INSTALLATION, OPERATION & MAINTENANCE MANUAL

CONCEALED CHILLED WATER FAN COIL UNITS 'DWL' SERIES

Part Number: 800-213-51 (Rev.-01)

INDEX

CONTINUING RESEARCH RESULTS IN STEADY IMPROVEMENTS.
THEREFORE, THESE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

GENERAL INFORMATION

Thank you for your purchase of this equipment from the COOLINE Air Conditioners. We trust that this unit will provide you with the proper Cooling/Heating requirements for years to come.

However, we would suggest that you read carefully this manual before you proceed with the installation and operation of this equipment and follow the instructions for a safe, trouble free operation.

This unit has been tested to the extremes in terms of working conditions and successfully passed all the requirements of quality, safety and performance.

WARRANTY TERMS

All of the DWL series of indoor fan coil (concealed) units are covered by the standard warranty terms against any manufacturer defect. Should you encounter any problem that falls under the warranty terms please contact your nearest COOLINE representative.

INSPECTION PROCEDURES

The moment you receive this unit, check the packaging carton for any visible damage due to shipment and mishandling. If you suspect any damage to the unit please call your nearest COOLINE representative.

After you open the carton, make sure that there is no visible damage to the body. Check the condition of the protective Styrofoam. Manually rotate the blower wheels to make sure that it is running freely.

Inside every DWL packaging you will find:

- DWL Concealed FCU 1 No
- Service Manual 1 No

WARNING:
Electric shock hazard and / or serious injury from rotating parts can result from improper handling and servicing. Only skilled and trained technicians should attempt at installing and servicing these units.

CAUTION:
Improper handling and operating procedures might adversely affect the proper functioning of the unit. Please read carefully this manual before operating the unit.

MODEL DECODING

1, 2 & 3 BASIC (SERIES)	4 & 5 SIZE (x 100 CFM)	6 ELECTRICAL SUPPLY (V-Ph-Hz)	7 COIL	8 HEATER	9 ACCESSORIES	10 FIN	11 COIL CONNECTION	12 FILTER	13 OPTION
DWL : COOLINE CHILLED WATER FAN COIL UNIT	02 03 04 06 08	**B** : 220/240-1-50	**A** : 3 ROW CHILLED WATER **J** : 3 ROW CHILLED WATER + 1 ROW HEAT	**N** : NO HEATER **D** : 2 kW **E** : 3 kW **G** : 5 kW	**N** : STANDARD **A** : 3C VALVE PACKAGE (COOL ONLY) **B** : 3D VALVE PACKAGE (COOL ONLY) **J** : 4C VALVE PACKAGE (HEAT & COOL) **K** : 4D VALVE PACKAGE (HEAT & COOL)	**A** : ALUMINUM FIN **B** : COATED ALUMINUM FIN **C** : COPPER FIN	**R** : RH SIDE, STANDARD (FACING AIR DIS-CHARGE) **L** : LH SIDE, OPTIONAL (FACING AIR DIS-CHARGE)	**N** : NONE **A** : ALUMINUM (1/2" THICK)	**N** : STANDARD UNIT
	10 12			**N** : NO HEATER **E** : 3 kW **G** : 5 kW **J** : 7 kW **M** : 10 kW					
	14 16 18 20		**B** : 4 ROW CHILLED WATER **K** : 4 ROW CHILLED WATER + 1 ROW HEAT						

OPTIONS

ELECTRIC HEATERS

The heater element is of the resistance open coil type. Thermal overheat cut-outs and fusible links are provided to shut-off power to heaters in case of airflow failure. The heaters are available as an option and can be installed at the blower outlet.

VALVE PACKAGES

A variety of valve packages, as a set are available as an option (3C & 3D for two pipe system and 4C & 4D for four pipe systems). These valves are supplied loose for field installations.

THERMOSTAT

An attractive wall mount three speed thermostat with all required functions and features for safe and smooth operation which can be used for cooling & heating. This thermostat can be supplied loose through separate Kit number.

TYPICAL THERMOSTAT

INSTALLATION PROCEDURES

A. Location of Indoor units

The Indoor FCU should be ideally located in a plenum or false ceiling clearance/cavity near the conditioned area where the access to the chilled water piping connection is easy.

Position the FCU in a way to avoid obstruction to return airflow, supply air, electrical cable connections, condensate drain pipe and chilled water piping.

The required clearances are shown in figure-1. (All dimensions are in cm).

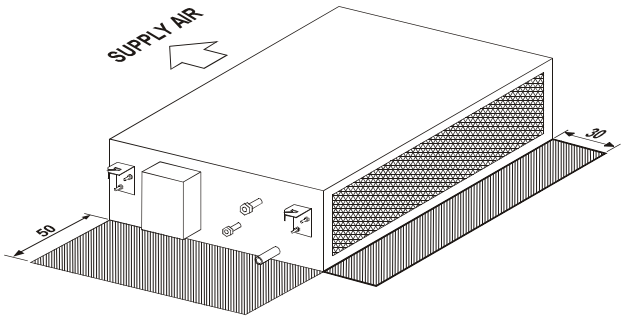


FIGURE - 1
REQUIRED INDOOR UNIT CLEARANCES

B. Site Preparation

The site for the FCU installation should be free from any obstacle that can be hazardous to the installation personnel and/or damaging to the unit.

Properly identify all existing building utilities (such as electrical cables, plumbing pipes, sanitary hardware, etc.).

Make sure that live electrical cables are not hanging or running near the FCU proposed location or obstructing in any way the movement of the installation personnel.

Clear the floor from all objects with sharp edges.

Remove liquid or slippery material from the installation site before proceeding.

C. Indoor unit installation

Cut the top carton panel and mark it with a sketch simulating the FCU. Use it as a template for positioning the unit and the corresponding mounting brackets hole/slot.

- Put the template against the ceiling and mark the corners. Make sure that you leave at least 30 cm. clearance from the rear and anther 50 cm. from the right hand side of the unit (when looking at the unit from the supply side) as shown in figure-1.
- Mark the 4 holes.
- Drill those 4 holes. Insert the threaded rods using anchor bolts (8 mm).
- Fit and tighten the nuts at the loose end of each threaded rod as per the arrangement show in figure- 2.
- Lift the FCU unit and insert the threaded rods into the mounting bracket slots. Let it rest on the lower nut/washer.
- After you complete the electrical connections (see corresponding sections (Electrical Wiring and Thermostat Installation and Connection)), level the FCU and press it against the ceiling (ensuring to separate it from the ceiling by inserting rubber cork pieces) by further tightening action of the lower nut(s). For added security counter tighten the upper nut as shown in figure-3. Cut the extra length of the threaded rod and round the edges.

  Note: Always leave 7 to 8 cm extra length in the threaded rod below the lower nut/washer.

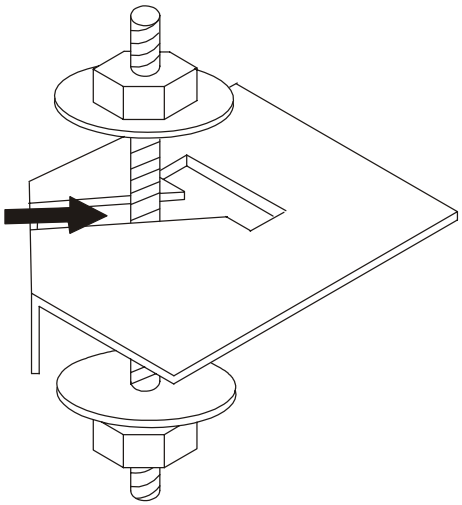


FIGURE - 2

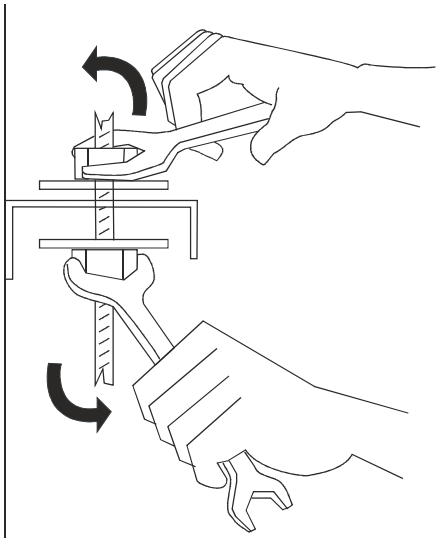


FIGURE - 3

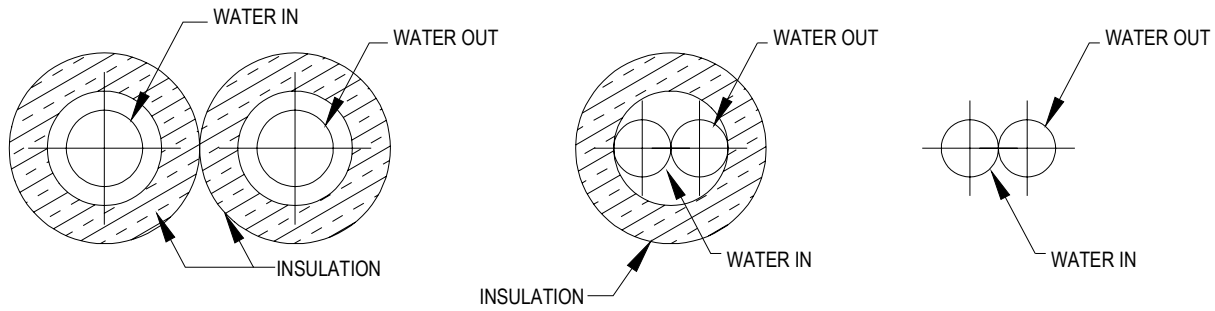
D. Piping connection

MODEL NUMBER	SWEAT CONNECTION	
	WATER INLET	WATER OUTLET
DWL 02	1/2"	1/2"
DWL 03	1/2"	1/2"
DWL 04	1/2"	1/2"
DWL 06	1/2"	1/2"
DWL 08	1/2"	1/2"
DWL 10	1/2"	1/2"
DWL 12	1/2"	1/2"
DWL 14	1/2"	1/2"
DWL 16	1/2"	1/2"
DWL 18	1/2"	1/2"
DWL 20	1/2"	1/2"

Note: The water lines must be installed level in both the horizontal & vertical plane.

Insulation of pipes

The pipe insulation should cover both inlet & outlet pipes as shown below.



YES **NO** **NO**

E. Condensate Drain connection

- Use PVC Class 3 material for the condensate drain piping (3/4") as per figure-4.
- Provide a "P" trap immediately at the condensate drain connection.
- Run your piping avoiding bends and elbows.
- Pitch the piping away from the unit with 2/100 slope.
- If the pipe is routed though a room (or an unconditioned space) insulate to avoid condensation on its outer walls.

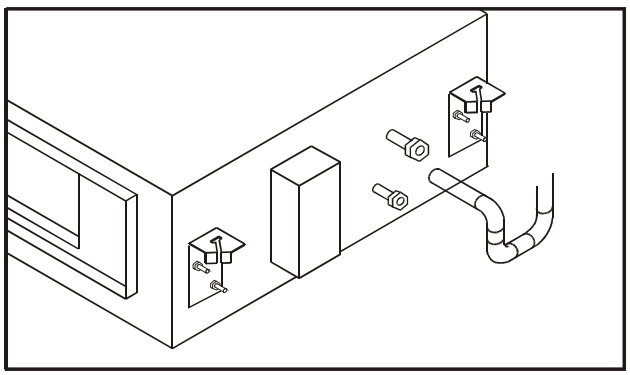
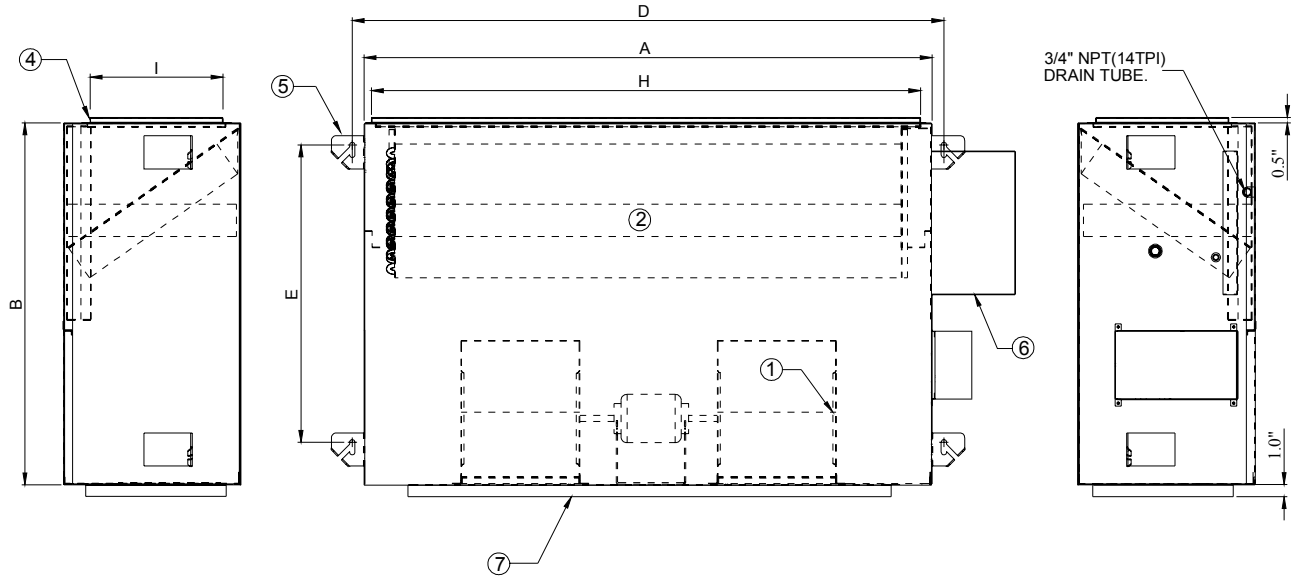


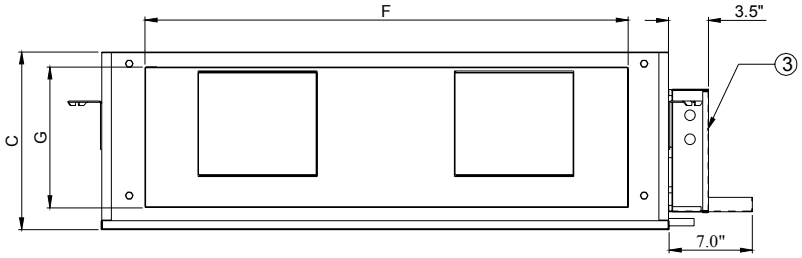
FIGURE - 4

DIMENSIONS

MODELS: DWL02 - DWL20



END VIEW **TOP VIEW** **END VIEW**



FRONT VIEW

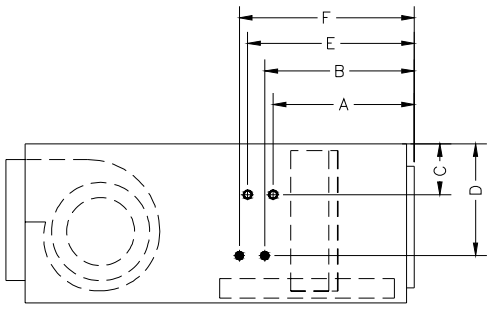
NOTE: All dimensions are in mm (dimensions in brackets are in inches).

MODEL	DIMENSIONS								
	A	B	C	D	E	F	G	H	I
DWL02	805 (31.7)	520 (20.5)	246 (9.7)	863 (34)	444 (17.5)	696 (27.4)	183 (7.2)	736 (29)	208 (8.2)
DWL03	805 (31.7)	520 (20.5)	246 (9.7)	863 (34)	444 (17.5)	696 (27.4)	183 (7.2)	736 (29)	208 (8.2)
DWL04	805 (31.7)	520 (20.5)	246 (9.7)	863 (34)	444 (17.5)	696 (27.4)	183 (7.2)	736 (29)	208 (8.2)
DWL06	904 (35.6)	610 (24)	244 (9.6)	960 (37.8)	521 (20.5)	769 (30.3)	183 (7.2)	841 (33.1)	206 (8.1)
DWL08	904 (35.6)	610 (24)	244 (9.6)	960 (37.8)	521 (20.5)	769 (30.3)	183 (7.2)	841 (33.1)	206 (8.1)
DWL10	1011 (39.8)	762 (30)	318 (12.5)	1067 (42)	640 (25.2)	858 (33.8)	241 (9.5)	945 (37.2)	259 (10.2)
DWL12	1011 (39.8)	762 (30)	318 (12.5)	1067 (42)	640 (25.2)	858 (33.8)	241 (9.5)	945 (37.2)	259 (10.2)
DWL14	1011 (39.8)	762 (30)	318 (12.5)	1067 (42)	640 (25.2)	858 (33.8)	241 (9.5)	945 (37.2)	259 (10.2)
DWL16	1194 (47)	762 (30)	368 (14.5)	1245 (49)	625 (24.6)	894 (35.2)	266 (10.5)	1155 (45.5)	292 (11.5)
DWL18	1194 (47)	762 (30)	368 (14.5)	1245 (49)	625 (24.6)	894 (35.2)	266 (10.5)	1155 (45.5)	292 (11.5)
DWL20	1194 (47)	762 (30)	368 (14.5)	1245 (49)	625 (24.6)	894 (35.2)	266 (10.5)	1155 (45.5)	292 (11.5)

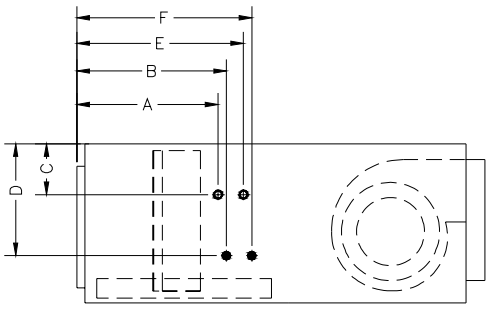
1. Blower & motor assembly
2. Cooling coil
3. Control box
4. Filter rack
5. Unit mounting brackets
6. Drip lip
7. Duct connector

DIMENSIONAL DATA - COIL CONNECTIONS

MODELS: DWL02, 03 & 04 (VERTICAL COIL)



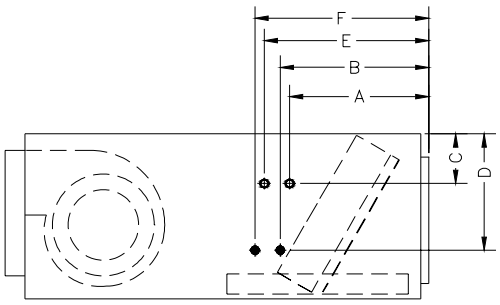
RH SIDE



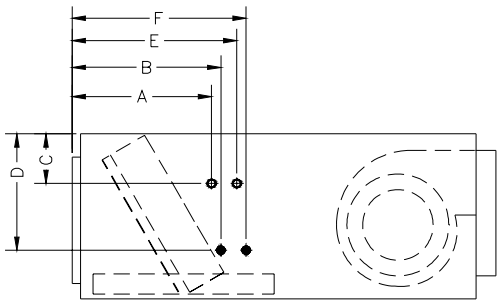
LH SIDE

● INLET
○ OUTLET

MODELS: DWL06 - DWL20 (INCLINED COIL)



RH SIDE



LH SIDE

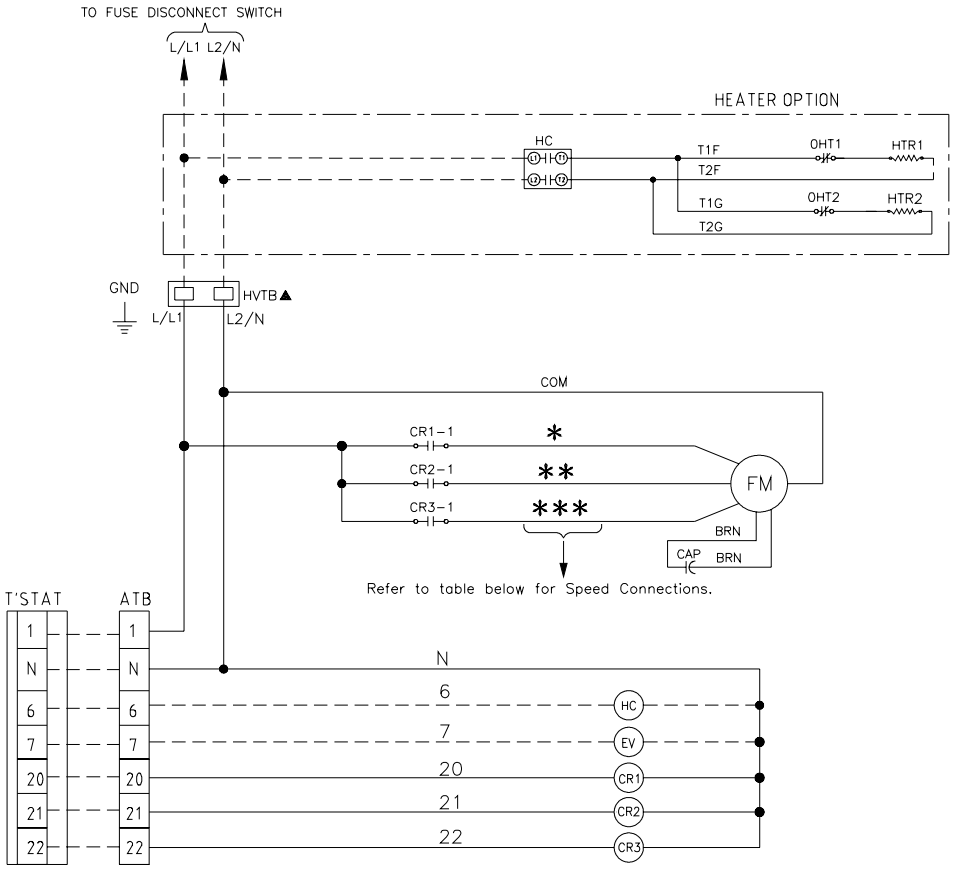
● INLET
○ OUTLET

MODEL	CHILLED WATER COIL					HOT WATER COIL		
	A	B	C	D	No. OF ROWS	E	F	No. OF ROWS
DWL02	225 (8.9)	237 (9.3)	32 (1.3)	176 (6.9)	3	264 (10.4)	275 (10.8)	1
DWL03	225 (8.9)	237 (9.3)	32 (1.3)	176 (6.9)	3	264 (10.4)	275 (10.8)	1
DWL04	225 (8.9)	237 (9.3)	32 (1.3)	176 (6.9)	3	264 (10.4)	275 (10.8)	1
DWL06	313 (12.3)	324 (12.8)	32 (1.3)	178 (7)	3	351 (13.8)	362 (14.3)	1
DWL08	313 (12.3)	324 (12.8)	32 (1.3)	178 (7)	3	351 (13.8)	362 (14.3)	1
DWL10	313 (12.3)	324 (12.8)	83 (3.3)	227 (8.9)	3	351 (13.8)	362 (14.3)	1
DWL12	313 (12.3)	324 (12.8)	83 (3.3)	227 (8.9)	3	351 (13.8)	362 (14.3)	1
DWL14	319 (12.6)	330 (13)	83 (3.3)	227 (8.9)	4	357 (14)	368 (14.5)	1
DWL16	376 (14.8)	389 (15.3)	129 (5)	273 (10.8)	4	414 (16.3)	427 (16.8)	1
DWL18	376 (14.8)	389 (15.3)	129 (5)	273 (10.8)	4	414 (16.3)	427 (16.8)	1
DWL20	376 (14.8)	389 (15.3)	129 (5)	273 (10.8)	4	414 (16.3)	427 (16.8)	1

NOTE: All dimensions are in mm (dimensions in brackets are in inches).

TYPICAL SCHEMATIC WIRING DIAGRAM

HEAT/COOL MODELS - ELECTRIC HEATER



LEGEND	
ATB	AUXILIARY TERMINAL BLOCK
CAP	CAPACITOR
CR	CONTROL RELAY
EV	ELECTRIC VALVE (COOLING)
FM	FAN MOTOR
GND	LUG GROUND
HC	HEATER CONTACTOR
HTR	HEATER
HVTB	HIGH VOLTAGE TERMINAL BLOCK
L/L1	LINE OR LINE 1
L2/N	LINE 2 OR NEUTRAL
OHT	OVER HEAT THERMOSTAT
- - -	FIELD WIRING
———	FACTORY WIRING

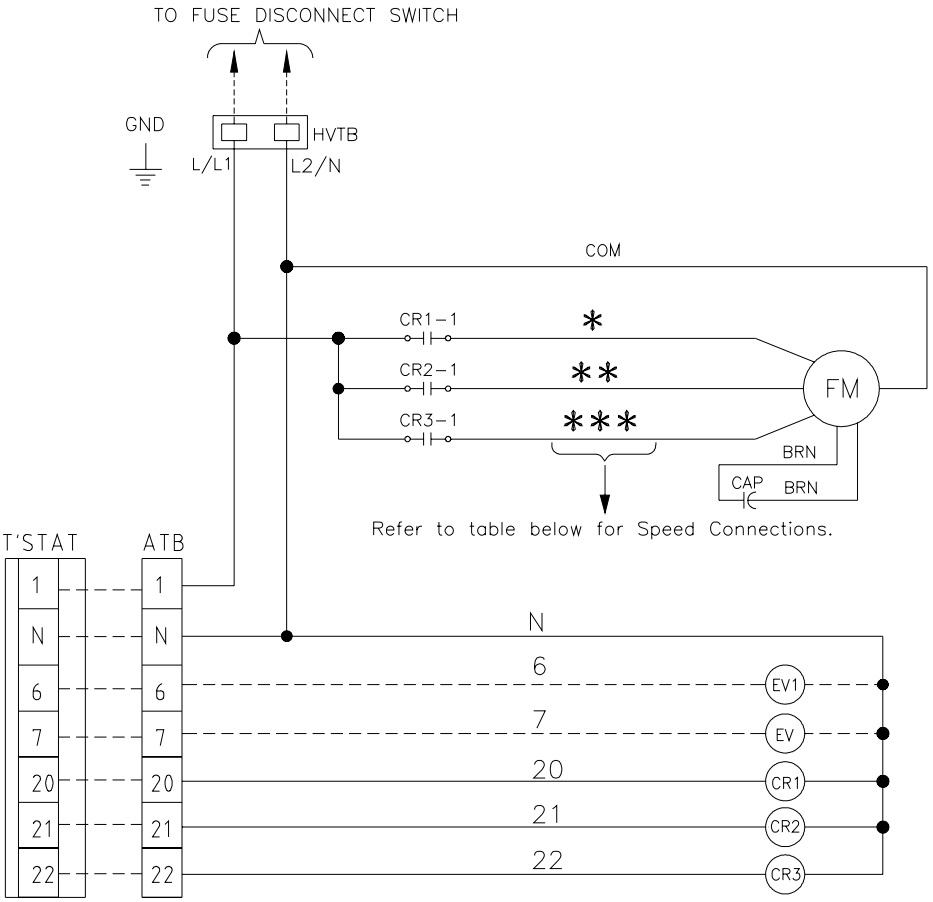
NOTES

1. POWER SUPPLY, 220/240V-1PH-50Hz.
2. MOTORS THERMALLY PROTECTED.
3. ▲ HVTB IS NOT REQUIRED FOR HEATER MODELS.
4. USE HEATER AS PER OPTION REQUIRED. IF EV & HEATERS ARE FACTORY INSTALLED, PLEASE READ DASHED LINE AS CONTINUOUS LINE.
5. USE COPPER CONDUCTORS ONLY.

FM SPEED CONNECTIONS								
SPEED	HI	MED-HI	MED	MED-LOW	LOW	LOWEST	COM	APPLICABLE FREQUENCY IN HERTZ
WIRE COLOR	BLK	VIO	BLU	ORN	RED	GRY	YEL	
MODEL								
DWL 02	—	—	—	***	**	*	—	50
DWL 03	—	—	***	**	*	—	—	50
DWL 04	***	**	*	—	—	—	—	50
DWL 06	—	***	**	*	—	—	—	50
DWL 08	***	**	*	—	—	—	—	50
DWL 10	—	***	**	*	—	—	—	50
DWL 12	***	**	*	—	—	—	—	50
DWL 14	***	**	*	—	—	—	—	50
DWL 16	—	***	**	*	—	—	—	50
DWL 18	***	**	*	—	—	—	—	50
DWL 20	***	**	*	—	—	—	—	50

TYPICAL SCHEMATIC WIRING DIAGRAM

HEAT/COOL MODELS - HOT WATER



LEGEND	
ATB	AUXILIARY TERMINAL BLOCK
CAP	CAPACITOR
CR	CONTROL RELAY
EV	ELECTRIC VALVE (COOLING)
EV1	ELECTRIC VALVE (HEATING)
FM	FAN MOTOR
GND	LUG GROUND
HVTB	HIGH VOLTAGE TERMINAL BLOCK
L/L1	LINE OR LINE 1
L2/N	LINE 2 OR NEUTRAL
- - -	FIELD WIRING
———	FACTORY WIRING

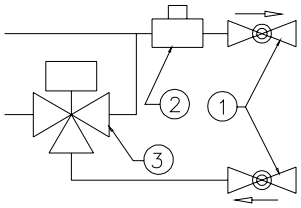
NOTES

1. POWER SUPPLY, 220/240V-1PH-50Hz.
2. MOTORS THERMALLY PROTECTED.
3. USE COPPER CONDUCTORS ONLY.
4. IF EV & EV1 ARE FACTORY INSTALLED, PLEASE READ DASHED LINE AS CONTINUOUS LINE.

FM SPEED CONNECTIONS								
SPEED	HI	MED-HI	MED	MED-LOW	LOW	LOWEST	COM	APPLICABLE FREQUENCY IN HERTZ
WIRE COLOR	BLK	VIO	BLU	ORN	RED	GRY	YEL	
MODEL								
DWL 02	—	—	—	***	**	*	—	50
DWL 03	—	—	***	**	*	—	—	50
DWL 04	***	**	*	—	—	—	—	50
DWL 06	—	***	**	*	—	—	—	50
DWL 08	***	**	*	—	—	—	—	50
DWL 10	—	***	**	*	—	—	—	50
DWL 12	***	**	*	—	—	—	—	50
DWL 14	***	**	*	—	—	—	—	50
DWL 16	—	***	**	*	—	—	—	50
DWL 18	***	**	*	—	—	—	—	50
DWL 20	***	**	*	—	—	—	—	50

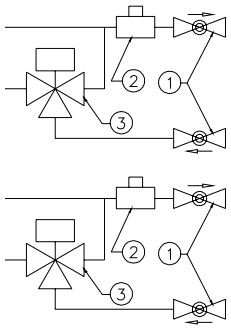
VALVE PACKAGES

VALVE PACKAGE 3-C (for 2-pipe)



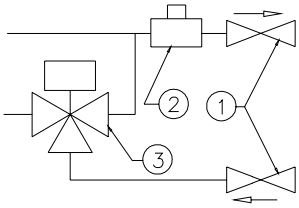
1. Two compression stop valves
2. One balancing valve
3. One 3-way motor valve

VALVE PACKAGE 4-C (for 4-pipe)



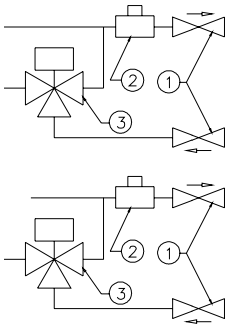
1. Four compression stop valves
2. Two balancing valves
3. Two 3-way motor valves

VALVE PACKAGE 3-D (for 2-pipe)

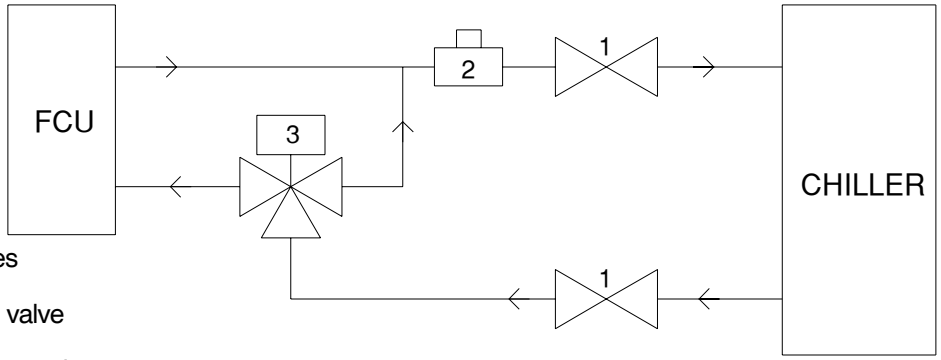


1. Two gate shut off valves
2. One balancing valve
3. One 3-way motor valve

VALVE PACKAGE 4-D (for 4-pipe)



1. Four gate shut off valves
2. Two balancing valves
3. Two 3-way motor valves



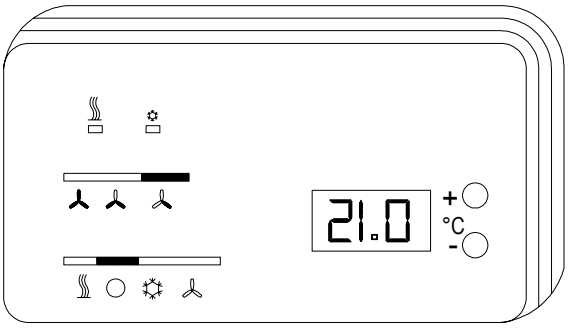
1. Two gate valves
2. One balancing valve
3. One 3-way motor valve

PARTS LIST

DESCRIPTION	MODEL NUMBER				
	DWL02/03/04	DWL06/08	DWL10/12/14	DWL16/18	DWL20
FAN DECK ASSEMBLY	800-089-75	800-089-71	800-089-72	800-089-73	800-089-76
BLOWER MOTOR	800-547-55	800-547-51	800-547-52	800-547-53	800-547-56
BLOWER WHEEL	800-711-50	800-711-51	800-711-52	800-711-53	800-711-53
VALVE PACKAGE (3C)	700-362-51	700-362-51	700-362-51	700-362-51	700-362-51
VALVE PACKAGE (3D)	700-364-81	700-364-81	700-364-81	700-364-81	700-364-81
RETURN AIR FILTERS	800-249-43	800-249-39	800-249-38	800-249-36	800-249-36
THERMOSTAT	800-646-20	800-646-20	800-646-20	800-646-20	800-646-20

NOTE: For 4C & 4D type valve package, order 2 x 3C & 2 x 3D valve packages.

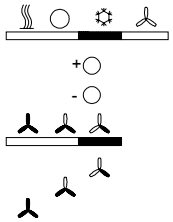
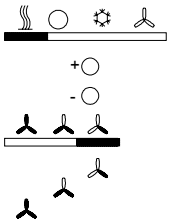
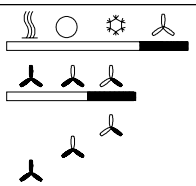
THERMOSTAT OPERATION & SPECIFICATION DATA



OPERATING INSTRUCTIONS

SYMBOL	FUNCTION
◯ →	OFF mode switch position
✲ →	COOL mode switch position
→	FAN mode switch position
→	HEAT mode switch position
+◯ →	Temperature set button (increasing)
-◯ →	Temperature set button (decreasing)
→	LOW fan speed switch position
→	MEDIUM fan speed switch position
→	HIGH fan speed switch position

OPERATING PROCEDURE

SWITCH POSITION	FUNCTION
	COOLING MODE - Position the switch S1 to COOL mode function. - Set desired temperature setting by pressing the (+) or (-) button to increase or decrease the set value displayed on the LCD of the thermostat . - Fan speeds can be selected by positioning the switch S2 to: LOW speed MEDIUM speed HIGH speed
	HEATING MODE - Position the switch S1 to HEAT mode function. - Set desired temperature setting by pressing the (+) or (-) button to increase or decrease the set value displayed on the LCD of the thermostat . - Fan speeds can be selected by positioning the switch S2 to: LOW speed MEDIUM speed HIGH speed
	FAN MODE - Position the switch S1 to FAN mode function. - Fan speeds can be selected by positioning the switch S2 to: LOW speed MEDIUM speed HIGH speed
	UNIT OFF - Position the switch S1 to OFF position to turn off the unit.

Notes:

1. Start-up display: When power is supplied to the thermostat, the LCD indicates a flashing display of the standard set point value. Press the (+) & (-) button at the same time to change the display to ambient temperature.
2. Set point adjustment: When the (+) or (-) button is pressed, the thermostat assumes the temperature set point setting mode and the present set point is displayed. The displayed set point can now be adjusted in 0.5K steps to the required value. After 3 seconds (approx.) the actual temperature will then be displayed.

PRODUCT DATA

Part Number : 800-646-20
Switches : Fan speed high/med/low
Heat/Fan/Cool/Off
Outputs : Heat
Cool
Fan speed high/med/low
Inputs : Remote sensor (optional)

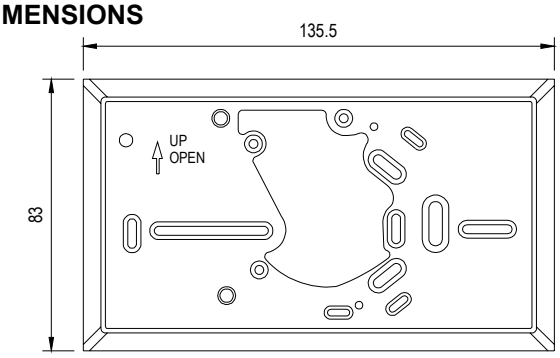
TECHNICAL DATA

Operating voltage	: 230V + 10%; AC 50/60 Hz
Operating ambient	: 0°C to 40°C
Temperature range	: 5°C to 30°C
Selectivity of set value	: 0.5K
Display range (actual value)	: 0... + 40°C
Selectivity of actual value	: 0.1K
Hysteresis	: ~0.5K
Switching current at 250 VAC	: 3 (2)A
Maximum fan current	: 6 (3)A
Sensor system	: NTC (in housing)
	Optional Remote Sensor 193720
Switches	: Heat/Off/Cool/Fan
	3 Fan Speed
Indicator lamps	: Cool/Heat

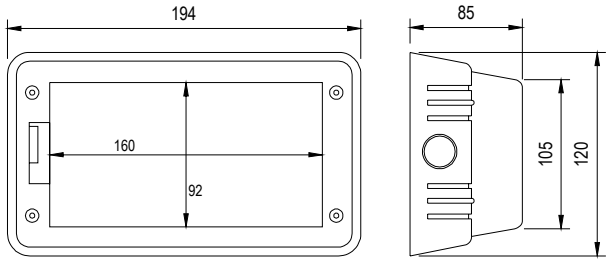
PHYSICAL DATA

Color : Polar white
Material : ABS plastic
Protection class : IP30 Plastic
Weight : 130 grams
Accessories : Base plate and screws
Option : Transparent wall mounted housing, lockable with ventilation slit.

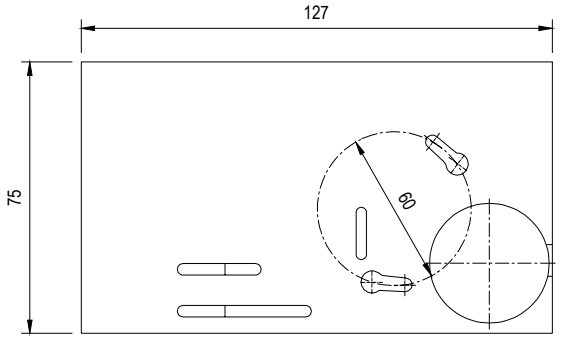
DIMENSIONS



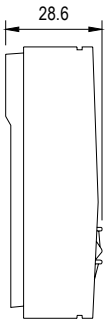
BASE PLATE



HOUSING PROTECTION (OPTIONAL)



THERMOSTAT



NOTE: All dimensions are in mm.

INSTALLATION

The complete shipment should be inspected for damage. Any damage, visible or concealed, should be reported immediately to the delivery man or driver and noted on the shipping invoice.

Place unit in position and make sure that unit is level. This is important to assure proper drainage and operation. Slots provided in the mounting brackets should be used for installing the units.

ELECTRICAL

Please ensure power supply (V-Ph-Hz) to the unit is as per unit nameplate requirements.

Caution: Operation of the unit on improper power supply will result in damage to the unit.

Warning: Before installation or servicing, always TURN OFF all power to the unit. There may be more than one disconnect switch. Ensure all of them are turned off.

GROUND & POWER WIRES

Connect power wires as per wiring diagram. Connect ground wire to the ground lug inside the control box.

MAINTENANCE

COIL

Coil may be cleaned by removing and brushing between fins with a stiff wire brush. Brushing should be followed by cleaning with vacuum cleaner. The coil may also be cleaned by using a high pressure air, if compressed air source is available. It should be pointed out that if air filters are used and periodically cleaned, the coils will not be clogged up prematurely.

DRAIN PIPE

Drain pipe should be checked before summer operation of unit. If it is clogged, steps should be taken to clear the debris so that condensate will flow out easily. A standard pipe cleaner for 1/2" ID pipe may be used. Periodic checks of the drain pipe should be taken during summer operation, as there is a possibility of it becoming clogged with dirt.

FILTER CLEANING

Remove access panel, slide filter out of filter rack, and clean as follows:

Tap filter on solid surface to dislodge heavy particles. Wash under stream of hot water. If filter has been put to exceptional service, a mild solution of Sal-Soda, Tri-Sodium Phosphate or any other commercial solvent can be used. Set filter on end with slots in frame down, which allows it to drain. Filters should dry thoroughly before reuse.

REPLACEMENT PARTS

When writing for replacement parts, refer to model number and serial number on the nameplate of the unit.

ROUTINE/PREVENTIVE MAINTENANCE

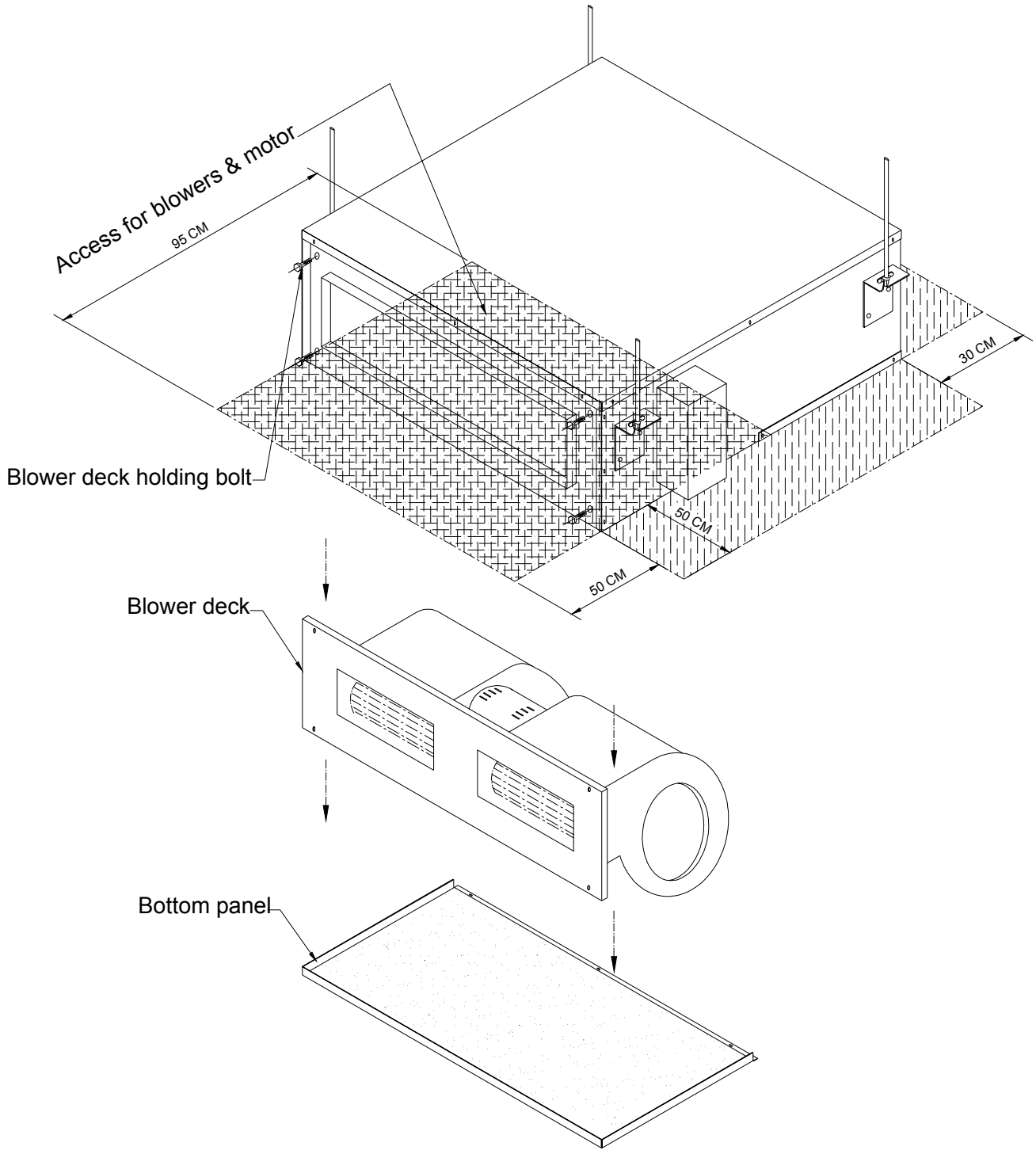
- Clean the thermostat box with a dry soft cloth.
- Remove the filter by either:
    a) Swinging away the knuckles on top of the filter rack then lifting the filter from the lower rack.
    b) Swinging away the knuckles on top of the filter rack then sliding the filter sideways.
    c) Clean the filter by a jet of air in the reverse return air direction.
    d) Inspect the condensate pipe for clogging.

SAFETY INSTRUCTIONS

Warning: Before you attend to any routine maintenance, make sure that the electrical power is disconnected.

- Avoid spilling any liquid on the thermostat
- Always allow for 1 to 2 minutes before activating different commands.

SERVICING INSTRUCTIONS



Note:

1) Required indoor unit access clearances are shown as hatched area.
2) Free sevice access should be available from the bottom of the unit for removing & servicing the blower/motor deck.
3) Servicing instructions:
   a) Remove the bottom panel.
   b) Support the blower deck while unscrewing the 4 blower deck holding bolts and bring down the blower deck.