



ENERGY RECOVERY VENTILATOR RESIDENTIAL AND COMMERCIAL ENGINEERING MANUAL



ARVU053ZEA2

ARVU063ZEA2

ARVU093ZFA2

ARVU123ZFA2

ARV00903RA6

ARV01203RA6

PROPRIETARY DATA NOTICE

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TABLE OF SYMBOLS

 DANGER	<i>This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</i>
 WARNING	<i>This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</i>
 CAUTION	<i>This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</i>
Note:	<i>This symbol indicates situations that may result in equipment or property damage accidents only.</i>
	<i>This symbol indicates an action that must not be performed.</i>

MECHANICAL SPECIFICATIONS

General

ERV indoor units are factory assembled and provided with an internally mounted control circuit board, exhaust fan, supply fan, cross-flow air to air heat exchanger, washable outdoor air and return air filters, and bypass damper. Each unit is designed to operate using 208-230/60/1 power with voltage variances of $\pm 10\%$. ERV operation range is 14°F - 113°F outdoor temperature.

Casing

The metal casing is designed to mount concealed above a finished ceiling. Supply fan discharge and exhaust fan inlet (return air) are front horizontal. Supply fan inlet (outdoor air) and exhaust fan discharge are rear horizontal. Cold metal surfaces are externally insulated. The case is provided with hanger brackets designed to support the unit weight on for corners. Hanger brackets have pre-punched holes designed to accept field supplied, all-thread rod hangers.

Fan Assemblies

ERV units have two fans; one fan for supply air and one fan for exhaust air. Both fans are direct driven. Fan motors are brushless, digitally-controlled (BLDC) design with permanently sealed bearings. The fan/motor assemblies are mounted in vibration attenuated rubber grommets. The fan speeds are controlled using a microprocessor-based direct digital control algorithm that provides three fan speeds. Fan speeds are super high, high, and low. Each fan speed can be adjusted from the factory setting using external static pressure (ESP) control settings to change fan speeds to compensate for airflow resistance caused by field installed ductwork.

Cross flow Air-to-air Heat Exchanger

Cross flow air-to-air heat exchanger is constructed of non-flammable, specially processed paper that allows transfer of heat and humidity. The air-to-air heat exchanger recovers energy from indoor air as it is exhausted outdoors. The recovered energy is transferred to the in-coming outdoor air without mixing airstreams. A hinged access panel allows removal of air-to-air heat exchanger for vacuum or brush cleaning. Since both heat and humidity are transferred, condensate drain is not required.

Air Filter

Two washable mesh filters are provided at the outdoor air and return air inlets of the air-to-air heat exchanger.

Microprocessor Controls

The ERV is provided with an integrated microprocessor-based controller. All unit operation parameters, excluding the unit operating schedule, are stored in non-volatile memory, resident on the ERV microprocessor. Operating schedules are stored in the wall controller or central controller. ERV units can be operated independently with a wall controller or interlocked to a Multi V system. When interlocking to a Multi V system, the field supplied communication cable between the ERV and outdoor unit is to be a minimum of 18 AWG, 2-conductor, stranded, and shielded cable (RS485), terminated via screw terminals on the control board. The microprocessor control provides the following functions:

- Auto restart following power restoration
- External static pressure (ESP) control of fans
- ERV mode allowing air to pass thru air-to-air heat exchanger
- Bypass mode allowing exhaust air to bypass air-to-air heat exchanger

The control board is also provided with terminals for connection of a field supplied CO2 sensor. DIP switch settings on the control board allow the ERV to operate independently or as a slave to a Multi V indoor unit.

ERV BENEFITS



ZE Chassis



ZF Chassis



ZR Chassis

Ventilation

Ventilation is a process that allows users to exchange indoor air with outdoor air in order to improve the air quality and to maintain environmental temperature conditions. The Energy Recovery Ventilation (ERV) system reduces the temperature and humidity of incoming outside air. A balance is achieved between indoor and outdoor ambient which enables the cooling or heating load placed on the air conditioning system to be reduced. It can be controlled individually or as an integral part of the air conditioning system.

Benefits

The ERV system provides efficiency, cost savings, superior performance, compact and light design, linear E.S.P control and

easy maintenance. The ERV system is ideal for hotels, dormitories, restaurants, hospitals, retail establishments, theaters, schools, and office buildings.

Energy Savings

The indoor air is passed through the heat exchanger to pre-warm or pre-cool the incoming outside air which saves energy and money.

Design

Acoustically engineered and tested for quiet operation.

Easy Maintenance

Offers easy filter replacement and heat exchanger cleaning.

List of Functions for Residential ERV

Category	Functions	ARV00903RA6	ARV01203RA6
Air Flow	Air Supply Outlet	1	1
	Airflow Steps (fan/cool/heat)	3 / - / -	3 / - / -
	Fan Speed Auto*	Basic	Basic
Air Purification	Ionizer	X	X
	UVnano	O	O
	Pre-Filter	O	O
	Fine Filter(ePM ₁ 95%)	O	O
Reliability	Self Diagnosis	O	O
Convenience	Auto Restart	O	O
	Child Lock*	O	O
	Forced Operation	O	O
	Group Control*	O	O
	Sleep Timer	X	X
	Turn On/Off Reservation	O	O
	Schedule*	O	O
	Night Silent Cooling Operation	O	O
	Delayed Operation	O	O
	Airflow Amount Customized Operation	O	O
	Seasonal Customized Operation	O	O
	Seasonal Auto Operation	O	O
Two Thermistor Control*	X	X	
Installation	Drain Pump	X	X
	E.S.P. Control*	O	O
ETC	Filter Alarm	O	O
	CO ₂ Sensor	O	O
	Wi-Fi	Accessory	Accessory

Note

1. O : Applied, X : Not applied

Accessory : Ordered and purchased separately the accessory package referring to the model name provided and install at field.

Accessory line-ups varies by region, so check your local catalogue or local sales material.

2. Some functions can be limited by remote controller.

3. * : These functions need to connect the wired remote controller.

GENERAL DATA - COMMERCIAL

ARVU053ZEA2, ARVU063ZEA2, ARVU093ZFA2, ARVU123ZFA2

Table 1: Energy Recovery Ventilator (ERV) Unit General Data

Type	ERV Units			
	ARVU053ZEA2	ARVU063ZEA2	ARVU093ZFA2	ARVU123ZFA2
<i>Performance</i>				
Capacity (CFM)	470	590	880	1,180
Power Input (SH ¹) Watts	360	470	720	930
<i>Operating Range</i>				
Operating Range (°F DB)	14-113	14-113	14-113	14-113
<i>Heat Exchanger Data</i>				
Air-to-Air Heat Exchanger	Cross flow fixed core			
Quantity	1	1	1	1
<i>Temperature Exchanger Efficiency (%) (fan speed SH¹)</i>				
Cooling (fan speed SH ¹)	62	59	62	59
Heating (fan speed SH ¹)	61	58	61	58
<i>Enthalpy Exchange Efficiency (%)</i>				
Cooling (fan speed SH ¹)	37	34	37	34
Heating (fan speed SH ¹)	52	49	52	49
<i>Unit Data</i>				
Sound Pressure dB(A)	40/37/31	41/39/33	44/41/35	45/41/35
Net Unit Weight (lbs)	148	148	331	331
Shipping Weight (lbs)	177	177	397	397
<i>Fan</i>				
Type	Cross Flow	Cross Flow	Cross Flow	Cross Flow
Quantity	2	2	2	2
Motor/Drive	Brushless Digitally Controlled/Direct	Brushless Digitally Controlled/Direct	Brushless Digitally Controlled/Direct	Brushless Digitally Controlled/Direct
Airflow Rate SH/H/L (CFM)	471/471/388	589/589/471	883/883/706	1177/1177/942
External Static Pressure SH/H/L (in wg)	0.80/0.44/0.24	0.64/0.36/0.20	0.80/0.44/0.24	0.64/0.36/0.20
<i>Filters</i>				
Quantity	2	2	4	4
Size	41-9/16" x 8-3/8" x 13/32"			

¹SH - Super High

Condensate drain not required.

ERV temperature and enthalpy exchange efficiencies are in accordance with AHRI 1060 test condition, 100% airflow, 0" external static pressure.

Cooling: Outdoor 95°F DB, 78°F WB; Exhaust 75°F DB, 63°F WB

Heating: Outdoor 35°F DB, 33°F WB; Exhaust 70°F DB, 58°F WB

GENERAL DATA - RESIDENTIAL

ARV00903RA6, ARV01203RA6

Table 2: Residential Energy Recovery Ventilator (ERV) Unit General Data

Model Name				ARV00903RA6	ARV01203RA6	
Ventilation Capacity			m ³ /h	150	200	
			ft ³ /min	90	120	
Temperature Exchange Efficiency (AHRI condition)	Cooling	100% Air Flow	%	65	62	
	Cooling	75% Air Flow	%	69	65	
	Heating	100% Air Flow	%	61	58	
	Heating	75% Air Flow	%	65	61	
Enthalpy Exchange Efficiency (AHRI condition)	Cooling	100% Air Flow	%	61	55	
	Cooling	75% Air Flow	%	66	61	
	Heating	100% Air Flow	%	58	52	
	Heating	75% Air Flow	%	61	58	
Power Supply			V, Ø, Hz	208/230, 1, 60	208/230, 1, 60	
Wiring Connections	Power Supply Cable(included Earth)		No. x mm ² (AWG)	3C x 0.82 (18)	3C x 0.82 (18)	
	Power and Communication Cable(included Earth)		No. x mm ² (AWG)	-	-	
Dimensions		W x H x D	mm	640 x 320 x 640	640 x 320 x 640	
			inch	25-3/16" x 12-9/16" x 25-3/16"	25-3/16" x 12-9/16" x 25-3/16"	
Net Weight			kg(lbs)	23.4(51.6)	23.4(51.6)	
ERV Mode	Air Flow Control Step		-	SH / H / L	SH / H / L	
	Power Input	Rated	SH / H / L	W	54.3 / 47.6 / 27.9	79.2 / 71.4 / 30.5
	Running Current	Rated	SH / H / L	A	0.44 / 0.40 / 0.26	0.62 / 0.56 / 0.28
	Air Flow Rate		SH / H / L	m ³ /h	150 / 150 / 80	200 / 200 / 100
			SH / H / L	ft ³ /min	90 / 90 / 47	120 / 120 / 60
	External Static Pressure		SH / H / L	Pa	100 / 70 / 50	100 / 70 / 50
			SH / H / L	in. H ₂ O	0.4 / 0.28 / 0.2	0.4 / 0.28 / 0.2
Sound Pressure Level		SH / H / L	dB(A)	28 / 26 / 21	30 / 28 / 22	
Bypass Mode	Air Flow Control Step		-	SH / H / L	SH / H / L	
	Power Input	Rated	SH / H / L	W	62.6 / 53.8 / 31.9	83.6 / 75.6 / 35.9
	Running Current	Rated	SH / H / L	A	0.50 / 0.44 / 0.29	0.65 / 0.59 / 0.32
	Air Flow Rate		SH / H / L	m ³ /h	150 / 150 / 80	200 / 200 / 100
			SH / H / L	ft ³ /min	90 / 90 / 47	120 / 120 / 60
	External Static Pressure		SH / H / L	Pa	100 / 70 / 50	100 / 70 / 50
			SH / H / L	in. H ₂ O	0.4 / 0.28 / 0.2	0.4 / 0.28 / 0.2
Sound Pressure Level		SH / H / L	dB(A)	28 / 26 / 21	30 / 28 / 22	
Heat Exchanger	System Type		-	Air to Air Cross Flow	Air to Air Cross Flow	
	Element		-	Specially pocessed non-flammable paper	Specially pocessed non-flammable paper	
Supply Air Fan	Quantity		EA	1	1	
	Fan Type		-	Direct-Drive	Direct-Drive	
	Motor Type		-	BLDC	BLDC	
	Motor Output		W	30	30	
Exhaust Air Fan	Quantity		EA	1	1	
	Fan Type		-	Direct-Drive	Direct-Drive	
	Motor Type		-	BLDC	BLDC	
	Motor Output		W	30	30	
Duct Connecting	Connecting Quantity		EA	4	4	
	Connection Duct Diameter	Outer Dia.	Ø, mm(inch)	Ø 125 (4-23/25")	Ø 125 (4-23/25")	
Filters_1	Quantity		EA	2	2	
	Type		-	Pre	Pre	
	Dimensions	W x H x D	mm	275 x 280 x 7	275 x 280 x 7	
inch			10-13/16" x 11" x 1/4"	10-13/16" x 11" x 1/4"		
Filters_2	Quantity		EA	1	1	
	Type		-	MERV 13	MERV 13	
	Dimensions	W x H x D	mm	275 x 277 x 50	275 x 277 x 50	
inch			10-13/16" x 10-7/8" x 1-15/16"	10-13/16" x 10-7/8" x 1-15/16"		
Operation Range (Outdoor Temperature)		Min. ~ Max.	°C DB(°F DB)	-10~40 (14~104)	-10~40 (14~104)	

ACCESSORIES

Table 3:ERV Residential Controller

Type	Name	Model Number
Remote Controller	Standard III Wired Remote Controller	PREMTB100 (RS3)
Dry Contact	220V, 1 Input	PDRYCB000
Dry Contact	24V, 1 Input	PDRYCB100
IDU Accessory	Group Control	PZCWRCG3
IDU Accessory	Cable Extension	PZCWRC1
Central Control System	AC EZ	PQCSZ250S
Central Control System	AC Smart IV BACnet	PBACNA000
Central Control System	ACP IV BACnet	PQNFB17C1
Central Control System	AC Smart 5	PACS4B000
Central Control System	ACP 5	PACP4B000
Required for Central Control System	PI-485	PSNFP14A1

Table 4:ZE/ZF Chassis Central Controllers

Central Controller	Name	Model No.	Devices per Controller	Systems per Comm Bus	Devices per Comm Bus	No. of Comm Bus Ports	Binary Signals Input/ Output	Power, Conn	Description
	AC Smart Premium	PQCSW421E0A	128	16	128	1	2/2	24 VAC	Provides scheduling, autochangeover, setback, remote controller lock, setpoint, range limit, run time limit, web access, email alarm notification, visual floorplan navigation, peak/demand control, software device interlocking, PDI integration, and AC Manager Plus integration advanced functionality in addition to basic unit control and monitoring.
	AC Ez	PQCSZ250S0	32	16	256	1		12 VDC, ODU	Provides for scheduling in addition to basic indoor unit control and monitoring.
	Advanced Control Platform (ACP) Standard	PQCPA11A0E	256	16	64 (128 with PDI Premium)	4	2/2	24 VAC	Provides for scheduling, remote controller lock, setpoint range limit, web access, peak/demand control, PDI integration, and AC Manager Plus integration advanced functionality in addition to basic unit control and monitoring.
	Advanced Control Platform (ACP) Premium	PQCPB11A0E	256	16	64 (128 with PDI Premium)		10/4	24 VAC	

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices.

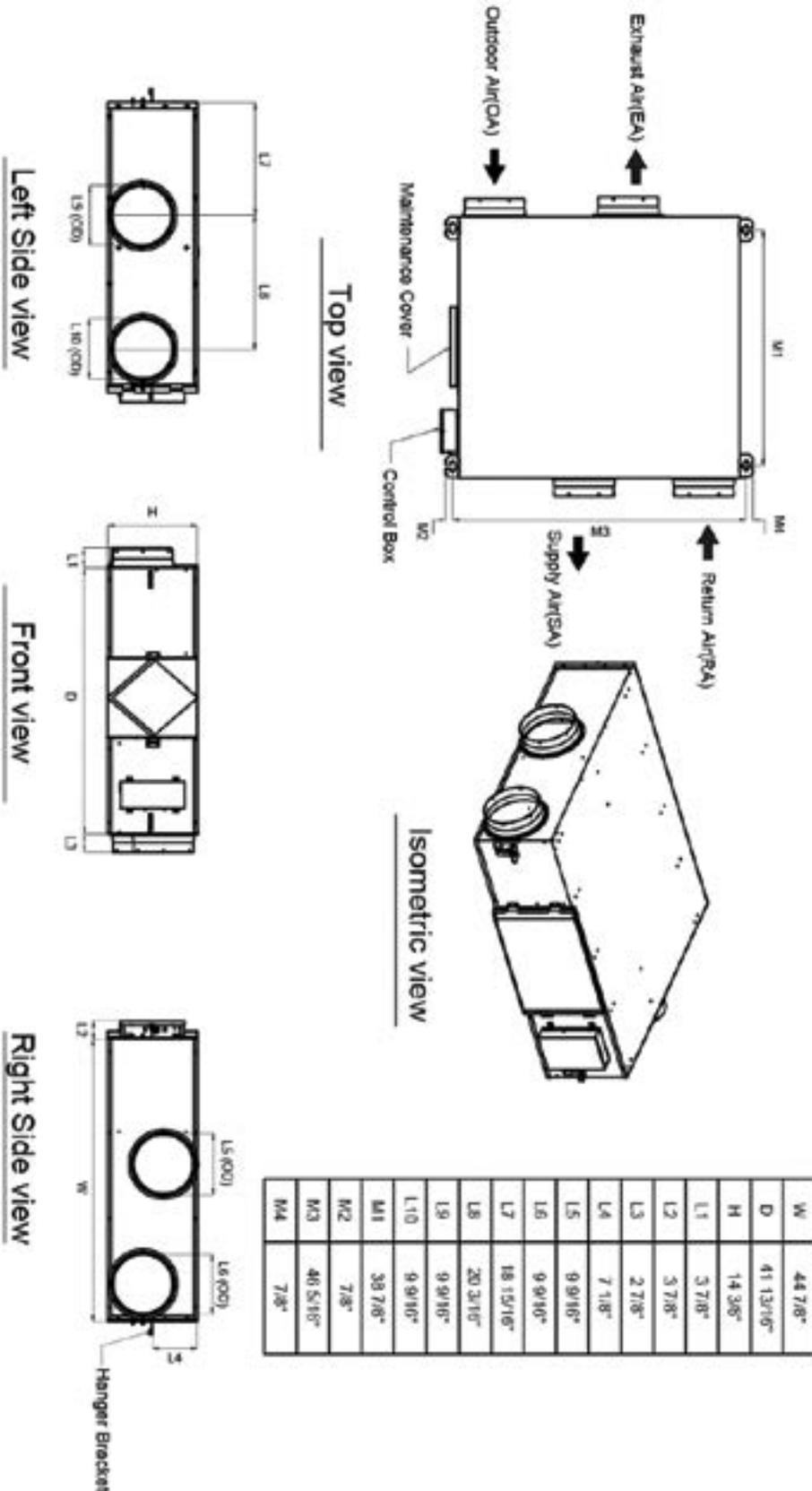
Table 5:ZE/ZF Chassis Integration Solutions

Integration Solution	Name	Model No.	Devices per Controller	Systems per Comm Bus	Devices per Comm Bus	No. of Comm Bus Ports	Power	Binary Signals Input/ Output	Description
	BACnet® Gateway	PQNFB17C1	256	16	64 (128 with PDI Premium)	4	24 VAC	10/4	Allow integration of LG equipment for control and monitoring by open protocol BACnet® and LonWorks® building automation and controls systems.
	LonWorks® Gateway	PLNWKB100	64	16	64	1	24 VAC	2/2	

Before specifying or placing an order, refer to the V-Net Network Solution Engineering Product Data Book and review the detailed technical data provided to fully understand the capabilities and limitations of these devices.

DIMENSIONS

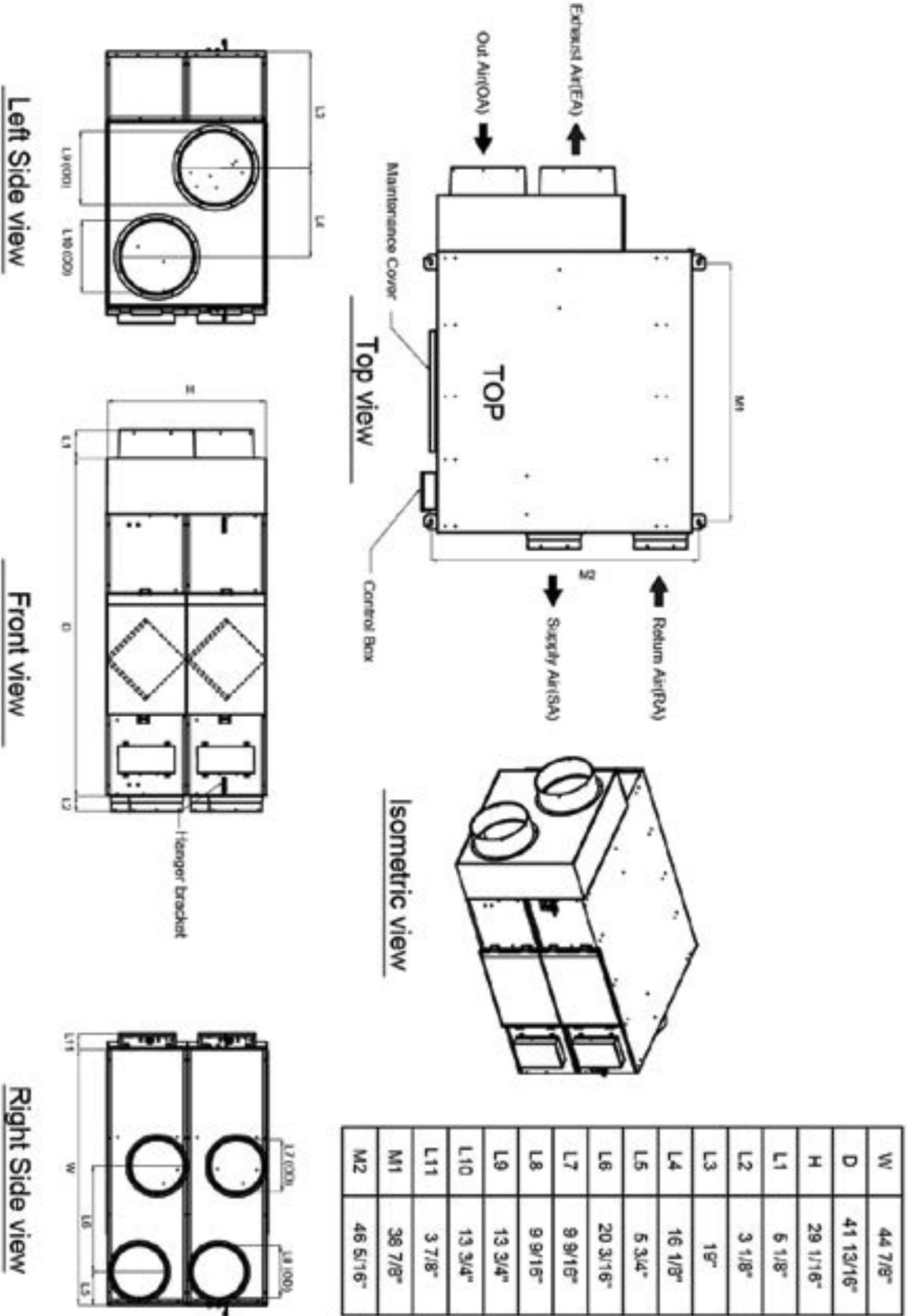
ZE Chassis



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DIMENSIONS

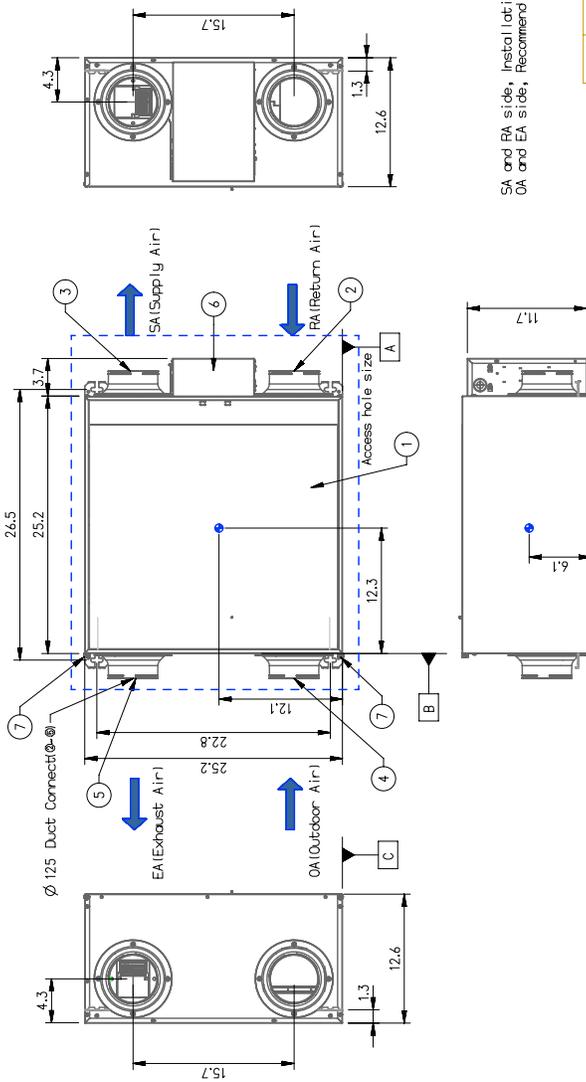
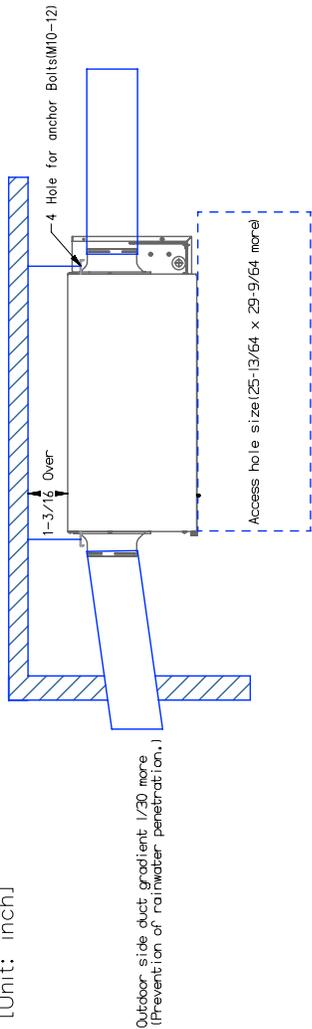
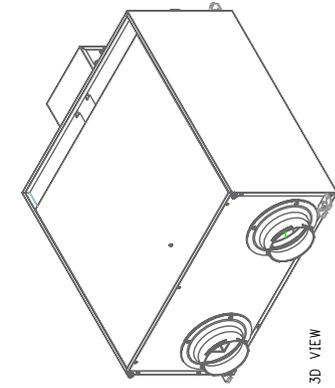
ZF Chassis



DIMENSIONS

ZR Chassis

[Unit: inch]



SA and RA side, Installation of Flexible sound absorption ducts is recommended.
OA and EA side, Recommend adhering Insulation (PET10mm more).

Symbols



Note for PDB of indoor unit

Note

1. Unit should be installed in compliance with the installation manual in the product box.
2. Unit should be grounded in accordance with the local regulations and materials.
3. All electrical components and materials to be supplied from the site must comply with the local regulations or international codes.

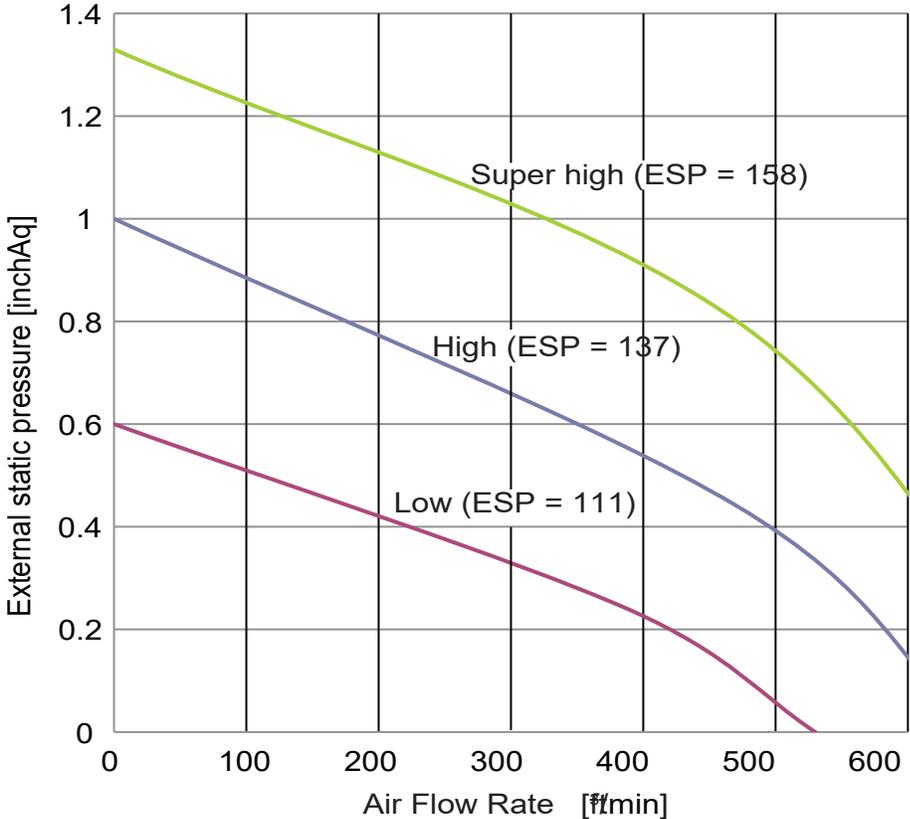
7	Bolt, Customized	Bolt for removing door
6	Case Assembly, Indoor	C/Box
5	EA (Ø 125)	Exhaust Air
4	OA (Ø 125)	Outdoor Air
3	SA (Ø 125)	Supply Air
2	RA (Ø 125)	Return Air
1	Door Assembly	Maintenance Door
No.	Part Name	Description

EFFICIENCY CURVES

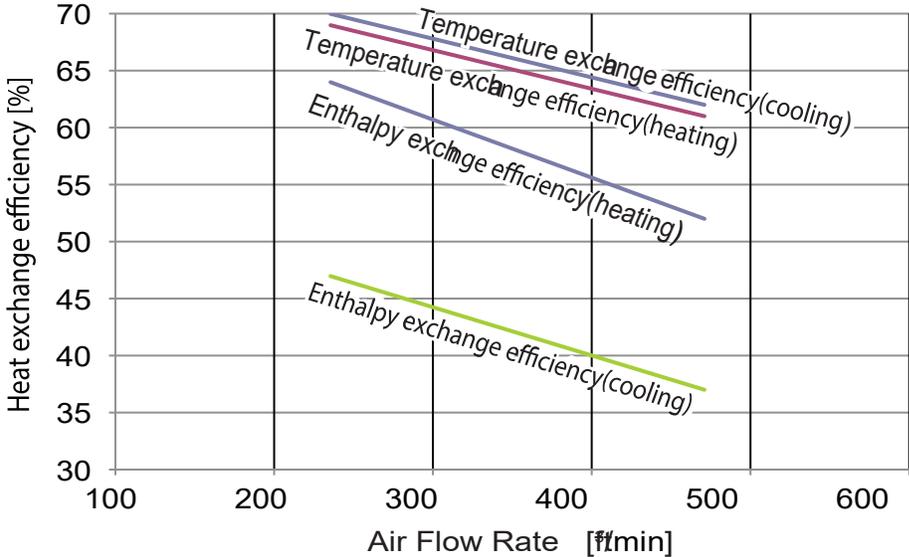
ARVU053ZEA2

Figure 1: ARVU053ZEA2.

Ventilation



Efficiency



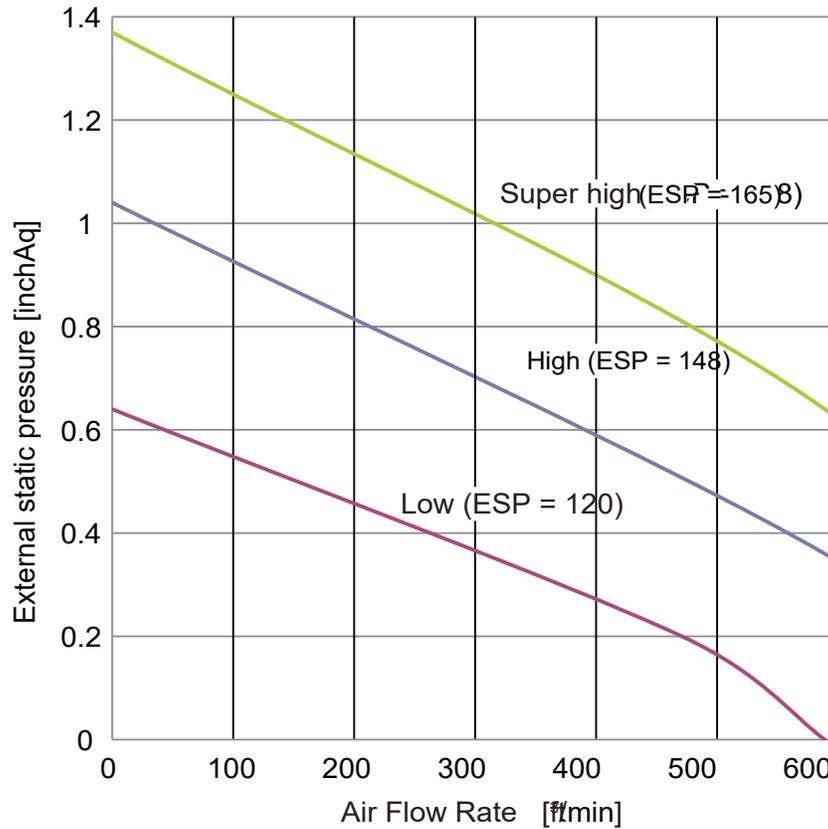
The graphs above show the available E.S.P range.

EFFICIENCY CURVES

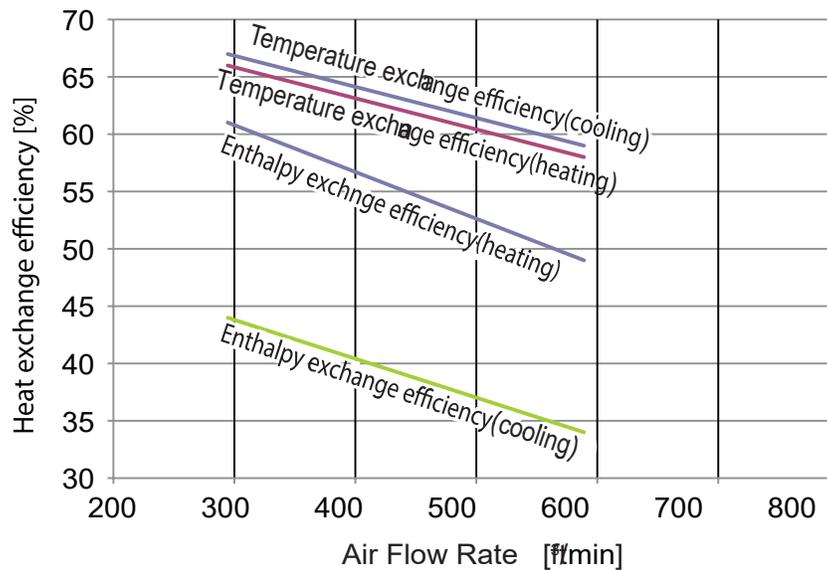
ARVU063ZEA2

Figure 2: ARVU063ZEA2.

Ventilation



Efficiency



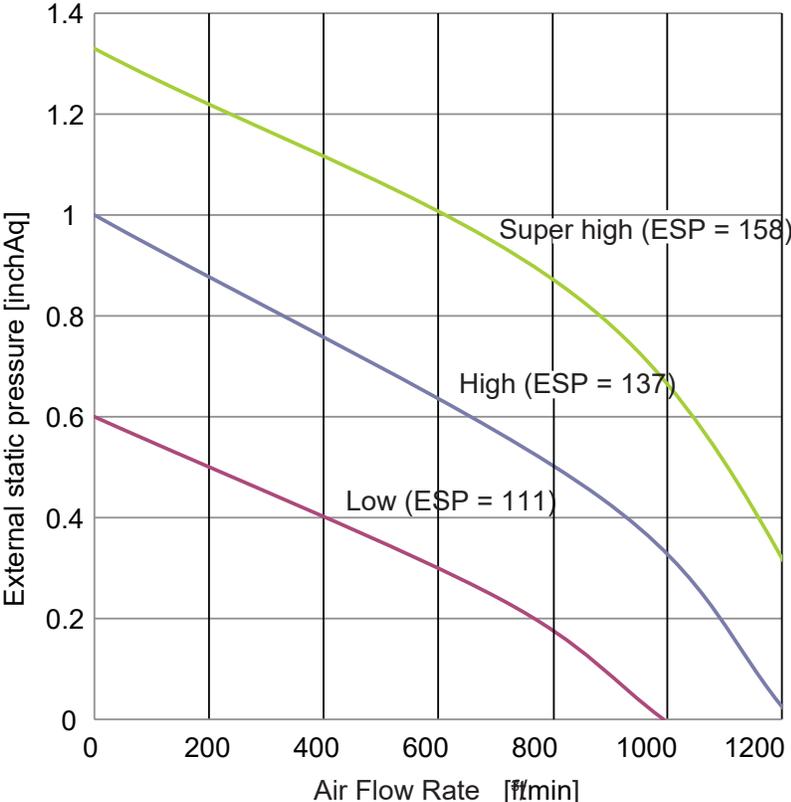
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EFFICIENCY CURVES

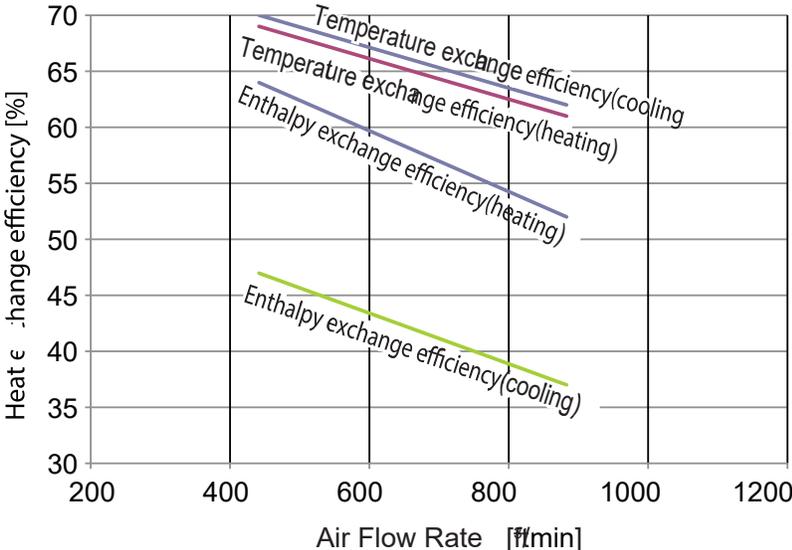
ARVU093ZFA2

Figure 3: ARVU093ZFA2.

Ventilation



Efficiency



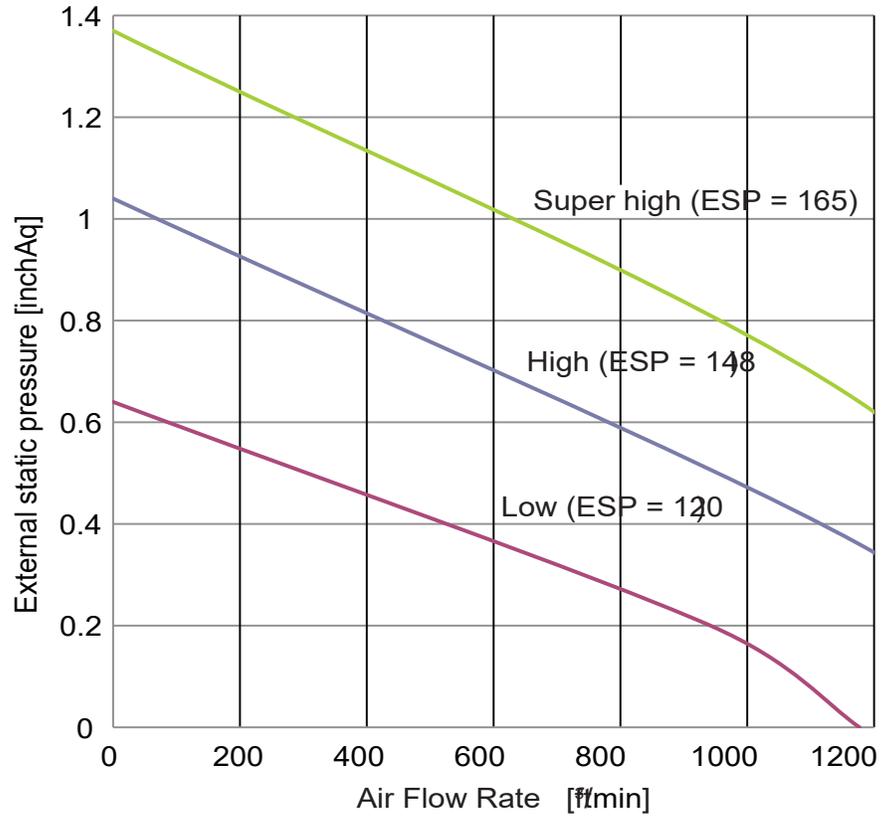
The graphs above show the available E.S.P range.

EFFICIENCY CURVES

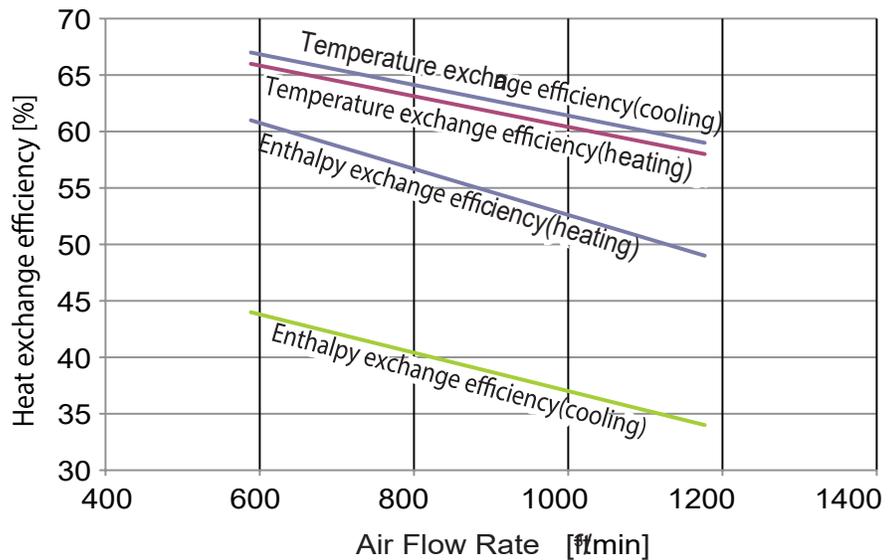
ARVU123ZFA2

Figure 4:ARVU123ZFA2.

Ventilation



Efficiency

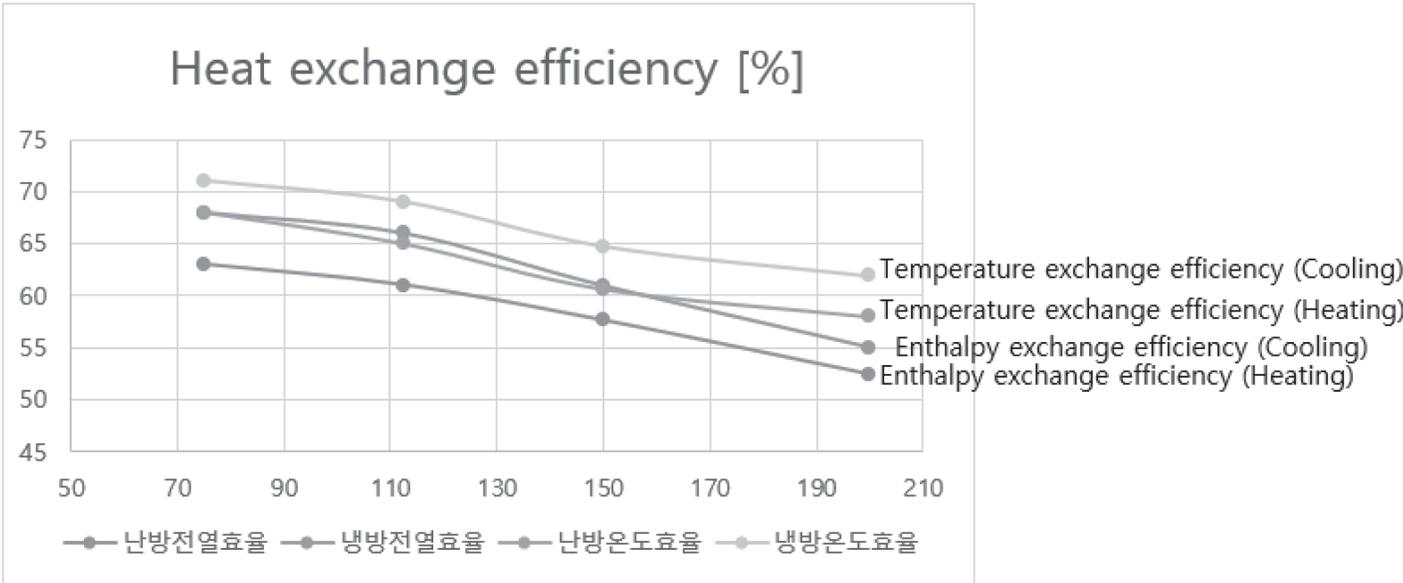
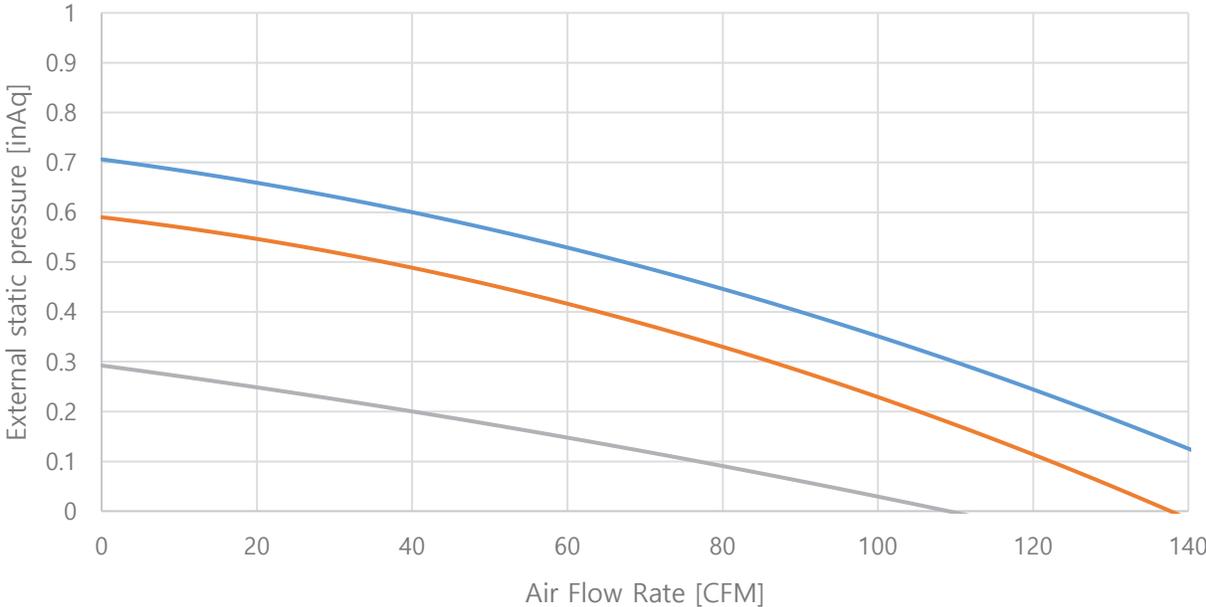


The graphs above show the available E.S.P range.

EFFICIENCY CURVES

ARV00903RA6

Figure 5: ARV00903RA6.

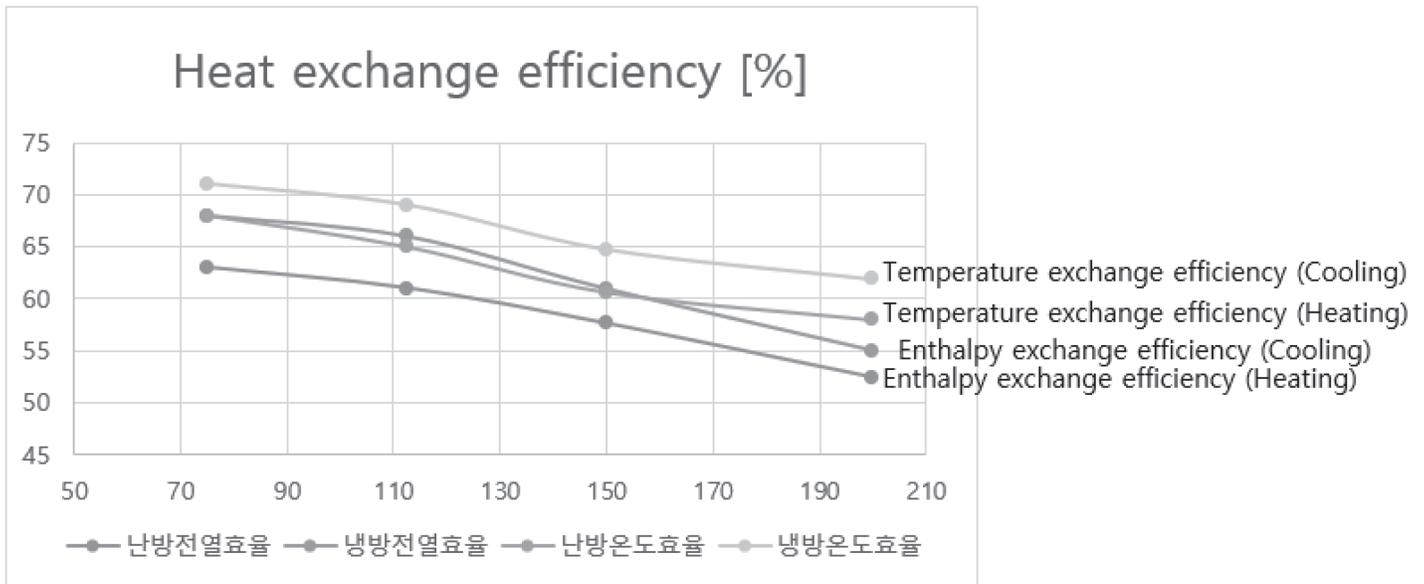
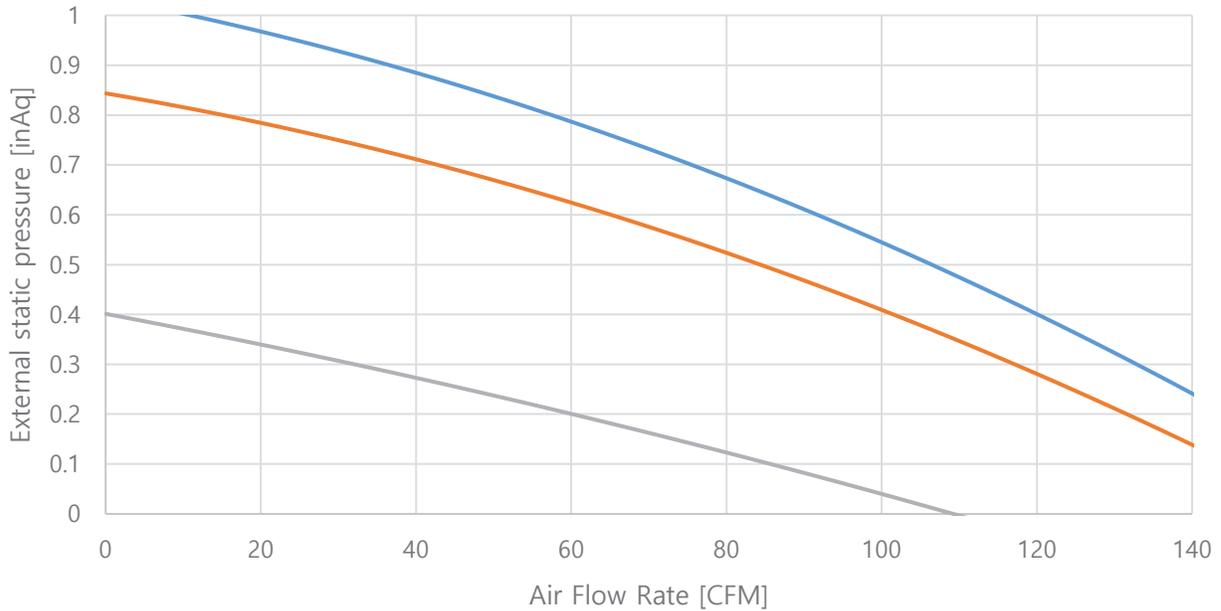


Airflow (CMH)	Enthalpy exchange efficiency (Heating)	Enthalpy exchange efficiency (Cooling)	Temperature exchange efficiency (Heating)	Temperature exchange efficiency (Cooling)
200	52	55	58	62
150	58	61	61	65
112.5	61	66	65	69
75	63	68	68	71

EFFICIENCY CURVES

ARV01203RA6

Figure 6: ARV01203RA6.



Airflow (CMH)	Enthalpy exchange efficiency (Heating)	Enthalpy exchange efficiency (Cooling)	Temperature exchange efficiency (Heating)	Temperature exchange efficiency (Cooling)
200	52	55	58	62
150	58	61	61	65
112.5	61	66	65	69
75	63	68	68	71

ELECTRICAL AND ACOUSTIC DATA

Model	Voltage Range	Rated Amps (A)	Power Supply			Power Input (W)	
			Hz	Volts	Phase	Cooling	Heating
ARVU053ZEA2	187-253	2.8	60	208-230V	1	360/270/165	360/270/165
ARVU063ZEA2		3.44				470/385/210	470/385/210
ARVU093ZFA2		5.62				720/540/340	720/540/340
ARVU123ZFA2		6.82				930/770/420	930/770/420

Model	Voltage Range	Rated Amps (A)	Power Supply			Power Input (W)	MCA	MFA
			Hz	Volts	Phase	SH / H / L		
ARV00903RA6	187-253	0.44	60	208-230	1	54.3 / 47.6 / 27.9	0.5	15
ARV01203RA6		0.62				79.2 / 71.4 / 30.5		

Units are suitable for use on an electrical system where voltage supplied to unit terminals is within the listed range limits.

Model	Sound Levels dB(A)		
	Super High Fan Speed	High Fan Speed	Low Fan Speed
ARVU053ZEA2	40	37	31
ARVU063ZEA2	41	39	33
ARVU093ZFA2	44	41	35
ARVU123ZFA2	45	41	35
ARV00903RA6	28	26	21
ARV01203RA6	30	28	22

Sound pressure levels are tested in an anechoic chamber under ISO Standard 3745.

ACOUSTIC DATA

Figure 7:ARVU053ZEA2

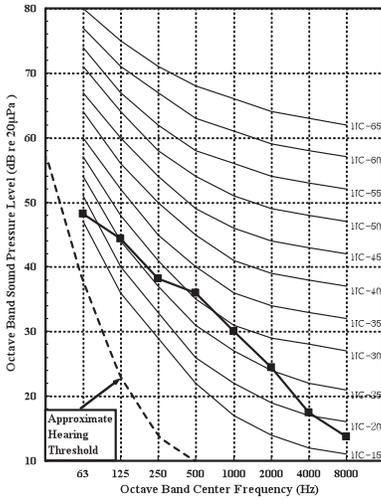


Figure 8:ARVU063ZEA2

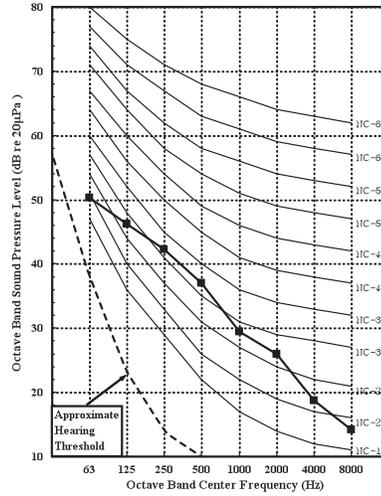


Figure 9:ARVU093ZFA2

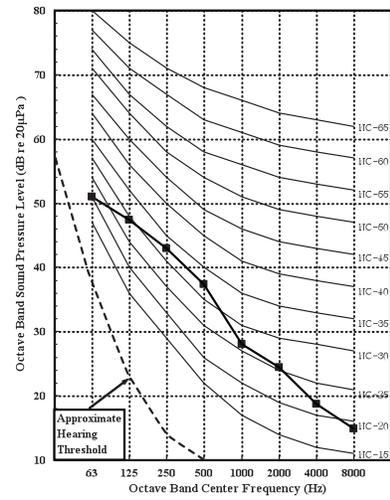


Figure 10:ARVU123ZFA2

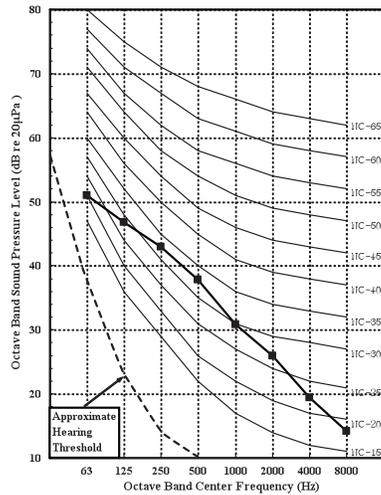


Figure 11:ARV00903RA6

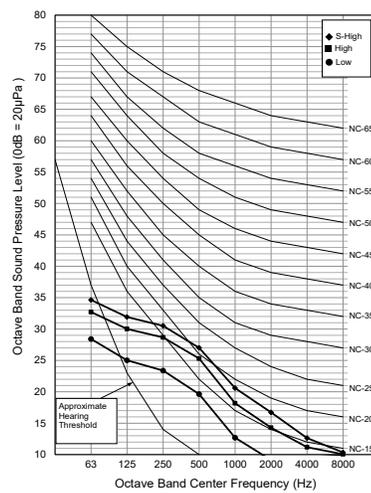
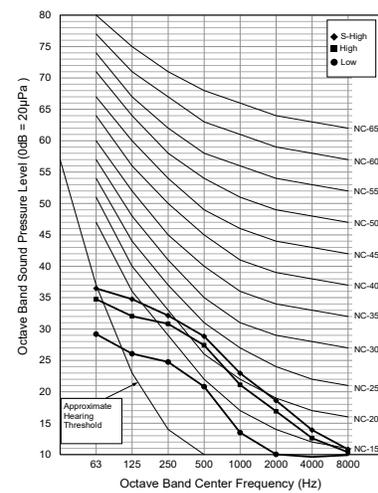


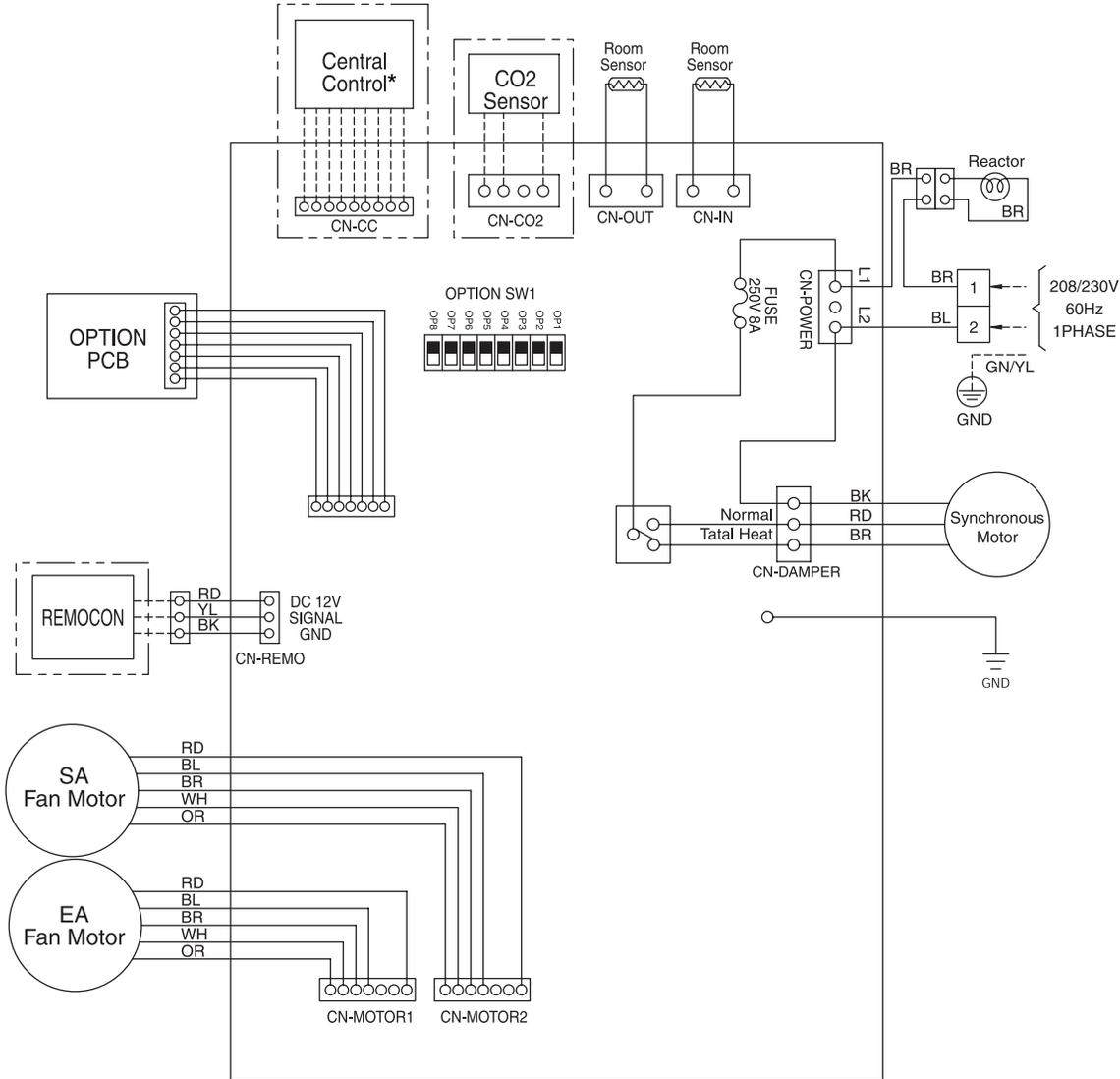
Figure 12:ARV01203RA6



WIRING DIAGRAMS

ZE Chassis

Figure 13:ZE Chassis.



*Central controller requires PI485 (PSNFP14A0)

INFORMATION	
* Purchase a dedicated circuit separately	
* - - - - - Field Wiring	
* [- - - - -] Accessory	

Note
 RD : RED
 BR : BROWN
 BL : BLUE
 BK : BLACK
 OR : ORANGE
 YL : YELLOW
 WH : WHITE
 GN/YL : GREEN / YELLOW

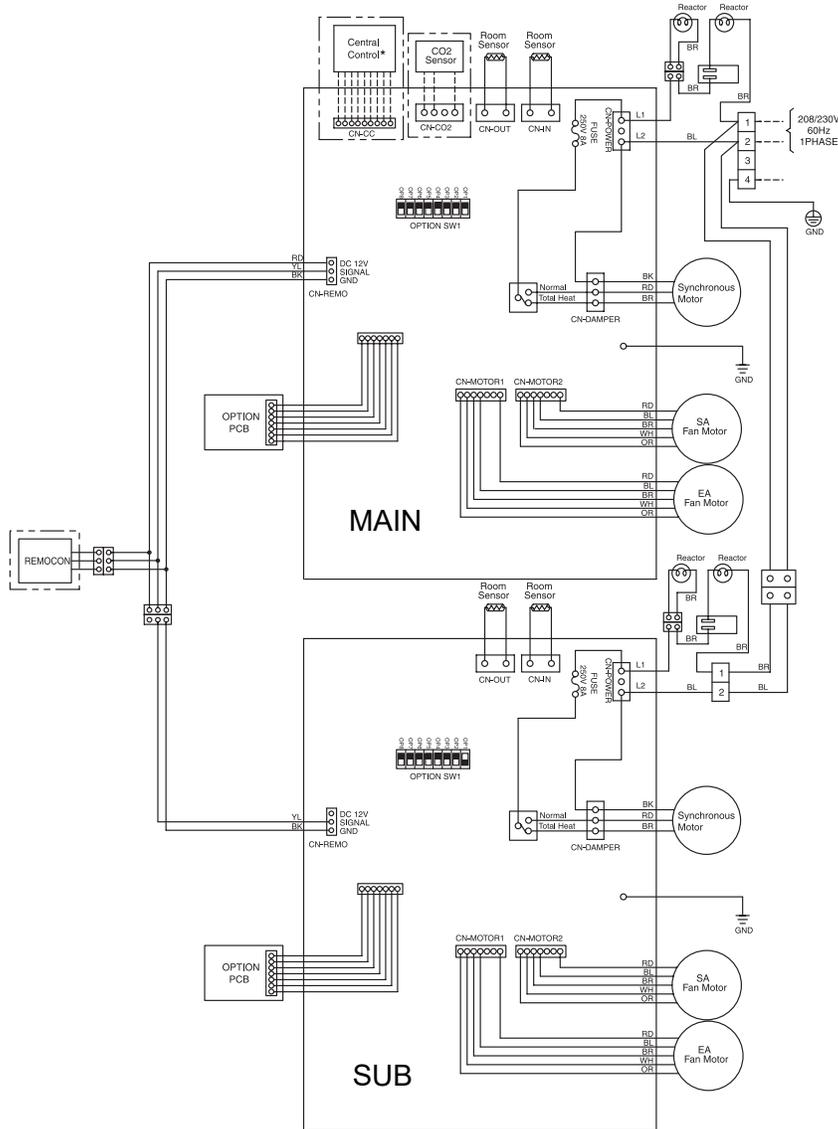
⚠ WARNING

- There is risk of electric shock due to failure or electric leakage.
- Installation work must be performed by authorized personnel and in accordance with the national wiring standards.

WIRING DIAGRAMS

ZF Chassis

Figure 14:ZF Chassis.



*Central controller requires PI485 (PSNFP14A0)

INFORMATION	
* Purchase a dedicated circuit separately	
* - - - - - Field Wiring	
* Accessory	

Note
 RD : RED
 BR : BROWN
 BL : BLUE
 BK : BLACK
 OR : ORANGE
 YL : YELLOW
 WH : WHITE
 GN/YL : GREEN /YELLOW

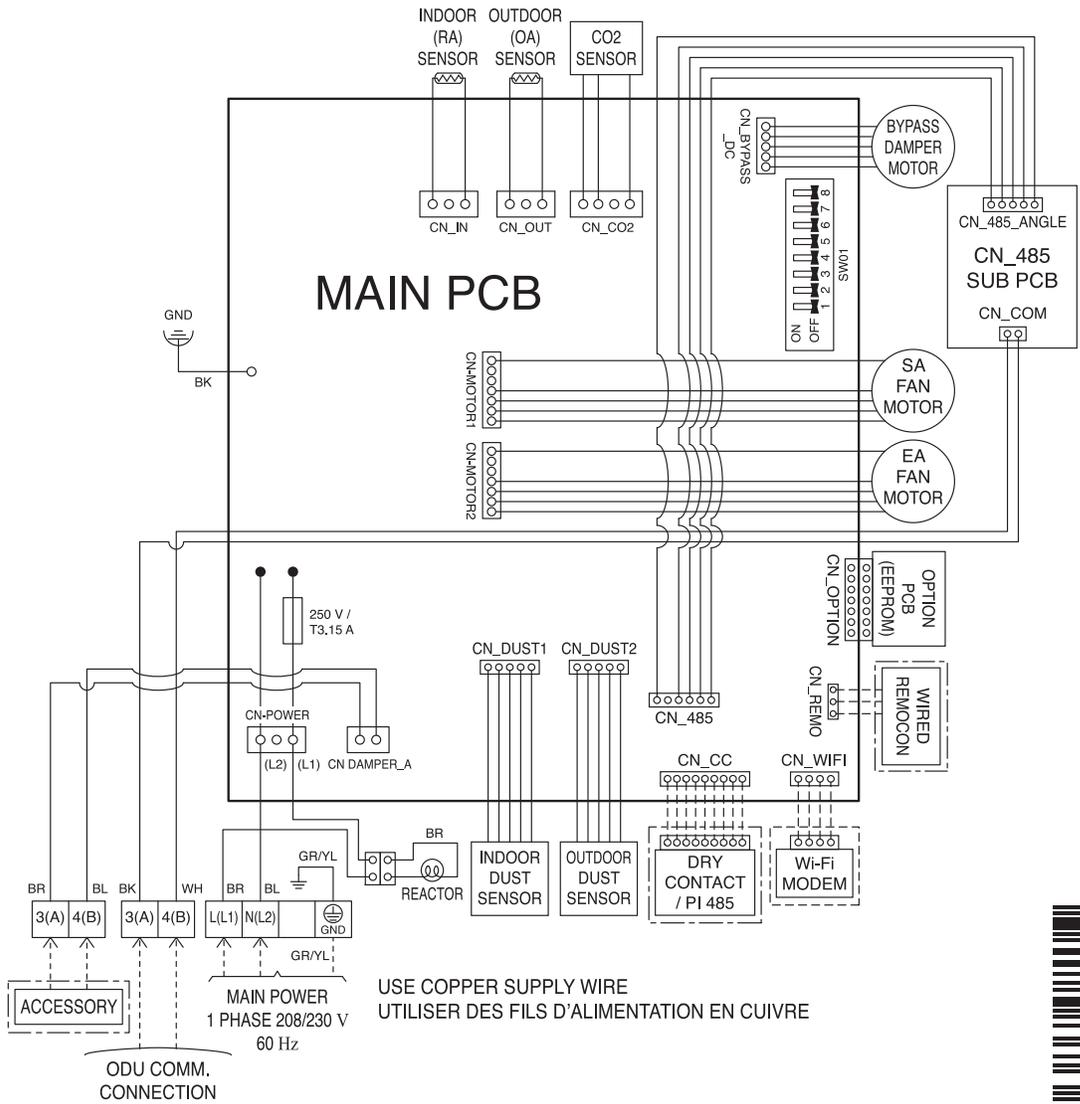
⚠ WARNING

- There is risk of electric shock due to failure or electric leakage.
- Installation work must be performed by authorized personnel and in accordance with the national wiring standards.

WIRING DIAGRAMS

ZR Chassis

Figure 15:ZR Chassis.



⚠ WARNING

- There is risk of electric shock due to failure or electric leakage.
- Always ground the product.
- You can install the product by referring to owner's manual.
- Do not remove the motor connector when the power is on. This can cause motor failure.

INFORMATION

- You need to buy a dedicated circuit separately.

Note

BR : BROWN
 BL : BLUE
 BK : BLACK
 GN/YL : GREEN/YELLOW

* This function may be applied differently depending on the application model.
 * When connecting connectors, make sure they match the color, size, and name on the PCB.

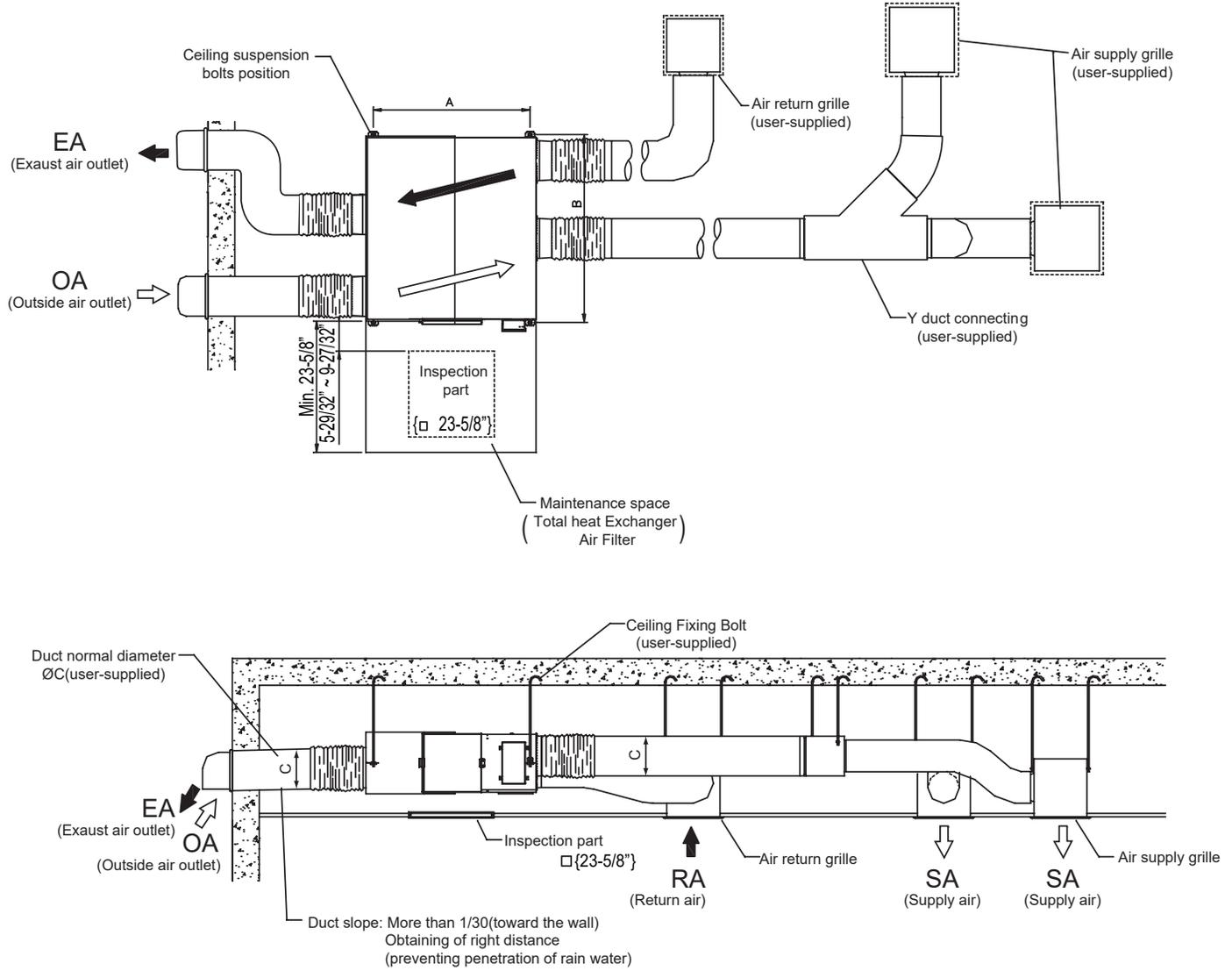
MEZ68959203 (REV00)



INSTALLATION AND LAYOUT BEST PRACTICES

ZE Chassis

Figure 16:ZE Chassis Installation Drawing.

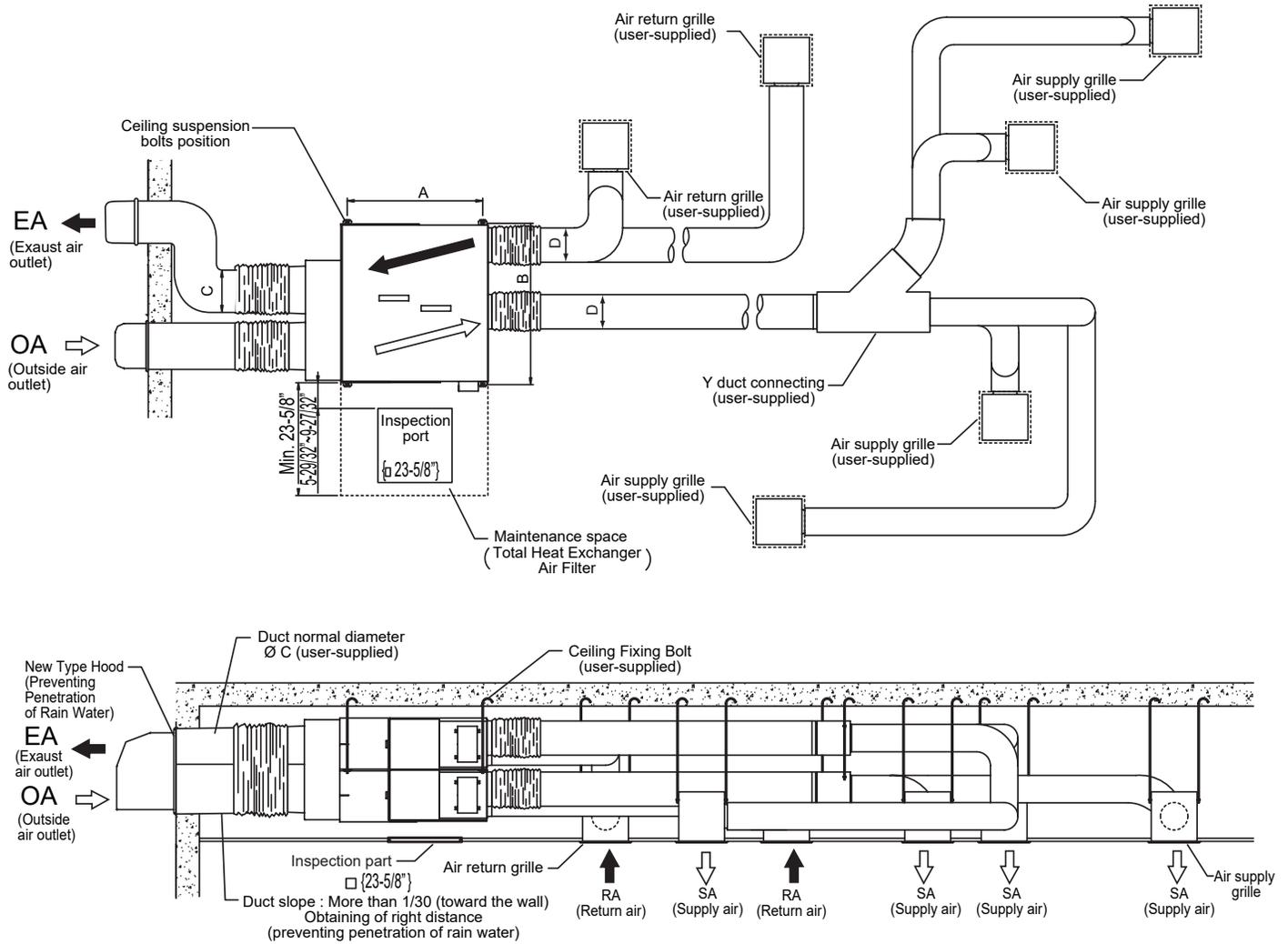


Model	Dimensions (inch)		
	A	B	C
ARVU053ZEA2 ARVU063ZEA2	38-27/32	46-5/16	9-27/32

INSTALLATION AND LAYOUT BEST PRACTICES

ZF Chassis

Figure 17:ZF Chassis Installation Drawing.

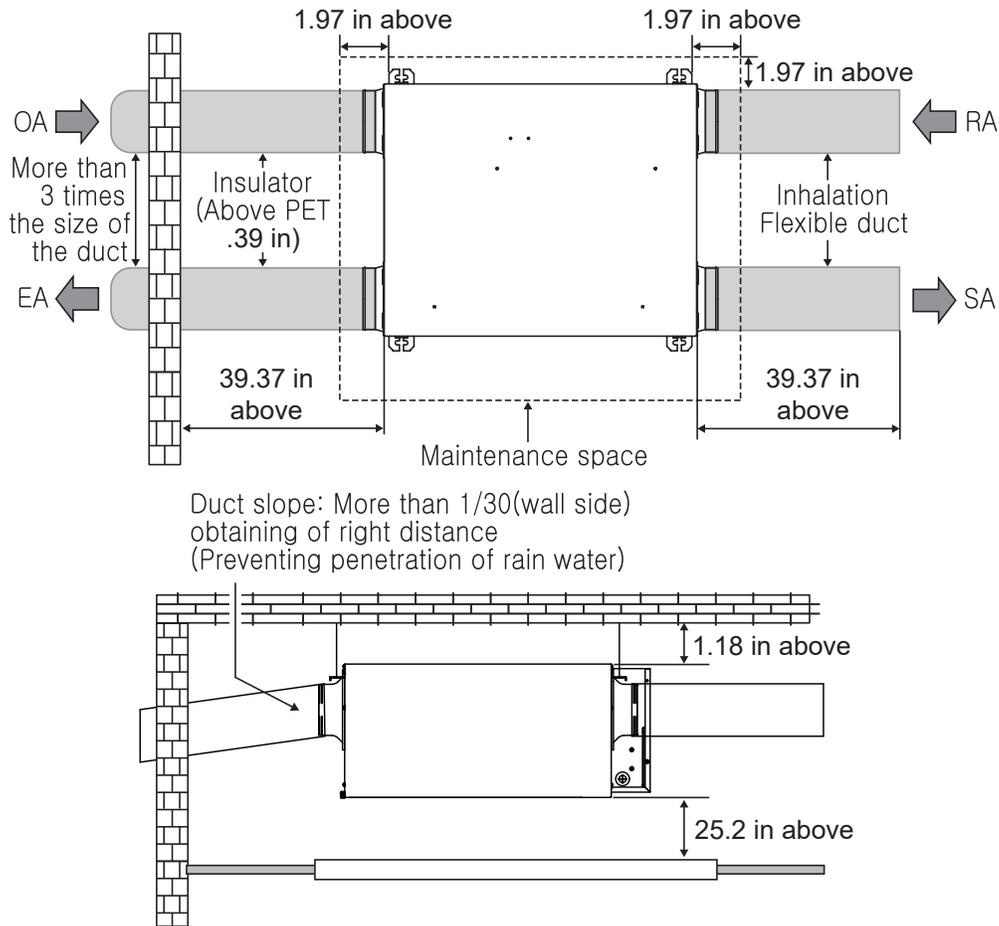


Model	Dimensions (inch)			
	A	B	C	D
ARVU093ZFA2	38-27/32	46-5/16	13-25/32	9-27/32
ARVU123ZFA2	38-27/32	46-5/16	13-25/32	9-27/32

INSTALLATION AND LAYOUT BEST PRACTICES

ZR Chassis

Figure 18: ZR Chassis Installation Drawing.

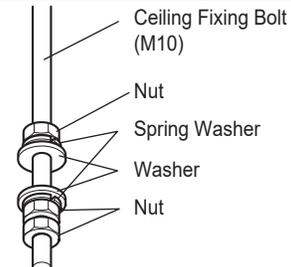


Installation of Main Body

Assembly of washer, Nut

Tighten the commercial washer nut (more than .83 in for the outside diameter of M10, to the commercial ceiling fixing bolt (M10) as shown in the figure.

- For the ceiling fixing bolt, perform work less than 1.97 in under the ceiling fixing bracket.

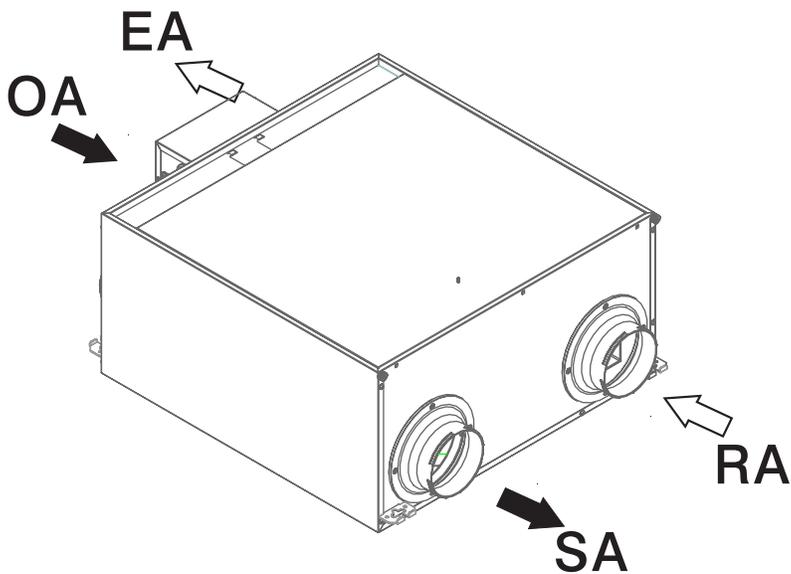


INSTALLATION AND LAYOUT BEST PRACTICES

Main Body Installation

- Attach the hanger bracket to the suspension bolt. Use nuts and washers (field supplied) to secure the upper and lower sides of the hanger bracket.
- Install the unit after checking the indoor (SA/RA) and outdoor (EA/OA) in accordance with the figure duct direction label.
- Install flexible duct between the unit and duct.
- Minimum thickness of the insulation for the connecting duct must be 3/8 inch.
- Tighten the upper nut.
- Use a level instrument to make sure that the unit is level.

Figure 19:ZR Main Body Installation.

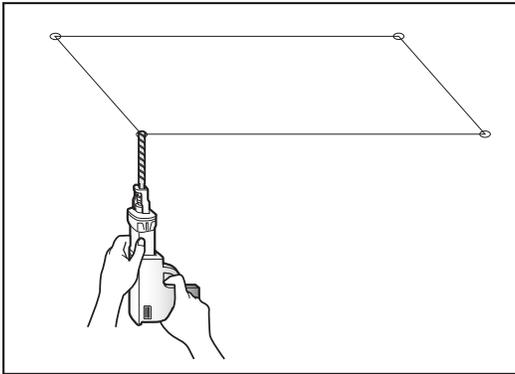


INSTALLATION AND LAYOUT BEST PRACTICES

Installing Fixing Bolts

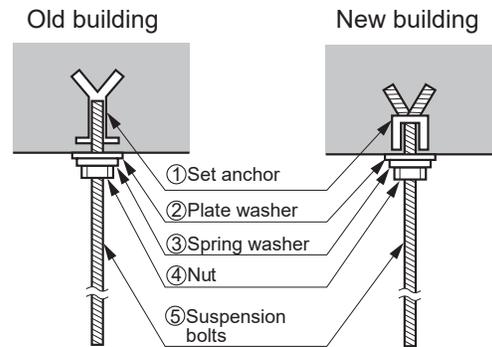
- Select and mark the position for the fixing bolts.
- Drill a hole on the face of the ceiling for the anchor.

Figure 20: Installing Fixing Bolts.



- Insert the anchor and washer on the suspension bolts to lock them in the ceiling.
- Firmly mount the suspension bolts to the anchor.
- User nuts, washers and spring washers to secure the installation plates onto the suspension bolt.

Figure 21: Securing Suspension Rods.



Selecting the Best Location

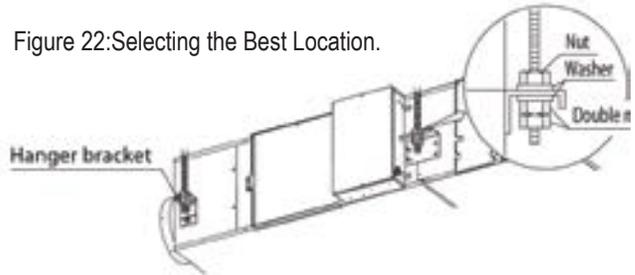
Do's

- Place the unit where it will be level and can support the weight of the unit.
- Install the unit where it can withstand vibration.
- Install the unit where service can be performed easily.

Don'ts

- Avoid installing the unit where inflammable gas is generated, flows, stored or vented.
- Avoid installing the unit where sulfurous acid gas or corrosive gas is generated.
- Avoid installing the unit near places near high frequency generators.

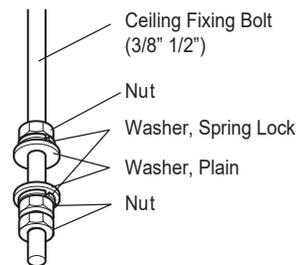
Figure 22: Selecting the Best Location.



Assembling Washer Nut

- Tighten the commercial washer nut (more than 13/16) for the outside diameter of 3/8" to the commercial ceiling fixing bolt 3/8".

Figure 23: Assembling the Washer Nut.



INSTALLATION AND LAYOUT BEST PRACTICES

ZE / ZF Chassis Power Wiring

Connecting Power Wiring

1. Remove two screws and open the cover of the control box.
2. Connect the main power wires to the terminal block.
3. After inserting the power wires into the bushing, fully insert it into the terminal block for connection.
4. Fix the power wires with the clamp.
5. Pull the power wires to ensure they cannot be removed.

Figure 24: Opening Control Box.

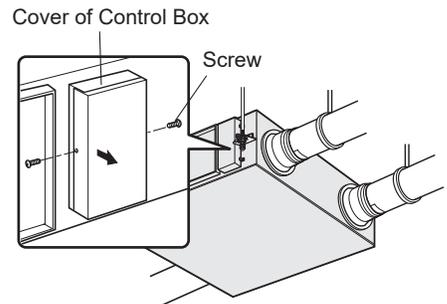
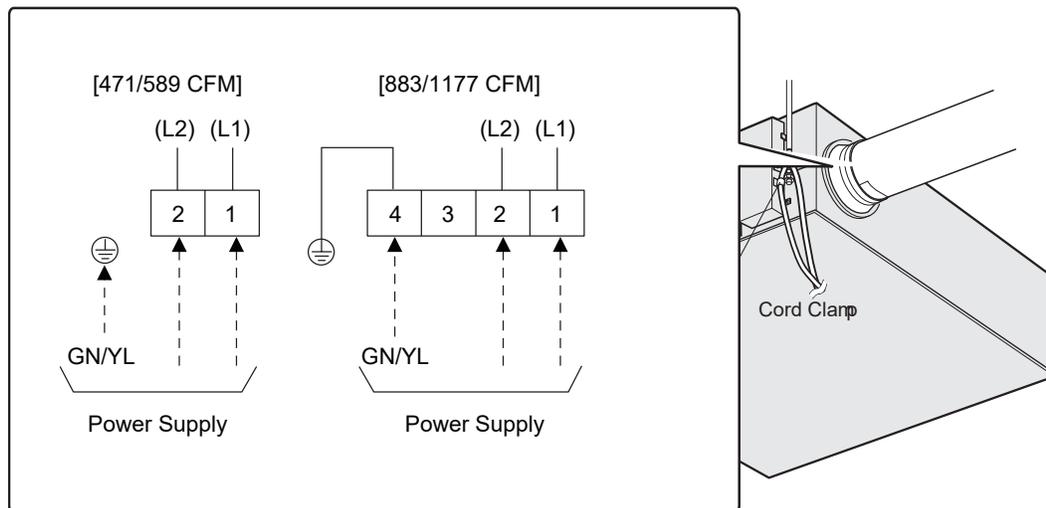


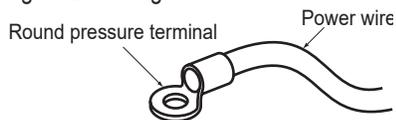
Figure 25: Inserting the Power Wiring.



Wiring Precautions

Use round pressure terminals for connections to the power terminal block.

Figure 26: Wiring Precautions.

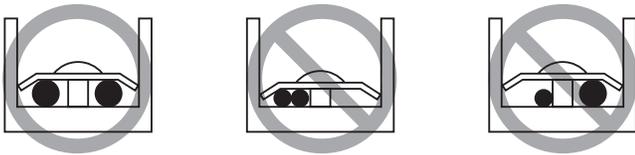


INSTALLATION AND LAYOUT BEST PRACTICES

ZE / ZF Chassis Power Wiring

- Do not connect wiring of different thickness to the power terminal block (slack in the power wiring could cause abnormal heat).
- When connecting wiring which is the same thickness, connect the wiring according to the first image shown below.

Figure 27: Connecting Wiring.



Conduit Connection

1. Set the connecting cable into the terminal block of the indoor unit and tighten the screw to lock the conduit bracket to the indoor unit.
2. Join the conduit and the conduit bracket together.
3. Use the elbow type (L-Type) conduit.

Figure 28: Conduit Connection.

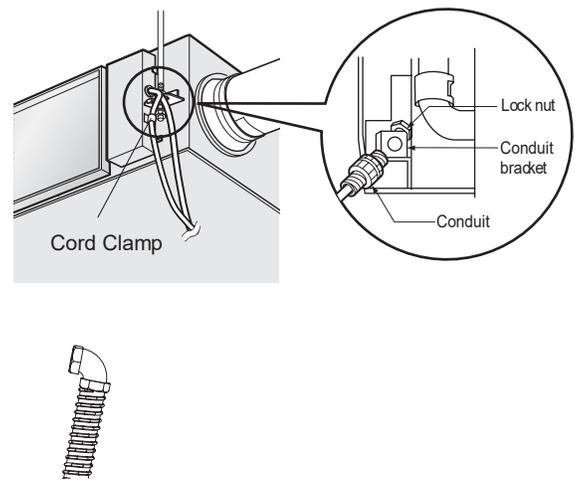
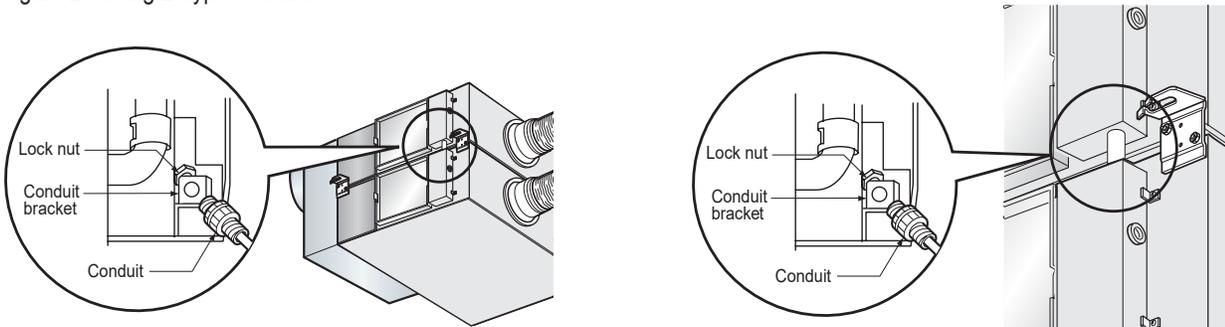


Figure 29: Using L-Type Conduit.

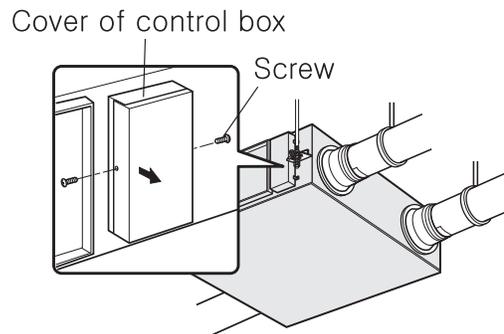


INSTALLATION AND LAYOUT BEST PRACTICES

ZR Chassis Power Wiring

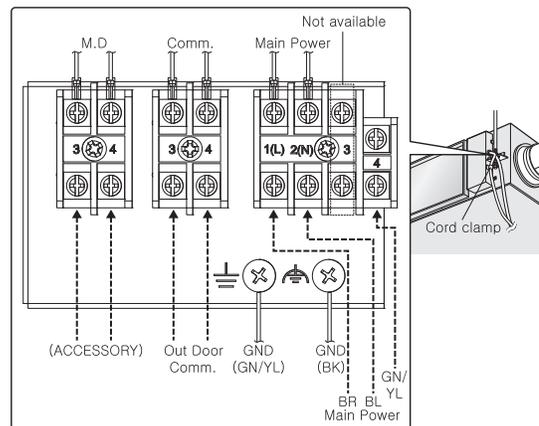
1. Release two screws and then open the cover of the control box.

- With reference to the below wiring diagram, accurately connect the main power cords into the terminal block.



2. After inserting the power cord into the bushing, fully insert it into the terminal block for connection.

- Fix the power cords with the clamp.
- Make sure that the power cords may not be removed by pulling them.



Capacity	150 / 200 CMH
Circuit Breaker	250 V / 5 A

⚠ WARNING

This appliance must be properly grounded.

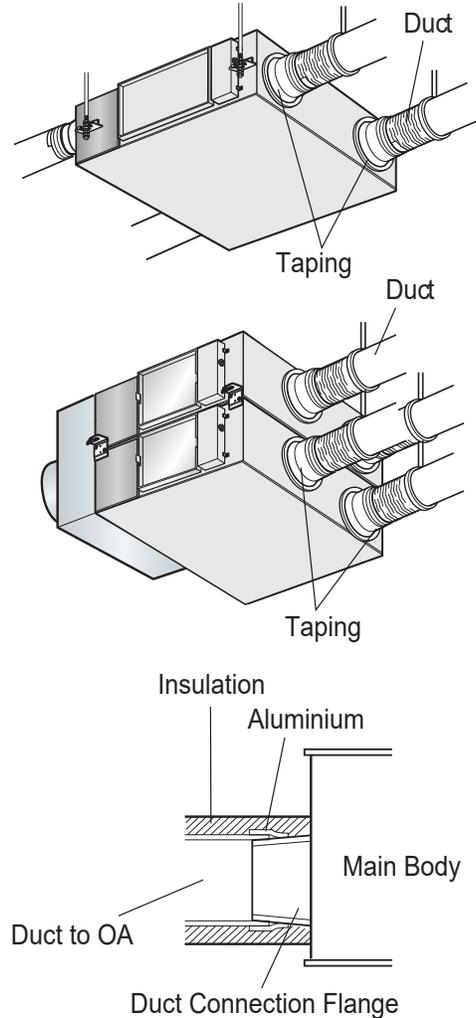
INSTALLATION AND LAYOUT BEST PRACTICES

Duct Connection

Connecting the Duct

- After securely connecting the duct with the duct connection flange, wrap it with commercial aluminum tape so that air cannot leak out.
- Adjust the duct from the ceiling so that no force is applied to the main body of the ventilation system.
- Ensure that there are no foreign materials in the duct before connecting the duct.
- Ductwork connected to ERV should be insulated to prevent condensation.

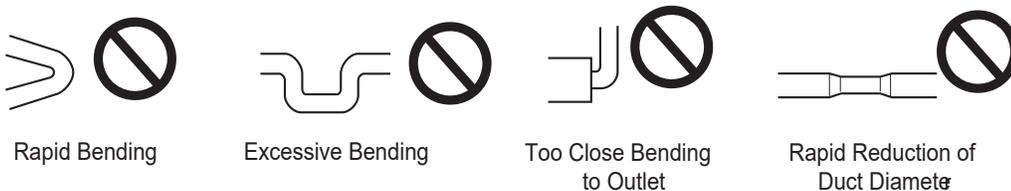
Figure 30: Connecting the Duct.



Note:

To avoid causing a reduction in air volume or abnormal noise, do not connect the duct as shown in the image below.

Figure 31: Bad Duct Connection Examples.



⚠ WARNING

- If an electric duct heater is connected, it must include a built-in safety device to prevent heater operation when airflow is not present, to prevent the possibility of fire, property damage, and/or personal injury.
- When the outdoor air temperature falls below the ERV operating limit (14°F), the electric duct heater temperature control shall energize the electric duct heater to pre-heat the outdoor air above 14°F.

INSTALLATION AND LAYOUT BEST PRACTICES

Table 6: Installer Setting Codes and Values Table

No.	Function	Code	Value
1	Setting Address of Central Control	01	00~FF : Address of central control
2	Supply ESP	02	Value1 - Step(01:low, 02:high, 03:super high)
3	Exhaust ESP	03	Value 2 - ESP value (0 ~ 255)
4	Product direction	04	01: Normal, 02:Reverse
5	Quick Refresh Priority	05	01:Supply air first, 02: Exhaust air first
6	Master setting	06	00:Slave, 01:Master
7	Dry Contact Auto	07	00:OFF, 01:ON
8	Release of 3 Min Delay	08	01:Set

Setting Address of Central Control

1. When connecting central control, it sets the central control address of the indoor unit.
2. Function control and setting
 - Select the address code with inputting the up-down button (0~ F).
 - Change the items with inputting the right-left button. (Group address <-> indoor unit address)
 - Set the address with inputting Setting/Cancel button (indoor data send)

Supply/Exhaust ESP Setting

1. Set the E.S.P (RPM) value of the air conditioner unit.
2. Function control and setting
 - Select the wind strength with inputting up-down button.
 - 01:low, 02:high, 03:very high (Seg flickering)
 - Move the setting items with inputting the right-left button.
 - Airflow selection <-> RPM value selection (Seg of selected item is flickering)
 - Select the RPM value of airflow with inputting up-down button.
 - 0~ 255 (Seg selecting)
 - Complete the RPM setting with inputting Setting/Cancel button (send RPM setting data of indoor unit).
 - Set the exhaust air ESP with conducting the steps above and inputting the function setting button and changing installer code to 04.

Product Direction

1. Set the installation direction of the ventilation for the indoor unit.
2. Function control and setting
 - Select the direction value with inputting the up-down button.
 - 01:normal direction, 02:opposite direction
 - Complete the setting with inputting Setting/Cancel button (stop flickering and send the date to the indoor unit).

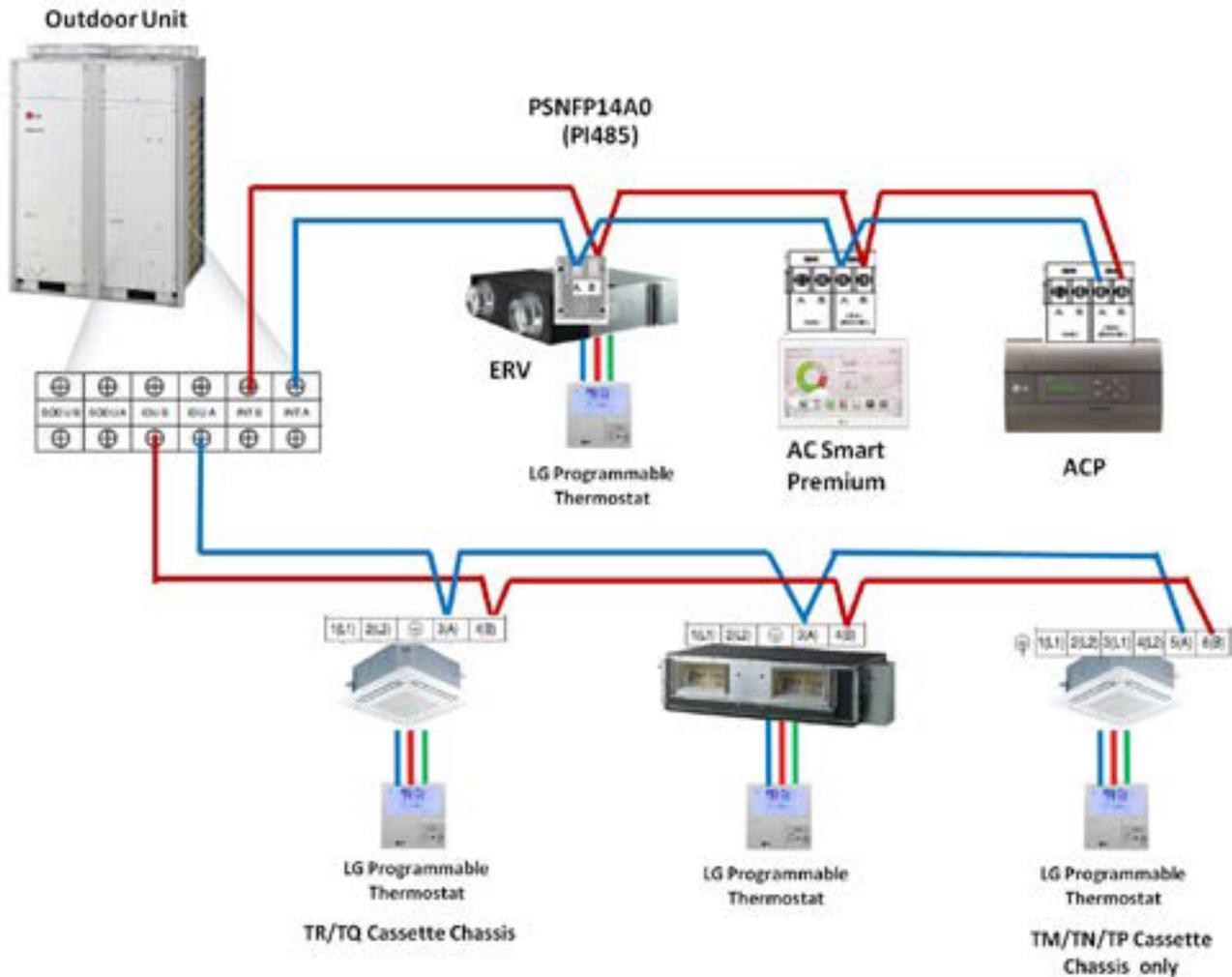
INSTALLATION AND LAYOUT BEST PRACTICES

ZE /ZF Chassis V-Net Wiring

V-Net Wiring

- This unit can be used as part of the combined operation system used together with Multi V indoor units or as an independent system for processing outside air.

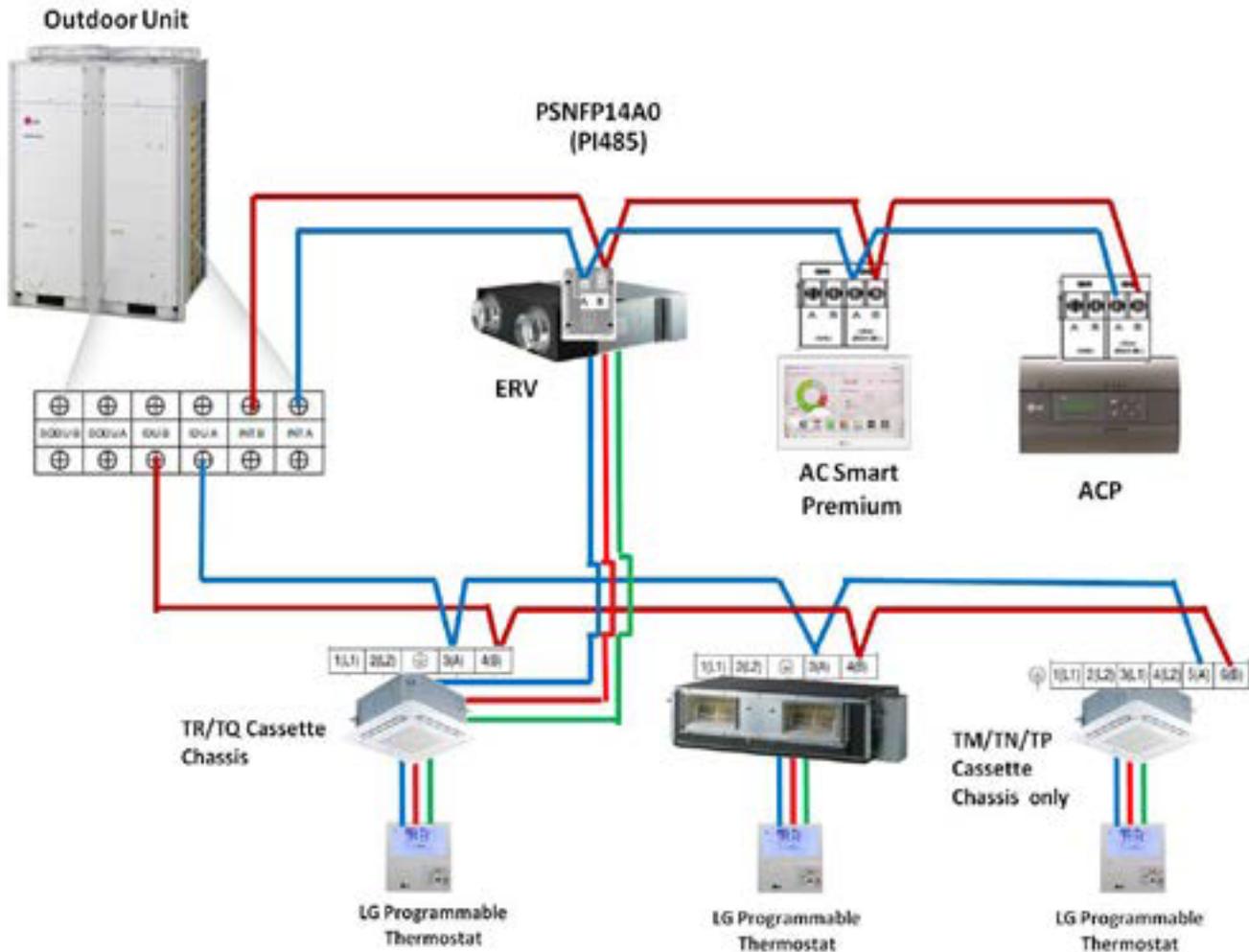
Figure 32:V-Net Wiring - Combined Operation System.



INSTALLATION AND LAYOUT BEST PRACTICES

ZE /ZF Chassis V-Net Wiring

Figure 33:V-Net Wiring - Independent System.

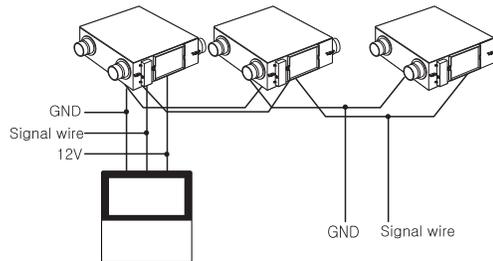


When interlocking ERV to indoor unit thermostat, ERV fan will **not** be interlocked to IDU fan. ERV mode and ON/OFF status can be controlled using "Vent" button.

INSTALLATION AND LAYOUT BEST PRACTICES

ZR Chassis Group Control

1. When installing more than 2 units of air conditioner to one wired remote controller, please connect as the below figure.
 - If it is not event communication indoor unit, set the unit as sub.
 - Check for event communication through the product manual.

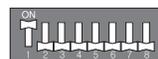


When controlling multiple indoor units with event communication function with one remote controller, you must change the main/sub setting from the indoor unit.

- Alter the main/sub switch while power stays 'Off' and then turn the power 'On' after one minute from the alteration.
- For ceiling type cassette and duct product group, change the switch setting of the indoor PCB.



#1 switch Off: Main
(Factory default setting)

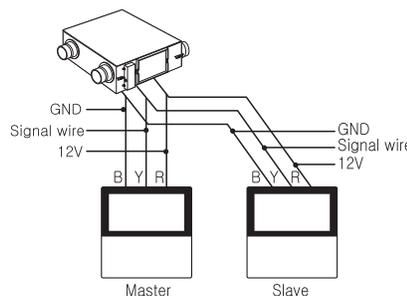


#1 switch On: Sub

- For wall-mount type and stand type product, change the main/sub setting with the wireless remote controller. (Refer to wireless remote controller manual for detail).
- When installing 2 remote controllers to one indoor unit with event communication function, set the main/sub of the remote controller. (Refer to remote controller main/sub selection).
- When installing the group, some functions excluding basic operation setting, fan level min/mid/max, remote controller lock setting and time may be limited.

2. When installing more than 2 wired remote controllers to one air conditioner, please connect as the below picture.

- When installing more than 2 units of wired remote controller to one air conditioner, set one wired remote controller as main and the others all as subs, as shown in the below picture.
- You cannot control the group as shown below for some product.
- Refer to the product manual for more detail.



<When simultaneously connecting
2 sets of wired remote controller>

Note

- When controlling in groups, set the main/sub of remote controller. Refer to Installer setting section on how to set main/sub for more detail.

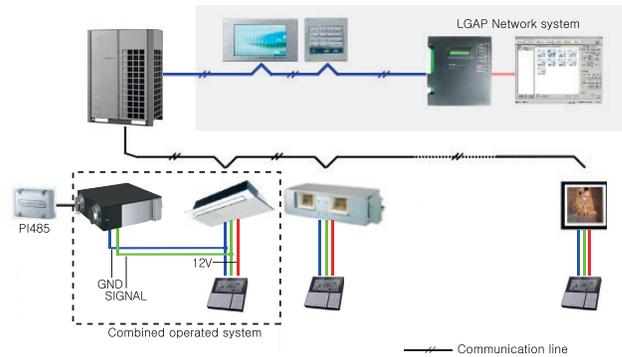
INSTALLATION AND LAYOUT BEST PRACTICES

ZR Chassis Group Control

This unit can be used as part of the combined operation system used together with indoor units (Multi V system air conditioner), or as an independent system for processing outside air.

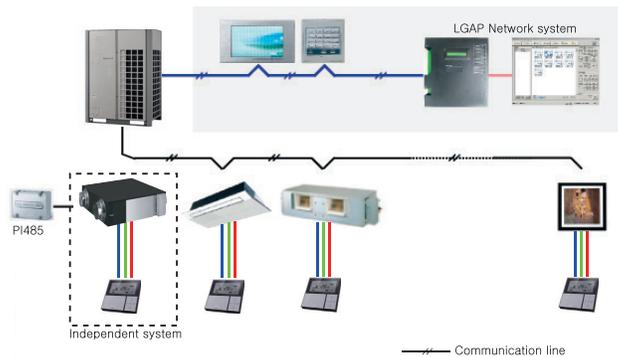
Combined Operation System with Multi V System

(Connected with ventilation units and standard indoor units in a single refrigerant circuit.)



Independent System

(Connected only with a ventilation unit in a single refrigerant circuit.)



MAINTENANCE AND SERVICE

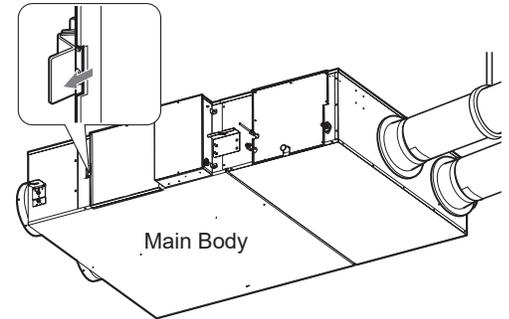
Maintenance and Service

- To prevent the ventilator from deteriorating, clean dust off the air filter and total heat exchanger regularly.

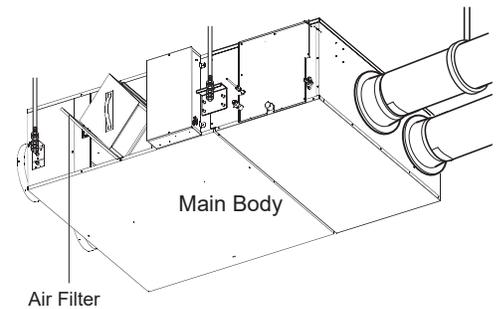
Removing the Filter and Heat Exchanger

1. Remove the maintenance cover.
 - Place your hands inside of the ceiling from the maintenance cover and pull the maintenance cover up.
 - Loosen the hinge and detach the maintenance cover.

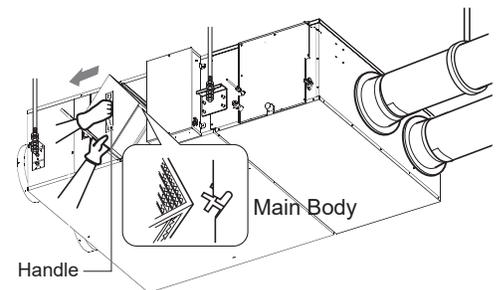
Figure 34: Removing the Filter and Heat Exchanger.



2. Remove the air filter.



3. Remove the total heat exchanger.

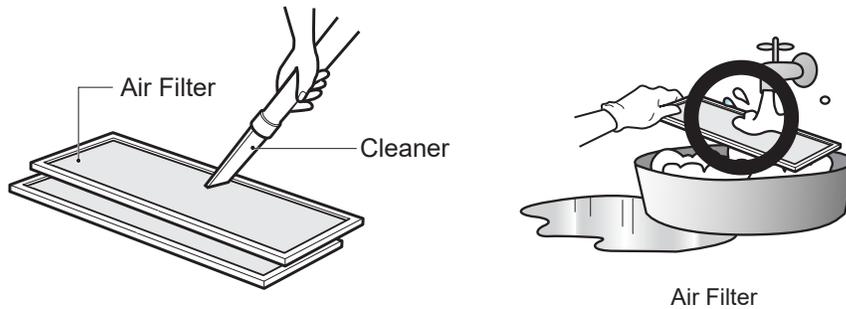


MAINTENANCE AND SERVICE

Air Filter Cleaning

- Clean the filter once every 6 months.
- Clean the dirt from the air filter using a vacuum cleaner or wash it with warm water.
- Dry the filter. Do not expose the air filter to direct sunlight or heat from fire.

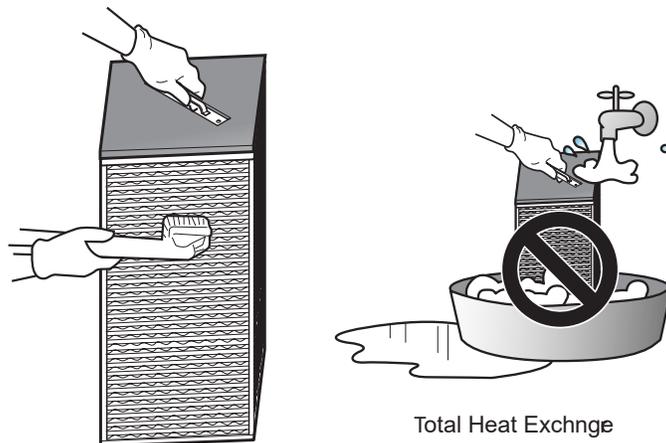
Figure 35:Cleaning the Air Filter.



Total Heat Exchanger Cleaning

- Use a soft brush and cleanser to remove dirt from the total heat exchanger.
- Never use water to clean the total heat exchanger.
- For service, contact the dealer or an authorized service center.

Figure 36:Cleaning the Total Heat Exchanger.

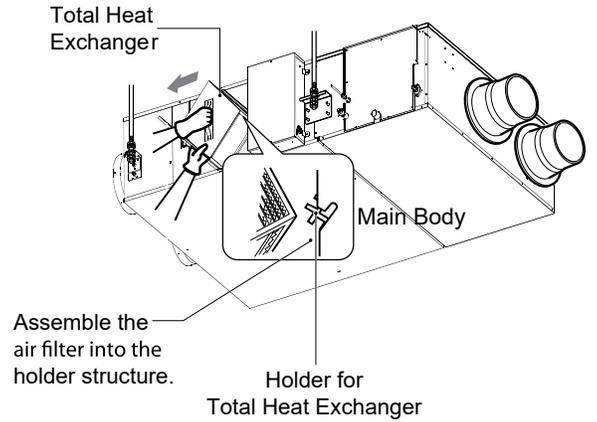


MAINTENANCE AND SERVICE

Reassembling the Total Heat Exchanger

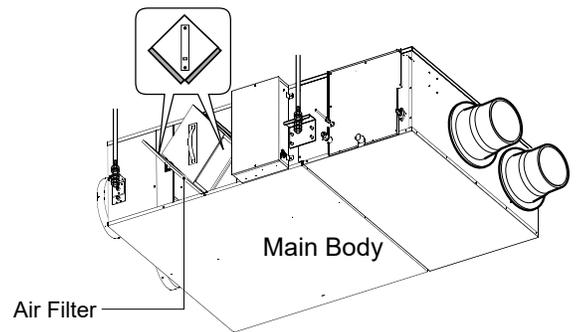
1. Securely put the corners of the total heat exchanger into the holder for assembly and slide them into the main body.

Figure 37: Assembling Total Heat Exchanger and Air Filter.

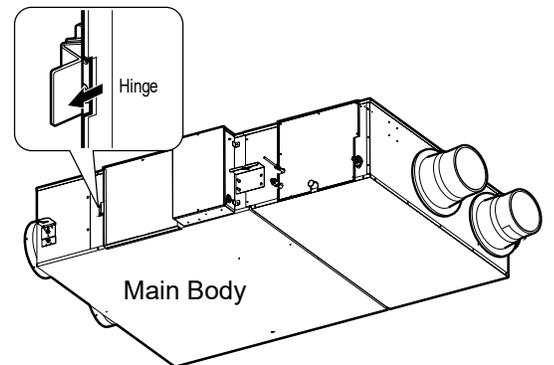


2. Assemble the air filter into the holding structure inside the total heat exchanger.

Be careful not to damage the surface of the total heat exchanger. Dust on the total heat exchanger may cause deterioration of air volume.



3. Fix the maintenance cover to the right hinge and fix it to the left side (a nameplate is attached toward the reading direction).



⚠ WARNING

Turn the breaker off prior to cleaning this product.

Part Name	Inspection Cycle (cleaning cycle)	Replacement Cycle
Air Filter	6 Months	3 Years
Total Heat Exchanger	1 Year	10 Years

162279



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Air Conditioning Technologies
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EM_ERV_09_23
Supersedes: EM_ERV_11_2022
VRF-EM-DT-001-US 014D11
VRF-EM-DT-001-US 013L12
VRF-EM-DT-001-US 013H21
VRF-EM-DT-001-US 013D10
VRF-EM-DT-001-US 013F04