

# Particle Works

## Particle Works Automated Nanoparticle System

Part Number: 7206008

Particle Works designs and builds game-changing particle engineering platforms, allowing you to produce nanoparticles with unrivalled precision, consistency and control which reduces your development time and cost.

Under Dolomite Microfluidics (part of Blacktrace), we've worked with particles for nearly two decades. Now with a dedicated particles brand, our technology enables scientists to formulate faster, be ready for their next breakthrough, and scale up discoveries.

Datasheet

# 1. Description

The Automated Nanoparticle (ANP) System is a microfluidic system designed for the generation of nanoparticles, such as lipid nanoparticles (LNPs) or polymer nanoparticles. It can be operated using Particle Works Flow Control Center Software in order to automate the production of a series of samples using a single pair of manually injected reagents stored in sample loops. By automating the release of fluids from these loops, small volumes of reagent can be accurately converged at a microfluidic chip junction where controlled particle formation occurs. Samples are subsequently collected by an Automated Collector, ready for further workup or analysis.

The system enables users to vary parameters such as total flow rate (TFR), flow rate ratio (FRR) and in-line dilution within the same set of automated experiments, in order to optimise the nanoparticle formation process. Parameters such as the concentration/composition of the formulation, and the chip type/configuration can be varied between automated runs.

The included calibrated tubing kit allows for easy experimentation with of a number of microfluidic chips with different mixing geometries and junction sizes, as well as ensuring that reagent slugs converge at the chip junction and samples are collected accurately and consistently for each experiment run.

The system is comprised of the following modules:

- Quad Pump (x2)
- Pressurized Fluid Store
- Automated Sample Valve
- Automated Collector
- Chip Docking Station



# 2. Benefits

- Enables the automation of a series of nanoparticle synthesis experiments.
- Flexible process parameters.
- Pump at flow rates between 100  $\mu$ l – to 15 ml/min.
- Work at pressures up to 10 bar.
- Automated control over valve timings to ensure precise convergence of reagent slugs.
- Extremely chemical resistant materials to cater to a wide range of fluids.
- Stackable modules for compact system footprint.

# 3. Specifications

<b>Operating Pressure</b>	0 – 10 bar
<b>Flow Rate Ratio</b>	Up to 1:10
<b>Recommended System Flow Rate Range</b>	0.1 – 15 ml/min (chip dependent)
<b>Fluidic Port Sizes</b>	¼"–28, 10–32 and Luer Fittings
<b>Sample Loop sizes</b>	1, 5 and 10 ml
<b>System Dimensions</b>	(H) 60 cm x (W) 90 cm x (D) 60 cm as pictured
<b>Module Weight</b>	60 kg
<b>Maximum Collection Volume</b>	Rack Code 24 can collect 14 x 20 ml (28 x 60 mm scintillation vials)
<b>Minimum Collection Volume</b>	Rack Code 15 can collect 0.3 ml (96-well microplate)
<b>Voltage Input</b>	100 V – 240 V AC, 50–60 Hz
<b>Current Rating</b>	See module datasheets
<b>Working Temperature Range (external)</b>	5 – 40 °C
<b>Maximum Relative Humidity</b>	80 %
<b>Communication</b>	USB by FCC
<b>Pressurized Fluid Store Wetted Materials</b>	Glass, PTFE, ETFE and polypropylene

<b>Quad Pump Wetted Materials</b>	Glass and PTFE, PCTFE, hastelloy and FFKM (white seal)
<b>Automated Sample Valve Wetted Materials</b>	PCTFE, CTFE & PTFE
<b>Chip and Connector Wetted Materials</b>	FKM, FFKM, glass
<b>Automated Collector Wetted Materials</b>	Glass, PTFE, PCTFE, PFA and Titanium
<b>Outer Materials</b>	Aluminium, stainless steel and polyurethane (finished with highly chemically resistant epoxy paint)

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