DVMChiller Training Introduction & Basic Installation

SAMSUNG HVAC

Rev 2.0

DVM Chiller Training

Due to Samsung's policy of ongoing product development, specifications are subject to change without prior notice. Every effort has been made to insure that the information included in this presentation is as accurate as possible at the time of it's publication.

This presentation is provided as a guide to help HVAC field technicians understand the proper procedures for installing Samsung DVM Chiller systems. This training module is not intended to replace Samsung service manuals, technical data books, installation/operation manuals or other factory documents.

Only properly trained, HVAC professionals should attempt to install and start up any Samsung heating and airconditioning system.

High Voltage Caution:

Extra care must be taken when working on or around DVM & DVM S equipment due to numerous high voltage components. Whether installing or servicing DVM equipment in the field or while attending Samsung HVAC training classes which include powered simulators and equipment, be aware of the potential dangers of high voltage <u>USE CAUTION</u>

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For technical support issues, always contact your Samsung equipment provider.www.samsunghvac.comhttps://samsunghvac.learnernation.comwww.dvmdownload.com

DVM Chiller Training

Training Topics

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DVM Chiller Introduction
Chiller System Components
Chiller Basic Installation
Basic System Commissioning
SNET Pro 2
Addendum

NOTE: Always refer to the DVM Chiller and Module Controller IOM's when installing any DVM Chiller system

SAMSUNG DVM Chiller

Introduction

DVM Pro Design Software

- Every DVM Chiller project must be designed through DVM Pro
 - Insures all system components are compatible
 - Insures correct layout of all system components
 - Insures that system will perform as designed







DVM Chiller Overview

The DVM Chiller is an air to water heat pump

- Chill water temperature range: 41°F to 77°F
 - Chill water temp down to 14°F with antifreeze
- Hot water temperature range: 77°F to 131°F
- Chiller ambient temperature operating range:
 - Cooling: 5°F to 118°F
 - Heating: -13°F to 109°F
- 10 ton and 15 ton nominal capacity models
 - 208/230vac 3Ø and 460vac 3Ø models
 - Modular combinations from 20 to 240 nominal tons
 - Up to 16 units can be combined in one control group
- Optional DMS 2.5 or Touch Central Controllers enable control of 3rd party air handlers
- No field installed refrigerant piping



Model	AG010	AG015
Water flow Range	16 ~ 48 gpm	17 ~ 68 gpm

DVM Chiller Overview

DVM Chiller Features

- AG010(015)KSVAFH 208/230vac 3Ø AG010(015)KSVAJH 460vac 3Ø models
- Chiller unit consists of a VRF side including dual flash injected inverter scroll compressors and a Hydro side
- Dual outdoor fans
- Braze Plate heat exchanger
- Leaving water temperature reset option ("Water Law" setting)
- Water temperature & pressure sensors
- Intelligent defrost operation
 - Monitors outdoor coil temperature and air flow differential to initiate defrost
- Selectable snow accumulation removal setting
- Sound rating 60dB (A)
- Maximum operating water pressure: 145 psi
- Compatible with Samsung centralized controls
 - Touch Controller, DMS 2.5, BACnet & LonWorks Gateways
- Dedicated module remote controller MCM-A00N (required)



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DVM Chiller Operation Patterns – System Design

Chiller system hierarchy overview

- Unit One DVM Chiller unit (10 or 15 ton)
- Module 1 to 8 units connected together (required configuration)



DVM Chiller Operation Patterns – System Design

Chiller system hierarchy overview

• **Group** – Consists of 2 to 8 modules with a maximum of 16 chiller units per group



DVM Chiller Operation Control Patterns

Selectable chiller group operation control patterns

Standard Control – Applications with high cooling/heating load factors

- All modules in the group start simultaneously
- Individual unit capacity control is based on the water outlet temperature sensor of each unit
- As individual units reach setpoint temperature, they go into thermo-off
- Factory default setting



Selectable chiller group operation control patterns

Rotation Control – Applications with lower loads at system startup and with small load fluctuations

- Chiller's water outlet temperature is controlled based on the average temperature of all units in the module
- The module with the highest priority starts first. When the module reaches full load, the next module with the next priority starts
- When the module with the lowest priority operates at minimum capacity and the water outlet temperature approaches set temperature, compressors stop
- Setting is enabled during commissioning



DVM Chiller Operation Control Patterns

Selectable chiller group operation control patterns

- Efficiency Control Applications where the controlled area has a low load
- System capacity control uses an average leaving water temperature of all operating units in a module
- Load response time is prioritized as system capacity is increased
- Efficiency Control maintains compressor operating frequencies in the mid range frequencies (50 80Hz)
- Setting is enabled during commissioning



DVM Chiller Operation Control Patterns

Water Law Control – Applications where efficiency is increased by resetting the leaving water temperature based on outside ambient temperature or room temperature

- When chiller is configured for standard water temperature range (default) the operating water temperature range in cooling will not drop below 41°F
- When chiller leaving water temperature is controlled by room temperature, a field supplied TP100 external sensor must be used or a signal from a BMS control



Water Law temperature setting ranges (°F)

Option	Range (°F)	Notes
AirCool1	32 - 68	OA temp. 1, cool mode
AirCool2	86 – 104	OA temp. 2, cool mode
RoomCool1	59 – 75.2	Room temp. 1, cool mode
RoomCool2	77 – 98	Room temp. 1, cool mode
TCool1	14 - 77	Water set temp. 1, cool mode
TCool2	14 - 77	Water set temp. 2, cool mode
AirHeat1	-4 - 41	OA temp. 1, heat mode
AirHeat2	50 - 60	OA temp. 2, heat mode
RoomHeat1	59 – 75.2	Room temp. 1, heat mode
RoomHeat2	77 - 95	Room temp. 1, heat mode
THeat1	91.4 - 131	Water set temp. 1, heat mode
THeat2	91.4 - 131	Water set temp. 2, heat mode

Example

Water Law based on outside temperature – cool mode As outdoor temperature rises, the water set temperature decreases (TCool1 = 48°F, TCool2 = 40°F, AirCool1 = 60°F, AirCool2 = 90°F)



Ambient Temperature (°F)

SAMSUNG DVM Chiller

Chiller System Components

DVM Chiller



DVM Chiller – Refrigerant Cycle

- PS = Pressure sensor
- V = Valve
- T = Temperature sensor
- AC = Accumulator
- RC = Receiver
- PW = Pressure switch
- OS = Oil separator
- PT = Service port
- E = EEV (Electronic Expansion Valve)
- HX = Heat exchanger
- HX PHE = Plate heat exchanger
- IPMC = Intelligent Power Module (inverter PCB cooler)
- V 4W = 4-way reversing valve



DVM Chiller – Control



- HUB PCB communication
- Main RGR SARTHOGENION
- EEV'sHydrowaynmaallee oil return
- Eat Versolvbypass valves

- Beetsing rie verifierin posterros or ptions
- Auto & Manual Addressing
- VRF status display

DVM Chiller – Control

VRF Control Box



• VRF PCB communication

Hydro communication

F8K0439

NA

B931

- F1 F2 not used
- OF1 OF2 not used
- R1 R2 Centralized control



"F" Model 208/230vac

_

"J" Model 460vac

DVM Chiller – Control



- Water temperature control
- Communication between outdoor units
- Communications between module units
- Module controller
- Operation and option settings

Hydro Control Box



DVM Chiller – Control

Hydro Terminal Blocks



- TB "A" External Output Contact
- TB "B" & "C" External Input Contact
- Communication Terminal Block:
 - F1 F2 Factory connection
 - V1 V2 Not used
 - F3 F4 Module Controller

Hydro Control Box



MCM-A00N – Module Controller

- Same design as MWR-WE10N wired controller
- Can monitor and control up to 16 DVM Chiller units
- Connects to F3/F4 terminals at each DVM Chiller (same connection point as standard DVM S indoor unit wired controllers)
- Set Module or Group status
- System option settings
- 12 or 24 hour clock

Chiller System Data Viewing

- Water inlet and outlet temperature
- Outdoor ambient temperature
- Approximate water flow rate (+ 10%)

Cool Storage Heat Hot water Restricted of Water Water Outdoor High Low Outlet Inlet Air Pressure Pressure Set C F Quiet Demand Forced Fan Water Law Efficiency Rotation Standard B B B B S A Standard B B B B B B B Panel	Central \mathcal{P} (M) \mathcal{C}_{Θ} \mathcal{C}_{O} \mathcal{C}_{O} Daily Timer \mathcal{C}_{O} Weekly Holiday SUN MON TUE WED THU FRI SAT \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} \mathcal{C}_{O} $\mathcal{C}_{$
(b) (+) (-)	G

MCM-A00N – Module Controller



MCM-A00N – Module Controller Display

No.	Function
1	Operation mode
2	Set or current water outlet, inlet, ODU air temp. high, low pressures
3	Selected operation
4	The operation pattern by each module or group.
5	Group No.(1~4)
6	Module No. (1~8)
7	Unit No. (0~15), Master or Slave When an unit operating by panel control, displays "Panel"
8	When a button input is restricted.
9	When unit control by upper level controls (ex. DMS)
10	When an error occurs in chiller or module controller itself
11	When chiller operating anti freezing
12	When the defrost function operates



No.	Function
13	When buttons locked
14	No. of scheduling by daily or entire
15	Scheduling / holiday
16	Displayed days of week while setting weekly or daily timer or displaying the set timer.
17	When summer time (daylight saving) activated
18	When set the off timer
19	Current time or set time
20	When selecting a group or a module while setting the weekly timer
21	Timer setting On or Off

MCM-A00N – Module Controller

Module controller can be connected to a maximum of 16 DVM Chiller units



MIM-F00N – FCU Kit

- FCU Kit is used to connect 3rd party fan coil units to the Samsung Chiller control system
 - DMS 2.5 Touch Centralized Controller Wired Remote Controllers
 - DMS 2.5 or Touch centralized controller is required
- FCU Kit can connect to 2 or 4 pipe fan coil units
- Provides external contact input
- Output control signals for fan coil unit
 - Not compatible with ECM style blower motors
- Output control signals for water valve



MIM-F00N – FCU Kit Inputs & Outputs



28

- Provides communication interface between the MIM-F00N FCU Kit and a high level controller
 - DMS 2.5 Gateways Touch Centralized Controller
- Controls up to 16 FCU Kits
- Maximum 16 Interface Modules per DMS 2.5
- Connects directly to the FCU Kit PCB



FCU Kit / Interface Module





Water Side System Components – Field Supplied

Closed loop flow switch

Prove water flow through the closed loop and plate heat exchanger

Closed loop inlet strainer 50 Mesh – Mandatory



Water Side System Components – Field Supplied

Closed loop expansion tank

- Expansion tank must be installed on the inlet side of the circulating water pump above the highest point in the system
- Expansion tank sizing: 5% of the total amount of circulating water in the system



Expansion tank example only

SAMSUNG DVM Chiller

Chiller Basic Installation

Outdoor Unit Placement – Coastal Installations

- DVM Chiller units should never be installed in locations where direct sea/ocean breezes prevail
- In coastal locations, outdoor units should be installed behind the building, wall or other obstruction to protect against direct winds
- Refer to installation and technical guides for exact specifications



Chiller Basic Installation

Outdoor Unit Placement

 Support the outdoor unit above grade a minimum of 8 inches

C. Sala

 Unit should be installed above the normal snow line


Outdoor Unit Placement

Basic Installation Clearances

- The minimum unit clearances are based on maximum outdoor ambient temperature of 95°F
 - Above 95°F the clearances should be increased
- Single or multiple units with no wall enclosure should have ≥4 inch clearance on sides and rear
- Single unit within a wall enclosure should have ≥12 inch clearance on the rear and ≥4 inches each side
- Multiple units within a wall enclosure should have ≥12 inches on rear ≥ 16 inches between units ≥4 inches
 on the side next to the wall



Outdoor Unit Hydro

Water side connections

- The Hydro water inlet and outlet pipe connections require a "cut groove" coupling (2 inch cut groove)
- Water drain valve is provided on the water outlet pipe
- Air vents are provided to purge air from the PHE water loop to insure system reliability





Outdoor Unit Hydro

Water side overview

- 1. Drain plug (winter heat operation)
- 2. Cut groove couplings
- 3. Inlet strainer
- 4. Drain valve
- 5. Temperature gauge
- 6. Pressure gauge
- 7. Valve Balancing or maintenance
- 8. Automatic air vent
- 9. Check valve
- 10. Pump
- **11**. Flexible joint
- 12. Expansion tank



Water side considerations

- Chilled water/Hot water loop minimum capacity
 - 10 Ton: 72 gallons
 - 15 Ton: 103 gallons
 - Additional storage tank may be required
- Water loop flow rate
 - 10 Ton: 16 48 gpm
 - 15 Ton: 17 68 gpm
- Maximum water pressure: 145 psi



- Module remote controller is mandatory for chiller operation
- Each chiller unit requires a dedicated line voltage circuit
- State and local electrical codes must be followed



Outdoor Unit Wiring

Hydro terminal block "A"

Output terminal designations

Hydro Terminal Blocks



Outdoor Unit Wiring

Hydro terminal block "B"

Input terminal designations

	7-8	Pump interlock		 Signal about pump operation Pump interlock error (E918) occurs if ON is not input when operating pump 	Pump ON	Pump OFF	Usual input	Each unit
	9-10 11-12	Operation ON/ OFF		Controlling operation ON/OFF Note 1)	Note3	0	Usual/ instant input	Main unit of group NOTE4)
B-T/B	13-14	Operation mode		Selecting cool/heat mode Note2)	Heat	Cool	Usual input	Main unit of group NOTE4)
5.75	15-16	Hot water (Cool storage) mode	Zero voltage contact	Entering hot water (cool storage) mode by external control • Cool + ON: Cool storage • Heat + ON: Hot water	Cool storage/ Hot water	Cool/Heat	Usual input	Main unit of group NOTE4)
	17-18	Hot water (Cool storage) control standard		Control depending on set temperature when ON Control depending on external hot water (cool storage) thermostat when OFF	Control by set temperature	Control by thermostat	Usual input	Main unit of group NOTE4)
	19-20	Hot water (Cool storage) thermostat signal		 When thermostat is set as standard for hot water (cool storage) mode Thermo ON when ON (Not over range of water outlet temperature) Thermo OFF when OFF 	Thermo ON	Thermo OFF	Usual input	Main unit of group NOTE-4)

Hydro Terminal Blocks



Note: "Usual Input" = Latched switch function "Instant Input" = Momentary switch function

Outdoor Unit Wiring

Hydro terminal block "C"

Input terminal designations

	No.		Name	Signal	Function	Contact Short	Contact Open	Signal recognition	Setting unit	
	1	-2	Quiet function		Operate quiet function in level set by main option or module control Noted)	Quiet function	-	Usual input	Main unit of group Note®)	7
	3	}-4	Demand function	Zero	Operate demand function (current limit control) in level set by main operation or module control Notes	Demand function	-	Usual input	Main unit of group Note®)	
	5-6 Forced fan contact function	Operate forced fan function NoteG	Forced fan function	-	Usual input	Main unit of group Note®)				
C-T	^{7/B} 7	-8	Unusual condition reset		 Reset on error occurred status Operates only when remote error reset input function is set to use 	Reset error	-	Instant input	Main unit of module	
	11	-12	Water law	Zero voltage contact	Operate water law Noter)	Water law control	outlet set temperature control	Usual input	Main unit of group Note®)	
C-T	17 [.] /B	-18	Set temperature/ room temperature sensor	Analog current	Recognize water outlet set temperature by external input (4 ~ 20 mA) Note1) Recognize value of room temperature sensor (4 ~ 20 mA) when standard for water law is room temperautre Note2)	-	-	Current input	Main unit of group Note®)	
	19	-20	External water outlet temperature	Analog current	Recognize external water outlet temperature by external temperature sensor (4 ~ 20 mA) Note3)	-	-	Current input	Main unit of group Note8)	

Hydro Terminal Blocks



Note: "Usual Input" = Latched switch function "Instant Input" = Momentary switch function

SAMSUNG DVM Chiller

Basic System Commissioning

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Basic System Commissioning

Hydro Control – View Mode & Option Settings Mode

- View Mode Display System operating data
 - Chiller powered up
 - Press & hold K3 K4 for 3 sec. to enter
 - Press K3 to view mode selection from table
 - Press K4 to reverse mode selection
 - Press & hold K3 to leave view mode
 - Refer to the chiller Installation Manual for complete view mode listing
- Hydro Controller Option Settings Select chiller operation parameters
 - Chiller powered up
 - Press & hold K2 to enter option settings
 - Press K1 to display the number for option setting
 - Press K2 to display the number for set value of the option
 - Press & hold K2 to save selected option setting
 - Refer to chiller Installation Manual for option setting listing



Setting Hydro Unit Options

- On/Off operation input
 - Module Controller / DMS or External contact
- Water temperature setting input
 - Module Controller / DMS or External contact
- Operation mode (Cool/Heat, Normal/Hot water) input
 - Module Controller / DMS or External contact
- Demand control input
 - Module Controller / DMS or External contact
- Power Demand Level Default 100%
 - Selectable from 50% to 95%
- Quiet function input
 - Module Controller / DMS or External contact
- Quiet function level
 - 100% Default
 - Level 1 Level 2 Level 3
- Forced fan function input
 - Module Controller / DMS or External contact
- "Water Law" input
 - Module Controller / DMS or External contact
- "Water Law" control standard
 - Outdoor ambient/Room temperature

- "Water Law" Air Cool 1 Air Cool 2
- "Water Law" Room Cool 1 Room Cool 2
- "Water Law" set temp Tcool 1- Tcool 2
- "Water Law" OD temp for Heat AirHeat1 AirHeat2
- "Water Law" Room Heat1 Room Heat2
- "Water Law" set temp Theat1 Theat2
- Remote error reset input
 - Enable/Disable
- Setting unit address 0 to 15 each unit
- Confirm delay for unsecured water flow rate
 - 10 to 240 sec. (factory default 30 sec.)
- External water outlet temperature sensor
 - Enable/Disable (Default)
- Operation On/Off by external contact
- Low water temperature function (requires antifreeze)
 - Disable(Default)/Enable

Mandatory Operation Settings

Trial Operation

- With system off including pump, perform water pressure sensor calibration procedure
 - Press & hold K4 and K6 for 3 seconds to start calibration
 - Calibration will finish automatically within 30 seconds
- Verify water circulation and air purged
- Verify water flow rate
- Mode of operation function
- Complete all required Hydro Controller settings
- DIP Switch #1 is ON
 - DIP Switch #2 ON Cool OFF-Heat
- Operation control
 - Press K1 for ON then press K2 for off
- Set DIP Switches #1&2 to OFF
- Press & hold K5 and K6 for 3 seconds to reset hydro controller



VRF Control – Service Settings Mode

- Inverter Controller Service Settings
 - Chiller powered up
 - Press & hold K2 to enter option settings
 - Press K1 to display the number for option setting
 - Press K2 to display the number for set value of the option
 - Press & hold K2 to save selected option setting
 - Refer to chiller Installation Manual for all service settings



When the module controller is turned on, the "tracking" function is started to establish the connected Chiller unit(s) and indicate on the controller display

If there is an error on startup, the error code will be displayed along with the status LED blinking red



Error codes	Description
604	Communication tracking error between a module control and DVM CHILLERs
618	The maximum number of DVM CHILLER Installation is exceeded. (Maximum:16)
627	Displayed when 2 or more module controls are installed.
601	Communication error between a module control and DVM CHILLERs
654	Module control EEPROM Read/Wirte error



- Press the On/Off button to control a single unit
 - Select the target Group/Module with the arrow keys
- The "All" button controls all units On/Off operation in a group



- Press the Temp + or to change the water target set temperature up or down
 - Select the target Group/Module with the arrow keys
- Press the "Water Outlet" button to display the current water outlet temperature



- Group/Module select button
- Mode: Cool/Cool storage Heat/Hot water
- Monitor: Sequentially displays Water inlet/outlet temperature
 Outside ambient temperature high/Low pressure and flow rate
- Pattern: Sets the operation pattern when controlling the chiller by groups or modules



- Quiet: Selects the Night Quiet function
- Demand: Selects the Demand function
- Forced Fan: Selects the snow prevention function
- Water Law: Selects the water Law function
- Parameters for these functions have been set in the Hydro Option Settings



- Timer: Sets the weekly On/Off timer
- Timer Display: Shows the current timer setting



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Basic System Commissioning

• To use the various additional functions for a Module Controller and a DVM Chiller



Main menu	Sub menu	F	Function	Default value	Page	Data Segment	Save
	1	Option setting/	DVM CHILLER cooling and heating/only cooling	0	1	0 - Cooling and heating, 1 - Only cooling	Save at Module control
		checking	Temperature unit display (°C)/(°F)	0	2	0 - Celsius (°C), 1 - Fahrenheit (°F)	Save at Module control

Module Controller

- Reset Function No need to turn power Off and On again to restart
- Press and hold "ESC" and "Delete" for 5 seconds to reset the module controller
- When reset is required?
 - After hardware setting change (ex. Option switch) or communication wiring change.
- After reset, all of LCD segment turn Off and turn On again then tracking procedure starts.



NOTE: Refer to the MCM-A00N IOM's for all of the installation, setup and functions of the Module Controller

SAMSUNG DVM Chiller

SNET Pro 2

SNET Pro 2 Setup

Connecting the SNET Pro 2 hardware to the chiller system

- Chiller VRF control box communication terminal block:
 - F1 F2: Each chiller unit
 - R1 R2: Cannot currently be used for SNET Pro connection





SNET Pro 2 Setup

Launch SNET Pro 2 and connect



SNET Pro 2 Setup



SNET Pro 2 Setup

		1 1 2 1 2 2 2 2 2 2 2	S-NET pro 2 - DVM Ch	iller		
	Home Ti	rend Graph Replay Add-On H	elp			
	8				Control Unit 10.14.00 -	
	Connect Contro	oller Control for Unoccupied K Button	Start Open Record	Reset to Report		
	-senal Port	Convoller	Communication File Record -		Control Unit	
	Hydro Info,					
		Hydro Info.	Hydr	o Installation Info.		
	Address	4 0	Address	0		
	Model	Module Chiller	Demand Level	85%		
	Group No / Module No	Group:4 / Module:8	Quiet Function Level	Level1		
	Module Main	no	Water Law Standard	0		
	RMC	00	AirCool1(Water Law)	100		
	Error Code	0	AirCool2(Water Law)	350		
	Power Themp.op/c#		RoomCool1(Water Law)	200		
	Mode	Heat	Tcool1(Water Law)	150		
	Set Temperature	30°C	Tcool2(Water Law)	70	1	
	Water In	25,10	AirHeat1(Water Law)	-100		
	Water Out	25,10	AirHeat2(Water Law)	150	-	
	Eva Out	250	RoomHeat2(Water Law)	300		
	Eva In2	25,3℃	Theat1(Water Law)	45℃	i i i i i i i i i i i i i i i i i i i	
	Eva Out2	25,30	Theat2(Water Law)	350	i de la companya de l	
	EEV EEV2	2000	Location Product Option			
	Water Pump	2000	Installation Option	[0]FFFFF-[1]FFFFF-[2]FFFFF-[3]FFFF	-	
	PHE In	51,1	Installation Option2	[0]50000-[1]00000-[2]00000-[3]00000		
	PHE Out	51,5	Main Micom	DB91-01743A 15/12/19		
	Flow Switch					
	Ext, water out remp	3276.7				
	Water Law	0				
Cycle Information		^	·		Installation Info	rmation
Note: SNET Pro cannot display circulating						
		in and the second s	-A.com - A.com - A.com - A.com			
water pressure values	Inverter Controller Hy	dro Info,				
	Version 1,5,8	Unit - Temp, C Power :kW Pressure : kgt/	/cm² 2016-01-08 오후 4:02		СОМ 3 🦲 📗 .:	

SNET Pro 2 Setup

and Entration Boom Code Default Loot Ward Loot ter Controller Selected Chiller's Address nout Margement Loozon Total Outdoor 1 Inverter Controller 31 Inverter Controller 42 Total Outdoor 1 Sensi Number Sensi Number Q/U Total Capacity 20 Comp1 O Outron I Capacity 20 Comp2 Inverter Controller 41 Outdoor Temp. 25.5 C Inverter EV Soil O Inverter Condout Temp. EV Soil O Inverter Suction Temp. Operation Mode CompDown Operation Mode Suction Temp. Order Frequency1 0 Inverter Sto Order Frequency2 0 Inverter 2 Micron Sto Order Frequency2 0 Inverter 2 Micron Sto Order Frequency2 0 Inverter 2 Micron Sto Order Frequency2 0 Inverter 1 Micron DB91-0000A +00000 Inverter Micron DB91-0000A +00000 Inverter 1 Micron DB91-0000A +00	and Brance Central Brance Br	Connect Controller	Control for Unoc	ccupied K Button	Start Open Record	Reset to Report	10.00.00 10.01.00	
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Discharge225,7 ℃Total Comp2Comp Top125 ℃Comp, CutNo ApplyCompressor Current10DefrostBasicCompressor Current20Fan CalibrationBasic	Discharge225,7 °CTotal Comp2Comp Top125 °CComp, CutNo ApplyComp Top225,7 °COil ReturnBasicCompressor Current20DefrostBasicFan CalibrationBasicSasic			Discharge1	25,7 °C	EEPROM Version		
Comp Top125 °CComp, CutNo ApplyComp Top225,7 °COil ReturnBasicCompressor Current10DefrostBasicCompressor Current20Fan CalibrationBasic	Comp Top125 °CComp, CutNo ApplyComp Top225,7 °COil ReturnBasicCompressor Current10DefrostBasicCompressor Current20Fan CalibrationBasic			Discharge2	25,7 C	Total Comp	2	
Comp Top2 25,7 °C Oil Return Basic Compressor Current1 0 Defrost Basic Compressor Current2 0 Fan Calibration Basic	Comp Top2 25,7 °c Oil Return Basic Compressor Current1 0 Defrost Basic Compressor Current2 0 Fan Calibration Basic			Comp Top1	25 C	Comp, Cut	No Apply	
Compressor Current1 0 Defrost Basic Compressor Current2 0 Fan Calibration Basic	Compressor Current1 0 Defrost Basic Compressor Current2 0 Fan Calibration Basic			Comp Top2	25,7 C	Oil Return	Basic	
Compressor Current2 0 Fan Calibration Basic	Compressor Current2 0 Fan Calibration Basic			Compressor Current1	0	Defrost	Basic	
				Compressor Current2	0	Fan Calibration	Basic	
				Compressor Current1 Compressor Current2	0	Defrost Fan Calibration	Basic Basic	

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DVM Chiller Training

Thank You

SAMSUNG DVM Chiller

Addendum

View Mode Display Settings

Number of press	KEY operation	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	
1 time	Water In	0	1	-	0	5	0	°F
2 times	Water Out	0	2	-	1	1	0	°F
3 times	Outdoor temperature	0	3	-	1	1	2	°F
4 times	High pressure	0	4		2	9	3	Psi
5 times	Low pressure	0	5		0	7	5	Psi
6 times	Comp 1 current frequency	0	6		1	1	0	Hz
7 times	Comp 2 current frequency	0	7		1	1	3	Hz
8 times	Discharge 1 temperature	0	8		1	0	1	°F
9 times	Discharge 2 temperature	0	9		1	0	1	°F
10 times	Top 1 temperature	1	0		1	0	1	°F
11 times	Top 2 temperature	1	1		1	0	1	°F
12 times	Total suction temperature	1	2	-	1	1	2	°F
13 times	Suction 1 temperature	1	3	-	1	1	2	°F
14 times	Suction 2 temperature	1	4	-	1	1	2	°F

15 times	COND Out temperature	1	5	-	1	1	2	°F
16 times	Liquid Temperature	1	6		3	5	0	°F
17 times	EVA In 1 temperature	1	7		3	5	0	°F
18 times	EVA Out 1 temperature	1	8		5	0	0	°F
19 times	EVA In 2 temperature	1	9		3	5	0	°F
20 times	EVA Out 2 temperature	2	0		3	5	0	°F
21 times	EVI In temperature	2	1		3	5	0	°F
22 times	EVI Out temperature	2	2		3	5	0	°F
23 times	IPM 1 temperature	2	3		8	0	0	°F
24 times	IPM 2 temperature	2	4		8	0	0	°F
25 times	CT 1	2	5		1	1	0	A
26 times	CT 2	2	6		1	1	0	A
27 times	Operation mode	2	7			Blank/S	C/H	S: Hot water/Cool storage / C: Cooling, H: Heating
28 times	Set temperature	2	8	-	0	5	0	°F
29 times	Pump output	2	9		0	n/F	Blank/F	On/Off
30 times	Fan Step	3	0		0	2	4	# Step

View Mode Display Settings – Cont.

Number of press	KEY operation	SEG1	SEG2	SEG3	SEG4	SEG5	SEG6	Remarks
31 times	Hydro EEV 1	3	1		1	0	0	ex) 1007 step → 100 (Drop "/10")
32 times	Hydro EEV 2	3	2		1	0	0	ex) 1007 step → 100 (Drop "/10")
33 times	Main EEV 1	3	3		1	0	0	ex) 1007 step → 100 (Drop "/10")
34 times	Main EEV 2	3	4		1	0	0	ex) 1007 step → 100 (Drop "/10")
35 times	EVI EEV	3	5		4	7	3	# Step
36 times	PHE inlet pressure	3	6		0	1	2	Psi
37 times	PHE outlet pressure	3	7		0	0	4	Psi
38 times	Capacity (Cooling)	3	8		0	7	0	# MBtu's
39 times	(Exterior) Room temperature	3	9		2	5	5	°F
40 times	(Exterior) Water outlet temperature	4	0	-	1	1	0	°F
41 times	Pressure difference calibration	4	1	-	0	0	2	Psi

No.	Description
1	Select operation On/Off input method of module/group
2	Select temperature setting input method of module/group
3	Select operation mode (Cool/Heat, Hot water/Cool storage) input method of module/group
4	Select demand control input method of module/group
5	Select demand level
	 Current will be limited below the set level when "Perform" command is transmitted.
6	Select quiet function input method of module
	Select forced fan function input method of module
7	 Forced fan: Removes accumulated snow by operating the fan of stopped unit in low frequency
· `	 Snow accumulation prevention, which operates occasionally when outdoor temperature is below 0°C
	(32°F), is basic function.
8	Select water law input method of module/group
9	Select pump operation status when thermo OFF NA in US models
10	Select to use error clear function by external contact
11	Setting CHILLER unit address: identical with channel address used by DMS
	Select quiet function level
12	 Quiet function will start in set level when "Perform" command is transmitted.
	Level comparison: Level3 > Level2 > Level1
	Confirm delay for unsecured flow rate when operating: Delay for inspecting no input for pump interlock and
13	unsecured flow rate
	Compressor will not operate until water flow is detected.
	Set when controlling water outlet temperature by installing extra water temperature gauge on water pipe
	External water outlet temperature senser should be installed on main unit of group (or module
14	External water outlet temperature sensor should be installed on main unit of group (or module when group is not available)
	Standard for water outlet temperature depends on outernal water outlet temperature concer except
	Standard for water obtiet temperature depends on external water obtiet temperature sensor except when operation pattern is standard control
I	men operation pattern is standard control.

	Setting water law standard
15	 To set room temperature as standard, external room temperature sensor should be installed.
15	Room temperature sensor should be installed on main unit of group (or module when group is not
10.0	available).
16 ~ 27	Water law control constant: Refer to water law operation graph.
	Recognition of external control operation ON/OFF
28	• O (recognizing usual signal): Constantly inspects ON/OFF status of contact and set operation ON/OFF
20	 1 (recognizing instant signal): Set operation ON/OFF when contact ON/OFF signal is input (when external contact is consisted of button click)
	Select to use low temperature function
	 The function will operate when set simultaneously with product option of module control (Seg23 of installation option 02 = 'E')
34	 Low temperature function: Expands water outlet usage range in Cool/Cool storage mode (5°C (41°F) ~ 25°C (77°F) → -10°C (14°F) ~ 25°C (77°F))
	 When using low temperature function, use brine and maintain the concentration under freezing point.

Hydro Controller Option Settings List

No. Option item Option ratio Pactory default Option Definition Se	Setting unit	control setting option ^{Note1)}
0 Module control/DMS M	Main unit	
1 Operation On/Off input method 0·1 0 1 External contact 0	of group Note2)	
0 Module control/DMS M	Main unit	
2 Temperature setting input method 0.1 0 1 External contact 0	of group Note2)	
Operation mode (Cool/Upst 0 Module control/DMS M	Main unit	
3 normal/hot water) input method 0.1 0 1 External contact 0	of group Note2)	
0 Module control/DMS M	Main unit	
4 Demand control input method 0.1 0 1 External contact 0	of group Note2)	
0 Default (100 %)		
1 95 %		
2 90 %		
3 85%		
4 80%		
5 Demand level 0~11 3 5 75% M	Main Unit	0
6 /0% OT	of module	
/ 65%		
0 60%		
10 50%		
10 50 %		

Hydro Controller Option Settings List – Cont.

No.	Option item	Option value	Factory default	Option	Definition	Setting unit	Module control setting option Note1)
				0	Module control/DMS	Main unit	
6	Quiet function input method	0.1	0	1	External contact	of group Note2)	
	Forced fan function input method	0.1	0	0	Module control/DMS	Main unit	
7				1	External contact	of group Note 2)	
	Water law input method	0.1	0	0	Module control/DMS	Main unit	
8				1	External contact	of group Note 2)	
	NA in US models	0.1	0	0	Pump OFF when thermo OFF	Main unit of module	
					and operation pattern is not		
9	Pump operation when thermo off				standard control		
				1	thormo OEE		
			-	0	Disuse	Main unit	
10	Remote error reset input	0.1	0	1	Use	of module	
11	Setting unit address Module address must be set. (Refer to installation manual	0~15	(Not set)		Setting unit address	Each unit	
-	of module controller.)			0	Default (100 %)		
	Quiet function level	0~3	1	0	Derduit (100 %)	Main unit of module	
12				1	Level1		0
				2	Level2		
				3	Level3		
13	Confirm delay for unsecured flow rate when operating	10 ~ 240	30		Delay for inspecting no input for pump interlock and unsecured flow rate (by seconds)	Main unit of module	
	Using exterior water outlet temperature sensor	0/1	0	0	Disuse	Main unit	
14				1	Use	of group Note2)	
				0	Outdoor temperature	Main unit	
15	Water law control standard	0/1	0	1	Room temperature (external room temperature sensor installation necessary)	of group Note2)	0

Hydro Controller Option Settings List – Cont.

No.	Option item	Option value	Factory default	Option	Definition	Setting unit	Module control setting option Note1)
16	AirCool1 (For water law)	0~20	10		Standard 1 outdoor temperature for cooling		
17	AirCool2 (For water law)	30 ~ 40	35		Standard 2 outdoor temperature for cooling		
18	RoomCool1 (For water law)	15~24	20		Standard 1 room temperature for cooling		
19	RoomCool2 (For water law)	25 ~ 35	30		Standard 2 room temperature for cooling		
20	Tcool1 (For water law)	-10~ 25	15		Standard 1 set temperature for cooling	Main unit of group Note2)	0
21	Tcool2 (For water law)	-10~ 25	7		Standard 2 set temperature for cooling		
22	AirHeat1 (For water law)	-20 ~ 5	-10		Standard 1 outdoor temperature for heating		
23	AirHeat2 (For water law)	10 ~ 20	15		Standard 2 outdoor temperature for heating		
24	RoomHeat1 (For water law)	15~24	20		Standard 1 room temperature for heating		
25	RoomHeat2 (For water law)	25 ~ 35	30		Standard 2 room temperature for heating		
26	Theat1 (For water law)	35 ~ 55	45		Standard 1 set temperature for heating		
27	Theat2 (For water law)	35 ~ 55	35		Standard 2 set temperature for heating		
	Operation ON/OFF by external contact	0/1	0	0	Recognize usual signal	Main unit of group Note 2)	
28				1	Recognize instant signal		
29	Function expansion available						
33							
34	Using low temperature function	0/1	0	0	Disuse	Each unit	
				1	Use		
35	Function expansion available						
Training Addendum

VRF Control – Service Mode Settings List

K1 (Number of press)	KEY operation	Display on 7-Segment
1 time	Refrigerant charging in Heating mode	8888
2 times	Trial operation in Heating mode	8888
3 times	Refrigerant discharging in Heating mode	8888
4 times	Disuse	8888
5 times	Disuse	8888
6 times	Disuse	8888
7 times	Vacuum	8888
8 times	Disuse	8888
9 times	Disuse	8888
10 times	Disuse	8888
11 times	Disuse	8888
12 times	End KEY operation	-

Training Addendum

VRF Control – Service Mode Settings List

K2 (Number of press)	KEY operation	Display on 7-Segment
1 time	Refrigerant charging in Cooling mode	8888
2 times	Trial operation in Cooling mode	8888
3 times	Pump down all units in Cooling mode	8888
4 times	Auto trial operation	8888
5 times	Checking the amount of refrigerant	A A X (Display of last two digits may differ depending on the progress)
6 times	Discharge mode of DC link voltage	8888
7 times	Forced defrost operation	8888
8 times	Forced oil collection	8888
9 times	Inverter compressor 1 check	8888
10 times	Inverter compressor 2 check	8888
11 times	Fan 1 check	8888
12 times	Fan 2 check	8888
13 times	End KEY operation	-

Training Addendum

K3 (Number of press)	KEY operation	Display on 7-Segment
1 time	Initialize (Reset) operation	Same as initial state

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VRF Control – View Display Settings List

K4 (Number of	Display contents	Display	
press)		SEG1	SEG2, 3, 4
1 time	Capacity depending on horsepower	1	AG010KSV*** → 0, 1, 2 AG015KSV*** → 0, 1, 8
2 times	Order frequency (Compressor 1)	2	Hz
3 times	Order frequency (Compressor 2)	3	Hz
4 times	High pressure (MPa)	4	Psi
5 times	Low pressure (MPa)	5	Psi
6 times	Discharge temperature (Compressor 1)	6	۴
7 times	Discharge temperature (Compressor 2)	7	۴
8 times	IPM temperature (Compressor 1)	8	۴
9 times	IPM temperature (Compressor 2)	9	°F
10 times	CT sensor value (Compressor 1)	Α	A
11 times	CT sensor value (Compressor 2)	В	А
12 times	Suction 1 temperature	С	°F
13 times	COND Out temperature	D	°F
14 times	Temperature of liquid pipe	E	°F
15 times	TOP temperature (Compressor 1)	F	°F

VRF Control – View Display Settings List

K4 (Number of	Display contents		Display	
press)		SEG1	SEG2, 3, 4	
15 times	TOP temperature (Compressor 1)	F	°F	
16 times	TOP temperature (Compressor 2)	G	°F	
17 times	Outdoor temperature	Н	°F	
18 times	EVI inlet temperature	1	°F	
19 times	EVI outlet temperature	J	°F	
20 times	Main EEV 1 step	К	# Step	
21 times	Main EEV 2 step	L	# Step	
22 times	EVI EEV step	М	# Step	
23 times	H/R EEV step	N	# Step	
24 times	Fan step (SSR or BLDC)	0	# Step	
25 times	Current frequency (Compressor 1)	Р	Hz	
26 times	Current frequency (Compressor 2)	Q	Hz	
27 times	Suction 2 temperature	R	°F	
28 times	Master indoor unit address	S	Master indoor unit not selected → BLANK, N, D If indoor unit No.1 is selected as the master unit → 0, 0, 1	
29 times	Snow accumulation sensor voltage	Т	Volts	
30 times	Total suction temperature	U	°F	