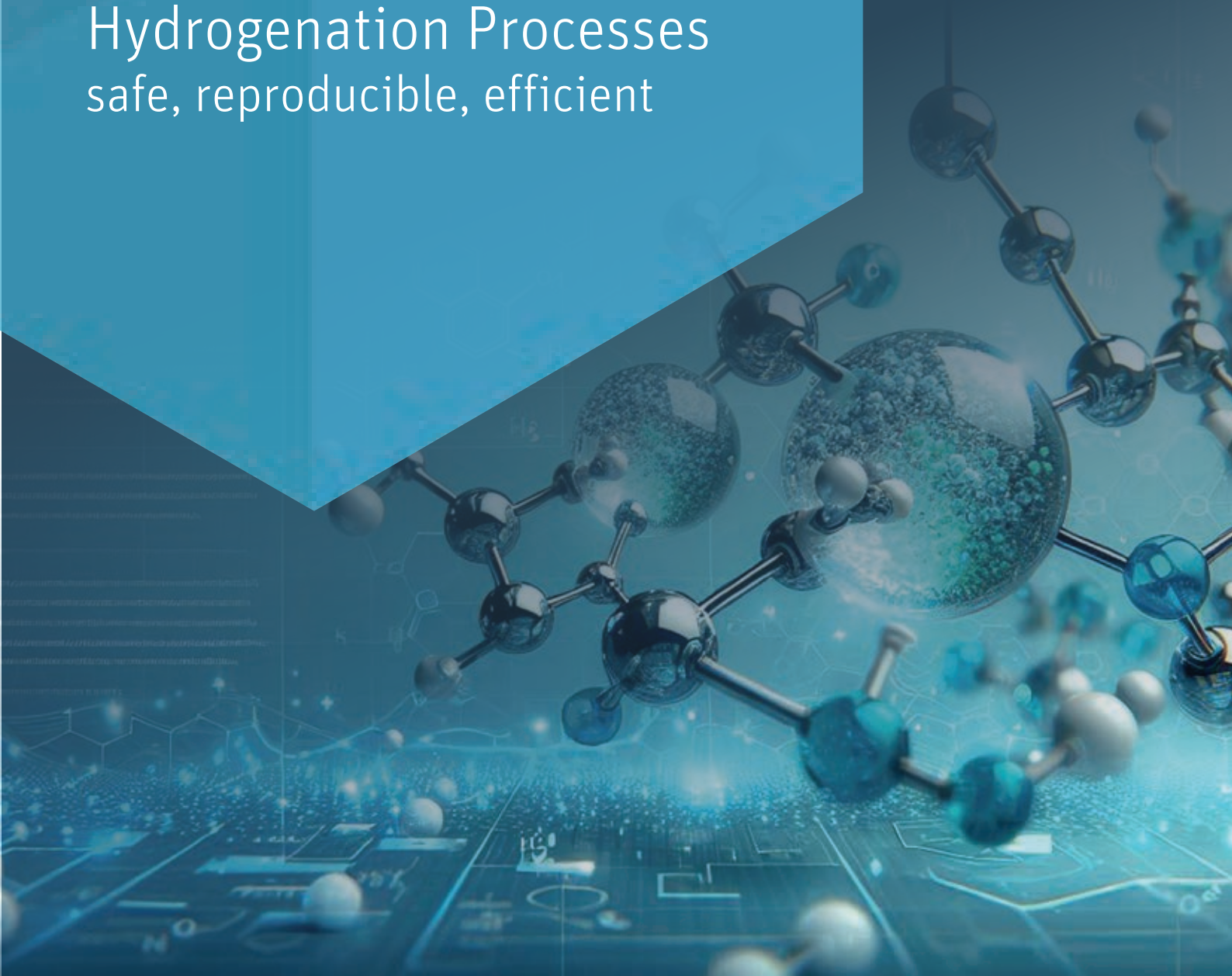


BERGHOF PRODUCTS + INSTRUMENTS GMBH

highpreactor

Hydrogenation Processes

safe, reproducible, efficient



Products + Instruments

Experts in Lab Equipment



FULLY AUTOMATED HYDROGENATION

BHC

– Berghof Hydrogen Control

Hydrogenations are among the most important reaction types in chemical and pharmaceutical development, yet they place high demands on process control and safety.

For reliable results, hydrogen uptake, pressure, temperature, and mass transfer must be precisely monitored. The BHC enables automated hydrogen dosing with continuous recording of H₂ consumption and complete data logging. This makes reaction kinetics, induction times, and reaction endpoints traceable. Experiments can be carried out reproducibly, allowing process decisions to be made on a more informed basis. Defined process sequences and integrated safety functions reduce dependency on operating personnel and provide a reliable foundation for process development, optimization and later scale-up.

In this way, the BHC supports researchers not only in carrying out hydrogenations safely, but also in understanding processes faster, evaluating them more soundly and developing them more efficiently.



Hydrogenation Process

- safe, reproducible and efficient

The central function of fully automated hydrogenation is the powerful Berghof Process Control software with its proprietary Gasboard. Together with a Berghof high-pressure reactor, they form the fully automated hydrogenation process control system BHC. When hydrogen is consumed during the chemical reaction, the system automatically adds gas until the previously defined reaction pressure is reached again. This keeps the reaction pressure constant throughout the entire process, while simultaneously recording and documenting gas consumption without interruption.



→ Gasboard:

- Inert gas and reactive gas supply up to 200 bar
- Integrated mass flow controller
- Bypass function for accelerated reactive gas supply
- Exhaust for reactor ventilation
- Prepared for space-saving wall mounting

→ High-pressure reactor up to 200 bar / 300 °C:

- Compatible with all high- and low-pressure reactors
- With or without PTFE lining
- PT100 and digital pressure sensor
- Electric stirrer drive
- Electric heating or heating via circulation thermostat

→ BHC – Berghof Hydrogen Control:

- Definition of safety parameters and abort criteria
- Setting of pressure, temperature and consumption limits
- Recipe control
- Gapless data acquisition
- Automatic stop upon self-defined abort criteria
- Pre-installed recipe

BHC - Plug and Play with pre-installed recipe

The BHC enables fully automated process control based on individually definable recipes. All safety- and process-related steps are performed reliably and reproducibly, independent of the operating personnel.



- Safe & efficient
- Reproducible
- User-independent

SEMI-AUTOMATIC HYDROGENATION

BRG – Berghof Reactor Gas Burette

The BRG sets new standards in automated gas dosing – combining the highest precision and reproducibility with intuitive handling.

By combining reliable gas supply with integrated consumption measurement, the system provides the exact data basis for well-founded process decisions in daily laboratory work. This allows gas consumption and reaction progress to be evaluated directly, without the need to integrate additional measurement systems.

The semi-automated control system helps users to safely manage complex processes while working more efficiently – with full control over the ongoing process. Thanks to its flexible compatibility with various gases, the BRG adapts flexibly to different requirements in chemical research and can be expanded to remain future-proof.

As a result, the BRG becomes not just an entry-level solution, but a tool that makes processes more transparent, more controllable, and noticeably easier.



Hydrogenation Process

- safe, reproducible and efficient

The BRG offers an easy-to-use and cost-effective solution for automated gas dosing with simultaneous gas consumption measurement. The semi-automated control system ensures high reproducibility and simplified process control. Thanks to its flexible applicability for a wide range of gases, the BRG is the ideal entry-level solution for automated gas consumption measurement in chemical research.

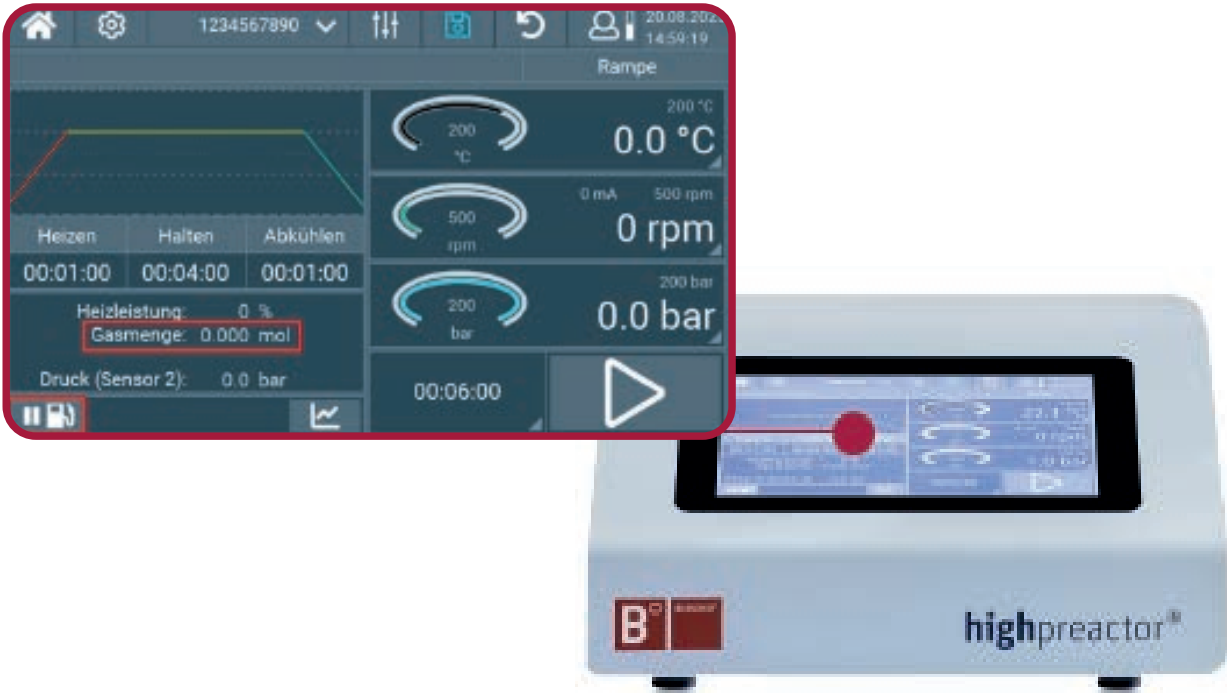
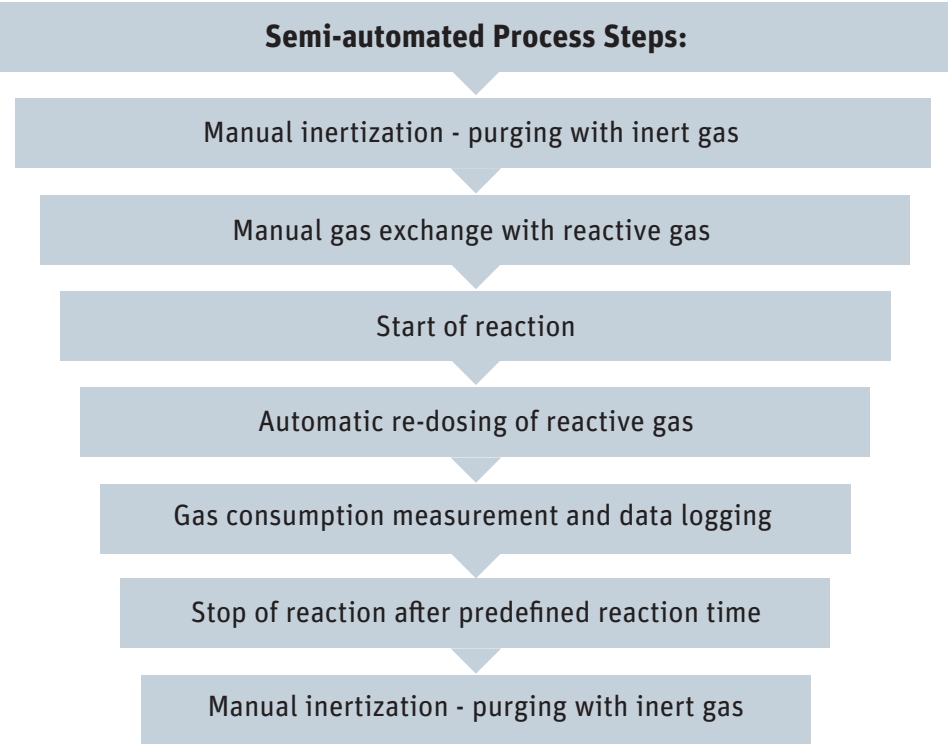


- **BRG – Berghof Reactor Gas Burette:**
 - Inert gas and reactive gas supply up to 100 bar
 - Digital pressure sensor
 - Electronically controlled valve
 - Rupture disc
 - Optional: ATEX version
- **BRC – Berghof Reactor Controller:**
 - Control of reactor temperature and stirring
 - Pressure monitoring of reactor and gas burette
 - Automatic gas dosing via the integrated ramp mode
 - Determination of gas consumption using the ideal gas law
 - Data logging of all process parameters
- **High Pressure Reactor up to 200 bar / 300 °C:**
 - Can be combined with all high- and low-pressure reactors
 - With or without PTFE lining
 - PT-100 and digital pressure sensor
 - Electric stirrer drive
 - Electric heating or heating with thermostat

BRC

- The Key to Intuitive Control

An essential element of the digital gas burette is the process control via the Berghof Controller BRC, which, thanks to its intuitive user interface and proprietary control software, provides optimal conditions for precise process control and partial automation. When hydrogen is consumed during the chemical reaction, the system automatically adds gas until the previously defined reaction pressure is reached again. This keeps the reaction pressure constant throughout the entire process. Gas consumption is determined by the pressure drop in the supply vessel, allowing the progress of a reaction to be tracked without the need for additional analytical methods to capture consumption.



The Right Solution for Your Hydrogenation

- Compare. Evaluate. Decide.

Two products. One goal: maximum process control.

Whether you are looking for a flexible entry into automated gas consumption measurement or need a fully automated solution for complex and demanding hydrogenation processes – Berghof offers the right system for your requirements and your budget.

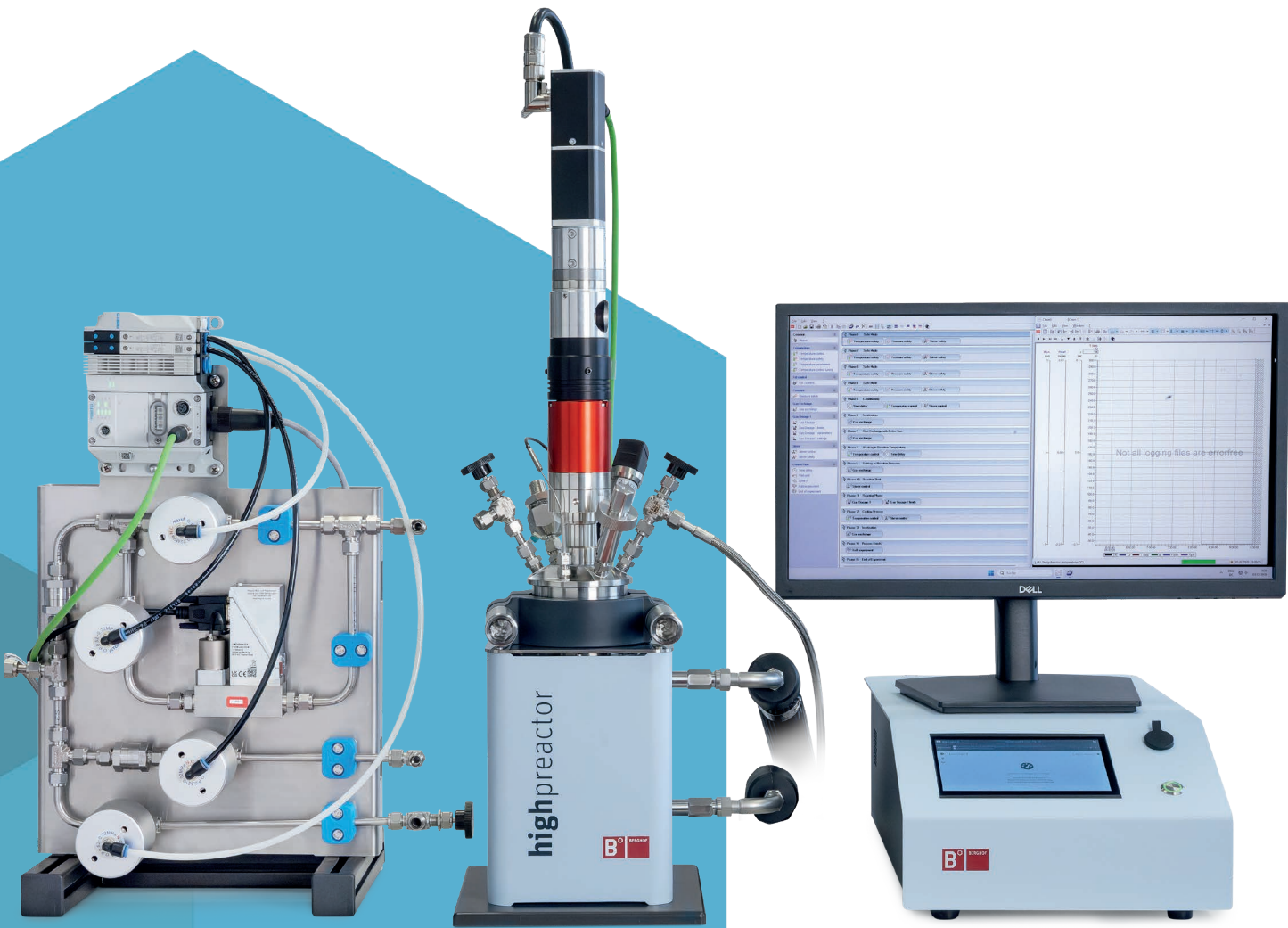
The BRG enables precise and reproducible hydrogenation with automated gas consumption measurement and flexible operation. The BHC extends these capabilities with comprehensive process automation, intelligent safety functions, and maximum control over the entire reaction process. Both systems help you make hydrogenation processes safer, more reproducible, and more efficient – from method development to daily laboratory use. Compare BRG and BHC at a glance and find the solution that best fits your process.

Berghof combines many years of experience in high-pressure technology with well-engineered process automation. This results in integrated solutions that reliably support users in the development, optimization, and scale-up of hydrogenation processes.



Not sure which solution fits your process?
Our experts will help you select the right setup for your hydrogenation.

Function		Gasboard (BHC)	Gas Burette (BRG)
	Termination logic & safe mode	✓	X
	Recipe control	✓	X
	Flushing with inert gas	✓	(✓)
	Gas exchange (reactive gas)	✓	(✓)
	Gas consumption measurement	✓	✓
	Other gases	✓	✓
	Data logging	✓	✓



Applications

**Chemical Synthesis
and Catalysis**

**Carbonation
Carboxylation CO₂
reduction**

Hydrogenation

**Oxidation reactions
Methanation Reactions
with ethylene oxide**



Products + Instruments
Experts in Lab Equipment

Arbachtalstraße 26 | 72800 Eningen | Deutschland
T +49.7121.894-233 | info.bpi@berghof.com
www.berghof-instruments.com