



# ATC2000

## Animal Temperature Controller



- PID control for maximum temperature stability
- Low Noise DC Heater
- Three temperature sensor inputs
- Automatic shutdown if the plate reaches 45°C

**ATC2000** is a low noise heating system for maintaining animal body temperature during experimental procedures. The DC heater is extremely quiet in terms of electromagnetic radiation. This is essential in electrophysiological recordings which are very sensitive to electromagnetic interference.

The controller uses proportional, integral, and derivative (PID) technology in adjusting the DC voltage output. Compared with switched on/off type controllers, PID controllers provide a much more precise and stable control of temperature. The PID approach is also more immune to the variation of the experimental conditions such as change in animal size and unexpected disturbances.

The controller has three temperature sensing inputs.

- The resistive temperature device (RTD) Probe input can be used to monitor an

RTD rectal probe to control the animal temperature or to monitor ambient temperature, induction chamber temperature or any other temperature.

- When using a thermocouple probe, the thermocouple (TC) probe input can be used just like the RTD input. (A T type thermocouple must be used.)

- The heater plate also has an internal temperature sensor. The **ATC2000** monitors this sensor to prevent the localized hot spots under animal.

The controller has three operational modes:

- Normal mode uses the configured sensor (RTD or TC) or the plate sensor to drive the control loop.
- Adaptive mode uses the temperature of the heated plate and the temperature of the subject to control. This approach is less prone to overshoot, but somewhat slower the normal mode, depending on the sampling rate used.
- Shutdown is a fail safe mode used if the plate temperature ever exceeds 45°C.

The **ATC2000** is tuned at the factory. However, the PID parameters may also be set manually. The temperature resolution of the controller is 0.1°C. The rectal temperature probe has a 6-ft ultra-flexible, shielded cable and an RTD sensor.

The metal heating plates (available separately) have built-in temperature sensors. Compatible with stereotaxic systems, the rigid, flat surface fits under the U-frame. Plates are washable with water and detergent.

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### PROBES

Probe Type	Size/Lead Diameter	Style	Time Constant	Isolated	Max. Temp	Lead Length	Description
<b>NEEDLE MICROPROBES</b>							
Fast-response needle probes for instant readings in tissue, semisolids, liquids, very small specimens, powders and materials. Needle tip is sealed to ensure only stainless steel contacts specimen.							
<b>MT-29/1</b>	29 ga / 1 cm	A	0.125 sec	No	200°C	5 ft.	29g ~0.013 in
<b>MT-23/3</b>	23 ga / 3 cm	A	0.15 sec	No	200°C	5 ft.	23g ~ 0.125 in
<b>MT-D</b>	—	C	0.025 sec	No	200°C	5 ft.	Fast response surface probe (stainless steel for locating inflammation, arteries, etc. Also for dental use.
<b>FLEXIBLE IMPLANTABLE PROBES</b>							
Designed for high accuracy on extremely small specimens such as insects, seeds, etc. Maximum insertion depth 1/8". Totally sheathed in chemical resistant Teflon.							
<b>IT-18</b>	0.025" dia	D	0.1 sec	Yes	150°C	3 ft	-
<b>IT-23</b>	0.009" dia	E	0.005 sec	Yes	150°C	3 ft	For ultra fast measurements/use on micro-size specimens. Tissue implantable with 23ga. needle. Fragile. Teflon coated.
<b>IT-1E</b>	0.025" dia	F	0.005 sec	Yes	150°C	3 ft	As IT-18 sensor except lead exposed. Combines ultra fast response of IT-23 with sheath strength of IT-18
<b>RECTAL PROBES</b>							
<b>RET-2</b>	3.175mm	G	0.8 sec	No	125°C	5 ft	Rectal probe (thermocouple)
<b>61824</b>	2.5mm						Rectal probe (RTD) - 1.25mm shaft
<b>RET-3</b>	1.6mm	G	0.5 sec	No	125°C	5 ft	Rectal probe (thermocouple)

### PLATES

<b>61840</b>	X-Small Heating Plate with built-in RTD sensor, 4x15cm
<b>61830</b>	Small Heating Plate with built-in RTD sensor, 10x15cm
<b>61800</b>	Medium Heating Plate with built-in RTD sensor, 15x25cm

### SPECIFICATIONS

Temperature Range . . . . .	up to 45°C
Resolution . . . . .	0.1°C
Accuracy . . . . .	± 0.3°C
Rat Sensor . . . . .	RTD, OD 2.0mm tube with 3.5mm ball head (Optional mouse sensor is available)
Maximum DC Output . . . . .	10V, 3A
Power . . . . .	Universal AC Adapter 90–264V Input, 12V@4.5A maximum output
Dimensions . . . . .	45x30x7 cm (17.7 x 11.8 x 2.76 in.)
Weight . . . . .	1.6 kg (3.6 lb.)



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