulation & their knowhow)

If they have no idea

- 1. Check your country regulation and follow
- 2. Decide how to install the cable (spec of wire will be different)
- 3. Check the spec of each cable
- 4. Calculate correct factor by condition
- 5. Select proper cable size

#### **Installation tip**

Keep the installation information



Form

Address can be check(set) easily by following the step

Step 1. Print attached form

Step 2. Put the S/N sticker on the form with No. & Location

Step 3. Using S-net pro 2 set the indoor unit's address & option by matching with S/N



No.	Model code	S/N sticker	Main Address	RMC Address		Location		
1	AM012FNNDCH	AM012FNNDCH/AA S/N : Y7JVPAGDB00025H	01		1A	Office 1 <sup>st</sup> flc	01 oor	
					Discharge(Duct)	Error Code	Serial Nun	nber
2				2	-58 F	702 >	Y7KFPAGD 01A	3000
			pin 2 Samong Gyanes AC 9 statistics Tachier - Brild 5 Web.		-58 F	129	Y7KFPAGD 08H	3000
3		Linear     Linear     Linear     Linear     Linear     Linear       Sector     Linear     Linear     Linear     Linear       Wind Linear     Linear     Linear     Linear       Zone     RD     On     Ann     Linear       Zone     RD     On     Ref     Ref	and Baccar and Backardinet Baccar Statistical Lat 6/17 142 447 7/2 1997/2000 237 4/17 0 237 139 1997/2000	о	-58 F	0	Y7KEPAGD 28T	3000
		2000         200 <td>22 637 100 607 5 100 201 214 617 100 617 10 7 10 10 201 145 617 10 617 10 10 10 10 10 10 10 10 10 10 10 10 10</td> <td>6</td> <td>-58 F</td> <td>0</td> <td>Y7K2PAGD</td> <td>3000</td>	22 637 100 607 5 100 201 214 617 100 617 10 7 10 10 201 145 617 10 617 10 10 10 10 10 10 10 10 10 10 10 10 10	6	-58 F	0	Y7K2PAGD	3000
1		2.288 10 <b>G</b> A 44 211 831 C	11 NOT 100 AT 1	1	-58 F	0	Y7K2PAGD 01R	3000
-		S-net pro	2 software		-58 F	129	Y7KFPAGD 23J	3000
		Constrainty Constraints and Provide State (Second State Sta		96	-58 F	0	Y7KFPAGD 02V	3000

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Manifold Set (dedicated for R-32)	Flaring Tool (45° Flare)	Vacuum pump & Pressure gauge
Tube cutter & de-burring tool	Hands tools	Torque Wrench
Torch Set & brazing rod	Nitrogen and flow gauge	Scale & leakage detector

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# Tank intergrated Hydro

### unit

- Example of application
- Installation information
- Mounting the Hydro unit
- Charging a water into the system

#### **Example of application**

#### 1. Space heating + Water heating An example of field supply scope

- space heating devices : Radiator or Fan coil unit
- water heating devices : Pipe
- control devices : Room controller, thermostat, mixing valve



#### **Example of application**

#### 2. Hybrid application (Back-up boiler and solar panel connected)

- space heating devices : Radiator or Fan coil unit
- water heating devices : Pipe
- control devices : Room controller, thermostat, mixing valve
- Solar system, Back-up boiler



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#### Installation information

#### Accessories

Installation Manual (2)	Zone sensor (1x10m, WH) (2)	Temperature Sensor for Mixing Valve (1x15m, BLU) (1)
$\square$	Q	Q
Sensor holder of zone sensor and mixing valve (ID Ø6.8 mm) (3)	Sensor clip of zone sensor and mixing valve (3)	Cable-tie for zone sensor and mixing valve (6)
	<u> </u>	C
Aluminum tape for zone sensor and mixing valve (3)	Rubber tape for zone sensor and mixing valve (3)	Insulator for zone sensor and mixing valve (3)
Connector wire-PV (S/G) (1x2 m, RED) (1)	Tube secondary (1) (only for 260 L Tank model)	Gasket (1) (only for 260 L Tank model)
	J.	
Drain-plug out (1)	Cap-drain (2)	
	0	

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Mono Split

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#### Main components

Split



No.	Part name	Note
1	Refrigerant pipe	ø15.88 (5/8"), Flare nut
2	Refrigerant pipe	ø6.35 (1/4"), Flare nut
3	Hot water outlet	ø22, Straight pipe
(4)	Secondary return	ø22, Straight pipe (260L option)
(5)	Cold water inlet	ø22, Straight pipe
6	Space heating outlet	ø28, Straight pipe
7	Space heating inlet	ø28, Straight pipe
8	T/P valve	7bar, 90 ℃
9	Pressure relief valve	3bar, BSPP 1/2"
(10)	3way valve	
No.	Part name	Note
(1)	Anode bar	BSPP 1"
(12)	Plate heat exchanger	
(13)	Back-up heater	
(14)	Drain port	
(15)	Air vent	BSPP 3/8"
(16)	Eva-in thermistor	
	Water-out thermistor	
(18)	Eva-out thermistor	
(19)	Water-in thermistor	
20	Tank thermistor	
(21)	Heater thermistor	
(1)	Water pump	
(3)	Water tank	200L / 260L
24	Manometer	0~4bar
(25)	S/D converter	
26	Control box	
Ø	Booster heater	3kW
(28)	Booster heater thermostat	
29	Flow sensor	
30	Expasion vessel	8L, Pre-charge gas: 0.1MPa, N2, BSPP 3/8"
31)	Strainer	
32	Tank drain valve	
33	Drain port	Primary circuit

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Mono Split

Mono



No.	Part name	Note
1	Water pipe (Return to heat pump)	ø22, Straight pipe
2	Water pipe (Flow from heat pump)	ø22, Straight pipe
3	Hot water outlet	ø22, Straight pipe
(4)	Secondary return	ø22, Straight pipe (260L option)
(5)	Cold water inlet	ø22, Straight pipe
6	Space heating outlet	ø28, Straight pipe
$\overline{O}$	Space heating inlet	ø28, Straight pipe
(8)	T/P valve	7bar, 90 ℃
9	Pressure relief valve	3bar, BSPP 1/2"
(10	3way valve	
No.	Part name	Note
(1)	Anode bar	BSPP 1"
(12)	Back-up heater	
(13)	Drain port	
(14)	Air vent	BSPP 3/8"
(15)	Tank thermistor	
(16)	Heater thermistor	
(17)	Water pump	
(18)	Water tank	200L / 260L
(19	Manometer	0~4bar
(20)	S/D converter	
(21)	Control box	
(2)	Booster heater	3kW
(23)	Booster heater thermostat	
(24)	Flow sensor	
(25)	Expasion vessel	8L, Pre-charge gas: 0.1MPa, N2, BSPP 3/8"
26	Strainer	
Ø	Tank drain valve	
(28)	Drain port	Primary circuit
### Dimensional drawing of Hydro unit



No	Split	Size	type
1	Refrigertant (Gas)	Ø15.88	Flare nut
2	Refrigertant (Liquid)	Ø6.35	Flare nut
3	Hot water outlet	Ø22, T1.0	Straight pipe
(4)	Secondary return (260L option)	Ø22, T1.0	Straight pipe
5	Cold water inlet	Ø22, T1.0	Straight pipe
6	Space heating outlet	Ø28, T1.2	Straight pipe
$\bigcirc$	Space heating inlet	Ø28, T1.2	Straight pipe

No	Mono	Size	type
1	Mono outdoor outlet	Ø28, T1.2	Straight pipe
2	Mono outdoor inlet	Ø28, T1.2	Straight pipe
3	Hot water outlet	Ø22, T1.0	Straight pipe
(4)	Secondary return (260L option)	Ø22, T1.0	Straight pipe
5	Cold water inlet	Ø22, T1.0	Straight pipe
6	Space heating outlet	Ø28, T1.2	Straight pipe
0	Space heating inlet	Ø28, T1.2	Straight pipe

0

Mono Split

## Installation information

#### Installation of the Indoor unit

The indoor unit should be installed indoors and meet the following conditions.

- □ Installation site should be sheltered from frost.
- □ In area with suitable space for servicing.
- □ A place with adequate ventilation.
- Where there is no risk of leakage of flammable gases.
- □ There is a provision for condensate drain and pressure relief valve blow-off.
- The wall for installation is a flat, vertical and non-combustible wall, capable of supporting the operation weight of the

#### Installation space

□ Ensure to leave the appropriate space as indicated in the drawing.

- Installation site should be secured with adequate ventilation so that
- □ the components of hydro unit will not be damaged from overheating.



(Unit:mm)

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#### Mounting the Hydro unit

A minimum of two people should lift the unit by the handles and not by the drain pan or pipe work.



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### Base construction and installation of the Tank hydro unit

Manufacturer is not responsible for the damage occurred by not following the installation standards.

- 1. Considering the vibration and weight of the Tank hydro unit, strength of the base ground must be strong enough to prevent noise and the top part of the base ground has to be flat. Adjust the level controller to make fixed controller has to be min.10 mm higher than level controller.
- 2. Base ground should be 1.5 times larger than the bottom of the Hydro unit.
- 3. When concrete construction for Tank hydro unit installation is completed, install an anti-vibration pad(t=20 mm or more) or an anti-vibration frame(vibration transmissibility=5 % and below) to prevent vibration of the outdoor unit from transferring to the base ground.



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## Installation information

Drain Work

Produced defrost water must be drained through the drain hole.

When the drain plug is used, make sure that it is located at a height of 100 mm or more from the floor.

When the drain plug is used, make sure to install it at one of the positions marked in the figure below.

When the drain plug is not used, make sure to plug it with the drain cap.



Split

Mono

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#### Refrigerant pipe work

11. . . 1.I. . .

For all guide lines, specifications regarding refrigerant pipe work between the indoor unit and the outdoor

unit,

. . . . . . . . . . .

	Gas pipe (O.D.)	Liquid pipe (O.D.)		Gas pipe Liquid pipe
Indoor unit	15.88 mm (5/8 inch)	6.35 mm (1/4 inch)		· ····································
Outdoor unit	15.88 mm (5/8 inch)	6.35 mm (1/4 inch)	"L	
Ou	uter diameter [mm(inch)]		Torque (N•m)	
	ø6.35 (1/4")		14~18	
	ø9.52 (3/8")		34~42	
	ø12.70 (1/2")		49~61	
	ø15.88 (5/8")		68~82	
	ø19.05 (3/4")		100~120	

When connecting the refrigerant pipes, always use 2 wrenches/spanners for tightening or loosening nuts. If not, piping connections can be damaged.

#### Water pipe work

The hydro unit is equipped with components listed on the table below.

The hot and cold water supply connections are clearly marked on the unit with labels. And service valves are provided.

Whole water plumbing system including Hydro unit shall be installed by a qualified technician and must comply with all relevant European and national regulations.

□ Allowable water pressure of hydro unit is maximum 3.0 bar.

An air-vent value is integrated on the hydro unit. Please check that air-vent value is not overtightened so the

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air-vent valve can release any air out of the system during system operation.

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	No.	Name	Size	Conncetions
Γ	1	Hot water outlet	ø22, T1.0, Copper	
6 Hull 1	2	Sencondary return	ø22, T1.0, Copper	
Split Hydro unit	3	Cold water inlet	ø22, T1.0, Copper	Crimp pipe fitting or
Γ	4	Space heating outlet	ø28, T1.2, Copper	weiding
Ē	(5)	Space heating inlet	ø28, T1.2, Copper	



	No.	Name	Size	Conncetions
	1	Outdoor outlet	ø28, T1.2, Copper	
	2	Outdoor inlet	ø28, T1.2, Copper	
Mono Hydro unit		Hot water outlet	ø22, T1.0, Copper	
	(4)	Sencondary return	ø22, T1.0, Copper	Crimp pipe fitting or
	5	Cold water inlet	ø22, T1.0, Copper	weiding
	6	Space heating outlet	ø28, T1.2, Copper	
	7	Space heating inlet	ø28, T1.2, Copper	



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#### Charging a water into the system

When filling water, the following start-up procedure should be followed.

- 1. All system components and pipes must be tested for the presence of leaks.
- 2. Make-up water assembly or Flushing unit is recommended for installation and service.
- 3. Before connecting pipes to the hydro unit, Flush water pipes clean to remove contaminants during 1 hours using a flushing unit or tap water pressure if it is adequate (at 2 to 3 bar)
- 4. Fill water into the hydro unit by opening service valves.
- 5. Purge the air (Fill with a flushing unit with sufficient capacity: avoid aerating the water)
- 6. Circulate for long enough to ensure that all air has been bled from the complete water piping system.

After installations, Commissioning should be performed by gualified representatives. Unless flushing and air-purging works are performed adequately, It might result in malfunctions.



SAMSUNG Split

Mono



Split

Mono

#### Charging a water into the system (Caution !!)

Check and clean strainer periodically.

□ Replace strainer when necessary.

□ Its recommended that you flush the system for 4 hours minimum once a per annum.

□ Use chemical cleaning agents(Begin with acid , finish with alkali).

Install Air vents on the top of the system

I The complete water circuit, including all pipe must be insulated to prevent condensation forming on the surface of the pipe and

heat loss to external environment.



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#### Charging a water into the system (Caution !!)

□ Service space should be secured.

 $\hfill\square$  Water pipe and connections must be cleaned using water.

□ If internal water pump capacity is not enough, install external water pump.

Do not connect electric wire while water charging.

D When initial installation or re-installation required, open the cap to prevent air trap in the unit while charging water.

The back-up heater vessel shall be full of water before heater is turned on. Confirm if the vessel is empty by opening the pressure relief valve of hydro unit. (OK if water is flowing out)

It is recommended to install the make-up water assembly to feed small quantities of water to the system automatically, replacing the minor water losses and maintaining the system pressure. This assembly usually consists of a pressure-reducing valve, water filter, check-valve and shut-off valves. In this case, Check-valve must be installed to prevent from contaminating city water.



#### How to choose an expansion vessel

When it is required to change the default pre-pressure of the expansion vessel(1 bar), keep in mind the following guidelines:

Use only dry nitrogen to set the expansion vessel pre-pressure.

□ Improper setting of the expansion vessel pre-pressure will make malfunction of the system.

Therefore, the pre-pressure should be adjusted by a licensed installer.



#### How to choose a water pump

The illustration below shows the external static pressure of the unit depending on the water flow and the pump setting. When ESP is not enough, additional pump should be installed. In this case, install the PWM control external type pump (Heating type) additionally.





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#### Freeze protection

Freeze protection solutions must use propylene glycol with a toxicity rating of Class 1 as listed in Clinical Toxicology of Commercial Products, 5th Edition.

• Ethylene glycol is toxic and must not be used in the primary water circuit in case of any cross-contamination of the potable circuit.



	Freezing Points of Propylene Glycol – Water Mixtures						
_	Propylene Glycol [wt. %]	Freezing Point [°C]	Propylene Glycol [wt. %]	Freezing Point [°C]			
	0	0	36	-18			
	10	-3	40	-20			
	20	-7	43	-23			
	30	-12	48	-29			

Changing Glycol concentration can cause pressure drop of the system and it can reduce water flow rate.

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# Split outdoor unit

- Installation information
- Wiring



#### Space requirements



\* When the air outlet is opposite the wall



\* When 3 sides of the outdoor unit are blocked by the wall



\* The upper part of the outdoor unit and the air outlet is opposite the wall



\* When the air outlet is towards the wall



\* The upper part of the outdoor unit and the air outlet is towards the wall



\* When front and rear side of the outdoor unit is towards the wall





AE090/120/140/160JXED\*H

## Installation information

#### Drainage

In case there is not enough space for drainage of the unit, additional drain works are required.

□ Make space more than \*\* between the outdoor unit and the ground for installation of the drain hose.

Insert the drain plug into the hole on the bottom of the outdoor unit.

□ Connect the drain hose to the drain plug.

□ Make sure dusts or small branches should not go into the drain hose.

□ Cover other drain holes which are not connected to drain plug with drain caps.





## Wiring

 For Power Cable, use the grade H07RN-F or H05RN-F materials.

□ When installing the indoor unit,

outdoor unit use the double shielded

(Tape aluminium /

polyester braid + copper ) cable of FROHH2R type.

	Rated		Voltage Range		MCA	MFA
Outdoor Unit	Hz	Volts	Min	Max	Min Circuit Amps	Max Fuse Amps
AE040RXEDEG	50	220-240	198	264	16A	20 A
AE060RXEDEG	50	220-240	198	264	16 A	20 A
AE090RXEDEG	50	220-240	198	264	22 A	27.5 A
AE090RXEDGG	50	380-415	342	457	10 A	16.1 A

Power supply	Max/Min (V)	Communication cable
1Ф, 220-240V, 50Hz	+ 10.9/	$0.75 \approx 1.5 \text{ mm}^2$ 2 wires
3Ф, 380-415V, 50Hz	± 10 %	0.75 ~ 1.5 mm <sup>-</sup> , 2 wires

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## Mono outdoor unit

- Installation information
- Wiring

AE090/120/140/160JXED\*H

## Installation information

#### Drainage

In case there is not enough space for drainage of the unit, additional drain works are required.

□ Make space more than \*\* between the outdoor unit and the ground for installation of the drain hose.

□ Insert the drain plug into the hole on the bottom of the outdoor unit.

□ Connect the drain hose to the drain plug.

□ Make sure dusts or small branches should not go into the drain hose.

Cover other drain holes which are not connected to drain plug with drain caps.





#### Water pipe connection

Allowable water pressure of outdoor unit is maximum 3.0 bar (static Pressure).

Be careful not to deform the unit piping by using excessive force when connecting the piping.

Deformation of the piping can cause the unit to malfunction.

Always use two wrenches (spanners) for tightening or loosening the water connections, and tighten connections with a torque wrench as specified in below table. If not, connections and parts can be damaged and leaks.



Name	Tightening Torque		
BSPP1	350~380 kgf•cm	34 ~ 37 N∙m	
Flow Switch	72~82 kgf•cm	7 ~ 8 N∙m	



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## Charging a water into the system

#### Charging a water into the system (Caution !!)

- Installation of Filter / Strainer is mandatory for water system. The Filter or Strainer shall be located in front of inlet pipe of PHE. (Filter mesh : #50) The strainer must be cleaned after flushing the pipes, and it should be cleaned periodically. Replace strainer when necessary.
- In case that the water piping would be located in a higher position than the air vent of the unit, it is necessary to add additional ones in the highest position of water circuit. The air vent should be located both where water temperatures are the highest and where the height of pipes are the highest.
- The complete water circuit, including all piping must be insulated to prevent condensation forming on the surface of the pipe and heat loss to external environment, as well as prevention of freezing of the outside water piping during winter time. The thickness of the sealing materials must be at <u>least 9 mm (0.035 W/mK)</u>.
   MONO Unit does not have a pressure relief valve. The valve shall prevent abnormal water pressure from damaging the system by opening at 3.0 bar.



Strainer Filter mesh #50





Water Pipe Insulation



Pressure Relief Valve

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#### Flow Sensor

□ Flow sensor is not an integrated part of ODU. But the installation is essential to operate MONO Unit.

□ Mono type tank integrated hydro unit is basically installed it.

□ Flow sensor is provided by Samsung control kit (MIM-E03CN) as a sub component.

□ Flow sensor shall be installed described by installation manual of Mono unit or Control kit.

□ All electric wiring works shall be implemented by manuals which Samsung provided.

Before completing the installation works, make sure to check if the flow switch is installed in horizontal and if flow direction is in

#### parallel with pipe direction.

(Straight length of In pipe of flow sensor shall have 10 times length in diameter and Straight length of Out pipe of flow sensor shall have 5 times length in diameter)





#### **Flow Sensor**

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#### Freeze protection

Freeze protection solutions must use propylene glycol with a toxicity rating of Class 1 as listed in Clinical Toxicology of Commercial Products, 5th Edition.

• Ethylene glycol is toxic and must not be used in the primary water circuit in case of any cross-contamination of the potable circuit.



	Freezing Points of Propylene Glycol – Water Mixtures						
_	Propylene Glycol [wt. %]	Freezing Point [°C]	Propylene Glycol [wt. %]	Freezing Point [°C]			
	0	0	36	-18			
	10	-3	40	-20			
	20	-7	43	-23			
	30	-12	48	-29			

Changing Glycol concentration can cause pressure drop of the system and it can reduce water flow rate.

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#### How to choose a expansion vessel

When it is required to change the default pre-pressure of the expansion vessel(1 bar), keep in mind the following guidelines:

Use only dry nitrogen to set the expansion vessel pre-pressure.

□ Improper setting of the expansion vessel pre-pressure will make malfunction of the system.

Therefore, the pre-pressure should be adjusted by a licensed installer.



Installation	Water Volume							
Height Difference	< 220 Litres	> 220 Litres						
< 7 m	No pre-pressure adjustment	<ul> <li>Actions required:</li> <li>Pre-pressure must be decreased, calculate according</li> <li>To "Calculating the pre-pressure of the expansion vessel".</li> <li>Check if the water volume is lower than maximum allowed Water volume</li> </ul>						
] 7 m	Actions required: IPre-pressure must be increased, calculate the appropriate value following by "Calculating the pre-pressure of the expansion vessel".	Expansion vessel of the unit too Small for the installation.						

## Wiring

For Power Cable, use the grade H07RN-F or H05RN-F materials.

□ When installing the indoor unit,

outdoor unit use the double shielded

(Tape aluminium /

polyester braid + copper ) cable of FROHH2R type.

	Rated		Voltage Range		MCA	MFA	
Outdoor Unit	Hz	Volts	Min	Max	Min Circuit Amps	Max Fuse Amps	
AE050RXYDEG	50	220-240	198	264	16A	20 A	
AE080RXYDEG	50	220-240	198	264	22 A	27.5 A	
AE120RXYDEG	50	220-240	198	264	28 A	35 A	
AE160RXYDEG	50	220-240	198	264	32 A	40 A	
AE080RXYDGG	50	380-415	342	457	10 A	16.1 A	
AE120RXYDGG	50	380-415	342	457	10 A	16.1 A	
AE160RXYDGG	50	380-415	342	457	12 A	16.1 A	

Power supply	Max/Min (V)	Communication cable	
1Ф, 220-240V, 50Hz	10.9/	$0.75 \pm 1.5 \text{ mm}^2$ $2 \text{ wires}$	
3Ф, 380-415V, 50Hz	± 10 %	0.75 ~ 1.5 mm <sup>-</sup> , 2 wires	

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## External wiring and set up with Hydro unit, Control kit

- Board features
- Information of connecting terminal block
- External contact information

## **Control box features**

Control kit control panel (Mono) Hydro unit control panel (Split/Mono) Main board Magnet contactor for Backup heater CONTRACTOR OF NOT FAXANNAN ELCB 00 0 Power in/out terminal 

## **Board features**

Hydro unit / Control kit board



## **Board features**

■ Main board of Hydro unit & Control kit(mone) @ @ @ @



No.	Connector Description	No.	Connector Description	No.	Connector Description	No.	Connector Description
1	Main Power (TB-A)	9	Water Pump SIG/GND (CNS002)	17	EEV (CNS062, BLU)	25	BUH/EVA-out/EVA-in/WTR-out/ WTR-in Temp Sensor (CNS043, WHT)
2	Booster Heater (TB-A1)	10	Water Pump SIG/GND (CNS001,WHT)	18	DC FAN (CNS808, YEL)	26	Backup heater sensor (CNS047, BLK)
3	External Control (TB-B)	11	FR Control (CNS003,GRN)	19	Flow sensor (CNS057, WHT)	27	Sensor/External Control (CNS051, WHT)
4	MC-COMMON (CNP003)	12	F1/F2, DC12V/GND, F3/F4 (TB-C)	20	Water tank sensor (CNS042, YEL)	28	Flow switch (CNS041, YEL)
5	3way Valve (CNP501)	13	DC12V (CNS012, BLU)	21	Error/Comp check (CNS081, RED)	29	Download (CNS301, BLK)
6	Heater Thermostat (CNP401, WHT)	14	EHS Converter (CNS202, WHT)	22	Room sensor (CNS044, WHT)	30	Earth (CNP101, WHT)
7	MC2-A (CNP002)	15	Wired Remocon F3/F4 (CNS304, RED)	23	External Control (CNS083, RED)	31	Sub LED PBA connection (CNS201, WHT)
8	MC1-A (CNP001)	16	PV Signal(S/G) (CNS046)	24	Mixing valve sensor (CNS045, BLU)		

## Information of connecting terminal block



Terminal No.	Function	Input /output	Max. current	Description	
B1/B6	Water Pump	AC 230V output	0.5 A	Water pump operation (maximum input power of pump 100W)	
B2/B3/B5	Mixing valve	AC 230V output	22 mA	Mixing Valve operation	Option
B4/B5	Backup Boiler	AC 230V output	10 mA	Signal output for Backup Boiler	Option
B7/B8	Water Pump	AC 230V output	0.5 A	Additional Water pump operation (maximum input power of pump 100W)	Option
B9/B10/B11/B12	2Way valve #1	AC 230V output	22 mA	2 Way Valve operation for Zone#1 (UFH)	Option
B13/B14/B11/B12	2Way valve #2	AC 230V output	22 mA	2 Way Valve operation for Zone#2 (FCU)	Option
B15/B16/B17/B18	3Way valve	AC 230V output	22 mA	3 Way Valve operation for DHW	Option
B19/B20	Thermostats	AC 230V output	22 mA	Power to external thermostat(s)	Option
B21/B22	Thermostat 1	AC 230V input	22mA	Thermostat for zone#1 (UFH) Cooling/Heating Signal	Option
B23/B24	Thermostat 2	AC 230V input	22mA	Thermostat for zone#2 (FCU) Cooling/Heating Signal	Option
B25/B26	Solar Pump	AC 230V input	10 mA	Signal input from Solar Pump / DHW Tank Thermostat	Option

## External contact of Hydro unit and Control kit

Booster heater (Inside of DHW tank)



If the gap between the supplied sensor and DHW tank sensor pocket is big, use thermal grease.

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Mono

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## External contact of Hydro unit and Control kit

#### Inverter water pump and PWM







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Mono

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#### Additional pump (Fixed)

1



X When connect multi water pump to 1 port, Magnet contactor must be used to prevent electrical failure what happened in the port.



• Terminal of this product is for additional water pump and the maximum allowable current is 0.5 A. CAUTION

#### Mixing valve

X Hydro unit or Control kit power should be turned off before the installation.





Description	No. of wires	Max. A	Thickness	Supply Scope
Mixing valve	4	22 mA	> 0.75 mm <sup>2</sup> , H05RN-F or H07RH-F	Field supply (230 V~, Input)

#### Select a mixing valve as recommended and install at the entrance position of each zone

	Maker	BELIMO	SIEMENS	HONEYWELL
Madalanda	3 Way Valve	R3020-6P3-S2	VXP45.20-4 (kvs 4)	V5011E1213
Wodel code	Actuator	LR230A(-S)	SSB31	ML6420A3015
Running time		90 sec.	150 sec.	60 sec.
FSV(#4046) setting		9	15	6






## Backup boiler

Back up boiler (N) Back up boiler (L)

Description	No. of wires	Max. A	Thickness	Supply Scope
Back-up Boiler	2+ground	10 mA	0.75mm <sup>2</sup> H05RN-F or H07RN-F	Field supply (230 V~, Input)



- X Control kit power should be turned off before the installation.
- X Make sure external control signal of backup boiler must be 230 Vac.
- ※ Heat pump does not work when the back-up boiler operate.
- % Heat pump product only supply a power which can operate the on/off switch

When it set back up boiler on the control kit (relay off) When it order to back up boiler operates (relay on)





#### 2 way valves



#### ※ When outlet water temperature reach to lower than 16 °C in cooling mode, UFH loops will be close

Description	No. of wires	Max. A	Thickness	Supply Scope
Motorized 2-way valve to shut off UFH loops during cooling.	2+ground	22 mA	> 0.75 mm <sup>2</sup> , H05RN-F or H07RH-F	Field supply (230 V~, Output)



**Normal Open Type** 

# ■ 3 way valve for DHW



Status	L1	L2
A (Initial)	OFF	ON
В	ON	OFF

Description	No. of wires	Max. A	Thickness	Supply Scope
Diverting type 3way valve	4	22 mA	> 0.75 mm <sup>2</sup> , H05RN-F or H07RN-F	Field supply (230 V~, Input)







escription	No. of wires	Max. A	Thickness	Supply Scope
Room Thermostat for	4	22 m A	> 0.75 mm <sup>2</sup> , H05RN-F or	Field supply (230 V~,
weather control	4	ZZ IIIA	H07RH-F	Input)

X Contact signal must be "L".

If you install two thermostats,

thermostat2 is prior to thermostat1.



## Solar pump signal for DHW



In operating mode, signal shall be around 230Vac B/W N&L.

In non-operating mode, signal shall be around 0Vac B/W N&L.

Description	No. of wires	Max. A	Thickness	Supply Scope
Solar pump	2+ground	10 mA	0.75mm <sup>2</sup> H05RN-F or H07RN-F	Field supply (230 V~, Input)



Maximun allwable current of each terminal is below 10 mA.

• Ports number B25, B26 are for input port for detection and they do not supply power to a solar pump.



Peak Control (FSV 5041 = "1")





※ Smart grid signal input connector (2m)

Field Setting Value					Tank integrated type			Wall-mounted type		ype	
Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Application	**41	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	Power Peak Control	Select forced off parts	**42	1		0 (All)	0	3	0 (AII)	0	3
		Using input voltage	**43	-	-	1 (High)	0 (Low)	1	1 (High)	0 (Low)	1
	Fre	quency Ratio Control	* * 51	-		0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	PV Control	Application	**81			0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
Others		Setting Temp Shift Value(Cooling)	**82	0.5	°C	1	0	5	1	0	5
ode 50**		Setting Temp Shift Value(Heating)	**83	0.5	°C	1	0	5	1	0	5
		Application	**91	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Setting Temp Shift Value(Heating)	**92	0.5	°C	2	2	5	2	2	5
	Smart Grid Control	Setting Temp Shift Value(DHW)	**93	0.5	°C	2	2	5	2	2	5
		DHW Mode	**94	-	÷	0	0 (Standard)	1 (Power)	0	0 (Standard)	1 (Power)

. According to FSV (#5042),

If input is "0 (default)", Back up heater (BUH) is unavailable while external contact is high.

- If input is "1", Only Compressor(Heat Pump) is available.
- If input is "2", Only Booster Heater (BSH) is available.
- If input is "3", nothing is available.

. Applying the control when power voltage of input contact is high is default. According to FSV (#5043), it is available to adopt this logic in low condition exceptionally.

Main

. When applying to this logic, SAMSUNG controller come to get "Thermo off" condition for all operation.

## Frequency Ratio Control (FSV 5051 = "1")



Main Menu & Code	Sub Menu Function	Description	Sub Code	Default	Min	Max	Step	Unit
		Water Out Temp for Cooling	**11	25	5	25	1	°C
		Room Temp for Cooling	**12	30	18	30	1	°C
		Water Out Temp for Heating	**13	15	15	55	1	°C
		Room Temp for Heating	**14	16	16	30	1	°C
	Outing	Auto Cooling WL1 Temp	**15	25	5	25	1	°C
		Auto Cooling WL2 Temp	**16	25	5	25	1	°C
		Auto Heating WL1 Temp	**17	15	15	55	1	.C
0		Auto Heating WL2 Temp	**18	15	15	55	1	°C
Others		Target Tank Temp	**19	30	30	70	1	°C
Code 50**	DHW Saving Mode	Temp Difference	**21	5	0	40	1	°C
		Priority Max. Operation Time	**31	30	10	90	5	min
	TDM preduct Only)	Non Priority Min. Operation Time	**32	5	3	60	1	min
	(TDM product Only)	A2A / DHW Priority	**33	0	0 (A2A)	1 (DHW)	1	
		Application	**41	0 (No)	0	1 (Yes)		
	Power Peak Control	Select forced off parts	**42	0 (All)	0	3	1	
		Using input voltage	**43	1 (High)	0 (Low)	1	-	191
	Frequency Ratio Control		**51	0 (No)	0	1 (Yes)	-	-

This is to limit the maximum frequency of the outdoor unit compressor. (if #5051 = 1 "use")

External DC signal Control uses a DC voltage of 0 ~ 10V (0v = 50%, ~ 10v = 150%)

The minimum ~ maximum frequency section being divided with 11 steps of 10%

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# Switches of unit

- Switch configuration (Outdoor unit / Hydro unit / Control kit)
- Hydro unit / Control kit option setting
- External contact information

## Outdoor unit main board feature



# Switch configuration

Outdoor unit main board – Tact switches



KEY	KEY operation	7-segment display
	Press once : Heating test run	" <i>E</i> " " <i>I</i> " "BLANK" "BLANK"
K1	Press twice : Defrost test run	" $E$ " " $B$ " "blank" "blank"
	Press 3times : Finishing test mode	-
	Press once : Cooling test run(Heating Only : skip)	" <i>E</i> " " <i>2</i> " "BLANK" "BLANK"
K2	Press twice : Output signal test run	" <i>E</i> " " <i>'</i> " "BLANK" "BLANK"
	Press 3 times : Finishing test mode	-
K3	Reset	
K4	View mode	Refer to View mode display

Case study )

K2 x 2 = The inverter checker mode.

Sequence is as follows.

Wait 10 seconds -> During 5 second, the checked mode transmission

with the inverter -> wait 5 seconds

(The checked mode transmission release) -> key operation release

## Outdoor unit main board – View mode by k4 tact switch



Number of	Display contonts	Display					
press	Display contents	Segment1	Segment2	Segment3	Segment4	Units	
0	Communication State	10s digit of Tx	1s digit of Tx	10s digit of Rx	1s digit of Rx	-	
1	Order frequency	1	100s digit	10s digit	1s digit	Hz	
2	Current frequency	2	100s digit	10s digit	1s digit	Hz	
3	Inverter Pump output	3	100s digit	10s digit	1s digit	%	
4	Outdoor air sensor	4	+/-	10s digit	1s digit	°C	
5	Discharge sensor	5	100s digit	10s digit	1s digit	°C	
6	Eva in sensor	6	+/-	10s digit	1s digit	°C	
7	Inlet water sensor	7	+/-	10s digit	1s digit	°C	
8	Outlet water sensor	8	+/-	10s digit	1s digit	°C	
9	Cond sensor	9	+/-	10s digit	1s digit	°C	
10	Current	A	10s digit	1s digit	First decimal	Α	
11	Fan RPM	В	1000s digit	100s digit	10s digit	rpm	
12	Target discharge temperature	с	100s digit	10s digit	1s digit	°C	
13	EEV	D	1000s digit	100s digit	10s digit	step	
14	Protective control	E 0:Cooling 1:Freezing 3:Over-load 4:Discharge 5:Total current		Frequency status 0 : Normal 1 : Hold 2 : Down 3 : Up_limit 4 : Down_limit	Э		
15	IPM temp.	F	+/-	10s digit	1s digit	°C	
long-1	Main Micom version	Year(Hex)	Month(Hex)	Day(two digit)	Day(One digit)	2	
long-1 and 1	Inverter Micom version	Year(Hex)	Month(Hex)	Day(two digit)	Day(One digit)	-	
long-1 and 2	EEPROM version	Year(Hex)	Month(Hex)	Day(two digit)	Day(One digit)	-	

# **Option setting**

- Outdoor unit option setting by Tact switches
- 1. Press the K2 switch for 2 seconds, only if compressor stop.
- 2. Press the K1 switch shortly to change the option number (SEG1, SEG2)
- 3. Press the **K2** switch shortly to change the **option value** (SEG3, SEG4)
- 4. Press the K2 switch for 2 seconds to store the changed option

All the segments blink to indicate the changed option has been stored

- Press K1 for 2 seconds to return to the original option. (Before option change store)
- Press K4 to set all the option values to the factory default. And then press K2 for 2 seconds
- Press K2 for 2 seconds to store the factory setting values to EEPROM.







## Outdoor option table

Optional item	SEG1	SEG2	SEG3	SEG4	Function of the option
Channel address	0	0	A	U	Automatic setting (Default)
	0	0	0	0	Manual setting for channel (0~15)
Page bester	0	1	0	0	Use (Default)
Dase nealer	0	I	0	1	Not use
Operation mode	0	2	0	0	Heat Pump (Default)
Operation mode	0	2	0	1	Heating Only
Show accumulation provention control	0	2	0	0	Not use (Default)
Show accumulation prevention control		3	0	1	Use
			0	0	Quiet Mode 1 (-3 dB)
			0	1	Quiet Mode 2 (-5 dB)
Quiet mode	0	4	0	2	Quiet Mode 3 (-7 dB)
			0	3	Quiet Mode 4 (-3 dB)
			0	4	TA LARM mode (Default)
Dower improvement mode	0	5	0	0	Not use (Default)
Power improvement mode	U	5	0	1	Use

# **Option setting**

■ Hydro unit / Control kit – Dip switches



KEY	ON (Default)	OFF	Remark
DIP 1	Normal Operation	Emergency Heating Operation	When both DIP 1 and 2 are OFF at the same time,
DIP 2	Normal Operation	Emergency DHW Operation	EHS operate emergency heating mode
DIP 3	Normal Operation	Concrete Curing Function	-
DIP 4	Normal Operation	Outdoor unit power off ->on Error code modification	If you set <b>Dip S/W #4 off in the hydro unit</b> , then the Error E101 still there but After outdoor unit power get back the error will go away> <b>can run</b>

## ■ Hydro unit / Control kit – Dip switches (Emergency space heating operation)

	Space Heating				
Activation	Dip S/W #1 OFF (Control PBA)				
Activation	FSV #4031 =1 (Backup heater available)				
Heat Source	Back up Heater 2 <sup>nd</sup> stage				
Display	Show 'E-op' on the Schedule Display				
3way valve	Room Direction Only				
2way valve	No Zone Control, always open				
Water Pump	Following water pump logic under TW2 Control. (ex. 3min-ON, 2min OFF after Thermo off)				
Thermo OFF	Tw3 ≥ Ts + 2.0°C				
Thermo ON	Tw3 < Ts – 2.0°C				
Allowed	E911,E912, Outing Mode, Water Pump, Flow Switch, Anti Freeze, Antipump lock, Electricity failure recovery				
Not Allowed or ignoring	oring Auto, Schedule, Silence, urgent DHW, Disinfection, Tr Control, Thermostat Control, Outdoor unit communication, Back up Boiler, Smart Grid, Eco Level, Viewing Outdoor temperature, Zone Control				

## ■ Hydro unit / Control kit – Dip switches (Emergency DHW operation)

	DHW				
Activation	Dip S/W #2 OFF (Control PBA)				
Activation	FSV #3031 =1 (Booster Heater available)				
Heat Source	Booster Heater				
Display	Show 'E-op' on the Schedule Display				
3way valve	Room Direction Only				
2way valve	No Zone Control, always open				
Water Pump	Following water pump logic under TW2 Control. (ex. 3min-ON, 2min OFF after Thermo off)				
Thermo OFF	Same as default DHW Control				
Thermo ON	Same as default DHW Control				
Allowed	E911,E912, Outing Mode, Water Pump, Flow Switch, Anti Freeze, Antipump lock, Electricity failure recovery				
Not Allowed or ignoring	ng Auto, Schedule, Silence, urgent DHW, Disinfection, Tr Control, Thermostat Control, Outdoor unit communication, Back up Boiler, Smart Grid, Eco Level, Viewing Outdoor temperature, Zone Control				

# **Option setting**

## Hydro unit (Concrete curing function)

When pipes of floor heating are installed, operation for reinforcing concrete curing is

applied. (Period of operation: 23 days)

Entering procedure

1. After turning off the DIP switch K3 of indoor unit (Default ON), power off and on the indoor unit. The operation for concrete curing starts automatically.

(If blackout occurs and communictation restarts later, operation will continue.)

- 2. Temperature of discharge water is controlled as time goes on like below.
- 3. Remaining days are displayed on the wired remote controller during operation but key operation is unavailable.



Classification Initial Heating		Step raise			Heating	Step down				Total (Hour)					
Time	96	72	24	24	24	24	24	144	24	24	24	24	24	552	
Temperature	30	55	30	35	40	45	50	55	50	45	40	35	30	-	



\* If an error is displayed, concrete curing function does not work.

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# Field Setting Value

- Service Mode Setting
- Field Setting Value

## Remote controller Overview (MWR-WW00N)



01 Operation status display

- Displays the operation/function settings and statuses.

02 Operation On/Off button (LED display)

- Turns the Air to Water Heat Pump power On/Off

03 Up/Down button

- Moves between items vertically or changes the set temperature.

04 Left/Right button

- Moves between items horizontally or changes the item value.

05 OK button

- Saves your new settings.

06 Save & Return button

- Saves your new settings and returns to the previous step.

07 Option button

- Selects the detailed setting function.

How to set the service mode with wired remote controller (MWR-WW00N)



- If you want to use the various additional functions for your Wired Remote Controller, press the and buttons at the same time for more than 3 seconds.
  - The password entry screen appears.
- 2. Enter the password, 0202, and then press **OK** the button.
  - The settings screen for installation/service mode appears.
- 3. See the list of additional functions for the Wired Remote Controller on the next page, and then select the desired menu.
  - Once you have entered the setting screen, the current setting appears.
  - Refer to the chart for data setting.
  - Using the  $\frown$  /  $\bigcirc$  buttons, change the settings and press the  $\bigcirc$  button to move to the next setting.
  - Press the **OK** button to save the new setting.
  - Press the  $\leftarrow$  button to move to the Home screen.

#### NOTE

• While setting the data, you can press the  $\bigcirc$  button to move to the Home screen after checking the saving status at a pop-up screen.

1. Unavailable functions are marked inactive and they cannot be set.

2. If communication initialization is needed after the setting, the system will reset automatically and communication

will be initialized.

Step 1	Step 2	Step 3	Description	Default
	Service Call Number		16-digit phone number Input: Blank, -, 0-9	
Service Timer	Last Inspection		Year, Month, Day	<u>2</u>
2	Installation Data		Year, Month, Day	
Quiet Mode			Enable/Disable	Disable
Automatic Time			Entry time to Exit time	PM 10:00 ~ AM 06:00
	Cooling/Heating Selection		Cooling & Heating/ Heating only	Cooling & Heating
	Master/Slave Wired Remote		Master/Slave	Master
	Zone Selection		Zone1/Zone2	Zone1
Indees Zooo	Standard Temperature		Water Outlet/Indoor	Water Outlet
Option	Temperature Unit		Celsius(°C): 1°C/0.5°C/0.1°C	0.5°C
	Temperature Sensor Selection		Wired Remote Controller/External Temperature Sensor	Wired Remote Controller
	Room Temperature	Reference Temperature	-9 to 40°C	<u> </u>
	Calibration	Calibration Value	-9 to 40°C	0°C

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Step 2	Step 3	Description	Default
Indoor Zone Status Information	Central :	ON/OFF	
	Normal Power:	ON/OFF	а.
	Mode :	Heat/Cool/Auto	-
	DHW Power :	ON/OFF	
	DHW Mode :	Economic/Standard/ Power/Forced	2
	Water Pump :	ON/OFF	12
	BUH :	ON/OFF	a de
	BSH :	ON/OFF	÷
	Flow sensor:	lpm	5
	Inverter Pump :	0%~100%	۵.
	EEV Step :	0~2000Step	1 <u>2</u> -
	Thermostat 1 :	ON/OFF	12
	Thermostat 2 :	ON/OFF	÷
	DHW Thermostat :	ON/OFF	-
	Step 2 Indoor Zone Status Information	Step 2Step 3Central :Normal Power:Mode :DHW Power :DHW Power :DHW Mode :BUH :StatusInformationBSH :Flow sensor :Inverter Pump :EEV Step :Thermostat 1 :Thermostat 2 :DHW Thermostat 2 :	Step 2Step 3DescriptionCentral ::ON/OFFINormal Power:ON/OFFIMode :Heat/Cool/AutoIDHW Power :ON/OFFIDHW Mode :Economic/Standard/ Power/ForcedIWater Pump :ON/OFFIBUH :ON/OFFIBSH :ON/OFFIFlow sensor :IpmIInverter Pump :0% ~100%IEEV Step :0~2000StepIThermostat 1 :ON/OFFIDHW Thermostat 2 :ON/OFFI

Step 1	1 Step 2 Step 3 Desc		Description	Default
	Number of Connection		0 to 16	543
	View Master Indoor Unit		Address	
		Serial No. :	5)	1.50
	Master Indoor Zone Information	Indoor Unit Eva In Temp.(Teva_in) :	Temperature	-
Connection Information		Indoor Unit Eva Out Temp.(Teva_ out) :	Temperature	9 <b>4</b> 9
		Indoor Unit PHE IN(Tw1) :	Temperature	
		Indoor Unit PHE OUT(Tw2) :	Temperature	17.
		DHW Tank Temp. (Tt) :	Temperature	120
		DHW Mode :	Economic/Standard/ Power/Forced	-

Step 1	Step 2	Step 3	Description	Default		
	Micom Code :		Micom code			
	Program Version :		Modified date	2		
Device	Touch Code :		Touch IC code	2		
Information	Program Version :		Modified date	-		
	Graphic Image :		Graphic image code	-		
	Program Version :		Modified date			
Reset All Service	Erase All Service mode data		423	3		
Modes	Initialize a remote controller		-	22-		
Power Master Reset 14				3		
ODU K3 Reset						
	10**		120	121 1		
2	20**		-	2		
	30**			94 1		
Field Setting Value	40**		-	34		
	50**		-			
	Simple Setting			5		
	FSV Upload/ Download		1000			

Step 1	Step 2	Step 3	Description	Default
		Water Inlet Temp. :	Temperature	-
		Water Outlet Temp. :	Temperature	-
		Backup Heater Outlet Temp. :	Temperature	-
	Self-Test Mode Display	Mixing Valve Outlet Temp. :	Temperature	-
		Tank Temp. :	Temperature	<b>—</b>
		Indoor Ambient Temp. :	Temperature	2
		Indoor Ambient Temp.(Zone 2) :	Temperature	<b>.</b>
		Water Outlet Temp. (Zone 1) :	Temperature	7
		Water Outlet Temp. (Zone 2) :	Temperature	-
Self-Test Mode		Thermostat #1(Zone 1) :	Heat/Cool	-
		Thermostat #2(Zone 2) :	Heat/Cool	-
		Solar Panel	ON/OFF	

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Step 1	Step 2	Step 3	Description	Default		
	Water Pump		ON/OFF	OFF		
	Booster Heater		ON/OFF	OFF		
	DHW Valve(3Way Valve)		ON/OFF	OFF		
	Zone 1 Valve		ON/OFF	OFF		
Self-Test Mode	Backup Heater1 + Water Pump		ON/OFF	OFF		
	Backup Heater 2 + Water Pump		ON/OFF	OFF		
	Backup Boiler		ON/OFF	OFF		
	Zone 2 Valve		ON/OFF	OFF		
	Mixing Valve		ON/OFF	OFF		

Step1	Step 2	Step 3	Description	Default
IndoorUnit	Address	Main address	00 to 4F	5. <del></del> .
	Address	RMC address	00 to FE	5. <del></del>
	Product Option <sup>2)*</sup>		Refer to the installation manual of the connected indoor unit or ventilator.	8 <b>-</b> -
Option	Installation Option 1 <sup>2)*</sup>			
	Installation Option 2 <sup>2)*</sup>			5. <del></del> .
	MCUIDort	MCU address	00 to 15	
	MCOPUL	MCU Port	A to F	2 <u>2</u>

1)\* Power Master Reset is a setting needed to supply optimized power to wired remote controller when multiple indoor units are connected to wired remote controller in a group.

2)\* The total option codes are 24 digits. You can set six digits at a time and it is distinguished by page number. Press the XX button to move to the next page.

#### FSV : Menus 10\*\*

#### : New

Field Setting Value						Tank integrated type			Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Water Out Temp for Cooling	Max	* * 11	1	°C	25	18	25	25	18	25
	Water Out Temp for Cooling	Min	* * 12	1	°C	16	5	18	16	5	18
Demete	Room Temp for Cooling	Max	* * 21	1	°C	30	28	30	30	28	30
Remote		Min	* * 22	1	°C	18	18	28	18	18	28
Sotting	Water Out Temp for Heating	Max	* * 31	1	°C	65	37	65	65	37	65
Bange		Min	* * 32	1	°C	25	15	37	25	15	37
	Doom Tomp for booting	Max	* * 41	1	°C	30	18	30	30	18	30
	Room temp for heating	Min	* * 42	1	°C	16	16	18	16	16	18
	DHW Tank Tomp	Max	* * 51	1	Ĵ° (	55	50	70	55	50	70
		Min	* * 52	1	°C	40	30	40	40	30	40

✓ Operation range expansion by exchanging to the compressor for R-32

- . Max water out temp. for heating : 55  $\rightarrow$   $65^{\circ}\text{C}$
- . Max DHW Tank temp by Heat pump : 50  $\rightarrow$  55°C

\* New compressor for R-32 : The operation range was expanded more than previous one.

#### FSV : Menus 10\*\*

#### **Space Cooling**

\* Target water outlet temperature : Upper limit(#1011, Default 25°C, Range : 18 ~ 25°C), Lower limit(#1012, Default 16°C, Range : 5 ~ 18°C)

	Field Setting Value								Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Mater Out Term for Coaling	Max	* * 11	1	°C	25	18	25	25	18	25
	vvater Out Temp for Cooling	Min	* * 12	1	°C	16	5	18	16	5	18
	D	Max	* * 21	1	°C	30	28	30	30	28	30
Remote	ote Room Temp for Cooling	Min	* * 22	1	°C	18	18	28	18	18	28
Controller	Mater Out Term feelle sting	Max	* * 31	1	°C	65	37	65	65	37	65
Setting	water Out Temp for Heating	Min	* * 32	1	°C	25	15	37	25	15	37
Code 10 * *	Denne Tenne feelberting	Max	* * 41	1	°C	30	18	30	30	18	30
Coue IU * *	Room Temp for heating	Min	* * 42	1	°C	16	16	18	16	16	18
	DUNA/Terely Terms	Max	* * 51	1	°C	55	50	70	55	50	70
	DHVV Tank Temp	Min	* * 52	1	°C	40	30	40	40	30	40

With this default FSV settings, user can change the target water outlet temperature within the range of 5 ~ 25°C for cooling

\* Target room temperature : Upper limit(#1021, Default 30°C), Lower limit(#1022, Default 18°C) With this default FSV settings, user can change the target room temperature within the range of 18 ~ 30°C for cooling.

#### **Space Heating**

\* Target water outlet temperature : Upper limit(#1031, Default 55°C, Range : 37 ~ 65°C),

Lower limit(#1032, Default 25°C, Range : 15 ~ 37°C)

With this default FSV settings, user can change the target water outlet temperature within the range of 15 ~ 65°C for heating.

\* Target room temperature : Upper limit(#1041, Default 30°C), Lower limit(#1042, Default 16°C) With this default FSV settings, user can change the target room temperature within the range of 16 ~ 30°C for heating.

#### **DHW Heating**

\* Target DHW tank temperature : Upper limit(#1051, Default 55°C, Range : 50 ~ 70°C),

Lower limit(#1052, Default 40°C, Range : 30 ~ 40°C)

With this default FSV settings, user can change the target tank temperature within the range of 30 ~ 70°C for DHW heating.

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#### ■ FSV : Menus 20\*\*

: New

	Field Setting Value					Tank inte	grate	d type	Wall-mo	unted	type
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Outdoor Tomp for Water Low (Heating)	Point ①	* * 11	1	°C	-10	-20	5	-10	-20	5
		Point 2	* * 12	1	°C	15	10	20	15	10	20
	Water Out Temp for WI 1 Heating (WI 1 Floor)	Point ①	* * 21	1	°C	40	17	65	40	17	65
		Point 2	* * 22	1	°C	25	17	65	25	27	65
	Water Out Temp for WL2 Heating	Point ①	* * 31	1	°C	50	17	65	50	17	65
	(WL2-Fan Coil Unit)	Point 2	* * 32	1	°C	35	17	65	35	17	65
	Heating Water Law for Auto Mode	WL Type	* * 41	-	-	1(WL1)	1	2	1(WL1)	1	2
Water Low	Outdoor Tomp for Water Law (Cooling)	Point ①	* * 51	1	°C	30	25	35	30	25	35
Code 20 * *		Point 2	* * 52	1	°C	40	35	45	40	35	45
	Water Out Temp for WI 1 Cooling (WI 1 Floor)	Point ①	* * 61	1	°C	25	5	25	25	5	25
		Point 2	* * 62	1	°C	18	5	25	18	5	25
	Water Out Temp for WL2 Cooling	Point ①	* * 71	1	°C	18	5	25	18	5	25
	(WL2-Fan Coil Unit)	Point 2	* * 72	1	°C	5	5	25	5	5	25
	Cooling Water Law for Auto Mode	WL Type	* * 81	-	-	1(WL1)	1	2	1(WL1)	1	2
	External Thormostat Application	#1(Floor)	* * 91	1	-	0(No)	0	4	0(No)	0	4
		#2(FCU)	* * 92	1	-	0(No)	0	4	0(No)	0	4
	WL interworking control by Wired RC	#3(Wired RC)	* * 93	1	-	4	1	4	4	1	4

#### ■ FSV : Menus 20\*\*

#### Water Law

- This function is used by room sensor of wired remote controller or Thermostat control.
- \* Only heating mode can use this function during auto mode.



#### ■ FSV : Menus 2091/2092

	Field Setting Value					Tank inte	grate	d type	Wall-mounted typ		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Point ①	* * 11	1	°C	-10	-20	5	-10	-20	5
	Outdoor Temp for Water Law (Heating)	Point ②	* * 12	1	°C	15	10	20	15	10	20
		Point ①	* * 21	1	°C	40	17	65	40	17	65
	Water Out Temp for WLT Heating (WLT-Floor)	Point ②	* * 22	1	°C	25	17	65	25	27	65
	Water Out Temp for WL2 Heating	Point ①	* * 31	1	°C	50	17	65	50	17	65
	(WL2-Fan Coil Unit)	Point ②	* * 32	1	°C	35	17	65	35	17	65
	Heating Water Law for Auto Mode	WL Type	* * 41		-	1(WL1)	1	2	1(WL1)	1	2
Mator Law	Outdoor Tomp for Water Law (Cooling)	Point ①	* * 5 <mark>1</mark>	1	°C	30	25	35	30	25	35
Code 20 * *	Outdoor Temp for Water Law (Cooling)	Point ②	* * 52	1	°C	40	35	45	40	35	45
	Water Out Temp for WI 1 Cooling (WI 1-Floor)	Point ①	* * 61	1	°C	25	5	25	25	5	25
	Water Out relip for WET Cooling (WETH loor)	Point ②	* * 62	1	°C	18	5	25	18	5	25
	Water Out Temp for WL2 Cooling	Point ①	* * 71	1	°C	18	5	25	18	5	25
	(WL2-Fan Coil Unit)	Point ②	* * 72	1	°C	5	5	25	5	5	25
	Cooling Water Law for Auto Mode	WL Type	* * 81		-	1(WL1)	1	2	1(WL1)	1	2
	External Thermostat Application	#1(Floor)	* * 91	1	-	0(No)	0	4	0(No)	0	4
		#2(FCU)	* * 92	1	-	0(No)	0	4	0(No)	0	4
	WL interworking control by Wired RC	#3(Wired RC)	* * 93	1	-	4	1	4	4	1	4

#### **External Room Thermostat (Field Option)**

(#2091 = 1, #2092 = 1)

Judgment for "Thermo On" or "Thermo Off" : According to thermostat signal only.

(#2091 = 2~4, #2092 = 2~4)

Judgement for "Thermo On" or Thermo Off" : According to thermostat signal or \*WL follow target outlet temperature (TW2).

Thermostat status	s	Signal On	Signal On	Signal Off	Signal Off	Pump status during "Thermo	* WL : Water Law
Status by *WL		Thermo On	Thermo Off	Thermo On	mo On Thermo Off Off"		
	1	On	On	Off	Off	Off (1min delay)	
Value of #2001 #2002	2					Off (1min delay)	
value 01 #2091, #2092	3	On	Off	Off	Off	On	
	4					Repeat 3min On / 7min Off	

#### FSV : Menus 2093

	Field Setting Value					Tank inte	arate	d type	Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Point ①	* * 11	1	°C	-10	-20	5	-10	-20	5
	Outdoor Temp for Water Law (Heating)	Point ②	* * 12	1	°C	15	10	20	15	10	20
	Mater Out Temp for M/L 1 Heating (M/L 1 Elect)	Point ①	* * 21	1	°C	40	17	65	40	17	65
	Water Out Temp for WLT Heating (WLT-Floor)	Point ②	* * 22	1	°C	25	17	65	25	27	65
	Water Out Temp for WL2 Heating	Point ①	* * 31	1	°C	50	17	65	50	17	65
	(WL2-Fan Coil Unit)	Point ②	* * 32	1	°C	35	17	65	35	17	65
	Heating Water Law for Auto Mode	WL Type	* * 41		-	1(WL1)	1	2	1(WL1)	1	2
Water Law		Point ①	* * 51	1	°C	30	25	35	30	25	35
Code 20 * *	Outdoor Temp for Water Law (Cooling)	Point ②	* * 52	1	°C	40	35	45	40	35	45
	Water Out Temp for W/L 1 Cooling (W/L 1-Elear)	Point ①	* * 61	1	°C	25	5	25	25	5	25
	Water Out Temp for WET Cooling (WET-Floor)	Point ②	* * 62	1	°C	18	5	25	18	5	25
	Water Out Temp for WL2 Cooling	Point ①	* * 71	1	°C	18	5	25	18	5	25
	(WL2-Fan Coil Unit)	Point ②	* * 72	1	°C	5	5	25	5	5	25
	Cooling Water Law for Auto Mode	WL Type	* * 81		-	1(WL1)	1	2	1(WL1)	1	2
	External Thormostat Application	#1(Floor)	* * 91	1	-	0(No)	0	4	0(No)	0	4
	External memostat Application	#2(FCU)	* * 92	1	-	0(No)	0	4	0(No)	0	4
	WL interworking control by Wired RC	#3(Wired RC)	* * 93	1	-	4	1	4	4	1	4

#### Wired Remote Controller

(#2093 = 1)

Judgment for "Thermo On" or "Thermo Off" : According to room temp. sensor of wired remote controller only.

#### (#2093 = 2~4)

Judgement for "Thermo On" or Thermo Off" : According to room temp. sensor of wired remote controller or \*WL follow target outlet temperature (TW2).

Status by wired rem controller	ote	Thermo On	Thermo On	Thermo Off	Thermo Off	Pump status during "Thermo	* WL : Water Law
Status by *WL		Thermo On	Thermo Off	Thermo On	Thermo Off		
	1	On	On	Off	Off	Off (1min delay)	
	2					Off (1min delay)	
value 01 #2093	3	On	Off	Off	Off	On	
	4				Repeat 3min On / 7min Off		

#### ■ FSV : Menus 30\*\*

: New

Field Setting Value								l type	Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Domestic Hot Water Tank	Application	* * 11	-	-	1(Yes)	0	2	0(No)	0	2
		Max Temp	* * 21	1	°C	55	45	55	55	45	55
		Stop	* * 22	1	°C	0	0	10	2	0	10
		Start	* * 23	1	°C	5	5	30	5	5	30
	Heat Pump	Min. Space heating Operation time	* * 24	1	min	5	1	20	5	1	20
		Max. DHW operation time	* * 25	5	min	30	5	95	30	5	95
		Max. Space heating Operation time	* * 26	0.5	hour	3	0.5	10	3	0.5	10
		Application	* * 31	-	-	1(On)	0(Off)	1	1(On)	0(Off)	1
	Booster Heater	Delay Time	* * 32	5	min	20	20	95	20	20	95
<b>D</b> 1.1147		Overshoot	* * 33	1	°C	0	0	4	0	0	4
DHW Code 20 * *		Application	* * 41	-	-	1(On)	0(Off)	1	1(On)	0(Off)	1
Code $30 * *$		Interval	* * 42	1	day	Fri(5)	Sun(0)	All(7)	Fri(5)	Sun(0)	All(7)
	Disinfection	Start Time	* * 43	1	o'clock	23	0	23	23	0	23
	Distriction	Target Temp	* * 44	5	°C	70	40	70	70	40	70
		Duration	* * 45	5	min	10	5	60	10	5	60
		Max time	* * 46	1	hour	8	1	24	8	1	24
	Forced DHW operation	Timer OFF Function	* * 51	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)
		Timer Duration	* * 52	1	(x10) min	6	3	30	6	3	30
	Solar Panel/DHW Thermostat	H/P Combination	* * 61	1	-	0(No)	0	2	0(No)	0	2
	Direction of DHW valve	DHW Tank	* *71	-	-	0(Room)	0	1(Tank)	0(Room)	0	1(Tank)
		BUH 1 step capacity	* * 81	1	kW	2	1	6	2	1	6
	Energy metering	BUH 2 step capacity	* * 82	1	kW	2	0	6	2	0	6
		BSH capacity	* * 83	1	kW	3	1	6	3	1	6

# **Field Setting Value**

■ FSV : Menus 302\* / 303\*

	Field	Setting Value				Tank	integrated	type	Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Heat Pump	Max Temp	**21	1	°C	55	45	55	55	45	55
		Stop	**22	1	°C	0	0	10	2	0	10
		Start	* * 23	1	°C	5	5	30	5	5	30
DIAN		Min. Space heating Operation time	**24	1	min	5	1	20	5	1	20
Code 20 x x		Max. DHW operation time	* * 25	5	min	30	5	95	30	5	95
Code 30***		Max. Space heating Operation time	* * 26	0.5	hour	3	0.5	10	3	0.5	10
		Application	**31	141	1	1(On)	0(Off)	1	1(On)	0(Off)	1
	Booster Heater	Delay Time	**32	5	min	20	20	95	20	20	95
		Overshoot	**33	1	°C	0	0	4	0	0	4

- 302\* : Heat pump variables for tank temp. control and combination

with booster heater

- 303\* : Booster heater variables for combination with heat pump

#### [ DHW Tank water temperature thermo on/off control]



#### [Time variation control of DHW and space heating mode]



# **Field Setting Value**

FSV : Menus 302\* / 303\*

	Field	Setting Value				Tank	integrated	type	Wall-	mounted t	ype
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Max Temp	* * 21	1	°C	55	45	55	55	45	55
		Stop	**22	1	°C	0	0	10	2	0	10
		Start	**23	1	°C	5	5	30	5	5	30
DIAM	Heat Pump	Min. Space heating Operation time	* * 24	1	min	5	1	20	5	1	20
Code 20 x x		Max. DHW operation time	* * 25	5	min	30	5	95	30	5	95
Code 30* *		Max. Space heating Operation time	* * 26	0.5	hour	3	0.5	10	3	0.5	10
		Application	**31	-	-	1(On)	0(Off)	1	1(On)	0(Off)	1
	Booster Heater	Delay Time	**32	5	min	20	20	95	20	20	95
		Overshoot	**33	1	°C	0	0	4	0	0	4

- 302\* : Heat pump variables for tank temp. control and combination

with booster heater

- 303\* : Booster heater variables for combination with heat pump

#### [Time variation control of Heat pump and booster heater of DHW]



**※ FSV #3031 should be set as "1(On)" to use Booster Heater.** 

**K** FSV #4022 should be set as "0(both) or 2(booster heater) to use booster heater otherwise the booster heater can be operated in case of no Backup Heater demand.

#### [Thermo on/off control of Heat pump and Booster Heater]

Condition	Operation
Setting temp. of DHW > 50℃	<ol> <li>BSH Thermo Off ≥ Setting temp. BSH Thermo On &lt; Thermo Off temp. – 2°C</li> <li>H/P Thermo Off ≥ Setting temp. H/P Thermo On &lt; Setting temp. – FSV #3023 (5°C)</li> </ol>
Setting temp. of DHW ≤ 50°C	<ol> <li>BSH Thermo Off ≥ Setting temp. BSH Thermo On &lt; Setting temp. – FSV #3023 (5°C)</li> <li>H/P Thermo Off ≥ Setting temp. H/P Thermo On &lt; Setting temp. – FSV #3023 (5°C)</li> </ol>



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### FSV : Menus 304\*

- 304\* : Periodical disinfection heating of water tank

	Field Set	ting Value				Tank	integrated	type	Wall-r	mounted t	ype
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Disinfection	Application	**41		-	1(On)	0(Off)	1	1(On)	0(Off)	1
		Interval	* * 42	1	day	Fri(5)	Sun(0)	All(7)	Fri(5)	Sun(0)	AII(7)
DHW		Start Time	**43	1	o'clock	23	0	23	23	0	23
Code 30 * *		Target Temp	**44	5	°C	70	40	70	70	40	70
		Duration	* * 45	5	min	10	5	60	10	5	60
		Max time	* * 46	1	hour	8	1	24	8	1	24

#### [Time variation control of Heat pump and booster heater of DHW]



**※ FSV #3041 should be set to use Disinfection mode.** 

#### **※ FSV #3031 setting and DHW thermo on signal is ignored in case of disinfection mode.**

#### FSV : Menus 30\*\*

	Field Sett	ing Value				Tank i	ntegrated	type	Wall-n	nounted t	ype
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Forned DHW/ operation	Timer OFF Function	**51	-		0(No)	0	1(Yes)	0(No)	0	1(Yes)
DHW Code 30* *	Forced DHVV operation	Timer Duration	**52	1	(x10) min	6	3	30	6	3	30
	Solar Panel/DHW Thermostat	H/P Combination	**61	1	-	0(No)	0	2	0(No)	0	2
	Direction of DHW valve	DHW Tank	**71	-	-	0(Room)	0	1(Tank)	0(Room)	0	1(Tank)
0000 00 1 1		BUH 1 step capacity	**81	1	kW	2	1	6	2	1	6
	Energy metering	BUH 2 step capacity	* * 82	1	kW	2	0	6	2	0	6
		BSH capacity	**83	1	kW	3	1	6	3	1	6

- 305\* : Forced DHW operation
  - . FSV #3011, should be set "1" (Yes) to use Forced DHW operation .
  - . Forced DHW mode shall be working depending on Timer setting (#3051, #3052).
- 3061 : Solar panel Forced DHW operation
- . #3061 "0" : Solar panel is not used.
- . #3061 "1" : Solar panel is used
  - \* Whenever solar panel on signal input -> Comp. off(only in DHW mode), Booster Heater off
  - \* Solar panel and heat pump are able to operate simultaneously except DHW mode.
- . #3061 "2" : Solar panel is not used and DHW thermostat is used.

## FSV : Menus 308\*

	Field Set	ting Value				Tank	integrated	l type	Wall-r	nounted	type
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Forced DHW operation	Timer OFF Function	**51	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)
		Timer Duration	* * 52	1	(x10) min	6	3	30	6	3	30
DHM	Solar Panel/DHW Thermostat	H/P Combination	**61	1	-	0(No)	0	2	0(No)	0	2
Code 30 * *	Direction of DHW valve	DHW Tank	**71		-	0(Room)	0	1(Tank)	0(Room)	0	1(Tank)
Code 30 * *		BUH 1 step capacity	* * 81	1	kW	2	1	6	2	1	6
	Energy metering	BUH 2 step capacity	**82	1	kW	2	0	6	2	0	6
	Energy metering	BSH capacity	* * 83	1	kW	3	1	6	3	1	6

#### - 308\* : Energy metering



- To check energy information of system, user should set to FSV #308\* according to heater (BUH, BSH) capacity.

- . In order to get the exact value, this should be set.
- \* The FSV #4021 should be set to BUH (Back Up Heater) use.

### ■ FSV : Menus 40\*\*

: New

	Fi	eld Setting Value				Tank i	ntegrate	d type	Wall-	mounted	l type
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Мах	Default	Min	Max
		Heating/DHW Priority	* * 11	-	-	0(DHW)	0	1(Heat)	0(DHW)	0	1(Heat)
	Heat Pump	Outdoor Temp for Priority	* * 12	1	С°	0	-15	20	0	-15	20
		Heating Off	* * 13	1	С°	35	14	35	35	14	35
		Application	* * 21	-	-	0(No)	0	2	0(No)	0	2
		BUH/BSH Priority	* * 22	1	-	2(BSH)	0(Both)	2(BSH)	0(Both)	0(Both)	2(BSH)
	Backup Heater	Cold weather compensation	* * 23	-	-	1(Yes)	0(No)	1	1(Yes)	0(No)	1
Heating		Threshold Temp	* * 24	1	°C	0	-25	35	0	-25	35
		Defrost Backup Temp.	* * 25	5	°C	15	10	55	15	10	55
	Backup Boiler	Application	* * 31	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)
		Boiler Priority	* * 32	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)
		Threshold Temp	* * 33	1	°C	-15	-20	5	-15	-20	5
Code 40 * *		Application	* * 41	1	-	0(No)	0	2	0(No)	0	2
		Target $\Delta T$ (Heating)	* * 42	1	°C	10	5	15	10	5	15
		Target $\Delta T$ (Cooling)	* * 43	1	°C	10	5	15	10	5	15
	Mixing Valve	Control factor	* * 44	1	-	2	1	5	2	1	5
		Control interval	* * 45	1	min	2	1	30	2	1	30
		Running Time	* * 46	3	(x10)se c	9	6	24	9	6	24
		Application	* * 51	-	-	1(Yes)	0	2	1(Yes)	0	2
	Inverter Pump	Target ΔT	* * 52	1	°C	5	2	8	5	2	8
		Control factor	* * 53	1	-	2	1	3	2	1	3
	Zone Control	Application	**61	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)

### ■ FSV : Menus 401\*

	Fi	ield Setting Value				Tank i	ntegrate	d type	Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
Heating Code 40 <del>*</del> *	Heat Pump	Heating/DHW Priority	* * 11	-	-	0(DHW)	0	1(Heat)	0(DHW)	0	1(Heat
		Outdoor Temp for Priority	* * 12	1	°C	0	-15	20	0	-15	20
		Heating Off	* * 13	1	°C	35	14	35	35	14	35

- 401\* : Heat pump variables for space heating



FSV #4011 for DHW priority is set to "0(DHW)" (Default) as a default. Space heating gets a priority by setting FSV #4011 "1", but this is only valid when the outdoor temperature is lower than the specified temperature defined by FSV #4012.

#### FSV : Menus 402\*

- 402\* : Backup Heater variables for space heating

	F	ield Setting Value				Tank i	integrate	d type	Wall-	mounted	type
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Backup Heater	Application	* * 21	-	-	0(No)	0	2	0(No)	0	2
Hantlan		BUH/BSH Priority	* * 22	1	-	2(BSH)	0(Both)	2(BSH)	0(Both)	0(Both)	2(BSH)
Code 40 W W		Cold weather compensation	* * 23	-	-	1(Yes)	0(No)	1	1(Yes)	0(No)	1
Code 40 * *		Threshold Temp	* * 24	1	°C	0	-25	35	0	-25	35
		Defrost Backup Temp.	* * 25	5	°C	15	10	55	15	10	55

. FSV #4021 should be set to 1 (Use both BUH 1 and BUH 2) or 2 (Use a BUH 1) to use electric backup heater in hydro unit as an additional heat source.

. To compensate the lowered heat pump heating performance under very cold weather conditions,

the FSV #4023 should be set to "1(On, Default)".

The threshold temperature to use backup heater for cold weather compensation: FSV #4024, Default "0°C", Range -25 ~ 35°C

The backup heater operation is restricted to save energy in the threshold temperature range.

. The FSV #4022 for backup heater priority should be set to "2 (BSH, Default)" or "0" (Both), or "1" (backup) to use backup heater.

If not (Booster heater priority), the backup heater can be operated in case of no booster heater demand.

. The threshold temperature for backup heater operation during defrost mode to prevent cold draft because of chilled water can be controlled by adjusting FSV #4025. Under FSV #4025 of water outlet temperature, backup heater Will be turned on.

### FSV : Menus 403\*

- 403\* : External Backup Boiler for space heating

	Fi	eld Setting Value			2	Tank i	ntegrate	d type	Wall-	mounted	type
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Application	* * 31	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes
	Backup Boiler	Boiler Priority	* * 32	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes
		Threshold Temp	* * 33	1	°C	-15	-20	5	-15	-20	5
Useting		Application	* * 41	1	-	0(No)	0	2	0(No)	0	2
Cede 40 V V		Target ∆T(Heating)	* * 42	1	°C	10	5	15	10	5	15
Code 40 * *	Mixing Volue	Target ∆T(Cooling)	* * 43	1	°C	10	5	15	10	5	15
	withing valve	Control factor	* * 44	1	-	2	1	5	2	1	5
		Control interval	* * 45	1	min	2	1	30	2	1	30
		Running Time	* * 46	3	(x10)sec	9	6	24	9	6	24

. FSV #4031 should be set to "1 (Yes)" to use a backup boiler as an additional heat source. (default: "0 (No installation)")

- . Priority of backup boiler and heat pump is defined by FSV #4032 (default: "0 (OFF)")
- . To compensate the lowered heat pump heating performance under very cold weather conditions, the backup boiler operates instead of heat pump under the threshold temperature (FSV #4033, Default "-15°C", Range -20 ~ 5°C).

### FSV : Menus 404\*

- 404\* : Mixing valve installation



	Fie	eld Setting Value				Tank i	ntegrate	d type	Wall-	mounted	type
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Application	* * 31	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)
	Backup Boiler	Boiler Priority	* * 32	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)
		Threshold Temp	* * 33	1	°C	-15	-20	5	-15	-20	5
Lingting		Application	**41	1	-	0(No)	0	2	0(No)	0	2
Heating Code 40 <del>*</del> *		Target ∆T(Heating)	* * 42	1	°C	10	5	15	10	5	15
	Missing Value	Target ∆T(Cooling)	* * 43	1	°C	10	5	15	10	5	15
	wixing valve	Control factor	* * 44	1	-	2	1	5	2	1	5
		Control interval	* * 45	1	min	2	1	30	2	1	30
		Running Time	* * 46	3	(x10)sec	9	6	24	9	6	24

#### . The FSV #4041 should be set to "1 or 2" to use mixing valve.

- 𝔆 #4041 =1 : Controlled based on the temperature difference (4042, 4043)
- % #4041 =2 : Controlled based on the temperature difference of the WL value



- .. The mixing valve is controlled based on the FCU WL value.
- •• As the #4044 value increases and the #4045 value decreases, the control speed increases.
- (Temperature hunting may occur if the control speed increases depending on the load.)
- •• The additional pump and mixing valve should be purchased separately. TW4 sensor is included in the product accessories.
- •• TW3 : Water temp. sensor 3

### ■ FSV : Menus 405\*

		Fi	eld Setting Value				Tank integrated type			Wall-mounted type		
	Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
	Heating Code 40 * *	Inverter Pump	Application	* * 51	-	-	1(Yes)	0	2	1(Yes)	0	2
			Target ∆T	* * 52	1	°C	5	2	8	5	2	8
			Control factor	* * 53	1	-	2	1	3	2	1	3
		Zone Control	Application	**61	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)

- 405\* : Inverter pump control



The FSV #4051 should be set to "1 or 2" to use inverter pump control.

**#4051 =**1 : Use (Max 100%)

**#4051 =**2 : Use (Max 70%)

The FSV #4052 is for adjusting temperature difference between Tw2 and Tw1.

\* Output signal of Inverter pump(%) = Current Inverter pump output (%) + ((Tw2-Tw1- FSV #4052) \* FSV 4053

# **Field Setting Value**

### FSV : Menus 4061

- 4061 : Zone control



	Field Setting Value       Ienu & Code     Sub     Sub     Structure       Application     # * 51     -     -					Tank i	ntegrate	d type	vpe Wall-mounted type			
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max	
	Inverter Pump	Application	* * 51	-	-	1(Yes)	0	2	1(Yes)	0	2	
Heating		Target ∆T	* * 52	1	°C	5	2	8	5	2	8	
Code 40 * *		Control factor	* * 53	1		2	1	3	2	1	3	
	Zone Control	Application	**61	-	-	0(No)	0	1(Yes)	0(No)	0	1(Yes)	

The FSV #4061 should be set to "1(Yes)" to zone control.

## ■ FSV : Menus 50\*\*

: New

		Field Setting Value				Tank	integrated	type	Wal	I-mounted t	уре
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Water Out Temp for Cooling	* * 11	1	°C	25	5	25	25	5	25
Main Menu & Code S Others Code 50**		Room Temp for Cooling	* * 12	1	°C	30	18	30	30	18	30
		Water Out Temp for Heating	* * 13	1	°C	15	15	55	15	15	55
		Room Temp for Heating	* * 14	1	°C	16	16	30	16	16	30
	Outing	Auto Cooling WL1 Temp	* * 15	1	С°	25	5	25	25	5	25
		Auto Cooling WL2 Temp	* * 16	1	С°	25	5	25	25	5	25
		Auto Heating WL1 Temp	* * 17	1	С°	15	15	55	15	15	55
		Auto Heating WL2 Temp	* * 18	1	С°	15	15	55	15	15	55
		Target Tank Temp	* * 19	1	°C	30	30	70	30	30	70
		Temp Difference	* * 21	1	С°	5	0	40	5	0	40
	DHW Saving Mode	Saving Mode	* * 22	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
Others Code 50**	DHW Saving Mode	Thermo On Temp during Saving Mode	* * 23	1	°C	25	0	40	25	0	40
Code 50**		Application	* * 41	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	Power Peak Control	Select forced off parts	* * 42	1	-	0 (All)	0	3	0 (All)	0	3
		Using input voltage	* * 43	-	-	1 (High)	0 (Low)	1	1 (High)	0 (Low)	1
	Free	quency Ratio Control	* * 51	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Application	* * 81	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	PV Control	Setting Temp Shift Value(Cooling)	* * 82	0.5	°C	1	0	5	1	0	5
		Setting Temp Shift Value(Heating)	* * 83	0.5	°C	1	0	5	1	0	5
		Application	<del>*</del> * 91	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Setting Temp Shift Value(Heating)	* * 92	0.5	°C	2	2	5	2	2	5
	Smart Grid Control	Setting Temp Shift Value(DHW)	* * 93	0.5	°C	2	2	5	2	2	5
s	Smart Grid Control —	DHW Mode	* * 94	-	-	0	0 (Standard )	1 (Power)	0	0 <del>(Standard)</del>	1 (Power)

### ■ FSV : Menus 502\*

	Field Setting Value Menu & Code Sub Menu Function Description Temp Difference					Tank	integrated	type	Wa	I-mounted t	ype
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
Others Code 50++	DHW Saving Mode	Temp Difference	**21	1	.С	5	0	40	5	0	40
		Saving Mode	* * 22	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Thermo On Temp during Saving Mode	* * 23	1	°C	25	0	40	25	0	40

- 502\* : DHW Saving mode

#### **Economic DHW Heating**

. DHW heating only by the heat pump to save energy.

Target DHW temperature is lower than the temperature set by user.

The temperature difference is defined by FSV #5021. (default: 5°C) If user sets the temperature 45°C, the system sets the target temperature 40°C with the default setting.

If user want additional energy saving, use a "Saving mode" (#5022, default : 0, OFF) The user can set the "Thermo On" temperature during "Saving mode" using FSV #5023.

### ■ FSV : Menus 504\*

- 504\* : Power peak control

	Field Setting Value					Tank	c integrated	type	Wa	Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max	
		Application	**41	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)	
	Power Peak Control	Select forced off parts	**42	1	-	0 (All)	0	3	0 (All)	0	3	
		Using input voltage	**43	-		1 (High)	0 (Low)	1	1 (High)	0 (Low)	1	
	Frequency Ratio Control		**51			0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)	
		Application	**81		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)	
Others	PV Control	Setting Temp Shift Value(Cooling)	**82	0.5	'C	1	0	5	1	0	5	
Code 50++		Setting Temp Shift Value(Heating)	**83	0.5	°C	1	0	5	1	0	5	
		Application	**91	-	-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)	
		Setting Temp Shift Value(Heating)	**92	0.5	'C	2	2	5	2	2	5	
	Smart Grid Control	Setting Temp Shift Value(DHW)	**93	0.5	°C	2	2	5	2	2	5	
		DHW Mode	**94	-	÷.	0	0 (Standard)	1 (Power)	0	0 (Standard)	1 (Power	

#### Peak Power Control (FSV 5041 = 1)

- . If users make contracts with local electric power company for limiting the amount of power consumption when a surge in power usage, users can set FSV of "Forced off".
- . And According to FSV (#5042), If input is "0 (default)", Back up heater (BUH) is unavailable while external contact is high.
- If input is "1", Only Compressor(Heat Pump) is available.
- If input is "2", Only Booster Heater (BSH) is available.
- If input is "3", nothing is available.
- . Applying the control when power voltage of input contact is high is default. According to FSV (#5043), it is available to adopt this logic in low condition exceptionally.
- . When applying to this logic, SAMSUNG controller come to get "Thermo off" condition for all operation.

# ■ FSV : Menus 5051 (FR control)



This is to limit the maximum frequency of the outdoor unit compressor. (if #5051 = 1 "use") External DC signal Control uses a DC voltage of  $0 \sim 10V$  (0v = 50%,  $\sim 10v = 150\%$ ) The minimum  $\sim$  maximum frequency section being divided with 11 steps of 10%

### FSV : Menus 508\*

		Field Setting Value				Tank integrated type Wall-mounted type					ype
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Application	**41	-		0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	Power Peak Control	Select forced off parts	**42	1	-	0 (AI)	0	3	0 (All)	0	3
		Using input voltage	**43	-	-	1 (High)	0 (Low)	1	1 (High)	0 (Low)	1
Others	Frequency Ratio Control		**51		~	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Application	**81			0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	PV Control	Setting Temp Shift Value(Cooling)	* * 82	0.5	°C	1	0	5	1	0	5
Code 50++		Setting Temp Shift Value(Heating)	**83	0.5	°C	1	0	5	1	0	5
		Application	**91		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Setting Temp Shift Value(Heating)	**92	0.5	°C	2	2	5	2	2	5
	Smart Grid Control	Setting Temp Shift Value(DHW)	**93	0.5	°C	2	2	5	2	Wall-mounted type       auti     Min     Maximum       40)     0     1 (Ye       All)     0     3       ign)     0 (Low)     1       Voi     0     1 (Ye       voi     0     1 (Ye       ign)     0 (Low)     1       voi     0     1 (Ye       ign     0 (Standard)     1 (Ye	5
		DHW Mode	**94	-	-	0	0 (Standard)	1 (Power)	0	0 (Standard)	1 (Power

- 508\* : PV Control (Photovoltaics control)
- This is for energy saving by using the solar energy.
- The FSV #5081 should be set to "1(Yes)" for PV control.

FSV	0	1
#5081 (New)	Disable (Default)	Activation

* Except for how water mode, This function is activated only for the outing mode.	
Cooling mode (FSV #5082 = 2°C, Default)	
① Room sensor setting : Current setting value - FSV #5082 (Min = FSV #1022)	
② Water outlet setting : Current setting value - FSV #5082 (Min = FSV #1012)	
③ Water law setting : Current setting value - FSV #5082 (Min = FSV #2061, #2062, #2071, #2072)	
Heating mode (FSV #5083 = 2°C, Default)	
① Room sensor setting : Current setting value + FSV #5083 (Max = FSV #1041)	
② Water outlet setting : Current setting value + FSV #5083 (Max = FSV #1031)	
③ Water law setting : Current setting value + FSV #5083 (Max = FSV #2021, #2022, #2031, #2032)	

#### Hot water mode

- Forced thermo on regardless of outing mode : Setting temperature = Max temperature of hot water mode (FSV #1051)

### ■ FSV : Menus 509\*

		Field Setting Value				Tank	integrated	type	Wall-mounted type		
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Application	**41	-		0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	Power Peak Control	Select forced off parts	**42	1	-	0 (AI)	0	3	0 (All)	0	3
		Using input voltage	**43	-	-	1 (High)	0 (Low)	1	1 (High)	0 (Low)	1
Others	Frequency Ratio Control		**51		~	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Application	**81		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	PV Control	Setting Temp Shift Value(Cooling)	* * 82	0.5	°C	1	0	5	1	0	5
Code 50++		Setting Temp Shift Value(Heating)	**83	0.5	°C	1	0	5	1	Vitil     Vitil       (No)     0       (All)     0       (High)     0 (Low)       (No)     0       (No)     0       1     0       0 (No)     0       2     2       0     (Gundard)       0     0	5
		Application	**91		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Setting Temp Shift Value(Heating)	**92	0.5	°C	2	2	5	2	2	5
	Smart Grid Control	Setting Temp Shift Value(DHW)	**93	0.5	°C	2	2	5	2	all-mounted type       Min     Min       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       0     1 (°)       (°)     2       0     1 (°)       (°)     1 (°)       (°)     1 (°)       (°)     1 (°)	5
		DHW Mode	**94	-	-	0	0 (Standard)	1 (Power)	0	0 (Standard)	1 (Power

- 509\* : Smart Grid Control
- The FSV #5091 should be set to "1(Yes)" for PV control.

FSV	0	1
#5081 (New)	Disable (Default)	Activation

#### ✔ Operation mode for Smart Grid

Mode 1	Short	Open
Mode 2	Open	Open
Mode 3	Open	Short
Mode 4	Short	Short

- 1) Mode 1 : Forced thermo off of all system
- 2) Mode 2 : Normal operation
- $\rightarrow$  Normal control is performed.

(normal determination of operation ON / OFF, Thermo ON / OFF)

# **Field Setting Value**

#### FSV : Menus 50\*\*

	Field Setting Value					Tank	integrated	type	Wa	Il-mounted t	ype
Main Menu & Code	Sub Menu Function	Description	Sub Code	Step	Unit	Default	Min	Max	Default	Min	Max
		Application	**41		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
	Power Peak Control	Select forced off parts	**42	1	-	0 (Al)	0	3	0 (All)	0	3
		Using input voltage	**43		-	1 (High)	0 (Low)	1	1 (High)	0 (Low)	1
	Fre	quency Ratio Control	**51			0 (No)	0	1 (Yes)	0 (No) 0 1		1 (Yes)
		Application	**81		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
Others	PV Control	Setting Temp Shift Value(Cooling)	* * 82	0.5	'C	1	0	5	1	0	5
Code 50++		Setting Temp Shift Value(Heating)	**83	0.5	°C	1	0	5	1	0	5
		Application	**91		-	0 (No)	0	1 (Yes)	0 (No)	0	1 (Yes)
		Setting Temp Shift Value(Heating)	**92	0.5	°C	2	2	5	2	2	5
	Smart Grid Control	Setting Temp Shift Value(DHW)	**93	0.5	°C	2	2	5	Default     Min       0 (No)     0     1       1 (Nigh)     0 (Low)     0       1 (Nigh)     0 (Low)     1       0 (No)     0     1       0 (No)     0     1       0 (No)     0     1       0 (No)     0     1       1     0     1       0 (No)     0     1       1     0     1       0 (No)     0     1       2     2     2       0     (Standard)     1	5	
		DHW Mode	**94	-	-	0	0 (Standard)	1 (Power)	0	0 (Standard)	1 (Power

#### 3) Mode 3 : When operating on, the setting temperature is reflected as follows (FSV #5092 =2°C, #5093 = 5°C, Default)

- $\rightarrow$  The heating and hot water setting temperature are set by the FSV setting value.
- ① Heating mode (Room sensor setting) : Current setting value + FSV #5092 (Max = FSV #1041)
- 2 Heating mode (Water outlet setting) : Current setting value + FSV #5092 (Max = FSV #1031)
- ③ Heating mode (Water law setting) : Current setting value + FSV #5092 (Max = FSV #2021, #2022, #2031, #2032)
- (4) How water mode : Current setting value + FSV #5093 (Max = FSV #1051)

#### 4) Mdoe 4 : When operating on, the setting temperature is reflected as follows

- ✔ Hot water mode
  - ① #5094=0 : Normal operation (Heat pump is operated.) : Target setting temperature is 55°C.
  - 2 #5094=1 : Power/Forced hot water operation (Heat pump + Booster heater are operated.) : Target setting temperature is 70°C.
- ✔ Heating mode
  - ① Heating mode (Room sensor setting) : Current setting value + **FSV #5092 + 3°C** (Max = FSV #1041)
  - 2 Heating mode (Water outlet setting) : Current setting value + FSV #5092 + 5°C (Max = FSV #1031)
  - ③ Heating mode (Water law setting) : Current setting value + FSV #5092 + 5°C (Max = FSV #2021, #2022, #2031, #2032)



### Self-Test mode

- Enter the self-test mode using wired remote controller,

\* Load list : When pressing the corresponding button, you can set the load On or Off.





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