



THE PHOENIX FLOW REACTOR™ – H-GENIE® PLATFORM

A new standard for scaling up continuous flow reactions



THE PHOENIX II FLOW REACTOR™

The second edition of ThalesNano's versatile **Phoenix Flow Reactor™** adds to the capabilities of the whole system, making chemical processes **more effective** and **significantly safer**. While keeping the best features of its original version, like the **extended chemical parameter window** and the option to perform **homogeneous and heterogeneous reactions** with the same instrument, it gives you **better control** over your reaction. **Regulation of temperature became much more precise, as overshoots are now completely evaded. Cooldown also became faster thanks to the built-in fan which can be controlled using the new touch screen or PC along with every other function.** Internal and optional external **temperature sensors** help you to monitor all thermal changes. Thanks to the **new design**, it is now much **easier to set up and handle** the reactor. Addition of other modules and complete automation will give you a completely **new toolbox** to work with.

THE H-GENIE® II

Our hydrogen generator now offers **improved performance** for your laboratory. With the H-Genie® II, you can use **high purity hydrogen gas** for your reactions, **generated on-demand and from water** at pressures **up to 100 bar** (14.5–1450 psi) and at **flow rates up to 1 NL/min**. Make your laboratory safer and expand your chemical capabilities by replacing your hydrogen cylinders with the H-Genie®!

The combination of the H-Genie® with the Phoenix Flow Reactor™ offers unparalleled hydrogenation synthesis, scale-up, or catalyst testing capabilities.

Designed to be used safely in any discovery, development, process, petrochemical or catalyst screening lab, this platform combines *in situ* high pressure hydrogen generation from water with high temperature reactor capability and a precise gas data monitoring system.

Chemists and chemical engineers can now run experiments involving hydrogen gas with homogeneous or heterogeneous catalysts up to 450°C and 100 bar, without the need for cylinders or hydrogen infrastructure.

FEATURES OF THE NEW PLATFORM

Extended chemical parameter window:

temperature up to 450°C, pressure up to 100/200 bar

Heterogeneous and homogeneous capabilities

Reactor options: PTFE, Hastelloy and stainless-steel coil reactors, metal-metal sealed cartridges, and prefilled CatCarts™ and MidiCarts™ are available

User-friendly software interface

Removable GUI touch screen

Modularity, versatility

Rapid heating

Cooling for **rapid cool down** at end of reaction

Internal and optional external temp. **sensors**

Intuitive, **easy set-up**

Simple interchange of reactors

Option for PC control

Multiple **Gas Modules™ and pumps** can be connected

Automated

Monitoring of thermal changes



MODULES FOR THE PHOENIX FLOW REACTOR™ - H-GENIE® PLATFORM

PHOENIX II FLOW REACTOR™

The Phoenix Flow Reactor™ is a versatile heater unit which can host various types of reactors, ranging from 4 mL to 32 mL loops made from PTFE, stainless steel or Hastelloy, or columns, pre-filled or loaded by the user, from 1 to 80 mL volume.

H-GENIE® II

The H-Genie® II offers variable gas flow rates, reaction monitoring, and pressure capability for an expanded chemical space and more precise reaction design. It is an ideal solution for providing high-pressure hydrogen for both batch and flow chemistry applications.

HPLC PUMP

The HPLC pump is either a 10 mL/min or 50 mL/min (higher pump capacity can be provided on special request) capacity unit with built-in pressure sensor.

PRESSURE MODULE™

The Pressure Module™ generates the pressure in the reaction chamber. The module contains a system valve, a pressure sensor and a 3-way valve to set the outlet (to waste or to product collection). The maximum pressure is 200 bar.

GAS MODULE™

When the Gas Module™ is connected to the Phoenix Flow Reactor™ - H-Genie® platform, it allows, along hydrogen, the introduction of another gas, such as carbon monoxide, oxygen, syngas, etc. 14 different gases can be used up to 100 bar pressure, or any gas compatible with the system, widening the reactor's chemical capabilities significantly. It is also possible to use more than one Gas Modules™ and mixers to introduce more than one gases at the same time.



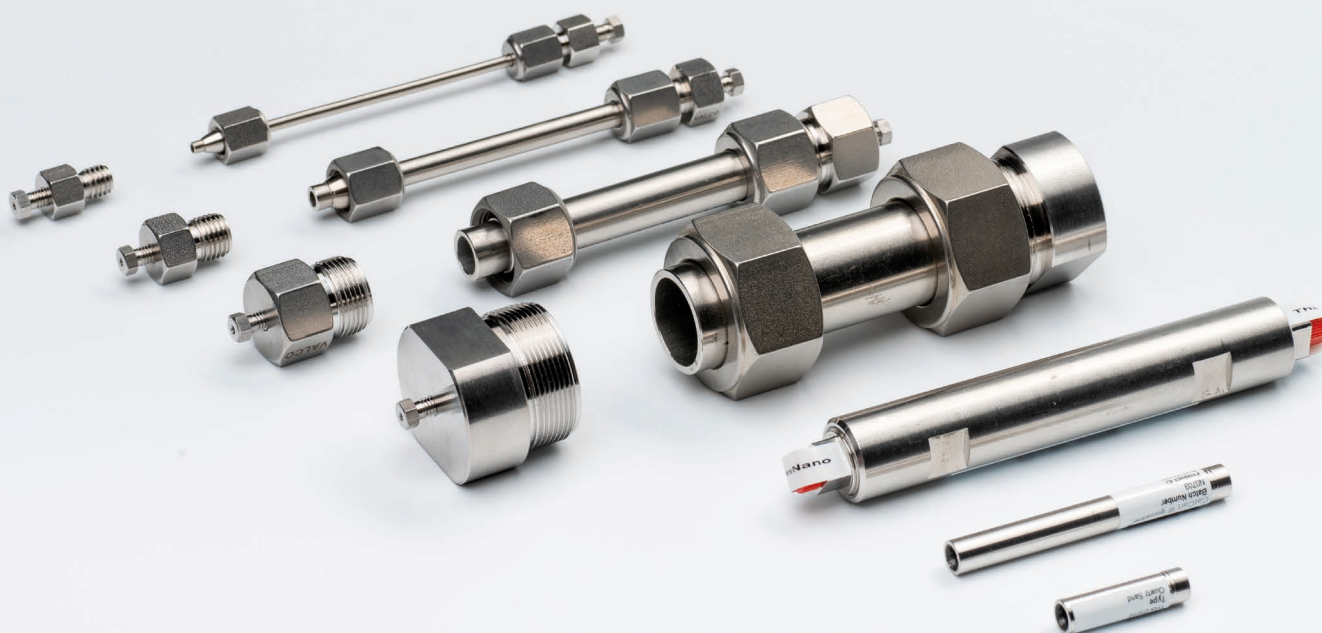
AVAILABLE REACTORS AND HOLDERS

Packed bed reactors:

- Pre-filled CatCarts® (30 mm, 70 mm long CatCarts®)
- MidiCarts™
- Metal-metal sealed cartridges with fittings from 1/8" OD to 1" OD with 125 mm and 250 mm lengths for custom applications.

Loops: 4, 8, 16 or 40 mL stainless steel, PTFE or Hastelloy loops

Custom-made reactors are available as well.



For more information, please visit
www.thalesnano.com
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Twitter: /thales_nano
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