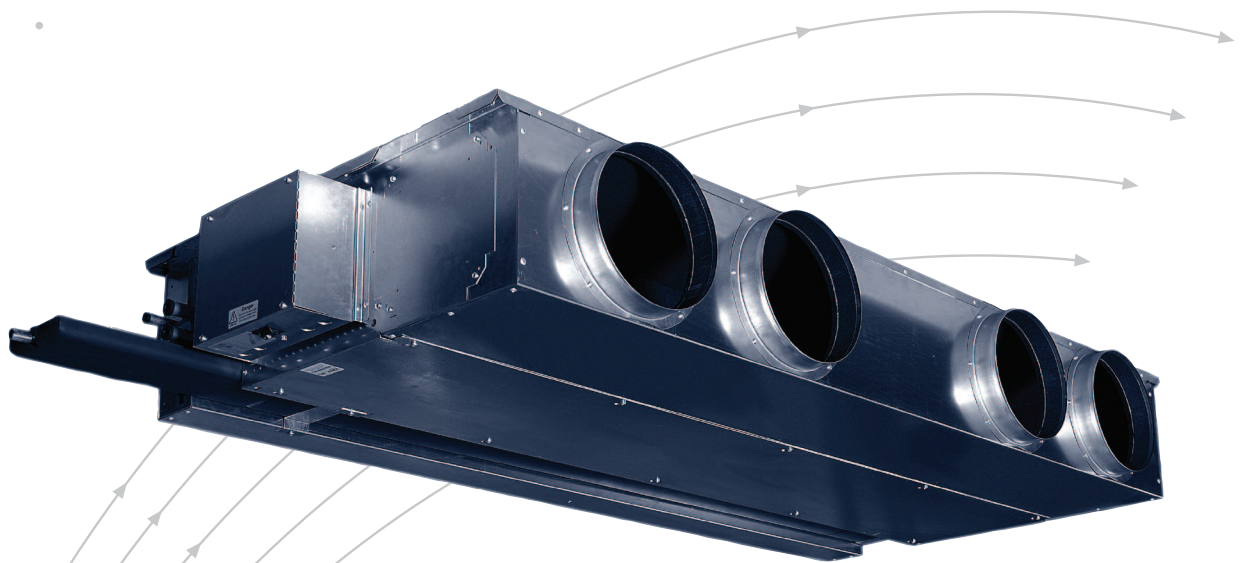


Water Side Fan Coil

Type PWH



TROX® **TECHNIK**

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Application

The main application of PWH is for the air conditioning of offices and hotel rooms. It is designed to be installed into false ceilings or under floor voids. Within the Fan Coil, fresh or re-circulating air is filtered, cooled or heated as necessary and supplied indirectly through spigots, ducts and grilles into the internal space, offering individual and zone control.

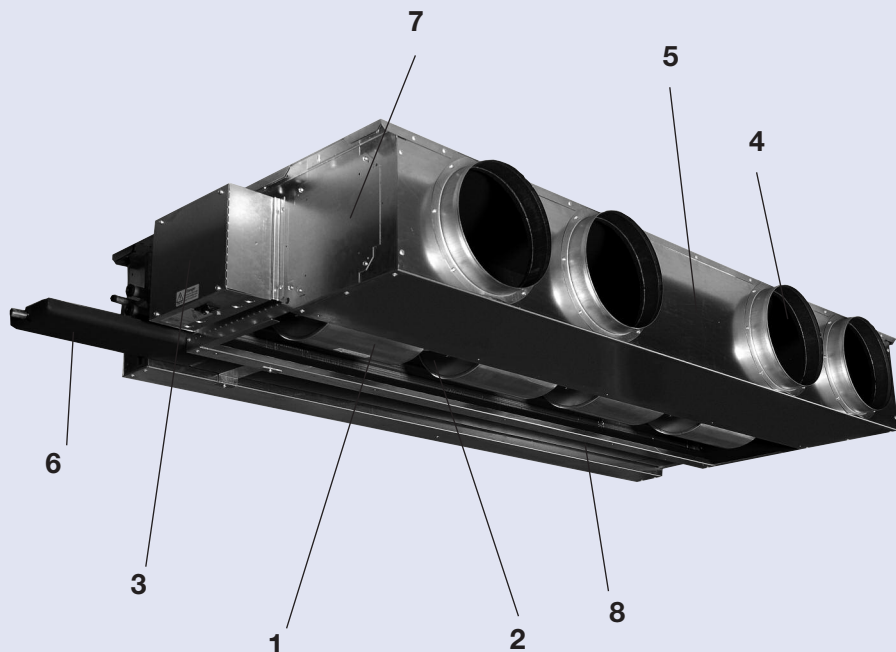
System Features and Benefits

- Safe: As a water based system, no refrigerant pipework needs to be installed to link up units, thus there is a reduction in risk, installation time and cost.
- Easy installation: Hot and cold water piping from the central plant boiler and main chiller plus an electrical supply is generally all that is required.

- Reliable and tested: All components are available as standard and have proven reliability. Every unit undergoes a complete functional test in the factory (excludes DDC controller which may be tested by Systems House at works).
- Functional: Can either heat or cool. Also, its decentralised configuration means that it is flexible should the building use or layout need to be changed. Equally, if there is a failure in one unit, this will only affect one area.
- Increase Capacity: The standard unit has a height of 270mm and can be used where higher duties are required.
- Flexible: Can easily be adapted, moved or altered if the building requirements change.

Type PWH

- 1 Fan Deck
- 2 Coil
- 3 Control Box
- 4 Spigot
- 5 Discharge Plenum
- 6 Drain Tray
- 7 Spigot Blanking Plate
- 8 Filter



Description · Dimensions

PWH is a range of horizontal concealed chassis water side controlled Fan Coil Units, with integral discharge plenum and options for discharge spigot outlet positions. The units are designed to provide maximum flexibility in thermal, hydraulic and acoustic performance. There are 7 sizes in the PWH range, larger sizes/duties available upon request.

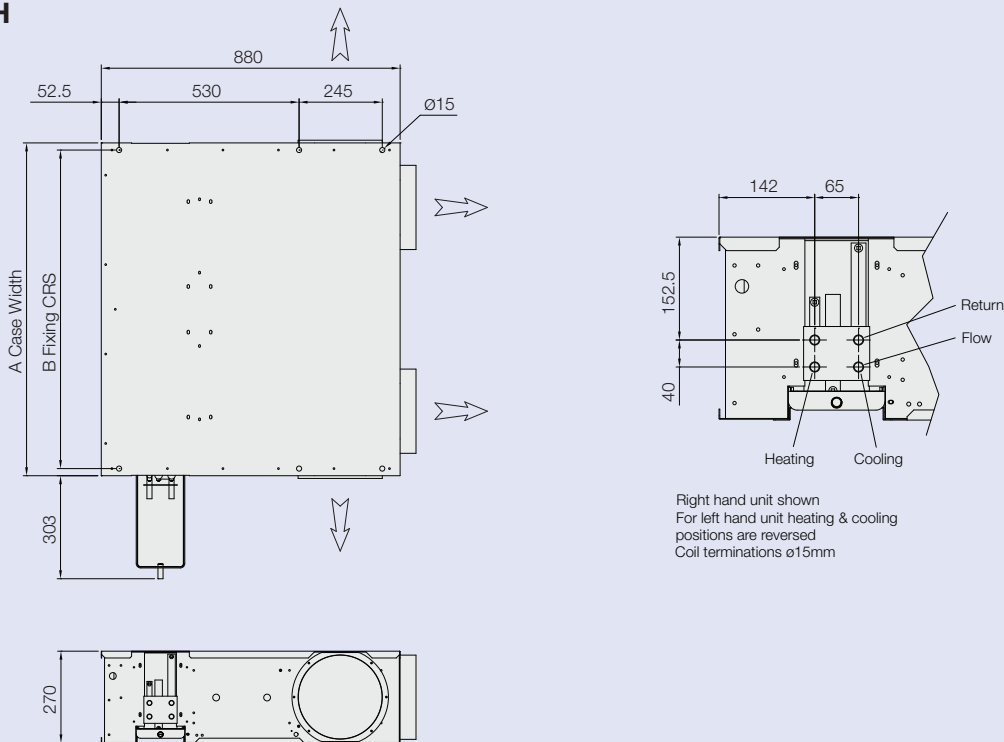
PWH water side fan coil is a localised air conditioning unit normally found within non-domestic, non-industrial buildings, such as office blocks, shops, restaurants and hotels.

All units are mill finish galvanised steel, consisting of a galvanised metal shell containing thermal and acoustic insulation, a filter, a heat exchanger, a drain tray, a fan deck assembly and a controls housing.

PWH operates by bringing either fresh, re-circulating or mixed air from within ceiling voids or directly ducted to the rear of the unit. This is then filtered before being either cooled or heated as it passes over the coil and supplied indirectly through spigots in the discharge plenum to ducts and grilles into the internal space. It is suitable for heating and cooling, offering individual and zone control.

Unit depth is 270mm throughout the range, excluding a stepped plenum if it is fitted, when depth becomes 330mm.

Type PWH



Size	Dim A	Dim B	Weight	Spigot options
PWH 1	680	638	31	see page 4
PWH 2	980	938	43	see page 4
PWH 3	1280	1238	55	see page 4
PWH 4	1580	1538	70	see page 4
PWH 5	1730	1688	82	see page 4
PWH 6	1880	1838	83	see page 4
PWH 7	2130	2088	91	see page 4

Specification · Spigot Arrangements

Chassis

The unit casing and integral discharge plenums are manufactured from 1.0mm or 1.2mm galvanised sheet steel, depending on size. The fan deck mounting plate is manufactured from 1.6mm galvanised sheet steel.

All units have a full width access panel for easy maintenance of the coil and fan deck. This access panel is easily removable via a keyhole slot arrangement retained by M5 screws.

The casing and integral plenum is fitted internally throughout with Fire Rated Class 'O' open cell self-adhesive foam for thermal and acoustic insulation.

The unit incorporates an integral external mounting flange with 6 no. Ø15mm holes for suspension from drop rod hangers.

Drain Tray

A full width condensation drain tray extends the full length of the coil and control valves. It is mounted in position to give a positive fall to drain.

The tray is manufactured from 1.2mm galvanised steel and is externally insulated with 3mm closed cell insulation.

Spigots

Standard spigots are 250mm diameter galvanised steel.

They are externally screwed into position on the plenum box to suit the customer's requirements. Where spigots are not required, a blanking plate will be fixed.

200mm, 300mm and rectangular spigots are available on request. A stepped discharge plenum is required for 300mm spigots.

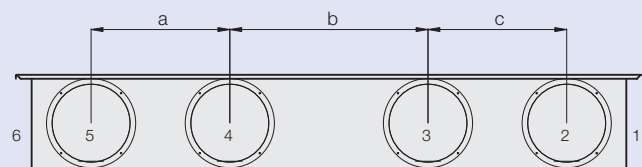
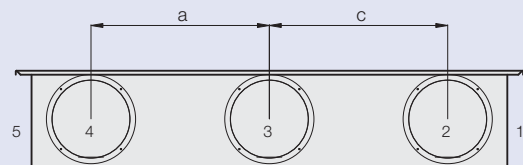
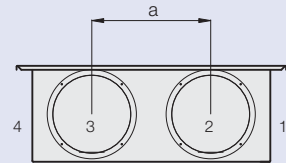
Dimensions - Spigot Arrangements

Spigot Size 200/250 dia

Size	Dim A	Dim B	Dim C	Spigot Options*
PWH 1	300	–	–	1,2,3,4
PWH 2	600	–	–	1,2,3,4
PWH 3	450		450	1,2,3,4,5
PWH 4	350	500	350	1,2,3,4,5,6
PWH 5	350	650	350	1,2,3,4,5,6
PWH 6	350	650	350	1,2,3,4,5,6
PWH 7	400	900	400	1,2,3,4,5,6

Spigot Size 300 dia (Stepped Unit)

Size	Dim A	Dim B	Dim C	Spigot Options*
PWH 1	–	–	–	2
PWH 2	400	–	–	2,3
PWH 3	400		400	2,3,4
PWH 4	350	400	350	2,3,4,5
PWH 5	400	450	400	2,3,4,5
PWH 6	400	450	400	2,3,4,5
PWH 7	400	800	400	2,3,4,5



* Other spigot options available on request.

Specification · Electrical Data · Performance

Coils

The units are fitted with a 3¹/₂ row cooling coil and 1/2 row heating coil as standard for four-pipe operation. A single coil block incorporates both the heating and cooling sections. Coils are copper tube/aluminium plate fin construction at 12 fins per inch. They are factory tested and suitable for 12 bar operating pressure.

Coils are fitted with key operated vents and drains in the header block as standard. Coil flow and return connections are at 40mm centres with plain 15mm o/d copper tails suitable for compression fittings.

Filters

Units are supplied fitted with a vertical flat replaceable filter pad to Eurovent Grade G3.

The filter includes an integral welded support frame, is located at the air inlet and is suitable for removal from the bottom or side of the unit.

Laboratory Testing

TROX can provide in-house test facilities to mock-up the proposed arrangement to enhance confidence in the units performance and eliminate uncertainty.

Fans & Motors

Forward curved DIDW direct-drive centrifugal fans with aluminium impellers (AC motors) and galvanized sheet steel (EC motors) are used throughout.

AC motors (F5)

Motors are continuously rated 230V single phase 50Hz with built-in thermal overload protection. Bearings are sealed for life and maintenance free. The fan/motor assembly is balanced and secured through anti-vibration mounts to the fan deck. Motors drive up to a maximum of three fan scrolls. A multi-tapped transformer with fine and coarse speed switches are used to vary the air volume.

EC Motors (F7)

Electronically commutated, permanently excited motors (EC motors) provide more advantageous solutions than conventional asynchronous motors.

The electronic commutation of an EC drive is the same as that of a DC motor but also incorporate an inverter to convert AC mains to DC line voltage. EC drives give the higher efficiencies of DC motor; the ease of AC motors and the flexibility of frequency control as the EC drive also include full speed control functionality.

Infinitely variable speed control is achieved by using either a potentiometer or a fan coil controller with a 0 – 10 v output.

RFI filter

A filter must be used on the input to the EC motor(s) to ensure that the harmonics produced during the AC to DC voltage conversion are prevented from affecting other electrical items.

All products are CE marked, EMC tested to BS EN 61000-3-2:2001 and manufactured in a facility to BS EN ISO 9001:2000.

Electrical Installation

All wiring must comply with the requirements of BS 7671. The fan coil requires a 230V 1ph 50Hz supply, fused at 5A.

Note: The fan coil is not fitted with an isolator. The fan coil must be isolated externally before any maintenance work is undertaken on the unit.

Controls

All AC units are fitted as standard with an on/off switch, 3-speed switch and 240/24V multi-tapped transformer.

All units are electrically tested for correct operation and all valve to coil connections are leak pressure tested. Test certificates can be provided upon request.

TROX is able to accommodate most types of controls package if required.

When selecting units for a given system there are many factors to take into account.

- Unit configuration
- Size of unit
- Unit capacity
- Water temperature
- Unit power consumption
- Noise
- Room conditions
- Controls (if supplied)

Wiring Diagram

CAV Fan Coils

There are three basic operating modes which are:

Isothermal mode

This is where the room temperature is at the design value (set point) and no heating or cooling is required. In this mode the water control valves, hot and cold, will be closed BUT THE FAN IS STILL RUNNING AT FULL SPEED. The fan delivers the maximum airflow which is a combination of fresh air and room air.

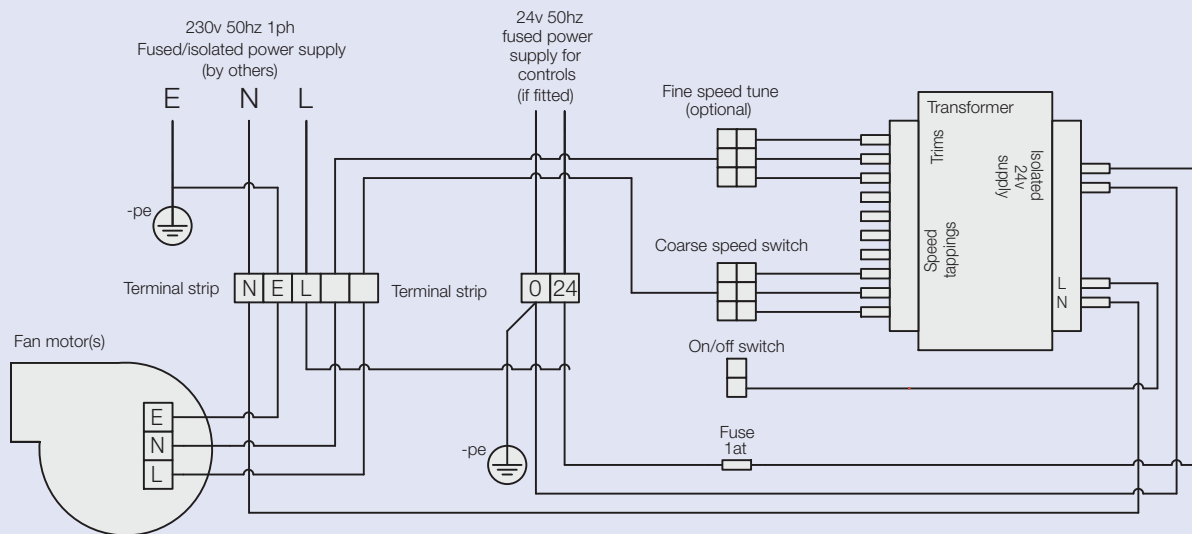
Cooling Mode

As the room air temperature increases a signal from the sensor to the controller starts to open the chilled water control valve. If the room air temperature continues to increase, the controller opens the chilled water valve further. All the time the fan is at maximum air flow.

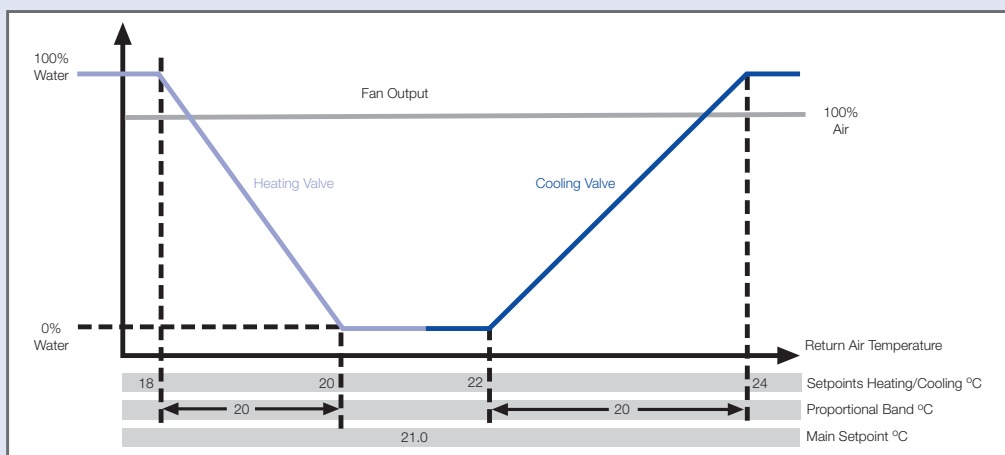
Heating Mode

As the room air temperature decreases a signal from the sensor to the controller starts to open the hot water control valve. If the room air temperature continues to fall, the controller opens the hot water valve further. All the time the fan is at maximum air flow.

Typical AC Wiring Diagram



Control sequence for constant volume AC motor



Wiring Diagram

VAV Fan Coils

A VAV fan coil is a variant to the standard waterside fan coil. The water controls stay the same, but, the motors are not running at 100% all the time. This saves more energy than CAV but is more difficult to design, etc. This also requires 0-10v dc modulating control water valves for more accurate control. The basic operating modes are:-

Isothermal Mode

This is where the room temperature is at the design value (set point) and no heating or cooling is required. In this mode the water control valves, hot and cold, will be closed BUT the fan will be running typically at 60% volume.

Cooling Mode

As the room air temperature increases a signal from the sensor to the controller starts to open the chilled water control valve. Care must be taken with the coil air off

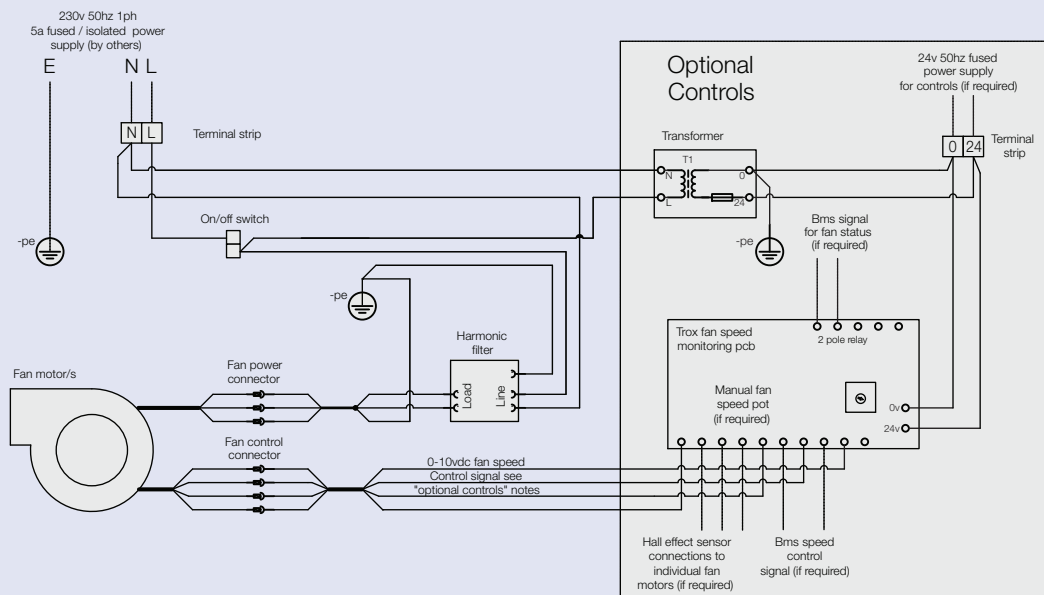
temperature such that the air entering the room is not too low and cause potential air distribution issues. It may be prudent to introduce a temperature sensor to monitor the coil air-off and at the specified minimum temperature, start to increase the air volume. If the room air temperature continues to increase, the controller opens the chilled water valve further and then increases the motor speed.

Heating Mode

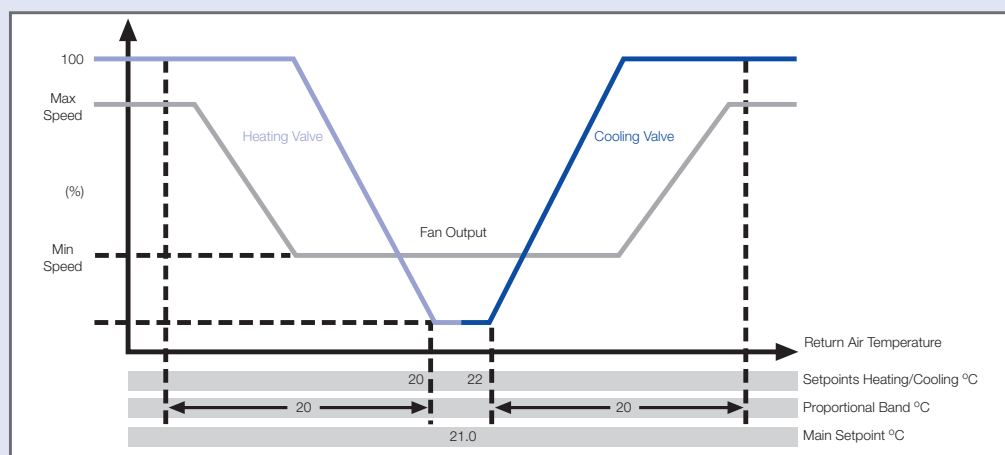
As the room air temperature decreases a signal from the sensor to the controller starts to open the hot water control valve. If the room air temperature continues to fall, the controller opens the hot water valve further and then increases the motor speed.

All of this is shown in the control diagram below which also shows a 2°C dead band where the fan coil operates in the isothermal mode.

Typical EC Wiring Diagram



Control sequence for VAV EC motor fan coils



Order Details

Specification Text

Fan coil unit in a compact construction for horizontal installation in false ceiling void.
 Consisting of casing with thermal and acoustic insulation, air filter, double inlet fan, cooling/heating coils for 2 or 4 pipe systems, condensation tray, multi-outlet spigots suitable for discharge of air through slot diffusers, square or swirl diffusers. (e.g. TROX types VSD, ADT, SDW).

Suitable for taking inlet air from ceiling void or ducted from space, also provision of controlled amount of fresh air (e.g. control by TROX type RN regulator).

Materials

Galvanised sheet steel casing with thermal/acoustic lining. Cooling/heating coils with galvanised steel frame, copper pipes aluminum fins. Galvanised sheet steel, externally insulated condensate drain pan, fan with galvanised steel casing.

Order Code

PWH / **0** / **3** / **R** / **H** / **T4** / **25A** / **234** / **F5** / **C** / **0** / **00X215**

Type
 Water Side Control
 270 mm

Size
 1
 2
 3
 4
 5
 6
 7

Handling
 R Right Hand
 L Left Hand

Drain Tray
 T4 = Epoxy Painted Galv Tray With Side Outlet

Spigot Option ¹⁾
 1234567

Fan Type
 F5 = AC Fan Deck
 F7 = EC Motor

Wiring Control

Condensate Pump
 0 = no pump
 1 = SI3200
 2 = PE5200
 3 = SI3200 + 5m cable

AC Fan Deck Transformer Tapping
 A = 3A
 B = 3B
 C = 3C
 D = 3D
 E = 3E
 F = 3F
 G = 3G

Coil
 H = 3 1/2 row cooling (15mm) + 1/2 row heating (15mm)
 G = 3 1/2 row cooling (22mm) + 1/2 row heating (15mm)
 F = 3 row cooling + 1 row heating
 C = 4 row cooling
 HS = 3 1/2 row cooling + electric heater
 CS = 4 row cooling + electric heater
 FS = 3 + 1 coil + electric heater

Inlet Plenum

0 = Standard No Entry
 E = Basic Extended inlet
 E10 = Extended inlet + 100mm Fresh Air Connection
 E12 = Extended inlet + 125mm Fresh Air Connection
 E15 = Extended inlet + 150mm Fresh Air Connection
 E16 = Extended inlet + 160mm Fresh Air Connection
 E20 = Extended inlet + 200mm Fresh Air Connection

I = Basic Inlet

I10 = Inlet + 100mm Fresh Air Connection
 I12 = Inlet + 125mm Fresh Air Connection
 I15 = Inlet + 150mm Fresh Air Connection
 I16 = Inlet + 160mm Fresh Air Connection
 I20 = Inlet + 200mm Fresh Air Connection
 I25 = Inlet + 250mm Fresh Air Connection

A = Inlet Splitter / Attenuator

A10 = Inlet Splitter/Attenuator + 100mm Fresh Air Connection
 A12 = Inlet Splitter/Attenuator + 125mm Fresh Air Connection
 A15 = Inlet Splitter/Attenuator + 150mm Fresh Air Connection
 A16 = Inlet Splitter/Attenuator + 160mm Fresh Air Connection
 A20 = Inlet Splitter/Attenuator + 200mm Fresh Air Connection

Handling for Fresh Air Connection = box handing

Outlet

25A = 250mm spigots (250mm opening)
 20A = 200mm spigots (200mm opening)
 30C = 300mm spigots (300mm opening ²⁾)
 SPL = rectangular spigots, etc.

No side spigots are available for stepped request.

Electric heater control panel covers 1 outlet spigot
 All spigots on a fan coil are the same size.

¹⁾ Other spigot options available on request

²⁾ Requires stepped plenum, depth of unit 330mm

Order Example

Make : TROX

Type : PWH/0/3/R/4H/T4/25A/2345/F5/C/0/00X215