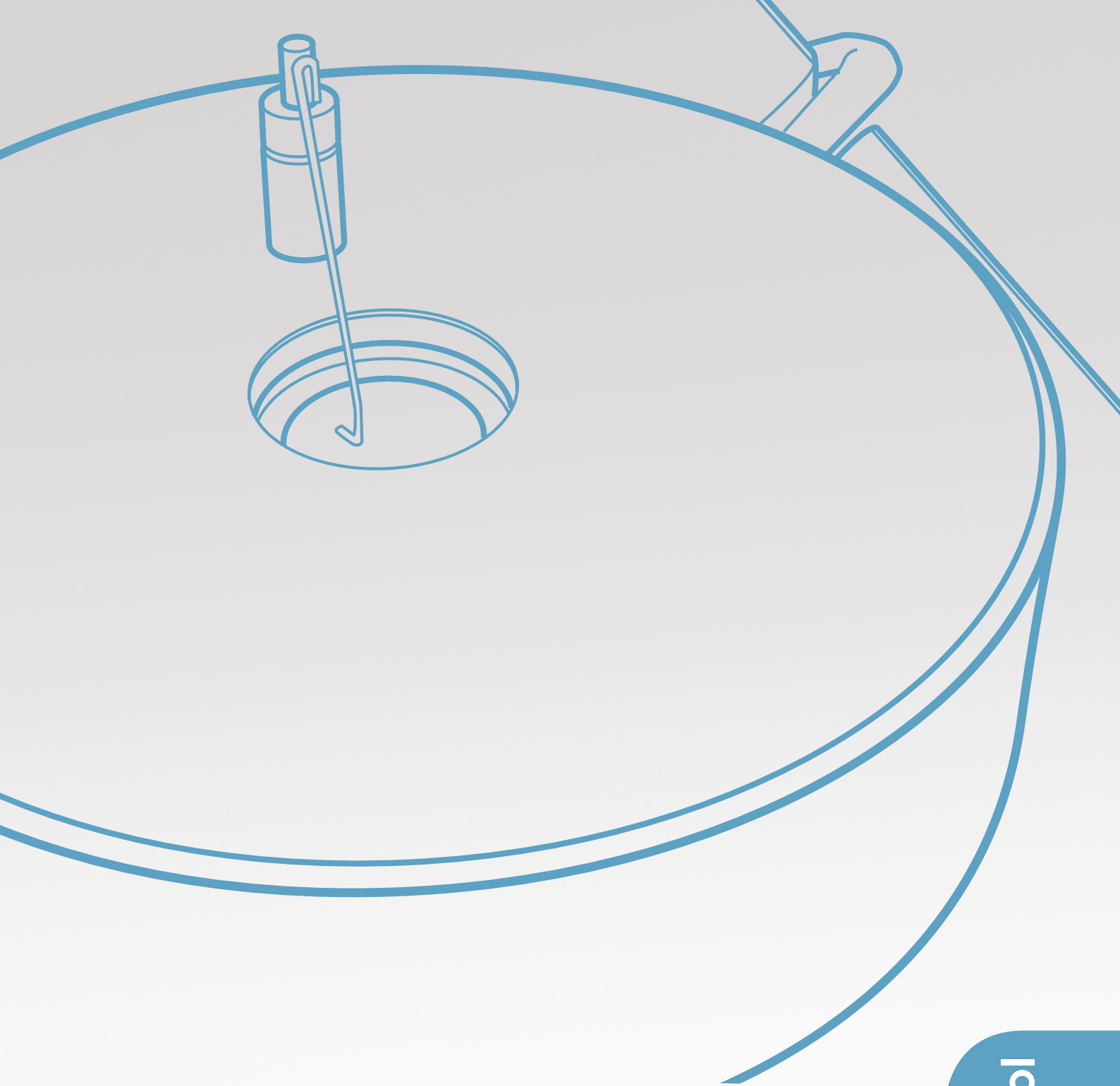
Temperature control

Port-a-Patch® – The heat is on.

- **Accurate maintenance of temperature**
- **Brief temperature pulses possible**
- **Experiments at physiological temperatures**
- **Allows continuous perfusion**



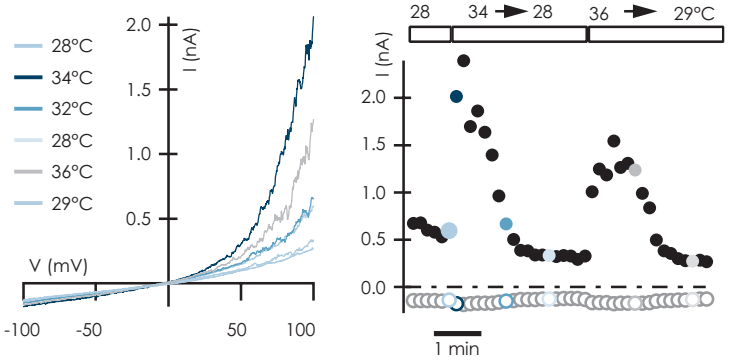
Temperature Control

The Temperature Control System for the Port-a-Patch® allows experiments at elevated temperatures or application of short temperature pulses. Two components are used to heat the solutions: a canulla for heating of solutions during continuous perfusion, and the flow chamber containing a resistive heating element. This results in stable temperature maintenance whether or not the solutions are perfused.

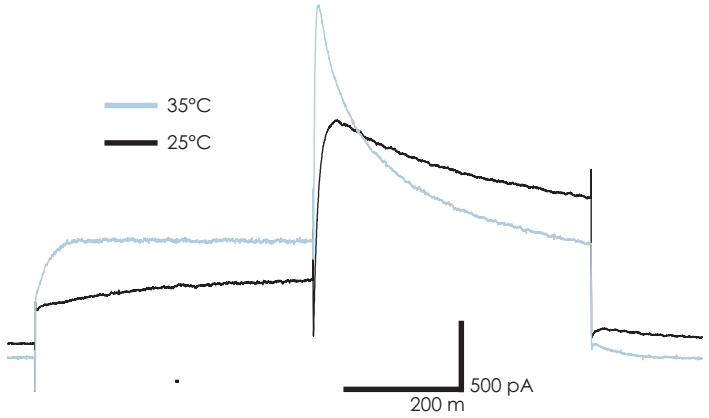
A computer interface is used to monitor and control the applied temperatures, allowing temperature changes with the click of a button.

Temperatures ranging from room temperature to 60 °C (± 0.5 °C) can be handled by the system. Temperatures are typically reached within two minutes. Cooling is passive. The Temperature Control System is an add-on for the Port-a-Patch® and is a useful tool for studies of hERG and various TRP channels.

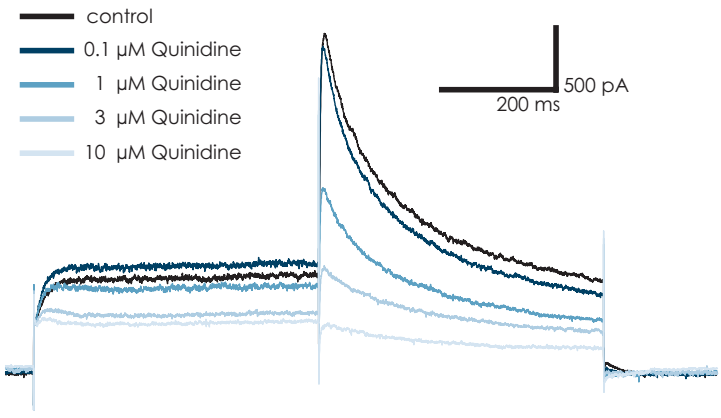
Temperature control up to 60 °C.
Nanion's Temperature Control System enables recordings from room temperature up to 60 °C. In this way, ion channels with temperature dependent pharmacology, kinetics or opening probabilities can be studied, for example hERG channels and heat activated TRP channels.



Heat activated channels.
Original traces of TRPV1 current responses to voltage ramps from –100 mV up to +100 mV. TRPV1 current at RT (28°C), during two stimulations by application of heated solution (34°C and 36°C), and after cooling down to RT (29°C). The right-hand picture shows the current amplitudes as recorded at -100 mV and +100 mV plotted against time.



Recordings at physiological temperature.
The image shows example traces for hERG mediated currents at 25 ± 2 °C (black) and 35 ± 2 °C (blue). The peak current amplitude was increased at 35 °C, and the rise time and decay time constants were faster at physiological temperature compared with those obtained at room temperature.



Pharmacological experiments at physiological temperature.
A full dose response curve of quinidine acting on the hERG channel was obtained at physiological temperature (35 °C). Example traces in the absence and presence of increasing concentrations of quinidine recorded from one cell are shown here. The IC_{50} for quinidine at physiological temperature was 1.3 ± 0.2 µM (n = 5), similar to that obtained at room temperature (1.0 ± 0.03 µM, n = 3).

Product Number	Specification	Size & Weight
03 1001	**Temperature Control with Perfusion System** (*02 1002*): • Valve Control Panel (analog, digital and USB-ports for computer control) • Laminar Perfusion Chamber • Chamber Upgrade including resistive heating element • Perfusion Canulla with heater and sensor • Temperature monitoring system • Manifold with accessories • Perfusion System starter kit with 50 ml syringes, Reagent Kit, tubing, connectors and waste bottle • Stand with syringe holder • Temperature Control Software for on-the-fly visualization of applied temperature	Valve Control Panel Size (l x w x h): 40 x 5.8 x 13 cm Weight: 2.45 kg Temperature control Size (l x w x h): 22 x 16.5 x 5.5 cm Weight: 1 kg
03 1002	**Temperature Control without Perfusion System** including: • Temperature monitoring system • Perfusion Canulla with heater and sensor • Chamber Upgrade including resistive heating element • Temperature Control Software for on-the-fly visualization of applied temperature	Temperature control Size (l x w x h): 22 x 16.5 x 5.5 cm Weight: 1 kg
03 1003	**Additional Perfusion Canulla:** • Perfusion Canulla with heater and sensor	