

6310-QCL Quantum Cascade Controller, 1 Amp



- 18V Compliance for QCL devices
- User selectable 500mA or 1A range
- < 2.5uA noise
- 60 Watts of TEC power
- 0.002°C stability
- AutoTune automatic PID
- USB / RS-232 interfaces

The **6310-QCL Quantum Cascade Controller** is designed for quantum cascade lasers (QCLs), which operate at a much higher voltage than typical laser diodes, providing up to 18 voltage of compliance. Combine that with excellent low current performance, with both a 1 Amp and 500mA operating range, 1uA set point resolution and less than 2.5uA of noise, the 6310-QCL provides a transparent driver that won't interfere with the performance of your quantum cascade laser .

Dual Range

One of the valuable features of the controller is the dual range capability, which allows operation in either a 500mA range or 1000mA range. For applications that need less than 500mA, the lower range offers higher accuracy, lower noise, and improved stability, while still maintaining the 1000mA range for higher power devices.

Ground Loops Eliminated

The controller optically and electrically isolates it's isolated inputs and outputs, preventing device-damaging ground loops. No other driver on the market has this capability.

User Function Keys

The user function keys can be used to quickly select a different configuration state or execute a predefined set of commands. Switch between two different experiments or script repetitive actions...anything you can do manually with the instrument can be programmed to the function key.

Powerful 60 Watt Temperature Controller

In addition to the high performance diode driver, the 6310-QCL adds a 60 watt temperature controller, giving you substantial power for demanding applications. Only need a little bit of power? No problem, because the 6310 works just as well driving 2 watts of power as it does driving 50. Support for all standard sensors (thermistor, RTD, AD590, and LM335) is also included.

AutoTune Automatic PID Calculation

All Arroyo Instruments temperature controllers feature AutoTune for automatic PID calculation. With AutoTune, you no longer need to fiddle with PID parameters to find values that work with your application. Simply hook up your mount, set the appropriate limits, and start the AutoTune process. The instrument will automatically calculate PID parameters that will work with your mount.

Simple User Interface

The 6310-QCL's user interface is remarkably simple... so easy to use, you'll have it up and running in no time. Easy-to-read messages, simple menus, and powerful multi-line display make the instrument incredibly easy to use.

Specifications

Summary

Laser Driver	1 Amp / 500mA, 18 Volt
Temperature Controller	5 Amp, 12 Volt, 60 Watt

Laser Driver

LASER CURRENT	
Range (mA)	0 – 1,000 or 0 – 500
Resolution (mA)	0.05
Setpoint Accuracy (\pm [% set + mA])	0.025% + 0.3
Measurement Accuracy (\pm [% reading + mA])	0.025% + 0.3
Stability (ppm, time)	< 10, 1 hour
Temperature Coeff (ppm/°C)	50
Noise/Ripple (μ A rms, low BW)	< 2.5
Transients (μ A)	< 200
Compliance Voltage (V)	18
Modulation Bandwidth (kHz)	200
Modulation Input Range	0 – 10V, 10k Ω
PHOTODIODE CURRENT	
Range (μ A)	5 – 5,000
Resolution (μ A)	0.1
Setpoint Accuracy (\pm [% set+ μ A])	0.05% + 1
Measurement Accuracy (\pm [% reading+ μ A])	0.05% + 1
Stability (ppm, time)	< 200, 24 hours
Temperature Coeff (ppm/°C)	< 200
PD Bias (V)	0 to -5V, software programmable
LASER VOLTAGE	
Range (V)	0 – 18
Resolution (V)	0.001
Setpoint Accuracy (\pm [% set+V])	0.05% + 0.005
Measurement Accuracy (\pm [% reading+V])	0.05% + 0.005
Stability (ppm, time)	< 50, 1 hour
Temperature Coeff (ppm/°C)	< 100
Four-wire Measurement	Yes
LIMITS	
Current Limit Accuracy (mA)	10
Voltage Limit Accuracy (\pm % FS)	2.5%

Temperature Controller

Power (A, V, W)	\pm 5A, \pm 12V, 60W
Stability (1 hour, °C)	0.002
Stability (24 hours, °C)	0.005

Temperature

Range (°C)	-99 to 250
Resolution (°C)	0.01
Thermistor (100 μ A) Accuracy at 25°C (°C)	0.03
AD590 Accuracy at 25°C (°C)	0.90
LM335 Accuracy at 25°C (°C)	0.90
RTD Accuracy at 25°C (°C)	0.35
Thermistor, 100μA Range	
Accuracy (\pm [% reading + k Ω])	0.05 + 0.005
Range (k Ω)	0.02 – 45
Resolution (k Ω)	0.001
Thermistor, 10μA Range	
Accuracy (\pm [% reading + k Ω])	0.05 + 0.05
Range (k Ω)	0.2 – 450
Resolution (k Ω)	0.01
LM335	
Accuracy (\pm [% reading + mV])	0.3 + 1
Range (mV)	1730 – 4730
Resolution (mV)	0.1
Bias (mA)	1
AD590	
Accuracy (\pm [% reading + μ A])	0.03 + 0.1
Range (μ A)	173 – 473
Resolution (μ A)	0.01
Bias (V)	4.5
RTD	
Accuracy (\pm [% reading + Ω])	0.03 + 0.1
Range (Ω)	20 – 192
Resolution (Ω)	0.01
Bias (mA)	1

Current

Range (A)	\pm 5
Compliance Voltage (V)	12
Max Power (W)	60
Resolution (A)	0.01
Accuracy (\pm [% value + A])	0 + 0.03
Noise/Ripple (A, rms)	< 0.005
Current Limit Accuracy (A)	0.05

Voltage (measurement only)

Accuracy (\pm [% reading + V])	0 + 0.05
Range (V)	\pm 12
Resolution (V)	0.01

General

Laser Connector	DB-9, female
TEC Connector	DB-15, female
Display Type	4x20 VFD
Computer Interface	USB 2.0 Full Speed (USB Type B), RS-232 (DB-9, male)
Power	100V / 120V / 230V 50/60 Hz
Size (H x W x D) [inches (mm)]	3.5 (90) x 8.5 (215) x 12 (305)
Weight (lbs [kg])	7.8 [3.5]
Operating Temperature	+10°C to +40°C
Storage Temperature	-20°C to +60°C