Bosch Climate 5000

Brushless DC Fan Coil Unit
Introduction to Bosch Thermotechnology

Bosch Thermotechnik GmbH is a leading supplier of resource-efficient heating products and hot water solutions in Europe. In fiscal 2013, the company generated sales of 3.1 billion Euros (68% outside Germany) and employed approximately 13,500 people. Bosch Thermotechnology has strong international and regional brands and manufactures a diversified product range in 21 plants in 11 European, North American and Asian countries. In 2013, Bosch Thermotechnology invested 129 million Euros in research and development. Intelligent networks and local systems for heating, ventilation, air-conditioning and electricity generation are fundamental technologies for the future building standard, which will generate more energy than is used.

In Southeast Asia, Bosch Thermotechnology has been established in the middle of 2011 to provide a closer support to its local customers as well as to further extend its market position. The regional headquarters office is based in Singapore, overseeing business development in the Southeast Asia region. Nowadays, Bosch Thermotechnology has successfully established sales offices in Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam, with a representative office in Myanmar.

Bosch Thermotechnology is mostly known in Southeast Asia for its large-scale, commercial and industrial boiler systems. In 2014, the product portfolio has been extended to cooling solutions which are energy efficient, eco-friendly and high quality products for commercial and industrial applications which help our customers to increase comfort and reduce energy cost.

A comprehensive range of renewable heat pumps, chillers, fan coil units and air handling units meets almost all kinds of requirements from buildings like office, hospital, hotel, shopping mall or industrial plants.

Bosch Climate 5000 Brushless DC fan coil unit is a product engineered with most advanced technology which brings you great energy savings, and an ultimate quiet and comfortable working/living environment.

Nomenclature

Bosch Climate 5000

<table>
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<tr>
<th>FC</th>
<th>02</th>
<th>CC</th>
<th>23 / 1</th>
<th>P1</th>
<th>L</th>
<th>A</th>
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</table>

Product Series:
A: DC Fan Coil Unit

L: Left R: Right

Static Pressure:
P1: 12Pa; P2: 30Pa; P3: 50Pa;

Power Supply:
1.220~230V/50Hz/1 Phase

Coil Layout: 23: 2 Pipes-3 Rows

Product Type:
CC: Ceiling Concealed without Plenum or Filter
CD: Ceiling Concealed with Down Return Plenum & Filter
CB: Ceiling Concealed with Back Return Plenum & Filter

Air Flow: ×100 CFM

Fan Coil Unit
Explosive View

1) Advanced Brushless DC motor
High efficiency brushless DC motor ensures a 30% more energy-saving performance than AC FCU and a less than 0.5°C temperature turbulence.
Insulation Class: B
Protection Class: IP42

2) Easy-to-access Centrifugal Fan
Easy-to-open ABS volute makes service work easy and simple; high efficient large centrifugal fan ensures strong and constant air flow. Axises and bearings have been specially treated for longer service life.

3) Intelligent Control
Working with new Bosch thermostat, Bosch DC FCU features automatic stepless air flow adjustment, contributing to a quicker temperature response and more comfortable indoor environment.

4) High Efficiency Heat Exchanger
Louvered hydrophilic aluminum fins and seamless copper pipes are made into this top-level heat exchanger.

5) Removable End Panel
End panels on both sides can be removed; coil connection orientation can be easily changed on site.

6) Clean Drainpan
Integrated punched drainpan is covered with 5mm PE insulation and has a two degree slope to ensure a smooth drainage.

7) Leakage-tight Header
This safe and secure header structure is perfectly designed, aiming at totally leakage-free and durable operation.

8) Innovative Filter Rack
Slip-on type mounting rack allows quick and easy filter replacement.
Features

1. **More Energy-saving**
   Bosch brushless DC fan coil features outstanding energy-saving performance, significantly reducing air conditioning system energy consumption.

   - Compared with traditional AC motor fan coil unit under the same condition, Bosch brushless DC fan coil is over 30% more energy-saving.

   ![Power Input Comparison](Image)

   - **High Speed, 12Pa ESP**
   - Power Input, W

   - **Bosch Brushless DC FCU**
   - **AC FCU**

2. **More Environment-Friendly**
   With outstanding energy-saving performance, Bosch brushless DC fan coil contributes a lot to global environment protection.

   - For example, in China there are 15 million fan coil units with an average air volume of 1,020 m$^3$/h, running 10 hours a day, 135 days a year. If they are 30% more energy-saving, over 580 million kW·h electrical power will be saved every year, reducing about 580,000 tons of CO$_2$ emissions. (saving one kW·h equals reducing 0.997 kg CO$_2$ emission)
More comfortable

- Bosch brushless DC fan coil adopts brushless DC motor to replace the carbon brush motor to avoid electromagnetic interference and electromagnetic noise generated by the mechanical commutation. Its quiet operation and stepless speed adjustment help create a comfortable indoor environment with a swift indoor temperature response and comfortable air flow.
- The traditional AC fan coil unit has a difference of +/- 2°C indoor temperature deviation, resulting in sudden hot or cold.
- Bosch brushless DC fan coil achieves a +/- 0.5°C indoor temperature accuracy via motor stepless speed regulation fan to create a more comfortable environment.

![Indoor Temperature Response Comparison](image)

- Bosch brushless DC fan coil features stable running and slight vibration, greatly reducing vibration and noise caused by on/off and fan speed switch.
- Bosch brushless DC fan coil units can realize minimum RPM running via stepless speed regulation.
- Bosch brushless DC fan coil has a large diameter flame retardant ABS fan and a low noise fan motor. Every product is strictly tested for dynamic balancing before delivery, in order to ensure minimum noise level upon a satisfied air flow and external pressure basis.

![Noise Level Comparison](image)
More Compact

- Bosch brushless DC fan coil features aesthetical outline and compact dimensions. The fuselage height is only 220 mm, ultra-thin design makes it possible for the unit to be installed within the fairly narrow ceiling top.
- Bosch brushless DC fan coil has the most compact size, compared with world class competitors.

<table>
<thead>
<tr>
<th>Height Comparison</th>
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<tr>
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</table>

A  B  C  D  Bosch Brushless DC FCU

More Reliable

- High quality and long lasting variable speed control module is used to reduce traditional AC motor components wearing out during operation.
- New brushless DC motor is equipped with high precision and high quality permanent lubricated closed ball bearing, which is of low noise and long service life.
- The motor shaft is processed with conditioning chrome plating treatment, durable and reliable.
- The flexible structure design is convenient for users to change coil connection on the site. Plenum can also be changed between back and bottom air return. Easy installation saves time and effort.
- Highly efficient heat exchanger is made of high quality red copper pipe, with efficient louver hydrophilic aluminium fin. Precision machinery tube expansion ensures a high thermal efficiency.
- The strengthened air supply of the large diameter impeller fan maximizes heat transfer efficiency of the unit.
- The safe and leak proof drainpan is made from whole stamping molding. No welding or solder joint. Overall paste type flame retardant insulation material covers the drainpan, eliminating water leakage. Specially designed drainpan has a certain slope, ensuring a quick condensation discharge.
Intelligent Control

This product is equipped with Bosch brand intelligent thermostat and combines with world leading microcomputer processing technology to achieve a true stepless variable speed. It is more energy-saving, more comfortable, quieter and more reliable than traditional fan coil products.

- Microcomputer control system is used to realize a wide range stepless speed regulation. User can select a mode between multi-step speed or stepless speed. Bosch brushless DC fan coil can be running stably under a wide voltage range.
- Motor and power supply have multiple protection functions such as sudden abnormal working current protection, abnormal load protection, and low consumption locked-rotor protection, etc.
- Thermostat adopts the microcomputer control technology, large-screen LCD and a build-in return air temperature sensor.
- Users can select running modes among heating, cooling and ventilation, modify fan speed and set temperature points via clicking buttons on the thermostat. Unit’s working status and settings can be reviewed on LCD.
- According to the comparison results of environmental temperature and set temperature, the thermostat automatically controls Bosch brushless DC motor and electric valve to achieve the purpose of regulating temperature.
Specifications

Brushless DC Fan Coil Unit Parameter Data (Two-pipe Three Rows)

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<th>FC05</th>
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</table>

Note:
1. Nominal 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 that in cooling;
2. Air flow is tested with standard air condition (20°C DB) and dry coil;
3. Sound pressure level are measured in an acoustic room, position of the measure point is 1m in the front and 1m below the vertical center line of the unit (GB/T19232-2003);
4. Static pressure is measured without filter and air outlet (no plenum).
Dimensions

Without Plenum

With Plenum
Correction Factors

Cooling Capacity Correction Factors

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<th>EWT (°C)</th>
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<th>6</th>
<th>7</th>
<th>8</th>
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Note: air side condition, entering DB 27°C, WB 19.5°C.

Heating Capacity Correction Factors

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Note: air side condition, entering DB 21°C.

Cooling Capacity Correction Factors Based on Different Ambient Conditions

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<th>DB (°C)</th>
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Note: Inlet cooling water temperature 7°C.

Heating Capacity Correction Factors Based on Different Ambient Conditions

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Note: Inlet hot water temperature 60°C.
Fan Curve

Water Flow-Pressure Drop

Wiring diagram
Bosch Thermotechnology in Southeast Asia

Singapore, Cambodia, Lao PDR, Myanmar
Robert Bosch (SEA) Pte. Ltd.
Thermotechnology Division
11 Bishan Street 21, #04-05
Singapore 573943
Tel +65 6258 5511
Fax +65 6571 2970
Email: tt.sales@sg.bosch.com

Indonesia (Jakarta):
PT. Robert Bosch
Arkadia Office Park Tower F
7th Floor, Suite 703-705
Jl. TB. Simatupang Kav.88,
Jakarta 12520
Indonesia
Tel: +62 21 3005 5800
Fax: +62 21 3005 5801
Email: tt.sales@sg.bosch.com

Indonesia (Surabaya)
PT. Robert Bosch
Plaza BRI, Suite 1203
Jl. Jend. Basuki Rahmat No. 122
Surabaya 60271
Indonesia
Tel: +62 31 5356262
Fax: +62 31 5356266
Email: tt.sales@sg.bosch.com

Malaysia:
Robert Bosch Sdn. Bhd
Thermotechnology Division
No. 8A, Jalan 13/6,
46200 Petaling Jaya, Selangor,
Malaysia
Tel. + 60 (3) 7966 3000
Fax: + 60 (3) 7958 8833
Email: tt.sales@sg.bosch.com

Myanmar:
Representative Office of Robert Bosch (SEA) Pte. Ltd.
Thermotechnology Division
No. 60B, Kabar Ayer Pagoda Road
Mayangone Township
Yangon, Myanmar
Tel. + 95 1 663616
Fax: + 95 1 663616
Email: tt.sales@sg.bosch.com

Philipines:
Robert Bosch Inc.
Thermotechnology Division
28 Floor, Fort Legend Tower
3rd Ave. Cor 31st St
Fort Bonifacio Global City
Metro Manila 1634
Philippines
Tel. +63 2 870 3888
Fax: +63 2 870 3830
Email: tt.sales@sg.bosch.com

Thailand:
Robert Bosch Limited
Thermotechnology Division
287 Liberty square building, 11th floor
Silom Road, Bangrak
Bangkok 10500
Thailand
Tel. + 66 2 639 3111
Fax: +66 2 238 4783
Email: tt.sales@sg.bosch.com

Vietnam (Ho Chi Minh):
Robert Bosch Vietnam Co., Ltd.
Thermotechnology Division
194 Golden Building
473 Dien Bien Phu str. – W.25 – Binh Thanh Dist. - Ho Chi Minh City
Vietnam
Tel. +84 (8) 6258 3690
Fax: +84 (8) 6258 3692
Email: tt.sales@sg.bosch.com

Vietnam (Hanoi):
Robert Bosch Vietnam Co., Ltd.
Thermotechnology Division
Unit 03C, 2nd floor, International Center
17 Ngo Quyen St., Hoan Kiem Dist.,
Ha Noi
Vietnam
Tel. +84 (4) 3939 3119
Fax: +84 (4) 3936 2899
Email: tt.sales@sg.bosch.com

For more information:
www.bosch-industrial.com