

Carousel 12 Plus™ Reaction Station

Simultaneously heats/cools,
stirs and refluxes multiple
samples under an
inert atmosphere

Faster
More efficient
Easier to use
Modular

Cost effective
personal parallel
synthesis station for
solution phase chemistry
and solid supported
reagent based
synthesis



Carousel 12 Plus Reaction Station...

The unique patented Carousel simultaneously heats/cool, stirs and refluxes multiple samples under an inert atmosphere...



Optional Temperature Controller with fuzzy logic microprocessor and Pt1000 probe controls heating without overshooting. Accuracy $\pm 0.5^{\circ}\text{C}$.

Easy to operate and set-up with minimal training time. No electrical or moving parts ensures maintenance free operation.

Avoid post Synthesis bottlenecks with the complimentary Carousel Work-Up Station. Visit www.radleys.com to find out more.

Provides 12 heated and stirred glass reactor positions, with a reaction volume of 5 to 20ml (1ml with the reduced volume tubes).

NEW Viewing slots allow easier viewing of tube contents. Easy to rotate round design gives access to all tubes with no need to lean into the fume cupboard.

NEW Carousel Stand is ideal for use between reactions, when changing tubes and for reactions that require rapid air cooling.

Fluoropolymer insulation plate provides faster heating and energy savings of up to 36%

NEW Unique removable fluoropolymer insulation plate helps insulate the heated base for faster heating and energy savings of up to 36%.



Central Quick Release inlet/outlet for vacuum and gas, combined with a radial gas distribution system and gas-tight fluoropolymer caps allow reactions under an inert atmosphere.



NEW Chemically resistant Easy-On fluoropolymer caps feature a quick-thread for fast attachment to the glass tubes and push-on connections to the stainless steel gas outlets.



Quick release water couplings with cut-off valves for ease of connection/removal of cooling water supply to reflux/inerting head.

NEW Fluoropolymer coating for heightened chemical resistance and easy cleaning.

NEW Heated base design improves heat transfer and provides energy savings.
Maximum operating temperature 180°C (220°C for short periods).

Rare earth cross shaped stirring bars for more vigorous stirring and a deeper vortex, without jamming.



Utilises the single rotating magnetic field of the stirring hotplate to stir all the positions evenly and powerfully.

NEW Carousel Tech Stirring Hotplate offers higher temperatures, more powerful stirring and digital control.

Compact size with a small bench-top footprint - easy to store.



Carousel Movie

Visit www.radleys.com to watch the demonstration.



Fits on a standard Carousel stirring hotplate, so utilising existing and readily available technology.



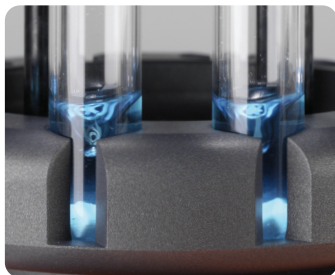
NEW removable water cooled aluminium reflux/inerting head provides efficient refluxing within individual reaction tubes.



NEW Transfer the reflux/inerting head to the Cooled Carousel for cooling to -78°C.

Carousel features and benefits...

The improved Carousel 12 Plus Reaction Station retains all of its popular features but with a host of new innovations making it even better...



Cost effective personal synthesis station for parallel solution phase chemistry and solid supported reagent based synthesis...

The innovative Carousel 12 Plus is quick to set-up and easy to use; providing heating/cooling, stirring and refluxing with inert gas control of 12 glass reaction tubes (1 to 20ml) simultaneously.

Whether using a single position or all 12, the Carousel is the neat and efficient way to perform your chemistry in the most productive manner. The Carousel provides all the productivity benefits offered by parallel synthesis techniques, but at a fraction of the cost of more expensive, automated systems.



Rapid, efficient heating...

Using the Carousel Tech Stirring Hotplate, the Carousel will simultaneously heat up to 12 reactions from ambient to 180°C (220°C for shorter periods) with an accuracy of $\pm 0.5^\circ\text{C}$. Temperature can be controlled using the hotplate's integral digital control or alternatively a greater level of accuracy and expanded safety features are available by plugging in the Carousel Temperature Controller.

The RR91210 Carousel Temperature Controller allows you to control your reactions by block or solution temperature. Either insert the temperature probe into the block or through the Suba-Seal in the cap, directly into the reaction mixture.



Powerful, even stirring...

The Carousel's patented design ensures powerful and equal stirring in all 12 reaction tubes. By positioning the tubes and magnetic stirrer bars equi-distance from the stirring hotplate's centrally located magnet, the Carousel ensures that all tubes are stirred at the same speed. This simple design coupled with a range of high performance stirring bars provides powerful magnetic stirring from 30 to 1400rpm.

Efficient refluxing...

The Carousel has an integral water cooled reflux/inerting head that provides efficient cooling to all tubes minimising solvent evaporation and loss. Water circulates inside the reflux head creating a cooling zone within the upper part of each tube, where vapours cool and condense back into the reaction, removing the need for numerous tall and fragile glass condensers. Quick-release water couplings with integral shut-off valves aid the connection/removal of the water supply and minimise leakages.

Operate under an inert atmosphere...

An integral radial gas distribution system in the Carousel reflux/inerting head combines with individual gas tight Easy-On fluoropolymer caps, which screw directly onto each reaction tube, to distribute inert gas to all 12 tubes. To purge the tubes simply connect the central gas inlet, via flexible tubing, to a two-way stopcock; then by alternating between vacuum and inert gas the tubes are quickly purged of unwanted air. This easy-to use inerting feature is ideal for reactions requiring an air or moisture free environment.



Faster
More efficient
Easier to use
Modular





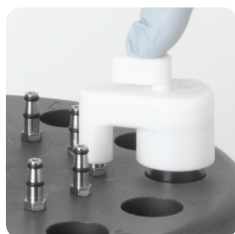
NEW Easily view your reaction...

The Carousel 12 Plus features viewing slots in the heated base that allow an excellent view of your tube contents during synthesis. The vertical slots allow natural light into your reaction so you can see any changes of state, and be certain your stirring is adequate. The Carousel's circular design allows you to easily rotate the unit providing access to all the tubes without having to lean into the fumehood.



NEW Easy-On fluoropolymer caps...

The fluoropolymer reaction caps are an essential component of the Carousel system. Manufactured from a chemically resistant fluoropolymer the caps are attached to the reaction tube using a quick-thread and feature an Easy-On push connection to the radial gas system. The caps include an on/off valve for isolation and removal from the inert gas system. A replaceable silicone Suba-Seal septum allows the addition or removal of samples or reagents from the tube using a suitable syringe.



Chemically resistant Easy-On fluoropolymer caps feature push-on connections to the stainless steel gas outlets.

Durable glass reaction tubes...

The Carousel's glass reaction tubes are manufactured from the highest quality, heavy walled borosilicate glass. The tubes are precision engineered to maximise the effectiveness of the temperature transfer from the heated base and cooled reflux head; ensuring that all tubes are heated and cooled at the same rate. The standard tubes have a reaction volume of 5 to 20ml and the reduced volume tubes have a reaction volume of 1 to 5ml.



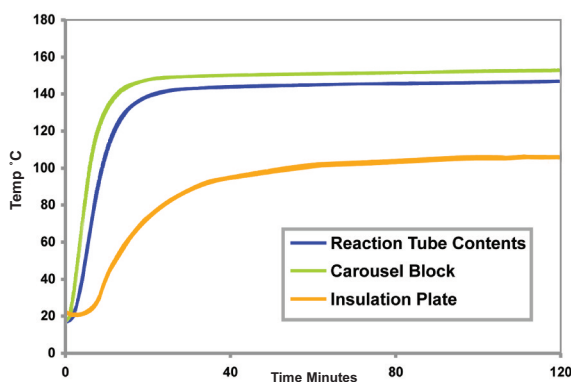
NEW Insulating plate improves heating and energy efficiency...

The Carousel now features a unique fluoropolymer insulating plate which helps retain thermal energy for faster heating and energy efficiency. The 2-piece plate sits over the Carousel's heated base and acts as a barrier to heat loss; studies show the Carousel uses 36% less energy reaching the same temperatures than its predecessor. The plate also helps protect the user from temperature extremes.



Insulating Plate, Carousel Block & Reaction Tube Contents

10ml TEG with Carousel Stirring Hotplate set at 162°C



Central quick release inlet/outlet for vacuum and gas allow reactions under an inert atmosphere.

NEW Removable reflux/inerting head...

The Carousel features an innovative removable reflux/inerting head that allows the removal of the head with the tubes in situ. This allows the reflux/inerting head to be easily transferred between the heated base, the stand or the cooling reservoir, providing the user with maximum flexibility.



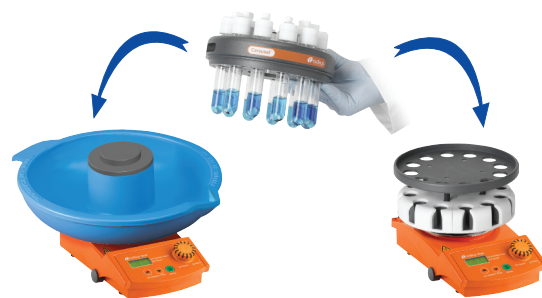
NEW Chemically resistant fluoropolymer coating...

The Carousel's fluoropolymer coating offers heightened chemical resistance, minimises the effects of chemical attack and makes the surface easier to clean and keep free from contamination.



Cooled Carousel 12 Plus...

Offering cost effective low temperature parallel synthesis from ambient down to -78°C...



HDPE lid keeps reactions cooler for longer

Upgrade your Carousel to perform cooled chemistry...

The innovative Cooled Carousel 12 Plus reservoir is designed to accept the removable reflux/inerting head from the Carousel 12 Plus; allowing the reaction tubes to be easily and rapidly transferred between heating and cooling bases.

- Simultaneously performs up to twelve cooled and stirred reactions to -78°C, with a working volume of 1ml to 20ml per tube.
- Reservoir fits directly on to the Carousel stirring hotplate in place of the Carousel's heated base.
- Reservoir is fabricated from robust HDPE and is compatible with a wide range of cooling mixtures, including dry-ice/acetone for manual cooling from ambient down to -78°C.
- Utilises the single rotating magnetic field of the stirring hotplate to stir all the positions evenly and powerfully.
- Features a non-drip spout and ergonomically designed handle for easy disposal of waste solvents.
- Insulated foam core maintains low temperatures for long periods, whilst protecting the stirrer from freezing. Also reduces condensation and ice formation on outer surfaces.
- HDPE lid keeps your reaction cooler for longer, minimises condensation and ice formation on your tubes (maintaining visibility of the contents) and prevents spitting from the cooling mixture.

Carousel Stirring Hotplates...



Standard

Tech

Advanced

The popular Carousel Tech Stirring Hotplate (RR91202) offers a unique combination of performance, control and safety at an affordable price and is the recommended hotplate for use with the Carousel 12 Plus. The Carousel Tech is offered as standard with all Carousel 12 Plus systems.

Two additional stirring hotplate models are now also available. These are the:-

- Carousel Standard Stirring Hotplate RR91200 for basic analogue heating and stirring control.
- Carousel Advanced Stirring Hotplate RR91204 with digital control, RS232 and added safety features.



RR91210 Carousel Temperature Controller

	Carousel Standard	Carousel Tech	Carousel Advanced
Cat No.	RR91200	RR91202	RR91204
Speed, max (rpm)	1400	1400	1400
Display	-	Digital	Digital
Analogue/digital interface	-	-	RS232
Heating power (W)	800 (600 for 115V)	800 (600 for 115V)	800 (600 for 115V)
Hotplate temperature (°C)	20 - 300	20 - 300	20 - 300
Accuracy temperature setting (K)	± 5	± 1	± 1
External temperature sensor	Carousel Temperature Controller	Carousel Temperature Controller	Integral Pt1000
Temp. accuracy with external temp. sensor (K)	± 1	± 1	± 0.2
Temperature control	Electronic	Electronic	Microprocessor
Safety circuit hotplate (°C)	25°C over hotplate temperature	25°C over hotplate temperature	10 - 25°C over nominal temperature
Plate diameter (mm)	ø 135	ø 135	ø 135
Plate material	Silumin with ceramic coating	Silumin with ceramic coating	Silumin with ceramic coating

Carousel Temperature Controller...

The microprocessor controlled Temperature Controller RR91210 features fuzzy logic technology designed for rapid heating without overshooting. The integral Pt1000 sensor can be inserted into the Carousel base or for control by solution temperature, through the septa in the cap, directly into the sample. Units feature an easy-to-read digital display for set and actual temperature. Temperature Controller includes plastic support clips, RR71125 Temp Sensor Support Rod and RR71120 Support Rod Hotplate Adapter.

Carousel Temp. Controller	
Cat No.	RR91210
Temperature range	-50 to +300°C
Resolution	0.1°C
Accuracy	± 1°C
Control Accuracy	± 0.5°C
Metal Sensor	Pt1000, V2A
Sensor Length	210mm

Accessories...

Support stand, magnetic stirring bars, septa, reaction tubes, caps and tube racks...

Support Stand...

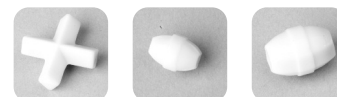
The Carousel Stand **RR91038** is designed to support the reflux/inerting head either with or without reaction tubes. The heavy duty metal stand is fluoropolymer coated for improved chemical resistance and ease of cleaning. The integral drip tray catches any dripping condensation from tubes and gives excellent stability.

- Use between reactions or when loading tubes.



PTFE magnetic stirring bars...

- **RR98091** The popular Medium Cross Shaped Rare Earth Stirring Bar contains strong rare earth magnets, it creates a deep vortex and is ideal for stirring resins and viscous samples.
- **RR98096 & RR98097** Elliptical Rare Earth Stirring Bars facilitate powerful stirring with a good vortex even in viscous samples, available in both small and large sizes.
- **RR98070 & RR98071** Octagonal Stirring Bars are general purpose stirring bars, available in both small and large sizes.
- **RR98075** Small Cross Shaped Stirring Bar creates a vortex at slow speeds.
- **RR98113** Medium Cylindrical Rare Earth Stirring Bar, a small, powerful, general purpose stirring bar.
- **RR98095** Stirring Bar Evaluation Kit contains 3 of each of the above (7 stirring bar styles) allowing you to identify the best stirring bar for your application.
- **RR98094** PTFE Stirring Bar Retriever allows you to retrieve stirring bars from reaction tubes, 350mm long.
- **RR98114** PTFE Stirring Bar Restrainer allows you to restrain your stirring bar with your tube when dispensing liquids.



RR98091

RR98096

RR98097



RR98070

RR98071

RR98075



RR98113



RR98094

Glass reaction tubes and inserts...

These 150mm x 24mm Ø tubes are manufactured from heavy walled borosilicate glass and feature a unique quick-thread for fast attachment to the caps. The RR91080 reaction tubes have a reaction volume of 5 to 20ml and are available in packs of 6 or 12 tubes. The RR91088 reduced volume tube has a working volume of 1 to 5ml (the lower part of these tubes is tapered to 16mm OD). The reduced volume tubes also require the RR91089 aluminium insert to reduce the well size accordingly.

- **RR91080** Quick-Thread Glass Reaction Tube, pk 6
- **RR91081** Quick-Thread Glass Reaction Tube, pk 12
- **RR91088** Quick-Thread Reduced Volume Reaction Tube, pk 6
- **RR91089** Carousel 12 Plus Reduced Volume Aluminium Inserts, pk 6



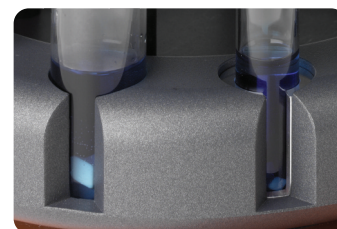
Fluoropolymer caps and glass tubes provide an inert, gas tight seal



Easy-On fluoropolymer reaction caps...

Manufactured from chemically resistant fluoropolymer the caps are attached to the reaction tube using a quick thread and feature an Easy-On push connection to the radial gas system. The RR91070 caps feature a Suba-Seal septa and on/off valve for isolation and removal from the inert gas system. The RR91072 Easy-On storage cap features the quick-thread and Suba-Seal septa but with no sidearm or valve. Caps feature a replaceable Nitrile o-ring with an optional Viton replacement.

- **RR91070** Easy-On Cap with valve, pk 6
- **RR91072** Easy-On Storage Cap, pk 6



Silicone and Viton Suba-Seals...

Reaction caps feature a replaceable septa that allows the addition of reagents or removal of samples using a syringe. All septa are silicone as standard but a Viton alternative is also available.

- **RR98076** Silicone Suba-Seal for caps, pk 100
- **RR98176** Viton Suba-Seal for caps, pk 100



Tube racks - zinc plated wire...

- **RR98901** Zinc Plated Wire Rack for 36 x 24mm Tubes
- **RR98902** Zinc Plated Wire Rack for 40 x 24mm Tubes
- **RR98903** Zinc Plated Wire Rack for 80 x 24mm Tubes

Lab Marker pen...

Ideal for marking glass, metal and plastics. Writes on wet or dry surfaces.

- **RR98906** Black Lab Marker, pk 10



Carousel 12 Plus Systems

Everything you need in convenient easy to order systems...

Carousel 12 Plus - Basic System 1

RR91091	Carousel 12 Plus Basic System
	1 x RR91030 Carousel 12 Plus Reaction Station
	1 x RR91080 Quick-Thread Glass Reaction Tube, pk 6
	1 x RR91081 Quick-Thread Glass Reaction Tube, pk 12
	2 x RR91070 Easy-On Fluoropolymer Cap, pk 6
	1 x RR98070 Octagonal Stirring Bar 13mm, pk 20
	1 x RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
	1 x RR98094 PTFE Magnetic Stirring Bar Retriever 350mm
	1 x RR98095 PTFE Magnetic Stirring Bar Evaluation Kit, pk 30
	1 x RR98076 Silicone Suba Seals for All Caps, pk 100
	1 x RR98901 Zinc Plated Wire Rack for 36 x Tubes

Carousel 12 Plus - Standard System 2 (with stand, stirring hotplate and temp. controller)

RR91092	Carousel 12 Plus Standard System
	1 x RR91030 Carousel 12 Plus Reaction Station
	1 x RR91080 Quick-Thread Glass Reaction Tube, pk 6
	1 x RR91081 Quick-Thread Glass Reaction Tube, pk 12
	2 x RR91070 Easy-On Fluoropolymer Cap, pk 6
	1 x RR98070 Octagonal Stirring Bar 13mm, pk 20
	1 x RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
	1 x RR98094 PTFE Magnetic Stirring Bar Retriever 350mm
	1 x RR98095 PTFE Magnetic Stirring Bar Evaluation Kit, pk 30
	1 x RR98076 Silicone Suba Seals for All Caps, pk 100
	1 x RR98901 Zinc Plated Wire Rack for 36 x Tubes
	1 x RR91038 Carousel 12 Plus Stand
	1 x RR91202 Carousel Stirring Hotplate 230v UK Plug
	1 x RR91210 Carousel Temperature Controller

Carousel 12 Plus - Complete System 3 (heated and cooled system)

RR91093	Carousel 12 Plus Complete System
	1 x RR91030 Carousel 12 Plus Reaction Station
	1 x RR91080 Quick-Thread Glass Reaction Tube, pk 6
	1 x RR91081 Quick-Thread Glass Reaction Tube, pk 12
	2 x RR91070 Easy-On Fluoropolymer Cap, pk 6
	1 x RR98070 Octagonal Stirring Bar 13mm, pk 20
	1 x RR98091 Cross Shape Stirring Bar 16.5mm RE, pk 20
	1 x RR98094 PTFE Magnetic Stirring Bar Retriever 350mm
	1 x RR98095 PTFE Magnetic Stirring Bar Evaluation Kit, pk 30
	1 x RR98076 Silicone Suba Seals for All Caps, pk 100
	1 x RR98901 Zinc Plated Wire Rack for 36 x Tubes
	1 x RR91038 Carousel 12 Plus Stand
	1 x RR91202 Carousel Stirring Hotplate 230v UK Plug
	1 x RR91210 Carousel Temperature Controller
	1 x RR91040 Carousel 12 Plus Cooling Reservoir & Lid
	1 x RR99905 Digital Thermometer (-250C to +400C) & 200mm Probe
	1 x RR99908 Dry Ice Scoop

Choose the system above if you want to perform heated and cooled reactions...

Carousel 12 Plus

Carousel 12 Plus Heated

RR91030	Carousel 12 Plus Reaction Station
	1 x RR91032 Carousel 12 Plus Reflux/Inerting Head
	1 x RR91034 Carousel 12 Plus Heating Base
	1 x RR91036 Carousel 12 Plus Insulating Plates, pair

Carousel 12 Plus Cooled

RR91040	Carousel 12 Plus Cooling Reservoir and Lid
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Carousel 12 Plus Components

RR91032	Carousel 12 Plus Reflux/Inerting Head
RR91034	Carousel 12 Plus Heating Base
RR91036	Carousel 12 Plus Insulating Plates, pair
RR91038	Carousel 12 Plus Stand
RR91041	Carousel 12 Plus Cooling Lid

Carousel
Systems
All the items you need
in a clear easy to
order kit

Carousel 12 Plus Accessories & Spare Parts

Caps & Tubes

RR91070	Easy-On Fluoropolymer Cap, pk 6
RR91072	Easy-On Fluoropolymer Storage Cap, pk 6
RR98076	Silicone Suba-Seals for All Caps, pk 100
RR98176	Viton Suba-Seals for All Caps, pk 100
RR91080	Quick-Thread Glass Reaction Tube 24 ø x 150mm, pk 6
RR91081	Quick-Thread Glass Reaction Tube 24 ø x 150mm, pk 12
RR91088	Quick-Thread Reduced Volume Tube 24 ø x 150mm, pk 6
RR91089	Carousel 12 Plus Reduced Volume Inserts, pk 6

PTFE Magnetic Stirring Bars

RR98070	Octagonal Stirring Bar 13mm, pk 20
RR98071	Pivot Ring Stirring Bar 12 x 6mm, pk 40
RR98075	Cross Shape Stirring Bar 10mm, pk 40
RR98091	Cross Shape Stirring Bar 16.5mm RE, pk 20
RR98096	Elliptical Stirring Bar 10mm RE, pk 40
RR98097	Elliptical Stirring Bar 15mm RE, pk 20
RR98113	Cylindrical Stirring Bar 12mm RE, pk 20
RR98094	PTFE Magnetic Stir Bar Retriever 350mm
RR98095	PTFE Magnetic Stir Bar Evaluation Kit, pk 30
RR98114	Stirring Bar Restrainer

Stirring Hotplates

RR91202	Carousel Tech Stirring Hotplate 230v UK Plug
RR91202/EURO	Carousel Tech Stirring Hotplate 230v Euro Plug
RR91202/JAP	Carousel Tech Stirring Hotplate 110v Japanese Plug
RR91202/SWISS	Carousel Tech Stirring Hotplate 240v Swiss Plug
RR91202/USA	Carousel Tech Stirring Hotplate 115v US Plug

Other Stirring Hotplate models are available on request...

Temperature Controller

RR91210	Carousel Temperature Controller
<i>Includes RR71125 Temp Sensor Support Rod and RR71120 Support Rod Hotplate Adapter</i>	
RR71125	Temp Sensor Support Rod
RR71120	Support Rod Hotplate Adapter

Racks & Other Accessories

RR98901	Zinc Plated Wire Rack for 36 x 24mm Tubes
RR98902	Zinc Plated Wire Rack for 40 x 24mm Tubes
RR98903	Zinc Plated Wire Rack for 80 x 24mm Tubes
RR98906	Black Lab Marker, pk 10

Spare Parts & Replacement O-rings

RR98160	O-Rings for Caps - Viton 24mm, pk 100
RR98060	O-Rings for Caps - Nitrile 24mm (standard), pk 100
RR91060	Nitrile O-Rings 4mm Gas Outlet - Bottom, pk 50
RR91061	Nitrile O-Rings 3mm Gas Outlet - Top, pk 50
RR91062	Viton O-Rings 4mm Gas Outlet - Bottom, pk 50
RR91063	Viton O-Rings 3mm Gas Outlet - Top, pk 50
RR91065	Quick Release Male Body Coupling No Shut-off
RR91066	Quick Release Barbed Coupling No Shut-off
RR99062	Quick Release Barbed Coupling + Shut-off, pk 2
RR99063	90 Elbow Quick Release Barbed Coupling + Shut-off, pk 2
RR99065	Quick Release Male Body Coupling + Shut-off, pk 2

Cooled Carousel 12 Plus Accessories

RR99905	Digital Thermometer (-250C to +400C) and 200mm Probe
RR99906	Digital Thermometer (-250C to +400C)
RR99907	200mm Temperature Probe
RR99908	Dry Ice Scoop
RR99909	Cold Temperature Apron 1060mm long, Waterproof
RR99910	Protective Face Shield
RR98024	Protective Cold Temperature Gloves
RR71505	Cooling Protection Kit
	1 x RR99909 Cold Temperature Apron 1060mm long, Waterproof
	1 x RR99910 Protective Face Shield
	1 x RR98024 Protective Cold Temperature Gloves

Improving the productivity of your chemistry...

Radleys have been manufacturing scientific glassware and laboratory instruments for over 40 years. Our customers include leading industrial and academic research facilities around the world. In the rapidly changing world of science, we are working hard to respond to the needs of our customers by investing in new product development that will allow them to remain at the forefront of chemistry research. Our specific areas of expertise are focused on equipment for chemistry synthesis, process development, work-up and evaporation.

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