Envi Group
All about HVAC-R

WCPU- Water cooled packaged unit

Technical Manual

Cooling capacity: 3.5kW~46kW
R410A

May 2024

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Technical Manual

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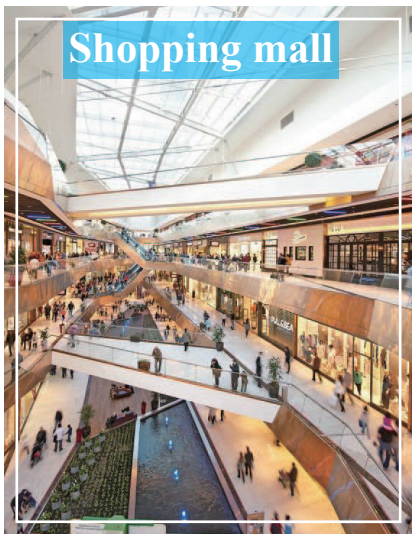
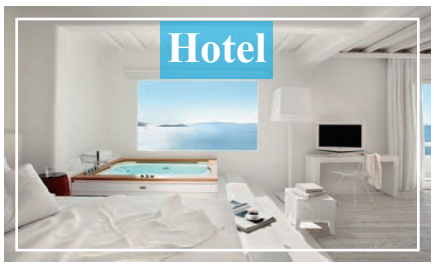
Brief introduction

Water cooled packaged unit use cycle water as heat source, could be in heating and cooling mode, it is high efficiency energy saving central air conditioning technique. When in cooling, use the cycle water as exhaust heat source. When in heating, use the cycle water as absorb heat source.
Water cooled packaged unit is a central air conditioning system. When the temperature of the water in the water cycle exceed a certain value because of the cooling or heating, normally use the cooling tower to exhaust the heat from the water inside the water cycle. When the temperature in the water cycle is lower than a certain value, normally use heating equipment to supplement heat into the cycle water. When the water temperature inside the water cycle is keep in a certain range, no need the cooling tower and heating equipment, the energy saving affection is obvious.

Applications

The water cooled packaged unit is ideal for multi-unit installations such as high-rise office, apartments or hotel buildings, where the flexibility of individual zone control is required.





Product introduction

Compact and reliable, these units can be installed above ceilings/corridors, or in other concealed spaces, saving valuable floor space and providing conditioned air direct to necessary locations.
Units are designed to be used with simple duct layouts. To take maximum advantage of this feature, units should be located as close to the space to be air conditioned as acoustic criteria allows. Multiple small units, utilizing minimal duct lengths, prove more economical than a single large central ducted unit.
The standard unit is right handed, i.e. when facing the discharge side of the unit, the water connections are on the right hand side of the unit. Opposite Hand versions are also available.
In office buildings, water cooled packaged unit system can provide the ideal off-peak system for occupied areas when the main system is not running, e.g. night time, weekends, holidays.
Applied to provide owner occupiers with individual control and billing, thus avoiding large central plant room areas, e.g. in apartment buildings.
Installing multiple reverse cycle versions enables simultaneous heating and cooling in different parts of a building.

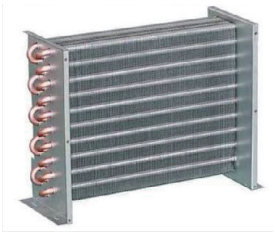
Features

Efficient

These air conditioners provide one of the most efficient forms of cooling / heating you can invest in, as evidenced by their high EER figures. Each unit include a high efficiency double inlet centrifugal fan, protection level IP44. Low noise, low speed, big air flow and high ESP.
Each unit incorporates a high efficiency rotary/scroll compressor. Heat exchange air coils use inner grooved (rifled) tube for better heat transfer.

High efficiency in heat exchange

Hydrophilic aluminum foil heat exchanger



Ordinary aluminum foil heat exchanger

High efficiency in centrifugal fan

Double inlet centrifugal fan

Insulation

Closed cell foam insulation has been used to inhibit mould growth in places where moisture could be present. Bonded polyester insulation ensures no particles are introduced into the air stream.

Structure

Panels and frame are made from galvanized steel protected with polyester powder painting to ensure total resistance to atmospheric agents.

Water side heat exchanger

High efficiency coaxial heat exchanger, factory insulated with flexible close cell material. Consists of an inner twisty tube and a steel outer tube. Large tube diameters prevent clogging, unlike brazed type heat exchangers which require mesh strainers.

Durable

The air coil is die formed plate type epoxy coated aluminium fins mechanically bonded to high efficiency inner grooved copper tubes.

Accessories

Air filter

Each unit is supplied with a washable synthetic fibre EU2/G2 rated filter that is integrated with the return air spigot. This filter complies with AS/NZS 1324.1:2001.
For ducted return air applications, filters should ideally be located in the ceiling return air grilles and removed from the unit's return air spigot, thereby improving access for cleaning.

Spring mounting kit

The units Spring Mounting System, supplied with each unit, has been designed to minimise the transfer of vibration from the unit into the building structure. Recommended for use in all installations.

Optional equipment

Condensate -Lift Pump – max. lift 800mm.

Electric heat option: 2kW, 3kW, 4kW, 6kW, 9kW, 12kW
EC centrifugal plug fan

Technical data

Model		Unit	WCPU3.5	WCPU5	WCPU7	WCPU10	WCPU12
Nominal cooling capacity		kW	3.5	5	7	10	12.2
		Ton	1	1.4	2	2.9	3.5
Cooling power input		kW	0.98	1.4	1.92	2.8	3.32
Nominal heating capacity		kW	4.5	6.4	8.1	12.2	14.5
		Ton	1.3	1.8	2.3	3.5	4.1
Heating power input		kW	1.07	1.5	2	2.9	3.25
Power			220~240V/1Ph/50Hz				
Minimum wiring specification			$2\times1.5mm^2+1\times1mm^2$	$2\times2.5mm^2+1\times1.5mm^2$		$2\times4mm^2+1\times2.5mm^2$	
Compressor type			Rotary				
Air flow amount		m^3/h	680	950	1280	1900	2160
External static pressure		Pa	60	120	120	160	200
Refrigerant	Type		R410A				
	Charge	Kg	0.6	0.85	1.1	1.7	1.9
Condenser	Type		Tube in tube coaxial heat exchanger				
Fan	Type		High efficiency low noise centrifugal fan				
	Power		220~240V/1Ph/50Hz				
Evaporator	Type		High efficiency copper tubes aluminum fins heat exchanger				
Water flow amount		m^3/h	0.6	0.9	1.2	1.7	2.1
Water pressure drop		Kpa	8	10	14	16	20
Diameter of water in/out pipe		mm	DN20				
Diameter of condensing pipe		mm	DN20				
Dimension	L	mm	1260	1310	1210	1320	1410
	W	mm	660	710	790	790	790
	H	mm	350	450	450	450	450
Weight		kg	75	90	100	130	135
Noise level		dB(A)	54	57	57	60	60

Note:

1. Nominal cooling capacity test condition:
   Water side water inlet/outlet 30ºC/35ºC, Ambient temperature DB 27 ºC, WB 19 ºC.
2. Nominal heating capacity test condition:
   Water side water inlet 20ºC, Ambient temperature DB 20 ºC, WB 15 ºC.
3. Noise level measured in the noise lab with background noise of 25 dB(A), at a distance of 1 m.
4. As our continuous products improvement, Amrta reserves the right to change specifications and design without notice.

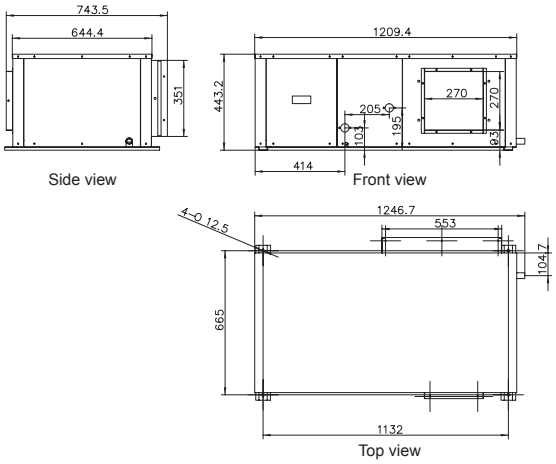
Model		Unit	WCPU14	WCPU18	WCPU23	WCPU30	WCPU35	WCPU45
Nominal cooling capacity		kW	14.4	18	23	30	34	46
		Ton	4.1	5.1	6.6	8.6	9.7	13.1
Cooling power input		kW	4.06	5.1	6.18	7.8	8.26	11.6
Nominal heating capacity		kW	17.3	22.6	25.9	30	35.4	49
		Ton	4.9	6.5	7.4	8.6	10.1	14
Heating power input		kW	4	5.6	6.86	8.6	9.1	12.84
Power			220~240V/1Ph/50Hz	415V/3Ph/50Hz				
Minimum wiring specification			$2\times6mm^2+1\times4mm^2$		$3\times2.5mm^2+1\times1.5mm^2$		$3\times4mm^2+1\times2.5mm^2$	
Compressor type			Rotary	Scroll				
Air flow amount		m^3/h	2500	3200	4000	5200	6200	8000
External static pressure		Pa	200	200	250	250	250	250
Refrigerant	Type		R410A					
	Charge	Kg	2.2	3	4	4.8	6	8
Condenser	Type		Tube in tube coaxial heat exchanger					
Fan	Type		High efficiency low noise centrifugal fan					
	Power		220~240V/1Ph/50Hz	415V/3Ph/50Hz				
Evaporator	Type		High efficiency copper tubes aluminum fins heat exchanger					
Water flow amount		m^3/h	2.4	3.1	4	5.2	5.8	7.9
Water pressure drop		Kpa	20	23	26	30	33	33
Diameter of water in/out pipe		mm	DN20	DN40				
Diameter of condensing pipe		mm	DN20					
Dimension	L	mm	1680	1680	2170	1975	2230	2430
	W	mm	930	930	1030	1030	1130	1130
	H	mm	450	600	500	650	650	900
Weight		kg	140	155	170	200	200	245
Noise level		dB(A)	63	66	66	68	68	69

Note:

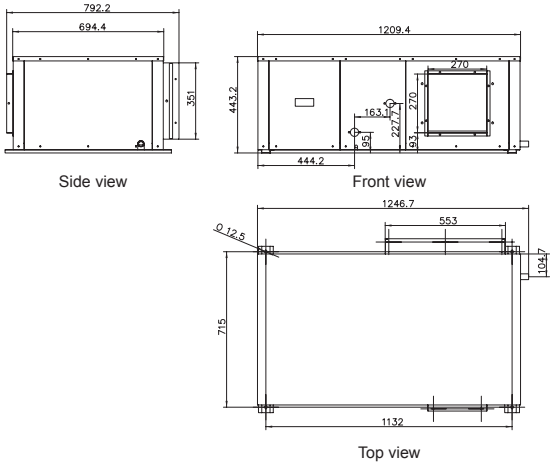
1. Nominal cooling capacity test condition:
   Water side water inlet/outlet 30ºC/35ºC, Ambient temperature DB 27 ºC, WB 19 ºC.
2. Nominal heating capacity test condition:
   Water side water inlet 20ºC, Ambient temperature DB 20 ºC, WB 15 ºC.
3. Noise level measured in the noise lab with background noise of 25 dB(A), at a distance of 1 m.
4. As our continuous products improvement, Amrta reserves the right to change specifications and design without notice.

Dimension data

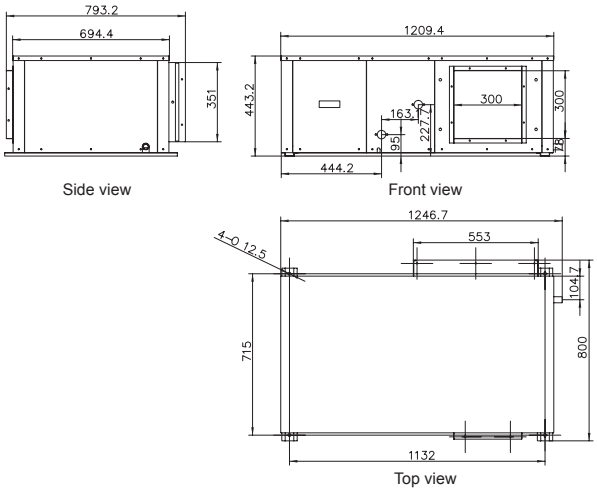
WCPU3.5



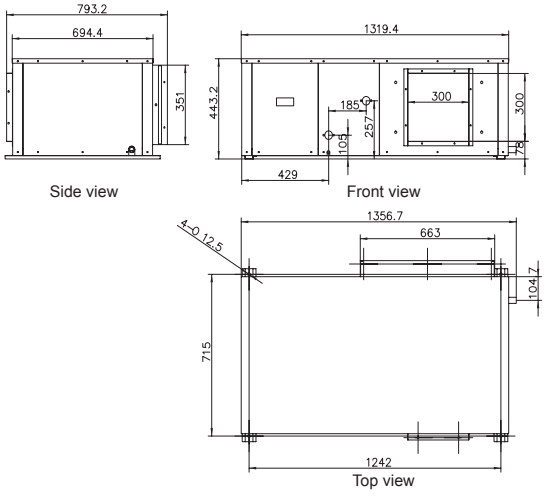
WCPU5



WCP7U



WCPU10



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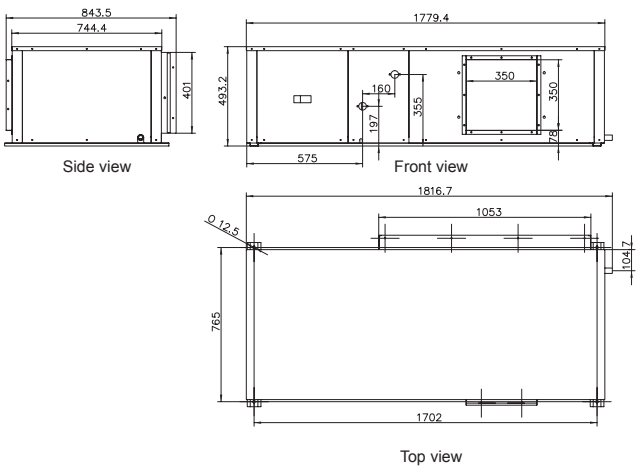

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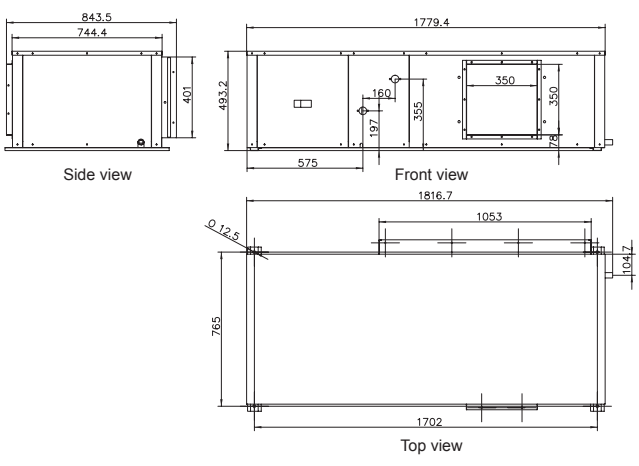

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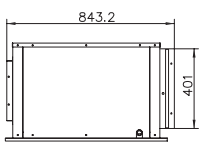
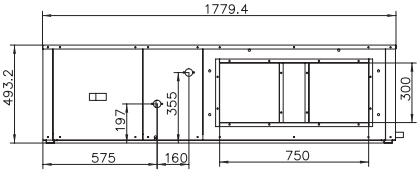
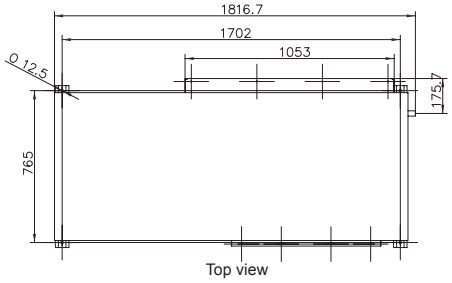


Side view

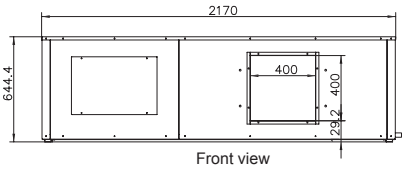


Front view

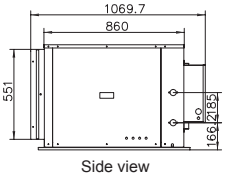


Top view

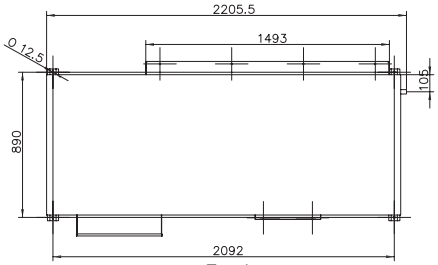
WCPU23



Front view

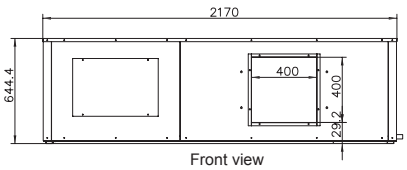


Side view

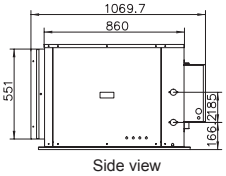


Top view

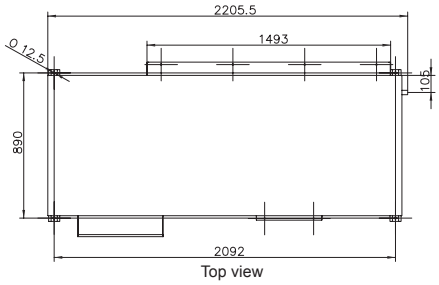
WCPU30



Front view

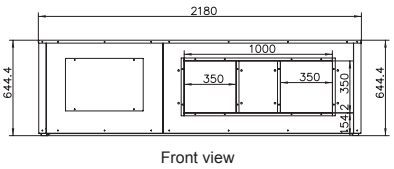


Side view

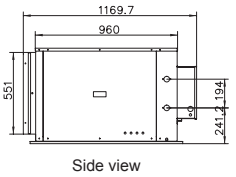


Top view

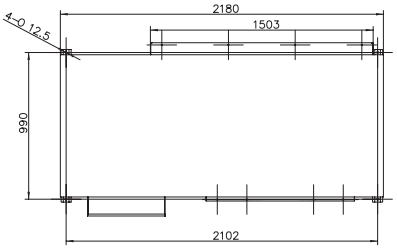
WCPU35



Front view

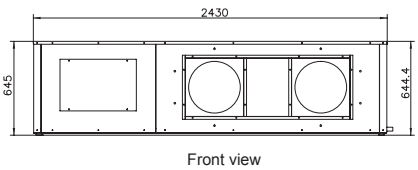


Side view

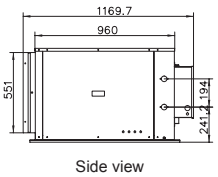


Top view

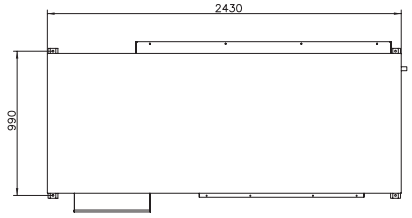
WCPU45



Front view



Side view



Top view

Performance data

Air flow correction factor

Rated air flow rate percent	85%	90%	95%	100%	105%	110%	115%
Sensible cooling capacity	0.972	0.982	0.994	1	1.007	1.01	1.013
Total heating capacity	0.926	0.948	0.974	1	1.027	1.055	1.066
Latent heating capacity	0.975	0.983	0.991	1	1.008	1.015	1.018
Cooling power input	0.977	0.984	0.993	1	1.011	1.018	1.028
Total heating capacity	0.967	0.978	0.99	1	1.009	1.017	1.024
Heating power input	1.009	1.006	1.003	1	0.997	0.995	0.993

Application limits

	Water Loop		Ground Loop	
	Cooling	Heating	Cooling	Heating
Return air temp.	16~32°C	10~30°C	16~32°C	10~30°C
Entering water temp.	15~43°C	5~32°C	13~43°C	-5~32°C

Capacity correction factors

Methanol	10%	15%	20%
Cooling	1.00	0.99	0.99
Heating	0.99	0.98	0.97

Ethanol	10%	15%	20%
Cooling	1.00	1.00	1.00
Heating	0.99	0.98	0.97

Propylene glycol	15%	20%	25%
Cooling	0.98	0.97	0.96
Heating	0.96	0.95	0.93

Cooling capacity correction factor(3.5kw)

Air flow rate (L/S)			194		
Water flow rate (L/S)			0.23		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	3.78	4.02	4.33
		S	2.64	2.98	3.36
		INPT	0.92	0.92	0.92
	25	T	3.62	3.82	4.08
		S	2.52	2.9	3.26
		INPT	0.99	0.99	0.99
	30	T	3.42	3.62	3.95
		S	2.34	2.79	3.19
		INPT	1.07	1.07	1.07
	35	T	3.21	3.5	3.65
		S	2.3	2.7	3.07
		INPT	1.14	1.14	1.14
	40	T	2.96	3.25	3.38
		S	2.18	2.61	2.95
		INPT	1.22	1.22	1.22

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(3.5kw)

Air flow rate (L/S)			194		
Water flow rate (L/S)			0.23		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	4.06	4.22	4.09
		INPT	1.14	1.01	1.19
	20	HC	4.18	4.51	4.27
		INPT	1.2	1.07	1.23
	25	HC	4.33	4.79	4.58
		INPT	1.24	1.16	1.26

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(5kw)

Air flow rate (L/S)			278		
Water flow rate (L/S)			0.29		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	5.04	5.36	5.78
		S	3.67	4.14	4.67
		INPT	1.07	1.07	1.07
	25	T	4.83	5.10	5.44
		S	3.50	4.03	5.49
		INPT	1.15	1.15	1.15
	30	T	4.56	4.83	5.27
		S	3.25	3.88	4.44
		INPT	1.24	1.24	1.24
	35	T	4.28	4.58	4.87
		S	3.20	3.75	4.27
		INPT	1.32	1.32	1.32
	40	T	3.95	4.34	4.51
		S	3.03	3.63	4.10
		INPT	1.41	1.41	1.41

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(5kw)

Air flow rate (L/S)			278		
Water flow rate (L/S)			0.29		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	5.13	5.33	5.17
		INPT	1.49	1.32	1.56
	20	HC	5.28	5.70	5.40
		INPT	1.57	1.40	1.61
	25	HC	5.47	6.05	5.79
		INPT	1.71	1.62	1.68

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(7kw)

Air flow rate (L/S)			378		
Water flow rate (L/S)			0.44		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	7.57	8.05	8.67
		S	5.31	5.99	6.76
		INPT	1.78	1.78	1.78
	25	T	7.25	7.65	8.17
		S	5.07	5.83	7.94
		INPT	1.92	1.92	1.92
	30	T	6.85	7.25	7.91
		S	4.71	5.61	6.41
		INPT	2.07	2.07	2.07
	35	T	6.43	6.87	7.31
		S	4.62	5.43	6.17
		INPT	2.21	2.21	2.21
	40	T	5.93	6.51	6.77
		S	4.38	5.25	5.93
		INPT	2.36	2.36	2.36

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(7kw)

Air flow rate (L/S)			378		
Water flow rate (L/S)			0.44		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	7.10	7.38	7.16
		INPT	2.34	2.08	2.45
	20	HC	7.31	7.89	7.47
		INPT	2.47	2.20	2.53
	25	HC	7.58	8.38	8.01
		INPT	2.68	2.55	2.64

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(10kw)

Air flow rate (L/S)			472		
Water flow rate (L/S)			0.58		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	9.70	10.32	11.11
		S	6.81	7.69	8.67
		INPT	2.22	2.22	2.22
	25	T	9.29	9.80	10.47
		S	6.50	7.48	10.19
		INPT	2.39	2.39	2.39
	30	T	8.78	9.29	10.14
		S	6.04	7.20	8.23
		INPT	2.58	2.58	2.58
	35	T	8.24	8.80	9.37
		S	5.94	6.97	7.92
		INPT	2.75	2.75	2.75
	40	T	7.60	8.34	8.67
		S	5.63	6.74	7.61
		INPT	2.94	2.94	2.94

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(10kw)

Air flow rate (L/S)			472		
Water flow rate (L/S)			0.58		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	9.22	9.58	9.29
		INPT	2.87	2.54	2.99
	20	HC	9.49	10.24	9.70
		INPT	3.02	2.69	3.09
	25	HC	9.83	10.88	10.40
		INPT	3.28	3.12	3.23

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(12kw)

Air flow rate (L/S)			639		
Water flow rate (L/S)			0.73		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	12.86	13.68	14.74
		S	8.97	10.13	11.42
		INPT	2.60	2.60	2.60
	25	T	12.32	13.00	13.89
		S	8.56	9.85	13.42
		INPT	2.79	2.79	2.79
	30	T	11.64	12.32	13.44
		S	7.95	9.48	10.84
		INPT	3.02	3.02	3.02
	35	T	10.92	11.67	12.42
		S	7.82	9.17	10.43
		INPT	3.22	3.22	3.22
	40	T	10.07	11.06	11.50
		S	7.41	8.87	10.02
		INPT	3.44	3.44	3.44

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(12kw)

Air flow rate (L/S)			639		
Water flow rate (L/S)			0.73		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	11.43	11.88	11.52
		INPT	3.49	3.10	3.65
	20	HC	11.77	12.70	12.02
		INPT	3.68	3.28	3.77
	25	HC	12.19	13.49	12.90
		INPT	4.00	3.80	3.94

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(14kw)

Air flow rate (L/S)			750		
Water flow rate (L/S)			0.89		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	15.54	16.52	17.80
		S	11.17	12.60	14.21
		INPT	3.48	3.48	3.48
	25	T	14.88	15.70	16.77
		S	10.66	12.27	16.71
		INPT	3.75	3.75	3.75
	30	T	14.06	14.88	16.24
		S	9.90	11.80	13.49
		INPT	4.05	4.05	4.05
	35	T	13.19	14.10	15.00
		S	9.73	11.42	12.98
		INPT	4.31	4.31	4.31
	40	T	12.17	13.36	13.89
		S	9.22	11.04	12.48
		INPT	4.62	4.62	4.62

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(14kw)

Air flow rate (L/S)			750		
Water flow rate (L/S)			0.89		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	14.04	14.60	14.15
		INPT	4.62	4.10	4.83
	20	HC	14.46	15.60	14.77
		INPT	4.87	4.34	4.99
	25	HC	14.98	16.57	15.84
		INPT	5.29	5.03	5.21

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(18kw)

Air flow rate (L/S)			899		
Water flow rate (L/S)			1.8		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	18.79	20.00	21.53
		S	13.19	14.90	16.80
		INPT	4.39	4.39	4.39
	25	T	18.00	18.99	20.29
		S	12.59	14.49	17.27
		INPT	4.72	4.72	4.72
	30	T	17.01	18.00	19.65
		S	11.70	13.95	15.95
		INPT	5.10	5.10	5.10
	35	T	15.97	17.05	18.16
		S	11.51	13.50	13.43
		INPT	5.44	5.44	5.44
	40	T	19.00	20.85	21.68
		S	10.91	13.06	14.74
		INPT	5.81	5.81	5.81

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(18kw)

Air flow rate (L/S)			889		
Water flow rate (L/S)			1.2		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	19.15	19.90	19.30
		INPT	5.15	4.56	5.37
	20	HC	19.71	21.27	20.15
		INPT	5.42	4.83	5.55
	25	HC	20.42	22.60	21.60
		INPT	5.89	5.60	5.80

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(23kw)

Air flow rate (L/S)			1112		
Water flow rate (L/S)			1.3		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	24.02	25.55	27.51
		S	16.97	19.16	21.60
		INPT	5.32	5.32	5.32
	25	T	23.00	24.26	25.92
		S	16.20	18.64	22.21
		INPT	5.72	5.72	5.72
	30	T	21.74	23.00	25.10
		S	15.05	17.94	20.51
		INPT	6.18	6.18	6.18
	35	T	20.40	21.79	23.20
		S	14.80	17.37	17.26
		INPT	6.59	6.59	6.59
	40	T	24.28	26.64	27.70
		S	14.03	16.79	18.96
		INPT	7.04	7.04	7.04

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(23kw)

Air flow rate (L/S)			1112		
Water flow rate (L/S)			1.3		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	21.95	22.81	22.11
		INPT	6.31	5.58	6.57
	20	HC	22.59	24.38	23.09
		INPT	6.64	5.91	6.79
	25	HC	23.40	25.90	24.76
		INPT	7.21	6.86	7.10

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(30kw)

Air flow rate (L/S)			1445		
Water flow rate (L/S)			1.5		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	31.32	33.33	35.88
		S	22.70	25.63	28.90
		INPT	6.71	6.71	6.71
	25	T	30.00	31.65	33.81
		S	21.67	24.93	29.72
		INPT	7.23	7.23	7.23
	30	T	28.35	30.00	32.74
		S	20.13	24.00	27.43
		INPT	7.80	7.80	7.80
	35	T	26.61	28.42	30.26
		S	19.80	23.23	23.10
		INPT	8.31	8.31	8.31
	40	T	31.67	34.75	36.13
		S	18.77	22.47	25.37
		INPT	8.89	8.89	8.89

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(30kw)

Air flow rate (L/S)			1445		
Water flow rate (L/S)			1.5		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	25.42	26.42	25.62
		INPT	7.91	7.00	8.24
	20	HC	26.17	28.24	26.75
		INPT	8.32	7.41	8.52
	25	HC	27.10	30.00	28.68
		INPT	9.04	8.60	8.90

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(35kw)

Air flow rate (L/S)			1722		
Water flow rate (L/S)			1.6		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	35.50	37.77	40.66
		S	25.24	28.51	32.14
		INPT	7.11	7.11	7.11
	25	T	34.00	35.87	38.32
		S	24.10	27.73	33.05
		INPT	7.65	7.65	7.65
	30	T	32.13	34.00	37.11
		S	22.39	26.69	30.51
		INPT	8.26	8.26	8.26
	35	T	30.16	32.21	34.29
		S	22.02	25.84	25.68
		INPT	8.80	8.80	8.80
	40	T	35.89	39.38	40.94
		S	20.87	24.98	28.21
		INPT	9.41	9.41	9.41

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(35kw)

Air flow rate (L/S)			1722		
Water flow rate (L/S)			1.6		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	30.00	31.17	30.23
		INPT	8.37	7.41	8.72
	20	HC	30.88	33.32	31.56
		INPT	8.81	7.85	9.01
	25	HC	31.98	35.40	33.84
		INPT	9.57	9.10	9.42

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Cooling capacity correction factor(45kw)

Air flow rate (L/S)			2223		
Water flow rate (L/S)			2.1		
Coil E.A.T.	DB °C		23	27	31
	WB °C		17	19	21
Entering water temperature (E.W.T) °C	20	T	48.03	51.10	55.01
		S	33.07	37.34	42.10
		INPT	11.05	11.05	11.05
	25	T	46.00	48.53	51.84
		S	31.56	36.32	43.29
		INPT	11.89	11.89	11.89
	30	T	43.47	46.00	50.21
		S	29.33	34.96	39.96
		INPT	12.84	12.84	12.84
	35	T	40.80	43.57	46.40
		S	28.84	33.84	33.64
		INPT	13.69	13.69	13.69
	40	T	48.56	53.28	55.39
		S	27.34	32.73	36.95
		INPT	14.63	14.63	14.63

T = Total capacity
S = Sensible capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Heating capacity correction factor(45kw)

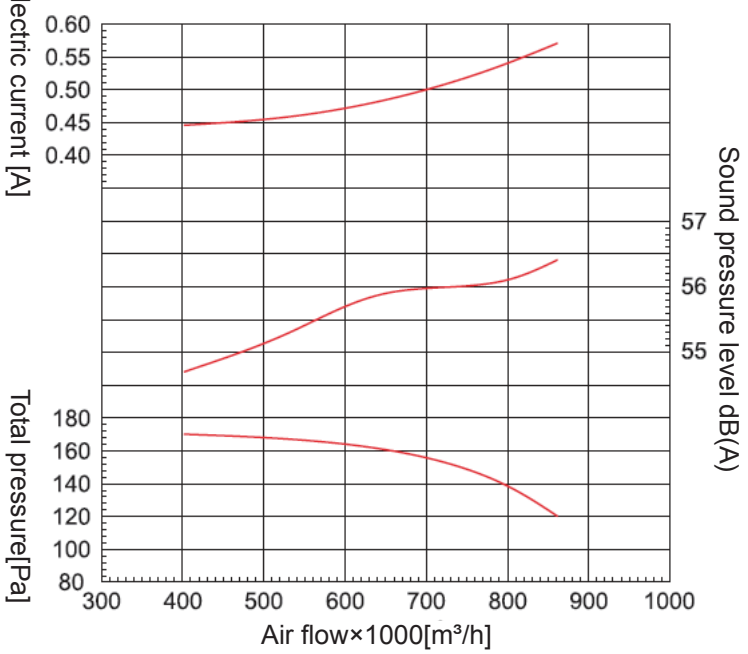
Air flow rate (L/S)			2223		
Water flow rate (L/S)			2.1		
Coil E.A.T.	DB °C		18	20	25
	WB °C		13	15	17
Entering water temperature (E.W.T) °C	18	HC	41.52	43.15	41.84
		INPT	11.81	10.45	12.31
	20	HC	42.74	46.12	43.69
		INPT	12.43	11.07	12.72
	25	HC	44.27	49.00	46.84
		INPT	13.50	12.84	13.29

HC=Heating capacity
INPT=Input power
E.A.T.= Entering air temperature
E.W.T.= Entering water temperature

Fan performance

WCPU3.5

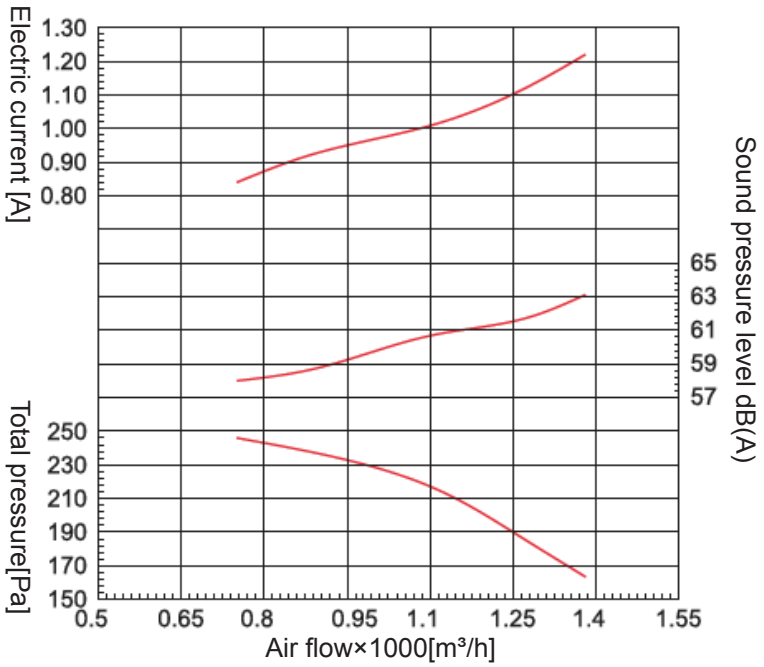
Motor: 75W-4P Weight: 4.7kg Rated current: 0.72A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
400	170	150	55.2
530	167	132	55.8
650	156	102	56.4
800	138	58	56.6
860	120	26	56.9

WCPU5

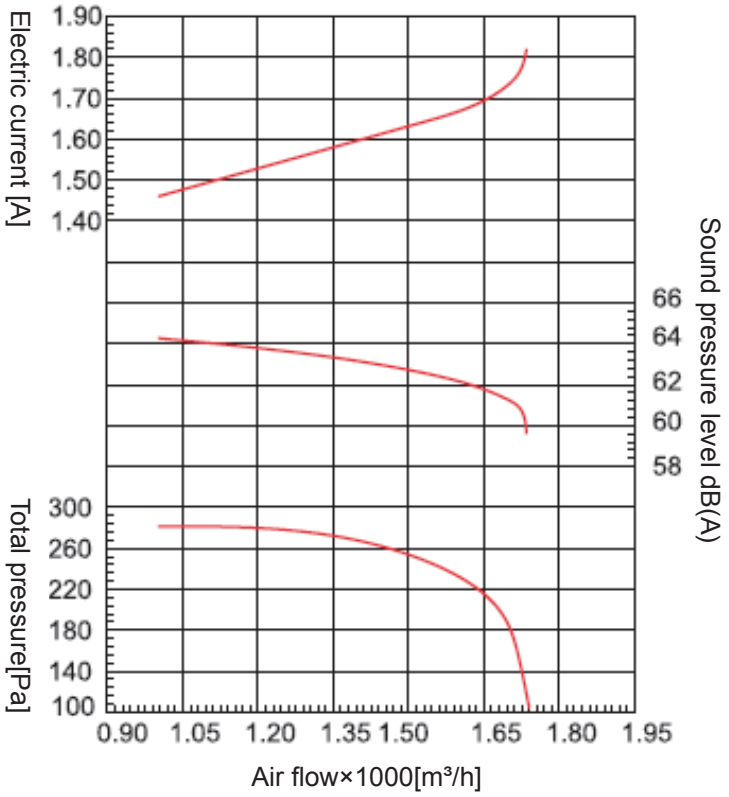
Motor: 150W-4P Weight: 7.5kg Rated current: 1.5A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
750	246	217	58.0
880	238	197	58.7
1100	215	151	60.7
1270	186	100	61.7
1380	163	62	63.1

WCPU7

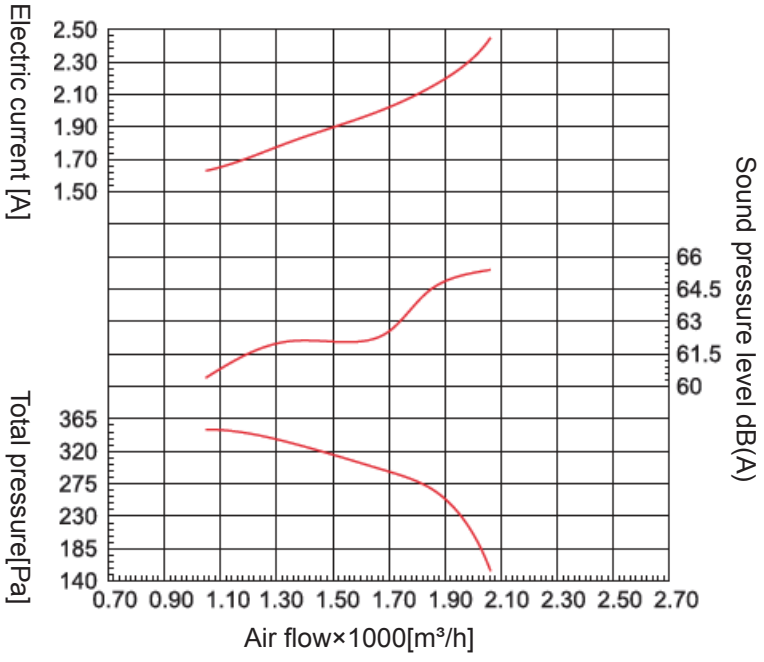
Motor: 200W-4P Weight: 11kg Rated current: 2.0A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
1000	282	264	64.3
1530	250	208	62.6
1700	189	137	61.3
1720	147	94	60.9
1750	104	49	59.6

WCPU10

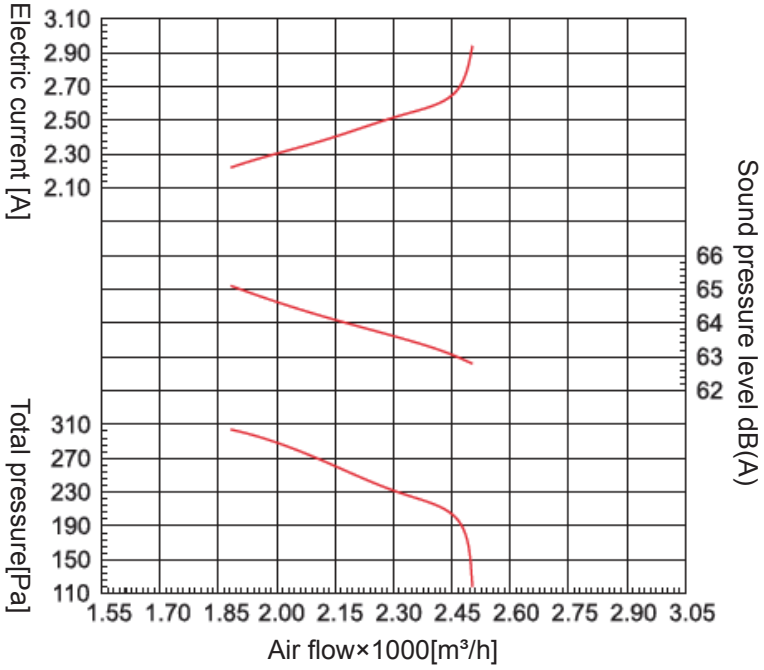
Motor: 250W-4P Weight: 12.5kg Rated current: 2.6A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
1050	351	340	65.4
1350	332	313	64.7
1680	294	265	62.4
1850	268	232	62.1
2060	155	110	60.4

WCPU12

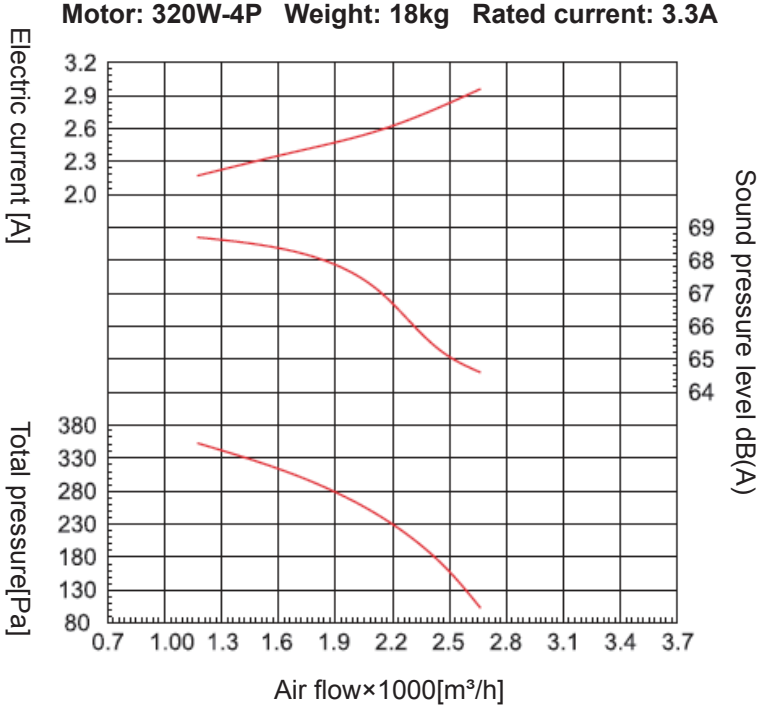
Motor: 275W-4P Weight: 14.6kg Rated current: 3.0A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
1880	305	267	65.1
2120	267	219	64.2
2340	227	170	63.5
2470	197	132	63.0
2500	117	50	62.8

WCPU14

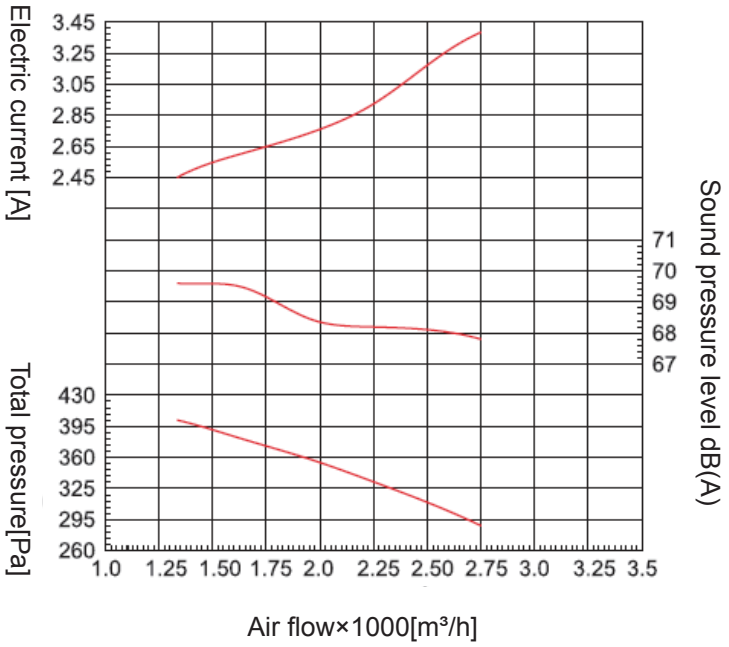
Motor: 320W-4P Weight: 18kg Rated current: 3.3A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
1170	353	345	68.7
1690	304	288	68.1
2120	247	221	67.1
2490	160	124	65.1
2660	103	62	64.6

WCPU18

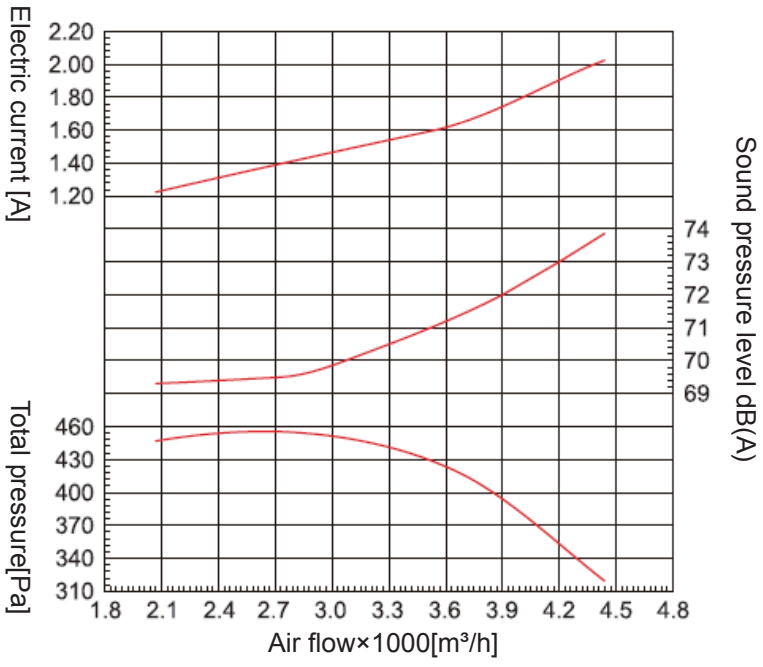
Motor: 450W-4P Weight: 19kg Rated current: 3.3A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
1330	402	390	69.6
1620	382	366	69.5
1980	356	332	68.4
2220	342	311	68.2
2750	288	241	67.8

WCPU23

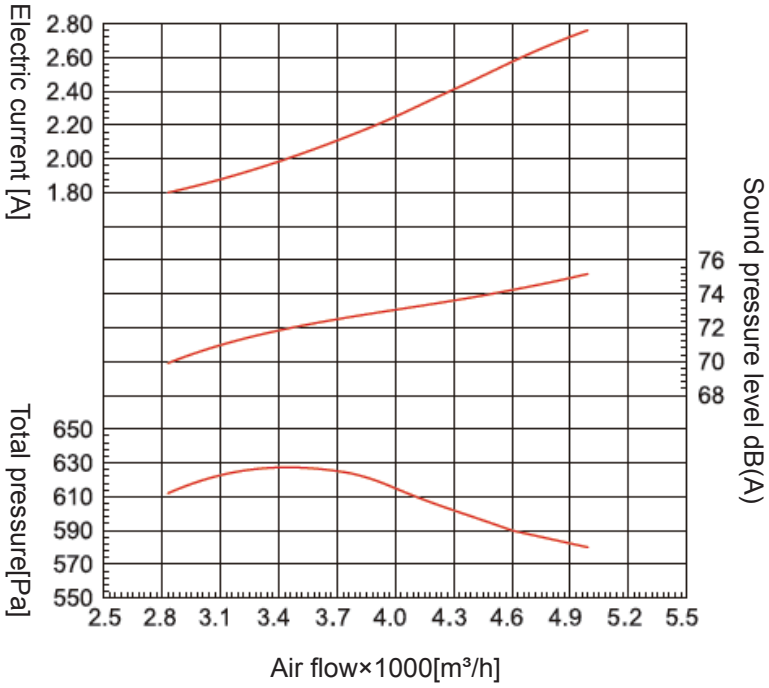
Motor: 0.75kW-4P Weight: 24.8kg Rated current: 2.3A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
2080	445	413	69.4
2980	453	401	69.8
3560	428	354	71.1
4020	374	280	72.4
4420	320	206	73.8

WCPU30

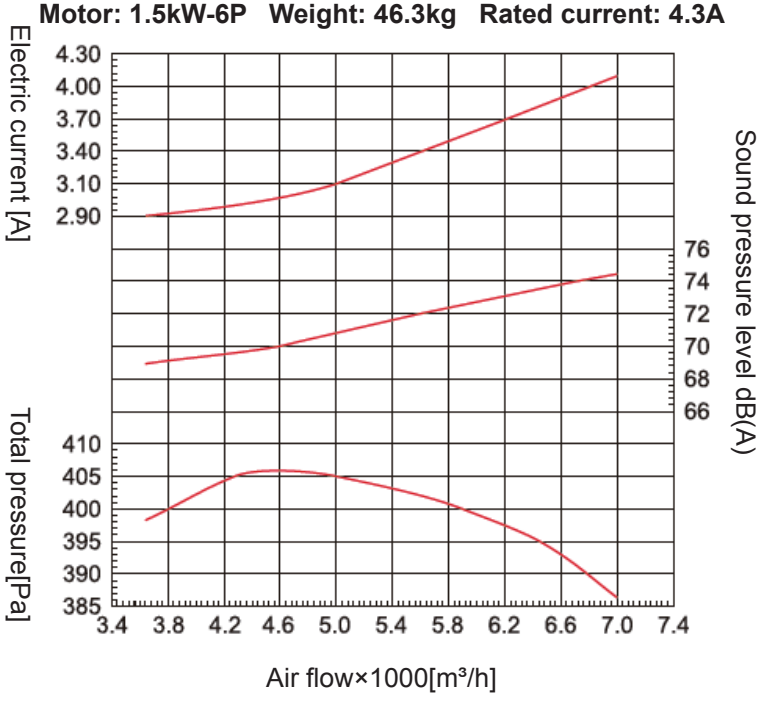
Motor: 1.0kW-4P Weight: 25.5kg Rated current: 2.8A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
2820	612	561	69.9
3440	624	549	71.9
3970	616	516	73.1
4530	592	462	74.2
5000	578	419	75.3

WCPU35

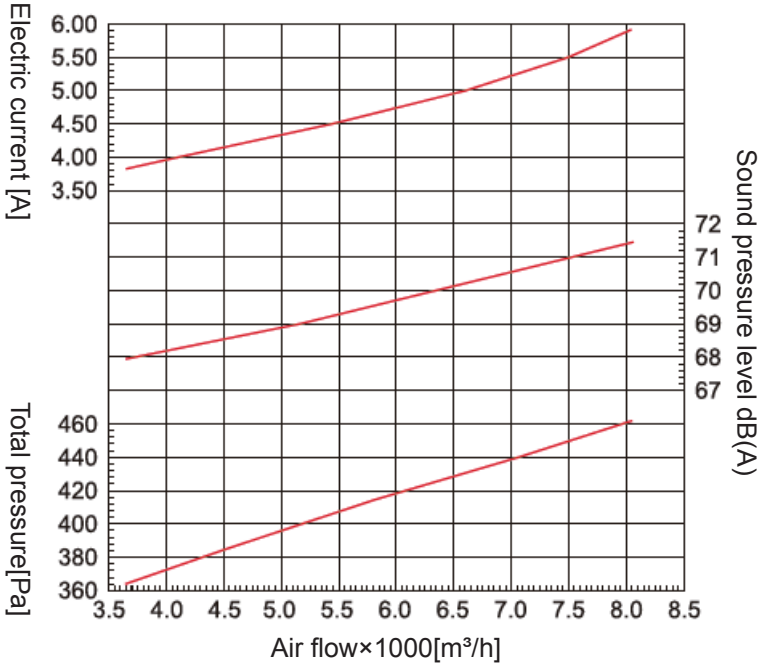
Motor: 1.5kW-6P Weight: 46.3kg Rated current: 4.3A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
3600	398	372	68.8
4500	406	365	69.8
5300	404	347	71.5
6200	398	319	73.1
7000	386	286	74.4

WCPU45

Motor: 2.2kW-6P Weight: 53.2kg Rated current: 6A



Air flow (m³/h)	Total pressure (Pa)	Static pressure (Pa)	A sound level dB(A)
3660	366	338	67.9
3930	371	336	68.1
4570	387	345	68.5
6240	422	342	69.9
8060	459	325	71.5

Units installation

Installation and pipe connection

Unit installation should be stable and firm, no vibration. Should not install the unit on the site where the people often stay there, should install in the path, store room or bathroom.

We should ensure the necessary space for installation and maintenance. The maintenance place should be open type, the maintenance place should near the units setting, the opening should not smaller than 450mm*450mm.

The duct system design should select the air inlet and outlet type and place according to the units external pressure value, otherwise should affect the units air output and causing the no necessary noise.

During installation should protect the units is not damaged, avoid the odds and ends to enter into the important equipment such as fan motor, rotor blade and heat exchanger and so on.

The water inlet and outlet pipe should adopt the flexible pipe connection. The water pipe screw thread connection should be seal by PTEF raw cook. The condenser drain water pipe should keep enough slope, and must not be flatten and being bent, to ensure the water drain smoothly.

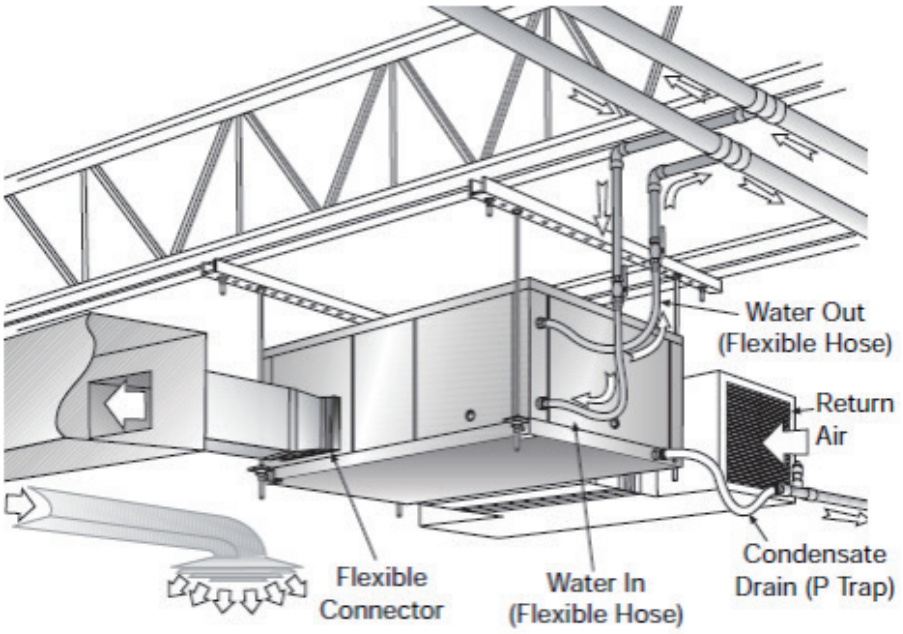
The air inlet should set the easy-disassemble air filter web, to avoid the dust block the pipe fin, to ensure the heat exchanger function.

avoid the noise reflex to the room, the air outlet and inlet should set a sound absorption pipe. The air inlet pipe should install the anti-fire valve when it is through the firewall. The air inlet adopt canvas to connect the air duck, to low the noise and vibration to the lowest position. The bottom of the units should have sound absorption plate, the area should bigger than 2 times of the bottom of the units, the sound absorption plate thickness should be 25mm. To reduce the noise caused by air inlet, the air inlet should be away the units as far as possible. When select model, should consider the units without air inlet plenum priority. If select the unit with air inlet plenum, should consider the back side air inlet plenum installation method.

When the unit is lifting, should ensure the lift should have corresponding strength to bear the units weight. The lift should aim to the units installation place, to avoid being damaged by the units panel. Should install the anti-vibration pad and fast by nut.

Should blow the units heat exchanger, drain pipe and air inlet filt web, to keep the ventilation and water drain smoothly. When the units stop using, should fill the water inside the tube in tube heat exchanger or other method , to reduce the pipe corrosion. In winter, must adopt the anti-freeze method to avoid the pipe frost crack.

Packaged ceiling type heat pump install



Typical Ceiling Installation

Ductwork and sound attenuation considerations

Ductwork is normally applied to ceiling mounted heat pumps on the discharge side of the unit. A discharge collar is provided on all models of horizontal units for fastening the ductwork. The use of a flexible connector is recommended between the discharge collar and duct transformation to help with sound attenuation from the cabinet and to simplify disconnection of the unit from the ceiling ductwork. If return ductwork is to be used, a flexible connector should also be attached to the filter rack collar to help with sound attenuation and removal of the unit. Return plenum ducting should be at least 300mm away from the coil so that the coil is evenly loaded with return air.

As a general recommendation, the interiors of the duct should be lined with an acoustic / thermal lining that is a minimum 1/2 inch thickness for entire duct run. For maximum attenuation, the last five diameters of duct before each register should be lined with a one-inch thick sound blanket. Elbows, tees and dampers can create turbulence or distortion in the airflow, so a straight length of duct 5 to 10 times duct width is recommended to smooth out airflow before the next fitting. Designing diffusers directly from the bottom of a trunk duct can also produce noise and volume control dampers should be located several duct widths upstream from air outlet.

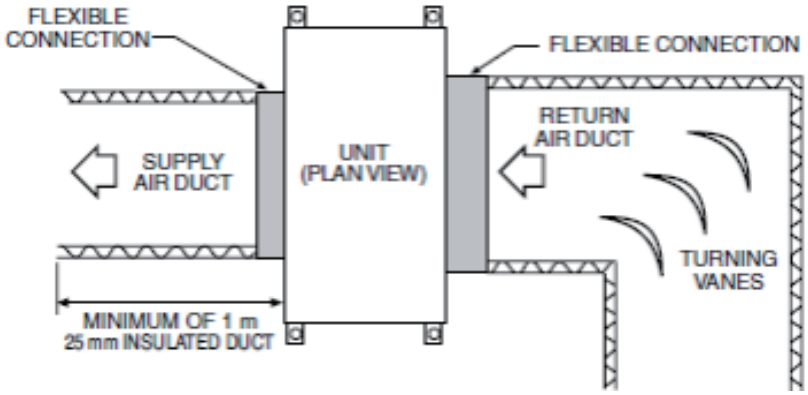
Recommendations for noise isolation

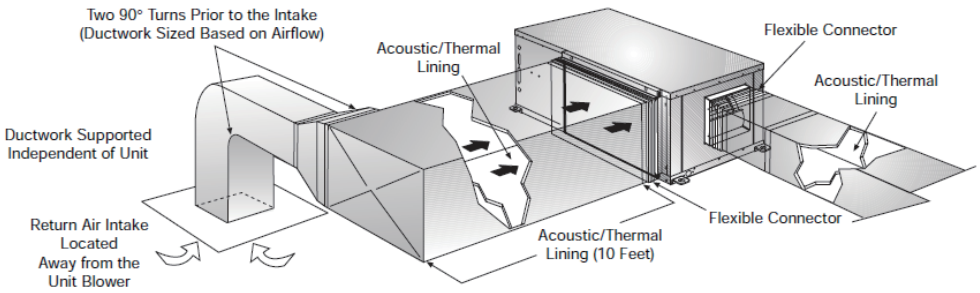
● Particularly for high static installations:

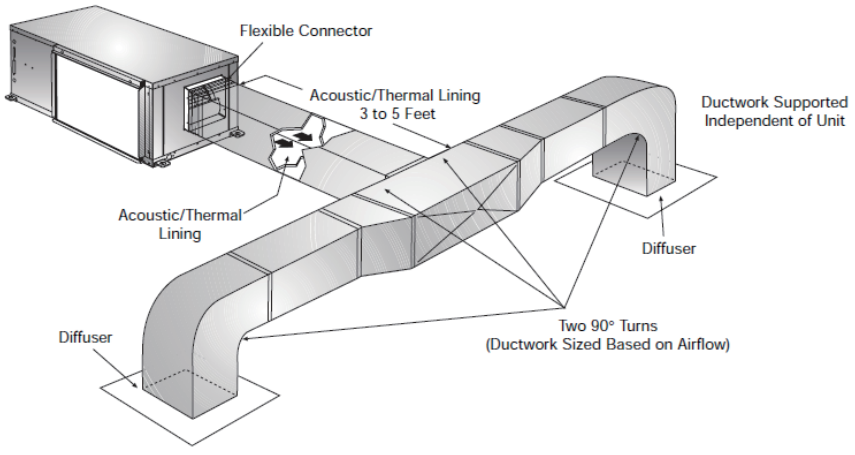
(1)Avoid installing units, with non-ducted return air, directly above spaces where noise is critical.

(2)Use flexible connections between unit and rigid ducting.

(3)Use generously sized acoustically lined ducts.
(4)If generous duct size is not possible, use turning vanes on bends to reduce air turbulence (regenerated noise).
(5)Use 90°bends in ducting to significantly assist in noise reduction.

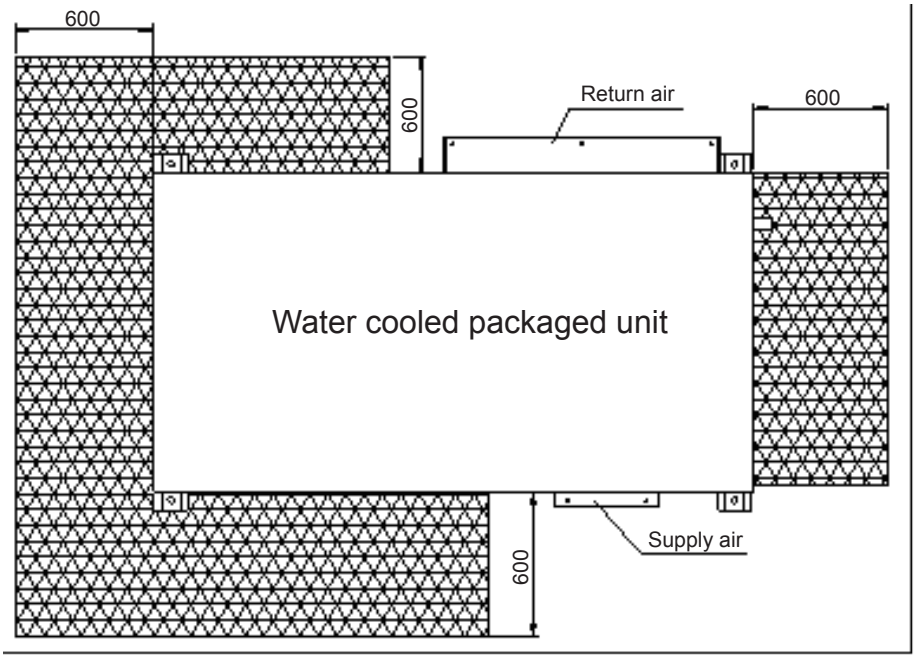




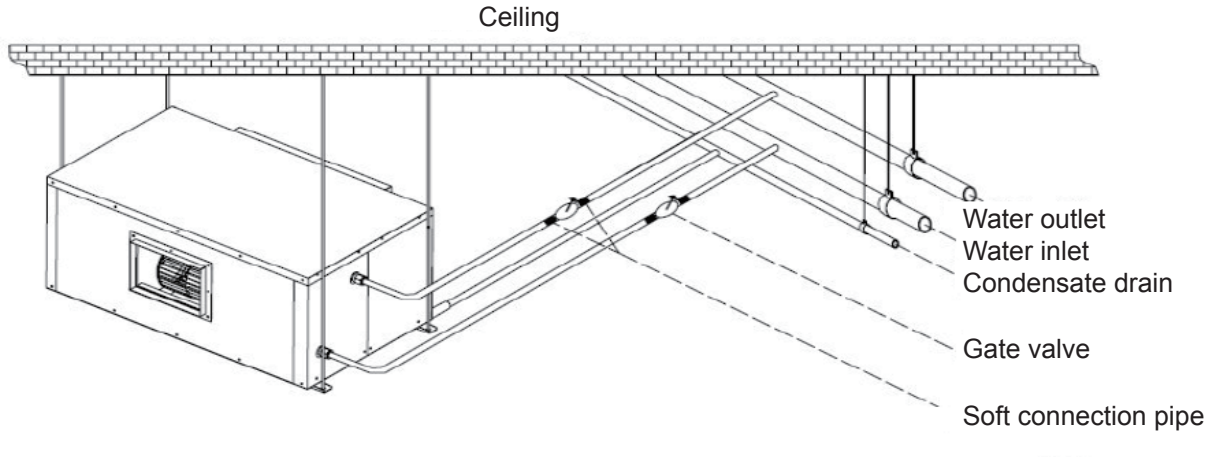


Installation spacing

● Minimal maintenance spacing(for standard unit)



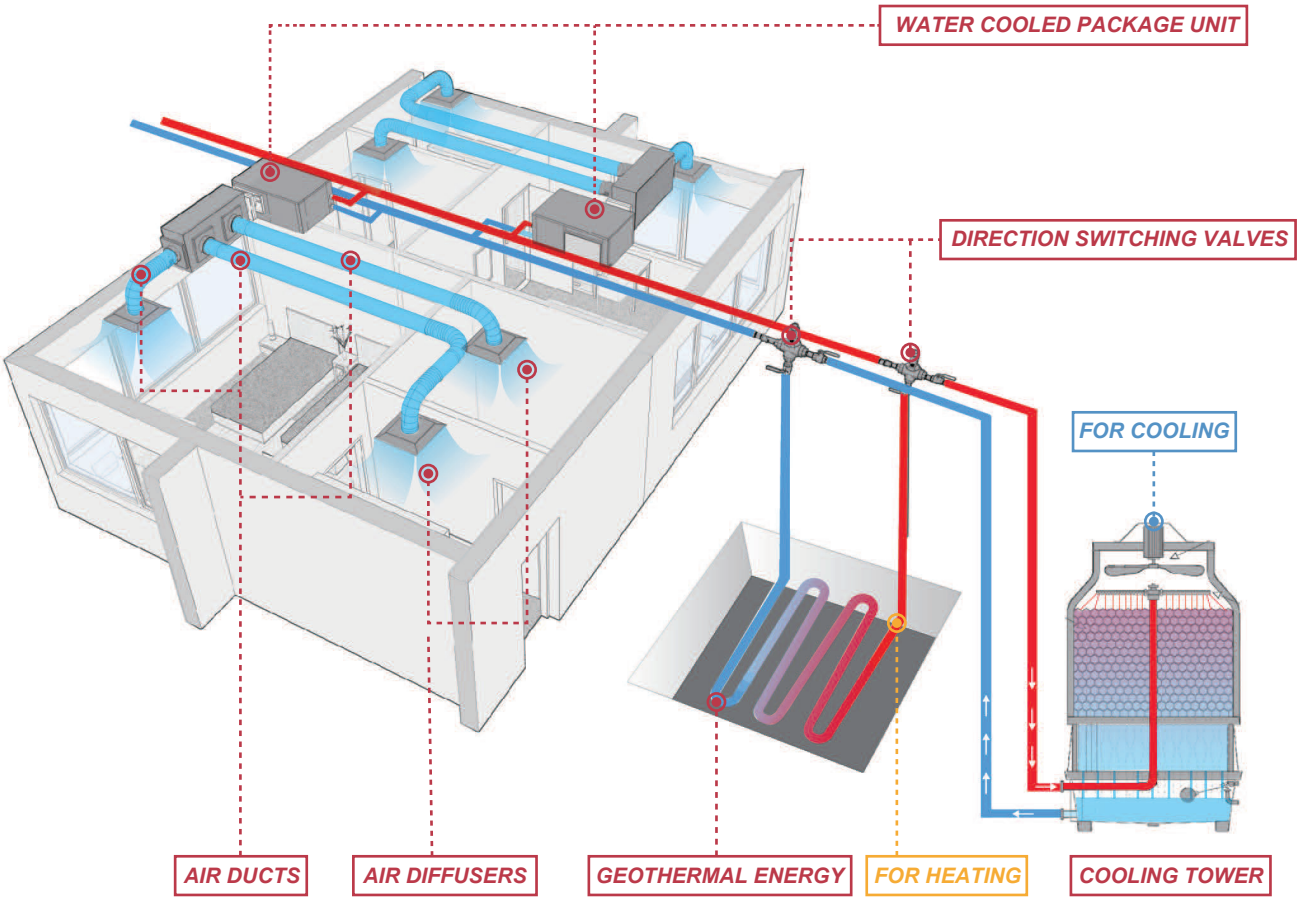
Packaged ceiling type heat pump unit pipe connection as below:



Notice during the pipe connection

(1) The flare opening which connect with the copper pipe should be made smoothly, the connection nut should be fast, the connect point do not allow any scratch and any crack.
(2) The connection pipe should preserve heat.
(3) The connection cooper pipe should not exceed 30m, the height should not exceed 10m.
(4) The corner of the connection pipe should be smooth, should not have serious bucking appearance.
(5) The thickness of the connection pipe should not lower than 0.8mm.
(6) When the connection pipes have been installed, charge the nitrogen from the air inlet valve nozzle.

Water pipe system installation



Envi Group
All about HVAC-R

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