

# TE Powrmaster Heater Range

*'A flexible, economic and effective solution for all warehouse heating applications'*



[www.powrmatic.co.uk](http://www.powrmatic.co.uk)



CE

# Air Rotation Technology

## Benefits

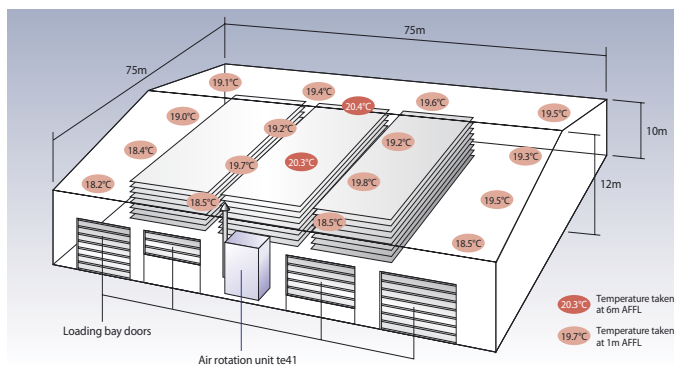
- Proven & trusted concept
- 100% system efficiency — uses all internal heat
- Ideal for intensively racked buildings
- Permits future racking change layouts without disturbance of the heating system
- In built de-stratification
- Provides an even pattern of heating throughout the building
- High thermal efficiencies
- Fuel flexibility: Gas, propane, oil

## Introduction

Pioneered by our US sister company over 40 years ago, the Powrmatic Group have been market leaders in air rotation technology for many years and continue to be a major global supplier of such systems today. Many customers worldwide benefit from the application of these well proven systems which are now found in a wide variety of buildings including warehouses, logistics centres, sports halls, arenas and many industrial and commercial premises.

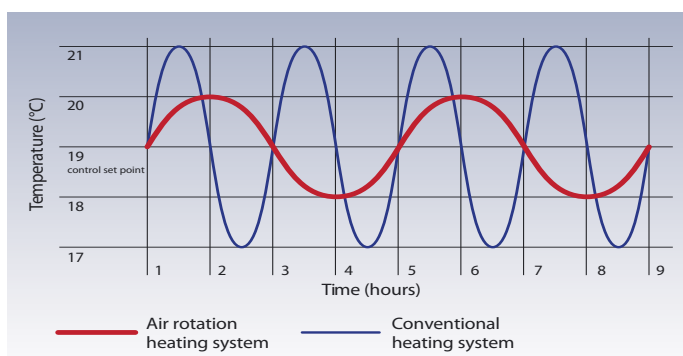
The principle of air rotation is to move large volumes of air at low velocity and controlled temperature. Cooler low level air is constantly drawn through the heater with a high level discharge effectively de-stratifying the building and, in turn, lowering the temperature gradient within the heated area. For the majority of applications a single heater can provide uniform warmth wall to wall and floor to ceiling without the need for costly ductwork. Flexibility is a key benefit of Powrmatic air rotation systems.

Alternative systems are often designed to suit the building and racking layouts. Such practice restricts future changes whereas with a Powrmatic air rotation system a racking layout can generally be changed without disturbance to the heating system. Heaters can be located directly within the space to be heated or located in plant rooms.



- Temperature readings taken from actual installation of TE41 unit, 'J&L Industrial Supply'.
- Outside temperature = 7.5°C, set point of control unit = 19°C

External versions are also available. The use of a central plant heater and no requirement for extensive ductwork significantly reduces both installed and on-going service costs whilst a choice of fuels, modulating burner options and controls combine to ensure optimum fuel efficiencies.



# TE Overview

## Models Available

- **TEG** - Gas Fired
- **TEO** - Oil Fired

## Application & Configuration

Powrmatic TE air rotation heaters are supplied in upright configuration. Whilst most TE heaters will be internally located it is possible to choose an external location for the heater and for such applications Powrmatic can offer a fully weatherproofed unit. Weatherproof units attract an additional cost.

On matters of system sizing and plant location it is strongly recommended to consult with our in-house design team prior to product selection and installation. A free design service is available to customers.

## Efficiencies

Fuel usage and emissions are a key consideration within the TE heater operating principles and design. All heaters have efficiencies which meet or exceed the requirements of current Building Regulations with additional output options available.

Efficiencies can be further enhanced with the selection of high/low or modulating burner options.

## Cabinet

The heater is supplied in modular format for on site assembly. Each section is of frame and panel construction and finished with hardwearing epoxy powder coat stove baked paint.

## Combustion Chamber

The drum type chamber is fabricated from high grade T304 stainless steel close coupled to a high efficiency tubular heat exchanger. Both elements have been life-cycle tested and consequently covered by an extensive twenty year warranty.

## Controls

Heaters are supplied ready for automatic operation and are complete with safety and comfort controls. As standard heaters will be provided with high temperature limit protection as well as an optimised entry code protected control which includes a digital time switch, electronic day thermostat and frost protection thermostats with the temperature sensor located in the fan compartment which will constantly monitor the return air temperature. This will operate the burner high/low or modulation maintaining the space temperature which in turn will lower operating costs and provide the close temperature control within the space.

The control console is heater mounted for all internal units and supplied in remote format for external heater variants. In the case of external the interconnecting wiring between the heater and control console is by others.

## Air Movement

Via dynamically balanced axial fan sets with direct drive motors.

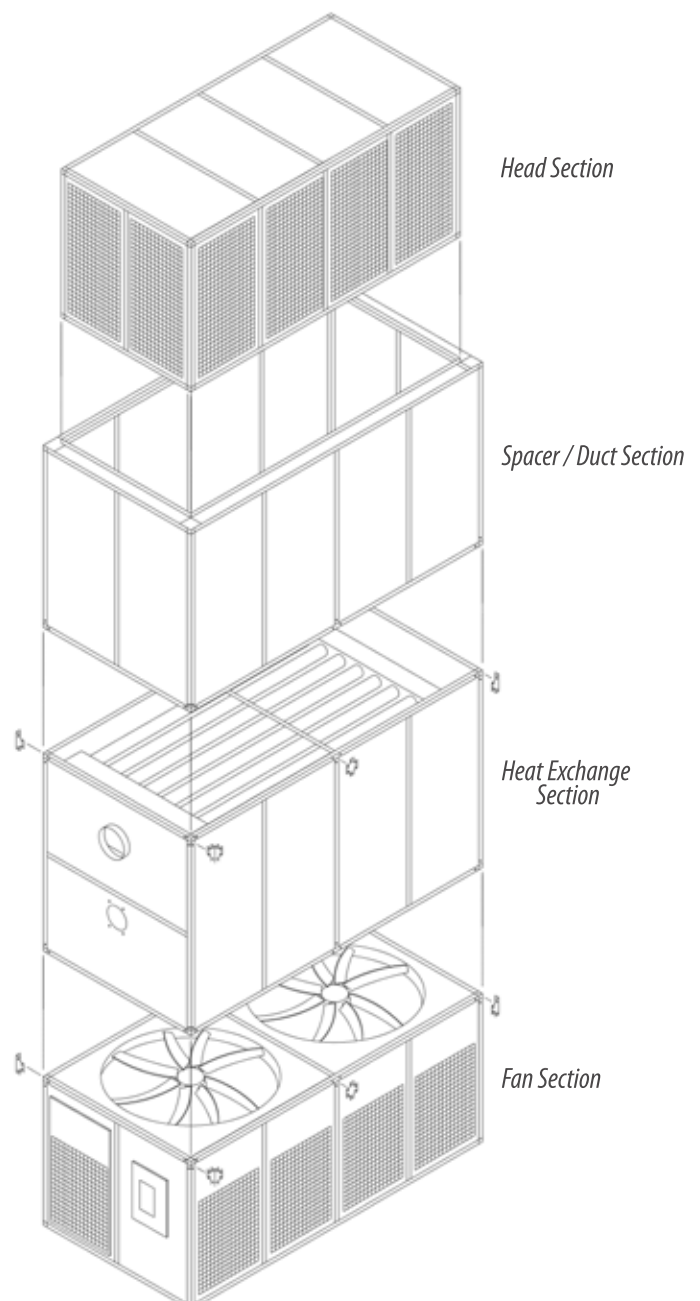
## Burners

Powrmatic TE heaters are specification matched to Riello pressure jet oil and forced draught gas burners. Oil fired heaters are arranged, as standard, for operation on Class D light distillate 35 second gas oil whilst gas fired heaters are supplied ready for use with natural gas (G20).

Alternative kerosene, LPG propane (G31) or liquid biofuel firing available to order.

## Approvals

All Powrmatic heaters are type tested to meet the stringent requirements of both the Gas Directive and are CE Approved.



# Duties

## Powrmaster - TEG / TEO

Model			21	31	41	61		
Nominal Output			kW	88	100-234	220-440	513-850	
Air Volume			m³/s	Dependant upon design criteria of system				
Electric	Supply	V/ph/Hz	230/1/50	400/3/50				
	Motor	kW	Dependant upon design criteria of system					
	Start	amp	Dependant upon design criteria of system					
	Run	amp	Dependant upon design criteria of system					
Burner Options	Gas (Standard)			Riello RS40GS10P	Riello RS40GS20P / GAS3GBP	Riello RS50/70	Riello RS70/100	
	High Low Gas (Optional)			Riello RS40GS10D	Riello RS40GS20D / RS34M2Z	std	std	
	Modulating Gas (Optional)			Riello RS40GS10M	Riello RS34MZ / RS50M	Riello RS34MZ / RS50M	Riello RS70M / 100M	
	Oil (Standard)			Riello R40G10	Riello R40G20S / PRESS GBV	Riello RL34/50	Riello RL70/100	
	High Low Oil (Optional)			Riello R40G10I	Riello R40G20D / RL34	std	std	
Fuel	Connection	Oil	BSP/Rc	¾"	¾"	¾"	½"	
		Gas	BSP/Rc	¾"	1¼"	1½"	2"	
	Minimum Inlet Pressure	Nat Gas	mbar	17.5				
		LPG	mbar	37.0				
	Consumption Standard Outputs	Oil	l/h	10.4	Dependant upon design criteria of system			
		Nat Gas	m³/h	10.9				
LPG		m³/h	3.4					
Overall Dimensions	UF Upright Freeblowing	Height	mm	5162	5225	6048	8045	
		Width	mm	1010	1162	1518	2026	
		Depth	mm	1568	2025	2991	4007	
Installation Clearances	UF Upright Freeblowing	Front	mm	1000				
		Side	mm	1000				
		Rear	mm	1000				
Flue Diameter			mm ø	150	200	300	350	
Combustion Air Spigot			mm ø	150			200	
Noise Level			dBA	Dependant upon design criteria of system				

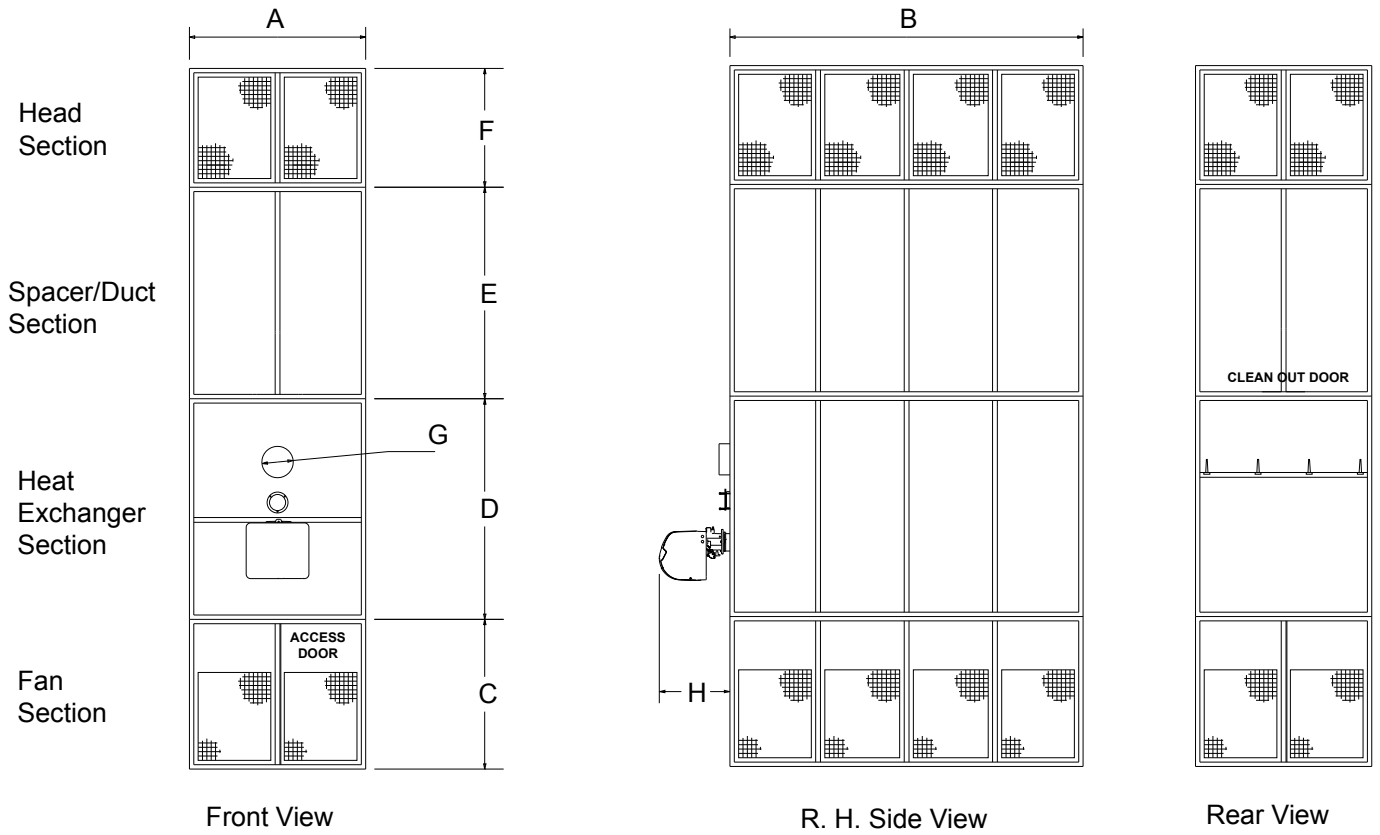
### Notes –

- Fuel consumption and output figures based upon gross calorific values as follows  
Class D light distillate fuel oil nett CV 36.28 MJ/l  
Natural gas (G20) nett CV 34.02 MJ/m³  
Propane (G31) nett CV 88.00 MJ/m³
- Overall heater height includes extension module
- Alternative height extension modules can be specified to suit site conditions
- The above weights are for standard heater and standard extension module only.
- Data and dimensions refer to standard internal models - for external models contact our sales office
- Fan motor sizes and electrical consumption levels will vary according to the specification of the heater. Actual rates will be confirmed at the time of quotation, alternatively contact the sales office for further information.
- Installer guidance notes on rear page



# Dimensions

## Powrmaster - TEG / TEO



Model	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H	
								Gas mm	Oil mm
TE 21	1010	1568	1873 in Total		1873	1416	150	346	346
TE 31	1162	2025	1213	1574	1778	660	200	580	468
TE 41	1518	2991	1215	1975	1897	960	300	580	468
TE 61	2026	4007	1769	2355	2152	1769	350	840	680



## Case Studies

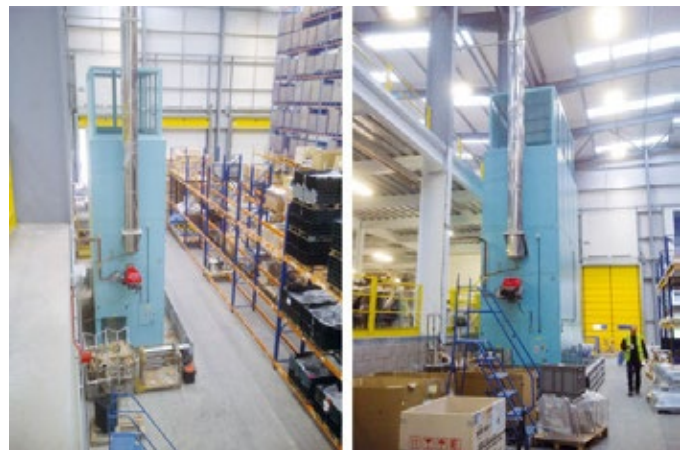
# Senator International Warehouse

### Project Background

Senator International is the largest manufacturer of office furniture in the UK, with a strong focus on delivering innovative workplace solutions. The company is committed to minimising its environmental impact and energy efficiency plays a key role in this.

### Solution

A Powrmatic TE61 500kW air rotation heater is delivering highly efficient heating at Senator International's warehouse in Lancashire, with additional loading bay heating from a VPC 90kW floor standing warm air heater. The system was designed by specialist HVAC installers CK Services 1990.Ltd. Powrmatic TE heaters use high efficiency axial fans which move large volumes of air through the space at relatively low temperatures, typically recycling the air within the space every 30 minutes. Their ability to maintain set point temperatures is not affected by the layout of the space, making them ideal for warehousing applications, such as that at Senator International.



### Result

*“ We needed to give Senator a heating system that would maintain suitable environmental conditions for both staff and warehouse stock, while minimising energy consumption and carbon emissions.*

*It was clear that a Powrmatic TE air rotation heater would meet these criteria more effectively than a distributed warm air or radiant system. Using a single, free standing air rotation heater also helped to reduce installation and ongoing lifecycle costs*

*As a higher temperature was required for the loading area we also installed a VPC 90 warm air heater, enabling the TE heater to maintain low return temperatures and maximise condensing. The heaters are controlled via the building management system, but the TE unit has a separate modulation function operated by a sensor in the return air section of the heater. ”*

**Andy Smith - CK Services**

## Case Studies

# Sports Direct Distribution Warehouse

### Project Background

With a new warehouse at the main distribution facility, at Shirebrook in Derbyshire, SportsDirect.com required a heating solutions for their 156m x 134m x 17m building.

### Solution

A key factor in choosing this technology was they had already experienced the efficiencies of such product in their other facilities. 2 x TEG 41 - Heaters Externally Mounted and 2 x TEG 61 - De-stratification Units - Externally Mounted were installed at the unit by Imtech with a BMS Integration and Control system employed.



### Result

Installation time was less than 2 weeks, including flueing and weatherproofing and now the warehouse at Sports Direct distribution centre has required heating level to keep stock and employees at a adequate temperature. The external installation has allowed for more internal space and the PPC colour of the external units blends into the exterior building design.

## General

The following notes are provided as a guide, however installers and operators should fully acquaint themselves with the more detailed guidance provided in the relevant installation manual. For copies of such manuals please consult our technical department or visit our website - [www.powrmatic.co.uk](http://www.powrmatic.co.uk)

## Standards

All Powrmatic TE heaters must be installed, commissioned and operated with due regard to appropriate regulations including but not limited to BS 6230, BS5410 1998, relevant Codes of Practice, the possible requirements of Local Authorities, Fire Officers and insurers as well as Powrmatic's installation manual.

## Position, Location & Assembly

Powrmatic TE heaters are specifically designed to operate on air rotation principles. Consequently the location of the heater(s) and any supplementary 'fan-only' units (if required) may have a direct impact on the achievement of required design criteria.

It is possible to install the heater(s) directly within the space to be heated, within a plant room area, an adjacent building or an external location. Weatherproofed external heaters will attract an additional cost.

The height at which the air is discharged within the building can, for some applications, be critical and the final outlet plenum section of the heater(s) and 'fan-only' units (if required) may need to be tailored to the application.

On all matters of heater(s) and 'fan-only' unit location it is strongly recommended to consult with our in-house design team prior to product selection and installation. A free design service is available to customers.

To aid installation the heater(s) is supplied in modular format. Consideration should however be given to the means of moving the component parts within the site and necessary mechanical handling for assembly. Each heater will be delivered in sections and will require on site lifting. Please contact Powrmatic for further advice.

Heaters should be installed on a level non-combustible base. It is important that all supporting structures have due regard to the relevant weight loadings.

Consideration should also be given to flue routes, gas, oil, electrical and control connections, issues of public access and the siting of environmental control stations and/or remote temperature sensors where the position needs to be representative of the zone temperature to which they refer.

If the heater is to be located in a plant room, an adjacent building or externally then consideration of delivery and return air ductwork will be necessary.

Heaters should not be installed in hazardous areas or areas where there is a foreseeable risk of flammable or corrosion inducing particles, gases or vapours being drawn into the combustion air or main fan circuits. Areas where special consideration or advice may be required could include but is not limited to: Where de-greasing solvents are present, even in minute concentrations  
Where paint spraying is carried out  
Where styrenes or other laminating products are used  
Where airborne silicone is present  
Where petrol engined vehicles are stored or maintained  
Where dust is present (i.e wood working or joinery shops)  
Where high levels of extract persist

Installation in such areas may be possible under specific conditions. Please consult our technical department for further information.

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## Plant Room Locations

Specific requirements exist where heaters are to be installed within plant rooms. Such requirements cover the provision of positive ductwork connections as well as ventilation for combustion air and general plant room or enclosure ventilation. It is recommended that you consult with our technical department prior to installation.

## Combustion Air & General Ventilation

Within the United Kingdom mandatory regulations apply concerning the provision of combustion air and general heater ventilation. Where a heater is installed within the heated space and where that heated space has a natural ventilation rate greater than 0.5 air changes per hour then combustion air and general heater ventilation is probably not required.

If the heated space has a natural ventilation rate of less than 0.5 air changes per hour or if the heater is plant room located then different criteria apply. Please consult the installation manual for further details.

## Installation Clearances

Particular clearances may be necessary for the correct and safe function of the heater as well as for maintenance purposes. Such clearances are confirmed in the relevant installation manual.

## Flue

Each heater requires a separate flue system of the appropriate size. The flue should essentially be installed in the vertical plane and the number of bends kept to a minimum

The flue must be adequately supported and terminated with a suitable cowl, with due regard to the point of exit and its proximity to any windows, doors or ventilation intakes etc.

## Pipework

Care should be taken when sizing pipework to ensure that minimum gas and maximum oil inlet pressures are not compromised under dynamic load conditions. Isolating valves and service unions should be provided for each heater and pipework installed with due regard for relevant standards and Codes of Practice.

## Guarantee

Powrmatic TE heaters are provided with a comprehensive guarantee covering both the heater and the heat exchanger. For United Kingdom sales the heater has the benefit of a two year parts and twelve month labour guarantee whilst the heat exchanger assembly has a five year guarantee with a further fifteen year sliding scale time related warranty. All guarantees are subject to terms and conditions.

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