

# Variable Bed Flow Reactor (VBFR) an advanced packed bed reactor

The VBFR exposes a new paradigm for the use of packed bed reactors. Traditional fixed bed reactors have been useful tools when working with heterogeneous reagents and catalysts in continuous flow. The VBFR takes packed bed reactors to new applications by allowing the packed media to increase or decrease in volume while maintaining the media to a precisely controlled packing. The volume of the packed media is recorded in real time providing new opportunity for process control and an untapped rich data-source.



## VBFR applications

- Use of heterogeneous stoichiometric reagents in continuous flow
- Use of immobilised heterogeneous catalysts on polystyrene resins
- Quantification of swelling of packed media
- In-process monitoring by measurement of volume change
- Peptide synthesis
- Oligonucleotide synthesis
- Glycan assembly

## Scale range of VBFR

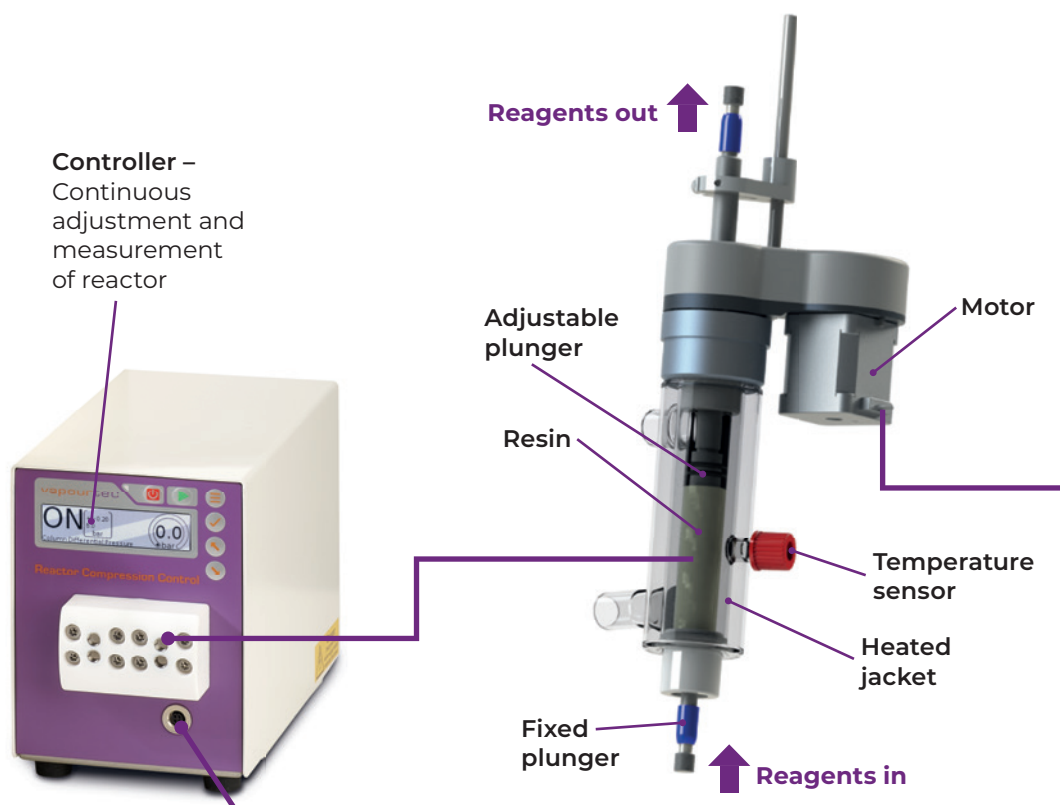
Four different sizes of VBFR are available covering working volumes in the range, 0.03 ml to 100 ml.

A reactor compression controller provides control of the packing density of the solid media and provides continuous real-time data of the change in reactor volume.



## Variable Bed Flow Reactor (VBFR)

How does the VBFR work?



### Variable Bed Flow Reactor features

- Glass, PTFE, PFA and Kalrez fluid contact – resistant to strong acids and bases
- Fully automatic volume change
- Can be heated and cooled, 150 °C to -20 °C
- Working volume range from 0.03 ml to 100 ml
- Four sizes available; 6.6 mm, 10mm, 15 mm and 35 mm bore reactor
- Measurement of volume change with a resolution of 0.5 ul (6.6 mm bore reactor)
- Maximum working pressure 20 bar (6.6 mm bore reactor), 5 bar (35 mm bore reactor)
- VBFR can interface to Vapourtec's R-Series software, and changes in volume can be logged and charted

### Compatible with both E-Series and R-Series flow chemistry systems

The VBFR is designed for seamless integration with both E-Series and R-Series flow chemistry systems.

VBFR	Min. working volume (ml)	Max. working volume (ml)	Max. Pressure (bar)
6.6 mm	0.03 ml	4.0 ml	20 bar
10 mm	0.12 ml	9.5 ml	15 bar
15 mm	0.4 ml	21 ml	10 bar
35 mm	5.0 ml	115 ml	5 bar