



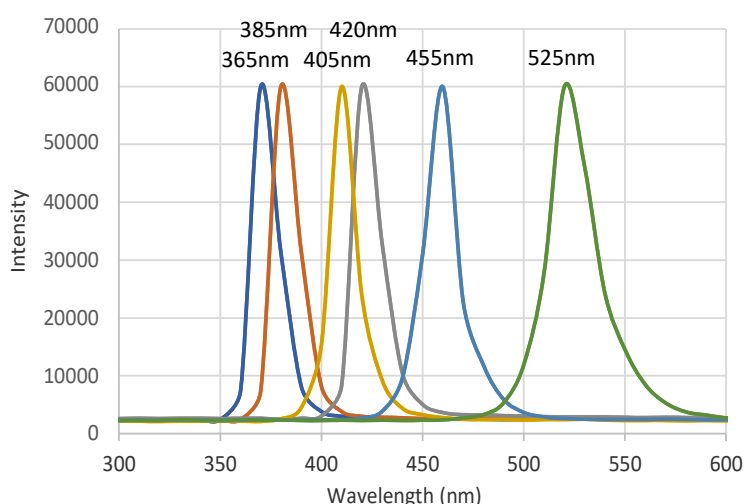
Borealis Flow™

Cost-effective LED photoreactor system for flow chemistry



Borealis™ Flow LED photoflow reactor system

Borealis LED lamp module:



- Compact, high-power (120W-180W) LED photoflow reactor system
- 365nm, 385nm, 405nm, 420nm, 455nm and 525nm options
- Efficient liquid-cooled temperature regulation
- Independent control of reactor temperature when used with Cold Coil
- Safety interlock and thermal cut-out
- FEP coil photoreactors

The Uniqsis Borealis™ is a high power LED lamp unit that converts the existing Cold Coil™ standalone coil reactor into a photoreactor for flow chemistry applications.

Borealis LED lamps are available with fixed wavelengths of 365, 385, 405, 420, 455, 525nm in both 120W and 180W versions. These are powered by either a compact 120W analogue or a 180W digital power supply respectively. The lamp module automatically cuts-out to avoid damage if the LED backplate temperatures exceed 50°C. A safety interlock prevents accidental illumination of the LEDs if the lamp is removed from the inside of the coil reactor.

Borealis LED lamps are compatible with both Solstice (batch) and Borealis Flow photoreactor systems. In Borealis Flow, the lamp fits inside an FEP coil reactor that is wound on the inside of a grooved aluminium mandrel. The coil reactor drops into the Cold Coil temperature control module and is clamped in place to ensure optimal thermal contact. The coil reactor has an embedded temperature sensor and the reactor temperature is either shown on the display of digital power supply unit (PSU) or using a digital thermometer.



Building your system:

The complete photoreactor system comprises of the **Borealis™** LED lamp unit, an FEP coil reactor, the **Cold Coil™** standalone reactor module and a matching variable power supply.

First, choose a suitable **Borealis** LED lamp and PSU combination.

The 120W LED lamps are fitted with 120x high power LEDs and are powered by the smaller **Borealis Scholar™** analogue PSU. This is a cost-effective constant current PSU that allows the lamp intensity to be varied in 20% increments using the rotary control knob on the top of the PSU.

The 180W LED lamps are fitted with 180x high power LEDs and are powered by a larger PSU with digital current control that enables the lamp intensity to be varied in 5% increments. In addition to showing lamp intensity, the digital PSU also displays lamp current and wavelength, and both the internal reactor and LED backplate temperatures. External serial and ethernet comms ports are fitted to facilitate system integration and remote control.



Borealis 120W LED lamp and Borealis Scholar PSU



Borealis 180W LED lamp and Borealis Digital PSU

Although Borealis Flow coil reactors can be wound with other materials and volumes, the standard coil reactor offered uses FEP tubing and has an internal volume of 15ml.

It is fitted with an embedded temperature sensor that is located as close to the surface of the reactor tubing that connects either directly to the rear of the digital PSU or to an external digital thermometer.

The maximum recommended temperature is 150°C, and pressure 20bar.

The temperature of the coil reactor is controlled using a thermoregulating recirculator. The temperature range achievable is determined by the power of the recirculator.

For reactions in the range 15°C- 60°C, compact and portable solid-state devices such as the Huber Piccolo are suitable, however outside this temperature range more conventional compressor-based systems are required.



To prevent overheating and/or damage to the LEDs, it is also necessary to actively cool the high-power Borealis LED lamp.

For reaction to be to room temperature, the Borealis lamp module and the Cold Coil™ may be connected in series with the temperature control module.

Alternatively, where the lamp and reactor temperatures are significantly different, it is recommended that the reactor temperature is controlled using the reactor controller, and a separate cooling water supply is used to cool the Borealis™ LED lamp module.



Huber Piccolo recirculator

Completing your system:

The Borealis Flow photoflow reactor system is completed by the addition of either the Uniqsis Binary Pump dual channel reagent delivery system, or a suitable standalone pump (such as the HPLC pump shown opposite).

BOREALIS FLOW™ Photoflow Reactor Components	
UQ1050-M2	Cold Coil MkII, coil reactor temperature control module
UQ8205	Borealis™ Coil Reactor, 1/16" OD FEP, 15ml, with temperature sensor
UQ8207	Piccolo™ Solid State Temperature Control Module, 4-70C; 230/110V
120W Borealis LED Lamps & SCHOLAR PSU	
UQ8204	Borealis LED Lamp Unit, UVA (365nm), 120W , LED
UQ8222	Borealis LED Lamp Unit, UVA (385nm), 120W , LED
UQ8223	Borealis LED Lamp Unit, PURPLE (405nm), 120W , LED
UQ8203	Borealis LED Lamp Unit, BLUE (420nm), 120W , LED
UQ8202	Borealis LED Lamp Unit, BLUE (455nm), 120W , LED
UQ8200	Borealis LED Lamp Unit, GREEN (525nm), 120W , LED
UQ8226-V	Borealis SCHOLAR™ Power Supply, variable intensity, 120W ; 110/230V
180W Borealis LED Lamps & Digital PSU	
UQ8204-HP	Borealis™ HP LED Lamp Unit, UVA (365nm), 180W , LED
UQ8222-HP	Borealis™ HP LED Lamp Unit, UVA (385nm), 180W , LED
UQ8223-HP	Borealis™ HP LED Lamp Unit, PURPLE (405nm), 180W , LED
UQ8203-HP	Borealis™ HP LED Lamp Unit, BLUE (420nm), 180W , LED
UQ8202-HP	Borealis™ HP LED Lamp Unit, BLUE (455nm), 180W , LED
UQ8200-HP	Borealis™ HP LED Lamp Unit, GREEN (525nm), 180W , LED
UQ8206	Borealis™ Digital Power Supply, variable intensity, 180W ; 230/110V