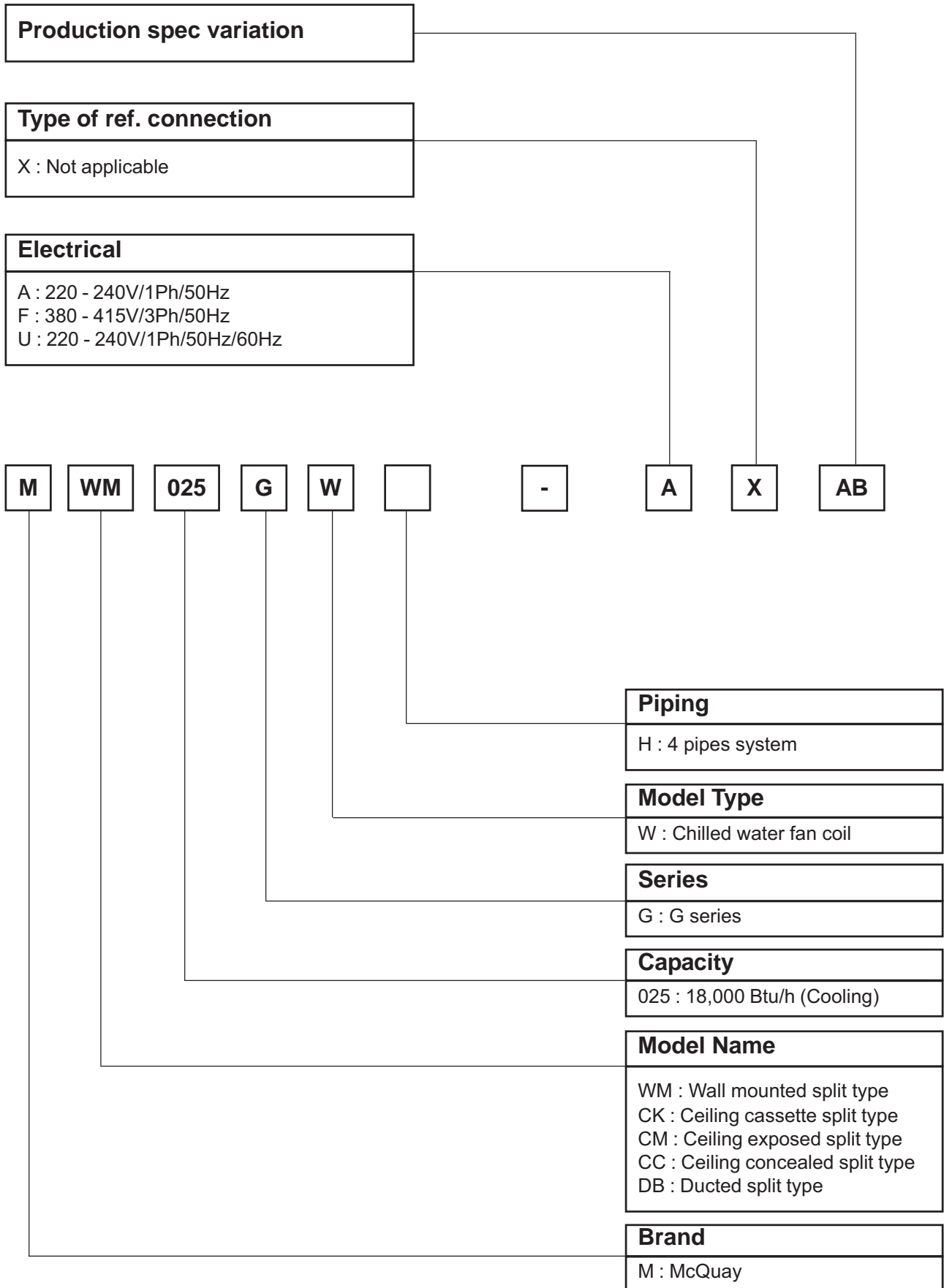


# Nomenclature



# Product Line-Up

## MCM-DW/CBW/EW Product Line-Up

Model Name		Nomenclature	Classification									
			Control				Handset				Marking	Connection
			W2.0 UCW	W/out Control	Valve/Valveless	Cool/Heat	G7 Cooling Handset	G7 Heatpump Handset	SLM 3 (Heat pump)	NETWARE 3 (Cool/Heat)	CE mark	3/4" BSP (female) brass union
MCM	020DW	AXCC	x		x	x	x				x	x
		AXCD	x		x	x		x			x	x
		AXCE	x		x	x			x		x	x
		AXCF	x		x	x			x		x	x
	AXCG		x	x						x	x	
	025DW	AXCC	x		x	x	x				x	x
		AXCD	x		x	x		x			x	x
		AXCE	x		x	x			x		x	x
		AXCF	x		x	x			x		x	x
		AXCG		x	x						x	x
	030DW	AXCC	x		x	x	x				x	x
		AXCD	x		x	x		x			x	x
		AXCE	x		x	x			x		x	x
		AXCF	x		x	x			x		x	x
		AXCG		x	x						x	x
	040DW	AXCC	x		x	x	x				x	x
		AXCD	x		x	x		x			x	x
		AXCE	x		x	x			x		x	x
		AXCF	x		x	x			x		x	x
		AXCG		x	x						x	x
	050DW	AXCC	x		x	x	x				x	x
		AXCD	x		x	x		x			x	x
		AXCE	x		x	x			x		x	x
		AXCF	x		x	x			x		x	x
		AXCG		x	x						x	x
	007CBW	UXBD	x		x	x	x				x	x
		UXBE	x		x	x		x			x	x
	010CBW	UXBD	x		x	x	x				x	x
		UXBE	x		x	x		x			x	x
	015CBW	UXBD	x		x	x	x				x	x
		UXBE	x		x	x		x			x	x
	015EW	AXAA	x		x	x		x			x	x
		AXAB	x		x	x	x				x	x
	020EW	AXAA	x		x	x		x			x	x
		AXAB	x		x	x	x				x	x
	025EW	AXAA	x		x	x		x			x	x
		AXAB	x		x	x	x				x	x

# Application Information

## General Installation Guide

### System Configuration

The standard controller board (W2) comes with a VALVE jumper and a HEAT jumper. The system can be configured as the jumper selection listed below:

	HEAT Jumper	VALVE Jumper
Heatpump Mode & Valve Application	√	√
Heatpump Mode & Valveless Application	√	X
Cooling Mode & Valve Application	X	√
Cooling Mode & Valveless Application	X	X

√ Jumper Remained

X Jumper Removed

### CAUTION !

Disconnect the power supply to the unit before attempting to connect the wiring

### VALVE & HEAT Jumper Location

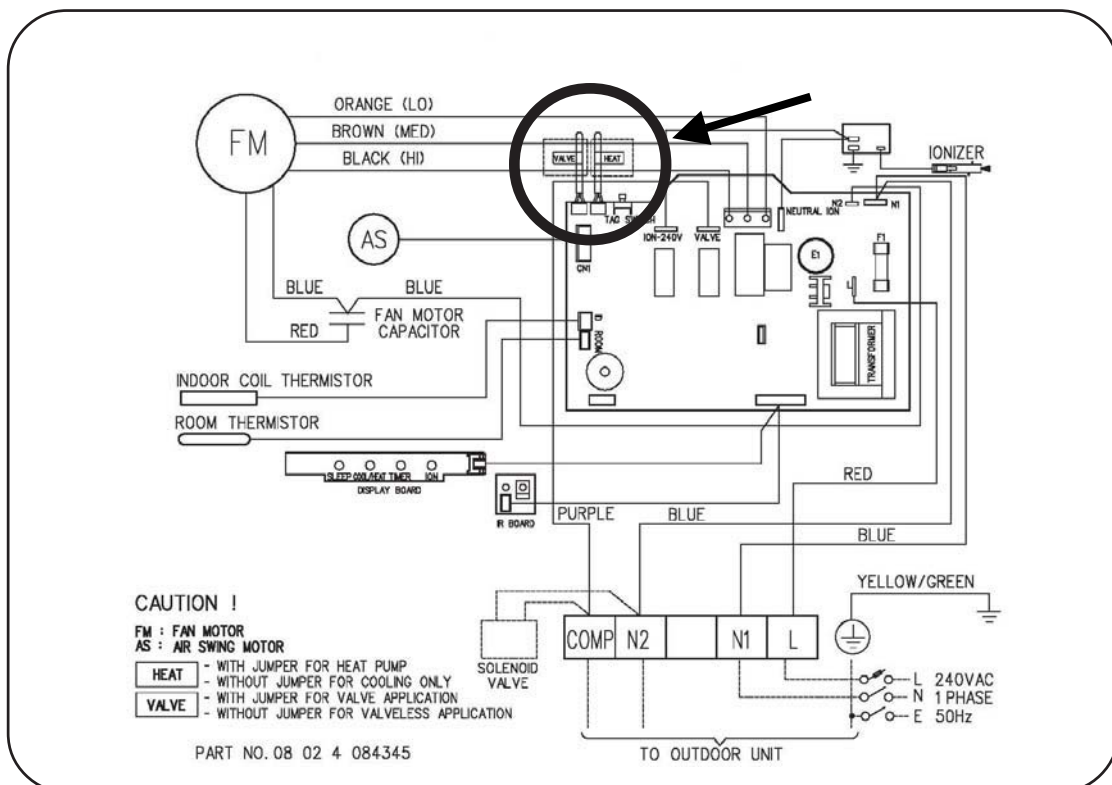
#### Model: MWM - GW / 301W

1. VALVE jumper is plugged into JVLV connector on the emergency switch board.
2. HEAT jumper is plugged into JMODE connector on the emergency switch board.

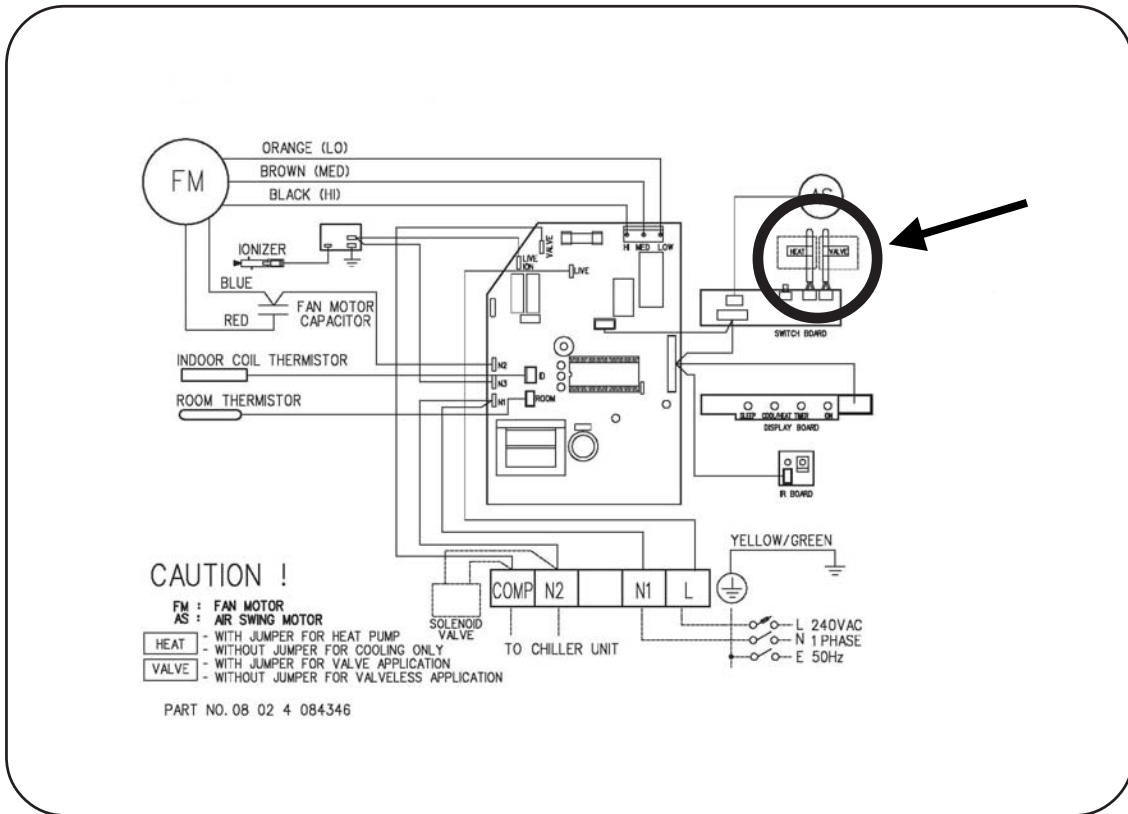
#### Model: MCK-AW/AWH/CW, MCM-DW/CBW/EW and MCC-CW

1. VALVE jumper is plugged into JVLV connector on the main board.
2. HEAT jumper is plugged into OD connector on the main board.

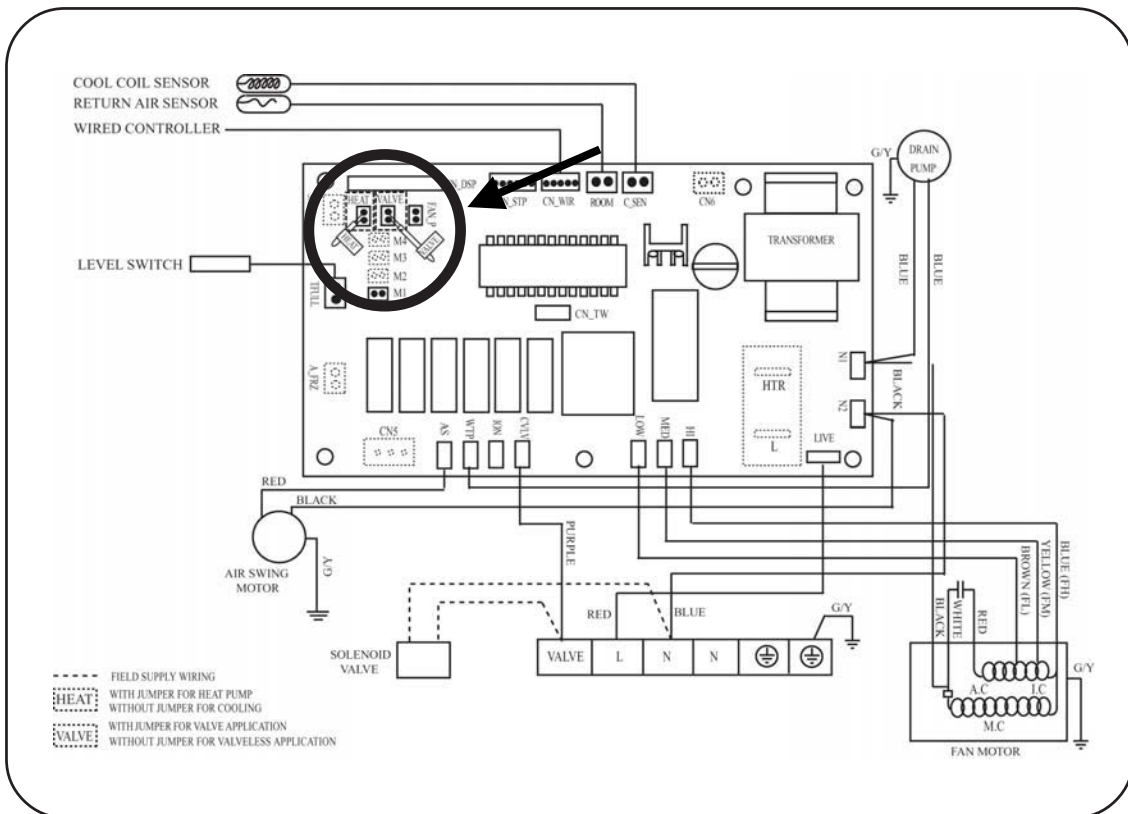
#### Model : MWM 007 / 010 / 015GW (IONIZER)



**Model : MWM 020 / 025GW (IONIZER)**

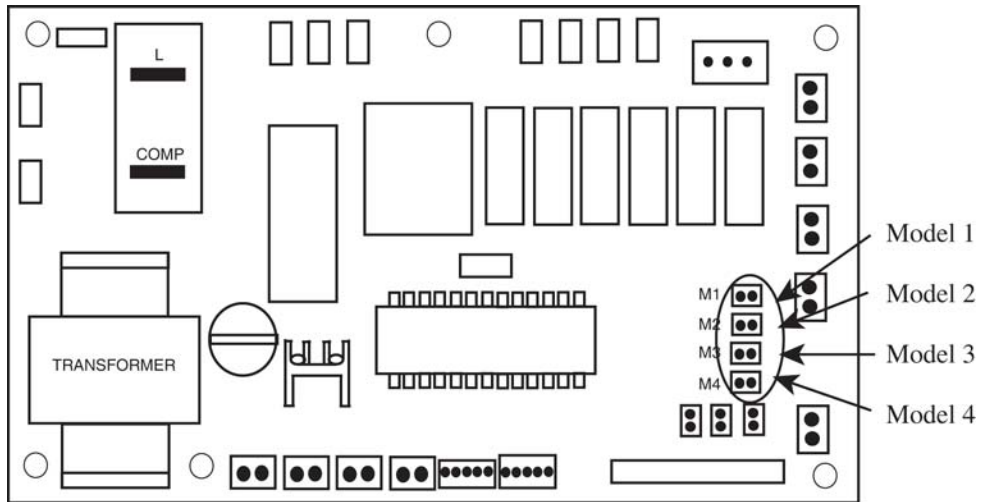


**Model : MCM Series / MCC Series / MCK-AW/CW**



# MCK-AWH 4 pipes system controller board setting

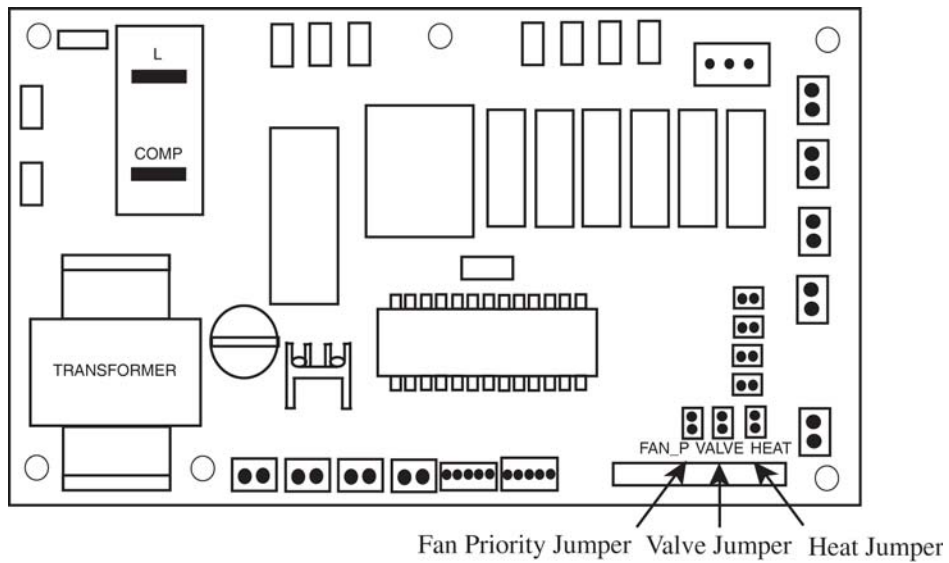
## A) Model selection



The standard controller board (W2.0) comes with a default setting for model selection. Please select the model accordingly by using jumper.

System	Model	Function
2 Pipe System	M1 - Model 1	Cooling or Heating 
	M2 - Model 2	Cooling or Heating with Auxiliary Heater 
4 Pipe System	M2 - Model 2	Cooling Only with Boiler 
	M4 - Model 4	Cooling or Heating with Boiler 

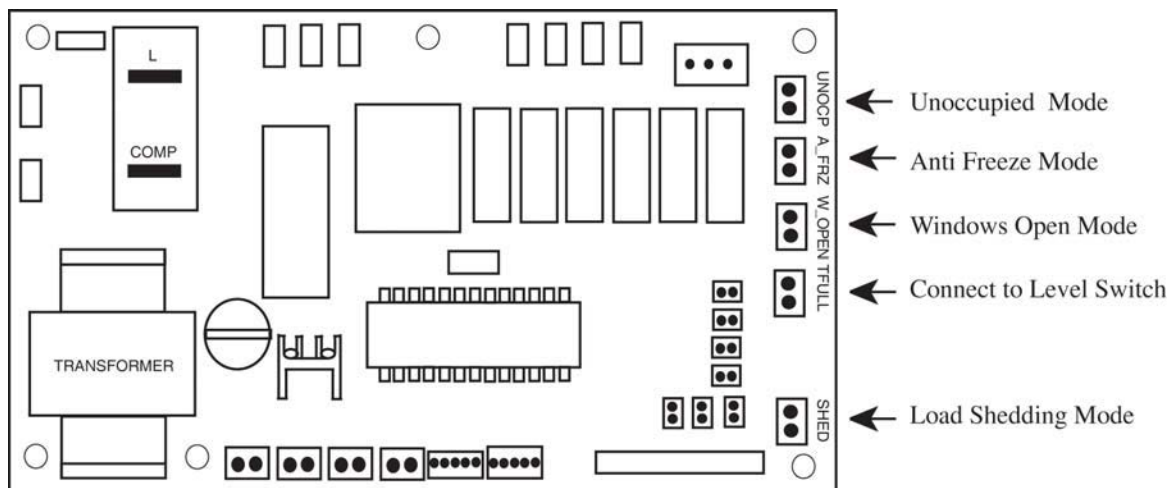
## B) Valve, Heat and Fan priority selection



Jumper	With Jumper (Default)	Without Jumper
Fan Priority Jumper	User set speed or lower fan if auto mode is selected	Fan stop when thermostat cut off
Heat Jumper	For Heat pump	For cooling only
Valve Jumper	For Valve control (Model 1,2,3 & 4)	For valveless control (Model 1 & 2)

## C) Others

The controller board comes with other option.



### i) Unoccupied Mode

If the dry contact is closed, the Unoccupied mode is activated and vice versa. When Timer On is active, system goes back to Occupied mode.

The dry contact connection points can be connected parallel with other fan coil unit (FCU) boards. If the dry contact is closed, Unoccupied mode will be activated on all fan coil units that are connected parallel as shown in figure below.

ii) Anti Freeze Mode

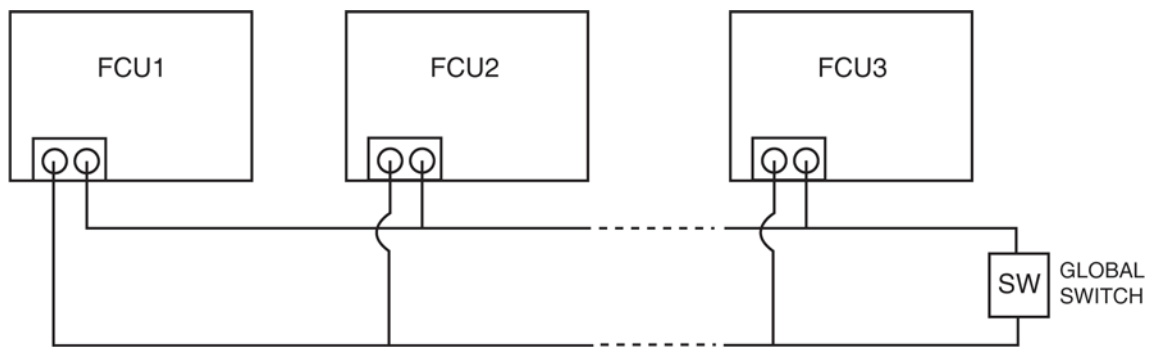
Anti Freeze operation has the highest priority among all unit operation. Anti Freeze operation will be activated only if dry contact is closed and vice versa.

iii) Window Open Mode

The dry contact connection points can be connected in parallel with other fan coil unit (FCU) boards. If the dry contact is closed, Window open mode will be activated on all the fan coil units which are connected in parallel as shown in figure below.

iv) Load Shedding

The dry contact connection points can be connected in parallel with other fan coil unit (FCU) boards. If the dry contact is closed, Load shedding mode will be activated on all the fan coil units which are connected in parallel as shown in figure below.



Global Unoccupied, Global Window Open and Global Load Shedding operation could also be activated via the network communication bus line by master controller with or without the above connection.

NOTE :

i) Auto Fan Mode is only applicable in Model 3 only. ( Cooling only with Boiler)

ii) Fan mode is not available in valveless control.

iii) Wired handset (Netware and SLM) has an indoor room sensor. Avoid locating the wired handset at isolated places where room temperature reading will be inaccurate.

## Water Piping Connection

The indoor unit is equipped with water outlet and inlet bare connection. There is an air-vent for air purging that is fitted at the outlet water header.

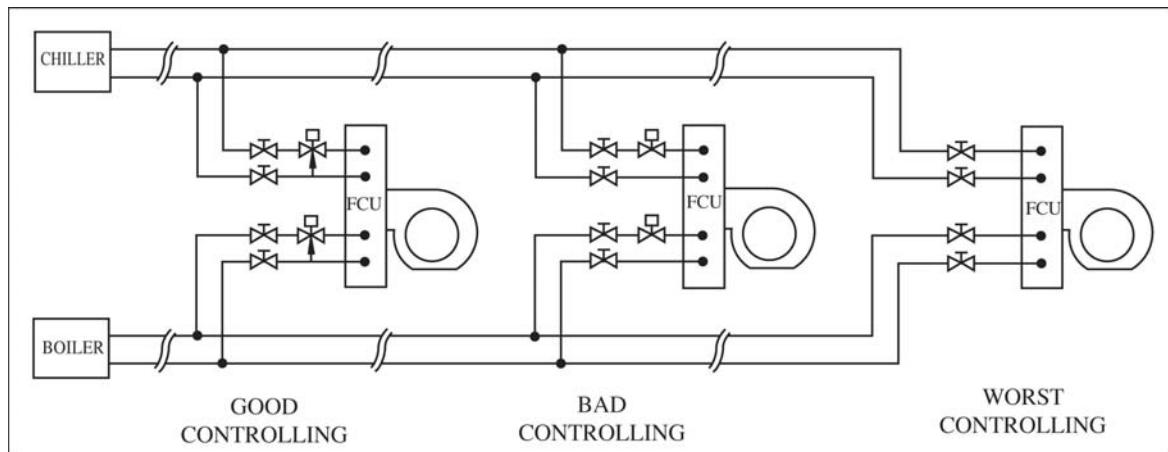
3 ways solenoid valve is required for cycling off or bypass the chilled water.

Black steel pipe, polyethrene pipe, PVC pipe and copper tube recommended in field installation.

All types of piping and connection must be insulated by polyurethane (ARMAFLEX type or equivalent) to avoid condensation.

Do not use contaminated or damaged pipe and fitting for installation.

Some main fitting components are needed in the system to enhance the capacity and ease of service, such as gate valve, balancing valve, 2 ways or 3 ways solenoid valve, filter, strainer etc.





## **Preliminary Site Survey**

Electrical supply and installation is to conform to LOCAL AUTHORITY's (e.g. National Electricity Board) CODES and REGULATIONS.

Voltage supply fluctuation must not exceed  $\pm 10\%$  of rated voltage. Electricity supply lines must be independent of welding transformers which can cause supply fluctuation.

Ensure that the location is convenient for wiring and piping.

## **Mounting**

For ceiling mounted models, locate a position where piping and ducting work can be kept to a minimum. Ensure that overhead supports are strong enough to hold the unit's weight. Position hanger rods and check for alignment with the unit. Check that hangers are secure and that the base of fan coil unit is level in two horizontal positions.

## **Piping**

Drain and water piping must be accurately connected.

Please refer to "Specification Sheet" for piping sizes.

## **Piping Support**

All water mains must be adequately supported to carry the necessary weight involved, provisions must be made by the installing contractor to allow for adequate free movement of all vertical and horizontal risers and run outs. Due to the fact that cold water will be circulated through the water mains, a sizeable movement of the water mains can be expected due to contraction. If for example, the piping is rigidly supported with no provision for movement, it is very possible that the tubing or fitting may be broken causing water leakage in the conditioned spaces throughout the building.

## **Coil Venting**

Each standard basic unit coil is equipped with a manually operated air vent which is installed at the end of a small copper line leading into the highest point of the coil. By means of this valve, air may be vented manually, from the coil to keep it operating at full capacity. When water is first introduced into a coil, air is sometimes trapped in the coil tubing. This trapped air will reduce cooling capacity and create "Bubbling" or "Clanking" noise within the units. To release air trapped in the coil, press the air vent head to allow air to flow out of the air vent opening. Release when a steady stream of water appear.

## **Electrical Connection**

As wiring regulations differ from country to country, please refer to your LOCAL ELECTRICAL CODES for field wiring regulations and ensure that they are complied with. Besides, take note of the following general precaution:

- 1) Ensure that the rated voltage of the unit corresponds to the name plate before commencing wiring work.
- 2) Provide a power outlet to be used exclusively for each unit and a power supply disconnect and a circuit-breaker for over-current protection should be provided in the exclusive line.
- 3) The unit must be EARTH to prevent possible hazards due to insulation failure.
- 4) All wiring must be firmly connected.

## General Operation Guide

### Start-Up

The following procedure must be completed before any attempts is made to put the entire system Into operation:

- 1) Piping connections completed.
- 2) Electrical connections completed.
- 3) Duct connections completed.
- 4) Auxiliary drain pans in position where required.
- 5) Drain line draining into drain pans.
- 6) Filters correctly installed and free of construction debris.
- 7) Motor-blower assembly rotates freely.
- 8) Unit Hydro-statically tested and air vented.

### Starting The Fan Coil Unit

- 1) Turn on the switch of water pump.
- 2) Start water chiller.
- 3) Operate the fan coil unit by turning on the fan and set the control switch to get the desired speed.
- 4) Inspect the duct and piping condition and rectify problem (e.g. vibration, noise, etc.) if exist.

### Servicing And Maintenance

Fan coil units are designed to operate continuously with minor routine maintenance. Since fan coil units cool the discharging forced air, the efficiency with which the units operate is directly related to the amount of air passing through the coil.

#### Air Filters

The function of the air filters is to remove foreign matter such as dirt, soot, pollen and certain other impurities from the air passing through it. A clogged or dirty filter not only fails to do the job for which it is designed, but restricts the flow of air over the coil.

The importance of cleaning the filter before it becomes clogged must be greatly stressed. The frequency with which a filter should be cleaned will depend upon the amount of dust and foreign material that enters a unit, and this depends upon location and situation.

The washable viledon or saranet filter may be cleaned by tapping the filter on a solid surface to dislodge heavy particles. Wash under stream of warm water, with detergent if necessary. Dry it thoroughly before replacing.

#### Fan Motor

The fan motor is pre-lubricated and sealed at the factory. Therefore, no lubricating maintenance is required.

#### Coils

Clean coil unit by brushing between fins with a nylon brush. Brushing should be followed by cleaning with a vacuum cleaner. The coil may also be cleaned by using a high pressure air hose and nozzle if a compressed air source is available. It should be pointed out that if suitable air filter is used and taken care of properly, the coils need no cleaning.

#### Drain Pipe

The drain pipe should be checked before operation of unit is begun. If it is clogged, steps should be taken to clean the debris so that condensate will flow out easily.

#### Replacement Of Parts

Replacement of parts are available through your local dealers. When ordering parts, you must supply

- 1) Model name of the unit.
- 2) Serial number of the unit.
- 3) Part name and number.

## Controller

### Type Of Controller Vs Type Of Fan Coil

MODELS	STANDARD CONTROLLER	OPTIONAL CONTROLLER
MWM - GW	G11 (Wireless)	NETWARE3 / SLM3 (Wired)
MWM 301W	G7 (Wireless)	NETWARE3 / SLM3 (Wired)
MCK - AW / AWH / CW	G7 (Wireless)	NETWARE3 / SLM3 (Wired)
MCM - DW / CBW / EW	G7 (Wireless)	NETWARE3 / SLM3 (Wired)
MCC - CW	NETWARE3 / SLM3 (Wired)	-
MDB - BW	Without Controller	

### Self Diagnosis Table

Error Indication	Cool LED	7 Segment Display
Room Sensor error (short/open)	Blinks 1 times	E1
Pipe Water Sensor Error (short/open)	Blinks 2 times	E2
Water Pump Error	Blinks 6 times	E6
Pipe Water Temperature Fault	Blinks 5 times	E5
* Window Open Activated	Blinks 3 times	-
* Antifreeze Mode Activated	Blinks 7 times	-
* Load Shedding Activated	Blinks 8 times	-

\* Only applicable for 4-pipe system

# Sound Data

## Sound Pressure Level

### Wall Mounted Split Type

Model	Speed	1/1 Octave Sound Pressure Level (dB, ref 20 $\mu$ Pa)							Overall (dBA)	Noise Criteria
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz		
MWM007GW	HIGH	32	34	38	37	32	23	15	40	36
	MEDIUM	27	30	34	32	26	17	14	35	31
	LOW	24	27	29	26	20	13	13	29	24
MWM010GW	HIGH	28	34	37	36	31	22	13	39	35
	MEDIUM	27	30	33	31	25	17	12	34	30
	LOW	24	26	28	25	19	12	11	28	23
MWM015GW	HIGH	30	35	39	38	33	25	15	42	37
	MEDIUM	28	31	34	33	26	18	13	36	32
	LOW	24	26	28	26	20	13	12	29	24
MWM020GW	HIGH	37	44	42	37	34	25	15	43	37
	MEDIUM	34	40	39	34	30	21	14	40	34
	LOW	30	35	35	30	26	18	13	35	30
MWM025GW	HIGH	41	48	47	43	40	32	23	49	43
	MEDIUM	39	44	43	39	35	28	20	44	38
	LOW	37	41	40	36	32	25	19	42	35
MWM301W	HIGH	42	46	45	44	41	35	28	49	43
	MEDIUM	40	45	44	43	35	33	27	47	42
	LOW	37	43	43	40	35	30	26	45	39

Microphone position : MWM-FW -- 1 m in front of the unit and 0.8 m below the vertical centre line of the unit. (JIS C 9612)  
MWM301W -- 1 m in front and 1 m below the air discharge opening of the unit (JIS B 8615)

### Ceiling Exposed Split Type

Model	Speed	1/1 Octave Sound pressure level (dB, ref 20 $\mu$ Pa)							Overall (dBA)	Noise Criteria
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz		
MCM020DW	High	45	46	47	46	41	38	29	50	45
	Medium	42	43	45	42	38	34	24	47	41
	Low	36	37	39	35	31	24	15	40	34
MCM025DW	High	48	51	51	50	45	41	33	54	49
	Medium	47	50	50	49	44	40	32	53	48
	Low	45	47	48	47	41	36	27	50	46
MCM030DW	High	45	48	48	47	43	33	24	51	46
	Medium	44	47	47	46	42	32	23	50	45
	Low	43	45	45	44	39	29	20	48	43
MCM040DW	High	51	53	51	50	47	37	30	54	49
	Medium	48	51	50	49	46	36	28	53	48
	Low	46	50	49	48	44	35	27	52	47
MCM050DW	High	51	53	51	50	47	37	30	54	49
	Medium	48	51	50	49	46	36	28	53	48
	Low	46	50	49	48	44	35	27	52	47

Microphone position : MCM 20/25DW -- 1 m in front of the unit and 0.8 m below the air discharge opening. (JIS C 9612)  
MCM 30/40/50DW -- 1 m in front of the unit and 1 m below the air discharge opening. (JIS B 8615)

Model	Speed	1/1 Octave Sound pressure level (dB, ref 20 $\mu$ Pa)							Overall A (dBA)	Noise Criteria
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz		
MCM007CBW	High	26	34	38	42	38	35	23	45	41
	Medium	23	29	36	39	34	31	18	42	38
	Low	19	26	33	34	31	23	12	37	33
MCM010CBW	High	27	35	39	43	39	36	24	46	42
	Medium	24	30	37	40	35	32	19	43	39
	Low	20	27	34	35	32	24	13	38	34
MCM015CBW	High	28	36	40	44	40	37	25	47	43
	Medium	25	31	38	41	36	33	20	44	40
	Low	21	28	35	36	33	25	13	39	35

Microphone position : 1m in front and 0.8m below the vertical centre line of the unit.

## Water Flow Vs Pressure Drop

### Ceiling Exposed Split Type

MODELS	FLOW RATE		WATER PRESSURE DROP	
	LITRES/M	USGPM	kPa	PSI
MCM020DW	8.86	2.34	5.17	0.750
	11.81	3.12	8.68	1.260
	14.76	3.90	13.02	1.890
	17.71	4.68	18.12	2.630
	20.67	5.46	24.18	3.510
MCM025DW	9.54	2.52	5.93	0.860
	12.72	3.36	9.92	1.440
	15.90	4.20	14.88	2.160
	19.08	5.04	20.74	3.010
	22.26	5.88	27.70	4.020
MCM030DW	11.13	2.94	5.24	0.760
	14.84	3.92	8.75	1.270
	18.55	4.90	13.09	1.900
	22.26	5.88	18.26	2.650
	25.97	6.86	24.39	3.540
MCM040DW	19.53	5.16	3.65	0.530
	26.04	6.88	6.06	0.880
	32.55	8.60	9.09	1.320
	39.06	10.32	12.61	1.830
	45.57	12.04	16.74	2.430
MCM050DW	21.12	5.58	4.20	0.610
	28.16	7.44	7.03	1.020
	35.20	9.30	10.47	1.520
	42.24	11.16	14.54	2.110
	49.28	13.02	19.43	2.820
MCM007CBW	2.95	0.78	2.66	0.386
	3.94	1.04	4.40	0.639
	4.92	1.30	6.58	0.955
	5.90	1.56	9.13	1.325
	6.89	1.82	12.06	1.750
MCM010CBW	4.09	1.08	4.73	0.686
	5.45	1.44	7.93	1.151
	6.81	1.80	11.84	1.719
	8.18	2.16	16.49	2.393
	9.54	2.52	21.85	3.171
MCM015CBW	5.22	1.38	1.38	0.200
	6.96	1.84	2.27	0.330
	8.71	2.30	3.38	0.490
	10.45	2.76	4.70	0.682
	12.19	3.22	6.20	0.900

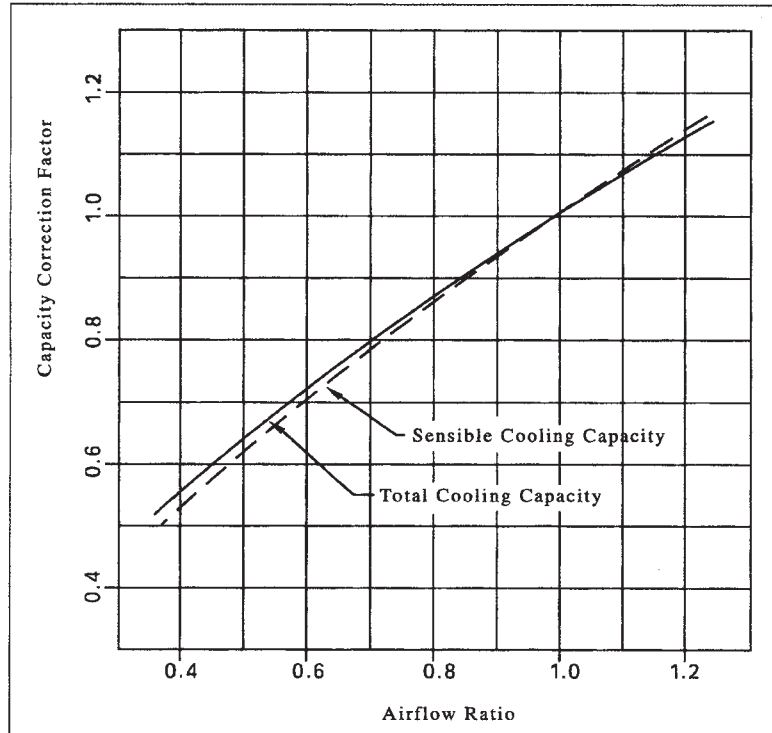
Note :

a. PRESSURE DROP CORRECTION FACTOR =  $1.2947 - 0.0021 * ( EWT^{\circ}C * 1.8 + 32 )$

b. PRESSURE DROP CORRECTION FACTOR =  $1.2947 - 0.0021 * EWT^{\circ}F$

## Correction Factors

### AIRFLOW CAPACITY CORRECTION FACTORS



Water temperature rise is held as constant.

### Altitude Correction Factors

Elevation, m	Total Capacity	Sensible Capacity
0	1.00	1.00
300	0.99	0.96
600	0.98	0.93
900	0.97	0.90
1200	0.96	0.86
1500	0.94	0.83
1800	0.93	0.80

### Heating Capacity Correction Factors

EAT °C	ENTERING TEMPERATURE, °C										
	37.8	43.3	45	48.8	54.4	60	65.5	71.1	76.7	82.2	87.7
4.4	0.838	0.980	1.021	1.122	1.265	1.406	1.552	1.698	1.845	1.988	2.134
7.2	0.771	0.913	0.954	1.055	1.198	1.379	1.485	1.631	1.778	1.920	2.067
10.0	0.700	0.843	0.885	0.986	1.130	1.272	1.417	1.563	1.710	1.853	2.000
12.7	0.631	0.773	0.817	0.918	1.062	1.205	1.349	1.495	1.639	1.786	1.931
15.5	0.562	0.705	0.748	0.848	0.992	1.137	1.281	1.427	1.572	1.719	1.865
18.3	0.493	0.636	0.679	0.779	0.923	1.070	1.212	1.358	1.504	1.650	1.799
21.1	0.424	0.567	0.610	0.711	0.855	1.000	1.146	1.290	1.438	1.583	1.730
23.9	0.354	0.498	0.541	0.642	0.786	0.932	1.078	1.222	1.369	1.515	1.664
26.7	0.284	0.428	0.471	0.573	0.717	0.863	1.008	1.155	1.302	1.449	1.597

Notes : Adjusted capacity, W (@ Nominal air flow) = base heating capacity (@ nominal 60°C EWT, 21.1°C EAT) x Heating Capacity Correction Factor

## General Data - MCM-DW

MODEL			MCM020DW	MCM025DW
NOMINAL TOTAL COOLING CAPACITY	Btu/h		17700	20800
	W		5190	6100
NOMINAL SENSIBLE COOLING CAPACITY	Btu/h		13700	15000
	W		4000	4400
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)	Btu/h		22000	25900
	W		6450	7590
NOMINAL AIR FLOW	HIGH	l/s / CFM	264 / 560	297 / 630
	MEDIUM	l/s / CFM	238 / 505	293 / 620
	LOW	l/s / CFM	189 / 400	262 / 555
UNIT DIMENSION	HEIGHT	mm/in	214 / 8.4	
	WIDTH	mm/in	1214 / 47.8	
	DEPTH	mm/in	670 / 26.4	
PACKING DIMENSION	HEIGHT	mm/in	301 / 11.9	
	WIDTH	mm/in	1311 / 51.6	
	DEPTH	mm/in	760 / 29.9	
UNIT WEIGHT	kg/lb	43 / 94.8		
SOUND PRESSURE LEVEL ( H/M/L )	dBA	50 / 47 / 40		54 / 53 / 50
NOMINAL WATER FLOW RATE	USGPM	3.92		4.62
	LITRES/M	14.84		17.49
HEAD LOSS (COOLING)	kPa / psi	46 / 6.6		56 / 8.1
HEAD LOSS (HEATING) : 50°C	kPa / psi	39 / 5.7		48 / 7
MAX. WORKING PRESSURE	kPa / psi	1608 / 233		
SURFACE AIR VELOCITY	m/s	1.39		1.56
	ft/min	273.0		307.2
CONNECTION	3/4" BSP FEMALE ADAPTOR			
CONTROL	ROOM TEMPERATURE	MICRO-COMPUTER CONTROLLED THERMOSTAT		
	AIR DISCHARGE	AUTOMATIC LOUVER (UP& DOWN)		
	OPERATION	LCD WIRELESS MICRO-COMPUTER REMOTE CONTROL		
CONDENSATE DRAIN SIZE	mm/in	19.05 / 3/4"		

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)

b) HEATING - ENTERING AIR TEMP. : 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS C 9612 STANDARD. MCM020/025DW : POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT. MCM030/040/050DW : POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE VERTICAL CENTRE LINE OF THE UNIT (JIS B 8615)

## General Data - MCM-DW

MODEL		MCM030DW	
NOMINAL TOTAL COOLING CAPACITY	Btu/h	24600	
	W	7210	
NOMINAL SENSIBLE COOLING CAPACITY	Btu/h	17700	
	W	5190	
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)	Btu/h	28000	
	W	8210	
NOMINAL AIR FLOW	HIGH	l/s / CFM	329 / 697
	MEDIUM	l/s / CFM	324 / 687
	LOW	l/s / CFM	307 / 650
UNIT DIMENSION	HEIGHT	mm/in	249 / 9.8
	WIDTH	mm/in	1214 / 47.8
	DEPTH	mm/in	670 / 26.4
PACKING DIMENSION	HEIGHT	mm/in	354 / 13.9
	WIDTH	mm/in	1376 / 54.2
	DEPTH	mm/in	766 / 30.2
UNIT WEIGHT	kg/lb	45 / 99.2	
SOUND PRESSURE LEVEL ( H/M/L )	dBA	51 / 50 / 48	
NOMINAL WATER FLOW RATE	USGPM	5.46	
	LITRES/M	20.67	
HEAD LOSS (COOLING)	kPa / psi	49 / 7.2	
HEAD LOSS (HEATING) : 50°C	kPa / psi	43 / 6.2	
MAX. WORKING PRESSURE	kPa / psi	1608 / 233	
SURFACE AIR VELOCITY	m/s	1.37	
	ft/min	270.3	
CONNECTION	3/4" BSP FEMALE ADAPTOR		
CONTROL	ROOM TEMPERATURE	MICRO-COMPUTER CONTROLLED THERMOSTAT	
	AIR DISCHARGE	AUTOMATIC LOUVER (UP& DOWN)	
	OPERATION	LCD WIRELESS MICRO-COMPUTER REMOTE CONTROL	
CONDENSATE DRAIN SIZE	mm/in	19.05 / 3/4"	

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)

b) HEATING - ENTERING AIR TEMP.: 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS C 9612 STANDARD. MCM020/025DW : POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT. MCM030/040/050DW : POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE VERTICAL CENTRE LINE OF THE UNIT (JIS B 8615)



## General Data - MCM-DW

MODEL			MCM040DW	MCM050DW
NOMINAL TOTAL COOLING CAPACITY	Btu/h		31200	45000
	W		9140	13190
NOMINAL SENSIBLE COOLING CAPACITY	Btu/h		25600	31400
	W		7500	9200
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)	Btu/h		42300	51500
	W		12400	15090
NOMINAL AIR FLOW	HIGH	l/s / CFM	451 / 956	500 / 1059
	MEDIUM	l/s / CFM	428 / 908	483 / 1023
	LOW	l/s / CFM	419 / 889	451 / 956
UNIT DIMENSION	HEIGHT	mm/in	249 / 9.8	
	WIDTH	mm/in	1714 / 67.5	
	DEPTH	mm/in	670 / 26.4	
PACKING DIMENSION	HEIGHT	mm/in	354 / 13.9	
	WIDTH	mm/in	1876 / 73.9	
	DEPTH	mm/in	766 / 30.2	
UNIT WEIGHT		kg/lb	70 / 154.3	
SOUND PRESSURE LEVEL ( H/M/L )		dBA	54 / 53 / 52	54 / 53 / 52
NOMINAL WATER FLOW RATE		USGPM	6.91	9.99
		LITRES/M	26.16	37.82
HEAD LOSS (COOLING)		kPa / psi	24 / 3.5	38 / 5.5
HEAD LOSS (HEATING) : 50°C		kPa / psi	22 / 3.1	32 / 4.6
MAX. WORKING PRESSURE		kPa / psi	1608 / 233	
SURFACE AIR VELOCITY		m/s	1.22	1.35
		ft/min	240.2	266.2
CONNECTION	3/4" BSP FEMALE ADAPTOR			
CONTROL	ROOM TEMPERATURE		MICRO-COMPUTER CONTROLLED THERMOSTAT	
	AIR DISCHARGE		AUTOMATIC LOUVER (UP& DOWN)	
	OPERATION		LCD WIRELESS MICRO-COMPUTER REMOTE CONTROL	
CONDENSATE DRAIN SIZE		mm/in	19.05 / 3/4"	

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)

b) HEATING - ENTERING AIR TEMP.: 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE ACCORDING TO JIS C 9612 STANDARD. MCM020/025DW : POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT. MCM030/040/050DW : POSITION OF THE MEASUREMENT POINT IS 1m IN FRONT AND 1m BELOW THE VERTICAL CENTRE LINE OF THE UNIT (JIS B 8615)

## General Data - MCM-CBW

MODEL			MCM007CBW	MCM010CBW
NOMINAL TOTAL COOLING CAPACITY	Btu/h		6500	8500
	W		1910	2490
NOMINAL SENSIBLE COOLING CAPACITY	Btu/h		5000	6700
	W		1460	1960
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)	Btu/h		8000	11000
	W		2340	3220
NOMINAL AIR FLOW	HIGH	l/s / CFM	94 / 200	142 / 300
	MEDIUM	l/s / CFM	82 / 173	134 / 284
	LOW	l/s / CFM	71 / 150	119 / 253
UNIT DIMENSION	HEIGHT	mm/in	235 / 9.3	
	WIDTH	mm/in	666 / 26.2	
	DEPTH	mm/in	824 / 32.4	
PACKING DIMENSION	HEIGHT	mm/in	301 / 11.9	
	WIDTH	mm/in	757 / 29.8	
	DEPTH	mm/in	936 / 36.9	
UNIT WEIGHT		kg/lb	33 / 72.8	
SOUND PRESSURE LEVEL ( H/M/L )		dB(A)	45 / 42 / 37	46 / 43 / 38
NOMINAL WATER FLOW RATE		USGPM	1.45	1.89
		LITRES/M	5.49	7.15
HEAD LOSS (COOLING)		kPa / psi	9 / 1.4	15 / 2.2
HEAD LOSS (HEATING) : 50°C		kPa / psi	7 / 1	13 / 1.8
MAX. WORKING PRESSURE		kPa / psi	1608 / 233	
SURFACE AIR VELOCITY		m/s	0.79	1.18
		ft/min	155.1	232.7
CONNECTION			3/4" BSP FEMALE ADAPTOR	
CONTROL	ROOM TEMPERATURE		MICRO-COMPUTER CONTROLLED THERMOSTAT	
	AIR DISCHARGE		AUTOMATIC LOUVER (UP& DOWN)	
	OPERATION		LCD WIRELESS MICRO-COMPUTER REMOTE CONTROL	
CONDENSATE DRAIN SIZE		mm/in	19.05 / 3/4"	

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

- a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)  
 b) HEATING - ENTERING AIR TEMP.: 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE TESTED AT 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT.

## General Data - MCM-CBW

MODEL		MCM015CBW	
NOMINAL TOTAL COOLING CAPACITY		Btu/h	10500
		W	3080
NOMINAL SENSIBLE COOLING CAPACITY		Btu/h	8600
		W	2520
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)		Btu/h	14500
		W	4250
NOMINAL AIR FLOW	HIGH	l/s / CFM	189 / 400
	MEDIUM	l/s / CFM	156 / 330
	LOW	l/s / CFM	139 / 294
UNIT DIMENSION	HEIGHT	mm/in	235 / 9.3
	WIDTH	mm/in	666 / 26.2
	DEPTH	mm/in	1174 / 46.2
PACKING DIMENSION	HEIGHT	mm/in	301 / 11.9
	WIDTH	mm/in	757 / 29.8
	DEPTH	mm/in	1286 / 50.6
UNIT WEIGHT		kg/lb	35 / 77.2
SOUND PRESSURE LEVEL ( H/M/L )		dBA	47 / 44 / 39
NOMINAL WATER FLOW RATE		USGPM	2.33
		LITRES/M	8.82
HEAD LOSS (COOLING)		kPa / psi	5 / 0.7
HEAD LOSS (HEATING) : 50°C		kPa / psi	4 / 0.5
MAX. WORKING PRESSURE		kPa / psi	1608 / 233
SURFACE AIR VELOCITY		m/s	0.99
		ft/min	195.2
CONNECTION			3/4" BSP FEMALE ADAPTOR
CONTROL	ROOM TEMPERATURE		MICRO-COMPUTER CONTROLLED THERMOSTAT
	AIR DISCHARGE		AUTOMATIC LOUVER (UP& DOWN)
	OPERATION		LCD WIRELESS MICRO-COMPUTER REMOTE CONTROL
CONDENSATE DRAIN SIZE		mm/in	19.05 / 3/4"

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3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)

b) HEATING - ENTERING AIR TEMP.: 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE TESTED AT 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT.

## General Data - MCM-EW

MODEL			MCM015EW	MCM020EW
NOMINAL TOTAL COOLING CAPACITY	Btu/h		15500	20300
	W		4540	5950
NOMINAL SENSIBLE COOLING CAPACITY	Btu/h		12700	15400
	W		3720	4510
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)	Btu/h		19500	25000
	W		5720	7330
NOMINAL AIR FLOW	HIGH	l/s / CFM	236 / 500	274 / 580
	MEDIUM	l/s / CFM	213 / 450	250 / 530
	LOW	l/s / CFM	189 / 400	231 / 490
UNIT DIMENSION	HEIGHT	mm/in	212 / 8.3	
	WIDTH	mm/in	1090 / 42.9	
	DEPTH	mm/in	630 / 24.8	
PACKING DIMENSION	HEIGHT	mm/in	297 / 11.7	
	WIDTH	mm/in	1197 / 47.1	
	DEPTH	mm/in	740 / 29.1	
UNIT WEIGHT		kg/lb	27 / 59.5	
SOUND PRESSURE LEVEL ( H/M/L )		dBA	50 / 43 / 41	53 / 51 / 49
NOMINAL WATER FLOW RATE		USGPM	3.43	4.49
		LITRES/M	12.98	17.00
HEAD LOSS (COOLING)		kPa / psi	27 / 4	48 / 7
HEAD LOSS (HEATING) : 50°C		kPa / psi	24 / 3.5	42 / 6.1
MAX. WORKING PRESSURE		kPa / psi	1608 / 233	
SURFACE AIR VELOCITY		m/s	0.72	0.83
		ft/min	140.9	163.3
CONNECTION			1/2" BSP FEMALE ADAPTOR	
CONTROL	ROOM TEMPERATURE		MICRO-COMPUTER CONTROLLED THERMOSTAT	
	AIR DISCHARGE		AUTOMATIC LOUVER (UP& DOWN)	
CONDENSATE DRAIN SIZE		mm/in	19.05 / 3/4"	

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)

b) HEATING - ENTERING AIR TEMP.: 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE TESTED AT 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT.

## General Data - MCM-EW

MODEL		MCM025EW	
NOMINAL TOTAL COOLING CAPACITY	Btu/h	21000	
	W	6150	
NOMINAL SENSIBLE COOLING CAPACITY	Btu/h	16200	
	W	4750	
NOMINAL TOTAL HEATING CAPACITY (ENTERING WATER TEMP. = 50°C)	Btu/h	28000	
	W	8210	
NOMINAL AIR FLOW	HIGH	l/s / CFM	293 / 620
	MEDIUM	l/s / CFM	269 / 570
	LOW	l/s / CFM	245 / 520
UNIT DIMENSION	HEIGHT	mm/in	212 / 8.3
	WIDTH	mm/in	1090 / 42.9
	DEPTH	mm/in	630 / 24.8
PACKING DIMENSION	HEIGHT	mm/in	297 / 11.7
	WIDTH	mm/in	1197 / 47.1
	DEPTH	mm/in	740 / 29.1
UNIT WEIGHT	kg/lb	27 / 59.5	
SOUND PRESSURE LEVEL ( H/M/L )	dBA	56 / 51 / 44	
NOMINAL WATER FLOW RATE	USGPM	4.67	
	LITRES/M	17.68	
HEAD LOSS (COOLING)	kPa / psi	57 / 8.3	
HEAD LOSS (HEATING) : 50°C	kPa / psi	50 / 7.3	
MAX. WORKING PRESSURE	kPa / psi	1608 / 233	
SURFACE AIR VELOCITY	m/s	1.54	
	ft/min	302.3	
CONNECTION	1/2" BSP FEMALE ADAPTOR		
CONTROL	ROOM TEMPERATURE	MICRO-COMPUTER CONTROLLED THERMOSTAT	
	AIR DISCHARGE	AUTOMATIC LOUVER (UP& DOWN)	
CONDENSATE DRAIN SIZE	mm/in	19.05 / 3/4"	

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2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151 & ISO13253.

3) NOMINAL COOLING AND HEATING CAPACITY ARE BASED ON THE CONDITIONS BELOW :

a) COOLING - ENTERING AIR TEMP. : 27°C (80.6°F) DB / 19°C (66.2°F) WB, ENTERING WATER TEMP. : 7°C (44.6°F), LEAVING WATER TEMP. : 12°C (53.6°F)

b) HEATING - ENTERING AIR TEMP.: 20°C (68°F) DB, ENTERING WATER TEMP. : 50°C (122°F), WATER FLOW RATE BASED ON COOLING CYCLE.

4) SOUND PRESSURE LEVEL ARE TESTED AT 1m IN FRONT AND 0.8m BELOW THE VERTICAL CENTRE LINE OF THE UNIT.

## Components Data - MCM-DW

MODEL			MCM020DW	MCM025DW	
FAN	TYPE		CROSS FLOW FAN		
	QUANTITY		2		
	MATERIAL		ABS		
	DRIVE		DIRECT		
	LENGTH x DIAMETER	mm/in	146 x 200 / 5.8 x 7.9		
FAN MOTOR	TYPE		INDUCTION		
	QUANTITY		1		
	INDEX OF PROTECTION (IP)		IP22		
COIL	TYPE		CROSS FINNED TUBES		
	TUBE	MATERIAL		PLAIN COPPER TUBE	
		DIAMETER	mm/in	9.52 / 3/8	
		THICKNESS	mm/in	0.33 / 0.013	
	FIN	MATERIAL		ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004	
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.19 / 2.05	0.19 / 2.05
		ROW		3	3
		FIN PER INCH		12	12
	WATER VOLUME	litre	1.68	1.68	
AIR FILTER	MATERIAL		WASHABLE SARANNET		
	QUANTITY	PC/S	2		
	SIZE	LENGTH	mm/in	544 / 21.4	
		WIDTH	mm/in	270 / 10.6	
		THICKNESS	mm/in	3 / 0.1	
CASING	MATERIAL		ELECTRO-GALVANIZED MILD STEEL		
	COLOUR		LIGHT GREY		

MODEL			MCM030DW		
FAN	TYPE		CROSS FLOW FAN		
	QUANTITY		3		
	MATERIAL		ABS		
	DRIVE		DIRECT		
	LENGTH x DIAMETER	mm/in	146 x 200 / 5.8 x 7.9		
FAN MOTOR	TYPE		INDUCTION		
	QUANTITY		1		
	INDEX OF PROTECTION (IP)		IP22		
COIL	TYPE		CROSS FINNED TUBES		
	TUBE	MATERIAL		PLAIN COPPER TUBE	
		DIAMETER	mm/in	9.52 / 3/8	
		THICKNESS	mm/in	0.33 / 0.013	
	FIN	MATERIAL		ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004	
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.24 / 2.58	
		ROW		3	
		FIN PER INCH		12	
	WATER VOLUME	litre	2.09		
AIR FILTER	MATERIAL		WASHABLE SARANNET		
	QUANTITY	PC/S	2		
	SIZE	LENGTH	mm/in	544 / 21.4	
		WIDTH	mm/in	270 / 10.6	
		THICKNESS	mm/in	3 / 0.1	
CASING	MATERIAL		ELECTRO-GALVANIZED MILD STEEL		
	COLOUR		LIGHT GREY		

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## Components Data - MCM-DW

MODEL			MCM040DW	MCM050DW	
FAN	TYPE		CROSS FLOW FAN		
	QUANTITY		4		
	MATERIAL		ABS		
	DRIVE		DIRECT		
	LENGTH x DIAMETER	mm/in	146 x 200 / 5.8 x 7.9		
FAN MOTOR	TYPE		INDUCTION		
	QUANTITY		1		
	INDEX OF PROTECTION (IP)		IP22		
COIL	TYPE		CROSS FINNED TUBES		
	TUBE	MATERIAL		PLAIN COPPER TUBE	
		DIAMETER	mm/in	9.52 / 3/8	
		THICKNESS	mm/in	0.33 / 0.013	
	FIN	MATERIAL		ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004	
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.37 / 3.98	
		ROW		4	4
		FIN PER INCH		12	14
	WATER VOLUME	litre	4.25	2.03	
AIR FILTER	MATERIAL		WASHABLE SARANNET		
	QUANTITY	PC/S	2 + 1	2 + 3	
	SIZE ( L x W x t )	mm	544 x 270 x 3 (2 pcs)	500 x 285 x 3 (2 pcs)	
		mm	494 x 270 x 3 (1 pc)	400 x 285 x 3 (3 pc)	
		in	21.4 x 10.6 x 0.1 (2 pcs)	19.7 x 11.2 x 0.1 (2 pcs)	
in		19.4 x 10.6 x 0.1 (1 pc)	15.7 x 10.6 x 0.1 (3 pcs)		
CASING	MATERIAL		ELECTRO-GALVANIZED MILD STEEL		
	COLOUR		LIGHT GREY		

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## Components Data - MCM-CBW

MODEL				MCM007CBW	MCM010CBW	
FAN	TYPE			CROSS FLOW FAN		
	QUANTITY			1	1	
	MATERIAL			ABS		
	DRIVE			DIRECT		
	LENGTH x DIAMETER		mm/in	146 x 200 / 5.8 x 7.9		
FAN MOTOR	TYPE			INDUCTION		
	QUANTITY			1		
	INDEX OF PROTECTION (IP)			IP22		
COIL	TYPE			CROSS FINNED TUBES		
	TUBE	MATERIAL			PLAIN COPPER TUBE	
		DIAMETER	mm/in	9.52 / 3/8		
		THICKNESS	mm/in	0.33 / 0.013		
	FIN	MATERIAL			ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004		
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.12 / 1.31		
		ROW	2			
	FIN PER INCH			14		
WATER VOLUME		litre	0.7			
AIR FILTER	MATERIAL			WASHABLE SARANNET		
	QUANTITY		PC/S	2		
	SIZE	LENGTH	mm/in	390 / 15.4		
		WIDTH	mm/in	292 / 11.5		
		THICKNESS	mm/in	3 / 0.1		
CASING	MATERIAL			ELECTRO-GALVANIZED MILD STEEL		
	COLOUR			LIGHT GREY		

MODEL				MCM015CBW		
FAN	TYPE			CROSS FLOW FAN		
	QUANTITY			2		
	MATERIAL			ABS		
	DRIVE			DIRECT		
	LENGTH x DIAMETER		mm/in	146 x 200 / 5.8 x 7.9		
FAN MOTOR	TYPE			INDUCTION		
	QUANTITY			1		
	INDEX OF PROTECTION (IP)			IP22		
COIL	TYPE			CROSS FINNED TUBES		
	TUBE	MATERIAL			PLAIN COPPER TUBE	
		DIAMETER	mm/in	9.52 / 3/8		
		THICKNESS	mm/in	0.33 / 0.013		
	FIN	MATERIAL			ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004		
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.19 / 2.01		
		ROW	3			
	FIN PER INCH			12		
WATER VOLUME		litre	2.09			
AIR FILTER	MATERIAL			WASHABLE SARANNET		
	QUANTITY		PC/S	2		
	SIZE	LENGTH	mm/in	390 / 15.4		
		WIDTH	mm/in	292 / 11.5		
		THICKNESS	mm/in	3 / 0.1		
CASING	MATERIAL			ELECTRO-GALVANIZED MILD STEEL		
	COLOUR			LIGHT GREY		

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## Components Data - MCM-EW

MODEL				MCM015EW	MCM020EW
FAN	TYPE			CROSS FLOW FAN	
	QUANTITY			2	2
	MATERIAL			ABS	
	DRIVE			DIRECT	
	LENGTH x DIAMETER		mm/in	146 x 200 / 5.8 x 7.9	
FAN MOTOR	TYPE			INDUCTION	
	QUANTITY			1	
	INDEX OF PROTECTION (IP)			IP22	
COIL	TYPE			CROSS FINNED TUBES	
	TUBE	MATERIAL		PLAIN COPPER TUBE	
		DIAMETER	mm/in	7.00 / 1/4	
		THICKNESS	mm/in	0.35 / 0.014	
	FIN	MATERIAL		ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004	
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.33 / 3.55	
		ROW		3	
		FIN PER INCH		18	
	WATER VOLUME		litre	1.11	
AIR FILTER	MATERIAL			WASHABLE SARANNET	
	QUANTITY		PC/S	2	
	SIZE	LENGTH	mm/in	300 / 11.8	
		WIDTH	mm/in	383 / 15.1	
		THICKNESS	mm/in	2 / 0.1	
CASING	MATERIAL			ELECTRO-GALVANIZED MILD STEEL	
	COLOUR			LIGHT GREY	

MODEL				MCM025EW	
FAN	TYPE			CROSS FLOW FAN	
	QUANTITY			2	
	MATERIAL			ABS	
	DRIVE			DIRECT	
	LENGTH x DIAMETER		mm/in	146 x 200 / 5.8 x 7.9	
FAN MOTOR	TYPE			INDUCTION	
	QUANTITY			1	
	INDEX OF PROTECTION (IP)			IP22	
COIL	TYPE			CROSS FINNED TUBES	
	TUBE	MATERIAL		PLAIN COPPER TUBE	
		DIAMETER	mm/in	7.00 / 1/4	
		THICKNESS	mm/in	0.35 / 0.014	
	FIN	MATERIAL		ALUMINIUM	
		THICKNESS	mm/in	0.11 / 0.004	
		FACE AREA	m <sup>2</sup> / ft <sup>2</sup>	0.33 / 3.55	
		ROW		3	
		FIN PER INCH		18	
	WATER VOLUME		litre	1.11	
AIR FILTER	MATERIAL			WASHABLE SARANNET	
	QUANTITY		PC/S	2	
	SIZE	LENGTH	mm/in	300 / 11.8	
		WIDTH	mm/in	383 / 15.1	
		THICKNESS	mm/in	2 / 0.1	
CASING	MATERIAL			ELECTRO-GALVANIZED MILD STEEL	
	COLOUR			LIGHT GREY	

1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.

# Performance Data

## Unit Selection Procedure

The cooling and heating capacities of the fan coil units can be determined by the Cooling Capacity Performance Chart and Heating Capacity Performance Chart in the following pages based on nominal air flow at standard water temperature. The total and sensible capacities must be adjusted as variables come in. A sample of selection procedure is given as below:

### Step 1

Determine type of fan coil units to be used, i.e. ceiling cassette (MCK-AW Series); ceiling exposed (MCM-DW Series); etc.

### Step 2

Select a tentative unit size based on cooling capacities at nominal air flow. Design entering air temperatures and required water flows from cooling capacities chart ([Page 93 - 136](#)) or the nominal capacities ratings ([Page 50 - 74](#)) from standard specification.

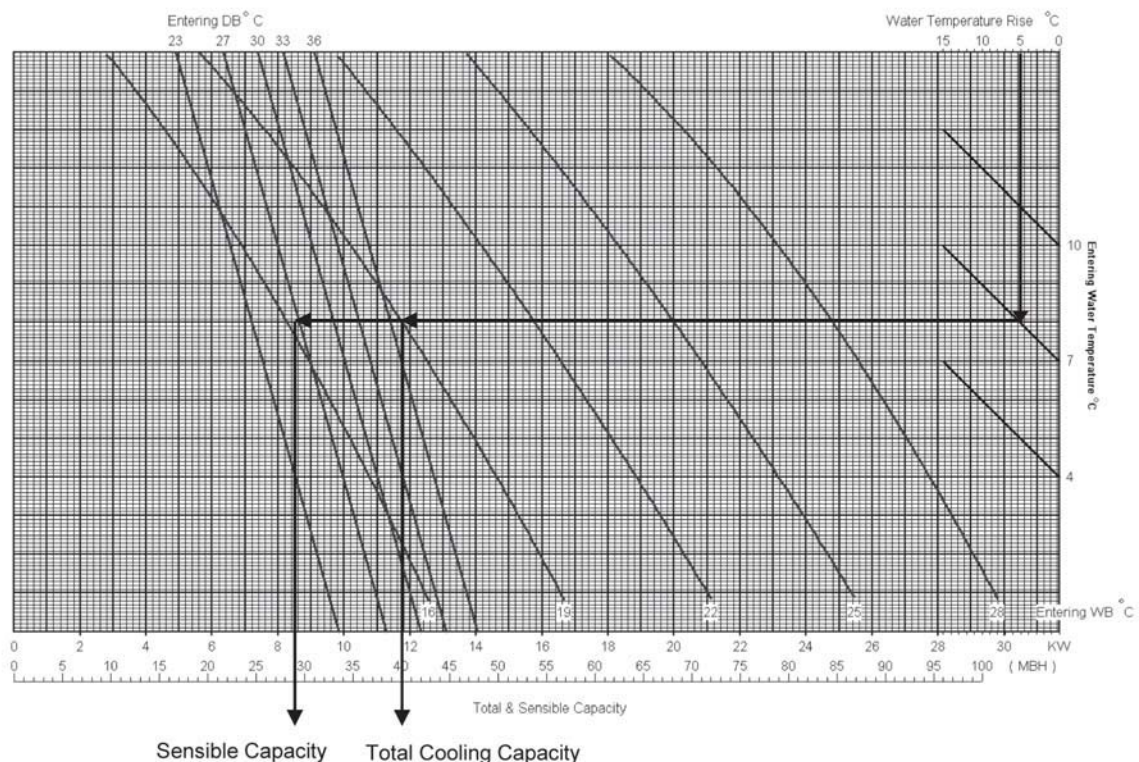
### Step 3

Determine the nominal unit cooling capacities for the unit selected. If the cooling capacities chart must be used, the following information must be known :-

- Design water temperature rise
- Design entering water temperature
- Design entering air dry bulb temperature
- Design entering air wet bulb temperature

Example of how to read the cooling performance chart.

## MCK050AW (ISO)



**Step 4**

If air flow value is different from the nominal value (high speed), then refer to specification from **Page 50 to 74** for the air flow required (medium or low speed). Determine the total and sensible correction factor from Air Flow Capacity Correction Factor (**Page 49**).

**Step 5**

If the unit is to operate at an altitude above sea level, multiply the capacity correction factors by an Altitude Correction Factors. Refer to **Page 49**.

**Step 6**

Calculate the actual cooling capacity by multiply the nominal capacity (from Step 3) with Air Flow Capacity Correction Factor from Step 4 and the Altitude Correction Factor from Step 5.

$$\text{Actual Capacity, W} = \text{Nominal capacity (Step 3)} \times \text{Air Flow Capacity Correction Factor (Step 4)} \times \text{Altitude Correction Factor (Step 5)}$$

**Step 7**

Water flow rate can be determined by:

$$\text{Litres/Min} = \frac{\text{Total Cooling Capacity, W}}{70 \times \text{Water Temperature Rise } ^\circ\text{C}}$$

$$\text{USGPM} = \frac{\text{Total Cooling Capacity, Btu/H}}{500 \times \text{Water Temperature Rise } ^\circ\text{F}}$$

**Step 8**

Heating Capacities at nominal air flow (**Page 137 to 141** - Heating Performance Chart) are based on standard condition of 60°C EWT and 21°C EAT. The actual heating capacity can be obtained by using the Heating Capacity Correction Factor (**Page 49**) and Altitude Correction Factor as per Step 5.

$$\text{Hence Actual Heating Capacity, W} = \text{Nominal Capacity (Page 137 to 141)} \times \text{Heating Capacity Correction Factor (Page 49)} \times \text{Air Flow Capacity Correction Factor (Step 4)} \times \text{Altitude Correction Factor (Step 5)}$$

**Step 9**

Water Pressure Drop Tables are on **Page 43 to 48**.

**EXAMPLE**

Select a ceiling cassette type fan coil unit at the following design specification:

Room design condition	: 27°C DB / 19°C WB
Room Cooling Load	: 8 kW sensible capacity / 11 kW total capacity
Room Heating Load	: 22 kW
Entering water temperature	: 7°C cooling / 70°C heating
Water temperature rise	: 5°C
Air Volume	: 1000 CFM
Altitude	: 600 m

**SOLUTION****Step 1**

Based on the type of fan coil required and the design conditions, tentatively select MCK050AW. From the cooling capacity performance chart (**Page 114**), at 26.7°C DB / 19°C WB air temperature, 7°C entering water temperature and with 5°C water temperature rise, the cooling capacity for this unit is 11.7 kW total capacity and 8.5 kW sensible capacity.

### Step 2

From [page 49](#), the air flow correction factor table, at high speed, the air volume is 1040 CFM and medium speed is 950 CFM, hence high speed is selected. And the correction factor is hence 1.0.

If lower air flow required, then use the medium and low fan speed. The correction factor can be determined by getting the ratio of air flow (i.e. medium or low speed / high speed).

### Step 3

As the unit is operating at 600m above sea level, the Altitude correction factor is 0.98 total and 0.93 sensible.

### Step 4

Multiply the cooling capacities obtained from step 1 (as per specification and design condition) by correction factors from (2) and (3)

$$\text{Actual total cooling capacity} = 11.7 \times 1.0 \times 0.98 \text{ kW} = 11.47 \text{ kW}$$

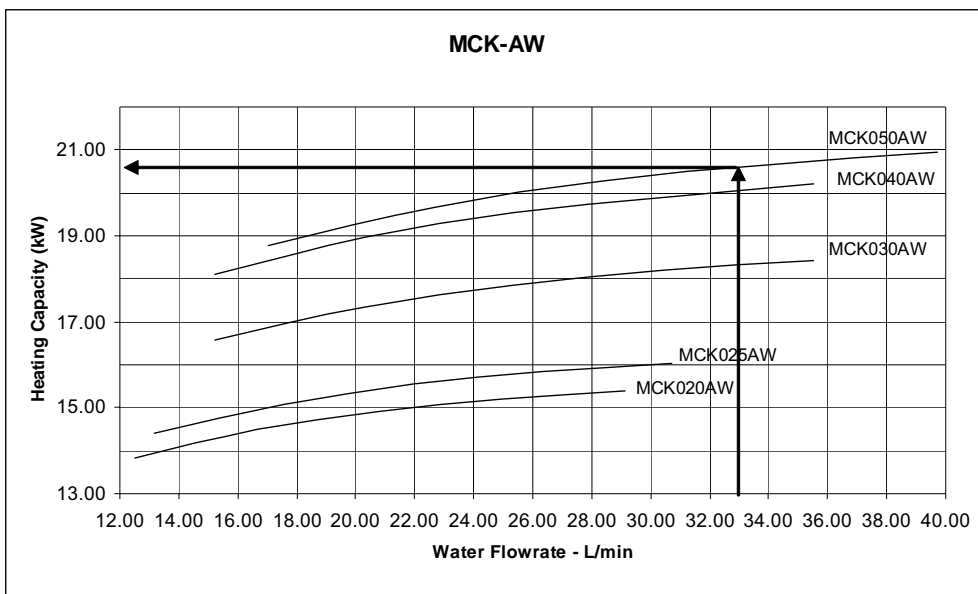
$$\text{Actual sensible cooling capacity} = 8.5 \times 1.0 \times 0.93 \text{ kW} = 7.91 \text{ kW}$$

### Step 5

$$\text{Water flow rate} = \text{Litres/M} = \frac{11470 \text{ W}}{70 \times 5} = 32.8$$

### Step 6

From Heating Capacity Performance Chart ([Page 138](#)), determine the heating capacity at the nominal air volume by using the flow rate calculated in step 5. The heating capacity is at 20.6 kW.



### Step 7

From Heating Capacity Correction Factor Tables at 70°C water entering temperature and 26.7°C entering air temperature, the correction factor is 1.1261,

$$\text{Actual Heating Capacity} = 20.6 \times 0.98 \times 1.1261 = 22.7 \text{ kW}$$

### Step 8

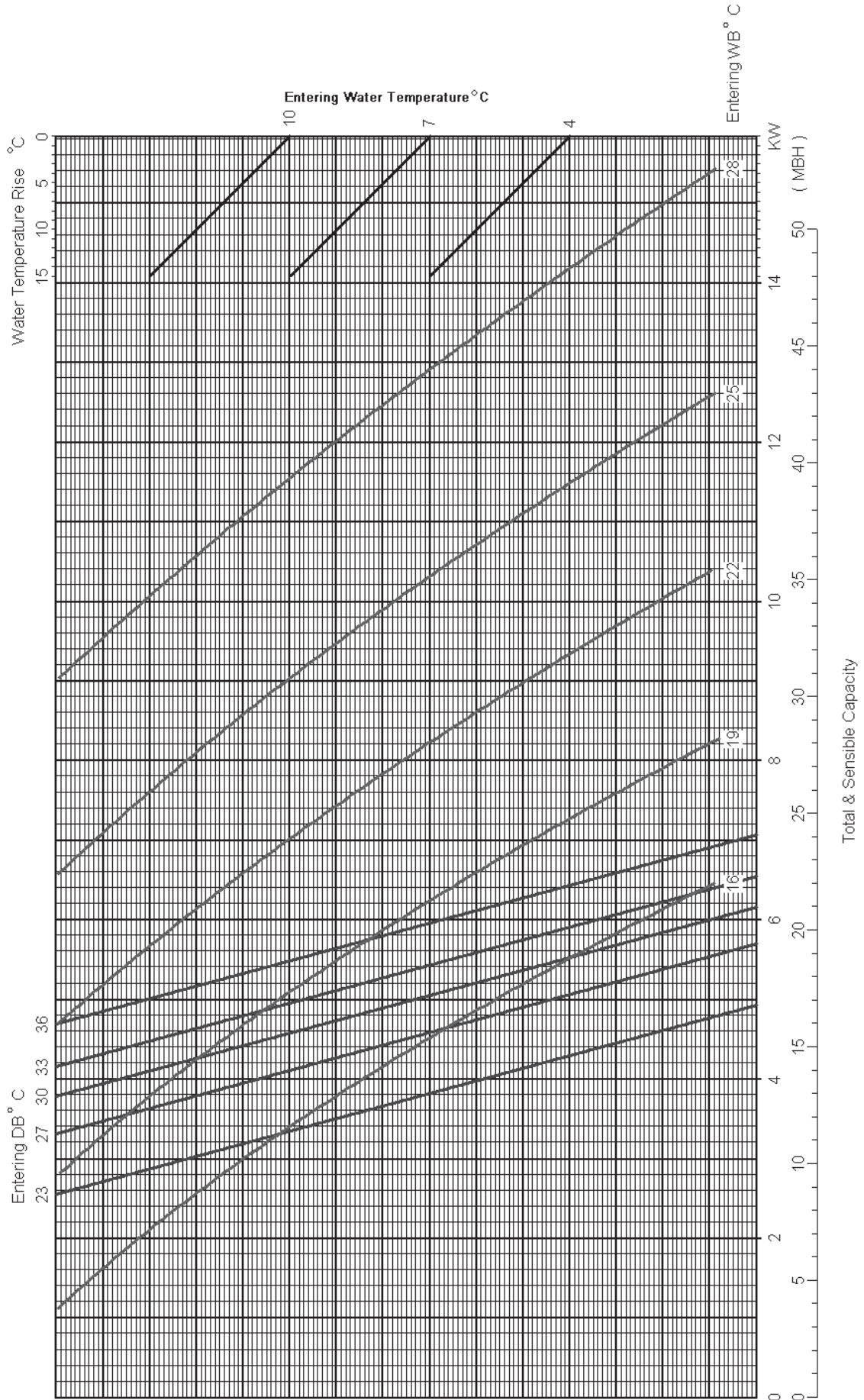
Water Pressure Drop can be estimated from water Pressure Drop Table ([Page 43 to 48](#)) using interpolate method:

At flow rate of 32.8 Litres/Min, the nominal pressure drop is 39.14 kPa

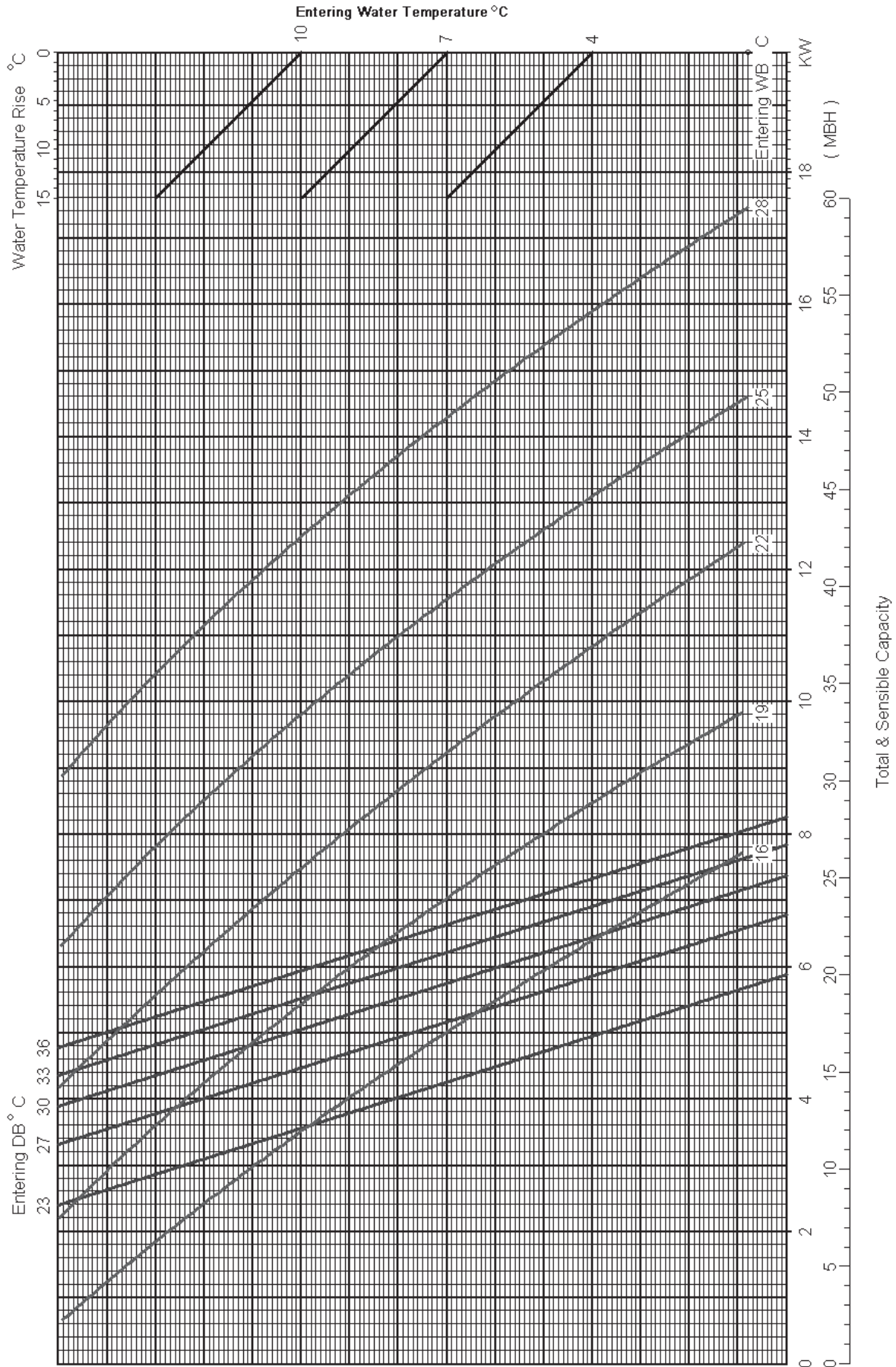
$$\text{Pressure drop correction factor} = 1.2947 - 0.0021 \times (\text{EWT}^\circ\text{C} \times 1.8 + 32) = 0.9629$$

Hence the actual pressure drop = nominal pressure drop x correction factor = 37.69 kPa.

# MCM020DW

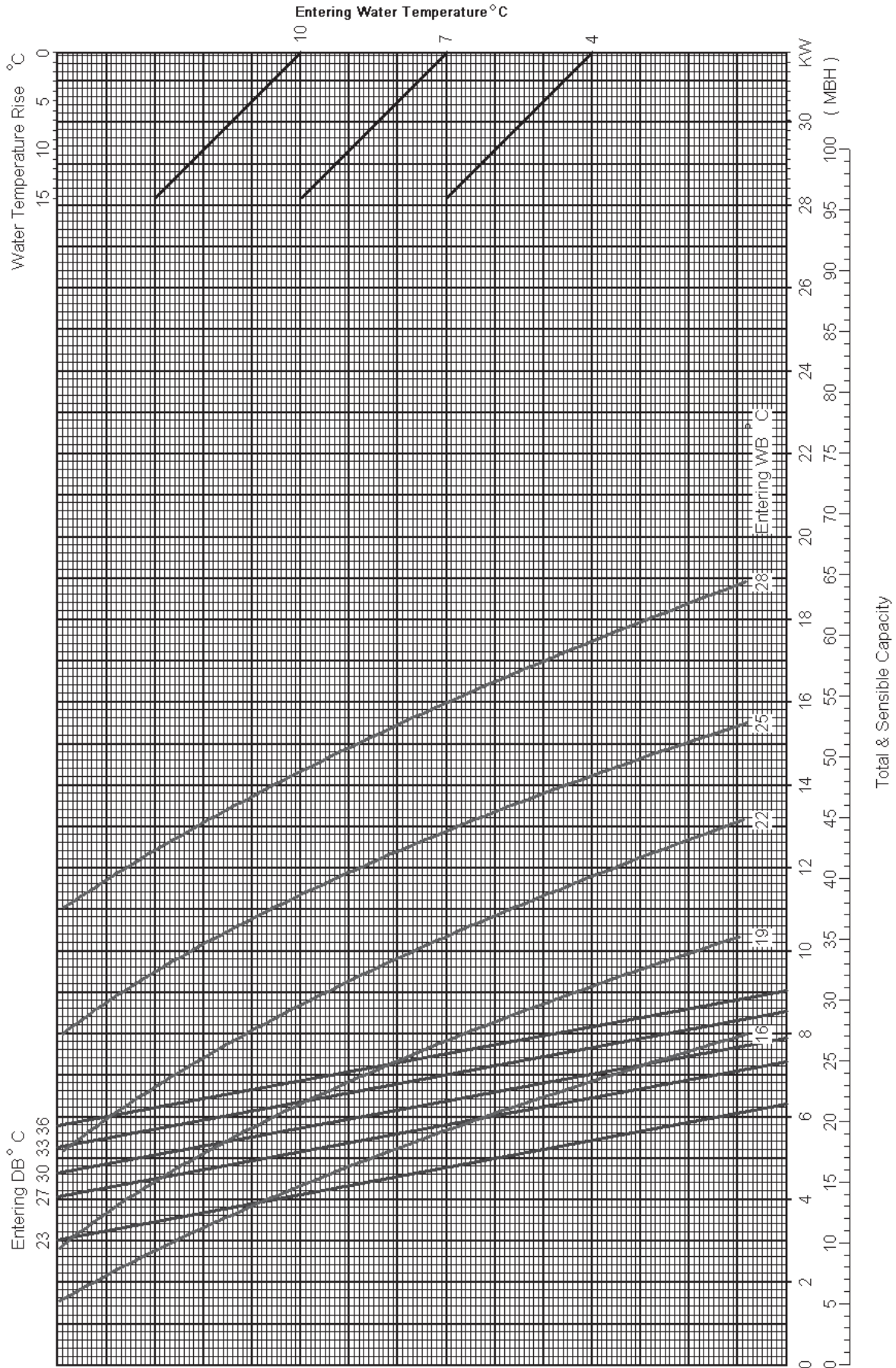


# MCM025DW

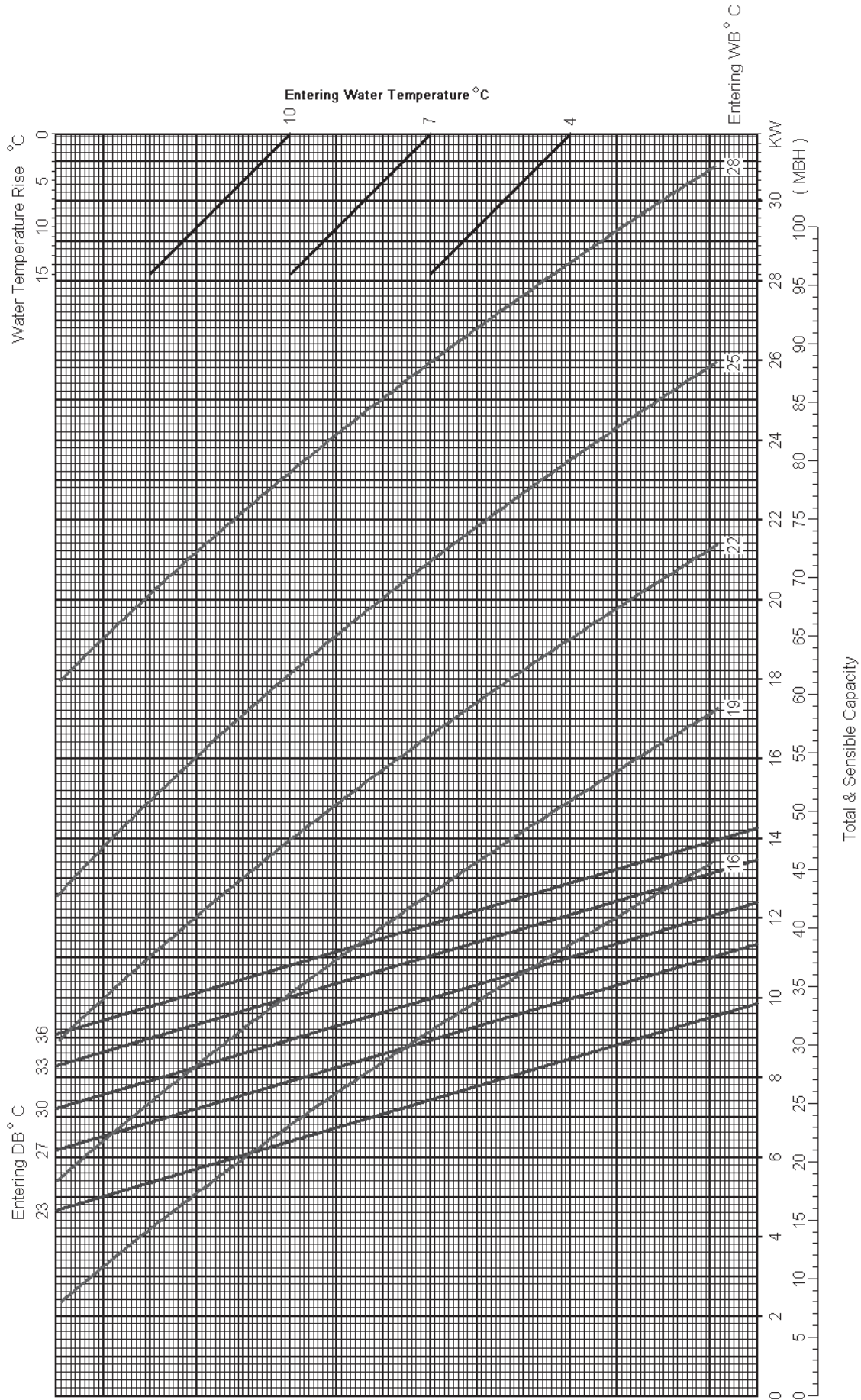




# MCM030DW

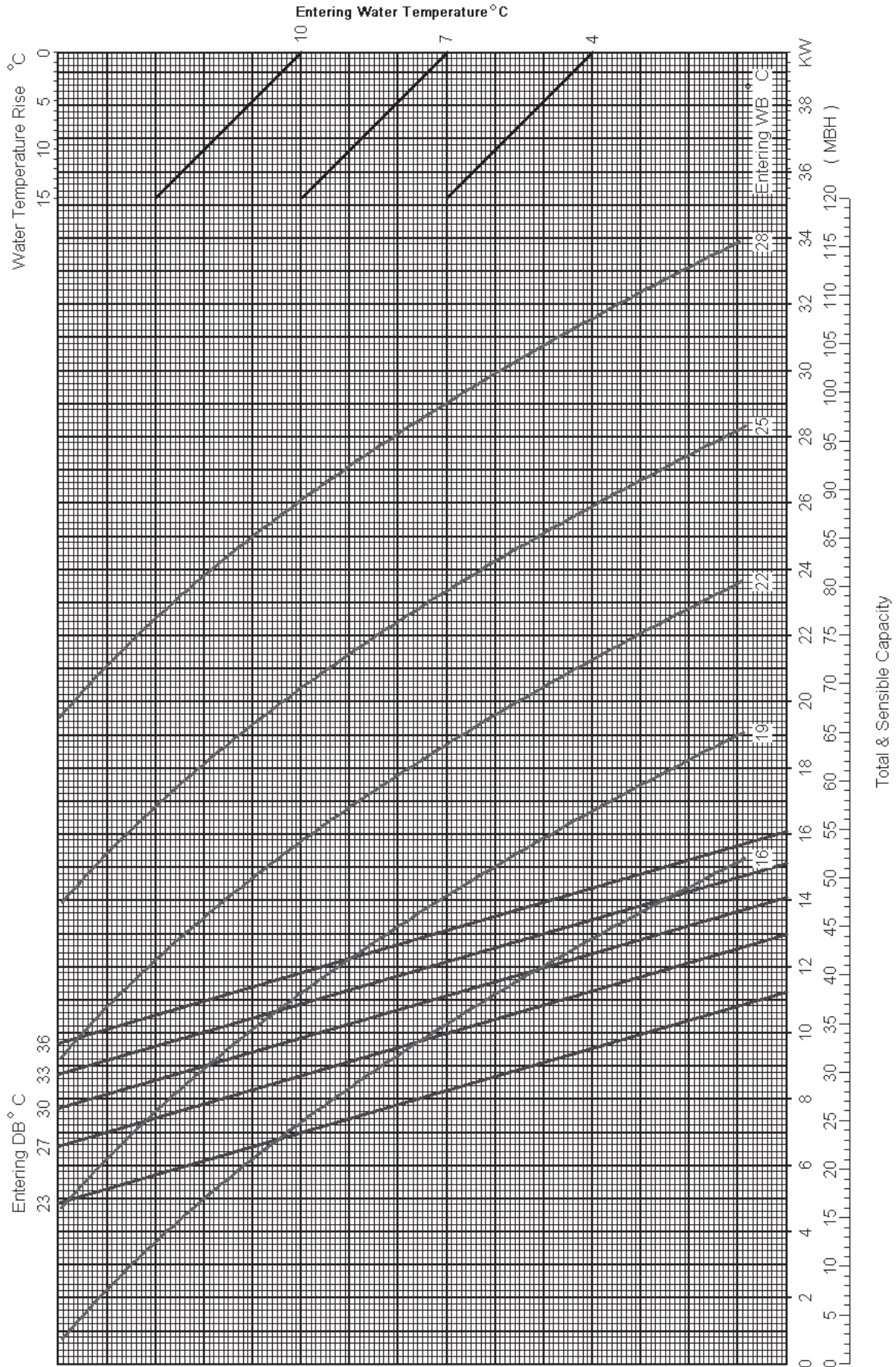


# MCM040DW

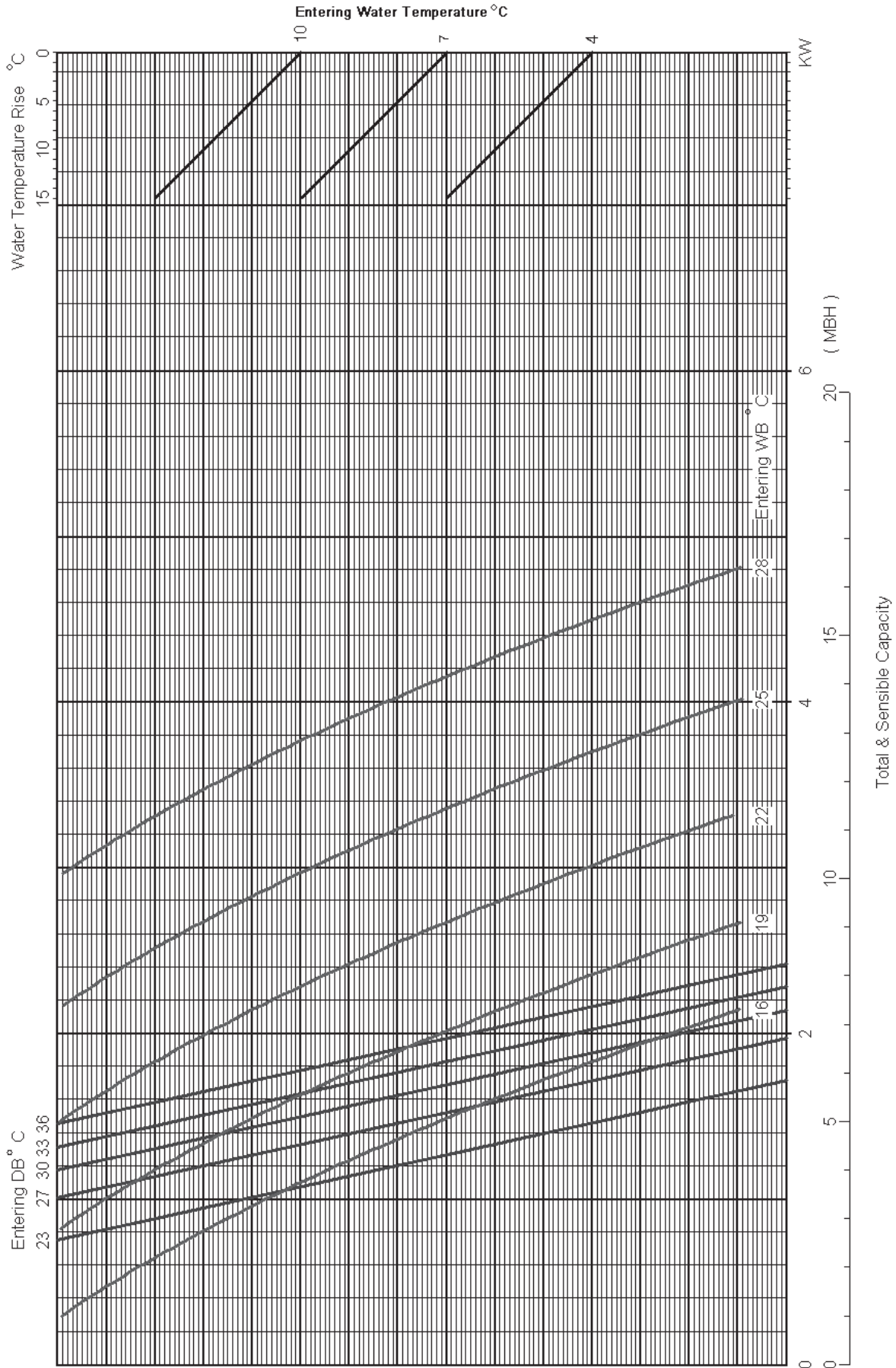




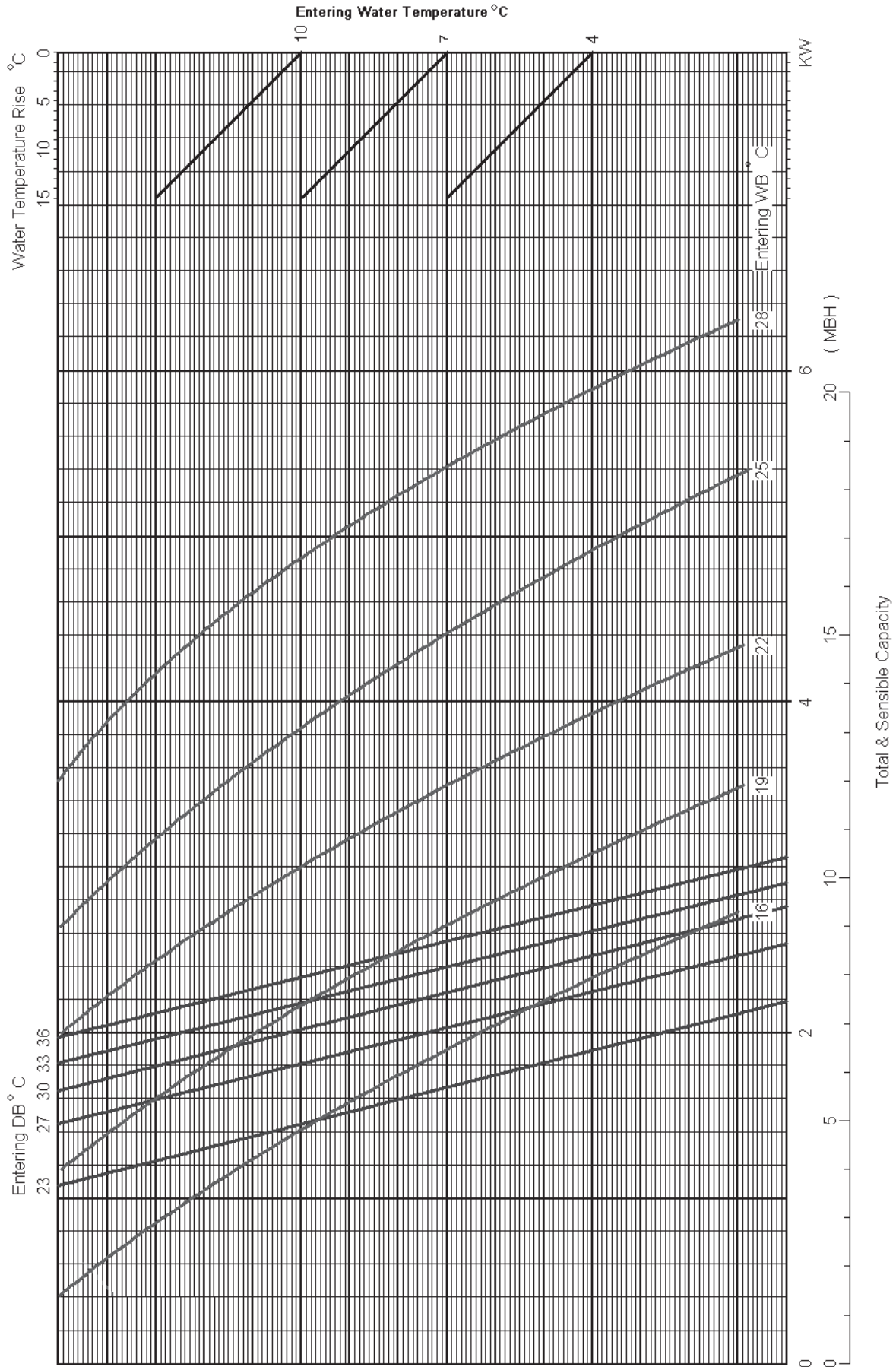
# MCM050DW



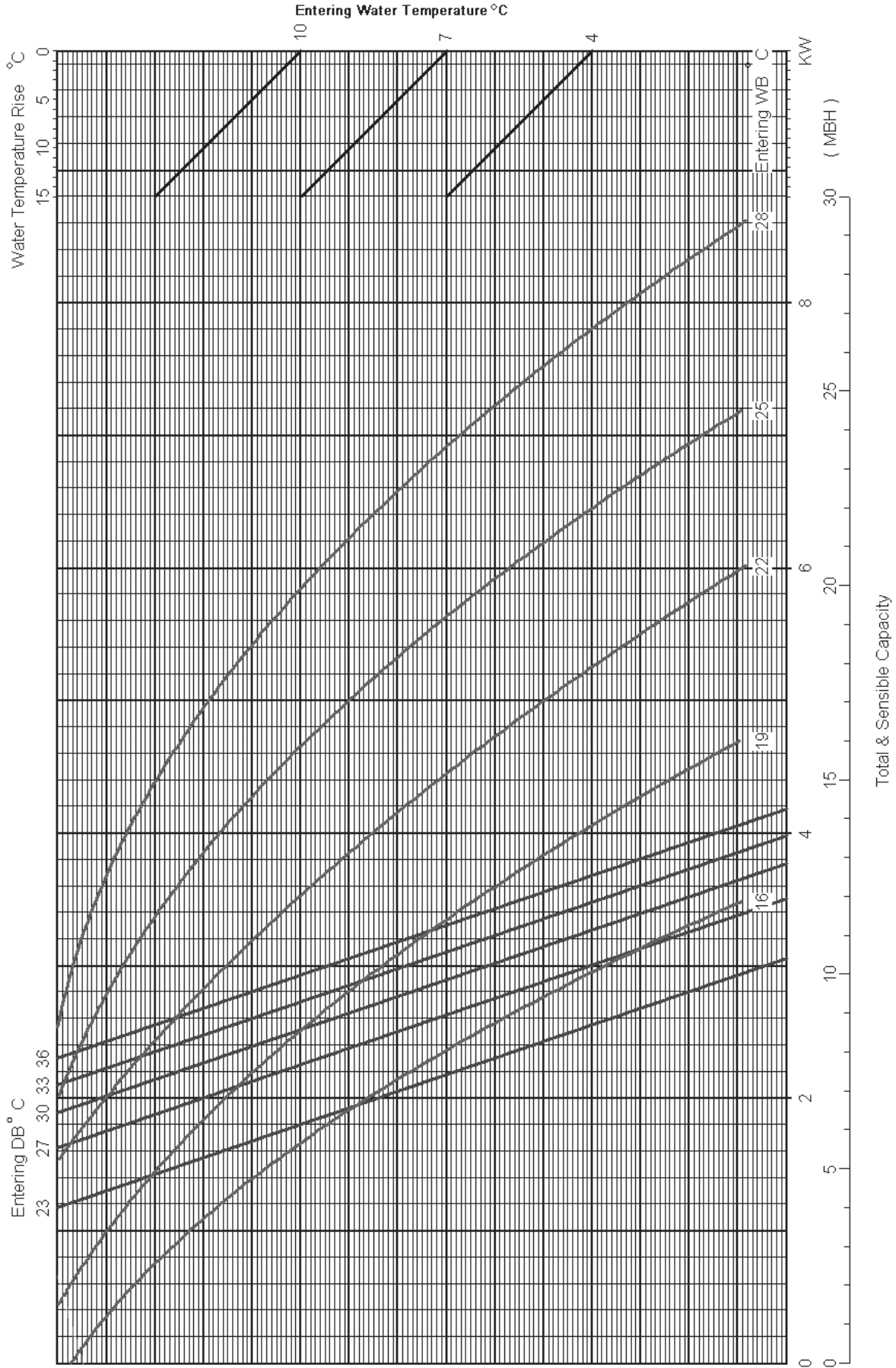
# MCM007CBW



# MCM010CBW

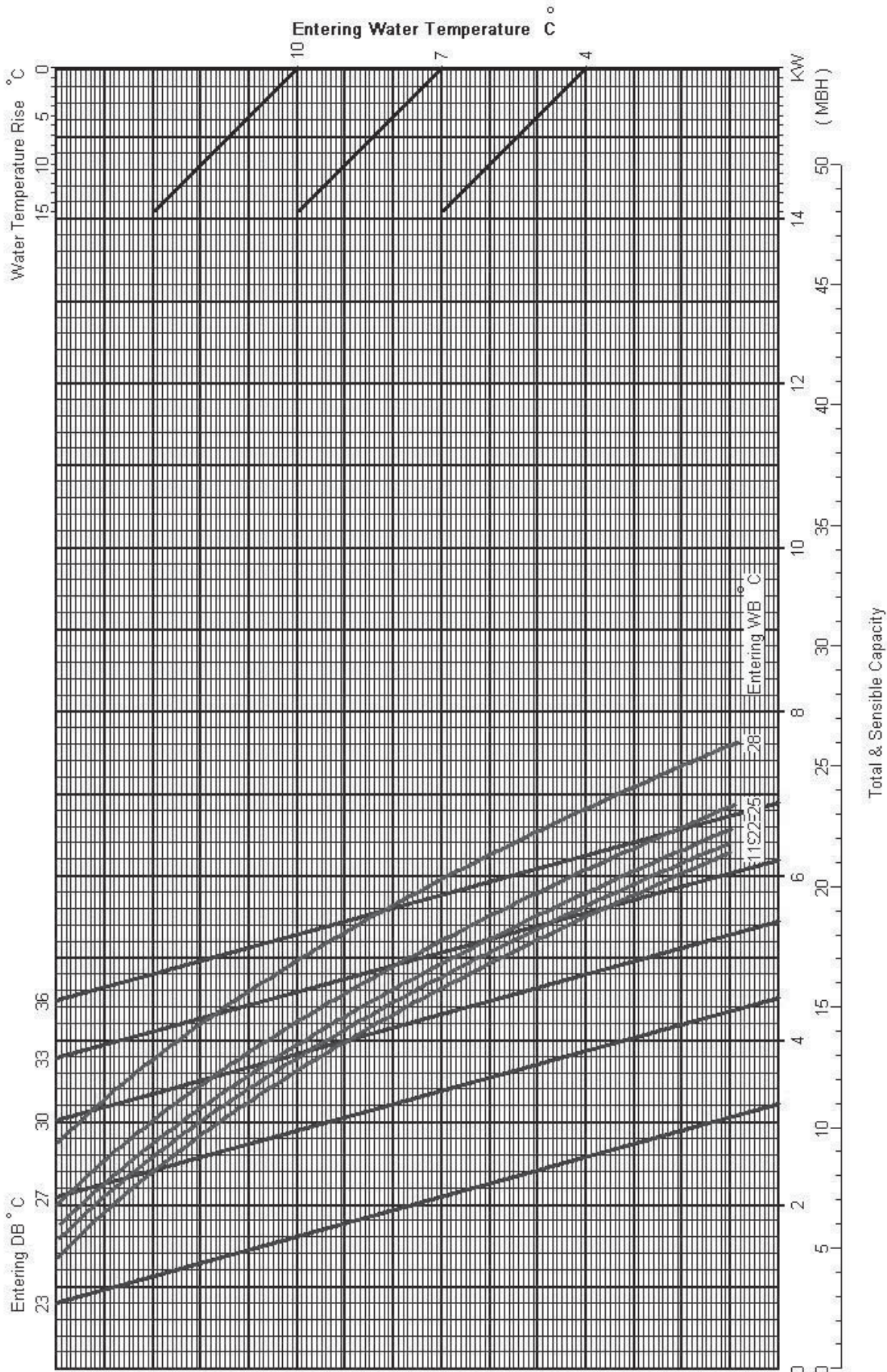


# MCM015CBW



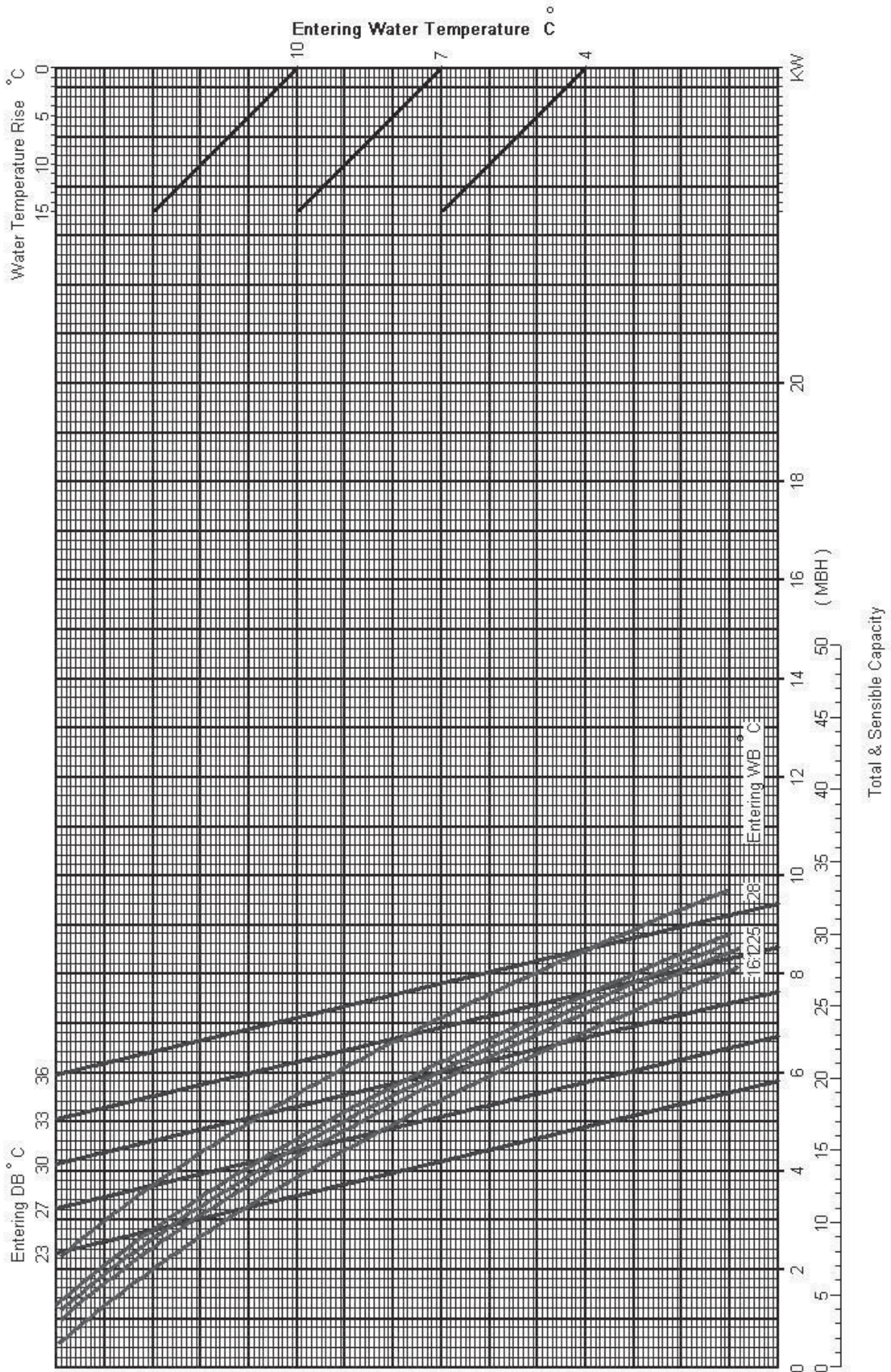


# MCM015EW

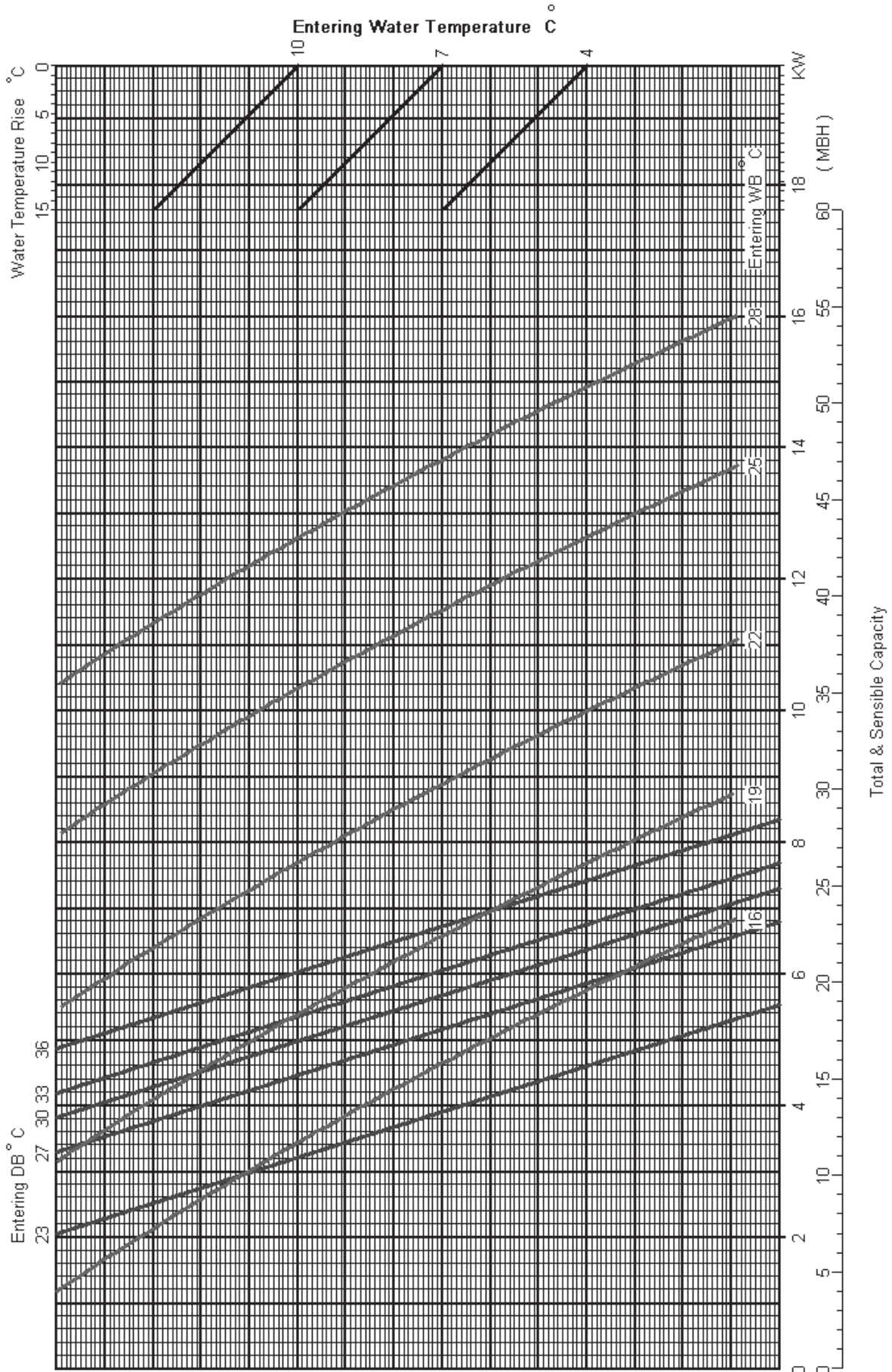




# MCM020EW



# MCM025EW

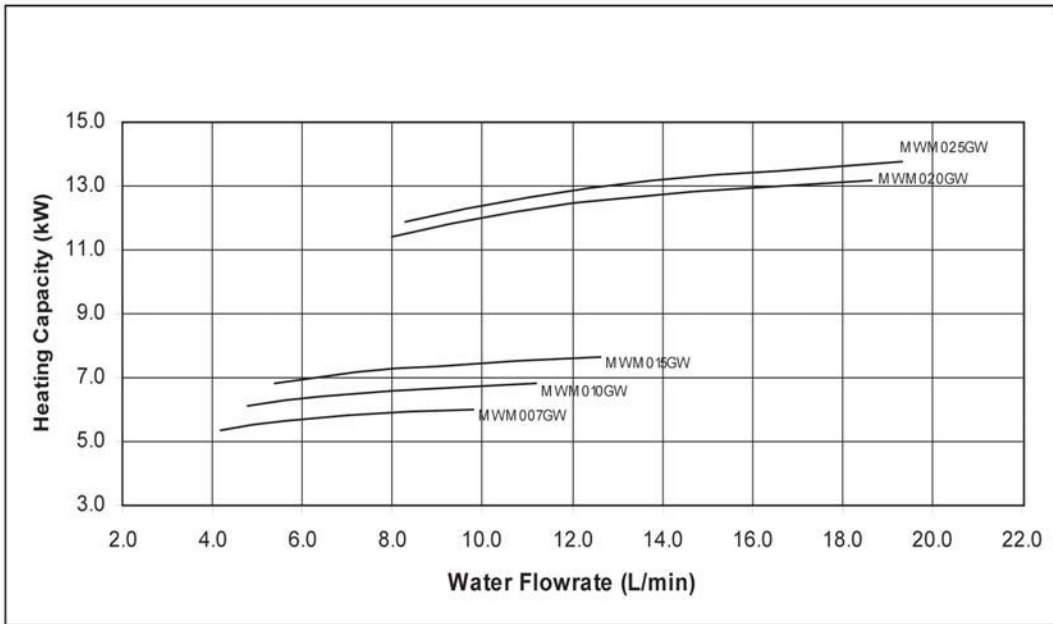




# Heating Capacity Performance Chart

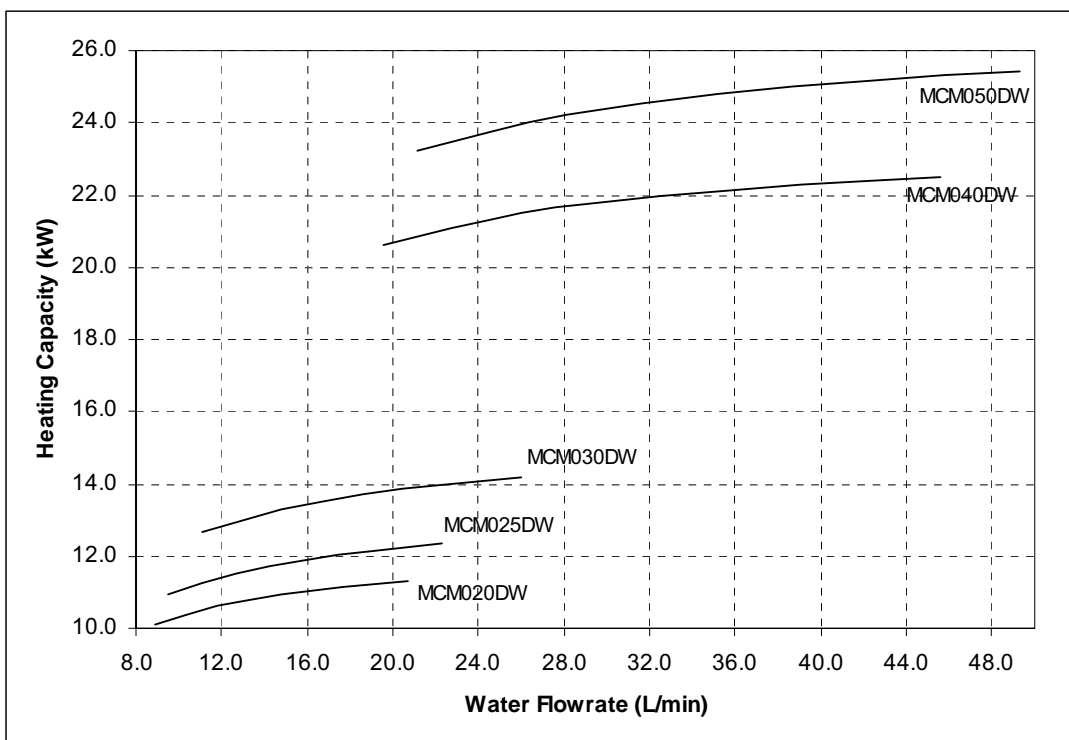
## Wall Mounted Split Type

### MWM-GW



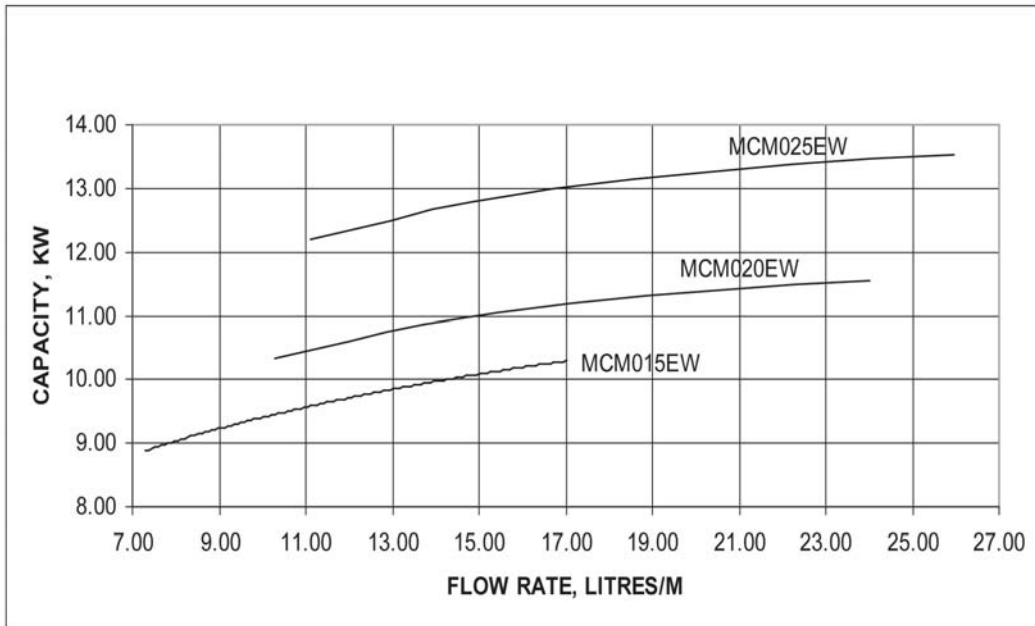
## Ceiling Exposed Split Type

### MCM-DW



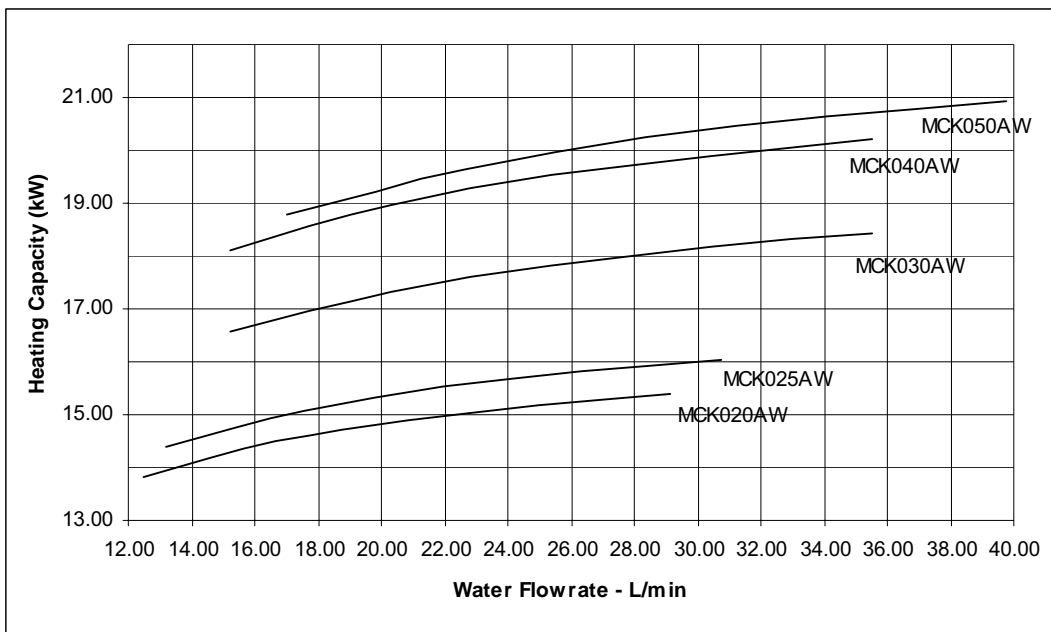


## MCM-EW

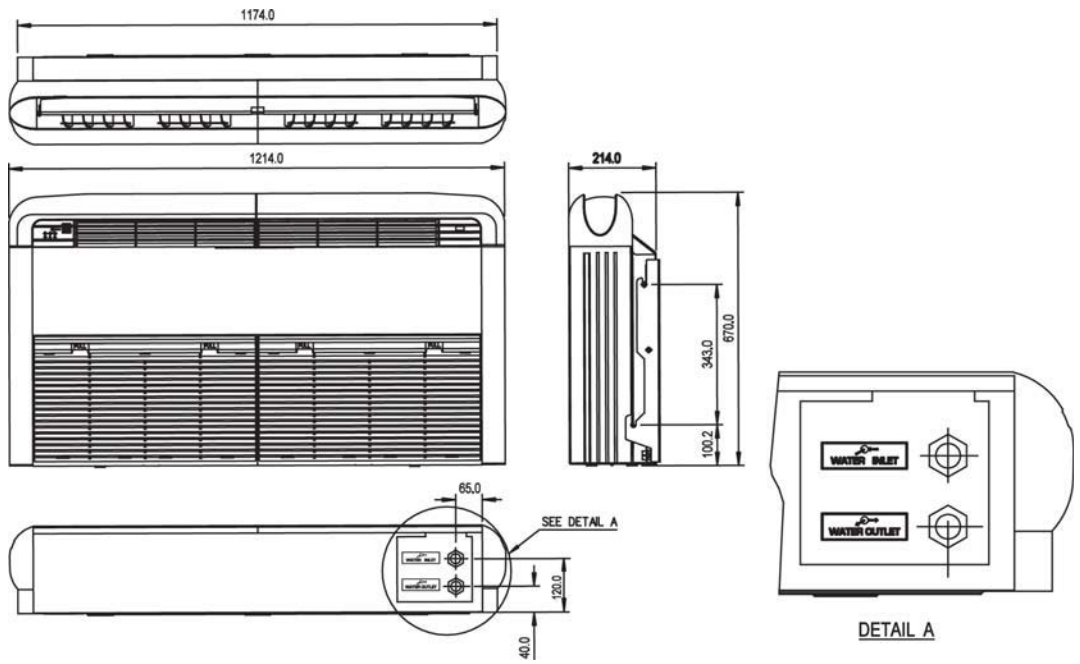


## Ceiling Cassette Split Type

### MCK-AW

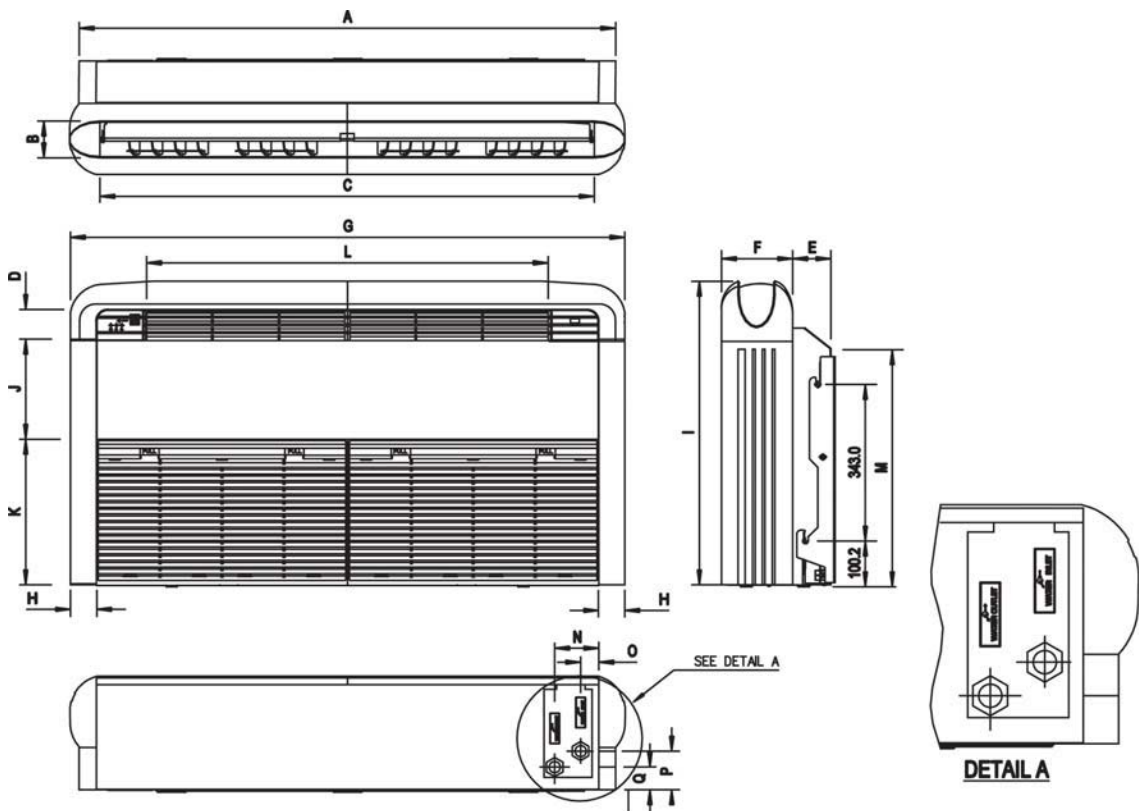


**Indoor Unit**  
**Model : MCM 020 / 025 DW**



Dimension in mm

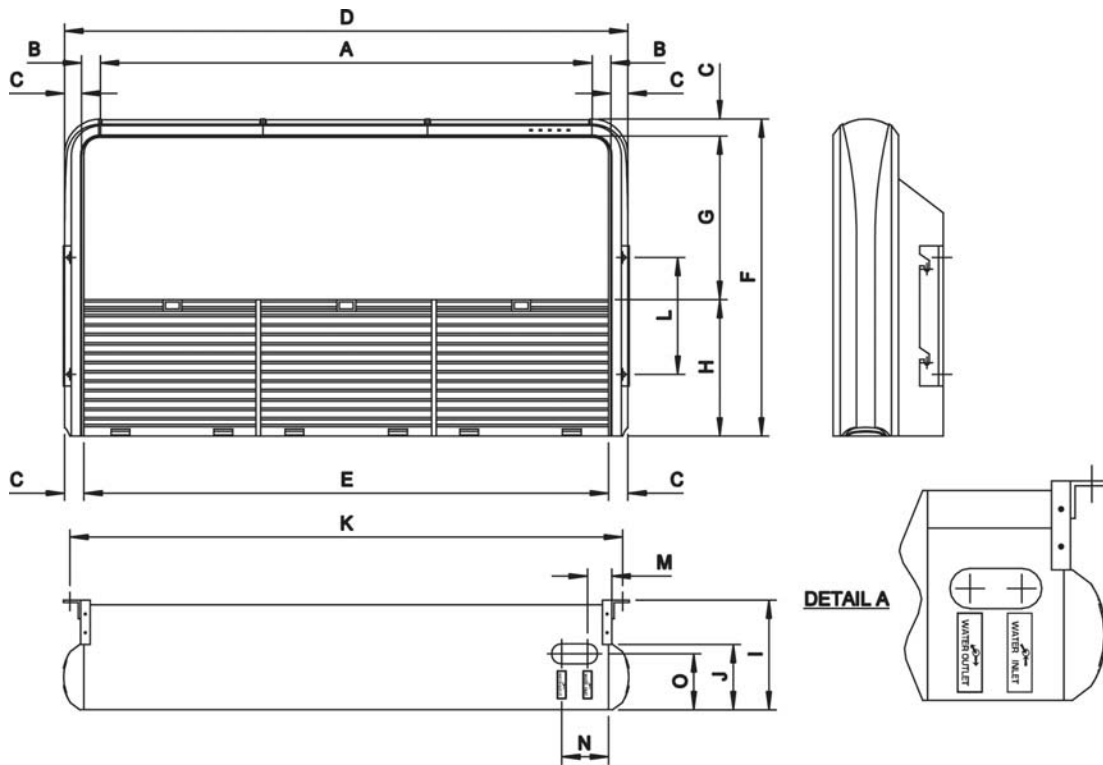
**Indoor Unit**  
**Model : MCM 030 / 040 / 050 DW**



MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
MCM030DW	1174	75	1082	68	93	156	1214	57	670	216	319	879	517	100	47	100	53
MCM040DW	1674	75	1582	68	93	156	1714	57	670	216	319	1379	517	95	40	100	45
MCM050DW	1674	75	1582	68	93	156	1714	57	670	216	319	1379	517	95	40	100	45

Dimension in mm

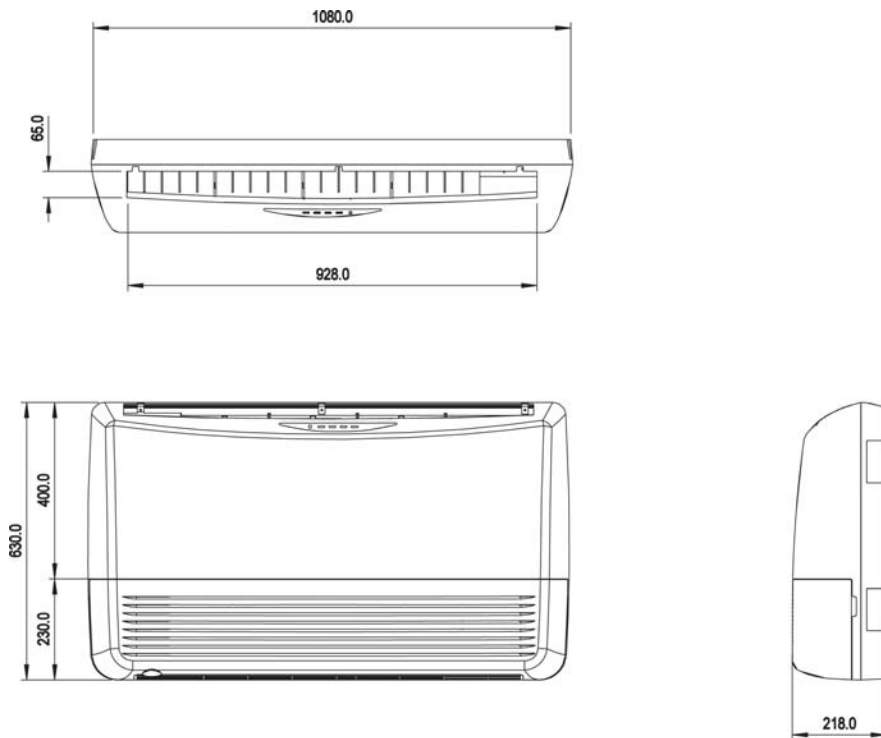
**Indoor Unit**  
**Model : MCM 007 / 010 / 015 CBW**



MODEL	A (GRILL)	B	C	D	E	F	G	H	I	J	K	L	M	N	O
MCM 007CBW	700	40	36	853	780	680	352	292	235	140	830	250	50	100	120
MCM 010CBW	700	40	36	853	780	680	352	292	235	140	830	250	50	100	120
MCM 015CBW	1050	40	36	1203	1130	680	352	292	235	140	1180	250	50	100	120

Dimension in mm

**Indoor Unit**  
**Model : MCM 015 / 020 / 025 EW**



Dimension in mm

## MCM-DW

MODEL			MCM020DW	MCM025DW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	96	130
	RATED RUNNING CURRENT	A	0.41	0.54
	MOTOR OUTPUT	W	40	65
	POLES		4	4

MODEL			MCM030DW
FAN MOTOR	INSULATION GRADE		B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50
	RATED INPUT POWER	W	132
	RATED RUNNING CURRENT	A	0.57
	MOTOR OUTPUT	W	65
	POLES		4

MODEL			MCM040DW	MCM050DW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	240	240
	RATED RUNNING CURRENT	A	0.98	1.03
	MOTOR OUTPUT	W	100	120
	POLES		4	4

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 2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

## MCM-CBW

MODEL			MCM007CBW	MCM010CBW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	49	50
	RATED RUNNING CURRENT	A	0.22	0.22
	MOTOR OUTPUT	W	47	52
	POLES		4	4

MODEL			MCM015CBW
FAN MOTOR	INSULATION GRADE		B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50
	RATED INPUT POWER	W	81
	RATED RUNNING CURRENT	A	0.35
	MOTOR OUTPUT	W	75
	POLES		4

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## MCM-EW

MODEL			MCM015EW	MCM020EW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	101	109
	RATED RUNNING CURRENT	A	0.46	0.49
	MOTOR OUTPUT	W	50	65
	POLES			4

MODEL			MCM025EW
FAN MOTOR	INSULATION GRADE		B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50
	RATED INPUT POWER	W	119
	RATED RUNNING CURRENT	A	0.52
	MOTOR OUTPUT	W	70
	POLES		

- 1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.  
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## MCC-CW

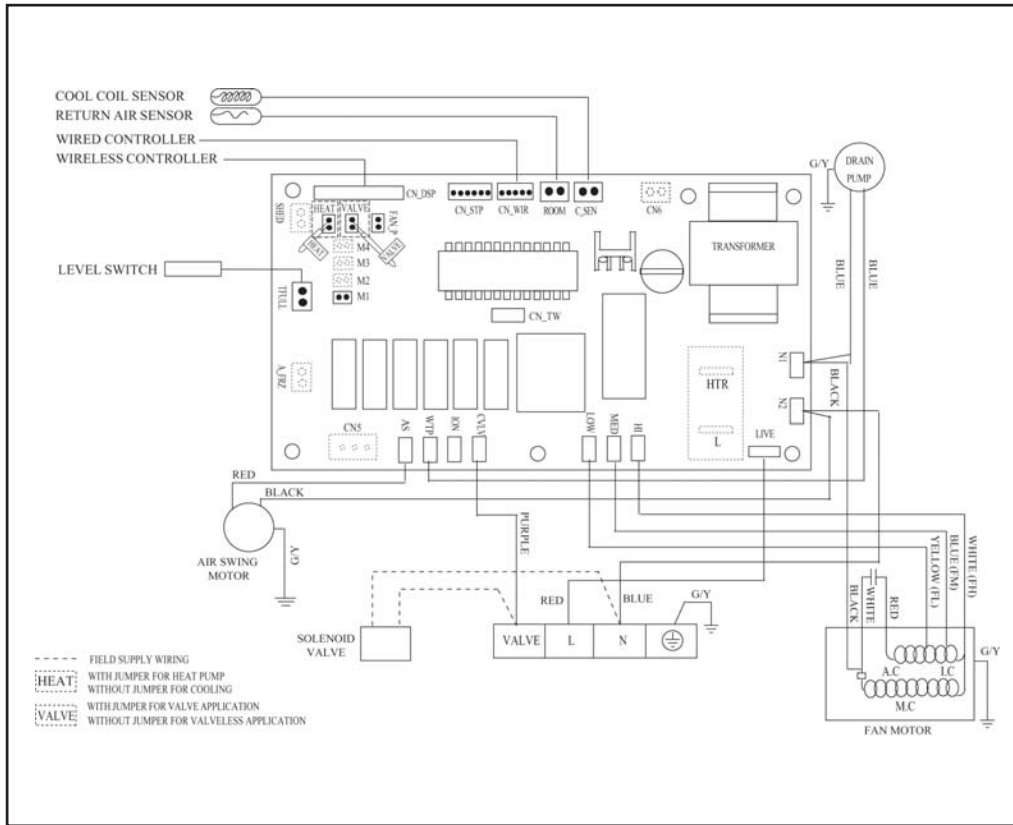
MODEL			MCC010CW	MCC015CW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	68	97
	RATED RUNNING CURRENT	A	0.30	0.42
	MOTOR OUTPUT	W	30	50
	POLES			4

MODEL			MCC020CW	MCC025CW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	141	165
	RATED RUNNING CURRENT	A	0.64	0.73
	MOTOR OUTPUT	W	80	100
	POLES			4

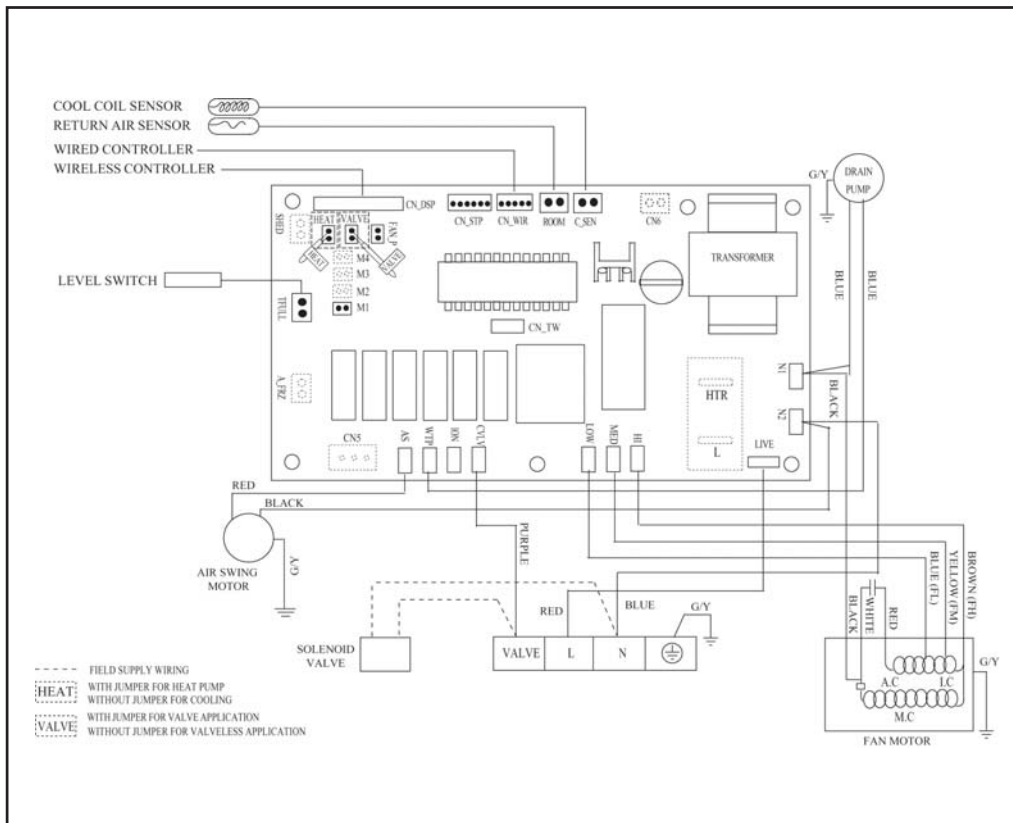
MODEL			MCC028CW	MCC038CW
FAN MOTOR	INSULATION GRADE		B	B
	POWER SOURCE	V/Ph/Hz	220 - 240 / 1 / 50	220 - 240 / 1 / 50
	RATED INPUT POWER	W	150	423
	RATED RUNNING CURRENT	A	0.66	1.81
	MOTOR OUTPUT	W	320	370
	POLES			4

- 1) ALL SPECIFICATIONS ARE SUBJECTED TO CHANGE BY THE MANUFACTURER WITHOUT PRIOR NOTICE.  
 2) ALL UNITS ARE BEING TESTED AND COMPLY TO ISO 5151.

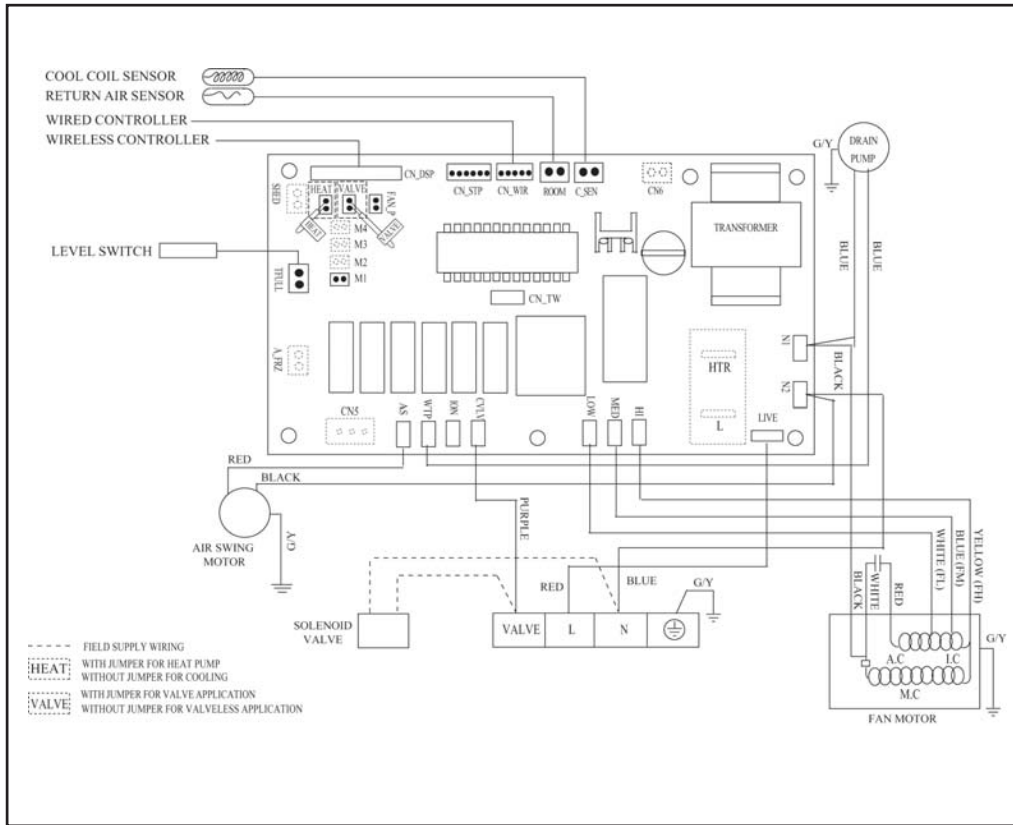
**Model : MCM 020 / 025 / 030 / 040 / 050DW**



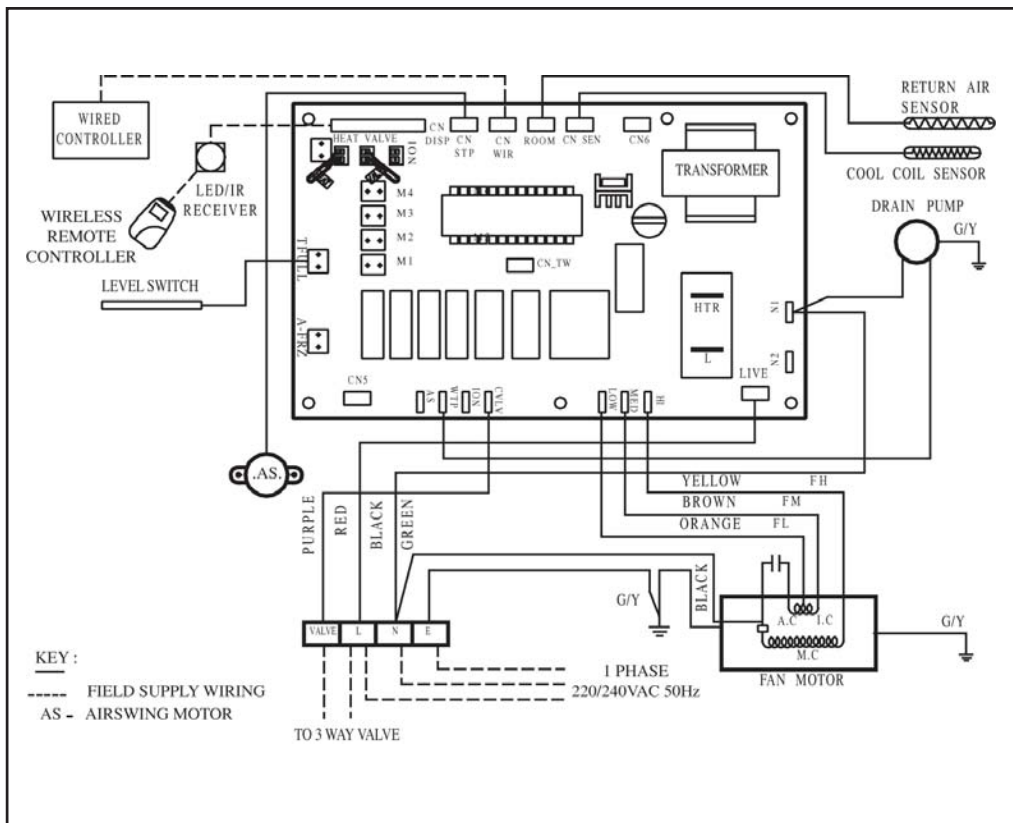
**Model : MCM 007 / 015 CBW**



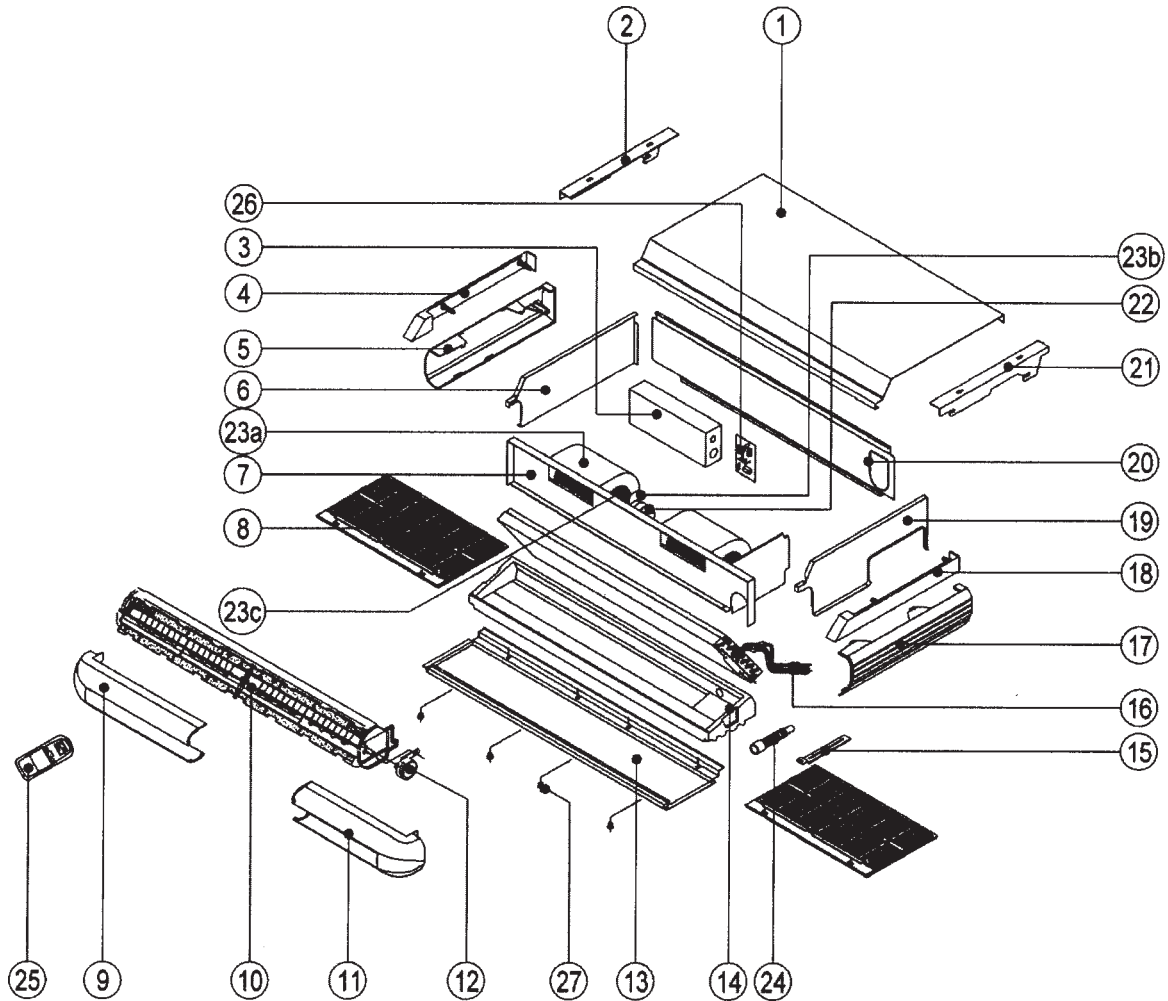
**Model : MCM 010 CBW**



**Model : MCM 015 / 020 / 025 EW**



**Model : MCM 020 / 025 DW**



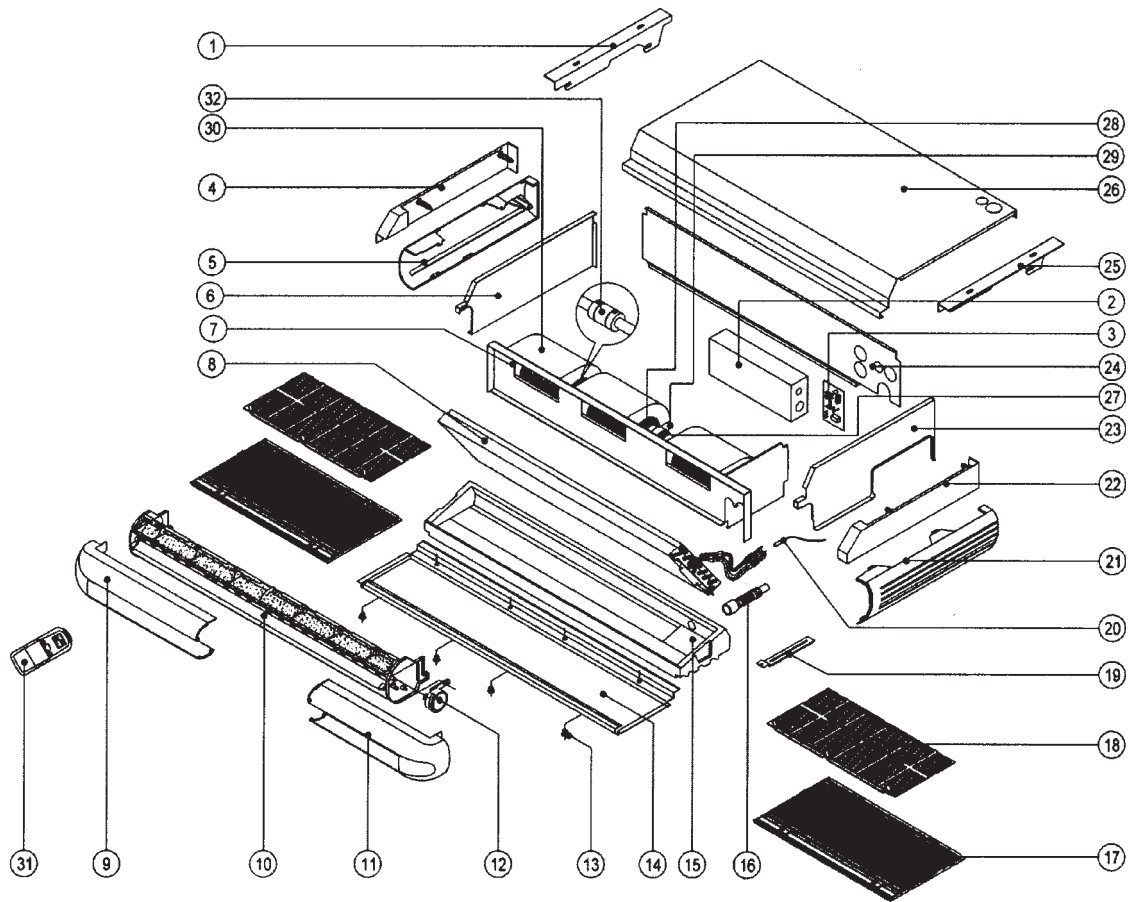
No	Description	Part No.
1	Top Panel	R01014022475
2	Hanger Bracket - Left	R01014058940
3	Control Box	R01014022491
4	Close Up, Side Panel (Left)	R12013022636
5	Side Frame Assy., Left	R12013022501
6	Coil Holder Assy. - Left	R01014022480
7	Fan Deck	R50014070732
8	Air Intake Grille Assy.	R50124032385
9	Front Frame - Left	R12013022443
10	Louver Assy.	R50129023197
11	Front Frame - Right	R12013022444
12	Air Swing Motor Assy.	R50034026127
13	Bottom Panel	R01015033342
14	Drain Pan Assy.	R50124023274
15	Centre Support Bracket	R01014022484
16	Coil Assy.	R50024064144

No	Description	Part No.
17	Side Frame Assy., Right	R12013022502
18	Close Up, Side Panel (Right)	R12013022637
19	Coil Holder Assy. - Right	R01014070734
20	Back Panel	R01013058750
21	Hanger Bracket - Right	R01014032843
22	Fan Motor	
	MCM040DW	R03039012873
	MCM050DW	R03039012875
23	Blower Housing, Top	R03094026108
	Blower Housing, Bottom	R03094021607
	Blower Wheel	R03024004754
24	Drain Hose Assy.	R50124025113
25	G7 Handset (Cooling Only)	R04084047723
	G7 Handset (Heat Pump)	R04084027531
26	W2 Control Module	R04089021708

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**Model : MCM 030 DW**

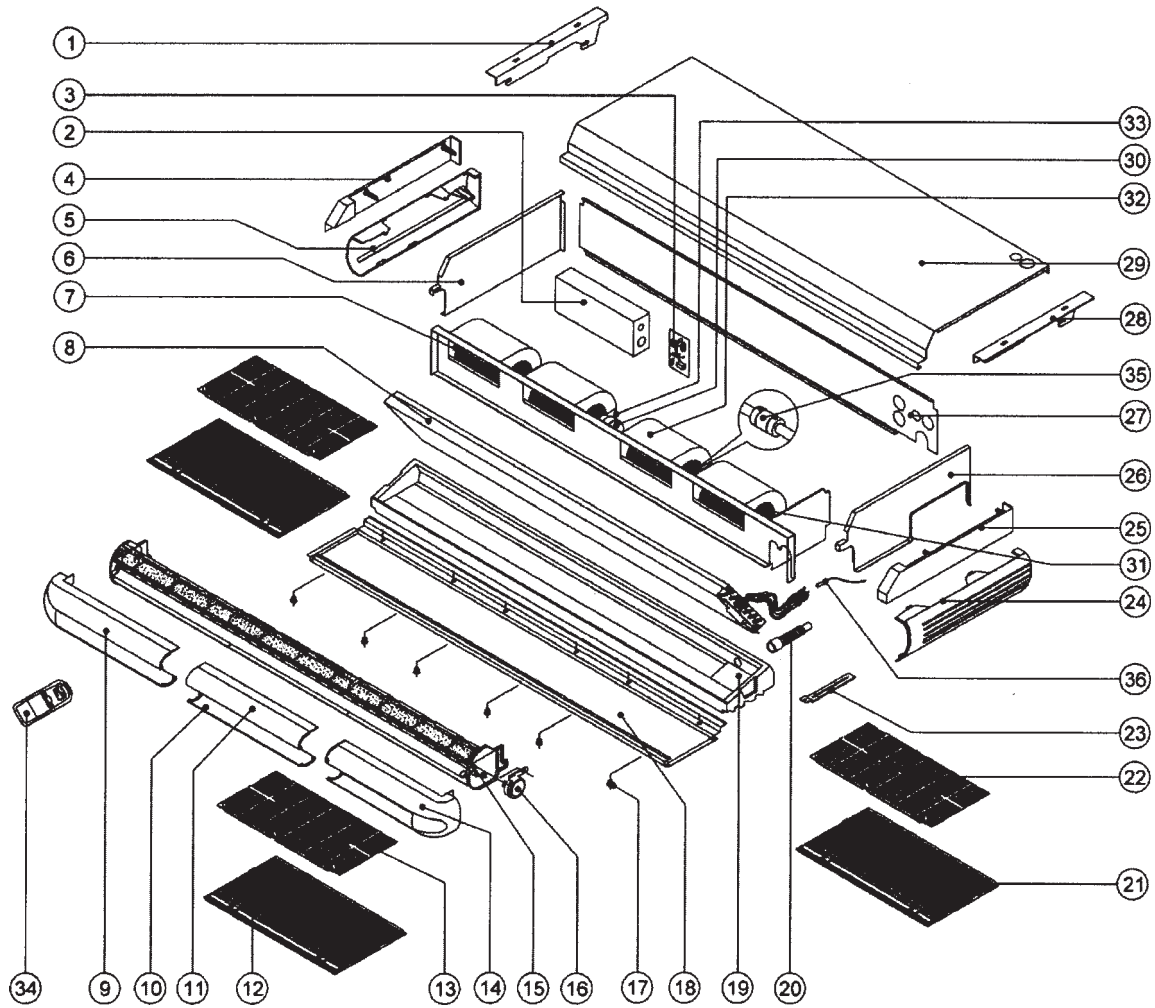


No	Description	Part No.
1	Bracket Hanger, Left	R01014058940
2	Control Box Cover	R01014022491
3	W2 control module	R04089021708
4	Close Up, Left	R12013024883
5	Frame, Side Left	R12013022501
6	Assy., Coil Holder Left	R50064028307
7	Fan Deck	R50014057534
8	Coil Assy.	R50024064141
9	Frame, Front Left	R12013022443
10	Assy., Louver	R50129023197
11	Frame, Front Right	R12013022444
12	Air Swing Motor Assy.	R50034026127
13	Air Intake Grille Frame Holder Assy.	R12014022098
14	Bottom Panel	R01015033342
15	Drain Pan Assy.	R50124023274
16	Drain Hose Assy.	R50124025113
17	Grille, Air Intake	R50124032385

No	Description	Part No.
18	Assy, Filter Frame Left/Right	R50124022130
19	Bracket Centre Support	R01014022484
20	Thermister	-
21	Frame, Side Right	R12013022502
22	Close Up, Right	R12013024884
23	Assy., Coil Holder Right	R50064059069
24	Back Panel	R01014058754
25	Bracket Hanger, Right	R01014032843
26	Top Panel	R50014028305
27	Fan Motor	R03039012877
28	Blower Wheel	R03024004754
29	Housing Blower, Bottom	R03090030300
30	Housing Blower, Top	R03094026108
31	G7 Handset (Cooling Only) G7 Handset (Heat Pump)	R04084047723 R04084027531
32	Rubber Coupling	R11054025589

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**Model : MCM 040 / 050 DW**

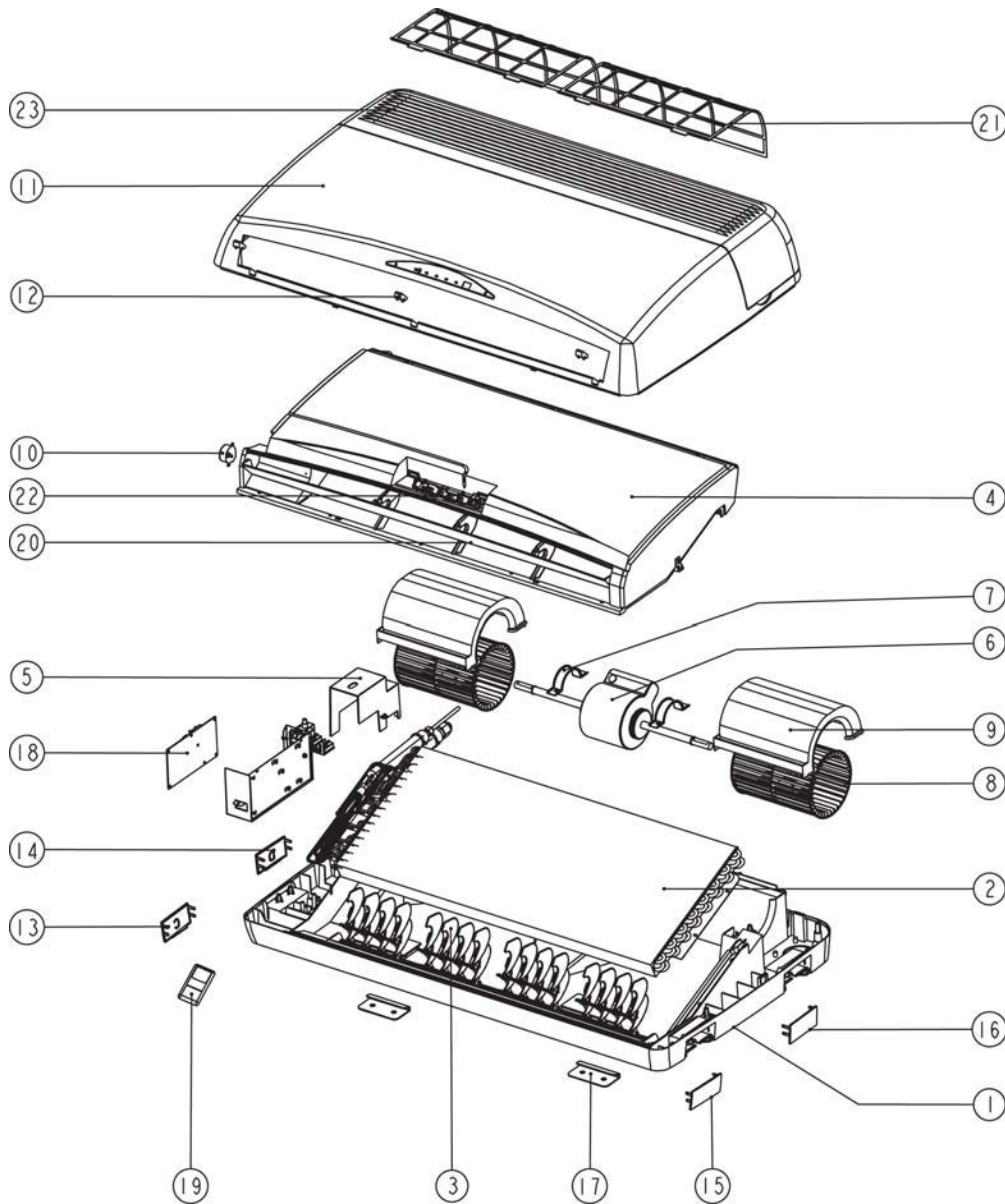


No	Description	Part No.
1	Bracket Hanger, Left	R01014058940
2	Control Box Cover	R01014022491
3	W2 Control Module	R04089021708
4	Close Up, Left	R12013024883
5	Frame, Side Left	R12013022501
6	Assy., Coil Holder Left	R50064028307
7	Fan Deck	R50014058757
8	Coil Assy. MCM040DW MCM050DW	R50024064137 R50024064138
9	Frame, Front Left	R12013022443
10	Frame Bottom Centre	R12013028976
11	Front Top Centre	R12014028975
12	Air Intake Grille Frame Center Assy.	R50124032397
13	Air Intake Grille Frame Center Assy.	R50124032397
14	Frame, Front Right	R12013022444
15	Assy., Louver Bottom	R50129003073
16	Air Swing Motor Assy.	R50034026127
17	Air Intake Grille Frame Holder Assy.	R50124026115
18	Bottom Panel	R01015024889
19	Drain Pan Assy.	R50124029045

No	Description	Part No.
20	Drain Hose Assy.	R50124025113
21	Air intake Grille Assy.	R50124032385
22	Air intake Grille Assy.	R50124032385
23	Bracket, Centre Support	R01014022484
24	Frame, Side Right	R12013022502
25	Close Up, Right	R12013024884
26	Assy., Coil Holder Right	R50014059069
27	Back Panel	R01014058758
28	Bracket Hanger, Right	R01014032843
29	Top Panel	R50014030260
30	Fan Motor MCM040DW MCM050DW	R03039013481 R03039012881
31	Blower Wheel	R03024004754
32	Housing Blower, Bottom	R03090030300
33	Housing Blower, Top	R03094026108
34	G7 Handset (Cooling Only) G7 Handset (Heat Pump)	R04084047723 R04084027531
35	Rubber Coupling	R11054025589
36	Thermister	-

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**Model : MCM 015 / 020 / 025 EW**



No	Description	Part No
1	Assy., Top Panel	R50124074907
2	Assy., Coil	R50024082075
3	Assy., Vane	R50124074906
4	Assy., Drain Pan	R50124085977
5	Assy., Control Box	R50044085921
6	Cover, Terminal Box	R50124080719
7	Motor	
	MCM015EW	R03039023304
	MCM020EW	R03039023305
	MCM025EW	R03039023306
8	Motor, Bracket	R01014071324
9	Blower Wheel	R03024004754
10	Blower Housing	R12014071385
11	Motor, Air Swing	R03039023303
12	Assy., Bottom Panel	R50124074909

No	Description	Part No
13	Cover, Hanger L1 (C)	R12014071354
14	Cover, Hanger L2 (D)	R12014071355
15	Cover, Hanger R1 (A)	R12014071356
16	Cover, Hanger R2 (B)	R12014071357
17	Mounting Bracket	R01014071318
18	Control Module	R04089029250
19	G11 Handset (Cooling Only)	R04084047723
	G11 Handset (Heatpump)	R04084027351
20	Louver	R12014071335
21	Saranet Filter	R12014071342
22	Assy., LED Board	
	MCM015/020/025EW (Cooling Only)	R50044085920
	MCM015/020/025EW (Heat Pump)	R50044085920
23	Air Intake Grille	R12014071341

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