



THORNE &
DERRICK
INTERNATIONAL

Thorne & Derrick
+44 (0) 191 410 4292
www.heatingandprocess.com

EX
HEAT
INDUSTRIAL

Hazardous Area Portable Fan Heater 'The Bulldog'



MFH 'The Bulldog' Portable Fan Heater



EXHEAT Industrial's MFH 'The Bulldog' Portable Fan Heater is the world's first truly portable hazardous area fan assisted heater. The Bulldog combines efficient design with simple functionality to provide a portable heating solution for use in hazardous environments where the atmosphere is classified as Zone 1 or 2 (IIA, IIB and H2). Certified to the new BS EN ISO 80079-36 and BS EN ISO 80079-37 standards for constructional safety, The Bulldog comes ready to 'plug and play' with the option of fitting a plug, or hard wiring to an isolator unit.

The casing is moulded from a steel reinforced polymer which makes The Bulldog tough and durable. Using adjustable feet, the heater can be angled to allow for flexibility in its positioning and, with its compact design, can be easily stored or transported.

The Bulldog can be used with or without ducting to provide a warm stream of air that can be felt metres away, even in ambient temperatures as low as -40°C and up to +40°C. The heater can optionally be fitted with an additional safety device above and beyond the requirements of the certification.

The Bulldog is patent pending, application number 1614657.3

FEATURES

- Compact and rigid housing suitable for onshore and offshore usage for typical applications such as offshore installations, gas installations, aircraft hangars, munition stores, spray shops, battery stores, fuel servicing areas, portable washdown heaters and many more.
- Portable and lightweight, allowing for single user manipulation / operation. Can be supplied on a long flying lead to get heat where you need it.
- Up to 6kW. The heater can be directed at an engineer working in a larger space, or at the same time, warm a mid-sized room to a comfortable operating temperature for all within.
- The Bulldog's design increases efficiency, providing a warmer flow of air for the operator at up to 5m.
- Suitable for ambient temperatures as low as -40°C and up to +40°C.
- Available in T3 and T4 temperature classes.



Certification	ATEX Ⓜ II 2 G D Ex h Ex db eb IIB + H2 T3 to T4 Gb Ex tb IIIC T200°C to T135°C Db	IECEX Ex db eb IIB + H2 T3 to T4 Gb Ex tb IIIC T200°C to T135°C Db
Main Materials	Casing: PA66 30% with EMI shielding Impeller: PA66 30% with EMI shielding with epoxy coated aluminium hub Ex d Enclosure: Anodised extruded aluminium Ex e Enclosure: Stainless steel Motor Housing: Epoxy coated aluminium	
Mounting	Adjustable feet at each corner allow for a stable standing on uneven surfaces	
Voltage	Single phase 110V to 277V, three phase 380V to 690V 50/60Hz	
Element	Finned stainless steel tubular elements	
Dimensions	Length 475mm, width 470mm, height 530mm	
Ingress Protection	IP65	
Weight	25kg, excluding cable and any optional components	
Patent	Patent pending, application number 1614657.3	

Performance Data	At 50Hz	At 60Hz
Air Velocity	4.8m/s	5.0m/s
Fan Speed	1380min-1	1460min-1
Motor Rating	0.09kW	0.09kW
Sound Pressure	65dB	68dB
Air Throw	8.8m	9.4m
Face Velocity	3.6m/s	4.3m/s

Performance Data

Model	Voltage *	Phase **	T Class	Nominal Output (kW)	Air Flow (m³/hr)		Air Temp. Delta (°C/°F) ***		Max Current (A) ****
					50Hz	60Hz	50Hz	60Hz	
MFH-5.5-220	220	1	T3	5.5	1050	1260	16.2 / 29.2	13.5 / 24.3	25.6
MFH-6-230	230	1	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	26.7
MFH-5.5-240	240	1	T3	5.5	1050	1260	16.2 / 29.2	13.5 / 24.3	23.5
MFH-6-254	254	1	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	24.2
MFH-6-277	277	1	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	22.3
MFH-5.5-380	380	3	T3	5.5	1050	1260	16.2 / 29.2	13.5 / 24.3	9.0
MFH-6-400	400	3	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	9.3
MFH-5.5-415	415	3	T3	5.5	1050	1260	16.2 / 29.2	13.5 / 24.3	8.3
MFH-6-440	440	3	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	8.5
MFH-6-480	480	3	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	7.8
MFH-6-600	600	3	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	6.4
MFH-6-690	690	3	T3	6	1050	1260	17.7 / 31.8	14.7 / 26.5	5.6
MFH-2.5-110	110	1	T4	2.5	1050	1260	7.4 / 13.3	6.1 / 11.1	23.3
MFH-3-120	120	1	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	25.6
MFH-2.75-220	220	1	T4	2.75	1050	1260	8.1 / 14.6	6.8 / 12.2	13.1
MFH-3-230	230	1	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	13.6
MFH-2.75-240	240	1	T4	2.75	1050	1260	8.1 / 14.6	6.8 / 12.2	12.1
MFH-3-254	254	1	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	12.4
MFH-3-277	277	1	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	11.4
MFH-2.75-380	380	3	T4	2.75	1050	1260	8.1 / 14.6	6.8 / 12.2	4.8
MFH-3-400	400	3	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	4.9
MFH-2.75-415	415	3	T4	2.75	1050	1260	8.1 / 14.6	6.8 / 12.2	4.4
MFH-3-440	440	3	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	4.6
MFH-3-480	480	3	T4	3	1050	1260	8.8 / 15.9	7.4 / 13.3	4.3
MFH-3.7-600	600	3	T4	3.7	1050	1260	10.9 / 19.6	9.1 / 16.4	4.2
MFH-3.7-690	690	3	T4	3.7	1050	1260	10.9 / 19.6	9.1 / 16.4	3.7

* Voltage tolerance +0/-10%.

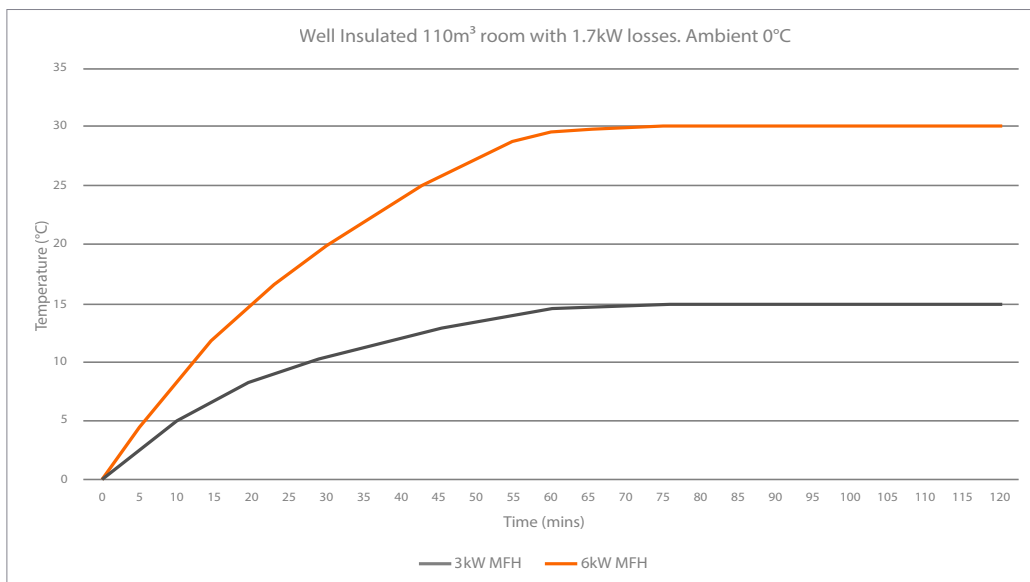
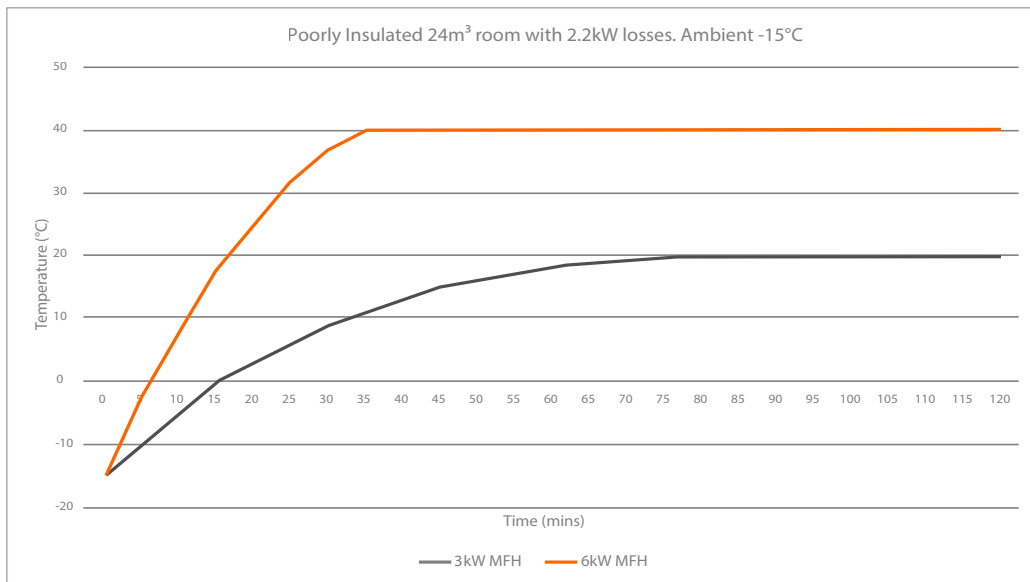
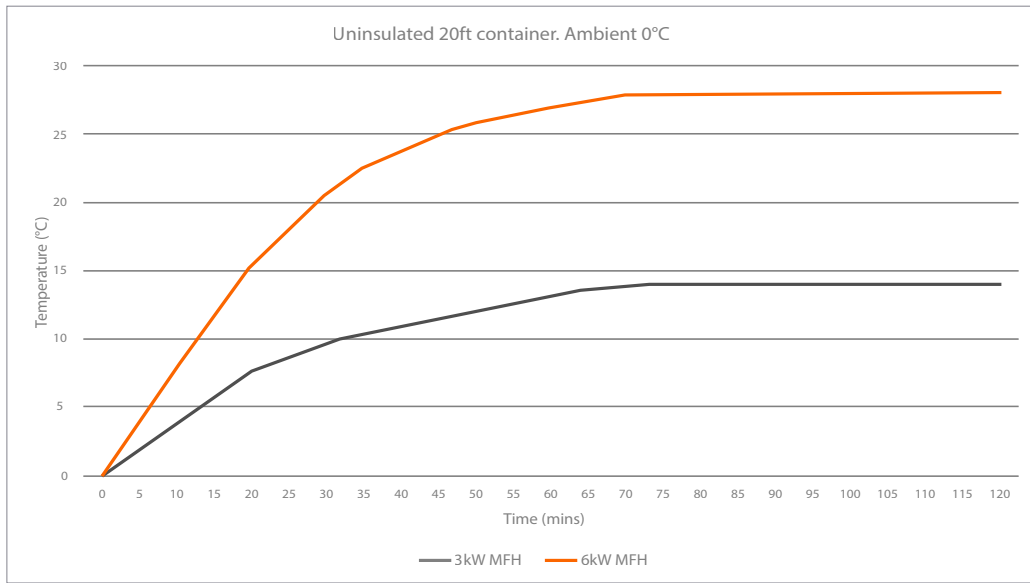
** Minimum SWA multicore cables required: 3Ph 380V–690V heaters require 4mm², 1Ph 220V-277V T4 heaters require 4mm², 110V-120V T4 & 220V-277V T3 heaters require 6mm², 110V-120V T3 heaters require 10mm².

*** ΔT (Delta T) refers to the air temperature difference at the inlet and outlet. For example, if the ambient is +6°C and the ΔT (temperature rise) is 15°C, then the outlet will be +21°C.

**** The maximum current includes the maximum motor inrush.

All values based on 25m cable lengths and an acceptable voltage drop of 4% at +40°C ambient.

Heating Performances for Different Room Sizes



Features

Constructional Safety

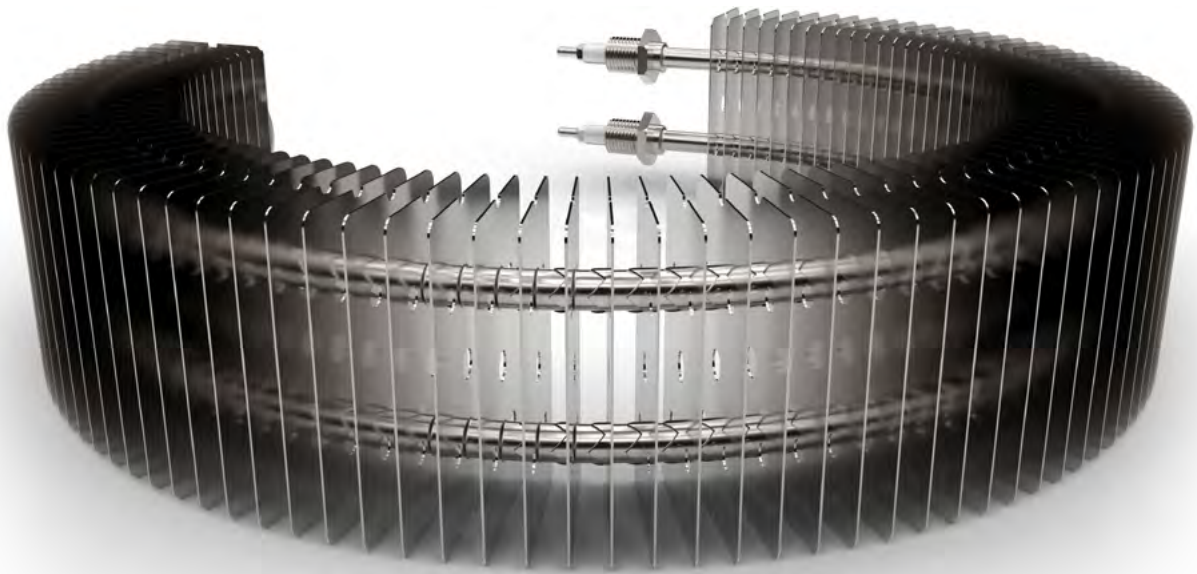
In 2016, two new standards were issued to replace the now withdrawn EN 13463 range of standards that are to protect non-electrical equipment for use in potentially explosive atmospheres. Adding to the IEC 80079 range of standards, EN ISO 80079-36 and EN ISO 80079-37 were published.

Ex II 2 G D Ex h

Products protected by constructional safety, control of an ignition source and liquid immersion have their ATEX markings suffixed by the letters 'c', 'b' and 'k' respectively. The new standards have compressed these three concepts into a single protection and allow the new Ex h marking to be used.

By including a fan in the design, the ATEX requirements in EN 14986 were triggered, which calls on the requirement for constructional safety markings. The Bulldog is one of the first products to be marked with the new Ex h markings and has undergone additional testing over and above the standard electrical and mechanical requirements of the EN IEC 60079 range of standards in order to confirm compliance.





Element Design

The tubular elements are constructed using a premium nickel chrome resistance wire, compacted in a high purity magnesium oxide powder and sheathed in environment resistant stainless steel. Each fin is fully soldered into place to improve the thermal transfer away from the element sheath, allowing for more powerful elements to be run in the same conditions whilst maintaining the temperature class.

EXHEAT Industrial's patented formation of the curved element allows for a circular element to fit in a circular casing, unlike normal hazardous area fan heaters that more commonly have a rectangular array.

Casing

The Bulldog's casing has been designed to not only be tough and durable, but also assist with the movement of air through the heater, ensuring that optimum thermal transfer can be achieved.

The two part moulding is made from aliphatic polyamide (PA66) and is reinforced with both glass and steel fibres, which improve the strength of the base material whilst being electrically conductive to eradicate the chance of static build-up.

An additional benefit for the casing is that it has EMI shielding. This means that the electrical components inside have an increased protection from electromagnetic frequencies operating in close proximity.



Enclosures

Comprising both a flameproof Ex d enclosure and an increased safety Ex e enclosure, The Bulldog allows for a single, neat cabling solution to ensure safe operation between the control solution, as well as the electrical connections to elements and motor. Affixing the two enclosures ensures that there are no looping wire runs to be caught in the impeller or heating elements.

Each enclosure can be accessed separately, whether to manually reset the protection device in the Ex d enclosure, or to undertake the routine maintenance within the Ex e.

Aluminium Components

By utilising aluminium for various other, normally heavier components, EXHEAT Industrial has been able to drastically reduce the 'normal' weight that is associated with a fan assisted heater. With the additional option of fixing castors instead of the standard adjustable feet, The Bulldog also has the ability to be moved around a room or facility effortlessly. All aluminium parts are protected for use in offshore environments whether by anodising or epoxy coating.

Stainless Construction

By using stainless steel for the remaining components, fan guards, brackets and heat shield, etc, The Bulldog is safe to use in the harshest of working environments - both onshore and offshore. The design of each internal component has taken into account the effect it has on the air flow through the heater. EXHEAT Industrial's patented design covers both the brackets and the heatshield, ensuring that all the air is directed over the heating elements.



Overtemperature Protection

The Bulldog is fitted with its own patented customised protection device which allows it to operate consistently at ambient temperatures as low as -40°C , where normal thermal protection circuits would struggle to run below 0°C .

Optional Accessories



Ducting

Flexible ducting to direct warm air can be affixed to the heater using a stainless steel mounting bracket available in various lengths. Suitable for use in ambient temperatures as low as -40°C . Fixing instructions available on request.



Local Isolator

The isolator will be suitably rated for each heater and can be fitted to The Bulldog with up to 1 x M32 cable entry. Alternatively, the isolator may be mounted remotely which will require additional cable.



Wall Mounting Brackets

Optional mounting bracket to allow for wall positioning. This requires a remote isolator to allow operation of the unit from an accessible position. The bracket is coated mild steel, with stainless steel option available on request.



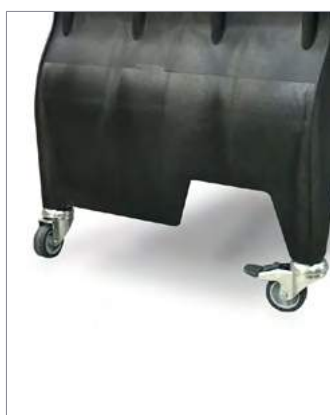
Emergency Stop Button

An emergency stop button can be supplied loose to be installed in the incoming power supply. This cannot be used in place of an isolator.



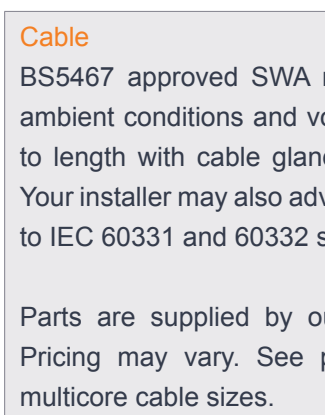
Indicating Lamps

Indicating lamps can be fitted to The Bulldog to provide visual indication when the heater is live and energised.



Anti-Static Castors

The Bulldog can be supplied with 50mm anti-static castors in place of fixed feet. This allows for easy manoeuvrability of the heater, allowing you to get heat where you need it.



Cable

BS5467 approved SWA multicore cables, rated for ambient conditions and voltage, can be supplied cut to length with cable glands to allow for installation. Your installer may also advise that cables be fire rated to IEC 60331 and 60332 standards.

Parts are supplied by our recognised distributors. Pricing may vary. See page 4 for recommended multicore cable sizes.

Room / Air Sensing Thermostat

Supplied fitted to the heater, the thermostat can be set up to control the heating elements and motor, or just the heating elements, whichever is preferred.

Plug

Our recognised distributors can supply a range of hazardous area plugs. If required, both plug and socket can be supplied. Pricing may vary.

Warranty, Packing & Ordering

Warranty

Our standard warranty is 18 months from date of despatch or 12 months from putting into service, whichever is earlier. Premiums for extended warranty on the motor and heating element parts only are available on request based on a maximum of 36 months from installation.

Please note that the associated Installation and Operating Manual and supporting Hazardous Area Certificates are available to view on our website www.exheat-industrial.com

Packing

Recycled cardboard box design boarded all round for domestic shipments and air/sea worthy export packaging for export shipments.



How to Order

Contact our UK recognised distributor Thorne & Derrick, quoting your model code and details about your specific application.

Thorne & Derrick International

Unit 7 Lumley Court, Drum Industrial Estate
Chester-le-Street, DH2 1AN

Tel: 0191 410 4292

Fax: 0191 411 1323

Email: exheat@thorneandderrick.co.uk

Website: www.heatingandprocess.com

www.exheat-industrial.com



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Thorne & Derrick
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