



titan

continuous processing
scale-up

» preview



The future of safe and reliable continuous flow scale-up

» titan

Titan is a revolutionary continuous chemical processing system for production scales from kilo lab, through pilot plant to manufacturing.

- » **Complete turn-key system** for development and scale-up of flow processes
- » **Highly flexible and modular:** ability to rearrange modules in minutes enables a wide variety of chemical processes to be performed
- » **High performance:** ideally suited for high mass transfer and heat transfer reactions
- » **Extremely high chemical resistance:** glass, PTFE, Hastelloy and Elgiloy wetted parts
- » **Scalability:** modules can be trivially added or removed to modify both complexity and desired output of the process
- » **Easy to use:** modules connect together in seconds and clip onto state-of-the-art intelligent framework, both floor standing and bench top
- » **Reliable and robust:** designed for long term use in demanding manufacturing environments
- » **Manual or fully automated control**

» from lab scale

» to pilot plant

» to manufacturing

» specifications



Laboratory Scale

Titan modules can be arranged to form smaller systems, ideal for development of a chemical process at the lab scale.

Our bench-top framework enables a wide range of Titan modules to be assembled on a lab bench or inside a standard fume cupboard.



Pilot Plant

Titan modules can be assembled into numerous system configurations for quick and easy evaluation of process parameters needed to carry out chemistry.

Our floor-standing framework allows you to carry out your pilot studies on the plant floor or in walk-in fume cupboards.



Manufacturing

Using the same continuous processing modules available at lab and pilot scale, you can move straight into manufacturing scale with minimal fuss.

Titan systems can produce up to a tonne (process dependent) of product per day.

Titan system is designed for long term operation with built in safety features.

- Reactor volumes:** 64 ml and 250 ml
- Production rates:** Output suitable for typical Laboratory, Pilot Plant and Manufacturing environments
- System flow rates:** 1 ml/min to 1 L/min
- Pump flow rates:** 1 ml/min to 250 ml/min
- Pressures:** Up to 20 bar
- Temperature range:** -40°C to 250°C
- Types of processes:** Suited for both fast reaction with high mass transfer and heat transfer requirements, and slow reactions. Designed for use with multiple phases
- Chemical compatibility:** Glass, PTFE, Hastelloy and Elgiloy wetted parts
- Automation:** Control process parameters from the modules, via Titan software or via pre-existing PLC or plant software
- Safety:** Interlocks, anti-tamper, pressure detection and auto shut down features

Titan Syringe Pump

The pump offers extremely smooth continuous flow and features 2 syringes per flow-stream. Flow rates from 1 to 250 ml/min, pressures to 20bar. Maximum chemical resistance - all wetted parts Glass, PTFE and Hastelloy. Seal wash and N₂ blanket. Full automation.



Titan Reactors

Titan features various reactor modules which can be quickly connected together to create single- or multi-step, and multi-temperature zone reactors. Our patent pending technology makes it easy to move from lab scale to pilot scale chemistry.

Pre-reaction Heat Exchanger
For heating or cooling liquids prior to the reaction.

Fast Mixing Injector
Designed for fast reactions. Liquid-liquid or liquid-gas. Extremely high mass transfer and heat transfer. The module allows multiple temperature

zones or maintenance of temperature between modules.

Residence Time Unit
Allows excellent temperature control for the desired residence time of the reaction. Reactor volumes of 64ml and 250ml with the ability to connect multiple Residence

Time Units to achieve the desired reactor volume to suit the process.

Post-reaction Heat Exchanger
For heating or cooling the reaction, typically back to near ambient temperature.



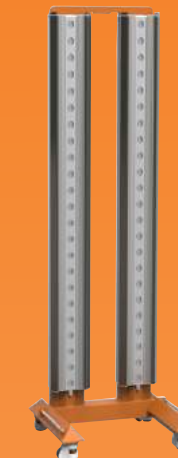
Titan Reagent Store & Product Collection

Temperature Controlled Reagent Store and Product Collector features a powerful stirrer for agitation of reagents. Optional full automation and pressurization is available. Bench-top or floor-standing frame with vessel sizes from 100ml to 50L. Quick vessel and stirrer changes.



Titan System Frame

The framework enables pumps, reactors, feed vessels, and other modules to be easily clipped on and off. The frame is modular and several frames can be quickly clipped together. The frame comes with wheels, drip tray, adjustable levelling mechanism, and integrated electrical and comms cables.



Temperature Control

Titan systems work seamlessly with Huber Pilot ONE®, and Titan Reactor Controllers allow simple, single-point control of two Huber circulators, simultaneously.



Titan Accessories

A wide range of accessories is available: Reactor Temperature Controller for accurate control of reactors. Universal Mounting Brackets, Drip Trays, Cable Ties, and Shelves.

Titan Pressure Controller is available for control of operating pressures of up to 20 bar.

For full range of accessories, please contact Syrris.





"Our vision has been to revolutionize flow chemistry and offer complete continuous processing solutions from lab scales through to manufacture. The future of continuous flow scale-up is finally here with the release of Titan."

Mark Gilligan, CEO, Blacktrace Group

Titan is designed and manufactured by Syrris, the world's longest established provider of laboratory scale flow chemistry systems.

Syrris' network of offices in the UK, USA, Japan, India and Brazil plus over 35 distributors worldwide offer local service and support.

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