



1. How to order:

CT198	Model Number: CT198 = Heaterstat (nominal setpoint)																																																																																																																													
-1000	Range: <table border="1"> <thead> <tr> <th></th> <th colspan="2">Setpoint (Ω)</th> <th colspan="2">Supply voltage (VDC)</th> </tr> <tr> <th></th> <th>Min</th> <th>Max</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr><td>-1000 =</td><td>4.50</td><td>6.75</td><td>4.75</td><td>10</td></tr> <tr><td>-1001 =</td><td>5.63</td><td>8.44</td><td>7.5</td><td>16</td></tr> <tr><td>-1002 =</td><td>7.03</td><td>10.55</td><td>7.5</td><td>21</td></tr> <tr><td>-1003 =</td><td>8.79</td><td>13.18</td><td>7.5</td><td>26</td></tr> <tr><td>-1004 =</td><td>10.99</td><td>16.48</td><td>7.5</td><td>33</td></tr> <tr><td>-1005 =</td><td>13.75</td><td>20.60</td><td>7.5</td><td>41</td></tr> <tr><td>-1006 =</td><td>17.17</td><td>25.75</td><td>7.5</td><td>60</td></tr> <tr><td>-1007 =</td><td>21.46</td><td>32.19</td><td>7.5</td><td>60</td></tr> <tr><td>-1008 =</td><td>26.82</td><td>40.23</td><td>7.5</td><td>60</td></tr> <tr><td>-1009 =</td><td>33.53</td><td>50.29</td><td>7.5</td><td>60</td></tr> <tr><td>-1010 =</td><td>41.91</td><td>62.86</td><td>7.5</td><td>60</td></tr> <tr><td>-1011 =</td><td>52.39</td><td>78.58</td><td>7.5</td><td>60</td></tr> <tr><td>-1012 =</td><td>65.48</td><td>98.23</td><td>7.5</td><td>60</td></tr> <tr><td>-1013 =</td><td>81.85</td><td>122.78</td><td>7.5</td><td>60</td></tr> <tr><td>-1014 =</td><td>102.32</td><td>153.48</td><td>7.5</td><td>60</td></tr> <tr><td>-1015 =</td><td>127.90</td><td>191.85</td><td>7.5</td><td>60</td></tr> <tr><td>-1016 =</td><td>159.87</td><td>239.81</td><td>7.5</td><td>60</td></tr> <tr><td>-1017 =</td><td>199.84</td><td>299.76</td><td>7.5</td><td>60</td></tr> <tr><td>-1018 =</td><td>249.80</td><td>374.70</td><td>7.5</td><td>60</td></tr> <tr><td>-1019 =</td><td>312.25</td><td>468.38</td><td>7.5</td><td>60</td></tr> <tr><td>-1020 =</td><td>390.31</td><td>585.47</td><td>7.5</td><td>60</td></tr> <tr><td>-1021 =</td><td>487.89</td><td>731.84</td><td>9</td><td>60</td></tr> <tr><td>-1022 =</td><td>609.86</td><td>914.80</td><td>11</td><td>60</td></tr> </tbody> </table>		Setpoint (Ω)		Supply voltage (VDC)			Min	Max	Min	Max	-1000 =	4.50	6.75	4.75	10	-1001 =	5.63	8.44	7.5	16	-1002 =	7.03	10.55	7.5	21	-1003 =	8.79	13.18	7.5	26	-1004 =	10.99	16.48	7.5	33	-1005 =	13.75	20.60	7.5	41	-1006 =	17.17	25.75	7.5	60	-1007 =	21.46	32.19	7.5	60	-1008 =	26.82	40.23	7.5	60	-1009 =	33.53	50.29	7.5	60	-1010 =	41.91	62.86	7.5	60	-1011 =	52.39	78.58	7.5	60	-1012 =	65.48	98.23	7.5	60	-1013 =	81.85	122.78	7.5	60	-1014 =	102.32	153.48	7.5	60	-1015 =	127.90	191.85	7.5	60	-1016 =	159.87	239.81	7.5	60	-1017 =	199.84	299.76	7.5	60	-1018 =	249.80	374.70	7.5	60	-1019 =	312.25	468.38	7.5	60	-1020 =	390.31	585.47	7.5	60	-1021 =	487.89	731.84	9	60	-1022 =	609.86	914.80	11	60
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R	Setpoint Calibration Code: R = Resistance																																																																																																																													
5.0	Initial Calibration Setpoint: Nominal heater resistance at set point temperature (in ohms). Must be within allowable range for specified model. Note: For ordering with heater that is being designed, use XX and note the setpoint temperature when ordering.																																																																																																																													
L	Leads: L = Leadwires P = Pins (LED not available)																																																																																																																													
1	Scan Rate: 0.1 to 10 seconds (1 second standard)																																																																																																																													
CT198-1000R5.0L1 ← Sample Part Number																																																																																																																														

2. Ordering Custom Models:  
CT198-X "X" to be specified by Minco at the time of order. (See note 1 for standard P/N scheme) This is a unique number for each application. The following information should be provided to Minco.
- Heater model number if known (see note 3).
  - Desired heatsink temperature.
  - Setpoint temperature.
  - Heater supply voltage (nominal value and range).
  - Scan rate: 0.1 to 10 seconds (see note 7).
  - Pins or wire leads.
  - Length of wire leads, if appropriate (6" std.)
3. Heater: Resistance type heater with high TCR.
4. Setpoint Adjustability: ±20% for standard 1000 series models based on center of range. Adjustability for custom models is based on application requirements.
5. Power Supply Voltage: 4.75 to 10 VDC or 7.5 to 60 VDC, depending on range.
6. Heater Current: 0.05 to 4 amps, depending on range.
- | Nominal heater current | Min. current for proper sensing | Maximum current (1 minute) | Maximum output ON resistance (pin 3 to 2) | Minimum output OFF resistance |
|------------------------|---------------------------------|----------------------------|---|-------------------------------|
| 0.05-0.2 A             | 0.012 A                         | 0.5 A                      | 2.3 Ω                                     | 50k Ω                         |
| 0.21-0.5               | 0.050                           | 1.0                        | 0.8                                       | 50k                           |
| 0.51-1.5               | 0.125                           | 2.0                        | 0.5                                       | 50k                           |
| 1.51-3.0               | 0.350                           | 4.0                        | 0.3                                       | 50k                           |
| 3.0-4.0                | 1.0                             | 5.0                        | 0.25                                      | 50k                           |
7. Scan Rate: .1, .25, .5, 1, 2, or 10 seconds +40%/-20%.
8. Scan Pulse Width: 10 milliseconds max.
9. Calibration Accuracy: ±0.2% (±0.4% for 1.5 to 4 A range), does not include heater tolerances.
10. Hysteresis: 0.05% maximum.

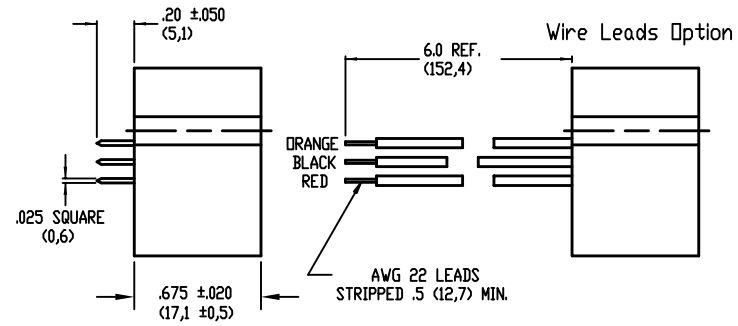
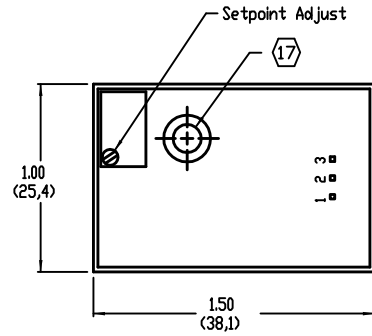
REVISIONS					
REV	DESCRIPTION	DATE	ECO	DR	APPD
H	NOTE 18: SCREW WAS SCEW	08-31-15	2308214	BMP	MJF
I	DIMENSION .675 WAS .69	02-17-16	2387087	BMP	MJF
J	Convert to ROHS, Added Note 20	07-05-18	2763587	DKL	BMP

11. Setpoint Drift due to:  
Self-Heating: ±0.2% max. (±0.4% for 1.5 to 4.0 A range).  
Ambient Temperature: ±0.02%/°C max. (±0.06%/°C for 1.5 to 4.0 A range).  
Supply Voltage Change: ±0.03%/volt maximum.
12. Supply Voltage ripple effects: Negligible, assuming 50/60 Hz, 10% maximum ripple.
13. Controller Supply Current:  
Output ON: 3 mA max.  
Output OFF: 2 mA max.
14. Ambient Temperature:  
Operating: -40 to 70°C (-40 to 158°F)  
Storage: -55 to 85°C (-67 to 185°F)
15. Relative Humidity: 90% max.
16. Weight: 1 ounce (28 g).
- Ⓜ Mounting: Mounting hole for #6 screw through or #8 thread forming screw.
18. Connections: Three pins on 0.1" centers or AWG 22 leadwires.
- | Pin | Lead Color | Description                  |
|-----|------------|------------------------------|
| 1   | Red        | Power supply (V+)/Heater (+) |
| 2   | Black      | Ground (V-)                  |
| 3   | Orange     | Heater (-)                   |
19. Heat indicating red LED on leadwire versions only.
20. Model meets the requirements of EI directive 2002/95/EC, restriction of hazardous substance (ROHS).

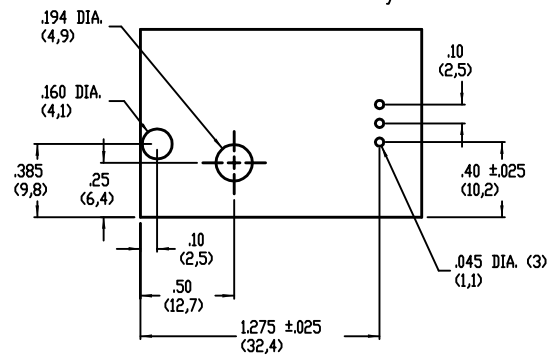
UNLESS OTHERWISE SPECIFIED DIMENSIONS AND TOLERANCES IN INCHES DIMENSIONS IN [ ] ARE IN MILLIMETERS		INITIALS	DATE	ITEM	REQD	INVENTORY NO	MATERIAL DESCRIPTION	
ONE PLACE (.0)	±.020 [±0.51]	DR	06-21-90	TPB			TITLE:  CT198 HEATERSTAT™ SENSORLESS CONTROLLER SPECIFICATION DRAWING	 www.minco.com COMPANY CONFIDENTIAL PROPRIETARY INFORMATION OF MINCO PRODUCTS, INC. DO NOT DUPLICATE
TWO PLACE (.00)	±.010 [±0.25]	CHK	06-21-90	DCE				
THREE PLACE (.000)	±.005 [±0.13]	APP	06-21-90	MWG				
ANGLES:		ENGR	06-21-90	DKS				
MATERIAL:		QA						
		PRD					CT198 REV J	
FINISH:		NEXT ASSY	PROD CODE	300				
		USED ON	INIT. ORDER		INVENTORY NO	SCALE NONE		DWG SIZE B 
						CAGE IDENT. 09359	SHEET 1 OF 2	

REVISIONS

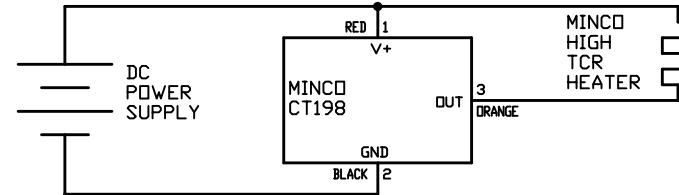
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Printed Circuit Board Layout



Wiring Diagram



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THREE PLACE (.000)	±.005	[±0,13]	DCE	06-21-90				
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MATERIAL:			DKS	06-21-90				
FINISH:							CT198	REV J
							CAGE IDENT. 09359	SHEET 2 OF 2