



INSTALLATION MANUAL



Model:

UATYQ250MCY17
UATYQ350MCY17
UATYQ450MCY17
UATYQ550MCY17
UATYQ600MCY17
UATYQ700MCY17
UATYQ900MCY17

Installation Manual
Rooftop Package Units

English

Installationshandbuch
Kompaktanlage Für Dachmontage

Deutsch

Manuel D'installation
Conditionneurs D'air En Toiture

Français

Installatiehandboek
Compactsysteem Voor Dakmontage

Nederlands

Manual De Instalación
Unidades Del Conjunto Del Tejado

Español

Manuale Di Installazione
Unità A Pacchetto Per Installazione Sul Tetto

Italiano

Εγχειρίδιο εγκατάστασης
Αυτόνομες μονάδες στέγης

Ελληνικά

Manual De Instalação
Unidades De Conjuntos De Telhado

Português

Руководство По Установке
Компактные Установки Для Кондиционирования
Воздуха, Монтируемые На Крыше Здания

Русский

Instrukcja instalacji
Urządzenia dachowe (typu „rooftop”)

Polski

Kurulum kılavuzu
Çatı Tipi Ambalaj Üniteleri

Türkçe

Installationsmanual
Paketenheter för Takovansidor

Svenska



(Applicable to certified models only)

IM-5RTBR-0710(9)-DAIKIN (DENV)
Part No.: R08019035377I

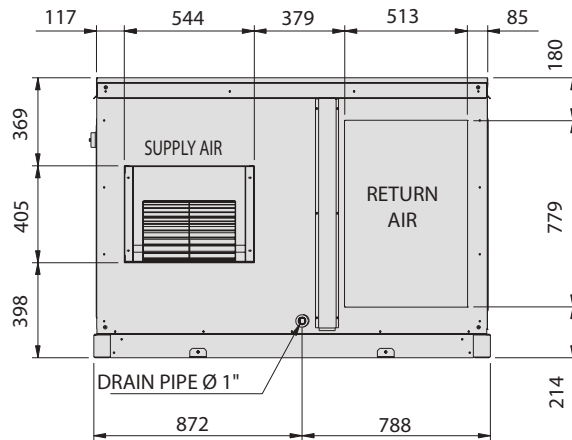
OUTLINE AND DIMENSIONS

Model: UATYQ250

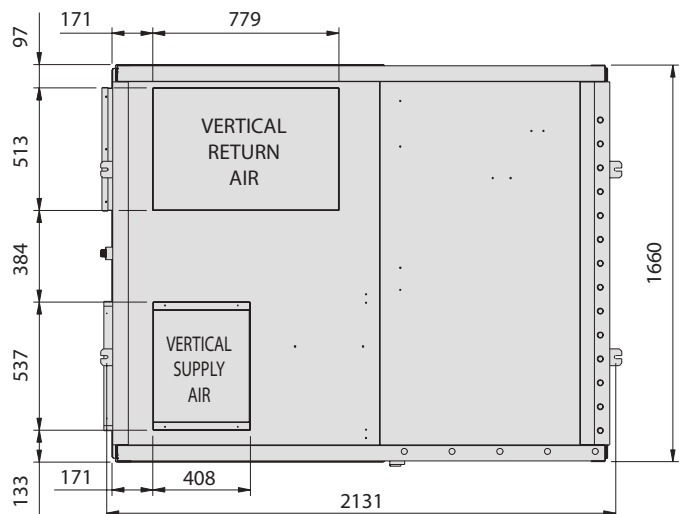
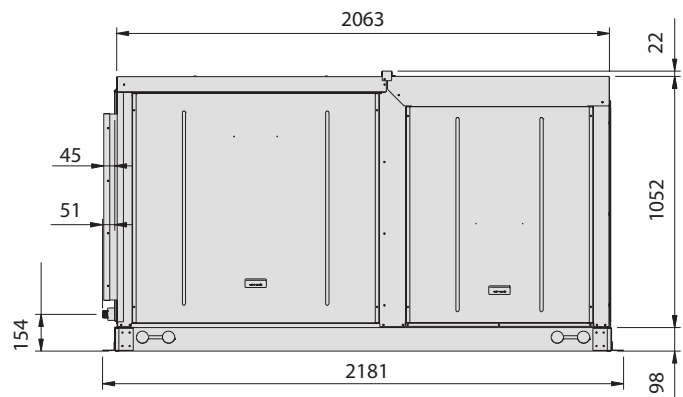
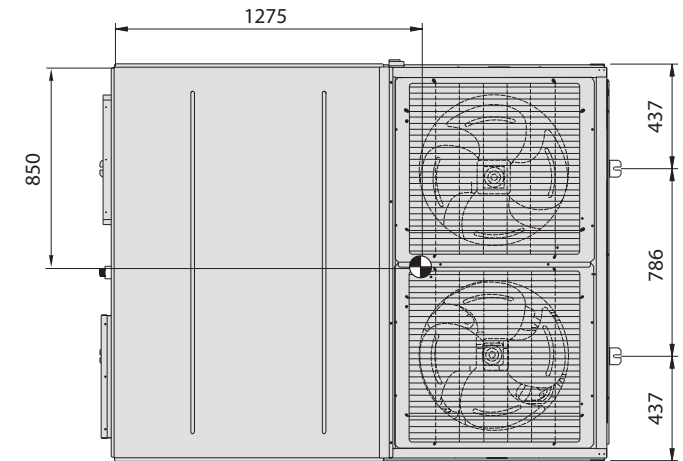
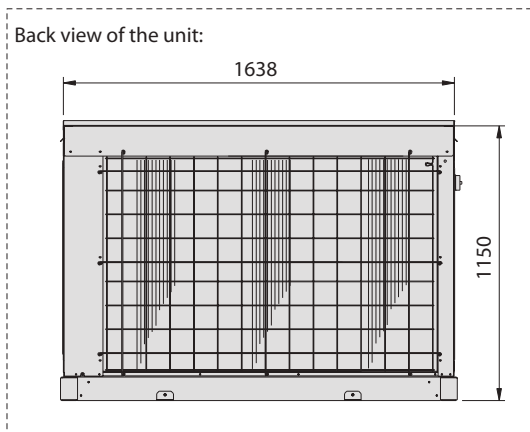
ENGLISH

Original Instruction

All dimensions are in mm



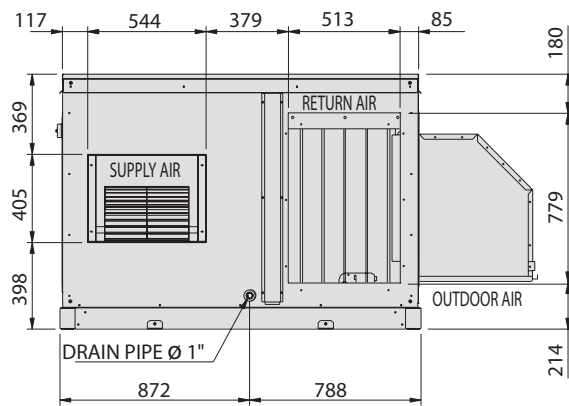
FOR HORIZONTAL DISCHARGE



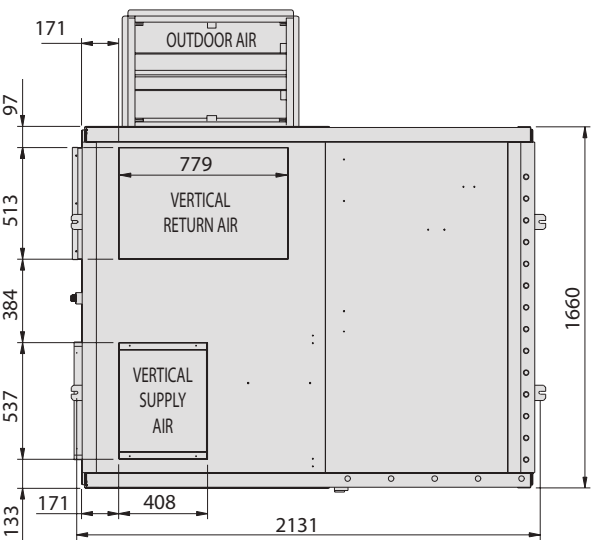
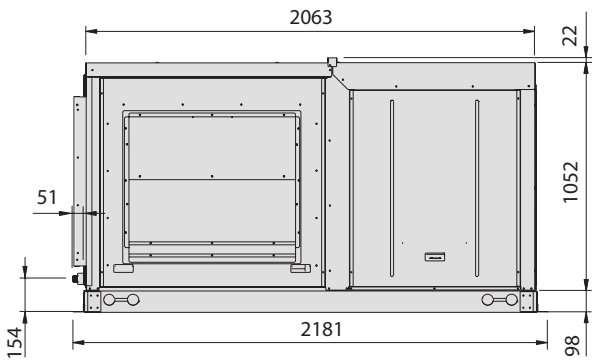
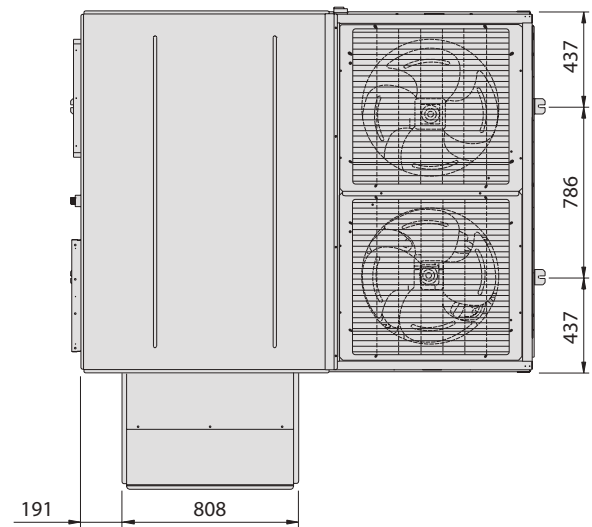
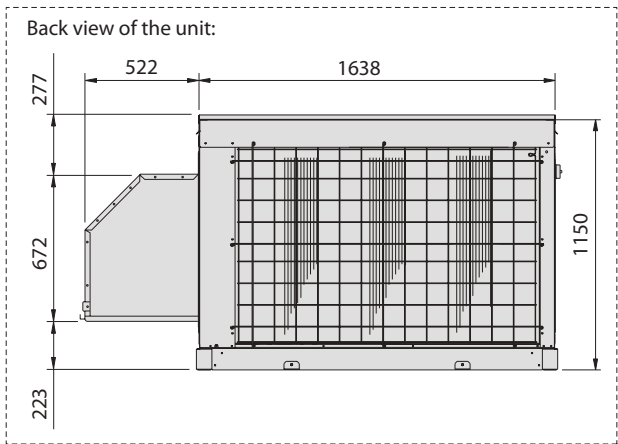
FOR VERTICAL DISCHARGE

Model: UATYQ250 WITH ECONOMIZER OPTION

All dimensions are in mm



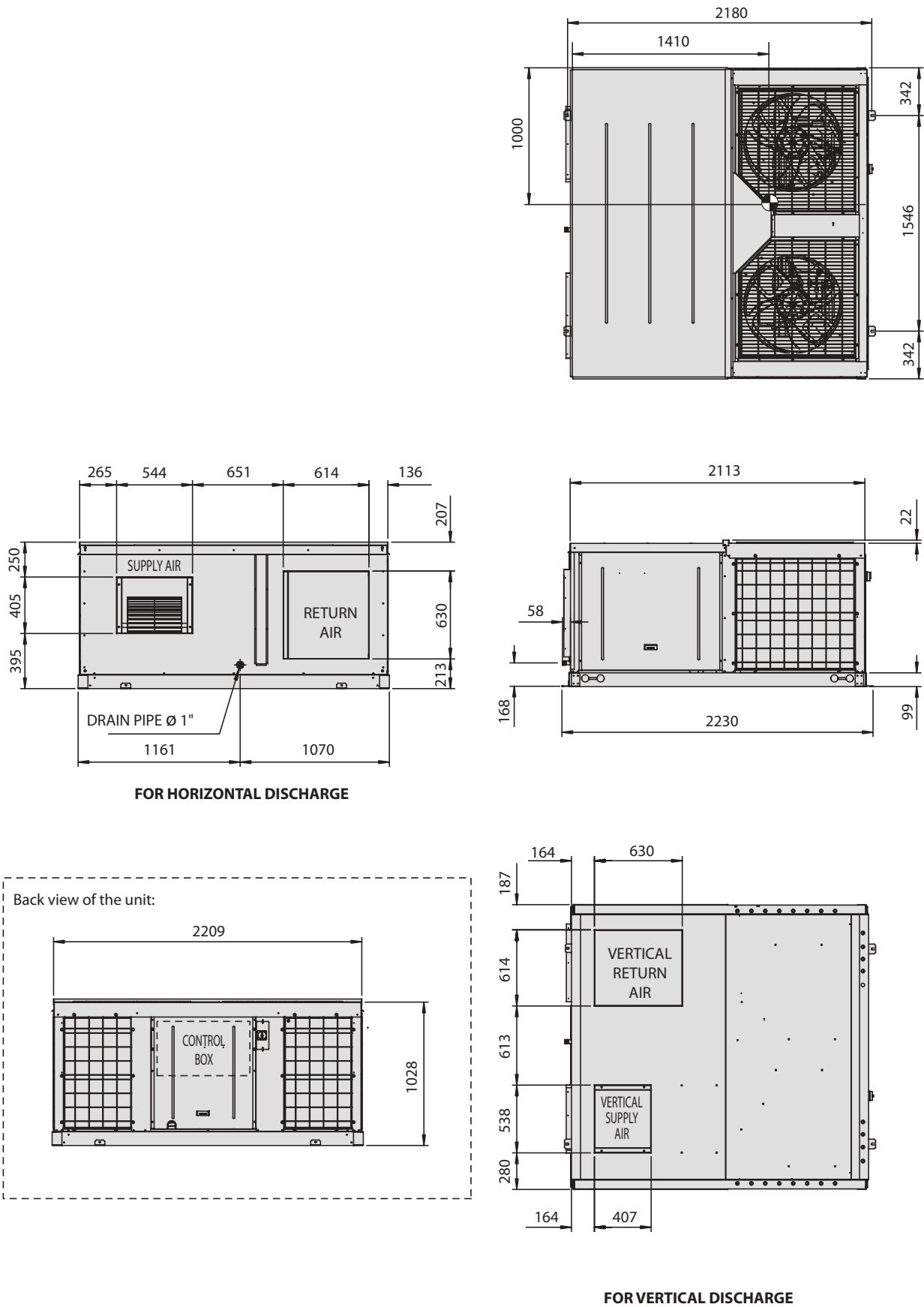
FOR HORIZONTAL DISCHARGE



FOR VERTICAL DISCHARGE

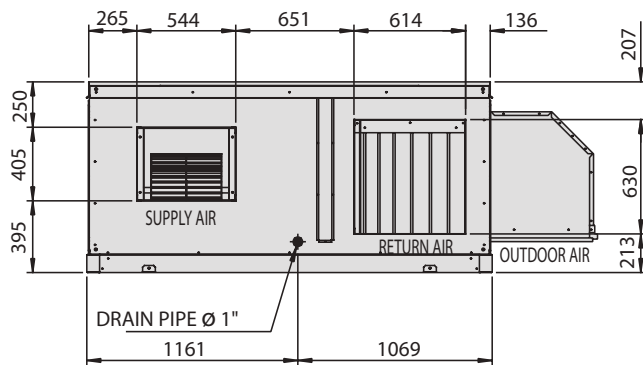
Model: UATYQ350

All dimensions are in mm

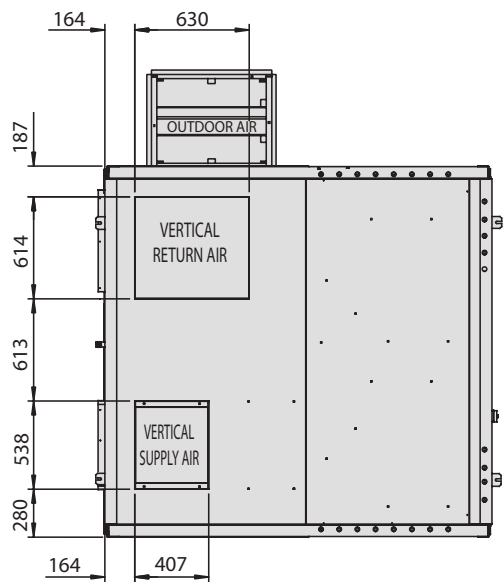
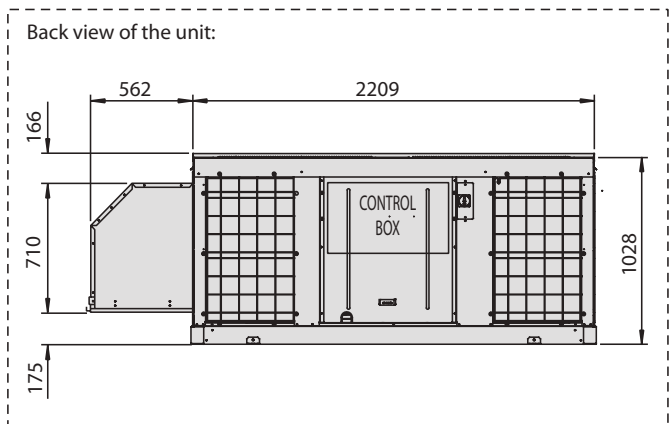
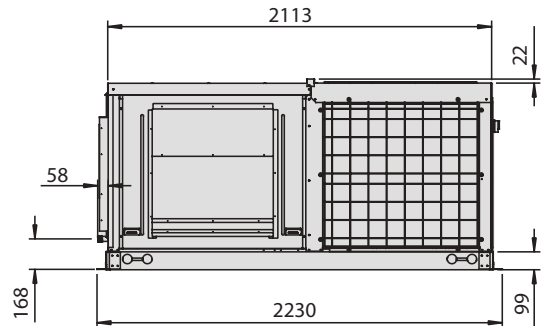
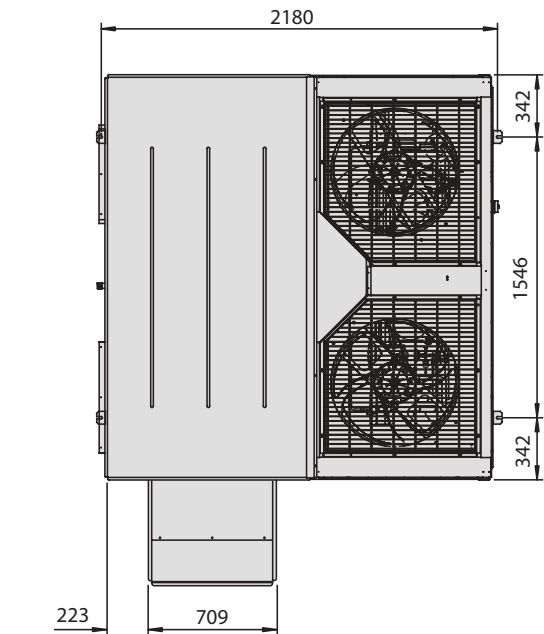


Model: UATYQ350 WITH ECONOMIZER OPTION

All dimensions are in mm

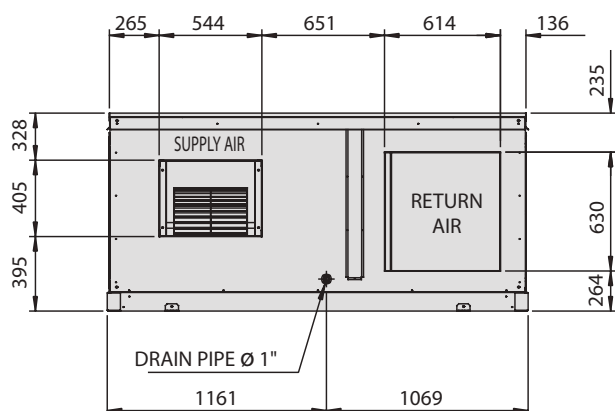


FOR HORIZONTAL DISCHARGE

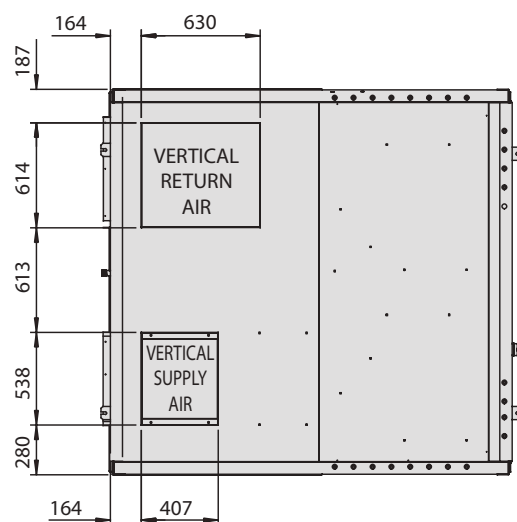
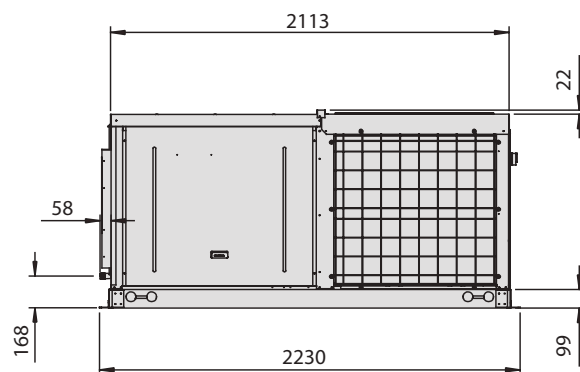
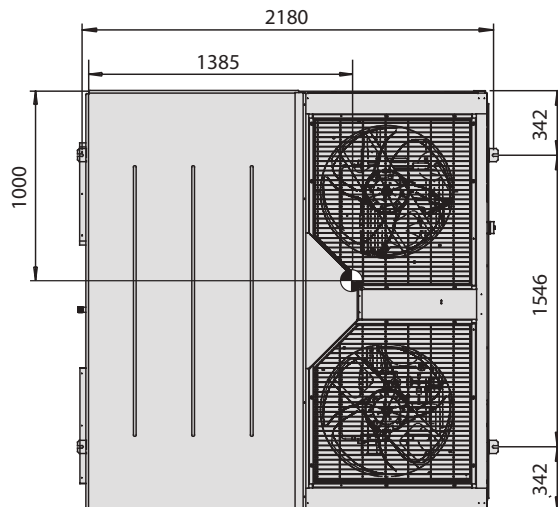
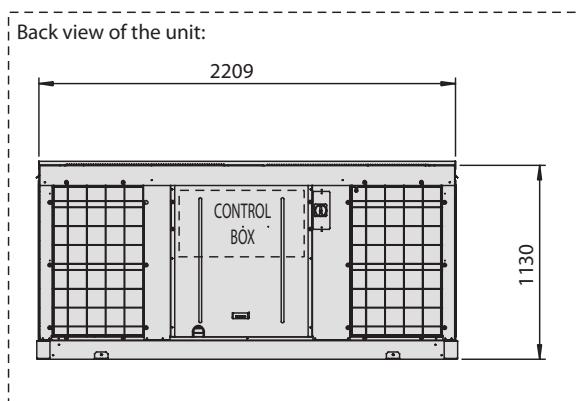


FOR VERTICAL DISCHARGE

All dimensions are in mm



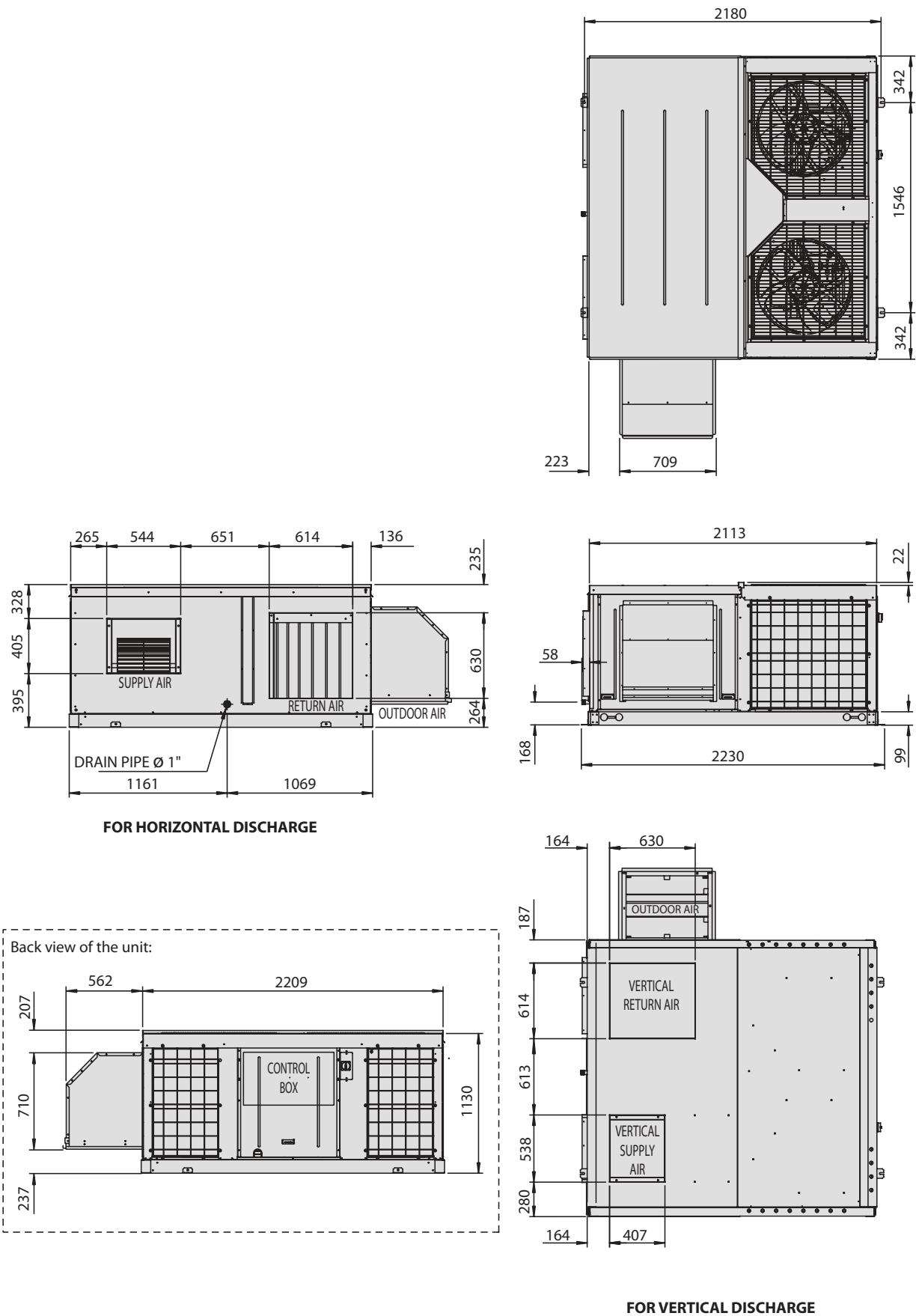
FOR HORIZONTAL DISCHARGE



FOR VERTICAL DISCHARGE

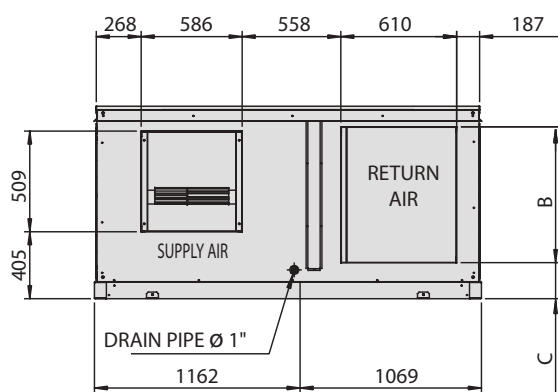
Model: UATYQ450 WITH ECONOMIZER OPTION

All dimensions are in mm

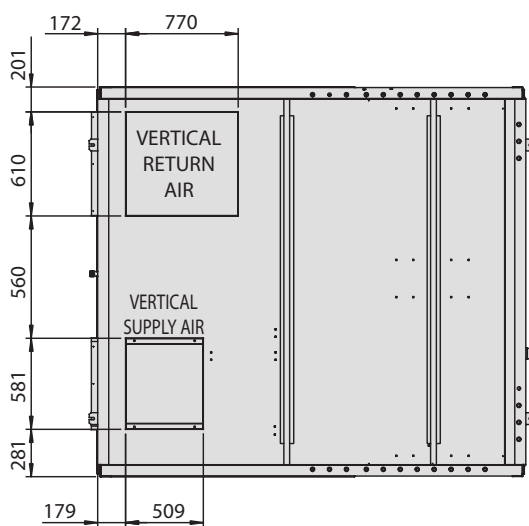
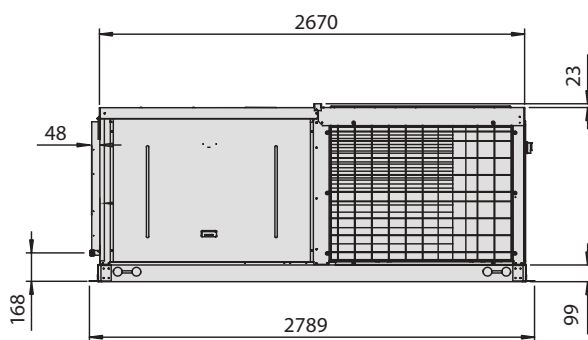
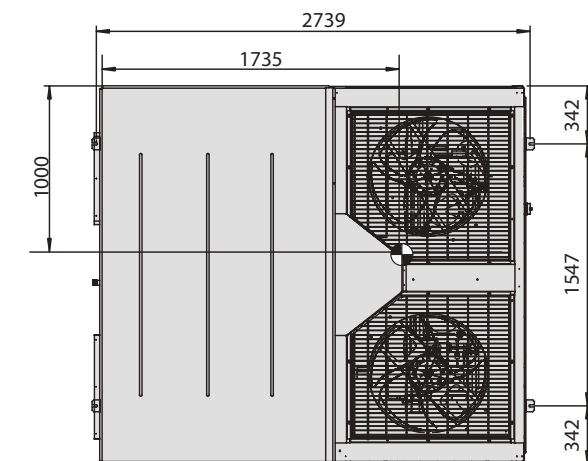
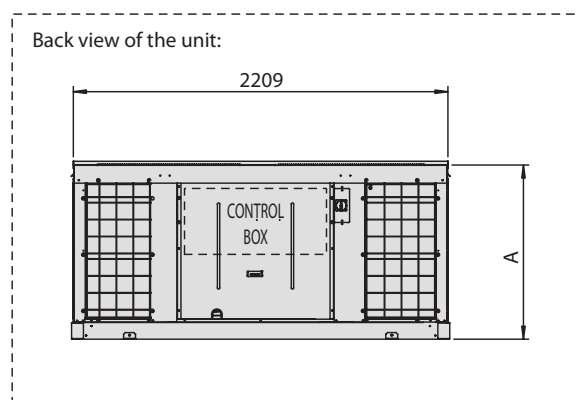


Model: UATYQ550/600/700/900

All dimensions are in mm



FOR HORIZONTAL DISCHARGE



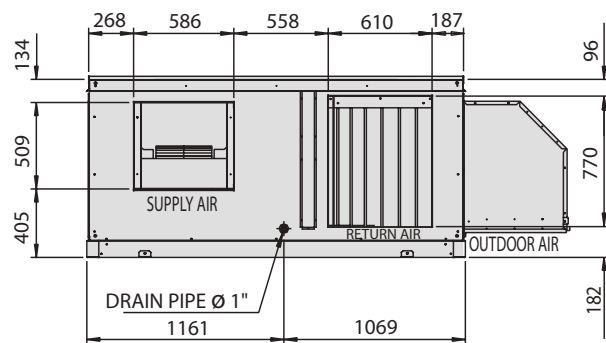
FOR VERTICAL DISCHARGE

Model (UATYQ)	550	600	700	900
A	1048	1302	1454	1454
B	770	770	1176	1176
C	182	322	182	182

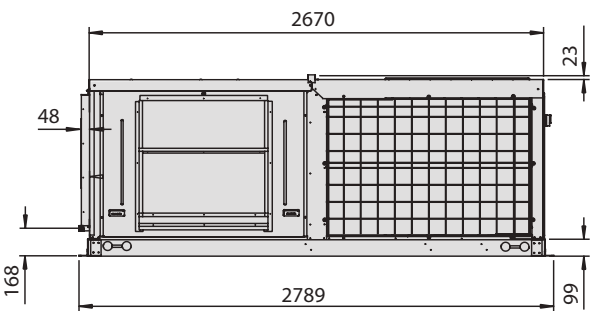
● CENTER OF GRAVITY

Model: UATYQ550 WITH ECONOMIZER OPTION

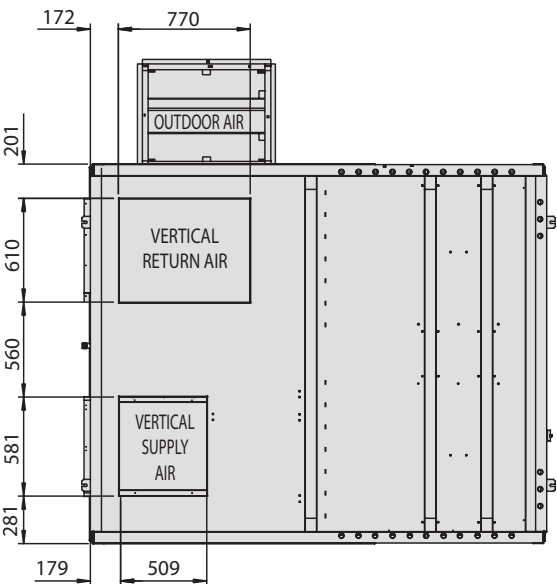
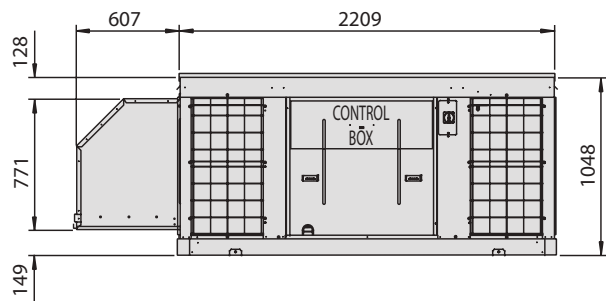
All dimensions are in mm



FOR HORIZONTAL DISCHARGE



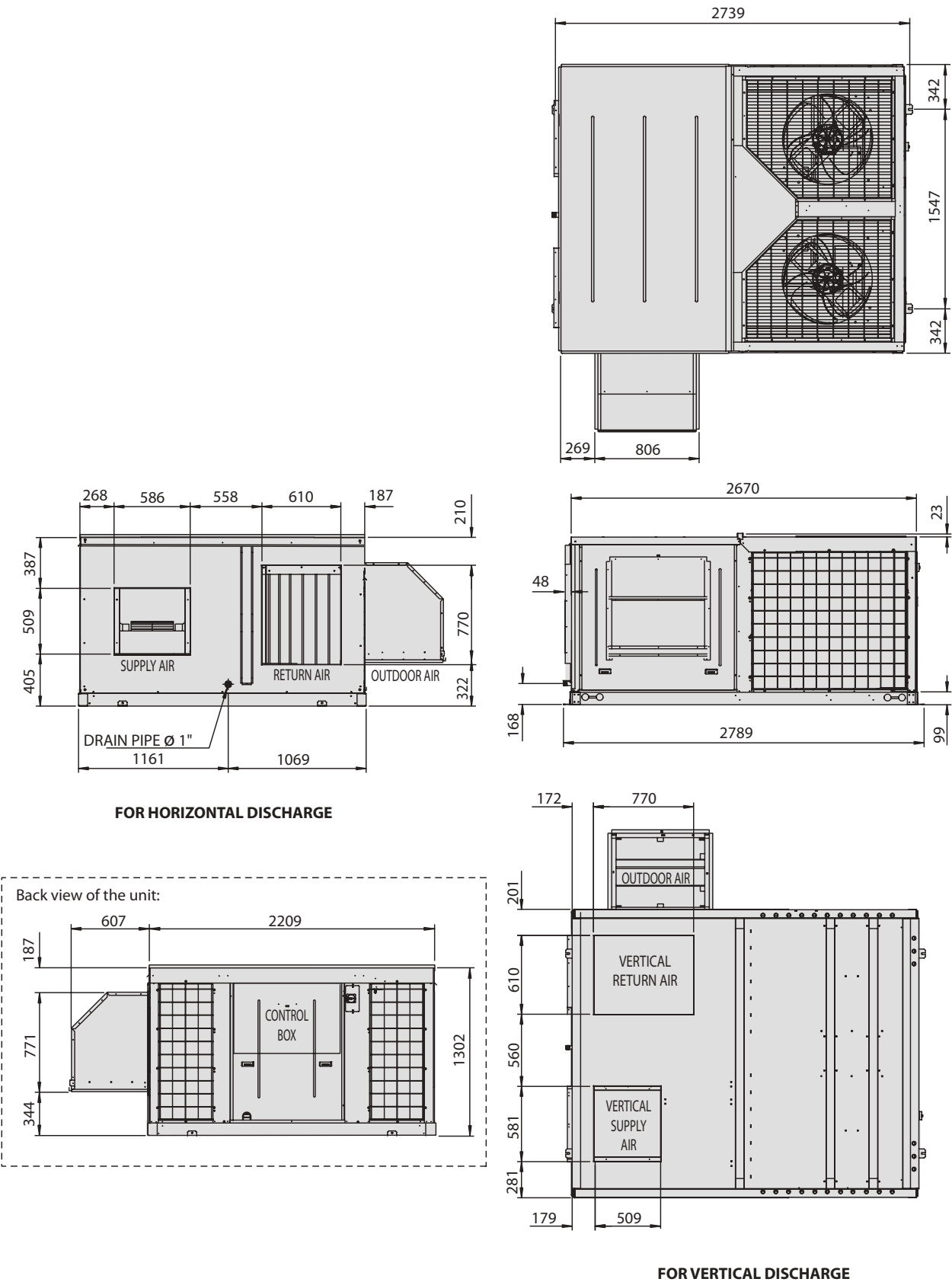
Back view of the unit:



FOR VERTICAL DISCHARGE

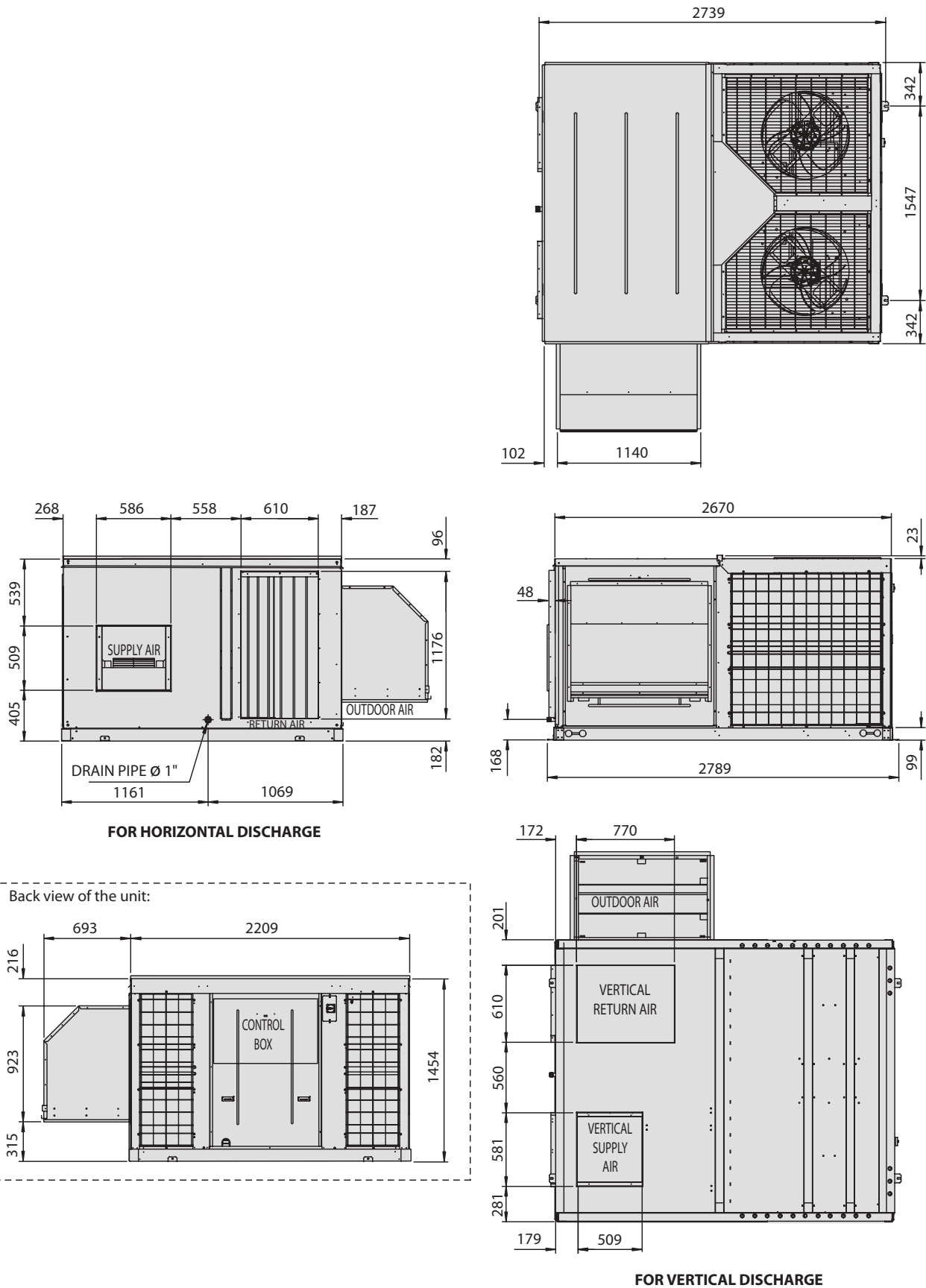
Model: UATYQ600 WITH ECONOMIZER OPTION

All dimensions are in mm

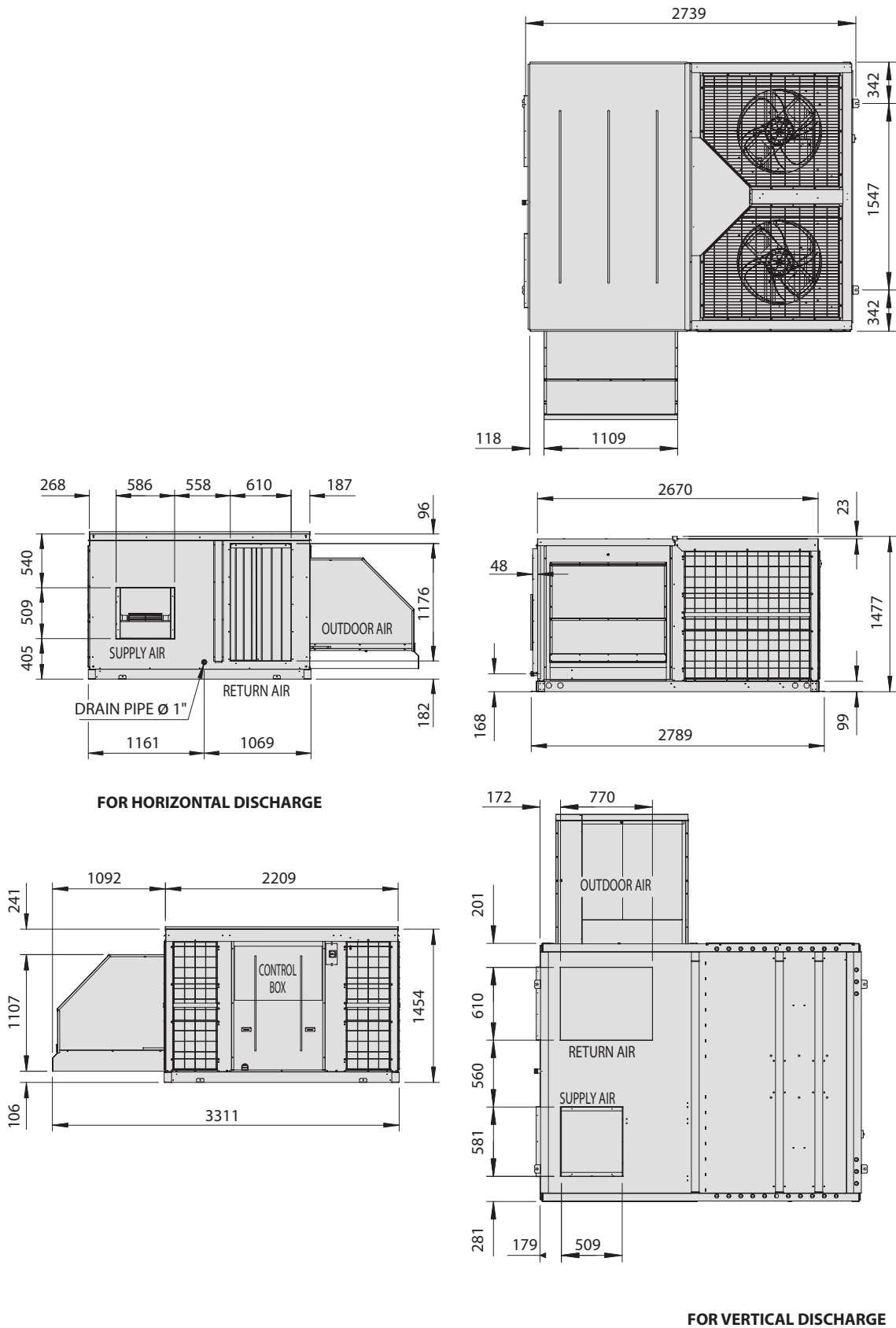


Model: UATYQ700 WITH ECONOMIZER OPTION

All dimensions are in mm



All dimensions are in mm

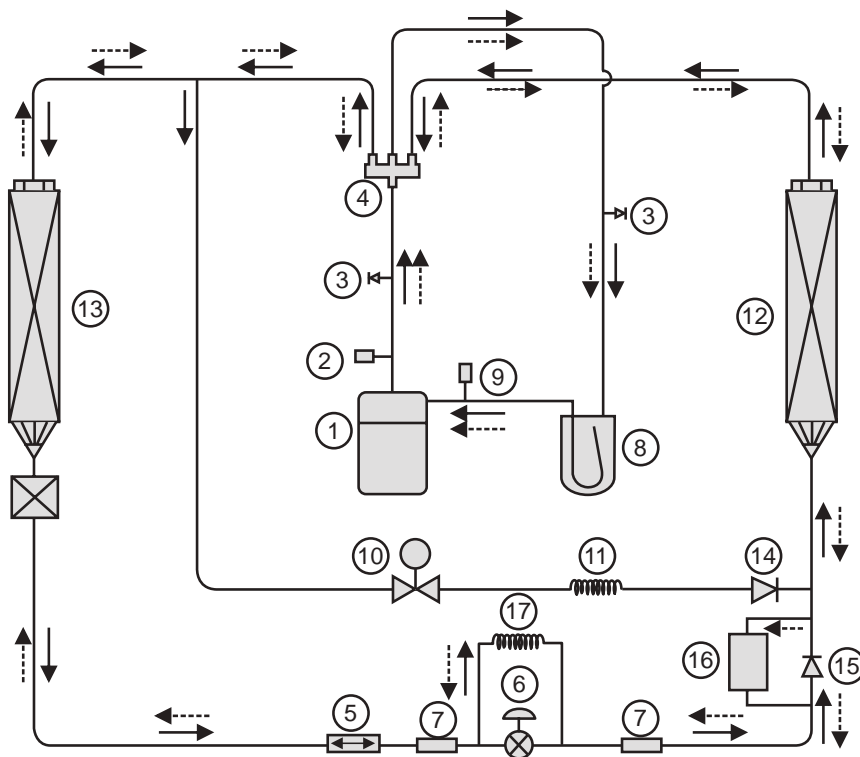


REFRIGERANT CIRCUIT DIAGRAM

Model: UATYQ 250, 350, 450, 550, 600, 700 & 900

→	Cooling Operation
←-----	Heating Operation

No	Item Description
①	Compressor
②	High Pressure Switch
③	Access Valve
④	4 - Ways Valve
⑤	Filter Drier
⑥	Electronic Expansion Valve
⑦	Strainer
⑧	Accumulator
⑨	Low Pressure Switch
⑩	Solenoid Valve
⑪	Bypass Capillary Tube
⑫	Indoor Heat Exchanger
⑬	Outdoor Heat Exchanger
⑭	Check Valve 1
⑮	Check Valve 2
⑯	Compensator
⑰	Capillary Tube



Note: (a) UATYQ350, 450, 550, 600, 700 & 900 consists of 2 circuits in the system.
 (b) Item no. 15 & 16 are applicable for UATYQ350 only.
 (c) Item no. 17 is applicable for UATYQ700 & UATYQ900 only.

INSTALLATION MANUAL

This manual provides the procedures of installation to ensure a safe and good standard of operation for the air conditioner unit.

Special adjustment may be necessary to suit local requirements.

Before using your air conditioner, please read this instruction manual carefully and keep it for future reference.

This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.

This appliance is not intended for use by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

SAFETY PRECAUTIONS

IMPORTANT

Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases. Do not vent gases into the atmosphere.

Refrigerant type:
R410A

GWP ⁽¹⁾ value:
2087.5

⁽¹⁾ GWP = global warming potential
The refrigerant quantity is indicated on the unit name plate. Periodical inspections for refrigerant leaks may be required depending on European or local legislation. Please contact your local dealer for more information.

NOTICE

In Europe, the **greenhouse gas emissions** of the total refrigerant charge in the system (expressed as tonnes CO₂-equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

Formula to calculate the greenhouse gas emissions:

GWP value of the refrigerant
× Total refrigerant charge [in kg] / 1000



WARNING

- Installation and maintenance should be performed by qualified persons who are familiar with local code and regulation, and experienced with this type of appliance.
- All field wiring must be installed in accordance with the national wiring regulation.
- Ensure that the rated voltage of the unit corresponds to that of the name plate before commencing wiring work according to the wiring diagram.
- The unit must be GROUNDED to prevent possible hazard due to insulation failure.
- All electrical wiring must not touch the refrigerant piping, or any moving parts of the fan motors.
- Confirm that the unit has been switched OFF before installing or servicing the unit.
- Disconnect from the main power supply before servicing the air conditioner unit.
- DO NOT pull out the power cord when the power is ON. This may cause serious electrical shocks which may result in fire hazards.
- Keep the air-conditioner units, power cable and transmission wiring, at least 1m from TVs and radios, to prevent distorted pictures and static. (Depending on the type and source of the electrical waves, static may be heard even when more than 1m away).
- The equipment is not intended for use in a potentially explosive atmosphere.



CAUTION

Please take note of the following important points when installing.

- **Do not install the unit where leakage of flammable gas may occur.**



If gas leaks and accumulates around the unit, it may cause fire ignition.

- **Ensure that drainage piping is connected properly.**



If the drainage piping is not connected properly, it may cause water leakage.

- **Do not overcharge the unit.**



This unit is factory pre-charged.

Overcharge will cause over-current or damage to the compressor.

- **Ensure that the unit's panel is closed after service or installation.**



Unsecured panels will cause the unit to operate noisily.

- **Sharp edges and coil surfaces are potential locations which may cause injury hazards.**

Avoid from being in contact with these places.

- **Before turning off the power supply, set the remote controller's ON/OFF switch to the "OFF" position to prevent the nuisance tripping of the unit.** If this is not done, the unit's fans will start turning automatically when power resumes, posing a hazard to service personnel or the user.

- **Do not operate any heating apparatus too close to the air conditioner unit.**
- **Do not use joined and twisted wires for incoming power supply.**

Disposal Requirement:

Dismantling of the unit, treatment of the refrigerant, oil and other parts must be done in accordance with the applicable legislation.

INSTALLATION OF THE UNIT

A Location For Installation

- Install the unit in such way that air discharged by the unit cannot be drawn in again (as in the case of short circuit of discharge air). Allow sufficient space for maintenance around the unit.
- When two or more units are installed in a location, they must be positioned such that one unit will not be taking the discharge air from another unit.
- Ensure that there is no obstruction of air flow into or out of the unit. Remove obstacles which block air intake or air discharge.
- The location must be well ventilated, so that the unit can draw and distribute plenty of air.
- The unit is recommended to install in:-
 - A place capable of bearing the weight of the unit and isolating noise and vibration.
 - A place where has adequate drainage.
 - A place where the unit will not be buried in snow.
 - A place where air inlet and outlet ports are not exposed to strong wind.
 - A place where the air discharge and operating sound level will not annoy the neighbours.
 - The location where it is not accessible by general public.

Note

- To install the unit with economizer kit, follow the recommendations given in part (B) (iii) under chapter "OPTIONAL ACCESSORY" in this manual.



CAUTION

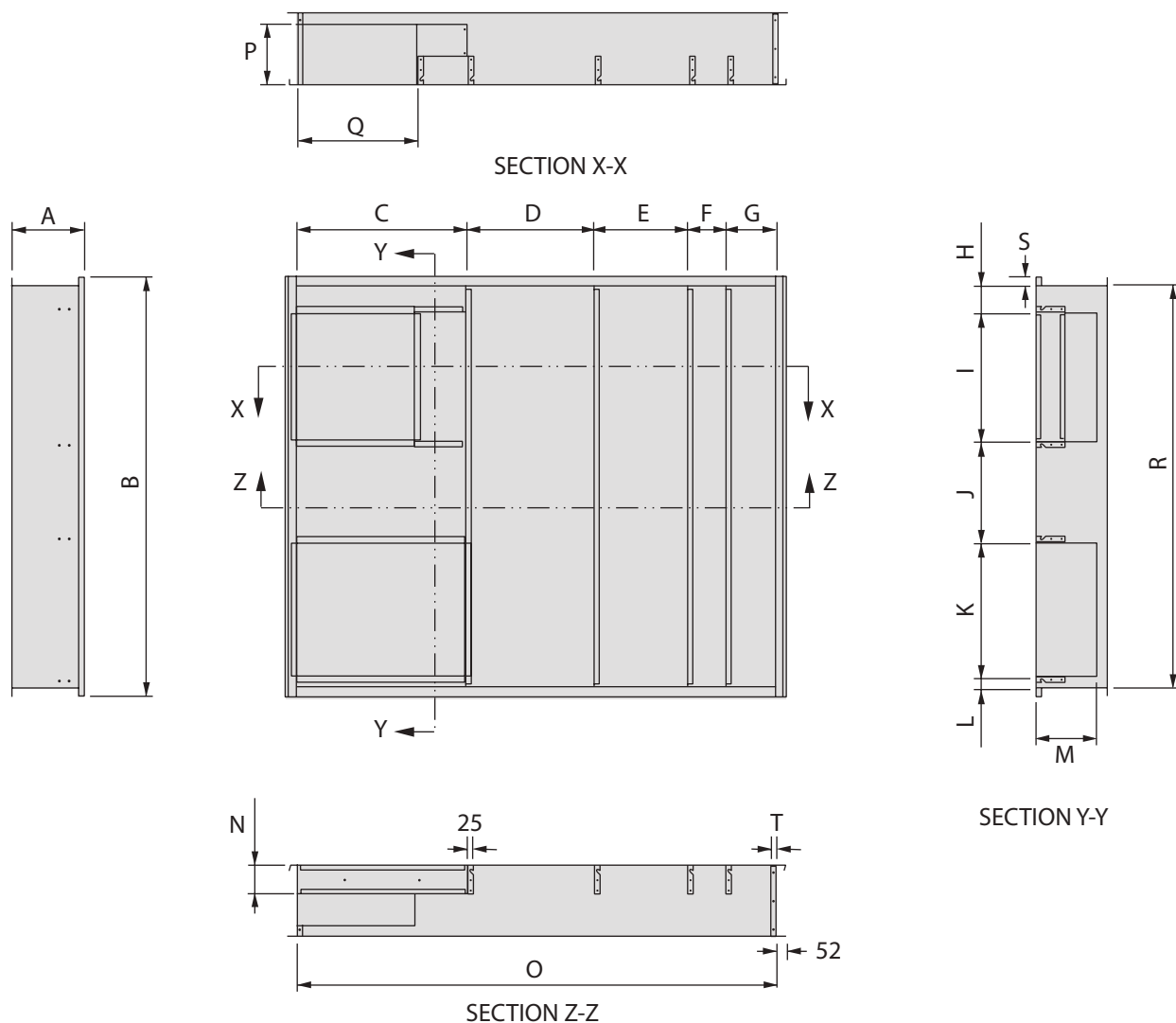
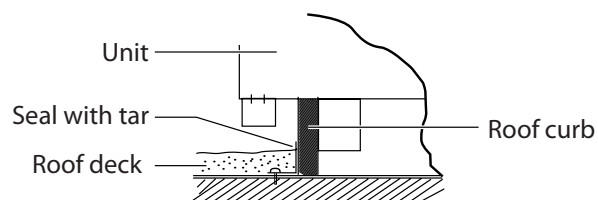
Do not install the unit at altitude over 2000m.

B Duct Construction

- This unit are equipped with supply and return air openings. Duct connection to the unit should be made with duct flanges and secured directly to the air openings with flexible duct connectors to avoid normal noise transmission.
- To prevent air leakage, all duct seams should be sealed.
- Ducts in the spaces that not air-conditioned must be insulated.
- Ducts exposed to the outside must be weather proofed.
- Ducts that entering building through the roof, the entering should be sealed with weather stripping to prevent rain, sand, dust etc., from entering the building.
- Correct size of filter must be installed at the return air duct.

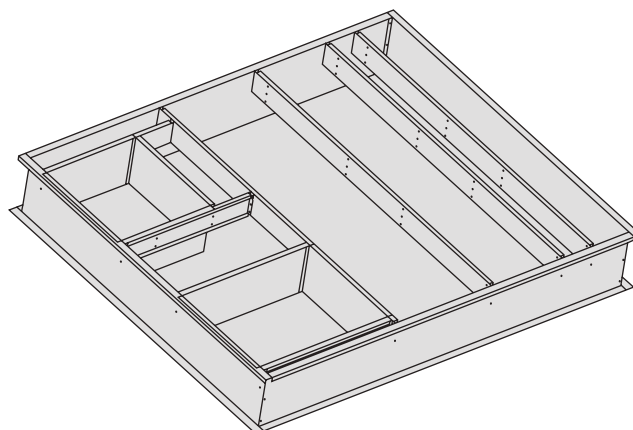
C Unit Support (For down throw unit only)

- The figure shows the use of the roof curb for mounting these units.
- The curb should be sealed and fixed to the roof by weather stripping. A suggested means of sealing the unit and roof curb as shown in the right.
- Recommended roof curb dimension is shown below.



Model (UATYQ)	250	350/450	550/600/700/900
A	355	355	355
B	1506	2081	2081
C	840	700	840
D	315	410	625
E	315	410	462
F	0	0	190
G	314	287	248
H	0	131	131
I	607	600	646
J	322	544	495
K	540	682	676
L	0	42	51
M	300	300	300
N	141	141	141
O	1784	1807	2365
P	300	300	300
Q	481	477	590
R	1469	1998	1998
S	20	41.5	41.5
T	20	41.5	41.5

Note: All dimensions are in mm

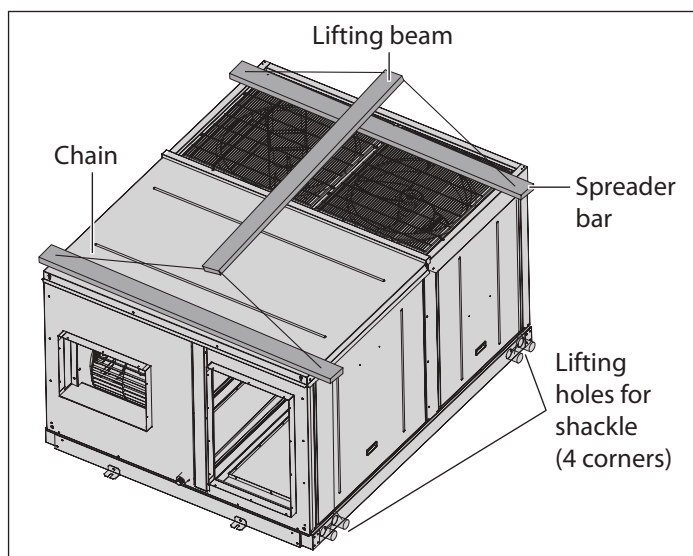


D Unit Lifting

- Holes at 4 corners of the unit base are used for unit lifting purpose.
- The spreader bar shall be slightly wider than the unit width.
- The insulation should be added at 4 corners of the chain to prevent the damage of the panel when lifting.

Note

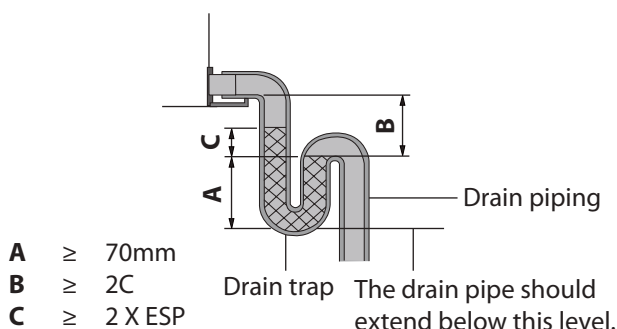
- Unit shown in diagram is UATYQ250.
- Other models will follow the same method in lifting.



E Drain Piping

- A 1" MPT condensate drain fitting is provided. The drain pipe can be led out at the front side.
- The drain pipe must be provided with a trap on the outside of the unit and also installed at an incline for proper drainage, as shown in the right.
- To prevent condensate formation and leakage, provide the drain pipe with insulation to safeguard against sweating.
- Upon completion of piping work, check that there is no leakage and that the water drains off properly.

The drain piping should have a drain trap.



Note

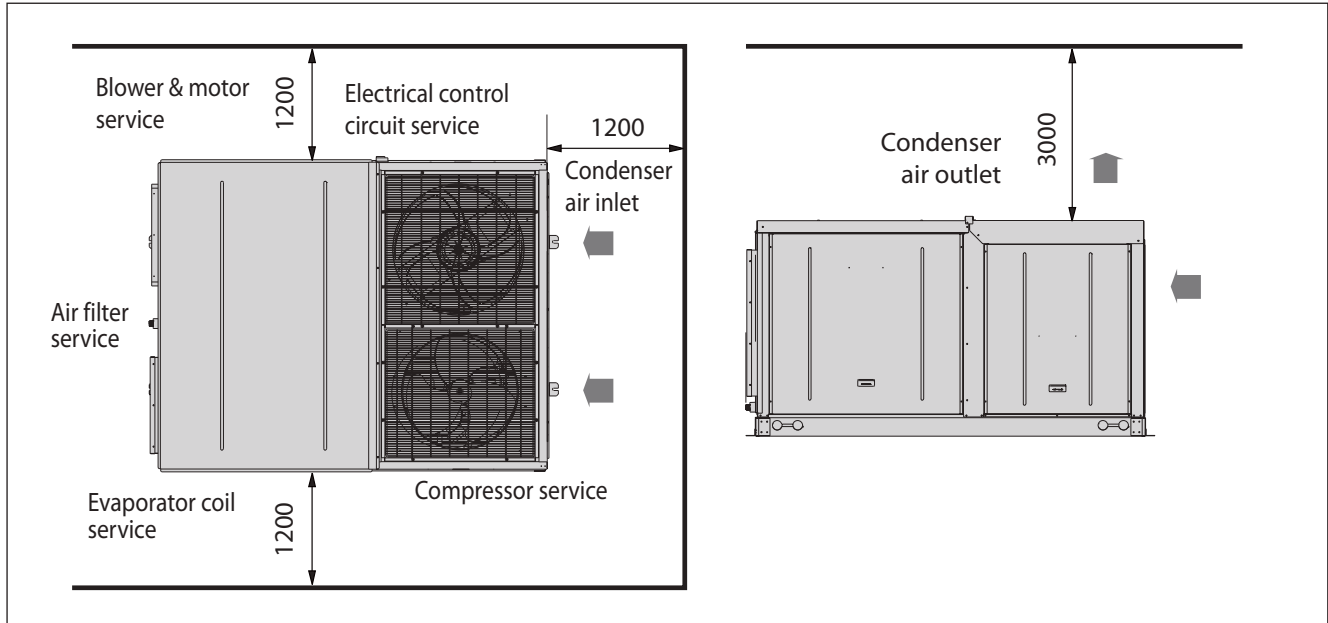
- ESP = External Static Pressure

Drain trap for condensate

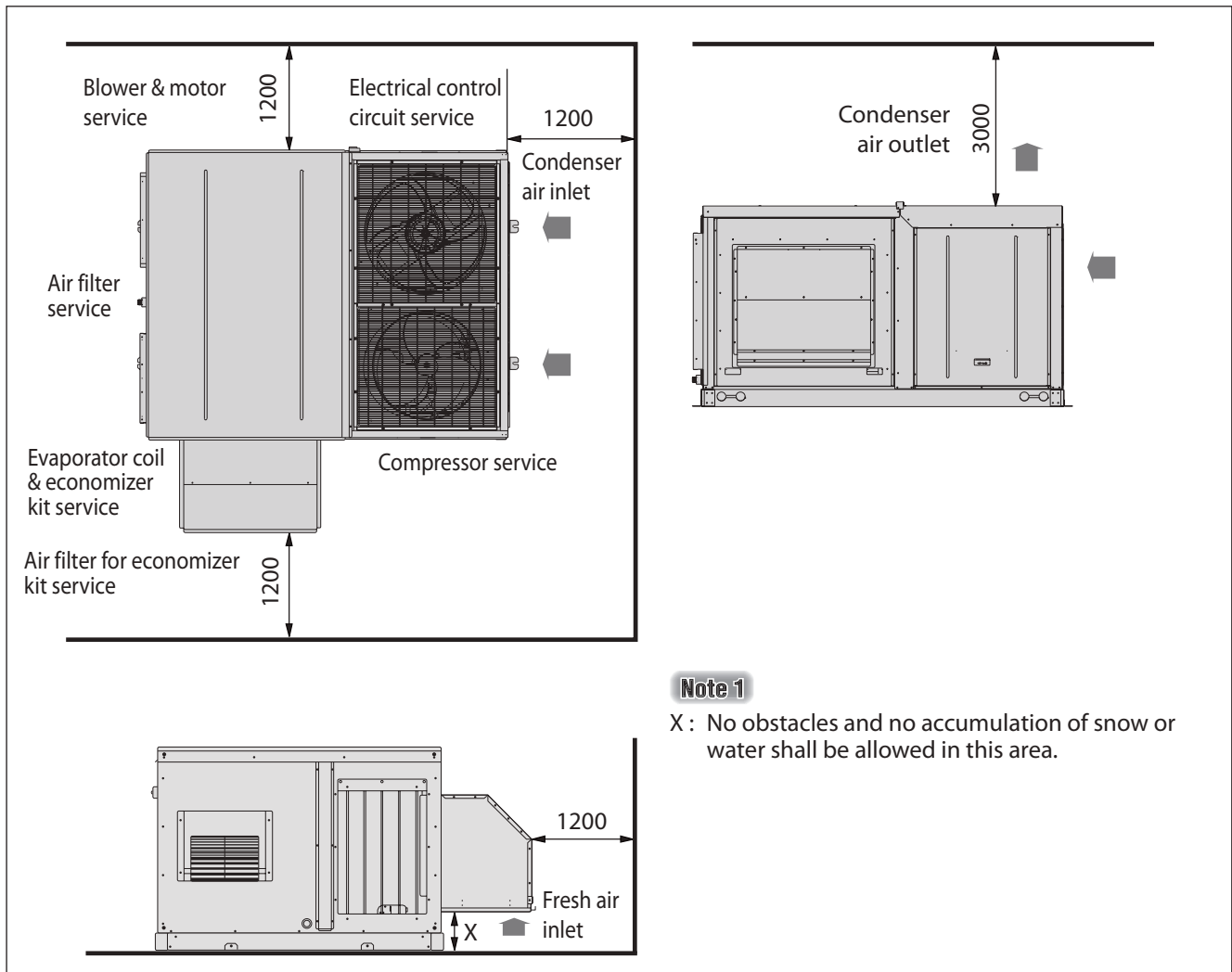
F Space Required Around Unit

Refer diagram below for the space required around the unit. Note that:-

- All dimensions shown are in mm.
- All space value shown are **minimum clearance** required for the unit.
- Unit shown in the diagram is UATYQ250. Other models shall follow the same clearance.



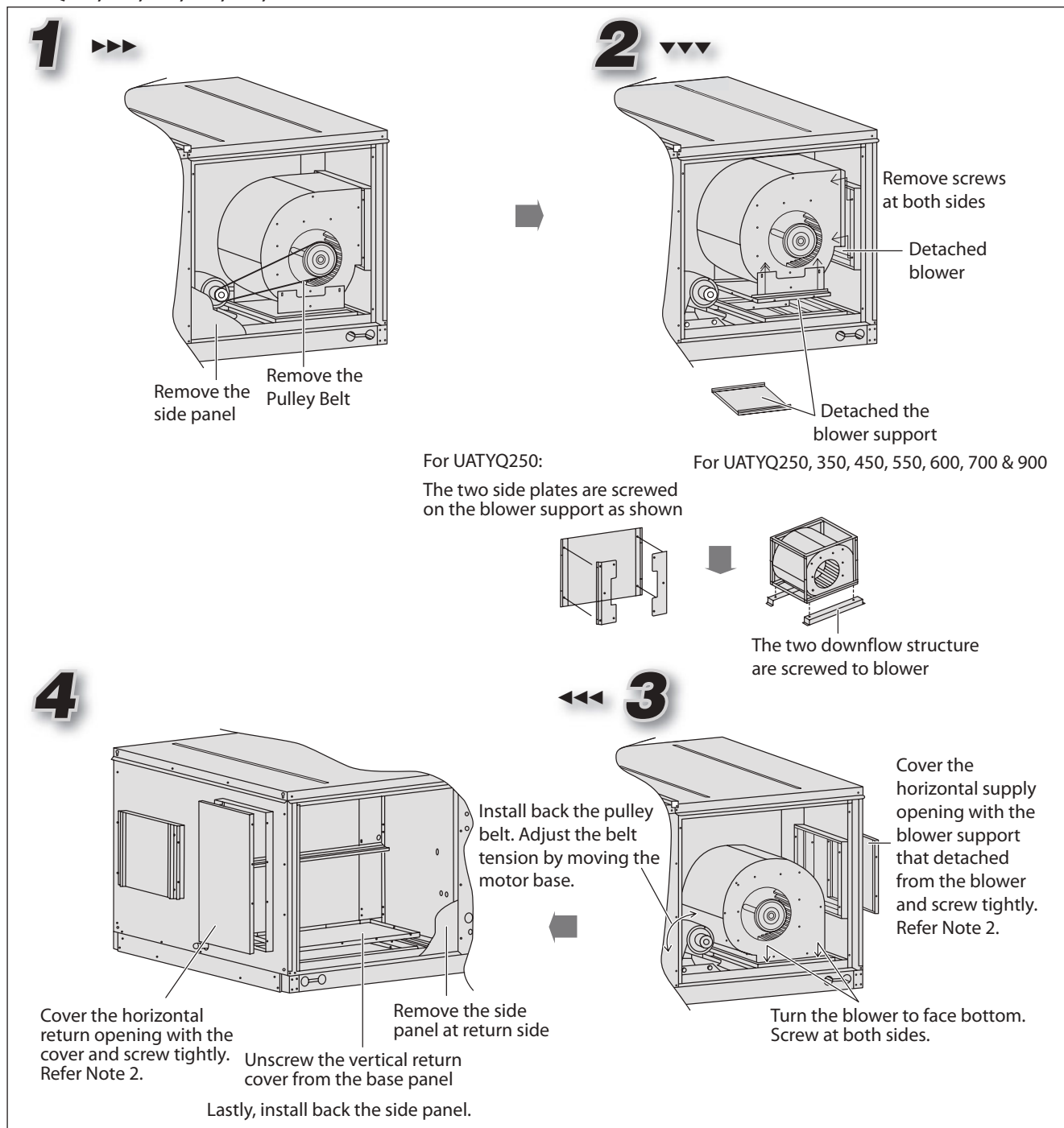
Additional space or clearance is required when economizer kit is installed. Whenever the unit is equipped with economizer kit, the space required around the unit with economizer kit shall follow the diagram below:-



G Unit Conversion

In the case of converting standard unit to downthrow unit, follow the steps as stated below:

UATYQ250, 350, 450, 550, 600, 700 & 900



Install back the pulley belt. Adjust the belt tension. Lastly, install back the side panel. Refer Note 1.

Note 1

For downthrow conversion, belt length need to be changed.

For unit with standard pulley, belt length = a mm

Shaft to shaft distance for downthrow, C-C = b mm

	UATYQ250	UATYQ350	UATYQ450	UATYQ550	UATYQ600	UATYQ700	UATYQ900
a	1432	1457	1382	1500	1500	1500	1500
b	425	430	345	420	420	440	445

Note 2

Sealant such like gasket (field supply) shall be placed in between the metal cover and flange. Besides that, weather-proof silicone shall be applied on all the joints, screw holes and gaps to ensure water-tight condition.

Note 3

Refer Engineering Data Book for blower curve and technical data of variable pitch pulley.

PHYSICAL DATA

Heat Pump (R410A)

Model		UATYQ250	UATYQ350	UATYQ450	UATYQ550	UATYQ600	UATYQ700	UATYQ900
Refrigerant		R410A						
Refrigerant charge	kg	6.1	5.8/5.8	7.2/7.2	8.7/8.7	10.4/10.4	11.6/11.6	11.6/11.6
Evaporator air flow	CFM	3300	4300	5650	6700	7300	8300	9600
	L/S	1557	2029	2667	3162	3445	3917	4531
External static pressure	mmAq	15			21			
	Pa	147			206			
Condenser air flow	CFM	8230	6000/6000	6050/6050	6450/6450	10100/10100	10600/10600	10600/10600
	L/S	3884	2831/2831	2855/2855	3044/3044	4767/4767	5003/5003	5003/5003
Control		Wired Rooftop Controller						
Control wire length (Standard/Max) : Size	m : mm ²	15 / 100 : 3						
Compressor (Type/Quantity)		Scroll/1	Scroll/2	Scroll/2	Scroll/2	Scroll/2	Scroll/2	Scroll/2
Air filter (Type/Quantity)		Washable Saranet/2						
Air filter dimension (Length x Width x Thickness)	mm	880 x 467 x 4	1126 x 385 x 4	1126 x 435 x 4	1497 x 392 x 4	1497 x 495 x 4	1497 x 595 x 4	1497 x 595 x 4

ELECTRICAL DATA

Heat Pump (R410A)

Model		UATYQ250	UATYQ350	UATYQ450	UATYQ550	UATYQ600	UATYQ700	UATYQ900
Power supply	V/Ph/Hz	380-415/3N~/50						
Max continuous current (Comp)	A	26	17/17	19/19	26/26	28/28	29/29	40.0/40.0
Full load current (FLA, Comp)	A	21	12/12	15/15	21/21	22/22	25/25	34.0/34.0
Locked rotor current (LRA, Comp)	A	111	74/74	101/101	111/111	118/118	118/118	174.0/174.0

The equipment fulfils the requirements in EN 61000-3-11 and is subject to conditional connection to the mains. It may be connected in consultation with the supply authority. The equipment may only be connected to a mains supply with a system impedance of less than the value stated in table below. The system impedance in the interface point may be obtained from the supply authority.

Model	Maximum impedance (Z_{max}), ohm
UATYQ250	0.22
UATYQ350	0.23
UATYQ450	0.21
UATYQ550	0.21
UATYQ600	0.21
UATYQ700	0.21
UATYQ900	0.20

If the mains supply has a higher system impedance, short voltage dips may appear when the equipment is started or during operation. This may influence or disturb the operation of other apparatuses, e.g. flickering lamps, especially those connected to the same supply mains.

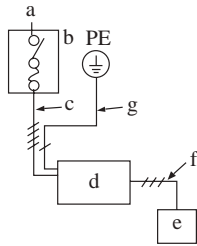
WIRE CONNECTION

- All electrical work must be carried out by qualified electrician and accordance with local supply requirement and associate regulation.

Method for connecting electric wire

Before connecting the wire, consult the electric power company of jurisdiction.

1. The entire wiring diagram of unit



a	Power supply
b	Main switch/fuse (field supply)
c	Power supply wiring for unit
d	Unit
e	Remote control
f	Connection wiring for unit & remote controller
g	Earth

2. Wiring connection to unit

Route the power supply wires and control wire through the knockout holes or cable holes in the unit.

Remove the service panels and connect the units power supply wires to terminal block inside the control box, as shown.

Make use of push releasable cable ties which are located at the bottom of control box to hold the power supply wires properly.

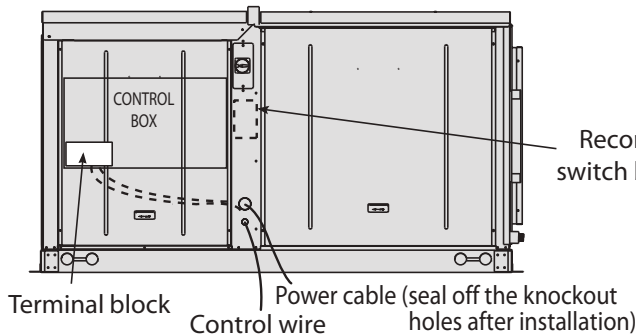
Note

While installing the circuit breaker onto the unit, make sure that the screws do not damage the components (e.g. coil) inside the unit.

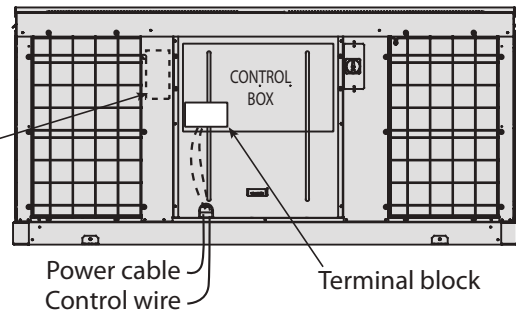
The switch box also can be installed without attaching to the unit.

The knockout holes are only available in UATYQ250; UATYQ350, UATYQ450, UATYQ550, UATYQ600, UATYQ700 & UATYQ900 comes with a power cable hole.

UATYQ250



UATYQ350, 450, 550, 600, 700 & 900



Wiring Example And Selection Of Circuit Breaker

Model	Power cable (mm ²)	Breaker capacity (A)	Over current protection switch (A)	Earth cable (mm ²)
UATYQ250	4	32	32	4
UATYQ350	6	40	40	6
UATYQ450	10	40	40	10
UATYQ550	10	50	50	10
UATYQ600	16	63	63	16
UATYQ700	25	80	80	25
UATYQ900	35	100	100	35

Note

A main switch or other means for disconnection, having a contact separation in all poles, must be incorporated in fixed wiring in accordance with local and national legislation.

- The unit is to be wired directly from an electrical distribution board either by a circuit breaker (preferred) or HRC fuse.
- Fix the power supply wiring to control module. Connect control wiring to control terminal block through the control box's hole.
- Earth wiring must be connected.
- The power supply cord must be equivalent to H07RN-F which is the minimum requirement, and to be used in protective tube.
- There must be an all pole disconnection in the supply mains with a contact separation of at least 3mm.



WARNING

- Before working in this unit, isolate it from the power supply.
- Electrical wiring to this unit and the remote controller shall be installed in accordance with the appropriate requirement of the local wiring code.

Observe the notes mentioned below when wiring to the terminal block. Precautions to be taken for power supply wiring.

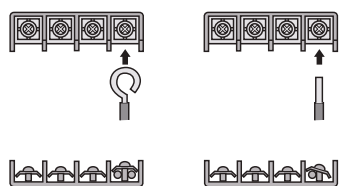
(Use a round crimp-style terminal for connection to the terminal block. In case it cannot be used due to unavoidable reasons, be sure to observe the following instruction.)

Round crimp-style terminal

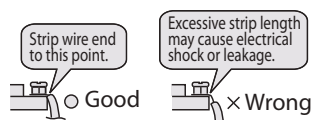


CAUTION

When connecting the connection wires to the terminal block using a single core wire, be sure to perform curling. Problems with the work may cause heat and fires.



Stripping wire at terminal block



- Pull the wire and make sure that it does not disconnect. Then fix the wire in place with a wire stop.



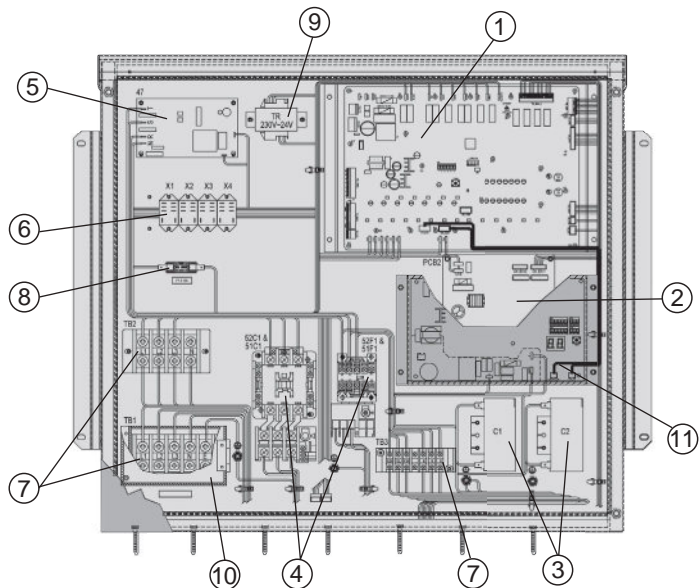
WARNING

- Transmission wire must be routed at least 50mm away from the power cable.
- Transmission wire should be a shielded wire.

Arrangement of terminal blocks and components for controller are shown as below:

A

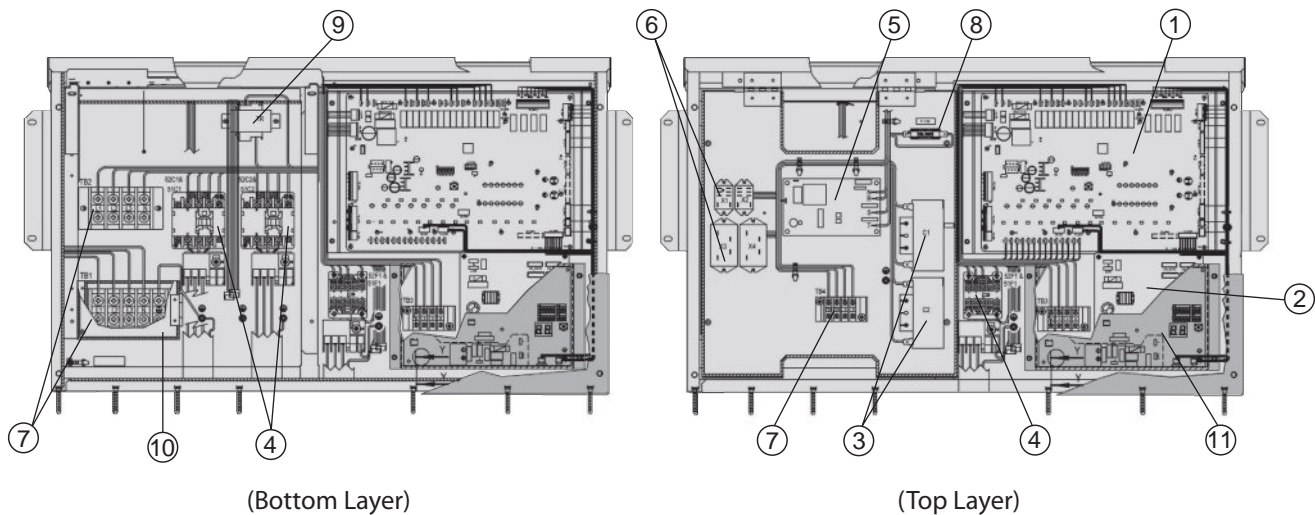
Control Module UATYQ250



No.	Item Description
①	Controller Main Board
②	EXV Controller Board
③	Capacitor
④	Contactor
⑤	Phase Protector
⑥	Relay
⑦	Terminal Block
⑧	Fuse
⑨	Transformer
⑩	Terminal Block Cover
⑪	Economizer Controller Board

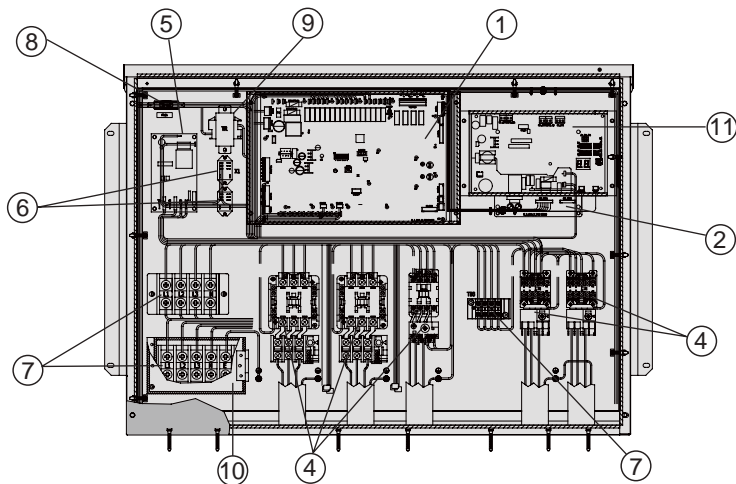
B

Control Module UATYQ350/450/550



C

Control Module UATYQ600/700/900



WARNING

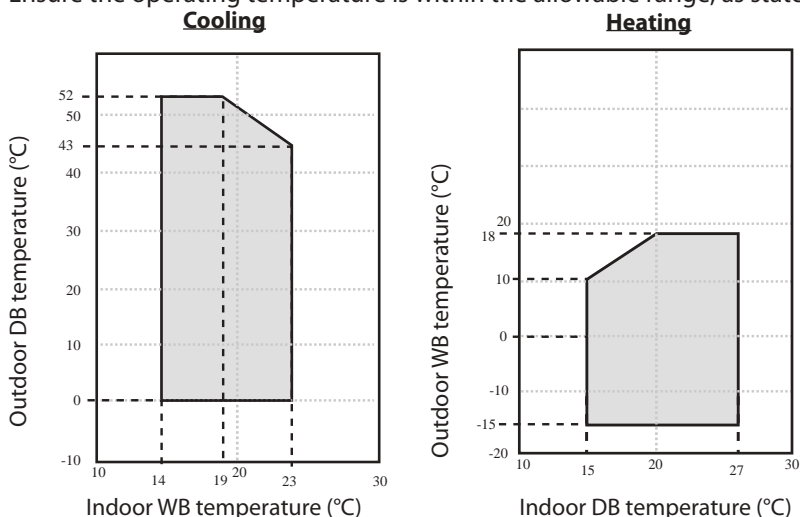
Unless the main supply switch is turned off, the terminal block (TB1) will remain Live when the isolator is turned off.

Note

Item 11 (Economizer Controller Board) shall be used together with the economizer kit which is provided separately as the accessory.

OPERATING RANGE

Ensure the operating temperature is within the allowable range, as stated in diagram below:



CAUTION

The use of the air conditioner outside the range of working temperature and humidity can result in serious failure.

Note

Refer Operating Range for unit with economizer option in part (E) (vi) in chapter "OPTIONAL ACCESSORY".

DB = Dry Bulb
WB = Wet Bulb

CONTROL OPERATION GUIDE

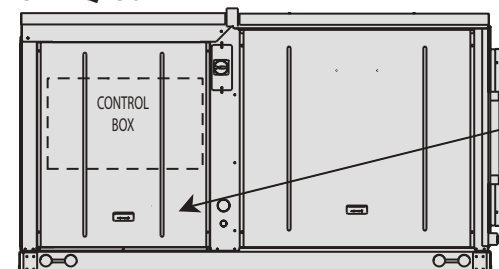
The unit is equipped with a controller main board, and a wired remote controller is connected to the controller main board.

All the setting in the unit is preset by the manufacturer. It is not recommended to change the setting unless necessary or mentioned below.

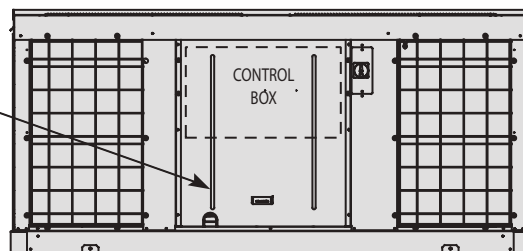
a) Remote Controller Location

The remote controller is located on a metal bracket behind the service panel. It is packed together with installation manual.

UATYQ250



UATYQ350, 450, 550, 600, 700 & 900



Remove panel

b) LED Display (Controller Main Board)

The LED will blink when power up the unit.

c) LCD Display (Remote Controller)

During normal operations, the LCD displays compressor on/off status, mode, set temperature and so on. Refer to Operating Manual for the details of operation guide. The LCD will display the main screen upon power-up. When malfunctioning occur, a pop-up message will appear on the LCD with backlight blinking and 'beep' sound.

d) Optional Configurations

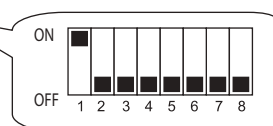
The controller main board can be used as the interface for thermostat control and BMS system.

(i) Thermostat control (TB_THM-I)

- To use this control, set Dip Switch Setting: SW1-ON (default is OFF).
- Follow the method below for thermostat control inputs:

G	Y1	Y2	W1	W2	Mode	Operation
0	0	0	0	0	-	Unit off
1	0	0	0	0	Fan	Indoor fan on
X	1	0	X	X	Cool	1 stage compressor
X	1	1	X	X	Cool	2 stage compressor
X	0	X	1	0	Heatpump/Heater	1 stage compressor
X	0	X	1	1	Heatpump/Heater	2 stage compressor

Remark: X = Don't care.



- Refer table below for installation recommendations:

Input	Rated voltage	Rated current	Wire size
G	24V AC	5mA	AWG18~22
Y1			
Y2			
W1			
W2			

Note

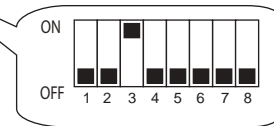
- When the controller main board is configured as thermostat control, the remote controller is used for monitoring purpose only.
- Unit needs to be restarted (power off and on) whenever dip switch setting is changed.

(ii) BMS control (TB_BMS-I)

- To use this control, set Dip Switch Setting: SW3 - ON (default is OFF) and panel parameter G8 to '1' (default is '0').

Note

- G8 = Control Type
0 = Panel
1 = BMS
2 = DEC
- For TB_BMS-I, there are 3 control inputs:
unit on/off; operating mode (cool-0/heat-1); and set point (4~20mA).
- Refer below table for installation recommendations:



Input TB_BMS-I	Rated voltage	Rated current	Wire size
On/Off	24V AC	5mA	AWG18~22
Operating mode	24V AC	5mA	
Cool/Heat set point	-	4~20mA	

Note

- When the controller main board is configured as BMS control, the remote controller is used for monitoring purpose only.
- Unit needs to be restarted (power off and on) whenever dip switch setting is changed.

(iii) Dry contact output (TB_BMS-O)

- For TB_BMS-O, there are 4 monitoring outputs: error alarm; output1; output2; and defrost signal.
- Refer table below for installation recommendations:

Input TB_BMS-O	Rated voltage	Rated current (A)	Wire size
Alarm output (AL)	230V AC/125V AC/30V DC	1/3/3	AWG18~22
Output1 (O1)	230V AC/125V AC/30V DC	2/3/3	
Output2 (O2)	230V AC/125V AC/30V DC	3/3/3	
Defrost signal (DFRT)	230V AC/125V AC/30V DC	4/3/3	

- The output signals will vary depending on the configuration of controller main board, whether it is thermostat control or BMS control.

(1) For thermostat control, the outputs are indicated as shown in the table below.

Thermostat input (SW1-ON)					ERROR	DEFROST	Alarm output	Output1	Output2	Defrost signal
G	Y1	Y2	W1	W2			(AL)	(O1)	(O2)	(DFRT)
0	0	0	0	0	X	X	X	0	0	X
1	0	0	0	0	X	X	X	0	1	X
X	1	0	X	X	X	X	X	1	0	X
X	1	1	X	X	X	X	X	1	0	X
X	0	X	1	0	X	X	X	1	1	X
X	0	X	1	1	X	X	X	1	1	X
X	X	X	X	X	1	X	1	X	X	X
X	X	X	X	X	X	1	X	X	X	1

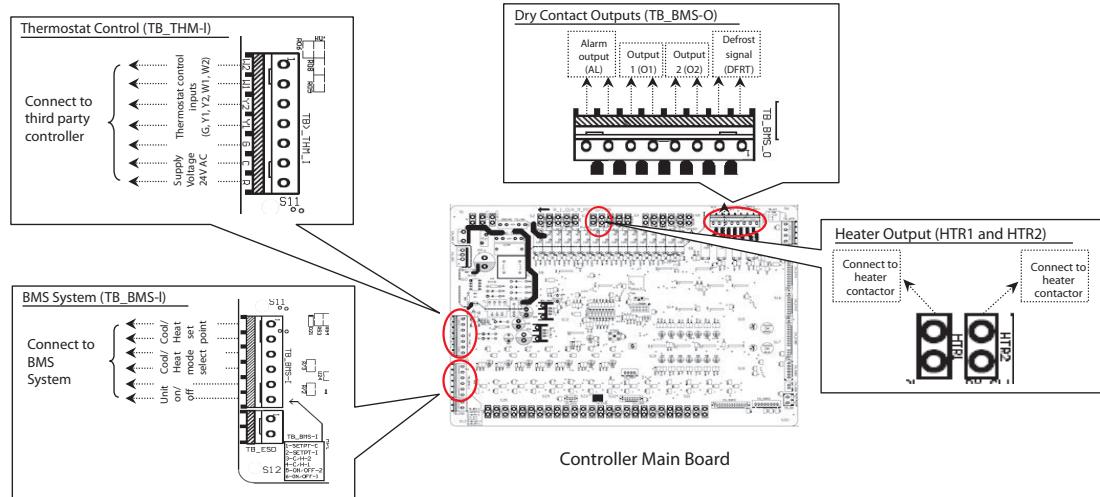
Remark: X = Don't care.

(2) For BMS control, the outputs are indicated as shown in the table below.

BMS input (SW3-ON)			ERROR	DEFROST	Alarm output	Output1	Output2	Defrost signal
ON/OFF	OPERATING MODE	COOL/HEAT SET POINT			(AL)	(O1)	(O2)	(DFRT)
0	0	X	X	X	X	0	0	X
0	1	X	X	X	X	0	1	X
1	0	X	X	X	X	1	0	X
1	1	X	X	X	X	1	1	X
X	X	X	1	X	1	X	X	X
X	X	X	X	1	X	X	X	1

Remark: X = Don't care.

The diagram below shows the position for terminal blocks in the controller main board which are used for thermostat control and BMS system. Beside that, the output pins for auxilliary electrical heater are shown as well.



(iv) Auxilliary Electrical Heater Output (HTR1 and HTR2)

- There are two output pins (HTR1 and HTR2) on controller main board, which are used to energize the heater contactor. The contactor must be selected accordingly to avoid any safety issue(s).
- The heater shall be installed in accordance with local and national legislation. It must comply with EN60335-2-40.
- Thermal fuse(s) shall be installed on the heater to eliminate any danger or damage on the heater/unit. This is especially critical when there is any malfunction happen to controller main board or blower.
- The heater shall be in a safe location, whereby no risk of damage could be happen on the unit.
- Use non-flammable duct for the unit that is installed with heater
- Use different power supply for electrical heater and install a circuit breaker for each of the heater.
- Maximum temperature in the unit must not exceed 60°C. Temperature measurement shall be taken during the installation or commissioning in order to ensure the temperature not exceed this value.
- Select the proper safety device or thermal protector accordingly.
- The heater shall never be installed inside the unit. The recommended location for the heater is inside the supply duct, whereby the distance of the heater is sufficient to ensure the temperature inside the unit does not exceed 60°C.

(v) Economizer control

- Ensure the economizer kit has been incorporated with rooftop unit before activate the economizer function in the controller main board. Else, error will occur.
- To activate economizer function, set Dip Switch Setting: SW4 - ON (default is OFF) in the controller main board and panel parameter G6 to '1' (default is '0').

Note

G6 = Economizer control
0 = disable
1 = enable.



- In economizer controller board, there are 4 dip switches and 3 shunt jumpers which provide flexible selection based on different requirements:
 - Dip Switch 1: Minimum fresh air opening setting in heating mode, where by the selection of different pins will give different opening setting. SW1: 5%, SW2: 10%, SW3: 15%, SW4: 20%, SW5: 25%, SW6/7/8: no function, Default: 0% (no selection, all OFF).
 - Dip Switch 2: Minimum fresh air opening setting in cooling mode, where by the selection of different pins will give different opening setting. SW1: 0%, SW2: 5%, SW3: 15%, SW4: 20%, SW5: 25%, SW6/7/8: no function, Default: 10% (no selection, all OFF).
 - Dip Switch 3: CO₂ PPM level threshold value selection, where by the selection of different pins will give different value setting. SW1: 25%, SW2: 50%, SW3: 75%, SW4: 100%, Default: 0% (no selection, all OFF).
 - Dip Switch 4: Type of operation, which include the following selection:-
SW1: OFF = Differential temperature operation (default), ON = No function at this moment.
SW2: OFF = Economizer mode (default), ON = Fresh air mode.
SW3: OFF = Overcooled protection is activated (default), ON = Overcooled protection is not activated.

Shunt jumper 1, 2 and 3: Minimum fresh air opening setting in fan mode, where by the selection of different pins will give different opening setting. Let name the shunt jumper 1 = JP1, shunt jumper 2 = JP2 and shunt jumper 3 = JP3; refer the table below for different fresh air opening selection:-

Fresh air opening (%)	JP1	JP2	JP3
0 (default)	OFF	OFF	OFF
10	OFF	OFF	ON
20	OFF	ON	OFF
30	OFF	ON	ON
40	ON	OFF	OFF
50	ON	OFF	ON
70	ON	ON	OFF
85	ON	ON	ON

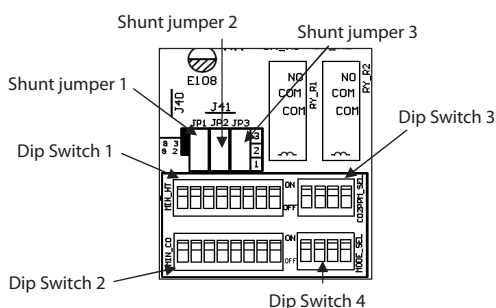
Legend: OFF = Short pin 2 and pin 3
ON = Short pin 1 and pin 2



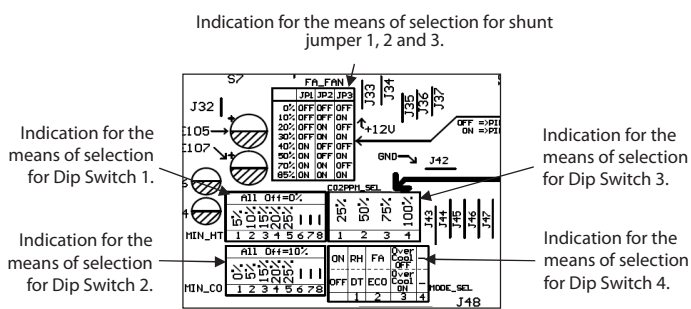
CAUTION

Dip Switch 1, 2 and 3 allow only 1 pin selection. Multiple pins selection will cause error and the operation will go back to default setting. While Dip Switch 4 allow multiple pins selection.

Location of dip switches and shunt jumpers in the economizer controller board:



Indication on the economizer controller board:

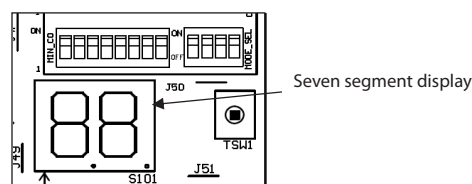


- There are two LEDs in economizer controller board, which are green LED and red LED. Green LED will blink when economizer controller board is powered-up. Red LED will blink when error(s) occur. Refer the table below for error codes and their meaning:-

Error Code	Fault
F0	Fresh air actuator faulty/ malfunction
F1	Return air actuator faulty/ malfunction
F2	Communication error
F3	CO ₂ sensor short
F4	CO ₂ sensor open
F5	Fresh air RH sensor short
F6	Fresh air RH sensor open
F7	Return air RH sensor short
F8	Return air RH sensor open
F9	Activation of actuator protection
FA	Multiple pins selection in Dip Switch 1, 2 or 3

Note

The error codes will be shown on the seven segment display on the economizer controller board.



Note

When error(s) occur and the faults persist, please call your authorized local dealer/ serviceman for troubleshooting. However, all the errors occur in economizer controller board will not affect the normal operation of rooftop unit.

Note is valid for Turkey only: The lifetime of our products is ten (10) years

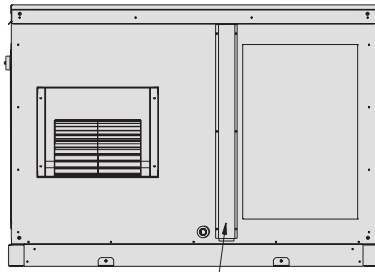
SERVICE OF THE FILTER

- Remove any dust adhering to the filter by using a vacuum cleaner or wash in lukewarm water (below 40°C) with neutral cleaning detergent.
- Rinse the filter well and dry before placing it back onto the unit.
- Do not use gasoline, volatile substances or chemicals to clean the filter.
- Clean the filter at least once every 2 weeks. Or more frequently if necessary.

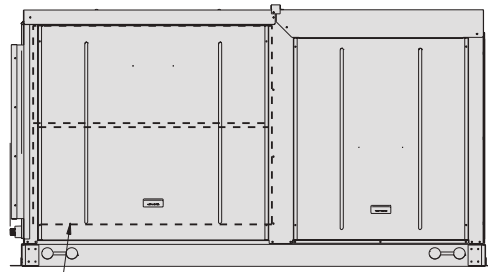
Filter Position

The filters are mounted in front of the indoor heat exchanger.

Unit shown in the diagram is UATYQ250. Other models shall follow the same method.

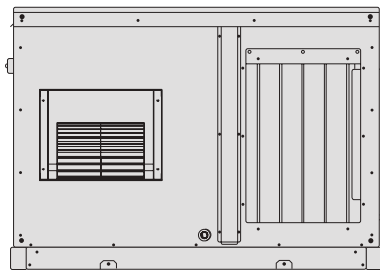


Remove filter cover for filter service.



Alternatively, remove side panel for filter service.

For unit which is installed together with economizer kit, there is one additional filter which is mounted at the bottom side of rain hood. Unit shown in the diagram is UATYQ250 + economizer kit (field installed). Other models shall follow the same method.



Rain hood (field installed)

Remove filter cover on the rain hood for filter service.



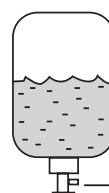
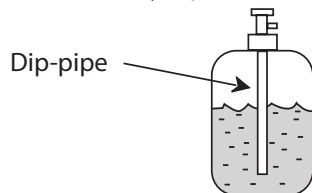
CAUTION

Ensure the filter is placed properly and the filter cover is fastened with screws tightly after the service to avoid water leaking. If necessary, weather-proof sealant shall be applied in order to ensure water-proof finishing on the filter cover and rain hood.

VACUUMING AND CHARGING

The rooftop package units are factory pre-charged with sufficient refrigerant. However, there may be a need for charge recovery during service and maintenance works. Therefore, some precautions must be taken to ensure optimum and trouble-free system operation:

- The system should be thoroughly vacuumed to ensure no incompressible gas and moisture in the system.
- Use a vacuum pump for R410A exclusively. Using the same vacuum pump for different refrigerants may damage the vacuum pump or the unit.
- The refrigerant should never be released directly into the environment.
- When charging R410A, ensure that only liquid is being withdrawn from the cylinder or can.



Invert cylinder without dip-pipe

Liquid withdrawal

Normally, the R410A cylinder or can is equipped with a dip-pipe for liquid withdrawal. However, if the dip-pipe is not available, invert the cylinder or can so as to withdraw liquid from the valve at the bottom.



CAUTION

- R410A must be charged as liquid. Usually R410A cylinder is equipped with a dip-pipe for liquid withdrawal. If there is no dip-pipe, the cylinder should be inverted so as to withdraw liquid R410A from the valve.
- Do not top-up when servicing leak, as this will reduce the unit performance. Vacuum the unit thoroughly and then charge the unit with fresh R410A according to the amount recommended in the specification.

TROUBLESHOOTING

For any enquiries on spare part please contact your authorized dealer. If any malfunction of the air-conditioner unit is noted, check the following fault conditions and causes for some simple troubleshooting tips.

Problem	Causes	Action
Unit does not run.	<ul style="list-style-type: none"> ● Power failure. ● Fuse blown or circuit breaker tripped. ● Power supply wiring phase incorrect. 	<ul style="list-style-type: none"> ▶ ● Press the [ON/OFF] after power restore. ▶ ● Replace fuse or reset circuit breaker. ▶ ● Modify the wiring phase.
Compressor does not operate in 3 min after unit has started.	<ul style="list-style-type: none"> ● Protection against frequent starting. 	<ul style="list-style-type: none"> ▶ ● Wait for 3 min for the compressor to start.
Air flow is low.	<ul style="list-style-type: none"> ● Filter is filled with dust and dirt. ● There are some obstacles at the air inlet or outlet of the units. 	<ul style="list-style-type: none"> ▶ ● Clean the filter. ▶ ● Remove obstacles.
Compressor operate continuously.	<ul style="list-style-type: none"> ● Dirty air filter. ● Temperature setting is too low (for cooling). ● Temperature setting is too high (for heating). 	<ul style="list-style-type: none"> ▶ ● Clean the air filter. ▶ ● Reset the temperature.
No cool air delivered during cooling cycle, or no hot air delivered during heating cycle.	<ul style="list-style-type: none"> ● Temperature setting is too high (for cooling). ● Temperature setting is too low (for heating). 	<ul style="list-style-type: none"> ▶ ● Set the temperature lower. ▶ ● Set the temperature higher.
On heating cycle, no air delivered (UATYQ250). Or, the delivered air is not warm enough (UATYQ350/450/550/600/700/900).	<ul style="list-style-type: none"> ● Unit is in defrosting cycle. 	<ul style="list-style-type: none"> ▶ ● Wait for a while. (It will be resumed after defrosting.)

If the fault persists, please call your authorized local dealer/serviceman.

ECONOMIZER KIT

A Introduction

Economizer kit is an accessory provided by the factory, but requires field installation. Economizer kit is compatible for R410A rooftop models. If you are unsure whether this kit can be used with your particular unit, please contact authorized service division. The economizer kit allows outside air to be mixed with return air for 'free' cooling if the outdoor air temperature is suitable. Economizer cooling can be used alone or in conjunction with mechanical cooling. Beside that, the economizer kit can be used as well to provide ventilation air thus can improve indoor air quality. It is vital to do a correct selection on economizer kit, refer the table below for kit selection guideline:

No.	Rooftop Unit	Economizer kit which is compatible with rooftop unit
1	UATYQ250	ECONO250
2	UATYQ350	ECONO350
3	UATYQ450	ECONO450
4	UATYQ550	ECONO550
5	UATYQ600	ECONO600
6	UATYQ700	ECONO700
7	UATYQ900	ECONO900

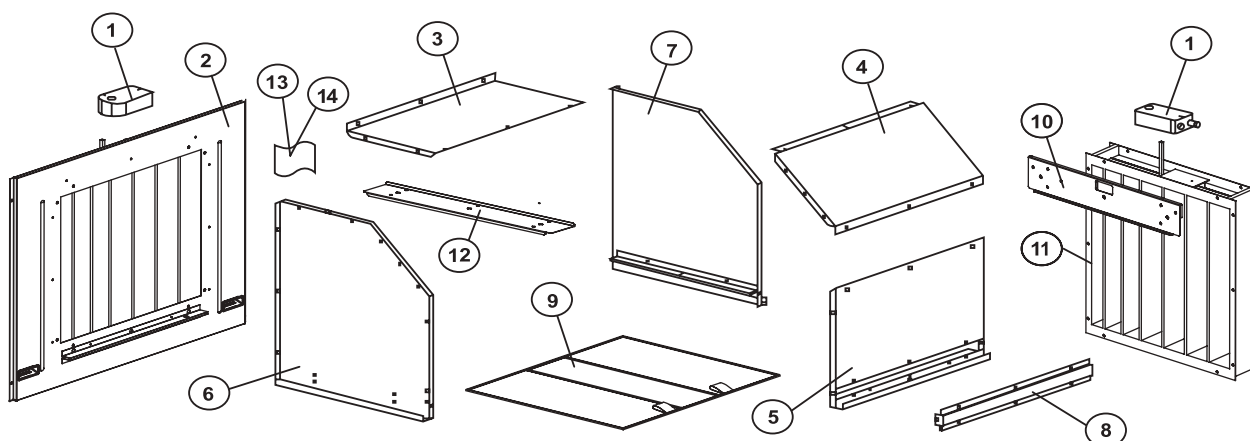
Note

Wrong selection may cause the kit is unable to be assembled with the rooftop unit.

B Preinstallation Checking

(i) The Contents of Economizer Kit

Before installation, it is recommended to check the contents of the economizer kit after removing the packaging. The kit includes the following components:

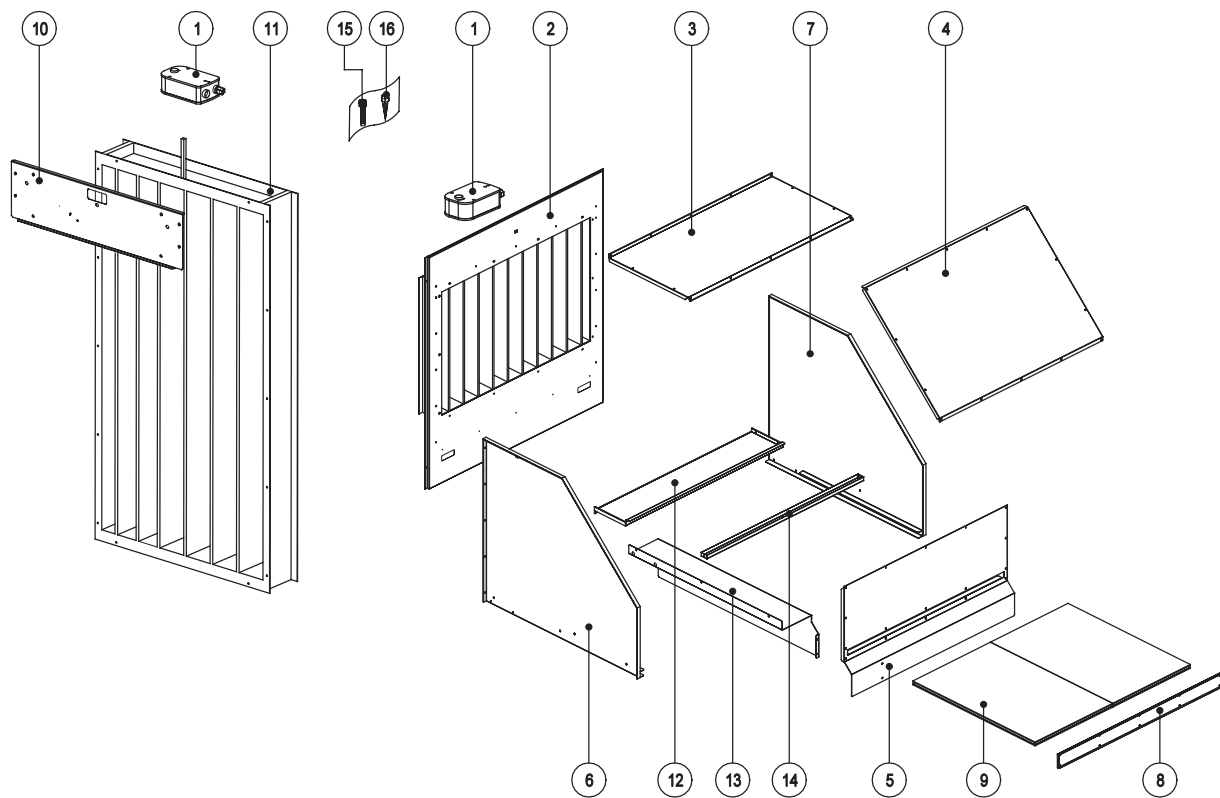


No.	Item Description	Quantity (set)
1	Belimo actuator, LF24-SR	2
2	Side panel with outdoor air damper	1
3	Hood, top panel	1
4	Hood, center panel	1
5	Hood, bottom panel	1
6	Hood, side panel left	1
7	Hood, side panel right	1

No.	Item Description	Quantity (set)
8	Filter cover	1
9	Filter	1
10	Support bracket, return air damper	1
11	Return air damper	1
12	Support bracket, down throw	1
13	Screw, M5x16	55
14	Screw, M4x12	4

* Support bracket, down throw (item 12) is not available in ECONO700.

(ii) The Contents of Economizer Kit UATY900



No.	Item Description	Quantity (set)
1	Belimo actuator, LF24-SR	2
2	Side panel with outdoor air damper	1
3	Hood, top panel	1
4	Hood, center panel	1
5	Hood, front panel	1
6	Hood, side panel right	1
7	Hood, side panel left	1
8	Filter cover	1

No.	Item Description	Quantity (set)
9	Air Filter, AAF	1
10	Support bracket, return air damper	1
11	Return air damper	1
12	Hood, Bottom Panel	1
13	Flange, Air Hood 1	1
14	Support Filter	1
15	Screw, M5x16	97
16	Screw, M4x12	4

Note

Contact authorized service division if accessory is damaged or incomplete.

(iii) Unit Clearance

Provide sufficient space for air flow, servicing and wiring after the kit is mounted on the unit. There shall be no obstruction of air flow in this space. Refer to part (F) under chapter "INSTALLATION OF THE UNIT" in this manual. Fail to do so may cause low air flow or unit malfunction.

(iv) Location for installation

Follow the recommendations given in part (A) under chapter "INSTALLATION OF THE UNIT" in this manual. In addition, there is a need to consider the installation condition around the kit whereby:

- The clearance of the rain hood from the floor shall always have no snow nor water accumulation.
- The fresh air inlet does not face prevailing wind direction.
- The outdoor air shall be always clean and no odor, complies with the limit of concentration for several contaminants set by local standards, and does not exceed the threshold limit value (TLV) for toxicity specified by local standards.

(v) Damper Function

Check the two dampers in the economizer kit, which are item 2 and item 11 by turning the shaft of damper +90° and -90° (fully opened to fully closed or vice versa). The damper turning shall be smooth and easy. Any damages or abnormalities shall inform to authorized service division.

C Tools And Materials Required For Installation

- | | |
|--|---|
| (i) Electric screwdriver with assorted sockets | (vii) Adjustable spanner (small size) |
| (ii) Electric drill with assorted sockets | (viii) Crowbar and hammer |
| (iii) Small flat blade screwdriver | (ix) Weather-proof sealant (such as silicone) |
| (iv) Cutter | (x) Gasket |
| (v) Philip type screwdriver | (xi) Safety lockout tag |
| (vi) Measurement tape or ruler | (xii) Cable tie |

D Installation Guidelines

(i) Side return (horizontal) application

STEP 1

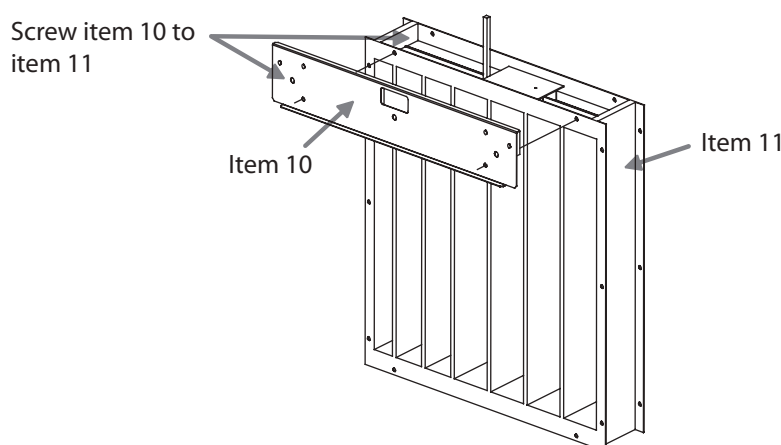
- Disconnect power supply to the unit and install a safety lockout tag before installation, commissioning or service of the economizer unit. Prepare all the tools required as mentioned above.

STEP 2

- Unpack the wooden crate of economizer kit by using crowbar and hammer. Then, remove the polybags containing loose parts and fasteners by using cutter. Perform preinstallation checking as mentioned above.

STEP 3

- Attach support bracket, return air damper (item 10) to return air damper (item 11) by using screw M5x16 (item 13) provided in the kit.



STEP 4

- Mount 1pc Belimo actuator, LF24-SR (item 1) labelled with 'RA' to return air damper (item 11). Align and insert the hole of actuator to the shaft of the damper.



CAUTION 1

The default setting for return air damper (item 11) shall be fully opened. Ensure this damper is in 'fully opened' position before mounting it to the actuator. Failed to do so will cause errors during the unit operation.

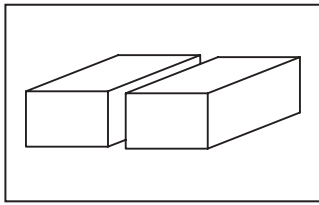


CAUTION 2

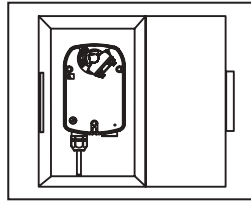
The surface of actuator which is facing upward/ outside shall be labelled with 'L' symbol to ensure the rotation of actuator modulation in clockwise direction. Failed to do so will cause errors during the operation of unit with economizer function.

Note

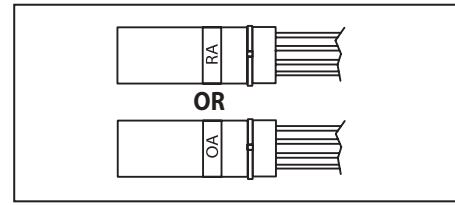
There are 2pcs of Belimo actuator, LF24-SR (item 1) in economizer kit which come together with carton boxes. Open the boxes and recognize the label on the wire. The actuator used in step 4 is the one with label 'RA'.



2pcs of item 1 in carton boxes.

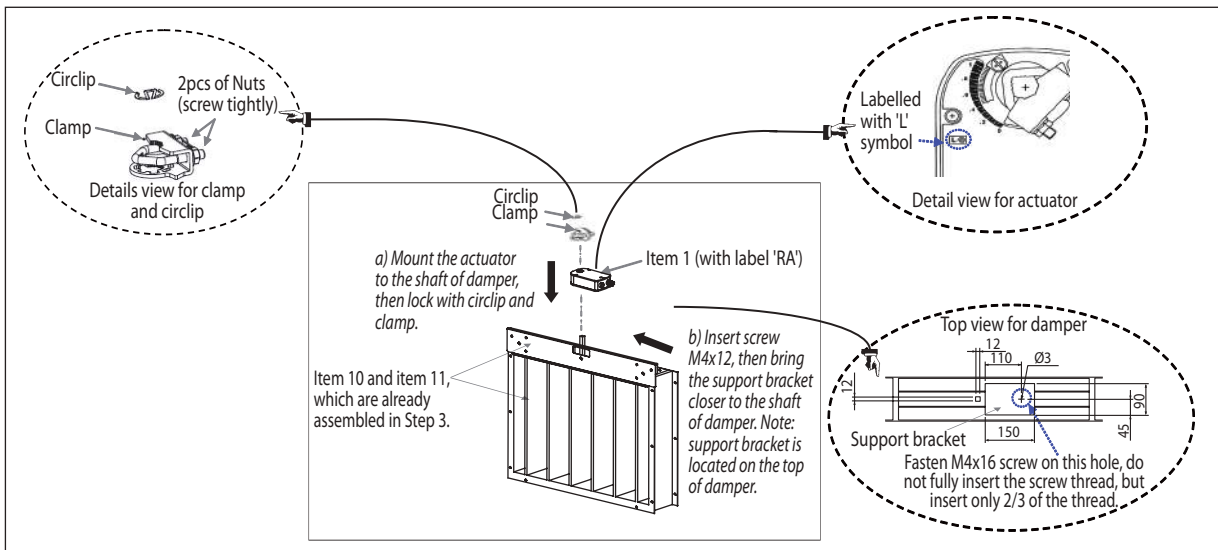


Open the box.



Recognize the label on the wire. One of them is indicated with 'RA', while the other is 'OA'.

- Then, fastens 1pc screw M4x12 (item 14) on the support bracket of the damper. Do not fully insert the screw thread, but only insert up to 2/3 of the screw thread. Mount the actuator to the support bracket by bringing the support bracket closer to the shaft of damper. The function of screw M4x12 is to lock the actuator from slippery during modulation.
- Next, put the clamp into the shaft and lock the actuator with circlip. Fasten the nuts of clamp tightly by using adjustable spanner. Noted that clamp and circlip come together with actuator as the standard parts, you may find these parts inside the actuator box.



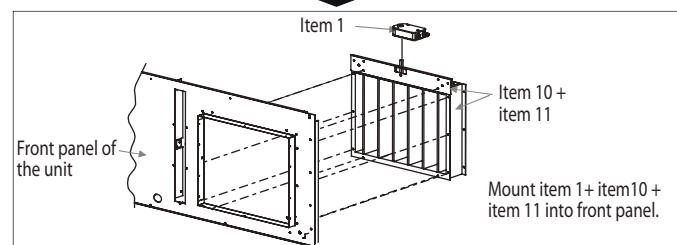
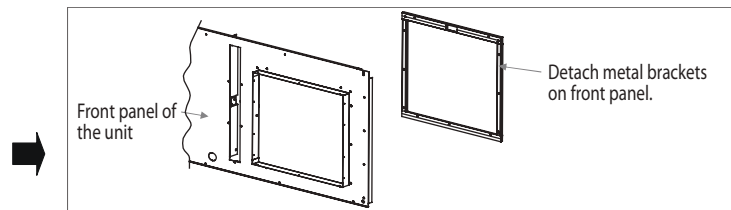
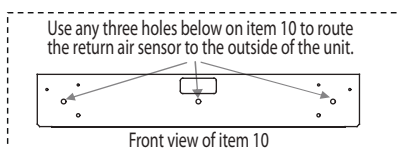
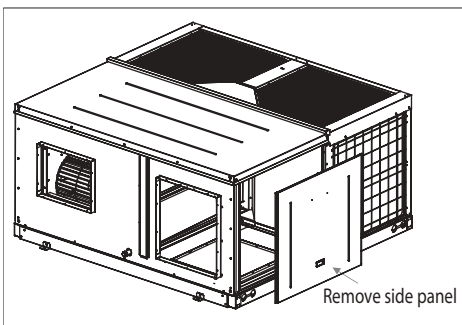
STEP 5

- Remove side panel. Then, detach 4pcs metal bracket on front panel. Install the return air damper (item 11) + support bracket, return air damper (item 10) + Belimo actuator, LF24-SR (item 1) which are already assembled in step 3 and step 4 into front panel of the unit by using the same screw holes. Use screw M5x16 (item 13) for fastening purpose.



CAUTION

Extend the return air sensor which is located inside the unit (on top of return air opening) to the outside area of the unit. This can be done by routing the sensor through small holes on support bracket, return air damper (item 10). The sensor is then located properly inside the return air duct by using the cable ties (field supply). Failing to do so may affect the performance of the unit and cause thermal discomfort to the users.



STEP 6

- Mount 1pc Belimo actuator, LF24-SR (item 1) labelled with 'OA' to the side panel with outdoor air damper (item 2). Align and insert the hole of actuator to the shaft of the damper.



CAUTION 1

The default setting for outdoor air damper (item 2) shall be fully closed. Ensure this damper is in 'fully closed' position before mount the actuator. Fail to do so will cause errors during the unit normal operation.

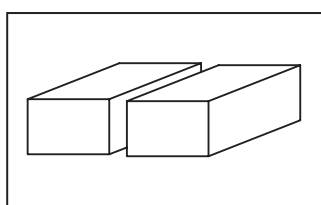


CAUTION 2

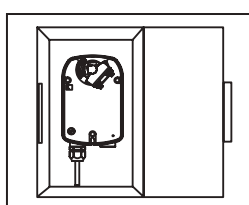
The surface of actuator which is facing upward/ outside shall be labelled with 'R' symbol to ensure the rotation of actuator modulation in counter clockwise direction. Fail to do so will cause errors during the operation of unit with economizer function.

Note

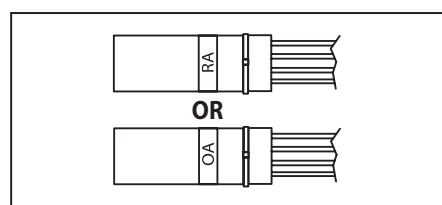
There are 2pcs of Belimo actuator, LF24-SR (item 1) in economizer kit which come together with carton boxes. Open the boxes and recognize the label on the wire. The actuator used in step 6 is the one with label 'OA'.



2pcs of item 1 in carton boxes.

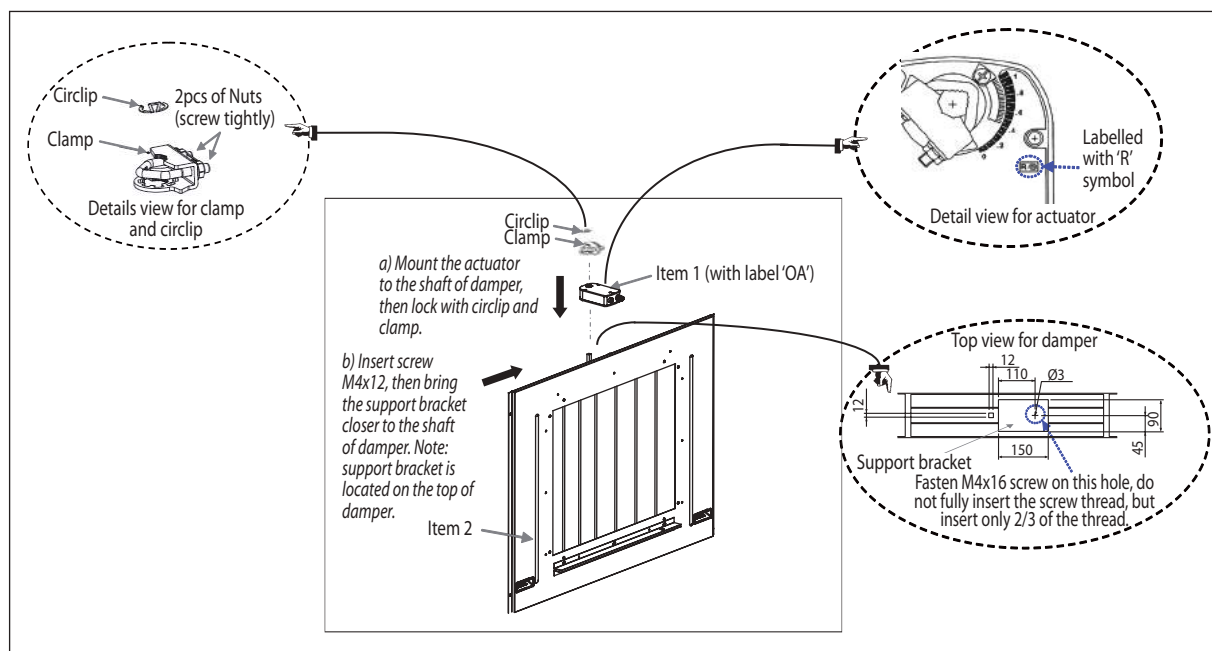


Open the box.



Recognize the label on the wire. One of them is indicated with 'RA', while the other is 'OA'.

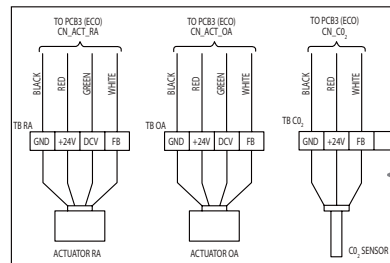
- Then, fastens 1pc screw M4x12 (item 14) on the support bracket of the damper. Do not fully insert the screw thread, but only insert up to 2/3 of the screw thread. Mount the actuator to the support bracket by bringing the support bracket closer to the shaft of damper. The function of screw M4x12 is to lock the actuator from slippery during modulation.
- Next, put the clamp into the shaft and lock the actuator with circlip. Fasten the nuts of clamp tightly by using adjustable spanner. Noted that clamp and circlip come together with actuator as the standard parts, you may find these parts inside the actuator box.



STEP 7

- Connect Belimo actuator, LF24-SR (item 1) with label 'RA', which is now located at the assembly damper on the front panel to terminal block with label 'RA' inside the junction box.
- There are four wires on the actuator with different colours (black, red, green and white colours). Connect the wires as below:

Black colour wire - connect to first pole of terminal block with label 'GND'.
 Red colour wire - connect to second pole of terminal block with label '+24V'.
 Green colour wire - connect to third pole of terminal block with label 'DCV'.
 White colour wire - connect to fourth pole of terminal block with label 'FB'.
 (You may refer to sticker wiring diagram which is located on the front cover of junction box.)



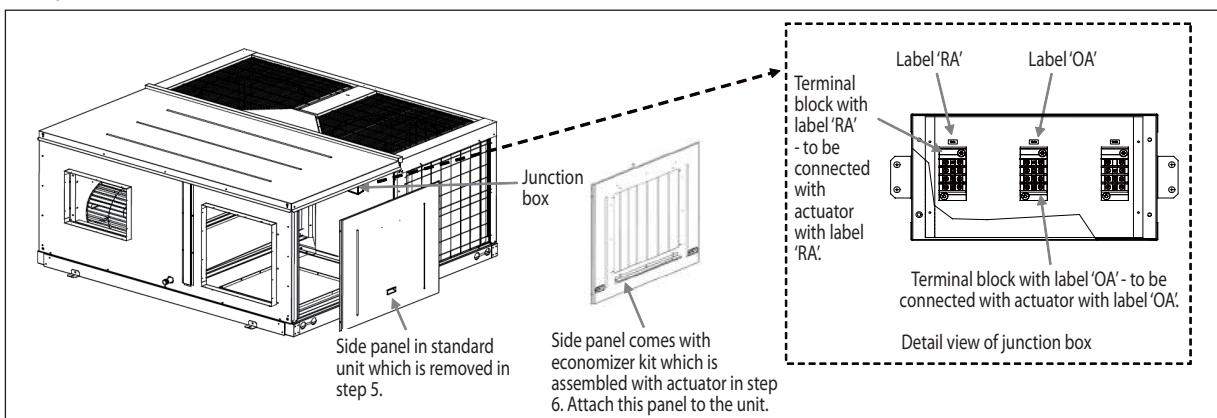
Sticker wiring diagram on the front cover of junction box



CAUTION

Wrong wiring connection may cause the malfunction on actuator or economizer controller board or both. Tie the wires with releasable cable ties under the junction box.

- Then, connect Belimo actuator, LF24-SR (item 1) with label 'OA', which is now located at the assembly damper on the side panel to terminal block with label 'OA' inside the same junction box. Follow the same method used for wiring connection between actuator 'RA' and terminal block 'RA'. Next, attach the side panel to the unit. You may need to do proper arrangement on the actuator wires by using cable ties (field supply) before attach the side panel to the unit.

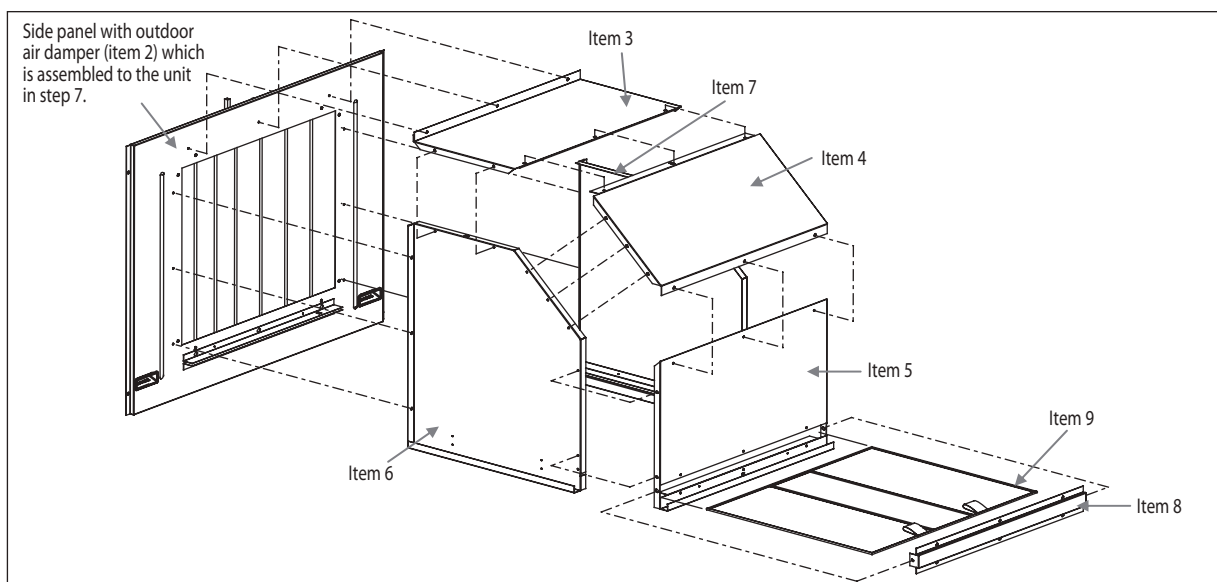


STEP 8

- To build the rain hood, install the loose parts (metal parts) to the side panel. Before that, place the gasket (field supply) on the side panel for sealing purpose.
- Then, follow the installation sequence below to build the rain hood:

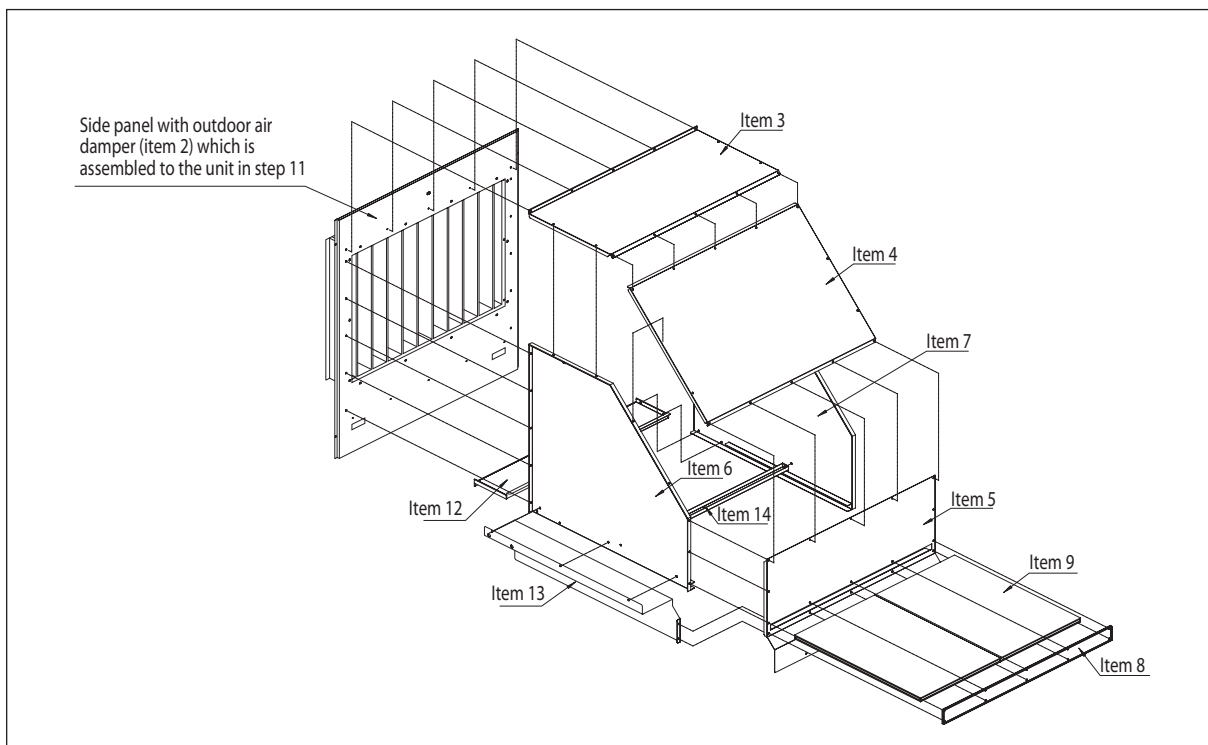
Model : UATYQ 250, 350, 450, 550, 600, 700

Gasket
 Item 2 -----> Item 6 -----> Item 7 -----> Item 3 -----> Item 4 -----> Item 5 -----> Item 9 -----> Item 8 -----> Sealant



Model : UATYQ 900

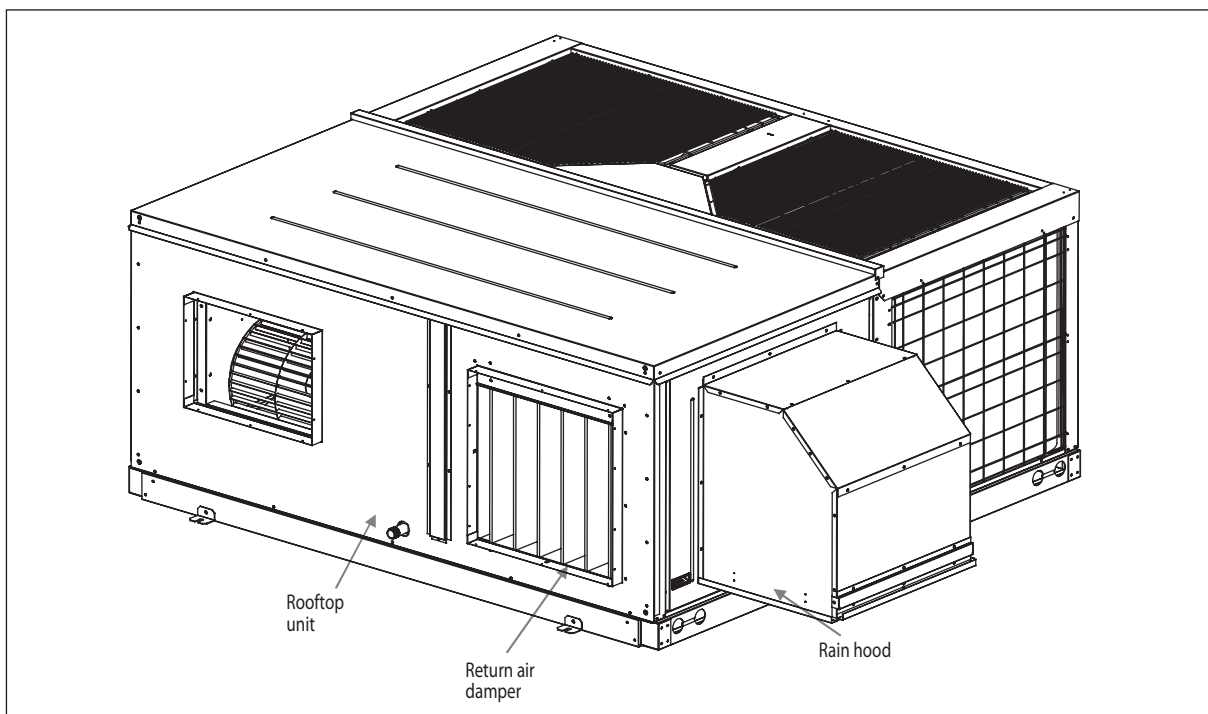
Gasket
Item 2----->Item 6----->Item 7----->Item 12----->Item 14----->Item 5----->Item 4----->Item 3----->Item 13----->Item 9----->Item 8----->Sealant



- It is recommended to seal off all the joints and gaps with weather-proof sealant (such as silicone, field supplied item) in order to ensure a water-proof finishing on the rain hood.

STEP 9

- Finally, you may see the unit with economizer kit as shown in the diagram below:



Note

Unit shown in the diagrams from step 1 to step 9 are UATYQ350. Other models shall follow the same method.
Unit shown in the diagrams from step 1 to step 12 are UATYQ900. Other models shall follow the same method.

(ii) Down return (vertical) application

STEP 1

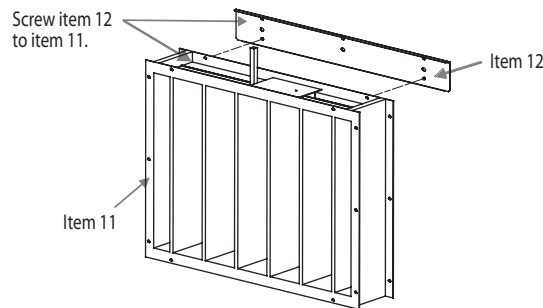
- Disconnect power supply to the unit and install a safety lockout tag before installation, commissioning or service of the economizer unit. Prepare all the tools required as mentioned above.

STEP 2

- Unpack the wooden crate of economizer kit by using crowbar and hammer. Then, remove the polybags containing loose parts and fasteners by using cutter. Perform preinstallation checking as mentioned above.

STEP 3

- Attach support bracket, down throw (item 12) to return air damper (item 11) by using screw M5x16 (item 13) provided in the kit.



Note

Support bracket, down throw (item 12) is not available in ECONO 700 & 900. To install economizer kit for this model, ignore step 3 and jump to step 4.

STEP 4

- Mount 1pc Belimo actuator, LF24-SR (item 1) to return air damper (item 11). Align and insert the hole of actuator to the shaft of the damper.



CAUTION 1

The default setting for return air damper (item 11) shall be fully opened. Ensure this damper is in 'fully opened' position before mount the actuator. Fail to do so will cause errors during the unit normal operation.

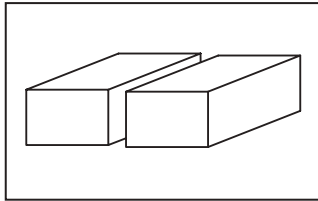


CAUTION 2

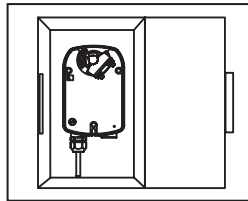
The surface of actuator which is facing upward/ outside shall be labelled with 'L' symbol to ensure the rotation of actuator modulation in clockwise direction. Fail to do so will cause errors during the operation of unit with economizer function.

Note

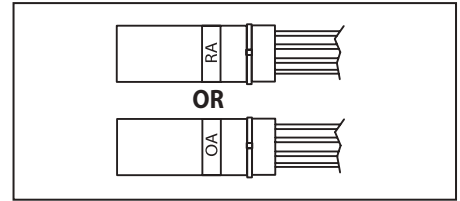
There are 2pcs of Belimo actuator, LF24-SR (item 1) in economizer kit which come together with carton boxes. Open the boxes and recognize the label on the wire. The actuator used in step 4 is the one with label 'RA'.



2pcs of item 1 in carton boxes.

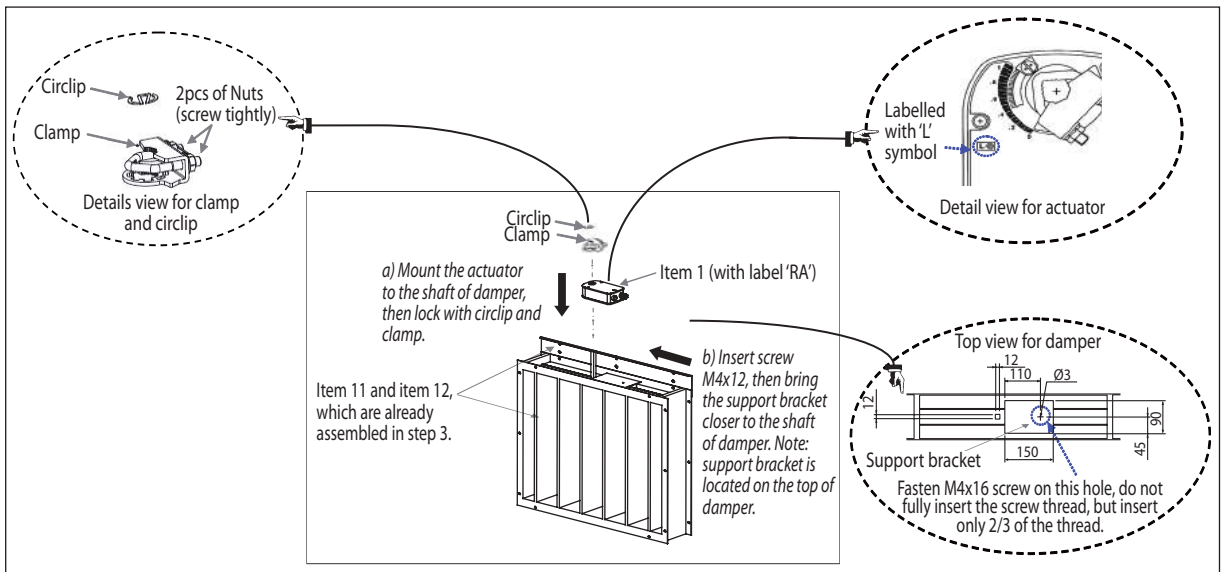


Open the box.



Recognize the label on the wire. One of them is indicated with 'RA', while the other is 'OA'.

- Then, fastens 1pc screw M4x12 (item 14) on the support bracket of the damper. Do not fully insert the screw thread, but only insert up to 2/3 of the screw thread. Mount the actuator to the support bracket by bringing the support bracket closer to the shaft of damper. The function of screw M4x12 is to lock the actuator from slippery during modulation.
- Next, put the clamp into the shaft and lock the actuator with circlip. Fasten the nuts of clamp tightly by using adjustable spanner. Noted that clamp and circlip come together with actuator as the standard parts, you may find these parts inside the actuator box.



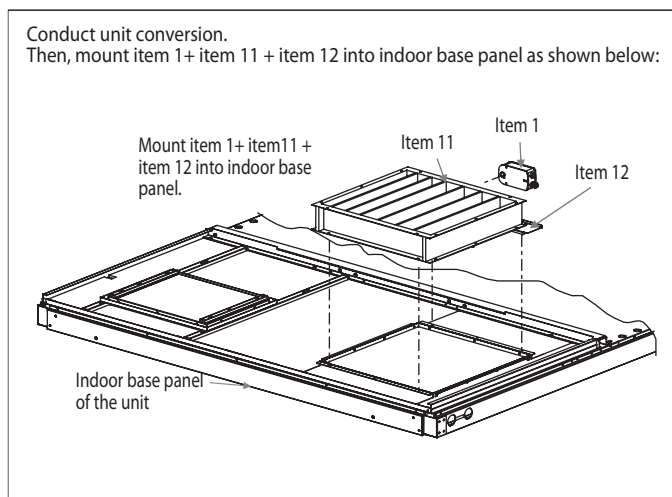
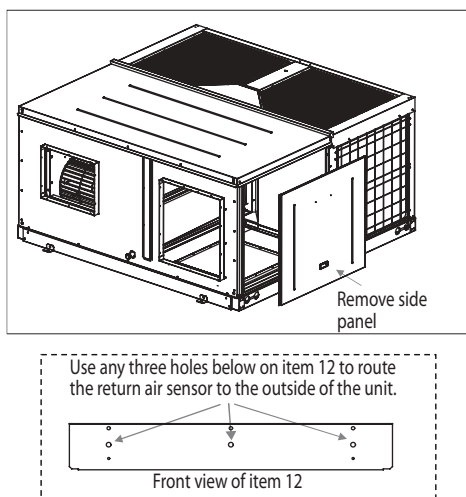
STEP 5

- Remove side panel. Conduct unit conversion from standard unit to downthrow unit by following the steps stated in part (G) under chapter "INSTALLATION OF THE UNIT" in this manual.
- Then, install the return air damper (item 11) + support bracket, down throw (item 12) + Belimo actuator, LF24-SR (item 1) which are already assembled in step 3 and step 4 into indoor base panel of the unit by using screw M5x16 (item 13).



CAUTION

Extend the return air sensor which is located inside the unit (on top of return air opening) to the outside area of the unit. This can be done by routing the sensor through small holes on support bracket, down throw (item 12). The sensor is then located properly inside the return air duct by using the cable ties (field supply). Failing to do so may affect the performance of the unit and cause thermal discomfort to the users. For model ECON0700 and UATYQ700, sensor routing can be done through the small hole on metal flange of down throw return air opening.



STEP 6

- Mount 1pc Belimo actuator, LF24-SR (item 1) to the side panel with outdoor air damper (item 2). Align and insert the hole of actuator to the shaft of the damper.



CAUTION 1

The default setting for outdoor air damper (item 2) shall be fully closed. Ensure this damper is in 'fully closed' position before mount the actuator. Fail to do so will cause errors during the unit normal operation.

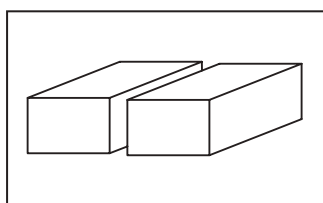


CAUTION 2

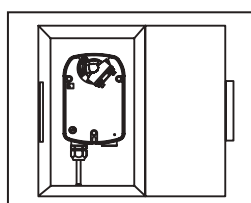
The surface of actuator which is facing upward/ outside shall be labelled with 'R' symbol to ensure the rotation of actuator modulation in counter clockwise direction. Fail to do so will cause errors during the operation of unit with economizer function.

Note

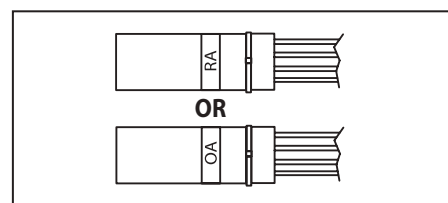
There are 2pcs of Belimo actuator, LF24-SR (item 1) in economizer kit which come together with carton boxes. Open the boxes and recognize the label on the wire. The actuator used in step 6 is the one with label 'OA'.



2pcs of item 1 in carton boxes.

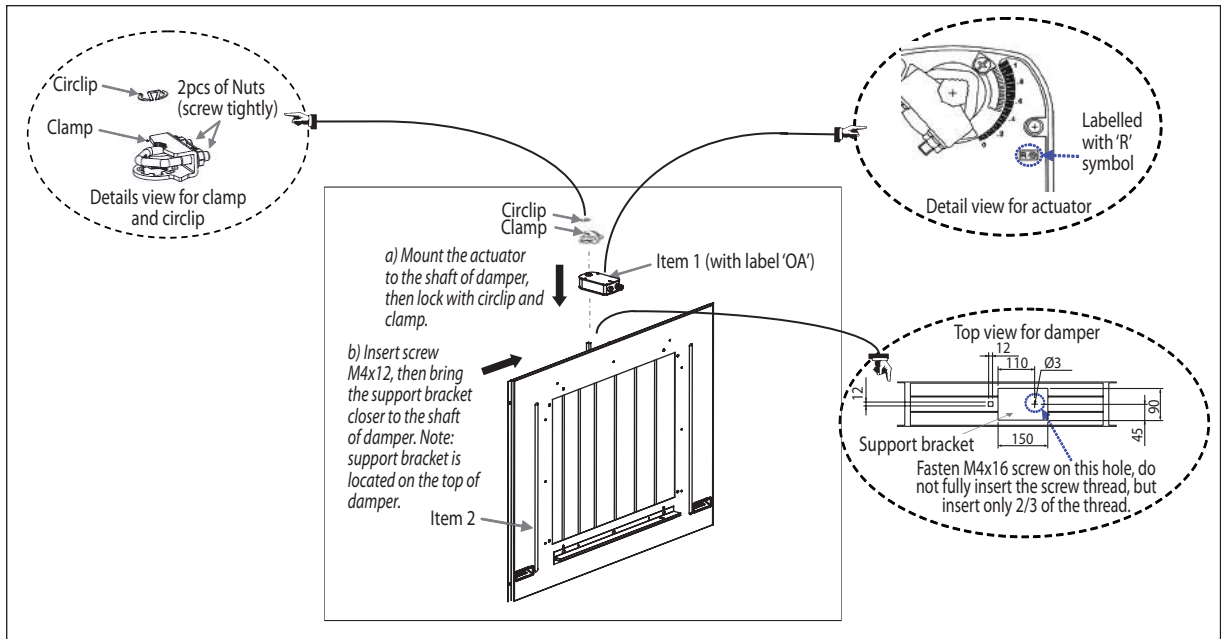


Open the box.



Recognize the label on the wire. One of them is indicated with 'RA', while the other is 'OA'.

- Then, fastens 1pc screw M4x12 (item 14) on the support bracket of the damper. Do not fully insert the screw thread, but only insert up to 2/3 of the screw thread. Mount the actuator to the support bracket by bringing the support bracket closer to the shaft of damper. The function of screw M4x12 is to lock the actuator from slippery during modulation.
- Next, put the clamp into the shaft and lock the actuator with circlip. Fasten the nuts of clamp tightly by using adjustable spanner. Noted that clamp and circlip come together with actuator as the standard parts, you may find these parts inside the actuator box.

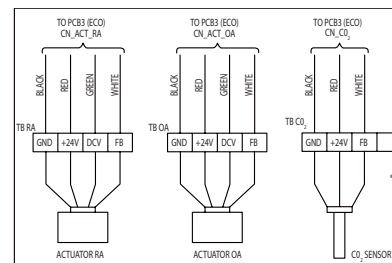


STEP 7

- Connect Belimo actuator, LF24-SR (item 1) with label 'RA', which is now located at the assembly damper on the indoor base panel to terminal block with label 'RA' inside the junction box.
- There are four wires on the actuator with different colours (black, red, green and white colours). Connect the wires as below:

- Black colour wire - connect to first pole of terminal block with label 'GND'.
- Red colour wire - connect to second pole of terminal block with label '+24V'.
- Green colour wire - connect to third pole of terminal block with label 'DCV'.
- White colour wire - connect to fourth pole of terminal block with label 'FB'.

(You may refer to sticker wiring diagram which is located on the front cover of junction box.)



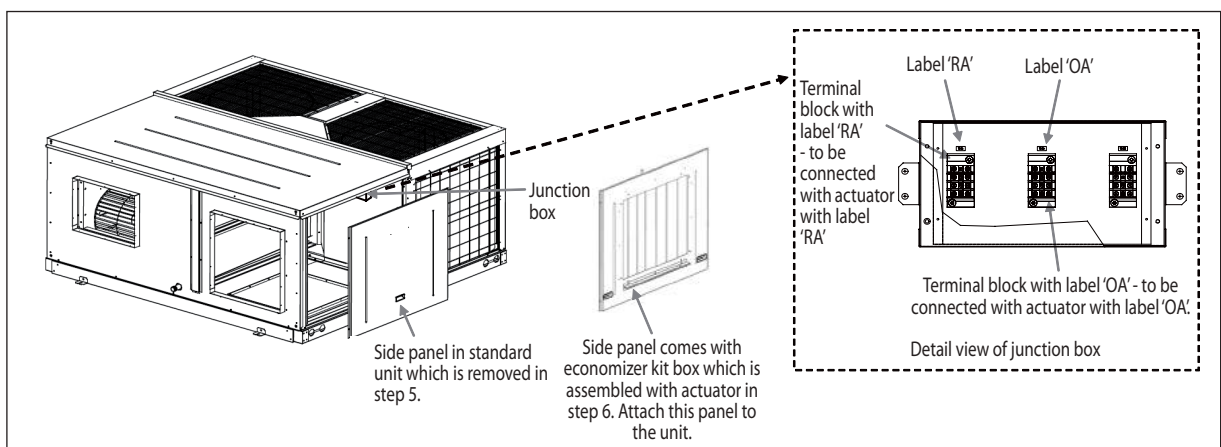
Sticker wiring diagram on the front cover of junction box



CAUTION

Wrong wiring connection may cause the malfunction on actuator or economizer controller board or both. Tie the wires with releasable cable ties under the junction box.

- Then, connect Belimo actuator, LF24-SR (item 1) with label 'OA', which is now located at the assembly damper on the side panel to terminal block with label 'OA' inside the same junction box. Follow the same method used for wiring connection between actuator 'RA' and terminal block 'RA'. Next, attach the side panel to the unit. You may need to do proper arrangement on the actuator wires by using cable ties (field supply) before attach the side panel to the unit.

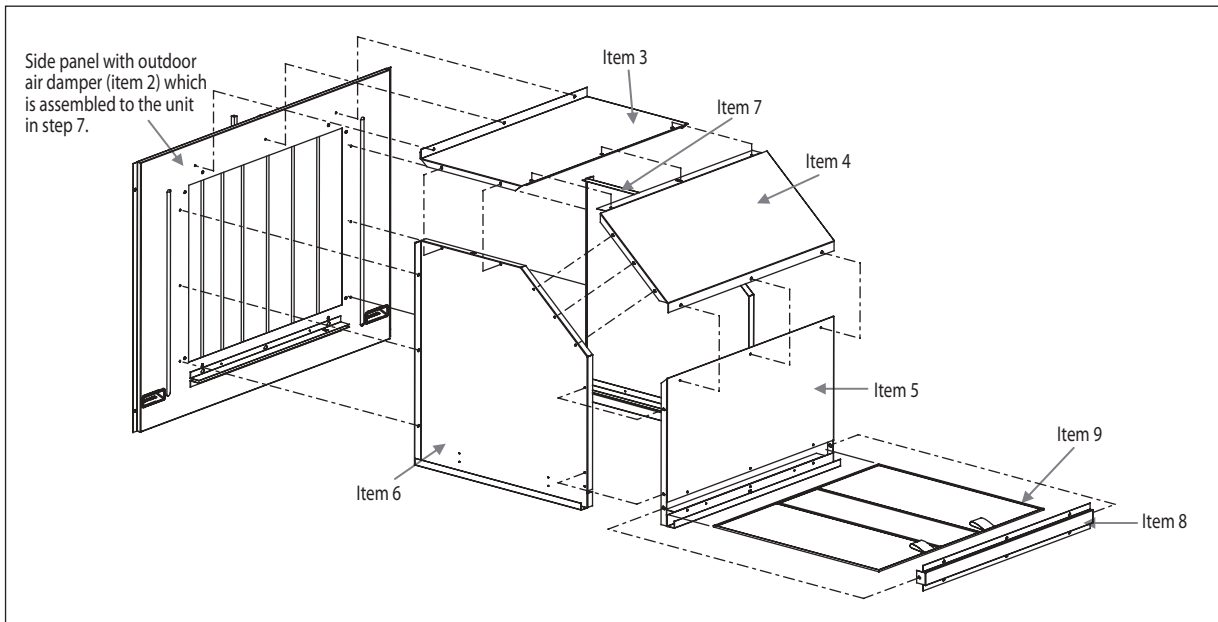


STEP 8

- To build the rain hood, install the loose parts (metal parts) to the side panel. Before that, place the gasket (field supply) on the side panel for sealing purpose.
- Then, follow the installation sequence below to build the rain hood:

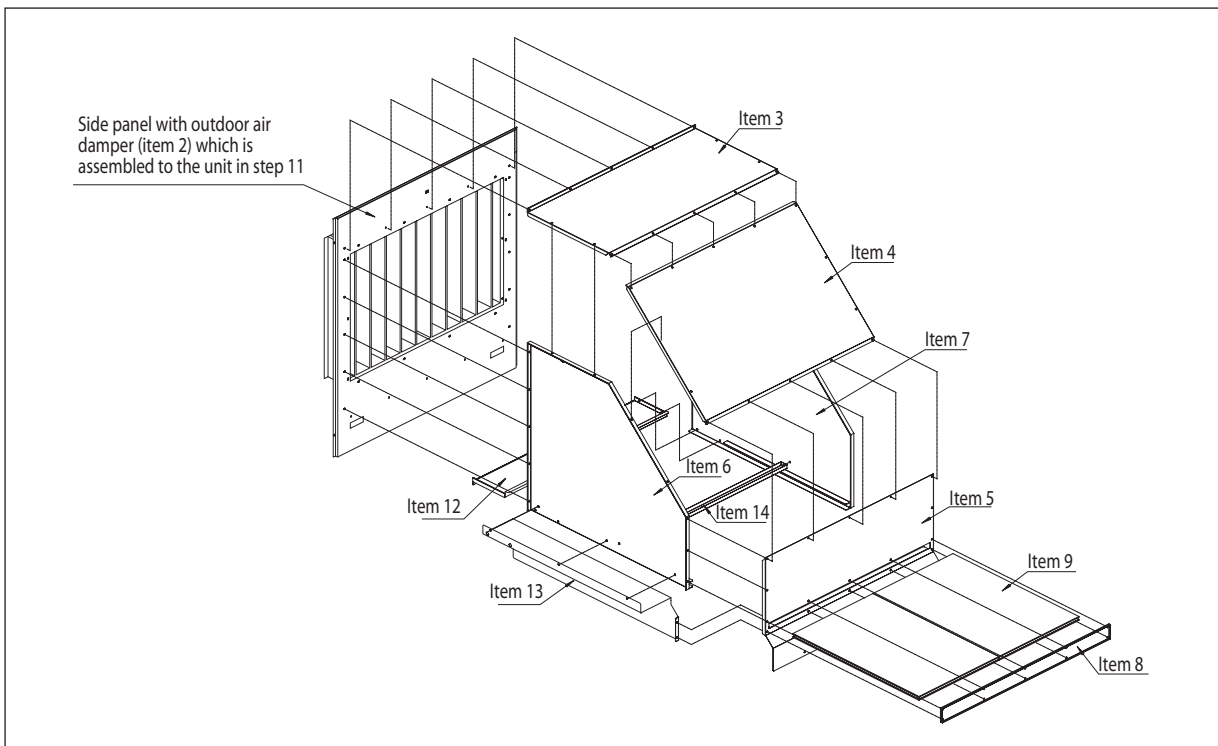
Model : UATYQ 250, 350, 450, 550, 600, 700

Gasket
Item 2 -----> Item 6 -----> Item 7 -----> Item 3 -----> Item 4 -----> Item 5 -----> Item 9 -----> Item 8 -----> Sealant



Model : UATYQ 900

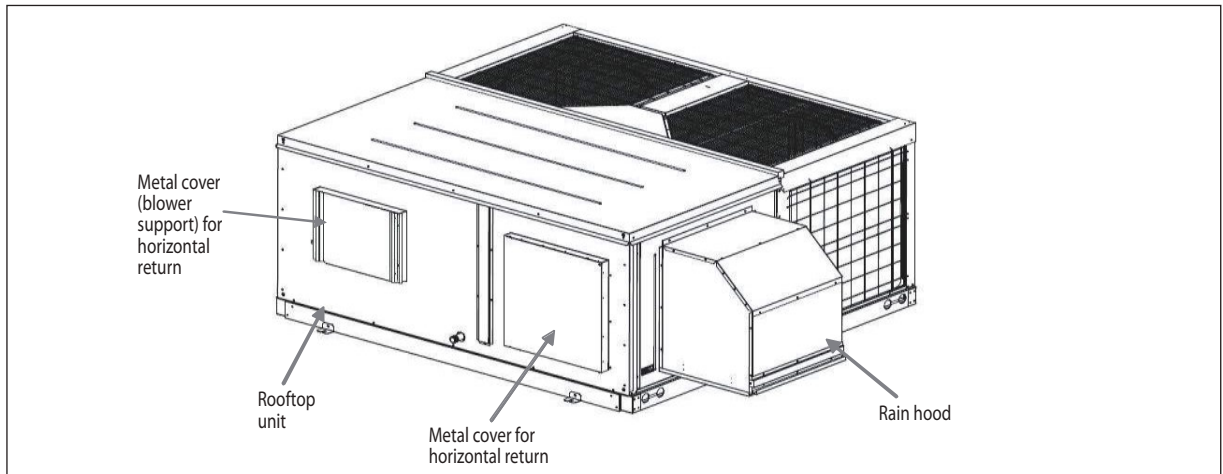
Gasket
Item 2 -----> Item 6 -----> Item 7 -----> Item 12 -----> Item 14 -----> Item 5 -----> Item 4 -----> Item 3 -----> Item 13 -----> Item 9 -----> Item 8 -----> Sealant



- It is recommended to seal off all the joints and gaps with weather-proof sealant (such as silicone, field supplied item) in order to ensure a water-proof finishing on the rain hood.

STEP 9 & STEP 10 (for UATYQ900 only).

- Finally, you may see the unit with economizer kit as shown in the diagram below:
- When roof curb is required for down throw application, refer to the recommendation in part (C) under chapter "INSTALLATION OF THE UNIT" in this manual.



Note

Unit shown in the diagrams from step 1 to step 9 are UATYQ350. Other models shall follow the same method. Unit shown in the diagrams from step 1 to step 10 are UATYQ900. Other models shall follow the same method.

E Commissioning

(i) Airflow Resistance

Airflow resistance refers to pressure drop caused by the economizer kit. Before installation, it is recommended to check the pressure drop table which is provided in Engineering Data Book in order to do a correct design selection.

(ii) Performance Adjustment

Performance of the unit will derate when the unit operates with fresh air mode, it depends on user's selection. Before installation, it is recommended to check the correction factor table which is provided in Engineering Data Book in order to do a correct design selection.

(iii) Mode Selection

Generally, the kit provides two mode selection, which are Economizer Mode and Fresh Air Mode.

- Economizer Mode: Provide 'free' cooling when the outdoor air temperature is suitable. It can be used alone or in conjunction with mechanical cooling.
- Fresh Air Mode: Provide minimum fresh air that is necessary for ventilation or local requirements.

Note

Refer to hardware setting guideline provided in part (D) (v) under chapter "CONTROL OPERATION GUIDE" in this manual for mode selection.

(iv) Minimum Fresh Air Selection

The kit provides minimum fresh air selection from 0~25% for both cool and heat mode. While the economizer mode & fan mode can provide up to maximum 85% of fresh air.

Note

Refer to hardware setting guideline provided in part (D) (v) under chapter "CONTROL OPERATION GUIDE" in this manual for minimum fresh air selection.

(v) Overcooled Protection Feature

Thermal discomfort may happen during the cold ambient due to the outdoor air damper opening. This situation can be avoided when the overcooled protection feature is activated.

Note

Refer to hardware setting guideline provided in part (D) (v) under chapter "CONTROL OPERATION GUIDE" in this manual for the activation of overcooled protection setting.

(vi) Operating Range

The applicable operating range for unit with economizer feature same like normal unit. Refer to chapter "OPERATING RANGE" in this manual.

However, the restriction of fresh air opening will occur in high ambient or low ambient in order to ensure the reliability of the unit. Refer to Engineering Data Book for detail information.



CAUTION

The performance will be reduced at high ambient or low ambient, refer item (E)(ii).

(vii) Optional Air Filter

There is a 2" filter slot inside the unit. Optional filter (field supplied) is recommended as the second layer filtration since outdoor air damper opening may bring in dust and dirt.

F Service And Maintenance

(i) Service of the filter

Airflow resistance may increase when the filter becomes dirty. Thus, clean the filter regularly with at least once every 2 weeks. Air filter in rain hood which is exposed to outdoor environment may have chance to be damaged by vermins or animals. Replace the air filter when it is damaged.

(ii) Service of the indoor compartment

Outdoor air damper opening may still bring in dust and dirt as hood filter cannot fully filter the dirt particles. Thus, indoor compartment must be cleaned as well during the service of filter.

(iii) Service of the damper

Wipe the dirty damper, especially outdoor air damper which is exposed to the environment all the time.

Note

Refer to chapter "SERVICE AND MAINTENANCE" in this manual.

- One technique to reduce energy consumption while maintain adequate air quality is demand controlled ventilation. Instead of setting at a fixed air replacement rate, carbon dioxide sensor (CO₂ sensor) is used to control the rate dynamically, based on the emissions of actual building occupants.
- CO₂ sensor is an optional component supplied in field. Refer to the information below for the recommendation of CO₂ sensor selection:

- Type: Duct-mounted type
- Power input: 24 VDC, 50Hz
- Operating temperature range: 0 ~ 52°C
- Ambient temperature range: -15 ~ 52°C
- Measuring range: 0 ~ 5000 PPM (depends on the application)
- Output voltage: 2 ~ 10 VDC
- Wire size: AWG18
- Maximum allowable current: 7A
- Compliance standards: To follow local and national regulations

- The economizer controller comes with a build-in software which is ready with the integration of CO₂ sensor. It is activated only in economizer mode. User is allowed to choose the different threshold value selection via Dip switch 3. Refer to hardware setting guideline provided in part (D) (v) under chapter "CONTROL OPERATION GUIDE" in this manual for CO₂ PPM level threshold value selection.

For example: To use a CO₂ sensor with measuring range from 0 ~ 5000 PPM with the threshold value at 1250PPM, user needs to do the following steps:-

- Step 1: Enable SW4 in the only Dip Switch in controller main board to ON position (default factory setting is in OFF position).
- Step 2: Enable panel parameter G6 (economizer control) in remote controller to '1' (ON) position (default factory setting is in '0' (OFF) position).
- Step 3: Ensure SW2 in Dip Switch 4 (Economizer controller board) is in OFF position (default factory setting is in OFF position).
- Step 4: Enable SW1 in Dip Switch 3 (Economizer controller board) to ON position (default factory setting is in OFF position).
{ SW1 in Dip Switch 3 = 25%, by calculation means 25% of 5000 PPM or equivalent to 1250 PPM }.

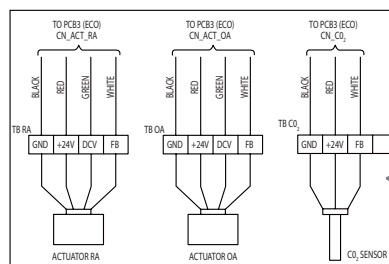
- If the CO₂ sensor is exposed to outdoor environment, cover the sensor with a splash proof (IPX4) box with screw as locking mechanism or similar method to prevent water from entering into the CO₂ sensor and also to avoid possible contact with the sensor. The connection of CO₂ sensor is considered a LIVE part.
- Then, connect the wire from CO₂ sensor to the junction box in the indoor compartment of the unit. There are three wires on CO₂ sensor. Connect the wires as below:

System ground wire - connect to first pole of terminal block with label 'GND'.

+24VDC live wire - connect to second pole of terminal block with label '+24V'.

Output/ feedback signal wire - connect to third pole of terminal block with label 'FB'.

(You may refer to sticker wiring diagram which is located on the front cover of junction box.)



Sticker wiring diagram on the front cover of junction box



CAUTION

Wrong wiring connection may cause the malfunction on CO₂ sensor or economizer controller board or both. Tie the wires with releasable cable ties under the junction box.

