SAMSUNG

SAMSUNG

System Air Conditioner

VRF & Chiller Reference Guide Ver.1.0

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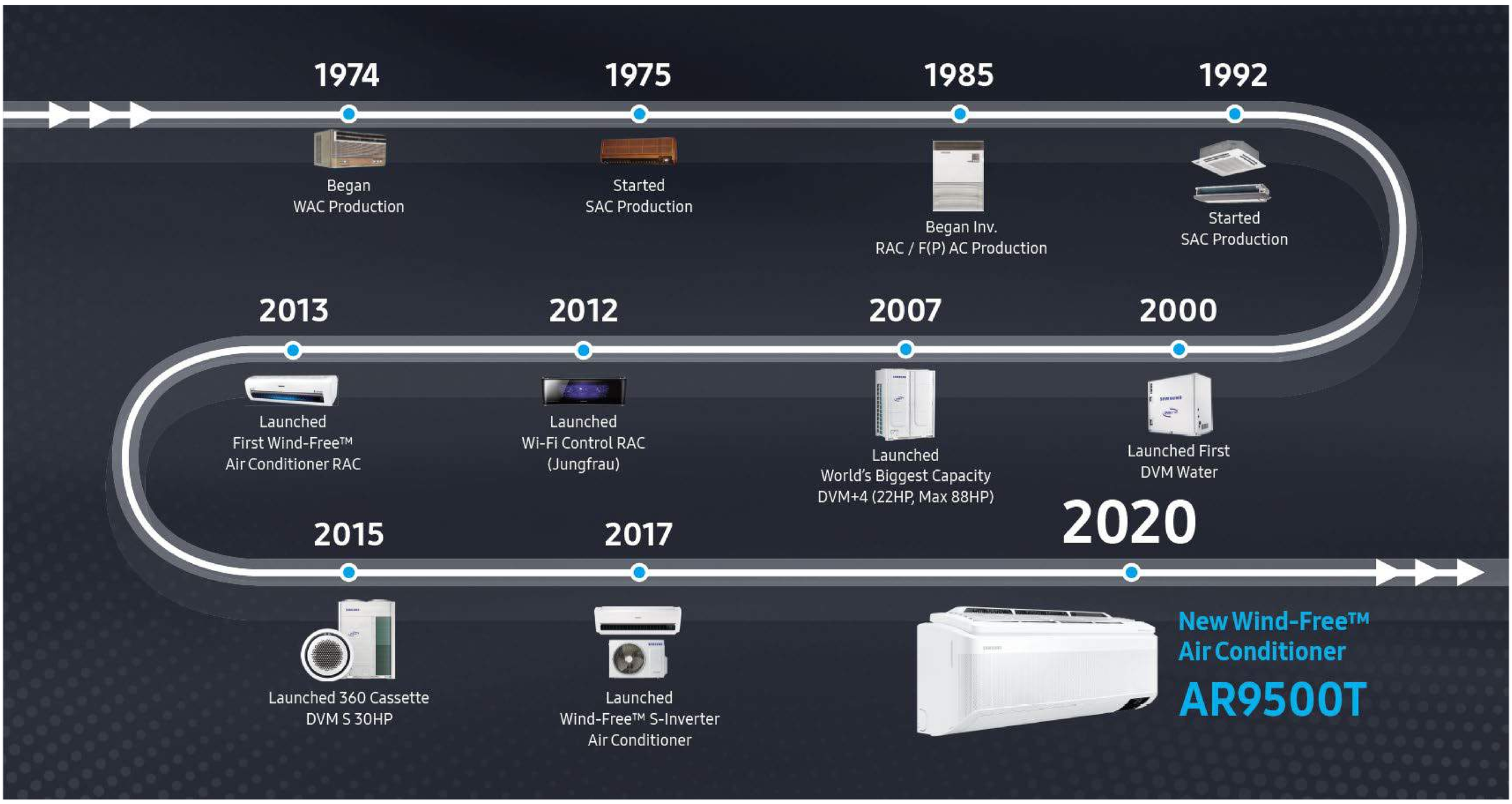
Innovation Milestones

Samsung has been manufacturing air conditioners and challenging the status quo of the industry for over 45 years. Thanks to cutting-edge innovations in design and technology, we will continue to aspire to be a leader in the cooling and heating industry in the years to come.



Worldwide Recognition

Efficiency & Innovation 2018

Organized by Fiera Milano International, 40Th Mostra Convegno Expocomfort 2018 aimed to reward the best product that's shows high level of energy efficiency and innovation, providing To complete overview of the sector along the lines of "Efficiency - Innovation Path." And the Samsung Digital Inverter 8-Pole have been recognized in MCE's "Beyond Class A" initiative for product excellence.

International Design Excellence Awards 2017

Started in 1980 by The Industrial Designers Society of America (IDSA), the International Design Excellence Awards (IDEA) fosters Business and public Understanding about the impact of design excellence on the quality of life and the economy. The IDEA program Is considered the preeminent design competition with entries from over 39 countries. The Samsung floor standing air conditioner received the Silver award in 2017.

Ces Innovation Awards 2017

The CES Award Is given to products submitted to CES based on product design and technological innovation. The award is jointly evaluated by the US Industrial design association and USA CEA(Consumer Electronics Association). The Samsung air conditioner AR9500M received the 2017 CES innovation honoree with it's innovative Wind-Free™ Cooling Technology.

iF Product Design Awards 2017

Ace one of the world's oldest and most prestigious design competitions, the iF product design award You stood for qualitatively outstanding design awards for over 50 years. And the Samsung air conditioner, with it's design Innovations was selected ace To finalist in 2017. Samsung air conditioner continues To receive worldwide recognition and awards, proving the high quality of it's functions and beauty.

Basic Information

Unit conversion

Air Conditioning Capacity

	Kcal/h	Btu/h	(US) Rt	(JP) Rt	kW	HP	HP Nominal
Kcal/h	1	3.986	0.0003306	0.0003012	0.001162	0.00155	0.0004
Btu/h	0.252	1	0.0000833	0.0000759	0.000293	0.00039	0.00001
(US) Rt	3024	12000	1	0.91	3.57142	4.69	1.251
(JP) Rt	3320	13174.6	1097	1	3.861	5.149	1.373
kW	860	3.412	0.2843	0.259	1	1.333	0.3555
HP	640	2559.5	0.213	0.1942	0.75	1	0.2667
HP Nominal	2400	9598.1	0.799	0.728	2.81	3.75	1

Pressure

	Kgf/cm^2	bar	Pa	atm	psi	inH_2O
Kgf/cm^2	1	0.98065	98,066.50	0.9678	14.22339	393.7
bar	10,197	1	100,000	0.9869	14.5038	401.4628
Pa	0.0000102	0.00001	1	0.00001	0.000145	0.004015
atm	1.0332	1.01325	101,325	1	14.696	406.782
psi	0.070307	0.68947	6,894.70	0.068046	1	27.67979
inH_2O	0.00254	0.00249	249.089	0.002458	0.036127	1

Basic Information

Unit conversion

Copper Pipe Size

Pipe Size		Minimum thickness		Temper Grade
mm	inch	mm	inch	
6.35	1/4	0.70	1/32	Annealed type C1220T-O
9.52	3/8	0.70	1/32	
12.70	1/2	0.80	1/32	
15.88	5/8	1.00	1/16	
19.05	3/4	0.90	1/16	Drawn type C1220T-1/2H or C1220T-H
22.22	7/8	0.90	1/16	
25.40	1	1.00	1/16	
28.58	1 1/8	1.10	1/16	
31.75	1 1/4	1.10	1/16	
34.92	1 3/8	1.21	1/16	
38.10	1 1/2	1.35	1/16	
41.28	1 5/8	1.43	1/16	
44.45	1 3/4	1.60	1/16	
50.80	2	2.00	1/16	
53.98	2 1/8	2.10	1/16	

Air Flow

	m^3/s	m^3/min	l/s	l/min	m^3/h	ft^3/s	CFM
m^3/s	1	6x10	$1x10^3$	$6x10^4$	$3.6x10^3$	3.531x10	$2.118x10^3$
m^3/min	$1.66666x10^{-2}$	1	1.66666x10	$1x10^3$	6x10	$5.885x10^{-1}$	3.531x10
l/s	$1x10^{-3}$	$6x10^{-2}$	1	$6x10^4$	3.6	$3.531x10^{-2}$	2.118
l/min	$1.66666x10^{-5}$	$1x10^{-3}$	$1.666x10^{-2}$	1	$6x10^{-2}$	$5.9x10^{-4}$	$3.54x10^{-2}$
m^3/h	$2.77777x10^{-4}$	$1.66666x10^{-2}$	$2.77777x10^{-1}$	1.66666x10	1	$9.81x10^{-3}$	$5.886x10^{-1}$
ft^3/s	$2.832x10^{-2}$	1.69833	2.832x10	$1.69833x10^3$	$1.019x10^2$	1	6x10
CFM	$4.72x10^{-4}$	$2.831x10^{-2}$	0.472	2.831x10	1.6983	$1.66666x10^{-2}$	1

External Static Pressure

	Pa	mmAq	inAq	Kgf/cm^2	atm	bar	lbf/in
Pa	1	$1.019x10^{-1}$	$4.017x10^{-3}$	$1.019x10^{-5}$	$9.869x10^{-6}$	$1x10^{-5}$	$1.450x10^{-4}$
mmAq	10	1	$3.939x10^{-2}$	$1x10^{-4}$	$9.678x10^{-5}$	$9.806x10^{-5}$	$1.442x10^{-3}$
inAq	$2.49x10^2$	25	1	$2.54x10^{-3}$	$2.46x10^{-3}$	$2.49x10^{-3}$	$3.61x10^{-2}$
Kgf/cm^2	$9.80665x10^4$	$1x10^4$	$3.937x10^2$	1	0.9678	0.980665	14.22334
atm	$1.01325x10^5$	$1.0332x10^4$	$4.071x10^2$	1	1	1.01325	14.696
bar	$1x10^5$	$1.0197x10^4$	$4.018x10^2$	1.101972	0.986923	1	14.5038
lbf/in	$6.895x10^3$	$7.031x10^2$	27.686	$7.031x10^{-2}$	$6.805x10^{-2}$	$6.895x10^{-2}$	1

Product Nomenclature

Indoor Unit

Model Name

AM	005	T	N	V	D	C	H	/	AA
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		Buyer

(1) Classification

AC	CAC (Split)
AE	EHS
AG	DVM Chiller
AJ	FJM (Multi split)
AM	DVM (VRF)
AN	ERV (Ventilation)

(2) Capacity

x 1 kBTU/h (3 digits) for Buyer AA or AZ
x 1/10 kW (3 digits) for Buyer EU, TL
Air Volume (m³/h) for ERV

(3) Version

F	2013
H	2014
J	2015
K	2016
M	2017
N	2018
R	2019
T	2020

(4) Product Type

N	Indoor Unit (NASA)
X	Outdoor Unit (NASA)

(5) Product Notation

1	1Way Cassette
2	2Way Cassette
4	(Wind-Free) 4Way Cassette
N	(Wind-Free) 4Way Cassette(600x600)
L	LSP Duct
M	MSP Duct
H	HSP Duct
E	OAP Duct
T	Boracay EEV Not Included
Q	Boracay EEV Included
A	Wind-Free EEV Not Included
V	Wind-Free EEV Included
C	Ceiling
J	Console
F	Floor Standing
P	PAC
K	ERV Plus
B	Hydro Unit

(6) Feature

F	Flagship
P	Premium
D	Deluxe
S	Standard

(7) Rating Voltage

C	208~230V, 60Hz, 1Φ
E	220~240V, 50Hz, 1Φ
K	220~240V, 50/60Hz, 1Φ
G	380~415V, 50Hz, 3Φ

(8) Mode

C	Cooling Only (R410a)
H	Heat Pump (R410a)
B	Heat Pump (R134a)

Product Nomenclature

Outdoor Unit

Model Name

AM	200	M	X	V	A	J	C	/	AZ
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		Buyer

(1) Classification

AC	CAC (Split)
AE	EHS
AG	DVM Chiller
AJ	FJM (Multi split)
AM	DVM (VRF)
AN	ERV (Ventilation)

(2) Capacity

x 1/10 HP (3 digits) for Buyer AZ, TC, TL, EU, ET
x 1 kBTU/h (3 digits) for Buyer AA

(3) Version

F	2013
H	2014
J	2015
K	2016
M	2017
N	2018
R	2019
T	2020

(4) Product Type

N	Indoor Unit (NASA)
X	Outdoor Unit (NASA)

(5) Feature 1

M	DVM S Eco
V	DVM S
W	DVM Water

(6) Feature 2

A	Standard + General Temp.+ Module
H	High EER + Low Temp. + Module
G	High EER + General Temp. + Module
D	Standard + General Temp. + Non-Module

(7) Rating Voltage

C	1Ø, 208~230V, 60Hz
E	1Ø, 220~240V, 50Hz
G	3Ø, 380~415V, 50Hz
N	3Ø, 380~415V, 50/60Hz
H	3Ø, 380V, 60Hz
F	3Ø, 208~230V, 60Hz
J	3Ø, 460V, 60Hz

(8) Mode

H	Heat Pump (R410a)
R	Heat Recovery (R410a)
C	Cooling Only (R410a)

(9) Category

A	Anti Corrosion (Corrosion Resistance)
/	Non Anti Corrosion
1~9	Version

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VRF Design

Indoor Unit Features

- Capacity Range
- Wind-Free & 360 Cassette Solution
- Wind-Free Wall-Mounted Solution
- Ceiling & Floor Standing
- Ducted Units
- Air Handled Units
- Water Solution (CST F&C and Hydro)
- Ventilation

Outdoor Unit Features

- Capacity Range
- Air Sourced CO, HP & HR
- Water Sourced
- DVM Chiller

Cassette Units - Capacity Range - 50 Hz

Model		Capacity (kW)														
		1.5	1.7	2.2	2.8	3.2	3.6	4.5	5.6	6.0	7.1	8.2	9.0	11.2	12.8	14.0	16.0
Wind-Free 1Way CST	JSF-0		✓	✓													
	JSF-1			✓	✓		✓										
	JSF-2								✓		✓						
2Way CST									✓		✓						
Wind-Free 4Way CST (600X600		✓		✓	✓		✓	✓	✓	✓							
Wind-Free 4Way CST								✓	✓		✓		✓	✓	✓	✓	
360 CST								✓	✓		✓		✓	✓	✓	✓	

Wall Mounted - Capacity Range - 50 Hz

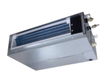
Model	Capacity (kW)															
	1.5	1.7	2.2	2.8	3.2	3.6	4.5	5.6	6.0	7.1	8.2	9.0	11.2	12.8	14.0	16.0
Boracay	✓		✓	✓		✓	✓	✓		✓						
Boracay (with EEV)	✓		✓	✓		✓	✓	✓		✓						
Wind-Free	✓		✓	✓		✓	✓	✓		✓	✓					
Wind-Free (with EEV)	✓		✓	✓		✓	✓	✓		✓	✓					

Floor Standing - Capacity Range - 50 Hz

Model	Capacity (kW)															
	1.5	1.7	2.2	2.8	3.2	3.6	4.5	5.6	6.0	7.1	8.2	9.0	11.2	12.8	14.0	16.0
Floor Standing Unit							✓		✓		✓					
Ceiling									✓		✓		✓		✓	
Console				✓	✓		✓	✓	✓							

✓ Product Innovation

Duct Units - Capacity Range - 50 Hz

Model	Capacity (kW)															
	1.7	2.2	2.8	3.2	3.6	4.5	5.6	7.1	8.2	9.0	11.2	12.8	14.0	18.0	22.0	28.0
Duct S (MSP)																
Slim Duct																
MSP Duct																
Home Duct																
HSP Duct																
Big Duct																

Ventilation Units - Airflow Range - 50 Hz

Model	Capacity (m³/h)				
	260	350	500	800	1000
ERV					

Model	Capacity (kW)															
	2.8	3.2	3.6	4.5	5.6	6.0	7.1	8.2	9.0	11.2	12.8	14.0	18.0	22.0	28.0	45.0
ERV Plus																
OAP Duct																

Hydro Units - Capacity Range - 50 Hz

Model	Capacity (kW)															
	2.8	3.2	3.6	4.5	5.6	6.0	7.1	8.2	9.0	11.2	12.8	14.0	18.0	22.0	28.0	45.0
Hydro Unit LT																
Hydro Unit HT																

Cassette Units - Capacity Range - 60 Hz

Model		Capacity (MBH)															
		5.0	7.5	9.5	12	15	18	20	24	30	36	42	48	54	60	76	96
Wind-Free 1Way CST	JSF-1		✓	✓	✓												
	JSF-2						✓		✓								
2Way CST																	
Wind-Free 4Way CST (600X600																	
Wind-Free 4Way CST																	
360 CST																	

Wall Mounted - Capacity Range - 60 Hz

Model	Capacity (MBH)															
	5.0	7.5	9.5	12	15	18	20	24	30	36	42	48	54	60	76	96
Boracay																
Boracay (With EEV)																
Wind-Free	✓	✓	✓	✓	✓	✓		✓	✓							
Wind-Free (with EEV)	✓	✓	✓	✓	✓	✓		✓	✓							

Floor Standing - Capacity Range - 60 Hz

Model	Capacity (MBH)															
	5.0	7.5	9.5	12	15	18	20	24	30	36	42	48	54	60	76	96
Floor Standing Unit																
Ceiling																
Console																

✓ Product Innovation

Duct Units - Capacity Range - 60 Hz

Model	Capacity (MBH)															
	5.0	7.5	9.5	12	15	18	20	24	30	36	42	48	54	60	76	96
Duct S (MSP)																
Slim Duct																
MSP Duct																
HSP Duct																
Big Duct																
Multi Position																

Ventilation Units - Airflow Range - 60 Hz

Model	Capacity (m³/h)				
	260	350	500	800	1000
ERV					

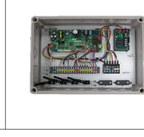
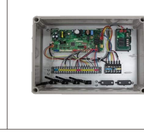
Model	Capacity (MBH)															
	7.5	9.5	12	15	18	20	24	30	36	42	48	54	60	72	76	96
ERV Plus																
OAP Duct																

Hydro Units - Capacity Range - 60 Hz

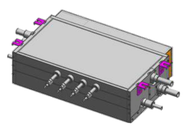
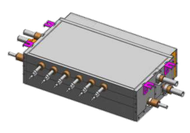
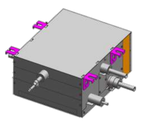
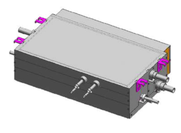
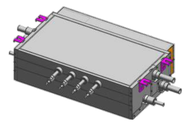
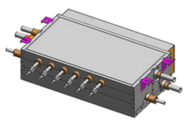
Model	Capacity (MBH)															
	9.5	12	15	18	20	24	30	36	42	48	54	60	72	76	96	153
Hydro Unit LT																
Hydro Unit HT																

AHU Kit - Capacity Range

Model	Capacity (MBH)							
	21.6 ~30.0	43.2 ~ 60.0	64.8 ~ 85.0	86.4 ~ 120.0	86.4 ~ 119.0	172.8 ~ 239.0	259.2 ~ 358.0	345.6 ~ 478.0
AHU Kit (50 / 60 Hz)								

Model	Capacity (MBH)												
	7~18	7~30	30~42	42~60	60~72	72~96	96~144	144~192	192~240	240~288	288~336	336~384	384
Universal Comm. Kit (Only 60 Hz)													

Mode Control Unit - Capacity Range

Model	Capacity (MBH)					
	54.0	76	76	108.0	216.0	216.0
Max. IDU	8	12	18	16	32	32
Max. IDU per branch	8	3	3	8	8	8
# of branch	1	4	6	2	4	6
DVM S Eco		 MCU-R4NEK0N	 (Sub) MCU-S6NEK3N			
DVM S DVM S Water	 MCU-S1NEK1N			 MCU-S4NEK3N	 MCU-S6NEK2N	 MCU-S6NEE1N

Indoor Units - Wind-Free 1 Way CST

Product benefits versus Duct Type

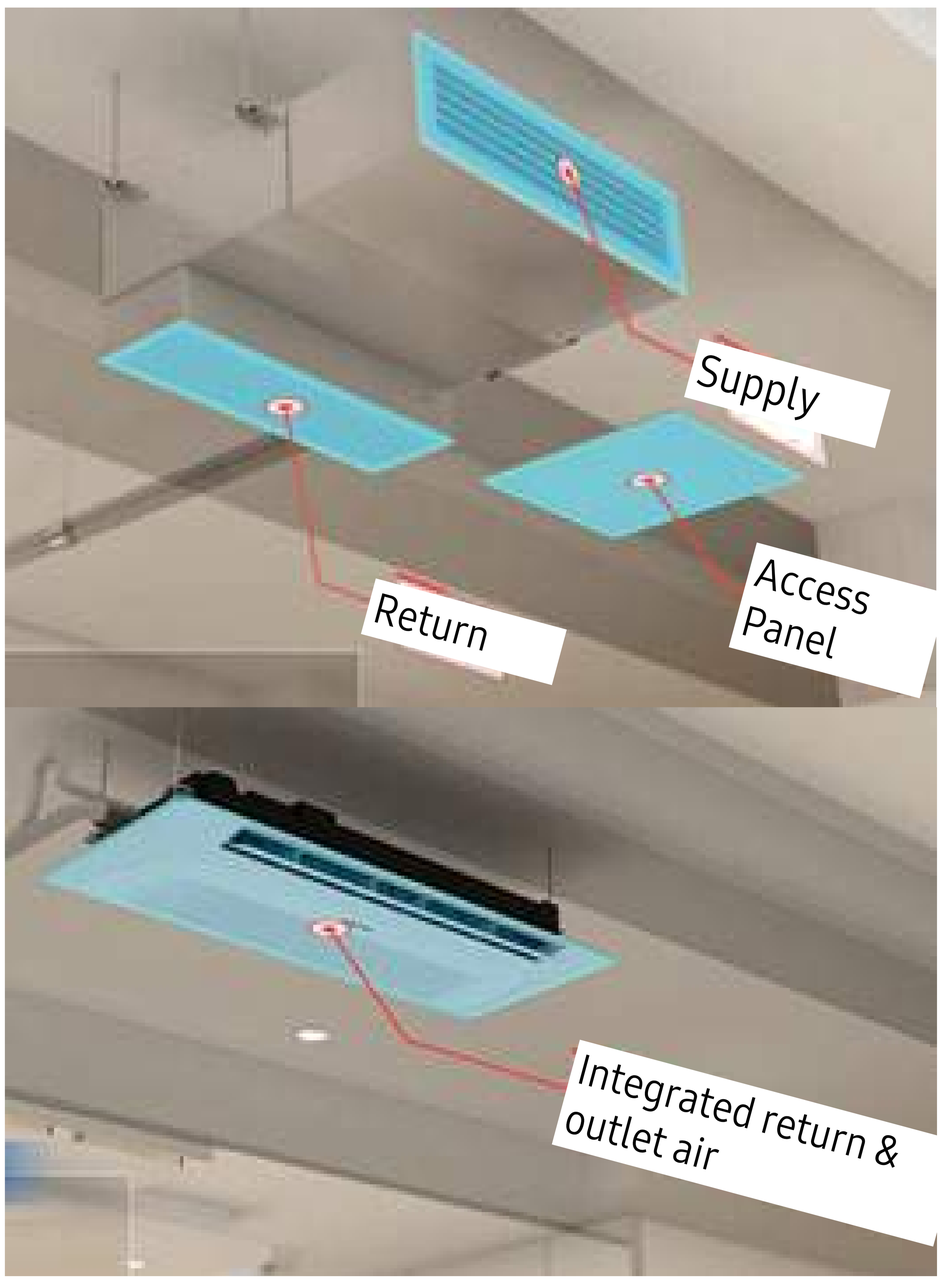
Samsung 1Way Cassette is an optimized air solution that suits both practical and aesthetic needs with its simple design and efficient cooling operation. The duct is not necessary for the 1-way cassette and filter cleaning is easier, keeping the air clean efficiently and economically.

Less ceiling space height for installation

In contrast, 1Way cassette requires at least ceiling height 155mm for installation since it has a slim & compact size. Thus it can save installation height 35% compared to the similar capacity ducted unit. and if installing 1Way Cassette instead of the slim duct in 40 story building, about 3.4 m of building total height can be reduced.

Simple installation with a saving cost

When installing a Ducted unit, it needs at least 3 ceiling openings, but when installing a 1Way cassette, it needs only one opening. therefore, installers could minimize their installation effort and save cost by selecting 1Way cassette.



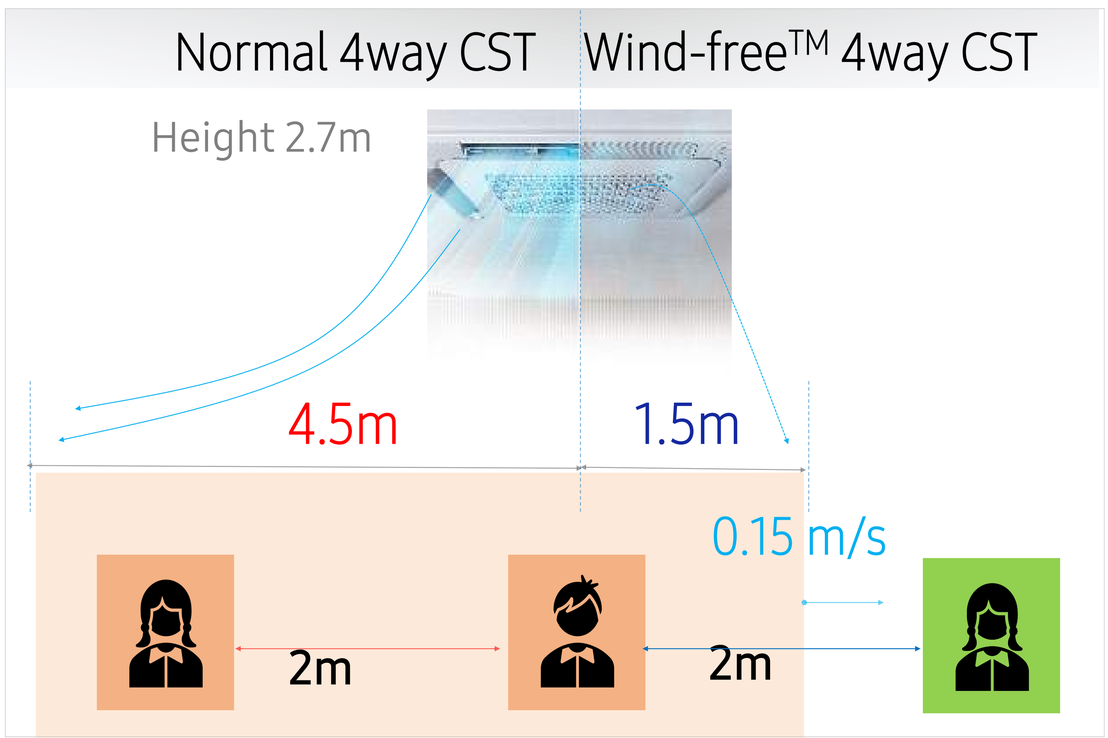
Even air distribution

The ducted unit provides limited air distribution because its air outlet direction is not adjustable so it causes a cold draft and uneven cooling. whereas, 1Way cassette provides even & comfort air distribution by adjusting supply louver 30~80° so it makes the room more pleasant and comfortable.

Indoor Units - Wind-Free CST Solution

Stay Cool without direct wind

Wind-Free™ Cooling effectively maintains a comfortable level of coolness without the unpleasant feeling of cold wind. Cool air is gently dispersed through 10,000 (9,000 for 4Way Mini 9,000 and 15,000 for 4Way CST) micro air holes, so you don't feel too hot or cold.



Stay Cool without direct wind

The airflow speed of Wind-Free TM air-conditioner is less than 0.15m/s at a point of 1.5m away from air-conditioner. It is called 'Still air' and you hardly feel wind.
So, you can stay safe just 2m away from someone else.

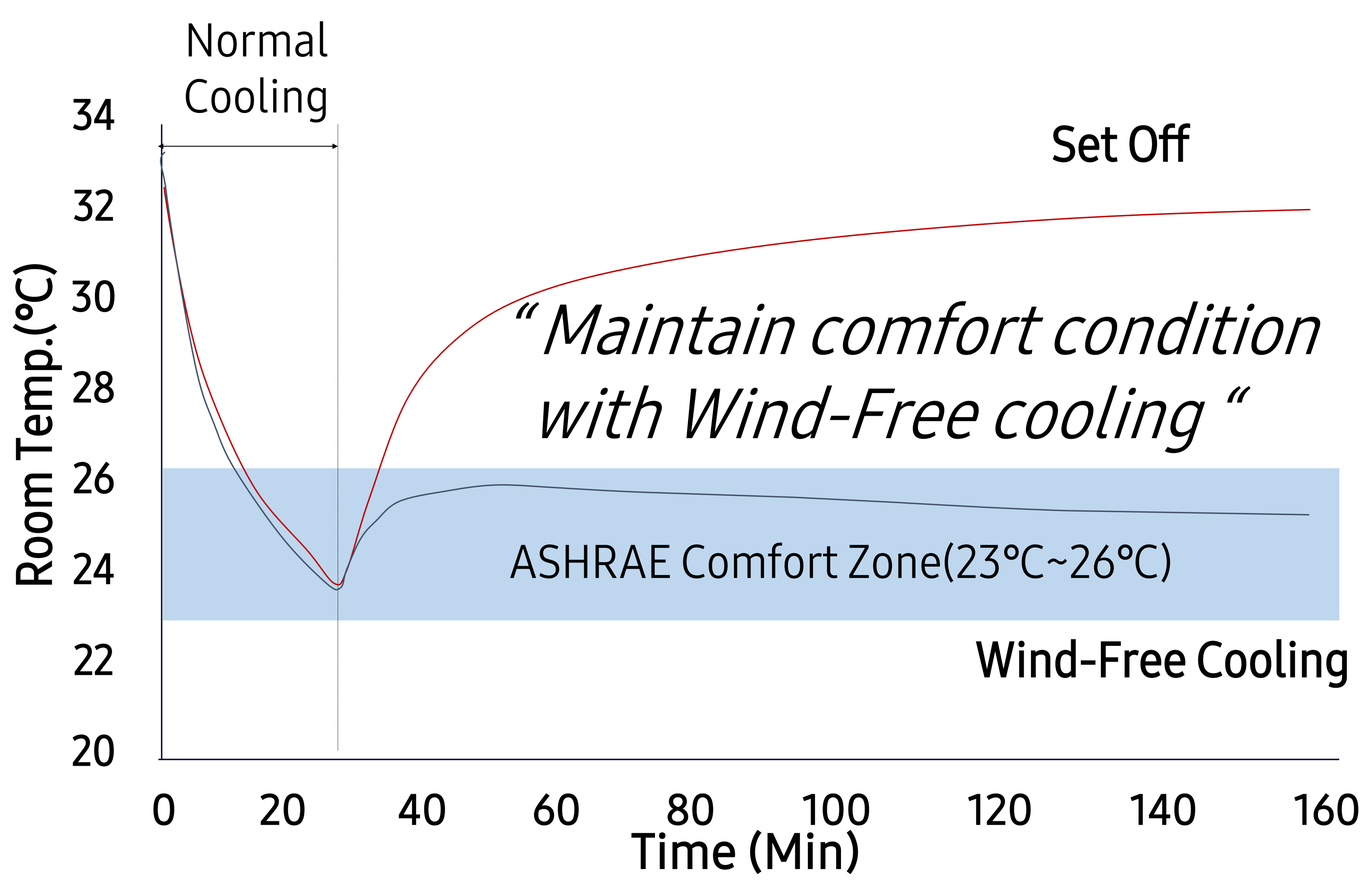
※ ASHRAE defines Still-Air as a wind that flows under 0.15m/s, without cold draft.

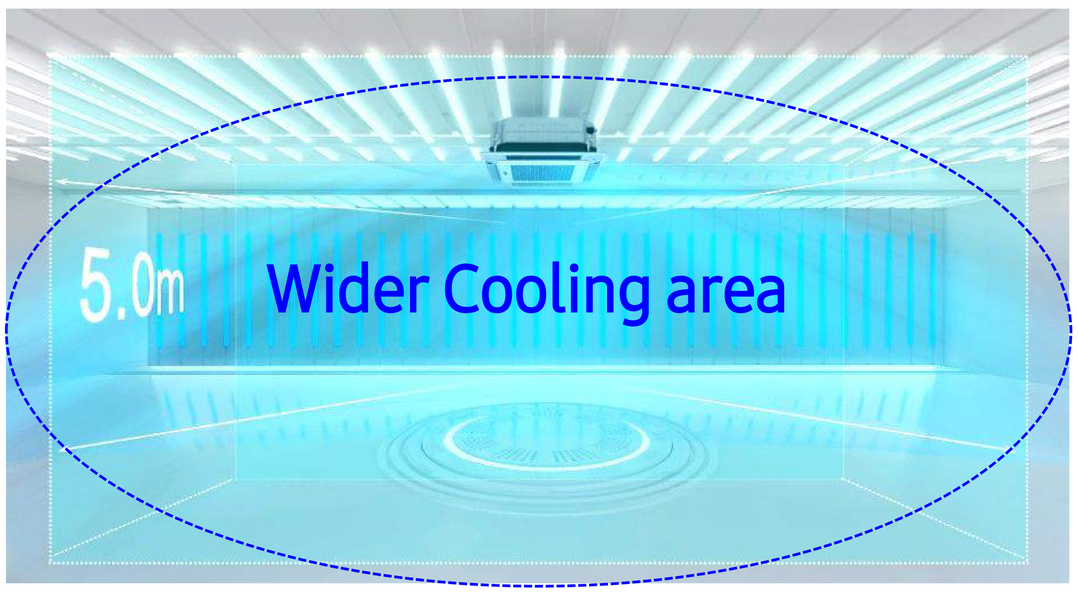
Energy saving with Wind-Free

Wind-Free™ Cooling allows efficient energy saving by 55% with comfortable temperature for more than 8 hours

Test Condition

- Model : Wind-Free 4Way 14.0 kW
- Temp. : OD 35℃ DB / 24℃ WB
  ID 27℃ DB / 19℃ WB

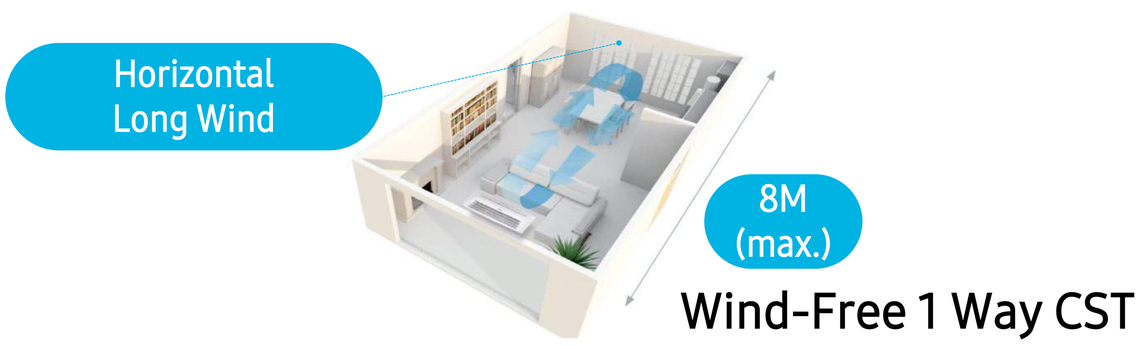




Wind-Free 4 Way CST — 5M (max.)
Wind-Free 4 Way Mini CST — 2.5M (max.)

Faster cooling in wide air throw

Wider and bigger blade cools large area much faster, without leaving dead zone.



Wind-Free 1 Way CST

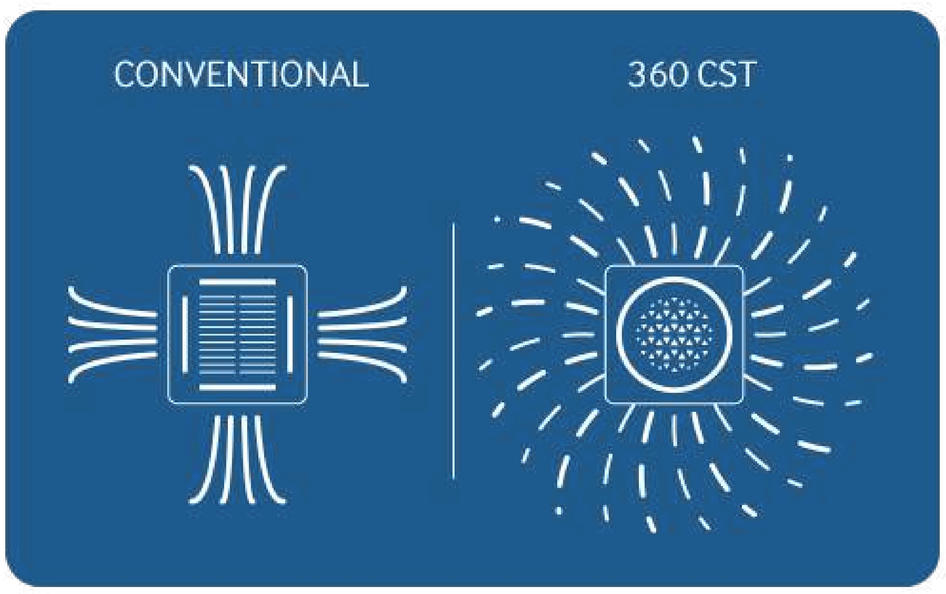
Indoor Units - 360 CST Solution

Stay Cool without direct wind

360 Cassette provide Perfect Even Cooling With Omnidirectional Flow Discharge.
Temperature deviation is smaller than 0.6℃ within 9.3m diameter area

Functionality meets Design

360 Cassette can be applied in all places from luxury shops and conference rooms to your ordinary café. Design of 360 Cassette blends in naturally to different interiors and adds something special to the space, with availability of 2 types of panel

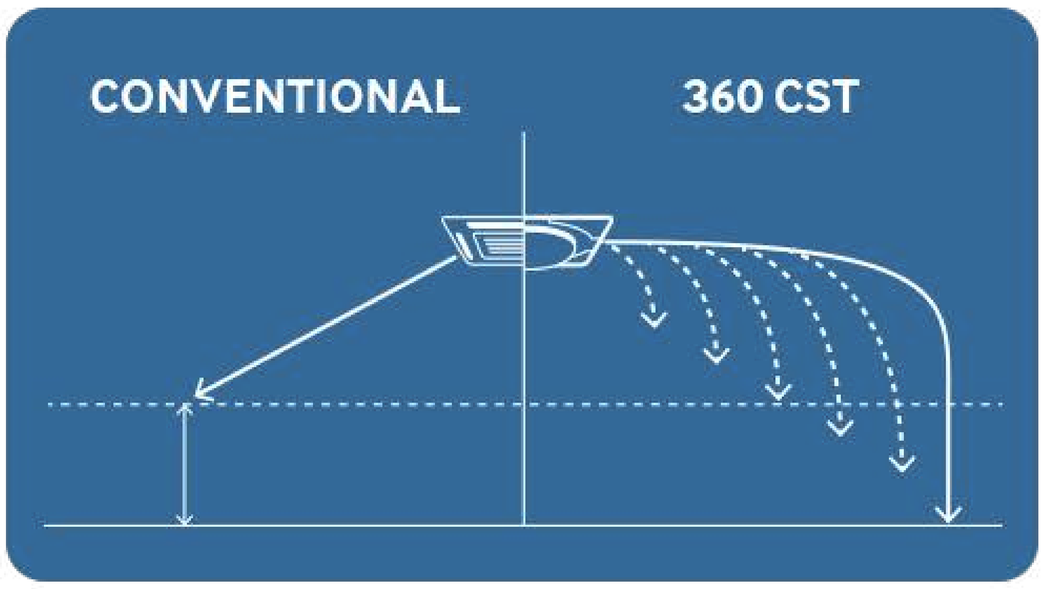


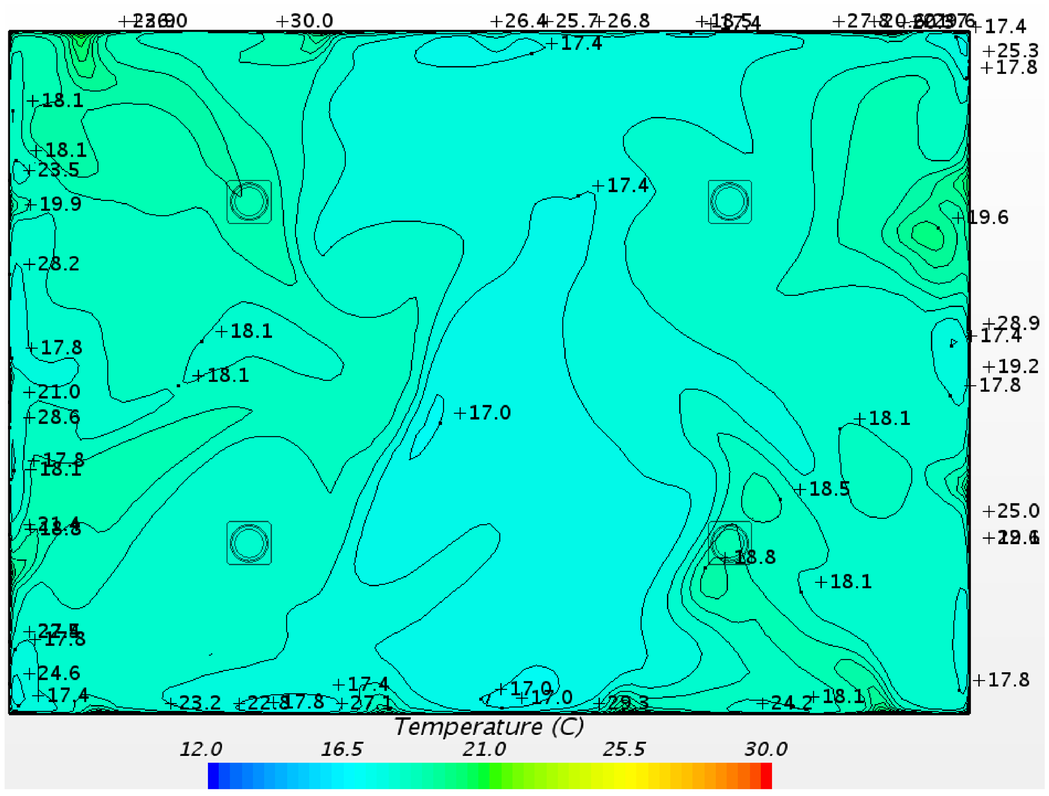
Evenly circulates & cools every corner

Unlike 4-way, cassette type air conditioners that create areas of uneven airflow where cool air can’t reach*, a circular outlet blows cool air in all directions, so every corner of a room is the same temperature.

Comfortable cool, not unpleasantly cold

A bladeless design softly disperses cool air across the room, making you comfortably cool without feeling a cold draft**. With no blades to block the air flow, it also expels 25% more air* and spreads it farther.





Spreads more air in more ways

An innovative Booster Fan enables cool air to be expelled at much lower angles. It creates a low pressure area around the outlet, so that cool air comes out parallel to the ceiling and disperses across a wider area.

Indoor Units - CST Solution

- An best combination of economic and flexible installation for Small Offices, large open area, hotel bedrooms and retail. Drain pumps are included.
- Direct connection to fresh air is possible at up to 5% of the total indoor unit airflow

	Model	Capacity Range [MBH]	Air Throw [m]	Ceiling Height [mm]	Min. Sound Pressure [dB(A)]	Max. Fresh Air
	AM___NN1_____	7~12	8	135	27	-
	AM___NN1_____	18~24	8	138	31~34	-
	AM___FN2_____	18~24	3	230	35~37	2~3%
	AM___NNN_____	5~20	4	250	23~35	2~3%
	AM___NN4_____	9~24	4	204	30~33	2~3%
	AM___NN4_____	30~48	5	288	35	2~3%
	AM___KN4_____	9~24	5	233	29~30	5~4%
	AM___KN4_____	30~48	6	317	32~35	2~3%

- What should be considered in the installation?

1. Installation Height: 2.7~4.6m
2. 2m away from Projector
3. 1.5m away from Fire Detector
4. Inspection hole (450x450 mm)
5. Avoid Wall or Pilar which can block airflow (1.5m or more)
6. Install away from lighting apparatus that uses ballast stabilizer

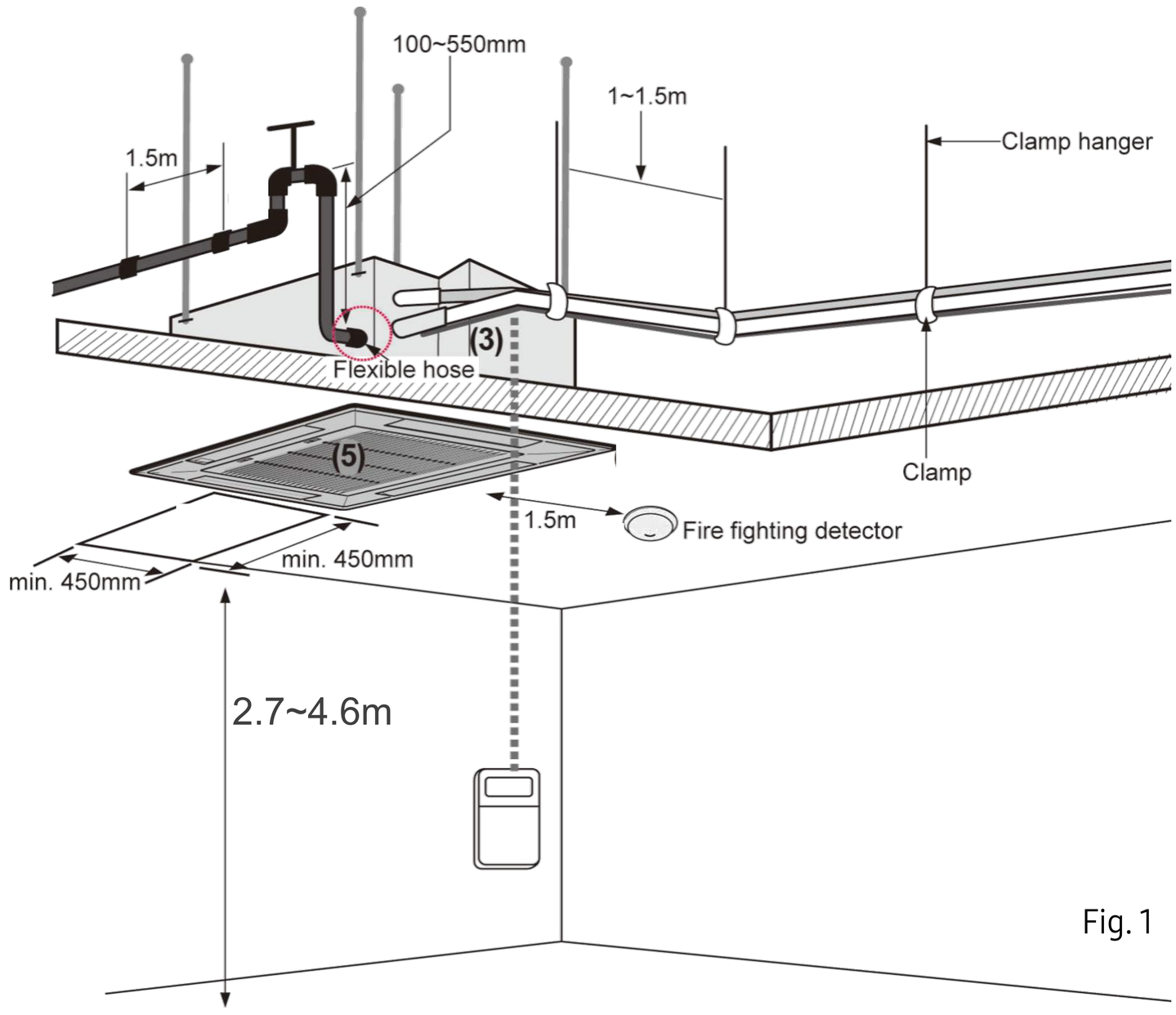


Fig. 1

Indoor Units - Wind-Free Wall Mount Unit

Stay Cool without direct wind

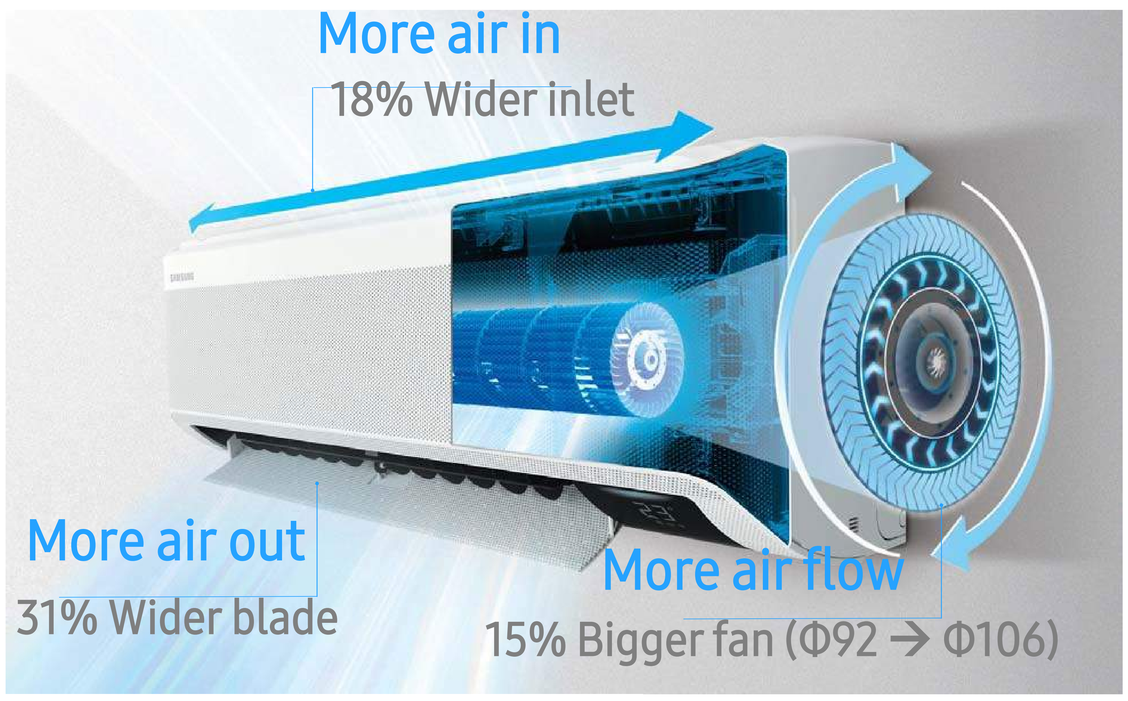
Wind-Free™ Cooling effectively maintains a comfortable level of coolness without the unpleasant feeling of cold wind. Cool air is gently dispersed through 23,000 micro air holes, so you don’t feel too hot or cold.

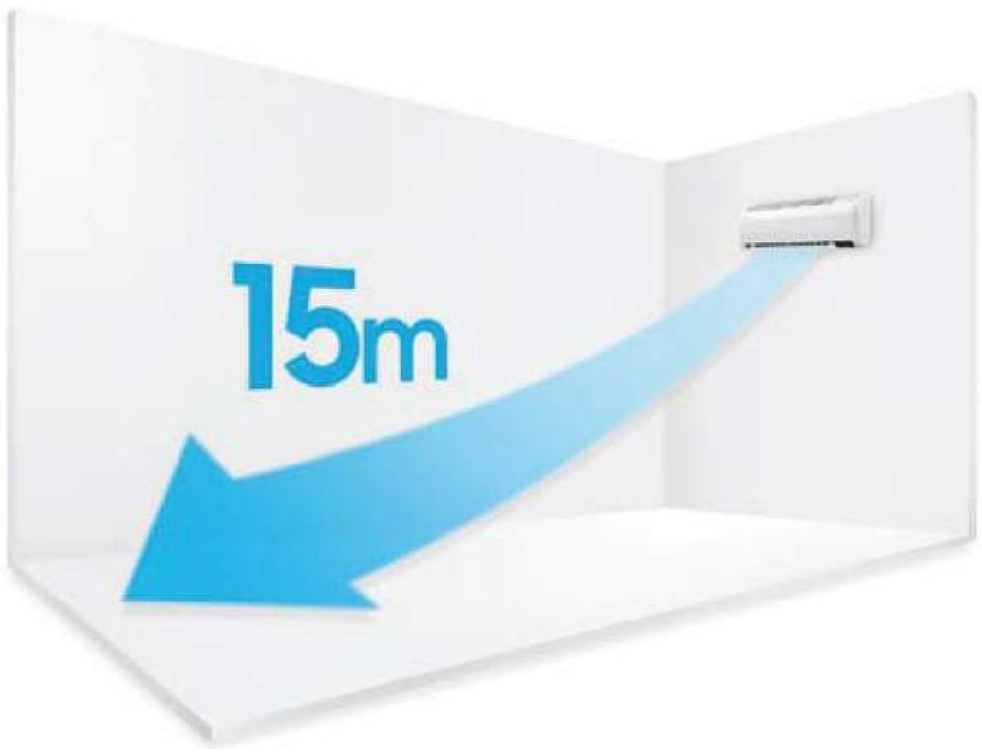
Easy to clean anti-bacterial filter

Keep your air conditioner working efficiently with less effort. The Easy Filter Plus is located outside, on the top, so it can easily be taken out and cleaned. Its dense mesh keeps the Heat Exchanger clean and an anti-bacterial coating helps protect you against dangerous airborne contaminants.

Designed to cool faster, wider & farther

Cool rooms quickly from corner to corner, so you’re always comfortable. Its advanced design also has a 15% larger fan, 18% wider inlet and a 31% wider blade. So cool air is dispersed farther and wider*, reaching up to 15 meters (24 MBH model).



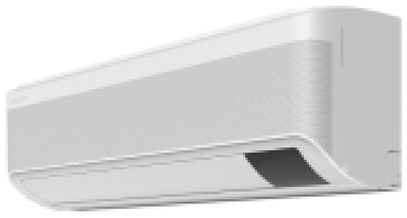
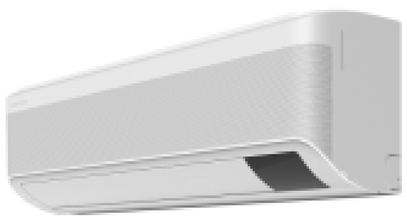


Fast Cooling

Cools corner to corner, so you always feel comfortable whenever you want and wherever you are. With advanced design the So cool air is dispersed farther and wider into every corner of a room, reaching up to 15 meters. (Air velocity 0.25 m/s on 0.6 m height for 24 MBH Model).

Indoor Units - Wall Mounted Solution

- An economical and easy installation for environments such as bedrooms, hotels and small offices, retail with no void space / enclosure to hide indoor units chassis.

Model		Capacity Range [MBH]	Max. Allowable height difference between IDU [m]		Min. Sound Pressure [dB(A)]
			Only Wall Mounted	With Wall Mounted	
	AM___TNA_____	5~12	50	50	27~34
	AM___TNA_____	15~28			33~43
	AM___TNV_____	5~12	15 for H/P, H/R 50 for CO	30 for H/P, H/R 50 for CO	27~34
	AM___TNV_____	15~28			33~43
	AM___KNT_____	7~12	50	50	25~29
	AM___KNT_____	18~24			33~35
	AM___KNQ_____	7~12	15 for H/P, H/R 50 for CO	30 for H/P, H/R 50 for CO	25~29
	AM___KNQ_____	18~24			33~35

- What should be considered in the installation?

1. Max. 32 Wall-mounted units with EEV can be connected to one system.

2. In case of the system designed by mixing a wall mounted type with other type of indoor unit, the wall mounted type of unit must be installed within 15m(49ft) from the lowest indoor unit . See Fig. 2

3. Decide the position & direction of pipe & drain hose

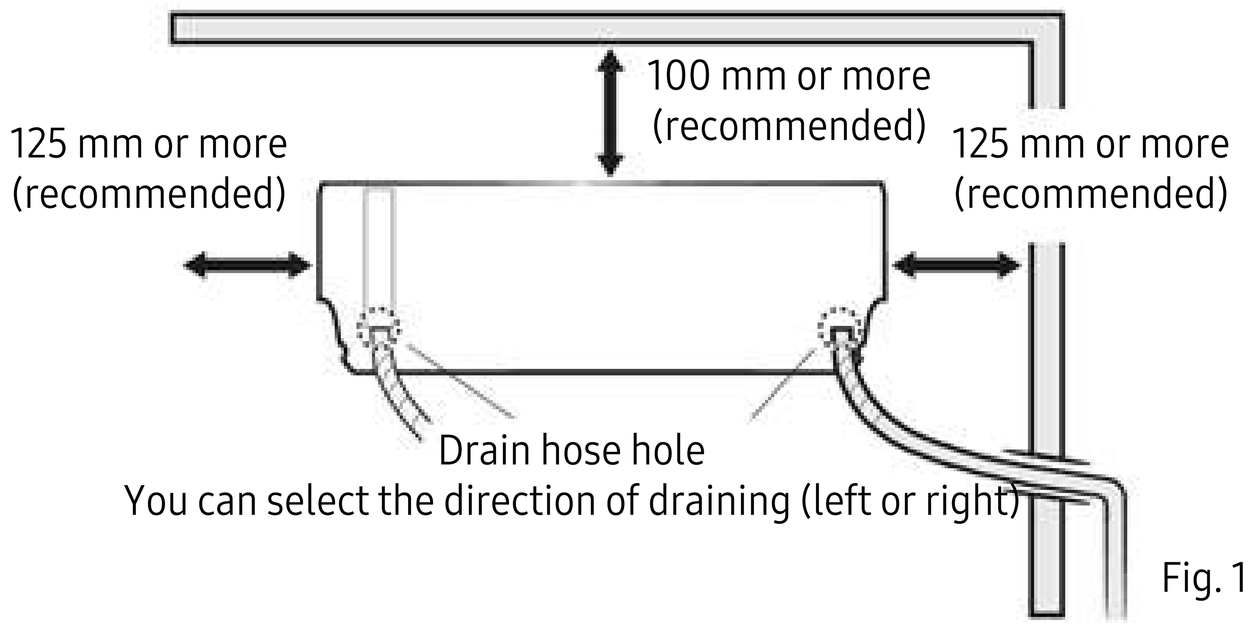


Fig. 1

[MBH]	a [mm]	b [mm]	c [mm]
5~12	165	305	416
15~28	150	305	650.5

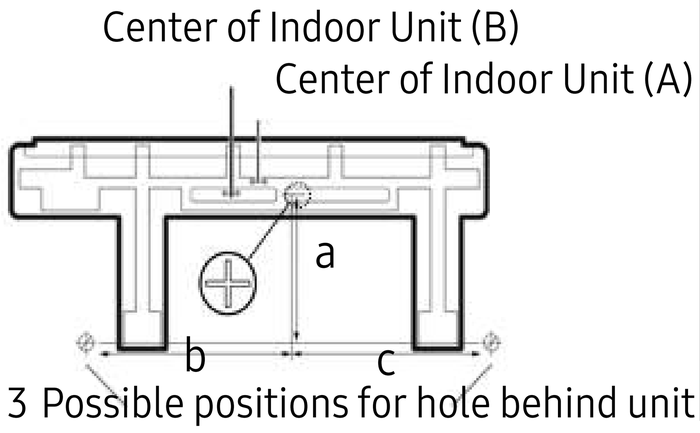


Fig. 3 Possible positions for hole behind unit

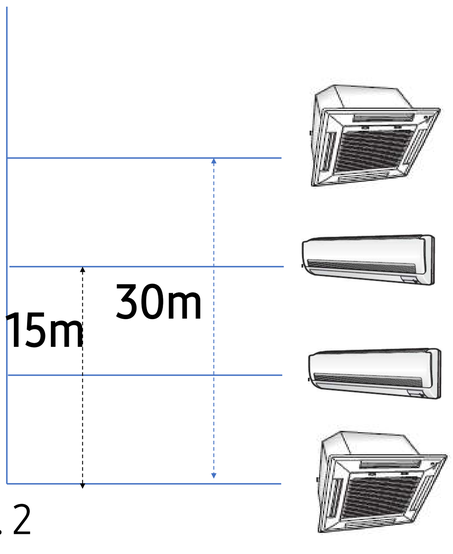


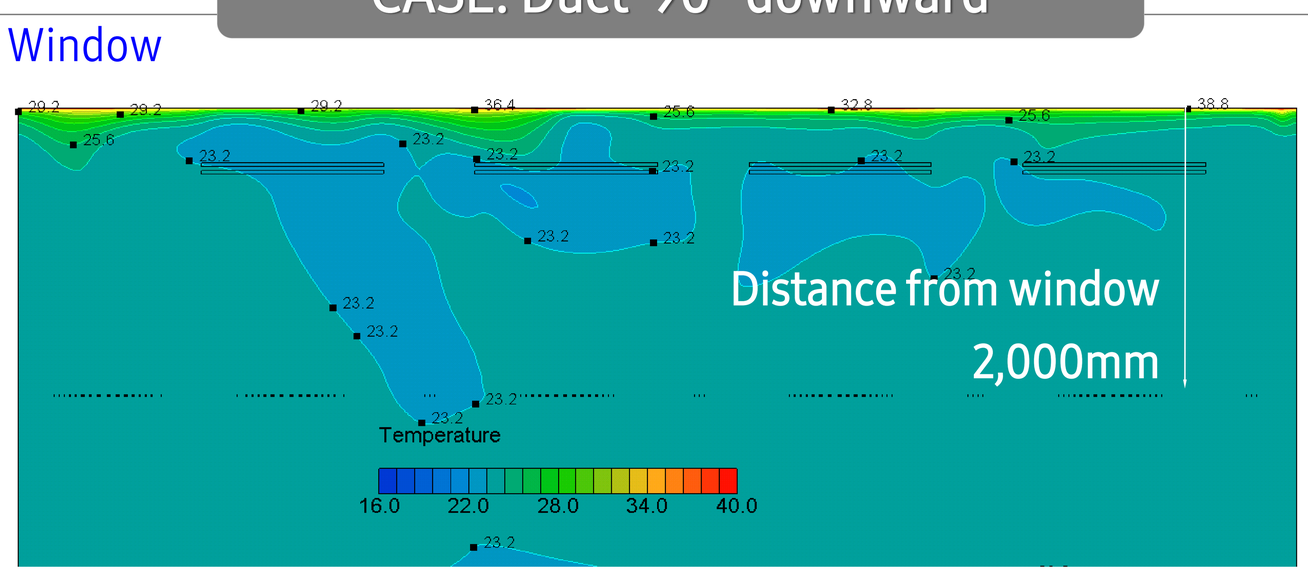
Fig. 2

Indoor Units - Ceiling & Floor Standing

Flexible Installation

Ductless indoor units that cover cooling & heating load in perimeter zone or larger space in a shorter time.

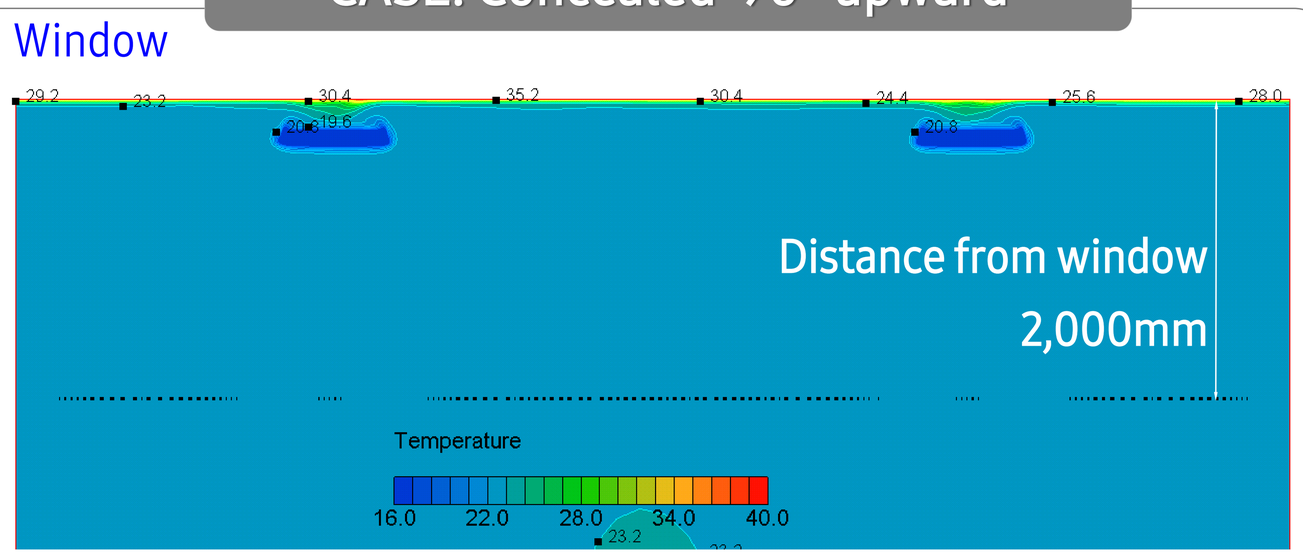
CASE: Duct 90° downward

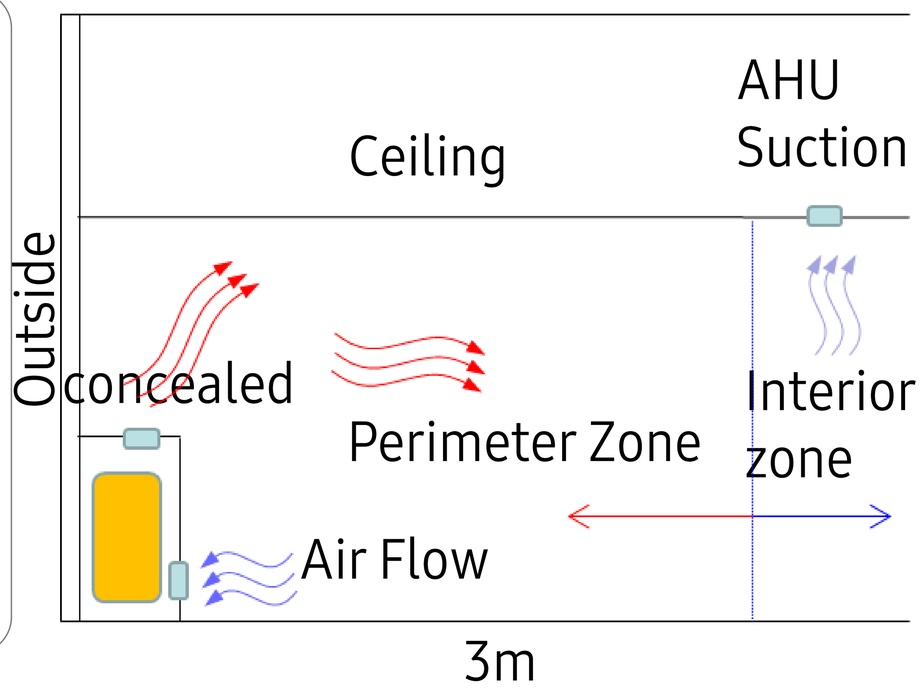


Better Temperature Distribution

For Perimeter Zone, Concealed floor standing unit is better solution for Cooling & Heating than Duct type. The Discharge air can reach up to 3m far from the window.

CASE: Concealed 90° upward





Clean Design

Simple and colorful display adds to the overall aesthetic, while also providing clear status information. The Filter Alarm considering Time Limit + Operating Pattern.
Single-side installation provides a more streamlined design for piping & wiring work

Indoor Units - Ceiling & Floor Standing

- The best option for an integrated ventilation solution with a distribution to multiple rooms and large open / common areas.
- Consider MERV (local purchase) and drain pump is optional for some models.

Model	Capacity Range [MBH]	Air Throw [m]	Height [mm]	Min. Sound Pressure [dB(A)]	ESP [mmAq]
 AM___FNC_____	18~24	4.5	220 (depth)	34~40	-
 AM___JNC_____	36~48	15	235	37~38	-
 AM___MNF_____	12~24	4.5	220 (depth)	27~32	0~6

- What should be considered in the installation?

1. Installation beneath a window or without plenum space?
2. Place where indoor unit will not be exposed to direct sunlight
3. Keep the distance of at least 60mm among the indoor unit
4. Maintain the distance of max. 50mm between indoor unit and cover. See Fig. 2

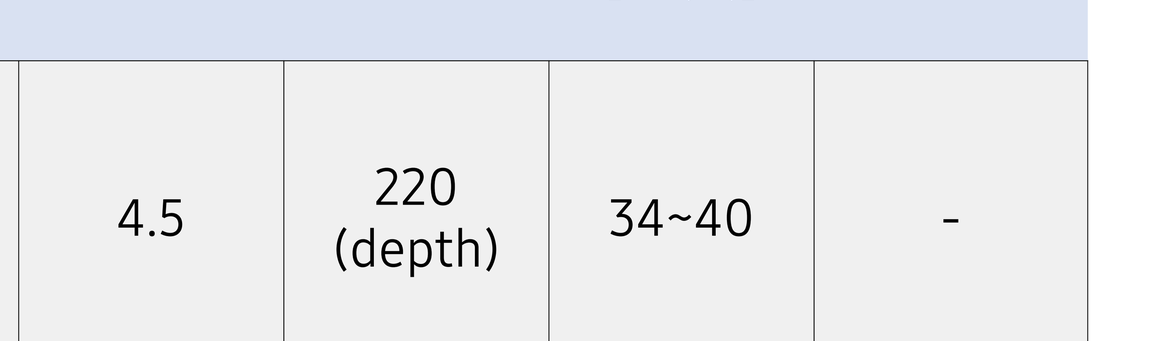


Fig. 2

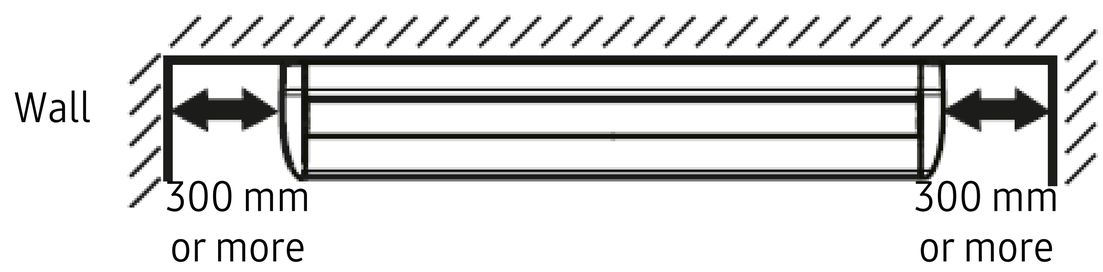


Fig. 1

[MBH]	A [mm]
12	700
18~24	980

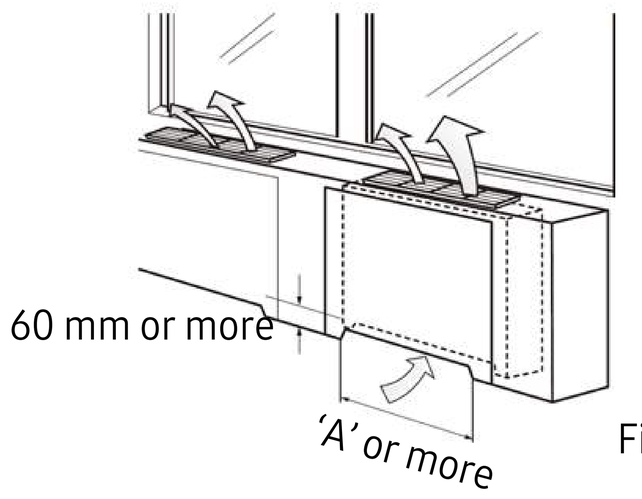
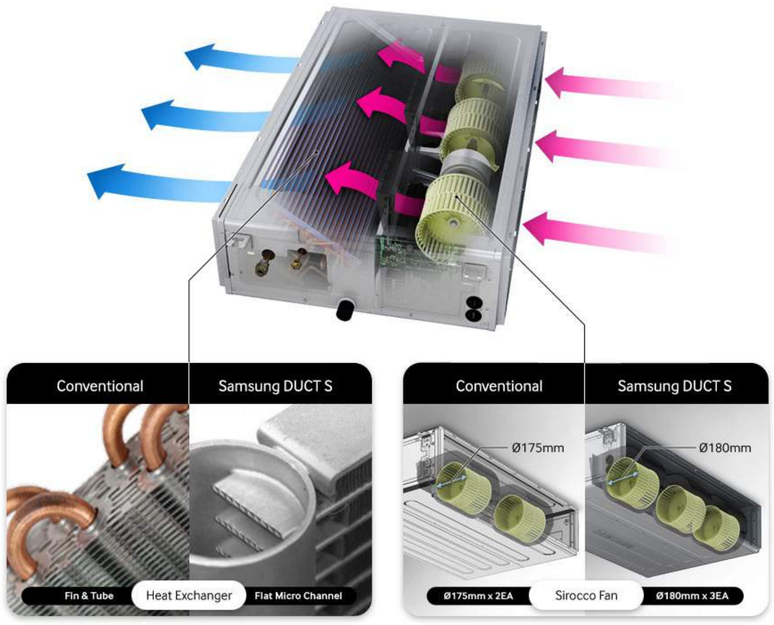


Fig. 2

Indoor Units - Ducted Units

Small & lightweight Big on performance.

Samsung Ducted type are a smart solution for low-maintenance, consistent cooling and heating performance in any environment. Offering a comprehensive lineup, just the right solution for every need (from the office or shop to the restaurant kitchen)

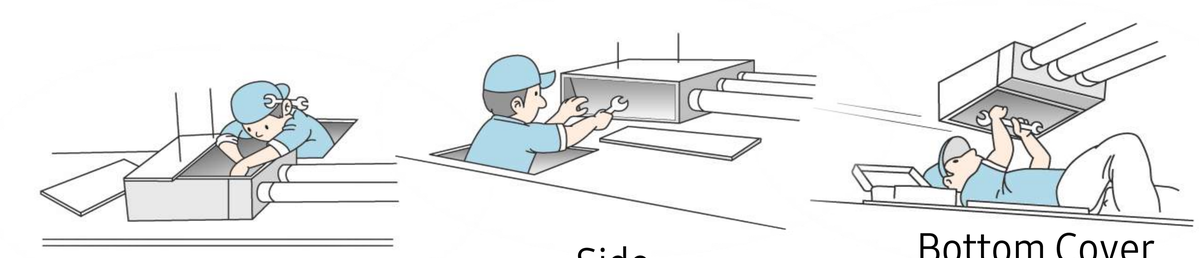


World-class energy efficiency and savings

The large Sirocco Fan features aerodynamic blades, so it generates more air, with less noise. The compact Flat Micro Heat Exchanger is also extremely efficient.

Easy maintenance

It Can Be Accessed from Any Direction



Top Cover (Front & Rear)
Heat Exchanger
Fan & Motor

Side
Control Part
Piping, Sensor
Drain Pump

Bottom Cover
(Front & Rear)
Drain Pan
Heat Exchanger
Fan & Motor

Automatically more comfort and performance

Duct S Auto ESP Adjustment function efficiently and automatically senses the external static pressure (ESP), whatever the length of duct. It then quickly adjusts its performance to optimize the air volume and pressure and minimize noise, for maximum comfort in any situation. The ESP can also be easily adjusted using a remote control, which reduces the installation time.

Small & lightweight

Samsung Duct Type is easy and convenient to install and maintain. Its exceptionally compact design reduces its volume and weight by 30% compared with conventional air conditioners. So it's much easier to handle and install, even in small spaces

Indoor Units - Ducted Units

- Flexible installation for environments such main zones of building, restaurants, retails with large spaces with void space / enclosure to hide indoor units chassis.

	Model	Capacity Range [MBH]	Height [m]	Max. Fresh Air	Min. Sound Pressure [dB(A)]	ESP [mmAq]
	AM___KNHPKH__ Duct S	12~30 36~48	250 300	20%	23~32	0~15 0~20
	AM___KNL_____ Slim Duct	5~24 30~48	199 295	20%	19~33 34~36	0~4
	AM___MNL__ Home Duct	15~24	199	20%	25~27	0~4
	AM___KNM_____ MSP Duct	7.5~12 15~30 36~60	199 260 360	20%	19~36	0~6 0~8 4~14
	AM___FNH_____ HSP Duct	36~48 76~96	360 470	20%	39~44	5~20 5~28
	AM___JNHFKH__ Big Duct	60~76	450	20%	35~36	5~20
	AM___TNZ____ Multi Position	36~72	533	20%	38~50	10

* Included Discharge Air Temperature Control

- What should be considered in the installation?

1. Determine zoning , duct path and the duct size to make it equal pressure loss from every return and supply diffuser.

2. Noise transmitted from duct to indoor should be less than the allowable level. The vibration of the duct should be prevented with increasing of plate thickness or bracket. The noise in the duct should be prevented with silencer

3. If the humidity is over 80%, it is required to add 10mm thickness polyethylene foam or other similar insulation to the indoor unit

4. Inspection hole: In case, the ceiling is consisted of gypsum board, Inspection hole needed

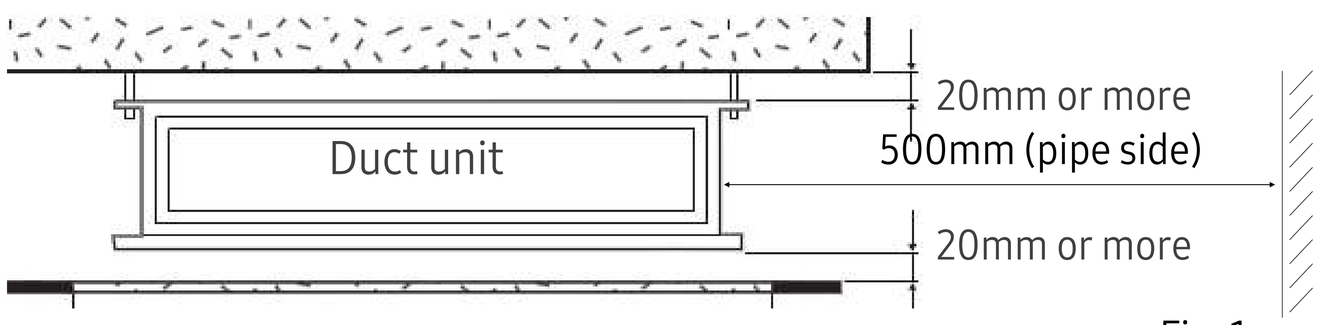


Fig. 1

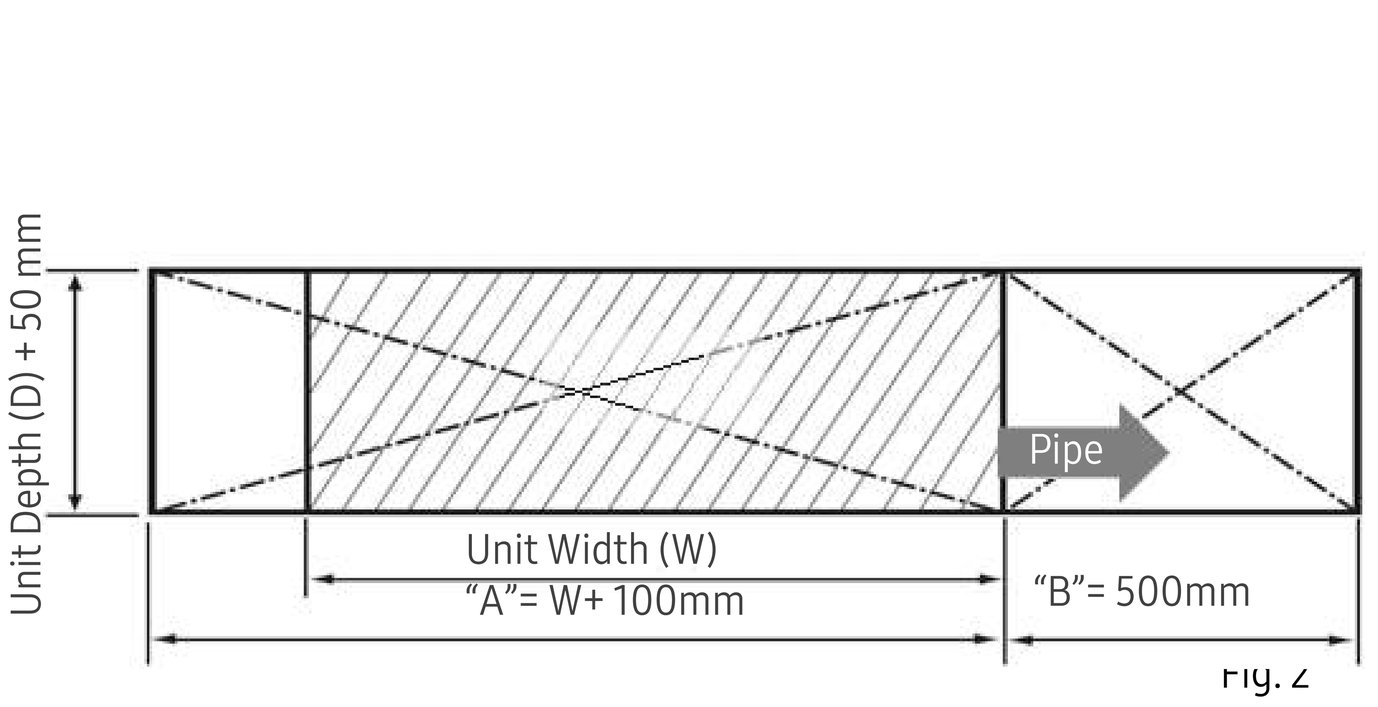


Fig. 2

- Height is more than 0.5m : Only "B" [Inspection for PBA] is applied.

- Height is less than 0.5m : Both "A" & "B" are applied

Indoor Units - AHU Units

- For dedicated applications requiring a special filtration system or higher static pressure, AHU can provide cooling, heating, ventilation(fresh air) and humidity in one package

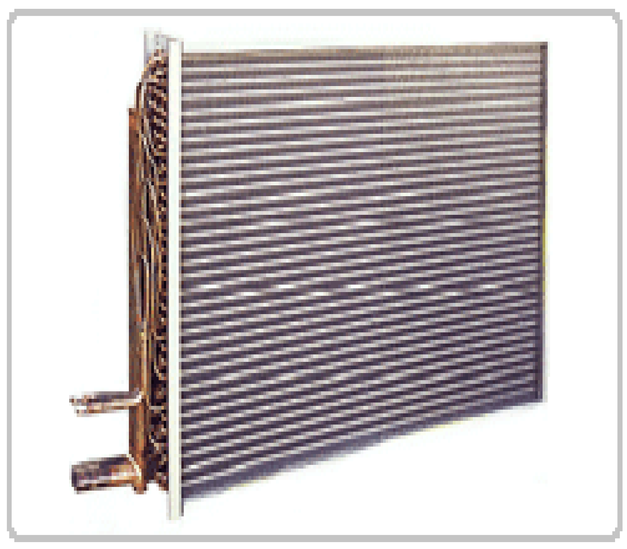
Model (Btu/h)	 MXD-K___AN 21.6~120 MBH	 MCM-D201N 86.4~478 MBH	 MCM-D211UN 7~384 MBH
7k to 18k			1x EEV
7k to 18k			1x EEV
18k to 30k	1x EEV (21.6~30k)		1x EEV
30k to 42k			1x EEV
42k to 60k	1x EEV (43.2~60k)		1x EEV
60k to 72k	1x EEV (64.8~85k)		1x EEV
72k to 96k	1x EEV (86.4~120k)	1x EEV (86~119k)	1x EEV
96k to 144k			1x EEV
144k to 192k		2x EEVs (172.8~239k)	2x EEVs
192k to 240k			2x EEVs
240k to 288k		3x EEVs (259.2~358k)	3x EEVs
288k to 336k			3x EEVs
336k to 384k		4x EEVs (345.6~478k)	4x EEVs
384k			4x EEVs

※ Evaporating temperature : 7 ℃, Superheat : 2 ℃ , 26.6 ℃ DB, 19.4 ℃ WB / Outdoor temperature 35 ℃ DB, 24 ℃ WB

- What should be considered in the installation?

1. Discharge Temperature Control: Cooling : 8~25℃ Heating : 18~43℃ (same for Duct Type)
2. Features as Free Cooling, Damper control, Enthalpy control, Aux heater and 3 Fan Speeds are available only for UCK model
3. Noise transmitted from duct to indoor should be less than the allowable level. The vibration of the duct should be prevented with increasing of plate thickness or bracket. The noise in the duct should be prevented with silencer
4. check the engineering manual TDB for the minimum and maximum heat exchanger volume
5. Tube : 9.52Φ, 0.7t, Bared tube
6. Pitch : 1.9mm, Waffle Louver
7. 4 row (Max 6 row)
8. Facial Area: Standard 0.55 m^2 (Min 0.50m^2) - Based on 10HP
9. Air velocity: ↓ 2.5m/s
10. Airflow Rate: 8.0 m^3/min / HP

    Min.: 7.2 m^3/min , Max.:9.6 m^3/min



Hydro Unit - Hot Water Integration

- Best solution for heat recovery producing Domestic Hot Water, Fan Coil, Radiator, Under floor heating or Pool applications.

Model		Capacity Range [MBH]	Power Input [W]	Heating Temp. Min. [ºC]	Heating Temp. Max. [ºC]	Heating Flow Rate [l/min]
	AM___FNBD____	48 96 153	10	20	50	48 92 150
	AM___FNBF_____ (~1 phase) AM___FNBG_____ (~3 phase)	48 96	3100 5000	25	80	23 36

- What should be considered in the installation?

1. 50kW model is not allowed to connect with HR Outdoor unit

2. In case of full capacity operation in indoor side, there might be a capacity drop when the combination ratio › 100%

3. Combined installation with A2A (Air to Air indoor units) with Hydro Unit, for Heat Pump System, has the combination ratio has bellow:

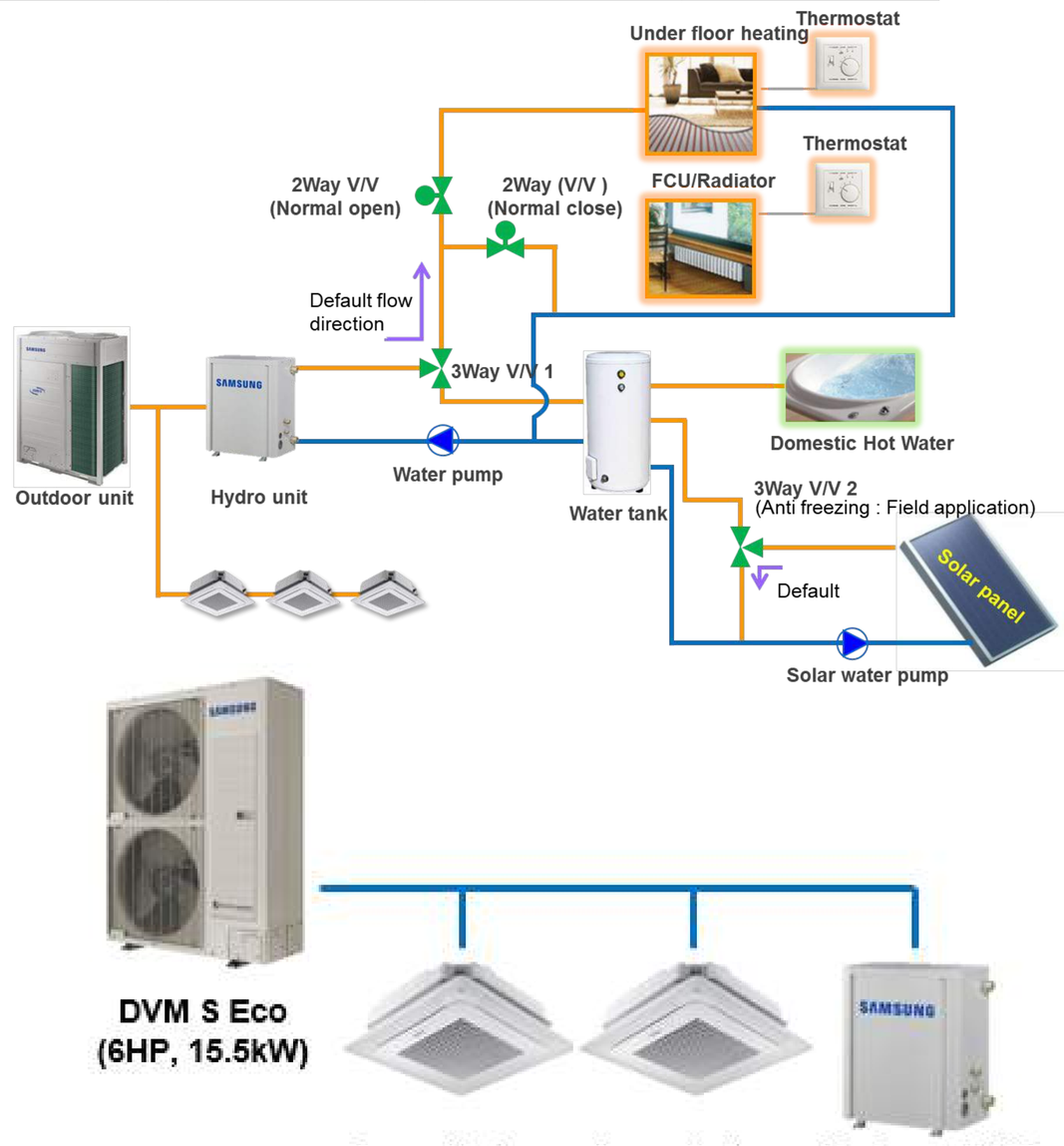
   DVM S Eco: up to 190%, DVM S: up to 180%

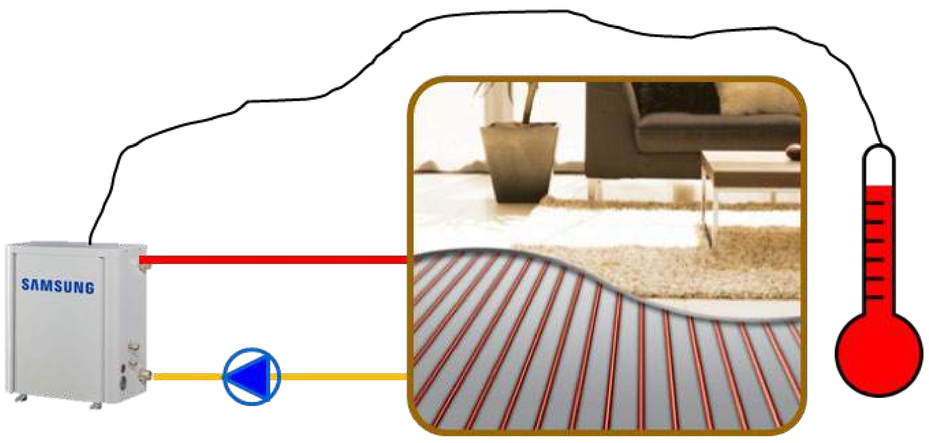
   A2A indoor unit have to be set to Cooling only

   Hydro units have to be operated Heating only

   HR Model is not applicable

4. Number of occupant, vertical purpose and Water Tank information is necessary to determine the Hot Water required per person and estimate the Heating Capacity





Indoor Units - Ventilation

- Ventilation is the replacement of stale or noxious air with fresh air. A lack of ventilation concentrates air pollution where people often spend the majority of their time and it can cause bad effect for human body.

	Model	Capacity Range [MBH]	Height [m]	Min. Sound Pressure [dB(A)]	ESP [mmAq]
	AM___KNE_____ OAP	48~96	250 300	42~47	5~25 10~27.5
	AM___FNK_____ ERV +	12~24	270 340	28~31	8~16
	AN___JSK_____ ERV	260~1000 m³/h	270 340	25~30	5~16

- What should be considered in the installation?

1. Determine zoning , duct path and the duct size to make it equal pressure loss from every return and supply diffuser.

2. Head load from fresh air is normally 30% of total heat load. Samsung developed a tool capable of supporting the Min. Ventilation Airflow and Ventilation Load

3. If the humidity is over 80%, it is required to add 10mm thickness polyethylene foam or other similar insulation to the indoor unit

4. Inspection hole: In case, the ceiling is consisted of gypsum board, Inspection hole needed

5. Samsung ERV recovers up to 70 percent of the energy needed to cool or heat the environment Outdoor conditions: -15~40ºC and Relative Humidity 80% or less.

* Included Discharge Air Temperature Control

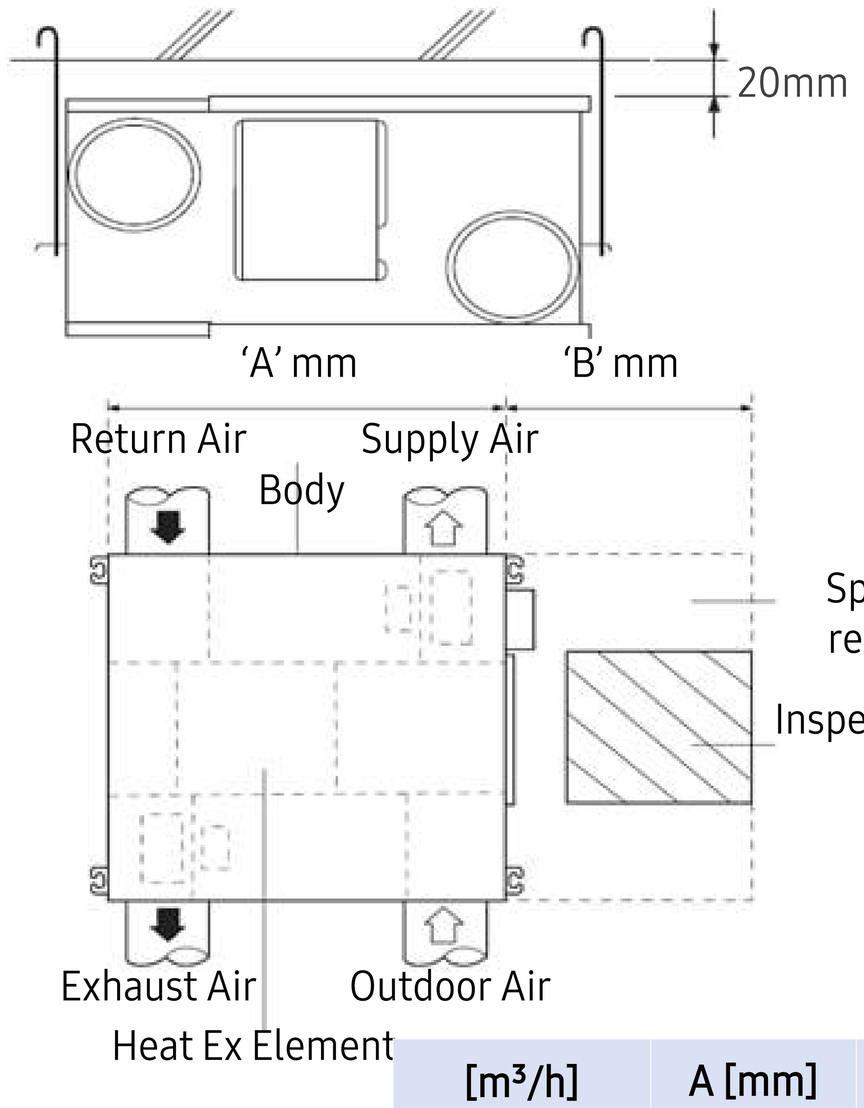


Fig. 1

Fig. 2

[m³/h]	A [mm]	B [mm]
260~500	1000	600
800~1000	1135	800

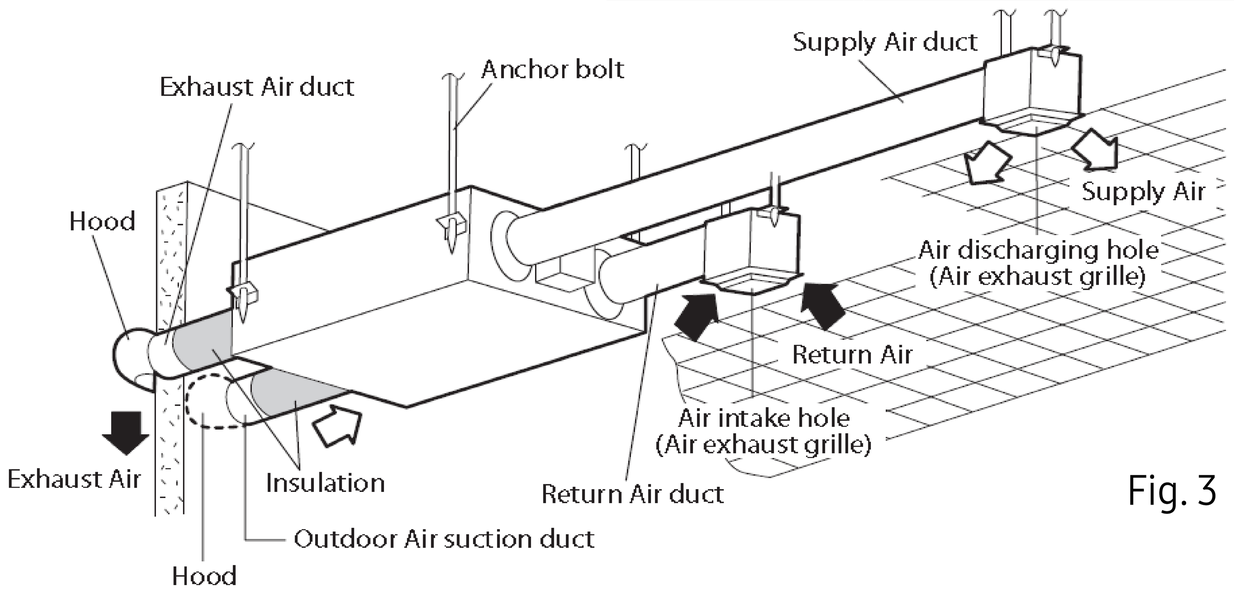
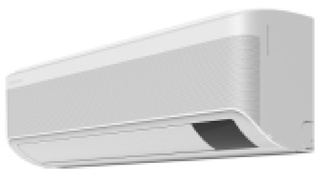


Fig. 3

Indoor Units - Summary

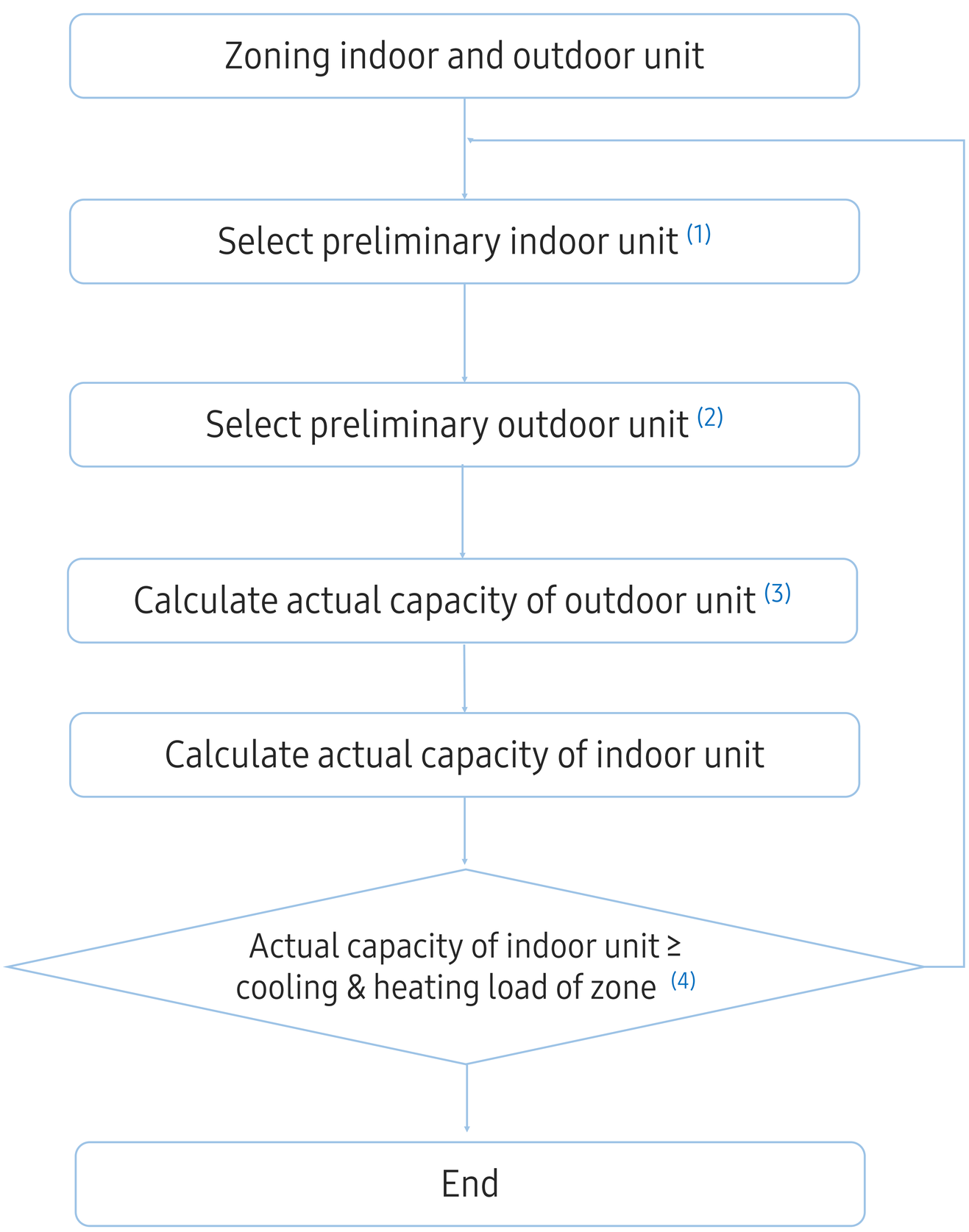
- Indoor units application (guideline / reference only) by vertical

Model & Capacity [MBH]	Air Throw [m]	Residential & Hotel Bedrooms	Class-rooms	Retail	Restaurant	Small Offices	Perimeter Zones	Office & Larger Space
Cassette  5~48	4~6	● 1 Way	● 1 Way 4 Way	● 4 Way 360	● 4 Way 360	● 1 Way 4 Way		● 4 Way 360
Wall Mounted  5~28	3~15	●				●		
Ceiling & Floor Std  12~48	4.5~15	● Floor Std		● Ceiling		● Floor Std	● Floor Std	● Ceiling
Ducted  5~96	Depending on Duct		●	●	●	●		●
AHU Kit  7~384	Depending on Duct			●	●			●
Hydro Units  48~153	-	●	●					●
Ventilation  12~96	Depending on Duct	●	●	●	●	●	●	●

Outdoor Units - Design Procedure

- **DVM S** (CO/HR/HP)

  Previously, the design condition, heat load calculation might be determined and electricity specification and piping length



(1) .Choose indoor unit type according to usage of the room or customer requirement.
. Select indoor unit's capacity with design indoor and outdoor temperature through its capacity table.
. Consider to select the nearest and larger indoor unit than actual load.
(An individual indoor unit's capacity may be changed by the combination ratio, piping length, level, etc..)

(2) .Choose outdoor unit model by design purpose. (**Air Cooled, Water Cooled, HR, HP, CO**, Premium compact, Premium energy efficiency, standard)
. Select outdoor unit by the sum of the preliminary selected indoor units capacity.
It is recommended to select a larger outdoor unit than the sum of indoor unit capacity.

(3) .**Calculate actual capacity by combination ratio**, outdoor and indoor temperature through outdoor unit capacity table,
. **Compensate piping length, level difference** and defrost correction (Heating).

(4) .Reselect indoor unit which is less than cooling and heating load of a zone

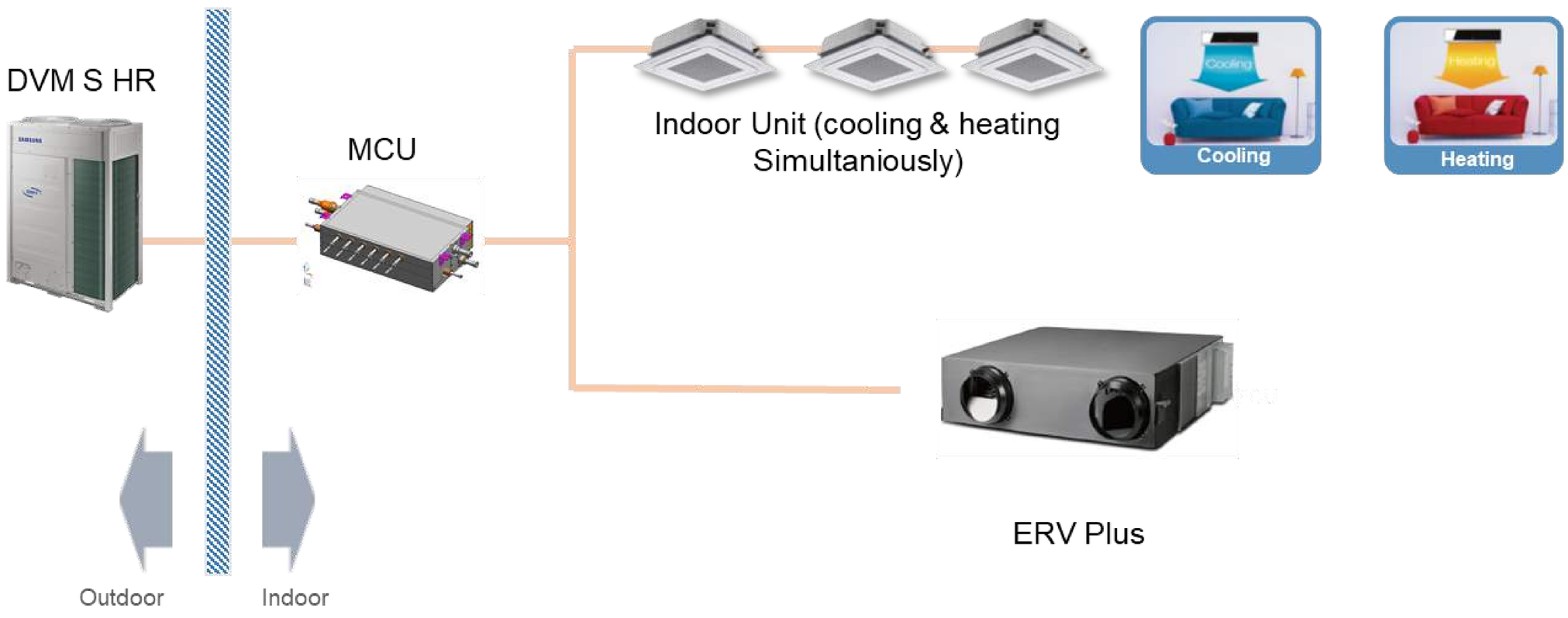
Outdoor Units - Design Procedure

DVM S Heat Recovery

Single outdoor units can operate all indoor units in both cooling and heating mode. They can also simultaneously operate in cooling and heating mode, when necessary, providing more operational freedom.
Perfect solution for **Office, Hotels, Hospital**, because each zone can select the desired temperature independently of the temperatures of the other zones.

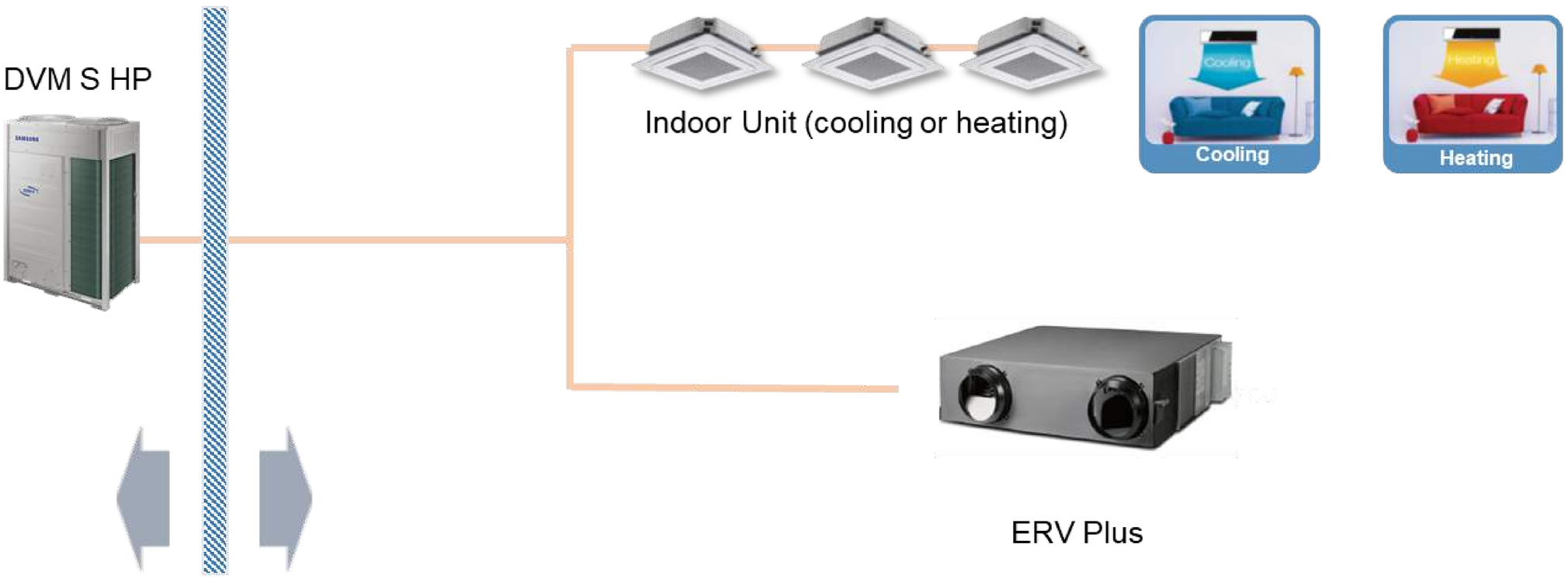
Fine-tuned control

DVM S HR uses a Mode Change Unit (MCU) kit that has an internal on/off valve that enables fine-tuned control via an electronic expansion valve (EEV) and sub-cooler. Improved performance and reduced noise create a pleasant temperature-controlled environment
Heat Recovery systems **require 3 pipes**, from the ODU to the MCU box.



DVM S Heat Pump

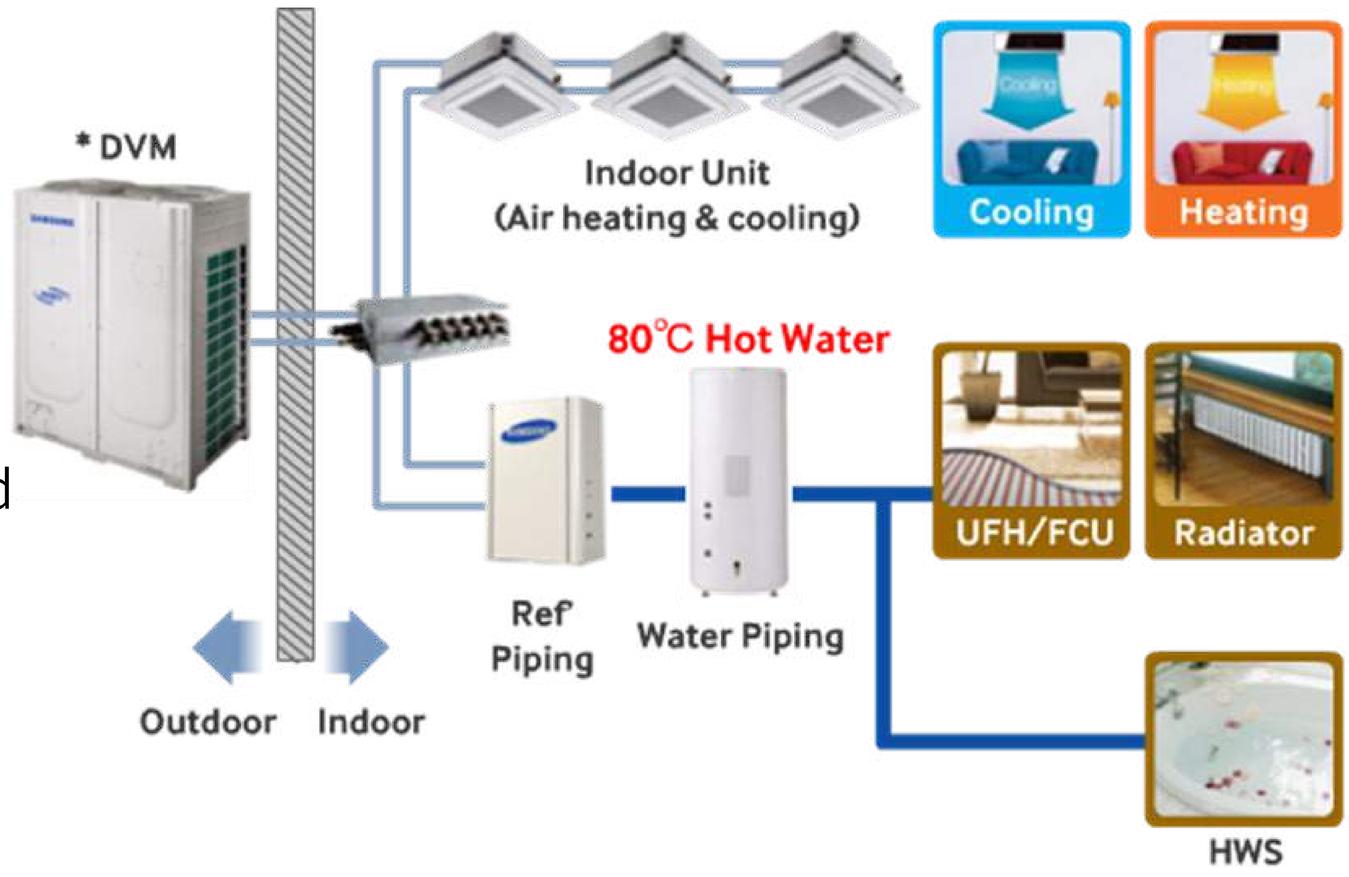
Single outdoor units can operate all indoor units in cooling or heating mode. They can also interchange from cooling or heating mode based ambient temperature or schedules settings.
A simultaneous cooling / heating approach can also be achieved using HP systems, grouping systems based on the areas with the highest heat concentration and others where there is less concentration. In this way, the modes of the systems can be adjusted to satisfy the temp of the majority.
Perfect solution for **Open Spaces,** where the same mode (temperature) will be required for the entire area.
Heat Pump systems **require 2 pipes**, from the entire installation.



Outdoor Units - Design Procedure

DVM S Air Cooled

Air condenser systems are applied in most projects due to their easy design, low costs, simple and quick installation.
Like water cooled, it allows the option to integrate HP, HR, CO systems together with all advanced controls.

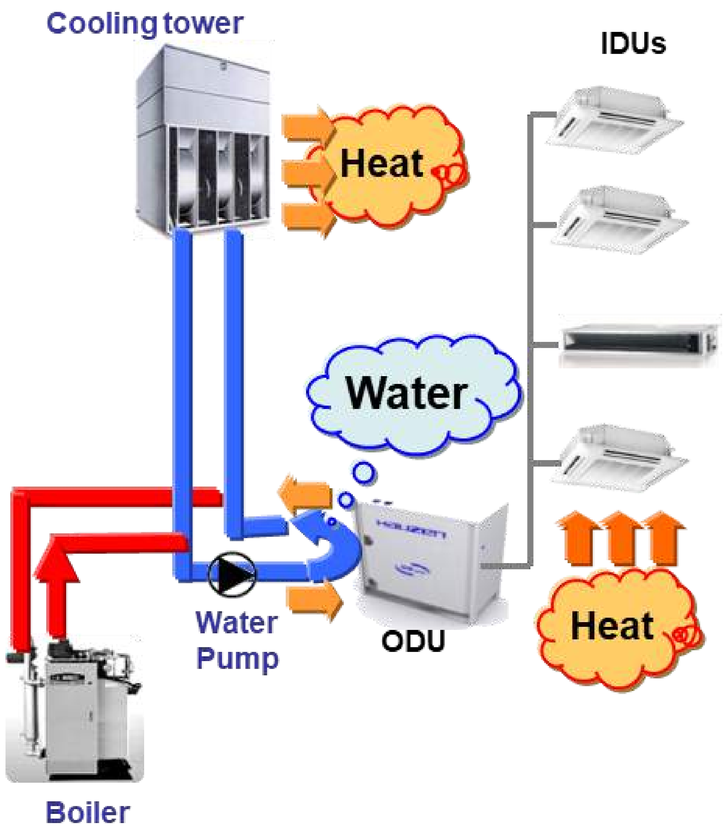


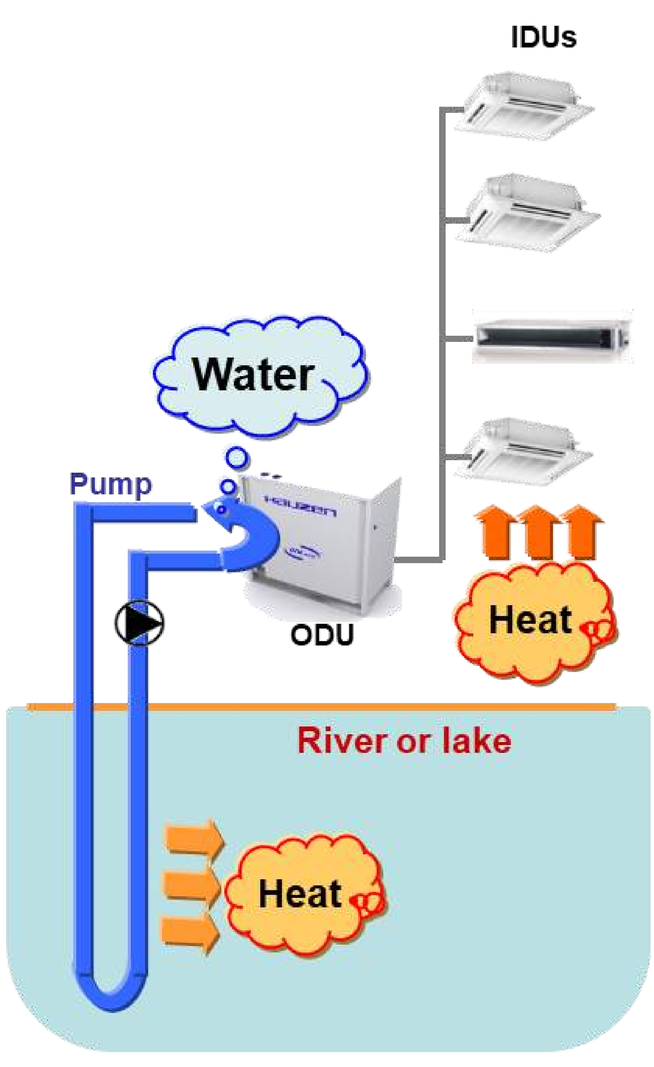
DVM S Water Cooled

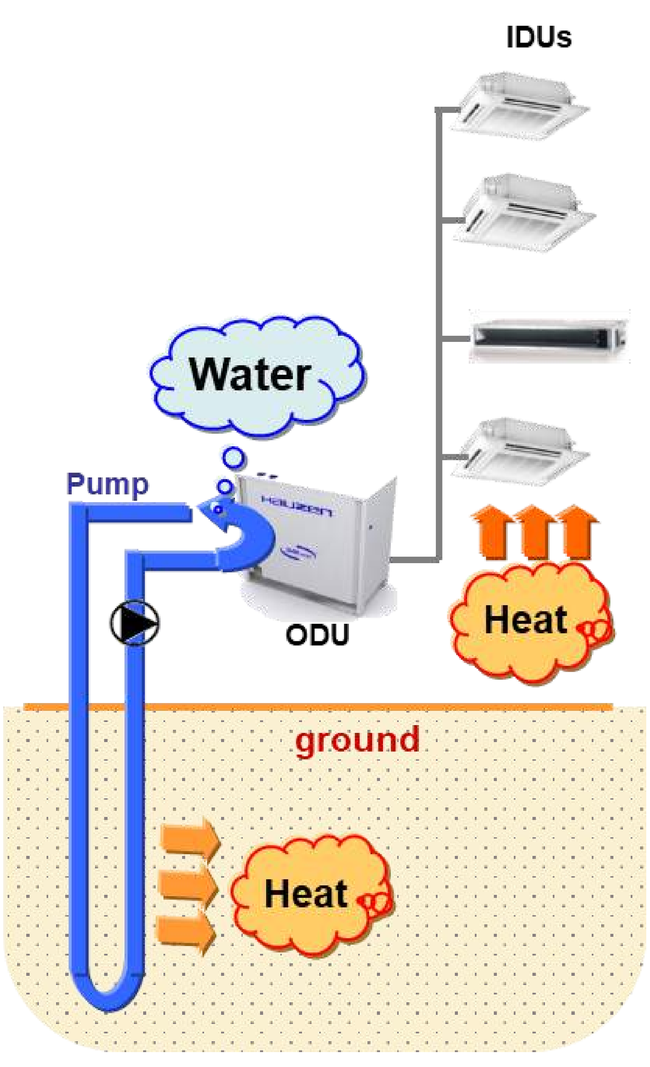
The only difference between DVM S & DVM S WATER is energy source for ODU.
Eco-friendly capabilities uses **geothermal energy as a renewable heat source** instead of a standard cooling tower and boiler, effectively supporting businesses' environmental and cost reduction initiatives.

Perfect solution for:
Tall or wide multi story buildings: No water pipe length limitation
Building renewal: Reuse the existing water pipe and heat source(cooling tower & boiler)
Government office: Mandatory use of renewable energy as certain ratio (district water, underground water, sea water, solar energy etc. exist)
Luxury resident building: Low noise, no defrost in heating, Individual control

Basic	Renewable - River	Renewal - Geothermal







Outdoor Units - Design Range

- **DVM S** (CO, HP, HR) Capacity limits

Frequency	Phase	Voltaje	Model / HP	Single Module (HP)												Max Comb
				8	10	12	14	16	18	20	22	24	26	28	30	
60Hz	Φ3	220V	HP AHRI	●	●	●		●	●	●						55
			HR AHRI	●	●	●		●	●	●						55
			HP Standard	●	●	●	●	●	●	●	●	●	●			80
			CO Standard	●	●	●	●	●	●	●	●	●	●			80
			CO Std Anticorrosive	●	●	●	●	●	●	●						80
		380V	HP Standard Value-Up	●	●	●	●	●	●	●	●					88
		460V	HP AHRI	●	●	●		●	●	●	●					55
			HR AHRI	●	●	●		●	●	●	●					55
			HP Standard	●	●	●	●	●	●	●	●					80
			CO Standard	●	●	●	●	●	●	●	●	●	●	●	●	120
50/60HZ		380V	HP Entry	●	●	●	●	●	●	●	●	●	●	●	●	120
			HR Eurovent Standard	●	●	●	●	●	●	●	●					80
50Hz			HR Eurovent High Efficiency	●	●	●	●	●	●	●	●					
			HP Eurovent Standard	●	●	●	●	●	●	●	●	●	●	●	●	120
			HP Eurovent High Efficiency	●	●	●	●	●	●	●	●	●	●	●		90

- **DVM S ECO** (CO, HP, HR) Capacity limits

Frequency	Phase	Voltage	Fan	Mode	HP								
					3	4	5	6	7	8	10	12	14
60Hz	Φ1	220V	1	Eco CO Standard		●	●	●					
				Eco CO Anticorrosive		●	●	●					
				Eco HP/HR AHRI		●	●	●					
				Eco HP Compact		●	●		● 2 Fan				
	Φ3	220V	2	Eco HP Big						●	●	●	
		380V		Eco CO Big						●			
				Eco HP Big							●	●	●
50Hz	Φ1	220V	1	Eco HP Compact EU		●	●		● 2 Fan				
				Eco HP/HR Eurovent		●	●	●					
	Φ3	380V	2	Eco HP Big Eurovent		●	●	●		●	●	●	●

● New Models
CO: Cooling only
HR: Heat Recovery
HP: Heat Pump

Outdoor Units - Design Range

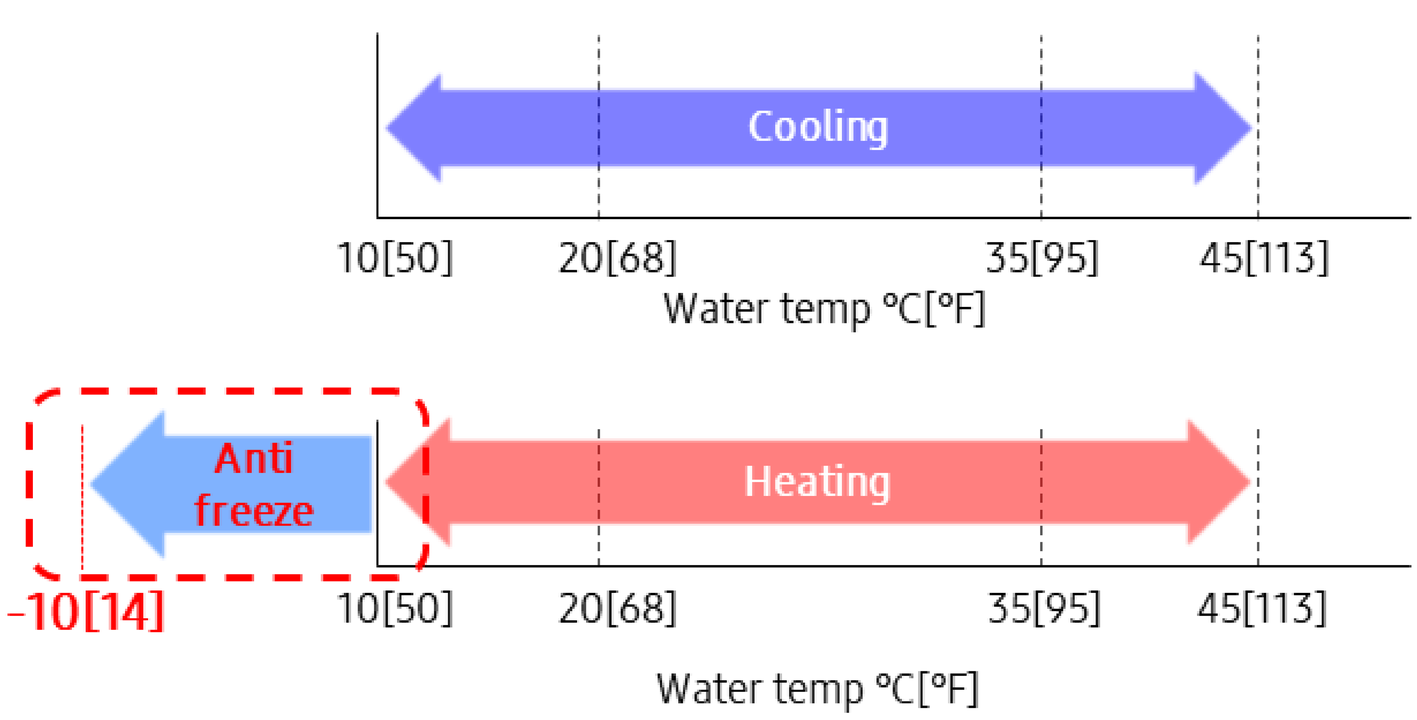
- **DVM Water** (HP, HR) Capacity limits

Frequency	Phase	Voltaje	Model	Single Module (HP)										Max Comb
				4	5	6	8	10	12	16	20	25	30	
60HZ	Φ1	208-230V	HP AHRI	●	●	●								-
	Φ3		HR AHRI				●	●	●	●		●		100
50/60Hz		380-415V	HR Eurovent Standard				●	●	●		●		●	120
			HR Eurovent High Efficiency				●	●	●		●			60

HR: Heat Recovery
HP: Heat Pump

Operational Range

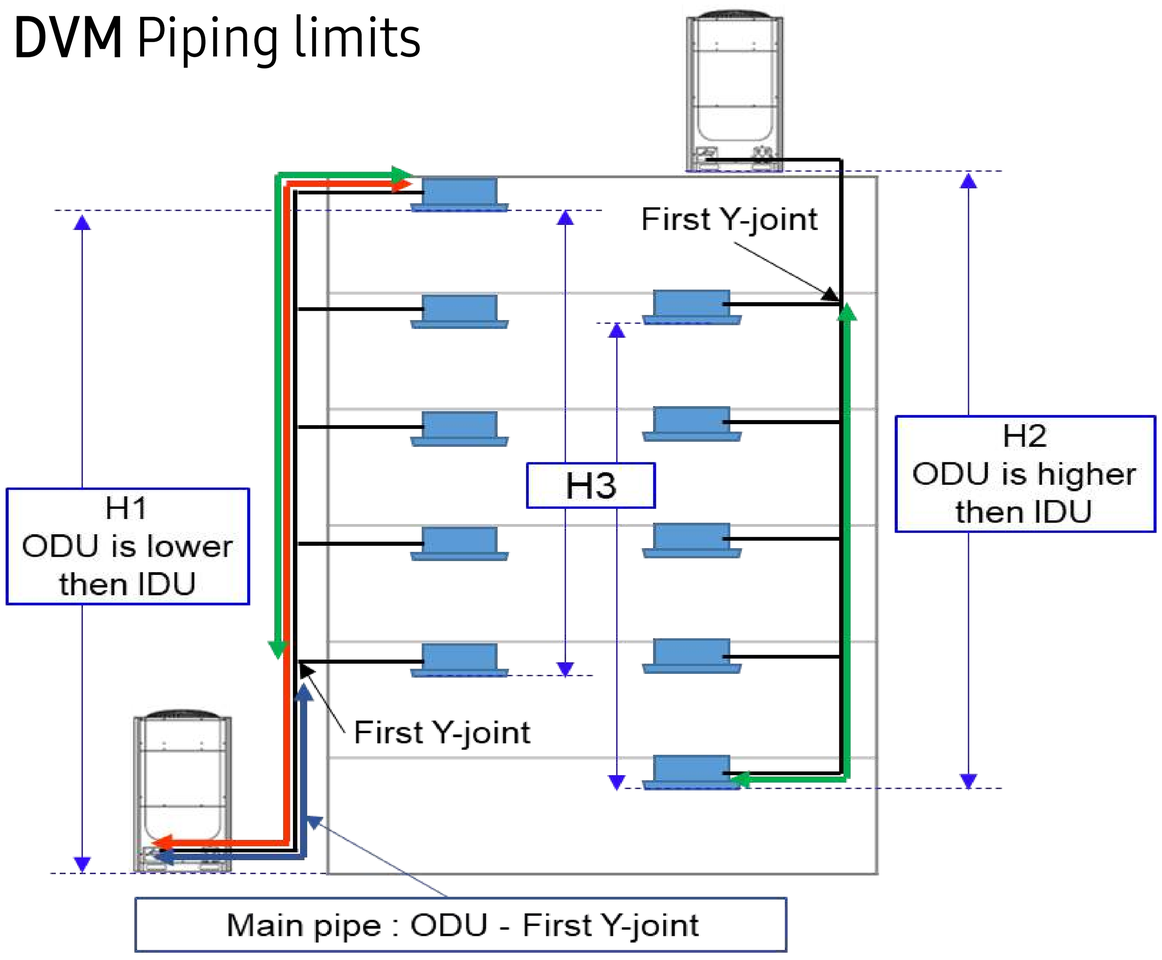
Type	Circulating water	Operation	Inlet water temperature	
Heat source water	Water loop	Cooling	Main usage range	Usage range limit(3)
		Heating	20 ~ 35 ℃	10 ~ 45℃
Ground heat source(1)	Ground loop	Cooling	15 ~ 35 ℃	10 ~ 45℃
		Heating	5 ~ 25℃	-5 ~ 45℃ (-10 ~ 45℃)(2)



(1) .Anti-freeze must be used when temperature of water inlet for heating is below 10°C or ground heat source is used. Maintain appropriate concentration level of anti-freeze according to temperature of water inlet.
(2) .Strict management of anti-freeze concentration level is required. Consult Samsung before application.
(3) .When inlet water temperature is outside of limit, consult Samsung before application.

Outdoor Units - Design Range

- **DVM** Piping limits



Limitation of pipe length & height		Air Cooled			Air Cooled	
		DVM S HP & CO	DVM S HR	DVM S Eco	DVM Water HP	DVM Water HR
						
Total		1000m(3281')	1000m(3281')	300m(984')	200m(656')	500(1640')
ODU to IDU Equivalent		200m(656')	200m(656')	150m(492') (*4)	75m(246')	170m(557')
		220m(722')	220m(722')	175m(574')	90m(295')	190m(623')
First Y-joint to the farthest IDU		45m(148')	45m(148')	40m(131')	40m(131')	45m(148')
		*90m(295') (*1)	*90m(295') (*1)			*90m(295') (*1)
ODU-ODU		10m(33')	10m(33')	-	-	10m(33')
Level difference	H1 ODU-IDU	40m(131')	40m(131')	40m(131')	30m(98')	40m(131')
		*110m(361') (*2)	*110m(361') (*2)			
	H2 ODU-IDU	50m(164')	50m(164')	50m(164')	30m(98')	50m(164')
		*110m(361') (*3)	*110m(361') (*3)			*110m(361') (*3)
	H3 IDU-IDU	50m(164')	40m(131') Different MCU	15m(49')	15m(49')	HP : 50m(164')
		* 15m if EEV RAC is installed	* 15m if EEV RAC is installed			* 15m if EEV RAC is installed
	MCU-MCU	-	30m(98')	20m(65')	-	30m(98')
	MCU-MCU Series	-	5m(16')	-	-	5m(16')
	MCU-IDU	-	15m(49')	-	-	15m(49')
	ODU-ODU	0m (0')	0m (0')	0m (0')	0m (0')	0m (0')

1) Condition required: The pipe size(Liquid & Low pressure gas) shall be increased by one grade over 45 m (Refer to TDB)
2) Pipe size up is required according to condition(Refer to installation part)
3) PDM kit may be required over 50m
4) Condition required: If longer than 90 m (295 ft), increase the pipe size by one grade

Outdoor Units - Design Range

- Number of connectable indoor units

	HP														
DVM S DVM S Eco DVM S Water	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36 ~
Max IDU Q'ty	14	18	21	26	29	32	36	40	43	47	51	54	58	61	64

Maximum number of connectable indoor units

Max qty = DVM S cooling rated capacity / 1.55kw

* Maximum 32 Wall-mount units with EEV(AM✳✳✳FNQDEH✳,
AM✳✳✳JNVDKH✳) can be connected
to one system -> Otherwise refrigerant noise problem can be occurred

Combination ratio

CR: 0.5×Σ(ODU capacity) ≤ Total capacity of IDUs ≤ 1.3×Σ(ODU capacity)
-> 50% ~ 130%
Ex) 10HP DVM S = 28kW -> Total capacity of IDUs = 14kW ~ 36.4kW

Combination Type	Air Cooled		Water Cooled	
	DVM S	DVM S Eco	DVM S Water	DVM S Water HP
Normal condition (A2A)	50% ~ 130%	50% ~ 130%	50% ~ 130%	50% ~ 130%
Normal condition (Hydro unit Only)	50% ~ 130%	50% ~ 130%	50% ~ 130%	50% ~ 130%
Normal condition (A2A & Hydro unit)	50% ~ 130%	50% ~ 130%	50% ~ 130%	50% ~ 130%
HP - Special condition (A2A & Hydro unit) *	50% ~ 180%	50% ~ 190%	-	-

*Special Conditions:

. Maximum Capacity of A2A Indoor units ≤ 100% (Based on Cooling capacity)
. **DVM S Eco** Maximum Capacity of Hydro units ≤ 90% (Based on Cooling capacity)
. **DVM S** Maximum Capacity of Hydro units ≤ 80%(Based on Cooling capacity)
. A2A Indoor units have to be set to Cooling only
. Hydro units have to be operated Heating only

※ HR Model is not applicable
※ A2A Indoor units and Hydro units can never be operated at the same time.

Outdoor Units - Design Range

- **Extended Combination Ratio**

Definition of Combination Ratio, CR

$$CR = \frac{\text{Sum of Nominal Cooling Capacity of Indoor units}}{\text{Nominal Cooling Capacity of Outdoor unit}} * 100\%$$

Constraints of Allowable Combination Ratio

DVM S systems are normally designed to utilize a CR 50% to 130% to ensure effective load balancing between indoor units and outdoor unit. As buildings have become more insulated, and usage and occupancy of buildings are highly variable, more buildings can realize a higher load balancing between IDUs and ODU, thus higher CR (>130%) are often required. If a system design exceeds 130%, risks associated to increased indoor sound level and reduced comfort levels should be considered. Therefore, when it is necessary to design a combination ratio exceeding 130%, the following conditions must be complied with: -

Design & Selection Procedure

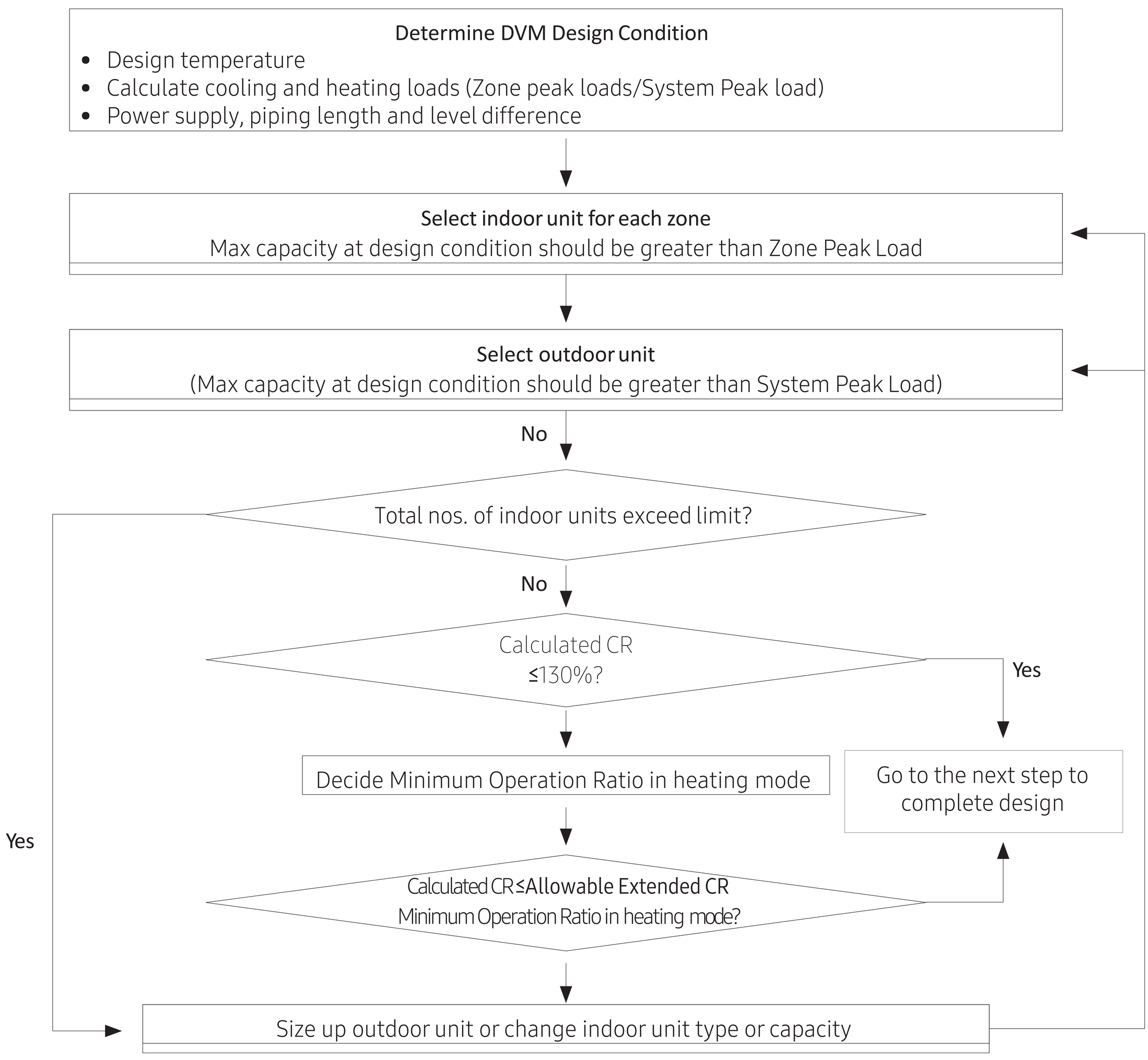


Fig. 1 Design & Selection Procedure for Extended Combination Ratio

Outdoor Units - Design Range

- Extended Combination Ratio

Satisfying cooling & heating comfort

The Maximum Capacity of outdoor unit at design condition calculated from Samsung capacity data table or design tool (DVM Pro) should always be the same or greater than System Peak Load (Block Load) defined in table1.

Time	Room A	Room B	Room C	Room D	Room E	Room F	Total
	Music Room	Class room	Class room	Class room	Class room	Class room	
09:00	8.4	8.0	8.4	8.0	8.4	8.6	49.8
12:00	9.2	8.8	10.8	8.6	10.8	9.8	58.0
14:00	10.0	9.6	9.6	9.6	11.4	10.8	61.0
16:00	11.0	10.6	8.8	10.8	9.6	9.6	60.4
18:00	9.4	9.0	8.8	9.0	9.0	8.4	53.6

Table 1. Example of System Peak loads

- ▶ Zone Peak Loads ( ): To satisfy the demand for each room any time
  - Sum of Zone peak Loads = 65.4kW (11.0 + 10.6 + 10.8 + 10.8 + 11.4 + 10.8)
- ▶ Block load ( ): Total peak load at a given of day.
  - Sum of Zone peak Loads at 14:00 = 61.0kW

NOTE

- When a system combination ratio is over 130%, a max system capacity is the same as the published capacity in TDB capacity table at the combination ratio of 130%

Cooling Operation Only

When only cooling operation is used, CR is allowed up to 180% if the Max Capacity of outdoor unit is greater than System Peak Load (Block load) as shown table 2.

Outdoor unit	All capacities of H/P & H/R model
Indoor unit	All indoor unit types
Operation Condition	Cooling mode only
Allowable CR	180%

Table 2. Allowable CR in only cooling operation

NOTE

- Table 2 shows a standard for allowable CR of cooling only model. Samsung Electronics is not responsible for any problem caused by using a heating mode at the site with a system designed by table 2. If heating operation is required, extended CR design must follow section “Allowable CR limit to avoid abnormal sound level risks in heating operation.”

Outdoor Units - Design Range

- Extended Combination Ratio

Allowable CR limit to avoid abnormal sound level risks in heating operation

- If the CR exceeds 130%, in a specific case of heating operation, an indoor unit may have higher sound level than the level specified in the technical documents.
- In order to minimize the sound level, the system minimum operation ratio needs to be verified and considered as follows:

* Operation Ratio(%), OR

- Heat Pump system, H/P

$$OR_{(H/P)}(\%) = \frac{\text{Sum of nominal capacity of indoor units running in heating mode}}{\text{Sum of nominal capacity of indoor units}} * 100\%$$

- Heat Recovery system, H/R

$$OR_{(H/R)}(\%) = \frac{\text{Sum of nominal capacity of indoor units running in both cooling \& heating mode}}{\text{Sum of nominal capacity of indoor units}} * 100\%$$

The Minimum Operation Ratio should be determined during the project design stage using Fig. 2.

Outdoor unit	All capacities of H/P & H/R (Single, Dual and Triple Module Systems)		
Indoor unit	All indoor unit types *)except Wall-Mounted		Wall-Mounted
Operation Ratio	Nominal capacity ≤ 4.5kW	Nominal capacity > 4.5kW	All capacities
10%	131%	145%	135%
20%	137%	153%	141%
30%	149%	162%	151%

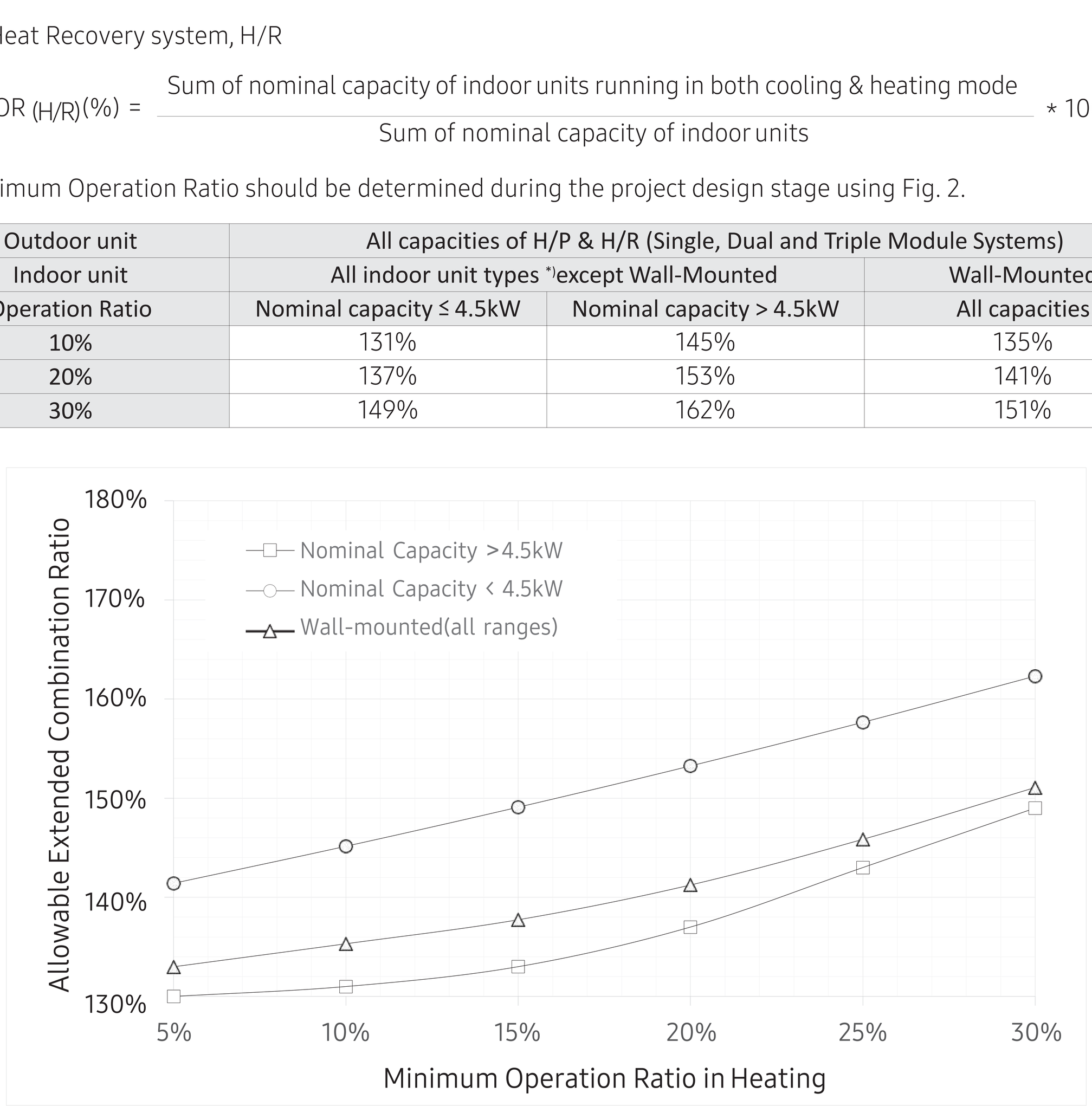


Fig. 2 Allowable CR with respect to indoor unit type as operation ratio increases

Outdoor Units - Design Range

• Extended Combination Ratio

- The minimum operation ratio should be considered during the design stage.
- If a system has a mix of unit types or capacity, the lowest extended connection ratio curve must be utilized.
- In case that a designed Minimum Operation Ratio is less than 5% or more than 30%, the Allowable Extended CR must be considered as the value at 5% and 30%, respectively.
- *)If one of following indoor unit types is included in a system, the CR cannot be extended beyond130%.

Type of indoor unit	Limited by CR 130%
1Way Cassette ; 4Way Cassette (600 x 600)	2.8kW or below
360 Cassette / Slim Duct (LSP Duct)	3.6kW or below
4Way Cassette	5.6kW or below
Floor Standing (Exposed or Concealed)	5.6kW only
Ceiling Suspended	14.0kW only
Hydro unit (HE/HT)	All capacities

NOTE

- Samsung is not responsible for any issue, including abnormal noise that arises during heating operation due solely to the operation rate being lower than the designated combination ratio shown in Fig. 2. Please contact your local Samsung representative for further details if the project requires you to design the project with a connection ratio greater than130%.

Outdoor Units - Design Range

Wiring Work

Power Wiring and communication between ODU, IDU and MCU

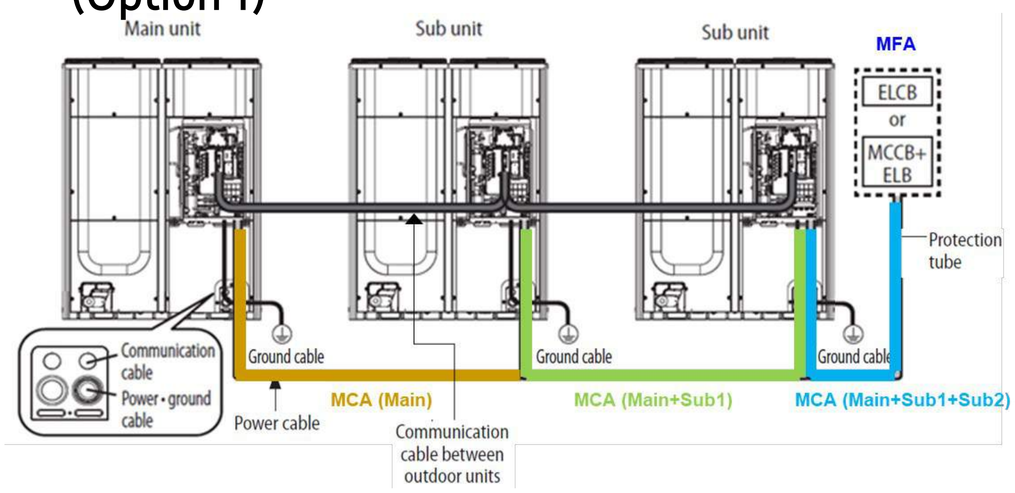
- **Communication**

Cable diameter 0.75~1.5mm², 2P, Unshielded
Communication has no polarity
Maximum wiring length between the outdoor unit and the farthest indoor unit is 1000m

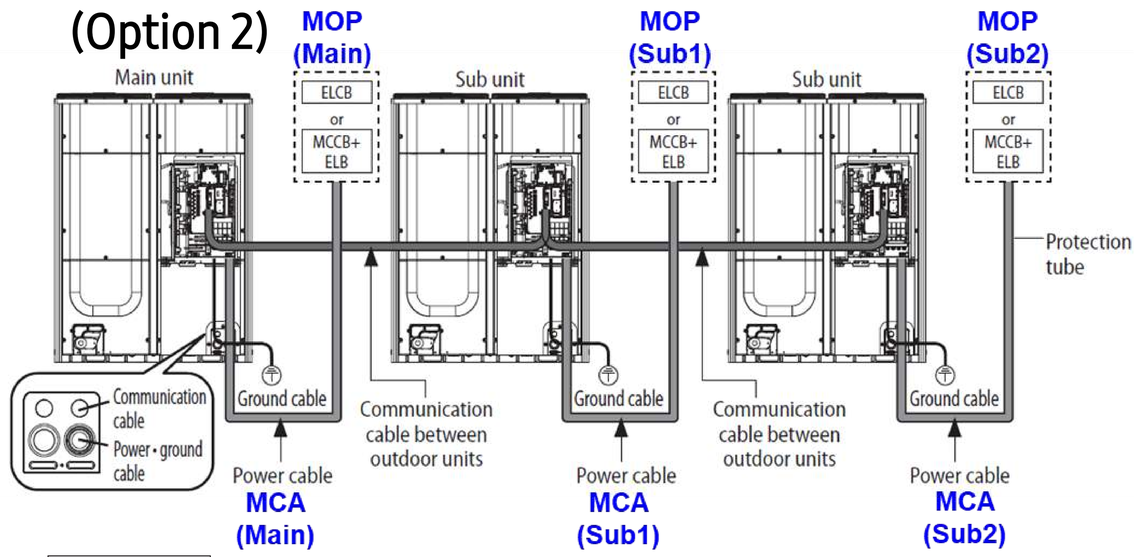
- **Power Wiring**

Separate circuit breaker and wire for each unit **(Option 1)** and single circuit breaker **(Option2)** are allowed.
*Wire and circuit breaker has to be selected accordance with the local regulations, based on MCA and MFA value in the installation manual.

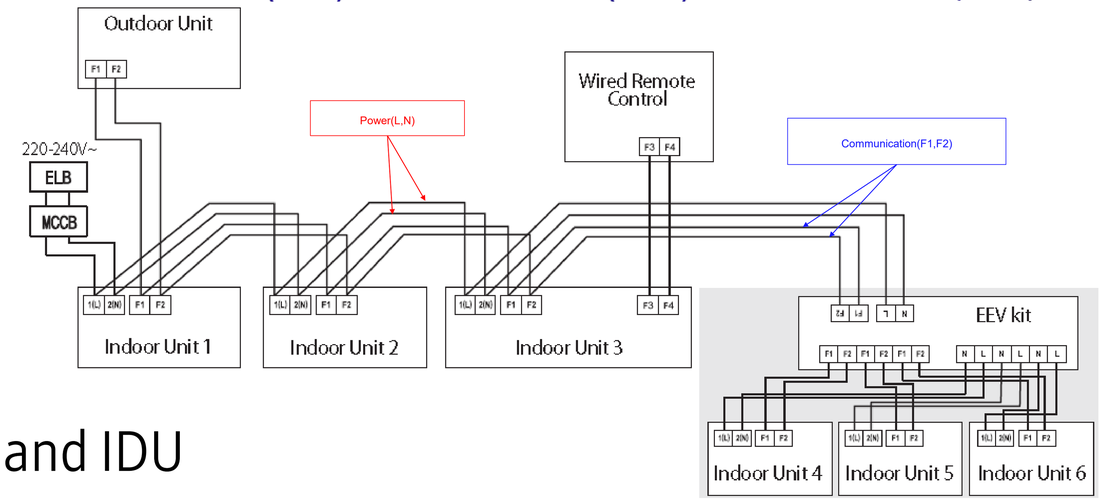
(Option 1)



(Option 2)

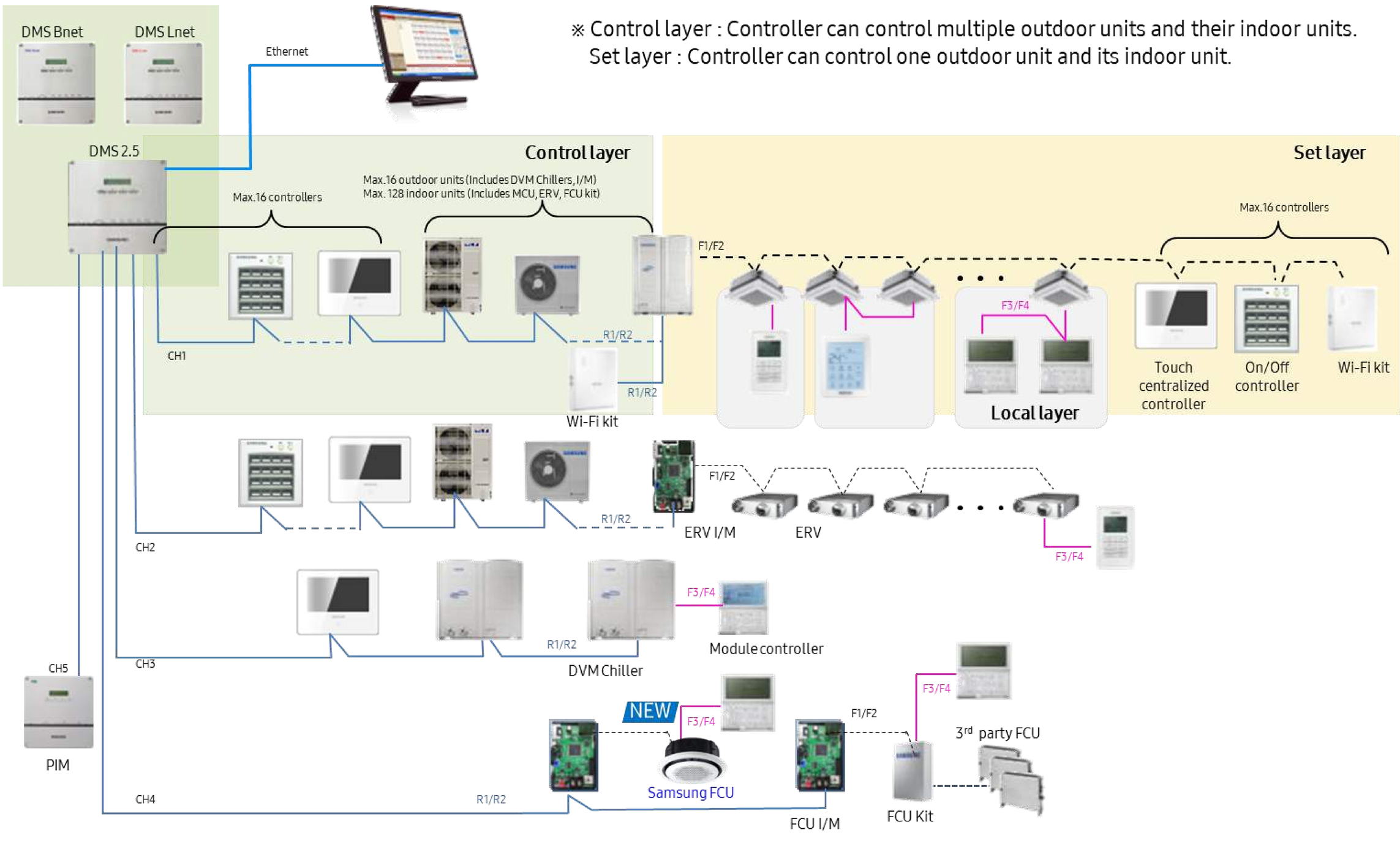


Single circuit breaker for multiple IDUs is allowed and must to be selected according to local regulations.



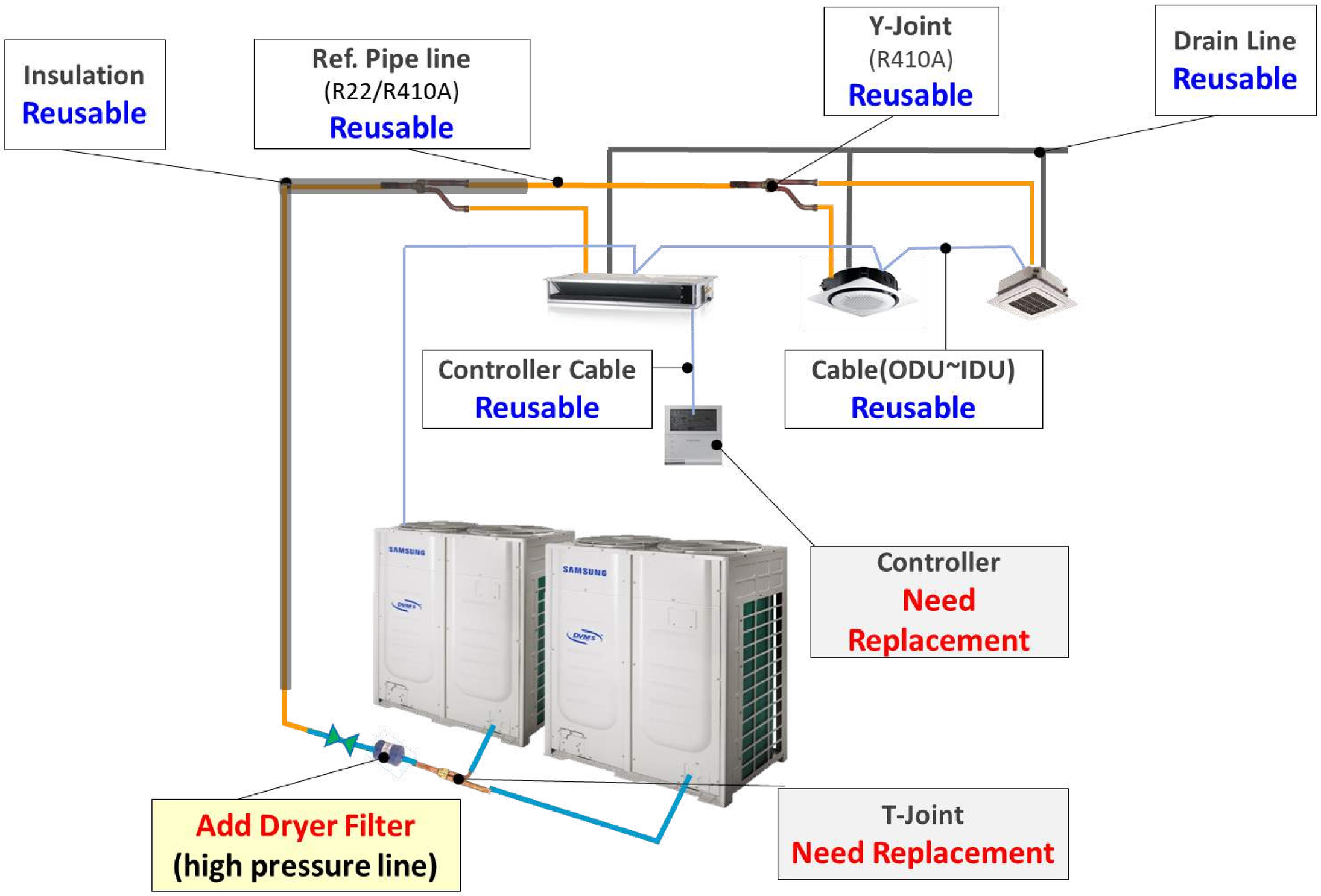
- Communication between Controllers, ODU and IDU

※ Control layer : Controller can control multiple outdoor units and their indoor units.
Set layer : Controller can control one outdoor unit and its indoor unit.



Outdoor Units - Design Range

- Renewal



- What should be considered in the installation?

Y-Joint

Third party's or competitor's Y-joint could be reusable. DVM S allows the reuse of the Y-joints based on its performance and reliability(refrigerant distribution, oil circulation). However, Samsung will not hold responsibility to third party's or competitor's Y-Joint if occurs any leakage / safety problem.

Copper Pipe

For copper pipe, please make sure the existing pipe layout meets the installation policy mentioned in the DVM S installation manual that will be replaced.

Insulator

Reuse of the insulation system should satisfy the minimum thickness standard.

Power, Communication Cable, Circuit Breaker

The size of power cable and circuit breaker size must be decided by an electrical designer and in compliance with Samsung's MCA & MFA, as it is related to safety.

SAMSUNG

Chiller

Fan Coil Units

DVM Chiller

Chiller - Design Procedure

DVM Chiller

Modular Chiller system Applications

Samsung Electronics is producing Air to Water heat pump(DVM Chiller) with features of VRF and Central Air Conditioning based on heat pump development experience. This combinable chiller is suitable for small and medium sized sites requiring water solutions.

Renewal Central HVAC

DVM Chiller is easy to apply at the central air conditioning renewal site, where you want to replace cooling and heating facilities gradually.

Low temperature plants

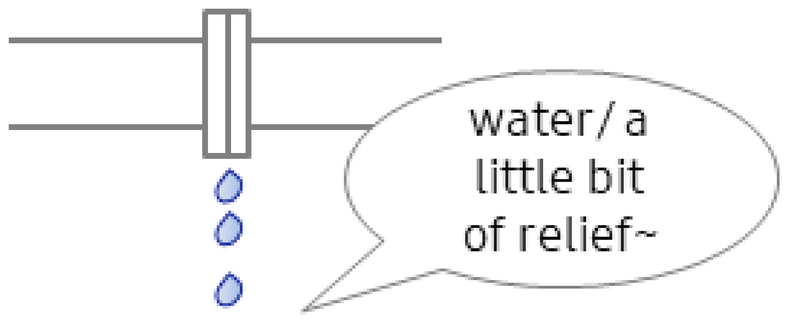
DVM Chiller can also respond to sites where SAC does not meet temperature conditions.

ex) - Ice Thermal Storage System
- Factory requiring 5℃ or less
- Gardening with Indoor Temp. of 18 ℃ or less
- etc.

Site that prefer water system

DVM Chiller does not use refrigerants in AHU or FCU, so it is advantageous for the site to worry about the refrigerant leak.

ex) - Sanatorium
- Residential buildings
- etc.



Chilled water system configuration

Application	Constant primary flow	Primary secondary flow	Variable primary flow
	Small plants (Few coils serving similar loads	Multiple chiller and multiple loads where operator is not existed. (Many coils serving similar loads or dissimilar loads)	Multiple chiller and multiple loads with high loads like data center. (Many coils serving similar loads or dissimilar loads)
Pump energy	-	50~60% less than constant primary flow	60~75% less than constant primary flow
Control valve	3Way valve	2Way valve	2Way valve
Remark	Simple	Common	Control complex

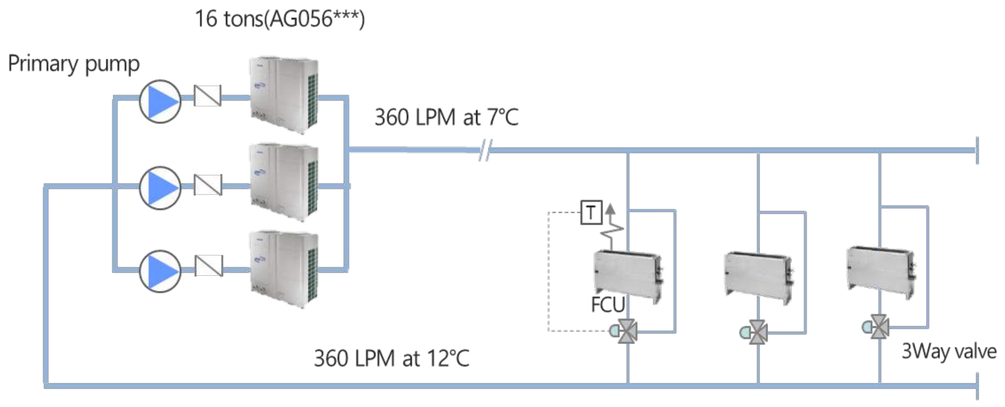
Chiller - Design Procedure

DVM Chiller

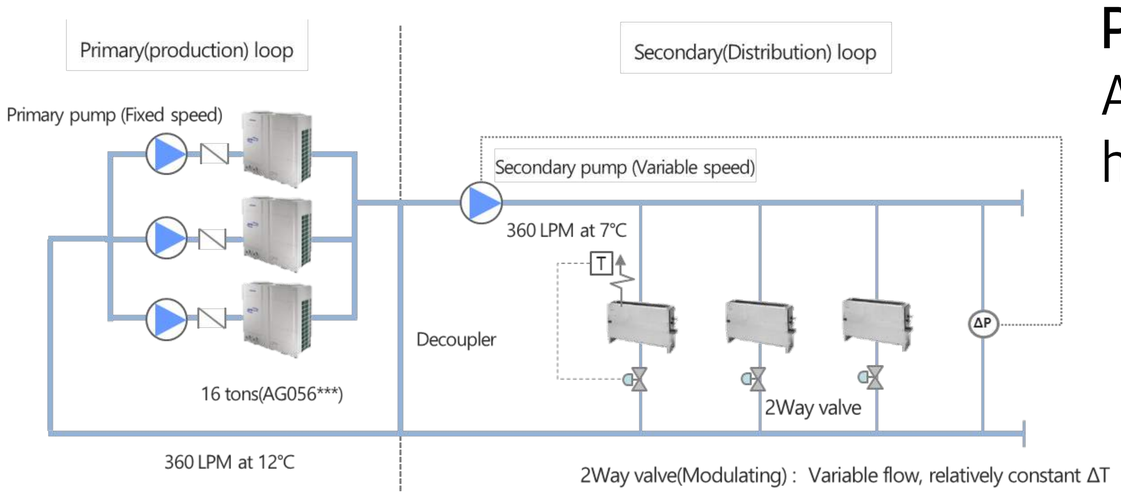
Modular Chiller system configuration

Constant Primary Flow

The chilled water pumps are constant speed. For constant flow rate, a 3 way valve is placed on the outlet of each coil.
A 3way valve is maintain the set point of the air leaving temperature.



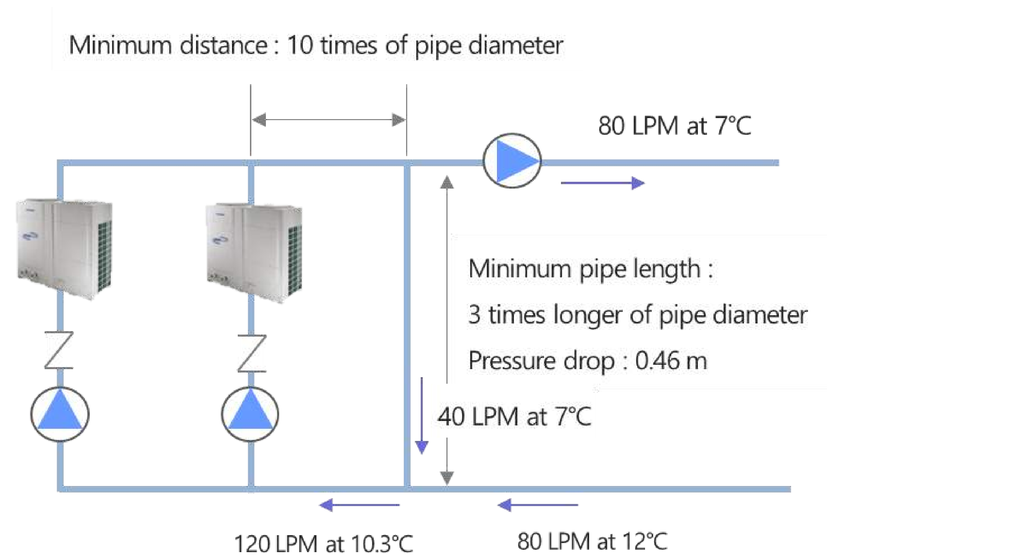
3Way valve(Modulating) : Constant flow rate, Variable ΔT



Decoupler pipe size can cover the flow rate of the largest primary pump
The pressure drop less than 0.46 m(1.5ft)

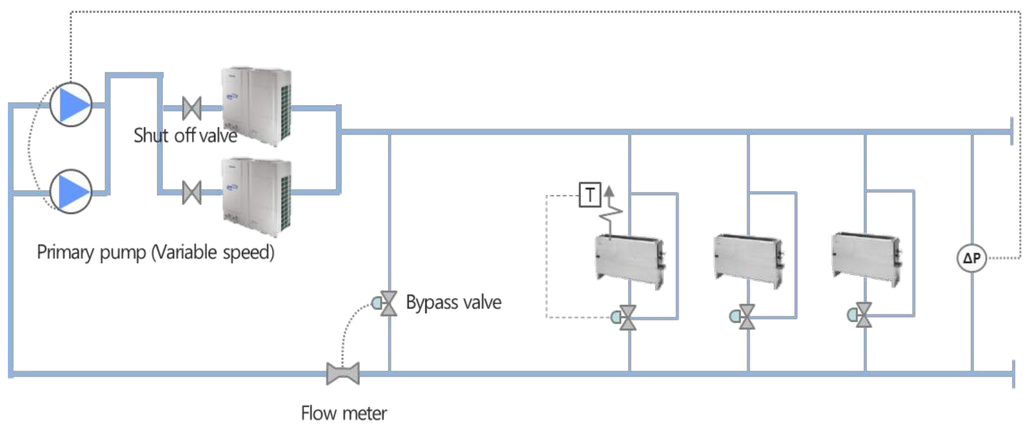
Primary secondary flow

A decoupler pipe separates the two loop hydronically.



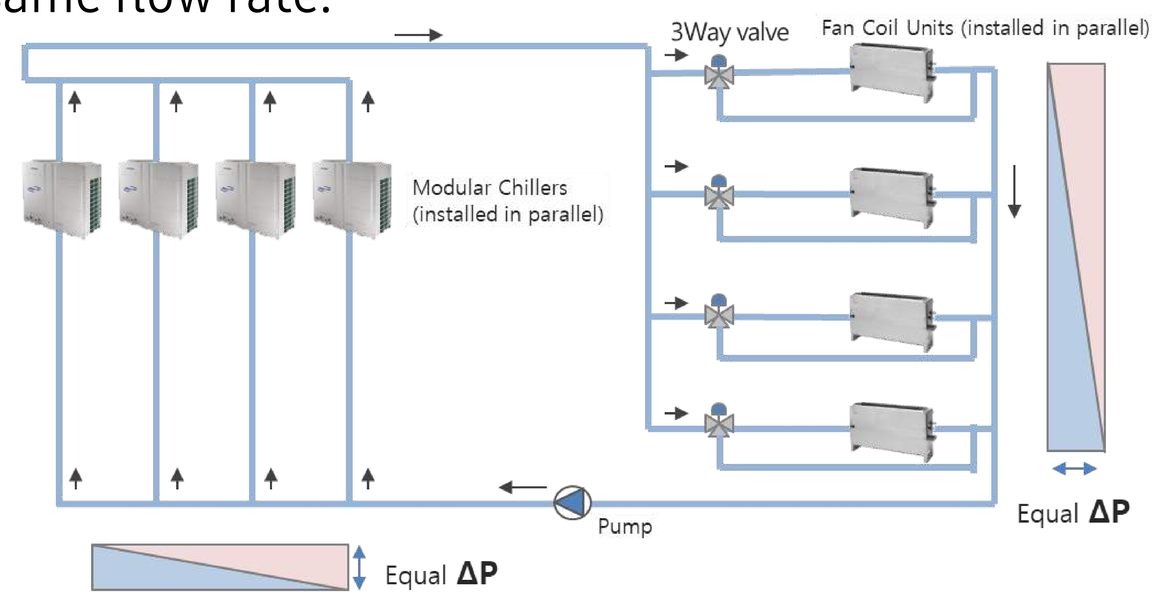
Variable primary flow

Variable primary flow design uses variable pump instead of constant speed pump.
The bypass valve ensures minimum flow rates. The valve should be automatically controlled by using flow meter in primary circuit typically.(Or differential pressure sensors across chillers)



Return pipe (Reverse)

Reverse return configuration is highly recommended in modular configuration to keep same pipe length between supply and return, it has approximately the same friction loss, which it makes the same flow rate.



Profile of Pressure Drop between inlet and outlet

※ Although reverse return system are closer to self-balancing than direct return systems, make sure each load is to balance water flow

Fan Coil Units - Capacity Range

Model	50 Hz - Capacity (kW)								60 Hz - Capacity (MBH)							
	2.6	3.2	4.2	6	7.2	9	10.5	14	9.0	11.0	14.0	20.0	24.0	30.0	36.0	48.0
1Way CST																
4Way CST																
360 CST																

DVM Chiller Heat Pump - Capacity Range

Frequency	Phase	Voltage	Model	HP								
				12	14	16	18	20	22	24	26	Comb
60Hz	Φ3	208-230V	HP AHRI	•			•					300
		460V		•			•					300
50/60HZ		380-415V	HP Standard		•			•		•		400

Fan Coil Units - Water Solution

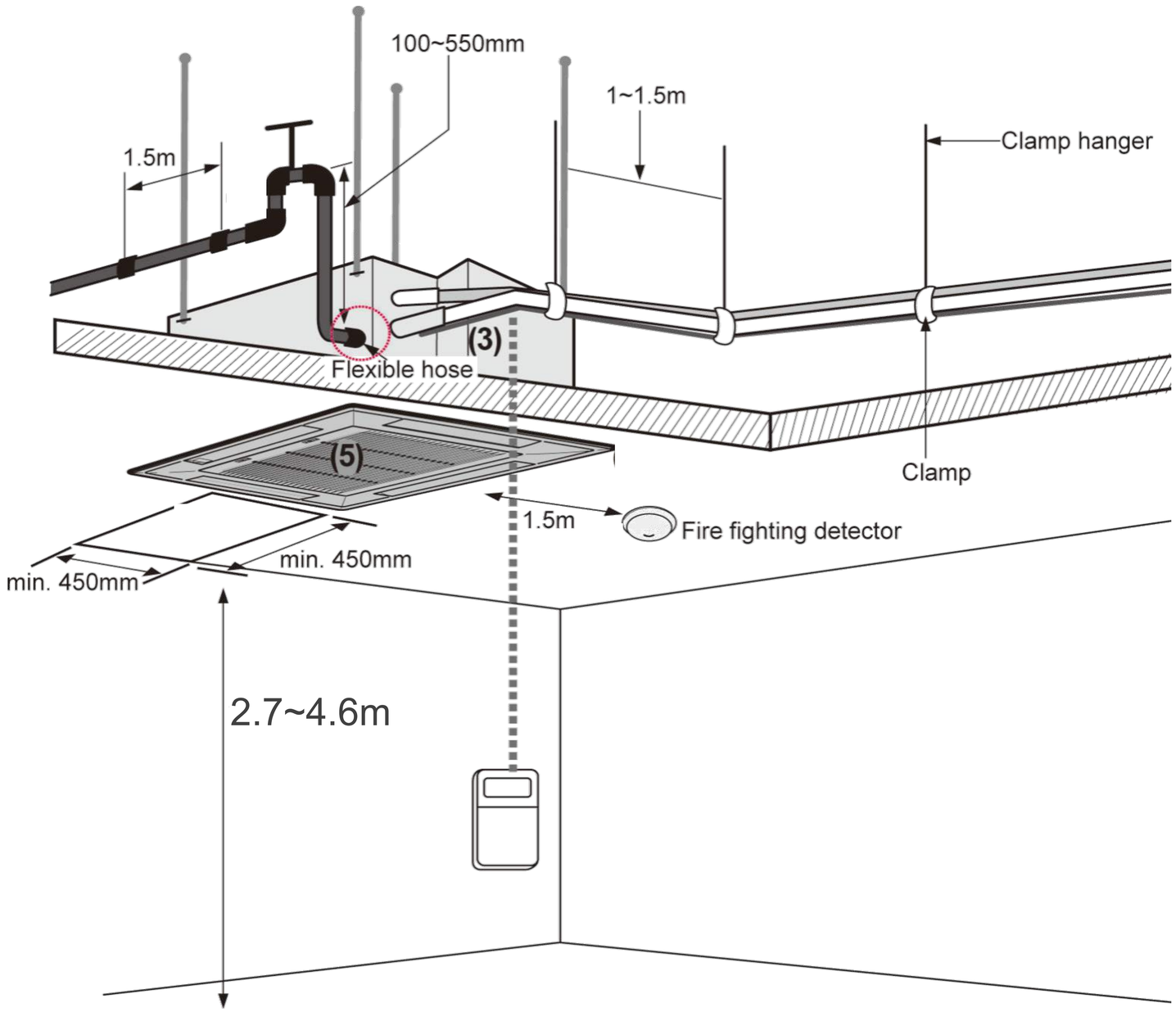
- Innovative products that allow integration with the chilled water system

Model		Capacity Range [MBH]	Cooling Range [m]	Ceiling Height [mm]	Min. Sound Pressure [dB(A)]	Max. Fresh Air
	AG___MN1_____	7~12	8	135	28~29	-
	AG___MN1_____	15	8	138	33	-
	AG___MN4_____	20~24	8	204	30	2~3%
	AG___MN4_____	30~36	8	246	35	2~3%
	AM___KN4_____	20~24	10	233	29~30	5~4%
	AM___KN4_____	30~36	12.5	317	32~35	2~3%

- In addition to the integration with the Samsung ecosystem, the FCU Chilled water units can also be used with other brands of Chiller and be controlled in stand alone mode, third party BMS or through DMS 2.5.

- What should be considered in the installation?

1. Installation Height: 2.7~4.6m
2. 2m away from Projector
3. 1.5m away from Fire Detector
4. Inspection hole (450x450 mm)
5. Avoid Wall or Pilar which can block airflow (1.5m or more)
6. Install away from lighting apparatus that uses ballast stabilizer



DVM Chiller - Multi-Module Combination 380 V

Modulated Units		Capacity of Single Unit (kW)			Recommended pipe size [A]	Modulated Units		Capacity of Single Unit (kW)			Recommended pipe size [A]
Capa (kW)	No. of mod.	42	56	65		Capa (kW)	No. of modules	42	56	65	
		AG042	AG056	AG070				AG042	AG056	AG070	
42	1	1			40	455	7			7	125
56	1		1		40	462	11	11			125
65	1			1	50	504	9		9		125
84	2	2			50	504 (Higher Efficiency)	12	12			125
112	2		2		65	520	8			8	125
126	3	3			65	546	13	13			125
130	2			2	80	560	10		10		125
168	3		3		80	585	9			9	125
168 (Higher Efficiency)	4	4			80	588	14	14			125
195	3			3	80	616	11		11		125
210	5	5			80	630	15	15			125
224	4		4		100	650	10			10	125
252	6	6			100	672	12		12		125
260	4			4	100	672 (Higher Efficiency)	16	16			125
280	5		5		100	715	11			11	125
294	7	7			100	728	13		13		125
325	5			5	100	780	12			12	150
336	6		6		100	784	14		14		150
336 (Higher Efficiency)	8	8			100	840	15		15		150
378	9	9			100	845	13			13	150
390	6			6	100	896	16		16		150
392	7		7		100	910	14			14	150
420	10	10			100	975	15			15	150
448	8		8		125	1040	16			16	150

DVM Chiller - Multi-Module Combination 220/460 V

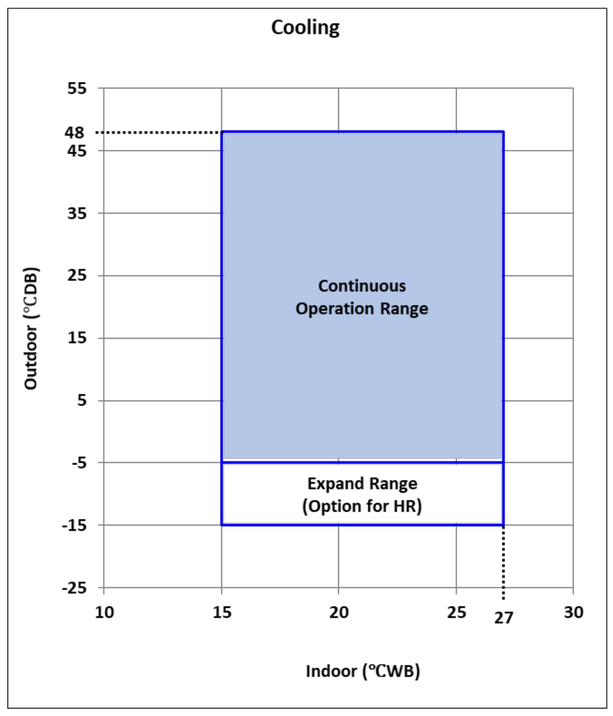
HP	usRT	Standard			High Efficiency		
		AG010KSV***	AG015KSV***	Recommended pipe size [A]	AG010KSV***	AG015KSV***	Recommended pipe size [A]
12	10	1		2"			
18	15		1	2"			
24	20	2		2"			
36	30		2	2 1/2"	3		2 1/2"
48	40	4		2 1/2"			
54	45		3	3"			
60	50	5		3"			
72	60		4	3"	6		3"
84	70	7		3 1/2"			
90	75		5	3 1/2"			
96	80	8		4"			
108	90		6	4"	9		4"
120	100	10		4"			
126	105		7	4"			
132	110	11		4"			
144	120		8	4"	12		4"
156	130	13		4"			
162	135		9	4"			
168	140	14		5"			
180	150		10	5"	15		5"
192	160	16		5"			
198	165		11	5"			
216	180		12	5"			
234	195		13	5"			
252	210		14	5"			
270	225		15	5"			
288	240		16	5"			

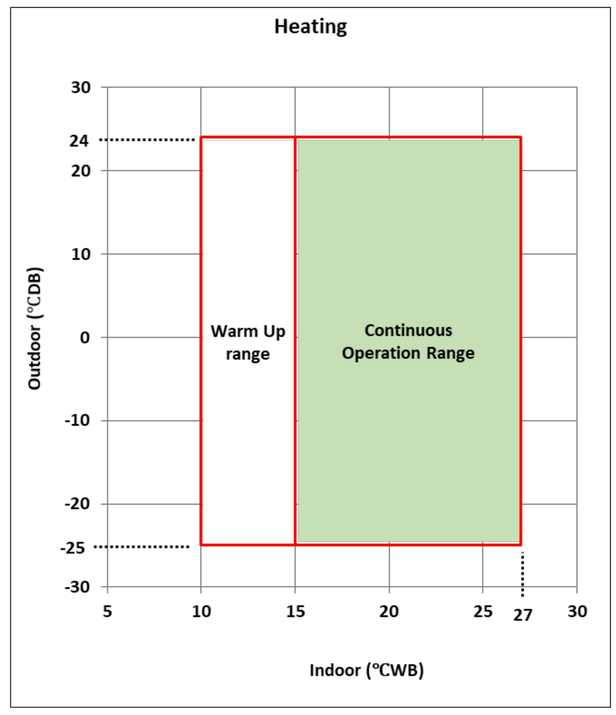
Modular Chiller - Design Range

- Operating temperature Limit

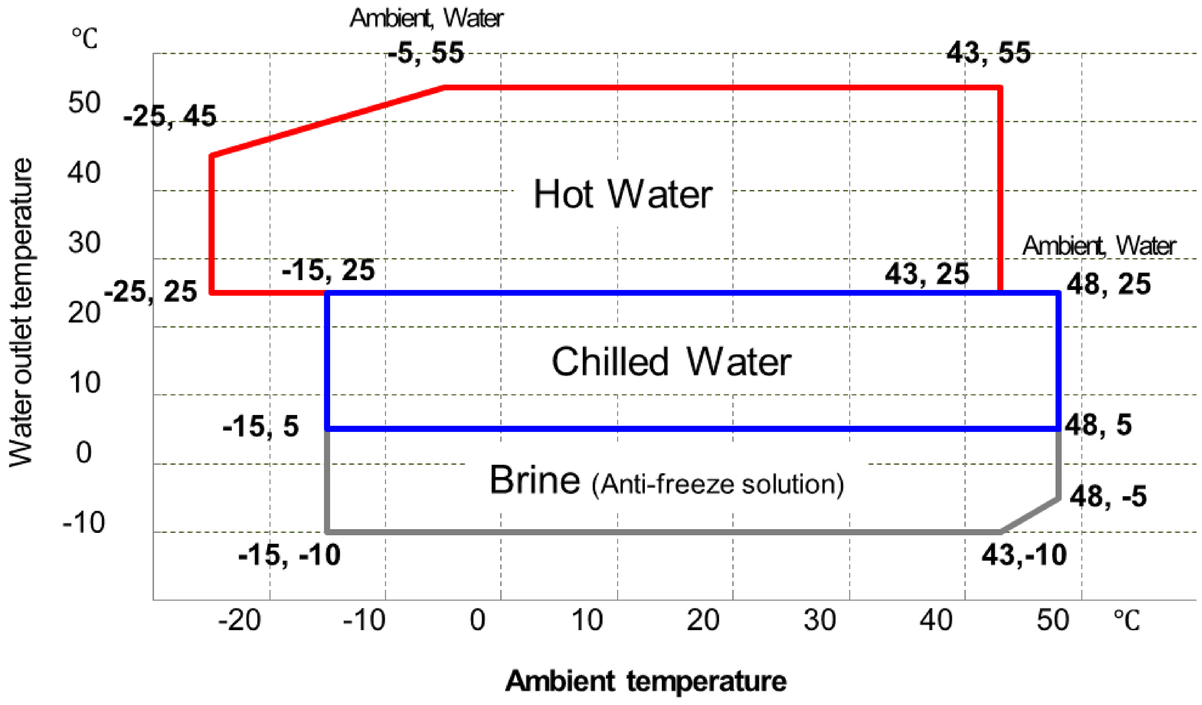
DVM Chiller

In case of heat recovery model, cooling operation range is extended to outdoor temperature of -15℃. In heating mode, indoor temperature range from 10 to 15℃ is a transient operation area and a continuous operation is not guaranteed in this area





Operational Range



- Heating : 25 ~ 55 ℃ water available (Ambient temperature : -25 ~ 43 ℃)
- Chilled water : -10 ~ 25 ℃ water available,
(For under 5 ℃ application, an anti-freeze solution is required).

SAMSUNG

Control Solution

AC Control Solution NASA

Individual Controllers
Centralized Controllers
BMS Controls
Accessories

Control Solution

The must-have, Samsung control system!
To maximize usability & efficiency

Control system overview		
Individual control system	· Controllers to enable individual control on each indoor unit. **Main user :** General user	
Centralized control system	· Controllers to enable central controls on multiple indoor units. **Main user** : System administrator, General user	
Integrated management system	· Controllers to enable the integrated management to control multiple indoor units and to handle energy, error, troubleshooting history, user management, and so forth. **Main user**: System administrator, General user	
BMS Gateway	· BMS gateway to enable a connection between Samsung system air conditioner and BMS (Building Management System) **Main user**: which controls all facilities and managements of an entire building.	
Accessories	· Additional devices used for other purposes to enhance the control and management of Samsung system air conditioners. Can provide special solutions for users who have specific requirements.	

Control Solution

- Controller selection: Individual requirements

MWR-WG00JN
Graphic

MWR-WE13N
Multifunction

MWR-SH11N
Touch Simplified

MWR-SH10N
(Simplified)

Main function & feature:

Attributes	Graphic	Multi-Function	Touch Simplified	Simplified
Individual zone control	●	●	●	●
Multi-Zoning control Small to Medium Projects				
Multi-Zoning control Medium to large Projects				
Temperature range limit for energy saving	●	●	●	●
Simple energy Monitoring: Outdoor only, reference purpose	●			
Advance energy monitoring: Whole system, billing purpose				
Multi-Zoning control w/o schedule				
Auto changeover (Cooling/Heating)	●			
Internet connection for control and monitoring				
Operation mode and remote controller restriction	●	●		

Control Solution

- Controller selection: Intermediate requirements

MIM-H04(U)N
Wi Fi-Kit

MCM-A202D(U)N
On/Off

MCM-A300(U)N
Touch Controller

(MIM-D01A(U)N)
DMS 2.5

Attributes	Wi Fi-Kit	On/Off	Touch Controller	DMS 2.5
Individual zone control	●	●	●	●
Multi-Zoning control Small to Medium Projects	●	●	●	
Multi-Zoning control Medium to large Projects			●	●
Temperature range limit for energy saving			●	●
Simple energy Monitoring: Outdoor only, reference purpose	●			●
Advance energy monitoring: Whole system, billing purpose				● (1)
Multi-Zoning control w/o schedule		●		
Auto changeover (Cooling/Heating)			●	●
Internet or intranet control connection and monitoring	●			●
Operation mode and remote controller restriction		●	●	●
Level management: User, Administrator, Manager				●

(1) .Required PIM Module and Wattmeter per system

Control Solution

- Controller selection: Advance requirements

(MIM-B17U(U)N)
BACnet

(MIM-B18U(U)N)
Lon Works

(MIM-B19(U)N)
Modbus

(SM-ACN-KNX-***)
KNX

Attributes	BACnet	Lon Works	Modbus	KNX
Multi-Zoning control Small to Medium Projects			●	●
Multi-Zoning control Medium to large Projects	●	●		
Temperature range limit for energy saving	●	●	●	
Simple energy Monitoring: Outdoor only, reference purpose				
Advance energy monitoring: Whole system, billing purpose	●	●		
Remote alarm, error notification via internet/intranet	●	●	●	●
Auto changeover (Cooling/Heating)	●	●	●	●
Internet or intranet connection for control and monitoring	●	●	●	●
Operation mode and remote controller restriction	●	●	●	●
Level management: User, Administrator, Manager	●	●	●	●

Control Solution

- An easy controller in a room or an office, wherever you are!

Individual Controller: Wireless R/C

Main user: General user
To enable individual control on each indoor unit

AR-KH03E
(360 cassette)

AR-EH03E
(Wind free, Normal)

Zone selecting control

Individual blade control

Main function & feature:

Model	AR-KH03E	AR-EH03E
Zone selecting control (max. 4 Zones)	●	●
Individual blade control	●	●
Simple schedule control(On timer / Off timer)	●	●
On/off, operation mode, fan speed, Airflow, temperature setting	●	●
Filter replacement alarm reset	●	●
Buzzer sound mute	●	●
Address and option setting	●	●
Wind free control		● (1)
360 cassette air flow direction control	● (1)	
Auto Clean, MDS(Indirect/Direct)	● (1)	

(1) .Special functions

Control Solution

- An easy controller in a room, hotel or an office, with energy consumption and temp. limitation

Individual Controller: Wired R/C

Main user: General user, manager
Allows connection and control of up to 16 indoor units, max 100m of wiring

MWR-WG00JN
Graphic

MWR-WE13N
Multifunction

MWR-SH11N
Touch Simplified

MWR-SH00N
(Simplified)

Main function & feature:

Model	MWR-WG00JN	MWR-WE13N	MWR-SH11N	MWR-SH00N
On/off, operation mode, fan speed, Airflow, temperature setting, Error Display	●	●	●	●
Air swing, Filter cleaning alarm reset, Wireless R/C restriction, Quiet mode	●	●	●	●
Temperature Range Limit	●	●	●	●
Partial button lock	●	●	●	●
Schedule: Simple timer(On/Off)			●	●
Schedule: Weekly schedule	●	●		
Built-in room sensor, LCD backlight, Sleep mode	●	●	●	
Ionizer display	●	●	●	
Wind Free function	●	●	●	

(1) .Special functions

Control Solution

- An easy controller in a room, hotel or an office, with energy consumption and temp. limitation

Individual Controller: Wired R/C

Main user: General user, manager
Allows connection and control of up to 16 indoor units, max 100m of wiring

MWR-WG00JN
Graphic

MWR-WE13N
Multifunction

MWR-SH11N
Touch Simplified

MWR-SH10N
(Simplified)

Main function & feature:

Model	Graphic	Multi-Function	Touch Simplified	Simplified
ERV Control (Energy Recovery Ventilation)	●	●		
ERV: CO2 display, Humidity display, Purification mode, Energy saving mode	●	●		
Real-time clock, Summer time, Individual blade control,	●	●		
IR receiver	●			●
Energy monitoring: consumption of ODU	●			
Outing mode (SAC): up to 5°C difference with desired outing temperature				●
Touch screen				●
Auto Change Over (ACO): with primary and secondary temp setting for Cool & Heat	●			
Ionizer control	●	●		
Multilanguage ((EN/EN/FR/PT/DE/NL)	●			

(1) .Special functions

Control Solution

- Simple central management for small & mid size building. Remote Control & Monitoring

Centralized Controller

Main function & feature:

Centralized control system		MIM-H04(U)N	MCM-A202D(U)N	MCM-A300(U)N
		Wi-Fi Kit 2.0	On/Off controller	Touch centralized controller
Dimension (WxHxD, mm)		185 x 130 x 29	110 x 120 x 55	203 x 161 x 38
Connection	Indoor unit control	●	●	●
	ERV control	●	●	●
	Max. connectable unit number	16	128	128
Control & monitoring	On/Off	●	●	●
	Operation mode	●	●	●
	Fan speed	●	-	●
	Air swing	●	-	●
	Filter cleaning alarm reset	●	-	●
	Error display	●	-	●
Schedule	Weekly schedule	●	-	●
Convenient function	Mobile control (App)	●	-	-
	Touch screen	-	-	●
	Summer time setting	-	-	●
	Zone (Group) control	● (Editable by user)	● (Editable by user)	● (Editable by user)
	Remote controller restriction	-	●	●
	Operation mode limit	-	-	●
	External contact interlock	-	-	●
Energy saving	Temperature range limit	-	-	●
	Power consumption monitoring	●	-	-

Control Solution

- Simple central management for small & mid size building. Remote Control & Monitoring

Centralized Controller

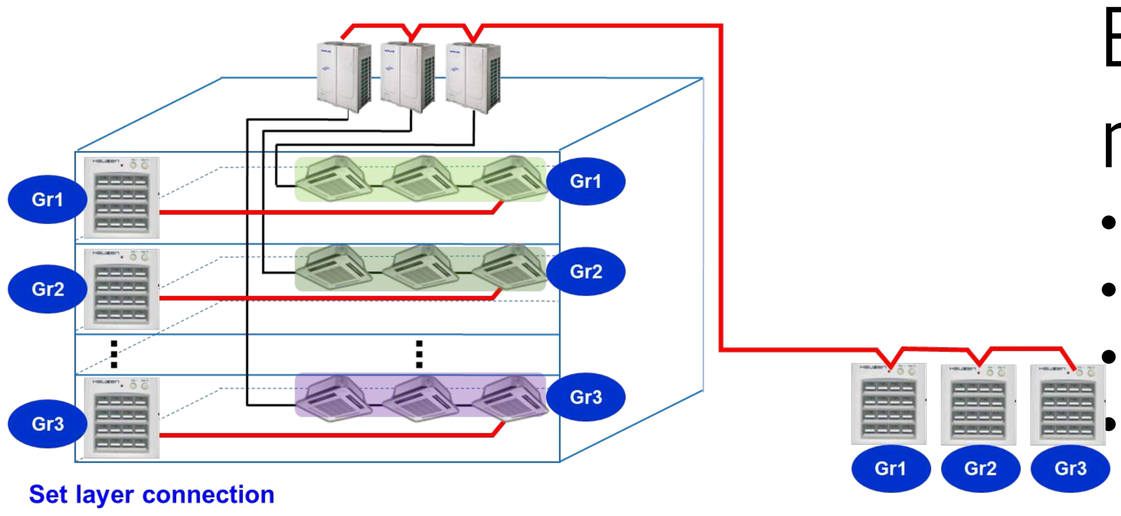
Voice recognition

- SmartThings App enables voice recognition via Bixby
- Pre-cooling / Pre-heating before arriving home: using a geo-fencing, the environment c a home is made comfortable.

Range: 100m ~ 150 km

Easy On/Off control over multiple indoor units as a group

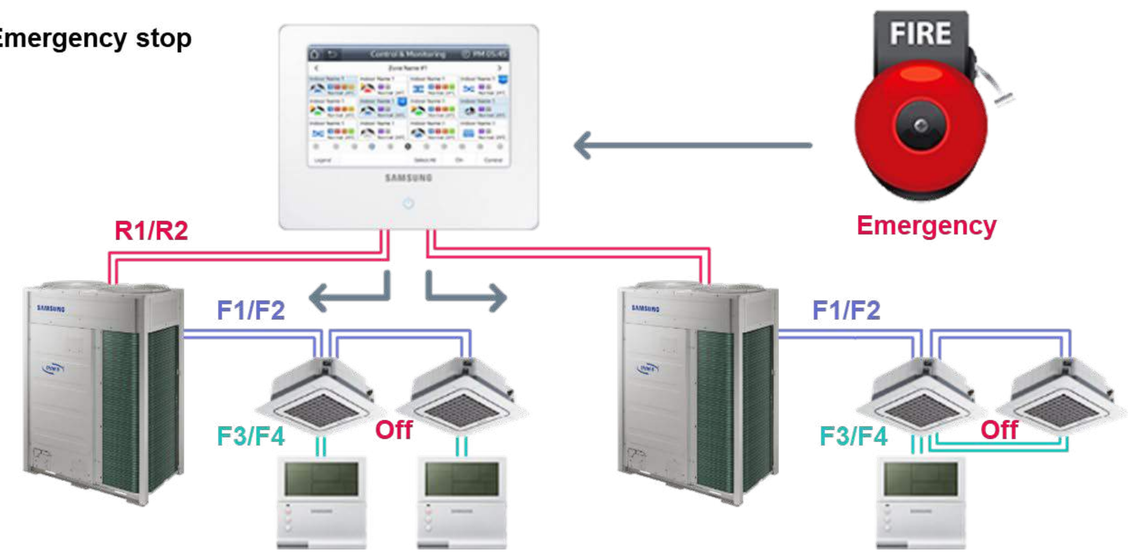
- Best for large as well as small buildings
- Flexible connection
- Wireless / wired R/C restriction
- Cooling / Heating mode control



Simple Control Integrated

- Simple operation control interlocking with external contact (2 Digital input)
- Indoor unit operation On/Off status output (1 Digital output)
- Zone management: Simply controls all indoors, zone with one button
- Easy to check each device status using color and icon
- Turning over pages with flicking or simple touch (No scroll bar)

EX Emergency stop

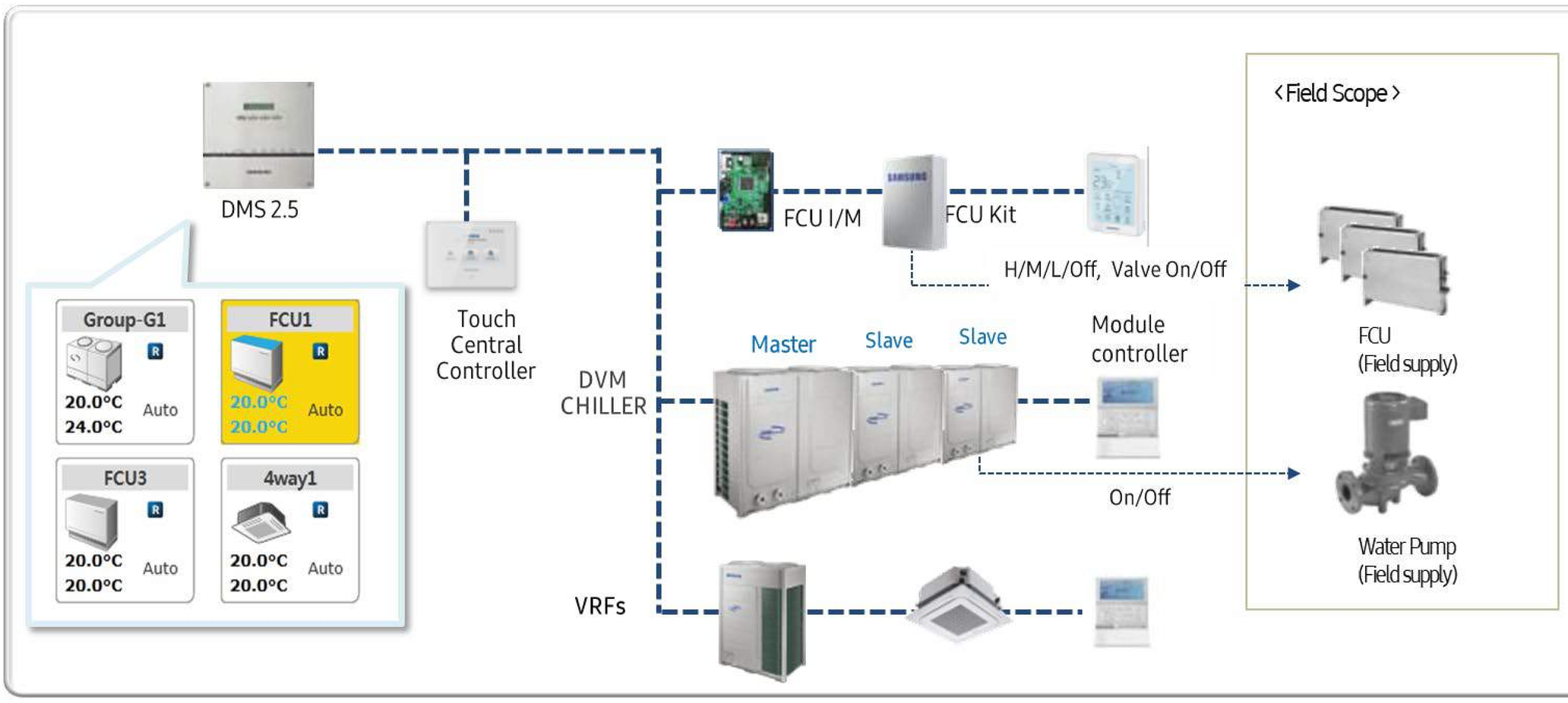


Control Solution

- A system controller based on web browser systematic control and effective management

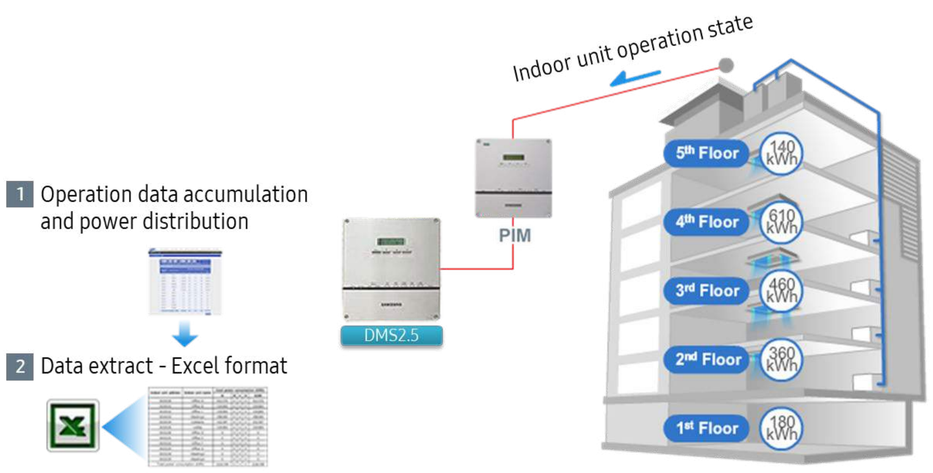
BMS Controls:

Main function & feature:

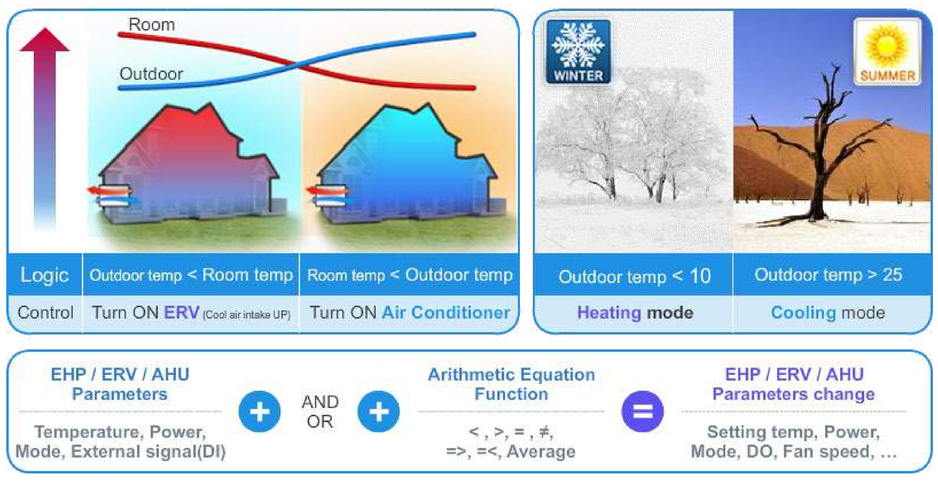


Data Management Server (DMS)
MIM-D01AN

- Individual / Zone management (Max. 256 indoor units)
- Remote control via local/internet
- DMS 2.5 can control and monitor DVM Chiller and FCU Kit.
- Using “Control logic” function, user can interlock the operation of DVM Chiller and FCU Kit.
- External device interlocking



- Accessible level management (Admin, Manager, User)
- History & Error management for AC operation analysis
- Power distribution to up to 256 indoor units: required Pulse Input Module (PIM) and Wattmeter per System



- Vacant room control / occupied room control
- User can edit control logic with arithmetic / conditional operators and parameters
- Efficient energy saving realization for various operation conditions.

Control Solution

- A system controller based on web browser systematic control and effective management

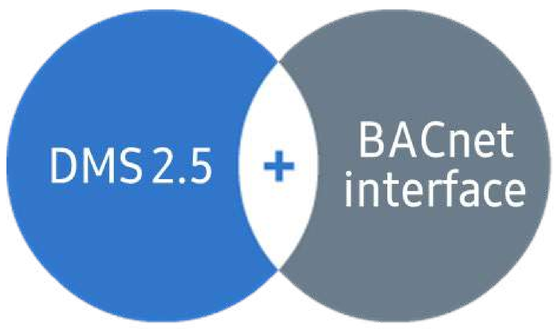
BMS Controls:

Main function & feature:

S-NET 3 MST-P3P

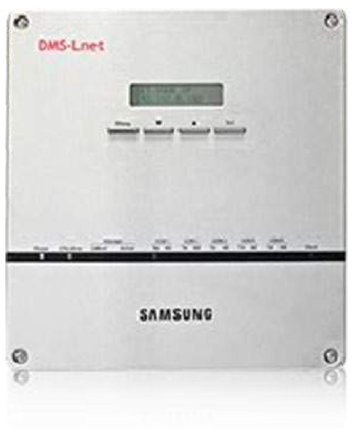
S-NET 3 is a complex management program that controls and monitors a complete air conditioner network system.
The S-NET series provides flexible and complete control for a variety of applications

- Up to 16 DMSs connection through the Ethernet
- Control & Monitoring of up to 4,096 indoor units



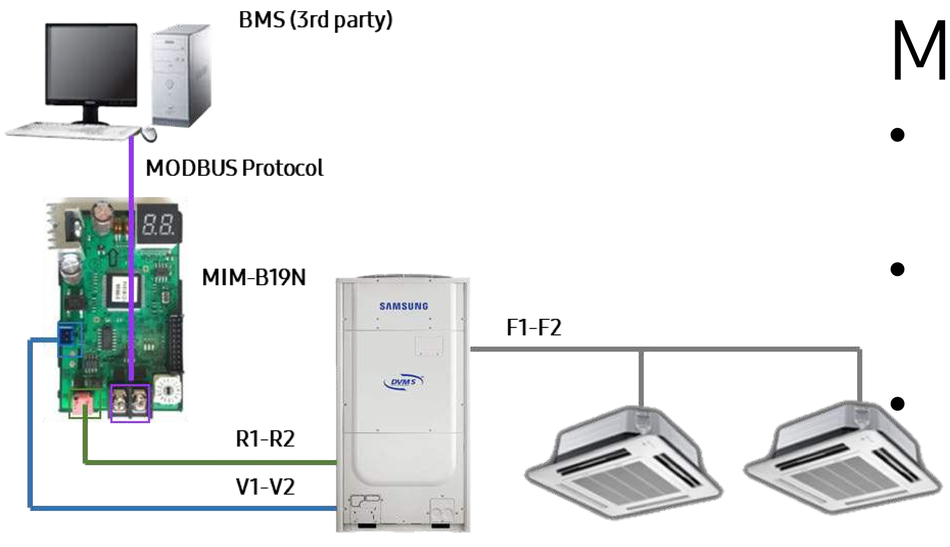
BACnet gateway MIM-B17BN

- Interface for BACnet Building Management System
- Included DMS2.5 function
- Central management of up to 256 indoor units
- Communication connection
  - Lower layer : RS485 (To Air conditioner)
  - Upper layer : Ethernet 10/100 Base-T (To Internet)
  - BACnet layer : Ethernet 10/100 Base-T (To BMS)



LonWorks gateway MIM-B18BN

- Interface for LonWorks Building Management System
- Central management of up to 128 indoor units
- Included DMS 2.5 function
- Communication connection
  - Lower layer : RS485 (To Air conditioner)
  - Upper layer : Ethernet 10/100 Base-T (To Internet)
  - LonWorks layer : TP/FT-10A (To BMS)



Modbus interface module MIM-B19N

- BMS or 3rd controller can control Samsung SAC by using MODBUS protocol
- Central management of up to 48 indoor units
  - 1 outdoor unit system (Include modular)
- Communication connection
  - Lower layer : R1/R2 RS485 (NASA)
  - Upper layer : Modbus RS485 (Max. 1,000m)

Control Solution

- Optional devices to provide various solutions for a customer's needs

Accessories:

Wireless signal receiver
(MRK-A10N)

Operation mode selection switch
(MCM-C200)

External room sensor
(MRW-TA)

Compatible interface module
(MIM-N01)

ERV interface module
(MIM-N10)

External contact interface module
(MIM-B14)

Multi Tenant Function Controller
(MCM-C210N)

DVM Chiller control
system

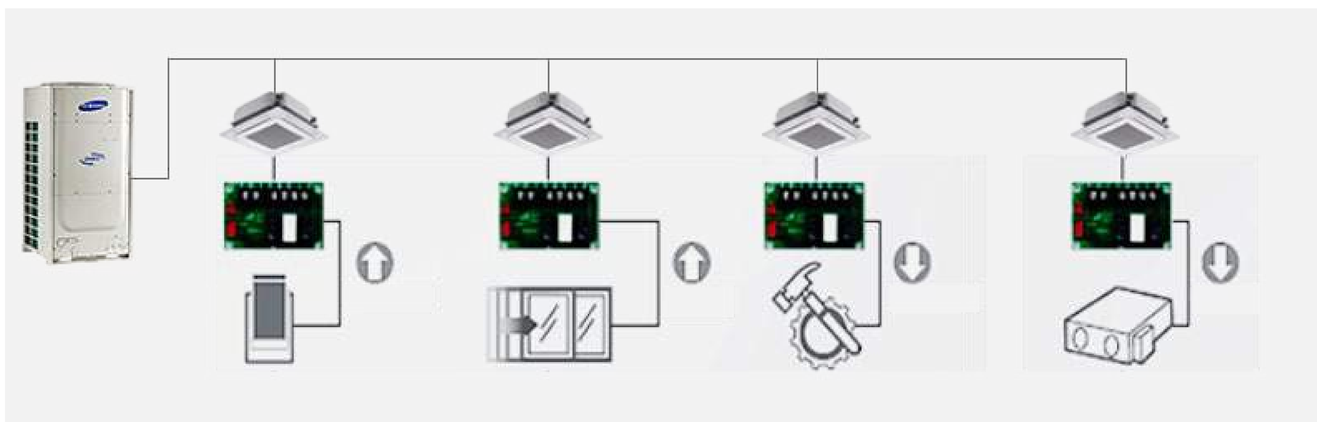
Main function & feature:

Wireless signal receiver MRK-A10N

- On/Off control
- Operation indication
- Error Indication
- Filter replacement sign
- Use with receiver wire

External room temp. sensor MRW-TA

- Indoor unit is operated by MRW-TA instead of its own sensor.
- Supports all types of indoor unit.
- Wire length: 12m(39ft)



Ext. contact interface module MIM-B14

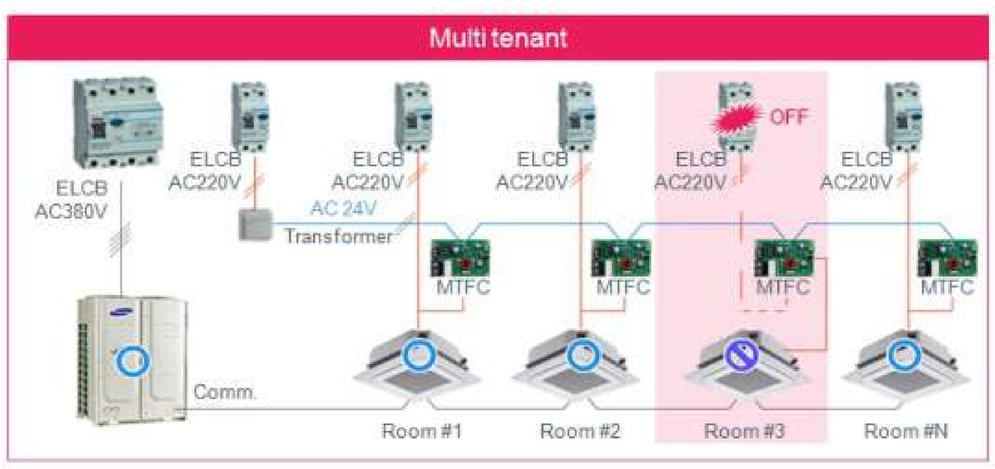
- Direct indoor unit control by external contact signal
- Window-synchronized indoor unit control
- Indoor unit operation/error state output through relay contacts
- Emergency control with simple contact input)

Control Solution

- Optional devices to provide various solutions for a customer's needs

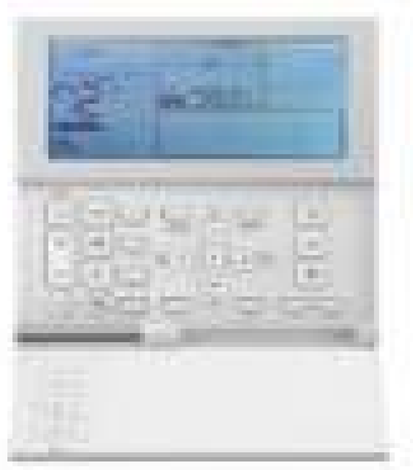
Accessories:

Main function & feature:



MTFC – MCM-C210N (Multi Tenant Function Controller)

MTFC is an auxiliary power supply device which allows indoor unit to turn off (close EEV) normally and maintain communication when main power supply is cut



Module controller – MCM-A00N

- DVM Chiller On/Off control (Module /Group)
- Operation mode, water outlet temperature setting
- Optional operation setting, module / group setting
- Weekly operation schedule setting.

FCU Kit – MIM-F00N

- Communication and control interfacing kit between 3rd party FCU and Samsung control system
- Possible to use wired R/C
- Possible to use DMS 2.5, touch centralized controller
- Provides external contact input
- Outputs control signal for FCU fan / water valve

FCU interface module - MIM-F10N

- Communication interface module between FCU Kit or FCU and high level controller
- Supports Samsung FCU, FCU kit
- Max. 16 FCU Kits connection

SAMSUNG

Design Software & App

AC Support
DVM Mobile
AR 360 Cassette Installer
DVM Pro Sales Mode
DVM Pro CAD Mode
E-Solution
ERV Simulator

Design Support & App

- Tools overview

Product/Tool	DVM INDOOR	DVM OUTDOOR	DVM CHILLER	CAC	FJM	RAC	ERV	EHS
DVM Pro	●	●	●	●	●		●	●
E-Solution	●	●						
ERV Simulator							●	
DVM Mobile APP	●	●		●	●			
EHS Simulator								●
AC Support APP				●	●	●		
360 CST APP	●			●				
LAT & Capacity Calculator	●			●	●	●		●
CFD Analysis	●	●	●	●	●	●	●	●
Submittal Generator	●	●						

Design Software

- Design software tools developed to support consultant, designers and customer.

DVM Pro

Quick and easy design/selection software

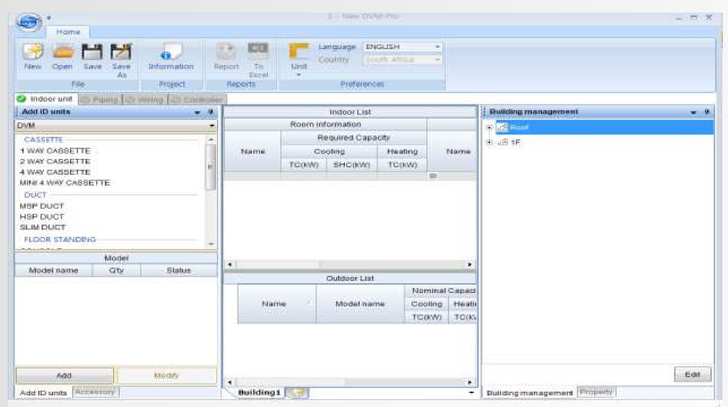
Offering

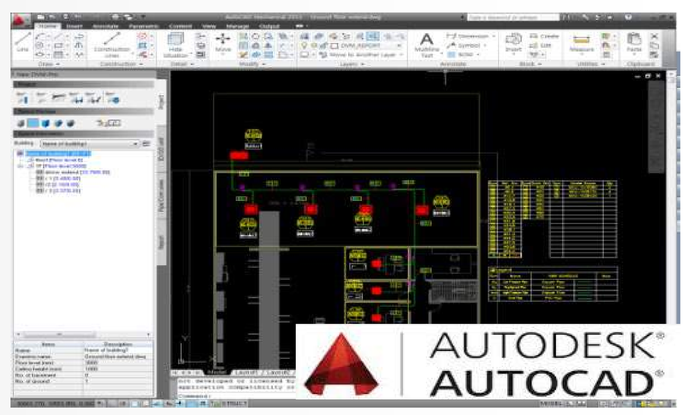
- Sales mode : Simple design with model list
- CAD mode : Designing the drawing system in AutoCAD.

Automatic update
Product database

Simple & Images
Sales Mode

Powerful CAD design
Based on Autocad





Products: DVM, CAC, FJM, EHS, ERV and DVM Chiller

Download Link
http://dvm.inno-lab.co.kr/dvmsetup/setup_x86(Contain%20.Net).zip
http://dvm.inno-lab.co.kr/dvmsetup/setup_x64(Contain%20.Net).zip

DVM E-Solution

Simulate power consumption for one year, calculate SEER and SCOP, check specifications, capacity table

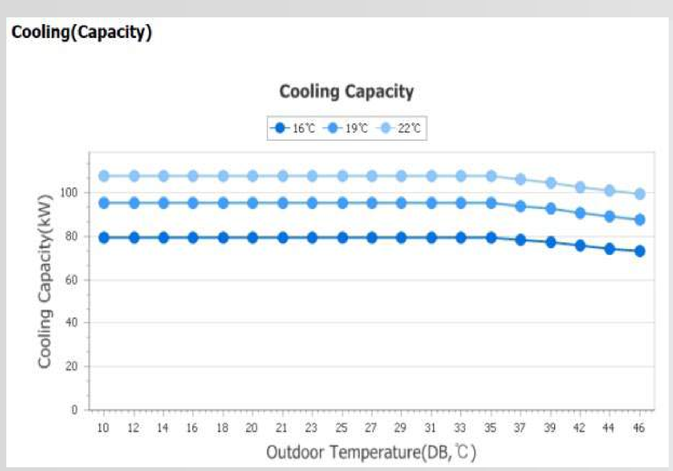
Offering

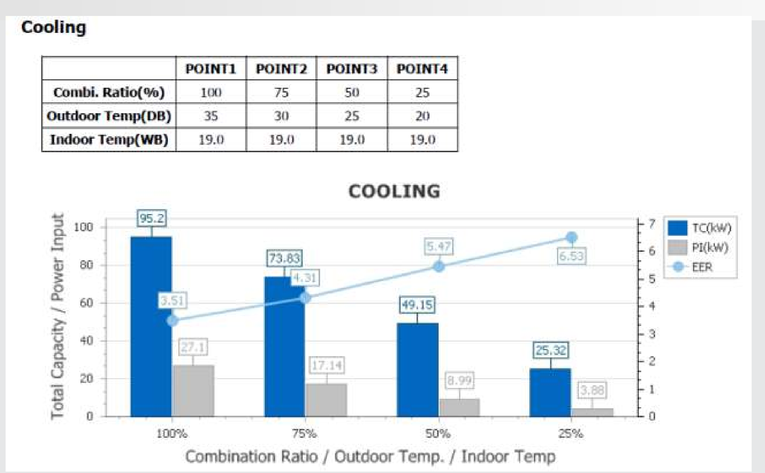
- Product Specifications
- Capacity Table & Chart
- EER / COP Table & Chart
- SEER/SCOP
- Energy load simulation
- Simulation of energy use

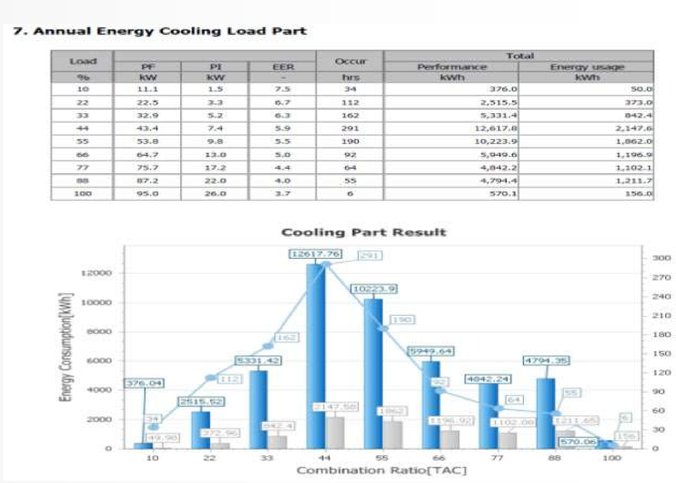
Capacity

SEER/SCOP

Annual performance
Use of Energy







Products: DVM

Download Link
http://dvme.bimpeers.com/publish_eng.htm

Design Software

- Design software tools developed to support consultant, designers and customer.

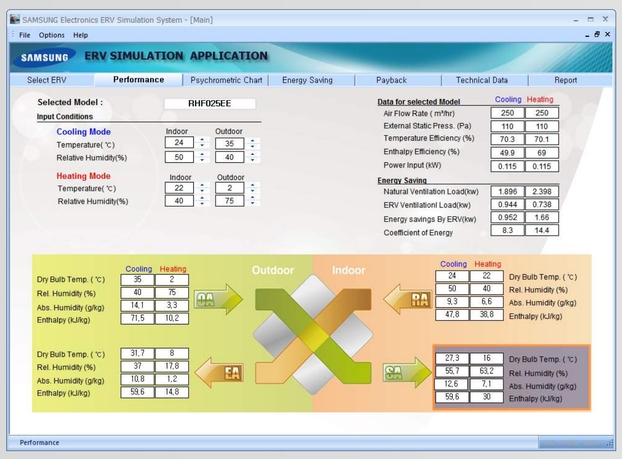
ERV Simulator

Ventilation program, can determine the correct unit, energy saving and payback based on operation, air flow and ESP.

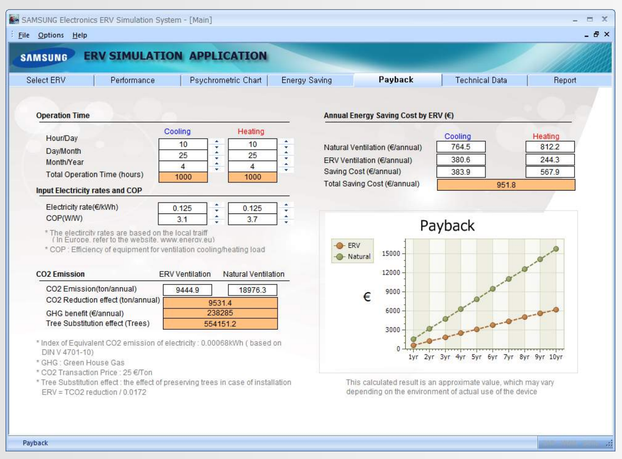
Offering

- Supply Air Properties:
- Economic Effects (Reports)
- Psychrometric Chart
- Payback, CO2 emission

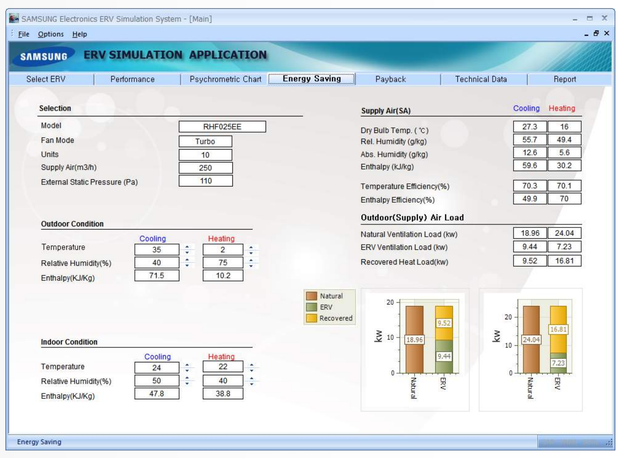
Performance Calculation



Energy Saving



Payback Calculator



Products: ERV, ERV+ , OAP

Download Link
https://partnerhub.samsung.com/

Minimum Airflow Calculator

It should provide the proper level of ventilation to satisfy IAQ no matter what kinds of HVAC system is applied. Based on ASHRAE standard 62.1-2013

Offering

- Air flow calculation by area type based on ASHRAE
- Thermal calculation based on outdoor temperature and supply temperature conditions.

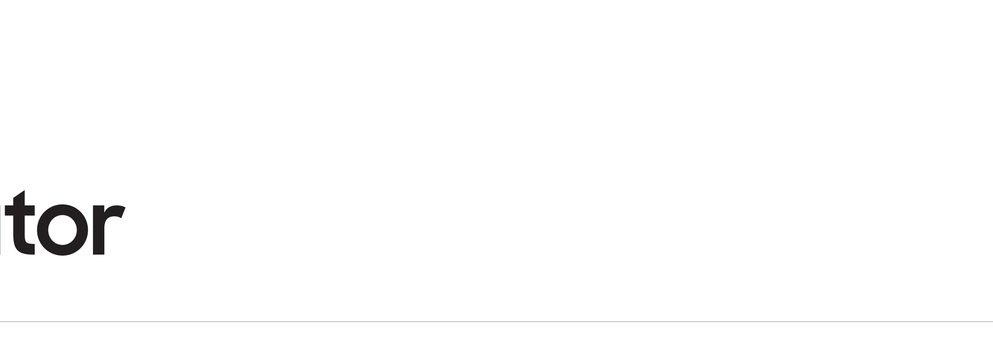
Minimum Airflow Calculation

Minimum Ventilation Airflow & Ventilation Load Calculator — SAMSUNG

Minimum Ventilation Airflow

	Market Application	Hotels, Motels, Resorts, Dormitories		Altitude [m]	1,000			
	Zones	Zone Floor Area [Az, m²]	max.Occupancy [Pz]	OA /person [Rp, L/s-person]	OA /area [Ra, L/s-m²]	People OA rate [Rp·Pz, L/s]	Area OA rate [Ra·Az, L/s]	Air-distribution Configuration [Ez]	Total OArequired [Vot, L/s]
1	Bedroom/living room	500	50.0	2.5	0.30	129	154	CSFR 1.0	283
2	Barracks sleeping areas								
3	Laundry rooms, central	300	30.0	2.5	0.60	77	185	CS 1.0	262
4	Laundry rooms within dwelling units								
5	Lobbies/prefunction	150	45.0	3.8	0.3	176	46	CS 1.0	222
6	Multipurpose assembly	50	60.0	2.5	0.3	154	15	CSCRH 0.8	212
7									
8									
9									
10									
11									
12									
13									
14									
	Sum	1,185	196				Sum of Zones		979
							Increase breathing zone outdoor airflow by	10%	1,077

Thermal load cooling/heating



The ventilation rate for Single-Zone or 100% Outdoor Air ventilation systems is calculated as follows
Breathing Zone Outdoor Airflow
$V_{bz} = R_p \cdot P_z + R_a \cdot A_z$ [CFM, L/s]
A_z = zone floor area: the net occupiable floor area of the zone (ft², m²)
P_z = zone population: the largest number of people expected to occupy the zone during typical usage. [persons]
If the number of people expected to occupy the zone fluctuates, P_z may be estimated based on averaging approaches
R_p = outdoor airflow rate required per person [CFM/person, L/s person]
R_a = outdoor airflow rate required per unit area [CFM , L/s]

The design zone outdoor airflow (V_{oz}), the outdoor airflow that must be provided to the zone by the supply air distribution system, shall be determined as
V_{ot} (V_{ou}) = V_{bz} / E_z
E_z = The zone air distribution effectiveness

Ventilation Loads per Design Temperature Conditions

	Cooling				Heating			
	DB [℃]	WB [℃]	HR [%]	h [kJ/kg]	DB [℃]	WB [℃]	HR [%]	h [kJ/kg]
Outdoor Design Temperatures	35.0	29.0	64.3	94.6	-11.0	-9.0	167.7	-4.9
Discharge Air Temperatures	19.0	17.0	82.2	47.9	29.0	15.5	22.0	43.2
Total Thermal Load [kW]	**59.8**				**60.2**			
Sensible Load [kW]	22.0				50.8			
Latent Load [kW]	37.7				9.4			

Products: ERV, OAP, AHU Kit

Download Link
https://partnerhub.samsung.com/

Design Software

- Design software tools developed to support consultant, designers and customer.

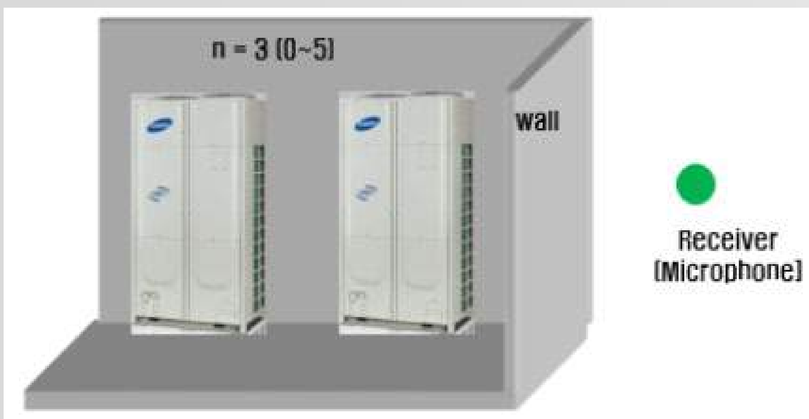
Sound Level Calculator

Calculates Sound levels at a certain distance from multiple outdoor units, Even if there is a wall between the outdoor units and sound receiving point(microphone), it can calculate in a consideration of reflection and diffraction.

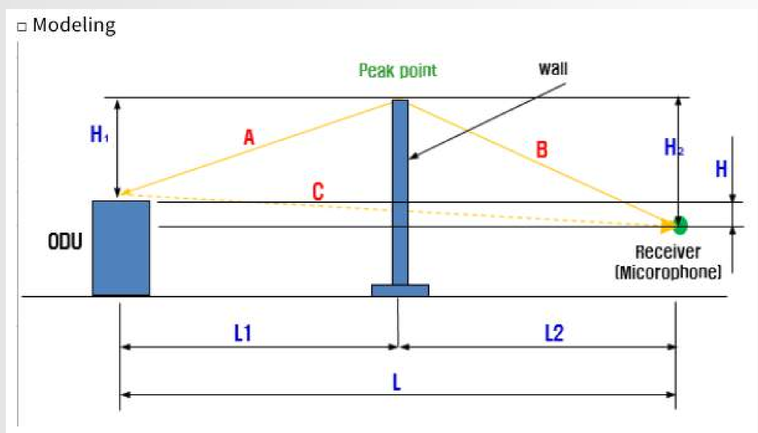
Offering

- Total sound Pressure at microphone
- Total sound Pressure considering surrounding noise

Outdoor Configuration



Onsite Installation



Sound Calculator

Outdoor unit No.		1	2	3	4
Basic input	1) Outdoor units' Model Name	AM300KXVAGH/ET	AM140MXVDGH/ET	AM220NXVAGH/ET	
	2) Sound Power (dBA) on TDB	90.0	81.0	86.0	
	3) Horizontal distance, L (m)	10.0	9.0	8.0	
	4) Height from ODU and Microphone, H (m)	0.7	0.5	0.5	
	5) Number of Reflect surface, n (including floor)	3.0	3.0	3.0	
	6) Background noise [dBA] at microphone if unknown, input 0 (zero)	Background noise level is (35.0) dBA			
Additional input in case that there is a wall between outdoor unit and microphone					
	7) Horizontal distance from ODU to wall, L1 (m) (Input "0"(zero) if there is no wall in between ODU and microphone)	3.0	2.0	1.0	
	8) Height between ODU and Wall, H2 (m) (Input "0"(zero) if there is no wall in between ODU and microphone)	3.0	3.0	3.0	
Result	Horizontal distance from wall to Microphone, L2 (m)	7.0	7.0	7.0	
	Height between Wall and microphone, H2 (m)	2.3	2.5	2.5	
	Distance from ODU to Microphone, C (m)	10.0	9.0	8.0	
	Path difference of Electromagnetic wave, L2 [m] = A+B-C	1.6	2.0	2.6	
	Attenuation				
	- by distance [dBA]	31.0	30.1	29.1	
	- by diffraction [dBA]	13.2	14.0	14.9	
	- by reflection [dBA]	(9.0)	(9.0)	(9.0)	
	Sound level of each outdoor unit at Microphone [dBA]	54.8	45.9	51.1	
	Total Sound Pressure at Microphone, SPL (dBA)	Sound Level at Microphone is 56.7 [dBA]			
	Total sound Pressure considering background noise(dBA)	Sound Level at Microphone is 56.7 [dBA] incl			

※ Note : This calculation table calculates using simple noise formula and is ignored absorbtion/permeation at the wall for the approximation. It may

Products: DVM ODU

Download Link
https://partnerhub.samsung.com/

Leaving air temperature and capacity Calculator

This tool is used to determine the LAT(Leaving air temperature) or required cooling capacities based upon psychrometric properties

Offering

- Calculate LAT using the total heat and sensible heat of the Samsung ducted unit
- Determine the required cooling capacity of Samsung ducted unit to satisfy the target DAT.

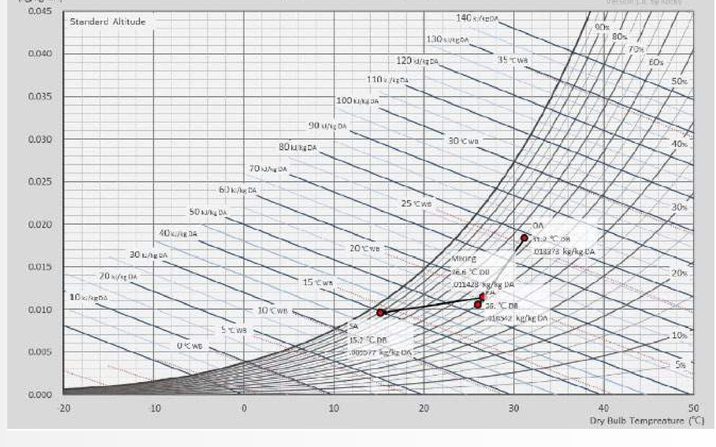
LAT Calculator

Finding LAT (Leaving Air Temp.) Input

Properties	Outdoor Air	Return Air	Mixing Air	Supply Air
Altitude from sea level (m)	0			
Dry Bulb Temp - DBT (℃)	31.2	26.0	26.6	15.18
Choose One (WBT or RH or Abs.Humidity)				
Wet Bulb Temp - WBT (℃)	25.5			
Relative Humidity (RH, %)		50.0		
Absolute Humidity (kg/kgDA)			0.011429	0.009577
Air Flow (CMM, m^3/min at Outlet)	5.0	38.0	43.0	43.0
Wet Bulb Temp - WBT (℃)	25.50	18.70	19.57	14.05
Water Vapor Sat. Pressure @DBT (Pa)	4,547.4	3,363.1	3,482.1	1,725.8
Water Vapor Sat. Pressure @WBT (Pa)	3,264.9	2,157.3	2,277.6	1,604.1
Absolute Humidity (kg/kgDA)	0.018373	0.010542	0.011428	0.009577
Relative Humidity (RH)	0.636	0.500	0.523	0.887
Specific Volume (m3/kgDA)	0.8877	0.8619	0.8648	0.8294
Enthalphy (kJ/kgDA)	78.37	53.02	55.88	39.49
Specific Heat = Cp (kJ/kgK)	1.020	1.014	1.015	1.014
Dew Point Temp (℃)	23.49	14.78	16.02	13.33
Mass Flow (kg/h, at outlet)	344.2	2,673.3	3,017.5	3,140.3
Mass Flow (kg/h, Dry Air)	338.0	2,645.4	2,983.4	3,110.5
Dehumidification (kg/h)				5.76
Total Heat (kW)				14.0
Sensible Heat (kW)				10.0
Latent Heat (kW)				4.0
SHR (Sensible Heat Ratio)				0.71

※ Input Negative numbers when Heating
47.8 kBtu/hr
34.1 kBtu/hr
13.6 kBtu/hr

Psychrometric chart



Products: IDU LSP, MSP, HSP and DUCT S

Download Link
https://partnerhub.samsung.com/

Design Software

- Design software tools developed to support consultant, designers and customer.

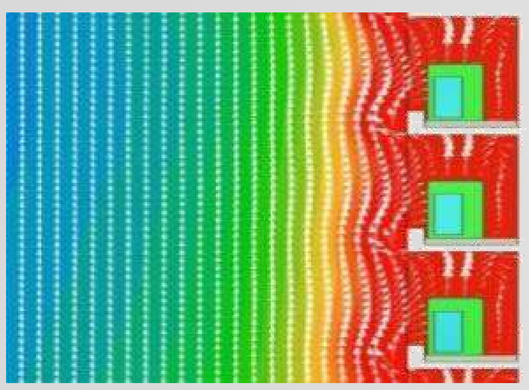
CFD - Computational Fluid Dynamics

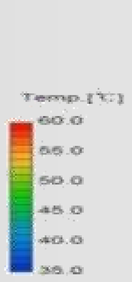
Simulate heat transfer, air movement in a 3D model, looking for possible high temperature or noise level problems.

Offering

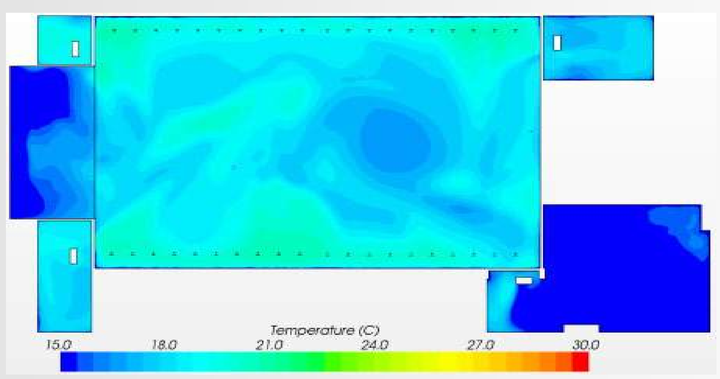
- Operating temperature simulation
- Simulation of the indoor temperature
- Airflow distribution simulation
- Air calculation in the ventilation system
- Visualization and animation

Predicting problems and issues

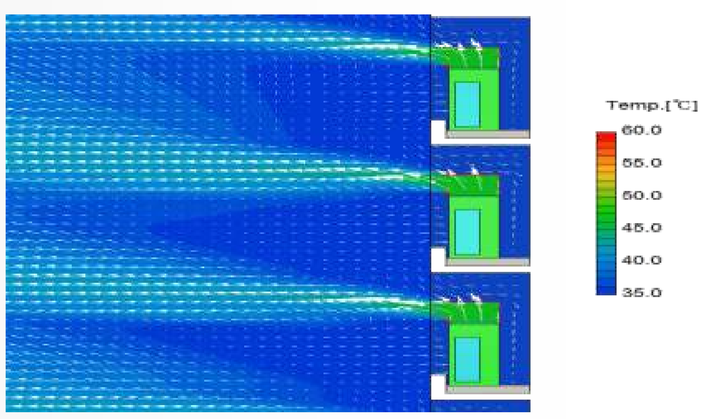




Performance Display



Propose optimized design



Products: DVM, CAC, FJM, DVM Chiller

Download Link
Contact local representative for more details

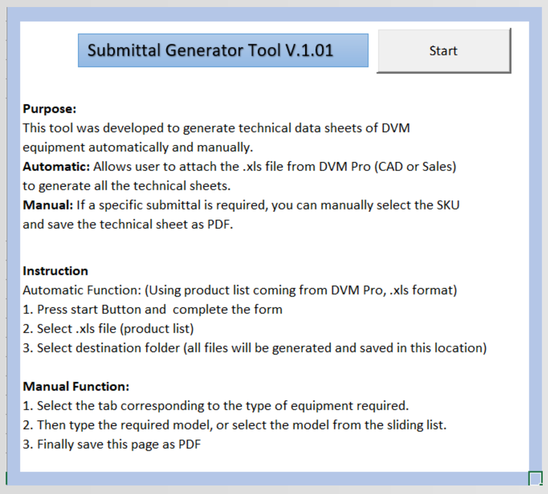
Submittal Generator

Developed for consultant, designer to generate technical data sheets of DVM equipment automatically or manual in PDF format.

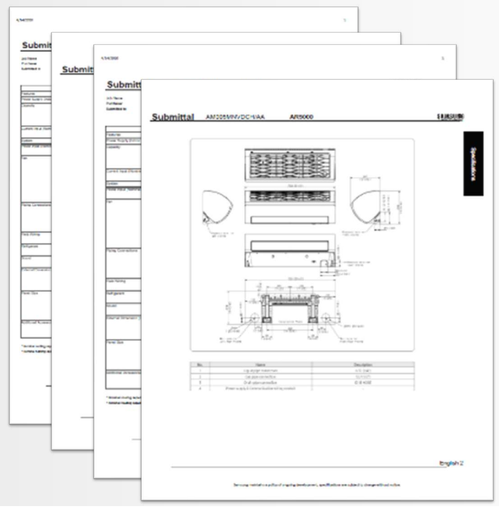
Offering

- Automatic: Allows to attached .xls file from DVM Pro CAD/Sales to generate submittal package.
- Manual: If a specific submittal is required, you can manually select the SKU and save as PDF.

Submittal Generator



Submittal Package



Products: DVM (ODU & IDU)

Download Link
Contact local representative for more details

Mobile App

- Design software tools developed to support consultant, designers and customer.

AC Support APP

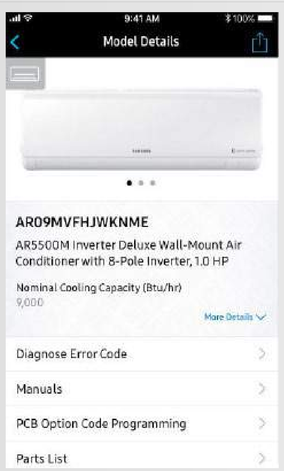
Serve as a personal assistant to help Samsung AC technicians diagnose and solve problems with Samsung Single and Multi Split Units.

Offering

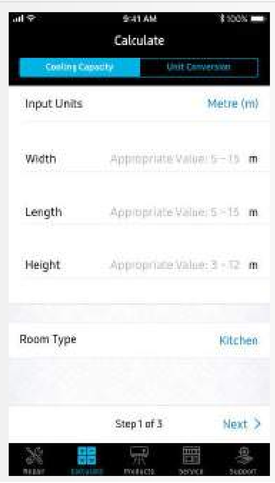
- **Repair Assistance**: Error Code, part list, PCB Programming, User & Installation Manuals
- Room AC capacity calculator
- Authorized service Centers

Main Screen

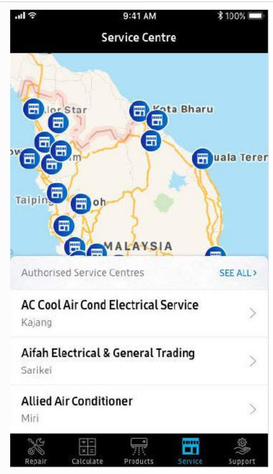
Repair Assistance



Calculator



Service Centers



Products: RAC, CAC & FJM

Download Link
Google Play: https://play.google.com/store/apps/details?id=com.samsung.kato
iTunes: https://apps.apple.com/pa/app/ac-support/id1339539596

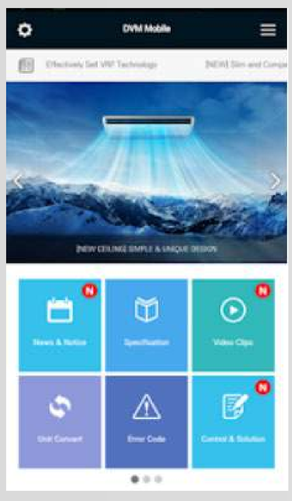
DVM Mobile APP

Support Dealers, Contractors and installers in the air conditioning industry for their field work.

Offering

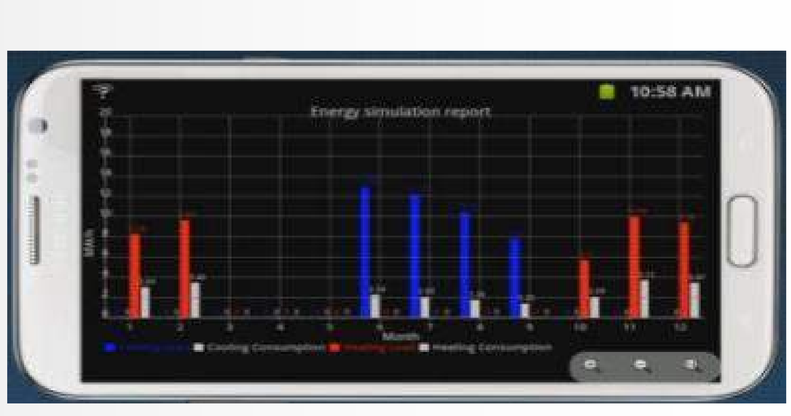
- Video Clip
- News
- Error code
- Product features
- Additional refrigerant calculation
- Energy simulation
- Psychrometric chart

Main Screen



Capacity Chart

Energy Simulation



Products: DVM, CAC & FJM

Download Link
Google Play: https://play.google.com/store/apps/details?id=com.bimpeers.dvmmobile
iTunes: https://apps.apple.com/pa/app/dvm-mobile/id797900367

Mobile App

- Design software tools developed to support consultant, designers and customer.

360 Cassette Installer APP

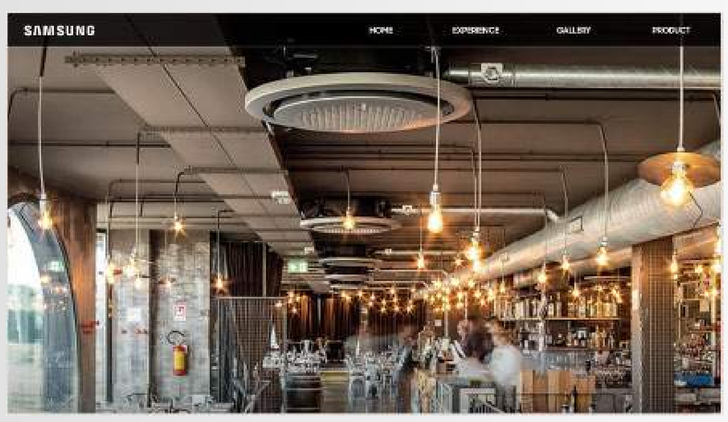
Application for designers, architects and clients who want to see before how their 360 CST would look installed in their space, with the option of customizing the panel.

Offering

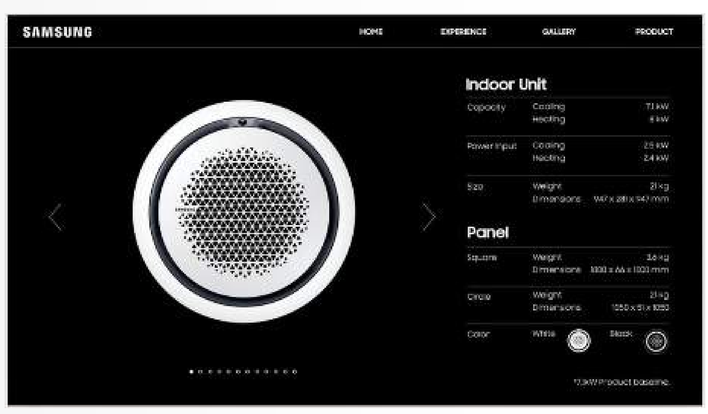
- 360 CST Virtual Installation
- Examples of spaces with different types of 360 CST panels
- 360 CST Promotion Video
- Tech specifications
- Main features

Customization Screen

Gallery



Product Spec



Products: 360 Cassette (DVM, CAC)

Download Link

Google Play: https://play.google.com/store/apps/details?id=com.samsung.Samsung360Cassette

iTunes: https://apps.apple.com/pa/app/360-cassette-installer/id1198867309

SAMSUNG

Customer Support

Partner Hub
SBA Cloud
Support & Social Network
Where to find more Information

Customer Support

- Where to find more information.

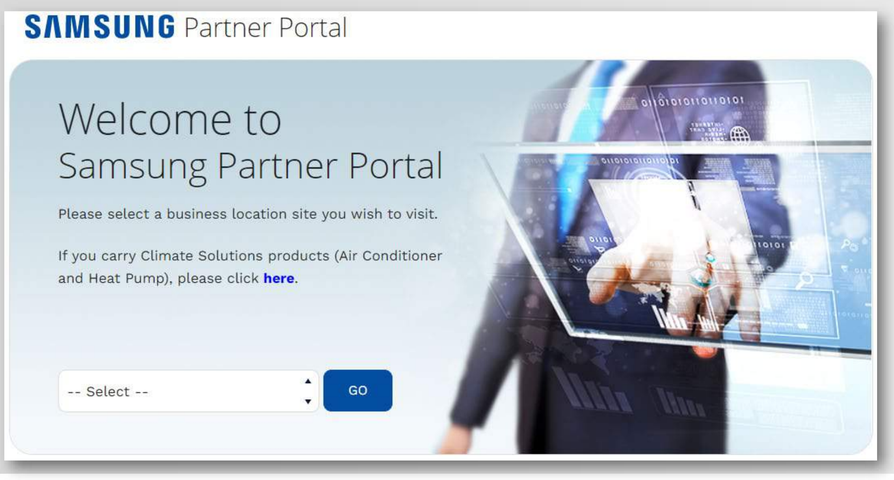
SAMSUNG Partner Portal Partner Hub

Web portal developed for partners, can download technical content and create tickets easily and intuitively.

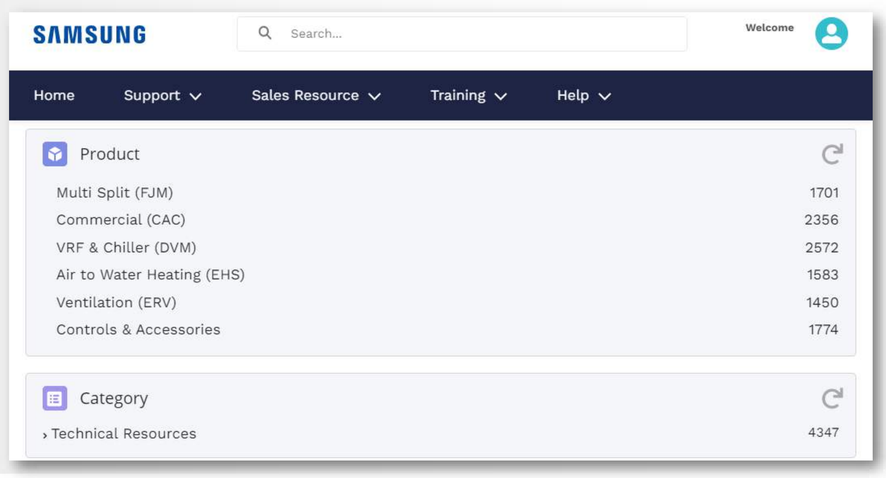
Offering

- **Tech Resources:** TDB, IM, UM, DWG & Revit, Exploded view
- **Case: Ticket** creation for assistance

Welcome Page



Screen Category



Link
https://partnerhub.samsung.com/

SAMSUNG BUSINESS ACADEMY SBA Cloud

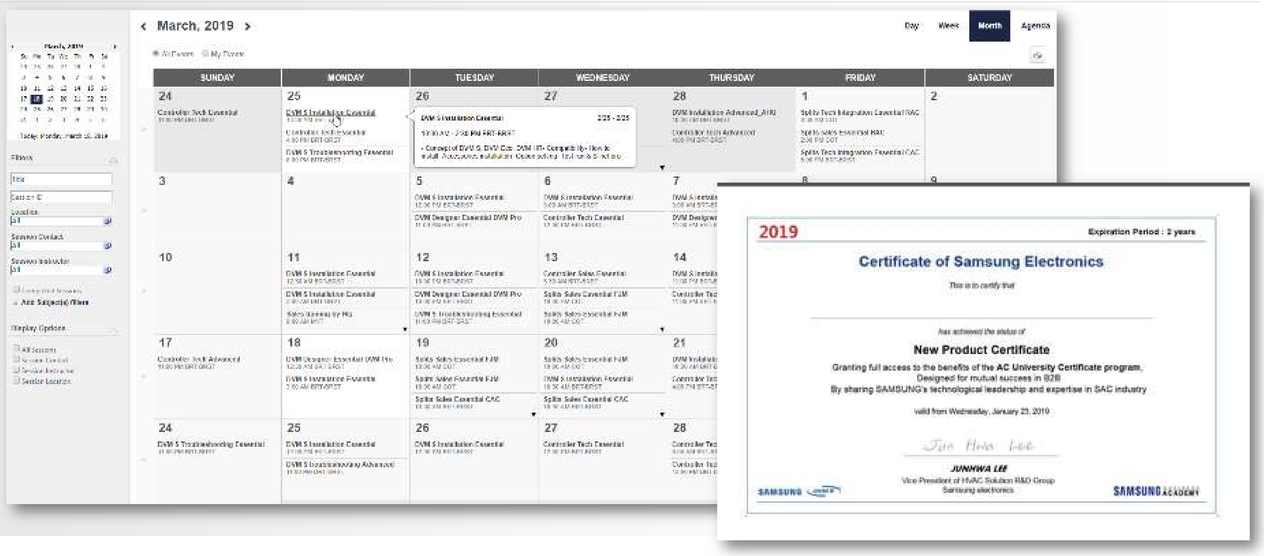
Learning platform targeting to partner, can register for training sessions offered by our experienced trainers, find online courses, materials and test for certification.

Offering

- Calendar View: Sessions located in Training Center or On-site (up to 17 courses available)
- Download Training Material: brochure, videos
- Certificate: get your certificate after the session valid for 2 years

Main Screen

Training Calendar



Link
https://samsung.csod.com/client/samsung/aircon.aspx

Customer Support

- Social media network channels.

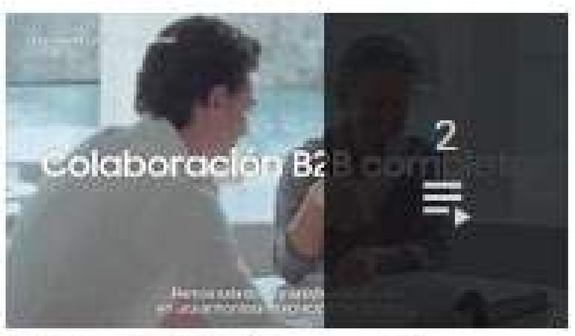
YouTube: Samsung A/C LatinAmerica

Portal dedicated to sharing new releases, live training, troubleshooting guides, referral site, and more about air conditioner.

Offering

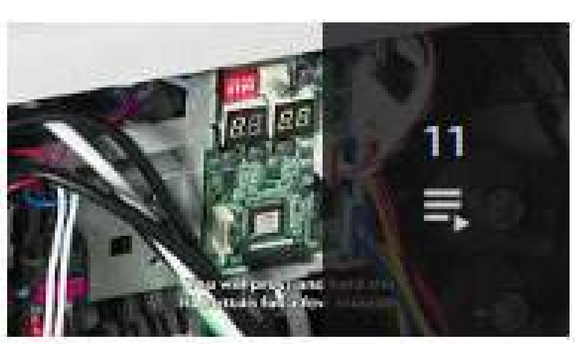
- **Products:** General Features
- **Tech**: Installation, troubleshooting, maintenance
- **Marketing**: Reference Sites
- **Training:** Webinar & Online training

Marketing Category



[Marketing] Reference Sites

Tech Category



[Tech] Comercial (DVM CAC)

Product Category

[Product] Controls

Link
https://www.youtube.com/channel/UC6jQSZ-Q2Lp3CCsTuYeIQTg

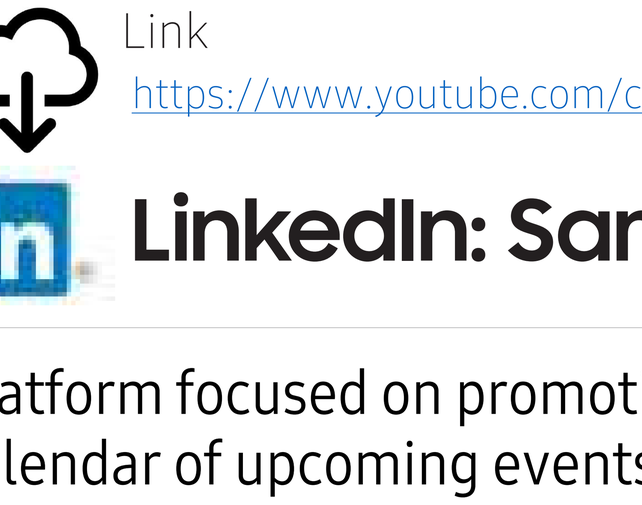
LinkedIn: Samsung A/C Latin America

Platform focused on promoting new projects, launches, social activities, good practices, calendar of upcoming events and more

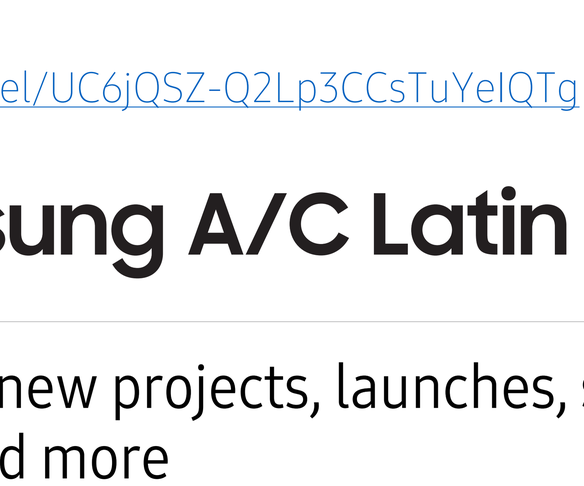
Offering

- Launching
- Training news
- Reference Sites
- Product news & recommendations
- Promotions

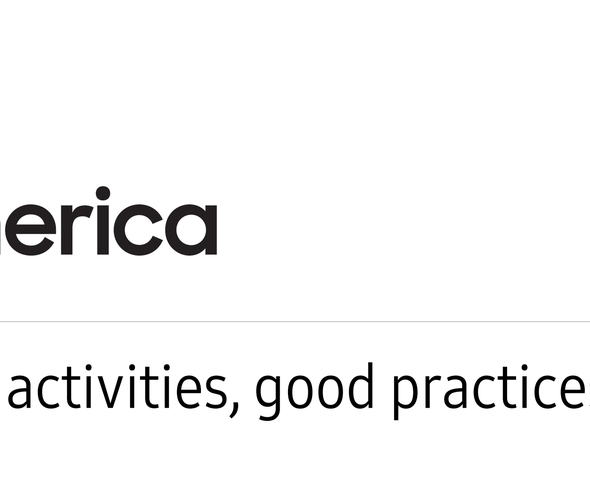
Main Screen



Product News



Training News



Link
https://www.linkedin.com/in/samsung-a-c-latinamerica-200193183/

Customer Support

- Where to find more information

Item		Find Local Sales Branch	Partner Hub				Google Play & Apple Store	
Product Detail		SUBMITTAL	Drawings & BIM	Technical Data Book (TDB)	Installation Manual (IM)	User Manual (UM)	DVM MOBILE APP	AC SUPPORT APP
Features & Benefits	Summary	●		●		●	●	
Specification	Combination Table			●	●		●	
	Electrical	●		●	●		●	
Drawings	Dimension	●		●			●	
	Piping			●			●	
	Wiring			●			●	
	CAD (dwg)		●					
	Revit (rfa + txt)		●					
Performance	Capacity Correction			●			●	
	Piping	●		●			●	
	Airflow / ESP	●		●			●	
	Sound Level	●		●			●	
Installation	Piping				●			●
	Wiring				●			●
	Fundamentals				●			●
	Sizing & Charging				●		●	●
Operation	How to use					●		●
	Controls					●		●
Accessories	Specification			●			●	
	Installation				●			
Characteristics	Functions			●		●	●	
Set-up, Commissioning & Service	Test Operation				●			
	Troubleshooting				●			
	Flow Charts				●			
	Replace Procedure				●			

MEMO

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Latin America Office Digital Appliances

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