



C-Joule

Ohmic Heating Range

C-Joule

A Range Of Fully Automated
Ohmic Heating Systems



Fully automated ohmic heating systems offering efficient, high speed heating and a seamless transition from Lab to Pilot Scale through to Production.



Why C-Tech Innovation

With over 20 years' experience in ohmic heating, C-Tech Innovation has designed, installed and commissioned bespoke ohmic heating equipment in the UK, Europe, India, and North America.

Our installations include heating equipment for the Food & Beverage and Specialty/Fine Chemical industries.

At C-Tech Innovation we have a multi-disciplinary team that includes project managers, scientists, electrical and mechanical design engineers and technicians who combine to deliver a quality solution for our clients.

Our Ohmic Technology

Ohmic heating is a volumetric electrical heating technology meaning that heat is generated within the product due to its electrical conductivity.

The heating is uniform and rapid. The equipment consists of a heating pipe or chamber which is fitted with electrodes and a power supply that provides electrical energy to the system with a power in, to heat generated efficiency of greater than 95%.

We supply a range of ohmic heaters from lab scale through to production systems, capable of throughputs greater than 10 tonne/hour with precise product temperature control.

An Ohmic Solution For You



About C-Joule

C-Joule is our range of fully automated continuous flow ohmic heating systems that are capable of rapidly heating any conductive fluid.

A comprehensive ohmic heater product range, from lab systems through to customised production systems capable of running at 10 tonnes/hour.



C-Joule LAB 100

Atmospheric Batch ohmic heating system: Suited to process development up to 100°C

Pages 4-6



C-Joule LAB 150

Pressurised Batch ohmic heating system: Suited for process development up to 150°C and 5 bar

Pages 7-9



C-Joule PLT

A pilot scale out-of-the-box solution: Designed with the flexibility to enable full process development at a throughput of 60 litres/hour

Pages 10-12



C-Joule PRD

A customised ohmic production system: Designed and built specifically to meet the clients' needs

Pages 13-15

C-Joule LAB 100

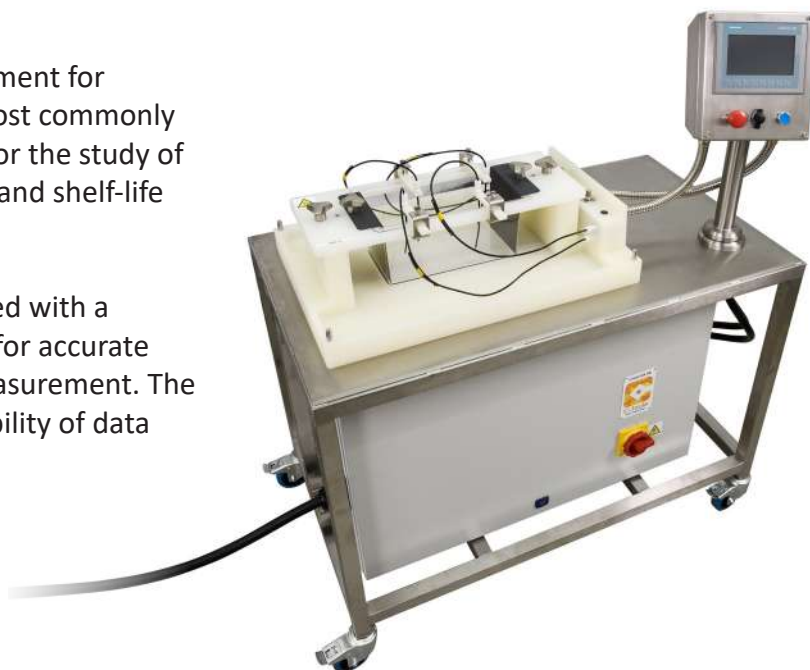


C-Joule LAB 100

C-Joule LAB 100 is a laboratory scale atmospheric batch ohmic heater capable of heating a wide range of products. Ohmic heating produces a rapid and uniform temperature rise throughout the product by heating the medium directly from within.

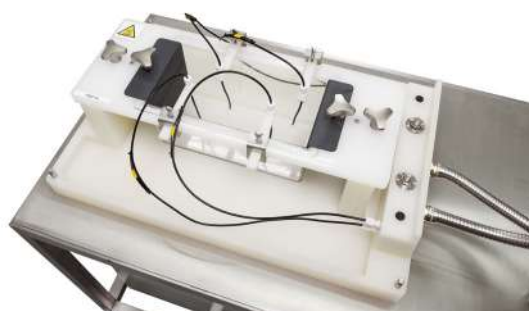
This model is an ideal piece of equipment for industrial or academic R&D and is most commonly used in the food and drink industry for the study of pasteurisation, recipe enhancement and shelf-life evaluation.

The unit is easy to use and is equipped with a control panel and touch screen HMI for accurate temperature, power and current measurement. The C-Joule LAB 100 also offers the capability of data logging via USB.



Features

- Ease of use. It is a trolley-mounted unit that works 'out of the box'
- Fully safety interlocked
- Data logging of temperature, voltage, current and power via USB
- Multiple interchangeable vessels for testing different volumes of product volumes
- No hot surfaces so that fouling, caramelisation and thermal degradation are minimised
- Rapid heating at 5-10°C/second & energy efficient processing with greater than 95% power utilisation
- Precise temperature control to set-point is achieved using our purpose designed control system with continual monitoring and feedback loops



C-Joule LAB 100

Specifications

Unit height:	1492 mm
Unit width:	1270 mm
Unit depth:	720 mm
Unit weight:	160 kg
Electrical power:	Requires a 415V 3-phase neutral and earth, 63 Amp, 50 Hz supply. 4m power cable provided
Heater body:	Polycarbonate
Electrodes:	Titanium with proprietary mixed metal oxide coating
Footings:	Flat level surface suitable for equipment weight
Operation:	Atmospheric pressure and 0 to 100°C
Fluid:	Suitable for fluids or slurry only, material must remain in contact with the electrodes. Fluid must have an electrical conductivity in order to heat, lower conductivity fluids may heat slowly.
Conductivity Range:	0.03 S/m to 1.5 S/m

See more at:

www.ctechinnovation.com/product/c-joule-lab-100

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C-Joule LAB 150



C-Joule LAB 150

C-Joule LAB 150 is the pressurised version of our C-Joule LAB 100 and operates at temperatures up to 150 °C. It is a laboratory scale pressurised batch ohmic heater capable of heating a wide range of products.

C-Joule LAB 150 is an ideal R&D tool for industry or academia and has been used in food and beverage industry for pasteurisation and sterilisation evaluation, recipe enhancement and shelf-life testing. Ohmic heating is particularly useful for foodstuffs with high viscosity or with delicate particulates that are easily damaged by conventional heating equipment.

The C-Joule 150 offers simplicity for the operator and is equipped with a control panel and touch screen HMI for accurate temperature, power and current measurement. The C-Joule LAB 150 also offers the capability of data logging via USB.



Features

- Rectangular product chamber for even heating between electrodes
- Fully safety interlocked including a bursting disc rated to 5.5 bar gauge
- Steam/condensation collection vessel
- A tilting mechanism to facilitate product handling and vessel cleaning
- Data logging of temperature, pressure, voltage, current and power via USB
- Elimination of a hot surfaces reduces fouling, thermal degradation and caramelising of products
- Precise temperature control to set-point is achieved using our purpose designed control system



C-Joule LAB 150

Specifications

Unit height:	1280 mm
Unit width:	1370 mm
Unit depth:	750 mm
Unit weight:	190 kg
Electrical power:	Both 230V single-phase, 32Amp,50Hz supply; and 415V 3-phase neutral and earth 63Amp, 50Hz supply
Heater body:	Polycarbonate
Electrodes:	Titanium with proprietary mixed metal oxide coating
Fluid:	Suitable for fluids or slurry only, material must remain in contact with the electrodes.
Conductivity Range:	0.3 S/m to 0.75 S/m
Max working volumes:	2 L
Max working pressure:	5 barg
Max working temperature:	150°C
Heater body:	Stainless steel body, PTFE, Silicone

See more at:

www.ctechinnovation.com/product/c-joule-lab-150

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C-Joule PLT



C-Joule PLT

C-Joule PLT is our pilot or small production scale continuous flow ohmic heater capable of flow rates up to 60 kg/hour from ambient to 90 °C in approximately 10 seconds. At 60 kg/hour C-Joule PLT is suitable for pre-production trials or small production runs.

Ideal for use in applications which have demanding product quality or process requirements, C-Joule PLT has been specifically designed for use in the Food and Beverage industry for product pasteurisation and the Fine and Specialty Chemicals industry for continuous flow heating applications.

The heater itself consists of insulating pipe sections and electrode housings. The unit is fully safety interlocked with a PLC/HMI for automated control.

C-Joule PLT offers all the benefits of ohmic heating, fast heating rates, precise heating control, no hot surfaces and 95 % energy efficiency in a convenient skid mounted system.



Features

- Skid mounted occupying a minimal footprint with a vertical flow path
- Frame mounting system allows the unit to be easily reconfigured
- 3 different heater configurations to accommodate a wide range of product conductivities
- Equipment is supplied with a pump with product flowrate control
- Control panel consists of a PLC and touch screen HMI for automated use. Includes data logging of temperature, voltage, current and power
- A temperature rise of 70°C in approximately 10 seconds
- Suitable for pumpable liquids (up to 1000cp) with very small particulate e.g. milled nuts or fruit pulp



C-Joule PLT

Specifications

Unit height:	1800 mm
Unit width:	760 mm
Unit depth:	1200 mm
Unit weight:	160 kg
Power supply:	Electrical Power 230V single phase, 32A, 50Hz supply
No of electrodes:	3 (N-L-N)
Electrode spacing:	Polycarbonate
Other materials:	Stainless steel, PEEK, Silicone
Fluid:	Capable of pasteurising pumpable liquid products for example dairy, fruit/veg juices, pulps and compotes and health & protein supplements.
Conductivity Range:	0.2 S/m to 0.75 S/m
Max Operating Temperature:	90°C
Heater body:	Polycarbonate or PEEK
Heating power:	5kW required into all standard range conductivities at 60 l/h.
Heater Internal Diameter:	16mm

See more at:

www.ctechinnovation.com/product/c-joule-plt

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C-Joule PRD



C-Joule PRD

C-Joule PRD is a custom designed production scale continuous flow ohmic heater. This continuous process is a direct replacement for current batch heating processes in a number of industries. More specifically it has been deployed in;

- Food and Beverage Industry for pasteurisation, sterilisation and ‘cook in pipe’ applications.
- Pharma and Fine/Specialty Chemical Industries for continuous flow heating of chemical reactions.

Features

- Small footprint suitable for even the most constrained plant layout
- Easily reconfigured for different fluids and process conditions
- Hygienic design suitable for all foods and drinks applications
- Robust design and easy maintenance
- Compatible with conventional CIP systems
- Electrically powered



C-Joule PRD

Specifications

Throughput: Up to 2 tonnes/hour

Power: 20 kW to 250 kW

Temperature: Up to 200 °C, controlled to +/- 1 °C

Control: Fully automatic control

Product viscosity: 1 cP to 5000 cP

Product conductivity: 0.09 Sm⁻¹ to 0.7 Sm⁻¹ at infeed temperature

Pressure: Up to 20 bar

Internal diameter: 32 mm up to 100 mm

Contact materials: PEEK, Stainless Steel 316, O-rings EDPM or silicone

Hygienic Design: Through pipe with O-ring seals

Electrodes: Metal oxide coated electrodes

See more at:

www.ctechinnovation.com/product/c-joule-prd

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Please note due to the bespoke nature of this product this is an indicative specification and is subject to confirmation at time of request.



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