



# B.R.O.M.<sup>TM</sup>

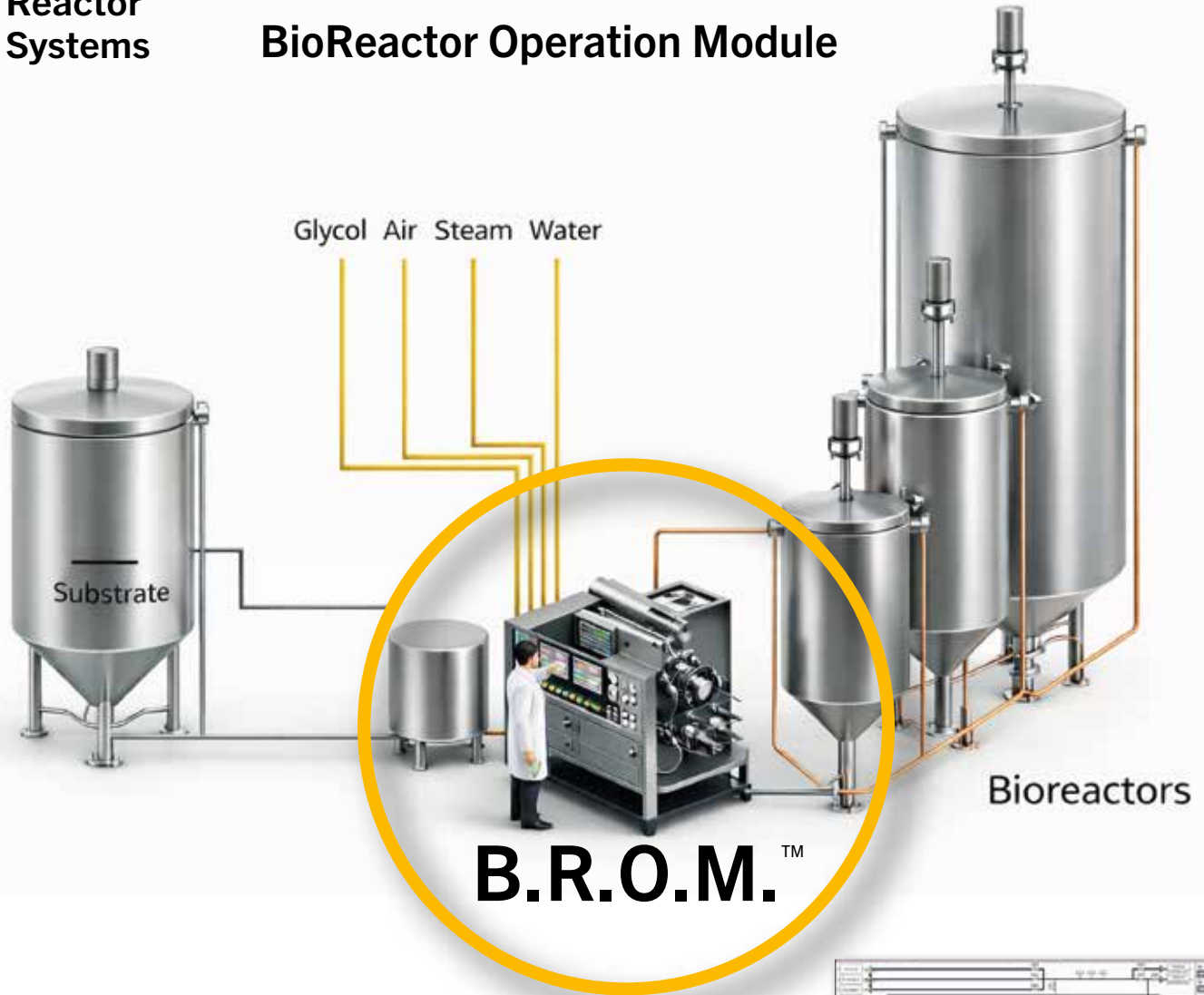
## BioReactor Operation Module



**Scale smarter. Produce faster. Invest safer.**

# B.R.O.M.™

## BioReactor Operation Module



### Our Products

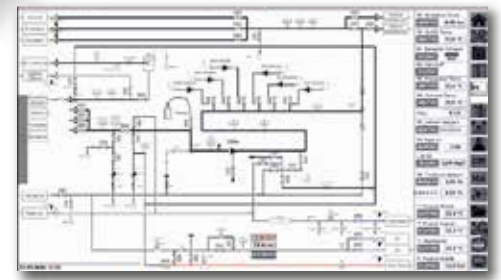
Modular design for different process scales and development stages.

#### B.R.O.M. DN 15 – Startup & early production

- 30 – 500 L reactors
- Ideal for development, testing, and early production
- Fast market entry with low CAPEX

#### B.R.O.M. DN 40 – Growth & production

- 100 – 20.000 L reactors
- Scale-up to semi-industrial production
- Seamless transition from pilot to production



### System Integration

- Bioreactor vessels (30 – 20.000 L, stirred & aerated)
- Substrate preparation
- Flash pasteurization / UHT
- CIP systems
- FLECKSMIXER (shearless agitation)



## Concept

An external bypass platform integrates all key bioprocess functions, enabling maximum flexibility with minimal infrastructure.

## Core Functions

- Aeration & mixing
- Sensors & dosing
- Inoculation & sampling
- Heating & cooling
- Automation & data acquisition



## Efficiency & Risk

One system for multiple tanks reduces investment costs and accelerates time-to-market while minimizing technical risk.

## Validation

Testing at the FLECKS biotech facility enables fast process validation and scale-up.

B.R.O.M. transforms stirred, aer

## Applications

- Food & nutrition
- Fermentation & biotechnology
- Bioeconomy startups
- Pilot plants & scale-up

## Modularity

Flexibly expandable with additional modules and sensors.

- Heating/cooling modules (30–150 kW)
- Offgas sensors
- CIP system
- Pasteurization and UHT
- Advanced sensors (e.g., Raman, inline-microscope)
- AI-based process optimization



## Process Control

All process steps integrated inline and fully controlled by SIMATIC TIA PORTAL.

- pH, DO, temperature, pressure, flow, turbidity
- Inoculation, dosing & sampling
- Integrated CIP / SIP
- SCADA control (recipe-based)
- Remote monitoring

## Operation Modes

One system for many operation modes: batch, fed-batch, continuous, airlift. Bacteria, yeasts, algae, fungi, enzymatic reactions

ated vessels into powerful bioreactors –

## Benefits

- Fast ROI through reduced infrastructure costs
- Minimized technical risk
- Scalable business model
- Ready for industrialization



## Target Group

Ideal for startups, investors, and companies focused on fast validation and scalable growth.

- flexible, efficient, and scalable



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## FLECKS BIOREACTOR SYSTEMS GmbH

Engineering expertise since 1989 in biotechnology, fermentation, and brewing systems. Over 200 installations worldwide. Focus on efficient and scalable production systems. Partner in various research and development projects. FLECKS pilot plant for testing in Austria.

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