



C-Joule
Ohmic Heating Range

C-Joule™

A Range Of Fully Automated
Ohmic Heating Systems



Our C-Joule™ range of products are highly efficient continuous flow ohmic heating systems capable of rapidly heating any conductive fluid. The most comprehensive scalable and customised systems capable of running at 10 tonnes/hour.



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. We focus our installations for the 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, and not via heat transfer from a hot surface. This eliminates the thermal gradients that are a feature of conventional jacketed heating vessels, pipes and heat exchangers.

The heating is uniform and rapid and instantaneous power control gives precise temperature control for minimised side reactions and reduce product spoilage. 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 to heat the product with efficiency of greater than 95%.

We offer development of laboratory scale processes to our pilot scale system (C-Joule PLT) and our production scale system (C-Joule PRD), which is suitable for up to 10 tonnes/hour. The technology can operate at high temperature and pressure and with aggressive chemical compositions. It can be used in single pass or recirculating mode, and with or without temperature hold sections.

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 process fluids. A comprehensive ohmic heater product range of scalable and customised systems suitable for commercial R&D and industrial use.



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

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C-Joule PRD

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

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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. The PLT system is Ideal for use in applications which have demanding product quality or process requirements.

The C-Joule™ PLT has been specifically designed for use in 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 second



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:	PEEK
Other materials:	Stainless steel, PEEK, Silicone
Fluid:	Capable of processing fluids which have a finite electrical conductivity, including chemical reaction mixtures and most formulated chemical and consumer products. Can operate at high temperature and pressure and with aggressive chemical compositions.
Conductivity Range:	0.2 S/m to 0.75 S/m
Max Operating Temperature:	90°C
Heater body:	PEEK
Heating power:	5kW required into all standard range conductivities at 60 l/h.
Heater Internal Diameter:	16mm

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 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
- 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

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



C - Joule is a registered trademark of C-Tech Innovation Ltd.

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