



RHM5K-CH

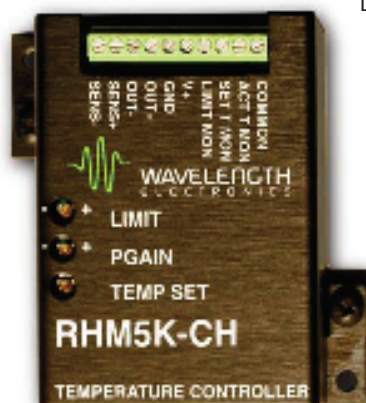
Precision Unipolar Temperature Controller

GENERAL DESCRIPTION:

Operating from a single DC supply, the RHM5K-CH can be used to achieve control at off-ambient temperatures. It uses a PID control loop to drive resistive heaters or thermoelectric coolers. The RHM offers a high level of stability and can drive up to 5 A with a small footprint.

On-board 12-turn trimpots control temperature setpoint, proportional gain, and output voltage limit. A single 10-pin terminal strip provides easy access to the DC supply, sensor, resistive heater, and measurement connections.

The RHM5K-CH is suited for applications where heating or cooling (not both) is required. This product is ideal for applications where temperature stability is critical and space is tight, such as heated optics (non-condensing circumstances), CCDs, preheated liquids and chamber stabilization.



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RHM5K-CH RESISTIVE HEATER CONTROLLER

FEATURES:

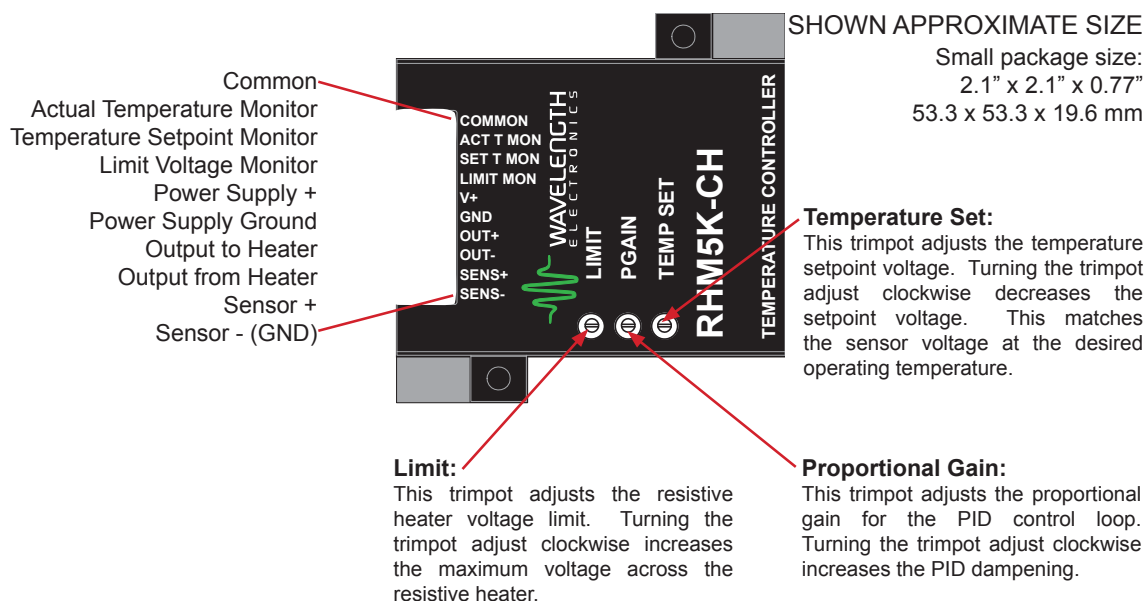
- 5 A Drive Current
- Single supply operation: +5 V to +30 V
- < 0.003°C stability (24 hours)
- Voltage limit
- > +27 V compliance with +30 V input
- Supports Thermistors, IC sensors or RTDs
- Temperature Setpoint, Proportional Gain, and Limit Voltage are user adjustable

Ordering Information

RHM5K-CH	5 A Resistive Heater Controller
WCB-108	4-Pin Unterminated Cable
WCB-109	6-Pin Unterminated Cable
TCS10K5	10 kΩ Thermistor -- 5 pack
TCS605	5 kΩ Thermistor -- 10 pack
TCS610	10 kΩ Thermistor -- 10 pack
TCS620	20 kΩ Thermistor -- 10 pack
TCS650	50 kΩ Thermistor -- 10 pack
TCS651	100 kΩ Thermistor -- 10 pack

Figure 1

Top View and Pin Descriptions



ELECTRICAL AND OPERATING SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS		SYMBOL	VALUE		UNIT
RATING					
Supply Voltage, standard (See SOA Calculator for all voltage levels)		V ⁺	+5 to +30		Volts DC
Operating Temperature, case		T _{OPR}	0 to +70		°C
Storage Temperature		T _{STG}	-40 to +150		°C
Size (WxDxH)			2.1 x 2.1 x 0.77 53.3 x 53.3 x 19.6		inches mm
Weight			4		ounces
PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
RESISTIVE HEATER OUTPUT					
Supply Voltage		+4.5		+30	V
Output Current Range ⁽¹⁾		0		5	A
Voltage Limit Range ⁽²⁾ ⁽³⁾		(V ⁺ - 2.4)		(V ⁺ - 1.25)	V
Compliance Voltage ⁽⁴⁾		(V ⁺ - 3)		(V ⁺ - 2.5)	V
Internal Power Dissipation ⁽⁵⁾				20	W
Maximum Output Power	Load resistance of 5.4 Ω			135	W
TEMPERATURE CONTROL					
P (Proportional Gain)		9		100	A / V
I (Integrator Time Constant)			1		sec
D (Differentiator Time Constant)			6		msec
Short Term Stability (1 hour)	10 kΩ Thermistor @ 17°C	0.0005		0.002	°C
Long Term Stability (24 hour)	10 kΩ Thermistor @ 17°C	0.002		0.005	°C
Temperature Coefficient	10 kΩ Thermistor @ 25°C		20		ppm/°C
MONITOR SIGNALS					
Setpoint Monitor ⁽⁶⁾		0		5.0	V
Quiescent Current			< 10		mA
Setpoint Monitor Output Impedance			41.5		kΩ
Actual Temp Monitor Output Imped.			400		kΩ
Setpoint vs. Actual Accuracy			16		mV
Sensor Voltage vs. ACT T			4		mV
SENSOR					
Bias Current	100 μA, 1 mA, or 10 mA				

NOTES

- (1) Maximum Output Current is dependent on the supply voltage and the resistance of the sensor. Care should be taken not to exceed the maximum internal power dissipation of 20 W. Please review the online Safe Operating Area (SOA) Calculator at: <http://www.teamwavelength.com/support/calculator/soa/soatc.php> to ensure safe operation.
- (2) The voltage limit potentiometer can be adjusted to produce voltages on Limit Mon of 0 V to (V⁺ - 1.25 V), but the effective range of output voltages is 2 V to (V⁺ - 3 V).
- (3) The limit current is equal to the limit voltage divided by the load resistance of the resistive heater or thermoelectric.
- (4) Maximum Output Voltage will vary depending on input voltage. A maximum compliance voltage of 27 V will be obtained with +30 V input. A maximum compliance voltage of 2.5 V will be obtained with a 5 V input.
- (5) Maximum internal power dissipation. Derating begins at 40°C ambient temperature. See the online Safe Operating Area (SOA) Calculator at: <http://www.teamwavelength.com/support/calculator/soa/soatc.php> for details.
- (6) Range is dependent on input supply voltage, and bias current and sensor choice. The maximum sensor range will be (V⁺ - 1.2 V) for supply voltages less than 6.3 V.