

## COMPARISON TABLE:

### KNAUER

### BlueShadow Pump 80P series



The Preparative Pump 80P delivers stable and precise solvent flow for semi-preparative as well as preparative HPLC applications. By adding one or more additional pumps, binary, ternary or even quaternary high-pressure gradient systems can be easily configured. The pump can also be equipped with a binary or ternary gradient valve block to configure cost-effective low-pressure gradient systems. Exchangeable pump heads for flow rates up to 1000 ml/min and pressures up to 40 MPa make it possible to easily optimize the pump to changing performance requirements and allow simple maintenance. Available in stainless steel or biocompatible titanium versions, the pump heads enable a wide range of applications.

For more information on this pump range contact us on [info@rubiconscience.com.au](mailto:info@rubiconscience.com.au)

BlueShadow Pump 80P series	100 ml/min Stainless steel pump head P/N APD30KA	100 ml/min Titanium pump head P/N APD60KB	250 ml/min Stainless steel pump head P/N APD30LA	250 ml/min Titanium pump head P/N APD60LC	500 ml/min Stainless steel pump head P/N APD30MA	500 ml/min Titanium pump head P/N APD60MC	1000 ml/min Stainless steel pump head P/N APD30NA	1000ml/min Titanium pump head P/N APD60NB
<b>Max. flow rate</b>	100 ml/min	100 ml/min	250 ml/min	250 ml/min	500 ml/min	500 ml/min	1000 ml/min	1000 ml/min
<b>Flow rate increment</b>	0.01 ml/min	0.01 ml/min	0.01 ml/min	0.01 ml/min	0.01 ml/min	0.01 ml/min	0.1 ml/min	0.1 ml/min
<b>Maximum delivery pressure [psi]</b>	5800 psi	5800 psi	3260 psi	3260 psi	1450 psi	1450 psi	1088 psi	1088 psi
<b>Maximum delivery pressure [MPa]</b>	40 Mpa	40 Mpa	22.5 MPa	22.5 MPa	10 Mpa	10 Mpa	7.5 Mpa	7.5 Mpa
<b>Maximum delivery pressure [bar]</b>	400 bar	400 bar	225 bar	225 bar	100 bar	100 bar	75 bar	75 bar
<b>Pump head materials</b>	Stainless steel	Titanium	Stainless steel	Titanium	Stainless steel	Titanium	Stainless steel	Titanium
<b>Maximum viscosity</b>	100 cp	100 cp	100 cp	100 cp	100 cp	100 cp	100 cp	100 cp
<b>Liquid temperature range</b>	4-60 °C	4-60 °C	4-60 °C	4-60 °C	4-60 °C	4-60 °C	4-60 °C	4-60 °C
<b>Gradient</b>	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)	Isocratic (but optional LPG & HPG blocks)
<b>Leak management</b>	No	No	No	No	No	No	No	No
<b>Wetted materials</b>	GFP (graphite fiber reinforced PTFE), PEEK, FFKM, aluminum oxide (Al2O3), ruby, sapphire, stainless steel	Titanium, GFP (graphite fibre reinforced PTFE), ruby, sapphire, FFKM, aluminium oxide (Al2O3), PEEK	GFP (graphite fiber reinforced PTFE), PEEK, FFKM, aluminum oxide (Al2O3), ruby, sapphire, stainless steel	Titanium, GFP (graphite fibre reinforced PTFE), ruby, sapphire, FFKM, aluminium oxide (Al2O3), PEEK	GFP (graphite fiber reinforced PTFE), PEEK, FFKM, aluminum oxide (Al2O3), ruby, sapphire, stainless steel	Titanium, GFP (graphite fibre reinforced PTFE), ruby, sapphire, aluminium oxide (Al2O3), FFKM, PEEK	GFP (graphite fiber reinforced PTFE), PEEK, FFKM, aluminum oxide (Al2O3), ruby, sapphire, stainless steel	Titanium, GFP (graphite fibre reinforced PTFE), ruby, sapphire, aluminium oxide (Al2O3), FFKM
<b>Pump Features</b>	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming	Piston seal wash, RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor, Standalone control and programming
<b>DETAILED INFORMATION</b>								
<b>Best working conditions</b>	1 - 80 ml/min	1 - 80 ml/min	2.5 - 200 ml/min	2.5 - 200 ml/min	5 - 400 ml/min	5 - 400 ml/min	10 - 800 ml/min	10 - 800 ml/min
<b>Continuous working conditions</b>	1 - 40 ml/min	1 - 40 ml/min	2.5 - 100 ml/min	2.5 - 100 ml/min	5 - 200 ml/min	5 - 200 ml/min	10 - 400 ml/min	10 - 400 ml/min
<b>Flow rate accuracy</b>	± 2 %	± 2 %	± 2 %	± 2 %	± 2 %	± 2 %	± 2 %	± 2 %
<b>Flow rate accuracy conditions</b> (using ethanol/water 10:90)	5 - 50% of flow range	5 - 50% of flow range	5 - 50% of flow range	5 - 50% of flow range	5 - 50% of flow range	5 - 50% of flow range	5 - 50% of flow range	5 - 50% of flow range
<b>Flow rate precision</b> (measured at 1 ml/min using ethanol/water 10:90)	≤ 0.1 % RSD	≤ 0.1 % RSD	≤ 0.1 % RSD	≤ 0.1 % RSD	≤ 0.1 % RSD	≤ 0.1 % RSD	≤ 0.1 % RSD	≤ 0.1 % RSD
<b>HPG: gradient accuracy</b>	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)	± 2 % (5 - 95 %, measured at 5 - 50 % of flow range, water/caffeine tracer)
<b>HPG: gradient precision</b>	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature	1 % RSD, based on retention time at constant room temperature
<b>LPG: gradient accuracy</b>	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)	± 3 % (5 - 95 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)
<b>LPG: gradient precision</b>	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room	2 % RSD, based on retention time at constant room
<b>Active piston seal wash</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Piston seal washing</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Pump outlet thread</b>	Female M8 x 1 (coned)	Female M8 x 1 (coned)	Female M8 x 1 (coned)	Female M8 x 1 (coned)	Female M8 x 1 (coned)	Female M8 x 1 (coned)	Female M8 x 1 (coned)	Female M8 x 1 (coned)
<b>Pump head inlet (standard)</b>	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)	M8 x 1 (flat bottom)
<b>Pump head outlet (standard)</b>	M8 x 1 (coned)	M8 x 1 (coned)	M8 x 1 (coned)	M8 x 1 (coned)	M8 x 1 (coned)	M8 x 1 (coned)	M8 x 1 (coned)	M8 x 1 (coned)
<b>COMMUNICATION</b>								
<b>Interfaces</b>	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)	Keypad; LAN; RS-232; pin header connectors (events control and remote control)
<b>Control</b>	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector	Stand-alone via keypad; digital via LAN or RS-232; analog via remote control pin header connector
<b>Inputs</b>	Flow rate	Flow rate	Flow rate	Flow rate	Flow rate	Flow rate	Flow rate	Flow rate
<b>Outputs</b>	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)	Pressure; 8 event outputs (TTL, OC, relays)
<b>Analog inputs</b>	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V	0 - 10 V
<b>Analog outputs</b>	1, 2 or 5 V	1, 2 or 5 V	1, 2 or 5 V	1, 2 or 5 V	1, 2 or 5 V	1, 2 or 5 V	1, 2 or 5 V	1, 2 or 5 V
<b>GENERAL</b>								
<b>Power supply</b>	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz	100 - 240 V; 50 - 60 Hz
<b>Dimensions</b>	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)	242 x 191 x 407 mm (W x H x D)
<b>Weight</b>	13.2 kg	13.2 kg	13.2 kg	13.2 kg	13.2 kg	13.2 kg	13.2 kg	13.2 kg
<b>Leak sensor</b>	No	No	No	No	No	No	No	No
<b>Ambient Conditions</b> air humidity below 90 % humidity (non-condensing)	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C	10 - 40 °C
<b>Note</b>	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.	Accessory Kit includes PTFE tubing and PETP bushing/sealing ring for standard applications. For applications with aggressive solvents, PEEK or stainless steel parts are available.

