

DUNHAM-BUSH®

SERIES BM COMFORT

FAN CONVECTOR HEATERS

PRODUCT CATALOGUE



Products that perform... by people who care

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Identification

Introduction

This product catalogue provides comprehensive information about Series BM fan convector heaters and is a guide on selection, application, use and supply. Series BM fan convectors provide warm air heating when connected to a low or medium temperature hot water system and a single phase electrical supply. A structured fan convector description code is used to identify heaters and accessories and each individual heater has a unique serial number.

Authority

Dunham-Bush operates a quality control system and is a registered firm of assessed capability BS EN ISO 9001 : 1994.

Description

Each Series BM fan convector comprises a basic galvanised sheet steel casing with access panel, fan and motor platform, air filter, hot water heating coil and electrical connections box. A single phase electric heating coil can be supplied instead of a hot water coil, with an output up to 6kW.

Heaters are supplied for single or two speed operation. Single speed heaters are set to low, medium or high speed. Two speed heaters are set to low/medium, low/high or medium/high speeds. Both fan and heat control is by means of switches and/or thermostats, listed in the Accessories section of this Product Catalogue.

Range

The range consists of 8 standard models, arranged in 4 groups – floor, wall, ceiling and base mounting, as illustrated in the Range of Standard Models.

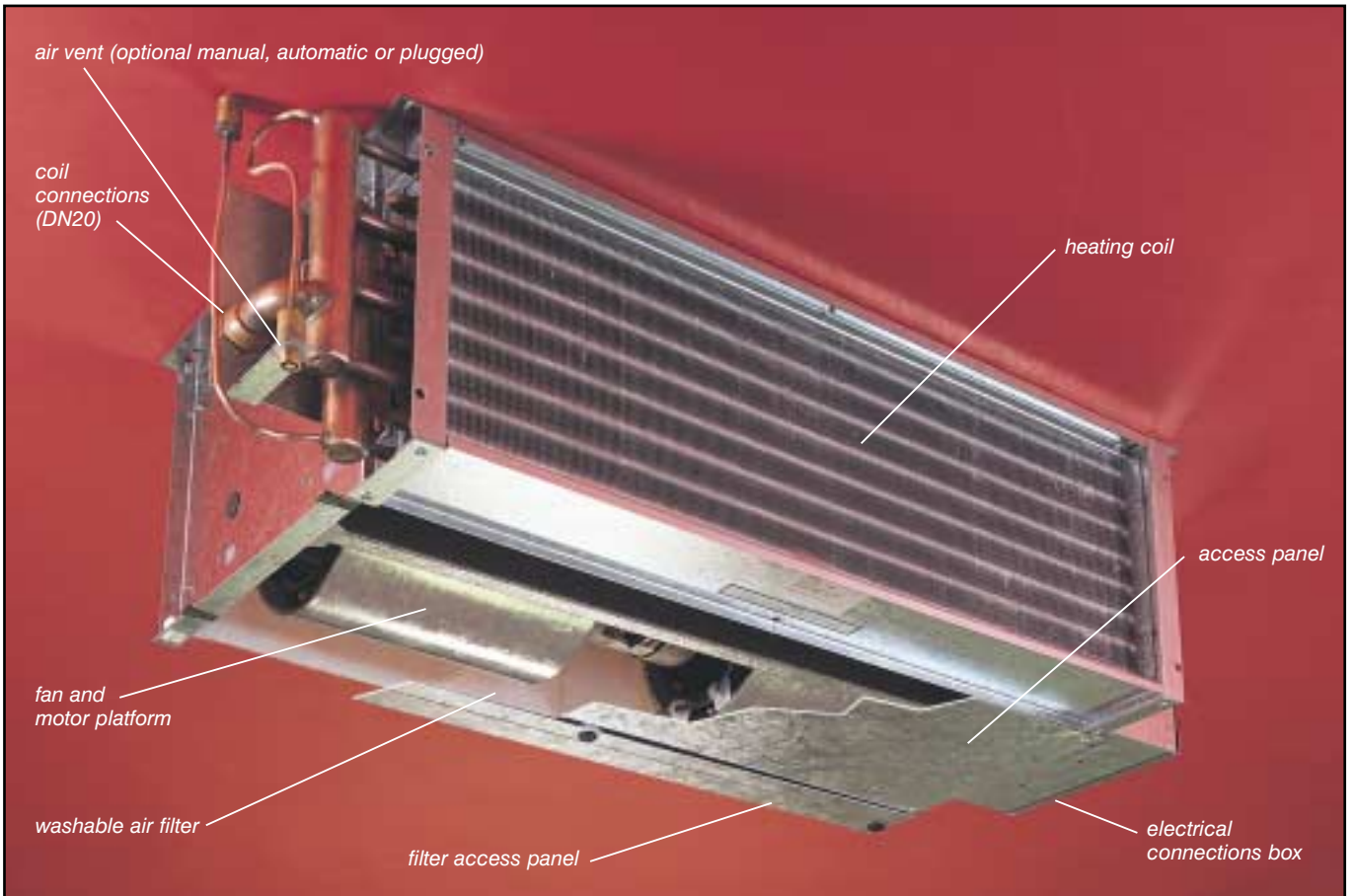
For cased floor, wall and ceiling models, please refer to Dunham Bush Series AM product catalogue.

All models can be supplied in a range figure numbers (sizes). The figure number relates to the nominal heat output and length, as shown below.

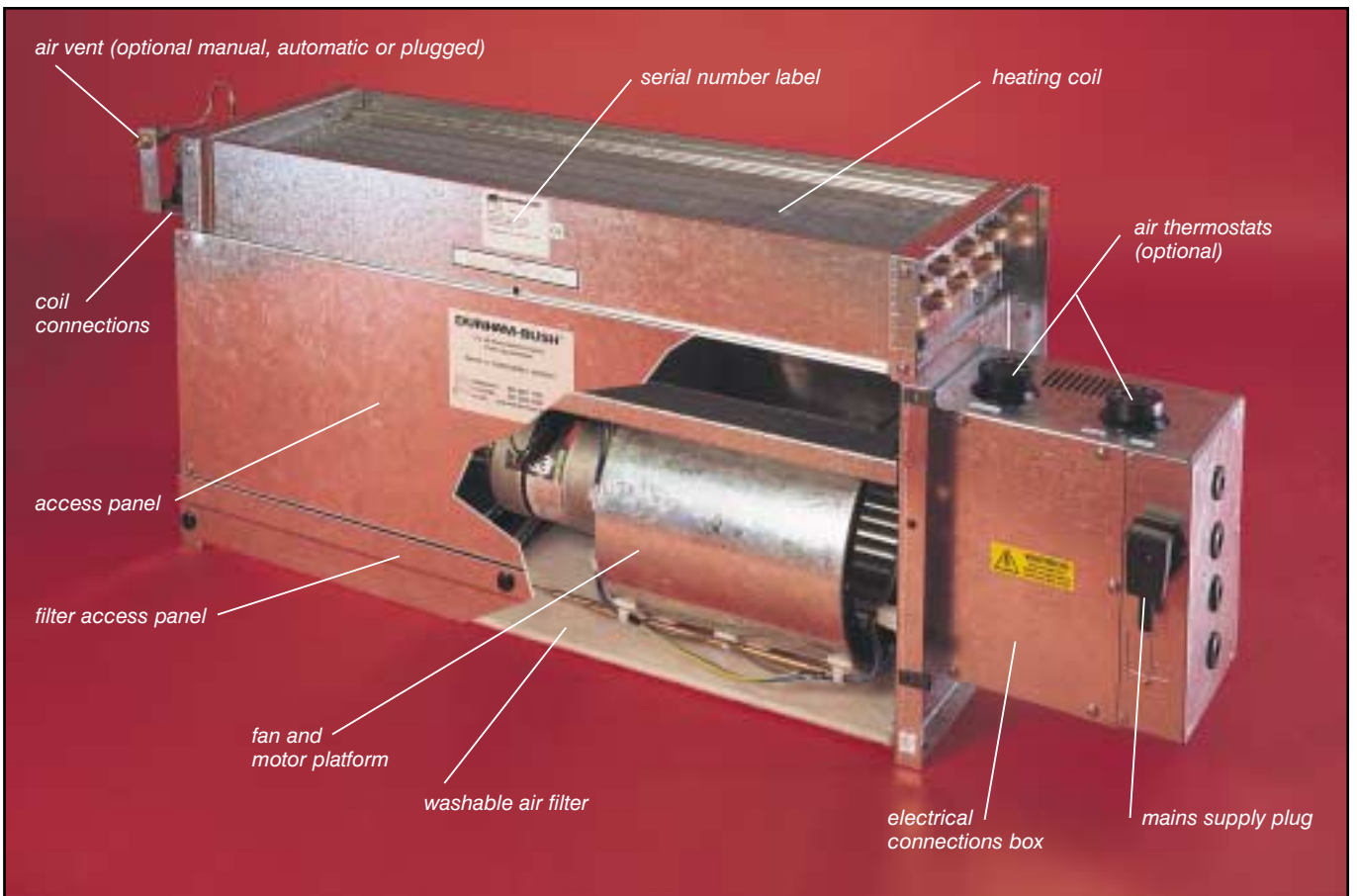
Size	Nominal output (kW)	Nominal length (mm)
Fig 03	2.6	800
Fig 04	4.8	1000
Fig 06	5.9	1000
Fig 08	8.0	1300
Fig 10	9.3	1300
Fig 12	11.3	1600
Fig 15	12.7	1600
Fig 16	15.4	1300
Fig 18	19.1	1600

Nominal outputs are based on LTHW 80/70°C, entering air 18°C, 25Pa external resistance at medium speed and coil type WA2.

Composition – features



Series BM Model 3 figure 04 – LH connections



Series BM Model 1 figure 04 – LH connections



Range of Standard Models

The eight standard models available are illustrated above.

A wide range of factory fitted accessories – inlet and outlet boxes, manual and motorised inlet damper boxes, extension duct, plinth and controls are available.

Various remote accessories – loose grilles, switches and controls are also available.

Accessories

Each model can be supplied with a range of fitted or remote accessories, detailed in the following pages.

Air thermostats

Air thermostats can be provided to automatically switch the heater on/off and to change the fan speed/heat output, in response to a fall or rise in ambient air temperature.

Fitted air thermostats – Models 1 and 2 only.

Capillary thermostats can be fitted for on/off and speed change.

Remote thermostats

Standard or tamper resistant, wall mounting room thermostats, with accelerator heater can be provided, for on/off and speed change.



Fitted on/off and speed change capillary thermostats

Low temperature cut-out (LTC)

A low temperature cut-out thermostat can be provided to prevent the heater operating until the heating water temperature is hot enough for it to work efficiently. This thermostat will automatically stop the heater at the end of the normal operating period, when the boiler plant closes down.

Type 1, fixed setting LTC, break circuit $38^{\circ}\text{C} \pm 3\text{K}$, make circuit $50^{\circ}\text{C} \pm 3\text{K}$

If fitted, type 1 is wired into the control circuit and clamped to the coil tube nearest to the LTHW flow connection. Note, maximum operating temperature 95°C .

Type 2, adjustable setting LTC, range 30°C to 90°C

If supplied, type 2 is wired into the control circuit for clamping to the LTHW flow pipe by the installer. Note, maximum operating temperature 95°C .



Fitted type 1 LTC



Switches

Remote switches can be provided to switch the heater on/off, change fan speed, allow thermostats to work automatically or to override any thermostats. The override “manual” switch allows the fans to circulate room air when the boiler plant is shut down during the summer. A remote switch can also be provided to open or close motorised dampers, if a motorised damper box is supplied. Switches can also be fitted to the electrical connections box.

Remote switches – flush or surface mounting

Switch	Operation
1	On/off
2	High/off/low
3	Manual/off/auto
4	Manual/off/auto & high/low
5	F.A.I./ recirc.
6	F.A.I./recirc. & high/off/low
7	F.A.I./recirc. & man/off/auto
8	F.A.I./recirc., man/off/auto & high/low

F.A.I = fresh air inlet, Recirc. = recirculation air inlet

Switches fitted to heater electrical connections box.

Switch	Operation
1	on/off
2	high/off/low

Electric heating coil – E11 to E62

All models, figure numbers 03, 04 and 06 only, can be fitted with a single phase, one or two stage electric heating coil module, instead of the standard hot water heating coil. The module includes power relay(s), high temperature cut-out and miniature circuit breakers. Please refer to the Performance section of this catalogue for outputs of models with electric heater coils. Only certain switch and thermostat arrangements are suitable for electric heating.

Please contact a Dunham Bush sales representative for further information.

Electronic speed control – ESC

All models can be supplied with electronic speed control, instead of the standard auto transformer. The ESC automatically varies the fan motor speed, (and hence heat output) in response to a change in air temperature. On rise in air temperature, the fan gradually slows down and stops when the air temperature reaches the set-point. A set-point adjustment knob and heating/cooling mode switch are provided.

In the cooling mode the operation is reversed to allow room air to be recirculated. Air sensors can only be fitted within models 1 and 2. Remote sensors can be provided with all models.

Electronic speed control is not suitable for use with

- models selected to introduce a constant quantity of outside or primary air
- ceiling mounting models, due to the risk of stratification, as the air volume flow rate decreases and the leaving air temperature increases.
- models with electric heater coil.
- figure nos 16 and 18 due to motor power rating

Special controls

Various special control arrangements can be supplied to suit particular applications. 24VAC relays can be fitted, to allow master/slave operation of several fan convectors from one pair of room thermostats, or from a remote control system. Please contact a Dunham Bush sales representative for details.



Fitted switches on electrical connections box



Fitted isolating ball valves



Electronic speed control



Electric heating coil



Inlet box 01

Provides air inlet on access side on models 1, 3 and 7. Provides air inlet opposite to access side on model 4.

Inlet box 02

Provides air inlet opposite to access side on models 1, 3 and 7. Provides air inlet on access side on model 4.

Outlet box 01

Provides air outlet on access side on models 1, 3, 5, 7 and 8. Provides air outlet opposite to access side on models 4 and 6.

Outlet box 02

Provides air outlet opposite to access side on models 1, 2, 3, 5, 7 and 8. Provides air outlet on access side on models 4 and 6.

180° Manual damper box 03

Provides air inlet on access side and opposite to side on models 1, 3, 4 and 7. Manual adjustment of fresh air/recirculation air mixture.

180° Motorised damper box 04

Provides air inlet on access side and opposite side on models 1, 3, 4 and 7. Motor supply 24VAC/1ph/50Hz, non-modulating. A remote switch or thermostat is necessary to change the damper from full fresh air to full recirculation.

90° Manual damper box 05

Provides air inlet on the access side and bottom on model 1.

Provides air inlet on the access side and end on model 3.

Provides air inlet opposite to access side and end on model 4.

Provides air inlet on access side and top on model 7.

Manual adjustment of fresh air/recirculation air mixture.

90° Manual damper box 06

Provides air inlet opposite to access side and bottom on model 1.

Provides air inlet opposite to access side and end on model 3.

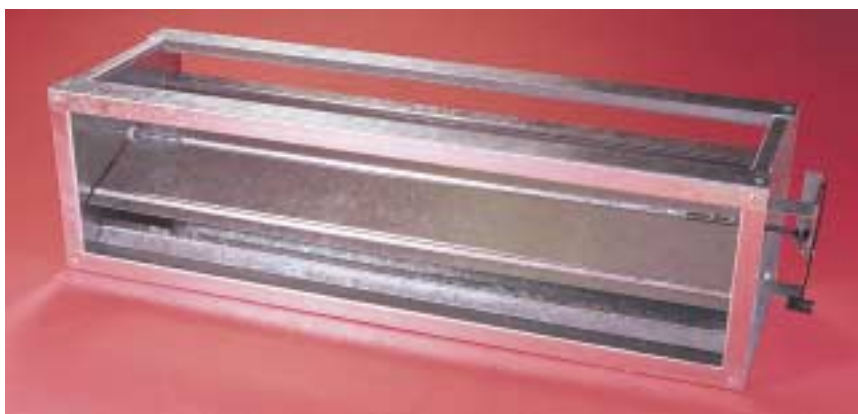
Provides air inlet on access side and end on model 4.

Provides air inlet opposite to access side and top on model 7.

Manual adjustment of fresh air/recirculation air mixture.



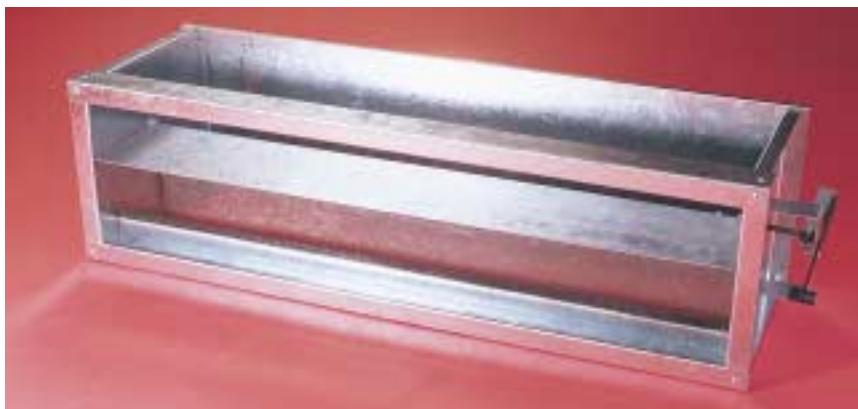
Inlet box 01 and 02. Outlet box 01 and 02



180° manual damper box 03



180° motorised damper box 04



90° manual damper box 05 and 06



90° Motorised damper box 07

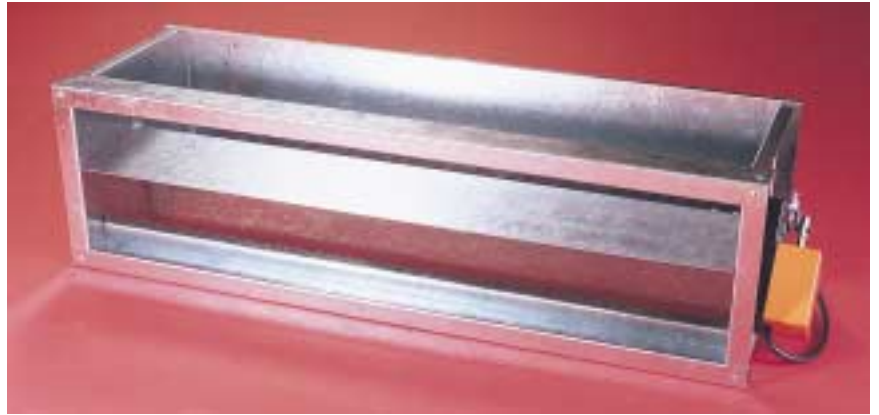
Provides air inlet on access side and bottom on model 1.

Provides air inlet on access side and end on model 3.

Provides air inlet opposite to access side and end on model 4.

Provides air inlet on access side and top on model 7.

Motor supply 24VAC/1ph/50Hz, non-modulating. A remote switch or thermostat is necessary to change the damper from full recirculation to full fresh air.



90° motorised damper box 07 and 08

90° Motorised damper box 08

Provides air inlet opposite to access side and bottom on model 1.

Provides air inlet opposite to access side and end on model 3.

Provides air inlet on access side and end on model 4.

Provides air inlet opposite to access side and top of model 7.

Motor supply 24VAC/1ph/50Hz, non-modulating. A remote switch or thermostat is necessary to change the damper from full recirculation to full fresh air.



Circular spigot box SB

Circular spigot box SB

Provides spigots for circular duct connections on inlet on models 1, 3, 4 and 7.

Provides spigots for circular duct connections on outlet on all models 1 to 8 inclusive. Please refer to 'Accessories Dimensions' for sizes and positions of spigots.



Circular spigot plate SP

Circular spigot plate SP

Provides spigots for circular duct connections on inlet of models 1, 3, 4 and 7

Provides spigots for circular duct connections on outlet on all models 1 to 8 inclusive. Please refer to 'Accessories Dimensions' for sizes and positions of spigots.

Rectangular spigot plate RS

Provides spigot for rectangular duct connection on outlet of all models.

Loose grille LG can be connected directly to spigot plate RS. Maximum wall panel thickness 34mm.



Rectangular spigot plate RS



Fitted plinth, P1 and P2

A 100mm plinth P1, or 150mm plinth P2, can be fitted on vertical models to raise the heater and provide additional clearance between the bottom of the heater and the finished floor level. A plinth can be fitted directly to model 2 and with other suitable accessories on models 1, 7 and 8.



Plinth P1 and P2

Fitted isolating valves, B and G

DN20($\frac{3}{4}$ " BSP) isolating ball valves B or gate valves G, can be fitted to flow and return coil connections.



Loose grille LG and fixing frame FF

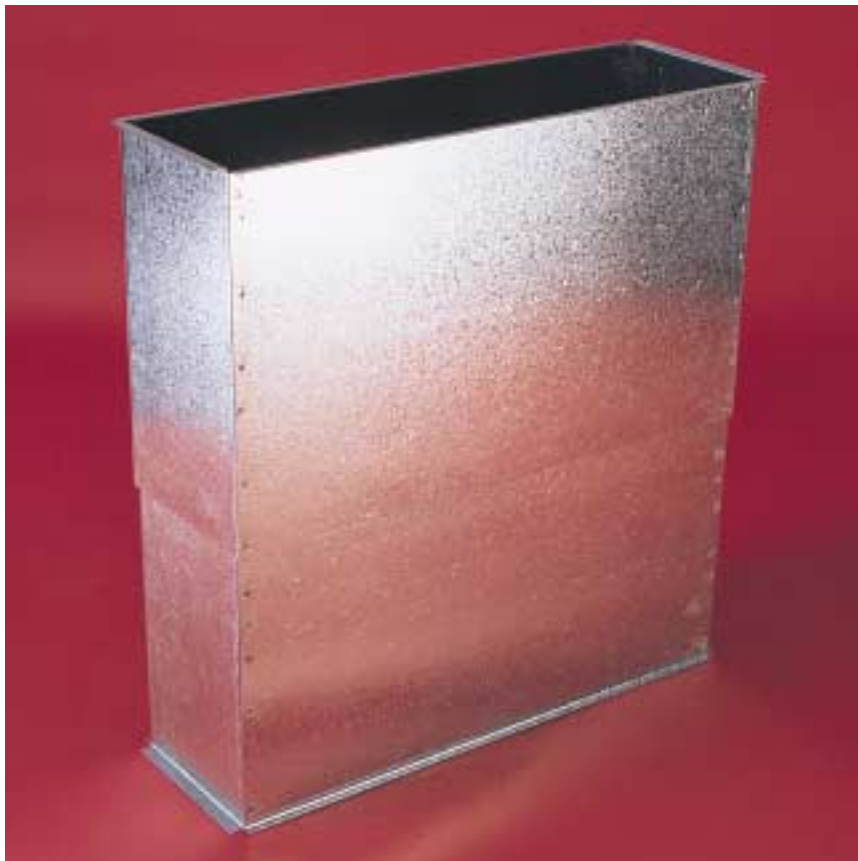
Pencil proof loose grille with fixing frame – LG and FF

Pencil proof loose grilles (LG) with fixing frames (FF) can be provided for use with all models. The fixing frame is intended for installation in a wall opening, allowing the loose grille to be fixed to the frame with screws, which are recessed between the grille blades. A loose grille has a natural satin anodised surround and black powder coated grille core.

Loose grilles are unsuitable for external use. Proprietary weatherproof louvres are recommended where outside air is to be introduced.

Extension duct – E1, E2 and E3

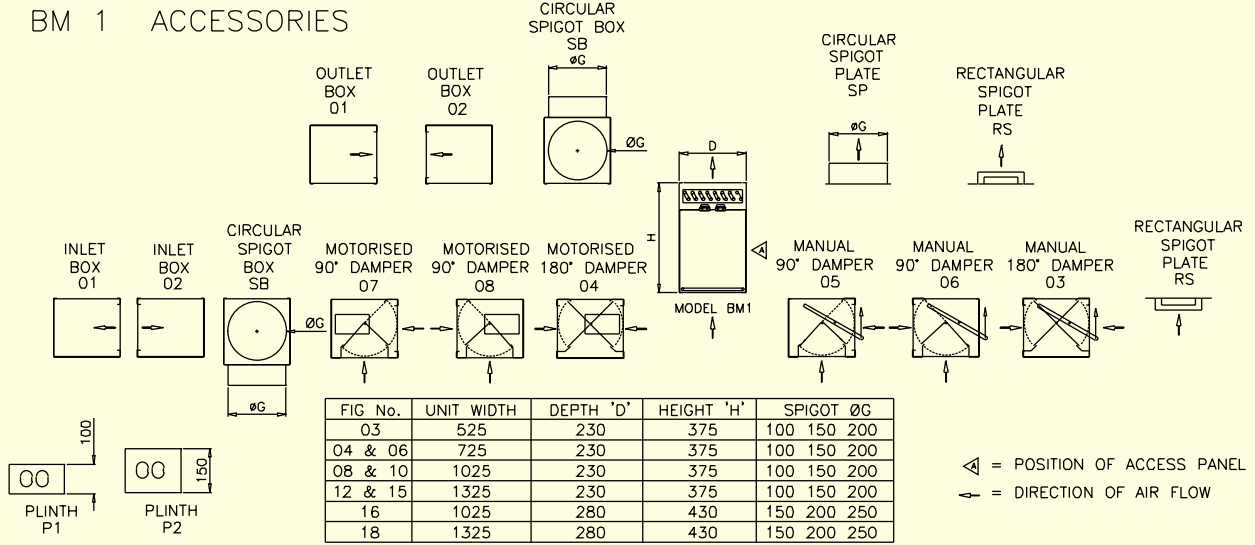
Provides adjustable height extension of 200 to 400mm (E1), 400 to 800mm (E2) or 800 to 1600mm (E3), when fitted to models 1, 2, 7 and 8, with other accessories.



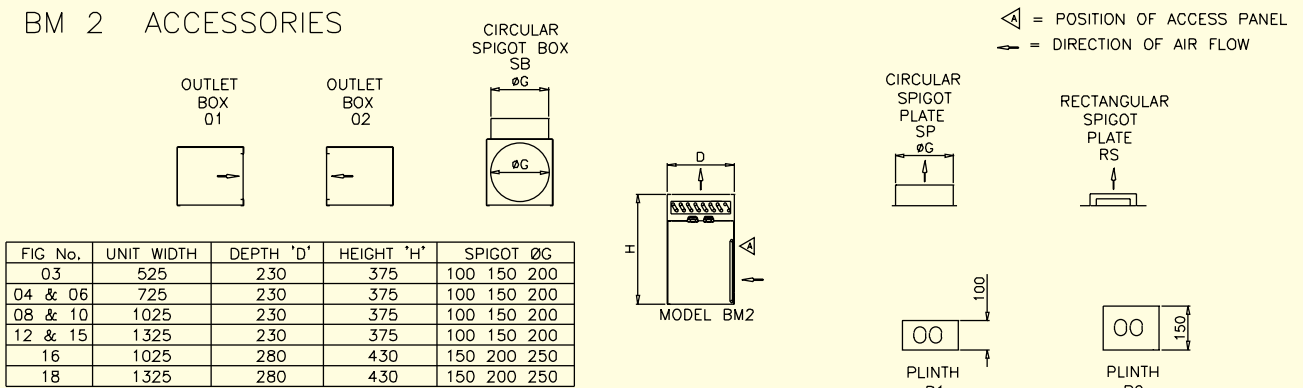
Extension E1, E2 and E3



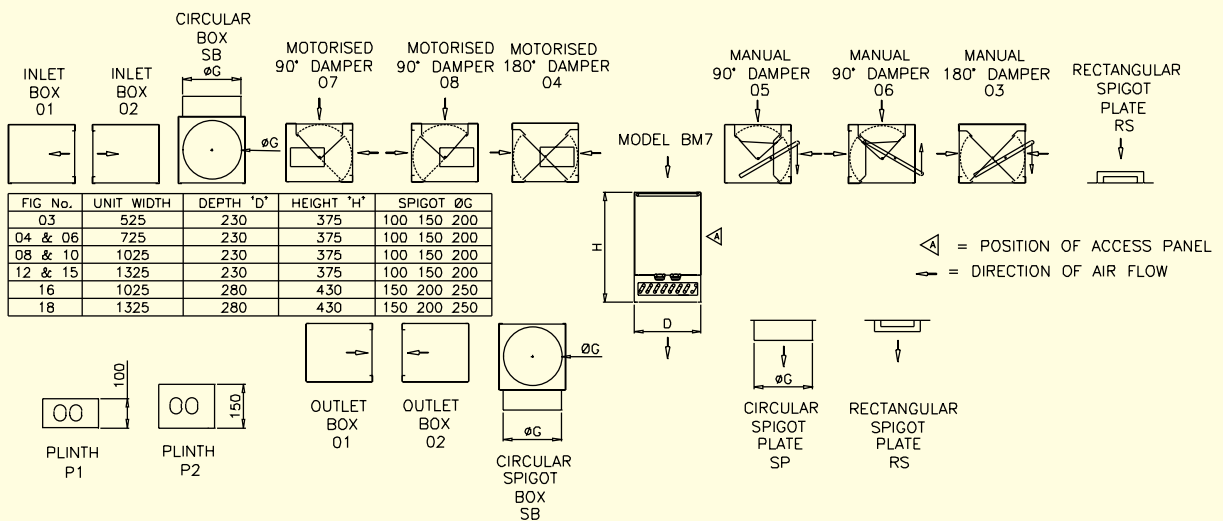
BM 1 ACCESSORIES



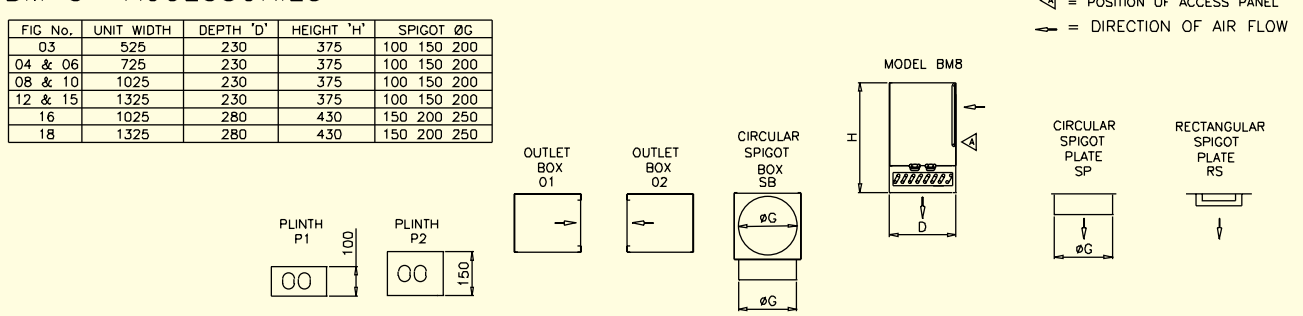
BM 2 ACCESSORIES



BM 7 ACCESSORIES



BM 8 ACCESSORIES

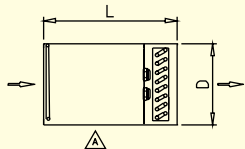




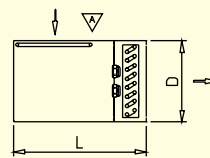
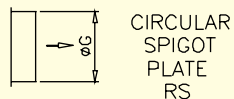
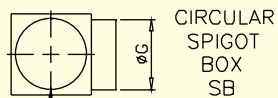
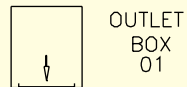
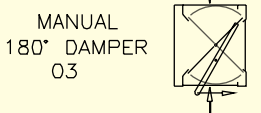
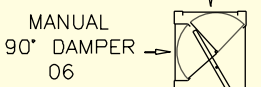
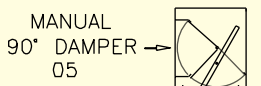
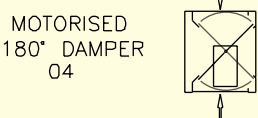
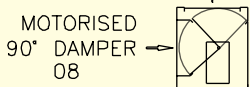
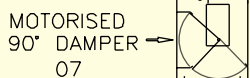
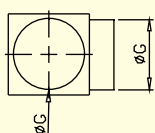
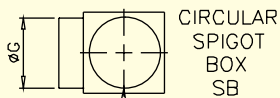
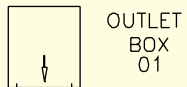
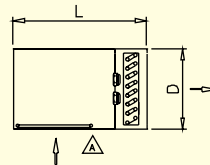
BM 03 & 04 ACCESSORIES

BM 05 & 06 ACCESSORIES

MODEL BM3

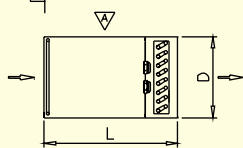


MODEL BM5



MODEL BM6

FIG No.	UNIT HEIGHT	DEPTH 'D'	LENGTH 'L'	SPIGOT ØG
03	525	230	375	100, 150, 200
04 & 06	725	230	375	100, 150, 200
08 & 10	1025	230	375	100, 150, 200
12 & 15	1325	230	375	100, 150, 200
16	1025	280	430	150, 200, 250
18	1325	280	430	150, 200, 250



MODEL BM4

▽ = POSITION OF ACCESS PANEL

↔ = DIRECTION OF AIR FLOW

Performance



Table 1 Heat outputs

Heat outputs (kW), air volume flow rates (l/s), leaving air temperatures (°C) and hydraulic resistances (kPa).
 Conditions: LTHW 75°C mean, 10K drop across the coil at each speed, entering air temperature 18°C.

Size	Coil type	Low speed				Medium speed				High speed			
		kW	l/s	°C	kPa	kW	l/s	°C	kPa	kW	l/s	°C	kPa
Fig 03	WA2	1.86	55	46	0.20	2.75	80	47	0.5	3.33	100	46	0.48
Fig 04	WA2	3.50	85	52	0.90	4.71	115	52	1.5	5.74	145	51	2.10
Fig 06	WA2	4.11	100	52	1.20	5.88	150	51	2.20	6.16	160	50	2.40
Fig 08	WA2	7.21	180	51	0.90	8.04	205	51	1.10	9.11	245	49	1.40
Fig 10	WA2	7.40	185	51	1.00	9.25	250	49	1.50	9.64	265	48	1.60
Fig 12	WA2	7.18	175	52	1.00	10.21	250	52	2.00	11.93	310	50	2.70
Fig 15	WA2	8.19	200	52	1.30	11.38	290	51	2.40	12.34	325	50	2.80
Fig 16	WA2	11.16	250	55	1.70	15.36	380	52	3.10	17.67	460	50	4.10
Fig 18	WA2	16.00	360	55	3.70	19.23	460	53	5.30	21.54	530	52	6.50

- Notes : 1. Air volume flow rates at medium speed are against 25Pa external resistance
 2. Type WA1 coils, listed in Table 2, are recommended for use with medium temperature hot water (MTHW).

Table 2 Heat outputs

Heat outputs (kW), air volume flow rates (l/s), leaving air temperatures (°C) and hydraulic resistances (kPa).
 Conditions: LTHW 75°C mean, 10K drop across the coil at each speed, entering air temperature 18°C.

Size	Coil type	Low speed				Medium speed				High speed			
		kW	l/s	°C	kPa	kW	l/s	°C	kPa	kW	l/s	°C	kPa
Fig 03	WA1	1.53	55	41	0.20	2.24	80	41	0.3	2.71	100	41	0.40
Fig 04	WA1	2.49	85	42	0.50	3.40	115	43	0.80	4.10	145	42	1.20
Fig 06	WA1	2.95	100	43	1.20	4.19	150	41	1.20	4.36	160	41	1.30
Fig 08	WA1	5.12	180	42	0.50	5.73	205	41	0.60	6.44	245	40	0.70
Fig 10	WA1	5.27	185	42	0.50	6.53	250	40	0.80	6.77	265	39	1.60
Fig 12	WA1	5.12	175	42	0.50	7.36	250	42	1.10	8.46	310	41	1.40
Fig 15	WA1	5.89	200	42	0.70	8.11	290	41	1.30	8.71	325	40	1.50
Fig 16	WA1	7.15	250	42	0.70	9.48	380	39	1.30	10.89	460	38	1.60
Fig 18	WA1	10.19	360	42	1.60	11.90	460	39	2.10	13.27	530	39	2.60

- Notes: 1. Air volume flow rates at medium speed are against 25Pa external resistance
 2. Type WA1 coils are recommended for use with medium temperature hot water (MTHW).

Table 3 Heat outputs

Heat outputs (kW), air volume flow rates (l/s), leaving air temperatures (°C) and hydraulic resistances (kPa).
 Conditions: LTHW 75°C mean, 10K drop across the coil at each speed, entering air temperature 18°C.

Size	Coil type	Low speed				Medium speed				High speed			
		kW	l/s	°C	kPa	kW	l/s	°C	kPa	kW	l/s	°C	kPa
Fig 03	WA3	2.87	55	61	0.5	4.16	80	61	1.0	5.06	100	60	1.4
Fig 04	WA3	4.57	85	63	1.4	6.15	115	62	2.4	7.57	145	61	3.6
Fig 06	WA3	5.36	100	63	1.9	7.77	150	61	3.7	8.17	160	60	4.1
Fig 08	WA3	9.42	180	61	1.5	10.56	205	61	1.9	12.13	245	59	2.4
Fig 10	WA3	9.68	185	61	1.6	12.32	250	59	2.5	12.9	265	58	2.7
Fig 12	WA3	9.39	175	62	1.7	13.33	250	62	3.3	15.83	310	60	4.5
Fig 15	WA3	10.71	200	62	2.2	15.03	290	61	4.1	16.43	325	60	4.9
Fig 16	WA3	13.06	250	61	2.3	18.22	380	58	4.3	21.07	460	56	5.7
Fig 18	WA3	18.79	360	61	5.1	22.78	460	59	7.3	25.6	530	58	9.1

- Notes: 1. Air volume flow rates at medium speed are against 25Pa external resistance.
 2. Type WA3 coils are recommended for use with low grade heat source.
 3. Type WA3 coils should not be used with MTHW and care must be taken when using LTHW, due to elevated leaving air temperatures.

Table 4 Correction factors

Approximate factors for heat output (kW) and hydraulic resistance (kPa), at mean water temperatures (°C), entering air temperatures (°C) and water temperature drops (K) across the coil. Factors may be applied to tables 1, 2 and 3

Mean water (°C)	Entering air temperature (°C)	Water temperature drop across coil							
		5k		10k		15k		20k	
		Output	Hyd. res.	Output	Hyd. res.	Output	Hyd. res.	Output	Hyd. res.
40	0	0.69	1.92	0.59	0.35	–	–	–	–
	18	0.34	0.47	0.24	0.06	–	–	–	–
	20	0.30	0.36	0.21	0.03	–	–	–	–
45	0	0.78	2.46	0.71	0.50	–	–	–	–
	18	0.44	0.79	0.33	0.11	–	–	–	–
	20	0.40	0.65	0.30	0.09	–	–	–	–
50	0	0.88	3.08	0.82	0.68	–	–	–	–
	18	0.54	1.17	0.44	0.20	–	–	–	–
	20	0.50	1.02	0.40	0.16	–	–	–	–
55	0	0.98	3.84	0.93	0.87	–	–	–	–
	18	0.65	1.66	0.58	0.33	–	–	–	–
	20	0.61	1.48	0.54	0.29	–	–	–	–
60	0	1.08	4.68	1.04	1.09	–	–	–	–
	18	0.75	2.23	0.70	0.49	–	–	–	–
	20	0.71	2.05	0.66	0.44	–	–	–	–
65	0	1.18	5.53	1.14	1.30	1.10	0.54	–	–
	18	0.84	2.83	0.80	0.65	0.74	0.24	–	–
	20	0.80	2.59	0.77	0.59	0.70	0.22	–	–
70	0	1.27	6.44	1.24	1.54	1.20	0.64	–	–
	18	0.94	3.51	0.9	0.81	0.85	0.32	–	–
	20	0.90	3.23	0.86	0.75	0.81	0.29	–	–
75	0	1.37	7.47	1.34	1.78	1.31	0.76	1.26	0.40
	18	1.03	4.25	1.00	1.00	0.96	0.41	0.90	0.20
	20	0.99	3.95	0.96	0.93	0.92	0.38	0.86	0.18
80	0	1.46	8.55	1.43	2.05	1.40	0.87	1.37	0.47
	18	1.13	5.07	1.10	1.20	1.06	0.50	1.02	0.26
	20	1.09	4.47	1.06	1.12	1.03	0.47	0.98	0.24
85	0	–	–	1.53	2.33	1.50	1.00	1.47	0.54
	18	–	–	1.19	1.42	1.16	0.60	1.13	0.32
	20	–	–	1.16	1.34	1.13	0.56	1.09	0.30
90	0	–	–	1.62	2.64	1.60	1.14	1.57	0.62
	18	–	–	1.29	1.66	1.26	0.71	1.23	0.38
	20	–	–	1.25	1.57	1.22	0.67	1.20	0.36

Table 5 Heat outputs – electric heating

Heat outputs (kW), air volume flow rates (l/s) and leaving air temperatures (°C)

Conditions : 230VAC/1ph/50Hz electrical supply, entering air 18°C.

Size	Coil type	Output (kW)	No. of stages	Low speed		Medium speed		High speed	
				l/s	°C	l/s	°C	l/s	°C
Fig 03	E11	1.5	1x1.5	50	43	75	34	105	30
Fig 03	E31	3.0	1x3.0	50	67	75	51	105	41
Fig 03	E32	3.0	2x1.5	50	67	75	51	105	41
Fig 04	E21	2.0	1x2.0	75	40	115	32	160	28
Fig 04	E31	3.0	1x3.0	75	51	115	40	160	33
Fig 04	E41	4.0	1x4.0	75	62	115	47	160	38
Fig 04	E42	4.0	2x2.0	75	62	115	47	160	38
Fig 06	E51	5.0	1x5.0	105	57	150	45	180	41
Fig 06	E52	5.0	1x2.0, 1x3.0	105	57	150	45	180	41
Fig 06	E61	6.0	1x6.0	105	65	150	51	180	45
Fig 06	E62	6.0	2x3.0	105	65	150	51	180	45

Notes: 1. Air volume flow rates at medium speed are against 25Pa external resistance.

2. Heat outputs of two stage elements are with both stages in circuit.

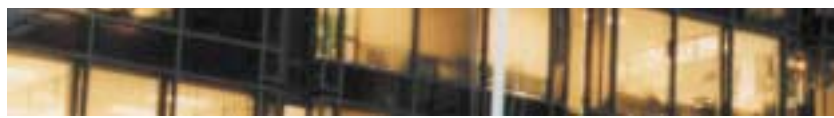


Table 6 Electrical Data

Electrical Data – running and starting currents in Amperes, at low, medium and high speeds and motor outputs in Watts.

Size	Running current (A)			Starting current (A)	Motor rating (W)
	low	medium	high		
Fig 03	0.17	0.21	0.24	0.45	25
Fig 04	0.27	0.31	0.36	0.75	40
Fig 06	0.30	0.36	0.41	0.75	40
Fig 08	0.43	0.48	0.48	1.15	75
Fig 10	0.46	0.47	0.46	1.15	75
Fig 12	0.53	0.57	0.53	1.15	75
Fig 15	0.56	0.54	0.53	1.15	75
Fig 16	1.16	1.37	1.25	3.50	200
Fig 18	1.3	1.37	1.25	3.50	200

Table 7 Coil capacities

Approximate capacities of coils WA1, WA2 and WA3

Size	Coil capacity (l)
Fig 03	0.63
Fig 04	0.77
Fig 06	0.77
Fig 08	1.03
Fig 10	1.03
Fig 12	1.25
Fig 15	1.25
Fig 16	1.16
Fig 18	1.51

Table 8 Heaters and accessories – masses

Item description	Approximate shipping masses (kg)								
	Fig 03	Fig 04	Fig 06	Fig 08	Fig 10	Fig 12	Fig 15	Fig 16	Fig 18
Model 1 to 8	19	25	25	33	33	37	37	45	45
Inlet and outlet box 01	4	5	5	7	7	8	8	9	9
Damper box 03, 05 & 06	6	7	7	9	9	11	11	13	13
Damper box 04, 07 & 08	7	8	8	10	10	12	12	14	14
Circular spigot box SB	5	6	6	9	9	11	11	13	13
Circular spigot plate SP	1	2	2	3	3	4	4	5	5
Extension duct E3	19	26	26	33	33	44	44	45	45
Loose grille & fixing frame LG & FF	2	2	2	3	3	4	4	5	5
Plinth P2	2	3	3	3	3	4	4	5	5
Rectangular spigot plate RS	1	2	2	2	2	3	3	4	4

Application

General

Dunham Bush Series BM is available in a versatile range of 8 models, each produced in nine sizes and three hot water coils, with alternative electric heating up to 6kW. It is the ideal heating product for many applications, such as schools, colleges, elderly persons' homes, libraries, offices and churches. It is suitable for floor, wall, ceiling and base mounting, concealed within the building fabric or ceiling void. Where cased models are required within the room being heated or in an adjacent room to that being heated, Dunham Bush Series AM fan convectors are recommended.

Models 1, 3, 4 and 7 are available with optional manual or motorised dampers and can be used for heating, ventilation or 'free cooling', since they allow the introduction of tempered primary or fresh air into the room. If fresh air is to be

introduced during the winter season, the hot water coil must have frost protection and external weatherproof louvres must be fitted. Care should be taken to ensure heaters are sited so that airflow will not be obstructed. This is particularly important when using reversed air flow models 7 and 8, and any model with electric heating.

Ceiling mounting models 3, 4, 5 and 6 are generally less effective than floor mounted models, since the entering air temperature is higher at ceiling level and the warm buoyant discharge air may cause stratification and take longer to produce comfortable conditions at occupancy level. For these reasons, we recommend floor or wall mounting models where the application allows.



Selection

Refer to the Range of Standard Models on page 4 to select the model most suitable for the application. From the calculated heat loss and the operating conditions, the quantity of heaters, heat output, figure number and coil type can be selected, using tables 1, 2 and 3. If the operating conditions are different to those stated, use the appropriate factor from table 4. The air volume flow rates and heat outputs listed in the performance tables are for basic units without accessories. If circular spigot box SB or circular spigot plate SP is used, the available fan static pressure to overcome any external resistance will be reduced. Please contact a Dunham-Bush sales representative for further assistance.

If a larger room is to be heated, it is usually better to select two smaller

heaters rather than one large, to give better heat distribution and lower spot noise levels. Wherever possible, heaters should be located near windows or in areas of high heat loss. It is recommended that heaters are selected to operate at medium speed for general use or at low speed for rooms where noise levels are critical. Heaters should only be selected at high speed, for non critical application, such as entrance foyers, corridors etc. or for initial rapid warm up. Sound power levels are available on request.

By design, Dunham-Bush fan convectors have moderate leaving air temperatures to reduce stratification as well as low outlet velocities and low air throws to improve comfort. Comfortable conditions are achieved by good air circulation ; it is recommended that if practicable, the

total volume of room air should be circulated through all heaters in the room four or five times per hour.

Sound data

Series BM fan convectors are 'commercially quiet'. Sound power levels, available on request, may be used to calculate NR or RC levels in accordance with the CIBSE guide or other recognised methods.

Non-Catalogue Selections

For selections not described in this catalogue, please contact a Dunham Bush sales representative.



Fan/motor platform mounted on 'slide-out' channels



'Quick release' filter access panel

Example selection

To calculate the approximate the heat output, hydraulic resistance and leaving air temperature of Series BM figure 06 fitted with WA2 coil, operating at medium speed with LTHW 55°C mean and 5K drop, entering air temperature 18°C.

- From table 1, heat output 5.88kW , air volume flow rate 150 l/s, hydraulic resistance 2.20 kPa
- From table 4, heat output factor 0.65, hydraulic resistance factor 1.66.
Thus: Heat output 5.88kW x 0.65 = 3.82kW
Hydraulic resistance 2.20kPa x 1.66 = 3.65kPa

- To estimate the leaving air temperature with the new output, find the temperature rise Δt , and add it to the entering air temperature

$$\Delta t = \frac{3.82\text{kW}}{150/\text{s} \times 0.00122\text{kJ/IK}} = 21\text{K} \quad (\text{where } 0.00122 \text{ is approximate specific heat capacity of entering air})$$

- thus: leaving air temperature = 18°C + 21K = 39°C

Dimensions



NOTES:

1. ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE -IF IN DOUBT ASK.
2. MODEL B1 VERTICAL, BOTTOM INLET LEFT HAND COIL CONNECTIONS DRAWN. RIGHT HAND COIL CONNECTIONS OPPOSITE HANDING OF COIL CONNECTIONS DETERMINED FACING ACCESS PANEL AND AIR OUTLET
3. ELECTRICAL CONNECTIONS BOX ALWAYS ON OPPOSITE SIDE TO COIL CONNECTIONS
4. AIR VENT OPTIONS;
TYPE M MANUAL AIR VENT FITTED.
TYPE A AUTOMATIC AIR VENT FITTED TO COIL.
TYPE P PLUGGED

2 No. DN20 (3/4" BSP) FEMALE PARALLEL CONNECTIONS

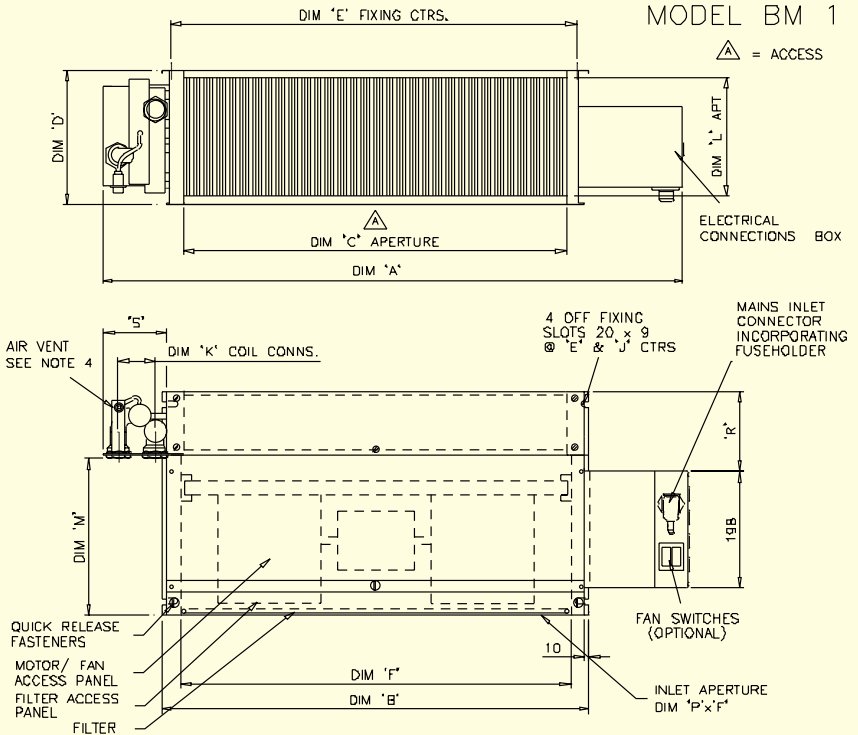
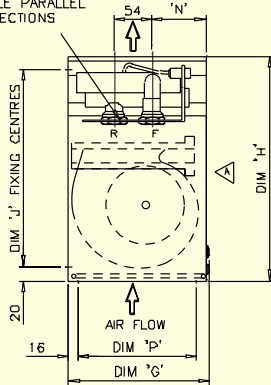


FIG	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'	DIM 'G'	DIM 'H'	DIM 'J'	DIM 'K'	DIM 'L'	DIM 'M'	DIM 'N'	DIM 'P'	DIM 'R'	DIM 'S'
03	772	525	446	230	495	463	235	375	337	52	206	278	86	202	117	96
04&06	972	725	646	230	695	663	235	375	337	52	206	278	86	202	117	96
08&10	1272	1025	946	230	995	963	235	375	337	52	206	278	86	202	117	96
12&15	1572	1325	1246	230	1295	1263	235	375	337	52	206	278	86	202	117	96
16	1300	1025	963	280	995	963	285	430	392	62	256	336	111	252	122	115
18	1600	1325	1263	280	1295	1263	285	430	392	62	256	336	111	252	122	115

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE -IF IN DOUBT ASK.
2. MODEL B2 VERTICAL, FRONT INLET LEFT HAND COIL CONNECTIONS DRAWN. RIGHT HAND COIL CONNECTIONS OPPOSITE HANDING OF COIL CONNECTIONS DETERMINED FACING ACCESS PANEL AND AIR OUTLET
3. ELECTRICAL CONNECTIONS BOX ALWAYS ON OPPOSITE SIDE TO COIL CONNECTIONS
4. AIR VENT OPTIONS;
TYPE M MANUAL AIR VENT FITTED.
TYPE A AUTOMATIC AIR VENT FITTED TO COIL.
TYPE P PLUGGED

2 No. DN20 (3/4" BSP) FEMALE PARALLEL CONNECTIONS

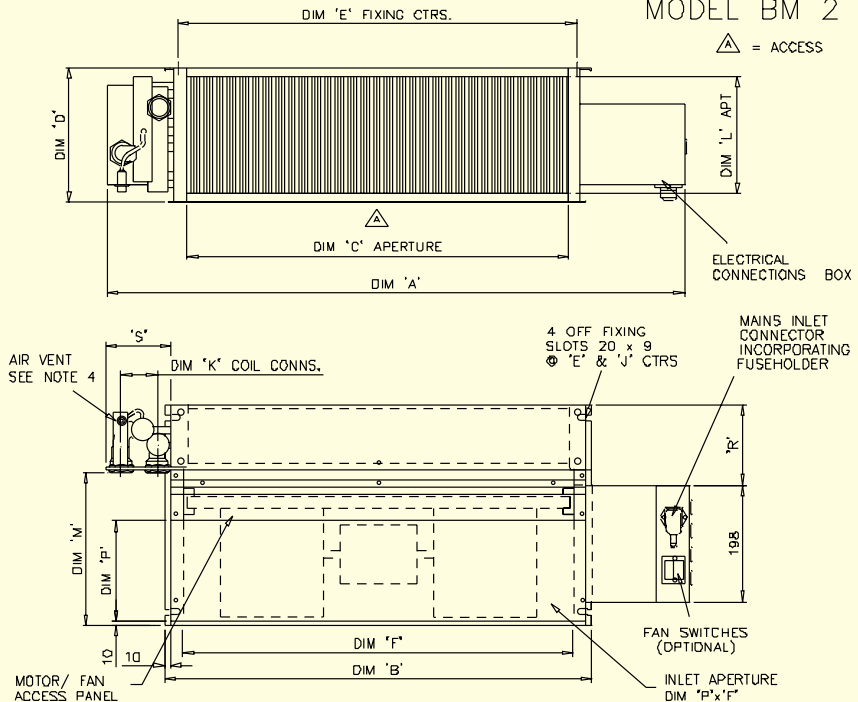
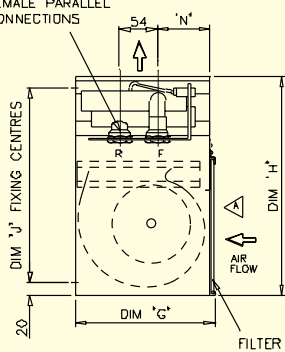


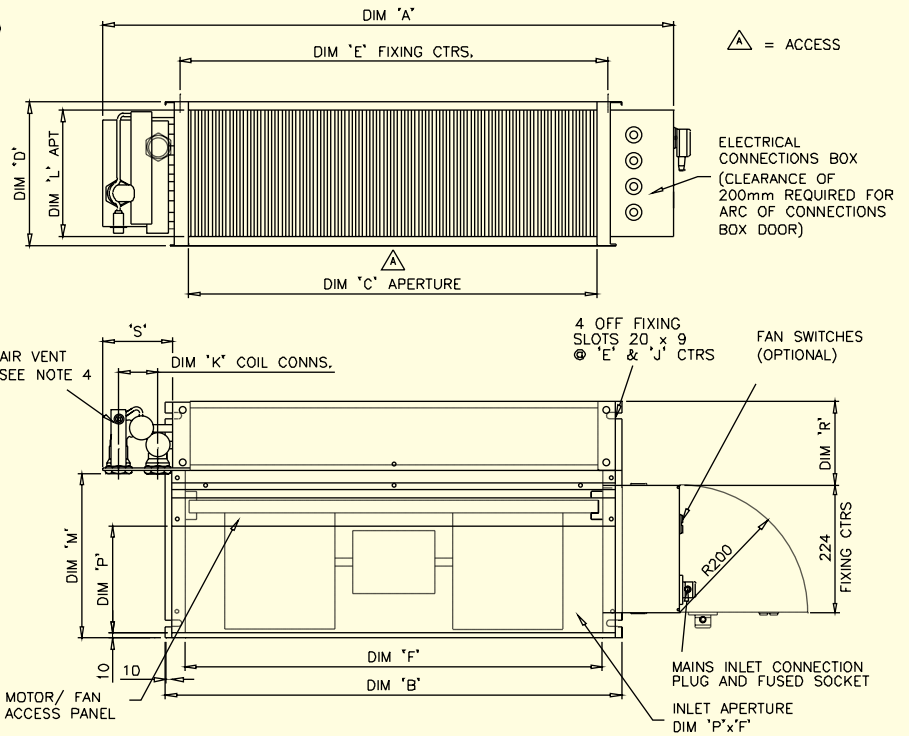
FIG	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'	DIM 'G'	DIM 'H'	DIM 'J'	DIM 'K'	DIM 'L'	DIM 'M'	DIM 'N'	DIM 'P'	DIM 'R'	DIM 'S'
03	772	525	446	230	495	463	240	375	337	52	206	278	86	162	117	96
04&06	972	725	646	230	695	663	240	375	337	52	206	278	86	162	117	96
08&10	1272	1025	946	230	995	963	240	375	337	52	206	278	86	162	117	96
12&15	1572	1325	1246	230	1295	1263	240	375	337	52	206	278	86	162	117	96
16	1300	1025	963	280	995	963	290	430	392	62	256	336	111	214	122	115
18	1600	1325	1263	280	1295	1263	290	430	392	62	256	336	111	214	122	115



MODEL BM 5

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE -IF IN DOUBT ASK.
2. MODEL B5 HORIZONTAL, CEILING MOUNTED BOTTOM INLET. LEFT HAND COIL CONNECTIONS DRAWN RIGHT HAND COIL CONNECTIONS OPPOSITE HANDING OF COIL CONNECTIONS DETERMINED FACING ACCESS PANEL AND AIR OUTLET
3. ELECTRICAL CONNECTIONS BOX ALWAYS ON OPPOSITE SIDE TO COIL CONNECTIONS
4. AIR VENT OPTIONS;
TYPE M MANUAL AIR VENT FITTED.
TYPE A AUTOMATIC AIR VENT FITTED TO COIL.
TYPE P PLUGGED



2 No. DN20 (3/4" BSP) FEMALE PARALLEL CONNECTIONS

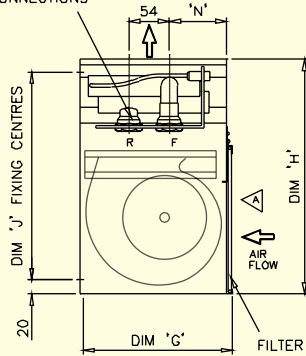
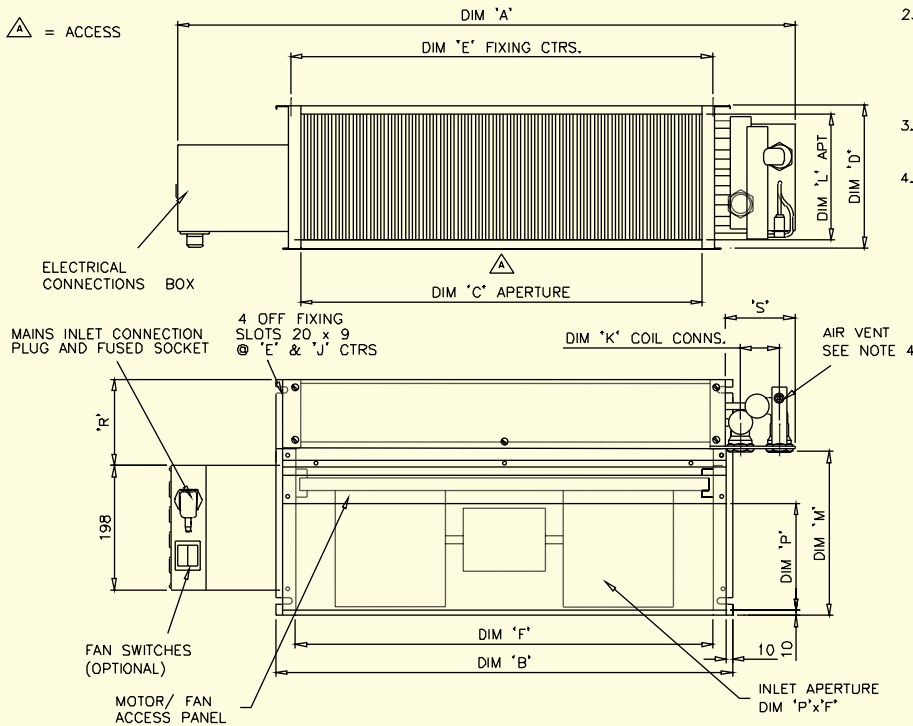


FIG	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'	DIM 'G'	DIM 'H'	DIM 'J'	DIM 'K'	DIM 'L'	DIM 'M'	DIM 'N'	DIM 'P'	DIM 'R'	DIM 'S'
03	715	525	446	230	495	463	240	375	337	52	206	278	86	162	117	96
04&06	915	725	646	230	695	663	240	375	337	52	206	278	86	162	117	96
08&10	1215	1025	946	230	995	963	240	375	337	52	206	278	86	162	117	96
12&15	1515	1325	1246	230	1295	1263	240	375	337	52	206	278	86	162	117	96
16	1242	1025	963	280	995	963	290	430	392	62	256	336	111	214	122	115
18	1542	1325	1263	280	1295	1263	290	430	392	62	256	336	111	214	122	115

MODEL BM 6

Δ = ACCESS



NOTES:

1. ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE -IF IN DOUBT ASK.
2. MODEL B6 HORIZONTAL, BASE MOUNTED TOP INLET. LEFT HAND COIL CONNECTIONS DRAWN RIGHT HAND COIL CONNECTIONS OPPOSITE HANDING OF COIL CONNECTIONS DETERMINED FACING ACCESS PANEL AND AIR OUTLET
3. ELECTRICAL CONNECTIONS BOX ALWAYS ON OPPOSITE SIDE TO COIL CONNECTIONS
4. AIR VENT OPTIONS;
TYPE M MANUAL AIR VENT FITTED.
TYPE A AUTOMATIC AIR VENT FITTED TO COIL.
TYPE P PLUGGED

2 No. DN20 (3/4" BSP) FEMALE PARALLEL CONNECTIONS

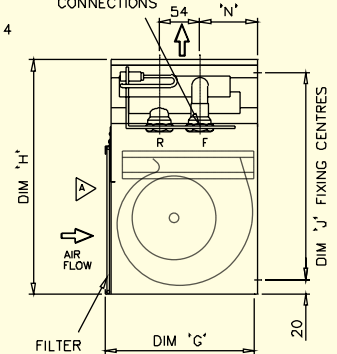


FIG	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'	DIM 'G'	DIM 'H'	DIM 'J'	DIM 'K'	DIM 'L'	DIM 'M'	DIM 'N'	DIM 'P'	DIM 'R'	DIM 'S'
03	772	525	446	230	495	463	240	375	337	52	206	278	86	162	117	96
04&06	972	725	646	230	695	663	240	375	337	52	206	278	86	162	117	96
08&10	1272	1025	946	230	995	963	240	375	337	52	206	278	86	162	117	96
12&15	1572	1325	1246	230	1295	1263	240	375	337	52	206	278	86	162	117	96
16	1300	1025	963	280	995	963	290	430	392	62	256	336	111	214	122	115
18	1800	1325	1263	280	1295	1263	290	430	392	62	256	336	111	214	122	115

FIG	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'	DIM 'G'	DIM 'H'	DIM 'J'	DIM 'K'	DIM 'L'	DIM 'M'	DIM 'N'	DIM 'P'	DIM 'R'	DIM 'S'
03	772	525	446	230	495	463	235	375	337	52	206	383	86	202	117	96
D4&08	972	725	646	230	695	663	235	375	337	52	206	383	86	202	117	96
DB&10	1272	1025	946	230	995	963	235	375	337	52	206	383	86	202	117	96
12&15	1572	1325	1246	230	1295	1263	235	375	337	52	206	383	86	202	117	96
16	1300	1025	963	280	995	963	285	430	392	62	256	438	111	252	122	115
18	1600	1325	1263	280	1295	1263	285	430	392	62	256	438	111	252	122	115

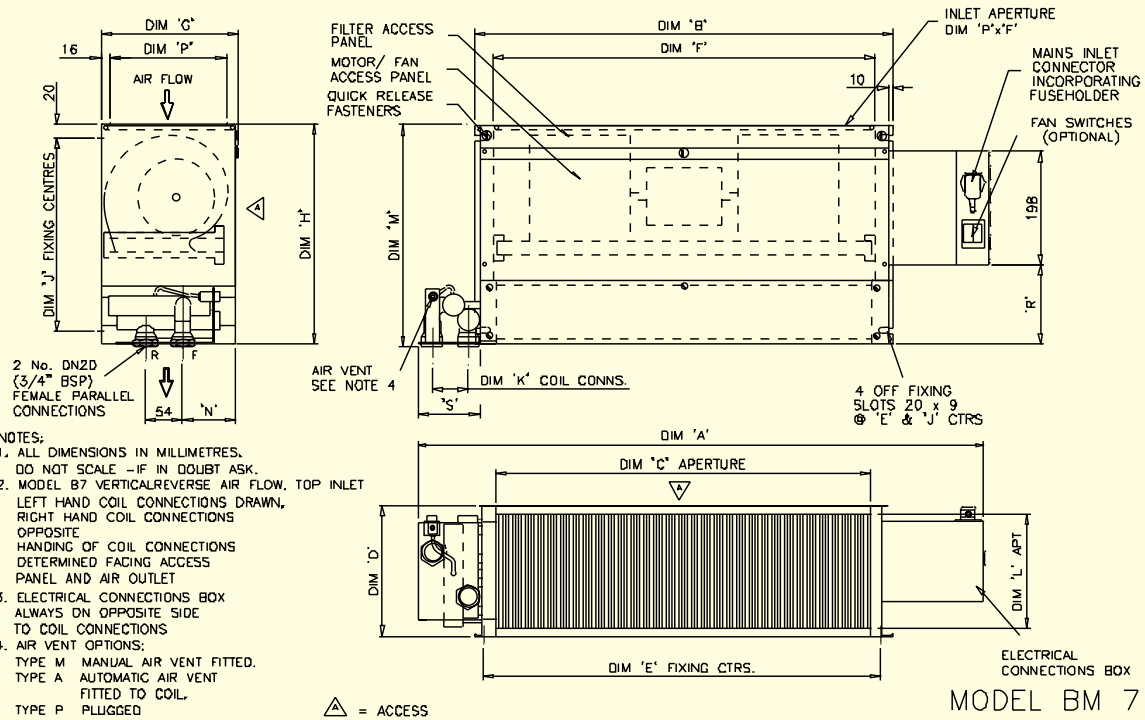
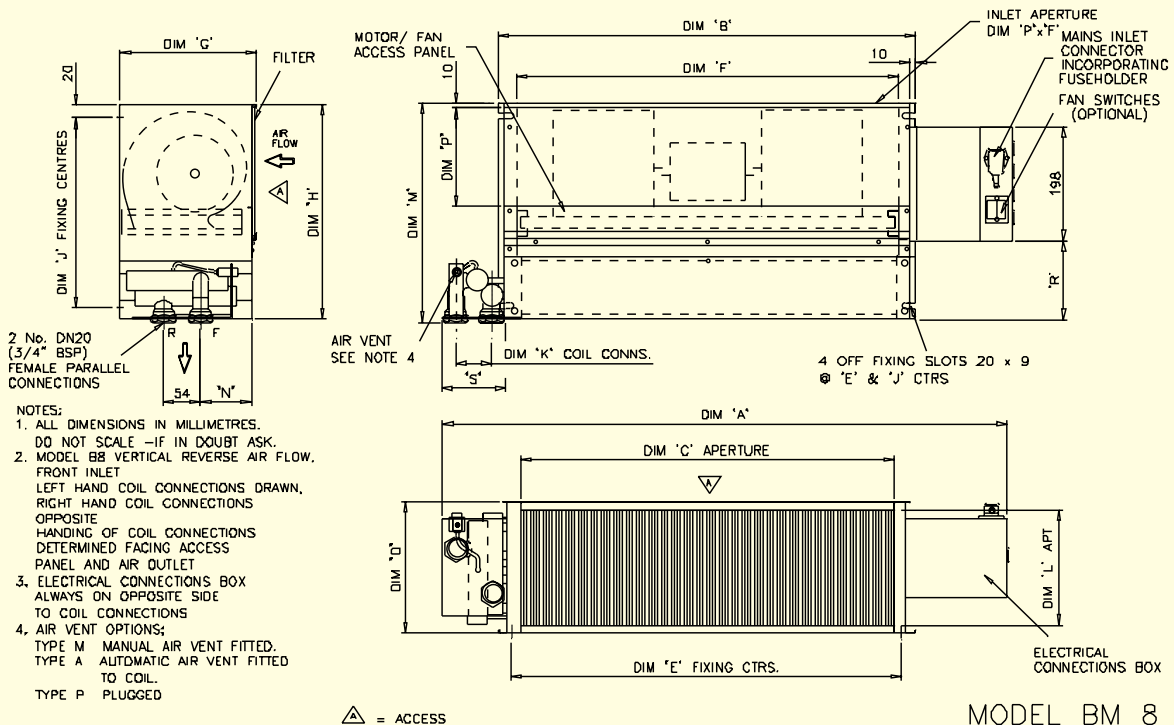


FIG	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'	DIM 'G'	DIM 'H'	DIM 'J'	DIM 'K'	DIM 'L'	DIM 'M'	DIM 'N'	DIM 'P'	DIM 'R'	DIM 'S'
03	772	525	446	230	495	463	240	375	337	52	206	383	86	162	117	96
04&06	972	725	646	230	695	663	240	375	337	52	206	383	86	162	117	96
08&10	1272	1025	946	230	995	963	240	375	337	52	206	383	86	162	117	96
12&15	1572	1325	1246	230	1295	1263	240	375	337	52	206	383	86	162	117	96
16	1300	1025	963	280	995	963	290	430	392	62	256	438	111	214	122	115
18	1600	1325	1263	280	1295	1263	290	430	392	62	256	438	111	214	122	115

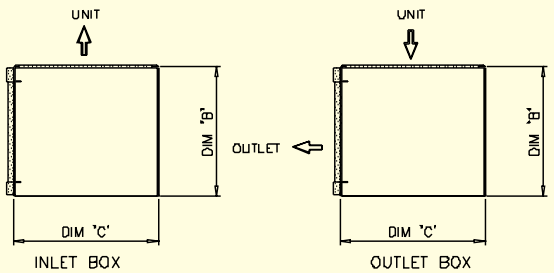
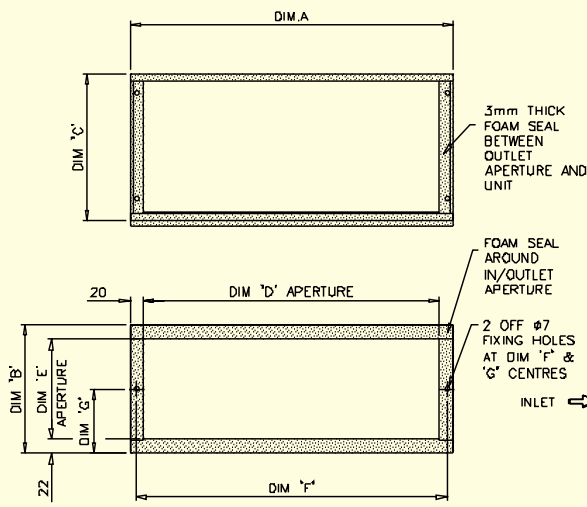




01 & 02 INLET/OUTLET BOX

NOTES:
1. ALL DIMENSIONS IN MILLIMETRES

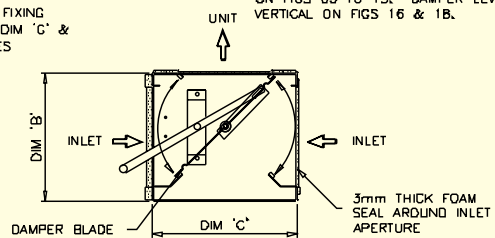
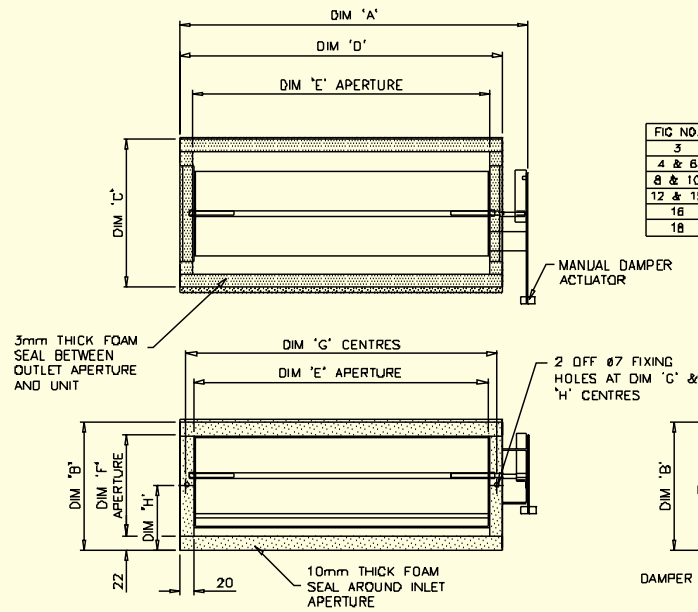
FIG NO.	'A'	'B'	'C'	'D'	'E'	'F'	'G'
3	505	200	230	465	156	485	100
4 & 6	705	200	230	665	156	685	100
8 & 10	1005	200	230	965	156	985	100
12 & 15	1305	200	230	1265	156	1285	100
16	1005	250	280	965	206	985	125
18	1305	250	280	1265	206	1285	125



03 180° INLET DAMPER BOX – MANUAL

FIG NO.	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'
3	545	200	230	505	465	156	485	100
4 & 6	745	200	230	705	665	156	685	100
8 & 10	1045	200	230	1005	965	156	985	100
12 & 15	1345	200	230	1305	1265	156	1285	100
16	1045	250	280	1005	965	206	985	125
18	1345	250	280	1305	1265	206	1285	125

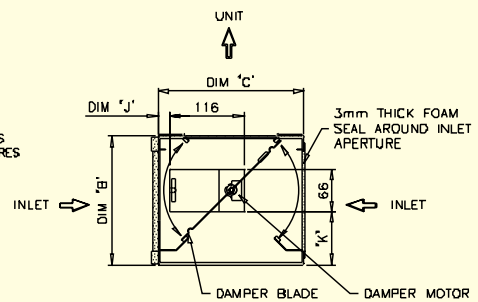
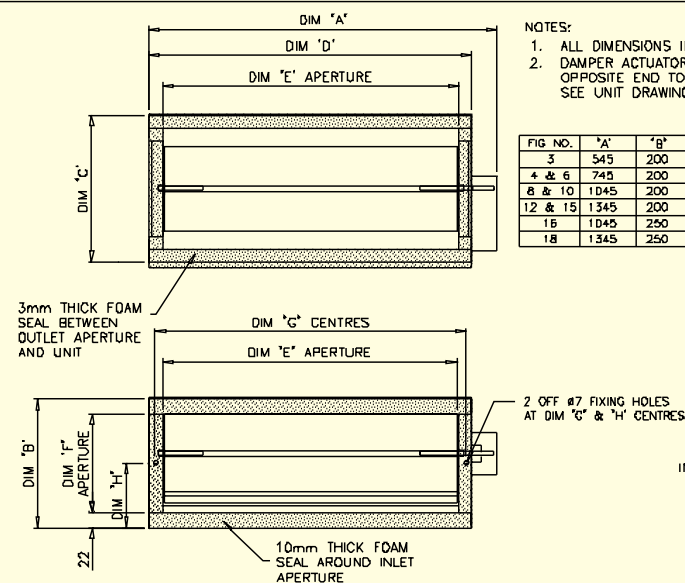
NOTES:
1. ALL DIMENSIONS IN MILLIMETRES
2. DAMPER ACTUATOR ALWAYS SITED AT OPPOSITE END TO COIL CONNECTIONS – SEE UNIT DRAWINGS
3. DAMPER LEVER HORIZONTAL, AS DRAWN, ON FIGS 03 TO 15. DAMPER LEVER VERTICAL ON FIGS 16 & 18.

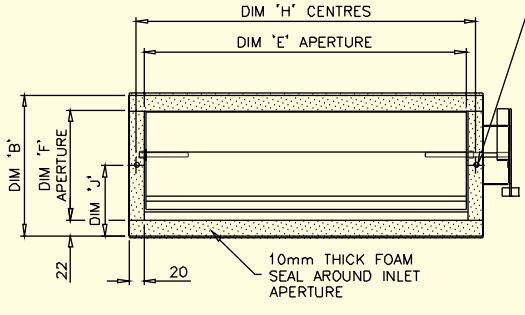


04 180° INLET DAMPER BOX – MOTORISED

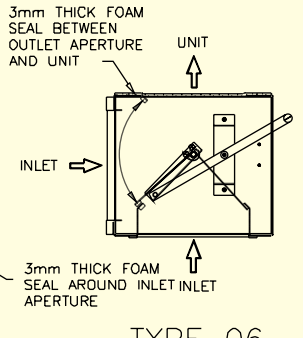
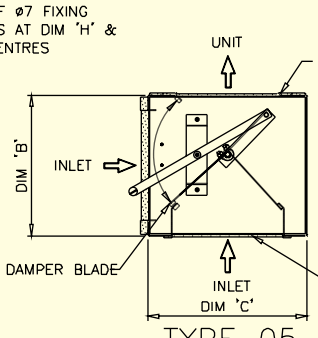
NOTES:
1. ALL DIMENSIONS IN MILLIMETRES
2. DAMPER ACTUATOR ALWAYS SITED AT OPPOSITE END TO COIL CONNECTIONS – SEE UNIT DRAWINGS.

FIG NO.	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'J'	'K'
3	545	200	230	505	465	156	485	100	18	82
4 & 6	745	200	230	705	665	156	685	100	18	82
8 & 10	1045	200	230	1005	965	156	985	100	18	82
12 & 15	1345	200	230	1305	1265	156	1285	100	18	82
16	1045	250	280	1005	965	206	985	125	43	104
18	1345	250	280	1305	1265	206	1285	125	43	104





2 OFF $\phi 7$ FIXING HOLES AT DIM 'H' & 'J' CENTRES



TYPE 05

TYPE 06

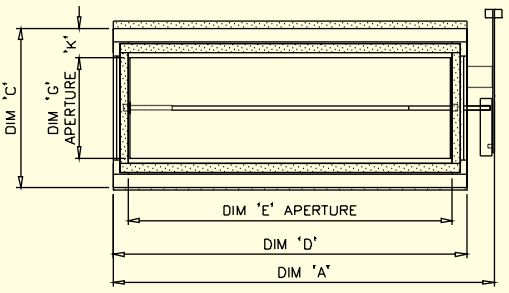
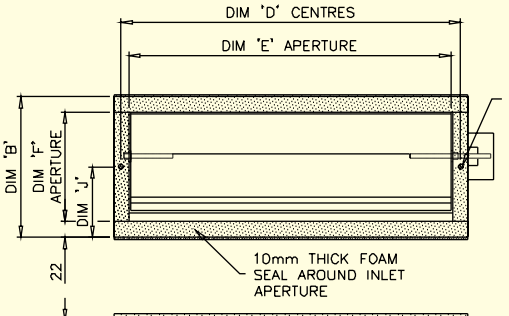


FIG NO.	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'J'	'K'
3	545	200	230	505	465	156	160	485	100	35
4 & 6	745	200	230	705	665	156	160	685	100	35
8 & 10	1045	200	230	1005	965	156	160	985	100	35
12 & 15	1345	200	230	1305	1265	156	160	1285	100	35
16	1045	250	280	1005	965	206	200	985	125	40
18	1345	250	280	1305	1265	206	200	1285	125	40

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES
2. DAMPER ACTUATOR ALWAYS SITED AT OPPOSITE END TO COIL CONNECTIONS - SEE UNIT DRAWINGS.
3. DAMPER LEVER HORIZONTAL, AS DRAWN, ON FIGS 03 TO 15, DAMPER LEVER VERTICAL ON FIGS 16 & 18.

05 & 06
90° INLET DAMPER BOX - MANUAL



2 OFF $\phi 7$ FIXING HOLES AT DIM 'H' & 'J' CENTRES

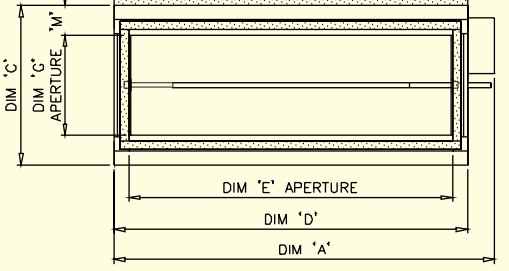
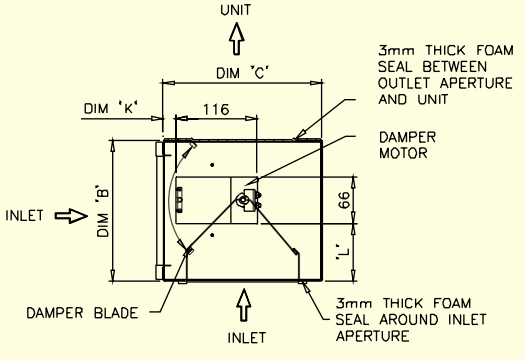


FIG NO.	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'J'	'K'	'L'	'M'
3	545	200	230	505	465	156	160	485	100	18	82	35
4 & 6	745	200	230	705	665	156	160	685	100	18	82	35
8 & 10	1045	200	230	1005	965	156	160	985	100	18	82	35
12 & 15	1345	200	230	1305	1265	156	160	1285	100	18	82	35
16	1045	250	280	1005	965	206	200	985	125	43	104	40
18	1345	250	280	1305	1265	206	200	1285	125	43	104	40

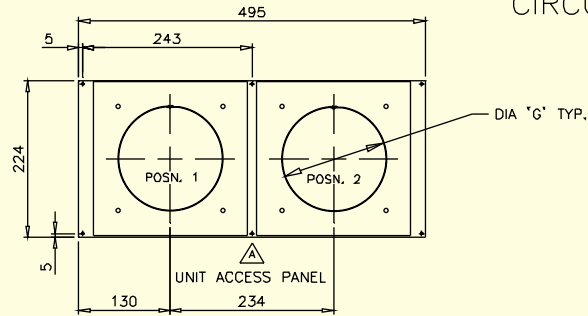
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES
2. DAMPER ACTUATOR ALWAYS SITED AT OPPOSITE END TO COIL CONNECTIONS - SEE UNIT DRAWINGS.

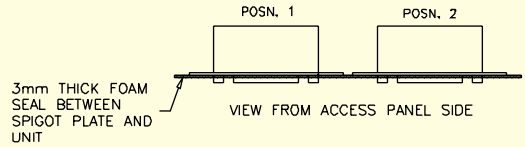
07 & 08
90° INLET DAMPER BOX - MOTORISED

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. CIRCULAR SPIGOT PLATE SP IS FITTED TO HEATER OUTLET.
3. FOR SPIGOT POSITION ORIENTATION REFER TO SPIGOT POSITION REFERENCES ON PAGE 25.
4. ACTUAL SPIGOT O/S DIAMETER IS NOMINAL DIAMETER MINUS 2mm
5. SPIGOTS CAN BE ANY COMBINATION OF SIZE AT POSITIONS 1 AND 2
6. WHEN 0mm DIA. SPIGOT IS SELECTED A BLANKING PLATE WILL BE FITTED AT THAT POSITION



'G' NOMINAL SPIGOT ϕ
0mm
100mm
150mm
200mm



SP OUTLET
CIRCULAR SPIGOT PLATE
FIG 03



SP OUTLET
CIRCULAR SPIGOT PLATE
FIGS 04, 06 & 16

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. CIRCULAR SPIGOT PLATE SP IS FITTED TO HEATER OUTLET.
 3. FOR SPIGOT POSITION ORIENTATION REFER TO SPIGOT POSITION REFERENCES ON PAGE 26.
 4. ACTUAL SPIGOT O/S DIAMETER IS NOMINAL DIAMETER MINUS 2mm
 5. SPIGOTS CAN BE ANY COMBINATION OF SIZE AT POSITIONS 1, 2 AND 3
 6. WHEN 0mm DIA, SPIGOT IS SELECTED A BLANKING PLATE WILL BE FITTED AT THAT POSITION

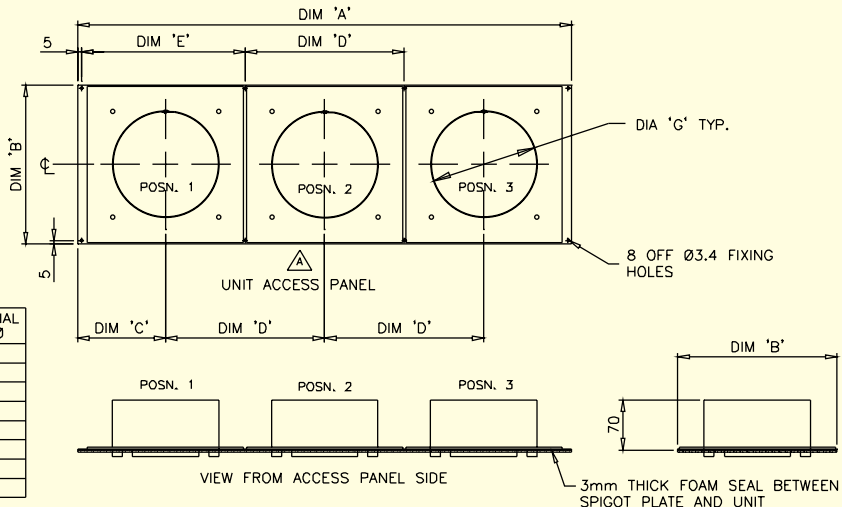


FIG No	'A'	'B'	'C'	'D'	'E'	'G' NOMINAL SPIGOT Ø			
						POSN. 1	POSN. 2	POSN. 3	Blanking
04 & 06	695	224	123.5	224	235.5	0mm	100mm	150mm	200mm
						150mm	200mm	0mm	0mm
						200mm	0mm	150mm	100mm
						0mm	150mm	200mm	250mm

SP OUTLET
CIRCULAR SPIGOT PLATE
FIGS 08, 10 & 18

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. CIRCULAR SPIGOT PLATE SP IS FITTED TO HEATER OUTLET.
 3. FOR SPIGOT POSITION ORIENTATION REFER TO SPIGOT POSITION REFERENCES ON PAGE 27.
 4. ACTUAL SPIGOT O/S DIAMETER IS NOMINAL DIAMETER MINUS 2mm
 5. SPIGOTS CAN BE ANY COMBINATION OF SIZE AT POSITIONS 1, 2, 3 AND 4
 6. WHEN 0mm DIA, SPIGOT IS SELECTED A BLANKING PLATE WILL BE FITTED AT THAT POSITION

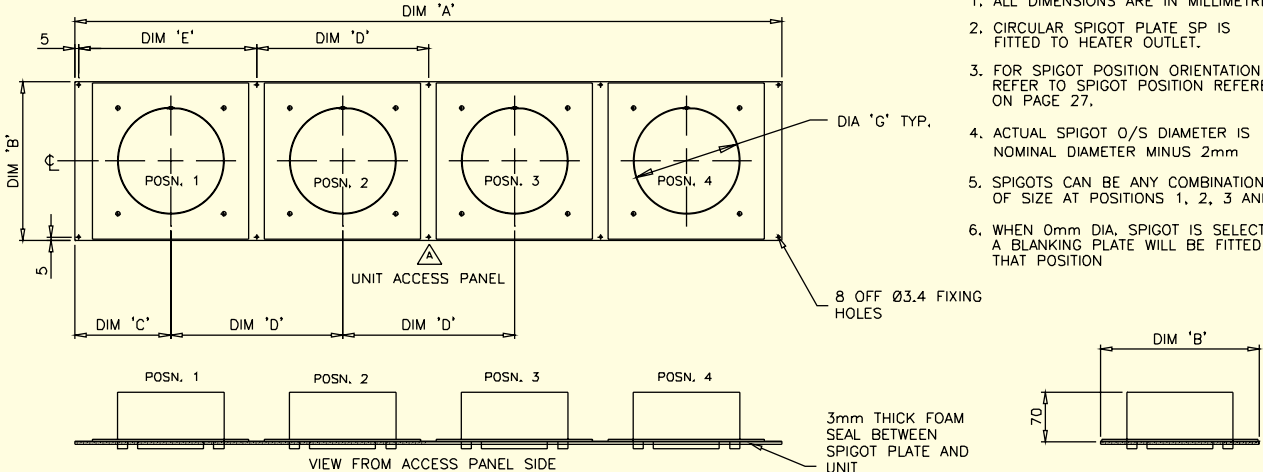


FIG No	'A'	'B'	'C'	'D'	'E'	'G' NOMINAL SPIGOT Ø			
						POSN. 1	POSN. 2	POSN. 3	POSN. 4
08 & 10	995	224	134.5	242	255.5	0mm	100mm	150mm	200mm
						150mm	200mm	0mm	0mm
						200mm	0mm	150mm	100mm
						0mm	150mm	200mm	250mm

FIG No	'A'	'B'	'C'	'D'	'E'	'G' NOMINAL SPIGOT Ø			
						POSN. 1	POSN. 2	POSN. 3	POSN. 4
18	1295	274	175	315	332.5	0mm	150mm	200mm	250mm
						150mm	200mm	0mm	0mm
						200mm	0mm	150mm	100mm
						0mm	150mm	200mm	250mm

SP OUTLET
CIRCULAR SPIGOT PLATE
FIGS 12 & 15

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. CIRCULAR SPIGOT PLATE SP IS FITTED TO HEATER OUTLET.
 3. FOR SPIGOT POSITION ORIENTATION REFER TO SPIGOT POSITION REFERENCES ON PAGE 28.
 4. ACTUAL SPIGOT O/S DIAMETER IS NOMINAL DIAMETER MINUS 2mm
 5. SPIGOTS CAN BE ANY COMBINATION OF SIZE AT POSITIONS 1, 2, 3, 4 AND 5
 6. WHEN 0mm DIA, SPIGOT IS SELECTED A BLANKING PLATE WILL BE FITTED AT THAT POSITION

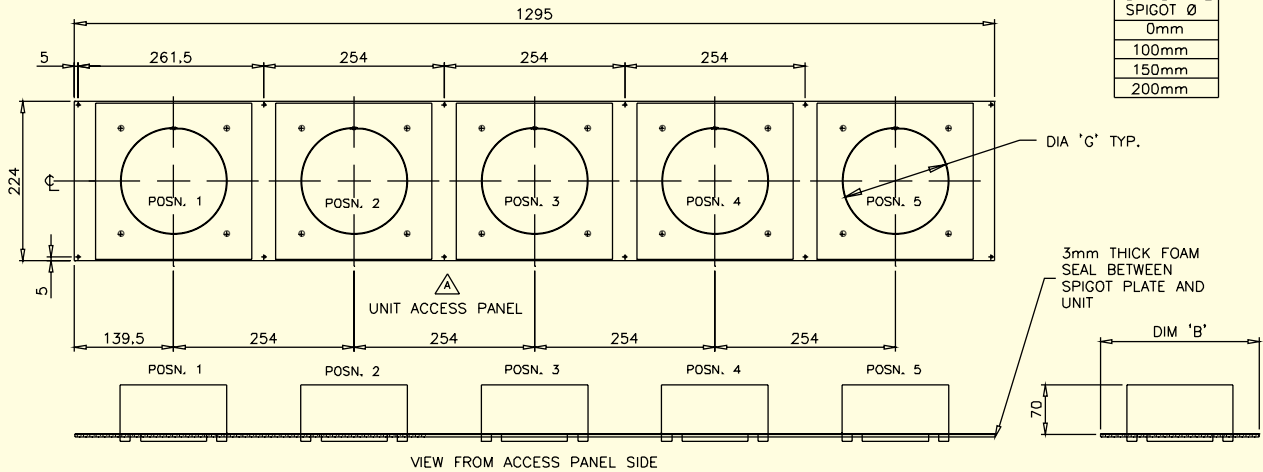
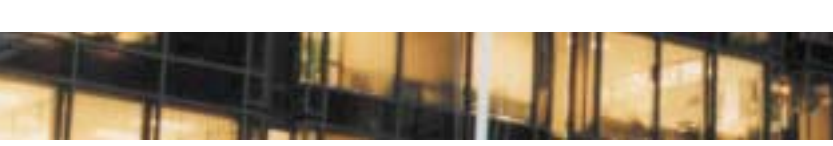
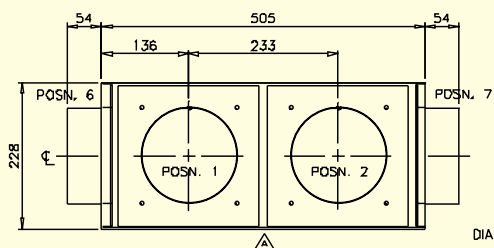


FIG No	'A'	'B'	'C'	'D'	'E'	'G' NOMINAL SPIGOT Ø				
						POSN. 1	POSN. 2	POSN. 3	POSN. 4	POSN. 5
12 & 15	1295	224	139.5	254	254	0mm	100mm	150mm	200mm	250mm
						150mm	200mm	0mm	0mm	0mm
						200mm	0mm	150mm	100mm	150mm
						0mm	150mm	200mm	250mm	0mm
						0mm	150mm	200mm	250mm	0mm

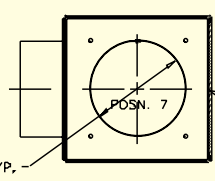
FIG No	'A'	'B'	'C'	'D'	'E'	'G' NOMINAL SPIGOT Ø				
						POSN. 1	POSN. 2	POSN. 3	POSN. 4	POSN. 5
12 & 15	1295	274	175	315	332.5	0mm	150mm	200mm	250mm	0mm
						150mm	200mm	0mm	0mm	0mm
						200mm	0mm	150mm	100mm	150mm
						0mm	150mm	200mm	250mm	0mm
						0mm	150mm	200mm	250mm	0mm



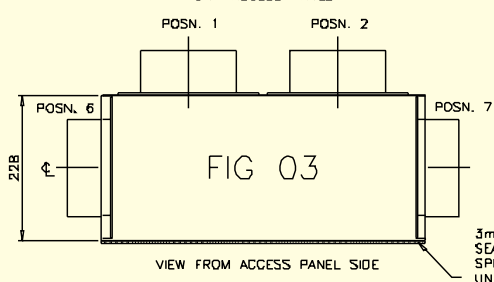
SB INLET/OUTLET BOX WITH CIRCULAR SPIGOTS



UNIT ACCESS PANEL



3mm THICK FOAM SEAL BETWEEN SPIGOT PLATE AND UNIT



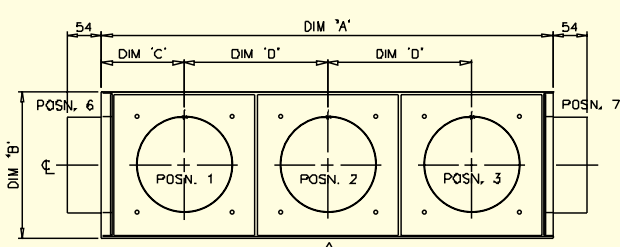
VIEW FROM ACCESS PANEL SIDE

3mm THICK FOAM SEAL BETWEEN SPIGOT PLATE AND UNIT

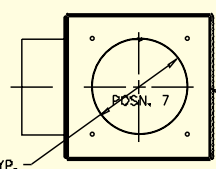
'G' NOMINAL SPIGOT Ø
0mm
100mm
150mm
200mm

NOTES:

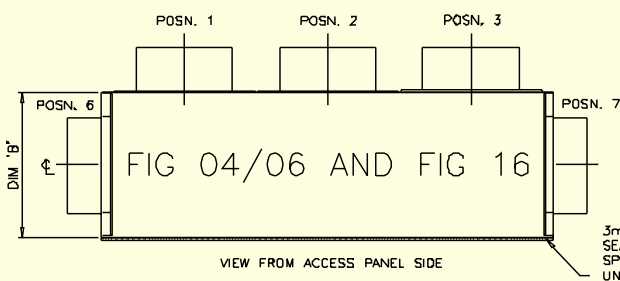
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. CIRCULAR SPIGOT BOX SB CAN BE FITTED TO HEATER OUTLET AND/OR INLET
3. FOR SPIGOT POSITION ORIENTATION REFER TO SPIGOT POSITION REFERENCES ON PAGES 25 TO 27.
4. ACTUAL SPIGOT O/S DIAMETER IS NOMINAL DIAMETER MINUS 2mm
5. SPIGOTS CAN BE ANY COMBINATION OF SIZE AND POSITION (1 THRU 7) INDICATED AS BEING AVAILABLE ON THE BOX REQUIRED.
6. WHEN 0mm DIA. SPIGOT IS SELECTED A BLANKING PLATE WILL BE FITTED AT THAT POSITION



UNIT ACCESS PANEL



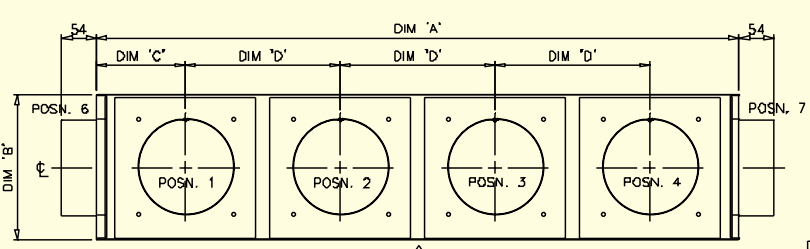
3mm THICK FOAM SEAL BETWEEN SPIGOT PLATE AND UNIT



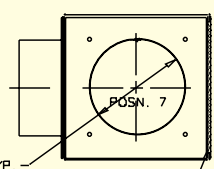
VIEW FROM ACCESS PANEL SIDE

3mm THICK FOAM SEAL BETWEEN SPIGOT PLATE AND UNIT

FIG No	'A'	'B'	'C'	'D'	'G' NOMINAL SPIGOT Ø
04 & 06	705	228	128.5	224	0mm
					100mm
					150mm
					200mm
16	1005	278	182.5	320	0mm
					150mm
					200mm
					250mm

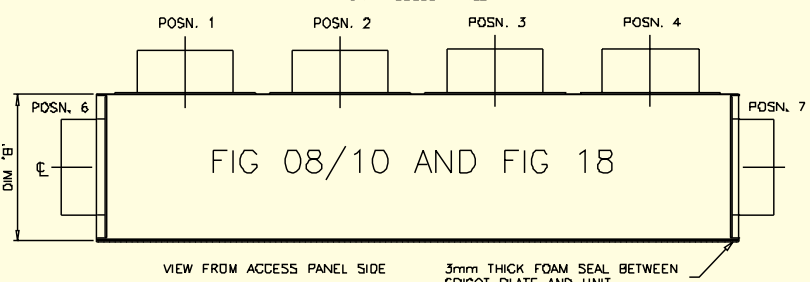


UNIT ACCESS PANEL



DIA 'G' TYP.

3mm THICK FOAM SEAL BETWEEN SPIGOT PLATE AND UNIT



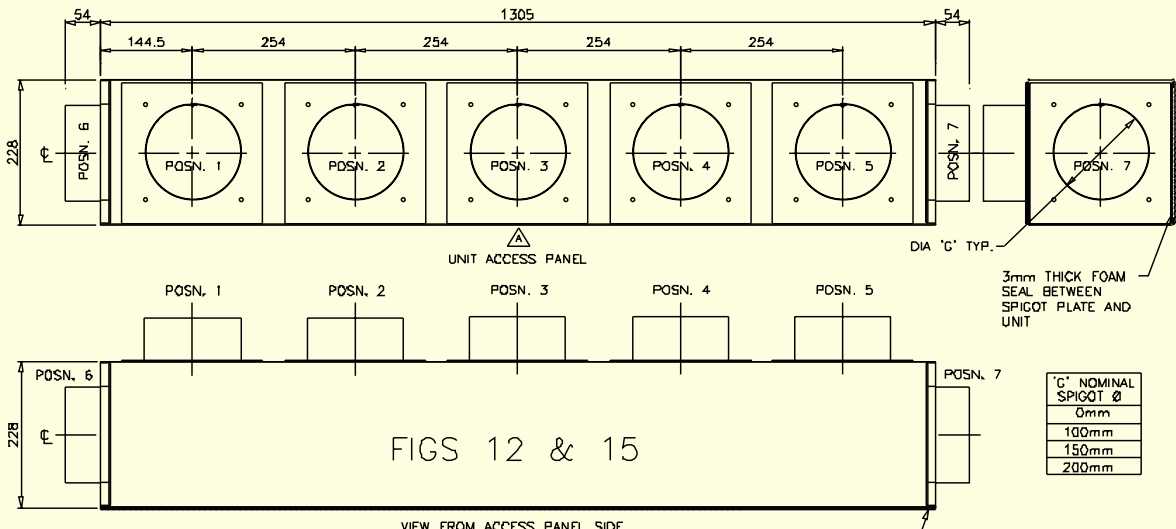
VIEW FROM ACCESS PANEL SIDE

3mm THICK FOAM SEAL BETWEEN SPIGOT PLATE AND UNIT

FIG No	'A'	'B'	'C'	'D'	'G' NOMINAL SPIGOT Ø
08 & 10	1005	228	139.5	242	0mm
					100mm
					150mm
					200mm
18	1305	278	180	315	0mm
					150mm
					200mm
					250mm



SB INLET/OUTLET BOX WITH CIRCULAR SPIGOTS



FIGS 12 & 15

'C' NOMINAL SPIGOT Ø
0mm
100mm
150mm
200mm

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. CIRCULAR SPIGOT BOX SB CAN BE FITTED TO HEATER OUTLET AND/OR INLET.
 3. FOR SPIGOT POSITION ORIENTATION REFER TO SPIGOT POSITION REFERENCES ON PAGE 28.
 4. ACTUAL SPIGOT O/S DIAMETER IS NOMINAL DIAMETER MINUS 2mm.
 5. SPIGOTS CAN BE ANY COMBINATION OF SIZE AND POSITION (1 THRU 7) INDICATED AS BEING AVAILABLE ON THE BOX REQUIRED.
 6. WHEN 0mm DIA. SPIGOT IS SELECTED A BLANKING PLATE WILL BE FITTED AT THAT POSITION.

RS INLET AND OUTLET PLATE WITH RECTANGULAR SPIGOT

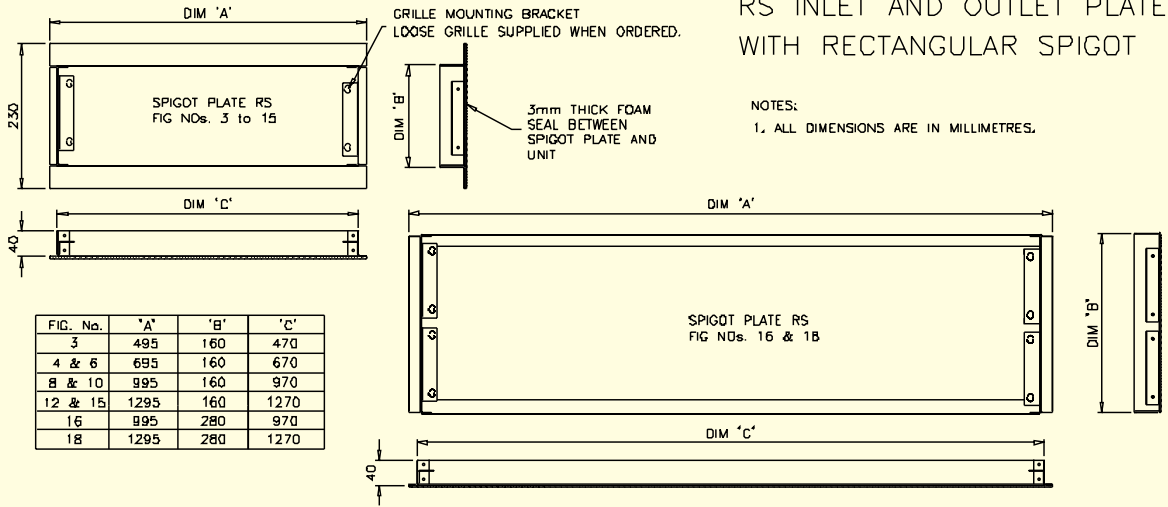


FIG. No.	'A'	'B'	'C'
3	495	160	470
4 & 6	695	160	670
8 & 10	995	160	970
12 & 15	1295	160	1270
16	995	280	970
18	1295	280	1270

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.

P1 AND P2 PLINTH

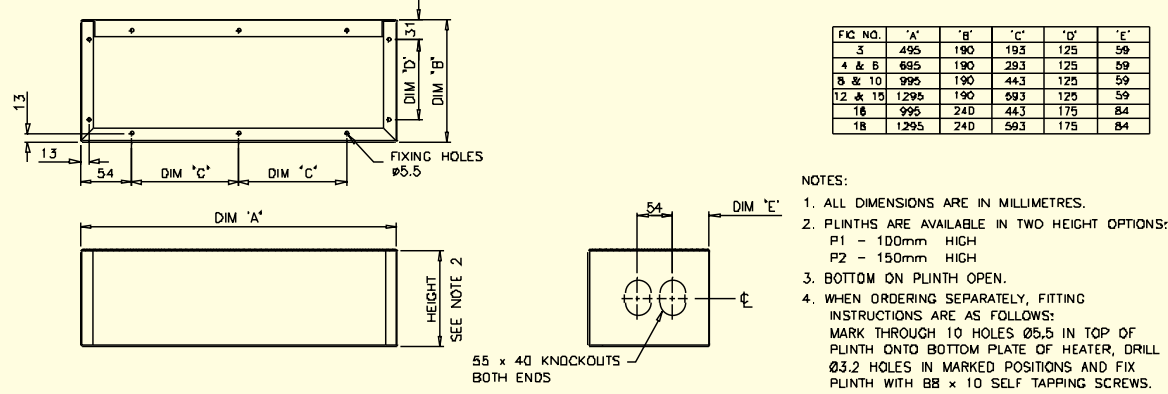
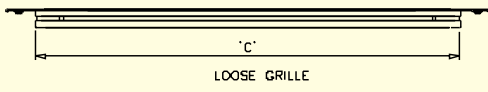
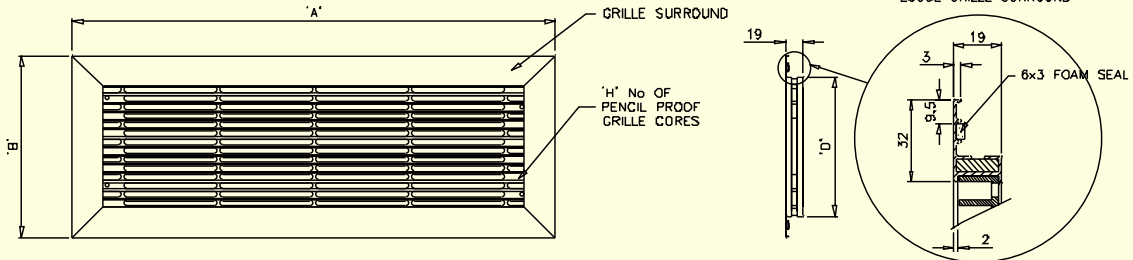


FIG. NO.	'A'	'B'	'C'	'D'	'E'
3	495	190	193	125	59
4 & 6	695	190	293	125	59
8 & 10	995	190	443	125	59
12 & 15	1295	190	593	125	59
16	995	240	443	175	84
18	1295	240	593	175	84

- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
 2. PLINTHS ARE AVAILABLE IN TWO HEIGHT OPTIONS:
P1 - 100mm HIGH
P2 - 150mm HIGH
 3. BOTTOM ON PLINTH OPEN.
 4. WHEN ORDERING SEPARATELY, FITTING INSTRUCTIONS ARE AS FOLLOWS:
MARK THROUGH 10 HOLES Ø5.5 IN TOP OF PLINTH ONTO BOTTOM PLATE OF HEATER, DRILL Ø3.2 HOLES IN MARKED POSITIONS AND FIX PLINTH WITH 88 x 10 SELF TAPPING SCREWS.

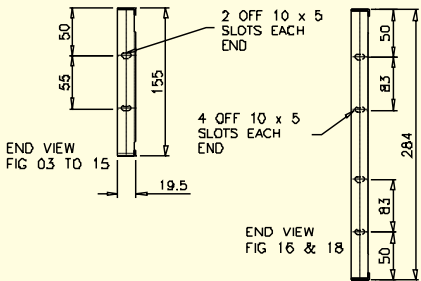
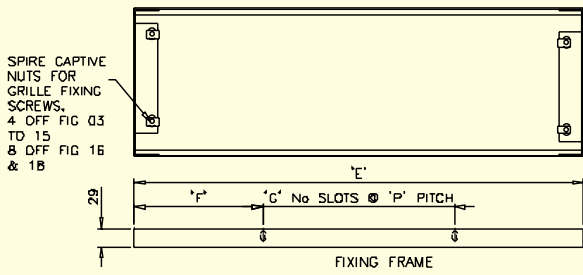
LG & FF LOOSE GRILLE AND FIXING FRAME

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.



NB: THIS GRILLE IS NOT WEATHERPROOF AND IS NOT RECOMMENDED FOR EXTERNAL USE.

FIG. No.	'A'	'B'	'C'	'D'	'E'	'F'	'G'	'H'	'P'
3	504	190	443	145	468	134	2	1	200
4 & 6	704	190	643	145	668	219	2	1	230
B & 1D	1004	190	943	145	968	321	2	1	326
12 & 15	1304	190	1243	145	1268	315	3	1	319
16	1004	319	943	275	968	321	2	2	326
18	1304	319	1243	275	1268	315	3	2	319



E1, E2 & E3 EXTENSION DUCT

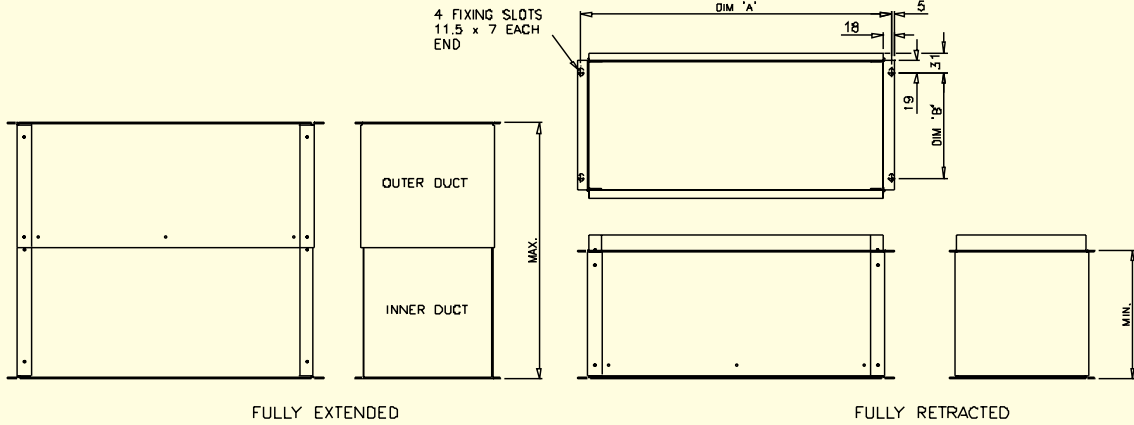


	FIG No.	DIM. A	DIM. B	MIN.	MAX.
E1	03	485.5	165.0	200.0	400.0
	04 & 06	685.5	165.0	200.0	400.0
	08 & 10	985.5	165.0	200.0	400.0
	12 & 15	1285.5	165.0	200.0	400.0
	16	985.5	215.0	200.0	400.0
	18	1285.5	215.0	200.0	400.0
E2	03	485.5	165.0	400.0	800.0
	04 & 06	685.5	165.0	400.0	800.0
	08 & 10	985.5	165.0	400.0	800.0
	12 & 15	1285.5	165.0	400.0	800.0
	16	985.5	215.0	400.0	800.0
	18	1285.5	215.0	400.0	800.0

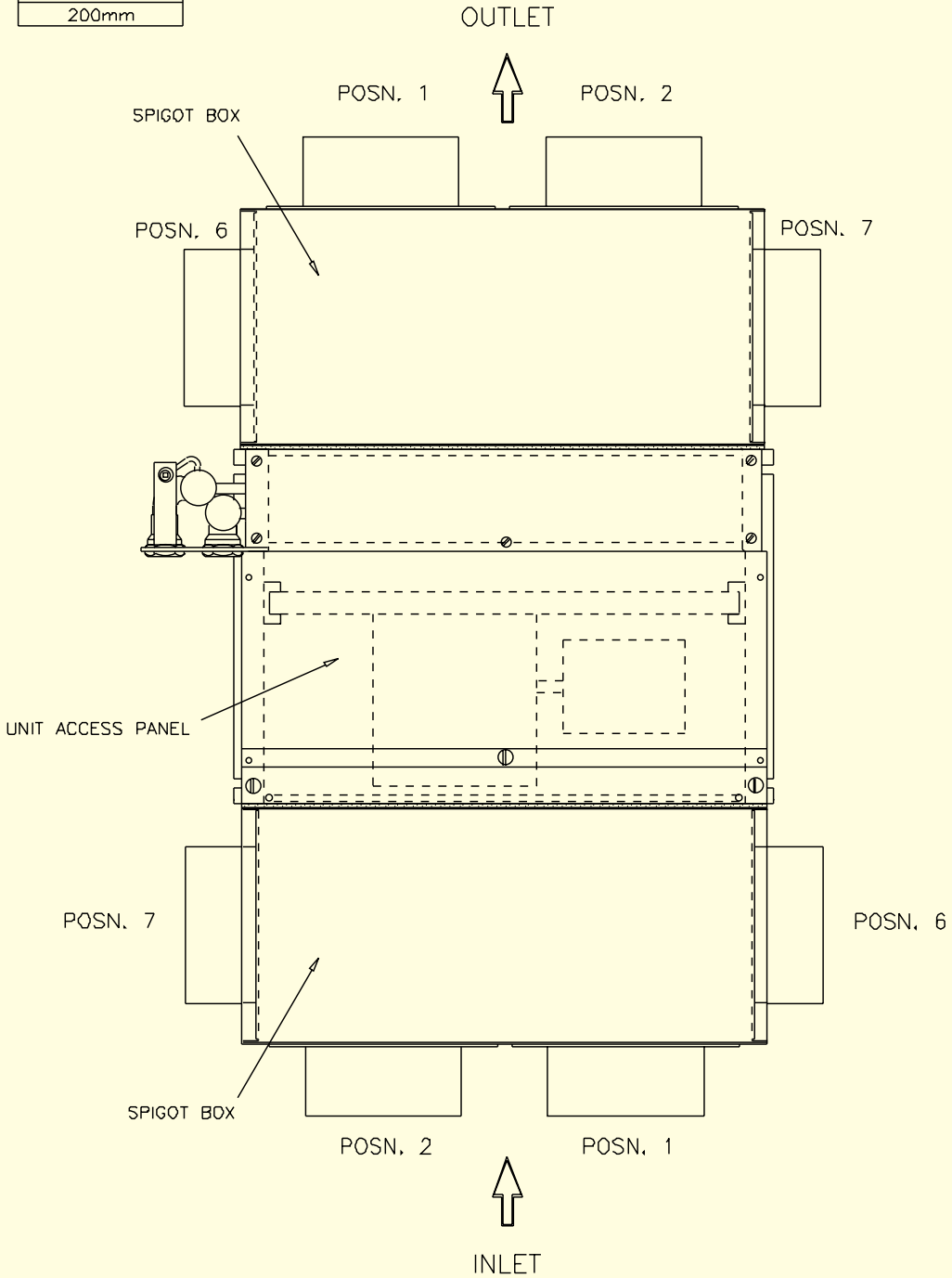
	FIG No.	DIM. A	DIM. B	MIN.	MAX.
E3	03	485.5	165.0	800.0	1600.0
	04 & 06	685.5	165.0	800.0	1600.0
	08 & 10	985.5	165.0	800.0	1600.0
	12 & 15	1285.5	165.0	800.0	1600.0
	16	985.5	215.0	800.0	1600.0
	18	1285.5	215.0	800.0	1600.0

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. EXTENSION DUCT E1 EXTENDABLE BETWEEN 200 AND 400mm.
EXTENSION DUCT E2 EXTENDABLE BETWEEN 400 AND 800mm.
EXTENSION DUCT E3 EXTENDABLE BETWEEN 800 AND 1600mm.
3. UNLESS SPECIFIED, EXTENSION DUCT WILL BE SUPPLIED LOOSE FOR ASSEMBLY ON SITE BY OTHERS.



SPIGOT POSITION REFERENCES FIG 03

"G" NOMINAL SPIGOT Ø
0mm
100mm
150mm
200mm



- NOTES:
1. SPIGOT POSITIONS ARE AS SHOWN ON ALL UNITS WHEN FACING ACCESS PANEL.
 2. SPIGOT POSITIONS 6 & 7 ARE NOT AVAILABLE ON INLET/OUTLET SPIGOT PLATES.
 3. ALL SPIGOT SIZES ARE AVAILABLE AT ANY POSITION, SEE ABOVE TABLE AND UNIT DESCRIPTION CODE AT BACK OF BROCHURE.
 4. UNIT SHOWN FOR INFORMATION ONLY.



SPIGOT POSITION REFERENCES FIG 04 & 06 AND 16

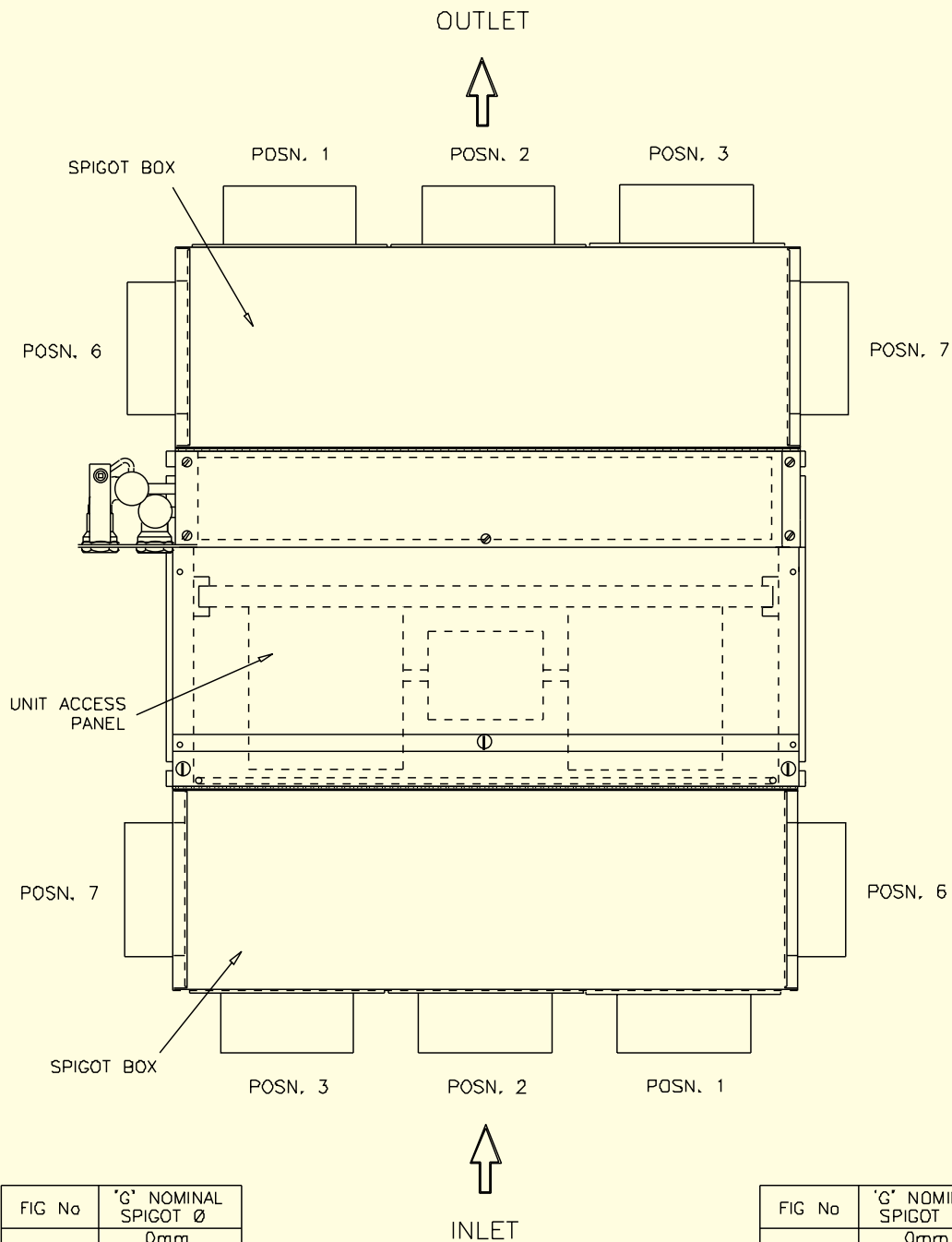


FIG No	'G' NOMINAL SPIGOT Ø
04 & 06	0mm
	100mm
	150mm
	200mm

FIG No	'G' NOMINAL SPIGOT Ø
16	0mm
	150mm
	200mm
	250mm

NOTES:

1. SPIGOT POSITIONS ARE AS SHOWN ON ALL UNITS WHEN FACING ACCESS PANEL.
2. SPIGOT POSITIONS 6 & 7 ARE NOT AVAILABLE ON INLET/OUTLET SPIGOT PLATES.
3. ALL SPIGOT SIZES ARE AVAILABLE AT ANY POSITION, SEE ABOVE TABLE AND UNIT DESCRIPTION CODE AT BACK OF BROCHURE.
4. UNIT SHOWN FOR INFORMATION ONLY.



SPIGOT POSITION REFERENCES FIG 08 & 10 AND 18

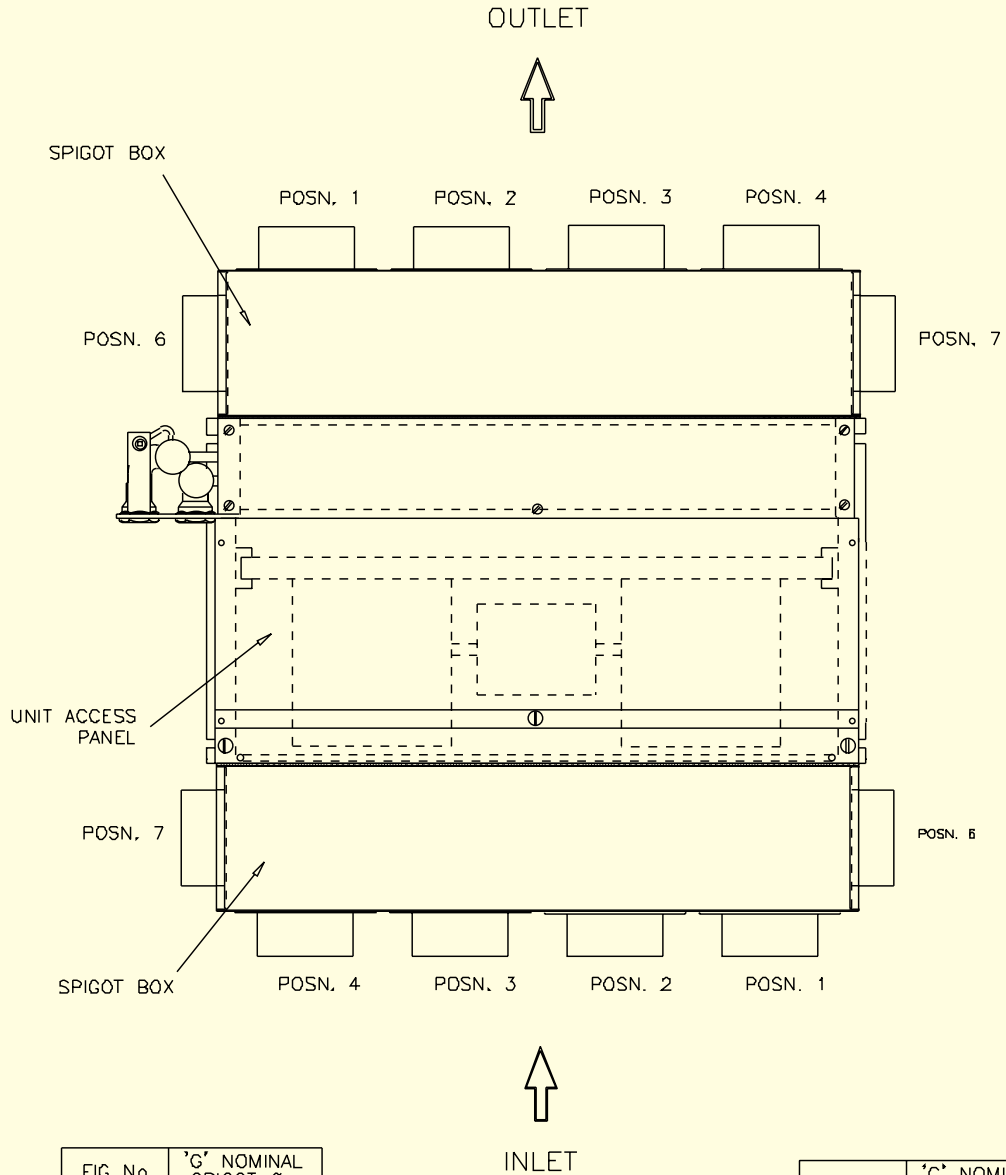


FIG No	'G' NOMINAL SPIGOT Ø
08 & 10	0mm
	100mm
	150mm
	200mm

FIG No	'G' NOMINAL SPIGOT Ø
18	0mm
	150mm
	200mm
	250mm

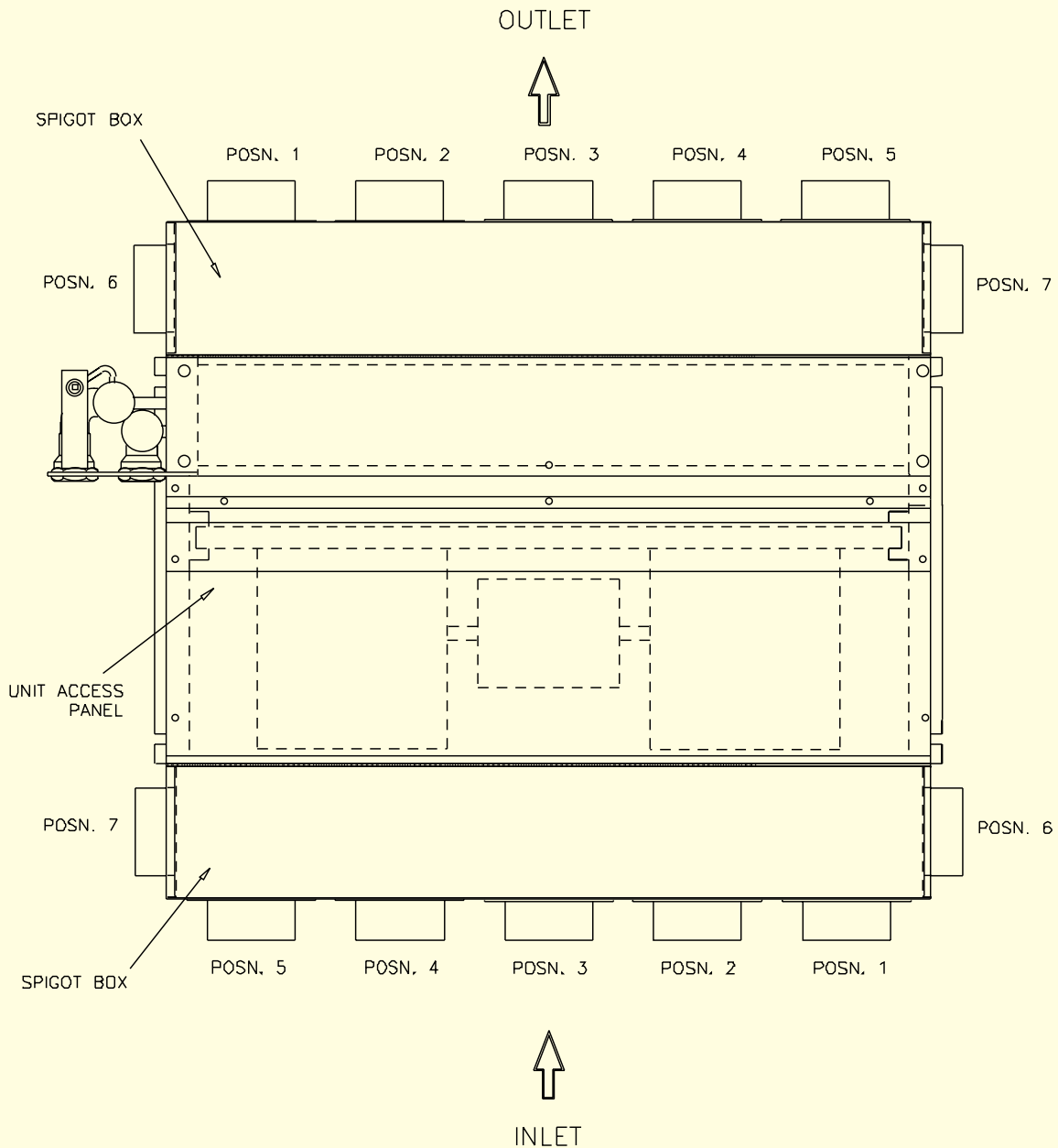
NOTES:

1. SPIGOT POSITIONS ARE AS SHOWN ON ALL UNITS WHEN FACING ACCESS PANEL.
2. SPIGOT POSITIONS 6 & 7 ARE NOT AVAILABLE ON INLET/OUTLET SPIGOT PLATES.
3. ALL SPIGOT SIZES ARE AVAILABLE AT ANY POSITION, SEE ABOVE TABLE AND UNIT DESCRIPTION CODE AT BACK OF BROCHURE.
4. UNIT SHOWN FOR INFORMATION ONLY.



SPIGOT POSITION REFERENCES FIG 12 & 15

FIG No	'G' NOMINAL SPIGOT Ø
12 & 15	0mm
	100mm
	150mm
	200mm



NOTES:

1. SPIGOT POSITIONS ARE AS SHOWN ON ALL UNITS WHEN FACING ACCESS PANEL.
2. SPIGOT POSITIONS 6 & 7 ARE NOT AVAILABLE ON INLET/OUTLET SPIGOT PLATES.
3. ALL SPIGOT SIZES ARE AVAILABLE AT ANY POSITION, SEE ABOVE TABLE AND UNIT DESCRIPTION CODE AT BACK OF BROCHURE.
4. UNIT SHOWN FOR INFORMATION ONLY.



Engineering Specification

Series BM fan convector heaters shall be manufactured by Dunham-Bush Limited, Downley Road, Havant, Hampshire, PO9 2JD. The models, figure numbers and quantities shall be as indicated in the selection schedule and/or on the drawings. The construction of all heaters must comply with the following specification.

General

Each heater shall consist of a basic sheet metal casing with access panel, heating coil, fan and motor platform, air filter and electrical connections box.

Basic casing

Basic casings shall be assembled from 0.9mm galvanised steel panels, adequately stiffened to minimise distortion. Each casing shall have an access panel. Models 1, 3, 4 and 7 shall have a separate filter access panel..

Basic casing dimensions shall be as shown in the manufactures product catalogue and shall have a manufacturing tolerance of ± 1 mm. Basic casing components shall be self finished galvanised steel.

Hot water heating coil

Heating coils shall be constructed from two rows of 9.53mm. O.D. solid drawn copper tubes, expanded into single plate corrugated aluminium fins and brazed to copper headers. Coil type shall be specified with reference to the performance tables. Flow and return connections shall be DN20 (fl" BSP) female parallel. Coil connections shall be specified left or right hand, determined facing the access panel and/or air outlet. Coils less air vents shall be tested to 24 bar gauge.

Coils shall be provided with type M manual air vent, type A automatic air vent or type P plugged air vent, as specified

Site test and working pressures – bar gauge

air vent type	maximum cold test pressure	maximum working pressure
M	10.5	7.0
A	9.0	7.0
P	24.0	18.0

Fan/motor platform

Fan/motor platforms shall be manufactured from 1.6mm galvanised steel and shall be fitted with galvanised steel fan housing(s), a resiliently mounted motor and centrifugal impellers. Motor wiring shall be complete with a four-way line connector. The platform shall be suspended within the heater casing on resilient channels and shall be removable by sliding out.

Air filter

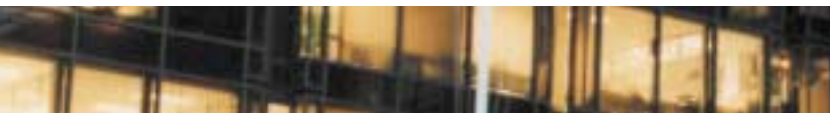
Air filters shall be washable, composed of thermally bonded polyester fibres. Filters shall be BS EN 779, class G2 (equivalent to Eurovent EU2).

Fan motor

Motors shall be quiet running, resiliently mounted, capacitor start and run, totally enclosed, having a minimum of class 'B' insulation and rated in accordance with BS5000 Part 11. Figure 03 motors shall be 25W, single shaft, all other figure numbers shall be double shaft ; figure numbers 04 and 06 shall be 40W ; figure numbers 08, 10, 12 and 15 shall be 75W ; figure numbers 16 and 18 shall be 200W. Motors shall be wound for 230VAC/1ph/50Hz supply and shall have 'sealed for life' ball bearings.

Centrifugal fans

Each fan shall be double inlet, forward curved, statically and dynamically balanced, secured to the fan motor shaft by a grub screw. Figure number 03 shall be fitted with one impeller, all other figure numbers shall be fitted with two impellers.



Electrical connections box and wiring

Each heater shall be provided with an electrical connections box fitted to the casing on opposite side to the hot water coil connections. The electrical connections box shall contain an auto-transformer and terminal block. The box on horizontal models 3, 4, 5 and 6 shall have a hinged cover. All other models shall have a lift-off cover. Each electrical connections box shall have a fused I.E.C. mains inlet connector with a spare fuse and an I.E.C. mains inlet plug. Internal wiring shall be tri-rated, high temperature PVC insulated cable 16/0.020. Figure numbers 03 to 15 shall be fitted with 2A inlet fuses. Figure numbers 16 and 18 shall be fitted with 5A inlet fuses.

Fan motor speed control

An auto-transformer shall be fitted within the electrical connections box to provide energy efficient fan motor speed control. Transformers shall be wired to provide one or two speeds from the range – low, medium and high. An isolated 24V AC (30VA) supply shall also be available for ELV controls.

Performance

Series BM fan convectors performance shall be tested and rated in accordance with BS4856, Part 1.

Identification

Each heater shall be complete with a nameplate indicating the model, figure number and serial number.

Packaging

Each heater shall be properly packed to suit the quantity being transported, and for storage in dry, indoor conditions. Heaters shall be marked with the model and figure number, and any other reference specified for site identification

Accessories

If specified, accessories listed in the manufacturers Product Catalogue shall be provided.





Construction

Handling

The purchaser is responsible for off-loading. Heaters are individually cartoned and two persons can usually handle the heaviest heater. When a significant quantity of heaters is delivered, they may be palletised and shrink wrapped, so a fork lift truck or similar form of lifting equipment is required. Care should be taken to ensure the heaters are not dropped or knocked under any circumstances.

Storage

Heaters should be stored under clean, dry indoor conditions. The cartons should not be removed until heaters are required for installation, unless damage in transit is suspected. Note – the purchaser must examine the heaters promptly upon receipt and any claims for damage will only be accepted if, at the time of delivery, the consignment note is endorsed with a note detailing the damage and counter-

signed by the transport company. Each heater is marked to show the model, figure number, serial number and any reference given on the order for site identification (stencil references).

Preparation

Extensive modification to the building fabric should not normally be necessary. However proper provision for fixings must be arranged. The structure to which heaters are to be fixed must be fit for purpose and capable of accepting plugs, anchors, screws or drop rods. Floor mounted models require a level base. Floor and wall models also require a flat wall surface to stand against.

Installation details

The access panel, fan and motor platform and filter can all be removed to allow easier handling. Please refer to Sitework Instructions/Recommendations supplied with the heater. Additional copies are available on request.

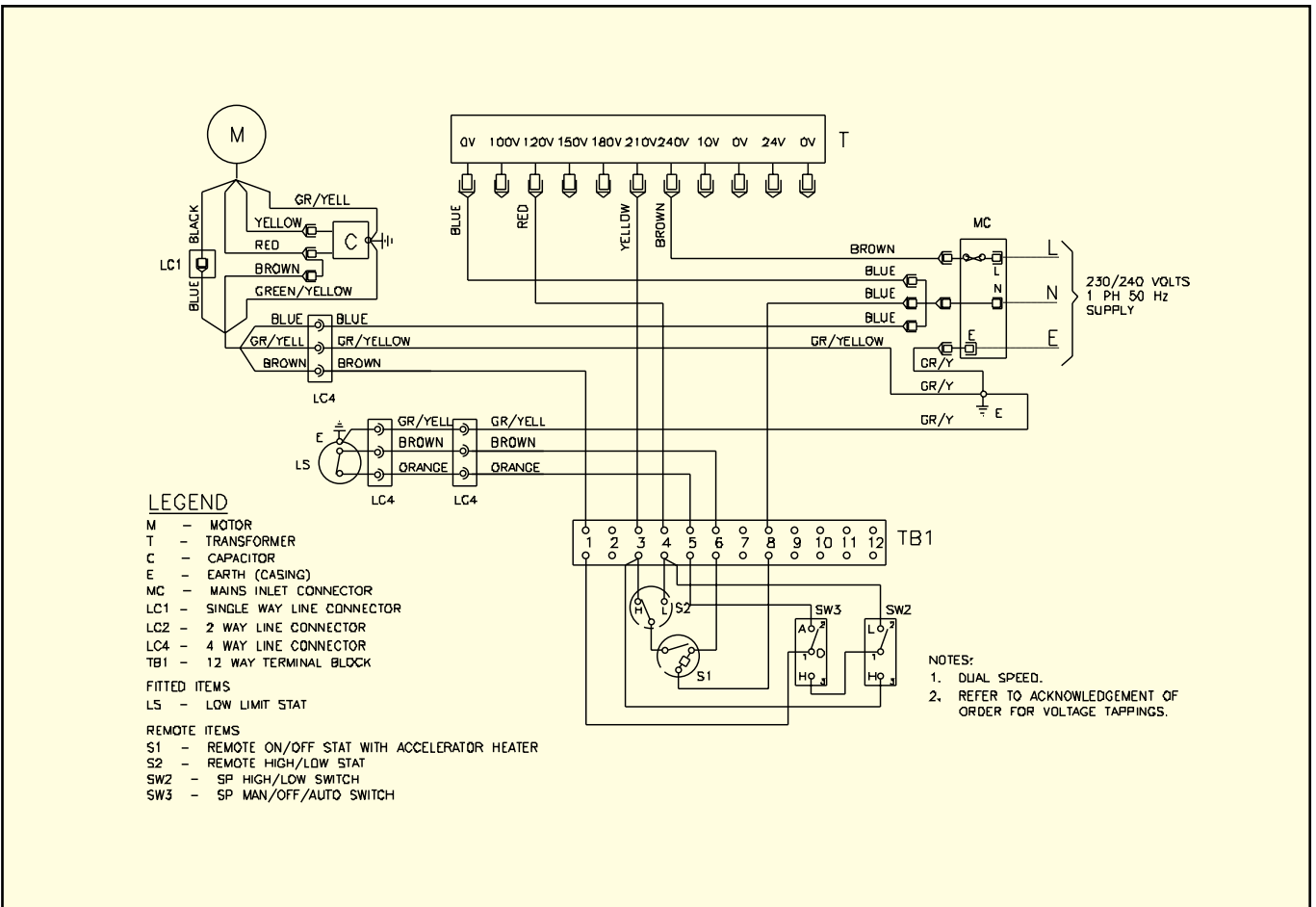
Pipework connections

Coil connections are DN20 (1/2" BSP) female parallel. Local isolating and regulating valves are recommended. Observe the correct flow and return positions specified in sitework instructions to ensure the rated heat output.

Electrical connections

A 230-240 Volt, single phase, 50 Hertz supply must be connected to the I.E.C. mains inlet plug. Any remote accessories must be connected as shown on the wiring diagram supplied with the heater.

Typical Wiring Diagram



MODEL BM1 HEATER – APPLICATION BEHIND WALL WITH ACCESSORIES:
 02 INLET BOX AND 02 OUTLET BOX, P PLINTH,
 LG LOOSE GRILLE AND FF FIXING FRAMES.
 (LEFT HAND CONNECTIONS SHOWN)

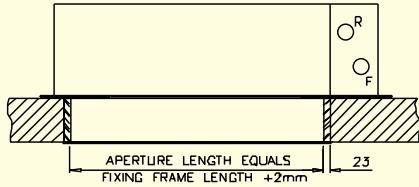
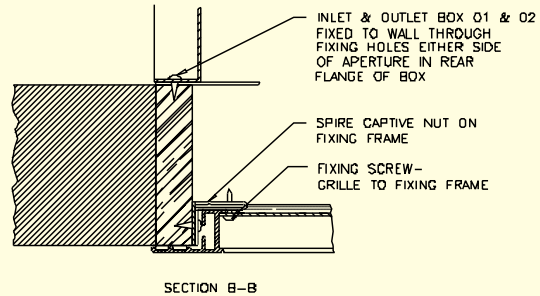
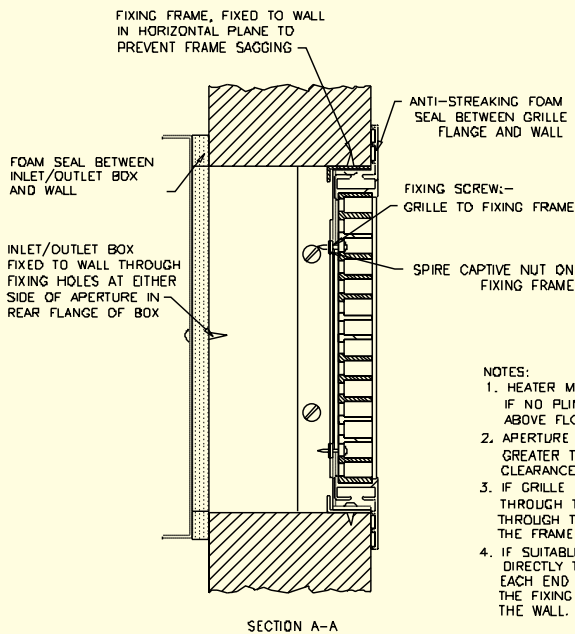
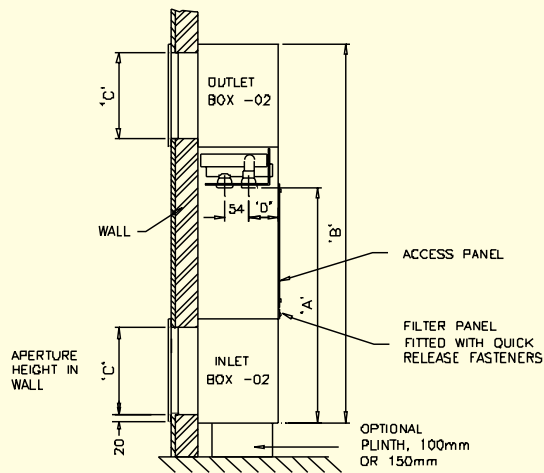
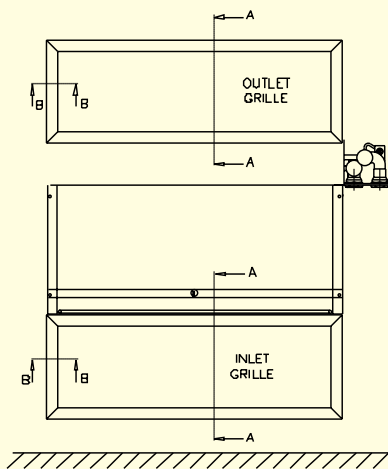


FIG No.	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'
03	478	775	157	86
04 & 06	478	775	157	86
08 & 10	478	775	157	86
12 & 15	478	775	157	86
16	586	930	286	111
18	586	930	286	111



NOTES:

1. HEATER MOUNTED ON OPTIONAL 100mm OR 150mm HIGH PLINTH. IF NO PLINTH IS FITTED, LOWER FLANGE OF INLET GRILLE WILL BE 2mm ABOVE FLOOR OR FALSE FLOOR LEVEL
2. APERTURE DIMENSIONS STATED (LENGTH AND HEIGHT) ARE TWO MILLIMETRES GREATER THAN THE MAXIMUM SIZES OF THE GRILLE FIXING FRAME FOR CLEARANCE
3. IF GRILLE FIXING FRAME IS ADEQUATELY FIXED AT BOTH ENDS THROUGH THE FIXING SLOTS PROVIDED, IT SHOULD NOT BE NECESSARY TO FIX THROUGH THE TOP AND BOTTOM SLOTS, EXCEPT TO PREVENT THE FRAME FROM SAGGING
4. IF SUITABLE FIXINGS ARE USED, THE GRILLE FIXING FRAME MAY BE FIXED DIRECTLY TO THE WALL, THUS ELIMINATING THE NEED FOR TIMBER LINING AT EACH END OF THE APERTURE. IN THIS CASE, IT WILL BE POSSIBLE TO REVERSE THE FIXING FRAME, TAKING THE FIXING POINTS FURTHER FROM THE EDGE OF THE WALL.



MODEL BM3 HEATER – APPLICATION IN CEILING VOID WITH ACCESSORIES:
 01 INLET BOX AND 01 OUTLET BOXES,
 LG LOOSE GRILLE AND FF FIXING FRAMES
 (LEFT HAND UNIT SHOWN)

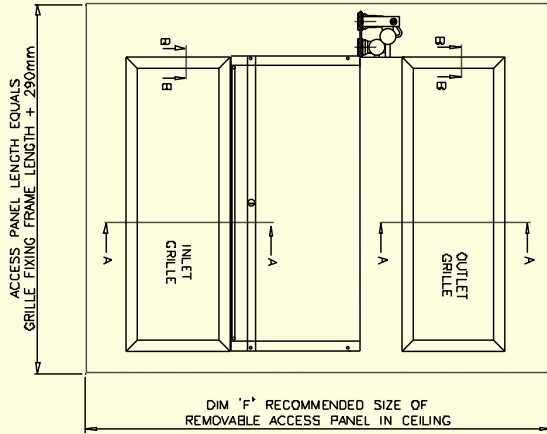
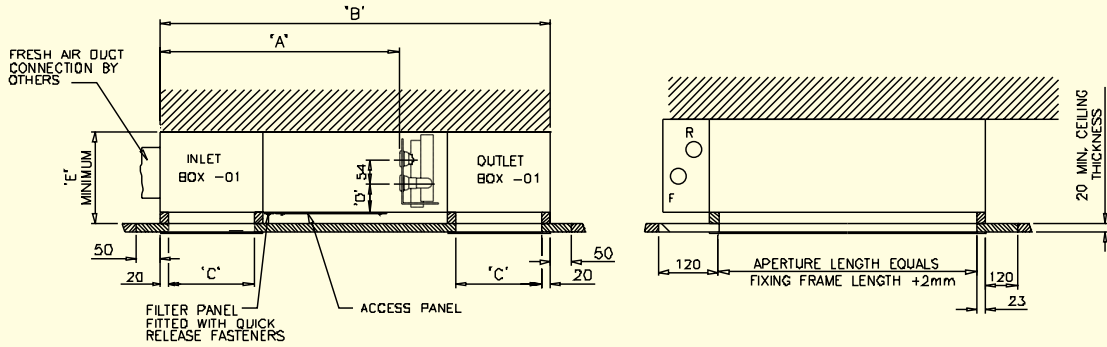
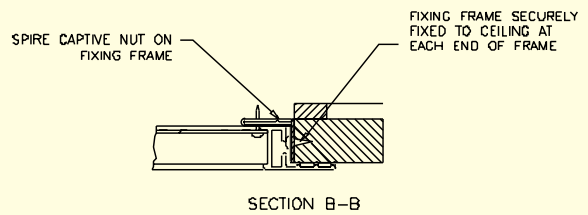
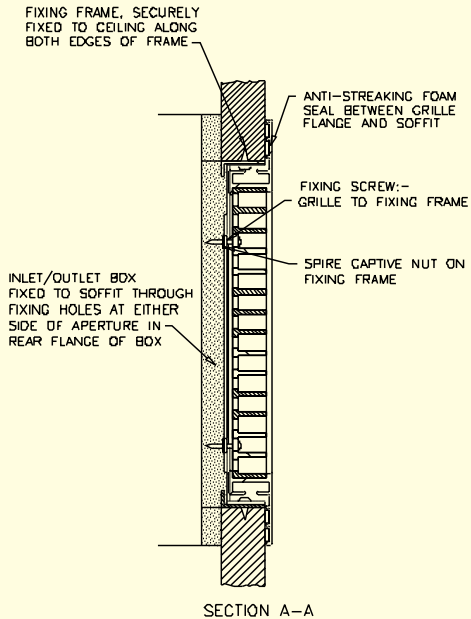
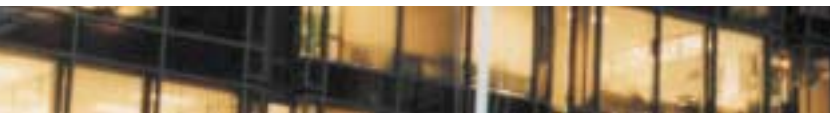


FIG No.	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'	DIM 'E'	DIM 'F'
03	478	157	157	86	240	1000
04 & 06	478	157	157	86	240	1000
08 & 10	478	157	157	86	240	1000
12 & 15	478	157	157	86	240	1000
16	586	930	286	111	290	1150
18	586	930	286	111	290	1150

RECOMMENDED SIZE OF REMOVABLE ACCESS PANEL IN CEILING



- NOTES:
1. APERTURE DIMENSIONS STATED (LENGTH AND HEIGHT) ARE TWO MILLIMETRES GREATER THAN THE MAXIMUM SIZES OF THE GRILLE FIXING FRAME
 2. UNIT FIXED TO CEILING WITH SUITABLE FIXINGS THROUGH FIXING HOLES IN FLANGE OF UNIT
 3. MODEL BM3L LEFT HAND SHOWN, MODEL BM3R RIGHT HAND CONNECTIONS OPPOSITE



Prices & Conditions of Sale

Prices

Dunham Bush Ltd do not issue price lists but will be pleased to supply a written quotation upon request. Contact a Dunham Bush sales representative.

Standard conditions of sale

The standard conditions of sale appear on all quotation and order acknowledgment forms. Additional copies are available upon request

Technical Support Services

Product support

In the United Kingdom and Ireland, Dunham Bush have a network of sales agents and representatives, situated at strategic locations, to provide local support on pricing and selection. Further technical support is available at Dunham Bush head office and factory in Havant.

Supply

Availability

Series BM fan convector heaters are supplied direct from our manufacturing plant in Havant. The availability varies with demand and should therefore be checked at the time of ordering. Contact a Dunham Bush sales representative for typical lead times.

Packaging

Heaters are packed for storage in clean, dry indoor conditions. Each heater is marked to show the model, figure number, serial number and any reference given on the order for site identification.

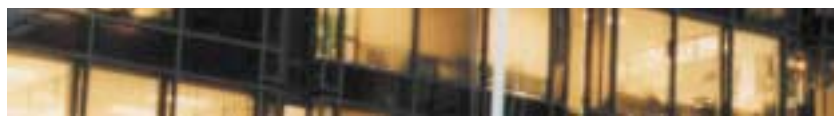
Ordering

To allow us to process your order promptly, please refer to any quotation we have supplied and any relevant correspondence. Please send your order to the Dunham Bush sales representative who provided the quotation. There are two ways of providing information necessary for us to supply the required heaters

- 1) please photocopy the Fan convector Description Code form on page 35 and fill in your requirements or,
- 2) please advise the following details :-
 - a) quantity of each model and figure number
 - b) left or right hand coil connections as viewed looking at the access panel and air outlet
 - c) coil type
 - d) air vent type
 - e) air volume flow rate and external resistance at low, medium or high speed
 - f) fan speed(s) required
 - g) details of any accessories required
 - h) marking or stencil reference for site identification

Delivery to Site

Series BM fan convectors are delivered to site in accordance with our Conditions of Sale. The purchaser is responsible for off-loading and proper safe storage.



Series BM Fan Convactor description code

Use the product description code to specify the complete fan convactor required

Code posn	Component	Component description
1	Series	BM – fan convactor
2	Model	1, 2, 3, 4, 5, 6, 7, 8 – Standard models, Q – Special model
3	Size – figure number	03, 04, 06, 08, 10, 12, 15, 16, 18
4	Coil connections	L – left hand, R – right hand
5	Coil type	WA1,WA2, WA3 – LTHW coils, E11, E21, E31, E32, E41, E42, E51, E52, E61, E62 – Electric coils QQQ – Special heating coil
6	Air vent	M – manual, A – automatic, P – plugged
7	Fixed isolating valves	N – none, B – ball, G – gate
8	Fan speeds	LN – low only, MN – medium only, HN-high only, LM – low/medium, LH – low/high, MH – medium/high
9a	On/off thermostat	C – capillary fitted, R – room remote, N – none
9b	Speed change thermostat	C – capillary fitted, R – room remote, N – none
10	low temp. cut-out LTC	1 – fixed setting, 2 – adjustable setting, N – none
11a	Switch location	F – fitted, R – remote, N – none
11b	Switches	N – none, 1 – on/off, 2 – high/off/low, 3 – man/off/auto, 4 – man/off/auto & high/low, 5 – FAI/recirc, 6 – FAI/recirc & high/off/low, 7 – FAI/recirc & man/off/auto, 8 – FAI/recirc, man/off/auto & high/low (Remote only)
12	Electronic speed control	N – none, F – fitted sensor, R – remote sensor
13	Inlet	01, 02, 03, 04, 05, 06, 07, 08, SB, SP, RS, NN
14	Outlet	01, 02, SB, SP, RS, NN
15	Fitted plinth	P1 – 100mm high, P2 – 150mm high, NN – none
16	Extension duct	E1 – 225-400mm, E2 – 450-850mm, E3 – 900-1750mm, NN – none
17	special features	Q – Specify with drawings or diagrams as applicable

1	2	3	4	5	6	7	8	9a	9b	10	11a	11b	12	13	14	15	16	17	
B	M																		

- Notes 1) Please refer to accessories section for items applicable to various models.
 2) Select any remote switches and/or thermostats required from the list below.

Use the description code box below, when inlet/outlet spigot box SB or inlet/outlet spigot plate SP is required. Refer to pages 21-24 for spigot positions.

10 – Ø100mm spigot

15 – Ø150mm spigot

20 – Ø200mm spigot

25 – Ø250mm spigot

0 – spigot not required

N – spigot position not available

Inlet	Type	Spigot Position						
	SB/SP	1	2	3	4	5	6	7

Outlet	Type	Spigot Position						
	SB/SP	1	2	3	4	5	6	7

Remote switches	flush mounting part no.	surface mounting part no.
on/off	121-601-010	121-601-001
high/off/low	121-601-011	121-601-002
man/off/auto	121-601-012	121-601-003
man/off/auto & high/low	121-601-015	121-601-006
FAI/recirc.	121-601-013	121-601-004
FAI/recirc & high/off/low	121-601-016	121-601-007
FAI/recirc & man/off/auto	121-601-017	121-601-008
FAI/recirc,man/off/auto & high/low	121-601-018	121-601-009

Room thermostats	standard thermostat part no.	tamper thermostat part no.
Honeywell T6360B1028	953-002-056	–
Honeywell T6360B1069	–	903-002-057



Quality

Dunham-Bush operates a quality control system and is a registered firm of Assessed Capability to BS EN ISO 9001 : 1994

Whatever the product, wherever its eventual destination, the Dunham-Bush design and manufacturing policy has always been firmly based on technical quality.

Other Heating Products:

Other Heating Products

Series AM fan convectors
Series CM fan convectors
Series L fan convectors

Series F fan coil units
Panther fan coil units
Cougar fan coil units
Leopard fan coil units
Ounce fan coil units
Lynx fan coil units

Dunham Strip radiant heating
Evolution Radiant Panels
Evo-Lite radiant panels

Voidpak air handling units
Finvector perimeter heating
Trench Finvector heating
WarmSafe LST radiators
Series UH unit heaters

Sentry Air Curtains
Gas fired products



Manufacturer reserves the right to change any product specification without notice.

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PDS-1000-H-0081-05
April 2003