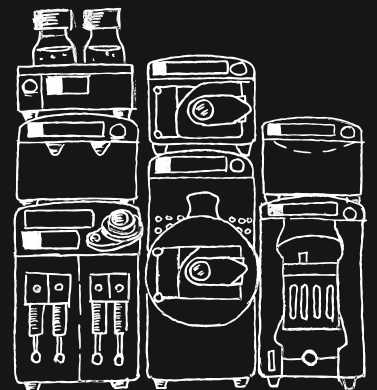




**SYRRIS**

Asia

# System specifications



# Asia

Asia is a revolutionary range of award-winning flow chemistry products from Syrris. It has been designed by chemists for chemists to enable the widest variety of chemical reactions and ultimate ease of use.

The proprietary technology allows manually controlled or fully automated experiments. Asia offers maximum chemical resistance with an extensive range of temperatures,

pressures, and reaction times on scales from mg to kg.

Asia has received an R&D 100 Award, this recognizes Asia's advanced functionalities, ease of use and applicability to an extremely wide range of chemistries.

[syrris.com/asia](http://syrris.com/asia)



# Main features

Asia is a modular range of flow chemistry systems, available in either regular or advanced configurations for both beginners with modest budgets and experts who demand the utmost functionality. The unique benefits of flow chemistry make it a suitable tool for a wide range of applications. Syrris has pre-configured systems for specific applications.




1. **Multiple reaction setups**
2. **Precise reaction control**
3. **Wider range of chemistry**
4. **Smooth and accurate pumping**
5. **Continuous reaction work-up and analysis**
6. **Discover new chemistry**



“ I have worked with flow chemistry for 15 years. Asia is the most advanced system available which enables me to perform chemistry I previously couldn't.”  
Andrew Mansfield, Asia Product Manager

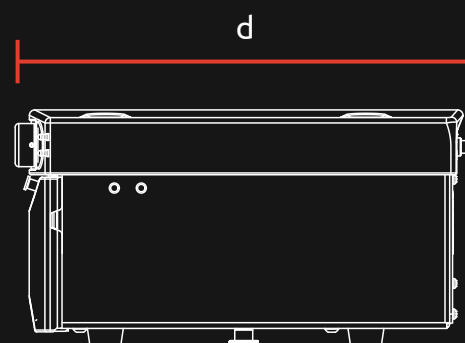
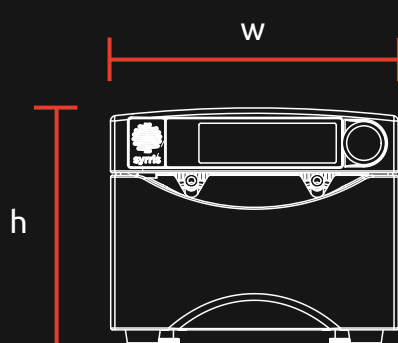


# Specifications

	Flow rate	1 $\mu\text{L}/\text{min}$ to 10 $\text{mL}/\text{min}$ per pump channel
	Temp. range	-100 to 250°C
	Pressure range	Up to 20 bar

# Dimensions

	h (mm)	w (mm)	d (mm)
Asia Manager PC Software	N/A	N/A	N/A
Auto RIM	505	160	300
Automated Collector	270	470	300
Chip Climate Controller	130	160	310
Cryo Controller	335	160	455*
FLLEX	130	160	280
FLUX	257	160	495
Heater	255	160	260
Pressurized Input Store	220	160	255
Pressure Controller	130	160	275
Reagent Injector	130	160	260
Sampler and Dillutor	260	160	270
Syringe Pump	260	160	260



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\* Not including measurement of reactor. Dimension will depend on choice of reactor.

# Modules

## Pressurized Input Store

Pressurizes four bottles with an inert gas enabling the use of air sensitive reagents and eliminates cavitation when pumping. Input pressure 1-10 bar, output pressure 1 bar.

## Auto RIM

Includes two independent chemically resistant channels allowing reagents stored in racks of septum capped vials to be automatically aspirated and loaded into injection loops.

## Reagent Injector

2 extremely chemically resistant injection valves with sample loops. 0.1 mL, 1 mL, 5 mL or 10 mL, manual or automated control, 0 to 20 bar. Ideal for rapid reaction optimisation.

## Heater and Chip

This module has adaptors that can be changed in seconds to heat the full asia range of reactors. Temperature range from room temperature to 250°C.

## FLLEX

The Flow Liquid Liquid EXtraction (FLLEX) offers continuous flow aqueous work up. Internal volume 100  $\mu$ L. FLLEX can be used anywhere within the flow setup.

## Pressure Controller

Automatically pressurizes the reaction up to 20 bar (300 psi) for ultra-fast reaction rates and control of gas/liquid reactions.

## Automated Collector

Allows automated collection of multiple reactions in separate vials or vessels. Waste is automatically diverted.

## Asia Manager Software

Easy to use for total 'walk-away' control of the Asia System.

## Syringe Pump

Extremely chemically resistant continuous flow pumps for ultra smooth flow. Flow rate from 1  $\mu$ L/min to 10 mL/min each, 20 bar, pressure sensor.

## Cryo Controller

Rapidly cool a selection of fluoropolymer or stainless steel tube reactors to -70°C or a range of glass or quartz microreactors to -100°C. Requires only mains power, no need for cryogenic media.

## Sampler and Dilutor

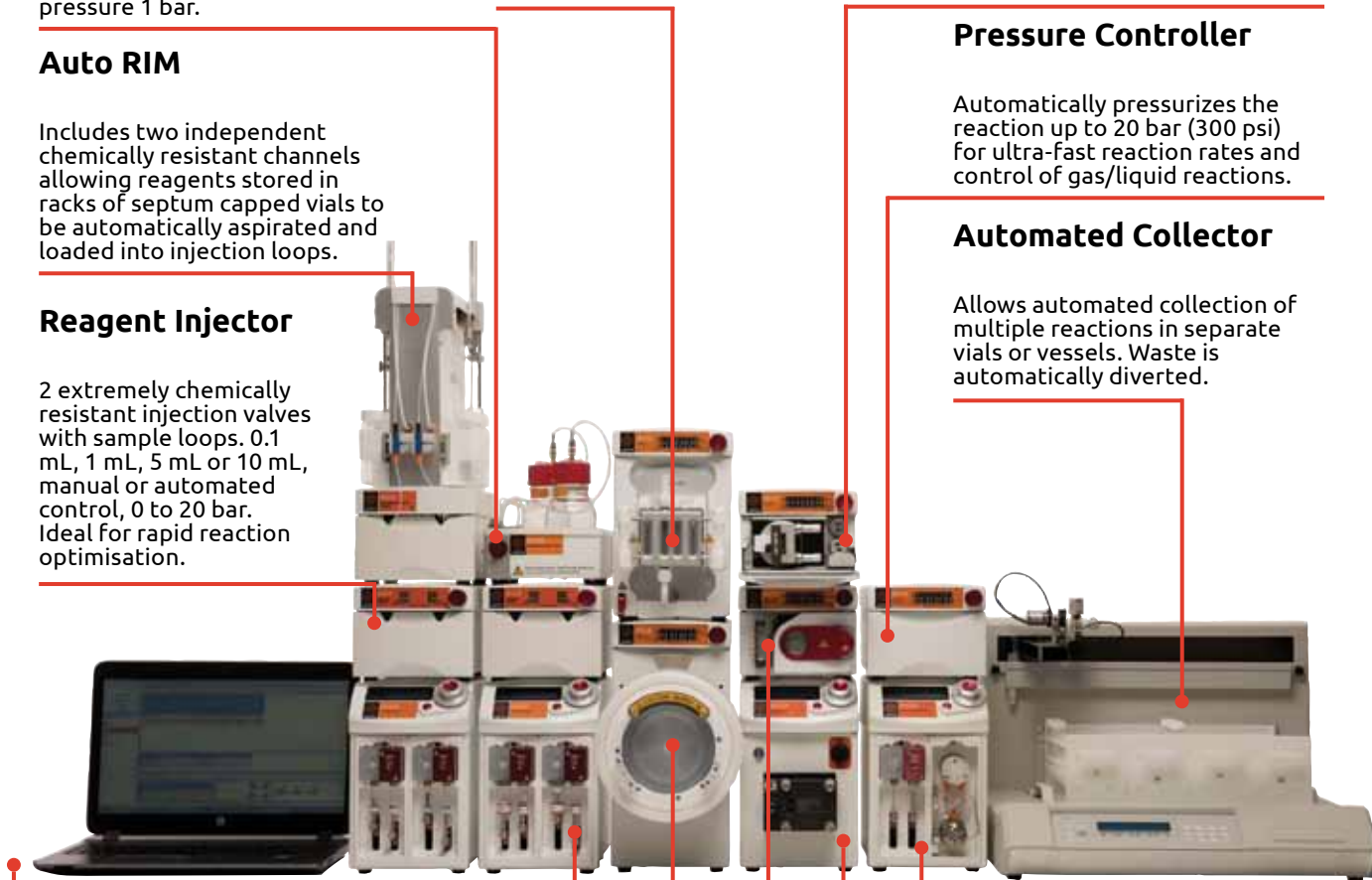
Enables on-line reaction analysis by automated sample extraction, dilution and transfer to an analytical system e.g. LCMS or UPLC. Dilution factor: 5 to 250.

## FLUX - Flow Electrochemistry

Enables a wide range of electrode materials to be changed in seconds. No tools. Includes a power supply and electrochemical flow cell with minimal electrode gap. Internal reaction volume 225  $\mu$ L.

## Chip Climate Controller

Enables glass microreactors to be cooled or heated from -15°C to +150°C - no need for circulator or cold water supply.



# Systems

## Starter System



The Asia Starter Systems are ideal for chemists eager to begin using flow chemistry as well as academics interested in introducing flow chemistry to their group.

The easy-to-use and affordable systems contain all essential flow system parts: an Asia pump, an Asia Chip Climate Controller, a glass microreactor and an Asia Pressure Controller. The systems are future-proof and can be seamlessly upgraded with additional features and modules as the user experience with flow chemistry grows.

	Regular	Advanced
Flow rate	1.0 $\mu\text{L}/\text{min}$ to 10 $\text{mL}/\text{min}^*$	
Pressure (bar)	0 to 20 bar	0 to 20 bar**
System temp. ( $^{\circ}\text{C}$ )	-15 to +150	-15 to +250
Pump channels	2	
Chip reactors	✓	✓
Tube reactors	✗	✓
Column reactors	✗	✓
Electrochemistry	✗	✗
FLUX volume	N/A	N/A
Product collection	✗	MANUAL
Aqueous work-up	✗	✗
Pressurized inputs	✗	✓
Injection valves	✗	2
Auto injection valves	✗	✗
Analysis interface	✗	✗
Automation	✗	✗

## Scale-up System



Flow chemistry offers an easy way for scaling up reactions.

Flow reaction parameters can be optimized using a small microreactor on few milligrams before moving onto a large tube reactor system for synthesizing multi-gram quantities of products. The systems enable exploratory reactions to be performed and optimized on a few mgs scale. The manufactured amount can then be increased to kgs per day on the same system, with minimal setup changes.

	Regular	Advanced
Flow rate	1.0 $\mu\text{L}/\text{min}$ to 10 $\text{mL}/\text{min}^*$	
Pressure (bar)	0 to 20 bar**	
System temp. ( $^{\circ}\text{C}$ )	-68 <sup>^</sup> to amb.	-100 to +250
Pump channels	2	4
Chip reactors	✗	✗
Tube reactors	✓	✓
Column reactors	✓	✓
Electrochemistry	✗	✗
FLUX volume	N/A	N/A
Product collection	✗	✗
Aqueous work-up	✗	✓
Pressurized inputs	✓	✓
Injection valves	✗	✗
Auto injection valves	✗	✗
Analysis interface	✗	✓
Automation	✗	✓

- \* Depending on the syringe size.
- \*\* 10 bar when using fluoropolymer tube reactors.
- ^ Depending on cooling solution.

## Nanoparticle System



**Flow chemistry offers exceptional advantages for nanoparticle synthesis which result in narrow particle size distribution and control over shape and architecture.**

The systems offer fast and reproducible mixing, excellent heat transfer and accurate temperature control. The systems are ideal for rapid optimization and production of nanoparticle synthesis.

	Regular	Advanced
Flow rate	1.0 µL/min to 10 mL/min*	
Pressure (bar)	0 to 20 bar**	
System temp. (°C)	+25 to +250	+25 to +250
Pump channels	2	4
Chip reactors	✓	✓
Tube reactors	✓	✓
Column reactors	✗	✗
Electrochemistry	✗	✗
FLUX volume	N/A	N/A
Product collection	MANUAL	AUTO
Aqueous work-up	✗	✗
Pressurized inputs	✓	✓
Injection valves	✗	4
Auto injection valves	✗	✗
Analysis interface	✗	✗
Automation	✗	✓

## Electrochemistry System



**Electrochemical activation of chemical reagents enables selectivity and transformations impossible by other techniques. The Asia Electrochemistry Systems give easy access to electrochemical reactions in continuous flow.**

The Asia Flux module and cell can accommodate a wide range of electrodes, assembled without the need for tools, and users can operate in either constant current (Galvanostatic) mode or constant voltage (Potentiostatic) mode to achieve reductions and oxidations.

	Regular	Advanced
Flow rate	1.0 µL/min to 10 mL/min*	
Pressure (bar)	0 to 5 bar	
System temp. (°C)	0 to +60	
Pump channels	2	4
Chip reactors	✓	✓
Tube reactors	✗	✓
Column reactors	✗	✓
Electrochemistry	✓	✓
FLUX volume	225 µL	225 µL
Product collection	MANUAL	AUTO
Aqueous work-up	✗	✗
Pressurized inputs	✓	✓
Injection valves	2	4
Auto injection valves	✗	✗
Analysis interface	✗	✗
Automation	✗	✓

# Systems

\* Depending on the syringe size.  
 \*\* 10 bar when using fluoropolymer tube reactors.  
 ^ Depending on cooling solution.

## Discovery Chemistry System



**For limited quantities of starting material or expensive reagents, Asia Discovery Chemistry Systems offer setups capable of running flow experiments using very small amounts of reagents.**

Users can design a list of experiments, each requiring just hundreds of microliters of reagents, and run them in sequence. Using a range of modules, the system will automatically inject the required amount for each reaction and collect the resulting solution in a small vial.

	Regular	Advanced
Flow rate	1.0 $\mu\text{L}/\text{min}$ to 10 $\text{mL}/\text{min}$ *	
Pressure (bar)	0 to 20 bar	0 to 20 bar**
System temp. ( $^{\circ}\text{C}$ )	-15 to +150	-100 to +250
Pump channels	2	4
Chip reactors	✓	✓
Tube reactors	✗	✓
Column reactors	✗	✓
Electrochemistry	✗	✗
FLUX volume	N/A	N/A
Product collection	AUTO	AUTO
Aqueous work-up	✗	✓
Pressurized inputs	✓	✓
Injection valves	2	4
Auto injection valves	✗	2
Analysis interface	✗	✗
Automation	✓	✓

## Premium System



**Ideal for chemists who are interested in the utmost functionality and access to the widest range of chemical space.**

The Asia Premium Systems offer a full range of Asia modules and enable standard flow chemistry operations (reaction optimization, scale-up, etc.) as well as advanced use (electrochemistry, multi-step reactions, cryogenic reactions, etc.). These exhaustive systems include the benefits of all the other systems.

	Regular	Advanced
Flow rate	1.0 $\mu\text{L}/\text{min}$ to 10 $\text{mL}/\text{min}$ *	
Pressure (bar)	0 to 20 bar**	
System temp. ( $^{\circ}\text{C}$ )	-100 to +250	
Pump channels	4	6
Chip reactors	✓	✓
Tube reactors	✓	✓
Column reactors	✓	✓
Electrochemistry	✓	✓
FLUX volume	N/A	N/A
Product collection	AUTO	AUTO
Aqueous work-up	✓	✓
Pressurized inputs	✓	✓
Injection valves	4	4
Auto injection valves	✗	2
Analysis interface	✓	✓
Automation	✓	✓