

TOSHIBA



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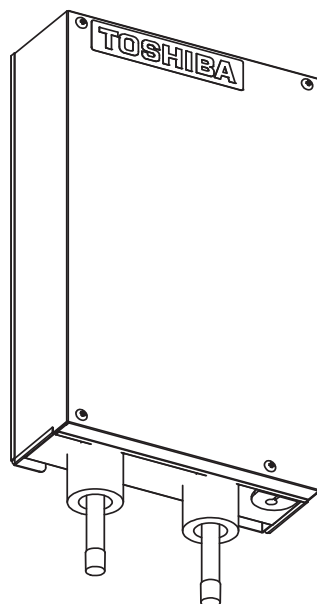
VRF DX VALVE KIT Installation Manual

R410A

MODEL NAME

For commercial use

RBM-A101UPVA-E
RBM-A201UPVA-E



English

Only the installation method of the Dx-valve kit is specified in this manual.

For the cautions of the system or wiring, be sure to refer to the Dx-coil controller installation Manual.

- To use it with DX-coil controller (TCB-IFDMX01UP-E or TCB-IFDMR01UP-E).
- For installation of the air handling unit, follow the Installation Manual attached to the air handling unit. (Field supply)
- For installation of the outdoor unit, follow the Installation Manual attached to the outdoor unit.
- TOSHIBA/Carrier does not take any responsibility on the local design.

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1. Precautions

The manufacturer shall not assume any liability for the damage caused by not observing the description of this manual.

WARNING

General

- Do not modify the products. Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
- Before starting to install the air conditioner, read through the Installation Manual carefully, and follow its instructions to install the air conditioner.
- Only a qualified installer or service person is allowed to do installation work. Inappropriate installation may result in water leakage, electric shock or fire.
- Do not use any refrigerant different from the one specified for complement or replacement. Otherwise, abnormally high pressure may be generated in the refrigeration cycle, which may result in a failure or explosion of the product or an injury to your body.
- Before opening the electrical control box cover of the air handling unit or service panel of the outdoor unit, set the circuit breaker to the OFF position. Failure to set the circuit breaker to the OFF position may result in electric shocks through contact with the interior parts. Only a qualified installer or qualified service person is allowed to remove the electrical control box cover of the air handling unit or service panel of the outdoor unit and do the work required.
- Before carrying out the installation, maintenance, repair or removal work, set the circuit breaker to the OFF position. Otherwise, electric shocks may result.
- Place a "Work in progress" sign near the circuit breaker while the installation, maintenance, repair or removal work is being carried out. There is a danger of electric shocks if the circuit breaker is set to ON by mistake.
- Only a qualified installer or qualified service person is allowed to undertake work at heights using a stand of 50 cm or more.
- Wear protective gloves and safety work clothing during installation, servicing and removal.
- When work is performed at heights, use a ladder which complies with the ISO 14122 standard, and follow the procedure in the ladder's instructions. Also wear a helmet for use in industry as protective gear to undertake the work.
- Before working at heights, put a sign in place so that no-one will approach the work location, before proceeding with the work. Parts and other objects may fall from above, possibly injuring a person below. While carrying out the work, wear a helmet for protection from falling objects.
- The refrigerant used by this air conditioner is the R410A.
- The air conditioner must be transported in stable condition. If any part of the product is broken, contact the dealer.
- Do not move or repair any unit by yourself. You may get electric shock when removing the cover and main unit.
- This appliance is intended to be used by expert or trained users in shops, in light industry, or for commercial use by lay persons.

Refrigerant piping

- Install the refrigerant pipe securely during the installation work before operating the air conditioner. If the compressor is operated with the valve open and without refrigerant pipe, the compressor sucks air and the refrigeration cycles is over pressurized, which may cause a injury.
 - After the installation work, confirm that refrigerant gas does not leak. If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas may be generated.
 - When the air conditioner has been installed or relocated, follow the instructions in the Installation Manual and purge the air completely so that no gases other than the refrigerant will be mixed in the refrigerating cycle. Failure to purge the air completely may cause the air conditioner to malfunction.
 - Nitrogen gas must be used for the airtight test.
 - The charge hose must be connected in such a way that it is not slack.
 - Due to the pressure of R410A is higher than that of other refrigerant (ex. R22), be sure to use the pipe specific for R410A and use the special tool for the pipe processing.
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■ Selection of installation place

Avoid installation in the following kinds of locations.

- Dx-coil interface is recommended to be installed indoors. Install it in a location where there is no rain, wind, and direct sunlight.
- Do not install in locations where there is a machine generating high frequency. Failure to do so may cause a wrong operation or an abnormality.
- Do not install in locations with atmospheres with mist of oil (including machine oil) or dense vapor, or locations containing salt such as the coast area, or locations with acidic or alkaline atmospheres, or locations where sulfurizing gas are generated such as areas with hot springs. Use in inappropriate locations result in malfunctions.
- Do not put any vessel contains the water in the vicinity of the indoor unit (including Dx-coil controller, Dx-valve kit). If the water spills and enters into the inside of the unit, the electric insulation deteriorates and may result in an electric shock.
- Make sure that the air filter is attached on the indoor unit. If it is not, the dust clogs in the heat exchanger etc. in the air conditioner and may result in water leakage or defrosting.
- Separate the television or radio from the air conditioner or remote controller at least 1 m. Failure to do so may cause the disturbance of the image, or the noise.
- Do not use for special-purpose (Foods, animals and plants, precision machine, storage of the artwork etc.).
- Do not use in locations where there is anything that would be compromised by wetness. The mist or water dew drop may result in damage.
- Do not install in locations where organic solvents are being used.
- Do not install in locations near doors or windows where the air conditioner may come into contact with high humidity outside air. Condensation may occur as a result.
- Do not install in locations where special sprays are used frequently. The location has an impact on the insulation of the equipment and may cause the ignition.
- Do not install in locations with high-humidity atmosphere. Doing so may cause condensation of the equipment, splashing of water from the air outlet side of indoor unit.
Ex. 1) Installation to inside of the ceiling where is high humidity.
2) Installation to inside of the ceiling used for the path of the fresh air intake.
3) Installation to a kitchen.
- In the above cases, additionally attach the heat insulator (grass wool etc.) to all positions of the air conditioner, which come to contact with the high-humidity atmosphere.
* The guideline of the high-humidity condition is “dew-point temperature: 23°C or higher”, however, the decision should be made according to the trial operation conducted in each installation location.
- Install in locations that ensure the sufficient space needed for the service so that the equipment does not come to contact with the surface of the wall or the ceiling.
- Fix the Dx-coil controller, Dx-valve kit to the stable surface. Failure to do so may cause the vibration or the noise.
- Do not install the Dx-coil controller, Dx-valve kit to the locations where there is a temperature difference with the ambient temperature. Failure to do so may result in condensation, rust, or malfunction. Ex. The sheet metal side surface of the AHU outlet.
- Install the Dx-valve kit to where the noise is no problem due to the Dx-valve kit makes the refrigerant noise. Also, it may make the refrigerant noise when other indoor units are operating even if the AHU is stopping like defrosting.
- Do not install in locations with the high temperature or the high-humidity atmosphere of 52°C or more / RH 80% or more. Also, do not install it in a place where dew condensation occurs inside the Dx-valve kit.
- When installing the Dx-valve kit and the Dx-coil controller into the Air handling unit, do not install it where it is exposed to the cooled air of the secondary side of the heat exchanger.
- Do not install in locations where iron or other metal dust is present. If iron or other metal dust adheres to or collects on the interior of the Dx-valve kit, it may spontaneously combusted and start a fire.

2. Overview

VRF DX COIL INTERFACE is the product that is used with connecting the AHU prepared on-site to the TOSHIBA VRF outdoor unit.

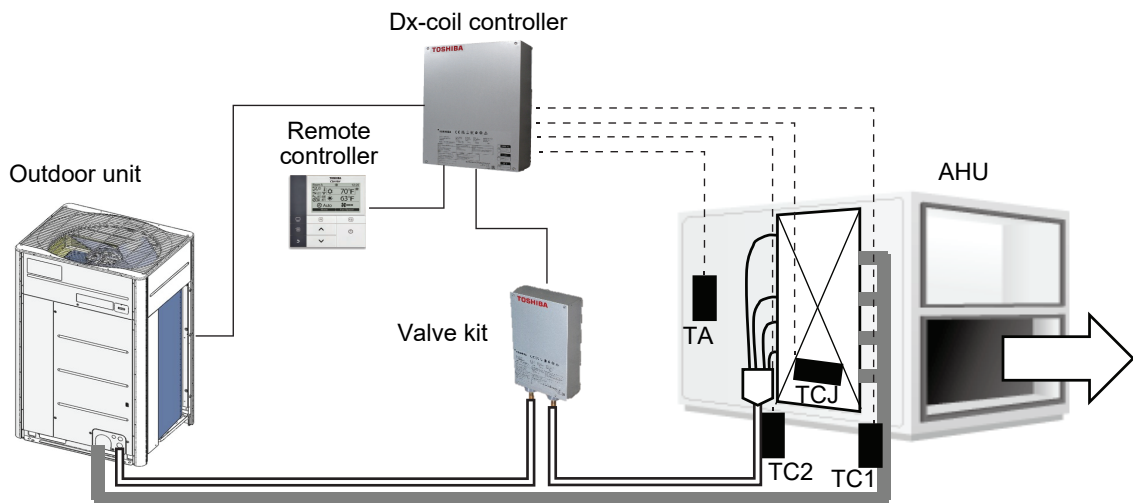
*1. DX COIL: Abbreviation of the Direct expansion coil (heat exchanger).

*2. AHU: Abbreviation of the Air Handling Unit

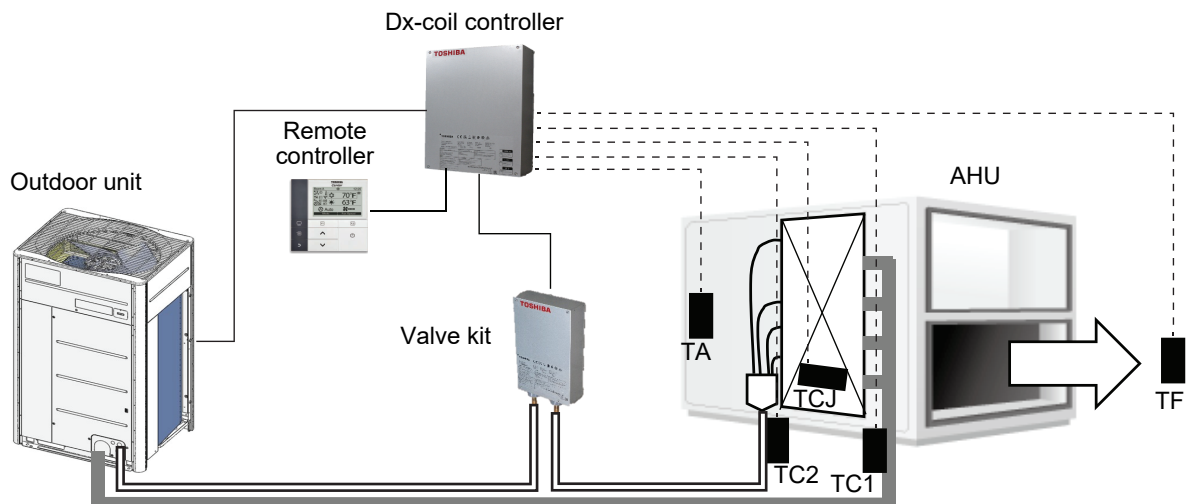
For the system design and the cautions, refer to the Dx-coil controller Installation Manual.

■ Example of the system configuration

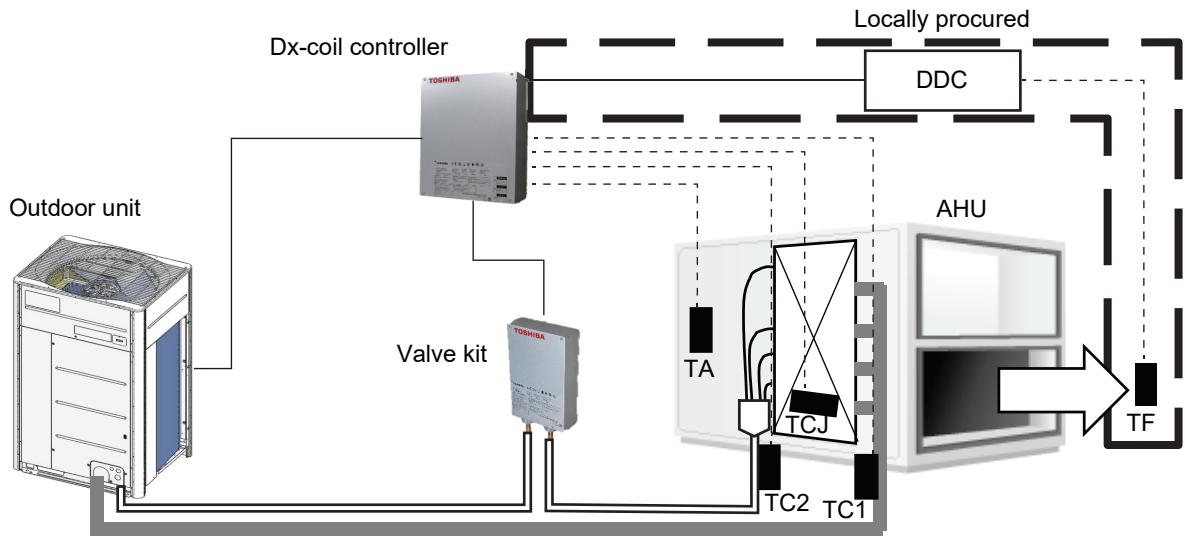
TA type : Enables to connect 3rd party indoor unit or air handing unit as one of VRF indoor unit.
(Return air temperature control by remote controller setting)
Main application target – Room temperature conditioning



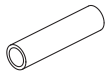

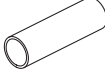

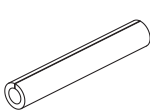

TF type : The discharge temperature is set by the remote controller to control the capacity.
Main application target – Ventilation



DDC type : Direct capacity control of Toshiba Carrier VRF outdoor unit by analogue input (0 - 10 V).
Mainly discharge air temperature control linked AHU system.



3. Accessories

No.	Item	Q'ty	Shape
1	Sensor holder (TC1) (O.D. 6.35 mm, Length: 26 mm)	1	
2	Sensor clip (TC1)	1	
3	Sensor holder (TC2, TCJ) (O.D. 8 mm, Length: 26 mm)	2	
4	Sensor clip (TC2, TCJ)	2	
5	Heat insulator (O.D. 40 mm, Length: 210 mm)	2	
6	Cable tie (Length: 152 mm)	1	

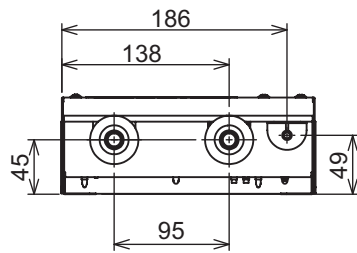
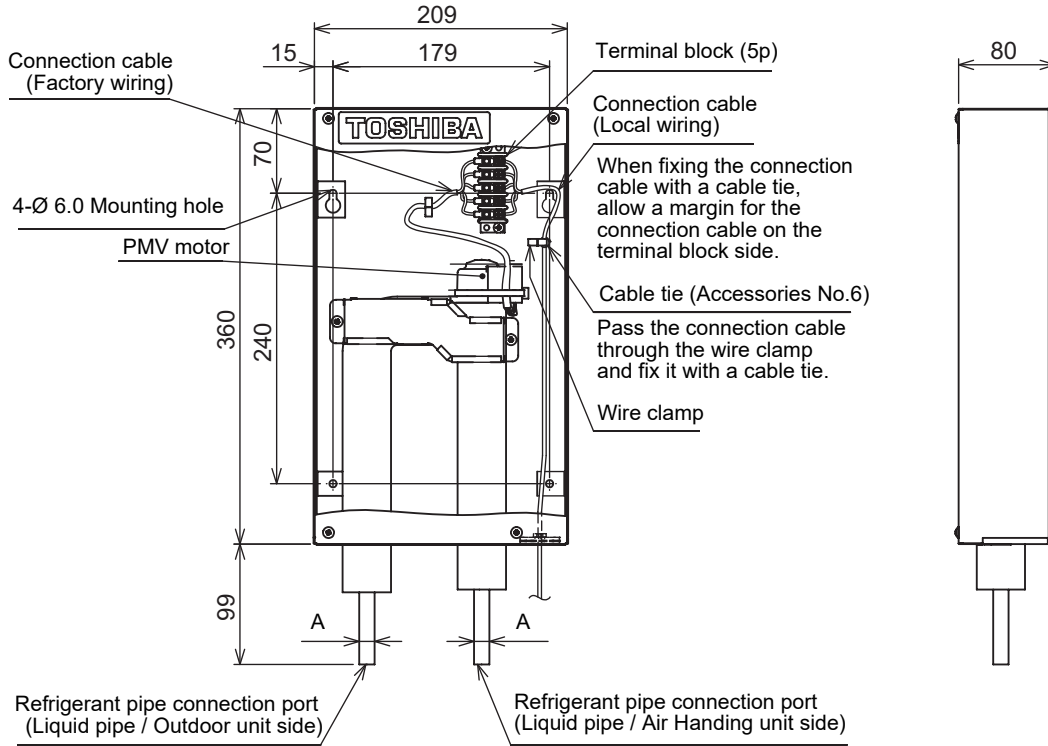
There are no accessories for the sensor holders for the TA sensor and TF sensor.

4. Installation

External dimensions and Installation space

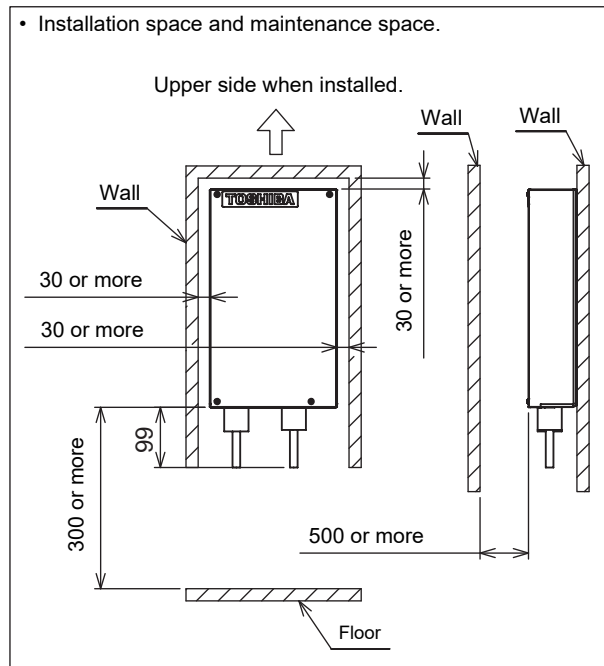
Be sure to install the valve kit in the indoor. Failure to do so may cause the frost formation, rust, or malfunction.

(Unit: mm)



Note)
This product is designed for the indoor installation.

Model	A (Pipe)
RBM-A101UPVA-E	Ø12.7
RBM-A201UPVA-E	Ø15.88



■ Installation Dx-valve kit

By the refrigerant circuit diagram, braze the sensor holder of TC1, TC2, TCJ of the valve kit and the accessory. Refer to the below table for the pipe diameter and the pipe length to use.

Item		TA type	TF, DDC type
Main pipe equivalent length		Same as piping length restriction of outdoor unit	
Total piping length (real length)		200 m	120 m (100 m)
Furthest equivalent pipe length L (real length)		130 m (120 m)	100 m
Furthest equivalent pipe length from the 1st branch		40 m	-
Furthest equivalent pipe length between outdoor unit		Same as piping length restriction of outdoor unit	-
Max, real length of pipes connected to indoor units		20 m	-
Maximum equivalent between branching section		30 m	-
Max. Height Difference	Outdoor unit - Indoor unit (Upper outdoor unit) H1	40 m or the outdoor unit spec. Whichever is shorter of outdoor unit.	40 m
	Outdoor unit - Indoor unit (Lower outdoor unit) H1		
	Indoor unit - Indoor unit (Upper outdoor unit) H2		-
	Indoor unit - Indoor unit (Lower outdoor unit) H2		-

Dx-valve kit and connection of the pipe

- Be sure to cool the strainer and PMV valve body using a wet cloth so that the body temperature does not exceed 120°C while brazing.
- For the connection pipe, it may vibrate during the defrosting operation. Carry out the installation work so that the connection pipe does not break after a long-term use.

Sensor holders

- To ensure reliable operation, all Sensor holders must be fitted by brazing.
- Be careful of that the brazing material does not enter into the sensor holder when attaching the TC1, TC2 and TCJ sensor holder.

TC1 sensor

- Install it in the collecting part of the gas header.

TC2 sensor

- Install it in the between the liquid pipe distributor and the PMV.
(TC2 sensor is attached to the refrigerant cycle of AHU.)

TCJ sensor

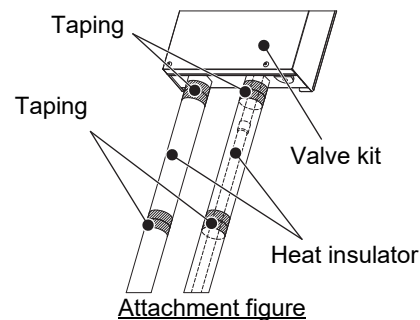
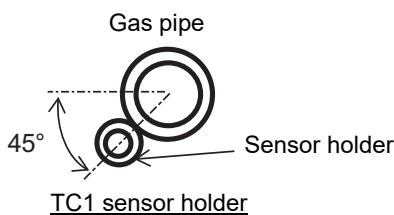
- Install it in the pass where the temperature of the capillary tube is the lowest.
- Keep a distance of 50 mm ± 25 mm from the end plate.

TA, TF sensor

- Install the TA, TF sensor where the better of air flow.
- The TA sensor must be located in the Return Air position, prior to mixing with any fresh air.
- Install the TF sensor in a place where the discharge air temperature is uniform.

If the TC1, TC2, or TCJ sensor are easy to be subjected to the surrounding thermal effect, cover them with the heat insulator material, and fix them with the fixing band.

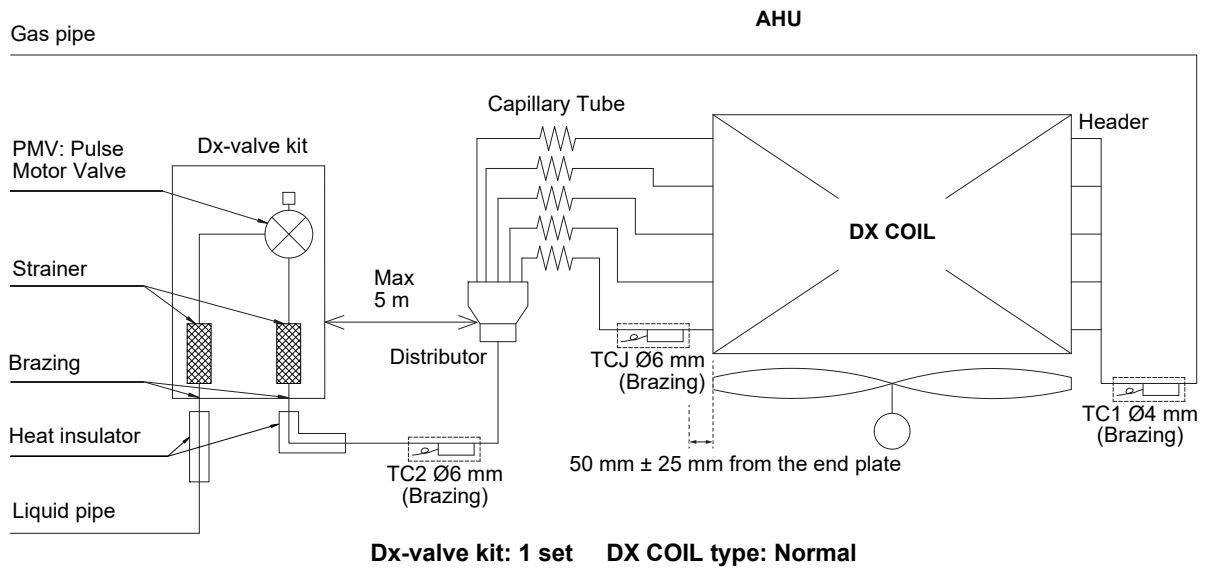
If the lead wires of various sensors are left over, protect them from the effects of external force, heat, and water, and fix them with a fixing band. If the lead wires of various sensors do not reach, use the Optional Sensor (10 m cable) TCB-IFDES1001P-E.



Braze the TC1 sensor on the location of the lower side 45° to detect the stable temperature.

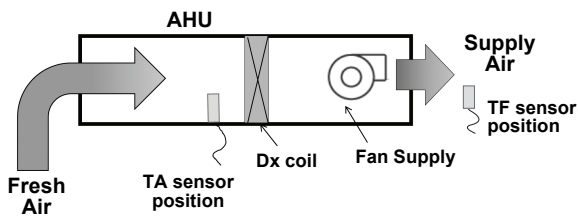
After brazing the pipe, wrap the attached heat insulator and fix it with a tape.

TC1, TC2 and TCJ sensor position on DX COIL

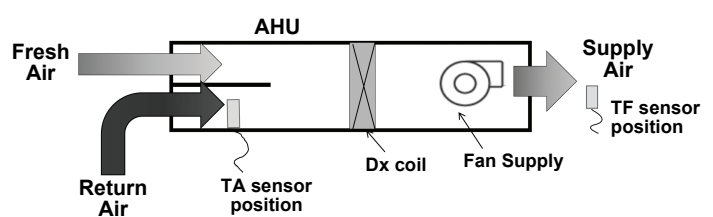


Example TA / TF*1 sensor position

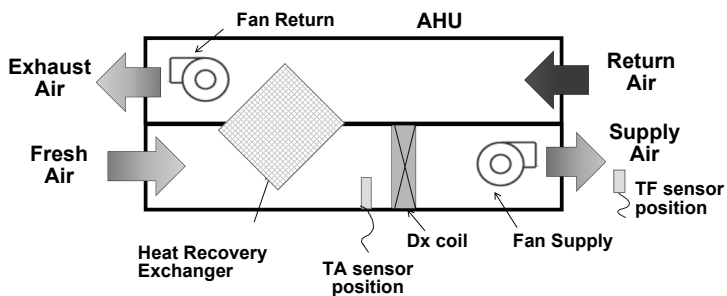
1. Fresh Air Only



2. Outdoor Air (Fresh Air) mixed with Return Air



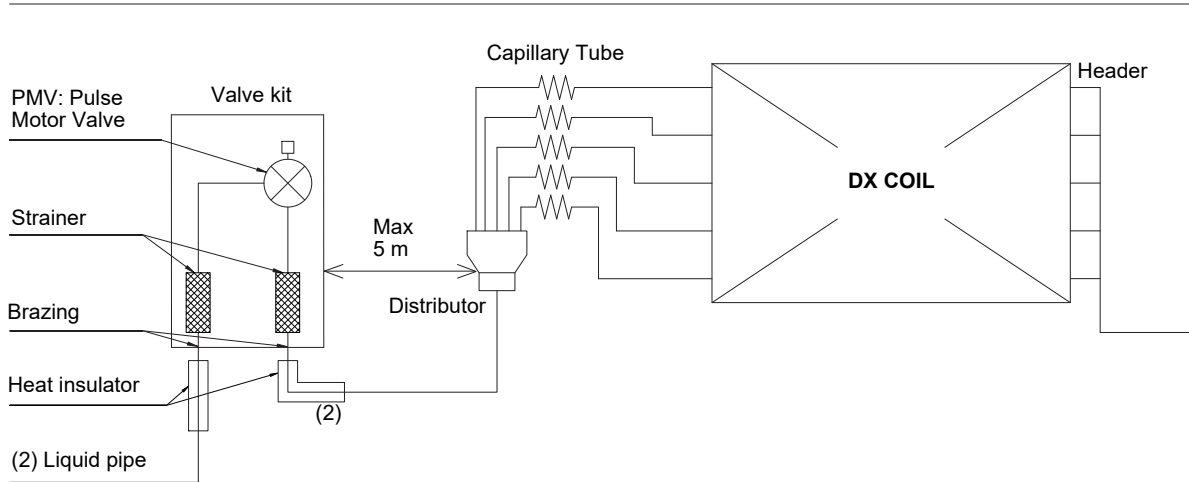
3. Outdoor Air (Fresh Air) mixed with Return Air by Heat Recovery Exchanger



*1: TF sensor can only be used with SMMS-u and SMMS ∞ .

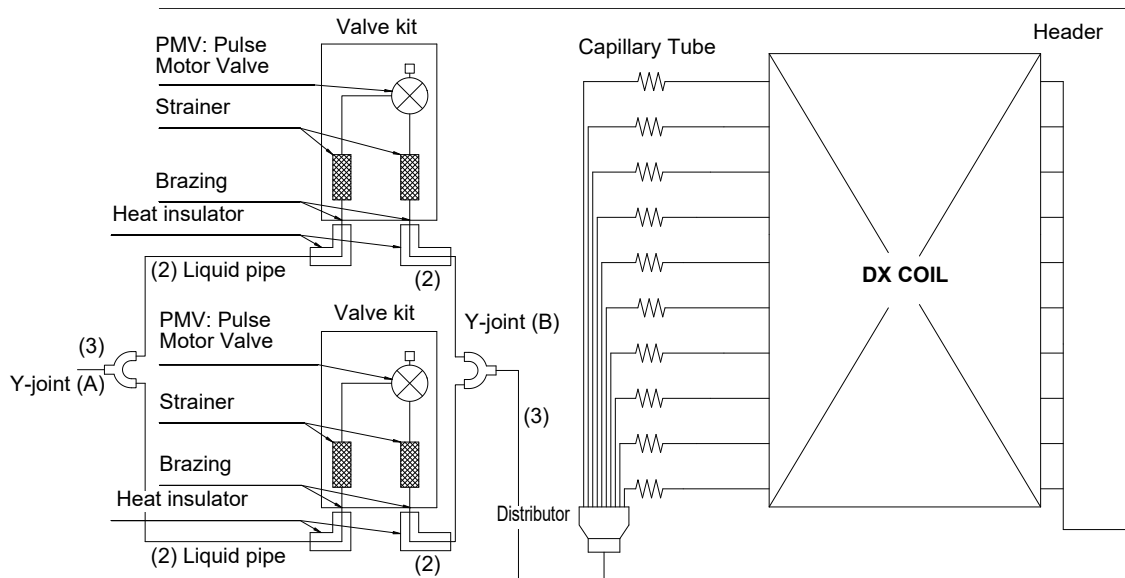
Refrigerant circuit diagram

(1) Gas pipe



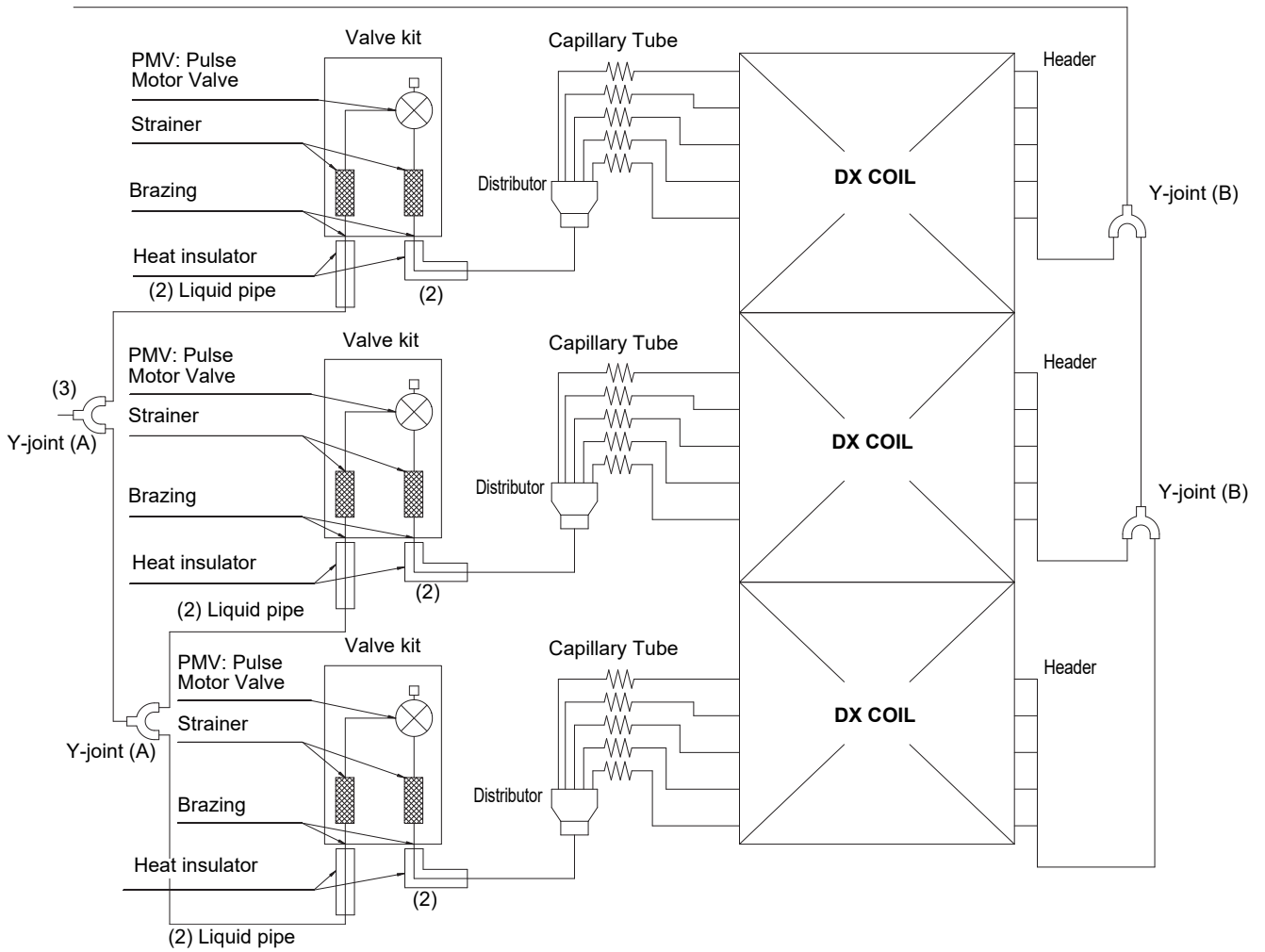
Valve kit: 1 set DX COIL type: Normal

(1) Gas pipe



Valve kit: 2 sets DX COIL type: Normal

(1) Gas pipe



Valve kit: 3 sets DX COIL type: Interlaced, Split face

Piping size and Y-joint

- Maximum real piping length between valve kit and Dx coil is up to 5 m.

DX COIL type	Pipe diameter		
	(1) Gas pipe	(2) Liquid pipe	(3) Liquid pipe
HP	Outer diameter		
8	19.1	12.7	/
10	22.2		
12	28.6	15.9	
14 ~ 18			
20			
22			
24 ~ 26	34.9	19.1	
28 ~ 34			
36 ~ 42	38.1	22.2	
44 ~ 52			
54			
56 ~ 60	41.3		
62 ~ 74			
76 ~ 92			
94 ~	54	25.4	

DX COIL type	Normal
HP	Y-joint (A, B)
24	RBM-BY205E
26 ~ 60	RBM-BY305E
61.2 or more	RBM-BY405E

(Unit: mm)

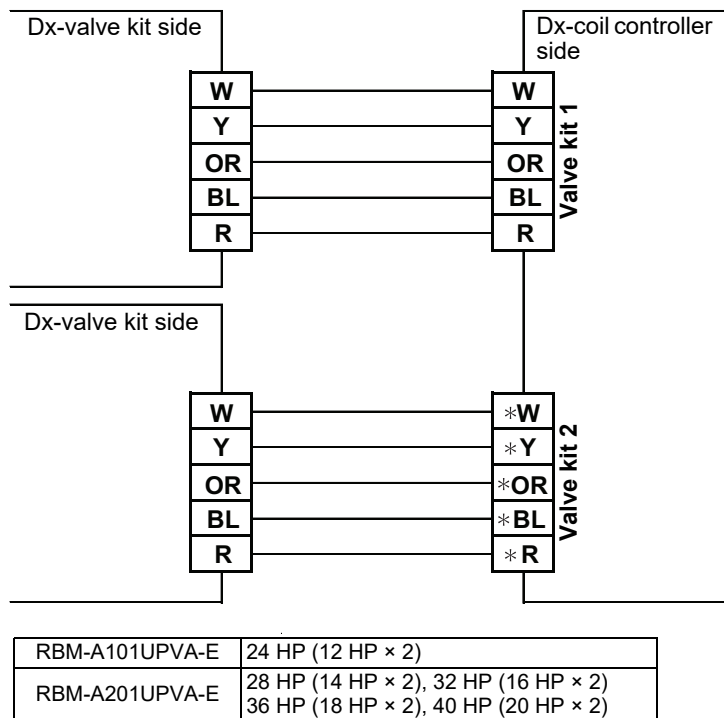
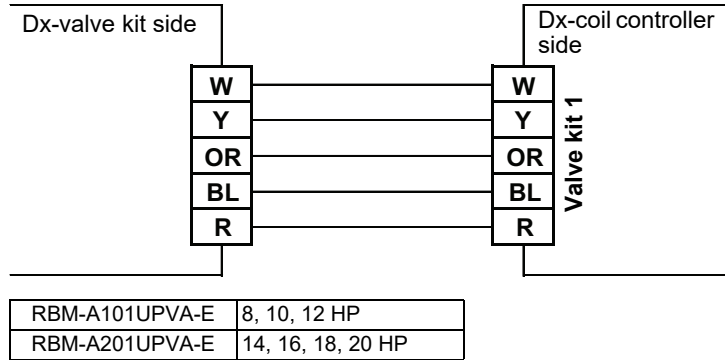
■ Electrical connection

The wiring from PMV is connected to Dx-coil controller.

Terminal: R / BL / OR / Y / W

Dx-valve kit 1, Dx-valve kit 2 : Connect the cable from the PMV.
Match the color of the wiring of the PMV side and the controller side.

Color identification	
W:	White
Y:	Yellow
OR:	Orange
BL:	Blue
R:	Red



- For the PMV, sensor wiring, do not bundle it with the motor wiring. The wrong operation may result in.
- The PMV cable cannot be extended, it is supplied at the maximum permissible length of 5 m.

EAC

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