Chilled Water Fan Coil Unit

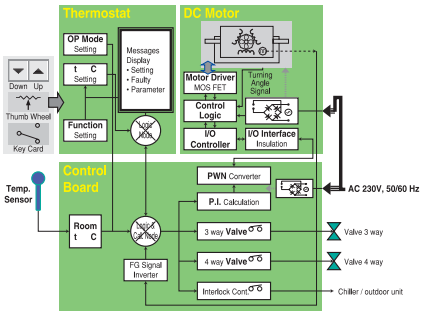
DCBL VAV Stepless FCU
Model : HFCF02~HFCF14

Features and Benefits

New Features

Variable Airflow & Accurate Control

DCBL fan coil unit features variable airflow in addition to accurate temperature control that are not available in typical fan coil units. With a dedicated wall mounted, intelligent, liquid crystal display (LCD) thermostat, unique control logic and an advanced stepless DC fan motor, the advanced DCBL fan coil unit can truely realize smooth fan speed modulation to create the real ambient comfort and achieve desired room temperature without excessive indoor moisture. Other advantages of DC fan motor are low noise and high efficiency.



DCBL VAV FCU Control Logic Chart

Temperature Swings less than 0.5℃

A typical fan coil unit varies room temperature by water flow controls (on-off or modulating) plus specific fan speed selection (hi-medium-low). These always result in unstable room temperature (figure 1) and poor humidity control in occupied spaces. In contrast to the old-fashioned control method, DCBL fan coil unit applies Proportional Integration (P-I) logic for modulation of fan speed and is able to stabilize room temperature within ± 0.5 Celsius degrees while operating in automatic mode.

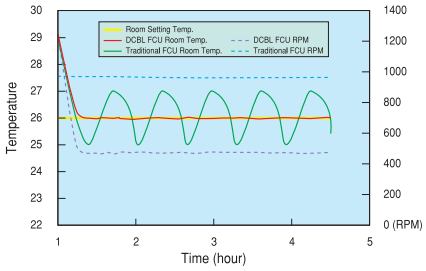


Figure 1

Low Noise with Gradual Changes

With P-I logic communications between DCBL fan coil control board and the LCD thermostat, the feedback signal from the return air temperature sensor is scanned every second in order to verify the set temperature continuously. DCBL fan coil control board commands the DC fan motor to maintain a continuous speed prior to receiving a new feedback signal. After examining five cycles of temperature measurement, a new fan motor speed is set. The fan speed change is made linearly with increasing or decreasing fan motor speed about ten revolutions per second in order to reach the set temperature again. The linear change in motor speed allows gradual changes to room temperature and minimizes fan blade sudden impact noise (compared to 20~25% RPM change with conventional control and old-fashioned 3-speed motors).

Desired Airflow at Lower Speed Equals Energy Savings

The DC motor is able to deliver high torque and thus overcome airflow friction at a low speed with generating substantial external static pressure to deliver the needed airflow. It also has less mechanical friction loss and therefore higher operating efficiency than a typical permanent split capacitor (PSC) motor. In other words, it achieves real energy savings. In the figure 2, there are 2 models (HFCF08 and DCBL08) expressing electrical consumption (Watt) against specific range of speed (600~950 RPM). The result is indicated that a DCBL08 saves energy about 30% at high speed and 60% at low speed beneath the same working conditions with HFCF08. DCBL fan coil unit enables to deliver extended performance of airflow (green color curve with extension dash line) by excess power input. Please consult Trane engineer for further technical support.

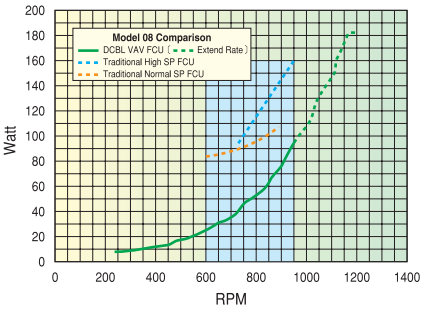


Figure 2

Model Nomenclatures

H	F	C	F	0	3	L	3	N	N	1	N	A	N	A	N	N	A
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Digit 1: H = Horizontal

Digit 2: F = Fan Coil Unit type

Digit 3: C = Concealed

Digit 4: F = Design Sequence

Digit 5, 6: Size / Nominal Airflow
- 02 = 200 CFM
- 03 = 300 CFM
- 04 = 400 CFM
- 05 = 500 CFM
- 06 = 600 CFM
- 08 = 800 CFM
- 10 = 1000 CFM
- 12 = 1200 CFM
- 14 = 1400 CFM

Digit 7: Connection Side
- L = Left Connection
- R = Right Connection

Digit 8: Coil Rows
- 2 = 2 Rows Cooling
- 3 = 3 Rows Cooling
- 4 = 4 Rows Cooling
- A = 2 Rows Cooling, 1 Row Heating
- B = 3 Rows Cooling, 1 Row Heating

Digit 9: Electric Heater (Size)
- N = None
- A = 0.5 kW Heater (02)
- B = 1.0 kW Heater (03)
- C = 1.4 kW Heater (04)
- D = 1.6 kW Heater (05)
- E = 1.8 kW Heater (06)
- F = 2.8 kW Heater (08)
- G = 3.2 kW Heater (10)
- H = 3.6 kW Heater (12)
- J = 4.6 kW Heater (14)

Digit 10: Motor Type
- N = Normal
- H = High Static
- A = DCBL Normal (w/ LCD Thermostat)
- B = DCBL High Static (w/ LCD Thermostat)
- C = Hermetic Motor Normal Type
- D = Hermetic Motor High Static Type

Digit 11: Voltage/Hz/Phase
- 1 = 220/50/1
- 2 = 220~240/60/1
- 3 = 115/60/1

Digit 12: Factory Mounted Control / Valve Package
- N = None
- A = 2-pipe, with 2-way Valve
- B = 2-pipe, with 3-way Valve
- C = 4-pipe, with 2-way Valves
- D = 2-pipe, with 2-way Valve & LCD Thermostat
- E = 2-pipe, with 2-way Valve & LCD Thermostat (Configured with VWV System only)
- F = 2-pipe, with 3-way Valve & LCD Thermostat
- G = 4-pipe, with 2-way Valves & LCD Thermostat
- H = 2-pipe, with 2-way Valve & ZN510 w/ Zone Sensor
- J = 2-pipe, with 3-way Valve & ZN510 w/ Zone Sensor
- K = 4-pipe, with 2-way Valves & ZN510 w/ Zone Sensor
- L = 2-pipe, with 2-way Valve & ZN520 w/ Zone Sensor
- M = 2-pipe, with 3-way Valve & ZN520 w/ Zone Sensor
- P = 4-pipe, with 2-way Valves & ZN520 w/ Zone Sensor
- Q = 2-pipe, with 2-way Floating Valve & ZN520 w/ Zone Sensor
- R = 2-pipe, with 3-way Floating Valve & ZN520 w/ Zone Sensor
- S = 4-pipe, with 2-way Floating Valves & ZN520 w/ Zone Sensor

Digit 13: Terminal Box
- A = Standard Wiring w/ Terminal Box
- B = Electric Heater Wiring w/ Terminal Box
- C = DCBL Wiring w/ Terminal Box
- D = ZN Wiring w/ Terminal Box
- E = VWV w/ Terminal Box

Digit 14: Return Plenum / Filter
- N = None
- A = with Rear Plenum Only
- B = with Rear Plenum/ 6mm Nylon Filter
- C = with Rear Plenum/ 20mm Aluminum Filter
- D = with Bottom Return Plenum Only
- E = with Bottom Return Plenum/ 6mm Nylon Filter
- F = with Bottom Return Plenum/ 20mm Aluminum Filter

Digit 15: Drain Pan
- A = STD. Galvanized Steel w/ 7mm PE Insulation
- B = STD. Galvanized Steel w/ 7mm PE Insulation & Extended 200mm
- C = STD. Galvanized Steel w/ 7mm PE Insulation & Extended 310mm
- D = Stainless Steel w/ 7mm PE Insulation
- E = Stainless Steel w/ 7mm PE Insulation & Extended 200mm
- F = Stainless Steel w/ 7mm PE Insulation & Extended 310mm
- G = STD. Galvanized Steel w/ 6mm Non-flammable Close Cell Insulation
- H = STD. Galvanized Steel w/ 6mm Non-flammable Close Cell Insulation & Extended 200mm
- J = STD. Galvanized Steel w/ 6mm Non-flammable Close Cell Insulation & Extended 310mm
- K = Stainless Steel w/ 6mm Non-flammable Close Cell Insulation
- L = Stainless Steel w/ 6mm Non-flammable Close Cell Insulation & Extended 200mm
- M = Stainless Steel w/ 6mm Non-flammable Close Cell Insulation & Extended 310mm
- N = STD. Galvanized Steel w/ 10mm Non-flammable Close Cell Insulation
- P = STD. Galvanized Steel w/ 10mm Non-flammable Close Cell Insulation & Extended 200mm
- Q = STD. Galvanized Steel w/ 10mm Non-flammable Close Cell Insulation & Extended 310mm
- R = Stainless Steel w/ 10mm Non-flammable Close Cell Insulation
- S = Stainless Steel w/ 10mm Non-flammable Close Cell Insulation & Extended 200mm
- T = Stainless Steel w/ 10mm Non-flammable Close Cell Insulation & Extended 310mm
- U = STD. Galvanized Steel w/ 25mm Non-flammable Close Cell Insulation
- V = STD. Galvanized Steel w/ 25mm Non-flammable Close Cell Insulation & Extended 200mm
- W = STD. Galvanized Steel w/ 25mm Non-flammable Close Cell Insulation & Extended 310mm
- X = Stainless Steel w/ 25mm Non-flammable Close Cell Insulation
- Y = Stainless Steel w/ 25mm Non-flammable Close Cell Insulation & Extended 200mm
- Z = Stainless Steel w/ 25mm Non-flammable Close Cell Insulation & Extended 310mm

Digit 16: Trane Digital Grille(TDG)
- N = None
- A = with Remote Controller Only
- B = with TDG LCD Thermostat Only
- C = with TDG LCD Thermostat & Remote Controller
- D = with Remote Controller & UV Light
- E = with TDG LCD Thermostat & UV Light
- F = with TDG LCD Thermostat, Remote Controller & UV Light

Digit 17: Future Use
- N = None

Digit 18: Region
- A = APR
- B = MAIR
- C = LAR

Performance Data

2 Row Coil

Model	Fan Speed	DCBL Airflow	Cooling Cap.	Normal Static Pressure			High Static Pressure			Water flow	WPD	Motor Qty.	Fan Qty.
				DCBL Power	DCBL Current	DCBL Noise	DCBL Power	DCBL Current	DCBL Noise				
		CFM	kW	w	A	dB(A)	w	A	dB(A)	l/s	kPa		
02	Super High	224	1.69	16	0.08	35	38	0.19	40	0.076	4	1	1
	High	206	1.48	13	0.08	34	33	0.16	39				
	Medium	159	1.16	8	0.05	25	25	0.13	35				
	Low	112	0.86	7	0.04	21	14	0.07	26				
	Super Low	94	0.79	7	0.04	21	11	0.06	25				
03	Super High	335	2.98	17	0.11	32	42	0.21	41	0.135	15	1	2
	High	312	2.64	14	0.11	31	39	0.19	43				
	Medium	229	2.06	9	0.08	21	29	0.15	33				
	Low	153	1.59	8	0.08	20	16	0.11	24				
	Super Low	135	1.49	8	0.08	20	11	0.09	23				
04	Super High	447	3.85	36	0.18	37	55	0.29	44	0.175	29	1	2
	High	412	3.41	35	0.18	36	50	0.26	43				
	Medium	294	2.71	18	0.11	27	28	0.17	35				
	Low	200	1.97	13	0.09	21	17	0.12	25				
	Super Low	176	1.90	11	0.09	20	13	0.12	24				
05	Super High	559	4.76	48	0.24	41	62	0.33	45	0.214	40	1	2
	High	518	4.13	45	0.22	40	59	0.32	44				
	Medium	406	3.52	24	0.13	34	37	0.21	37				
	Low	253	2.60	15	0.11	33	22	0.15	29				
	Super Low	224	2.51	13	0.09	30	13	0.12	28				
06	Super High	671	5.43	65	0.31	43	67	0.38	45	0.25	58	1	2
	High	618	4.85	59	0.28	42	66	0.36	44				
	Medium	429	3.88	26	0.14	31	46	0.28	38				
	Low	282	2.92	17	0.11	24	22	0.15	31				
	Super Low	224	2.61	13	0.10	24	13	0.12	30				
08	Super High	865	6.42	77	0.69	45	113	0.90	48	30.5	26	2	3
	High	824	5.91	74	0.66	44	102	0.84	47				
	Medium	618	4.96	47	0.48	36	70	0.65	41				
	Low	412	3.78	29	0.35	29	46	0.47	35				
	Super Low	335	3.20	22	0.30	28	25	0.32	34				
10	Super High	1088	8.26	93	0.72	45	139	0.96	50	0.378	40	2	4
	High	1024	7.34	81	0.68	44	127	0.91	49				
	Medium	759	6.18	52	0.49	35	84	0.67	41				
	Low	494	4.33	31	0.37	24	49	0.46	32				
	Super Low	418	4.23	21	0.30	24	31	0.36	31				
12	Super High	1288	9.68	131	0.93	49	183	1.23	52	0.435	52	2	4
	High	1212	8.45	119	0.90	48	160	1.04	51				
	Medium	988	7.43	83	0.68	41	117	0.88	46				
	Low	659	5.82	51	0.48	32	71	0.61	38				
	Super Low	447	4.82	25	0.33	31	36	0.38	37				
14	Super High	1453	10.84	164	1.15	51	221	1.42	55	0.503	75	2	4
	High	1412	9.77	148	1.05	50	201	1.34	54				
	Medium	1065	8.49	95	0.76	43	130	0.96	46				
	Low	741	7.03	67	0.58	36	68	0.59	36				
	Super Low	447	5.01	31	0.33	35	39	0.38	35				

Note: Entering Dry-bulb air temperature & Web-bulb air temperature EDB/ EWB=27/19.5℃.
Entering water temperature & Leaving water temperature EWT/ LWT=7/12℃.
Other design conditions can be generated from Trane Topss selection program.

Performance Data

3 Row Coil

Model	Fan Speed	DCBL Airflow	Cooling Cap.	Normal Static Pressure			High Static Pressure			Water flow	WPD	Motor Qty.	Fan Qty.
				DCBL Power	DCBL Current	DCBL Noise	DCBL Power	DCBL Current	DCBL Noise				
		CFM	kW	w	A	dB(A)	w	A	dB(A)	l/s	kPa		
02	Super High	224	2.45	17.2	0.09	35	38.6	0.19	40	0.108	10	1	1
	High	200	2.10	14.2	0.08	34	33.2	0.17	39				
	Medium	153	1.63	9.2	0.05	25	25.4	0.13	35				
	Low	112	1.21	8.4	0.05	21	15	0.08	26				
	Super Low	94	1.16	8.4	0.05	21	11.6	0.06	25				
03	Super High	341	4.02	18.2	0.11	32	42.6	0.21	41	0.172	33	1	2
	High	300	3.41	15.2	0.11	31	39.2	0.19	40				
	Medium	224	2.67	10.2	0.09	21	29.4	0.15	33				
	Low	153	1.98	9.4	0.09	20	17	0.11	24				
	Super Low	135	1.91	9.4	0.09	20	11.6	0.10	23				
04	Super High	459	4.91	37.2	0.19	37	55.3	0.29	44	0.209	19	1	2
	High	400	4.12	35.5	0.18	36	50	0.27	43				
	Medium	288	3.30	18.4	0.12	27	28	0.17	35				
	Low	200	2.56	13.9	0.10	21	17	0.13	25				
	Super Low	182	2.43	11.8	0.10	20	13.5	0.12	24				
05	Super High	571	6.10	49.1	0.24	41	62.5	0.33	45	0.256	27	1	2
	High	500	5.06	46.1	0.22	40	59	0.32	44				
	Medium	394	4.31	25.2	0.14	34	37.5	0.21	37				
	Low	253	3.19	15.6	0.11	33	22	0.15	29				
	Super Low	229	3.07	13.4	0.10	30	13.5	0.12	28				
06	Super High	688	7.06	65.7	0.31	43	68	0.38	45	0.299	38	1	2
	High	600	5.99	60	0.28	42	66	0.36	44				
	Medium	418	4.79	27	0.15	31	46	0.28	38				
	Low	282	3.63	17.5	0.11	24	22	0.15	31				
	Super Low	229	3.18	14.2	0.10	24	13.5	0.12	30				
08	Super High	894	8.36	78.7	0.70	45	113.8	0.91	48	0.368	22	2	3
	High	800	7.33	75.8	0.68	44	102.8	0.85	47				
	Medium	600	6.16	48.8	0.50	36	71.2	0.66	41				
	Low	418	4.69	30.4	0.37	29	47.3	0.48	35				
	Super Low	341	3.89	23.6	0.32	28	26.3	0.34	34				
10	Super High	1124	10.83	94.2	0.73	44	139.8	0.97	50	0.459	28	2	4
	High	1000	9.19	82.8	0.69	44	127.8	0.92	49				
	Medium	741	7.71	53.5	0.50	35	84.7	0.68	41				
	Low	500	5.79	32.2	0.39	24	49.8	0.47	32				
	Super Low	429	5.35	22.5	0.33	24	32.4	0.37	31				
12	Super High	1329	12.76	132.8	0.95	49	184.2	1.23	52	0.539	38	2	4
	High	1200	10.75	120.9	0.91	48	161.2	1.05	51				
	Medium	982	9.46	84.8	0.70	41	118.5	0.88	46				
	Low	676	7.42	52.3	0.50	32	72.3	0.62	38				
	Super Low	459	5.97	26.3	0.36	31	36.8	0.40	37				
14	Super High	1506	14.36	165.8	1.16	50	222	1.42	55	0.625	49	2	4
	High	1400	12.43	150	1.07	50	202	1.35	54				
	Medium	1053	10.81	97	0.77	43	131.4	0.97	46				
	Low	765	8.94	68.4	0.59	36	68.9	0.60	36				
	Super Low	459	6.17	32.2	0.35	35	40	0.39	35				

Note: Entering Dry-bulb air temperature & Web-bulb air temperature EDB/ EWB=27/19.5℃.
Entering water temperature & Leaving water temperature EWT/ LWT=7/12℃.
Other design conditions can be generated from Trane Topss selection program.

Performance Data

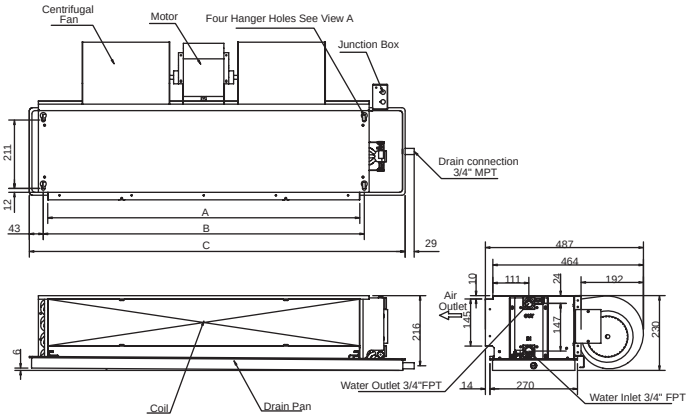
4 Row Coil

Model	Fan Speed	DCBL Airflow	Cooling Cap.	Normal Static Pressure			High Static Pressure			Water flow	WPD	Motor Qty.	Fan Qty.
				DCBL Power	DCBL Current	DCBL Noise	DCBL Power	DCBL Current	DCBL Noise				
		CFM	kW	w	A	dB(A)	w	A	dB(A)	l/s	kPa		
02	Super High	200	2.76	17	0.09	35	39	0.20	40	0.122	17	1	1
	High	176	2.37	14	0.08	34	34	0.17	39				
	Medium	141	1.84	9	0.05	25	26	0.13	35				
	Low	100	1.37	8	0.05	21	16	0.08	26				
	Super Low	88	1.33	8	0.05	21	12	0.06	25				
03	Super High	312	4.37	18	0.11	32	43	0.21	41	0.192	56	1	2
	High	276	3.72	15	0.11	31	40	0.20	43				
	Medium	200	2.91	10	0.09	21	30	0.16	33				
	Low	135	2.23	9	0.09	20	18	0.12	24				
	Super Low	129	2.13	9	0.09	20	12	0.10	23				
04	Super High	424	5.41	37	0.19	37	56	0.30	44	0.226	13	1	2
	High	365	4.39	36	0.18	36	51	0.27	43				
	Medium	265	3.52	19	0.12	27	29	0.17	35				
	Low	176	2.73	14	0.10	21	17	0.13	25				
	Super Low	171	2.54	12	0.10	20	14	0.12	24				
05	Super High	535	6.83	49	0.24	41	63	0.33	45	0.281	19	1	2
	High	453	5.45	46	0.22	40	60	0.32	44				
	Medium	359	4.64	25	0.14	34	38	0.21	37				
	Low	224	3.44	16	0.11	33	22	0.15	29				
	Super Low	218	3.30	14	0.10	30	14	0.12	28				
06	Super High	647	7.99	66	0.31	43	69	0.38	45	0.336	29	1	2
	High	547	6.53	60	0.28	42	67	0.36	44				
	Medium	382	5.23	27	0.15	31	47	0.28	38				
	Low	253	3.91	18	0.11	24	22	0.15	31				
	Super Low	218	3.35	14	0.10	24	14	0.12	30				
08	Super High	835	9.34	79	0.70	45	115	0.92	48	0.407	13	2	3
	High	729	7.90	76	0.68	44	104	0.86	47				
	Medium	541	6.64	49	0.50	36	72	0.67	41				
	Low	371	5.05	31	0.37	29	48	0.49	35				
	Super Low	324	3.97	24	0.32	28	27	0.35	34				
10	Super High	1059	12.27	94	0.73	45	141	0.98	50	0.516	20	2	4
	High	906	10.00	83	0.69	44	129	0.93	49				
	Medium	671	8.40	54	0.50	35	86	0.69	41				
	Low	447	6.30	32	0.39	24	51	0.48	32				
	Super Low	406	5.64	23	0.33	24	33	0.38	31				
12	Super High	1253	14.57	133	0.95	49	185	1.24	52	0.609	28	2	4
	High	1082	11.81	121	0.91	48	162	1.05	51				
	Medium	888	10.39	85	0.70	41	120	0.89	46				
	Low	606	8.05	53	0.50	32	73	0.63	38				
	Super Low	435	6.30	27	0.36	31	38	0.41	37				
14	Super High	1418	16.43	166	1.16	51	223	1.43	55	0.704	40	2	4
	High	1271	13.66	150	1.07	50	203	1.36	54				
	Medium	953	11.88	97	0.77	43	132	0.98	46				
	Low	682	9.83	69	0.59	36	70	0.61	36				
	Super Low	435	6.49	32	0.35	35	41	0.40	35				

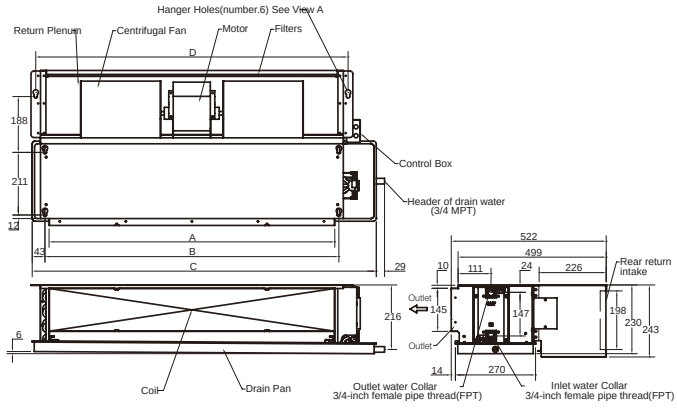
Note: Entering Dry-bulb air temperature & Web-bulb air temperature EDB/ EWB=27/19.5℃.
Entering water temperature & Leaving water temperature EWT/ LWT=7/12℃.
Other design conditions can be generated from Trane Topss selection program.

Dimensions and Weight

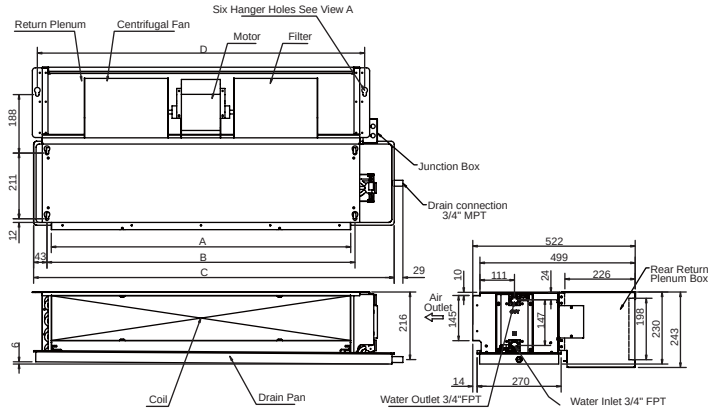
DCBL Standard Unit



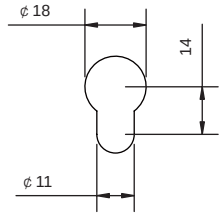
DCBL Bottom Return Plenum and Filter



DCBL Rear Return Plenum and Filter



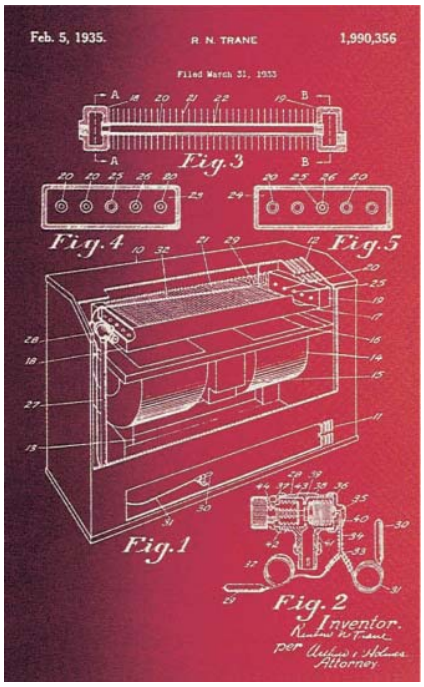
View A



Note:
1.Dimension in mm.
2.Above shown with right hard coil connection
3.Wiring connection is located at the same side as coil and drain connections.
4.Wiring and junction box will be supplied by Trane.

Unit Model	Dimension (mm)				Motor Qty.	Fan Qty.	Net Weight (kg) without Plenum Box and Filter			Net Weight (kg) with Plenum Box and Filter		
	A	B	C	D			2 Row	3 Row	4 Row	2 Row	3 Row	4 Row
HFCF02	458	485	648	547	1	1	13	14	15	16	17	18
HFCF03	693	720	883	782	1	2	17	19	21	21	24	25
HFCF04	793	820	983	882	1	2	18	20	22	22	25	26
HFCF05	913	940	1103	1002	1	2	20	22	24	24	28	28
HFCF06	963	990	1153	1052	1	2	21	23	25	25	29	29
HFCF08	1243	1270	1433	1332	2	3	29	31	33	35	38	39
HFCF10	1493	1520	1683	1582	2	4	32	35	38	39	43	45
HFCF12	1663	1690	1853	1752	2	4	36	39	42	44	49	50
HFCF14	1793	1820	1983	1882	2	4	38	41	44	46	51	52

The Trane Fan Coil...
...Invented by Trane
...Perfected by Trane



Since 1885, Trane has been at the technological forefront of air conditioning. The company's pioneering spirit, commitment to research and pursuit of quality have made it a world leader in the manufacture of water chillers.

Over 70 years ago Trane produced the first fan coil unit and in so doing created a product which is now built worldwide. The universal acceptance of this product has prompted Trane to focus the same engineering experience to the fan coil as given to the refrigeration products.

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For more information, contact your local Trane office or e-mail us at comfort@trane.com