

O-T-S PLATING & TANK HEATERS

FEATURES

Tubular Over the Side Immersion Heaters are loop form elements designed for Immersion heating of liquids by hanging over the side of open tanks.

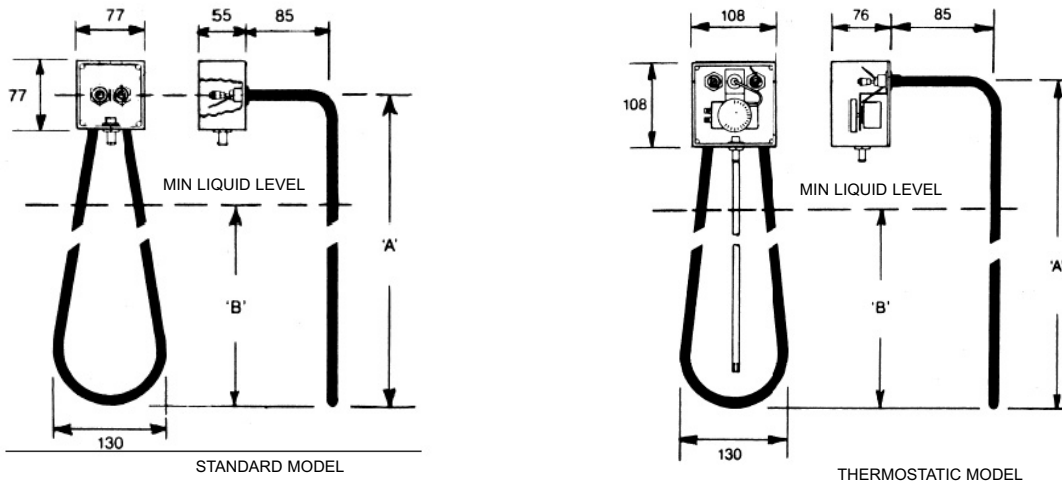
- * Sheath watts density 62kW/m².
- * Sheath diameter 11mm (8mm for 1,000W model).
- * IP55 terminal boxes with 16mm conduit entry.
- * Thermostats, when fitted, are fully enclosed for protection by the splashproof terminal box.

APPLICATIONS

Nicrofer[®] 3220 (alloy 800) elements are intended for the heating of mild alkaline solutions, detergent solutions, clean wash and rinse water etc., particularly in plating shops. However, their simplicity, ease of installation and portability makes them attractive to all industries for heating of water or solutions not injurious to alloy 800. For more corrosive applications choose Nicrofer[®] 4221 - alloy 825, Titanium or PTFE sleeved elements.

PRODUCT RANGE

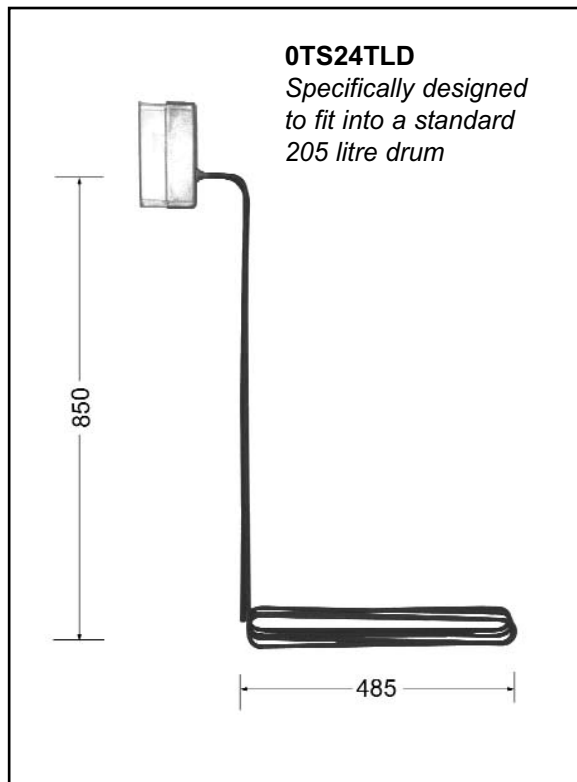
STANDARD MODELS are produced in wattages from 1,000W to 6,000W in 1,000W steps, and are available ex stock. THERMOSTATIC MODELS, fitted with a 16A 30° -110°C thermostat, are available on some models. ELECTRONIC THERMOSTAT MODELS, fitted with a 16A Electronic Controller, are available on most models.



All models rated at 240V	CATALOGUE MODEL No.				Dimensions		
	WATTS	Alloy 800	Alloy 825	Titanium (TIT)	PTFE sleeved	A	B
	1000	OTS10	OTS10825	OTS10TIT	OTS10PTFE	540	350
	2000	OTS20	OTS20825	OTS20TIT	OTS20PTFE	730	500
	3000	OTS30	OTS30825	OTS30TIT	OTS30PTFE	870	640
	4000	OTS40	OTS40825	OTS40TIT	OTS40PTFE	1000	770
	5000	OTS50	OTS50825	OTS50TIT	OTS50PTFE	1300	1070
	6000	OTS60	OTS60825	OTS60TIT	OTS60PTFE	1540	1300

- Thermostat — add "T" to part number; e.g. OTS20T or OTS10TITT
- Electronic Thermostat — add "TE" to part number; e.g. OTS20TITTE
- Replacement Element — add "R" to part number; e.g. OTS20R or OTS30PTFER

As a general guide, 1kW will raise 10 litres of water from 20°C to 90°C in one hour, allowing approx. 20% for heat losses.

BIO-DIESEL HEATER

A compact bio-diesel heater specifically designed for use in small scale production.

With the ever rising cost of oil, many businesses and individuals are turning to alternatives. Small scale producers of bio-diesel blend ingredients such as vegetable oil and animal fats to produce an environmentally friendly and low cost fuel. When using waste products such as used cooking oil, not only are they solving a waste disposal problem, they are conserving fossil fuel.

The 2.4kW units fit through a standard 205 litre drum nozzle and are thermostatically controlled.

The units are designed with low watts density to ensure that the oils being heated are not damaged by excessive temperatures due to localised overheating adjacent to the element sheath.

They can also be used for heating other materials such as waxes, paraffin and resins.

ALSO AVAILABLE**Alternative sheath materials**

- * Nicrofer[®] 4221 - alloy 825
- * Titanium
- * PTFE sleeved element

Nicrofer[®] 4221 - alloy 825

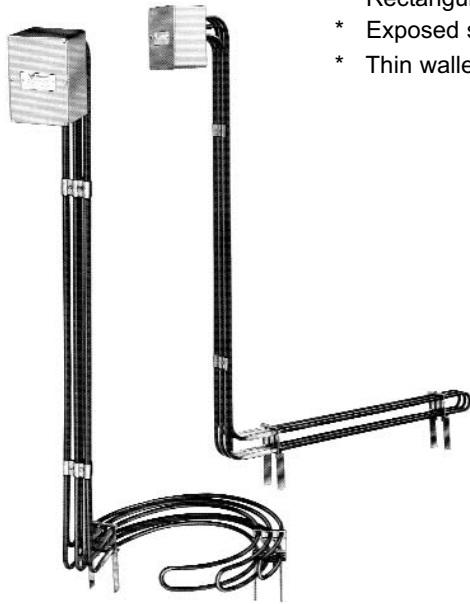
Nicrofer 4221 is a titanium-stabilised fully austenitic nickel-iron-chromium alloy with additions of copper and molybdenum.

Nicrofer 4221 is characterised by:

- * good resistance to stress-corrosion cracking
- * improved resistance to pitting and crevice corrosion
- * good resistance to oxidising and non-oxidising hot acids
- * good mechanical properties at both room and elevated temperatures, up to approximately 550°C (1020°F)

OVER-THE-SIDE HEATERS

The new series of over-the-side heaters combine the inherent efficiency of immersion heaters with portability, incorporate many options, which give coverage for a wide range of heated products and types of open-head storage including:



- * Rectangular or cylindrical vats, tanks, drums and vessels.
- * Exposed surface, lidded or buried storage.
- * Thin walled, concrete, or lined vessels; unsuitable for through-wall heaters.

APPLICATIONS

- * Heating of detergent, decreasing and coating solutions.
- * Heating of washing and rinsing water.
- * Heating alkaline pickling and alkaline plating solutions.
- * Heating of metal working lubricants and preheating of fuel oil.
- * Reducing viscosity of asphalt, tar, heavy oils etc.
- * Melting waxes, tallow, lard, coconut oil etc. - with sludge legs removed, heater will melt its way through when placed on top.
- * Food process heating etc., where stainless materials are mandatory.

FEATURES

- * All tubular constructions, all materials nickel/chromium/iron alloy up to the terminal box.
- * Three sheath power densities and a total of nine wattages available.
- * Straight or curved heated zone to fit shape of vessel. The curved form will fit into a 200 litre or 44 gallon drum.
- * Sludge legs keep heated zone above sediments.
- * Thermostat supplied if required, build into a water resistant terminal box.

MODEL SELECTION

Make your selection after considering the following:

- * The appropriate sheath power density needed to avoid deterioration of either product or heater - particularly important if the product is unstable, viscous or corrosive.
- * The total kilowatts required to achieve the desired temperature rise in the required time for the particular quantity of product.
- * The heater form and riser height necessary to fit vessel shape and size, insertion aperture etc.
- * If you require thermostatic control incorporated in the heater.

WIRING OPTIONS

When wiring up, the following options are available:

240V 3 PHASE: 4 wire "Star" connection with neutral or 3 wire "Star" connection with floating neutral.

240V SINGLE PHASE: 2 wire parallel connection for ratings up to and including 4300W models.

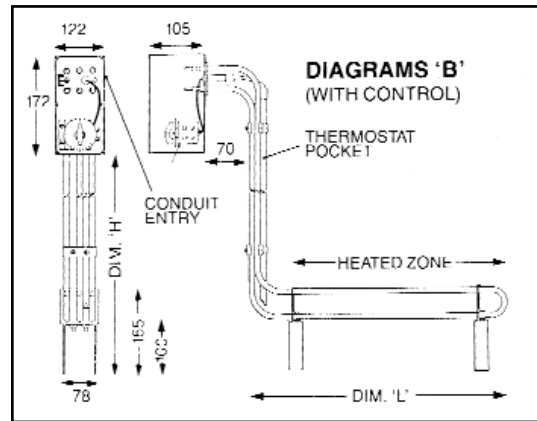
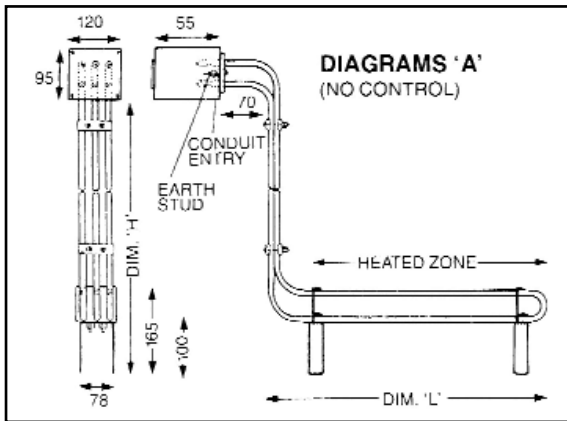


HEATER SPECIFICATIONS

The following specifications are common to all models:

- * Total wattage is spread evenly over three 240V Nicrofer 3220 sheathed heating elements.
- * Stainless steel clamps, element spacers and removable sludge legs are fitted at regular intervals.
- * Water resistant terminal box with 20mm conduit entry.
- * Tolerance on total wattage $\pm 10\%$ at 240V rating.
- * Dimensions are as shown in tables and drawings, models without an integral thermostat being shown in Diagrams "A" and those with an integral thermostat in Diagrams "B". If the heated zone is to be curved instead of straight, Inset "C" should be read in conjunction.

INTEGRAL THERMOSTATS: Models with integral thermostat have a larger terminal box as shown in Diagrams "B", fitted with an electronic thermostat (see section 15-9) and a three phase contactor.

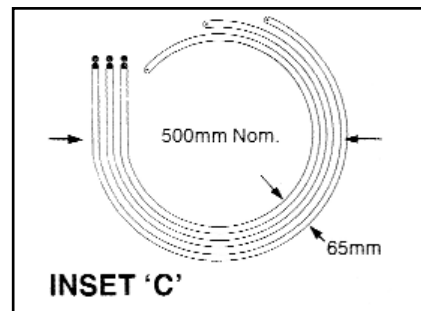


SHEATH POWER DENSITY	TOTAL WATTS	STRAIGHT FORM			CURVED FORM	
		CAT.No. NO CONTROL	CAT.No. WITH CONTROL	DIMENSION "L"	CAT.No. NO CONTROL	CAT.No. WITH CONTROL
12 kW/m ² (8W/in ²)	1,800	FU18A0	FU29A0	900	FU33A0	FU34A0
	2,400	FU18B0	FU29B0	1,080	FU33B0	FU34B0
31 kW/m ² (20W/in ²)	2,400	FU18C0	FU29C0	675	FU33C0	FU34C0
	3,800	FU18D0	FU29D0	820	FU33D0	FU34D0
	4,300	FU18E0	FU29E0	900	FU33E0	FU34E0
	5,800	FU18F0	FU29F0	1,080	FU33F0	FU34F0
78 kW/m ² (50W/in ²)	7,200	FU18G0	FU29G0	675	FU33G0	FU34G0
	9,600	FU18H0	FU29H0	820	FU33H0	FU34H0
	10,800	FU18J0	FU29J0	900	FU33J0	FU34J0
	14,400	FU18K0	FU29K0	1,080	FU33K0	FU34K0

ORDERING PROCEDURE

- * Nominate the catalogue number of the required heater.
- * Nominate the riser height required, Dimension "H", to be between 400mm and 3500mm max.
- * Nominate If an integral thermostat is required.

ALL HEATERS RATED @ 240V



TECHNICAL CONSIDERATIONS

Technical information contained in this publication is intended only as a guide for equipment selection (including approximate power densities, physical dimensions, etc) and to desirable practice in layout and installation thereof, in order to avoid commonly encountered problems. It is furnished without charge or liability and may only be used at the user's own risk.

Details of the terms and conditions of warranty are included in the Company's General Conditions of Sale, copies of which are available at request.

SHEATH POWER DENSITY NOMINAL SELECTION GUIDE

- 12 kW/m²** Heavy fuel and vegetable oils — waxes — tallow — bitumen — invert emulsions.
31 kW/m² Detergent and aqueous decreasing solutions — alkaline pickling and alkaline plating solutions — perchlorethylene — soluble oils, general lubricants.
78 kW/m² Clean water — mild alkaline and soap solutions.

Consult Grimwood Heating for further guidance or if in doubt.

FORMULA FOR LIQUID HEATING

$$\text{kW Required} = \frac{V \times \rho \times C_p \times \Delta T}{t}$$

- V = liquid volume (m³)
 ρ = liquid density (kg/m³)
 C_p = liquid specific heat capacity (kJ/kg°C)
 ΔT = required temperature change (°C)
 t = required heating time in second(s)

- Note that the above formula does not allow for changes of state or heat losses.
- An allowance of 10% is usual to cover heat losses.

SOME LIQUID PROPERTIES

	C _p	B.P.	Density
Liquid	kJ/kg°C	°C	kg/m ³
Fuel Oil, Bunker C	2.09	—	976
Glycerine	2.43	290	1264
Kerosene	1.97	—	824
Machine Oil	1.67	—	928
Olive Oil	1.97	300±	928
Paraffin, melted	2.97	400±	896
Perchlorethylene	0.88	121	1632
Tallow, melted	2.09	—	939
Turpentine	1.76	159	864
Water	4.187	100	1000

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Check out the on line catalogue at www.grimwoodheating.com.au for the latest