Samsung

Eco Heating System

An energy-efficient residential heating solution

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Samsung Electronics developed its Planet First initiative to make on-going efforts to develop environment-friendly products that minimise the negative impacts on the environment in every aspect of its products, from raw material procurement to production, transportation, usage and final disposal. Concerns for the environment are at the core of each product development.

Combining heat pump and its smart inverter technology, Samsung developed an Eco Heating System (EHS) to provide comfortable heating and hot water with minimal power consumption, thus saving the environment and operating costs.

Samsung have developed its 5th generation EHS; combining ultra high efficiencies, compact equipment sizes and a user friendly Wi-Fi control option, to provide customers with a descrete, simple to operate, energy efficient residential heating solution.

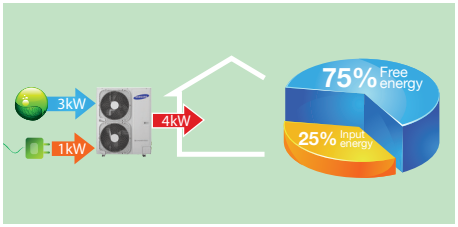
Contents

Eco Heating System

What is an Air Source Heat Pump?

An air source heat pump works in the same way as a domestic refrigerator, moving the heat energy from one place to another. Whereas a refrigerator moves the heat from the compartment to rear panel, an air source heat pump takes the heat energy from the outside air and uses it to heat water inside the home. This hot water is used to heat radiators or unfloor heating and sanitary hot water cylinder.

Air source heat pumps are available in two model styles: a split type (with an outdoor unit and indoor hydrobox) and a monobloc type (with a single combined hydro/ outdoor unit).

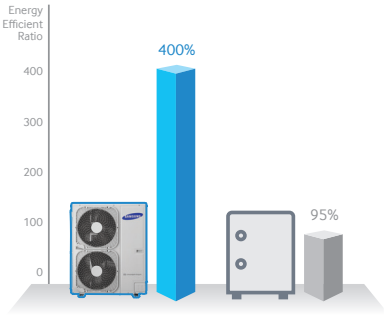


Heat a home using free energy from the outside air

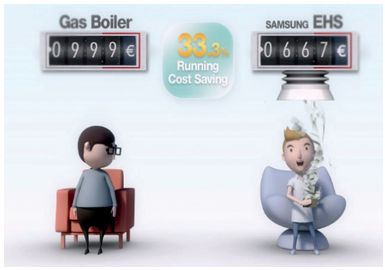
The Samsung EHS uses the heat from ambient air, which is a free and renewable energy source, for low cost heating and hot water production.

How it works

For every 1 kWh of energy input, a heat pump can deliver up to more than 4 kWh in energy output. This is an energy efficiency ratio of more than 400%, which is superior to high energy efficiency boiler systems. Since conventional boiler systems can only reach an efficiency ratio of up to 95%, they consume more energy than they can ever deliver.

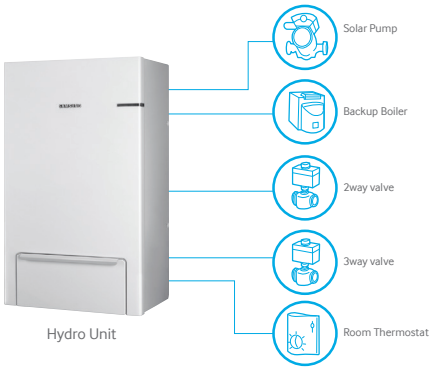


Why Samsung EHS?

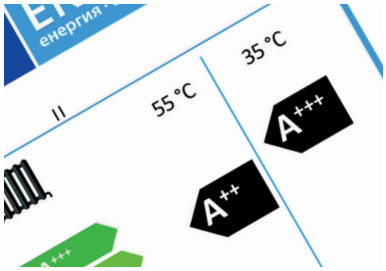


Reduced heating bills – up to 30% compared to a standard gas boiler

Efficient alternative to off gas grid, oil, LPG and electric heating systems



Simple to integrate into most existing heating systems



Gen5 systems achieve the highest A++ energy label efficiency

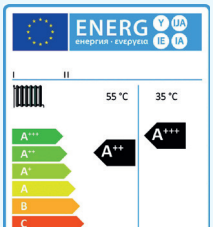
Government incentive schemes are available for this renewable technology

Smart Wi-Fi control (optional) of heating and hot water anywhere, anytime

New Features for 5th Generation Systems

Highest Efficiency Rating

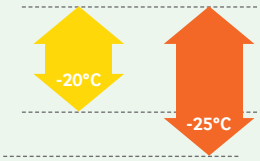
All Gen5 models are A++



*Gen% models already achieve proposed 2019 A+++ energy efficiency rating.

Wide Range of Operation

Down to -25°C



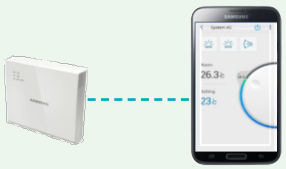
Powerful Heating

90% in Low Ambient conditions

*90% of heating performance at -10°C of Ambient Temp.

Smart Wi-Fi

Control Anywhere, Anytime



* Optional Kit

Low Noise Level

45dB(A) Sound Pressure level for 5kW mono

*Quiet night mode available

A Full Range

New 4kW Split and 5kW Mono

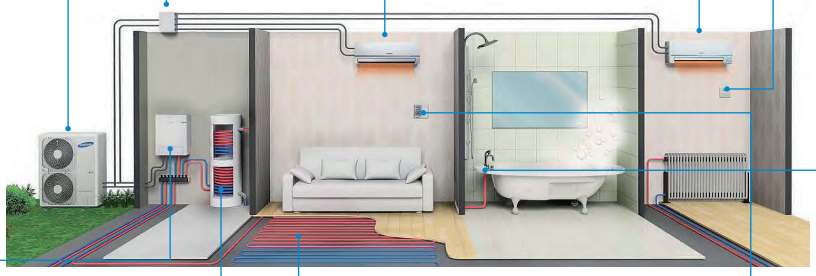
*Designed for the EPBD (Energy Performance of Buildings Directive)

Outdoor Unit
Extracts heat from the outside air and raises inside temperature to a level high enough to supply heating during winter or remits the heat inside to outside during summer

Indoor Unit (TDM only)
Supplies air heating and cooling

EEV Kit (TDM only)
Electronic Expansion Valve Kit controls the liquid refrigerant flow.

Room Thermostat
(Field Supply)
Auto-adjusts to the desired room temperature



Hydro Unit
(Split and TDM only)
Provides heated water

Wi-Fi Kit (optional)
Enables control via a wireless network

Domestic Hot Water Tank
(Field Supply)
Local Purchase

Underfloor Heating and Radiator
(Field Supply)
Water warmed up in the hydro unit circulates through the underfloor and radiators to make the home pleasant and comfortable

New Controller
Adjusts various options and displays the operating status

Lineup

		EHS Mono		EHS Split		EHS TDM
						
	Capacity / Power	1P 220-240 V 50 Hz	3P 380-415 V 50 Hz	1P 220-240 V 50 Hz	3P 380-415 V 50 Hz	1P 220-240 V 50 Hz
Outdoor Unit	4.0kW			•		
	5.0kW	•				
	6.0kW			•		•
	7.0kW					•
	8.0kW					•
	9.0kW	•	•	•	•	
	11.0kW					•
	12.0kW	•	•	•	•	
	14.0kW	•	•	•	•	•
	16.0kW	•	•	•	•	•
Hydro Unit	8.0kW					•
	9.0kW			•	•	
	16.0kW			•	•	•
Mono Control Kit		•				

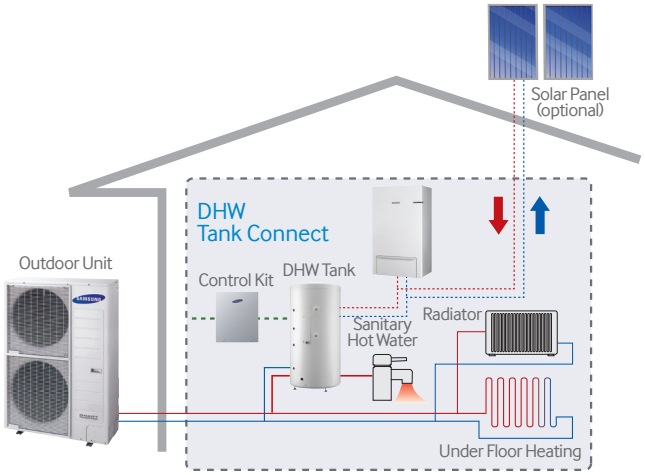
	MODEL		Wall	Slim Duct
Indoor Unit	2.2kW		•	•
	2.8kW		•	•
	3.6kW		•	•
	4.5kW			•
	5.6kW		•	•
	7.1kW		•	
	10.0kW			

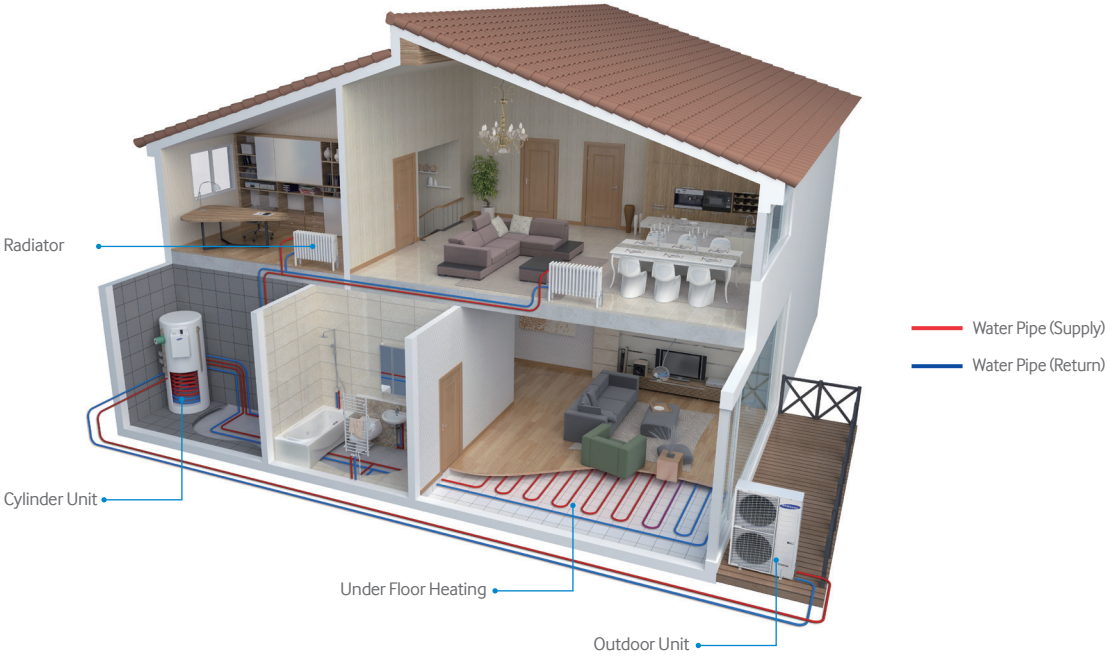
Key Features	• A++ Energy Label • Compact and light outdoor unit • Low noise level • Hybrid compatible • Optional Wi-Fi control option	• A++ Energy Label • Flexible installation option • Low noise level • Hybrid compatible • Optional Wi-Fi control option	• Integrated heating and cooling system at a lower cost • Perfect all-in-one system • Quick heating by TDM technology • Typical seasonal usage • Flexibility • Wall-mounted, Duct type indoor units

EHS Mono – Compact Efficiency

Maintain optimal comfort and convenience with energy and cost efficient units

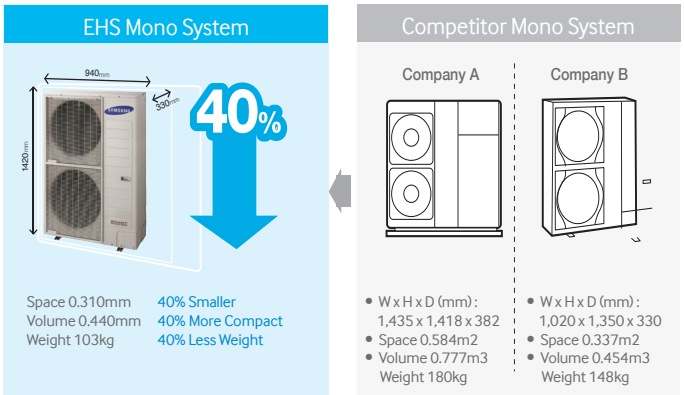
The Samsung EHS Mono integrates an outdoor unit that includes the hydronic parts. Therefore, EHS Mono does not require space or an installation process for hydronic units and the refrigerant pipes.





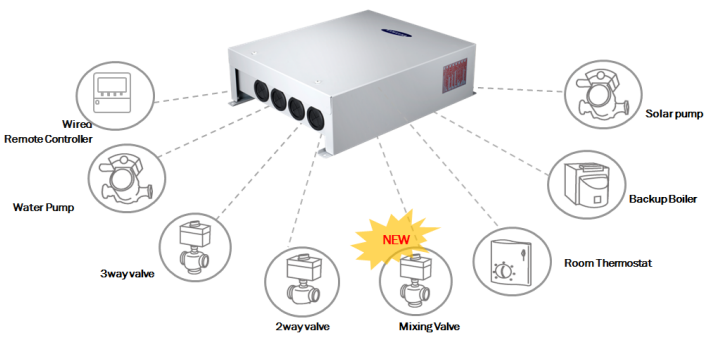
Compact, lightweight units for easy installation

Samsung EHS Mono features a compact, lightweight outdoor unit. Its unique frame considerably saves installation labour and costs, satisfying both installers and customers.



Control Kit

Control kit is an interface to allow connection to other auxiliary hydronic and heating equipment. Samsung Mono outdoor units can be used with this interface box, creating an ideal solution when a hydronic and heating equipment is required.



EHS Mono

- A self-contained compact system
- 5, 9, 12, 14 and 16kW models
- Up to 4x more efficient than gas boilers
- Hybrid capability (integrate with solar and/or boilers)
- Optional Wi-Fi control
- RHI eligible (subject to conditions)

Outdoor Units

MODEL NAME				AE050JXYDEH	AE090JXYDEH	AE120JXYDEH	AE140JXYDEH	AE160JXYDEH
Power Supply			Ø, ǂ, V, Hz	1, 2, 220-240, 50				
Performance (A2W ǂ1)	Nominal Capacity *1)	Heating	W	5,000	9,000	12,000	14,000	16,000
	Nominal Current Input *1)	Heating	A	5.1	9.2	12	14.3	17.1
	SCOP *1)		-	4.510	4.409	4.454	4.489	4.481
Electric Specification	Max current		A	16	22.0	28.0	30.0	32.0
Water side	Piping Connections	In/Out	Ø, inch	1"(BSPP)				
Refrigerant Side	Refrigerant	Type	-	R410A(GWP>150)				
Sound	Sound Pressure *3)	Heating	dB(A)	45	48	50	51	52
	Sound Power		dB(A)	61	63	64	65	66
External Dimension	Weight	Net	kg	59	76	108	108	108
	Dimensions (WxHxD)	Net	mm	880 x 798 x 310	940 x 998 x 330	940 x 1,420 x 330		
Operating Range	Leaving Water	Heating	°C	25 ~ 55				

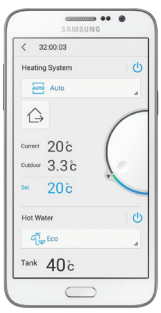
*1~2) A2W rating conditions in accordance with Eurovent Rating Standard for Liquid Chilling Packages RS-6/C/001-2011.
*1) A2W Condition ǂ1 : (Heating) Water In/Out 30°C/35°C, Outdoor Air 7°CDB/6°CWB.
*3) Sound Pressure was acquired in an anechoic room. Thus actual noise level may be different depending on the installation conditions.

Control Kit

MODEL NAME				MIM-E03AN	MIM-E03BN
Use with			-	9,12,14 and 16kW mono	5kW mono
Power Supply			Ø, V, Hz	1, 220-240, 50	
External Dimension	Weight	Net	kg	3.5	
	Dimensions (WxHxD)	Net	mm	290 x 370 x 110	

*External Control Options - 230V: (Max A)
Booster Heater (20A), hybrid (0.5A), water pump (2A), 2/3way valve (0.5A), Thermostat (10mA), solar pump (10mA), Inverter pump (2A), 3way mixing valve (0.5A)
Wi-Fi Kit (MIM-H03N) optional accessory.
Control App available to download. (Phone not included.)

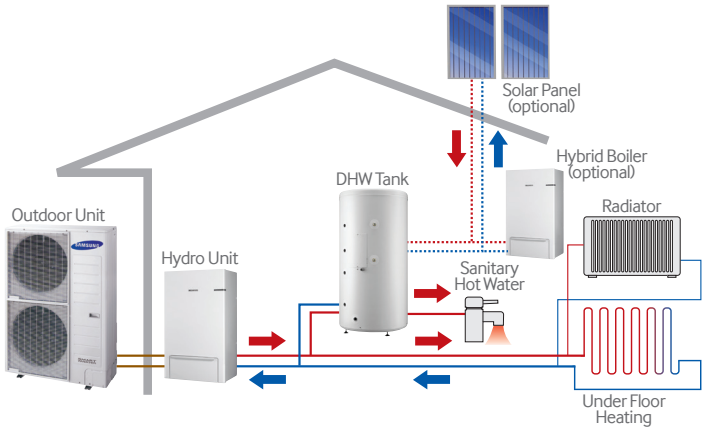
Wi-Fi Kit (MIM-H03N)

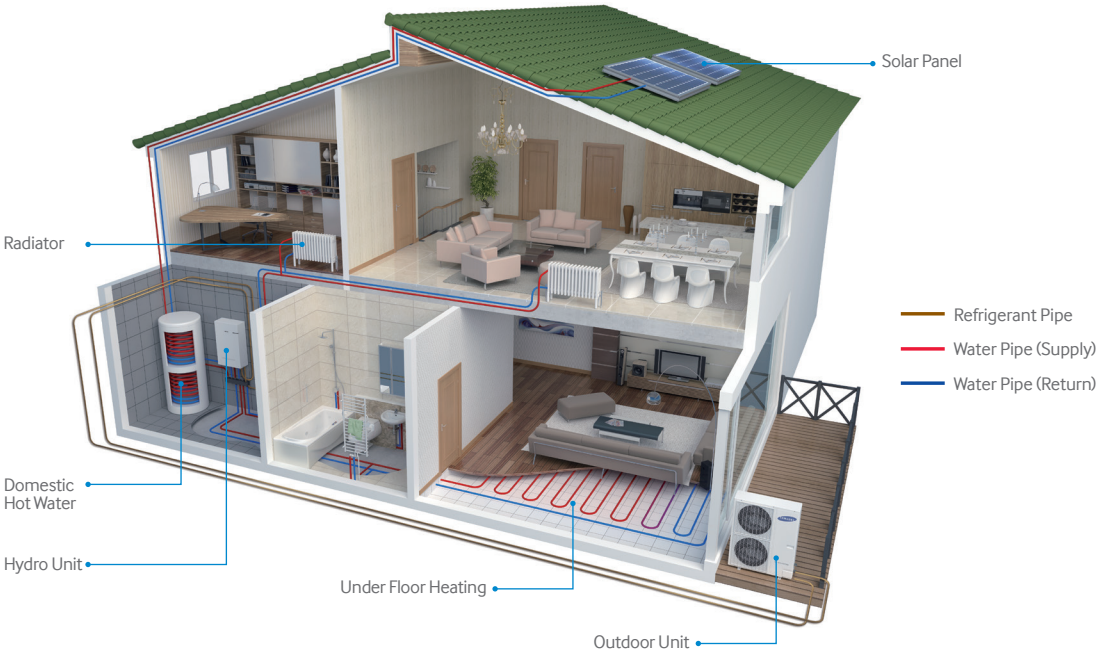


EHS Split – Flexible Efficiency

Maintain optimal heating performance with flexible installation options

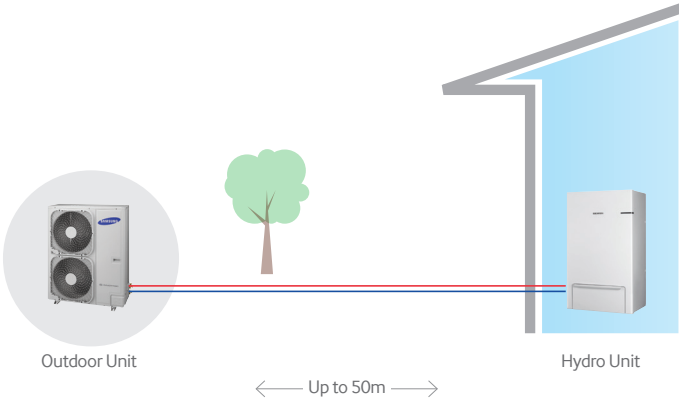
The Samsung EHS Split separates the system into a compact outdoor and indoor hydrobox to achieve more flexible installation solutions with greater distances between the outdoor unit and the residential property.





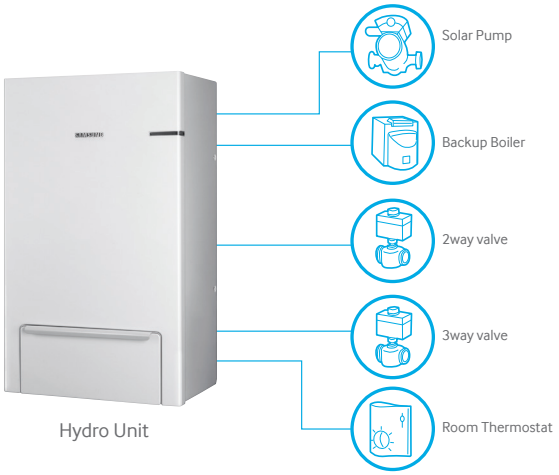
Flexible installation

By separating the system into two components the outdoor unit can be positioned up to 50m away from the internal hydrobox. Connected by refrigerant pipe and electrical cable, this flexibility ensures the outdoor unit can be sited in a convenient location.



Flexibility for increased control

Samsung EHS Split offers broad compatibility for easier control. The unit can be implemented with a domestic hot water tank, thermostat, pump, solar panel or back-up boiler, making it exceptionally versatile.



EHS Split

- A flexible 2 part system
- 4, 6, 10, 12.5, 14 and 16kW models
- Optional Wi-Fi control
- Up to 4x more efficient than gas boilers
- Hybrid capability (integrate with solar and/or boilers)
- RHI eligible (subject to conditions)

Outdoor Units

MODEL NAME				AE040JXEDEH	AE060JXEDEH	AE090JXEDEH	AE120JXEDEH	AE140JXEDEH	AE160JXEDEH
Compatible Hydro Unit			-	AE090JNYDEH			AE160JNYDEH		
Power Supply			Ø, ǂ, V, Hz	1,2,220-240, 50					
Performance (A2W ǂ1)	Nominal Capacity *1)	Heating	W	4,400	6,000	9,000	12,000	14,000	16,000
	Nominal Current Input *1)	Heating	A	4.1	5.7	9.2	11.7	14.3	16.9
	SCOP *1)		-	4.522	4.539	4.577	4.627	4.560	4.515
Electric Specification	Max current		A	20.0		22.0	28.0	30.0	32.0
Refrigerant Side	Refrigerant	Type	-	R410A(GWP>150)					
	Piping Connections	Liquid	Ø, mm (inch)	6.35 (1/4")			9.52 (3/8")		
		Gas	Ø, mm (inch)	15.88 (5/8")					
	Installation Limitation	Length	m	30	30	50	50	50	50
		Height	m	20		30			
Sound	Sound Pressure *3)	Heating	dB(A)	46	47	49	50	50	52
	Sound Power		dB(A)	63			64	66	69
External Dimension	Weight	Net	kg	48.5		68	100		
	Dimensions (WxHxD)	Net	mm	880 x 638 x 310		940 x 998 x 330	940 x 1,420 x 330		

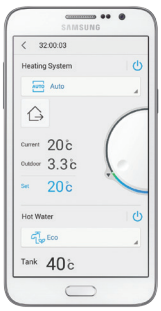
*1)~*3) A2W rating conditions in accordance with Eurovent Rating Standard for Liquid Chilling Packages RS-6/C/001-2011.
*1) A2W Condition ǂ1: (Heating) Water In/Out 30°C/35°C, Outdoor Air DB/WB 7°C/6°C.
*3) Sound Pressure was acquired in an anechoic room. Thus actual noise level may be different depending on the installation conditions.

Hydro Units

MODEL NAME				AE090JNYDEH	AE160JNYDEH
Power Supply			Ø, V, Hz	1, 220~240, 50	
Performance	Nominal Capacity	Heating	W	4,400 / 6,000 / 9,000	12,000 / 14,000 / 16,000
	Leaving Water Temperature Range	Heating	°C	15~55 (H/P : 25~55)	
Water Side	Piping Connections	In/Out	Ø, inch	1 1/4" (BSPP)	
Hydro Parts	Water Pump	Flow Rate	kg/min	13 / 17.5 / 26	35 / 40 / 46
	Electric Heater	Input Power	W	4,000	6,000
	Expansion Vessel	Volume	Liter	8	
External Dimension	Weight	Net	kg	45	46.5
	Dimensions (WxHxD)	Net	mm	510 x 850 x 315	

EHS Control built-in to Hydro Unit.
Wi-Fi Kit (MIM-H03N) optional accessory.
Control App available to download. (Phone not included.)

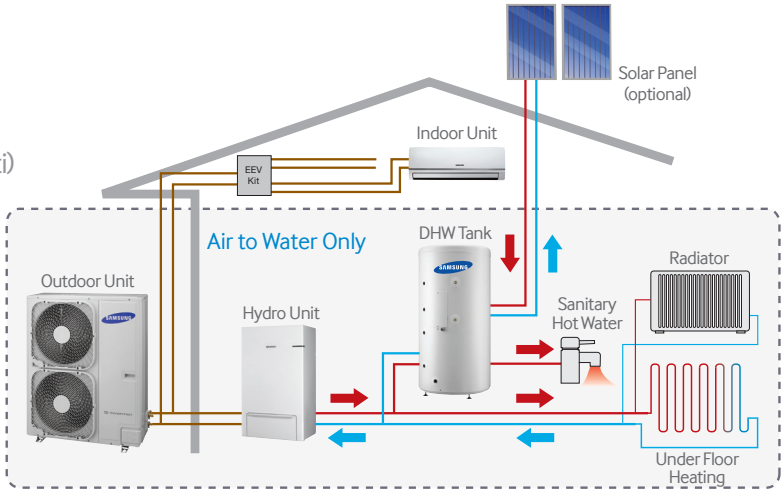
Wi-Fi Kit (MIM-H03N)

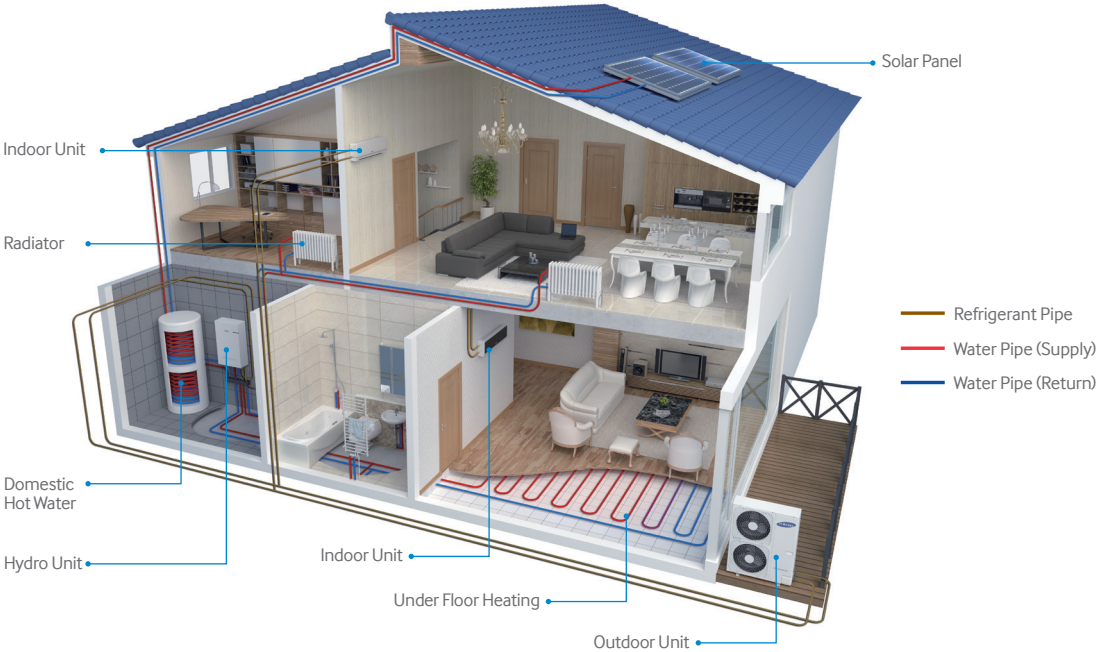


EHS TDM – Comfort for All Seasons

Unique all-season heating and cooling

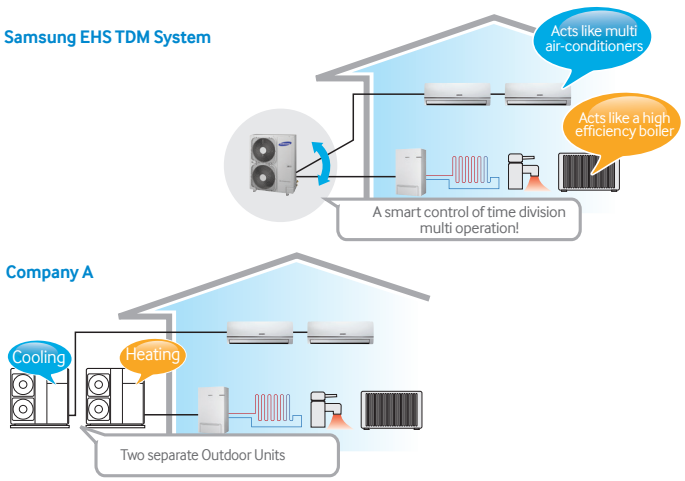
The all-in-one Samsung EHS TDM (Time Division Multi) supports both air-to-air and air-to-water heating and cooling, providing the ultimate indoor climate solution for every season.





Perfect all-in-one system

EHS TDM requires installation of only one outdoor unit. Smart control of TDM operation between air-to-water and air-to-air enables one outdoor unit to operate for both functionalities, resulting in lower product cost and space saving.



Selection of indoor units

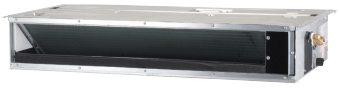
Homeowners can choose the most appropriate indoor unit according to their interior design taste or functional needs.

Neo Forte

This unit's clean panel design with a unique silver accent adds a touch of class to the interior space.

Slim Duct

Concealed behind ceilings, Slim Duct enhances the luxurious ambience of indoor spaces while providing fresh and powerful cool air.



EHS TDM

Outdoor Units

MODEL NAME				RD060PHXEA	RD070PHXEA	RD080PHXEA	RD110PHXEA	RD140PHXEA	RD160PHXEA
Hydro Unit			-	NH080PHXEA			NH160PHXEA		
Mode			-	Heat Pump (A2A/A2W Multi)					
Power Supply			Ø, #, V, Hz	1, 2, 220-240, 50					
Performance (A2W #1)	Nominal Capacity *1)	Heating	W	5,990	6,980	7,970	11,000	13,900	15,900
		Cooling	W	7,020	7,530	8,030	11,300	13,070	10,200
			Btu/h	24,000	25,700	27,400	38,600	44,600	34,800
	Nominal Current Input *1)	Heating	A	6.0	7.3	8.8	10.7	14.2	17.3
		Cooling	A	8.9	10.1	11.6	12.9	17.5	20.8
	COP (Heating) *1)		W/W	4.40	4.26	4.05	4.37	4.26	4.05
	EER (Cooling) *1)		W/W	3.53	3.36	3.12	3.91	4.36	2.91
	ESEER *2)		W/W	5.20	5.50	4.90	5.96	5.66	5.50
Electric Specification	Max Current		A	13.50	16.00	18.00	25.00	28.00	30.00
Refrigerant Side	Refrigerant	Type	-	R410A					
	Piping Connections	Liquid	Ø, mm (inch)	9.52 (3/8")					
		Gas	Ø, mm (inch)	15.88 (5/8")					
	Installation Limitation	Length	m	30			70		
		Height	m	15			30		
Sound	Sound Pressure *3)	Heating	dB(A)	48		49		51	53
		Cooling	dB(A)	48		50		52	54
External Dimension	Weight	Net	kg	71			108		
	Dimensions (WxHxD)	Net	mm	880x798x310			932 x 1,128 x 375		
Operating Range	Ambient (A2W)	Heating	°C	-20 ~ 35					
		Cooling	°C	10 ~ 46					
		DHW	°C	-20 ~ 43					

*1) A2W rating conditions in accordance with Eurovent Rating Standard for Liquid Chilling Packages RS-6/C/001-2011.
*1) A2W Condition #1 : (Heating) Water In/Out 30°C/35°C, Outdoor Air 7°CDB/6°CWB; (Cooling) Water In/Out 23°C/18°C, Outdoor Air DB 35°C.
*2) A2W Condition for ESEER (Cooling) at Water Out 7°C.
*3) Sound Pressure was acquired in an anechoic room. Thus actual noise level may be different depending on the installation conditions.

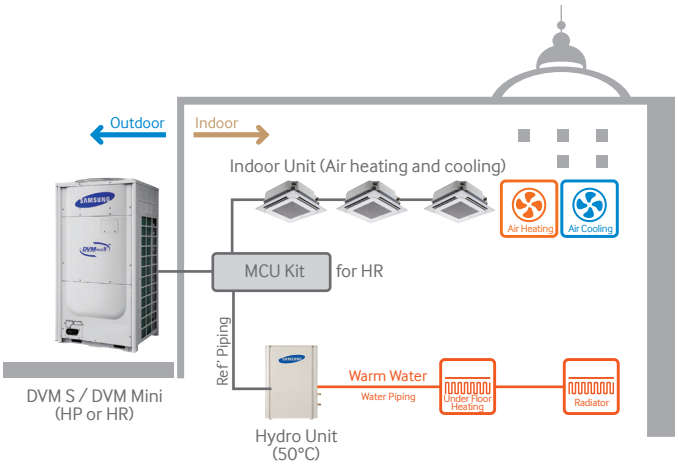
Hydro Units

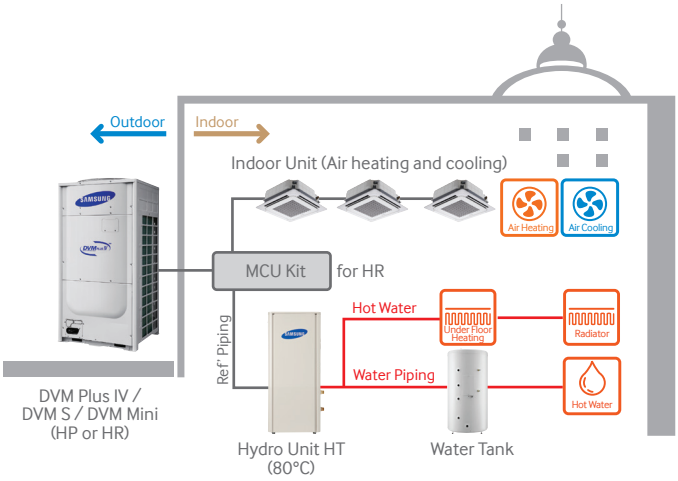
MODEL NAME				NH080PHXEA	NH160PHXEA
Power Supply			Ø, V, Hz	1, 220~240, 50	
Performance	Nominal Capacity	Heating	W	6,000 / 7,000 / 8,000	11,000 / 14,000 / 16,000
		Cooling	W	7,000 / 7,500 / 8,000	11,300 / 14,200 / 15,500
	Leaving Water Temperature Range	Heating	°C	15~55 (H/P : 25~55)	
Water Side	Piping Connections	In/Out	Ø, inch	1 1/4" (BSPP)	
Hydro Parts	Water Pump	Flow Rate	kg/min	17.0 / 20.5 / 23.0	31.5 / 40.1 / 45.9
	Electric Heater	Input Power	W	4,000	6,000
	Expansion Vessel	Volume	Liter	8.0	
External Dimension	Weight	Net	kg	45	48
	Dimensions (WxHxD)	Net	mm	510 x 850 x3 15	

Commercial Units

DVM S – EHS Hydro Unit

Samsung has utilised its residential EHS technology to create a commercial solution, by connecting hydroboxes to its efficient DVM S range of VRF systems. Two types of indoor units in various capacities provide either 50°C or 80°C sanitary water when connected to DVMS Eco, HP, HR or Water systems.





Hydro Unit

MODEL NAME				AM160FNBDEH/EU	AM320FNBDEH/EU	AM500FNBDEH/EU	AM160FNBFEB/EU	AM250FNBFEB/EU
Type				LT (50°C)			HT (80°C)	
Power Supply			Φ, ǂ, V, Hz	1, 2, 220-240, 50				
Mode			-	HP/HR				
Performance	Capacity (Nominal)	Heating *1)		16.0	31.5	50.4	16.0	25.0
Power	Power Input (Nominal)	Heating *1)	W	10.00			3,100	5,000
	Current Input (Nominal)	Heating *1)	A	0.05			14.3	23.1
Piping Connections	Liquid Pipe		Φ, inch	3/8		1/2	3/8	
	Gas Pipe		Φ, inch	5/8	7/8	1 1/8	5/8	
Refrigerant	Type		-	-			R-134a	
	Compressor Type		-	-			Rotary	
Sound	Sound Pressure *2)		dB(A)	27	28	31	42	
Dimensions	Net Weight		kg	29.00	33.00	40.00	104.00	
	Net Dimensions (W×H×D)		mm	518 x 627 x 330			518 x 1,210 x 330	
Operating	Ambient	Temp. Range		-20 ~ 24				
		Hot Water (Main Cooling, HR)	°C	-20.0 ~ 24 (30)			-20.0 ~ 35.0 (-5.0 ~ 43.0)	
	Leaving Water	Heating	°C	20.0 ~ 50.0			25.0 ~ 80.0	

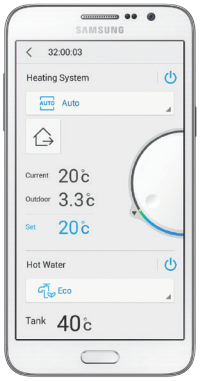
*1) Nominal heating capacities are based on; Water temperature : 55°C inlet, 65°C outlet, Indoor temperature : 20° DB, Outdoor temperature : 7°C DB, 6°C WB
*2) Sound pressure was acquired in an anechoic room. Thus actual noise level may be different depending on the installation conditions.

Model Guide and Wi-Fi Control

			RESIDENTIAL SOLUTION			COMMERCIAL SOLUTION	
	Power Source	kW	EHS Split	EHS Mono	EHS TDM	DVM HE	DVM HT
Outdoor Unit	1P, 220-240V 50Hz	4.0 – 5.0	AE040JXEDEH	AE050JXYDEH			
		6.0	AE060JXEDEH		RD060PHXEA		
		7.0			RD070PHXEA		
		8.0			RD080PHXEA		
		9.0	AE090JXEDEH	AE090JXYDEH			
		11.0			RD110PHXEA		
		12.0	AE120JXEDEH	AE120JXYDEH			
		14.0	AE140JXEDEH	AE140JXYDEH	RD140PHXEA		
		16.0	AE160JXEDEH	AE160JXYDEH	RD160PHXEA		
DVM Outdoor	3P, 380-415V 50Hz	-				DVM S series	DVM S series
DVM EHS Hydro	1P, 220-240V 50Hz	9.0	AE090JNYDEH		NH080PHXEA		
		16.0	AE160JNYDEH		NH160PHXEA	AM160FNBDEH	AM160FNBFEB
		32.0				AM320FNBDEH	AM250FNBFEB
		50.0				AM500FNBDEH	
	3P, 380-415V 50Hz	9.0	AE090JNYDGH				AM160FNBFGB
		16.0	AE160JNYDGH				AM250FNBFGB
Control Kit	1P,220-240V 50Hz	5.0		MIM-E03BN			
		9-16		MIM-E03AN			
Wifi Kit (optional)		-	MIM-H03N	MIM-H03N			

Smart Wi-Fi Control (optional)

- Adjust heating and hot water requirements via a mobile device from anywhere.
- The simple control interface controls the heat pump to ensure a comfortable environment and hot water when required.
- Available for Android or iOS devices, as part of the Samsung Smart Home environmental solution.

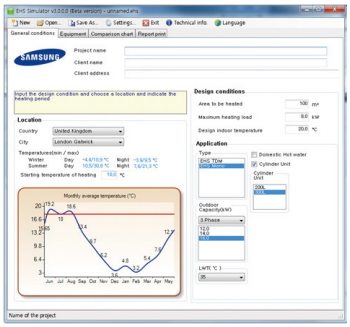


EHS Simulator

Through EHS simulation program, you can select devices and simulate heating load, energy consumption, cost, CO2 emission and LCC (Life cycle cost) analysis according to national/ regional temperature and architectural conditions. Furthermore, simulation report can be submitted to the client in saved file or printed format.

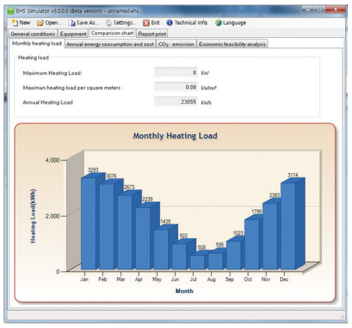
General conditions

Location/Design Conditions/Application Setting



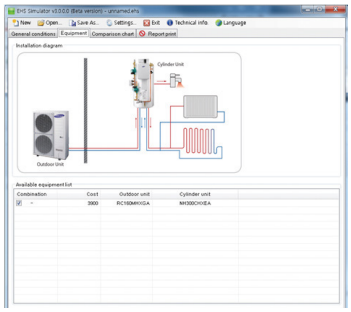
Comparions chart

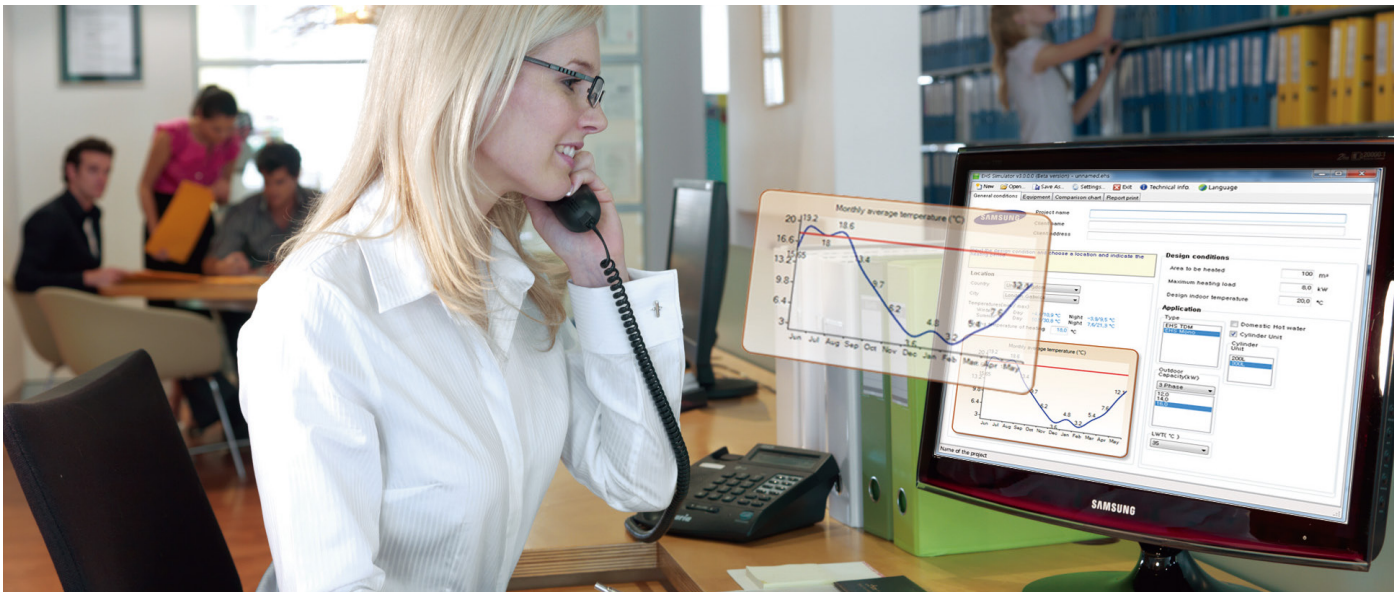
Monthly Heating Load/Annual Energy Consumption and Cost/CO_2 Emission/GHG Benefit /LCC Analysis



Equipment

Installation Diagram/Available Equipment List Check





Renewable Heat Incentive (RHI and MCS)

The government has released a grant scheme called RHI which is designed to encourage end users to choose renewable technologies to heat their house over more conventional fossil fuel systems. The 7-year scheme is designed to bridge the cost gap between existing technologies and renewables.

Who is eligible?

Owner occupiers, private and social landlords, who has had a qualifying air source heat pump installed in their home since 15 July 2009.

The requirements

Applicants will require an energy assessment and an energy performance certificate issued before any renewables are installed. The energy performance certificate (EPC) determines the amount of RHI is eligible as tarifs are not paid for the exact kWh used, even if a meter is installed.

The equipment must be MCS certified (or certified by an equivalent scheme), as must the installation engineer who carries out the survey, installation and comissioning of the heat pump.

Only equipment which is highly efficient and meets the stringent testing criteria will be eligible for MCS. All of Samsung's 5th generation EHS systems exceed the requirements and are MCS-certified.

The RHI will only cover systems considered to be highly efficient; all installations of heat pumps need to reach an average seasonal efficiency SPF of above 2.5.

MCS gives the installer guidelines on how to achieve this and qualify for RHI.

Tarif payments

RHI payments will be paid to the end user quarterly by direct debit for a period of 7 years.

Currently, customers with an air source heat pump will receive 7.42p/kWhr (as of 1 July 2015) of renewable heat provided into the house.

This means that an average 3-bedroom semi-detached house would receive around £500 a year and a bigger detached house would get approximately £800 a year depending.

Example RHI Calculation – Air Source Heat Pump Typical 3-Bedroom New Build	
Estimated Annual Heat Load (from EPC)	15,000kWh
SPF (from MCS Heat Emitter Guide)	2.7
RHI ASHP Tariff (1 July 2015)	7.42p
Estimated Annual Heat Load (total heat demand x (1-1/SPF)	15,000kWh x (1-1/SPF) = 9,444kWh
Totla Annual Domestic RHI Payment (tariff x estimated annual heat load)	£700.74
Quarterly Domestic RHI Payment	£175.18

Learn more about Samsung air conditioners at:
www.samsung.com/uk/ehs

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