



# TDA Series AHU Double Skin



Technical Catalog

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## 1. Introduction

Bitwise group of companies were established in 1988 in samutprakarn province by a determined team of engineers who desired to manufacture international standard air conditioner to cater to the needs of OEM and ODM customers.

Some years after very well success in Thailand, the company expanded its factory line to China. These companies are known as Shanghai Bitwise Electric Motor & Appliances, Yongwise (Shanghai) Molding Co., Ltd. And Shanghai Bitwise Freezing Equipment Co., Ltd.

Today, Bitwise Group has its production area of 120,000 square meters, the R&D team, highly qualified and experienced engineers, technicians, over 1,000 workers. The company has successfully developed a complete range of air conditioner products from 1,000 to 2,000,000 Btu/Hr, evaporator and condenser coils for air conditioners, as well as for the frozen food industry, evaporative air cooler and water heater, IQF freezer etc.

Apart from air conditioner industry, Bitwise Group also manufactures various types of different products such as resin packed motors, PCBA, LED bulbs, mould manufacturing and plastic injections, public telephone booths entrusted by government telecommunication authorities.

With over 20 years experience in the air conditioner industry, through all the international standards it had achieved, Bitwise Group has demonstrated that it will continue to develop further innovation and technologies by its own R&D teams. As a result, it is one of the main ODM players in this field and will continue to constantly grow together with its customers.

## 2. Nomenclature

T	D	A	0	1	2	–	H1	4	L	A
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### Model Name

TDA = Product Series

### Nominal Airflow

12x10<sup>2</sup> = 1,200 CFM

120x10<sup>2</sup> = 12,000 CFM

### Application

H1 = Horizontal type only pre filter

H2 = Horizontal type with pre filter and mixing box

H3 = Horizontal type with pre filter & medium filter and mixing box

V1 = Vertical type only pre filter

V2 = Vertical type with pre filter and mixing box

V3 = Vertical type with pre filter & medium filter and mixing box

### Cooling Coil

4 = Coil 4 Row

6 = Coil 6 Row

### Coil Header Pipe

L = Left Hand Side

R = Right Hand Side

### Supply Air Method

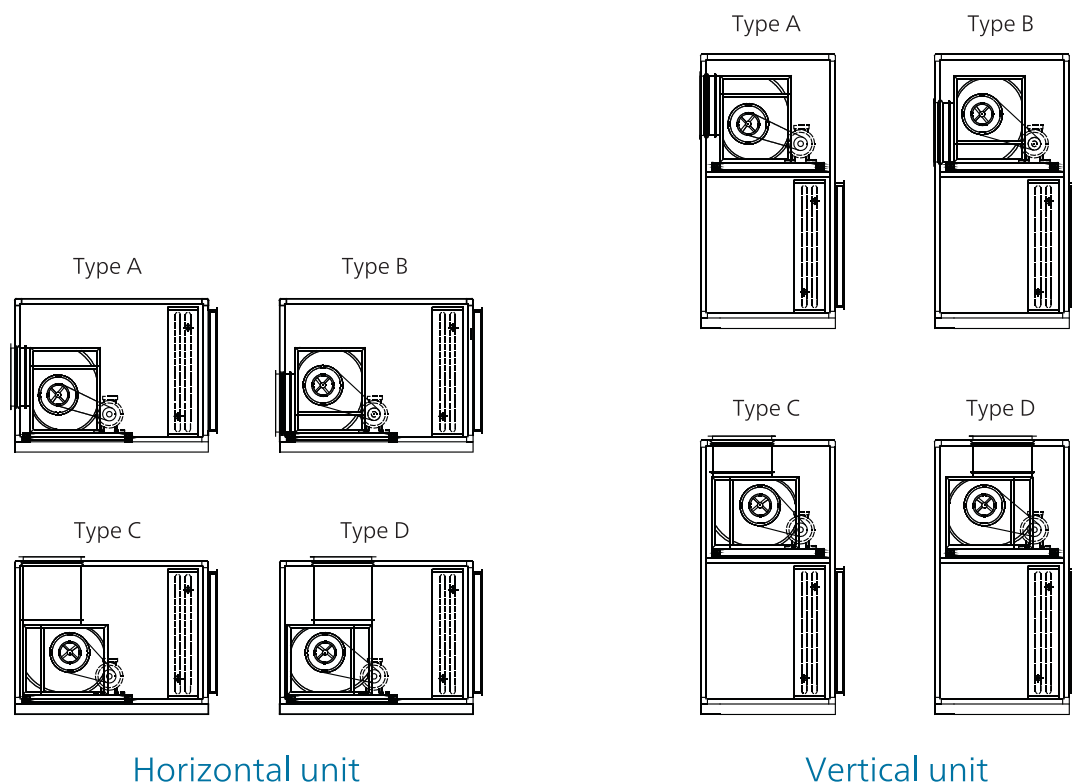
A,B,C,D

## 3. AHU Design Feature and Option

### Product feature

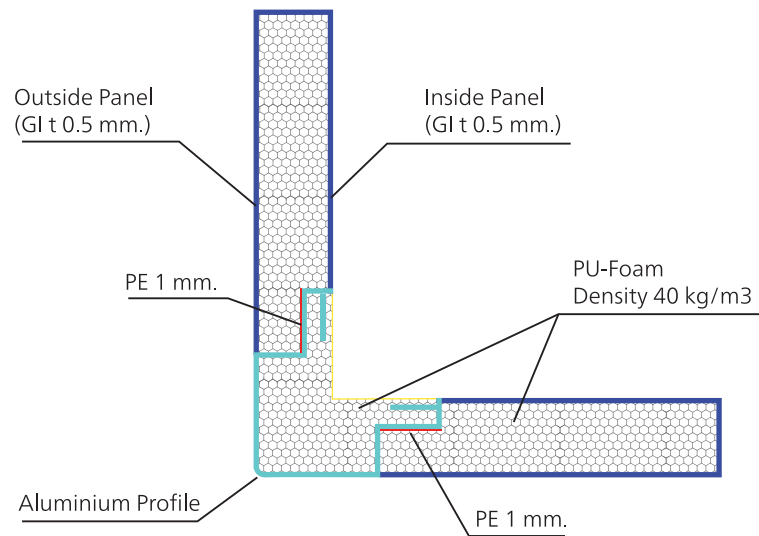
Model	Fan	Cooling Coil	Med. Filter	Pre Filter	Mixzing Box
H1/V1	o	o		o	
H2/V2	o	o		o	o
H3/V3	o	o	o	o	o

### Aire flow direction

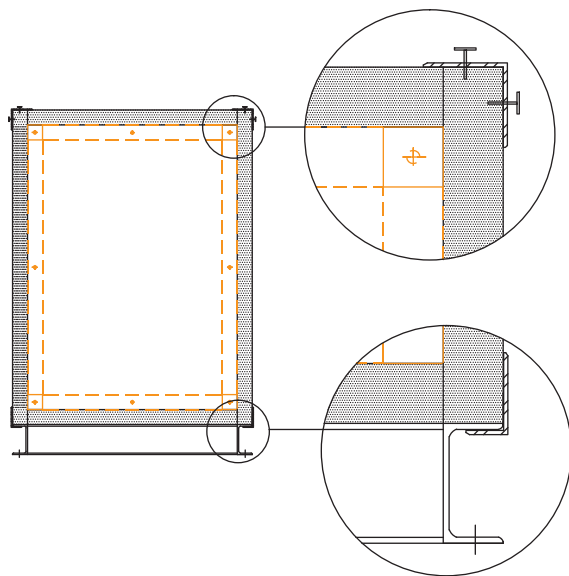


## 3.1 Profile

Bitwise's AHU has constructed to prevent the air leakage and the due condensation by the used of thermal break design aluminium frame for 25 mm. double skin and single skin model as well as inside frame for 50 mm. double skin as follow. It helps to increase energy efficiency (lower heat loss), unit condensation is minimized (Low conductivity) and Improve the sound insulation.



## 3.2 Coil section



Bitwise's AHU has its coil constructed with aluminium corrugated fin and copper plain tube 3/8", 1/2" and 5/8". Copper fins and hydrophilic fins are anti-corrosive materials which are optional. The fins are designed purposely for better heat transfer efficiency and moisture carry over limit performance. Capacity, pressure drop and selection procedure are designed in accordance with ARI standard 410.

The design face velocity is 2.5m/s and for higher face velocity must use eliminator to prevent carry over. If the unit has stack coil design as the coil section that Bitwise AHU provide medium drain-pan between upper coil and lower coil, this prevent water flooding the lower coil.



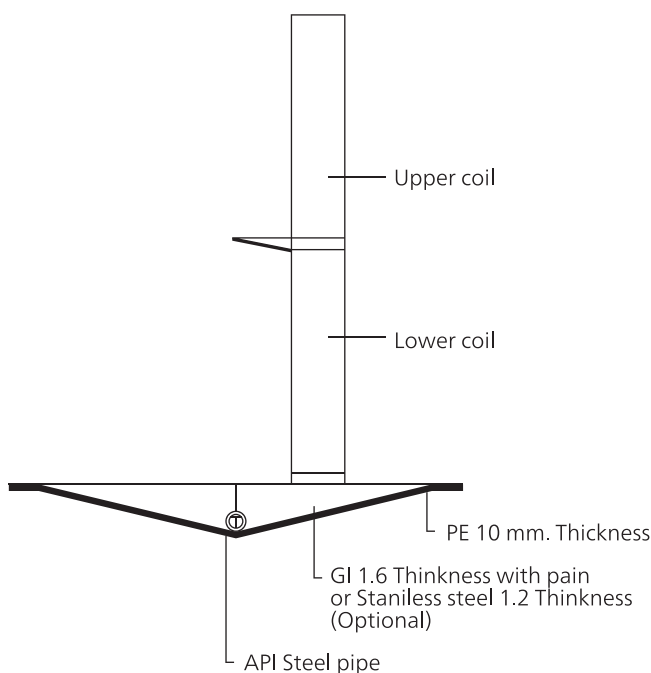
Water Coil picture



DX. Coil picture

## 3.3 Drain pan

The depth and sloped drain-pan are designed to discharge the condensate quickly. It is made by galvanize steel sheet that is protect by powder coating paint or stainless steel as optional. The drain pan is covered with 10 mm. thickness PE insulation to prevent condensation from occuring. For stacked coil, additional drain pan or intermediate drain pan fabricated from the same material as main drain pan wich will be installed between two coils.



## 3.4 Fan

Fan are used extensively in air-conditioning for circulating air over coil. The fan type includes forward curved, backward curve, twin fan and plug fan. The forward fan is a standard fan, it uses for low static pressure application. Other fan are optional. The blade of forward fan is constructed of galvanized steel, It consists of blade which have tips curving forward that are in the direction of rotation of fan wheel.

Backward fan, it is best for high speed. The blades of backward curve is made of heavy guage steel or mild steel and painted after manufactured. It can handle high static pressure system and able to show higher efficiency over broader range of high system resistance.

For plug fan, it require of high speed and direct drive of blower. Then the system require the inverter to control the motor. It is made of mild steel. Also, it shows higher efficiency, generate low noise level and it can handle high static pressure. The applica-tion such asclean room suit best for this type.

The fan performance of all these fan have been tested and measured in according to AMCA standard 210. The sound level is measured and rated in accordance with AMCA standard 300. The fan bearing provided will have a minimum life of 200,000 Hrs, and are available as high as 1,000,000 hours. The bearing is lubricated for lift and mainterance free. Relubrication is optional. Fan is dynamically and statically balanced to stand ISO 1940. The fan shaft is manufactured from C45 carbon steel. It is coated with a layer of anti-corrosion vanish.

There are 2 discharge direction, vertical and horizontal discharge. The fan discharge is square in area flanged and insulated by the fire retardant grade flexible grade flexible connection. Only one fan direction is provide.

Fan selection requires accurate calculation of air flow resistance through the whole system consisting of the total of two parts. External and internal static pressure. External static pressure is found in the distribution system, external to the air handler. Internal static pressure is the sum of the resistance of coil and the other component. Then we used the fan software to calculate.



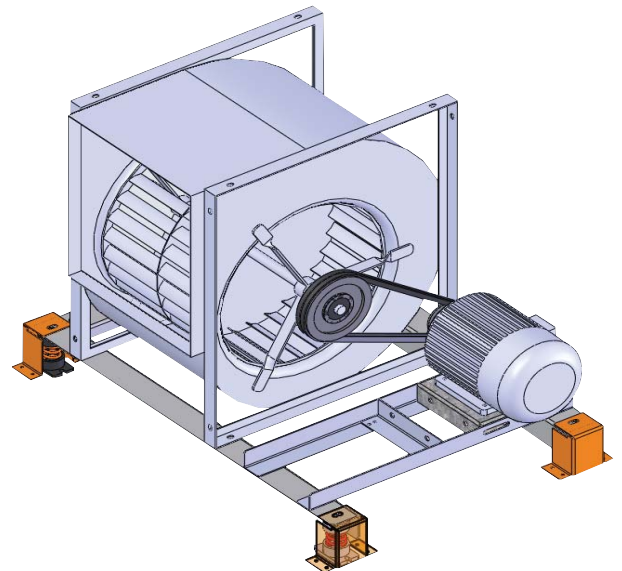
### 3.5 Motor

Motor is internally mounted integral to an isolated fan assembly. Standard motor shall be horizontal foot mounting, induction motor, squirrel, totally enclosed fan-close with ip 55 protection with class F. For the desired operation speed between fan and motor, there are 3 types of motor poles : 2, 4 and 6 poles

### 3.6 Fan motor and assembly

Fan assembly is easy to service. It is provided with the adjustable motor base which allows for proper tensioning of the belt and all item. The fan in AHU can create substantial vibration that will transform to panel/casing and consequently generate widespread of sound wave. To avoid this, the spring or rubber insulation is mounted between the fan components and the rest of the AHU to prevent the transmission of noise and vibration into the panels.

Also, the transposition plate is provided to prevent all problems from transposition. It must be taken off from the unit before starting running.



### 3.7 Electric heater (Optional)

It is used to achieve desired room condition at certain desired humidity. With negligible air pressure, accurate controllability, light weight, easy serviceability and inherent freeze protection, electric heater is a valuable alternative to conventional steam and hot water heating coil.

Electric heaters are optional with either single step or multi step of heating process. It depends much on the heating capacity.



## 3.8 Filter Section

The Bitwise AHU is provided pre filter, secondary filter and hepa filter chamber depending on application. The customer can recommend to the inquiry sheet or catalog.

### A) Pre filter

We have 3 filters for selection as following

- 2" Aluminium filter.
- G3 synthetic filter
- G4 synthetic filter

### B) Secondary filter

- BAG filter, bag filter has a unique feature patented pocked configuration, which has been aerodynamically balanced to ensure complete pocked inflation to removed crowing or

crowding or leakage thus decreasing resistance and maximizing dust holding capacity. This filter is perfect as pre-filter or final filter for particulate removal in humidity, high air flow and heavy dust loading condition, available 80-95% efficiency.

- BioCelR I filter was designed primarily to eliminate airborne biological contaminants in hospital critical areas, food and phamaceutical processing plants, precision manufacturing operation area and laboratories where very high efficiency filtration of fine perticulate matter is necessary, available 90-98% efficiency.



Aluminium Filter



G3 synthetic Filter



G4 synthetic filter



Bag Filter



BioCelR I Filter

- Varicel II provides a unique combination of feature and performance includes high efficiency filtration, board application flexibility, easy handling, installation and removal which unmatched by any other products. This slim line mini-plate design offers high performance and long service life in a thinner, lighter, totally rigid filter. Using this filter will save more than 400 mm. depth in the filter section by comparing with using bag filter, available 80-95% efficiency.

### C) Hepa Filter

- AstroCel I filter has board application in clean rooms and other areas requiring the very highest levels of contamination control. Air filters are designed to trap and concentrate particulate air contaminants including viable fungal and bacterial spores. This type of air filter is available in vareity of efficiency 99.97-99.99%, and higher, test on 0.1-0.2 micron particles.



Varicel II

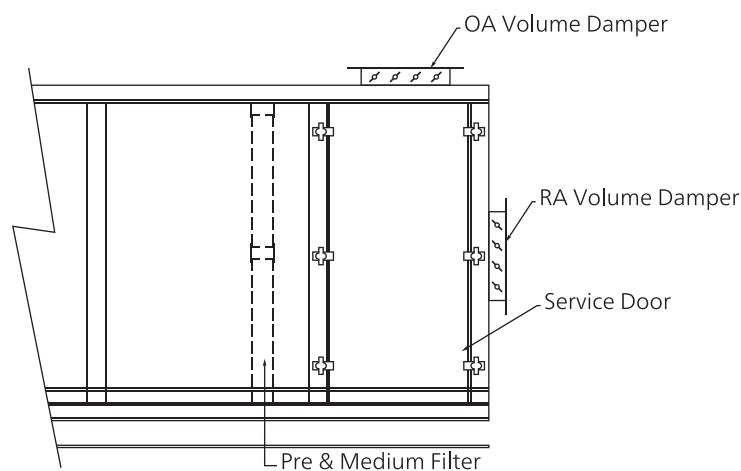


Hepa Filter



## 3.9 Mixing Box

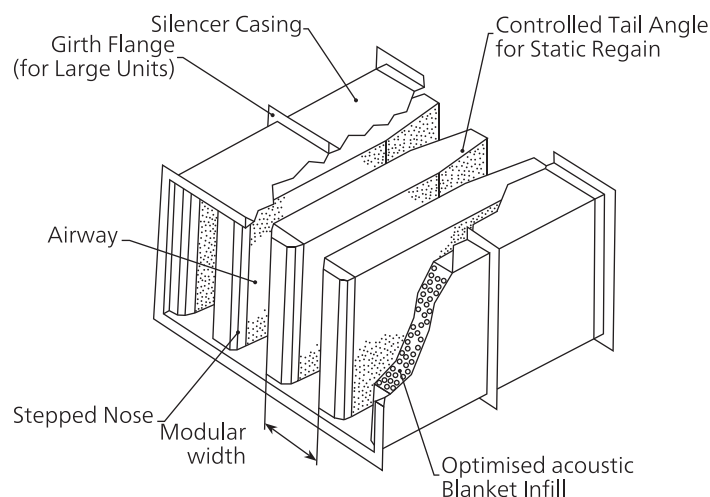
It is an air inlet section to mix fresh air and return air according to the system designer's requirement. It can regulate the amount of outside and return air supplied to the conditioned space. It consists of damper in parallel blades with opposed rotating blade with driving shaft. The damper blades are fabricated of aluminium and continuous thermoplastic elastomer seals are inserted onto every damper blade. The rotated rod of handle is made of brass and handle is fabricated of aluminium casting. There are a few type of arrangement. Top, rear and combination of top and rear. The mixing box can make use of free cooling by opening outside air dampers when the ambient air will help to condition the supply air stream. In addition, dampers maybe individually sized to provide better mixing effect.



## 3.10 Sound Silencer

It has a perimetral galvanized steel frame. Standard pods are supplied 100 mm. thick in standard length of 900 and 1200 mm. according to the attenuation required. The modular width available are 275 mm. or 300 mm.

Nowadays, sound level will be an essential factor to be considered as one of the performance of unit. Bitwise product has been designing to provide the quiet sound level. Difference in attenuator length can be selected to meet the most stringent sound attenuation requirements. A comfortable surrounding enhances human's working and living life.



## 4. Technical Data and Dimension

### 4.1 Technical Data -Horizontal Standard Unit

Model	Air Flow (CFM)	Coil Rows	Total Cooling Capacity kW	H1			H2			H3		
				Rated External Static Pressure	Rated Motor Power kW	Max. Motor Power kW	Rated External Static Pressure	Rated Motor Power kW	Max. Motor Power kW	Rated External Static Pressure	Rated Motor Power kW	Max. Motor Power kW
TDA012-H	1200	4	11.12	250	0.55	3	250	0.55	3	250	0.75	3
		6	13.08	220	0.55	3	220	0.55	3	220	0.75	3
TDA018-H	1800	4	16.21	250	1.1	3	250	1.1	3	250	1.1	3
		6	19.47	220	1.1	3	220	1.1	3	220	1.1	3
TDA024-H	2400	4	20.82	250	1.5	4	250	1.5	4	250	2.2	4
		6	24.19	220	1.5	4	220	1.5	4	220	2.2	4
TDA030-H	3000	4	26.26	250	1.5	4	250	1.5	4	250	2.2	4
		6	31.48	220	1.5	4	220	1.5	4	220	2.2	4
TDA036-H	3600	4	32.39	250	2.2	4	250	2.2	4	250	2.2	4
		6	38.75	220	2.2	4	220	2.2	4	220	2.2	4
TDA042-H	4200	4	37.58	250	2.2	5.5	250	2.2	5.5	250	2.2	5.5
		6	43.74	220	2.2	5.5	220	2.2	5.5	220	2.2	5.5
TDA048-H	4800	4	43.19	250	2.2	5.5	250	2.2	5.5	250	3	5.5
		6	50.31	220	2.2	5.5	220	2.2	5.5	220	3	5.5
TDA060-H	6000	4	51.34	300	3	7.5	300	3	7.5	300	4	7.5
		6	62.33	270	3	7.5	270	3	7.5	270	4	7.5
TDA080-H	8000	4	59.12	300	4	7.5	300	4	7.5	300	5.5	7.5
		6	82.72	260	4	7.5	260	4	7.5	260	5.5	7.5
TDA100-H	10000	4	80.86	300	5.5	7.5	300	5.5	7.5	300	7.5	7.5
		6	107.26	270	5.5	7.5	270	5.5	7.5	270	7.5	7.5
TDA120-H	12000	4	96.34	360	7.5	11	360	7.5	11	360	7.5	11
		6	119.23	330	7.5	11	330	7.5	11	330	7.5	11
TDA140-H	14000	4	112.15	360	7.5	11	360	7.5	11	360	11	11
		6	138.85	330	7.5	11	330	7.5	11	330	11	11
TDA160-H	16000	4	134.19	360	11	11	360	11	11	360	11	11
		6	163.98	330	11	11	330	11	11	330	11	11
TDA180-H	18000	4	149.77	480	11	15	480	11	15	480	15	15
		6	182.76	450	11	15	450	11	15	450	15	15
TDA200-H	20000	4	167.91	480	11	15	480	11	15	480	15	15
		6	203.99	450	11	15	450	11	15	450	15	15
TDA220-H	22000	4	187.16	480	15	15	480	15	15	480	15	15
		6	218.23	450	15	15	450	15	15	450	15	15
TDA240-H	24000	4	241.63	650	15	18.5	650	15	18.5	650	18.5	18.5
		6	288.19	620	15	18.5	620	15	18.5	620	18.5	18.5
TDA260-H	26000	4	282.74	650	18.5	25	650	18.5	25	650	22	25
		6	317.57	620	18.5	25	620	18.5	25	620	22	25
TDA300-H	30000	4	318.68	650	22	25	650	22	25	650	25	25
		6	355.05	620	22	25	620	22	25	620	25	25
TDA320-H	32000	4	342.88	650	30	30	650	30	30	650	30	30
		6	386.11	620	30	30	620	30	30	620	30	30
TDA360-H	36000	4	378.49	650	30	30	650	30	30	650	30	30
		6	427.28	620	30	30	620	30	30	620	30	30
TDA400-H	40000	4	413.67	650	30	30	650	30	30	650	30	30
		6	468.22	620	30	30	620	30	30	620	30	30
TDA420-H	42000	4	462.35	650	30	37	650	30	37	650	30	37
		6	519.18	620	30	37	620	30	37	620	30	37

Notes : 1. Standard return air cooling condition

Air inlet at 27°C DB/19°C WB

Chilled water inlet/Outlet at 7°C/12°C

## 4.2 Technical Data -Vertical Standard Unit

Model	Air Flow (CFM)	Rows	Total Cooling Capacity kW	V1			V2			V3		
				Rated External Static Pressure	Rated Motor Power kW	Max. Motor Power kW	Rated External Static Pressure	Rated Motor Power kW	Max. Motor Power kW	Rated External Static Pressure	Rated Motor Power kW	Max. Motor Power kW
TDA012-V	1200	4	11.12	250	0.55	3	250	0.55	3	250	0.75	3
		6	13.08	220	0.55	3	220	0.55	3	220	0.75	3
TDA018-V	1800	4	16.21	250	1.5	3	250	1.5	3	250	1.5	3
		6	19.47	220	1.5	3	220	1.5	3	220	1.5	3
TDA024-V	2400	4	20.82	250	1.5	3	250	1.5	3	250	1.5	3
		6	24.19	220	1.5	3	220	1.5	3	220	1.5	3
TDA030-V	3000	4	26.26	250	1.5	4	250	1.5	4	250	2.2	4
		6	31.48	220	1.5	4	220	1.5	4	220	2.2	4
TDA036-V	3600	4	32.39	250	1.5	4	250	1.5	4	250	2.2	4
		6	38.75	220	1.5	4	220	1.5	4	220	2.2	4
TDA042-V	4200	4	37.58	250	2.2	5.5	250	2.2	5.5	250	2.2	5.5
		6	43.74	220	2.2	5.5	220	2.2	5.5	220	2.2	5.5
TDA048-V	4800	4	43.19	250	2.2	5.5	250	2.2	5.5	250	3	5.5
		6	50.31	220	2.2	5.5	220	2.2	5.5	220	3	5.5
TDA060-V	6000	4	51.34	300	3	8.5	300	3	8.5	300	4	8.5
		6	62.33	270	3	8.5	270	3	8.5	270	4	8.5
TDA080-V	8000	4	59.12	300	4	11	300	4	11	300	5.5	11
		6	82.72	270	4	11	260	4	11	270	5.5	11
TDA100-V	10000	4	80.86	360	5.5	11	300	5.5	11	300	7.5	11
		6	107.26	330	5.5	11	270	5.5	11	270	7.5	11
TDA120-V	12000	4	96.34	400	7.5	15	360	7.5	15	360	7.5	15
		6	119.23	370	7.5	15	330	7.5	15	330	7.5	15
TDA140-V	14000	4	112.15	400	7.5	15	360	7.5	15	360	11	15
		6	138.85	370	7.5	15	330	7.5	15	330	11	15
TDA160-V	16000	4	134.19	440	11	20	360	11	20	360	11	20
		6	163.98	410	11	20	330	11	20	330	11	20
TDA180-V	18000	4	149.77	480	11	22	480	11	22	480	15	22
		6	182.76	450	11	22	450	11	22	450	15	22
TDA200-V	20000	4	167.91	480	15	22	480	15	22	480	15	22
		6	203.99	450	15	22	450	15	22	450	15	22
TDA220-V	22000	4	187.16	480	15	24	480	15	24	480	18.5	24
		6	218.23	450	15	24	450	15	24	450	18.5	24

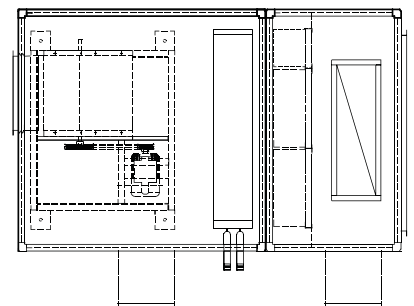
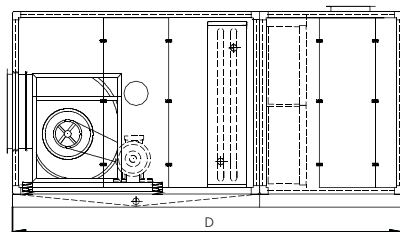
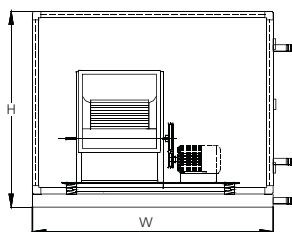
Notes : 1. Standard return air cooling condition

Air inlet at 27°C DB/19°C WB

Chilled water inlet/Outlet at 7°C/12°C

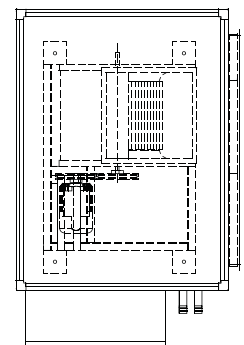
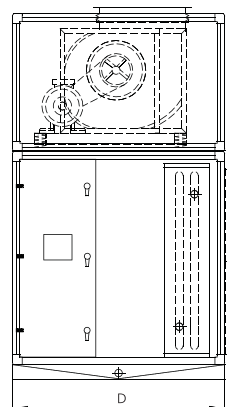
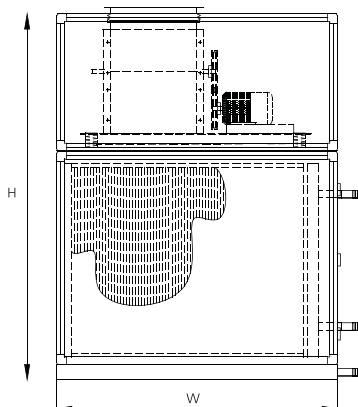
## 4.3 Dimension -Horizontal Standard Unit

Model	Air flow (CFM)	D			W	H
		H1	H2	H3		
TDA012	1200	1150	1470	1820	950	805
TDA018	1800	1150	1470	1820	1070	805
TDA024	2400	1150	1470	1820	1070	805
TDA030	3000	1150	1470	1820	1160	805
TDA036	3600	1200	1620	1970	1540	805
TDA042	4200	1300	1720	2070	1540	805
TDA048	4800	1300	1719	2069	1540	1135
TDA060	6000	1400	1920	2270	1540	1135
TDA080	8000	1350	1870	2220	1580	1440
TDA100	10000	1500	2020	2370	1845	1440
TDA120	12000	1550	2070	2420	2150	1440
TDA140	14000	1550	2170	2520	2150	1805
TDA160	16000	1700	2360	2710	2280	1805
TDA180	18000	1800	2460	2810	2455	1805
TDA200	20000	1800	2460	2810	2760	1805
TDA220	22000	1800	2460	2810	2870	1805
TDA240	24000	2050	2950	3300	3000	2190
TDA260	26000	2150	3050	3400	3610	2190
TDA300	30000	2150	3050	3400	3610	2485
TDA320	32000	2250	3150	3500	3610	2485
TDA360	36000	2250	3150	3500	3610	2665
TDA400	40000	2250	3150	3500	3610	2665
TDA420	42000	2250	3150	3500	4220	2765



## 4.4 Dimension -Vertical Standard Unit

Model	Air flow (CFM)	L			W	H
		V1	V2	V3		
TDA012	1200	650	970	1320	950	1250
TDA018	1800	650	970	1320	1070	1200
TDA024	2400	650	970	1320	1070	1350
TDA030	3000	650	1070	1420	1160	1400
TDA036	3600	650	1070	1420	1540	1550
TDA042	4200	750	1169	1519	1540	1700
TDA048	4800	750	1270	1620	1540	1750
TDA060	6000	850	1370	1720	1540	1900
TDA080	8000	850	1370	1720	1580	1900
TDA100	10000	850	1370	1720	1845	1950
TDA120	12000	850	1470	1820	2150	2250
TDA140	14000	850	1510	1860	2150	2400
TDA160	16000	1050	1710	2060	2280	2400
TDA180	18000	1050	1710	2060	2455	2400
TDA200	20000	1050	1710	2060	2760	2400
TDA220	22000	1050	1950	2300	2870	2400



## 4.5 Connection pipe

Model	Air flow (CFM)	Coil Connection Pipe mm (inch)	
		4 Rows	6 Rows
TDA012	1200	Ø48(1-1/2")	Ø48(1-1/2")
TDA018	1800	Ø48(1-1/2")	Ø48(1-1/2")
TDA024	2400	Ø48(1-1/2")	Ø60(2")
TDA030	3000	Ø48(1-1/2")	Ø60(2")
TDA036	3600	Ø60(2")	Ø60(2")
TDA042	4200	Ø60(2")	Ø60(2")
TDA048	4800	Ø76(2-1/2")	Ø89(3")
TDA060	6000	Ø76(2-1/2")	Ø89(3")
TDA080	8000	Ø89(3")	Ø89(3")
TDA100	10000	Ø89(3")	Ø89(3")
TDA120	12000	Ø76(2-1/2")	Ø89(3")
TDA140	14000	Ø76(2-1/2")	Ø89(3")
TDA160	16000	Ø76(2-1/2")	Ø89(3")
TDA180	18000	Ø76(2-1/2")	Ø89(3")
TDA200	20000	Ø76(2-1/2")	Ø89(3")
TDA220	22000	Ø76(2-1/2")	Ø89(3")
TDA240	24000	Ø89(3")	Ø89(3")
TDA260	26000	Ø89(3")	Ø89(3")
TDA300	30000	Ø89(3")	Ø89(3")
TDA320	32000	Ø89(3")	Ø89(3")
TDA360	36000	Ø89(3")	Ø89(3")
TDA400	40000	Ø89(3")	Ø89(3")
TDA420	42000	Ø89(3")	Ø89(3")

## 4.6 Standard Filter Quantity

### Horizontal Unit

Model	Air flow (CFM)	Filter	
		12"x24"	24"x24"
TDA012-H	1200	-	1
TDA018-H	1800	-	1
TDA024-H	2400	1	1
TDA030-H	3000	1	1
TDA036-H	3600	-	2
TDA042-H	4200	-	2
TDA048-H	4800	2	2
TDA060-H	6000	2	2
TDA080-H	8000	-	4
TDA100-H	10000	2	4
TDA120-H	12000	-	6
TDA140-H	14000	3	6
TDA160-H	16000	3	6
TDA180-H	18000	5	6
TDA200-H	20000	4	8
TDA220-H	22000	6	8
TDA240-H	24000	-	12
TDA260-H	26000	-	15
TDA300-H	30000	-	15
TDA320-H	32000	-	15
TDA360-H	36000	-	20
TDA400-H	40000	-	20
TDA420-H	42000	-	24

### Vertical Unit

Model	Air flow (CFM)	Filter	
		12"x24"	24"x24"
TDA012-V	1200	-	1
TDA018-V	1800	-	1
TDA024-V	2400	1	1
TDA030-V	3000	1	1
TDA036-V	3600	-	2
TDA042-V	4200	-	2
TDA048-V	4800	2	2
TDA060-V	6000	2	2
TDA080-V	8000	-	4
TDA100-V	10000	2	4
TDA120-V	12000	-	6
TDA140-V	14000	3	6
TDA160-V	16000	3	6
TDA180-V	18000	5	6
TDA200-V	20000	4	8
TDA220-V	22000	6	8
TDA240-V	24000	-	12
TDA260-V	26000	-	15
TDA300-V	30000	-	15
TDA320-V	32000	-	15
TDA360-V	36000	-	20
TDA400-V	40000	-	20
TDA420-V	42000	-	24



## 5. AHU option Parts

### 5.1 Backward curved Fan

Normally, we design centrifugal forward fan to standard models. The backward curved is necessary to be used for handle high static pressure system.



### 5.2 Plenum Fan

Some application, such as cleanroom need to provide clean air. Plenum fan can support about it. Also, plenum fan contribute to lower overall system pressure drop, thereby reducing energy consumption and can use it with inverter control.



### 5.3 Motor

Normally, we provide 4 poles, 380V-415V/3Ph/50Hz with IP55 class F to standard models and also we have to option motor as

1. 2 & 6 poles motor
2. Economic efficiency motor.
3. Hi efficiency motor
4. 60Hz motor

There are a few components which are able to provide safety, efficiency and flexibility for the operation of AHU. It includes thermistor, Inverter, disconnect switch and other.



### 5.4 Belt Guard

Safety guard is necessary in case of service team needs a secondary protection during service the coil or others. But about process of adjuster belt and other same as normal for the safety.



### 5.5 Stainless coil

Some of application field have more chemical over normal condition. It effects to copper coil but the stainless coil can solved everything.



### 5.6 Hot water coil

Hot water coils are available with various fin spacing and circuit arrangements. The design is similar to the chilled water coil. For high water pressure application and applications where water condition tend to be corrosive, cupro-nickel tubes are available.



### 5.7 Steam Coil

Steam coils is designed for general purpose air heating. It can be used for wide variety of heating and processing application. Both the standard and high steam pressure construction are available for all models. A baffle is provided at the inlet header to disperse the entering steam. This prevents blow-through or short-circuit and ensure equal steam distribution to all tube of the coil.



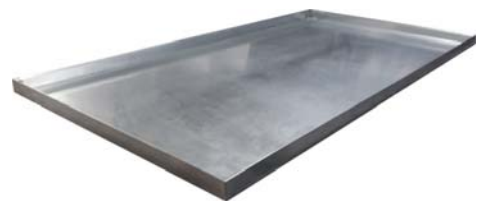
### 5.8 Electric Heater

Electric heater is designed for air heating and humidifying control. It complete component of heating in AHU chassis. And it has 2 kinds of heater : stainless or galvanize steel.



### 5.9 Stainless drain pan

Some application fields need no limit life time of drain pan. The stainless drain pan can be provided to your request.



### 5.10 Humidifier

Some of application field need to stable humidity. The humidifier needs to include in AHU. Bitwise TDA Series has many kinds as follow.

1. Electrode
2. Electric heater boiler
3. Water spay
4. Fire gas



## 6. Installation & Transportation

### TDA Installation, Operation & Maintenance Manual

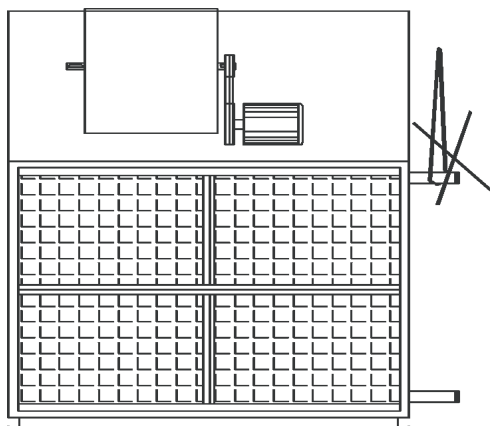
#### 6.1 Matters Needing Attention

1. In order to free drain out and well running, the air handling unit should be installed horizontally.
2. There are not any foreign matters left in the drain pan. All foreign matters should be eliminated in order to get free drain. Then it can be running.
3. During installation, please pay attention not to let plaster, paint or contamination leave on the panels, motor or fan blades. You should also be careful in preventing from damaging galvanized steel panel and insulation.

Notice: If contamination and foreign matters on motor or fan blades are not eliminated, CORPORATION cannot supply effective maintenance and service.

#### 6.2 Transportation

TDA air handling unit is packaged by wooden case The unit should not be damaged during transportation. The angle of inclination should not be more than 30 degree when carrying it. When the unit is delivered to destination and the wooden case is disassembled please do not uplift inlet or outlet pipe to move the unit. ( The following picture shows the wrong way to move the unit.)



#### 6.3 Preparations Before Installation

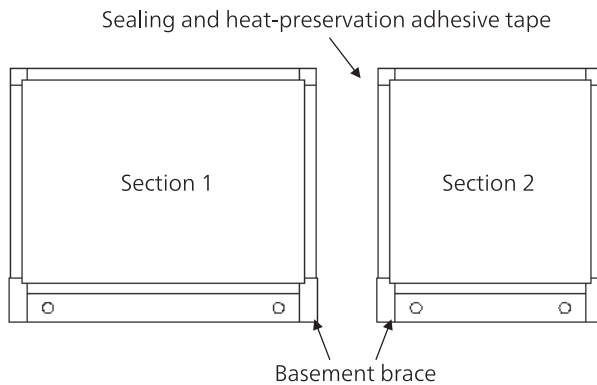
Before installation, please check the location of installation and confirm there are water supply and power supply or air duct are ventilating. The installation location should be kept clean and tidy. After unloading the unit, please check the unit and its components to confirm they are not damaged.

- Frame Structure of Unit
- Connection pipe
- Internal Components

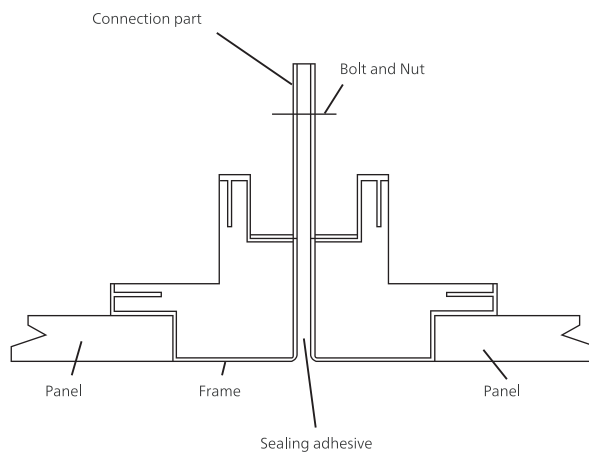
#### 6.4 Space of Installation

In order to install and maintain the unit conveniently, you should leave an appropriate space for the unit to be installed. The distance between each side of the unit and the wall is at least 300mm, And there are at least one side which the distance from it to the wall is not shorter than the unit width. In order to install pipe and maintain/service unit conveniently, you should install the unit on a convex foundation. The size of convex foundation should be a little bigger than the bottom of the unit. The height of the foundation should meet the installation of U-trap.

If the unit is the model which is above TDA, the unit section should be connected according to numbering order of the transporting section of the unit, and assembled in conformity to the airflow direction marked on the unit. Before connection, the basement brace should be taken apart. Stick the attached sealing and heat-preservation adhesive tape to the joint face of the frame among the unit sections (One face should be stuck for each section, as indicated below )



Two consecutive unit sections are about-jointed. Use a ruler to check whether they are aligned. Adopt connection parts screw for connection at four sides in the unit (as indicated Below ).



## 6.5 Fixture

The unit should be placed horizontally and fixed on foundation by bolts.

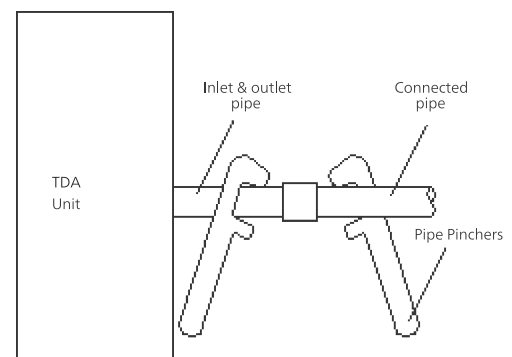
## 6.6 Connection of Air Duct

In generally,TDA air handling unit should be connected by supply air duct and return air duct (You neednt connect return air duct if return air by corridor). The arrangement and direction of supply air duct should meet the specification and standard. In order to prevent acoustic noise regeneration when

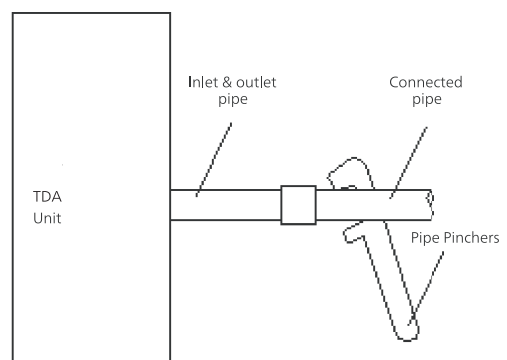
vibration is transmitted to air duct, air duct should be connected with the unit by one 100~200mm length flexible duct. Such connection should be good airproof and without any air leakage. The air duct itself should not be supported on the unit. It should be supported by brace or hanger. Air duct should be equipped with good insulation to avoid condensation.

## 6.7 Connection of Water Pipe

Inlet/outlet pipe are connected with pipeline by screw connection. You should use two pipe pinchers (see Diagram 3). Please take carefully so as not to damage screw and cause leakage. Pay attention to the flow direction of water in pipe when connect them. Do not reverse them.



Correct Operation



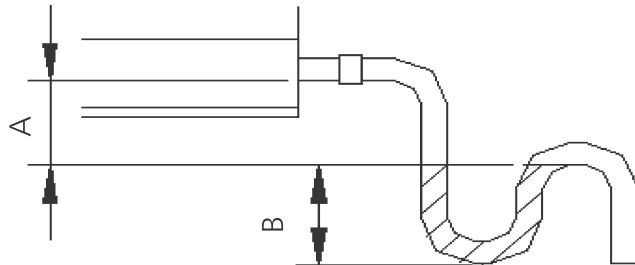
Wrong Operation

## 6.8 Water Quality & Required Environment

Clean and soft water quality is required. The best running temperature of air handling unit is  $\leq 40^{\circ}\text{C}$  and the relative humidity is  $\leq 90\%$

## 6.9 U-trap

In order to drain condensate water freely and eliminate the effect of the internal negative pressure, a U-trap (not provided by manufacturer) should be installed in drain pipe. The installation method of U-trap is followed by the following picture You can design its dimension as follows:  $P = \text{Absolute value of internal negative pressure}$  Pa  $A=B \geq P/10+20(\text{mm})$



## 6.10 Warnings

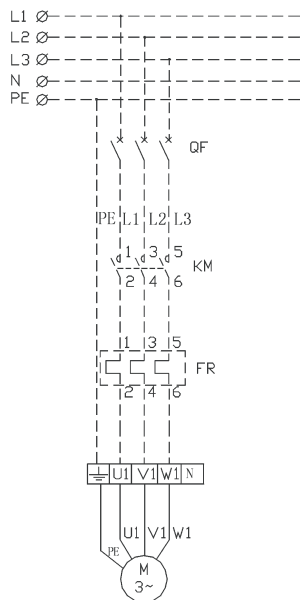
Warning marks are placed on dangerous parts of air handling unit. Please pay attention to them when transporting, installing and running it.

## 7.Starting & Running

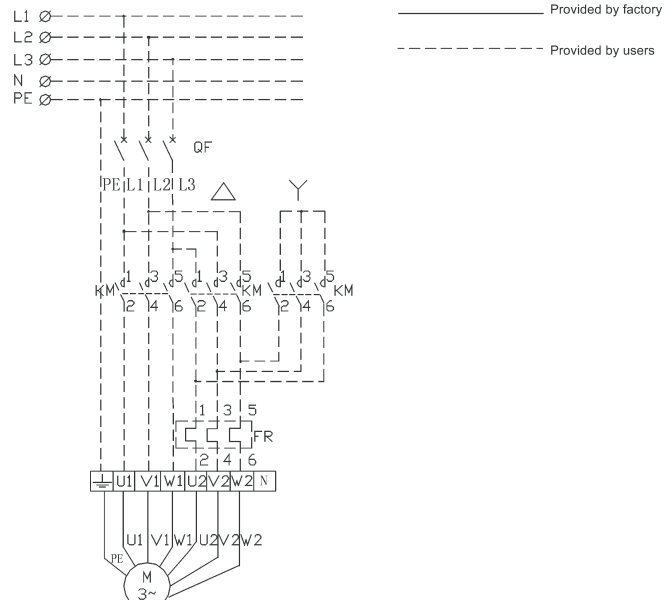
### TDA Installation, Operation & Maintenance Manual

#### 7.1 Electrical Diagram

1. Electrical wiring of dotted line users should prepare by themselves according to diagram 1 or diagram 2. There is no such configuration for standard unit.
2. All electrical wiring should comply with local electrical installation standard.
3. Ground point of unit should be connected to earth terminal of control panel.
4. Check all power supply to confirm they accord with namplate voltage or not; and power supply should be equipped with applicable fuses.



Power of motor: Less than or equal to 5.5 KW  
Direct Startup Principle Diagram



Power of motor: Bigger than or equal to 7.5 KW  
Y- Δ Startup Principle Diagram

#### 7.2 Check Before Startup

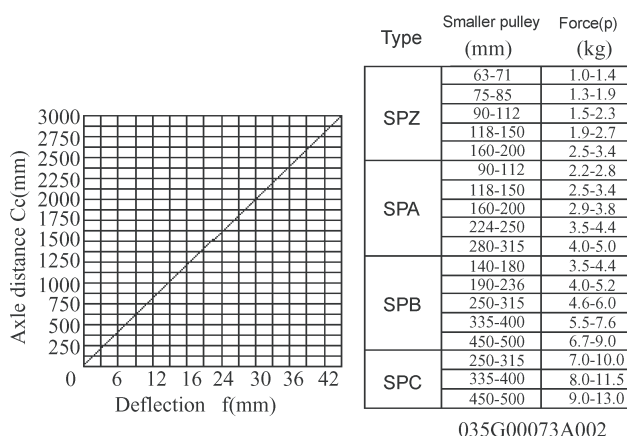
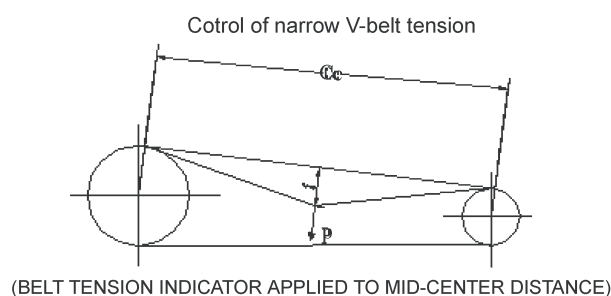
After air handling unit is installed, before starting-up and testing, please check the following items firstly:

1. Check air handling unit to find whether components are loosened or not;
2. Check earth-grounding wire to find whether it is connected well or not;
3. Before starting fan, check air duct to find whether it is ventilated or not; Damper should not be in offposition;
4. Check flexible duct or duct connecting apparatus;

5. All water pipes are connected well;
6. Check power supply, including short-circuit and circuit-break protection;
7. Drain pipes have been connected correctly;
8. Filter has been installed correctly without any building fragments and dust on it;
9. Check motor and fan bearing to find whether they run freely or not;
10. Hydraulic pressure testing and ventilation testing.
11. The wooden support under the fan base is taken out or not.

## Fan

- Shut off switch before checking internal parts of fan;
- Check fan and motor components to find whether anti-vibration and flexible connection apparatus operate freely or not;
- Air handling unit is driven by belt and pulley. Please check tension degree of belt. The tension degree of belt is as follows (Following picture);
- Check electrical connection apparatus of motor to find whether it accords with the provided wiring diagram or not;
- Check nameplate of motor to find whether its voltage, phase and electrical circuit accord with power on the spot or not;
- Check the running current of motor by ammeter; Compare it with the data on nameplate of motor.



## 7.3 Testing

After air handling unit is installed, please pay attention to condensate water problem when starting-up air conditioning system at the first time. Condensate water is caused because surface temperature of unit is lower than dew point temperature of environment.

Considering such special characteristics of this system, you can cool water temperature slowly so as to avoid moist air entering air conditioning room, and then avoid the production of condensate water in colder parts of unit. Use automatic flow switch to avoid the production of condensate water. If the system isn't installed automatic flow switch and thermostat, fan runs unstably, or inlet/outlet pipe valve of coil is not tight when it doesn't work, you should startup air handling unit carefully so as to avoid the production of condensate water.

## Fan

Put on the switch, the fan will be driven. It should run continuously. Switch off fan and it would stop running in time. Pay attention to the rotating direction of fan when it runs.








## 7.4 Running Fan

Put on the switch of the fan to control its running. The fan would run continuously. When you shut off fan, it will stop running in time.

## Exhaust the Air in the cooling coil

There is a discharge valve on the outlet pipe of coil. When coil is watered at the second time, there will be some air collecting in coil. The part air will be collected in the tiptop of coil under the function of water in generally. If there is "bubble" in coil, there is air in it. So you need to open the discharge valve to exhaust air so as to guarantee the heat exchange efficiency. After air is exhausted, you should close the discharge valve to avoid chilled water leakage. If you do not follow above-mentioned safety regulation to operate, manufacturer will not be responsible for any accident caused by that.



-  ADJUSTMENT
-  INSPECTION
-  WASHING
-  PAINTING
-  LUBRICATION
-  REPLACEMENT
-  PARTS CHANGE



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