

Operation and Installation Manual

Fan Coil Unit



Vertical Exposed Type Fan Coil

2 Pipe System

FCU34, 51, 68, 85, 102, 136, 170, 204, 238

***Please read this manual before using the fan coil.**

***Please keep this manual for future use**

1. Safety and User Information

1.1 Safety instructions

The fan coil units are developed and manufactured in accordance with the state-of-the-art technological standards and established technical safety norms and regulations. The fan coil units comply with the Machinery Safety Directive.

The fan coil units are reliable and satisfy high quality standards. This product range combines advanced technology with a high level of user friendliness and ease of maintenance.

However, all fan coil units inevitably pose residual risks of injury to the user or third parties or material damage to the unit or other objects. For this reason, you should take into account and follow all safety instructions. Ignoring these safety instructions is connected with risks to your health and safety, can lead to the environmental damage and/or extensive material damage.

Observing the safety instructions in the operation manual will help you to avoid risks, ensure economical operation of the unit and enjoy full benefits of the product.

The safety aspects covered by this Chapter are valid for the entire operation manual. To ensure our own safety consider the following safety instructions.



ELECTRICAL HAZARD!

Before carrying out any work on the unit, power the unit down to avoid injury from electrical current. Check that the unit is isolated and ensure that the appropriate point of the unit for the on-site power supply is secured against being switched back on.



DANGER OF SCALDING!

Before performing work on the valves or the inlet or outlet pipes, seal off the heating or cooling medium inlet to prevent scalding. Do not commence work before the heating medium has cooled down.



DANGER OF ROTATING UNIT PARTS!

Rotating fan wheels can cause injury! Before performing any work on the unit, ensure that it is powered down. Ensure that the appropriate point of the unit for the on-site power supply is secured against being switched back on.



DANGER OF OVERHEAD LOADS!

Wear a helmet and safety boots to prevent injury from falling components, especially when fitting the unit to the ceiling. Ceiling installations should always be performed by two people.



PERSONAL INJURY!

Always wear protective gloves when moving or fitting the unit to avoid injury from sharp edges.

1.2 Important notes

The fan coil units are end units of chilled/hot water air conditioning system featuring high profession and high technological requirement, therefore, the unit shall be installed, operated and maintained only by qualified, specially trained and authorized staff.

1.2.1 Proper use

The fan coil units are exclusively designed for ventilating, heating, filtering and cooling purposes. Water or water/glycol solution (max. 50%) may be used as the medium. The following limit values apply to the medium for operating Cu/Al heat exchangers:

		Unit	Value
pH value (at 20 °C)			7,5 – 9
Conductivity (at 20 °C)		µS/cm	< 700
Oxygen content	O ₂	mg/l	< 0,1
Total hardness		°dH	1 – 15
Dissolved sulphur	S		not detectable
Sodium	Na ⁺	mg/l	< 100
Iron	Fe ²⁺ , Fe ³⁺	mg/l	< 0,1
Manganese	Mn ²⁺	mg/l	< 0,05
Ammonium content	NH ₄ ⁺	mg/l	< 0,1
Chloride	Cl ⁻	mg/l	< 100
Sulphate	SO ₄ ²⁻	mg/l	< 50
Nitrite	NO ₂ ⁻	mg/l	< 50
Nitrate	NO ₃ ⁻	mg/l	< 50



DAMAGE TO THE UNIT!

On open systems (e.g. when using well water observe the limit values stated in above table), the used water should additionally be cleansed of suspended matter using a filter which should be located at the inlet. Otherwise there is a risk of erosion by suspended matter.

You also have to ensure that the unit is protected from dust and other substances that can cause acidic or alkaline reaction when combined with water (aluminum corrosion).

- The fan coil units may only be used indoors.

The unit is considered to be used in an improper manner if it is applied for other purposes or a purpose that is not covered by the scope of the given operation manual. The manufacturer or supplier is not liable for any resulting damage: the user alone bears the full risk.

The user is responsible for proper use. Proper use also stipulates the observance of the operation manual and the inspection and maintenance conditions defined by the manufactures.

1.2.2 Improper use

The fan coil may not be operated:

- In locations where there is a risk of explosion
- In wet areas or
- In locations with high dust levels or aggressive air.



PERSONAL INJURY & MATERIAL DAMAGE!

Improper use can cause personal injury and material damage.

2. Product Introduction

2.1 Features and benefits

Factory fixed three speed switch and optional for LCD thermostat.

High efficiency with seamless copper tube mechanically expanded to aluminum fins.

Practical Orientation

The fan coil units offer an extensive portfolio of solutions for all applications involving de-central air handling.

Effectiveness

The fan coil units guarantee cosy and comfortable room atmosphere.

Space savings

The fan coil units assure optimal use of available space by their design and installation possibilities.

Flexible

Depending on the model type, the customer enjoys a selection among possibilities of media connection to the heat exchangers- as well as the possibility of implementing heating and cooling with 2 or 4 conductor operations.

Quietness

Sophisticated systems mean that the fan coil units are characterized by a minimum of noise emission.

Stylishness

The modern appealing design of the fan coil units is truly impressive.

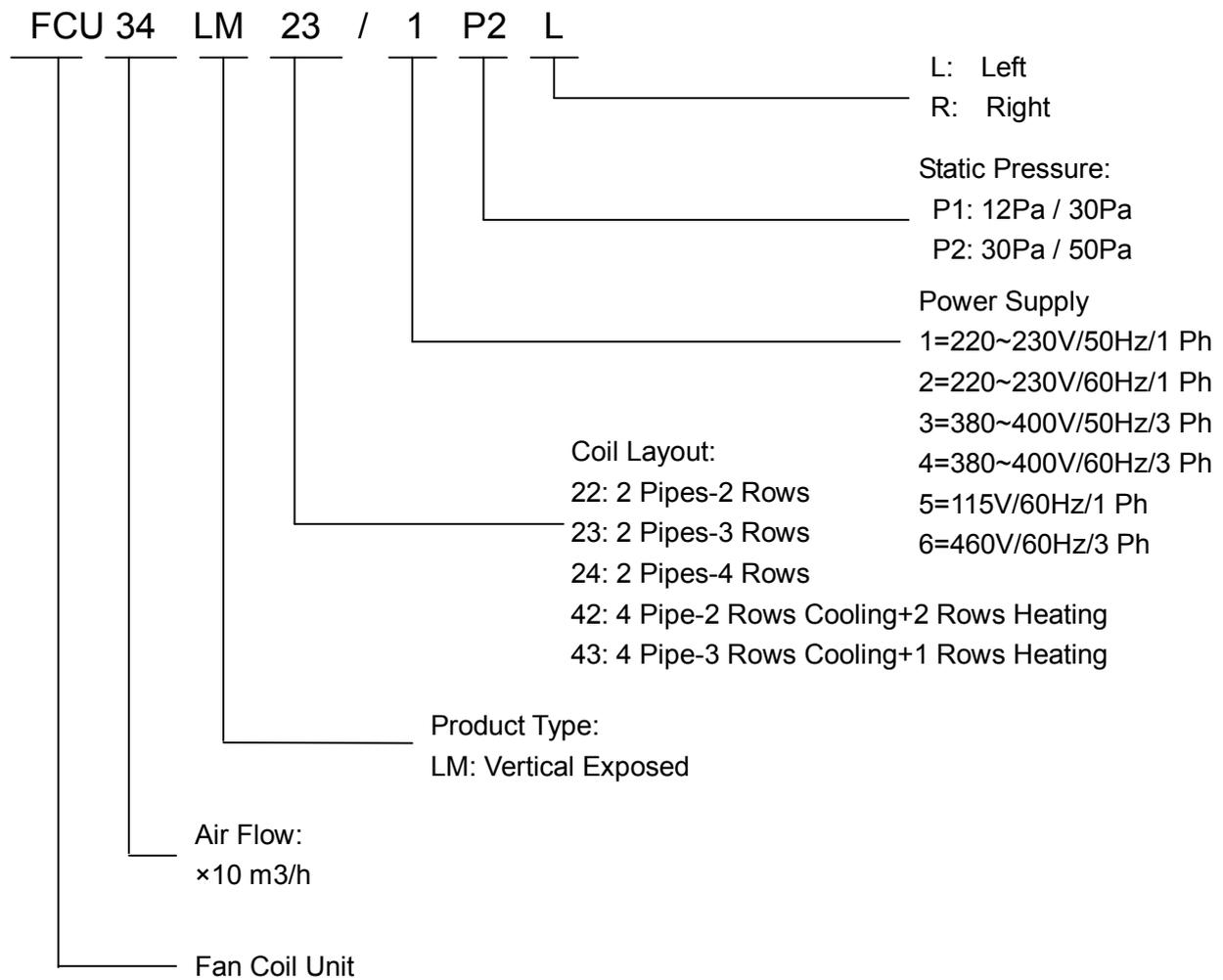
Cost effectiveness

The fan coil units have become the effective standard solution in many and various industrial segments for comfortable economical air conditioning.

Profitability

The fan coil units operate with low maintenance and follow-up costs.

2.2 Nomenclature



The Fan Coil can be divided by coil layout as:

- 2 pipe system 2 rows
- 2 pipe system 3 rows
- 4 pipe system 3 cooling + 1 heating rows
- 4 pipe system 2 cooling + 2 heating rows

2.2 Operating limits

Unit and heat exchanger	Values
Max. operating pressure/temperature	1,6 MPa (16 bar) / 85 °C
Max. permissible ambient temperature	40 °C
Min. permissible ambient temperature	2 °C
Operating voltage	220~230V AC (50Hz or 60Hz) *
Power consumption/protection class	See nameplate

***NOTE!**

- Please refer to unit name plate to know the right power supply!

2.3 Specifications

Please refer to below specification sheet in page 6

SPECIFICATION 2P3R(Specification Vertical Exposed FCU - 12/30/50Pa - 2 Pipe system 3 Rows (LM))

Specification	Model	FCU-34	FCU-51	FCU-68	FCU-85	FCU-102	FCU-136	FCU-170	FCU-204	FCU-238	
Air Flow	H	CFM	200	300	400	500	600	800	1000	1200	1400
		m ³ /h	340	510	680	850	1020	1360	1700	2040	2380
	M	CFM	150	225	300	375	450	660	825	990	1134
		m ³ /h	255	382	510	637	765	1122	1402	1683	1927
	L	CFM	100	150	200	250	300	500	625	750	875
		m ³ /h	170	255	340	425	510	850	1062	1275	1487
Total Cooling Capacity kW	H	2.17	3.12	4.09	4.75	6.07	8.21	9.38	11.65	12.49	
	M	1.95	2.82	3.74	4.35	5.45	7.47	8.54	10.50	11.48	
	L	1.58	2.32	3.01	3.50	4.38	6.04	6.89	8.48	9.27	
Sensible Cooling Capacity kW	H	1.86	2.64	3.47	4.43	5.41	7.21	8.28	10.17	10.79	
	M	1.56	2.23	2.94	3.83	4.56	6.15	7.04	8.45	9.11	
	L	1.09	1.51	2.02	2.38	2.89	4.05	4.69	5.77	6.21	
Heating Capacity kW	H	3.50	5.01	6.74	7.62	9.76	13.18	14.81	18.03	19.70	
	M	3.04	4.36	5.65	6.82	8.25	11.30	12.88	15.74	17.05	
	L	2.52	3.71	4.99	5.64	7.03	9.49	10.66	13.16	13.99	
Power Input W	12Pa-H	28	34	55	68	87	125	152	185	205	
	30Pa-H	42	55	68	87	108	142	174	210	253	
	50Pa-H	49	66	84	100	118	174	210	250	300	
Max Current	A	0.25	0.30	0.32	0.42	0.55	0.85	1.40	1.20	2.00	
Static Pressure	Pa	12/30/50 Pa									
Noise Level dB(A)	12Pa-H	34	35	38	42	43	44	46	48	49	
	30Pa-H	37	38	41	44	45	46	48	48	49	
	50Pa-H	42	44	46	47	49	50	52	54	56	
Water Flow	kg/h	373	536	703	851	1044	1412	1613	2004	2148	
	l/s	0.104	0.149	0.195	0.236	0.290	0.392	0.448	0.557	0.597	
Water Resistance	kPa	20	20	20	30	40	40	40	40	50	
Fan Type		Forward curve centrifugal fan									

Fan Coil Unit-Vertical Exposed Type

Motor	Type	Four speed asynchronous fan motor								
	Insulation	Class E								
	Power Supply	220~230V/1Ph/50 or 60Hz								
Coil	Type	Seamless copper mechanically expanded into aluminum fins								
	Rows	3								
	Max. Working Pressure	1.6 MPa								
Inlet/Outlet Water Pipe		3/4" FPT								
Condensate Water Pipe		3/4" MPT								
Unit Dimension	W*D*H (mm)	790*240*640	940*240*640	1100*240*640	1140*240*640	1290*240*640	1490*240*640	1610*240*640	1960*240*640	1960*240*640
Packing Dimension	W*D*H (mm)	810*260*650	960*260*650	1120*260*650	1160*260*650	1310*260*650	1510*260*650	1630*260*650	1980*260*650	1980*260*650
Unit Weight	kg	24.2	28.8	27.0	28.0	31.6	36.5	47.4	54.2	55.0
Gross Weight	kg	25.2	30.0	28.4	29.4	33.3	38.4	49.4	56.7	57.5

Note:

1. Nominal Testing condition:

Cooling: entering air temp 27°C DB/19.5°C WB; entering water temp 7°C, leaving water temp 12°C;

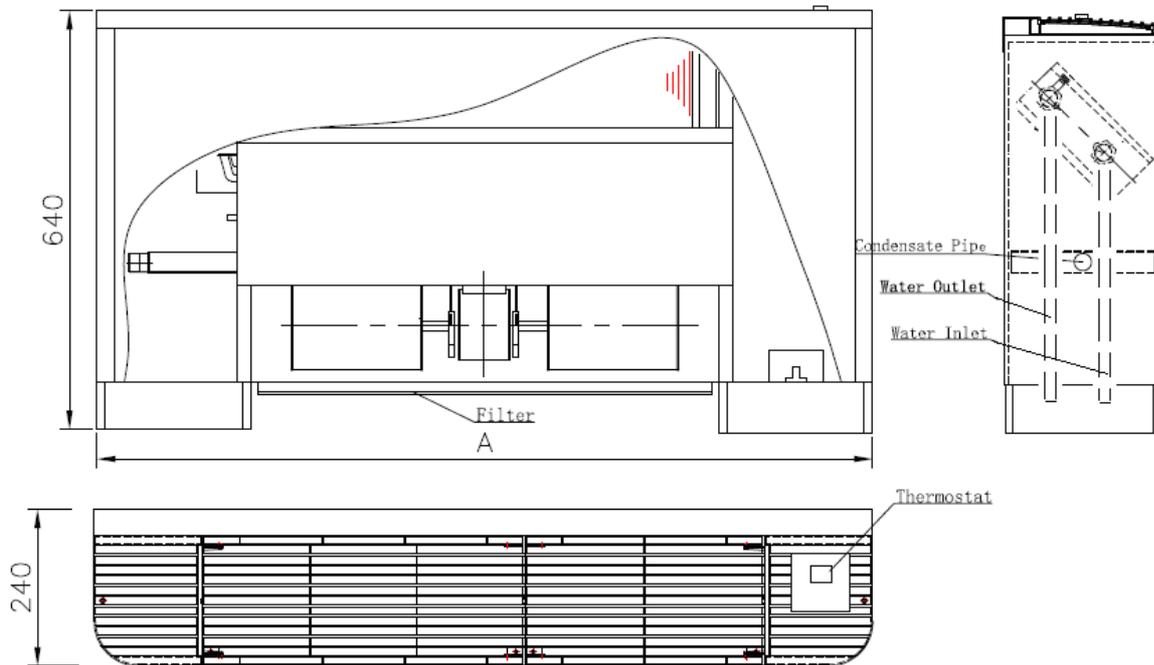
Heating: entering air temp 21°C; entering water temp 60°C, the same water flow as in cooling;

2. Sound pressure level are measured in acoustic room, position of the measure point is 1m in the front and 1m below the vertical center line of the unit;

3. Static pressure is measured without filter and air outlet.

3. Dimensions, Weight and Wiring diagram

3.1 Dimensions and weight



Size \ Model	FCU-34	FCU-51	FCU-68	FCU-85	FCU-102	FCU-136	FCU-170	FCU-204	FCU-238
A	790	940	1100	1140	1290	1490	1610	1960	1960

Frequently used installation data (2 pipe or 4 pipe system)

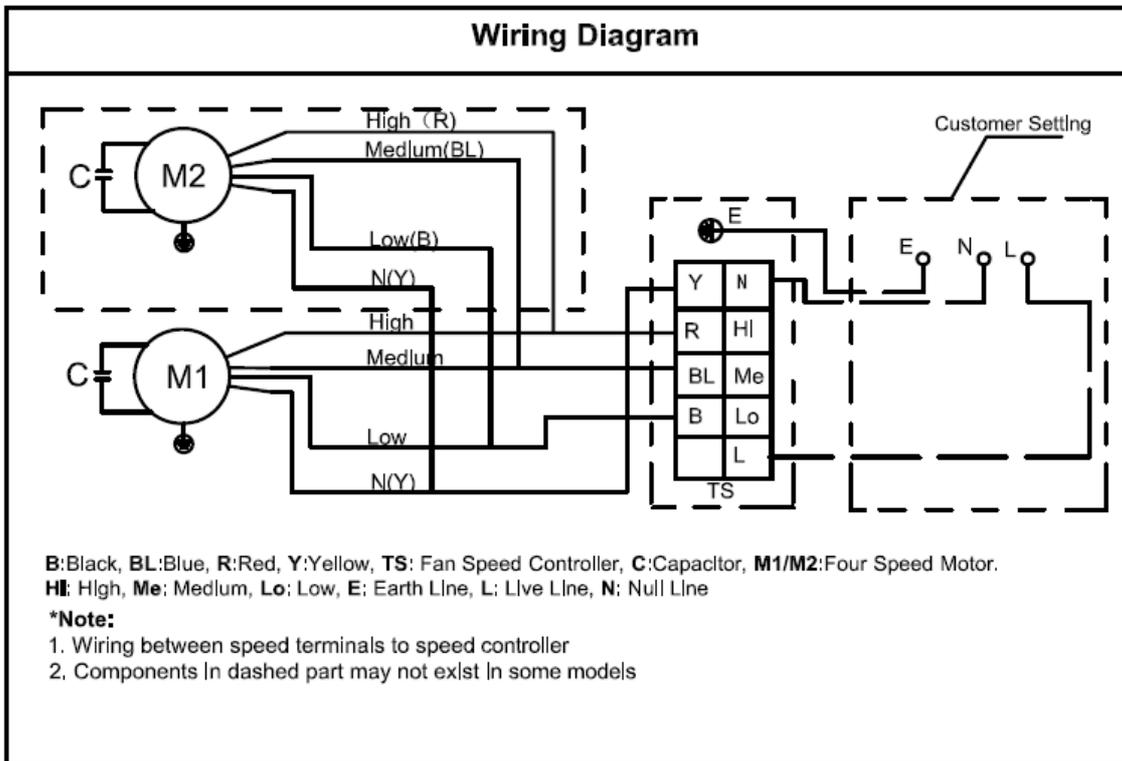
- Unit external dimension (W*D*H): a*245*639mm
- Air inlet flange dimension: a*175mm
- Air outlet flange dimension: a*110mm
- Hanging holes position dimension: b*226mm or b*348mm
- For Unit Weight, Water inlet/outlet dimension, condensate pipe dimension please refer to product specification sheet. In case of 4 pipe system there are 2 sets of water inlet/outlet instead of 1 set of a 2 pipe system.

3.2 Wiring diagram



WARNING:

Wrong wiring connection may cause permanent damage to fan motor! Please wire according to the wiring diagram!



NOTE!

- Before carrying out any wiring connection, always refer to the wiring diagram sticked on the back cover of the electric sheet box for the right information.

4. Installation

4.1 Checking and acceptance

Each fan coil is packaged in corrugated cartons to avoid damages during transportation, handling and site placement. To make sure no damages occurred due to transportation, please follow below steps to check upon receiving the equipment:

- a) Before acceptance, please check if each unit shows any abnormal facts, if carton edges and corners are in good conditions and if there are obvious carton damages;
- b) For any obvious carton damages, please immediately unpack to inspect the unit itself. If the unit is indeed damaged, please indicate on the receipt and refuse to accept. Please also check accessories;
- c) Check hidden damages of the unit;
- d) If any hidden damage is found, do not move the unit on the site. The receiver has the obligation to evidence such damage does not occur after delivery. Meanwhile, please stop unloading and take photos for reference;
- e) If damages are found, please notify the carrier, and request the carrier and the receiver to conduct a joint inspection;
- f) Do not repair it yourself before inspection and confirmation by the carrier representative has been made;
- g) After confirmation of damages, please contact related persons for replacement.

4.2 Transport

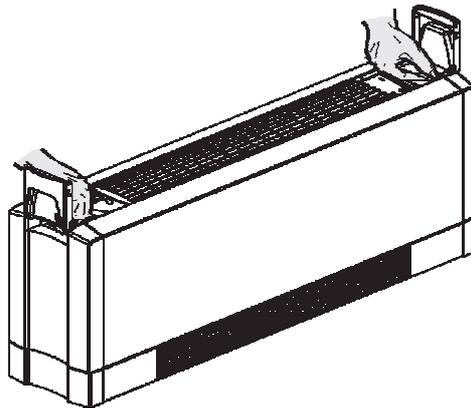


DAMAGE TO UNIT AND PERSONAL INJURY!

- Use protective gloves to avoid injury due to sharp edges.
- Ensure that at least two people carry the fan coil to avoid injury.
- In case of deliveries on pallets, use only lifting and transport vehicles with sufficient carrying capacity.
- Secure the load during transit to prevent it from tipping or falling.

4.2.1 Transport unit with casing

The sliding cover of both side of unit mounted with decorative casing should be open in order to lift the unit. The lift position is the same as concealed type. And it should be lifted from both sides at the top of the basic unit body.



4.3 Prepare for Installation

Ensure that the intended drilling area is free from electrical cables or pipes before drilling.



PERSONAL INJURY!

- Injury may be caused by falling parts and sharp edges!
- Wear a helmet, safety boots and protective gloves when installing the unit. Ceiling installations should always be performed by two people.

NOTE!

- **You must ensure that no mechanical deformations or twisting occurs during installation of all models in all installation locations.**

4.3.1 Installation location

The type, condition and ambient temperature of the installation location must be suitable for the relevant fan coil unit (See Section 1.2.1 and Section 1.2.2). Consider the following points:

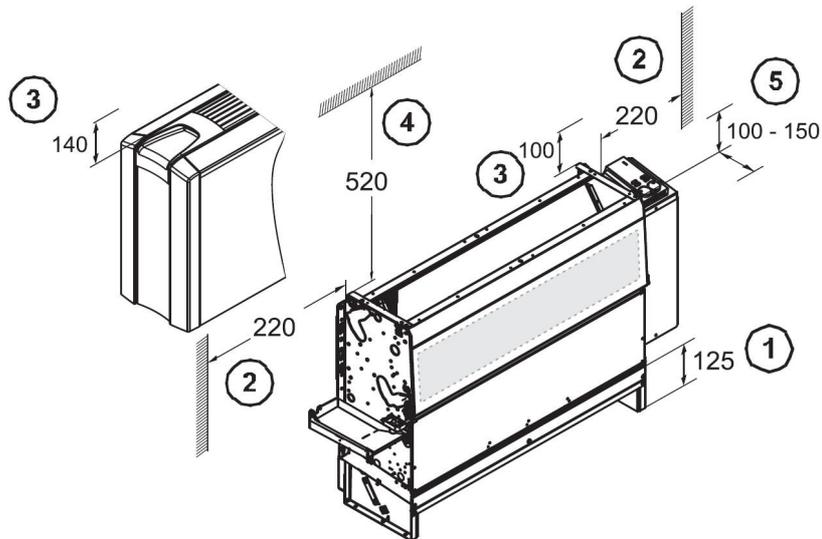
- Walls/ceilings or mounting systems must be capable of bearing the weight of the unit, including all accessories.
- Install the unit only in enclosed spaces indoors.

NOTE!

- **Make all wall and ceiling openings in conjunction with an architect or stress analyst and the building contractor.**

4.3.2 Fitting space

Depending on the model and installation, the pipes may be connected from left or right. The following fitting distances of Main Unit Body should be observed for all the type fan coil unit of Standard Series.



NOTE!

- Make sure there are adequate spaces reserved for installation of pipes, valves, wiring connections etc. Above indicated fitting space is for reference only and bigger fitting space should be reserved if not sure about the installation convenience or accessibility of the connections.

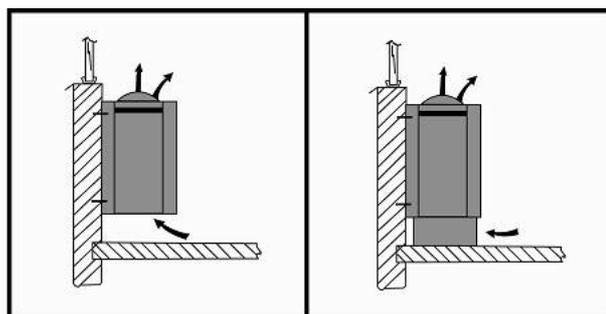
4.4 Unit installation

4.4.1 Precautions

To ensure good installation and operation, do check the following items before installation of the unit:

- Adequate space shall be provided for installation and maintenance of the unit.
- Make sure hanging structure adequate to support the unit weight;
- All units shall be leveled to ensure smooth water drain and proper operation;
- The unit connecting air duct shall be within the external static pressure scope;
- Thermal insulation of chilled water valves and pipelines shall be made by the installer.

4.4.2 Hanging or fixing



NOTE!

- In order to ensure complete removal of condensate from the condensate tray according to the hygiene regulations, cooling units are recommended to be installed with a 5 mm slope in the direction of the condensate drain and 0-2 mm in the direction of the unit front side.
- With stand alone installation on the floor auxiliary balancing devices like washers can

be used.

You can install the unit upright or wall-mounted.

- Hanging units without foot construction must be secured in at least four places (top and bottom on each side).
- Upright units with a foot construction need to be secured in two places only (top on each side).

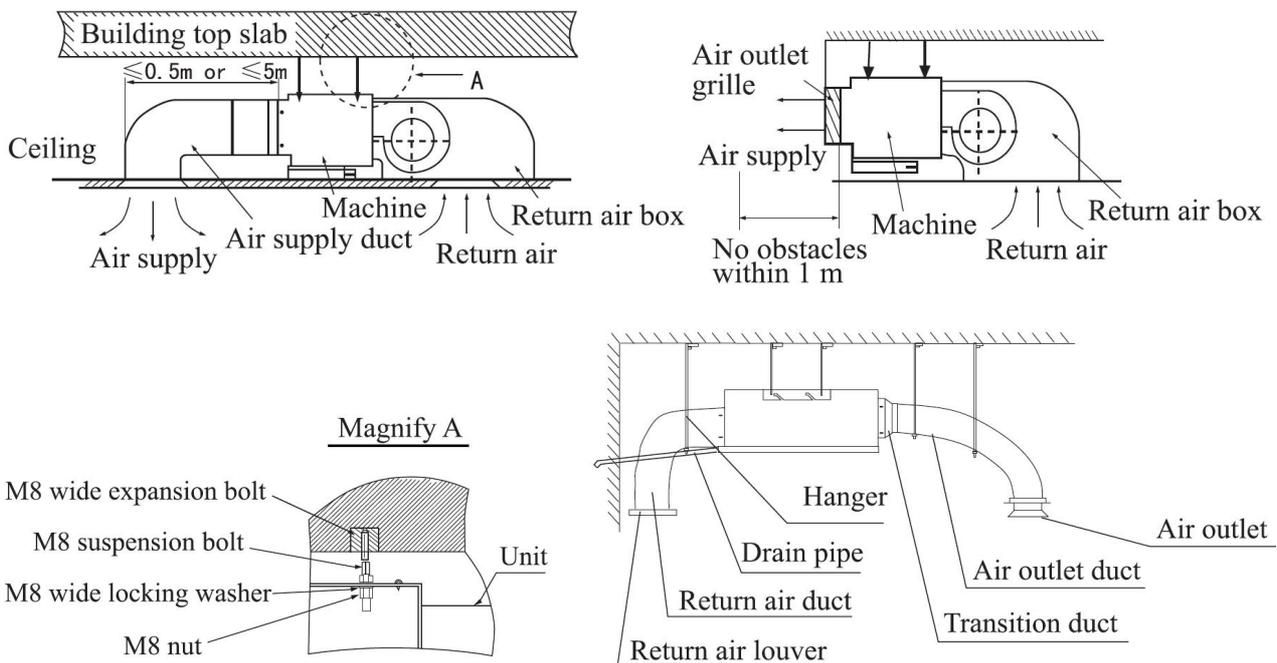
Two mounting slots are provided on each of the unit feet.

- Transfer the four drilling measurements to the ground
- Suitable screws for the intended mounting type are required.
- Use a spirit level for precise vertical and horizontal alignment of the fan coil and tighten the screws. (Pay attention to the tilt of cooling units!)

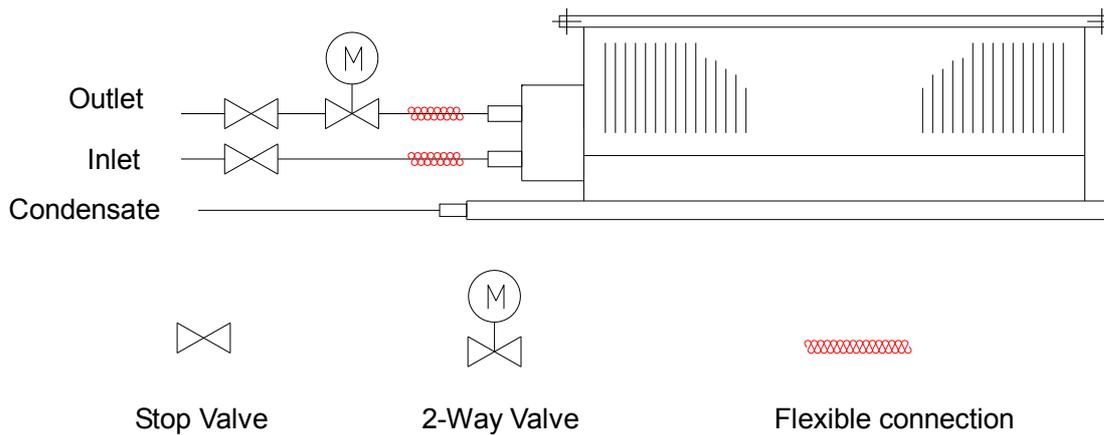
4.4.3 Duct connection (ceiling concealed installation)

Air ducts made of galvanized steel sheet of certain thickness (provided by the installer) may be connected to the flanges at air inlet/outlet of the unit. Refer to Unit Dimensions in section 3.1. Insert air ducts into flanges and fix with screws. If air duct and flange have different sizes, they should be connected through a site-made adapter. Connection of air supply cabinet and air duct: insert air duct into flange and fix them horizontally with screws or rivets. Same for connection of return air box.

For the ceiling concealed unit without return plenum (CC type) a return air box is recommended as shown below. The air return box/duct or air outlet duct showed below which should be respected for all ceiling concealed type fan coil unit.



The distance from air duct outlet to fan coil outlet shall depend on actual air duct length and static pressure terminal applied.



NOTE!

- **Water inlet in lower position while water outlet in higher position, refer to connection fittings indication sticked on side of unit.**
- **Flexible connection must be used and connected to water inlet/outlet fittings.**
- **Stop valves must be installed in water inlet/outlet pipeline.**
- **Air discharge valve must be installed in the highest position of the water system.**
- **Water discharge valve must be installed in the lowest position of the water system.**

NOTE!

During fitting, the connection nut on the heat exchanger should be countered using a suitable tool.

- **At the beginning of the fitting procedure, remove the caps of the water inlet and outlet pipes.**
- **Fit the connections, ensuring they are free of mechanical stress.**

In a 2- or 4-pipe system, pipes and all valves must be fitted directly above the lateral condensate tray to drain the condensate that forms on the pipes during cooling operation into the condensate tray.

- Note the specifications in section 2.4 to know the dimension of fittings.
- Run the pipes at a right angle to the side or to the rear.
- Seal the connections.
- Screw on the connections.

4.5.3 Condensate water pipe connection

In order for the condensate to be drained off properly, the condensate drain by others must be connected to the lateral condensate tray.

- Run the condensate drain at an angle/slope.
- When connecting the condensate drain to the wastewater system, observe the wastewater regulations (stench trap).

NOTE!

- **Condensate drains must always be positioned at a sufficiently steep angle! (Recommend 1:100). When running pressureless pipes or draining outdoors, no stench trap is required.**
- **The onsite condensate drain line is to be connected to the connector of the condensate**

tray in a stress-free way.

- **To avoid dew formation during cooling, chilled water pipe and condensate pipe must be thermally insulated with careful treatment at insulation ends.**

NOTE!

- **After the installation, the condensate tray must be cleaned to make sure efficiency drainage.**

4.6 Electric Wiring



DANGER FROM ELECTRICAL CURRENT!

- The electricity shall be disconnected before make any installation work.
- The electrical installation of the air treatment unit must only be carried out by qualified electricians in observance of this operation manual.
- The electrical connection of fan coil units must be performed in accordance with the valid connection diagrams. The connection diagram is located on the side of the sheet electric control box.
- The earth point provided on the unit shall be connected to the grounding system of the building.
- All electric connections shall comply with local electric regulations.
- The connection diagrams do not contain any protective measures. During connection, the standards and regulations currently in force must be observed and cleared with the local electricity company.

Please refer to section 3.2 wiring diagram to know the connection options in order to realize different static pressure.

1. Standard Static Pressure Type (P1)

If choose static pressure 12pa, pls wiring according to the real line (terminal 2, 3, 4)

If choose static pressure 30pa, pls wiring according to the dashed line (terminal 1, 2, 3)

2. High Static Pressure Type (P2)

If choose static pressure 30pa, pls wiring according to the real line (terminal 2, 3, 4)

If choose static pressure 50pa, pls wiring according to the dashed line (terminal 1, 2, 3)

Please refer to name plate to know the product type P1 or P2.

NOTE!

- **Please make the correct wiring of motorized 2-way or 3-way valve and thermostats in according to its installation instructions and make correct linkage between the units.**

5. Commissioning



ELECTRICAL HAZARD!

Before carrying out any work on the unit, power the unit down to avoid injury from electrical current. Check that the unit is isolated and ensure that the appropriate point of the unit for the on-site power supply is secured against being switched back on.



DANGER OF SCALDING!

Before performing work on the valves or the inlet or outlet pipes, seal off the heating or cooling medium inlet to prevent scalding. Do not commence work before the heating medium has cooled

down.



DANGER OF ROTATING UNIT PARTS!

Rotating fan wheels can cause injury! Before performing any work on the unit, ensure that it is powered down. Ensure that the appropriate point of the unit for the on-site power supply is secured against being switched back on.

5.1 Requirements for commissioning

After installation, the installers shall re-inspect and confirm the following items have been made. This manual has been carefully read through. Operators are generally familiar with the unit and can operate it.

- The fan coil is electrically isolated.
- The entire fan coil system has been installed both mechanically and electrically.
- Air ducts have been completely connected and firmly installed;
- All medium/water pipes have been rinsed and are free from residues and foreign objects.
- The system is properly pressurized (Recommended test pressure 2.4Mpa and more than 10min) and then filled with clean medium/water.
- Check that the fan coil is properly fixed and mounted (on the wall, ceiling or on the floor).
- Manually check if valves, actuators thermostats are secured according to its operation manual.
- Tighten all medium/water screw connections.
- Check all electric connections using current wiring diagrams and check terminal strip screws for correct tight seat.

NOTE!

Before commissioning, ensure that

- **the unit discharge (heat exchanger),**
- **the condensate trays and the condensate pump intake area**
- **and the filter medium are clean.**

If necessary, these components may have to be cleaned or the filter medium changed.

NOTE!

- **For first water filling, the fan coil pipeline may retain some air, which will be finally entrapped at top of the water system. A manual discharge valve is provided at the water outlet joint of the water system. When abnormal noise is heard due to residual air in the water system or coil, turn the discharge valve knob to release the air. If the knob is too tight, you may use a pair of pinchers to turn it anticlockwise until water flows out of the valve steadily, and then tighten the knob again.**

5.2 Startup

The fan coil usually is controlled by a thermostat which can on/off the unit, change the fan speed and also the water valve.

Switch on the power and follow the operation indication of the thermostat to operate the unit one by one working in high/mid/low speed.

Adjust the air outlet grill, setting fan speed and water flow to reach best cooling/heating effect.

In case of abnormal noise or behavior, switch off the unit and recheck the previous mentioned items. Otherwise it is recommended to set the unit working in high speed for 24 hours and recheck the unit behavior again.

NOTE!

- **After the commissioning, in case of non-use in winter season, water inside the unit shall be drained to avoid pipe cracks due to ice formulation.**

6. Maintenance and Troubleshooting



ELECTRICAL HAZARD!

Before carrying out any work on the unit, power the unit down to avoid injury from electrical current. Check that the unit is isolated and ensure that the appropriate point of the unit for the on-site power supply is secured against being switched back on.



DANGER OF SCALDING!

Before performing work on the valves or the inlet or outlet pipes, seal off the heating or cooling medium inlet to prevent scalding. Do not commence work before the heating medium has cooled down.



DANGER OF ROTATING UNIT PARTS!

Rotating fan wheels can cause injury! Before performing any work on the unit, ensure that it is powered down. Ensure that the appropriate point of the unit for the on-site power supply is secured against being switched back on.

6.1 Maintenance

The fan coil unit is a high-quality and reliable unit. However, to guarantee the permanent functioning and performance of the unit, regular maintenance and inspection by technical experts is necessary.

NOTE!

- **Maintenance may only be performed by trained technical personnel in observance of this operation manual and current regulations.**
- **The manufacturer's warranty will be invalidated if unit damage is attributed to the failure to perform regular maintenance and inspections.**
- **The valid warranty prescribes to maintain a written maintenance report according to the following table.**

6.1.1 Checklist of Periodic Maintenance

The following is a suggested maintenance plan.

Monthly Check

If the drip tray is clean and if condensate can flow to the drain pipe freely.

Yearly Check

- a) Check if the unit casing is corroded. Clean and repair it if necessary;
- b) Check if the fan blades and volute are damaged. Manually turn the blades to make sure it rotates freely without obstacles;
- c) Check if coil fins are too dirty or damaged;
- d) Clean and tighten all electric wirings;
- e) Drain chilled water of all the system to make descaling and water replacement

NOTE!

- **Untreated water may cause unit scaling, corrosion and deterioration. System testing and maintenance shall be guided by water treatment experts. The manufactory shall not be held liable for any losses due to poor water quality.**
- **Due to limitation of support weight and dimensions, this job shall be collaborated by two installers to ensure safety.**
- **During off period in winter, water inside the unit shall be drained to avoid pipe cracks due to ice formulation.**

6.1.2 Coil Cleaning

Blocked or contaminated coil may decrease cooling capacity. It is recommended to clean it every 3 month in the following steps. It is also recommended to read section 2.3 before going to following steps.

1. Disconnect the power and motor wiring to stop rotation of fan blades;
2. Un-tighten fixing screws between side panel and drip tray;
3. Separate the casing and trip tray. Un-tighten fixing screws between fixing plate and side panel;
4. Draw out the coil evaporator;
5. Clean the coil and remove the scale;
6. Re-install the coil evaporator and drip tray, and fix them with screws;
7. Connect the power and water supply. Make trial operation to see the effect.

6.1.3 Drip tray

For smooth draining of condensate, the drip tray must keep clean, otherwise immediate cleaning must be made.

1.1.4 Troubleshooting

Deviations from normal operating states of the fan coil units are evidence of malfunctions that must be investigated by maintenance personnel.

The following table should serve as a starting point for maintenance personnel regarding possible causes of trouble and their correction.

Fault	Possible causes	Remedy	M	
Fan does not work	Unit not switched on	Switch on unit		
	No electrical voltage	Check fuse/power supply	*	
	Electrical cables not connected	Connect electrical cables	*	
	Unit fuses defective	Replace fuses	*	
Unit too noisy	Too high RPM level switched on	Set a lower RPM level		
	Air intake or discharge areas blocked	Clear discharge/air intake of obstructions or kinks		
	Noisy fan bearings	Replace the faulty fan	*	
	Filter is dirty	Clean/replace the filter		
Unit does not cool(heat) or cool (heat) insufficiently	Fan not switched on	Switch on the fan		
	Air volume flow of the unit too low	Select a higher RPM level		
	Air intake or discharge areas blocked	Unobstruct or clean airways		
	Fan blocked/faulty	Check fan, replace if necessary	*	
	Filter is dirty	Clean/replace the filter		
	Water flow rate too low	Check pump performance, Check pipe run balance and adjust using calculated pressure loss	*	
	Cooling medium is not cold	Switch on chilled water set, Switch on the circulating pump, Bleed the system		
	Heating medium is not hot	Switch on the heating system boiler, Switch on the circulating pump, Bleed the system		
Water leakage in unit area	Main condensate tray drain blocked	Clean the main condensate tray and the condensate drain		
	Side wall-mounted/ceiling-mounted condensate tray drain blocked	Clean condensate drain and check for sufficient gradient, then clean and fill the siphon if necessary	*	
	Chilled water pipes not correctly insulated	Insulate the chilled water pipes	*	
	Unit not positioned horizontally	Align the unit and position it horizontally	*	
	Heat exchanger or hydraulic connections leaking	Check the heat exchanger, bleeding and valve connections for leaks		
		If necessary, retighten connections, clean screw insert or reseal the connections		
		On valves, check the screw connections for ease of movement, clean sealing surfaces and replace seal if necessary		*
		Check the soldered joints between the collector and heat exchanger tubes and on the heat exchanger deflection bends for leaks; if leaking, replace the heat exchanger		*

*Items marked with * can only be performed by technical person only.