Date: 07/17/2019
Subject: Updated DVM S Heat Pump Auto Changeover (ACO)
Models: DVM S 3Ø Heat Pump (AM****XV****AA),
DVM S Eco Heat Pump and Heat Recovery (AM0**TXMDCH/AA, AM060MXMDCH/AA, AM0**NXMDCR/AA)

Updated DVM S Heat Pump Auto Changeover (ACO)

Concept

DVM S Heat Pump outdoor units can switch mode of operation from heating to cooling or cooling to heating when indoor units are in auto mode based on certain conditions and option settings.

- Initial operation mode determination

If room temp. ≥ set temp. -1.8°F (1°C)	If room temp. < set temp. -1.8°F (1°C)
→ Auto cooling mode	→ Auto heating mode

- Thermal on/off control

Condition	Cooling (Auto)		Heating (Auto)
	Non-wall mount type	Wall mount type	
Thermal on	Room temp. ≥ Set temp.	Room temp. ≥ Set temp. +1.8°F (1°C)	Room temp. ≤ Set temp. -1.8°F (1°C) + △T°F
Thermal off	Room temp. ≤ Set temp. -1.8°F (1°C)	Room temp. ≤ Set temp.	Room temp. ≥ Set temp. + △T°F

△T°F (Heating compensation temperature)

- When does the system initiate mode change?

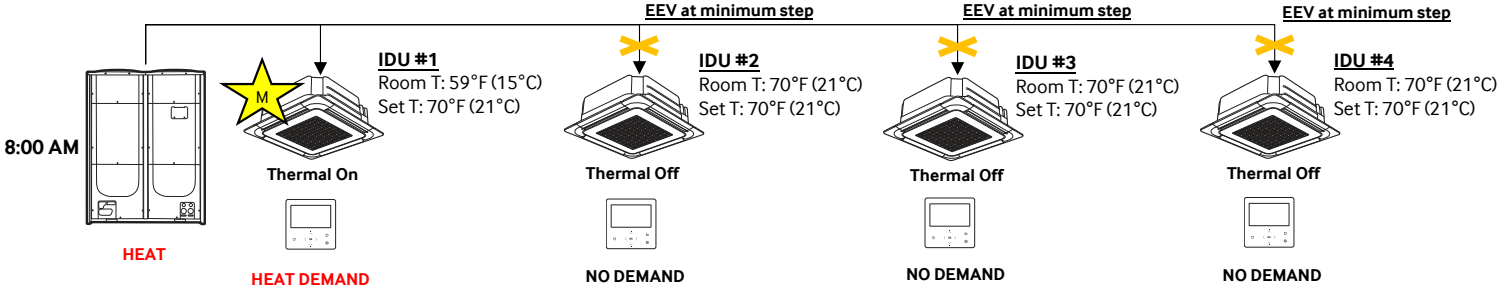
Condition	Heat → Cool (1 or 2)	Cool → Heat (1 or 2)
Detail	1. If (room temp. > Cool set temp. + "H to C" and heating thermal-off) is maintained for set time (default: 5 min.). 2. If (room temp. > Cool set temp. + "H to C" + "Cool 2nd offset") and heating thermal-off is maintained for 20 seconds.	1. If (room temp. < Heat set temp. - "C to H" and cooling thermal-off) is maintained for set time (default: 5 minutes). 2. If (room temp. < Heat set temp - "C to H" - "Heat 2nd offset") and cooling thermal-off is maintained for 20 seconds.

*H to C: 1.8°F (1°C)
C to H: 1.8°F (1°C)

*Cool 2nd offset: 3.6°F (2°C)
Heat 2nd offset: 3.6°F (2°C).
These values can be set by using wired controller MWR-WG00*N

Application example *with* Mode Master (heat pump)

M = Mode Master



- IDU #1 is the only indoor unit to demand a mode, ODU turns on and goes into heating mode

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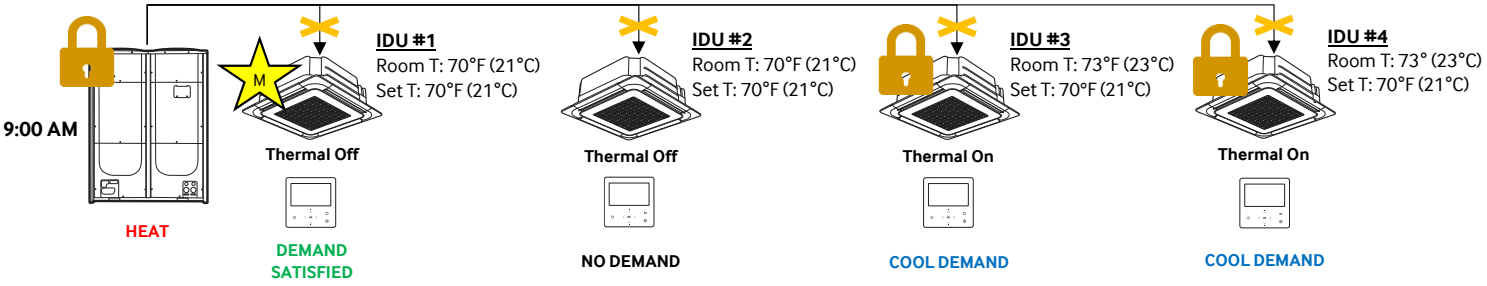

- IDU #1 is satisfied of its demand and goes into Thermal Off
- ODU is in mode lock due to Mode Master indoor unit
- IDU #3 and IDU #4 demands cooling but they are rejected, due to ODU mode lock

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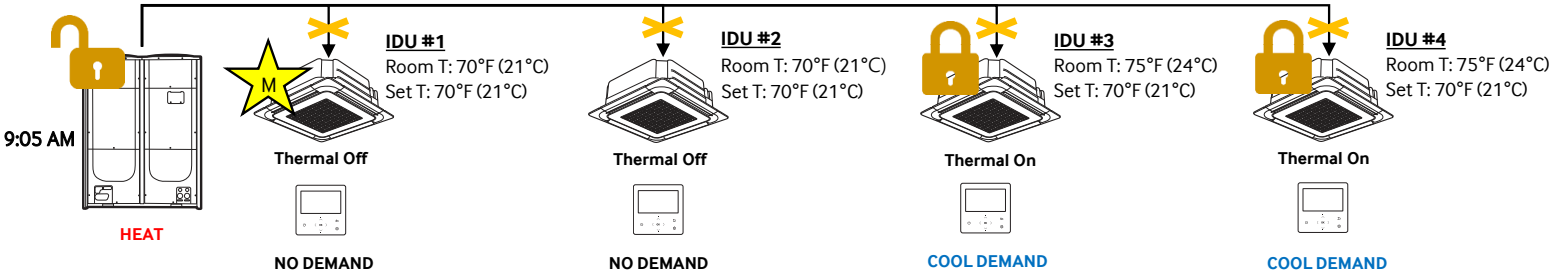

- after 5 minutes of time delay (option code set time), ODU mode lock is released
- however, the Mode Master's mode has not changed, so IDU #3 and IDU #4 still are rejected of their demands

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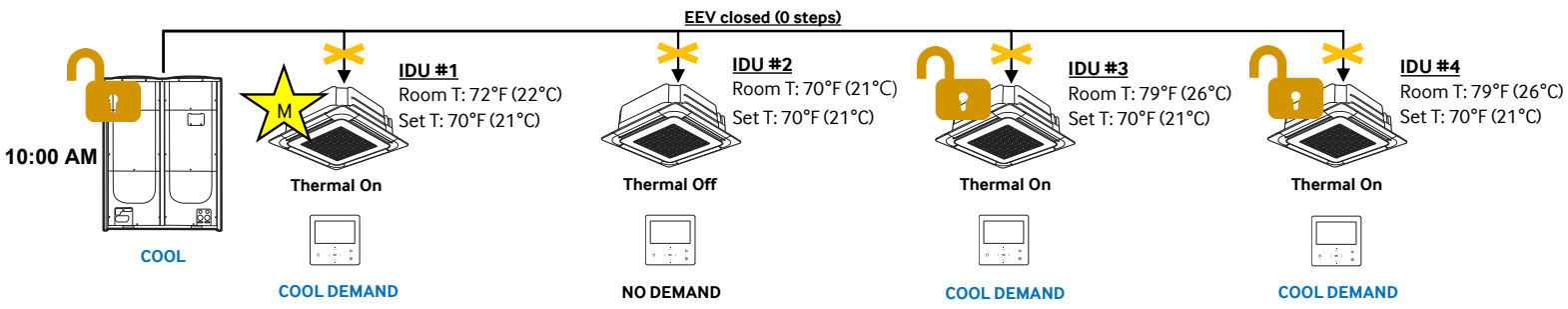
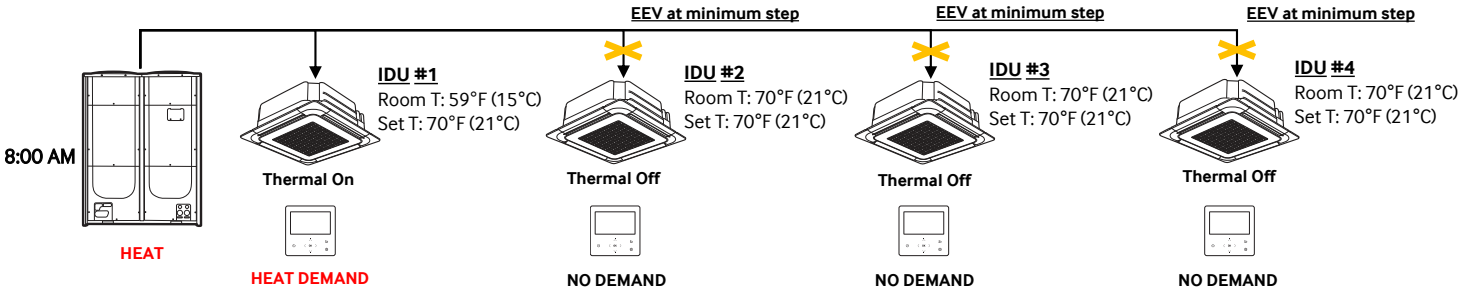
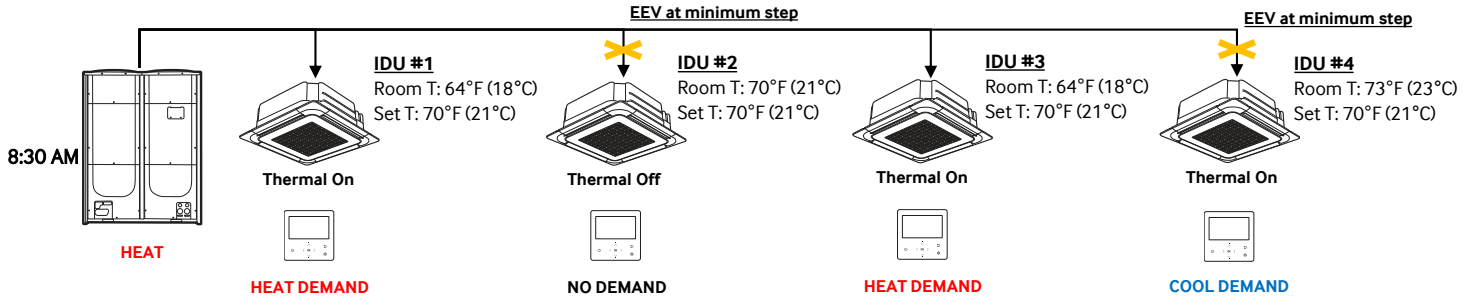


- After some time, the Mode Master IDU demands cooling and goes into cooling mode
- IDU #3 and IDU #4 are allowed to go into cooling mode, since their demand now matches that of the Mode Master

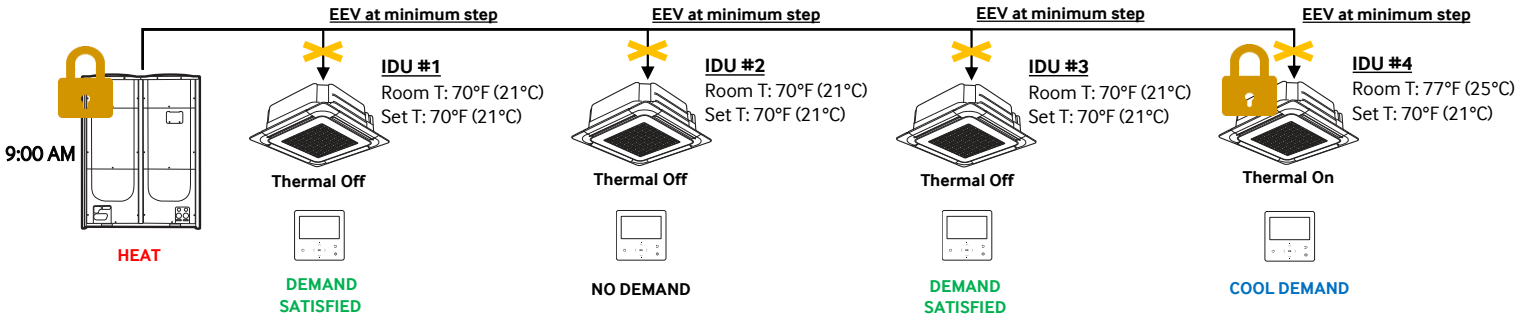
Application example *without* Mode Master (heat pump)



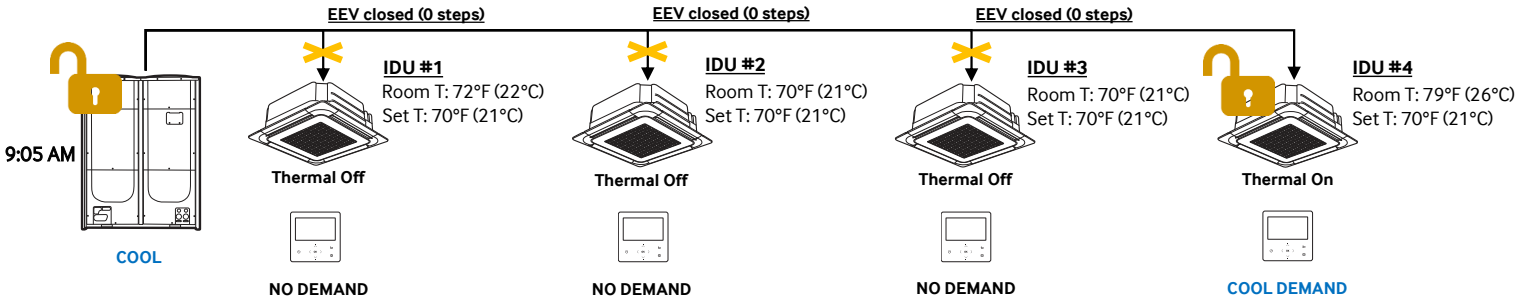
- IDU #1 being the only one to demand a mode, ODU turns on and goes into heating mode (outdoor unit mode is determined by first indoor unit demand)



- IDU #3's heating demand is allowed, since ODU is currently running in heating mode
- IDU #4's cooling demand is rejected, due to ODU mode conflict (no error code, fan only mode)



- IDU #1 and IDU #3 are satisfied of their demands and goes into Thermal Off
- Despite the fact that IDU #4 is the only one to demand a mode, it is still rejected, due to ODU mode lock (time delay)



- After 5 minutes of time delay (installation option code setting), ODU mode lock is released
- IDU #4 goes into cooling mode

Samsung HVAC maintains a policy of ongoing development, specifications are subject to change without notice.

System Settings

To enable the updated heat pump Auto Changeover (ACO) function, certain settings must configured.

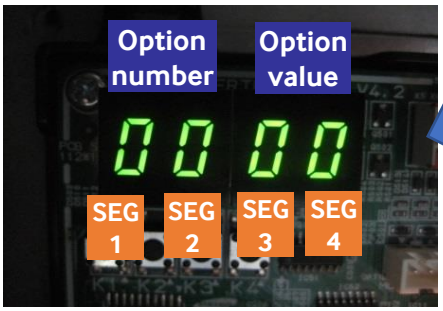
Mode Master Indoor Unit

- Setting of a Mode Master indoor unit is optional. This setting is used on projects that require one indoor unit to dictate the mode of all indoor units on a system. This setting is enabled in the service mode of the wired controller. Please refer to the installation manual of the wired controller being used for complete details. *Note: When the Mode Master indoor unit is powered off at the wired controller, the system mode is still locked.*

Outdoor unit option setting (for heat pump systems)

- The option setting for the updated Auto Changeover (ACO) function must be set at the outdoor unit (main unit for modular systems). ACO setting is option number 26. Please refer to the outdoor unit installation manual for full setting details. A firmware update may be required. Refer to page 5 of this document for firmware details. *The system must be reset using the K3 button on the main outdoor unit after setting this option.*

Optional item	Input unit	SEG1	SEG2	SEG3	SEG4	Function of the option	Remarks
Auto Changeover	Main unit	2	6	0	0	Disabled (factory default)	If all indoor units are thermal-off, ACO is executed.
				0	1	Enabled	



Main PCB of ODU

Indoor Unit Installation Option Setting (05 Series, Segment 9)

- The indoor unit installation option setting (05 series, segment 9) must be set if the required time delay (time required for mode change) needs to be increased from the factory default of 5 minutes.

- The installation option code can be modified using a wireless controller (for models that support wireless functions), wired controller, or with SNET Pro2 service software (MIM-C02N service tool is required and is sold separately).

Segment	Value	Description	Value	Description
SEG 9 (Time required for mode change)	0	5 minute delay (default)	4	13 minute delay
	1	7 minute delay	5	15 minute delay
	2	9 minute delay	6	20 minute delay
	3	11 minute delay	7	30 minute delay

Compatibility

- To use the updated Auto Changeover (ACO) function, a firmware update is required for indoor and outdoor units manufactured before the dates listed in the below tables. Firmware updates can be done using SNET Pro2 service software and the MIM-C02N service tool (sold separately). Please contact Samsung HVAC Technical Support for updated firmware files.
  NOTE: Units introduced and/or manufactured after 4/2019 include the listed functions but may not be noted in the table below)

DVM S Indoor Unit Firmware

Model Number	Model Type	DB Code	SW Version	Date Applied to Production
AM0**KN4DCH/AA	360 Cassette	DB91-01742A	190308	3/19/2019
AM0**TNZDCH/AA	Multi-Position Air Handler (MPAH)*	DB91-01509A	190812	2/11/2020*
AM076FNHDCH/AA, AM096FNHDCH/AA	Big Duct (HSP)	DB91-01507A	190308	3/27/2019
AM0*JNESCH/AA	Outside Air Processing (OAP) Duct	DB91-01507A	190308	3/27/2019
AM0**FNCDCH/AA	Under Ceiling/Low Wall Mount Console	DB91-01507A	190308	3/27/2019
AM0**JNFDCH/AA	Floor Standing Unit (Concealed)	DB91-01507A	190308	3/27/2019
AM0**JNGDCH/AA	Floor Standing Unit (Exposed)	DB91-01507A	190308	3/27/2019
AM054JNHDCH/AA	High Static Pressure (HSP) Duct	DB91-01507A	190308	3/27/2019
AM0**FNLDCH/AA	Slim Duct	DB91-01507A	190308	3/27/2019
AM0**JNCDCH/AA	Big Ceiling	DB91-01684A	190424	7/8/2019
AM0**(M/R)NMDCH/AA, AM0**MNHDCH/AA	Duct S (MSP/HSP)	DB91-01889A	190423	7/8/2019
MCM-D211UN	Universal Communication Kit (UCK)	DB91-01823A	190423	7/8/2019
AM0**NN1DCH/AA	Wind-Free™[1] 1-way	DB91-01888C	190308	3/20/2019
AM0**(N/R)N4DCH/AA, AM0**NNNDCH/AA	Wind-Free™[1] 4-Way/Mini 4-Way	DB91-02029A	190313	3/27/2019
AM0**TNVDCH/AA	Wind-Free™[1] High-Wall Mounted*	DB91-02256A	200224	4/01/2020*
AM032MNQDCH/AA	Max High-Wall Mounted	DB91-01674A	190423	7/8/2019

* This function was applied during the first production of this model. No update is required.

[1]The Wind-Free™ unit delivers an air current that is under 0.15 m/s while in Wind-Free™ mode. Air velocity that is below 0.15 m/s is considered "still air" as defined by ASHRAE (American Society of Heating, Refrigerating, and Air-Conditioning Engineers).

DVM S Outdoor Unit Firmware (for updated heat pump auto changeover functions)

Model Number	Model Type	DB Code	SW Version	Date Applied to Production
AM****XV****AA	DVM S 3Ø	DB91-01928A	181025 or newer	1/8/2019
AM0**TXMDCH/AA	DVM S Eco HP	DB91-02264A	200617 or newer	7/8/2021
AM0**NXMDCR/AA	DVM S Eco HR	DB91-02264A	200617 or newer	7/8/2021
AM060MXMDCH/AA	DVM S Eco HP	DB91-01828A	221227 or newer	1/16/2023
AM0**FXMDCH/AA	DVM S Eco HP	Not applied	Not applied	-
AM****XWA*R*AA	DVM S Water 3Ø	Not applied	Not applied	-
AM0**KXWDCH/AA	DVM S Water single phase	Not applied	Not applied	-

NOTE: If the heat pump outdoor unit firmware is not updated, the system will follow the original heat pump auto changeover logic.

Compatibility (cont.)

DVM S Indoor Unit Firmware (discontinued models)

Model Number	Model Type	DB Code	SW Version
AM0**FN1DCH/AA	1-Way Cassette	DB91-01507A	190308
AM0**FN4DCH/AA	4-Way Cassette	DB91-02029A	190308
AM0**FNNDCH/AA, AM0**KNNDCH/AA	Mini 4-Way Cassette	DB91-01507A	190308
AM0**FNTDCH/AA, AM0**HNQDCH/AA	Neo Forte High-Wall Mounted	DB91-01508A	190423
AM0**MNVDCH/AA	Whisper High-Wall Mounted (A3050)	DB91-01674A	190423
AM0**JNHDCH/AA	HSP Duct	DB91-01507A	190308
AM0**JNMDCH/AA	MSP Duct	DB91-01507A	190308
AM0**JNZDCH/AA	Multi-Position Air Handler (MPAH)	DB91-01509A	190405