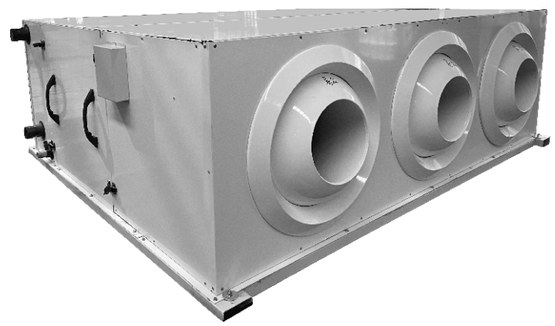
Installation, Operation and Maintenance

LWHA - Marvel
Low Height Blower

Coil Air Handler



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⚠SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury.When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

Dec 2022

LWHA-SVX01A-EN

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LWHA-SVX01A-EN Dec 2022
Supersedes LWHA-SVX01A-EN Aug 2022

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Contents

Foreword

Foreword

These instructions do not attempt to cover all variations in systems, nor to provide for every possible contingency to be met in connection with installation. Should further information be desired or should particular problems arise which are not sufficiently covered for the purchaser's purpose, the matter should be referred to the manufacturer.

Warranty

Warranty is based on the general terms and conditions of The Trane Company. The warranty is void if the equipment is repaired or modified without the written approval of the manufacturer, if the operating limits are exceeded or if the control system or the electrical wiring is modified. Damage due to misuse, lack of maintenance or failure to comply with the manufacturer's instructions or recommendations are not covered by the warranty obligation.

Reception

On arrival, inspect the unit before signing the delivery note. Specify any damage on the delivery note, and send a registered letter of protest to the last carrier of the goods within 72 hours of delivery. Notify the local Trane Sales Office at the same time.

The unit should be totally inspected within 15 days of delivery. If any concealed damage is discovered, stop unpacking the shipment.

Notify the carrier immediately by phone or any registered mail. Notify the local Trane Sales Office. Conceal damage must be reported within 15 days of delivery. Check the unit nameplate to confirm that the proper unit was shipped. Available power supply must be compatible with electrical characteristics specified on component nameplates.

Installation

This manual covers the installation, operation and maintenance of the Trane Chilled Water Blower coil Air Handlers. LWHA is completely designed to incorporate a single slab coil assembly, improved application flexibility, servicing and maintenance accessibility and an improved accessory line.

LWHAs are specially designed to meet tight ceiling space requirement.

Note:

"Warnings" and "Cautions" appear at appropriate places in this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The manufacturer assumes no liability for installations or servicing performed by unqualified personnel.

Handling

The unit will be supplied with a shipping based and protective packaging over the unit casing. The packaging should be kept on the unit during handling or storage on site.

If it is necessary to remove the packaging for inspection prior to completion of on site handling, retain packaging parts and reapply them by tapping in position to prevent damage to the casing. The unit as supplied has a shipping base which is suitable for handling by a fork lift truck.

Model Number Description

L	W	H	A	0	8	0	1	1	4	2	L	0	0	G	3	0	1	0	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Digit 1-4: **Product Name**
LWHA Marvel

Digit 5-7: **Unit Size**
020,030,031,040,041,050,060
080,100,120,150 (11 sizes)

Digit 8: **Airflow Code**

Digit 9: **ESP**
1 = 50Pa
2 = 100Pa
3 = 150Pa
4 = 200Pa
5 = 250Pa
6 = 300Pa
7 = 350Pa
L = Low ESP (Only for direct driver)
H = High ESP (Only for direct driver)

Digit 10: **Cooling Option**
4 = 4 Row Cooling Coil
6 = 6 Row Cooling Coil

Digit 11: **Heating Option**
0 = No Heating Option
1 = 1 Row Heating Coil
2 = 2 Row Heating Coil
E = Electric Heating Option

Digit 12: **Connection Side**
L = Left Hand
R = Right Hand

Digit 13: **Filter Option**
0 = Nylon Filter
1 = 1" Washable Filter
2 = 2" Washable Filter
3 = Nylon + Plug-in PCO
4 = 1" Washable Filter + Plug-in PCO
5 = 2" Washable Filter + Plug-in PCO
A = Aluminum Filter
B = Nylon Filter + 4" Secondary Filter
C = 1" Washable Filter + 4" Secondary Filter
D = Aluminum Filter + 4" Secondary Filter
E = Aluminum Filter + Plug-in PCO
F = Nylon Filter + 4" Secondary Filter + Plug-in PCO
G = 1" Washable Filter + 4" Secondary Filter + Plug-in PCO
H = Aluminum Filter + 4" Secondary Filter + Plug-in PCO

Digit 14: **Humidifier**
0 = None
4 = 40% Efficiency Evaporative Humidifier
6 = 60% Efficiency Evaporative Humidifier

Digit 15: **Drain Pan**
G = Galvanized Steel
S = Stainless Steel

Digit 16: **Motor**
3 = IE3 Motor (3P/380V/50Hz) (Only China Mainland)
L = IE2 Motor (3P/380V/50Hz) (Other coutries or region except China Mainland)
R = IE2 Motor (3P/400V/50Hz) (Other coutries or region except China Mainland)
S = IE2 Motor (3P/415V/50Hz) (Other coutries or region except China Mainland)
V = IE2 Motor (3P/380V/60Hz) (Other coutries or region except China Mainland)
B = IE3 Motor (3P/380V/50Hz) (Other coutries or region except China Mainland)
C = IE3 Motor (3P/400V/50Hz) (Other coutries or region except China Mainland)
D = IE3 Motor (3P/415V/50Hz) (Other coutries or region except China Mainland)
X = IE3 Motor (3P/380V/60Hz) (Other coutries or region except China Mainland)
W = Direct driver (3P/380V/50Hz)

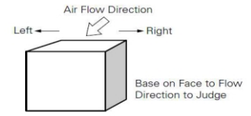
Digit 17: **Application**
0 = Std. return air condition
1 = Std. fresh air condition
2 = Earthwise return air condition
3 = Earthwise fresh air condition

Digit 18: **Design Code**
1 = Default number

Digit 19: **Country Code**
0 = China Mainland
1 = Hong Kong
2 = AP (Except China Mainland or Hong Kong)
3 = MAIR
4 = LAR

Digit 20: **Unit Type**
A = Single Skin, Galvanized Steel, with Flexible Options
B = Single Skin, Galvanized Steel, Basic Unit
C = Single Skin, Painted Steel, with Flexible Options
D = Single Skin, Painted Steel, Basic Unit
F = Double Skin, Painted Steel, Basic Unit

Note: * Option unit configuration:
Filter + Hot water coil or Electric Heater + Cooling Coil + Humidifier + Fan
Bacis unit configuration:
Single Skin: Filter (Digit 13: 0,1,A,3,4,E) + Cooling Coil + Fan
Double Skin: Filter (Digit 13: 0,1,2,A,3,4,5,E) + Cooling Coil + Fan
** Only basic unit for 031, 041
*** Only basic unit for double skin
**** Electric Heater Power:
020 = 4kW 080 = 16kW
030 = 6kW 100 = 20kW
040 = 8kW 120 = 24kW
050 = 10kW 150 = 30kW
060 = 12kW



Jet discharge unit model number

L	W	H	A	0	8	0	1	0	4	0	L	2	0	G	B	0	1	2	J
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Digit 1-4: **Product Name**
LWHA Marvel

Digit 5-7: **Unit Size**
020,030,031,040,041,050,060
080,100,120,150 (11 sizes)

Digit 8: **Airflow Code(Please refer to page 8)**

Digit 9: **ESP**
0 = 0 Pa (Only for Jet unit)

Digit 10: **Cooling Option**
4 = 4 Row Cooling Coil
6 = 6 Row Cooling Coil

Digit 11: **Heating Option**
0 = No Heating Option

Digit 12: **Connection Side**
L = Left Hand
R = Right Hand

Digit 13: **Filter Option**
0 = Nylon Filter
1 = 1" Washable Filter
2 = 2" Washable Filter
3 = Nylon + Plug-in PCO
4 = 1" Washable Filter + Plug-in PCO
5 = 2" Washable Filter + Plug-in PCO
A = 1" Aluminum Filter
E = 1" Aluminum Filter + Plug-in PCO

Digit 14: **Humidifier**
0 = None

Digit 15: **Drain Pan**
G = Galvanized Steel
S = Stainless Steel

Digit 16: **Motor**
L = IE2 Motor (3P/380V/50Hz)
R = IE2 Motor (3P/400V/50Hz)
S = IE2 Motor (3P/415V/50Hz)
V = IE2 Motor (3P/380V/60Hz)
B = IE3 Motor (3P/380V/50Hz)
C = IE3 Motor (3P/400V/50Hz)
D = IE3 Motor (3P/415V/50Hz)
X = IE3 Motor (3P/380V/60Hz)

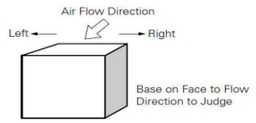
Digit 17: **Application**
0 = Std. return air condition
1 = Std. fresh air condition
2 = Earthwise return air condition
3 = Earthwise fresh air condition

Digit 18: **Design Code**
1 = Default number

Digit 19: **Country Code**
0 = China Mainland
1 = Hong Kong
2 = AP (Except China Mainland or Hong Kong)
3 = MAIR
4 = LAR

Digit 20: **Unit Type**
J = Basic Jet Unit, Double Skin, Painted Steel

Note: Bacis unit configuration:
Double Skin: Filter (Digit 13: 0,1,2,A,3,4,5,E) + Cooling Coil + Fan
** Only basic unit for double skin



Unit Installation

Unit Location Recommendations

When selecting and preparing of the unit operating location, consider the following:

1. LWHA shall be installed for horizontal application only.
2. Available power supply must agree with electrical data on unit nameplate.
3. Consider the weight of the unit .
4. Allow sufficient space for the recom-mended clearances.Refer to Figure 1.
5. Installer must provide suspension rods (threaded) for ceiling mounted unit.
6. All unit must be installed level.
7. Coil piping and condensate drain requirements must be considered.

Allow room for proper ductwork and electrical connections. Support all piping and ductwork independently of unit to prevent excess noise and vibration.

Lifting / Rigging Recommendations

Before preparing the unit for lifting, estimate the approximate center of gravity for lifting safety. Because of placement of internal components, the unit weight may be unevenly distributed, with more weight in the coil area. Before hoisting unit into position, be sure that a proper rigging method is used, with straps or slings and spreader bars for protection and safety during lifting. Always test-lift the unit to determine exact unit balance and stability before hoisting it to the installation location.

⚠ WARNING

CHECK THAT THE SUPPORTING STRUCTURE IS STRONG ENOUGH TO SUPPORT UNIT WEIGHT.

MOUNTING

Unit Suspension - Typical

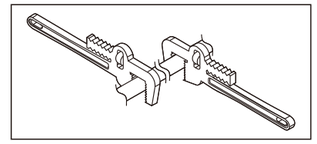
If the unit will be suspended, use suspension mouting kit to isolate the unit from structure. This is usually accomplished through the use of spring or rubber type vibration isolators. The units are designed to be suspended from ceiling on threaded rod size 3/8″ or 1/2″ (M12), furnished by the installing contractor. Four external mounting lugs are provided at bottom of the unit. The false ceiling opening must be large enough for future maintenance.

⚠ WARNING

DO NOT LIFT THE UNIT WITHOUT TEST-LIFTING FOR BALANCE AND RIGGING. DO NOT LIFT THE UNIT ABOVE PERSONNEL. FAILURE TO OBSERVE THESE WARNINGS MAY RESULT IN PERSONAL INJURY, DEATH OR EQUIPMENT DAMAGE.

To install unit complete the following:

1. Determine the unit mounting hole dimensions. Prepare the hanger rod isolator assemblies (provided by installing contractor) and install them in the selected area. Threaded rods are recommended for leveling the unit.
2. Hoist the unit to the suspension rods and attach with washers and lock nut. Refer to figure 2, for specific mounting details.
3. Level the unit for proper coil drainage and condensate removal from drain pan. Refer to drain trap sketch in the piping section.
4. Connect the ductwork to the unit.
5. In order to protect the coil, please use a couple of pipe wrenches to operate.



Auxiliary Drain Pan

A field fabricated auxiliary drain pan may be installed under the unit, and when condensate overflow may cause damage. This drain pan will eliminate any excess condensation that may be due to extreme humidity or an obstructed drain in the primary drain pan. Drain lines from this pan must be installed, but should not be connected to the primary drain line from the unit. Isolate the auxiliary drain pan from both the air handler and the structure.

Air Filters

For filter dimension and quantity, refer to General Specification. Filter loading method is sliding type and accessible from both sides.

Duct Connections

The Inlet and Discharge air duct connections to the unit should be made with a flexible material minimizing noise and vibration. Typically, about 3 inches(75mm) is needed for this connection to rigid ductwork.
Duct turns and transitions must be made carefully to minimize air friction
losses. Avoid sharp turns and use splitters or turning vanes when elbows are necessary. Discharge (supply) ductwork should run in a straight line, unchanged in size or direction, for at least a distance of 1-1/2 fan diameters(see General Specification, for fan diameter).
The return duct should be sized to the same dimensions as the return inlet the return inlet of the unit.
All ductwork should be properly insulated to prevet condensation and heat loss.

Coil Connections

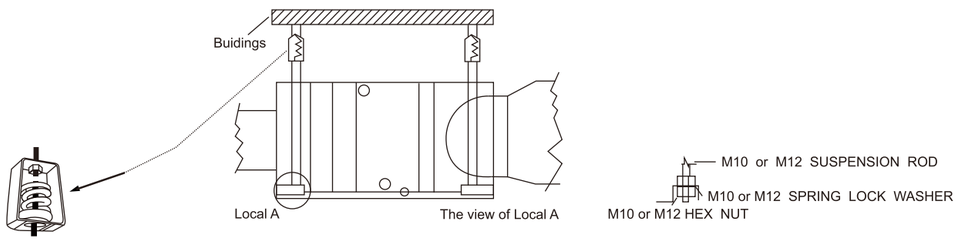
The water coils for LWHA units are of a 1-Row(heating),4-Row or 6-Row(Cooling)design with high efficency aluminum Fins and Coppper tubes.

Proper installation and piping is necessary to insure satisfactory coil operation and prevent operational damage. Water Inlet and Outlet connections protrude through the coil section side panel. Follow the industry standard practices when piping the coil.

Note the following:

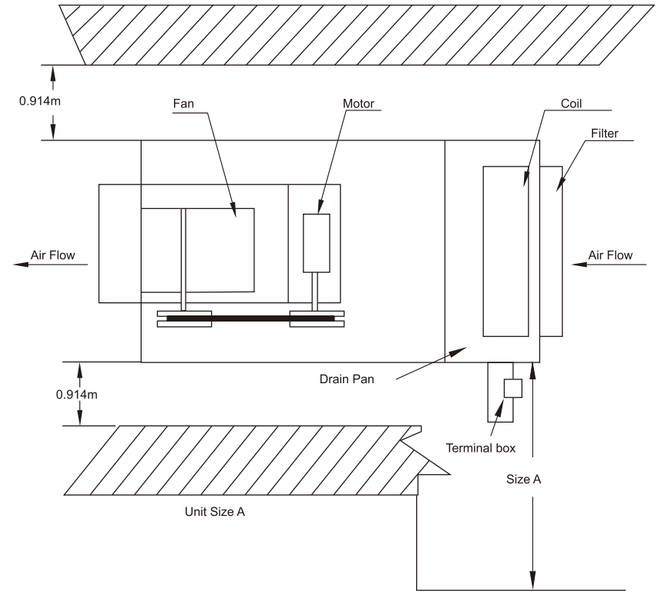
1. Support all piping independently of the coils.
2. Provide swing joints or flexible fittings in all connections that are adjacent heating coils in order to absorb thermal expansion and contraction strains.
3. When attaching piping to the coil header, make the connection only tight enough to prevent leaks, the maximum recommended torque is 200ft-lbs.
4. Teflon tape or teflon piping compound should not be used because of its high lubricity,Teflon makes it easier to tighten the pipe to the hander joint past the point where an effective seal is created,
   thus damage to the coil could result.
5. “White Zinc” compound / pipe sealer on all threaded connection is recommended, instead.

Figure 2 TYPICAL INSTALATION METHOD FOR LWHA , METHOD 1



Note:The installer provides all the nuts and suspension rods.

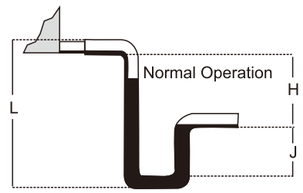
Figure 3 Space Requirement And clearance



Unit Size	Least clearance A (mm)
LWHA020	1100
LWHA030	1500
LWHA040/050	1770
LWHA060/080	2010
LWHA100/120	2300
LWHA150	2700

Figure 4 Conden Sate Drain Connections

Make sure the drain pan connection opening is unobstructed.Trap the drain line as shown in Figere 4.

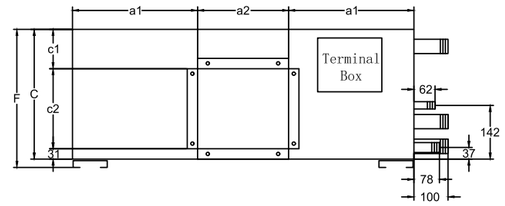


H = the static pressure of drain pan/10
J = 1/2H
L = H+J+Drain pipe dia + Heat preservation thickness +safety margin (at least 25.4mm)
Note: Drain pipe dia. not including the thickness of heat preservation.

Single Panel Unit Dimensions

Type A - 020

Front View

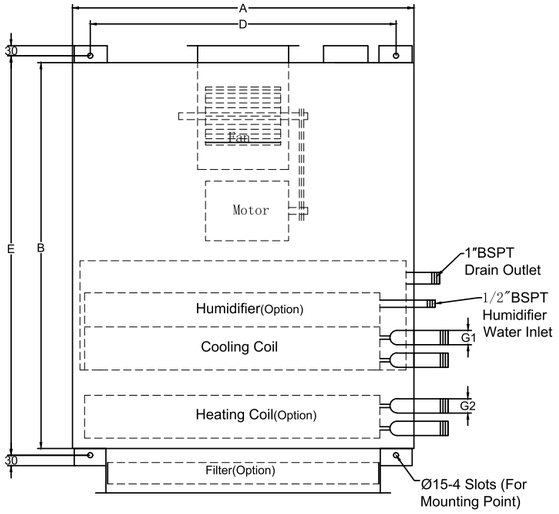


Model	A	B	C	D	E	F	G2	
							1Row	2Row
020	970	1280	380	870	1320	400	1-1/4″	1-1/4″

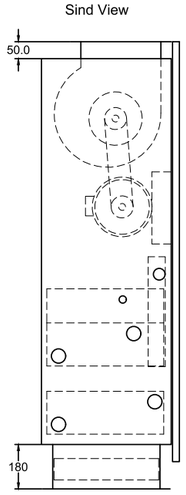
Coil Heater OD G1							
Normal Application				Normal Application			
Return Air		Fresh Air		Return Air		Fresh Air	
4rows	6rows	4rows	6rows	4rows	6rows	4rows	6rows
1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″

Note: 1.Return Air :EDB/WEB:27/19.5℃.Fresh Air :Edb/WEB:35/28℃.
2. Chilled Water Coil Normal Application : EWT / LWT : 7/12℃.
3. Chilled Water Coil Earthwise Application : EWT / LWT : 5/13℃.

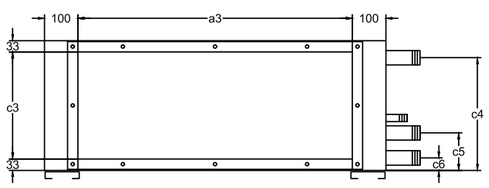
Top View



Sind View



Near View

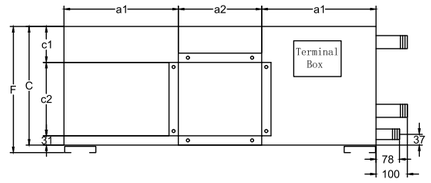


Model	a1	a2	a3	c1	c2	c3	c4	c5	c6	
									1Row	2Row
020	353	265	770	116	233	314	330	110	59	46

Note:The width of flange hem is 30mm

Single Panel Unit Dimensions

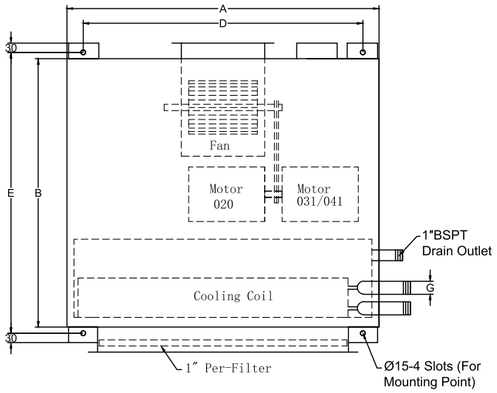
Type B - 020, 031, 041

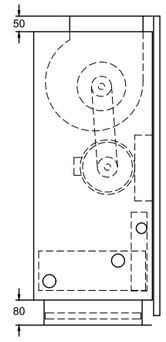


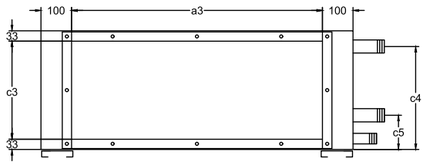
Model	A	B	C	D	E	F
020	970	860	380	870	900	400
031	1007	860	490	905	900	510
041	1264	860	490	1161	900	510

Model	Coil Heater OD G							
	Return Air		Fresh Air		Return Air		Fresh Air	
	4rows	6rows	4rows	6rows	4rows	6rows	4rows	6rows
020	DN32	DN32	DN32	DN32	DN32	DN32	DN32	DN32
031	DN32	DN32	DN32	DN32	DN32	DN32	DN32	DN32
041	DN32	DN32	DN32	DN32	DN32	DN32	DN32	DN32

Note: 1.Return Air :EDB/WEB:27/19.5℃.Fresh Air :Edb/WEB:35/28℃.
2. Chilled Water Coil Normal Application : EWT / LWT : 7/12℃.
3. Chilled Water Coil Earthwise Application : EWT / LWT : 5/13℃.





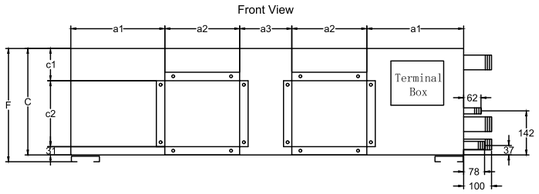


Model	a1	a2	a3	c1	c2	c3	c4	c5
020	353	265	770	116	233	314	330	110
031	458	271	809	166	294	421	443	106
041	497	271	1064	166	294	421	443	106

Note:The width of flange hem is 30mm

Single Panel Unit Dimensions

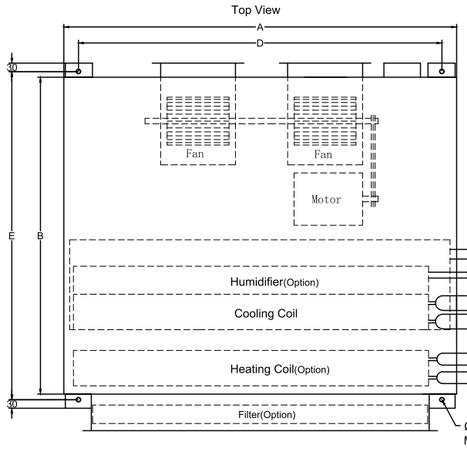
Type A - 030,040,050,060

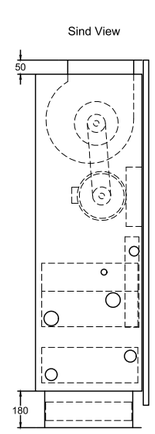


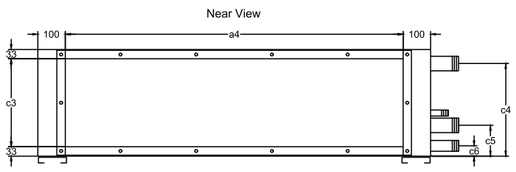
Model	A	B	C	D	E	F	G2	
							1Row	2Row
030	1330	1280	380	1230	1320	400	1-1/4″	1-1/4″
040	1600	1280	380	1500	1320	400	1-1/4″	1-1/4″
050	1600	1390	490	1500	1430	510	1-1/4″	1-1/4″
060	1910	1390	490	1800	1430	510	1-1/4″	1-1/4″

Model	Coil Header OD G1							
	Normal Application				Normal Application			
	Return Air		Fresh Air		Return Air		Fresh Air	
030	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″	1-1/4″
040	1-1/4″	1-1/4″	1-1/2″	2″	1-1/4″	1-1/4″	1-1/4″	1-1/4″
050	1-1/2″	1-1/2″	1-1/4″	2″	1-1/2″	1-1/2″	1-1/2″	1-1/2″
060	1-1/2″	1-1/2″	2″	2″	1-1/2″	1-1/2″	1-1/2″	1-1/2″

Note: 1.Return Air :EDB/WEB:27/19.5℃.Fresh Air :Edb/WEB:35/28℃.
2. Chilled Water Coil Normal Application : EWT / LWT : 7/12℃.
3. Chilled Water Coil Earthwise Application : EWT / LWT : 5/13℃.





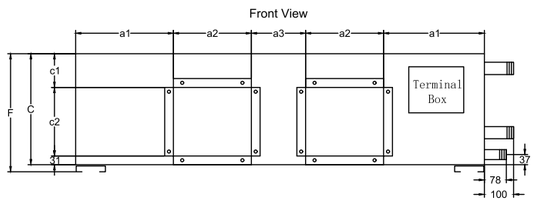


Model	a1	a2	a3	a4	c1	c2	c3	c4	c5	c6	
										1Row	2Row
030	311	265	178	1130	116	233	314	330	110	59	46
040	446	265	178	1400	116	233	314	330	110	59	46
050	425	271	208	1400	165	294	424	434	115	63	50
060	580	271	208	1710	165	294	424	434	115	63	50

Note:The width of flange hem is 30mm

Single Panel Unit Dimensions

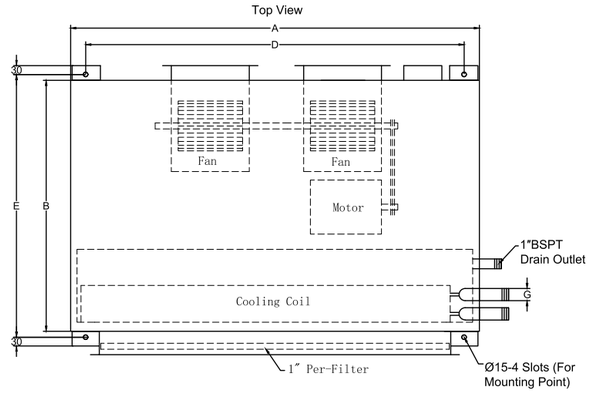
Type B - 030,040,050,060

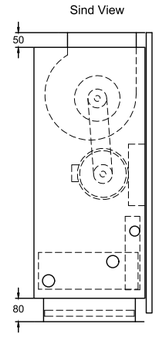


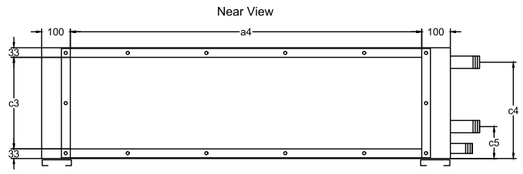
Model	A	B	C	D	E	F
030	1330	860	380	1230	900	400
040	1600	860	380	1500	900	400
050	1600	970	490	1500	1010	510
060	1910	970	490	1800	1010	510

Model	Coil Header OD G							
	Normal Application				Normal Application			
	Return Air		Fresh Air		Return Air		Fresh Air	
	4rows	6rows	4rows	6rows	4rows	6rows	4rows	6rows
030	1-1/4″	1-1/4″	1-1/4″	1-1/2″	1-1/4″	1-1/4″	1-1/4″	1-1/4″
040	1-1/4″	1-1/4″	1-1/2″	2″	1-1/4″	1-1/4″	1-1/4″	1-1/4″
050	1-1/2″	1-1/2″	2″	2″	1-1/2″	1-1/2″	1-1/2″	1-1/2″
060	1-1/2″	1-1/2″	2″	2″	1-1/2″	1-1/2″	1-1/2″	1-1/2″

Note: 1.Return Air :EDB/WEB:27/19.5℃.Fresh Air :Edb/WEB:35/28℃.
2. Chilled Water Coil Normal Application : EWT / LWT : 7/12℃.
3. Chilled Water Coil Earthwise Application : EWT / LWT : 5/13℃.







Model	a1	a2	a3	a4	c1	c2	c3	c4	c5
030	311	265	178	1130	116	233	314	330	110
040	446	265	178	1400	116	233	314	330	110
050	425	271	208	1400	165	294	424	434	115
060	580	271	208	1710	165	294	424	434	115

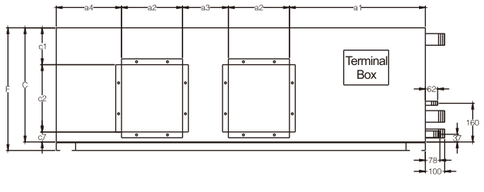
Note:The width of flange hem is 30mm

Note:The unit of filter & pipe inlet/outlet are inch,
the others are mm.

Single Panel Unit Dimensions

Type A - 080,100,120,150

Front View

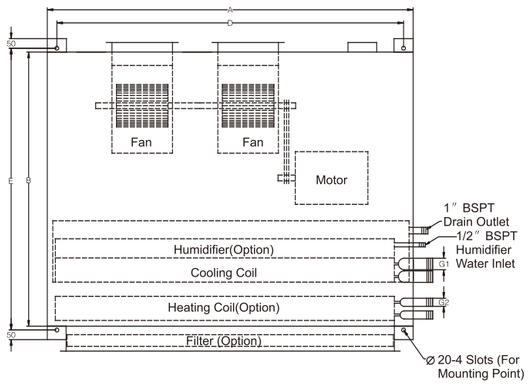


Model	A	B	C	D	E	F	G2	
							1Row	2Row
080	1910	1600	590	1810	1640	630	1-1/4″	1-1/2″
100	2200	1600	590	2100	1640	630	1-1/4″	1-1/2″
120	2200	1600	685	2100	1640	725	1-1/4″	1-1/2″
150	2600	1600	685	2500	1640	725	1-1/4″	1-1/2″

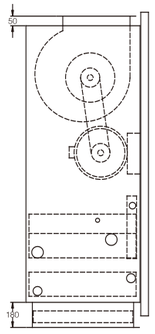
Model	Coil Header OD G							
	Normal Application				Normal Application			
	Return Air		Fresh Air		Return Air		Fresh Air	
	4rows	6rows	4rows	6rows	4rows	6rows	4rows	6rows
080	2″	2″	2″	2-1/2″	2″	2″	2″	2″
100	2″	2″	2-1/2″	2-1/2″	2″	2″	2″	2″
120	2″	2″	2-1/2″	2-1/2″	2″	2″	2″	2″
150	2″	2″	2-1/2″	2-1/2″	2″	2″	2″	2″

Note: 1.Return Air :EDB/WEB:27/19.5℃.Fresh Air :Edb/WEB:35/28℃.
2. Chilled Water Coil Normal Application : EWT / LWT : 7/12℃.
3. Chilled Water Coil Earthwise Application : EWT / LWT : 5/13℃.

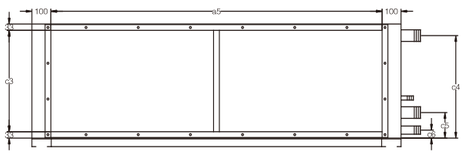
Top View



Side View



Rear View



Note:The unit of filter & pipe inlet/outlet are inch,
the others are mm.

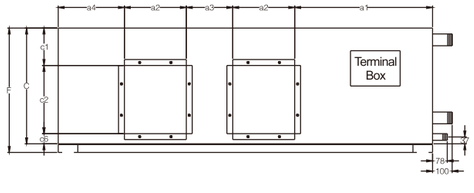
Model	a1	a2	a3	a4	a5	c1	c2	c3	c4	c5	c6		c7
											1Row	2Row	
080	705	313	240	339	1710	192	346	524	530	130	62	52	52
100	850	313	240	484	2000	192	346	524	530	130	62	52	52
120	772	377	290	384	2000	217	408	619	625	130	58	48	60
150	972	377	290	584	2400	217	408	619	625	130	58	48	60

Note:The width of flange hem is 30mm

Single Panel Unit Dimensions

Type B - 080,100,120,150

Front View

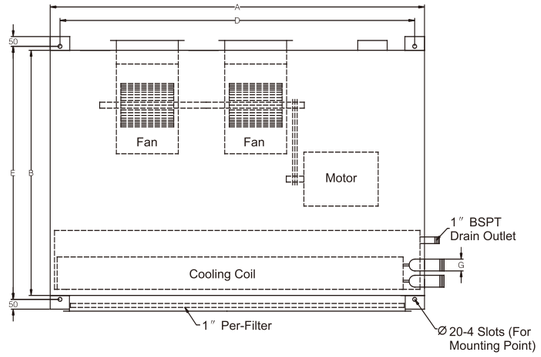


Model	A	B	C	D	E	F
080	1910	1250	590	1810	1290	630
100	2200	1250	590	2100	1290	630
120	2200	1250	685	2100	1290	725
150	2600	1250	685	2500	1290	725

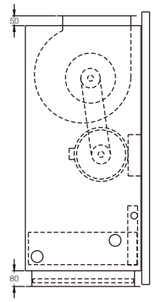
Model	Coil Header OD G							
	Normal Application				Normal Application			
	Return Air		Fresh Air		Return Air		Fresh Air	
	4rows	6rows	4rows	6rows	4rows	6rows	4rows	6rows
080	2″	2″	2″	2-1/2″	2″	2″	2″	2″
100	2″	2″	2-1/2″	2-1/2″	2″	2″	2″	2″
120	2″	2″	2-1/2″	2-1/2″	2″	2″	2″	2″
150	2″	2″	2-1/2″	2-1/2″	2″	2″	2″	2″

Note: 1.Return Air :EDB/WEB:27/19.5℃.Fresh Air :Edb/WEB:35/28℃.
2. Chilled Water Coil Normal Application : EWT / LWT : 7/12℃.
3. Chilled Water Coil Earthwise Application : EWT / LWT : 5/13℃.

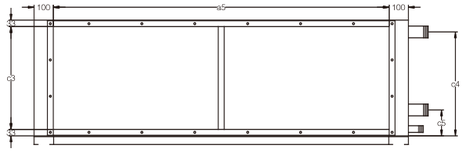
Top View



Side View



Rear View



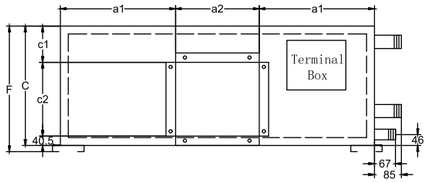
Note:The unit of filter & pipe inlet/outlet are inch,
the others are mm.

Model	a1	a2	a3	a4	a5	c1	c2	c3	c4	c5	c6
080	705	313	240	339	1710	192	346	524	530	130	52
100	850	313	240	484	2000	192	346	524	530	130	52
120	772	377	290	384	2000	217	408	619	625	130	60
150	972	377	290	584	2400	217	408	619	625	130	60

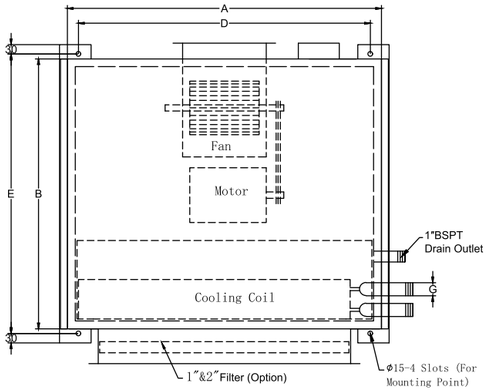
Note:The width of flange hem is 30mm

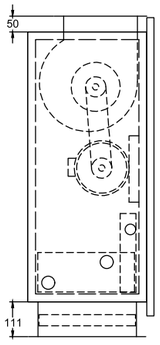
Double Panel Unit Dimensions

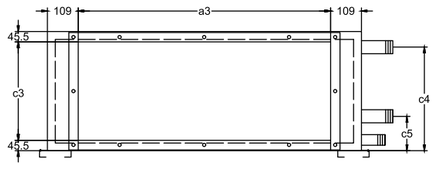
Type B - 020



Model	A	B	C	D	E	F	G	
							4Row	6Row
020	990	870	405	920	900	425	1-1/4"	1-1/4"



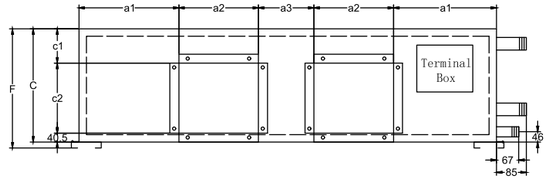




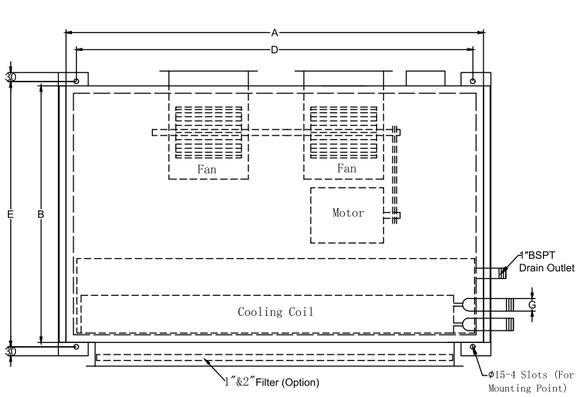
Model	a1	a2	a3	c1	c2	c3	c4	c5
020	362	265	772	132	233	314	340	120

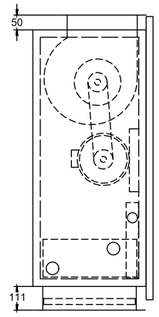
Double Panel Unit Dimensions

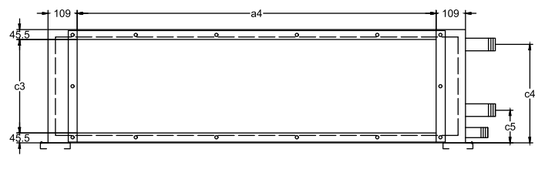
Type B - 030,040,050,060



Model	A	B	C	D	E	F
030	1350	870	405	1280	900	425
040	1620	870	405	1580	900	425
050	1620	1000	515	1580	1030	535
060	1930	1000	515	1860	1030	535



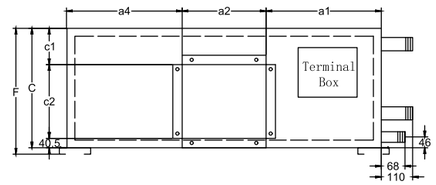




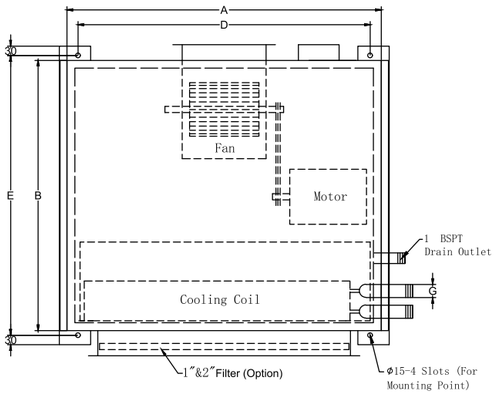
Model	a1	a2	a3	a4	c1	c2	c3	c4	c5
030	321	265	178	1132	131	233	314	340	120
040	456	265	178	1402	131	233	314	340	120
050	435	271	208	1402	180	294	424	444	125
060	590	271	208	1712	180	294	424	444	125

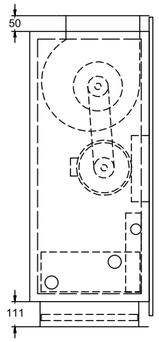
Double Panel Unit Dimensions

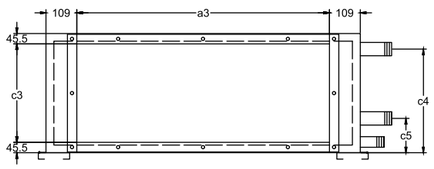
Type B - 031,041



Model	A	B	C	D	E	F
031	1025	870	515	955	900	535
041	1282	870	515	1212	900	535



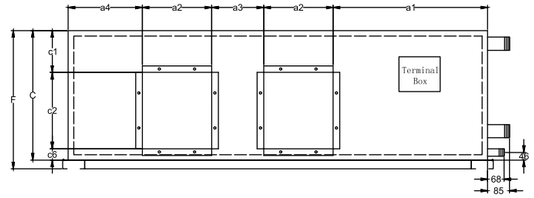




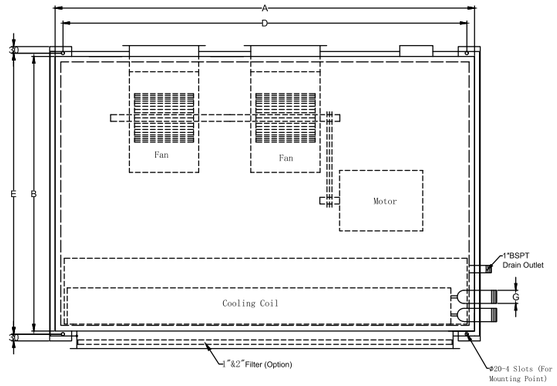
Model	a1	a2	a3	a4	c1	c2	c3	c4	c5
031	468	271	807	286	180	294	424	452	115
041	506	271	1064	506	180	294	424	452	115

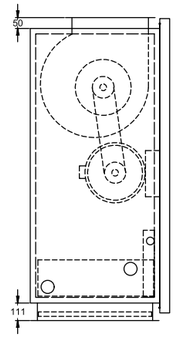
Double Panel Unit Dimensions

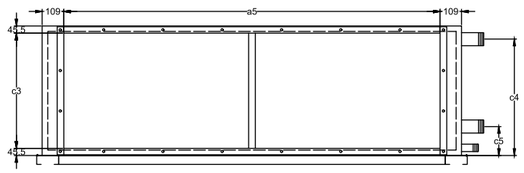
Type B - 080,100,120,150



Model	A	B	C	D	E	F
080	1930	1260	615	1860	1290	655
100	2220	1260	615	2150	1290	655
120	2220	1260	710	2150	1290	750
150	2620	1260	710	2550	1290	750



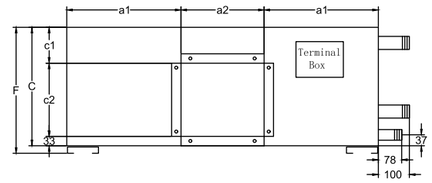




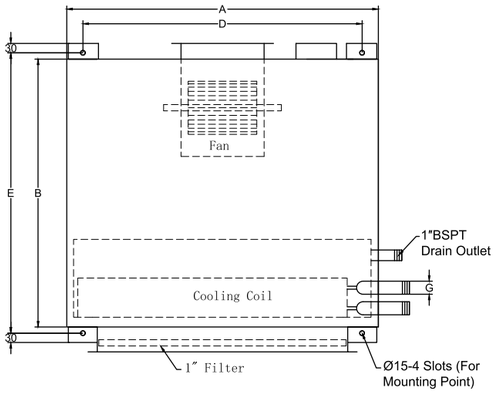
Model	a1	a2	a3	a4	a5	c1	c2	c3	c4	c5	c6
080	716	314	239	339	1712	207	346	524	538	140	62
100	861	314	239	491	2002	207	346	524	538	140	62
120	783	377	289	391	2002	232	408	619	633	140	70
150	983	377	289	591	2402	232	408	619	633	140	70

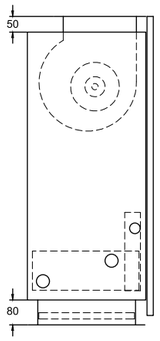
Single Panel Unit With External Rotation Fan

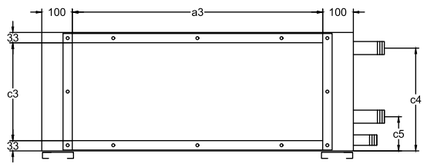
Type B - 020



Model	A	B	C	D	E	F	G	
							4Row	6Row
020	970	860	380	870	900	400	1-1/4"	1-1/4"

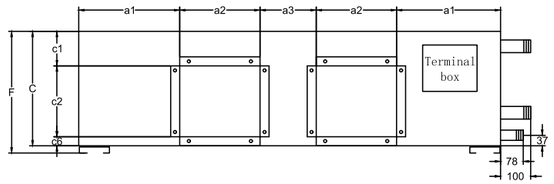




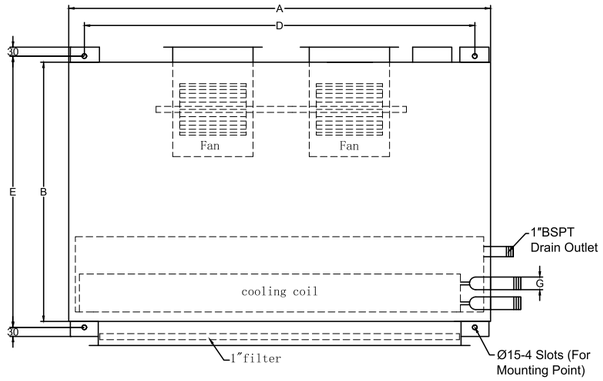


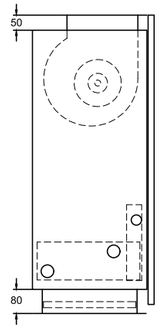
Single Panel Unit With External Rotation Fan

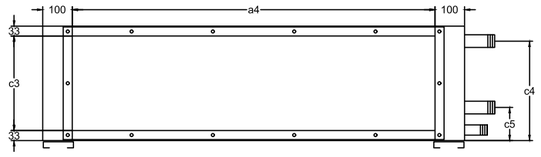
Type B - 030,040,050,060



Model	A	B	C	D	E	F
030	1330	860	380	1230	900	400
040	1600	860	380	1500	900	400
050	1600	970	490	1500	1010	510
060	1910	970	490	1800	1010	510



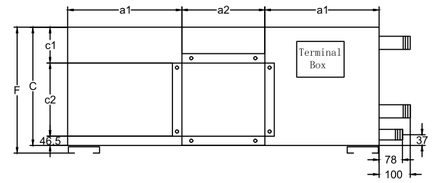




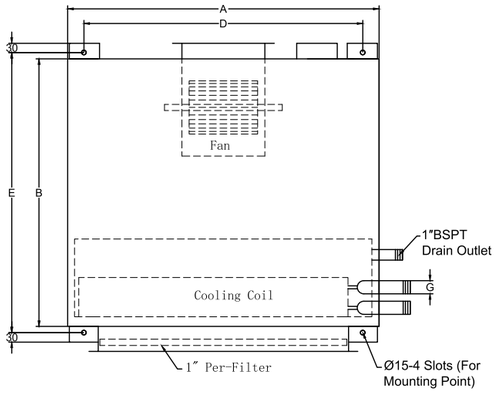
Model	LP&HP Fan	a1	a2	a3	a4	c1	c2	c3	c4	c5	c6
030	LP Fan	309	267	178	1130	112	235	314	330	110	33
	HP Fan	268	308	178	1130	110	237	314	330	110	33
040	LP Fan	403	308	178	1400	110	237	314	330	110	33
	HP Fan	372	339	178	1400	110	237	314	330	110	33
050	LP Fan	388	308	208	1400	216	229	424	434	115	45
	HP Fan	390	306	208	1400	176	269	424	434	115	45
060	LP Fan	543	308	208	1710	216	229	424	434	115	45
	HP Fan	545	306	208	1710	176	269	424	434	115	45

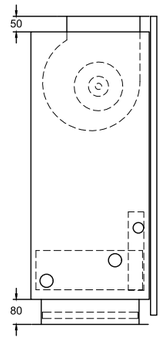
Single Panel Unit With External Rotation Fan

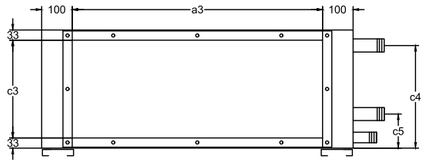
Type B - 031,041



Model	A	B	C	D	E	F
031	1007	860	490	905	900	510
041	1264	860	490	1161	900	510



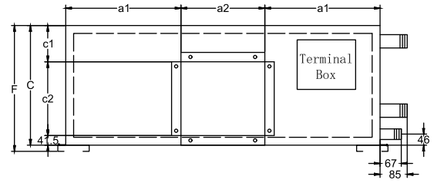




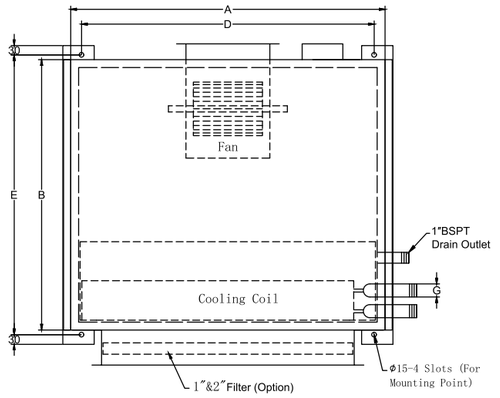
Model	LP&HP Fan	a1	a2	a3	c1	c2	c3	c4	c5
031	LP Fan	349.5	308	809	216	229	421	443	106
	HP Fan	350.5	306	809	176	269	421	443	106
041	LP Fan	453	358	1064	176	269	421	443	106
	HP Fan	493	358	1064	176	269	421	443	106

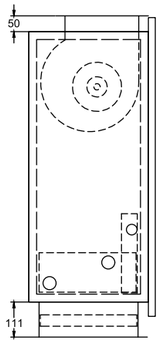
Double Panel Unit With External Rotation Fan

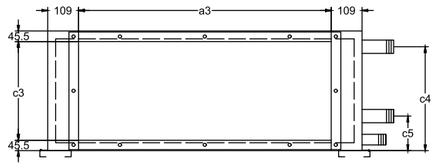
Type B - 020



Model	A	B	C	D	E	F	G	
							4Row	6Row
020	990	870	405	920	900	425	1-1/4"	1-1/4"



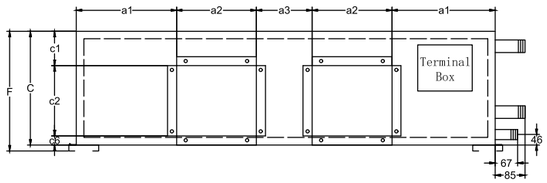




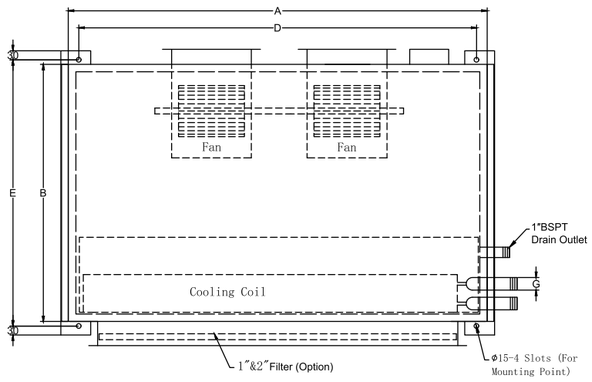
Model	LP&HP Fan	a1	a2	a3	c1	c2	c3	c4	c5
020	LP Fan	341	308	772	126.5	237	314	340	120
020	HP Fan	325.5	339	772	126.5	237	314	340	120

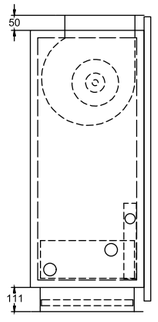
Double Panel Unit With External Rotation Fan

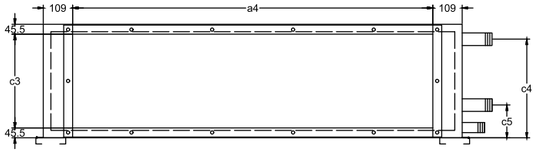
Type B - 030,040,050,060



Model	A	B	C	D	E	F
030	1350	870	405	1280	900	425
040	1620	870	405	1580	900	425
050	1620	1000	515	1580	1030	535
060	1930	1000	515	1860	1030	535



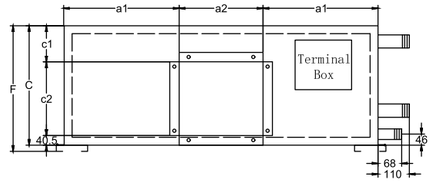




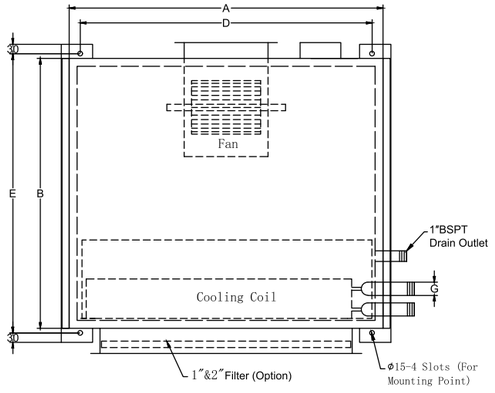
Model	LP&HP Fan	a1	a2	a3	a4	c1	c2	c3	c4	c5	c6
030	LP Fan	319	267	178	1132	128.5	235	314	340	120	41.5
	HP Fan	278	308	178	1132	126.5	237	314	340	120	41.5
040	LP Fan	413	308	178	1402	126.5	237	314	340	120	41.5
	HP Fan	382	339	178	1402	126.5	237	314	340	120	41.5
050	LP Fan	398	308	208	1402	232.5	229	424	444	125	53.5
	HP Fan	400	306	208	1402	192.5	269	424	444	125	53.5
060	LP Fan	553	308	208	1712	232.5	229	424	444	125	53.5
	HP Fan	553	306	208	1712	192.5	269	424	444	125	53.5

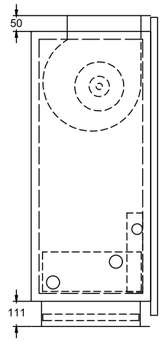
Double Panel Unit With External Rotation Fan

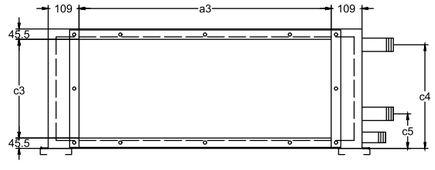
Type B - 031,041,



Model	A	B	C	D	E	F
031	1025	870	515	955	900	535
041	1282	870	515	1212	900	535



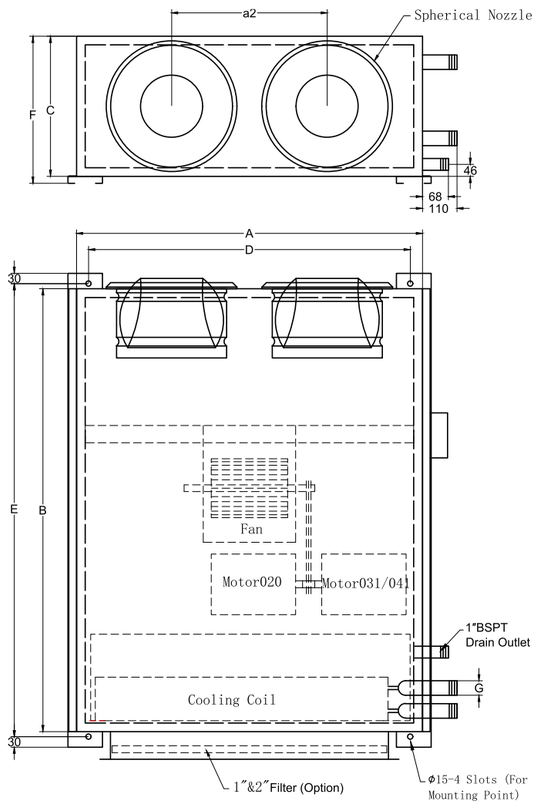


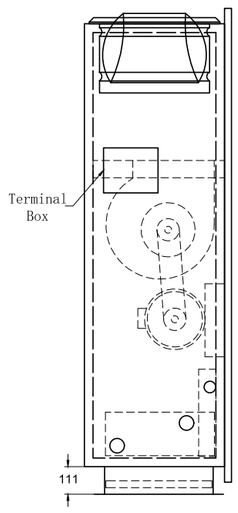


Model	LP&HP Fan	a1	a2	a3	c1	c2	c3	c4	c5
031	LP Fan	358.5	308	807	231	229	424	452	115
	HP Fan	359.5	306	807	191	269	424	452	115
041	LP Fan	462	358	1064	191	269	424	452	115
	HP Fan	462	358	1064	191	269	424	452	115

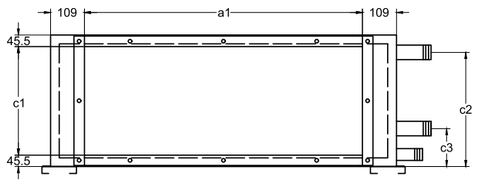
The double panel jet discharge unit

Type B - 020,031,041,





Model	A	B	C	D	E	F	Spherical Nozzle		
							Size	Inner Dia	Outer Dia
020	990	1290	405	920	1320	425	250	314	247
031	1025	1290	515	955	1320	535	315	390	312
041	1282	1290	515	1212	1320	535	400	495	397

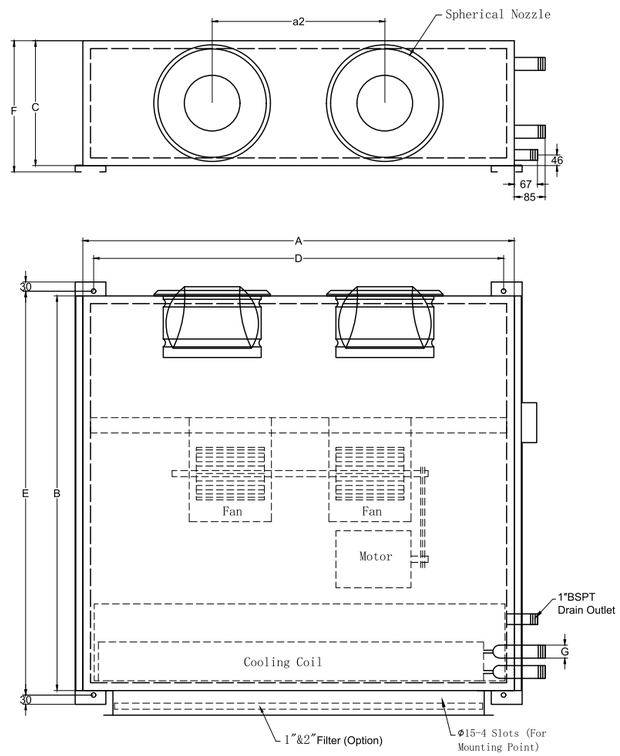


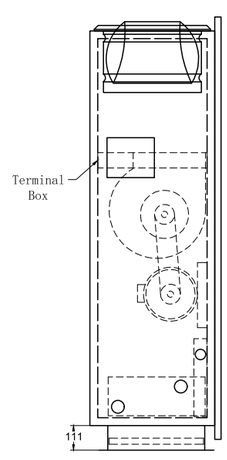
Model	a1	a2	c1	c2	c3
020	772	400	314	340	120
031	807	450	424	452	115
041	1064	550	424	452	115

Note:The width of flange hem is 30mm

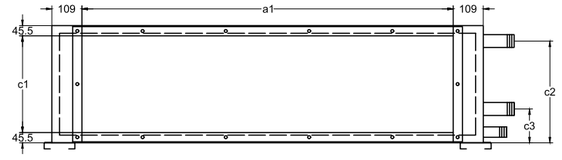
The double panel jet discharge unit

Type B - 030,050,





Model	A	B	C	D	E	F	Spherical Nozzle		
							Size	Inner Dia	Outer Dia
030	1350	1290	405	1280	1320	425	315	390	312
050	1620	1420	515	1580	1470	535	400	495	397

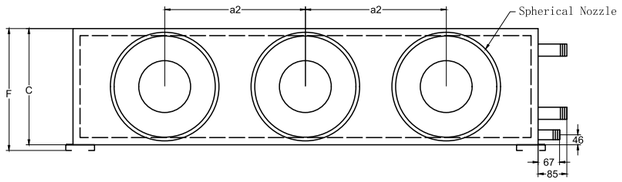


Model	a1	a2	c1	c2	c3
030	1132	500	314	340	120
050	1402	650	424	444	125

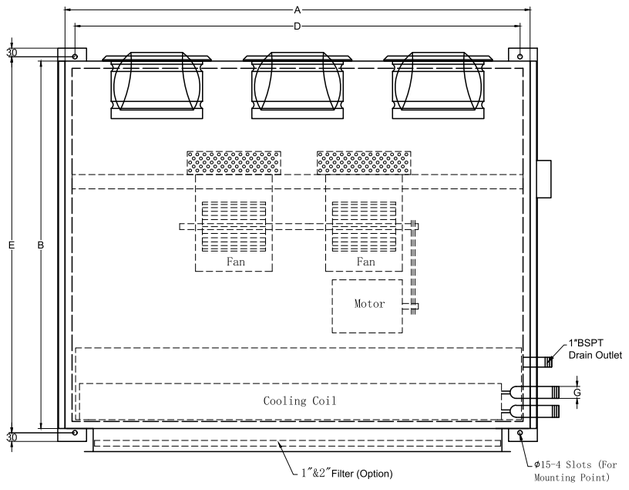
Note:The width of flange hem is 30mm

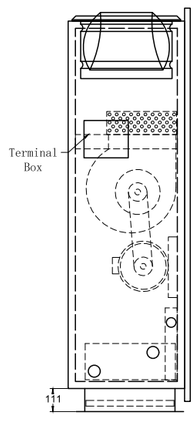
The double panel jet discharge unit

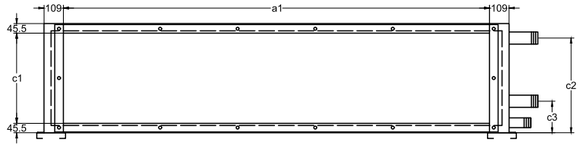
Type B - 040,060,



Model	A	B	C	D	E	F	Spherical Nozzle		
							Size	Inner Dia	Outer Dia
040	1620	1290	405	1580	1320	425	315	390	312
060	1930	1470	515	1860	1500	535	400	495	397





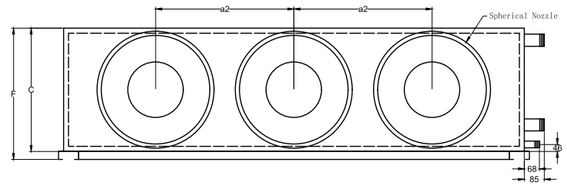


Model	a1	a2	c1	c2	c3
040	1402	450	314	340	120
060	1712	540	424	444	125

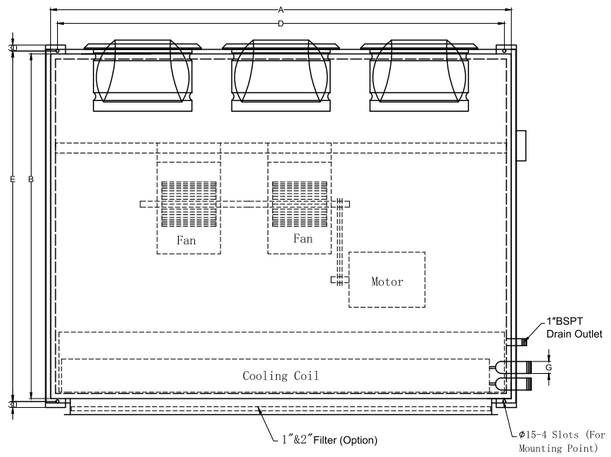
Note:The width of flange hem is 30mm

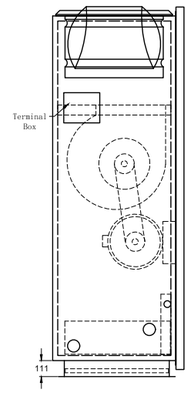
The double panel jet discharge unit

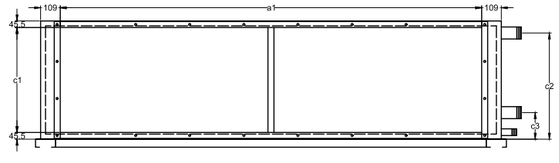
Type B - 080,100,120,150,



Model	A	B	C	D	E	F	Spherical Nozzle		
							Size	Inner Dia	Outer Dia
080	1930	1730	615	1860	1760	655	400	395	397
100	2220	1730	615	2150	1760	655	450	559	447
120	2220	1730	710	2150	1760	750	500	622	497
150	2620	1730	710	2550	1760	750	500	622	497





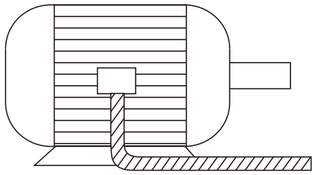


Model	a1	a2	c1	c2	c3
080	1712	540	524	538	140
100	2002	600	524	538	140
120	2002	650	619	633	140
150	2402	650	619	633	140

Note:The width of flange hem is 30mm

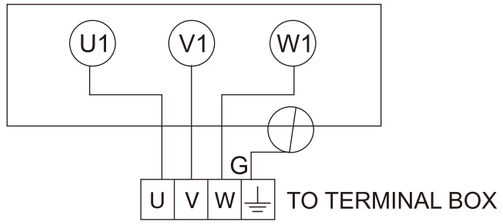
Electrical wiring diagram

Below are the wiring diagrams for LWHA with belt drive fan

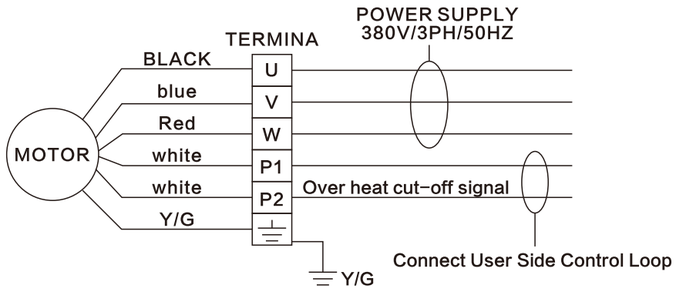


Note : Motors up 7.5kW are suitable for Direct-On-Line starting.

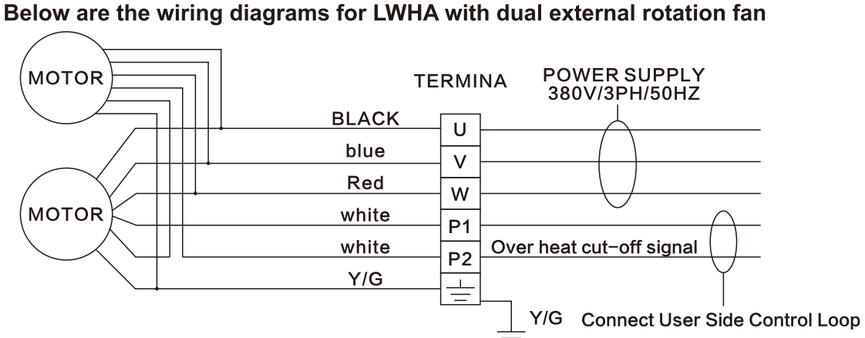
Fan Motor Wiring Termination (Three Terminal)



Below are the wiring diagrams for LWHA with single external rotation fan



Below are the wiring diagrams for LWHA with dual external rotation fan



Operation / Start-Up

Pre-Start-Up Inspection

Perform the following checks and inspections before operating the unit.

Inspection Checklist

- ☐ a) Unit is mounted securely to the ceiling support rods (mounting units).
- ☐ b) Ductwork connections are complete, valve and piping have thoroughly insulated.
- ☐ c) Coil connections are complete and tight.
- ☐ d) Condensate drainpan connections are complete and tight.
- ☐ e) Electricalconnections completed. Wiring is correct and in accordance with the wiring diagram.Ground connection completed.
- ☐ f) Check and retighten, if necessary all the motor, fan pulley, fan bearings and wheel.
- ☐ g) Rotate fan by hand, to ensure that is runs freely and that there is no interference.
- ☐ h) Check and retighten,if necessary, drive and bearing bolts, motor clamp plate bolts and isolator bolt.
- ☐ i) Check to ensure that pulley is correctly aligned and that shaft is parallel.
- ☐ j) Check belt tension as per instruction given in The maintenance section.

The word ‘motor’ and ‘pulley’ are mentioned in the article, generally used for belt drive fan.

Start-Up procedures

After completing all items under "Pre-Start-Up", the unit may be started and the following checks and adjustments performed:

- ☐ a) Bump start the motor to chec the direction of rotation. If the rotation need to be changed, stop the motor completely and change the direction of rotation by changing the line connection.
- ☐ b) After connecting the load, the motor should start quickly and run smoothly. If it does not,the power supply should be switched off at once and all connections, as well as the power supply,should be re-checked before re-starting.
- ☐ c) In the event of excessive vibration or unusual noises, the motor should be disconnected from the load and checked for poor alignment, loose mounting bolts,etc.
- ☐ d) When the motor has been operated under load for a short period of time,check that the operating current with the nameplate current.
- ☐ e) Measure the motor voltage and amps on all phases to insure proper operation.Compare these reading with the motor nameplate.

Note:

The converter carrier wave may cause inverter apply motors acoustic noise. Please adjust the switching frequency (Refer to inverter manual) until the motor is as noiseless as possible.

Maintenance

⚠ WARNING

WHEN INSTALLING OR SERVICING THIS EQUIPMENT, ALWAYS EXERCISE BASIC SAFETY PRECAUTIONS TO AVOID THE POSSIBILITY OF ELECTRIC SHOCK THAT COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH.

Monthly Inspection

1. Check condition of air filters and replace them if necessary.
2. Check the drain pan to be sure that it is clean and free to carry the flow of condensate through the drain line.
3. Check the coil surface for cleanliness. Clean if necessary.

Yearly Inspection

1. Replace filters.
2. Check coil surface, clean by vacuuming or flushing with cold water. Do not use steam or hot water.
3. Carry out check (g) through (j) as detailed in inspection checklist in the Operation Section.
4. Inspect the condition of the fan belt and replace if necessary. The belts fitted to units cannot achive design performance without the correct tensioning.
5. Check condition of external vibration isolators, replace if there is any sign of wear , loosening or material deterioration.
6. Check fan bearings for noisy operation and excessive lubricant leakage. Replace if necessary.
7. Inspect the condensate drain pan and condensate piping to make sure they are clear and will carry away all water.
8. Inspect the control panel wiring to make sure connections are tight and insulation is intact.
9. Check system for water leaks.

Change / Clean Filters

Change or clean air filters at least twice a year. Filters will require more frequent care under high load conditions or dirty air. A clogged air filters reduces airflow, cooling capacity and increases energy usage.

To clean washable filters, remove the filter media and wash it in water to remove dust, dirt and lint; allow to dry thoroughly before re-installing in the units. Do not rub or wring.

Washable filters can also be cleaned by blowing with compressed air in opposite direction of filter airflow.

Fan Belt Tension

Note: Fan belt tension should be checked at least twice during the first day of operation, since there is a rapid decrease in tension until belts are run in. Proper belt tensioning is required to ensure maximum bearing and drive component life and is based on fan brake horsepower requirement.

Belt Tension Measurement

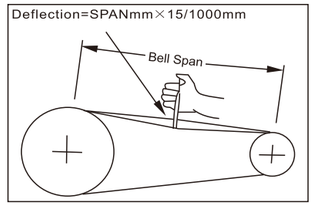
Check the belt tension as follows: Measure the span length mm of the drive. With a belt tensioner at the center of the span. apply a force K (perpendicular to the span) large enough to deflect the belt 15mm per 1 meter of span. Refer to figure 5.

DEFLECTION = SPAN mm X 15/1000mm

The deflection force for the belt should be within the minimum and maximum force shown in the Table 1. When the tension drops to the minimum value, readjust to the maximum value.

To measure belt tension, use a belt tensioner as shown in Figure 6. Determine actual deflection by depressing one belt with the belt tensioner and measuring the deflection relative to the other belts or to belt line. Adjust the belt tension to the correct force (Newton) and tighten all setscrews to the proper torques.

Figure 5
Belt Tension Measurement



Fan /Motor Bearing

⚠ IMPORTANT

THE MOTOR & FAN FURNISHED WITH SHIELDED BEARINGS.THE BEARINGS ARE PRE-LUBRICATED FOR LIFE AND MAINTERANCE FREE. REPLACE THE BEARING IF DAMAGED/NOISY.

Maintenance

Figure 6
Belt Tension Measurement

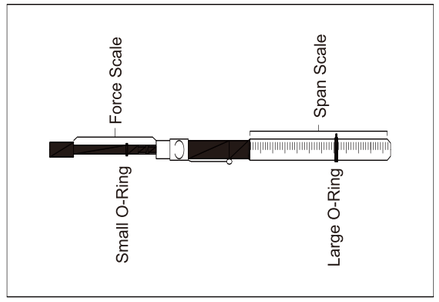
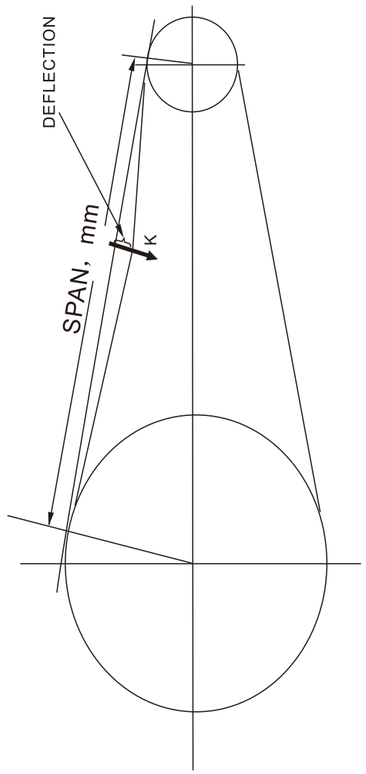


Table 3. Deflection Force,K

Cross Section	Force	DEFLECTION FORCE,K											
		SPZ		SPA		SPB		SPC					
		min.	Max.	min.	Max.	min.	Max.	min.	Max.				
63-80,mm	kgF	1.2	1.9	1.5	2.3	-	-	-	-				
	N	12	19	14	23								
81-112,mm	kgF	1.6	2.4	1.9	3.0	2.5	3.7						
	N	16	24	19	29	24	36						
113-160,mm	kgF	1.9	2.9	2.7	4.1	3.4	5.1	4.5	6.9				
	N	19	28	26	40	33	50	45	68				
161-224,mm	kgF	1.9	3.0	3.1	4.7	4.4	6.5	5.9	8.9				
	N	19	29	30	46	43	64	58	87				
225-355,mm	kgF	-	-	3.3	4.9	5.2	7.9	8.1	12.1				
	N			32	48	51	77	79	119				
356-630,mm	kgF	-	-	-	-	5.6	8.4	10.5	15.7				
	N					55	82	103	154				

N=Newton
kgF=kilogram Force=9.80665 N



Maintenance

Fan Belt Maintenance

Clean fan belts and pulleys with a dry cloth. Oil and grease must be kept off belts. The use of a belt dressing is not recommended. When replacing belts, use a matched set. Do not force belts onto pulleys, but adjust motor position to allow mounting and then re-tighten.

⚠ CAUTION

DO NOT OVER-TENSION THE BELTS. EXCESSIVE TENSION WILL REDUCE FAN AND MOTOR BEARING LIFE , ACCELERATE BELT WEAR AND POSSIBLY CAUSE SHAFT FAILURE. CLEAN THE SHEAVES AND BELT WITH A DRY CLOTH. OIL AND GREASE SHOULD BE KEPT AWAY FROM THE BELT BECAUSE THEY CAN CAUSE DETERIORATION AND SLIPPAGE. THE USE OF BELT DRESSING IS NOT RECOMMENDED

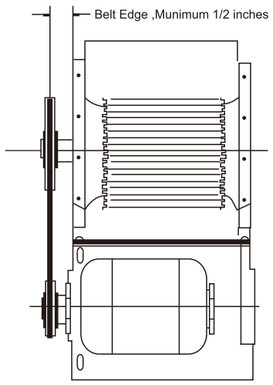
Sheave (Pulley) Alignment

To prevent interference of the fan frame with the belt, make sure that the belt edge closest to the motor has the proper clearance from the fan frame, as shown in Figure 7.
Align the fan and motor sheaves by using a straightedge as shown in Figure 8. The straightedge must be long enough to span the distance between the outside edges of the sheaves.
When the sheaves are aligned, the straightedge will touch both sheaves at points A throught D.

Maintenance Contract Training

It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will possibility that serious damage will ensures the maximum operating life of your equipment.
We would remind you that failure to respect these nstallationand maintenance instructions might result in immediate cancellation of the warranty.

Figure 7 Clearance

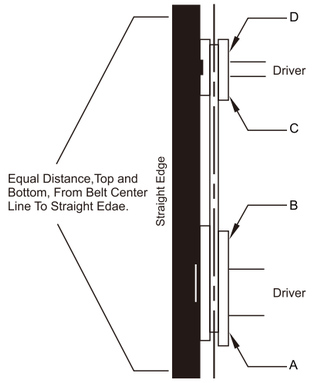


The equipment described in this manual is the result of many years of research and continuous development.

To assist you in obtaining the best use of it, and maintaining it in perfect operating condition over a long period of time, the constructor have at your sisposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and maintenance technicians a better knowledge of the equipment they are using, or that is under their charge.

Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventative maintenance, which reduces the cost of owning the unit by Avoiding serious and costly Breakdown.

Figure 8 Pulley Alignment



Daily maintenance for external rotation fan

Regularly shut down the power, check whether there is any impurities, abnormal fan rotation. And also need to check the below items:
1. Check and tighten bearing nuts and bushing fixing screws and other fasteners;
2. The operating current of the motor shall be less than the rated current, the voltage shall be within 380V±5%;
3. There is no over vibration and abnormal noise.

Trouble Analysis

⚠ WARNING

Prevent coil freezing
When it is lower than freezing temperature,the water inside the coil has to be drained out.
Attention: If the water inside coil is not drained out when it is lower than the freezing temperature, the coil will be break. Drain valve and discharge valve is provided by installation contractor.
First, the compressed air is blown into the coil. Then fill in the tube with ethylene glycol so that the water inside coil can be rained out as much as possible.
When the it is shut down in a short term or the water valve can be shut off, the anti-icing fluid should be added into the water system. It also can turn on the water pump to keep the water flowing to reduce the possibility of freezing.
If the unit stop using for short and long term,the outside air damper should be closed to prevent the cold air from outside entering the unit so that the copper tube was broken.

⚠ IMPORTANT

DISCONNECT ELECTRICAL POWER SOURCE AND ALLOW ALL ROTATING EQUIPMENTTO STOP COMPLETELY BEFORE INSPECTING OR SERVICING THE UNIT. FAILURE TO DO SO MAY RESULT IN PERSONAL INJURY OR DEATH FROM ELECTRICAL SHOCK OR MOVING PARTS.

Use the tables in this section to assist in identifying the cause of causes of a malfunction in LWHA operation. The column header RECOMMENDED ACTION will suggest repair procedures.

Note: These Tables are intended as a diagnostic aid only. For detailed repair procedures, contact your local Trane Service Company.

⚠ WARNING

DISCONNECT ELECTRICAL POWER PRIOR TO ACCESS INTO A FAN DUCTWORK. EVEN WHEN LOCKED OUT ELECTRICALLY, FANS MAY CAUSE INJURY OR DAMAGE IF THE IMPELLER IS SUBJECT TO “WINDMILLING”. THE IMPELLER SHOULD BE SECURED TO PHYSICALLY RESTRICT ROTATIONAL MOVEMENT. FAILURE TO SECURE IMPELLER CAN CAUSE SEVERE PERSONAL INJURY OR DEATH.

LWHA Series Trouble Analysis

Symptom	Probable cause	Recommended Action
Bearing is excessively hot	Over tensioned belts. No lubricant / lubrication dry-out Misaligned bearing.	Adjust tension. Replace bearing. Correct alignment. Check shaft level.
Motor fail to start	Blown fuse or open circuit breaker. Overload trip. In proper wiring or connections. Improper power supply. Mechanical failure.	Replace fuse or reset circuit breaker. Check and reset overload. Check wiring with diagram supplied on unit. Compare actual supply power with motor nameplate recommendations. Contact power company for adjust-ments. Check that motor and driver rotate freely.
Motor stalls	Open phase. Overloaded motor. Low line voltage.	Check line for an open phase. Reduce load or replace with larger motor. Check across AC line. Correct voltage if possible.
Excessive vibration	Over tensioned belts Misaligned drive	Adjust belts tension. Align drive.
Motor runs and then dies down	Partial loss of line voltage. Stator shorts when motor warms up.	Check for loose connections. Determine adequacy of main power supply. Replace stator / motor.
Motor does not come up to speed.	Low voltage at motor terminals. Line wiring to motor too small.	Check across AC line and correct volt-age loss if possible. Replace with larger sized wiring.
Motor overheats	Overloaded motor. Motor fan is clogged with dirt preventing proper ventilation.	Reduce load or replace with a larger motor. Remove fan cover, clean fan and replace cover.
Excessive motor noise.	Motor mounting bolts loose. Worn motor bearings. Fan rubbing on fan cover.	Tighten motor mouting bolts. Replace bearing. Remove interference in motor fan housing.

LWHA Series Trouble Analysis

Symptom	Probable cause	Recommended Action
Rapid motor bearing wear	Excessive overhung load due to overtensioned drive. Excessive overhung load due to a small diameter motor sheave.	Check belt tension and overhung load. Replace sheave with larger one.
Loose fan belt	Motor is poorly positioned. Worn or damaged belt. Worn sheaves.	Adjust belt tension. Replace belt or belt set.Check sheave alignment. Replace sheaves.
Short belt Life	Worn sheaves. Misaligned belt. Grease or oil on belts. Belt slipping. Belts rubbing.	Replace sheaves. Realign drive Check for leaky bearings. Clean belts and sheaves. Adjust tension. Remove obstruction or realign drive for Clearance.
Bearing Noise	Poor alignment. Inadequate lubrication.	Loosen bearing set screws and re-align. Replace bearing.
Low coil capacity (Chilled Water)	Incorrect airflow. Incorrect gpm. Incorrect water temperature.	Check fan-operating conditions. Check water pumps, valves and lines for obstructions. Provide proper water temperature.
Under CFM or low air flow	Belt loose Duct leakages Duct obstruction or too small causing high static Dirty filter or coil	Adjust belt tension or clean belt if it is greasy. Check duct joining or turning. Increase fan rpm to overcome high static but fan and motor working limita-tions must be considered. Change filter and clean coil.
Over cfm or high air flow	Low static due to oversize duct or duct work too short	Replace pulley to reduce fan rpm to meet requirement.
Water leaking	Drain pipe choked Improper or no U-trap Water carry over due to high velocity	Clear drain pipe. Ensure U-trap installed properly. Replace pulley to reduce fan rpm.