



## 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 uses a patented design (GB1614657.3) that combines efficiency with simple functionality to provide a portable heating solution for use in hazardous environments where the atmosphere is classified as Zone 1/2 (IIB+H2) or Zone 21/22 (IIC). Certified to the new EN 80079-36 and EN 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 trademarked under the European Union Intellectual Property Office registration number 016118069.

## 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.



<b>Certification</b>	<b>ATEX</b> Ⓜ II 2 G D Ex h Ex db eb IIB+H2 T3...T4 Gb Ex tb IIIC T200°C...T135°C Db IP65  <b>CU TR (EAC)</b> 1Ex db e IIB+H2 T3...T4 Gb X Ex tb IIIC T200°C...T135°C Db X	<b>IECEX</b> Ex db eb IIB+H2 T3...T4 Gb Ex tb IIIC T200°C...T135°C Db IP65  <b>CSA (USA/CAN)</b> Approval upcoming
<b>Dimensions</b>	L47 x W470 x H530mm. Base Weight 28kg	
<b>Main Materials</b>	<b>Casing:</b> PA66 30% with EMI shielding <b>Impeller:</b> PA66 30% with EMI shielding with epoxy coated aluminium hub <b>Elements:</b> Finned stainless steel tubular elements <b>Ex d Enclosure:</b> Anodised extruded aluminium <b>Ex e Enclosure:</b> Stainless steel <b>Motor Housing:</b> Epoxy coated aluminium	
<b>Mounting</b>	Adjustable feet at each corner allow for a stable standing on uneven surfaces. Wall mounting bracket option available (will require remote isolator for heater access/operation). Anti-static castors available.	
<b>Rating</b>	Up to 6kW	
<b>Temp Class</b>	Available in T3 and T4 temperature classes	
<b>Voltage</b>	<b>Single-Phase:</b> 110V to 277V <b>Three-Phase:</b> 380V to 690V, 50/60Hz	

Performance Data	At 50Hz	At 60Hz
Avg Air Velocity at Outlet (m/s)	4.8	5.0
Volumetric Flow Rate (m³/hr)	1050	1260
Fan Speed (min <sup>-1</sup> )	1380	1460
Motor Rating (kW)	0.09	0.09
Sound Pressure (dBA)	65	68

# Performance Data

Model	Voltage (V) *	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%.

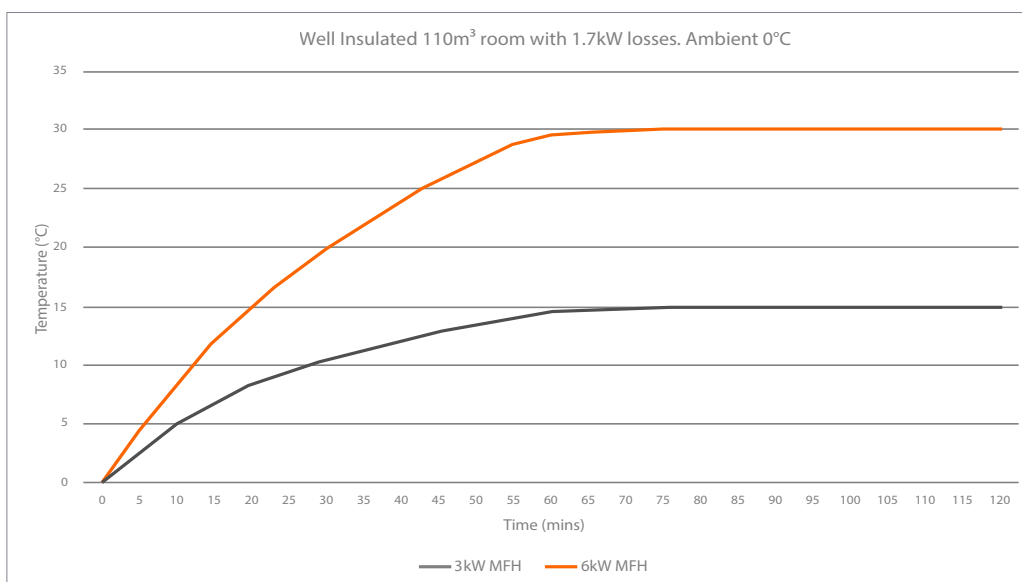
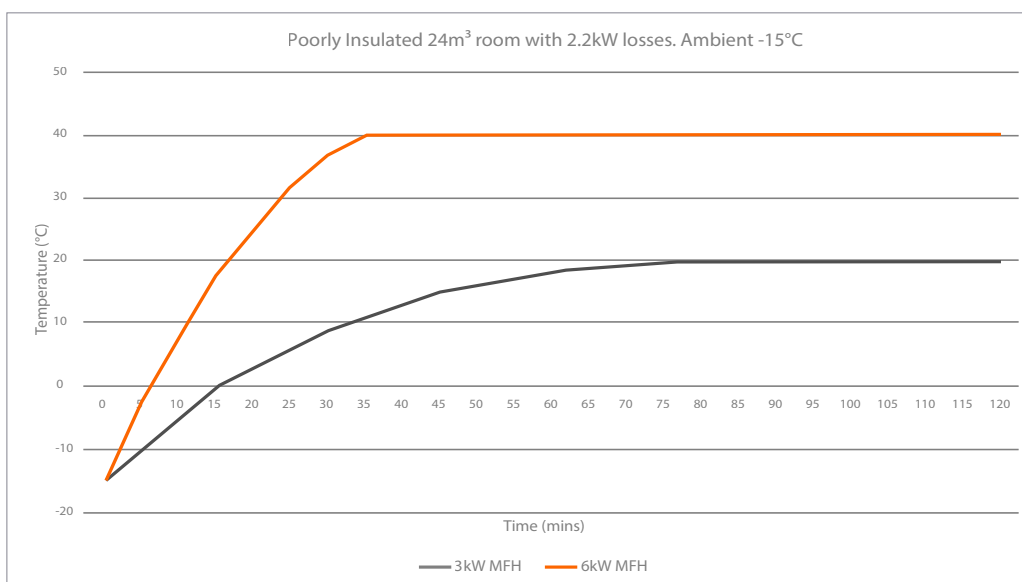
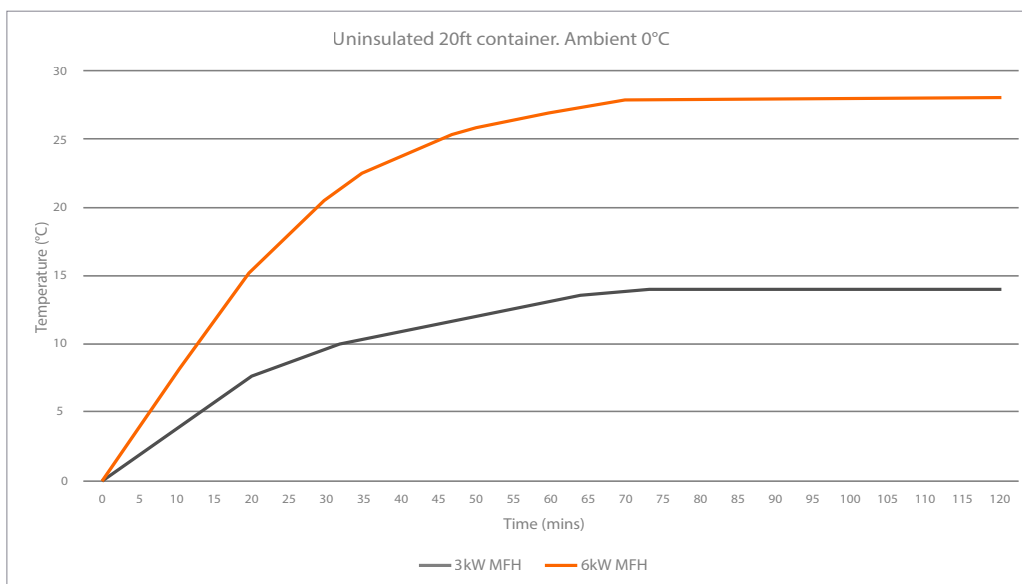
\*\* Minimum SWA multicore cables required: 3Ph 380V–690V heaters require 4mm², 1Ph 220V-277V T4 heaters require 4mm², 110V-120V T4 & 220V-277V T3 heaters require 6mm², 110V-120V T3 heaters require 10mm².

\*\*\* 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

## Approvals

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 80079-36 and EN 80079-37 were published.

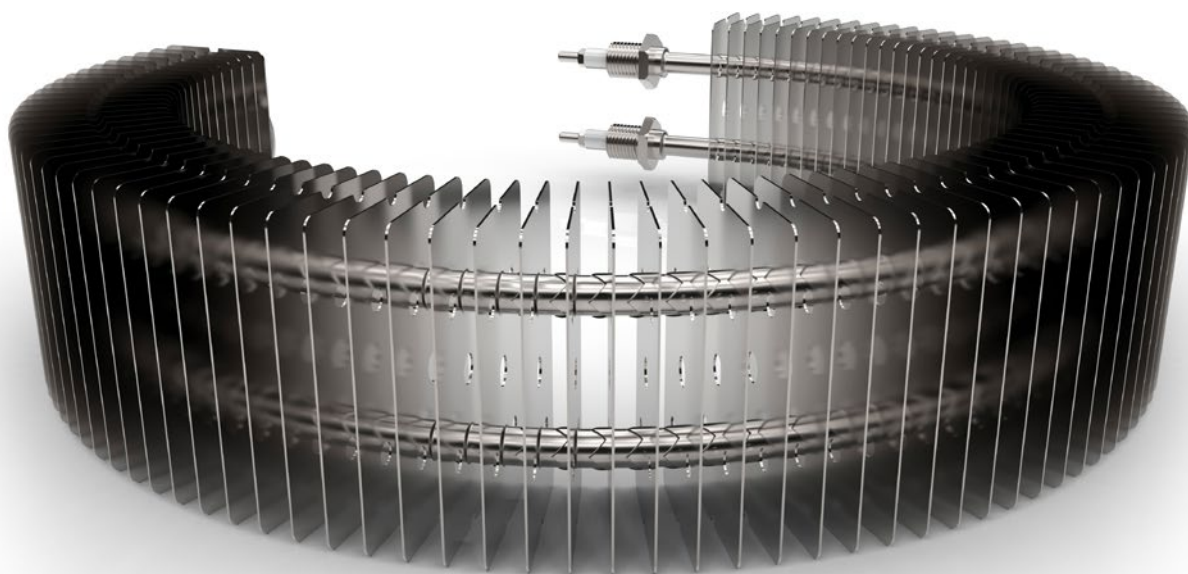
Ex II 2 G D Ex h

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.







## Heating Elements

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 formation of its patented curved element allows for a very compact assembly, unlike normal hazardous area fan heaters that generally 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.



## Over-Temperature Protection

The Bulldog is fitted with its own customised protection device which allows it to operate consistently at ambient temperatures as low as  $-40^{\circ}\text{C}$ , where normal thermal protection circuits would struggle to run below  $0^{\circ}\text{C}$ .

The Bulldog has an RTD sensor installed; this device constantly monitors the hottest part of the heating element protecting the unit from exceeding T-Class temperatures (through fault or misuse).



## Enclosures

The Bulldog comprises two enclosures that allows users to operate it safely:

- **Flameproof Ex d Enclosure:** Housing sparking electrical components, this enclosure is made from hard anodised aluminium for use in offshore environments. 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.
- **Increased Safety Ex e Enclosure:** Made from stainless steel, this enclosure allows for easy access to wiring, and is safe to use in the harshest of working environments - both onshore and offshore.



By directly mounting the enclosures to one another, EXHEAT Industrial ensures that there are no looping wire runs to be caught up in the impeller or heating elements. This provides you with a single neat cabling solution ensuring safe connections between the protection device, and the wiring of the elements and motor.

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.



## Components

All components used within The Bulldog have been specially selected and constructed with equipment robustness and effective heating in mind.

Stainless steel bracketry and fixings allow the heater to endure harsh marine environments, while parts like the motor and impeller have been specially chosen to provide the right air flow throughout The Bulldog for maximised efficiency.

# Optional Accessories



## Ducting

Flexible ducting to direct warm air can be affixed to the heater using a stainless steel mounting bracket available in 7.6m lengths as standard. Suitable for use in ambient temperatures as low as -40°C.



## Local Isolator

Suitably rated isolators can be fitted, with up to 1 x M32 cable entry. Isolators may also be mounted remotely (requires additional cabling).



## Wall Mounting Brackets

Mounting brackets for fixed wall positioning available in coated mild steel or 316L stainless steel options. Wall mounting will require a remote isolator in order to access and operate the heater.



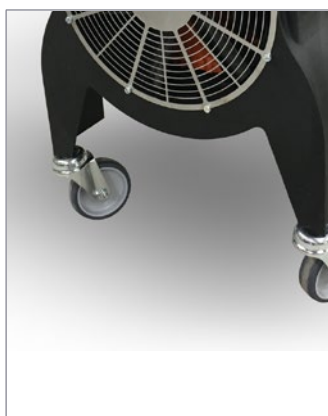
## Emergency Stop Button

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.



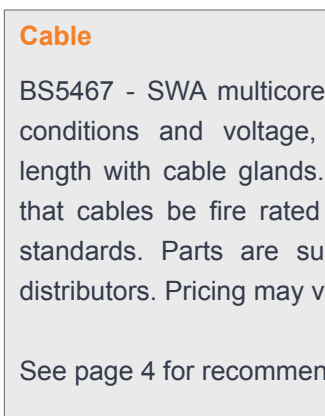
## Indicating Lamps

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 or 100mm anti-static castors in place of fixed feet for easy manoeuvrability of the heater.



## Cable

BS5467 - SWA multicore cables, rated for ambient conditions and voltage, can be supplied cut to length with cable glands. Your installer may 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

Fitted thermostats can be set to control heating elements, motor, or both.

## 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](http://www.exheat-industrial.com)

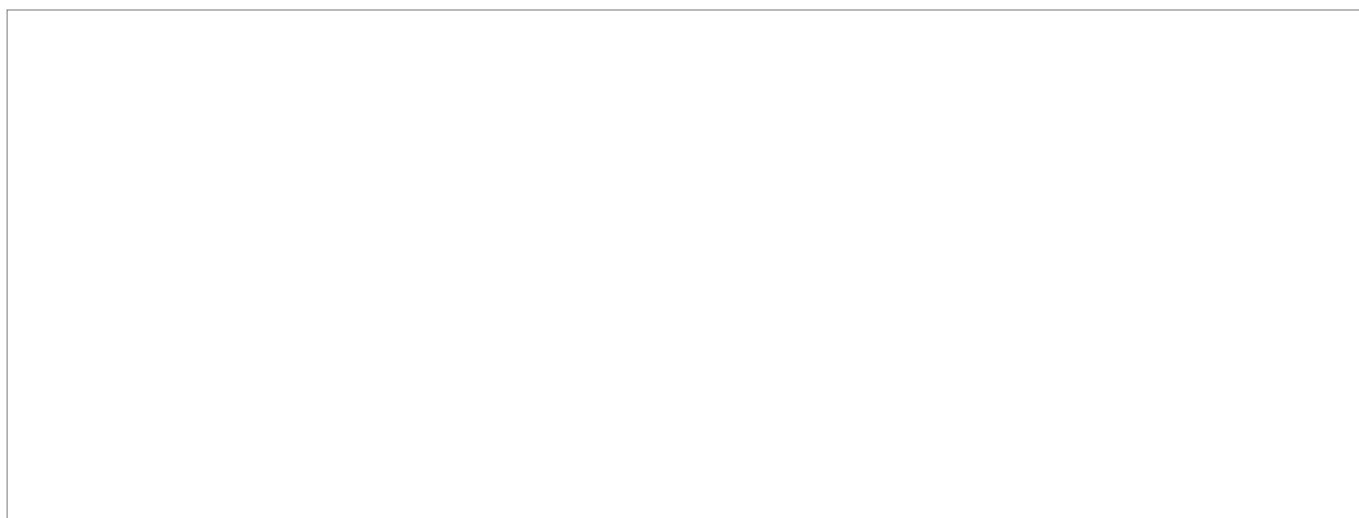
## Packing

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



## How to Order

Simply quote your model code and information about your specific application and call us on +44 1953 886210 or via email at [bulldog@exheat-industrial.com](mailto:bulldog@exheat-industrial.com). Alternatively, you can enquire and order directly from our recognised distributor below.



EXHEAT Industrial Ltd