

# Reactor-Ready™ Lab Reactors

Patented Design

Innovative, patented,  
low cost, reaction work  
stations for glass  
vessels from  
100 ml to 5 litres



-70°C

230°C



*Reactor-Ready Duo*

# Reactor-Ready Lab Reactor

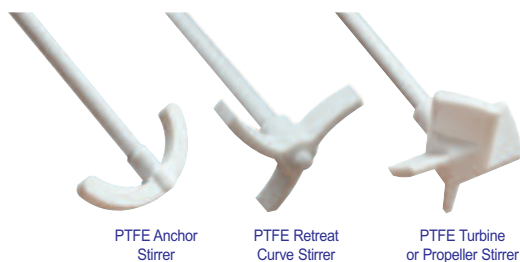


Replace multiple reaction set-ups with a single universal system that accepts vessels from 100 ml to 5 litres

A single reaction system that accepts a range of different vessel sizes



A choice of popular stirrer paddles



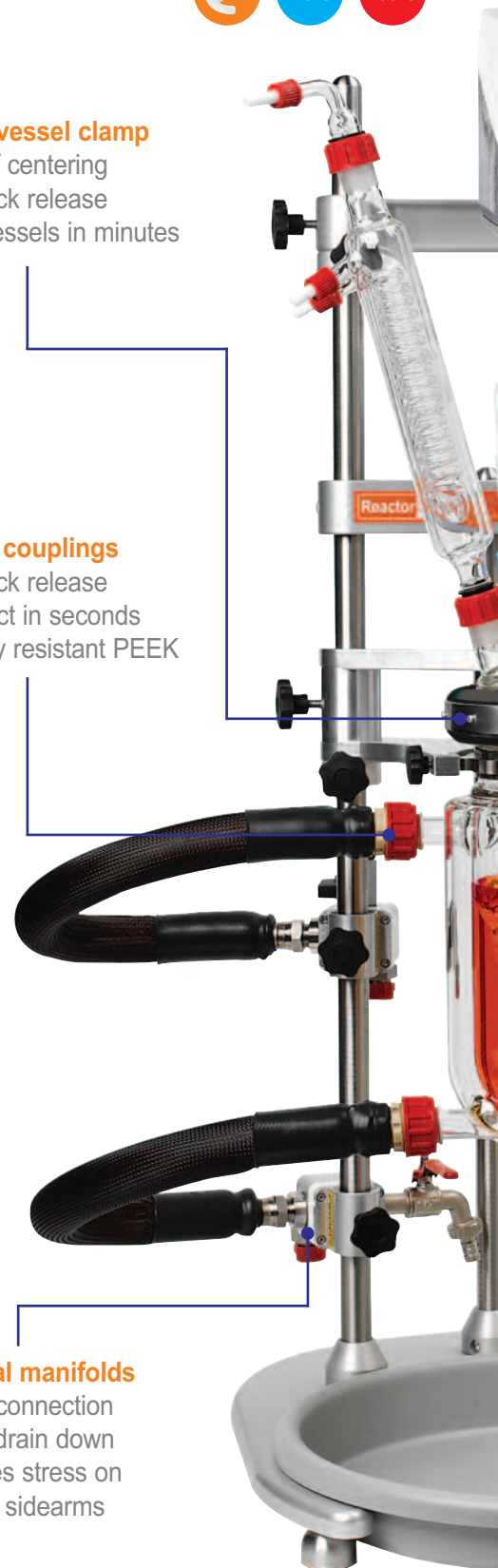
Convenient vessel kits make buying vessels and accessories easy and cost effective



- Unique vessel clamp**
- self centering
  - quick release
  - change vessels in minutes

- Hose couplings**
- quick release
  - connect in seconds
  - chemically resistant PEEK

- Individual manifolds**
- easy connection
  - easy drain down
  - reduces stress on vessel sidearms



# Change to Reactor-Ready

It improves your chemistry by saving space, time and money



## Simple stirrer alignment

- slide and glide
- set and lock

## Patented stirrer coupling

- drop in
- no tools
- no fuss

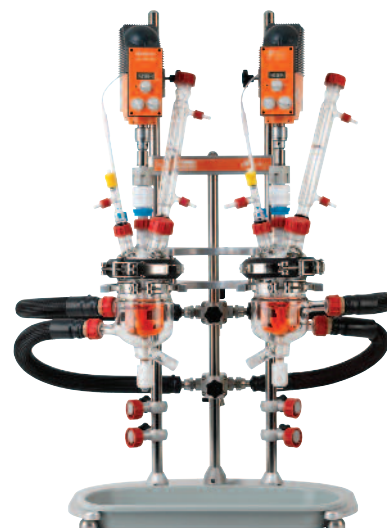
## Standard vessels

- 250 ml to 5 litres
- vacuum jacketed option

## Process vessels

- mimic plant scale geometry
- 100 ml to 5 litres
- vacuum jacketed option

Reactor-Ready Duo accepts two vessels and allows reactions in parallel or series



Optional AVA Control Software allows you to log and control stirrers, circulators, balances, pumps, temperature sensors and other devices



Accepts all leading brands of overhead stirrer



NEW



Compatible with all leading brands of circulator or thermoregulator

# Reactor-Ready

## Swap reaction vessels in minutes, NOT hours

Reactor-Ready is designed as a universal reactor work station that can be used for different vessel sizes and different experiments. Reactor-Ready can easily and quickly be configured to suit the chemistry and scale you need for each project.

The beauty of Reactor-Ready is that this one reactor work station can replace many, saving you money and fumehood space.

### Features include

- Rapid vessel exchange with quick-release vessel clamp and hose couplings.
- Range of single and vacuum jacketed vessels from 100 ml to 5 litres.
- Range of process vessels to mimic larger scale plant or manufacturing reactors.
- Accepts all leading brands of overhead stirrer and allows easy, tool-free adjustment.
- Triple support stand features heavy duty stainless steel support rods for strength and stability.
- Self aligning stirrer coupling engages without the need for tools.
- Temperature range: -70 °C to +230 °C (jacket temperature)
- Innovative hose manifolds allow easy thermofluid drain down.
- Wide range of accessory glassware including condensers, dropping funnels etc.
- Optional software allows you to log and control stirrers, circulators, balances, pumps, temperature sensors and other devices.

### Patented vessel clamp allows rapid vessel exchange without tools

- Unique clamp design allows vessel to be supported and clamped by a single operator in less than a minute.
- Use the same clamp to hold all vessel sizes; plus the vessels remain supported even when the clamp is unlocked.



### Vessel support collar aids vessel loading

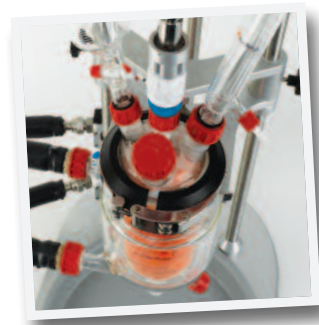
- Reactor-Ready uses an innovative support collar fitted to the neck of each vessel, which allows the vessels to be swapped in and out of the Reactor-Ready core like a cartridge.
- The stainless steel collar locks securely into the support plate on the framework and allows the vessel to remain supported, even when not clamped.
- Vessel exchange is tool free and can easily be undertaken by one person.

### Unique self aligning stirrer coupling saves time when changing vessels

- Patented drop-in stirrer coupling engages easily without the need for tools.
- Simply lower the stirrer coupling to engage with the stirrer guide below.
- The stainless steel stirrer coupling will fit in any standard stirrer chuck (for 10mm diameter)
- Powerful stirring up to 500 rpm, or 800 rpm for short periods (subject to motor selected).



Stainless steel vessel support collar

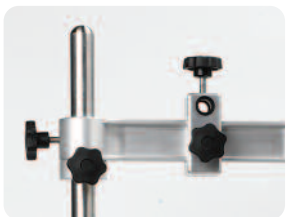


## Choice of PTFE stirring shafts

- Reactor-Ready is offered with a choice of PTFE stirring shafts: anchor, retreat curve and turbine/propeller styles.
- PTFE anchor stirring shaft is included with all standard reaction vessel kits
- PTFE turbine stirring shaft is included with all process reaction vessel kits.

## I-beam support allows the stirring motor to be positioned with ease

- I-beam allows the stirrer motor to be raised or lowered without needing to remount the stirrer.
- Adjustable safety stop collars located below the I-beam allow the user to lower the stirrer motor to a set position for ease of operation and safety.
- Reactor-Ready accepts all leading brands of motor or air-powered overhead stirrer with support rods up to 16 mm in diameter.



## PTFE Stirrer Guide

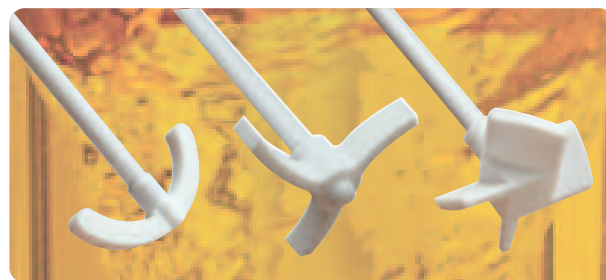
- The Reactor-Ready's PTFE stirrer guide screws directly on to the glass lid and features a unique extended support which minimises wobble even at high speeds.
- The stirrer guide is chemically inert, gas-tight and suitable for work under vacuum.

## Quick release PEEK hose couplings

- Operates over the temperature range -70 °C to +230 °C (jacket temperature).
- Quick-release, screwthread design allows rapid exchange of vessels without the use of tools.
- Simply tighten by hand for a leak-tight seal.
- PEEK with Viton O-rings ensures all wetted parts are chemically resistant.
- Lightweight, metal-free design prevents chipping and minimises strain on the glass fitting.
- All hoses have a 12 mm ID, maximising thermofluid flow and heating/cooling performance.
- Low thermal conductivity of PEEK reduces frosting when cooling.

## Hose manifolds allow easy thermofluid drain down

- The inlet and outlet hoses from the Reactor-Ready vessel connect to manifolds attached to the support rod. These manifolds serve two important functions:
  1. Support the hoses running from the vessel, thereby eliminating stress on the glass sidearms.
  2. Allows thermofluid drain-down, which provides a quick and clean method of removing the thermofluid from the vessel jacket when changing vessels.
- By opening the venting valve on the (upper) outlet manifold, thermofluid drains from the vessel back to the thermoregulator under gravity.
- Opening the drain tap on the (lower) inlet manifold allows drainage to an external reservoir.



PTFE anchor stirrer

PTFE retreat curve stirrer

PTFE turbine/propeller stirrer



PTFE stirrer guide provides whip-free agitation



## Case study: Accelerating process optimisation in a busy chemical development lab

Researchers at a leading US pharmaceutical company invested in Reactor-Ready for use in their chemical development lab. The process R&D group, specialising in small molecule research, are using Reactor-Ready for optimising new or existing chemistry, identifying and eliminating impurities, and screening process variables for transfer to kilo-labs, pilot plant and manufacturing sites.

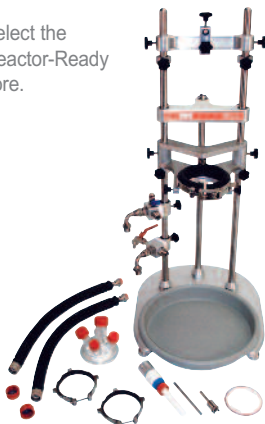
Commenting on their existing methods the Lead Scientist said, "We use round bottom flasks, but temperature control via mantles or oil baths is poor. Alternatively, when we use traditional jacketed reactor vessels, we need a different set up for every scale change. Even changing a reactor of the same size takes ages."

"So I liked Reactor-Ready the minute I saw how easy it was to change reactors. Reactor-Ready does it all. I get one stand which fits all sizes up to 5 litres. I get overhead stirring on all scales. I get vacuum jacketed vessels, which provide excellent temperature control with minimum heat loss, which is a real advantage at low temperatures, and I get the ability to rapidly change out my reactors."

"The first time I changed vessels, it took about 5 minutes but now I can change in less than 2 minutes. That includes removing and attaching the heating fluid hoses. Occasionally I lose a drop or two of heat transfer fluid but most times I lose none. The thing I like about the system is the control and speed. I get better control of my reactions and I can vary my work or scale immediately".

## How to order Reactor-Ready...

1. Select the Reactor-Ready core.



2. Choose the vessel kit or kits you require by selecting the vessel volume and style.



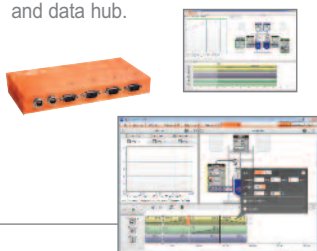
3. Select the overhead stirrer you need.



4. If you need a thermoregulator, hoses, hose adapters, thermofluid or accessory glassware, then select from the accessory list.



5. If you need automation add the AVA Control Software and data hub.



## Reactor-Ready in detail

It is the attention to detail and wealth of innovative features that makes Reactor-Ready so much better



Precision ground lid and vessel flanges combine with PTFE collar and FEP-encapsulated O-ring to offer superior sealing performance.

Vessel clamp support allows easy vertical repositioning of the vessel whilst maintaining the stirrer coupling alignment.



Venting stopcock on the outlet manifold allows quick and easy draining of the thermofluid during vessel exchange.

Vessel-to-manifold hoses are supported by the manifolds and frame, eliminating stress on the vessel.

Quick-release PEEK coupling allows rapid exchange of vessels without the use of tools. Operates over the temperature range -70 °C to +230 °C (jacket temperature).

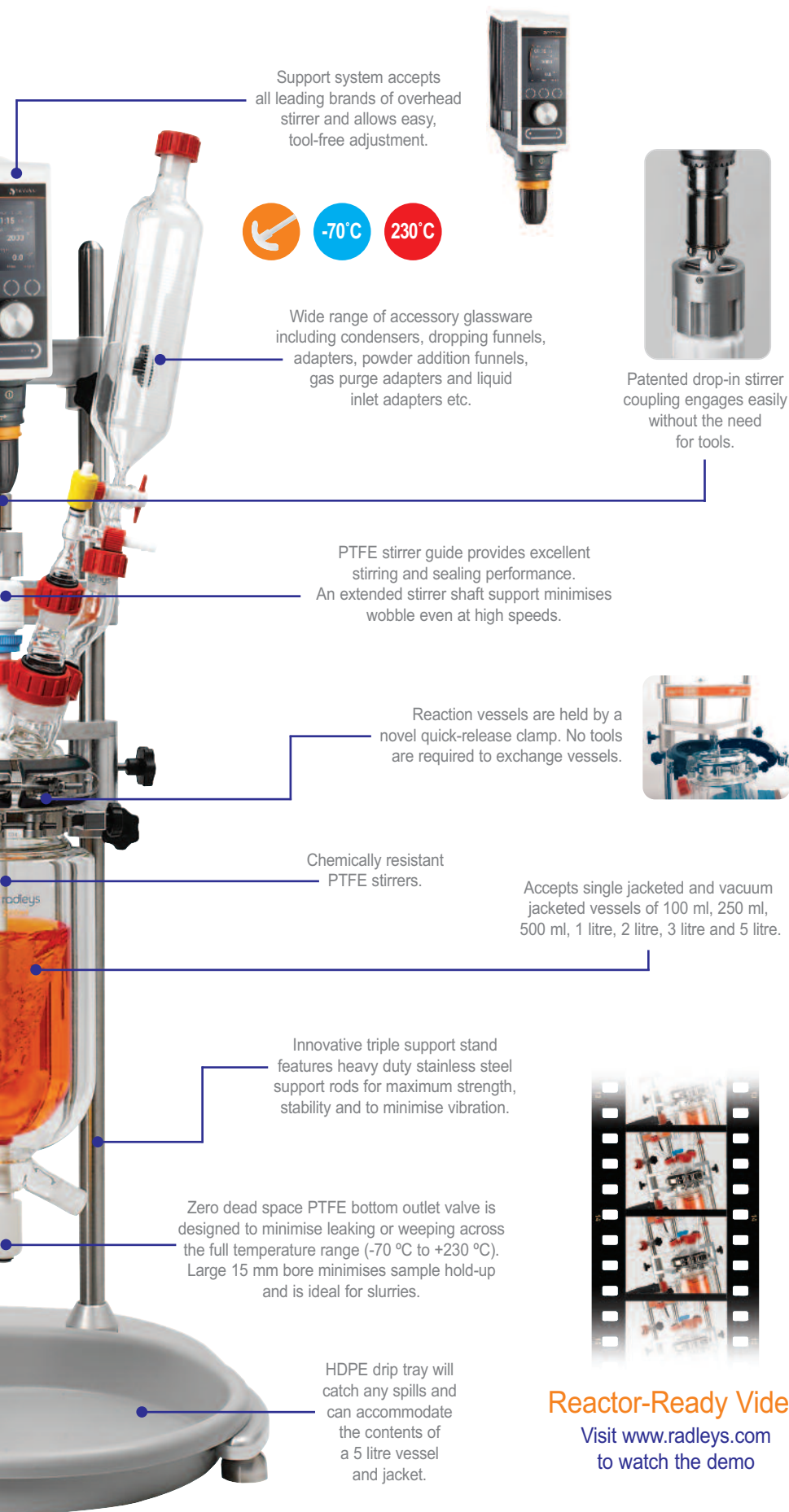


Thermofluid may be drained back to the thermoregulator or decanted via a fluid drain tap on the inlet manifold.

Heavy-duty base plate with levelling feet ensures that the Reactor-Ready support stand is secure and stable.

Stirrer support I-beam allows the stirrer motor to be easily raised and lowered.





Support system accepts all leading brands of overhead stirrer and allows easy, tool-free adjustment.



Wide range of accessory glassware including condensers, dropping funnels, adapters, powder addition funnels, gas purge adapters and liquid inlet adapters etc.

PTFE stirrer guide provides excellent stirring and sealing performance. An extended stirrer shaft support minimises wobble even at high speeds.

Reaction vessels are held by a novel quick-release clamp. No tools are required to exchange vessels.

Chemically resistant PTFE stirrers.

Accepts single jacketed and vacuum jacketed vessels of 100 ml, 250 ml, 500 ml, 1 litre, 2 litre, 3 litre and 5 litre.

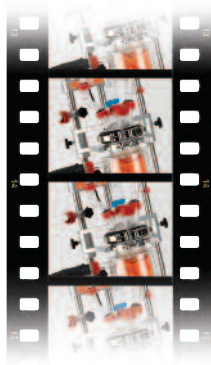
Innovative triple support stand features heavy duty stainless steel support rods for maximum strength, stability and to minimise vibration.

Zero dead space PTFE bottom outlet valve is designed to minimise leaking or weeping across the full temperature range (-70 °C to +230 °C). Large 15 mm bore minimises sample hold-up and is ideal for slurries.

HDPE drip tray will catch any spills and can accommodate the contents of a 5 litre vessel and jacket.



Patented drop-in stirrer coupling engages easily without the need for tools.



## Reactor-Ready Video

Visit [www.radleys.com](http://www.radleys.com) to watch the demo

## Reactor-Ready core system includes

- Stand with base, support rods, bosses and all clamps
- Glass reaction vessel lid
- Vessel FEP O-ring seal and PTFE collar
- HDPE drip tray
- Vessel-to-manifold insulated hoses with quick-release connections
- Lower inlet manifold + drain
- Upper outlet manifold + vent
- PTFE stirrer guide
- Stainless steel drop-in stirrer guide coupling
- Two stainless steel vessel support collars
- Locking rod for support rod bosses



## Reaction vessel kits make ordering vessels simple and more cost effective

These cost effective vessel kits include the vessel and accessories you need to get started. The Pt100 probe and PTFE stirrer included in each kit are matched to the vessel size. Each vessel kit includes:

- Reaction vessel with PTFE stopcock
- Sidearm couplings
- Pt100 PTFE temperature probe with LEMO connector
- PTFE temperature Probe adapter
- PTFE stirrer



# Reactor-Ready Duo

Supports two glass reaction vessels of different or same volume from 100 ml to 5 litres

Reactor-Ready Duo shares the same unique features as Reactor-Ready, except that it supports two separate jacketed glass reaction vessels. The system can be configured to operate with a single thermoregulator controlling the temperature of both vessels simultaneously, or with two thermoregulators controlling the temperature of each vessel independently.



**Unique vessel clamp**

- supports two vessels
- change vessels independently
- change vessels in minutes

**Vessels**

- 100 ml to 5 litres
- combine different volumes
- vacuum jacketed option
- process and standard geometry

**Thermofluid manifolds**

- choice of two manifold kits
- single circulator manifolds
- double circulator manifolds

**Simple stirrer alignment**

- set and lock
- independent stirring for each vessel

**Patented stirrer coupling**

- drop in
- no tools
- no fuss

**Hose couplings**

- quick release
- connect in seconds
- chemically resistant PEEK

**Strong framework**

- heavy duty base
- solid s/steel support rods
- large drip tray



# Why Reactor-Ready Duo?

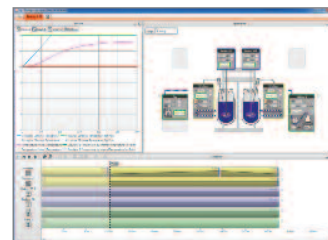
All the benefits of Reactor-Ready with two vessels in parallel or series

## Features include

- Rapid exchange of both vessels independently, with quick-release vessel clamp and hose couplings.
- Choice of manifold kits allow two vessels to run from a single thermoregulator or two separate thermoregulators.
- System accepts two overhead stirrers which can be operated and moved independently.

## Applications

- Parallel synthesis or reaction optimisation: use the same or different size vessels and vary stirring speed, stirrer shape and temperature between vessels as appropriate.
- Two stage reaction: transfer reactant from one vessel to the other using vacuum or a pump.
- Single reaction vessel: using the second vessel as either a receiving or feed vessel (where reagents can be pre-heated or pre-cooled prior to addition).
- Use optional AVA Software to control fluid transfer between vessels.



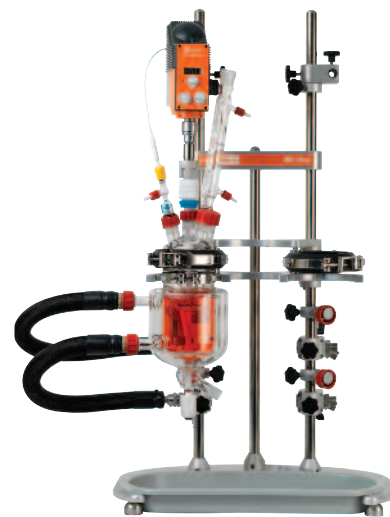
Similar vessels with double circulator manifold kit



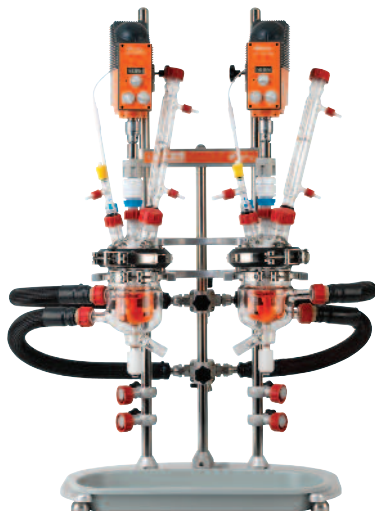
Different vessels with double circulator manifold kit



Single vessel with double circulator manifold kit



Similar vessels with single circulator manifold Kit



Different vessels with single circulator manifold Kit



Single vessel with single circulator manifold Kit

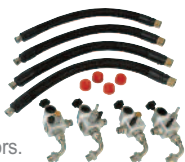


## How to order Reactor-Ready Duo...

1. Select the Reactor-Ready Duo core.



2. Choose manifold & hose kit for one or two circulators.



3. Choose the vessel kits you need.



4. Select the overhead stirrers.



5. If you need a thermoregulator, hoses, hose adapters, thermofluid or accessory glassware, then select from the accessory list.



6. If you need automation, add the AVA Software and data hub.



# Reactor-Ready Duo core system

Easy-to-order Reactor-Ready Duo core system includes all the framework components required for operation

## Features include

- Robust heavy-duty framework features solid stainless steel support rods.
- Two separate quick release clamps support each of the vessels independently.
- Large drip tray will retain vessel contents.
- Manifold and hose kits must be ordered separately.

## Core system (RR121300) includes

- Stand with base, support rods, bosses and all clamps
- 2 x glass reaction vessel lids
- 2 x vessel FEP O-ring seals and PTFE centering collars
- 2 x PTFE stirrer guides and couplings
- HDPE drip tray
- 2 x stainless steel stirrer drop-in couplings
- 2 x stainless steel vessel support collars
- locking rod for support rod bosses



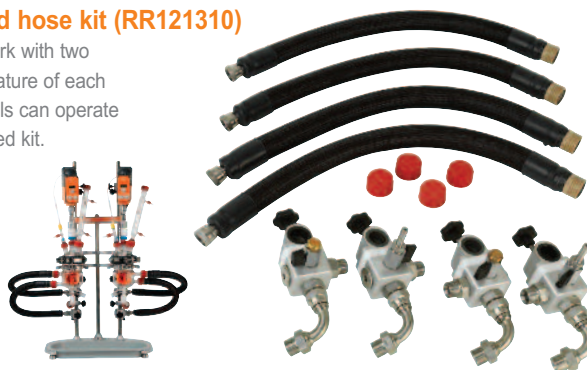
# Reactor-Ready Duo manifolds and hoses

A choice of manifold kits for use with one or two thermoregulators

## Double thermoregulator manifold and hose kit (RR121310)

This double thermoregulator kit is designed to work with two separate thermoregulators controlling the temperature of each vessel independently. With this set-up both vessels can operate at different temperatures. This is the recommended kit.

- R/H upper return manifold with vent valve
- L/H upper return manifold with vent valve
- R/H lower supply manifold with drain valve
- L/H lower supply manifold with drain valve
- 4 x quick-release insulated hoses, 60 cm
- 4 x sealing caps for hoses



## Single circulator manifold and hose kit (RR121305)

This single circulator kit is designed to work with one thermoregulator controlling the temperature of both vessels simultaneously. With this set-up both vessels would operate at the same temperature. The manifolds are supplied with blanking plugs should you wish to run only one vessel.

- central upper return manifold with vent valve
- central lower supply manifold with drain valve
- 4 x quick-release insulated hoses, 70 cm
- 4 x sealing caps for hoses
- 2 x stainless steel blanking plugs



# Hei-Torque overhead stirrers

The powerful Hei-Torque range can accomplish the most demanding mixing tasks whilst providing the highest safety

Includes  
3 YEAR  
warranty



## Stirrer models include

- Powerful stirring from 10 to 2000 rpm (Max. recommended speed with Reactor-Ready is 500 rpm).
- Available with basic (Value) or advanced (Precision) features, and a choice of up to 40, 200 or 400 Ncm torque.
- Intuitive control panel for easy operation, safe start and stop to avoid accidental start-up.
- **New** features for Precision range: set speed limit, adjustable acceleration, set a torque limit.
- **New** unique Quick-chuck for immediate and convenient 'one-hand' impellor changes, without tools.

	Hei-Torque Core	Hei-Torque Value 200	Hei-Torque Value 400	Hei-Torque Precision 200	Hei-Torque Precision 400
Power rating, motor input/output (W)	105/75	120/80	150/90	120/80	150/90
Number of gears	1	1	2	1	2
Speed range (rpm)	20 to 2000	10 to 2000	10 to 400 and 200 to 2000	10 to 2000	10 to 400 and 200 to 2000
Speed indicator	digital monochrome 2"	digital monochrome 2.4"	digital monochrome 2.4"	digital colour 3.2"	digital colour 3.2"
Speed control	electronic	electronic	electronic	electronic	electronic
Torque, maximum (Ncm)	40	200	400	200	400
Torque indicator (Ncm)	symbol	symbol	symbol	precise value	precise value
Overheat protection	automatic cut-out	automatic cut-out	automatic cut-out	automatic cut-out	automatic cut-out
Viscosity up to (mPa s)	10,000	100,000	250,000	100,000	250,000
Stirring cap. H <sub>2</sub> O max. (L)	25	50	100	50	100
Shaft diameter, max. (mm)	10.5	10.5	10.5	10.5	10.5
Dimensions (W x H x D) (mm)	70 x 281.5 x 195	86 x 350 x 247	93 x 350 x 247	86 x 350 x 247	93 x 350 x 247
Weight (kg)	2.3	5.1	5.3	5.1	5.3
Set speed limit, Torque limit, Adjustable acceleration	-	-	-	Yes	Yes
Analogue/digital interface	-	-	-	USB and RS232	USB and RS232

For Reactor-Ready and Reactor-Ready Duo the maximum speed is 500 rpm for continuous use for 800 rpm for short periods.

# Thermoregulators/circulators

## Which thermoregulator should you choose?

- Radleys are a Huber distribution and service partner, so we recommend the Huber range of thermoregulators, circulators, chillers and waterbaths. However, Reactor-Ready is compatible with all leading brands of thermoregulator including Julabo, Lauda, Polyscience, Haake and many others.
- Also available are a range of hoses, adapters, temperature probes and thermofluid for all applications.

Description	Temperature range °C	Heating power (kW)	Cooling power at 0 °C (kW)	Application Examples	
Huber Ministat 230	-45 °C to 200 °C	2.0	0.38	250 ml	Cool to -10 °C in <1 hr, then heat to 130 °C in <30 mins
				1 Litre	Control at 0 °C, then heat to 100 °C in 20 mins
Huber Petite Fleur	-40 °C to 200 °C	1.5	0.45	500 ml	Cool to -20 °C in approx 30 mins, then heat to 150 °C in <30 mins
				1 Litre	Heat to 150 °C, then cool to 0 °C at > 2.5 K/min
Huber Unistat Tango	-45 °C to 250 °C	3.0	0.7	1 Litre	Cool to -30 °C in <1 hr, then heat to 180 °C in <1 hr
				2 Litre	Heat to 180 °C, then cool to 20 °C in approx 1 hr
Huber Unistat 405	-45 °C to 250 °C	3.0	1.0	2 Litre	Cool to -20 °C in <30 mins, then heat to 100 °C in <30 mins
				5 Litre	Control at 20 °C, then cool to -20 °C in approx 70 mins
Huber Unistat 705	-75 °C to 250 °C	3.0	0.65	1 Litre	Control at 20 °C, then cool to -50 °C in 40 mins
				5 Litre	Cool to -40 °C at approx 1 K/min, then heat to 150 °C in <1 hr

The above applications are intended as a guide to the relative performance of each Huber thermoregulator with a range of vessel sizes and are not a prediction of actual performance. To achieve optimum performance the use of vacuum jacketed vessels is recommended for below ambient temperature applications. For comprehensive advice on thermoregulator selection please contact your local Radleys distributor.



Huber Unistat 405



Huber Petite Fleur - Baby Tango

# Reaction vessels

## Single jacketed, vacuum jacketed and process styles

### Features include

- Precision engineered borosilicate glass vessels can be used with Reactor-Ready and Reactor-Ready Duo.
- DN100 ground and polished flat flange combines with the FEP-encapsulated O-ring and our unique self centering PTFE collar to offer a leak-tight seal between the vessel and lid.
- Convenient and cost-effective vessel kits include stirrer, temperature probe and adapter.

### Vessels feature zero dead space PTFE bottom outlet valve

- Exclusive stopcock design prevents over-tightening that can cause glass breakage.
- Piston design allows quick and safe removal, eliminating the cleaning and assembly problems associated with other stopcock styles.
- Glass-filled PTFE piston minimises leaking or weeping across the full temperature range (-70 °C to +230 °C)
- Interchangeable between vessels with a full range of replacement parts and FEP O-rings.
- The large 15 mm bore minimises sample hold-up and is ideal for slurries (25 mm available on request).

### Glass vessel lids

- DN100 5 neck glass lid fits all vessel sizes.
- DN100 lid with 5 x Rodaviss, grease-free, safety joints. B24 centre, B34, B29, B24 and B19 side joints.
- Rodaviss glass sockets will accept any glassware with traditional A, B or C length conical cones.

### PTFE vessel lids

- DN100 7 neck PTFE lids fit all vessel sizes.
- More robust and less likely to break than glass.
- Ideal for use with analytical probes.
- Lids accept a range of removable Rodaviss sockets and compression fittings.
- Rodaviss PTFE sockets will accept any glassware with traditional A, B or C length conical cones.



## Standard Vessels

250 ml single jacketed vessel



250 ml vacuum Jacketed vessel



500 ml single jacketed vessel



500 ml vacuum jacketed vessel



1000 ml single jacketed vessel



1000 ml vacuum jacketed vessel



2000 ml single jacketed vessel



2000 ml vacuum jacketed vessel



5000 ml single jacketed vessel



5000 ml vacuum jacketed vessel



## Process Vessels - mimic the geometry of plant scale reactors

Feature a 1.25 to 1 ratio of internal height to internal diameter, with dish-shaped bottom.

100 ml single jacketed process vessel



100 ml vacuum jacketed process vessel



250 ml single jacketed process vessel



250 ml vacuum jacketed process vessel



500 ml single jacketed process vessel



500 ml vacuum jacketed process vessel



1000 ml single jacketed process vessel



1000 ml vacuum jacketed process vessel



2000 ml single jacketed process vessel



2000 ml vacuum jacketed process vessel



5000 ml single jacketed process vessel



5000 ml vacuum jacketed process vessel



Note: 3 litre vessels not shown

# Reaction vessel kits

Reaction vessel kits make ordering vessels and accessories simple and much more cost effective

## Standard reaction vessel kits

These cost effective vessel kits include the vessel and accessories you need to get started. The Pt100 probe and anchor stirrer included in each kit are matched to the vessel size. Each vessel kit includes:

- Reaction vessel
- PTFE anchor stirrer
- Sidearm couplings
- Pt100 PTFE temperature probe with LEMO Connector
- PTFE temperature Probe adapter



## Process reaction vessel kits

Process vessel kits include a Pt100 temperature probe and turbine stirrer matched to the vessel size. Each vessel kit includes:

- Reaction vessel
- PTFE turbine stirrer
- Sidearm couplings
- Pt100 PTFE temperature probe with LEMO connector
- PTFE temperature probe adapter



# Glassware and accessories

Wide choice of standard glassware to suit your application

Glassware features Rodaviss joints and is compatible with Reactor-Ready lids



Boss head

3 Pronged clamp



Condenser liebig, B29



Condenser double surface, B29



Condenser jacket coil, B29



Dropping funnel equalising arm, B24



PTFE hose adapter, B19



Liquid additions adapter, B24



Glass cone stopper, B29



Reducing adapter, B29



Right angle adapter, B29



Enlarging adapter, B29



Reflux divider head B29 + GL18 + PTFE fitting



Reflux divider head B29 + GL18 + temp-probe port B14



Valved liquid inlet adapter, B24



Gas purge adapter, B24



Oil bubbler, B24



Solid additions Funnel, B34



Swan neck Adapter, B24

Other styles and sizes of glassware are available, please see full listing.

## How to order Reactor-Ready

1. Select the Reactor-Ready core: RR121000.
2. Choose the vessel kit or kits you require by selecting the vessel volume and style.
3. Select the overhead stirrer you require.
4. If you need a thermoregulator, hoses, hose adapters, thermofluid or accessory glassware, then select from the accessory list opposite.
5. If you need automation, add the AVA Software and Data Hub.

### Reactor-Ready core system

- RR121000 Reactor-Ready core system includes:
- Stand with base, drip tray, support rods, bosses and all clamps
  - Vessel to framework insulated hoses with quick-release connections
  - Upper and lower drain-down manifolds
  - PTFE stirrer guide and drop-in coupling
  - Glass reaction vessel lid with Rodaviss sealing caps
  - Vessel FEP O-ring seal and PTFE centering collar
  - 2 x Stainless steel vessel support collars

**Important:** Hoses to connect the Reactor-Ready framework to your thermoregulator are NOT included. You will require hoses with an M24x1.5 female connection or appropriate adapters. See opposite for hoses, adapters and suitable thermoregulators.

### Standard Reaction Vessel Kits

Kits include: standard vessel, PTFE anchor stirrer paddle, PTFE Pt100 temp probe (with LEMO plug for connection to the thermoregulator) and PTFE temp probe adapter.

RR120010	250ml Single Jacketed Vessel Kit
RR120015	250ml Vacuum Jacketed Vessel Kit
RR120020	500ml Single Jacketed Vessel Kit
RR120025	500ml Vacuum Jacketed Vessel Kit
RR120030	1000ml Single Jacketed Vessel Kit
RR120035	1000ml Vacuum Jacketed Vessel Kit
RR120040	2000ml Single Jacketed Vessel Kit
RR120045	2000ml Vacuum Jacketed Vessel Kit
RR120042	3000ml Single Jacketed Vessel Kit
RR120047	3000ml Vacuum Jacketed Vessel Kit
RR120050	5000ml Single Jacketed Vessel Kit
RR120055	5000ml Vacuum Jacketed Vessel Kit



Kit includes  
Anchor Stirrer

### Process Reaction Vessel Kits

Kits include: process vessel, PTFE turbine stirrer paddle, PTFE Pt100 temp probe (with LEMO plug for connection to the thermoregulator) and PTFE temp probe adapter.

RR120105	100ml Single Jacketed Process Vessel Kit
RR120107	100ml Vacuum Jacketed Process Vessel Kit
RR120110	250ml Single Jacketed Process Vessel Kit
RR120115	250ml Vacuum Jacketed Process Vessel Kit
RR120120	500ml Single Jacketed Process Vessel Kit
RR120125	500ml Vacuum Jacketed Process Vessel Kit
RR120130	1000ml Single Jacketed Process Vessel Kit
RR120135	1000ml Vacuum Jacketed Process Vessel Kit
RR120140	2000ml Single Jacketed Process Vessel Kit
RR120145	2000ml Vacuum Jacketed Process Vessel Kit
RR120142	3000ml Single Jacketed Process Vessel Kit
RR120147	3000ml Vacuum Jacketed Process Vessel Kit
RR120150	5000ml Single Jacketed Process Vessel Kit
RR120155	5000ml Vacuum Jacketed Process Vessel Kit



Kit includes  
Turbine Stirrer

## How to order Reactor-Ready Duo

1. Select the Reactor-Ready Duo core: RR121300.
2. Choose manifold and hose kit for one or two circulators.
3. Choose the vessel kit or kits you require by selecting the vessel volume and style.
4. Select the overhead stirrers you require.
5. If you need a thermoregulator, hoses, hose adapters, thermofluid or accessory glassware, then select from the accessory list opposite.
6. If you need automation, add the AVA Control Software and Data Hub.

### Reactor-Ready Duo core system

- RR121300 Reactor-Ready Duo core system includes:
- Duo stand with base, drip tray, support rods, bosses and all clamps
  - 2 x PTFE stirrer guides and drop-in couplings
  - 2 x Glass reaction vessel lids with Rodaviss sealing caps
  - 2 x Vessel FEP O-ring seal and PTFE centering collars
  - 2 x Stainless steel vessel support collars

**Important:** Hoses to connect the Reactor-Ready Duo framework to your thermoregulator are NOT included. You will require hoses with an M24x1.5 female connection or appropriate adapters. See opposite for hoses, adapters and suitable thermoregulators.

### Double Circulator Manifold and Hose Kit

- RR121310 Double Circulator Manifold and Hose Kit includes:
- R/H Upper Return Manifold with Vent Valve
  - L/H Upper Return Manifold with Vent Valve
  - R/H Lower Supply Manifold with Drain Valve
  - L/H Lower Supply Manifold with Drain Valve
  - 4 x Quick-Release Insulated Hoses, 60cm
  - 4 x Sealing Caps for Hoses

### Single Circulator Manifold and Hose Kit

- RR121305 Single Circulator Manifold and Hose Kit includes:
- Central Upper Return Manifold with Vent Valve
  - Central Lower Supply Manifold with Drain Valve
  - 4 x Quick-Release Insulated Hoses, 70cm
  - 4 x Sealing Caps for Hoses
  - 4 x Stainless Steel Blanking Plugs

### Hei-Torque Overhead Stirrers

501-60410-00	Hei-Torque Core
501-62010-00	Hei-Torque 200 Value
501-62020-00	Hei-Torque 200 Precision (USB/RS232)
501-64010-00	Hei-Torque 400 Value
501-64020-00	Hei-Torque 400 Precision (USB/RS232)

### General Maintenance Accessories

RR121150	Reactor-Ready Maintenance Kit (includes items listed below)
RR121027	Oil Wipe for Support Rods, Pack 10
RR121063	Stirrer Guide Bearing Seal B24 10mm
RR121064	Stirrer Guide Ferrule and Shaft Seal B24 10mm
RR121071	23mm Viton O-Rings for Quick Release Hose Coupling, Pack 2
RR121072	28mm Viton O-Rings for Quick Release Hose Coupling, Pack 2
RR121090	FEP Encapsulated Silicone Vessel O-Ring
RR166100	Replacement 15mm Piston Top O-Ring
RR166102	Replacement 15mm Piston Middle O-Ring

## Reactor-Ready Duo reaction vessel compatibility guide

The following combinations of reaction vessel sizes can be used in the Reactor-Ready Duo.

	100ml	250 ml	500 ml	1000 ml	2000 ml	3000 ml	5000 ml
<b>Standard Vessel, Single Jacketed</b>							
250 ml	n/a	●	●	●	●	●	●
500 ml	n/a	●	●	●	●	●	●
1000 ml	n/a	●	●	●	●	●	●
2000 ml	n/a	●	●	●	●	●	●
5000 ml	n/a	●	●	●	●	●	●
<b>Process Vessel, Single Jacketed</b>							
100 ml	●	●	●	●	●	●	●
250 ml	●	●	●	●	●	●	●
500 ml	●	●	●	●	●	●	●
1000 ml	●	●	●	●	●	●	●
2000 ml	●	●	●	●	●	●	●
3000 ml	●	●	●	●	●	●	●
5000 ml	●	●	●	●	●	n/a	n/a

	100ml	250 ml	500 ml	1000 ml	2000 ml	3000 ml	5000 ml
<b>Standard Vessel, Vacuum Jacketed</b>							
250 ml	n/a	●	●	●	●	●	●
500 ml	n/a	●	●	●	●	●	●
1000 ml	n/a	●	●	●	●	●	●
2000 ml	n/a	●	●	●	●	●	●
5000 ml	n/a	●	●	●	●	n/a	n/a
<b>Process Vessel, Vacuum Jacketed</b>							
100 ml	●	●	●	●	●	●	●
250 ml	●	●	●	●	●	●	●
500 ml	●	●	●	●	●	●	●
1000 ml	●	●	●	●	●	n/a	n/a
2000 ml	●	●	●	●	●	n/a	n/a
3000 ml	●	●	●	●	●	●	●
5000 ml	●	●	●	n/a	n/a	n/a	n/a

### Huber Thermoregulators (Circulators)

HB2016.0005.01	Ministat 240 Pilot ONE Controller
HB1030.0001.01	Petite Fleur Pilot ONE Controller
HB1030.0001.01ET	Petite Fleur with 4 Litre Expansion Tank
HB1000.0037.01	Unistat Tango Pilot ONE Controller
HB1002.0045.01	Unistat 405 Pilot ONE Controller
HB1001.0041.01	Unistat 705 Pilot ONE Controller (230V or 400V)

### Thermoregulator Hoses, Adapters and Thermofluid

#### Insulated Hose with PTFE Inner

HB9325	M24x1.5 Insulated Hose NW12	100cm	-60°C to +260°C
HB9326	M24x1.5 Insulated Hose NW12	150cm	-60°C to +260°C
HB9327	M24x1.5 Insulated Hose NW12	200cm	-60°C to +260°C
HB9328	M24x1.5 Insulated Hose NW12	300cm	-60°C to +260°C

#### Insulated Hose with Metal Inner

HB9274	M24x1.5 Insulated Hose NW12	100cm	-100°C to +350°C
HB9275	M24x1.5 Insulated Hose NW12	150cm	-100°C to +350°C
HB9276	M24x1.5 Insulated Hose NW12	200cm	-100°C to +350°C
HB9277	M24x1.5 Insulated Hose NW12	300cm	-100°C to +350°C

#### Adapters

HB6724	M24x1.5 Female to M16x1 Male Adapter
HB6945	M24x1.5 Male to M16x1 Female Adapter
HB6723	M24x1.5 Female to M30x1.5 Male Adapter
HB6195	M16x1 90° Adapter
HB9256	M24x1.5 90° Adapter
HB6089	M16x1 Nut
HB12634	M24x1.5 Nut
HB6086	M16x1 Hose Connector NW8
HB9471	M24x1.5 Hose Connector NW12
HB6091	M16x1 Isolating Ball Valve -20°C...+140°C (max. 6 bar at +140°C)
HB9236	M24x1.5 Isolating Ball Valve -10°C...+180°C (max. 6 bar at +180°C)

#### Thermofluid

HB6161	SilOil M20.195/235.20, 5 Litre	-20°C to +195°C/235°C
HB6162	SilOil M20.195/235.20, 10 Litre	-20°C to +195°C/235°C
HB6163	SilOil M40.165/220.10, 5 Litre	-40°C to +165°C/220°C
HB6164	SilOil M40.165/220.10, 10 Litre	-40°C to +165°C/220°C
HB6165	SilOil M60.115/200.05, 5 Litre	-60°C to +115°C/200°C
HB6166	SilOil M60.115/200.05, 10 Litre	-60°C to +115°C/200°C
HB6479	DW-Therm M90.200.02, 10 Litre	-90°C to +200°C (Unistats only)

### Glassware Accessories

RR139005	Condenser Liebig 250mm B29 + GL14 + fittings
RR139007	Condenser Double Surface 200mm B29 + GL14 + fittings
RR139009	Condenser Jacket Coil Rodaviss B29 + GL14 + fittings
RR139011	Right Angle Adapter B29 + GL14 + PTFE fittings
RR139013	50ml Graduated Dropping Funnel Equalising Arm B24
RR139015	100ml Graduated Dropping Funnel Equalising Arm B24
RR139017	250ml Graduated Dropping Funnel Equalising Arm B24
RR139019	500ml Graduated Dropping Funnel Equalising Arm B24
RR139021	1000ml Graduated Dropping Funnel Equalising Arm B24
RR139023	Swan Neck Adapter Angled B24 to Vertical B24
RR139025	Gas Purge Adapter B24 + GL14 + fittings
RR139027	Glass Cone Stopper B19
RR139029	Glass Cone Stopper B24
RR139031	Glass Cone Stopper B29
RR139033	Glass Cone Stopper B34
RR139035	Enlarging Adapter B24 to B29
RR139037	Enlarging Adapter B29 to B34
RR139039	Reducing Adapter B24 to B19
RR139041	Reducing Adapter B29 to B19
RR139043	Reducing Adapter B29 to B24
RR139045	Reducing Adapter B34 to B19
RR139047	Reducing Adapter B34 to B24
RR139049	Reducing Adapter B34 to B29
RR139051	Oil Bubbler Type 1 B24 + GL14 + fittings
RR139053	Solid Additions Funnel B34 (with extended tube)
RR139057	Valved Liquid Inlet Adapter B24 to GL14
RR139063	PTFE Hose Adapter B19 for 12mm ID Tubing
RR139067	Boss Head
RR139069	3-Prong Clamp
RR139079	PTFE Flexible Bellows B24
RR139081	PTFE Flexible Bellows B29
RR139083	PTFE Flexible Bellows B34
RR139150	Reflux Divider Head B29 + GL18 + PTFE Fitting
RR139152	Reflux Divider Head B29 + GL18 + Temp Probe Port B14
RR139190	Reflux Divider Kit
RR139192	Reflux Divider Kit with Vapour Temp Kit
RR139154	250ml Receiver Flask 2 x B24 Socket, + B24 Cone and Tap
RR139324	500ml Receiver Flask 3 x B24 Socket, + B24 Cone and Tap
RR139326	1000ml Receiver Flask 3 x B24 Socket, + B24 Cone and Tap

### PTFE Pt100 Temperature Probes and Adapters

RR140250	Probe 8mm with LEMO Plug - 100ml, 250ml + 500ml Vessels
RR141000	Probe 9mm with LEMO Plug - 1000ml, 2000ml + 3000ml Vessels
RR145000	Probe 9mm with LEMO Plug - 5000ml Vessel
RR140010	PTFE Temperature Probe Adapter - 8mm
RR140015	PTFE Temperature Probe Adapter - 9mm

### Reaction Vessel Support Collar

RR121048	Vessel Support Collar
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### Glass DN100 Vessel Lid

RR136000	5 Neck Glass Lid - 1 x B19, 2 x B24, 1 x B29, 1 x B34 Includes Rodaviss sealing caps
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### PTFE DN100 Vessel Lids

RR136100	5 Neck PTFE Lid with 2 Blanked Ports. 1 x B19, 2 x B24, 1 x B29, 1 x B34 Includes Rodaviss sealing caps
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RR136110	7 Neck PTFE Lid with 7 Threaded Ports. 2 x ¼" NPT, 5 x ¾" NPT PTFE inserts not included - select from below
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### PTFE Rodaviss Sockets, Compression Fittings and Blanking Plugs for PTFE Lids

RR136300	Rodaviss B19 Socket Adapter (¾" NPT)
RR136301	Rodaviss B24 Socket Adapter (¾" NPT)
RR136302	Rodaviss B29 Socket Adapter (¾" NPT)
RR136303	Rodaviss B34 Socket Adapter (¾" NPT)
RR136304	Rodaviss B45 Socket Adapter (¾" NPT)
RR136314	3mm Bore Compression Fitting ¼" NPT
RR136315	6mm Bore Compression Fitting ¼" NPT
RR136316	8mm Bore Compression Fitting ¼" NPT
RR136317	12mm Bore Compression Fitting ¼" NPT
RR136318	14mm Bore Compression Fitting ¼" NPT
RR136319	16mm Bore Compression Fitting ¼" NPT
RR136320	19mm Bore Compression Fitting ¼" NPT
RR136327	PTFE Blanking Plug ¼" NPT
RR136328	PTFE Blanking Plug ¾" NPT

### Standard Reaction Vessels Only

RR130250	250ml Single Jacketed Vessel
RR130255	250ml Vacuum Jacketed Vessel
RR130500	500ml Single Jacketed Vessel
RR130550	500ml Vacuum Jacketed Vessel
RR131000	1000ml Single Jacketed Vessel
RR131050	1000ml Vacuum Jacketed Vessel
RR132000	2000ml Single Jacketed Vessel
RR132050	2000ml Vacuum Jacketed Vessel
RR133000	3000ml Single Jacketed Vessel
RR133050	3000ml Vacuum Jacketed Vessel
RR135000	5000ml Single Jacketed Vessel
RR135050	5000ml Vacuum Jacketed Vessel

### PTFE Stirrer Shafts (for Standard Vessels)

RR150250	Anchor PTFE Stirrer Shaft - 250ml vessels
RR150255	Retreat Curve PTFE Stirrer Shaft - 250ml vessels
RR150260	Turbine PTFE Stirrer Shaft - 250ml vessels
RR150500	Anchor PTFE Stirrer Shaft - 500ml vessels
RR150505	Retreat Curve PTFE Stirrer Shaft - 500ml vessels
RR150510	Turbine PTFE Stirrer Shaft - 500ml vessels
RR151000	Anchor PTFE Stirrer Shaft - 1000ml vessels
RR151005	Retreat Curve PTFE Stirrer Shaft - 1000ml vessels
RR151010	Turbine PTFE Stirrer Shaft - 1000ml vessels
RR152000	Anchor PTFE Stirrer Shaft - 2000ml vessels
RR152005	Retreat Curve PTFE Stirrer Shaft - 2000ml vessels
RR152010	Turbine PTFE Stirrer Shaft - 2000ml vessels
RR153000	Anchor PTFE Stirrer Shaft - 3000ml vessels
RR153005	Retreat Curve PTFE Stirrer Shaft - 3000ml vessels
RR153010	Turbine PTFE Stirrer Shaft - 3000ml vessels
RR155000	Anchor PTFE Stirrer Shaft - 5000ml vessels
RR155005	Retreat Curve PTFE Stirrer Shaft - 5000ml vessels
RR155010	Turbine PTFE Stirrer Shaft - 5000ml vessels

### Process Reaction Vessels Only

RR130102	100ml Single Jacketed Process Vessel
RR130152	100ml Vacuum Jacketed Process Vessel
RR130252	250ml Single Jacketed Process Vessel
RR130257	250ml Vacuum Jacketed Process Vessel
RR130502	500ml Single Jacketed Process Vessel
RR130552	500ml Vacuum Jacketed Process Vessel
RR131002	1000ml Single Jacketed Process Vessel
RR131052	1000ml Vacuum Jacketed Process Vessel
RR132002	2000ml Single Jacketed Process Vessel
RR132052	2000ml Vacuum Jacketed Process Vessel
RR133002	3000ml Single Jacketed Process Vessel
RR133052	3000ml Vacuum Jacketed Process Vessel
RR135002	5000ml Single Jacketed Process Vessel
RR135052	5000ml Vacuum Jacketed Process Vessel

### PTFE Stirrer Shafts (for Process Vessels)

RR150102	Anchor PTFE Stirrer Shaft - 100ml Process Vessels
RR150107	Retreat Curve PTFE Stirrer Shaft - 100ml Process Vessels
RR150112	Turbine PTFE Stirrer Shaft - 100ml Process Vessels
RR150252	Anchor PTFE Stirrer Shaft - 250ml Process Vessels
RR150257	Retreat Curve PTFE Stirrer Shaft - 250ml Process Vessels
RR150262	Turbine PTFE Stirrer Shaft - 250ml Process Vessels
RR150502	Anchor PTFE Stirrer Shaft - 500ml Process Vessels
RR150507	Retreat Curve PTFE Stirrer Shaft - 500ml Process Vessels
RR150512	Turbine PTFE Stirrer Shaft - 500ml Process Vessels
RR151002	Anchor PTFE Stirrer Shaft - 1000ml Process Vessels
RR151007	Retreat Curve PTFE Stirrer Shaft - 1000ml Process Vessels
RR151012	Turbine PTFE Stirrer Shaft - 1000ml Process Vessels
RR152002	Anchor PTFE Stirrer Shaft - 2000ml Process Vessels
RR152007	Retreat Curve PTFE Stirrer Shaft - 2000ml Process Vessels
RR152012	Turbine PTFE Stirrer Shaft - 2000ml Process Vessels
RR153002	Anchor PTFE Stirrer Shaft - 3000ml Process Vessels
RR153007	Retreat Curve PTFE Stirrer Shaft - 3000ml Process Vessels
RR153012	Turbine PTFE Stirrer Shaft - 3000ml Process Vessels
RR155002	Anchor PTFE Stirrer Shaft - 5000ml Process Vessels
RR155007	Retreat Curve PTFE Stirrer Shaft - 5000ml Process Vessels
RR155012	Turbine PTFE Stirrer Shaft - 5000ml Process Vessels

# AVA Lab Control Software - *take control of your chemistry*

## Control multi-device jacketed reaction system

### Multi-device reactions

- Control up to 4 reaction systems with up to 16 devices on one screen
- Create complex experiments with any number of steps in series or in parallel
- Pre-program multi-step recipe, with the flexibility to make and track on-the-fly adjustments
- Interlink devices and set feedback/control loops, end-point conditions and safety limits

### No more manual data logging or manual errors

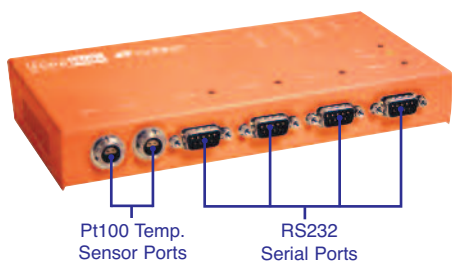
- Automatically record reaction parameters and log what you do, as you do it
- Repeat experiments accurately for reproducible and consistent results
- Create reports in a few clicks or export data as a CSV file for further analysis
- Share results between users to improve research and collaboration

### Safe unattended chemistry

- Automate cooling during exothermic events
- Link devices such as balances and pumps for controlled, unattended reagent additions
- Define safety overrides and cut-off conditions
- Configure audio and visual alarms

### Data Hub

Using the Data Hub, AVA can control and log multiple 3rd party devices with RS232 serial interface.



### Data Hub Specifications

- 4 x RS232 ports
- 2 x Pt100 temperature sensor ports with LEMO connection
- 1 x Ethernet port
- 2 x Ethernet cables

### AVA Software Kit includes:

- AVA Software
- Laptop controller
- 4 Port data hub
- 1 year AVA Care Support

### AVA Care Support

- Free support for 1st year
- Free priority email and telephone support
- Free set up and application support
- Free software updates during support period, keeping software current

## Download and try the software for FREE

Learn how AVA software works - try before you buy

- Simulate control of devices
- Set up apparatus and control experimental Schedules
- Share setups and schedules with other AVA users
- Analyse results and create reports for real or simulated data
- Find out more about AVA Level 1-3 on our website

Download  
Free AVA  
Demo  
[www.radleys.com](http://www.radleys.com)



### Level 4



Control and log reaction systems with multiple devices

### Control a variety of devices

AVA software includes a library of pre-configured driver files allowing easy integration with a wide range of 3rd party devices.

Radleys also provide a 'New Driver Configuration Service' if required.



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Radleys provides innovative chemistry equipment for safer, cleaner, greener and more productive chemical research.

We have been manufacturing scientific glassware and laboratory instruments for over 50 years and our customers include leading blue-chip industrial and academic research facilities around the world. Our areas of expertise are focused on equipment for chemical synthesis, process development, work-up and evaporation.

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