DVM Chiller Training

Introduction & Basic Installation

Rev 2.0

SAMSUNG HVAC

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 air-conditioning 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
USE CAUTION

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

Training Topics

- ***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

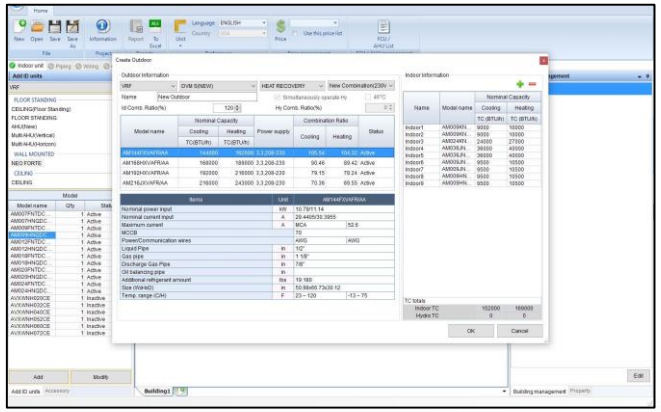
SAMSUNG DVM Chiller

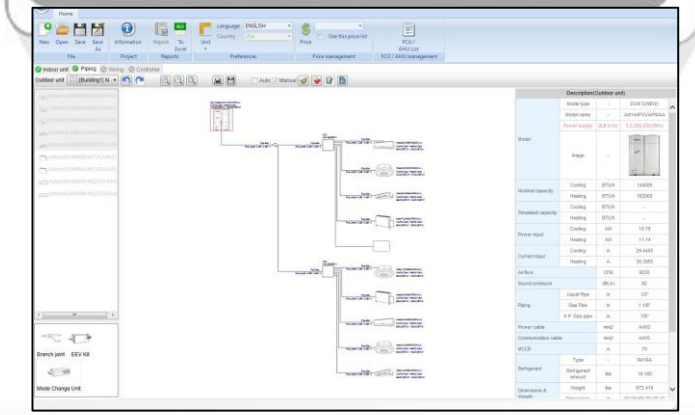
Introduction

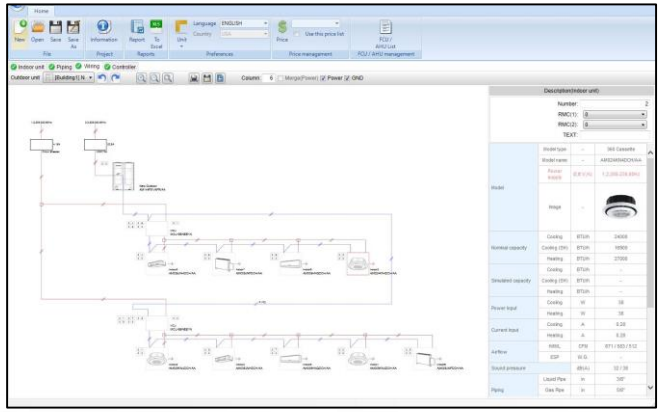
DVM Chiller Introduction

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 Introduction

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 Introduction

DVM Chiller Overview

DVM Chiller Features

- AG010(015)KSVA**F**H 208/230vac 3Ø AG010(015)KSVA**J**H 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)

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)

1 Unit module

2 Unit module

4 Unit module

8 Unit module

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

Example:

One group with up to 16 units can be controlled by a single Module Controller

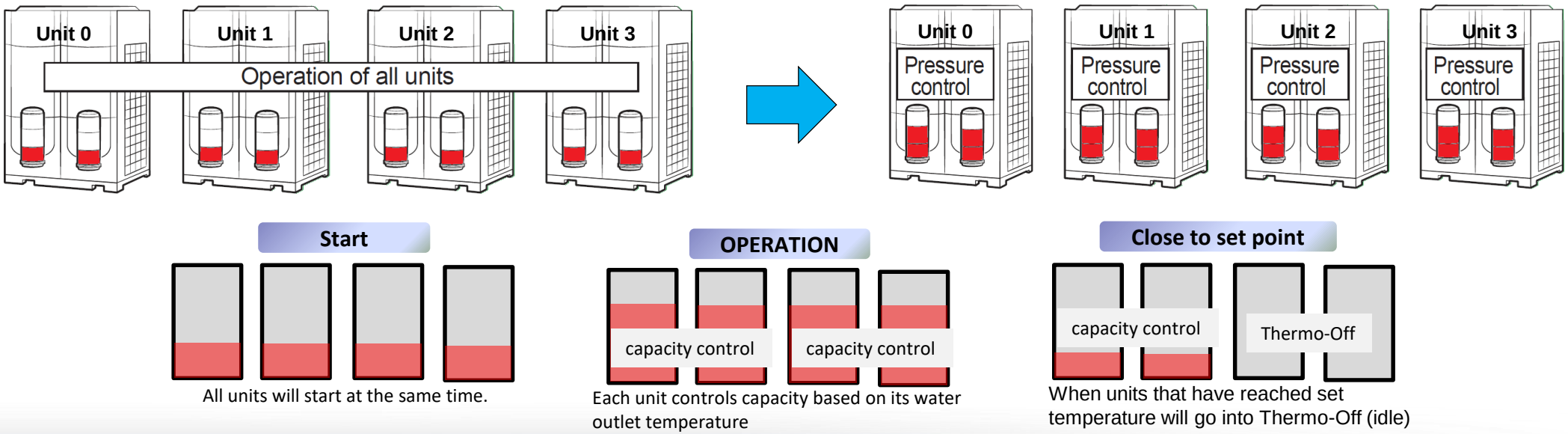
DVM Chiller Introduction

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

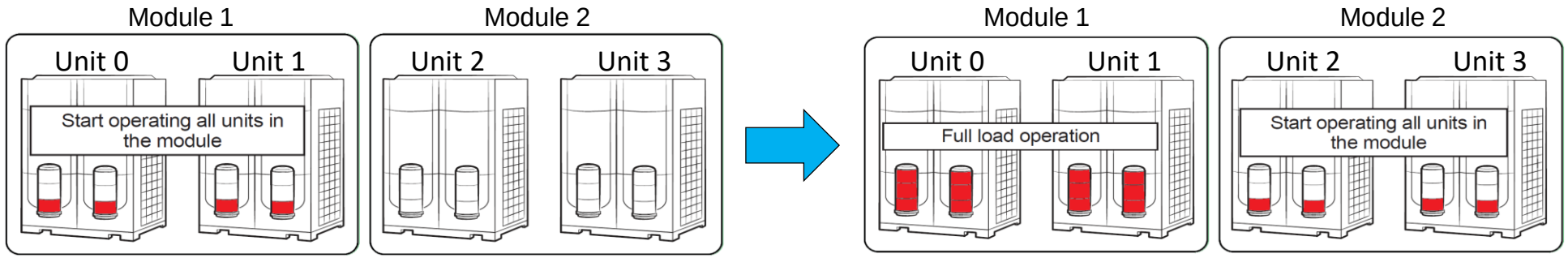


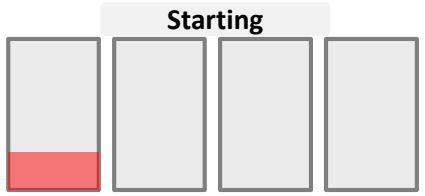
DVM Chiller Operation Control Patterns

Selectable chiller group operation control patterns

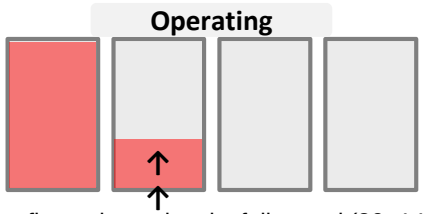
Rotation Control – Applications with lower loads at system startup and with small load fluctuations

- 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

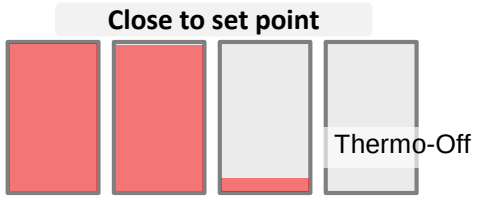




Operates the unit with the highest priority



When first unit reaches its full speed (80~140Hz) and average LWT, another unit that has the following priority will operate.

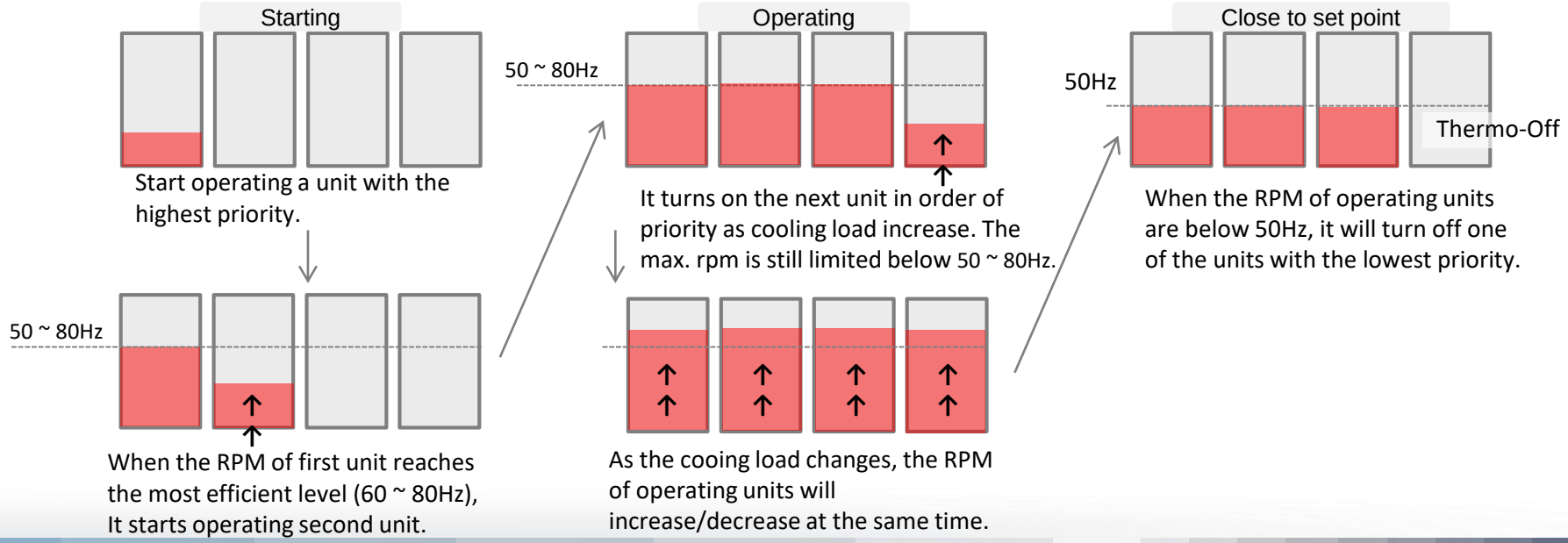


When LWT is close to set point, the unit with the last priority stops

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



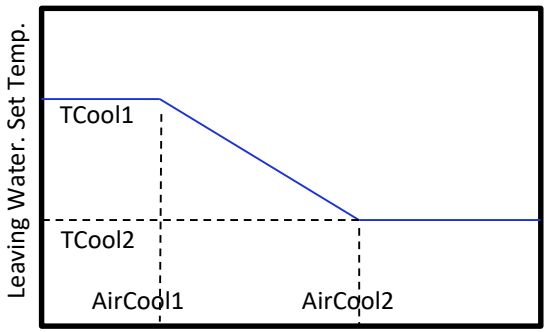
DVM Chiller Introduction

DVM Chiller Operation Control Patterns

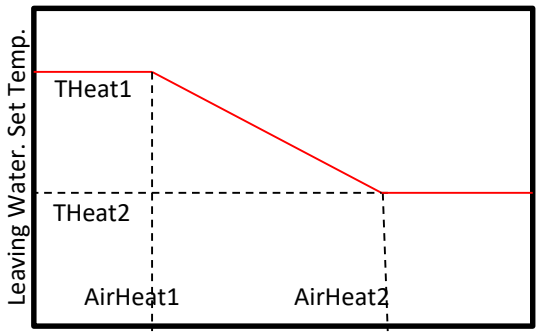
Water Law Control – Applications where efficiency is increased by resetting the leaving water temperature based on outside ambient temperature or room temperature

- 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

By Outside Temperature

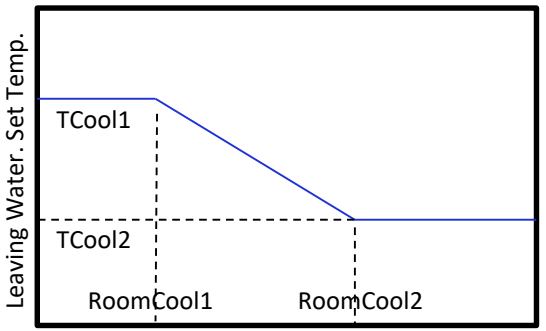


[Cooling Mode]

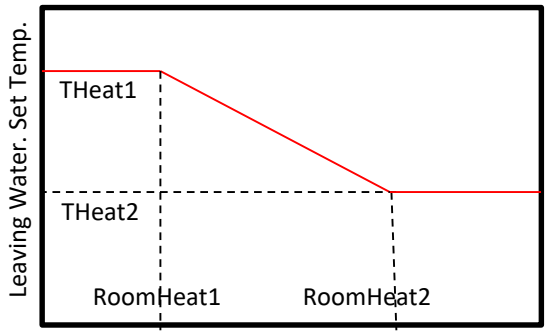


[Heating Mode]

By Room Temperature



[Cooling Mode]



[Heating Mode]

Water Law Control Example

Water Law temperature setting ranges (°F)

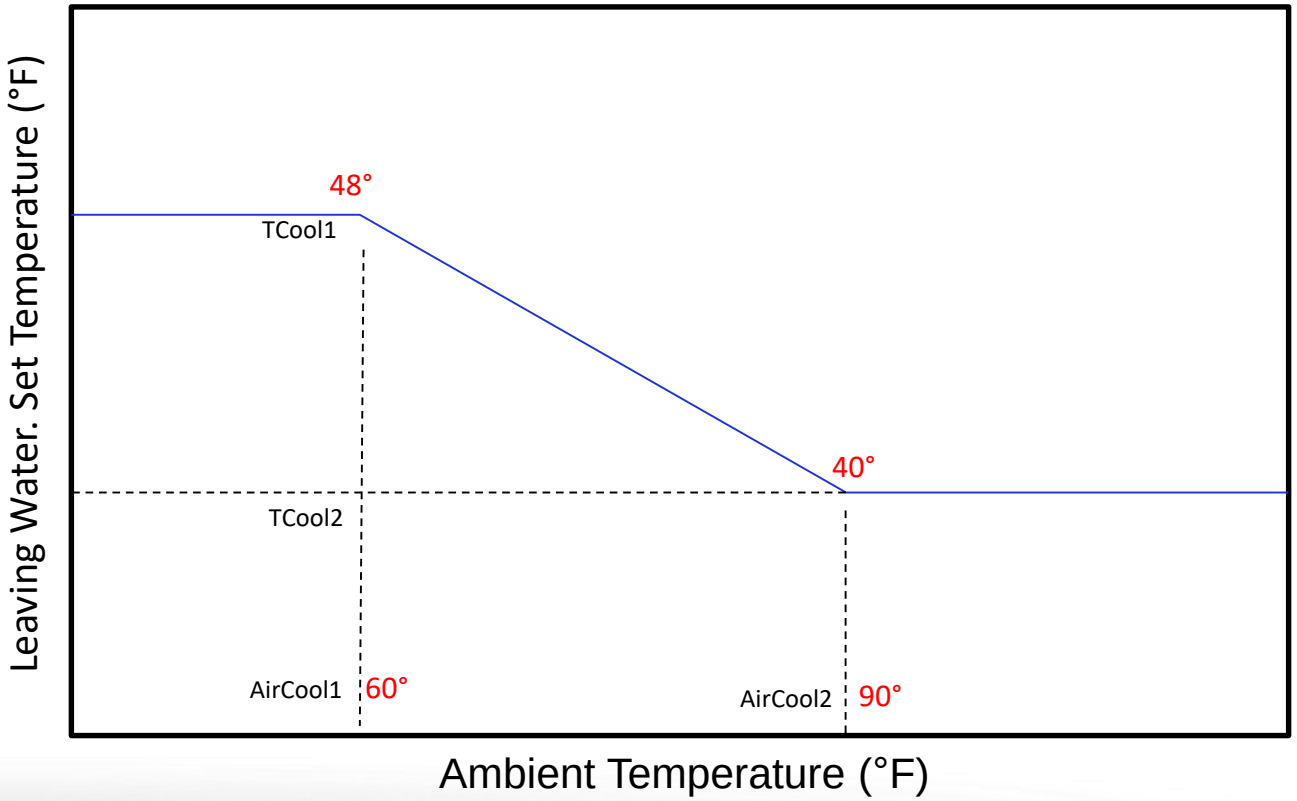
Option	Range (°F)	Notes
AirCool1	32 - 68	OA temp. 1, cool mode
AirCool2	86 – 104	OA temp. 2, cool mode
RoomCool1	59 – 75.2	Room temp. 1, cool mode
RoomCool2	77 – 98	Room temp. 1, cool mode
TCool1	14 - 77	Water set temp. 1, cool mode
TCool2	14 - 77	Water set temp. 2, cool mode
AirHeat1	-4 - 41	OA temp. 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)

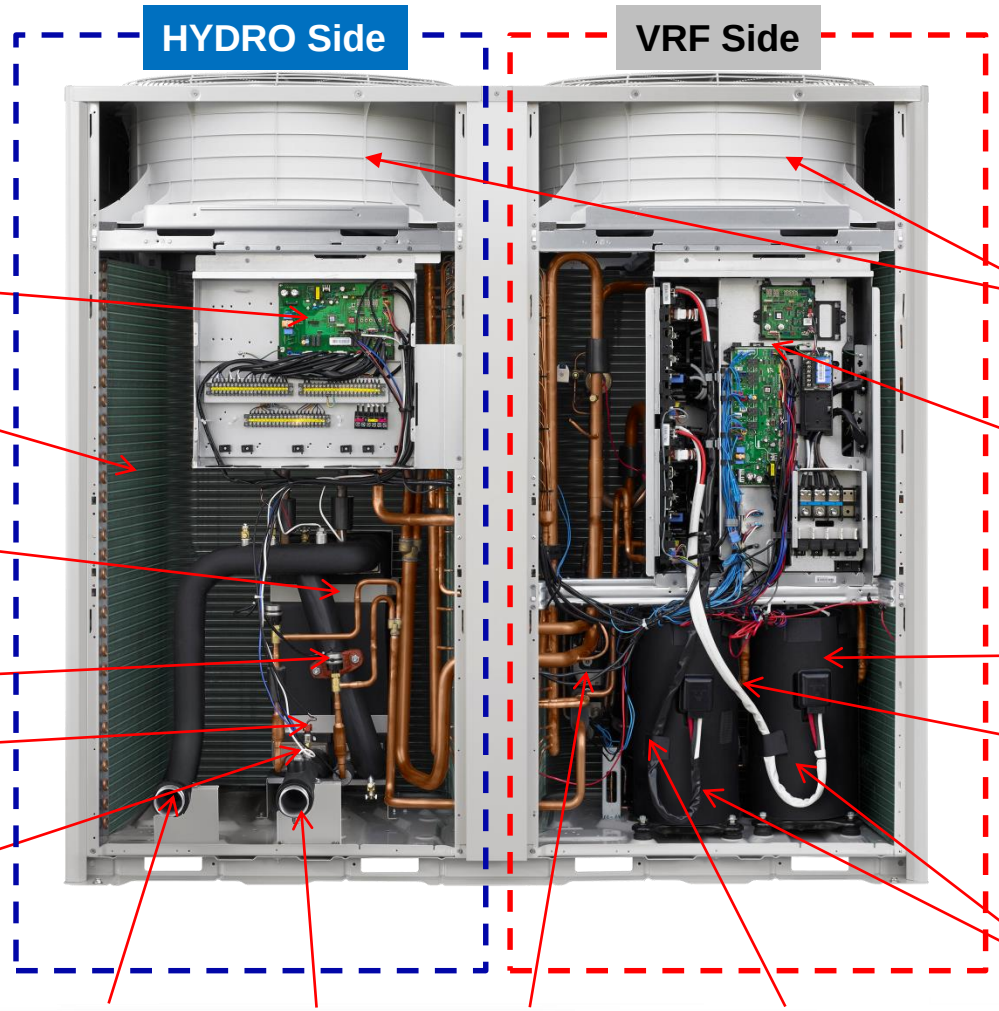


SAMSUNG DVM Chiller

Chiller System Components

Chiller System Components

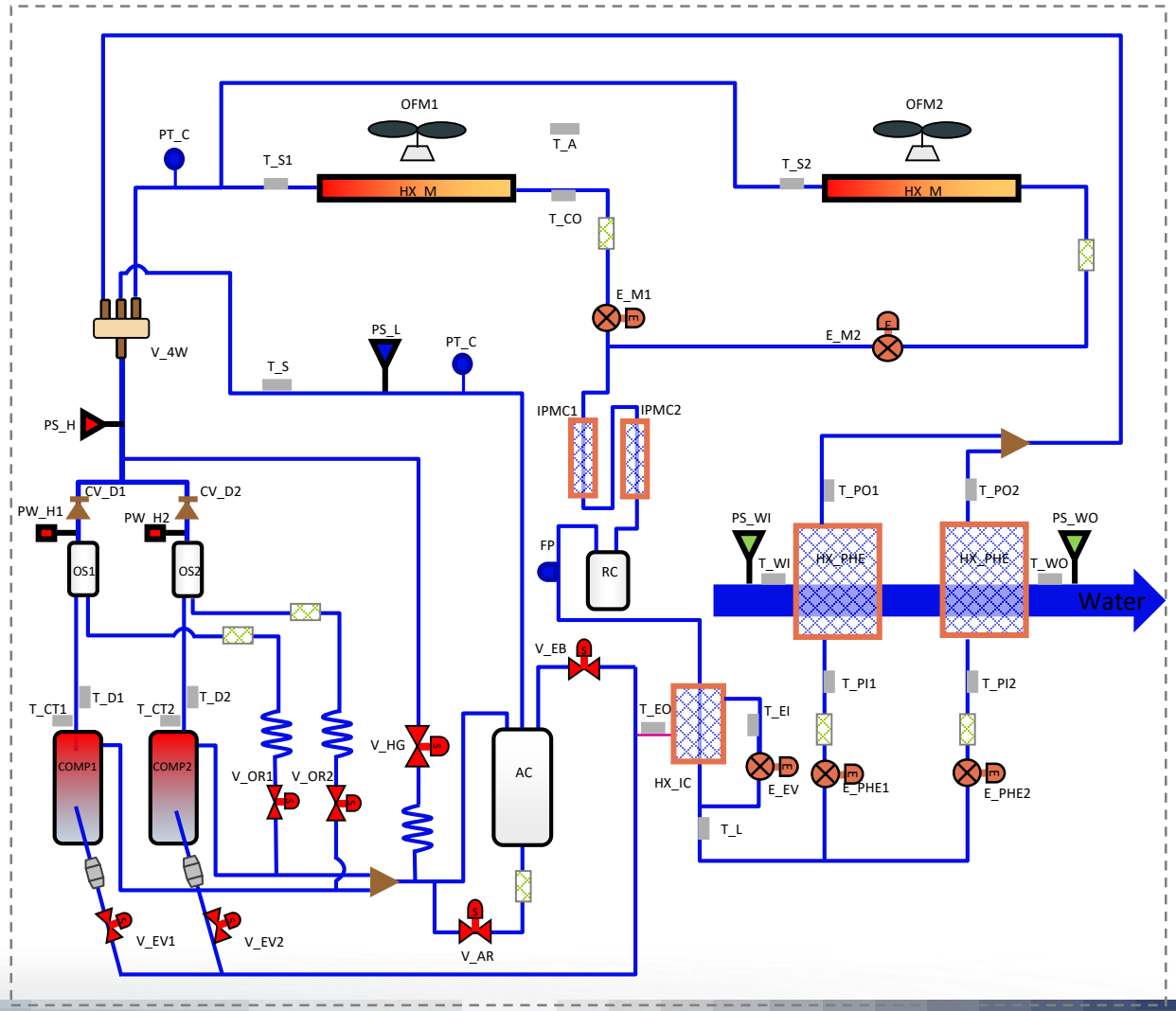
DVM Chiller



Chiller System Components

DVM Chiller – Refrigerant Cycle

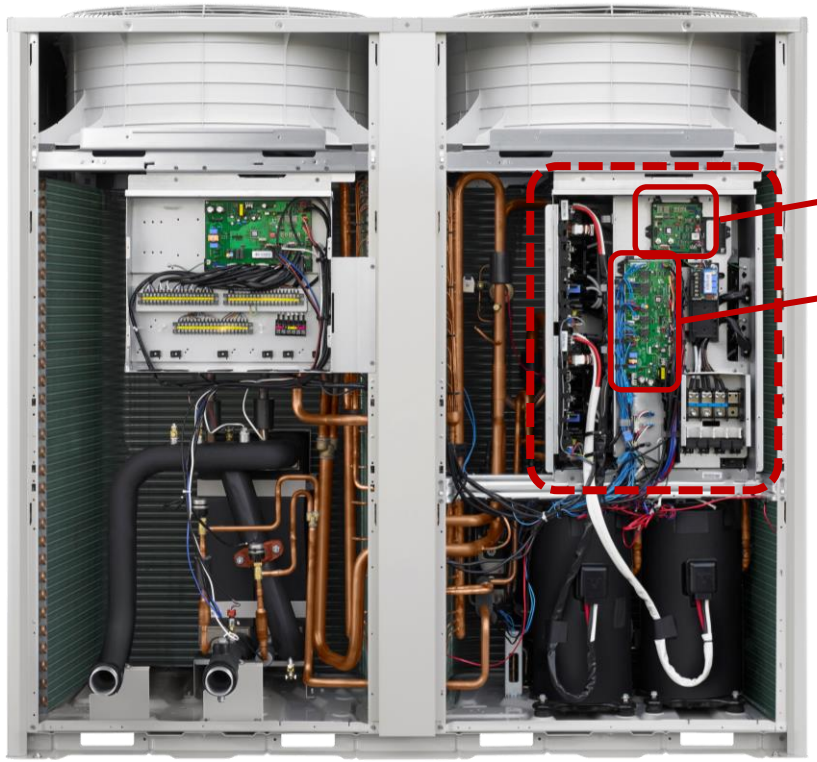
- PS = Pressure sensor
- V = Valve
- T = Temperature sensor
- AC = Accumulator
- RC = Receiver
- PW = Pressure switch
- OS = Oil separator
- PT = Service port
- E = EEV (Electronic Expansion Valve)
- HX = Heat exchanger
- HX PHE = Plate heat exchanger
- IPMC = Intelligent Power Module (inverter PCB cooler)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

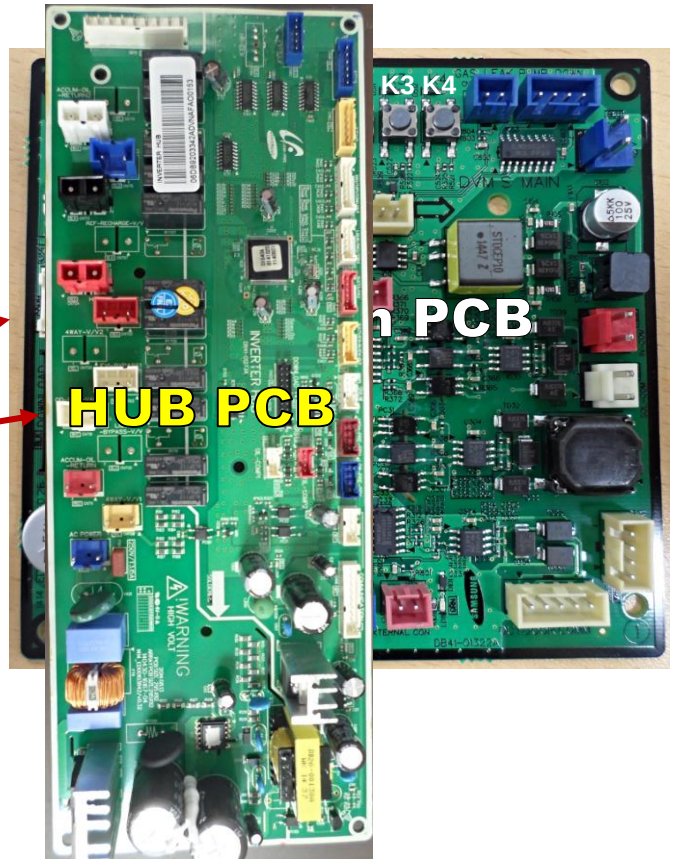


Chiller System Components

DVM Chiller – Control

VRF Control Box



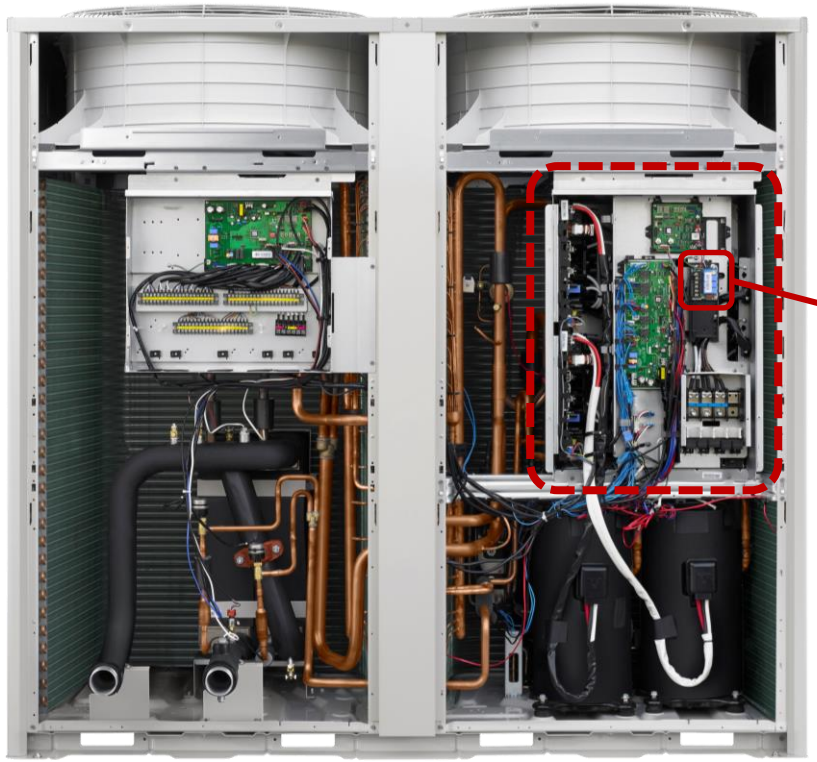


- HUB PCB communication
- Main PCB communication
- FAN PCB communication
- EEV's – 4-way valve – oil return valves – bypass valves
- Pressure & Temp sensors
- Auto & Manual Addressing
- VRF status display

Chiller System Components

DVM Chiller – Control

VRF Control Box

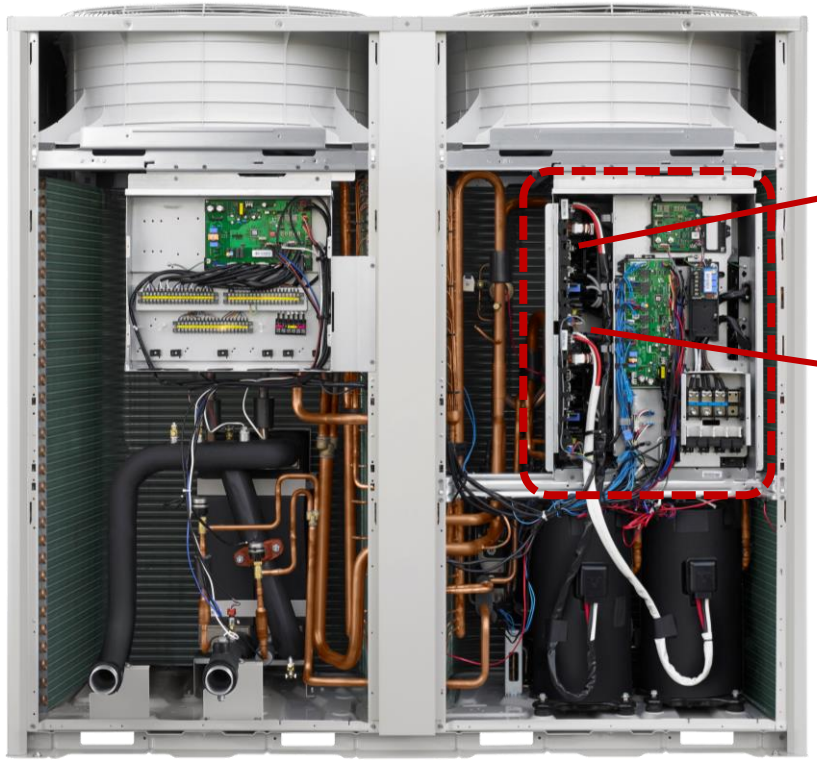


- VRF PCB communication
- Hydro communication
  - F1 F2 not used
  - OF1 OF2 not used
  - R1 R2 – Centralized control

Chiller System Components

DVM Chiller – Control

VRF Control Box

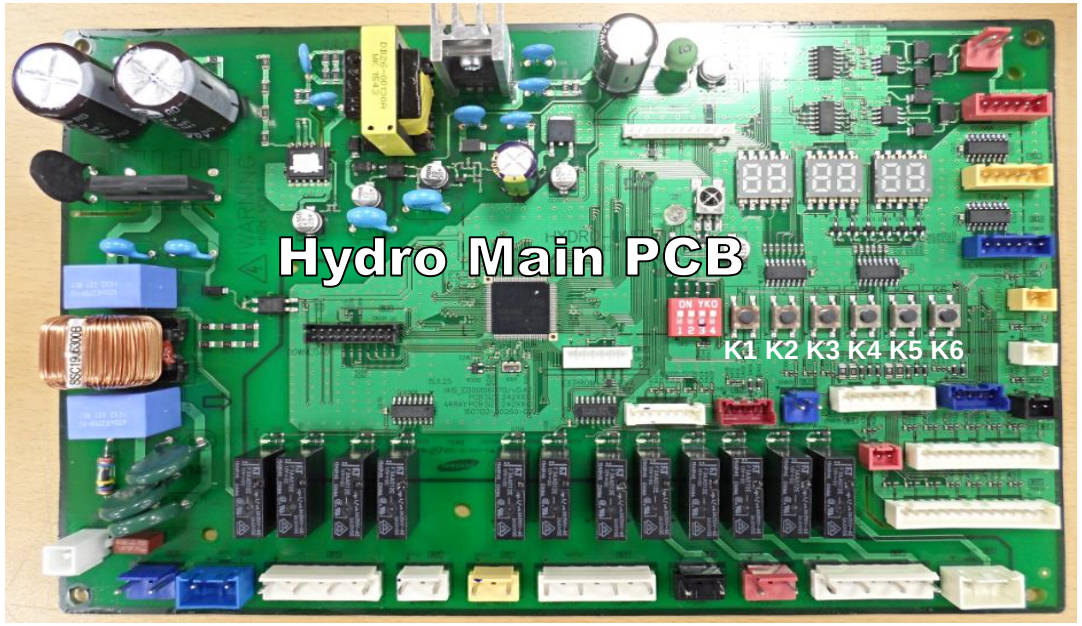


"F" Model 208/230vac

"J" Model 460vac

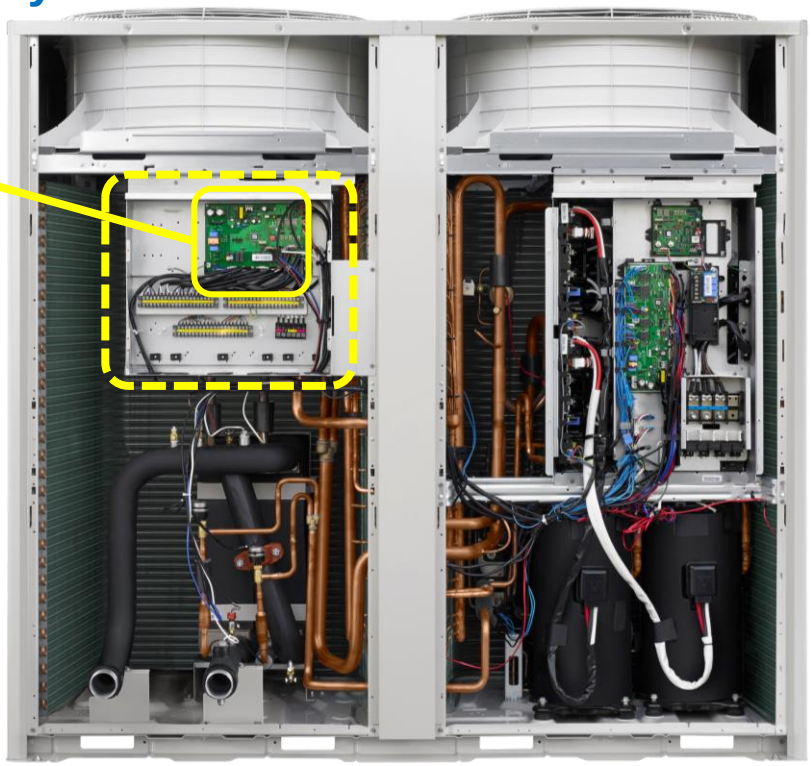
Chiller System Components

DVM Chiller – Control



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

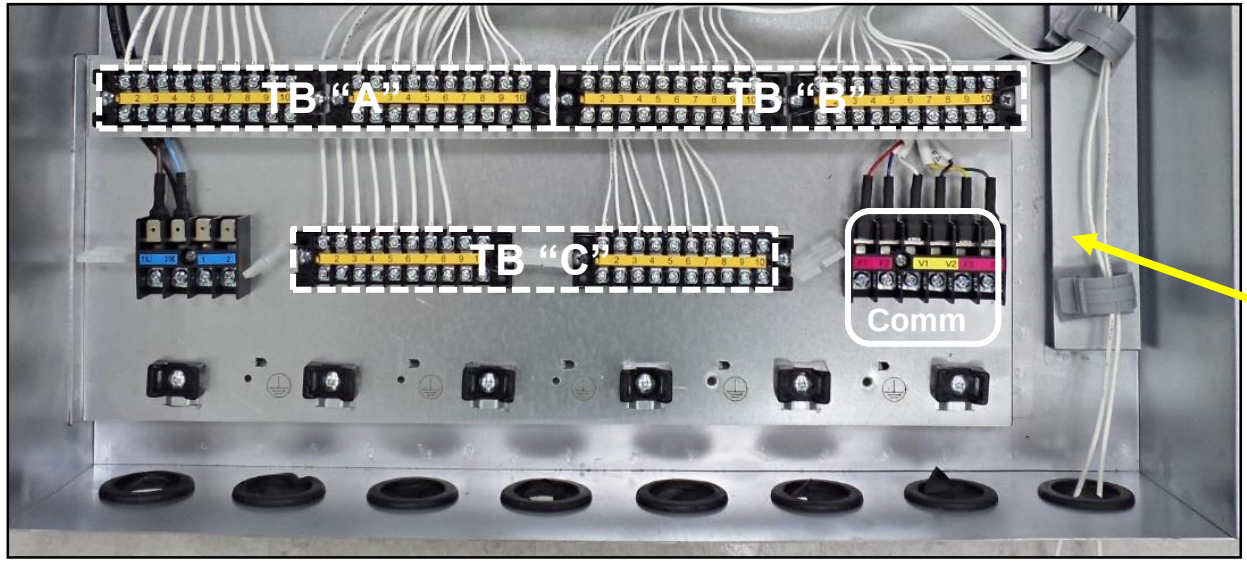
Hydro Control Box



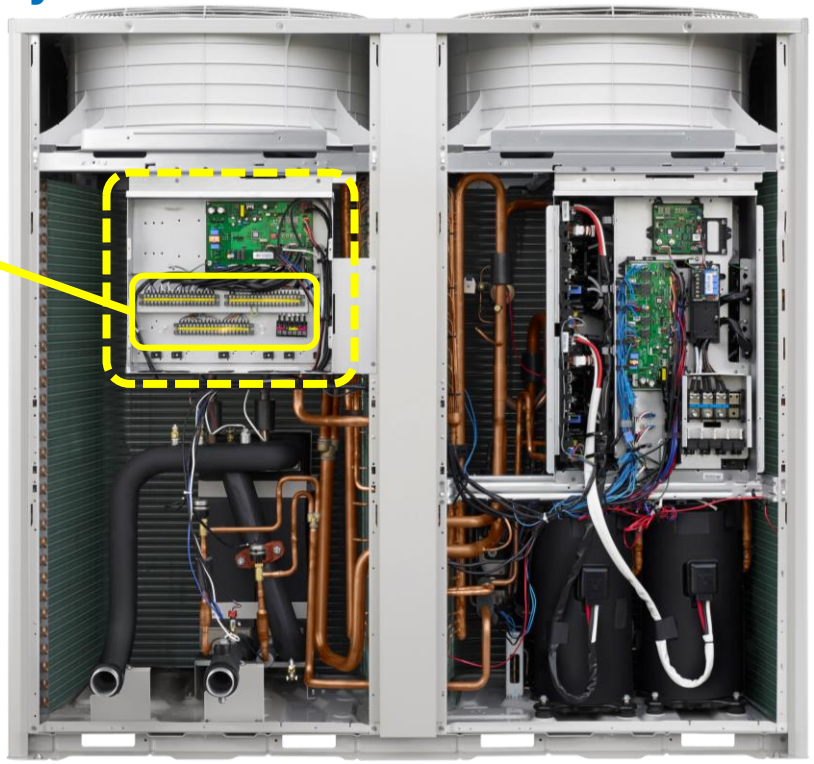
Chiller System Components

DVM Chiller – Control

Hydro Terminal Blocks



Hydro Control Box



- 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

Chiller System Components

MCM-A00N – Module Controller

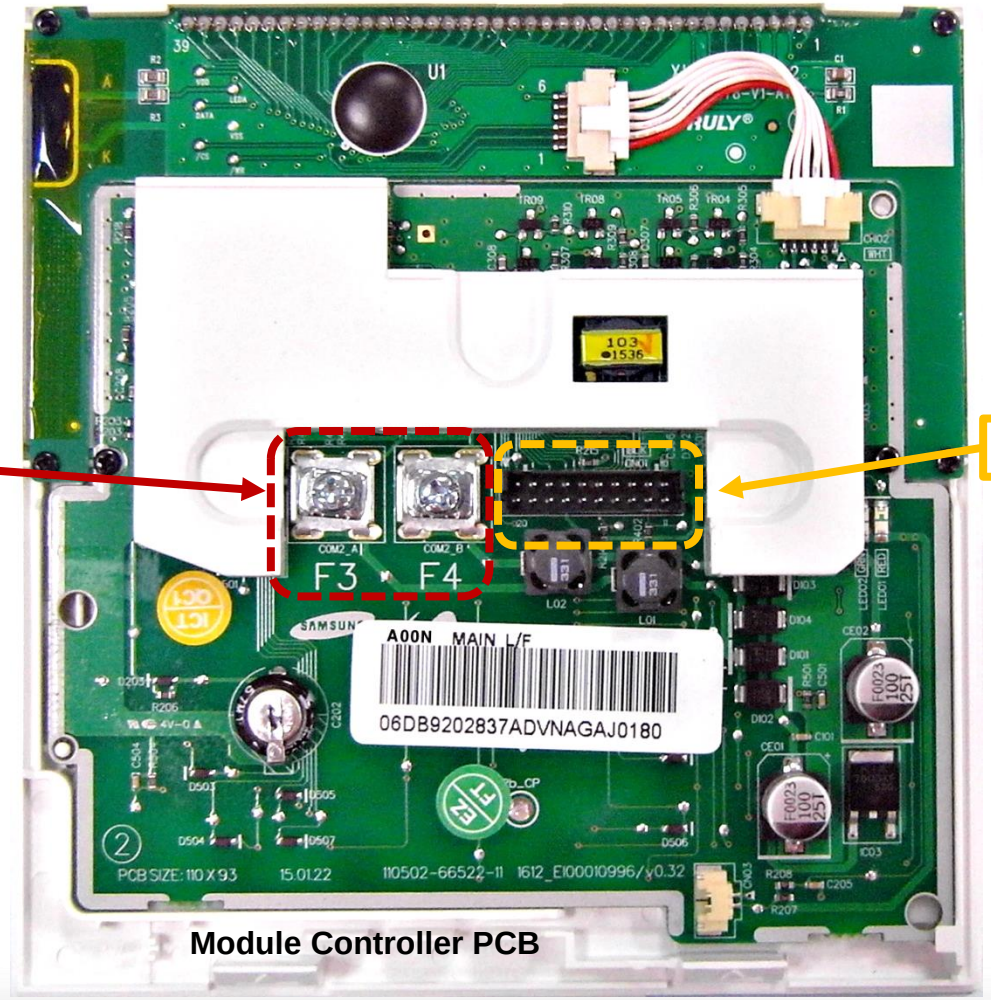
- Same design as MWR-WE10N wired controller
- Can monitor and control up to 16 DVM Chiller units
- Connects to F3/F4 terminals at each DVM Chiller
  (same connection point as standard DVM S indoor unit wired controllers)
- Set Module or Group status
- System option settings
- 12 or 24 hour clock

Chiller System Data Viewing

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

Chiller System Components

MCM-A00N – Module Controller



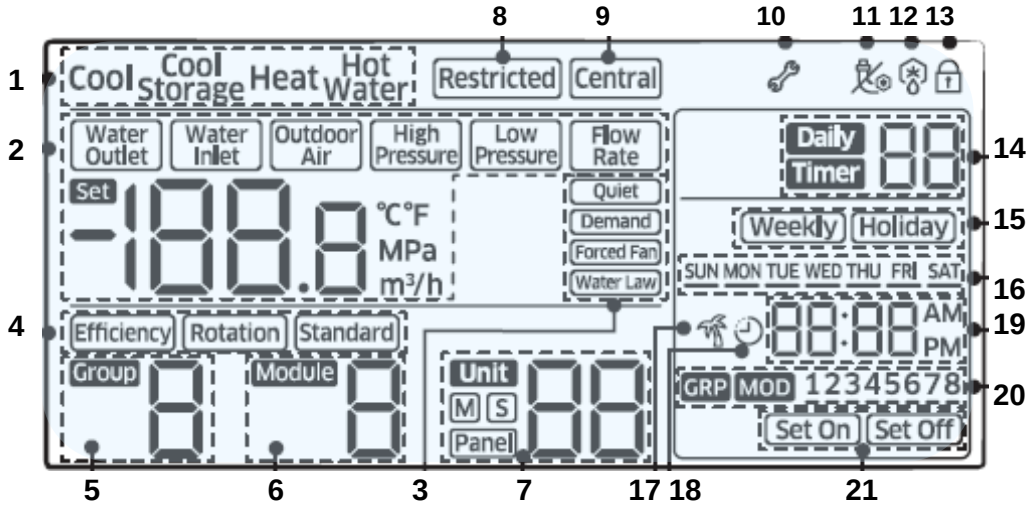
F3 F4
Power/Communications

Download Connector

Chiller System Components

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

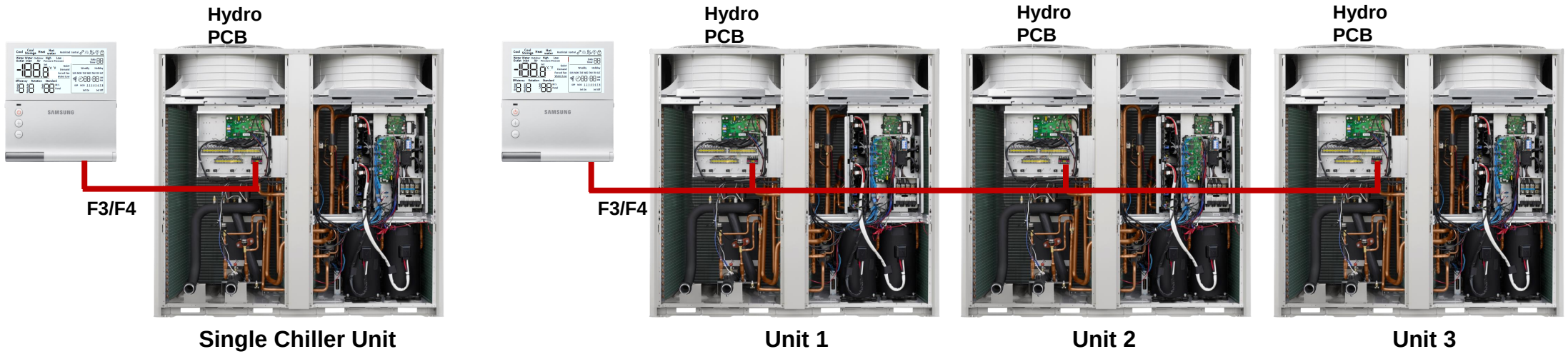


No.	Function
13	When buttons locked
14	No. of scheduling by daily or entire
15	Scheduling / holiday
16	Displayed days of week while setting weekly or daily timer or displaying the set timer.
17	When summer time (daylight saving) activated
18	When set the off timer
19	Current time or set time
20	When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

Chiller System Components

MCM-A00N – Module Controller

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



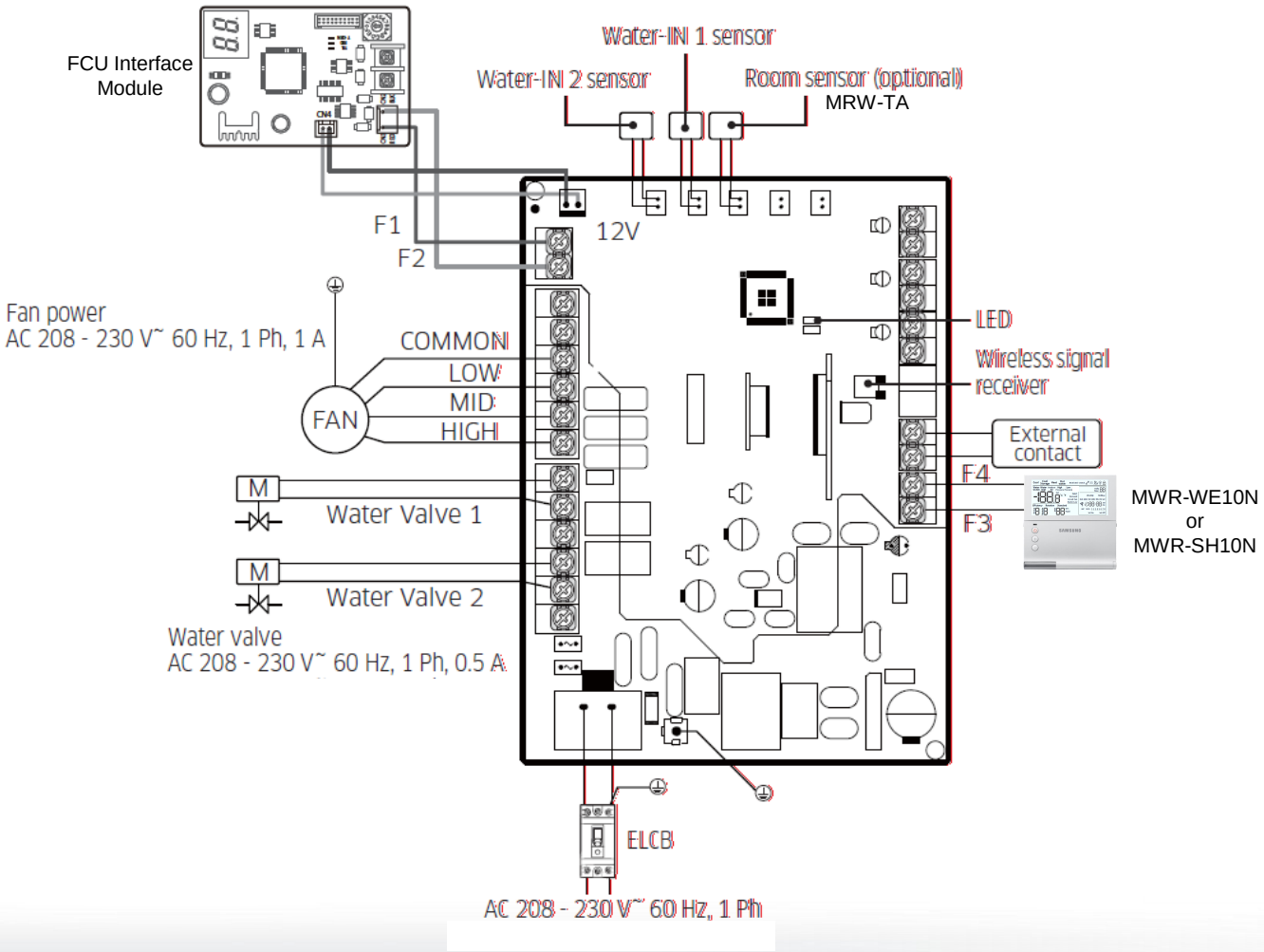
Chiller System Components

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

Chiller System Components

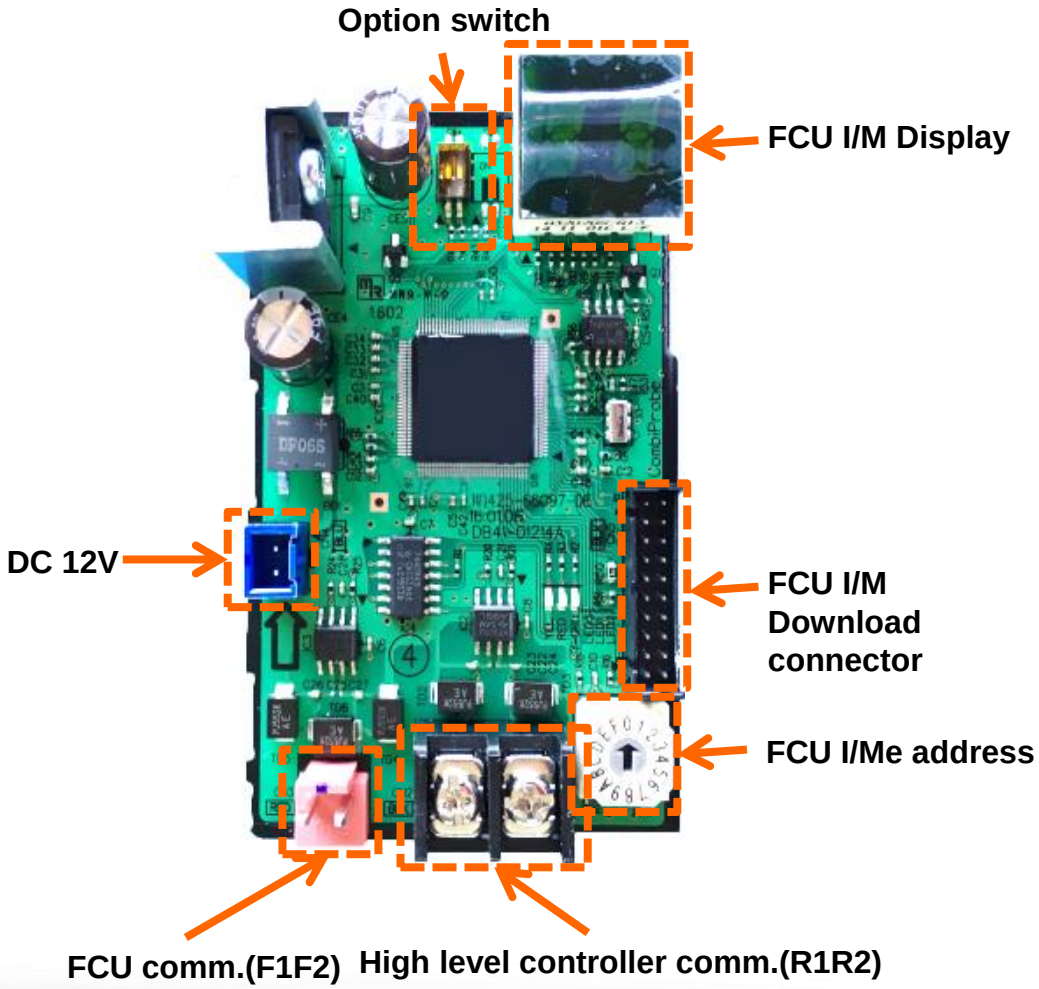
MIM-F00N – FCU Kit Inputs & Outputs



Chiller System Components

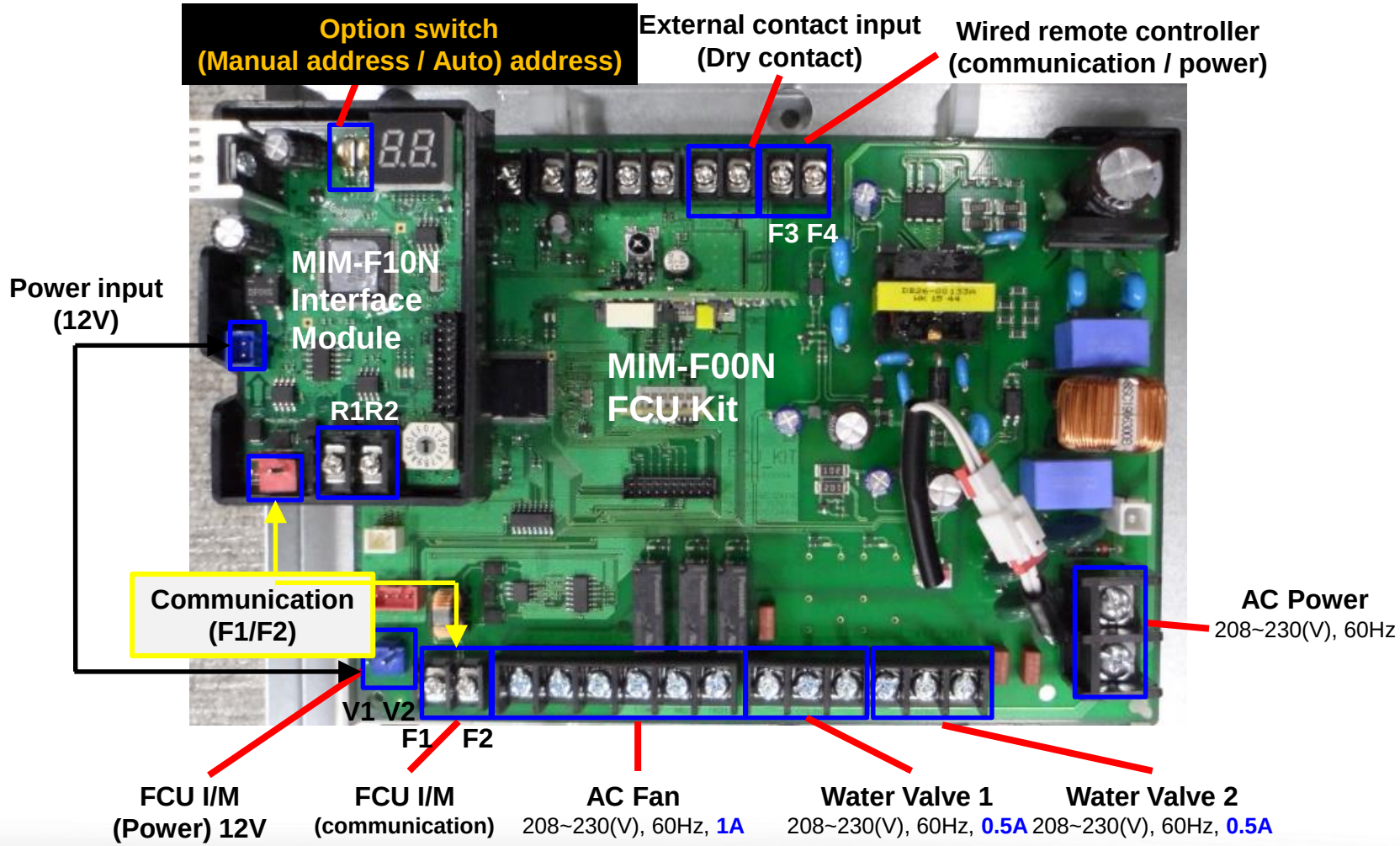
MIM-F10N – FCU Interface Module

- 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

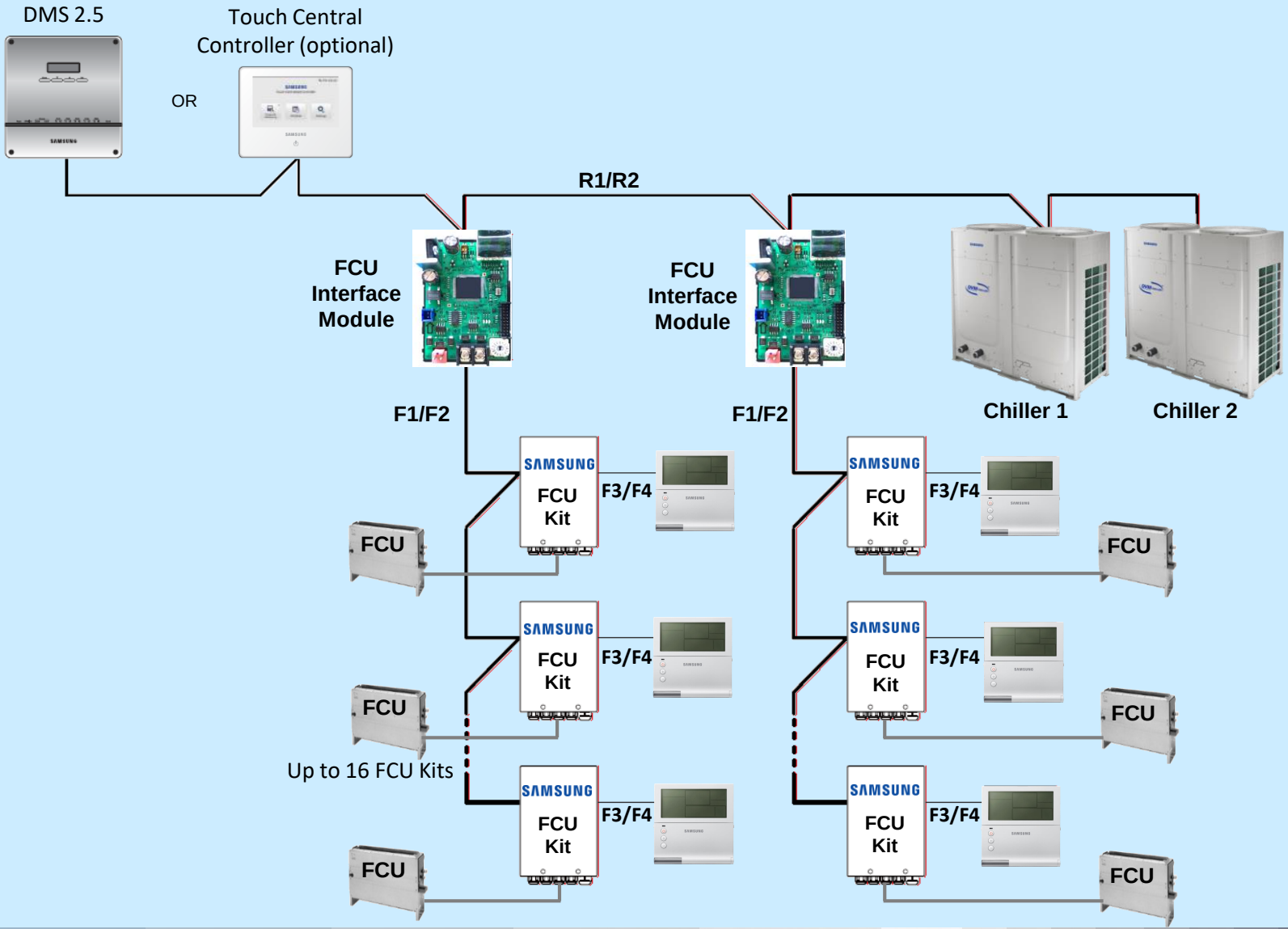


Chiller System Components

FCU Kit / Interface Module



Chiller System Components



Chiller System Components

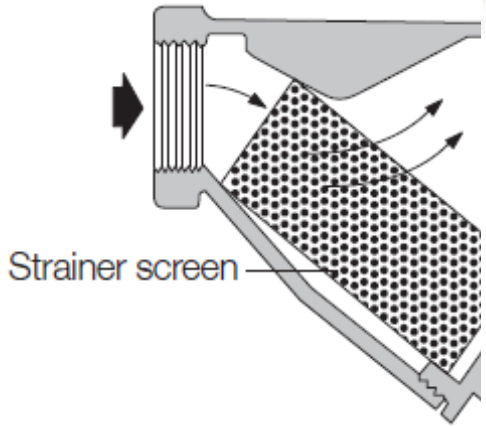
Water Side System Components – Field Supplied

Closed loop flow switch

- Prove water flow through the closed loop and plate heat exchanger

Closed loop inlet strainer 50 Mesh – Mandatory

- Required to filter the water entering the plate h



Preferred

Type	Punching Type	Mixed Type
		
ire	Punching in plate	Wire Type(inner) + Punching Type(outer)
Filtration area : large Stiffness : bad	Filtration area : small Stiffness : good	Filtration area : large Stiffness : good
△	△	O

Chiller System Components

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

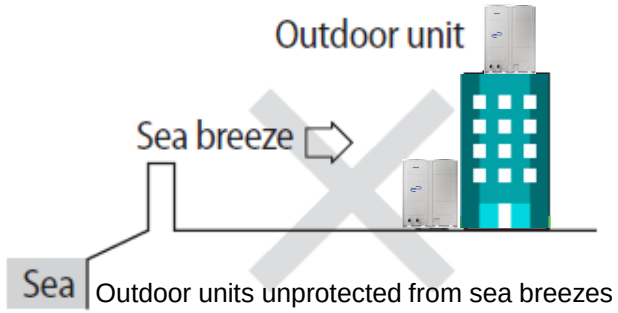
SAMSUNG DVM Chiller

Chiller Basic Installation

Chiller Basic Installation

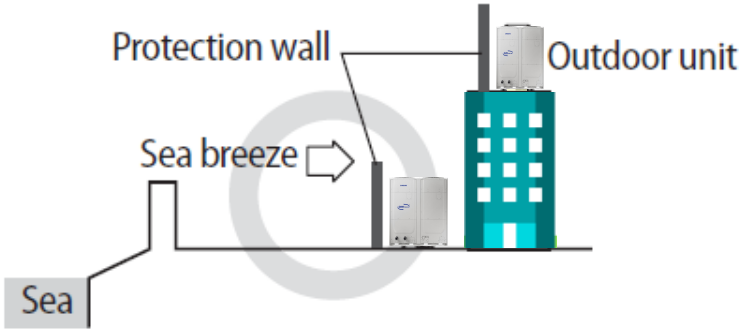
Outdoor Unit Placement – Coastal Installations

- 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



Outdoor units unprotected from sea breezes

Outdoor unit behind building protected from sea breezes



Chiller Basic Installation

Outdoor Unit Placement

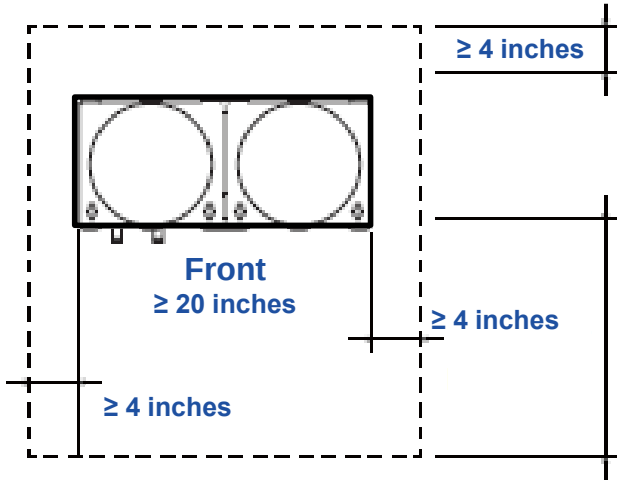
- Support the outdoor unit above grade a minimum of 8 inches
- Unit should be installed above the normal snow line

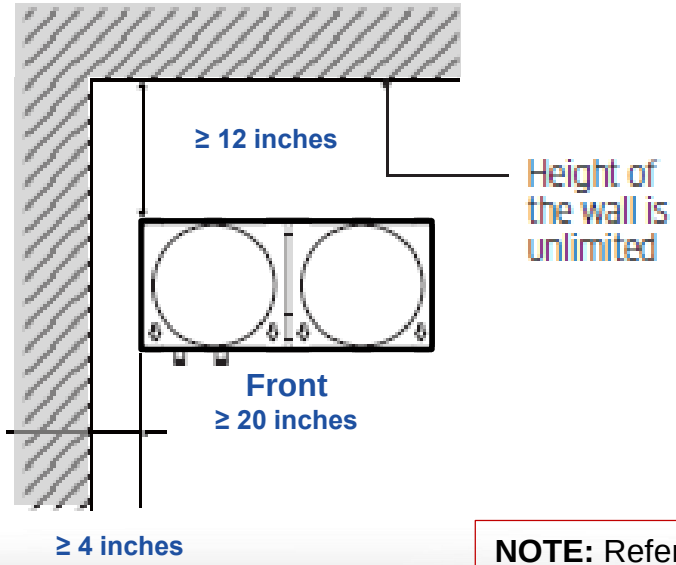
Chiller Basic Installation

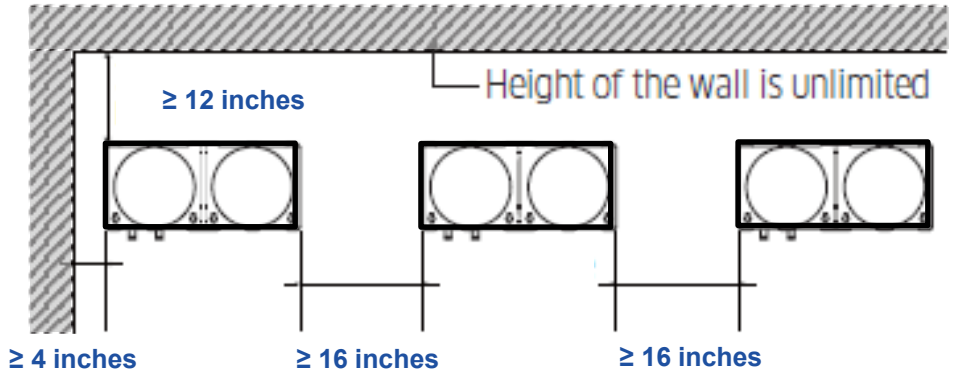
Outdoor Unit Placement

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







NOTE: Refer to the installation manual for all unit placement requirements

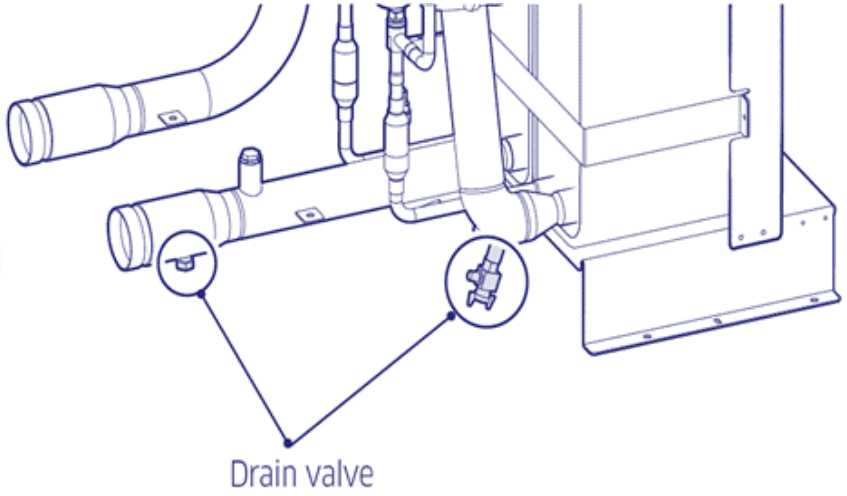
Chiller Basic Installation

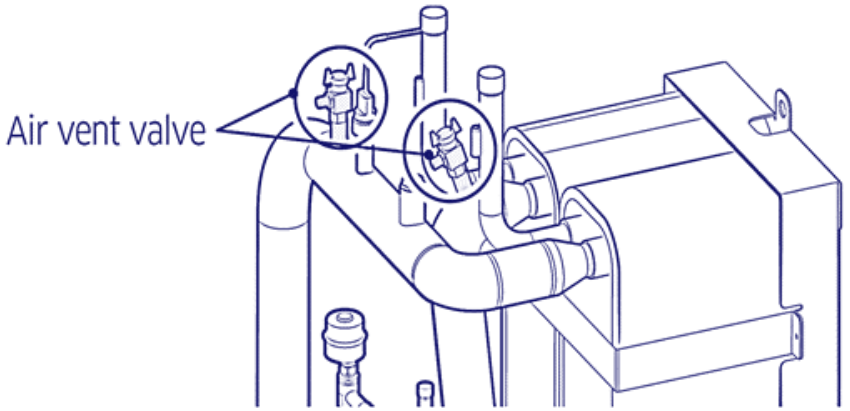
Outdoor Unit Hydro

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

2” cut groove coupling



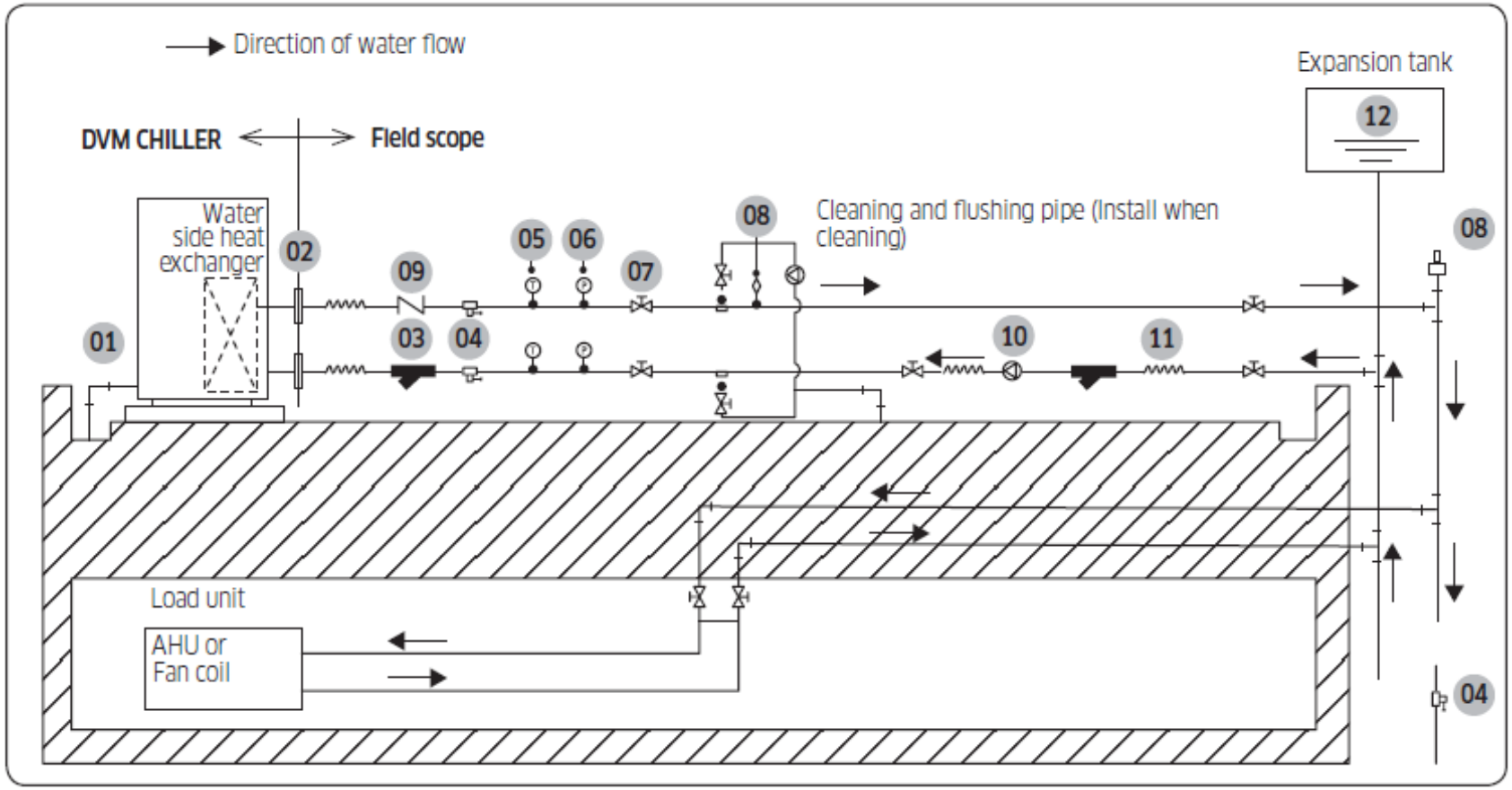


Chiller Basic Installation

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

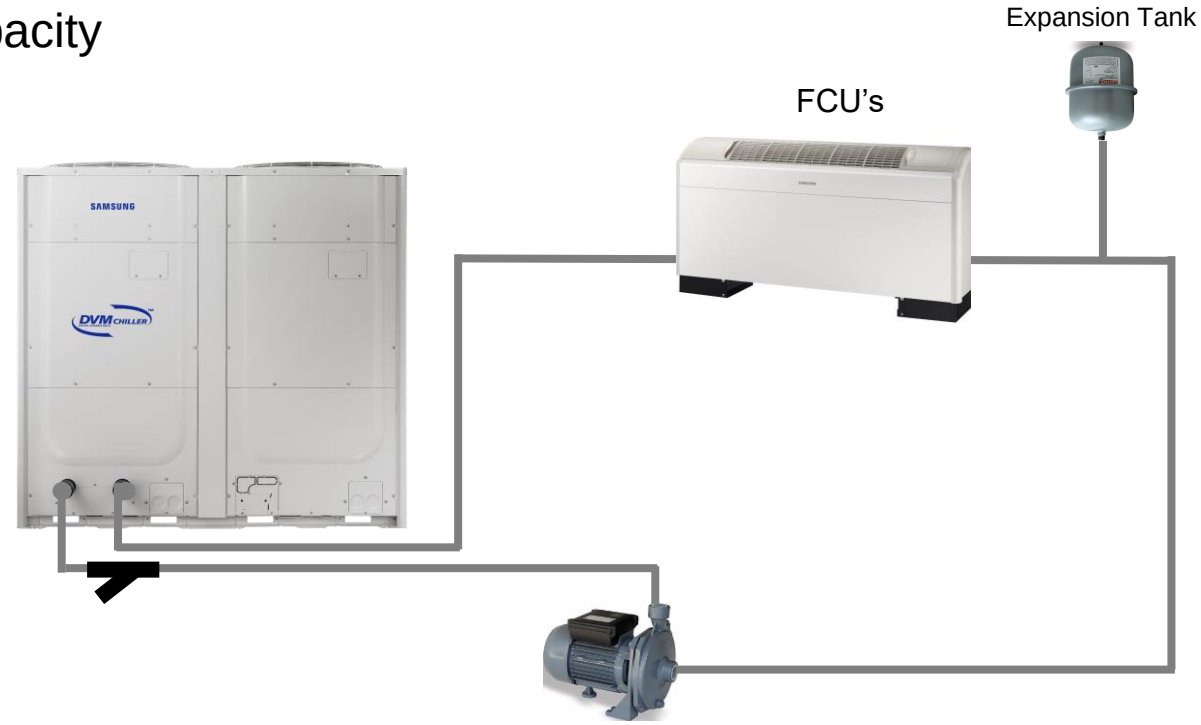


Chiller Basic Installation

Outdoor Unit Hydro

Water side considerations

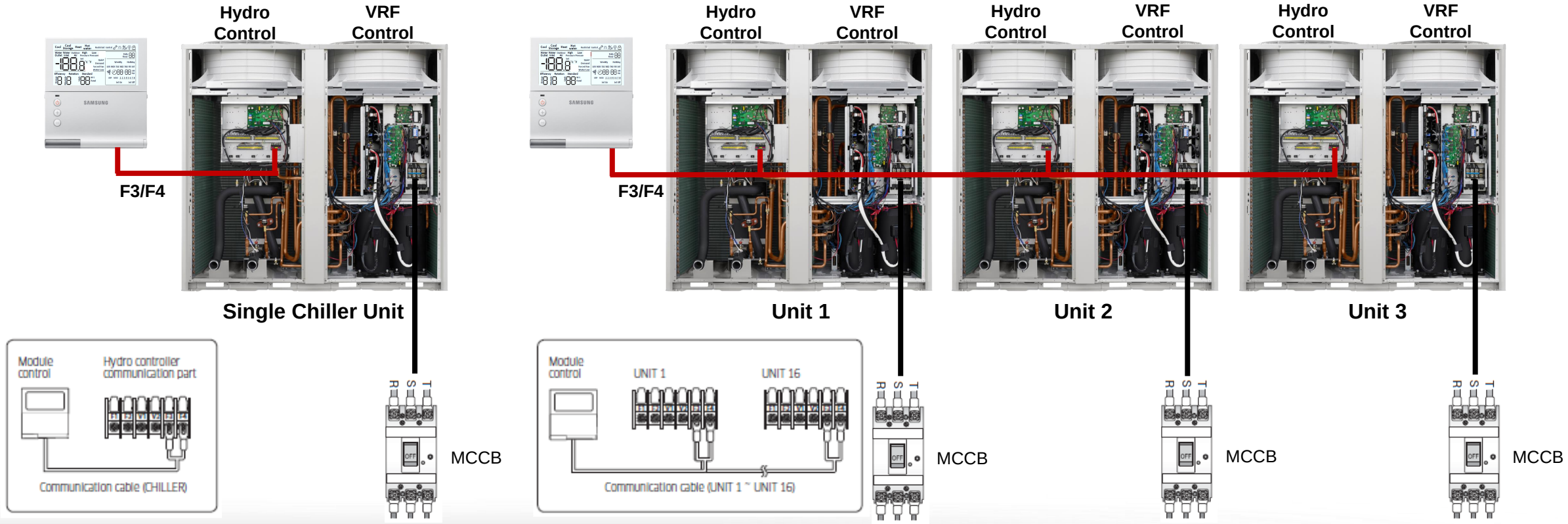
- Chilled water/Hot water loop minimum capacity
  - 10 Ton: 72 gallons
  - 15 Ton: 103 gallons
  - Additional storage tank may be required
- Water loop flow rate
  - 10 Ton: 16 – 48 gpm
  - 15 Ton: 17 – 68 gpm
- Maximum water pressure: 145 psi



Chiller Basic Installation

Outdoor Unit Wiring

- 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



Chiller Basic Installation

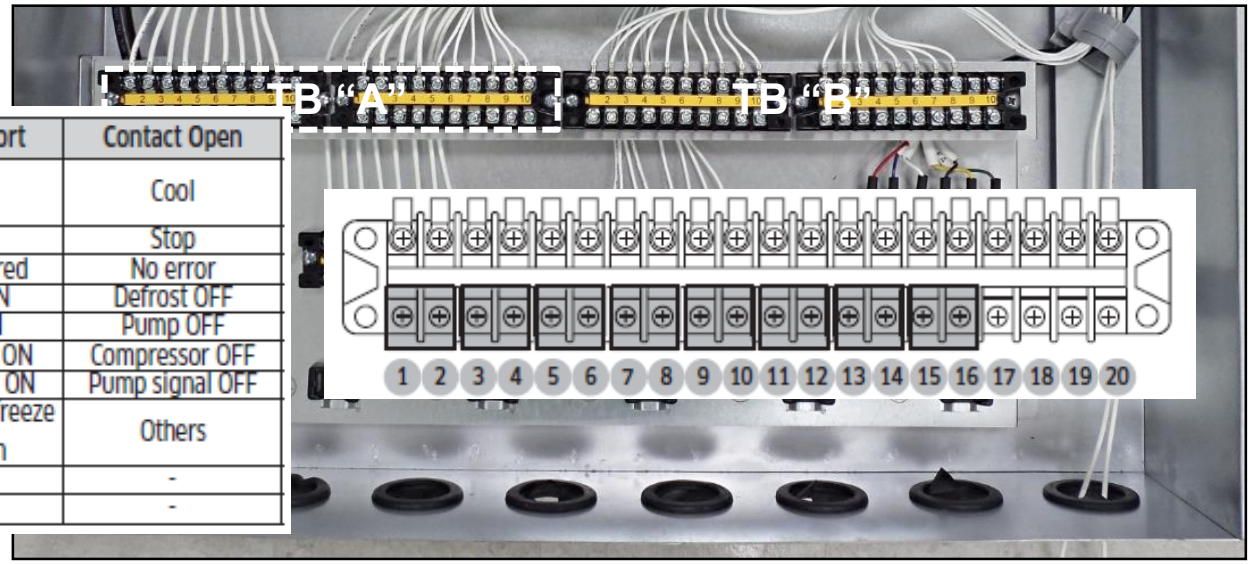
Outdoor Unit Wiring

Hydro terminal block “A”

Output terminal designations

No.		Name	Signal	Function	Contact Short	Contact Open
A-T/B	1-2	Cooling/Heating display	Zero voltage contact	Display when operates in heating mode	Heat	Cool
	3-4	Operation display		Display when operates	Operate	Stop
	5-6	Warning display		Display when error occurs	Error occurred	No error
	7-8	Defrost operation display		Display when defrosting	Defrost ON	Defrost OFF
	9-10	Pump operation display		Display when pump operates	Pump ON	Pump OFF
	11-12	Comp operation display		Display when compressor operates	Compressor ON	Compressor OFF
	13-14	Pump operation		Signal of pump operation	Pump signal ON	Pump signal OFF
	15-16	Freeze protection display		Display when freeze protection operates	Pump ON for freeze protection	Others
	17-18	Disuse	-	-	-	-
	19-20	Disuse	-	-	-	-

Hydro Terminal Blocks



Chiller Basic Installation

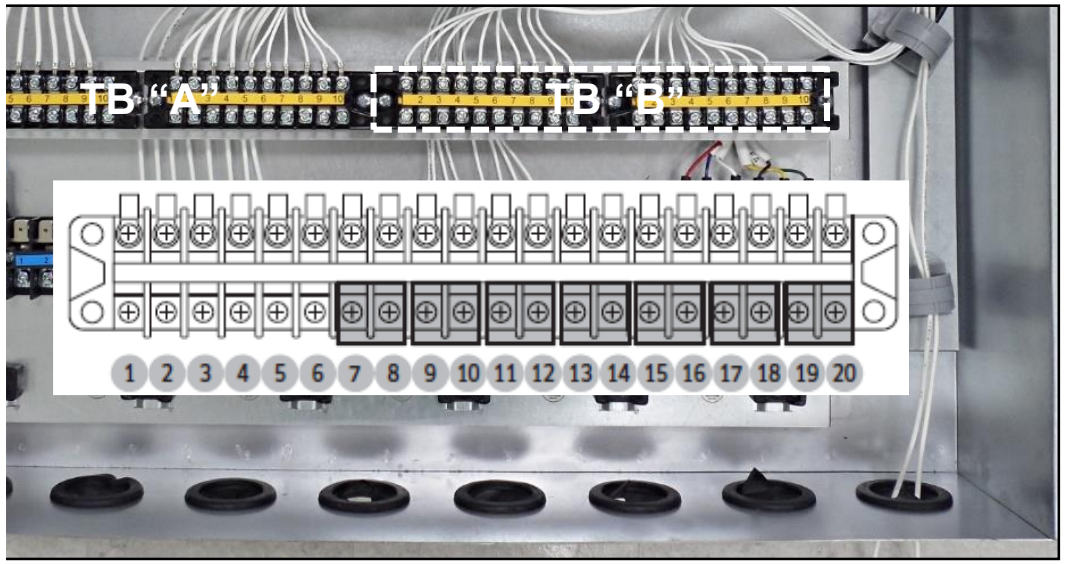
Outdoor Unit Wiring

Hydro terminal block “B”

Input terminal designations

B-T/B	7-8	Pump interlock	Zero voltage contact	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 Note1)	Note3)		Usual/ instant input	Main unit of group NOTE4)
	13-14	Operation mode		Selecting cool/heat mode Note2)	Heat	Cool	Usual input	Main unit of group NOTE4)
	15-16	Hot water (Cool storage) mode		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 NOTE4)

Hydro Terminal Blocks



Note: “Usual Input” = Latched switch function
“Instant Input” = Momentary switch function

Chiller Basic Installation

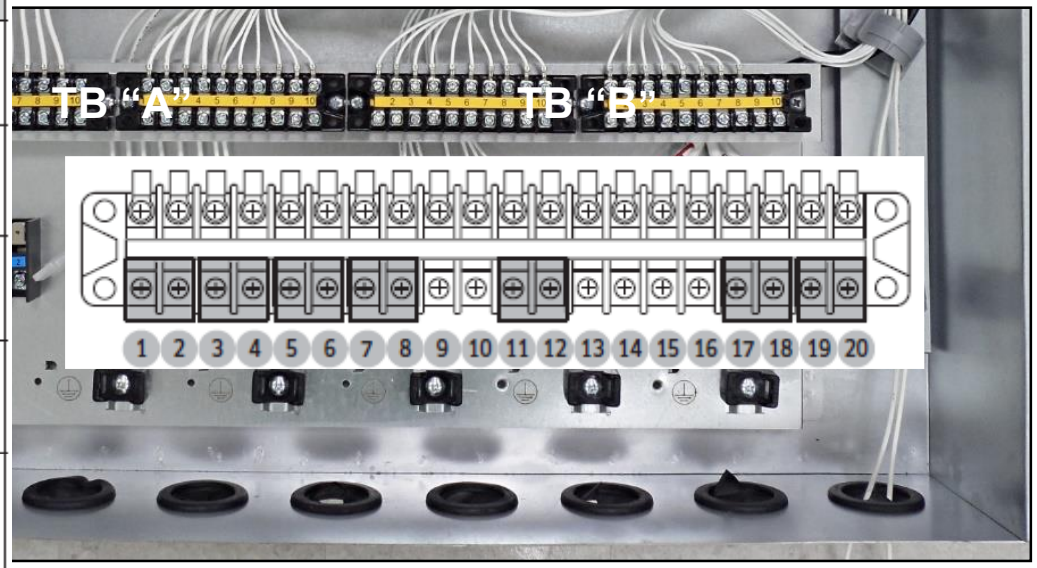
Outdoor Unit Wiring

Hydro terminal block “C”

Input terminal designations

No.		Name	Signal	Function	Contact Short	Contact Open	Signal recognition	Setting unit
C-T/B	1-2	Quiet function	Zero voltage contact	Operate quiet function in level set by main option or module control Note4)	Quiet function	-	Usual input	Main unit of group Note8)
	3-4	Demand function		Operate demand function (current limit control) in level set by main operation or module control Note5)	Demand function	-	Usual input	Main unit of group Note8)
	5-6	Forced fan function		Operate forced fan function Note6)	Forced fan function	-	Usual input	Main unit of group Note8)
	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 Note7)	Water law control	Water outlet set temperature control	Usual input	Main unit of group Note8)
C-T/B	17-18	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 Note8)
	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

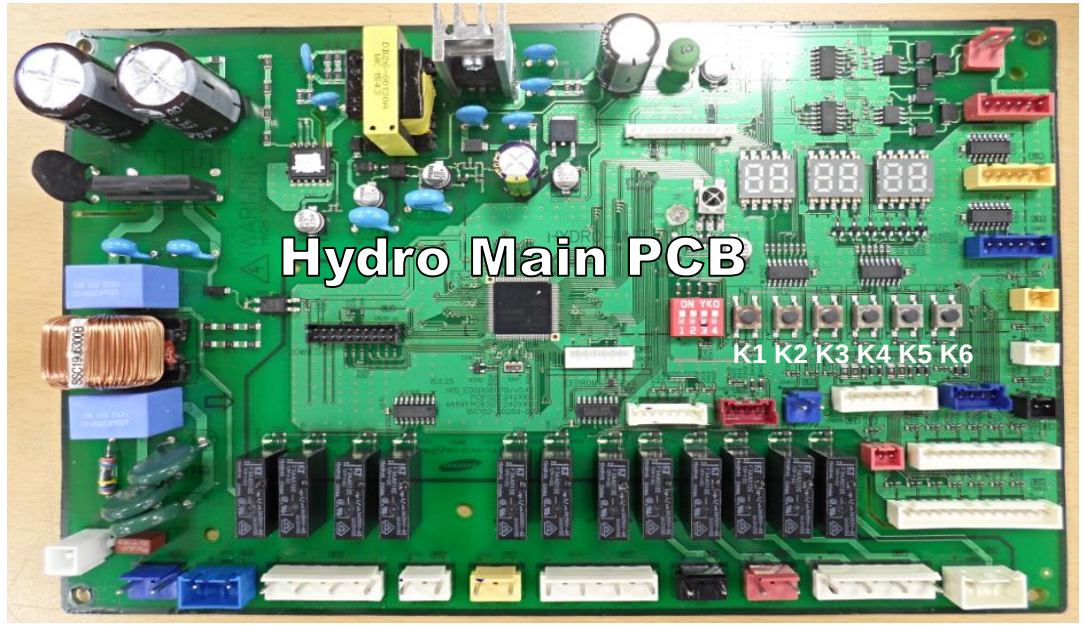
Basic System Commissioning

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



Basic System Commissioning

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

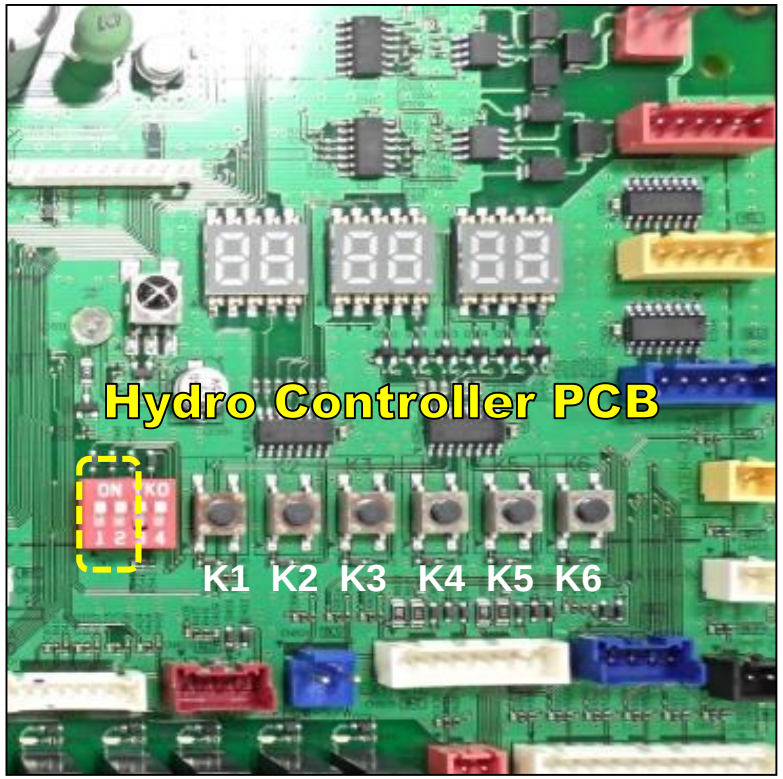
- “Water Law” Air Cool 1 – Air Cool 2
- “Water Law” Room Cool 1 – Room Cool 2
- “Water Law” set temp Tcool 1- Tcool 2
- “Water Law” OD temp for Heat AirHeat1 – AirHeat2
- “Water Law” Room Heat1 – Room Heat2
- “Water Law” set temp Theat1 – Theat2
- Remote error reset input
  - Enable/Disable
- Setting 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

Basic System Commissioning

Mandatory Operation Settings

Trial Operation

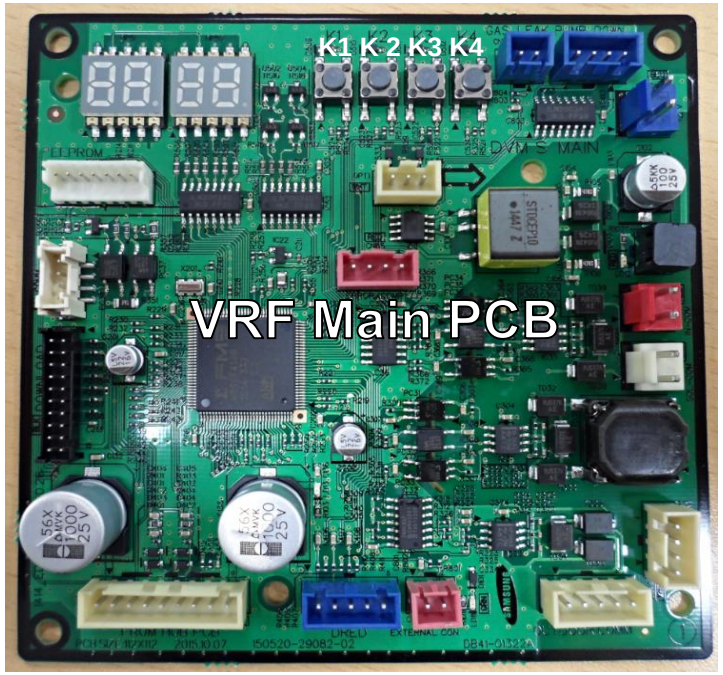
- With system off including pump, perform water pressure sensor calibration procedure
  - Press & hold K4 and K6 for 3 seconds to start calibration
  - Calibration will finish automatically within 30 seconds
- Verify water circulation and air purged
- Verify water flow rate
- Mode of operation function
- 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



Basic System Commissioning

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

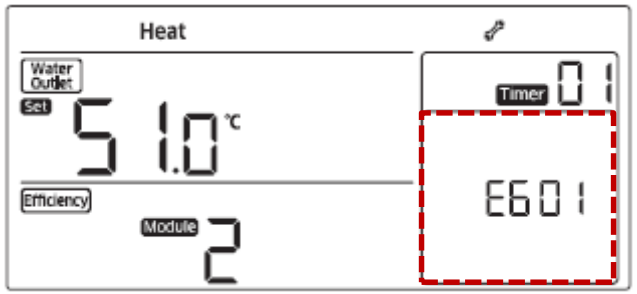


Basic System Commissioning

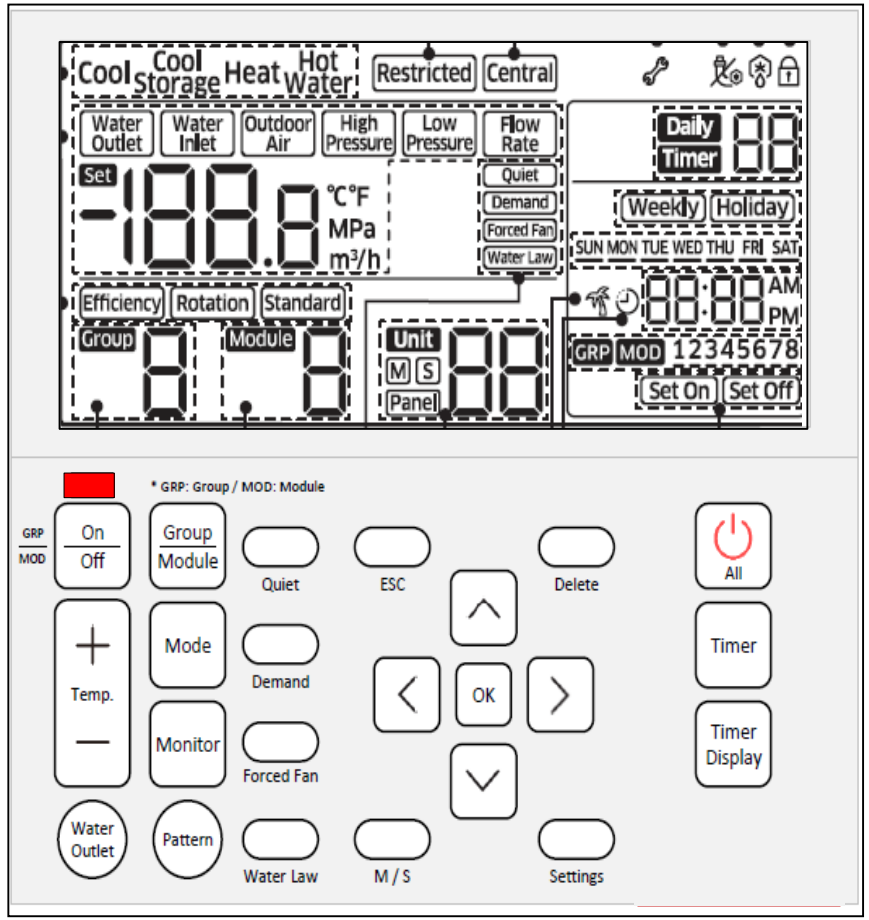
Module Controller

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



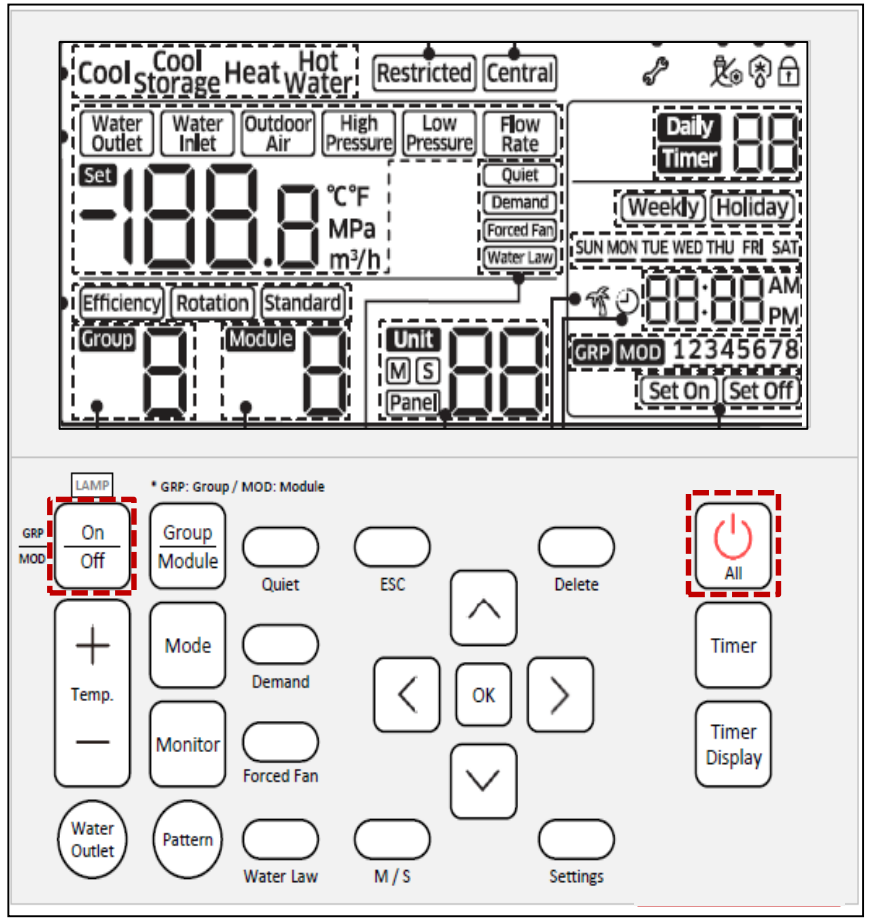
Error codes	Description
604	Communication tracking error between a module control and DVM CHILLERs
618	The maximum number of DVM CHILLER installation is exceeded. (Maximum:16)
627	Displayed when 2 or more module controls are installed.
601	Communication error between a module control and DVM CHILLERs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



Basic System Commissioning

Module Controller

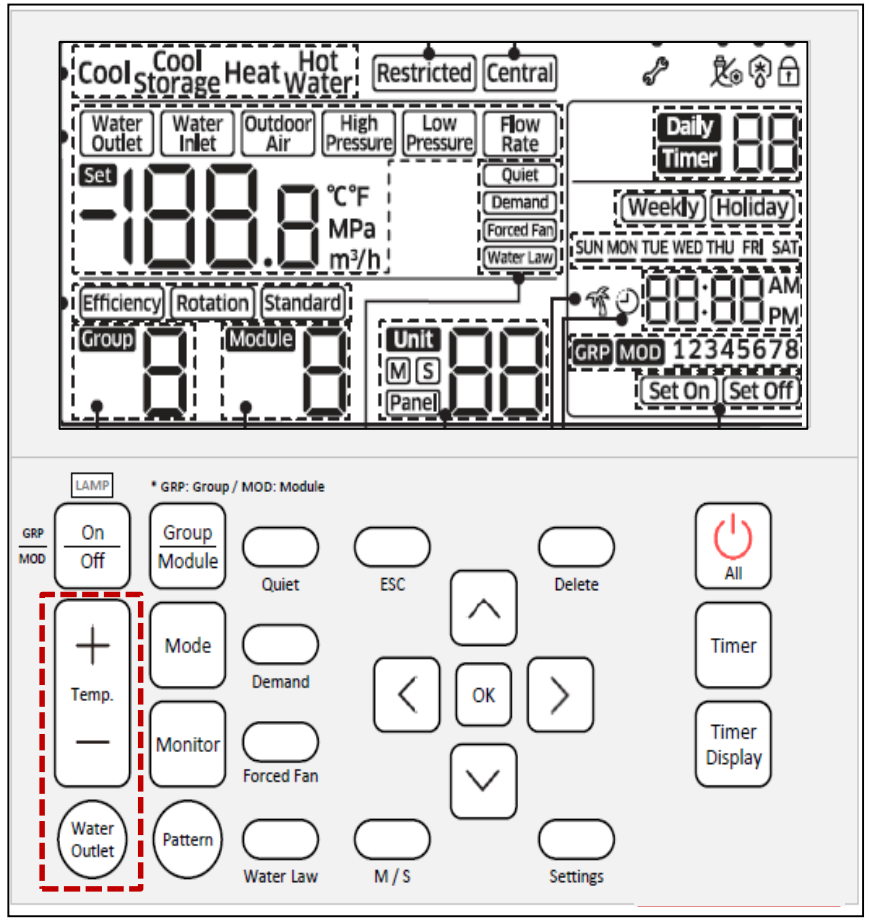
- Press the On/Off button to control a single unit
  - Select the target Group/Module with the arrow keys
- The “All” button controls all units On/Off operation in a group



Basic System Commissioning

Module Controller

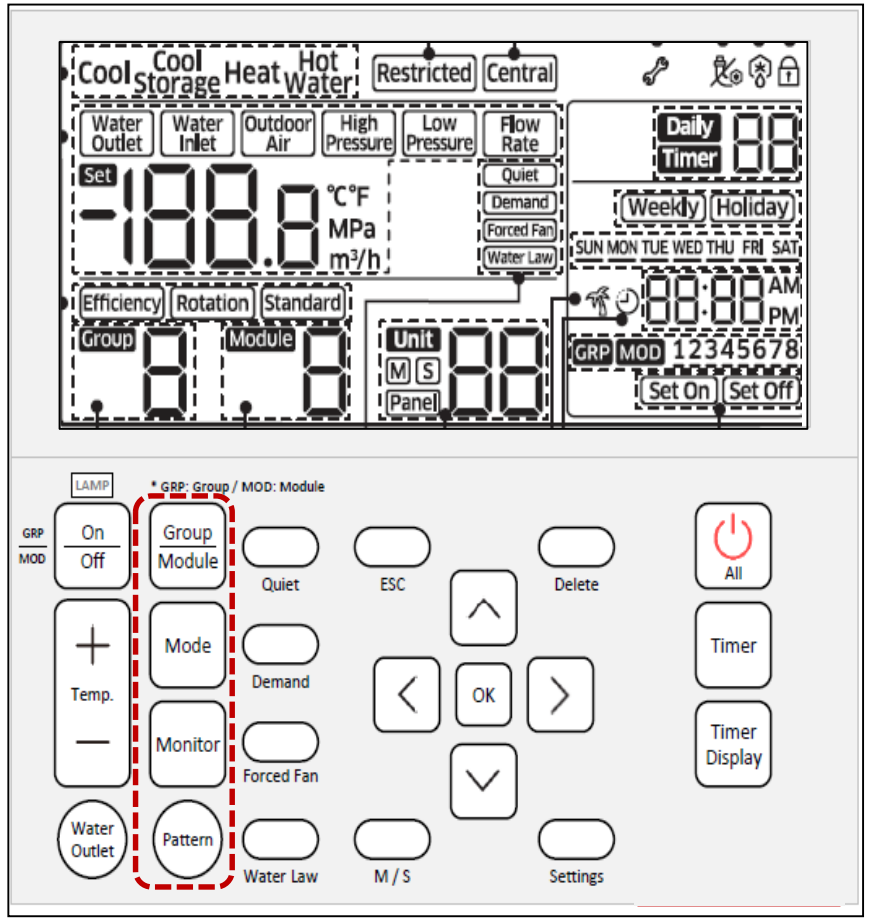
- Press the Temp + or - to change the water target set temperature up or down
  - Select the target Group/Module with the arrow keys
- Press the “Water Outlet” button to display the current water outlet temperature



Basic System Commissioning

Module Controller

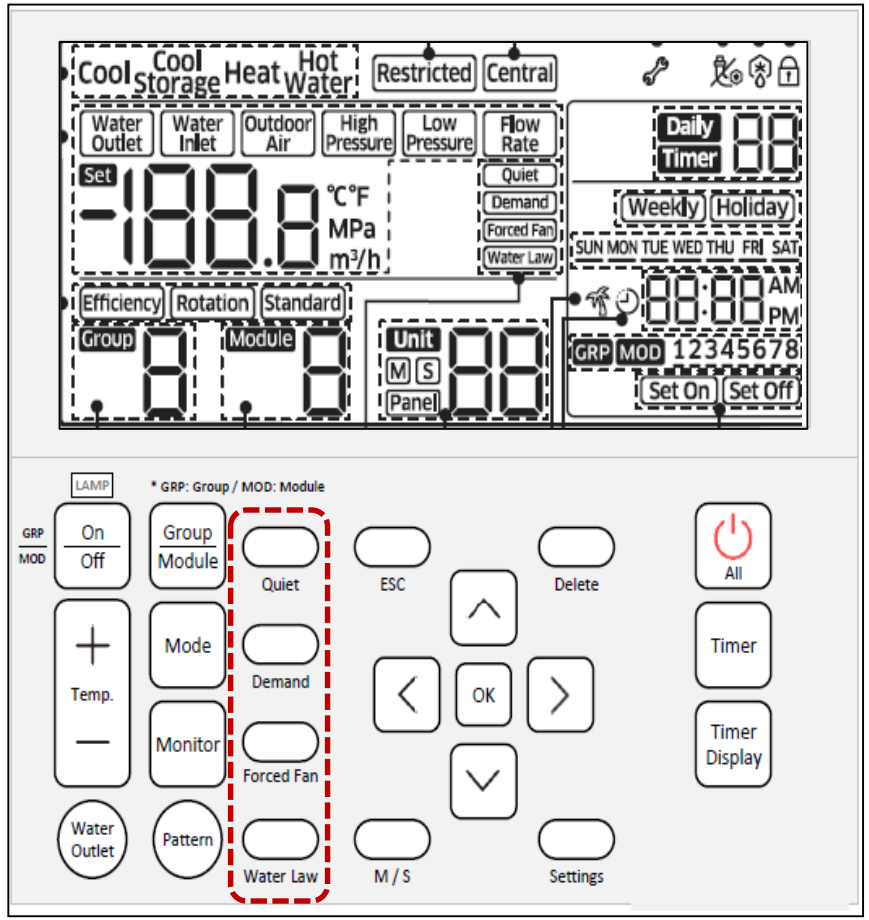
- Group/Module select button
- Mode: Cool/Cool storage – Heat/Hot water
- Monitor: Sequentially displays Water inlet/outlet temperature Outside ambient temperature - high/Low pressure and flow rate
- Pattern: Sets the operation pattern when controlling the chiller by groups or modules



Basic System Commissioning

Module Controller

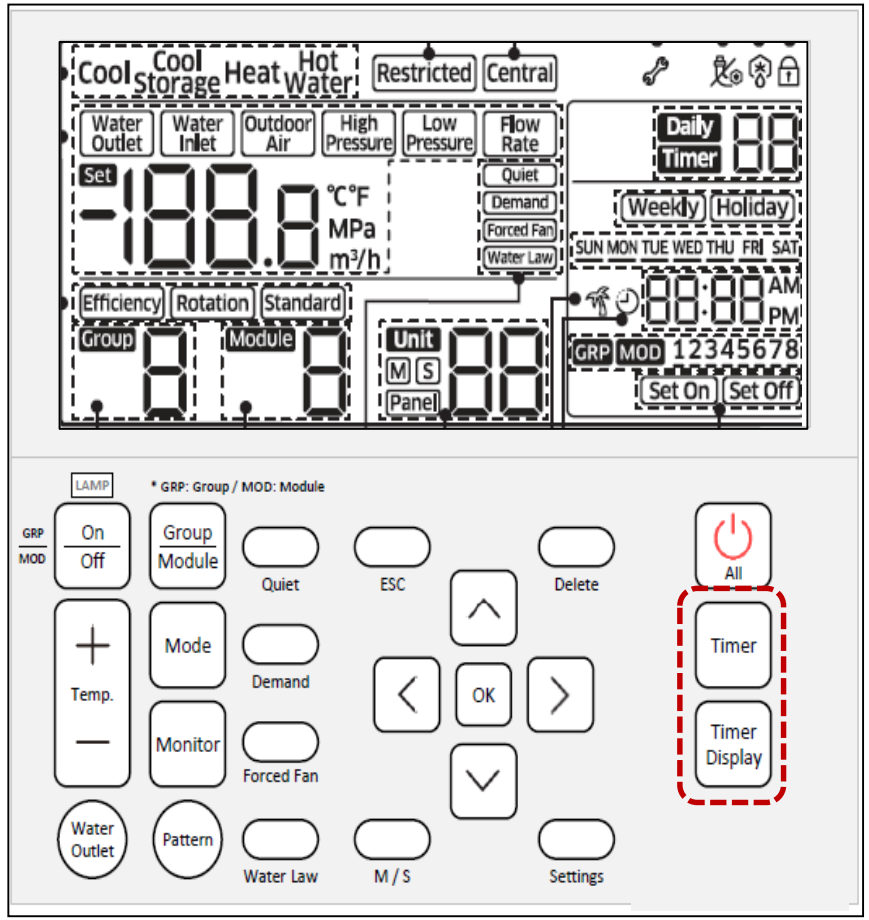
- Quiet: Selects the Night Quiet function
- Demand: Selects the Demand function
- Forced Fan: Selects the snow prevention function
- Water Law: Selects the water Law function
- Parameters for these functions have been set in the Hydro Option Settings



Basic System Commissioning

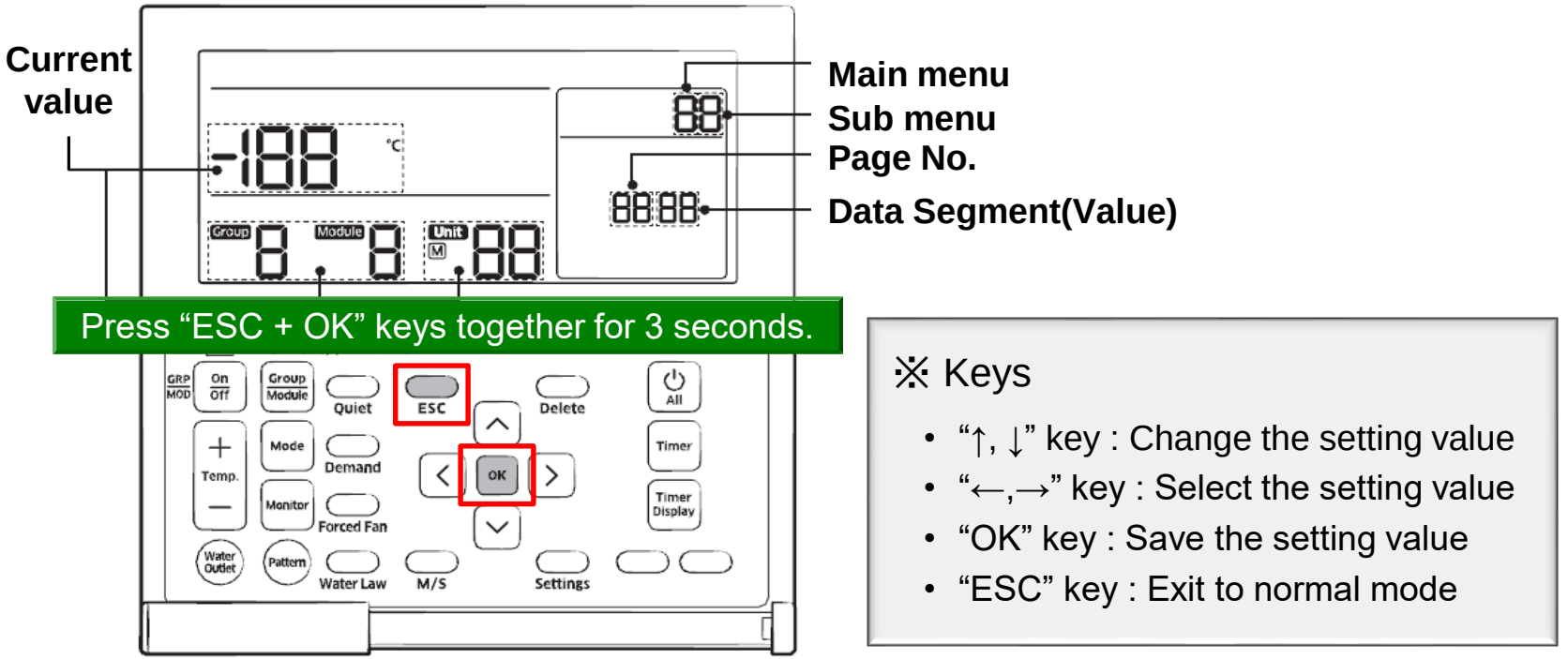
Module Controller

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



Basic System Commissioning

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



※ Keys

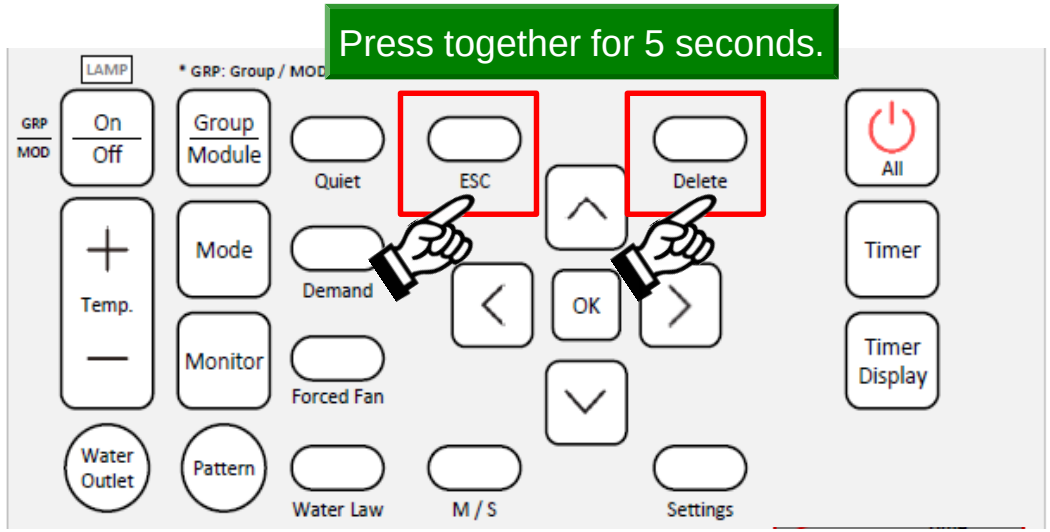
- “↑, ↓” key : Change the setting value
- “←,→” key : Select the setting value
- “OK” key : Save the setting value
- “ESC” key : Exit to normal mode

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

Basic System Commissioning

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

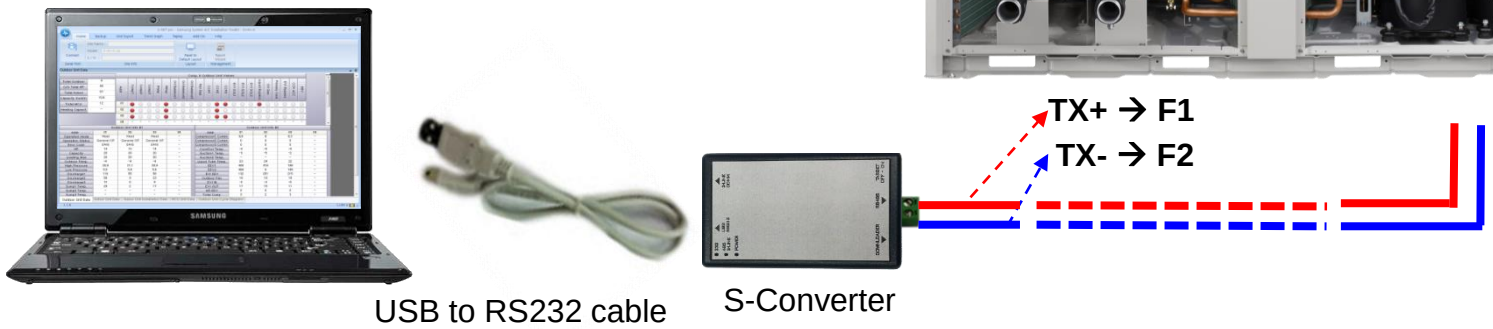
SAMSUNG DVM Chiller

SNET Pro 2

SNET Pro 2 Setup

Connecting the SNET Pro 2 hardware to the chiller system

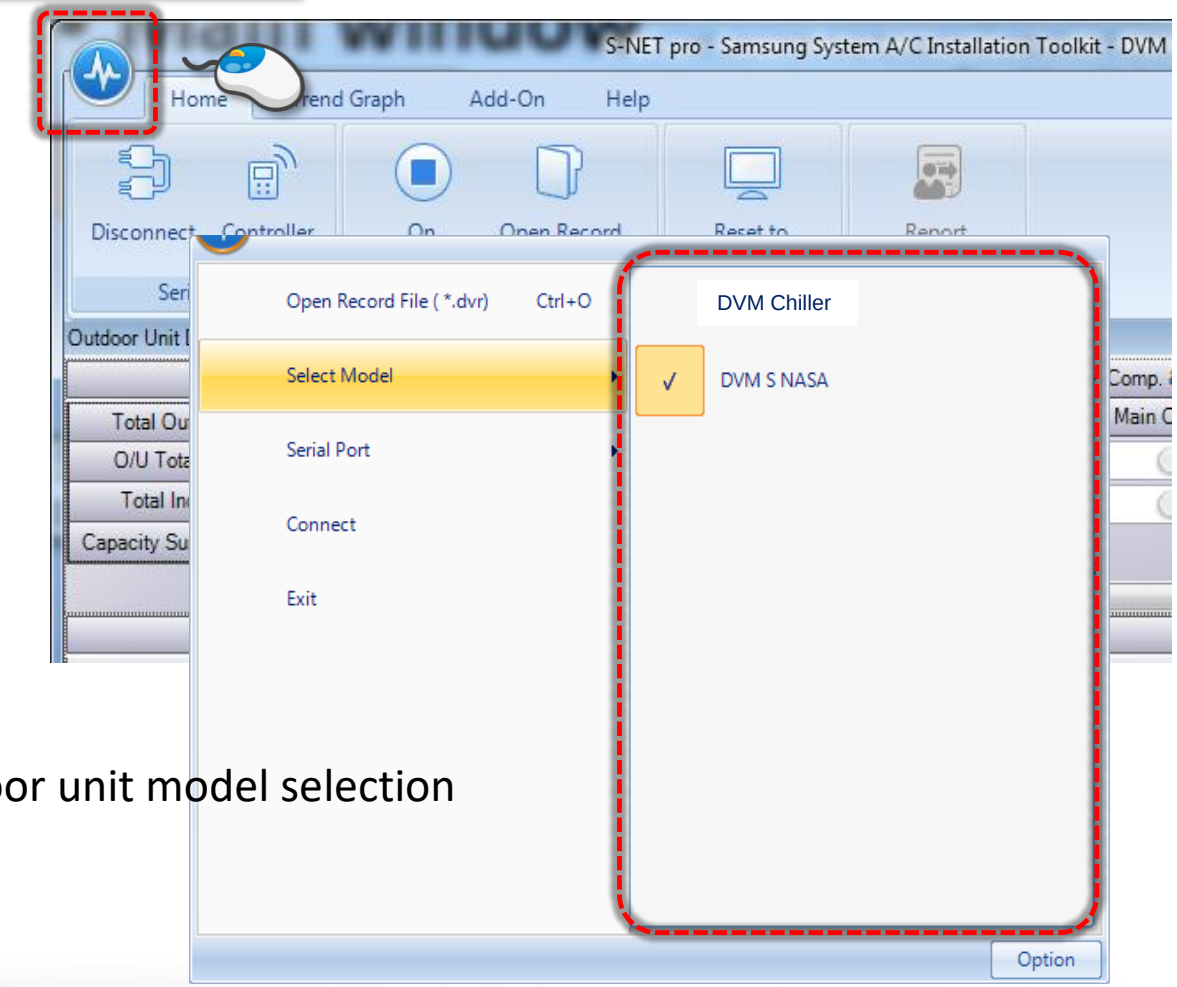
- Chiller VRF control box communication terminal block:
  - F1 F2: Each chiller unit
  - R1 R2: Cannot currently be used for SNET Pro connection



SNET Pro 2 Setup

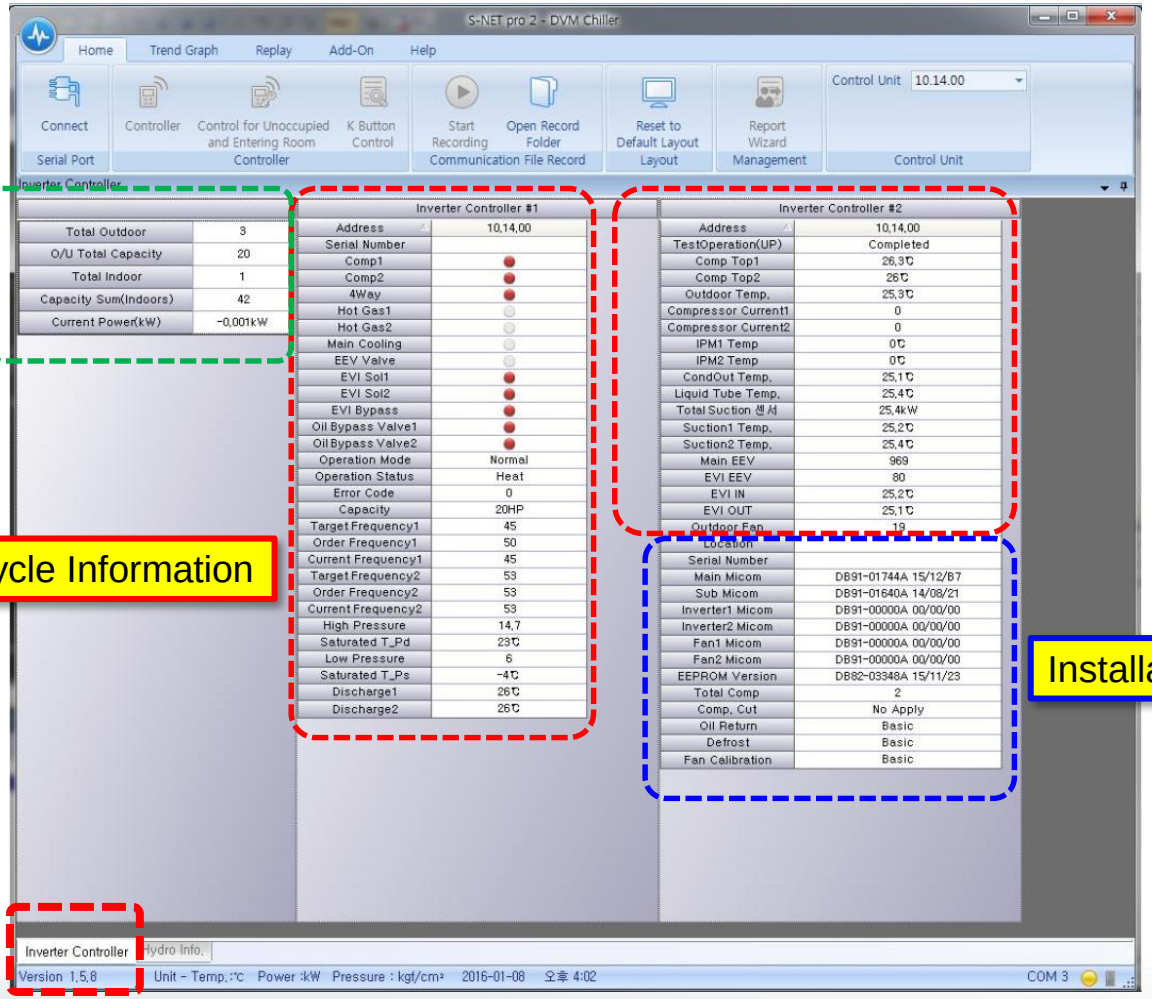
Launch SNET Pro 2 and connect

Configuration

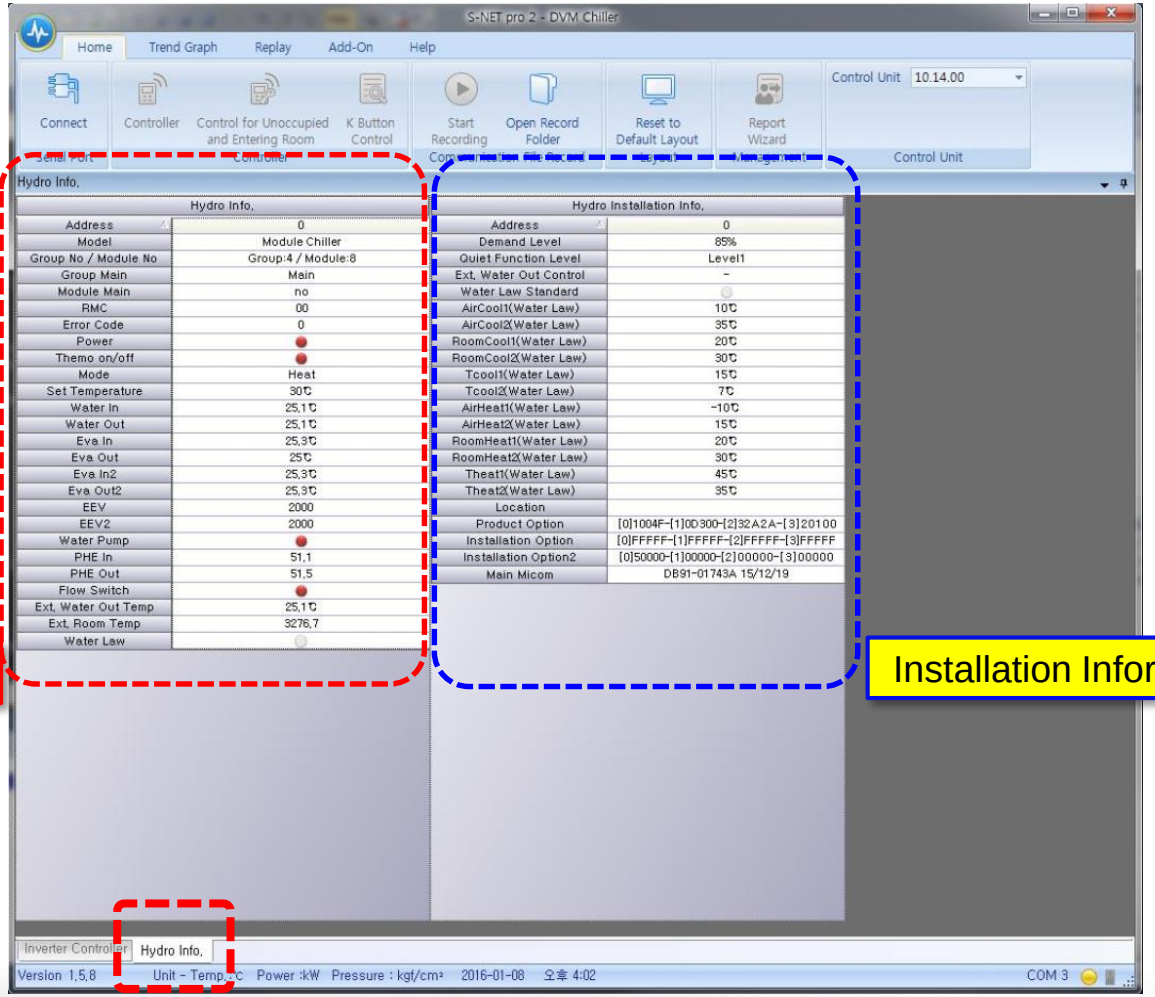


Outdoor unit model selection

SNET Pro 2 Setup



SNET Pro 2 Setup

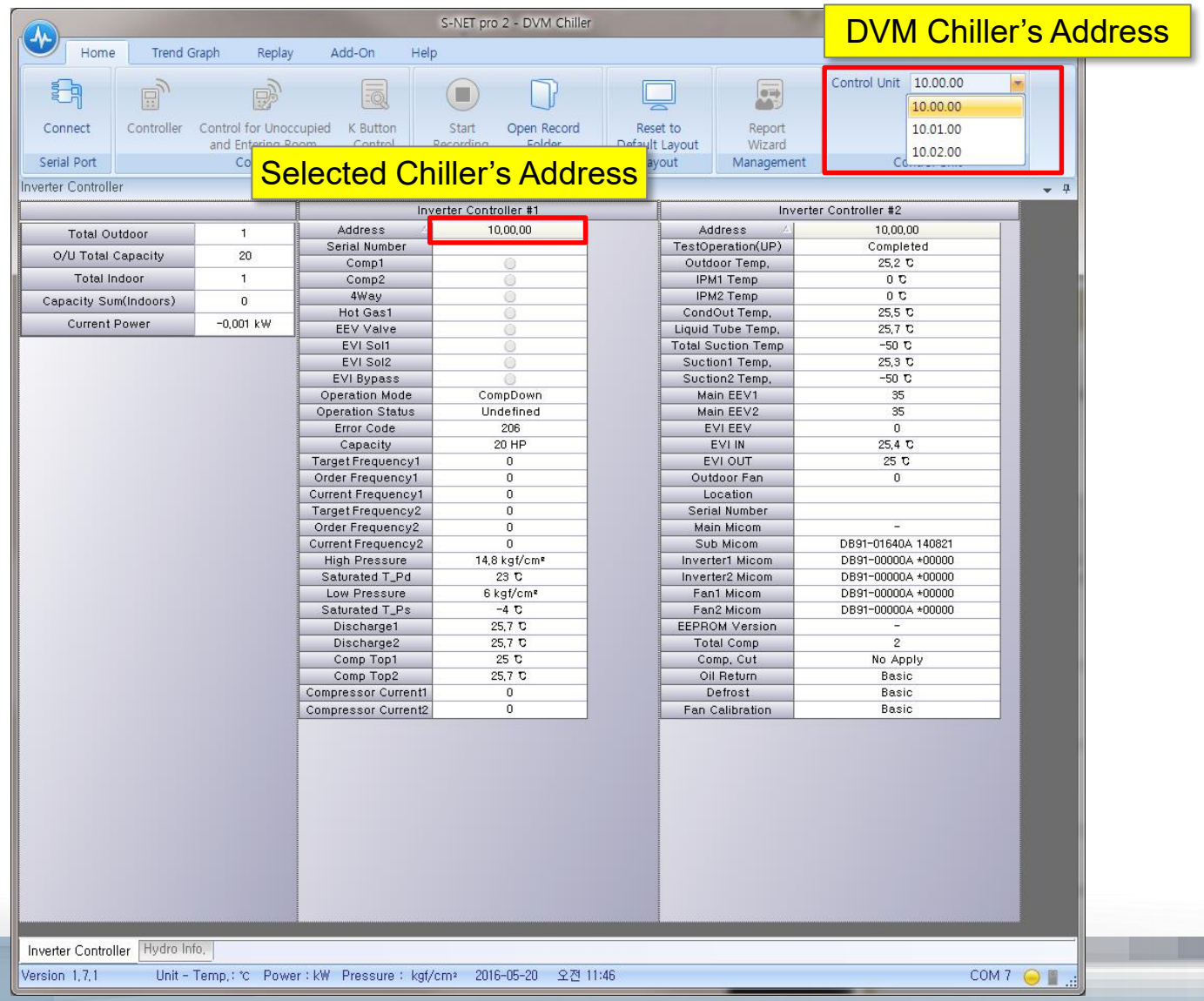


Cycle Information

Installation Information

Note: SNET Pro cannot display circulating water pressure values

SNET Pro 2 Setup



DVM Chiller Training

Thank You !

SAMSUNG HVAC

SAMSUNG DVM Chiller

Addendum

Training 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

Hydro Controller Option Settings Descriptions

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
7	Select forced fan function input method of module • 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
12	Select quiet function level • Quiet function will start in set level when "Perform" command is transmitted. • Level comparison: Level3 > Level2 > Level1
13	Confirm delay for unsecured flow rate when operating: Delay for inspecting no input for pump interlock and unsecured flow rate • Compressor will not operate until water flow is detected.
14	Set when controlling water outlet temperature by installing extra water temperature gauge on water pipe header or tank • 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 external water outlet temperature sensor except when operation pattern is standard control.

Hydro Controller Option Settings Descriptions – Cont.

15	Setting water law standard • To set room temperature as standard, external room temperature sensor should be installed. • Room temperature sensor should be installed on main unit of group (or module when group is not available).
16 ~ 27	Water law control constant: Refer to water law operation graph.
28	Recognition of external control operation ON/OFF • 0 (recognizing usual signal): Constantly inspects ON/OFF status of contact and set operation ON/OFF • 1 (recognizing instant signal): Set operation ON/OFF when contact ON/OFF signal is input (when external contact is consisted of button click)
34	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') • 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 value	Factory default	Option	Definition	Setting unit	Module control setting option Note1)
1	Operation On/Off input method	0·1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
2	Temperature setting input method	0·1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
3	Operation mode (Cool/Heat, normal/hot water) input method	0·1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
4	Demand control input method	0·1	0	0	Module control/DMS	Main unit of group Note2)	
				1	External contact		
5	Demand level	0 ~ 11	3	0	Default (100 %)	Main unit of module	0
				1	95 %		
				2	90 %		
				3	85 %		
				4	80 %		
				5	75 %		
				6	70 %		
				7	65 %		
				8	60 %		
				9	55 %		
				10	50 %		
				11	Not applied (No limit)		

Hydro Controller Option Settings List – Cont.

No.	Option item	Option value	Factory default	Option	Definition	Setting unit	Module control setting option Note:1)
6	Quiet function input method	0·1	0	0	Module control/DMS	Main unit of group Note:2)	
				1	External contact		
7	Forced fan function input method	0·1	0	0	Module control/DMS	Main unit of group Note:2)	
				1	External contact		
8	Water law input method	0·1	0	0	Module control/DMS	Main unit of group Note:2)	
				1	External contact		
9	NA in US models Pump operation when thermo off	0·1	0	0	Pump OFF when thermo OFF and operation pattern is not standard control	Main unit of module	
				1	Pump ON always when thermo OFF		
10	Remote error reset input	0·1	0	0	Disuse	Main unit of module	
				1	Use		
11	Setting unit address • Module address must be set. (Refer to installation manual of module controller.)	0 ~ 15	(Not set)		Setting unit address	Each unit	
12	Quiet function level	0 ~ 3	1	0	Default (100 %)	Main unit of module	0
				1	Level1		
				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	
14	Using exterior water outlet temperature sensor	0/1	0	0	Disuse	Main unit of group Note:2)	
				1	Use		
15	Water law control standard	0/1	0	0	Outdoor temperature	Main unit of group Note:2)	0
				1	Room temperature (external room temperature sensor installation necessary)		

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	Main unit of group Note2)	0
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		
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		
28	Operation ON/OFF by external contact	0/1	0	0	Recognize usual signal	Main unit of group Note2)	
				1	Recognize instant signal		
29 ~ 33	Function expansion available						
34	Using low temperature function	0/1	0	0	Disuse	Each unit	
				1	Use		
35 ~ 37	Function expansion available						

VRF Control – Service Mode Settings List

K1 (Number of press)	KEY operation	Display on 7-Segment
1 time	Refrigerant charging in Heating mode	H 1 0 0
2 times	Trial operation in Heating mode	H 2 0 0
3 times	Refrigerant discharging in Heating mode	H 3 0 1
4 times	Disuse	H 3 0 2
5 times	Disuse	H 3 0 3
6 times	Disuse	H 3 0 4
7 times	Vacuum	H 4 0 1
8 times	Disuse	H 4 0 2
9 times	Disuse	H 4 0 3
10 times	Disuse	H 4 0 4
11 times	Disuse	H 4 0 A
12 times	End KEY operation	-

VRF Control – Service Mode Settings List

K2 (Number of press)	KEY operation	Display on 7-Segment
1 time	Refrigerant charging in Cooling mode	b5
2 times	Trial operation in Cooling mode	b6
3 times	Pump down all units in Cooling mode	b7
4 times	Auto trial operation	b8
5 times	Checking the amount of refrigerant	b9XX (Display of last two digits may differ depending on the progress)
6 times	Discharge mode of DC link voltage	bA
7 times	Forced defrost operation	bb
8 times	Forced oil collection	bC
9 times	Inverter compressor 1 check	bd
10 times	Inverter compressor 2 check	bE
11 times	Fan 1 check	bF
12 times	Fan 2 check	bG
13 times	End KEY operation	-

VRF Control – Service Mode Settings List

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

VRF Control – View Display Settings List

K4 (Number of press)	Display contents	Display	
		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	°F
7 times	Discharge temperature (Compressor 2)	7	°F
8 times	IPM temperature (Compressor 1)	8	°F
9 times	IPM temperature (Compressor 2)	9	°F
10 times	CT sensor value (Compressor 1)	A	A
11 times	CT sensor value (Compressor 2)	B	A
12 times	Suction 1 temperature	C	°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 press)	Display contents	Display	
		SEG1	SEG2, 3, 4
15 times	TOP temperature (Compressor 1)	F	°F
16 times	TOP temperature (Compressor 2)	G	°F
17 times	Outdoor temperature	H	°F
18 times	EVI inlet temperature	I	°F
19 times	EVI outlet temperature	J	°F
20 times	Main EEV 1 step	K	# Step
21 times	Main EEV 2 step	L	# Step
22 times	EVI EEV step	M	# Step
23 times	H/R EEV step	N	# Step
24 times	Fan step (SSR or BLDC)	O	# Step
25 times	Current frequency (Compressor 1)	P	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	T	Volts
30 times	Total suction temperature	U	°F