QuickLock Heater 4.0

Run-time at different ambient temperatures

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Introduction

Semen cells are very sensitive to temperature fluctuations. This is relevant not only in semen processing before freezing, but also after thawing a frozen semen dose. Especially when thawing several semen doses to inseminate several cows at once, it is therefore recommended to carefully manage the post-thaw temperature of the semen doses to ensure appropriate temperature management right up until insemination.

The QuickLock Heater 4.0 provides a practical solution that guarantees a stable temperature of at least +33°C for up to 5 loaded insemination devices. Having a power-bank as power source makes it especially flexible and easy to charge on the go, or overnight. The duration of operation for a full charge of the standard 20,000 mAh power-bank was tested at different ambient temperatures to simulate a range of conditions. In all conditions, -10°C, +10°C and room temperature (around +25°C), the QuickLock Heater 4.0 proved itself to be a reliable device with great endurance.



Figure 1: QuickLock Heater 4.0, Ref. 17028/0400

Run-time tests at three different ambient temperatures

Measurement at room temperature

In the baseline scenario of working at room temperature (about +25°C), the QuickLock Heater 4.0 only took 5 minutes to reach operating temperature. With 33 hours of run-time, the powerbank will only have to be charged about every 10 days, assuming an operation time of about 3 hours per application. Even so it should be noted that charging can also be done with a standard 12 V socket in a car with the optional car charger, Ref. 17028/0420.

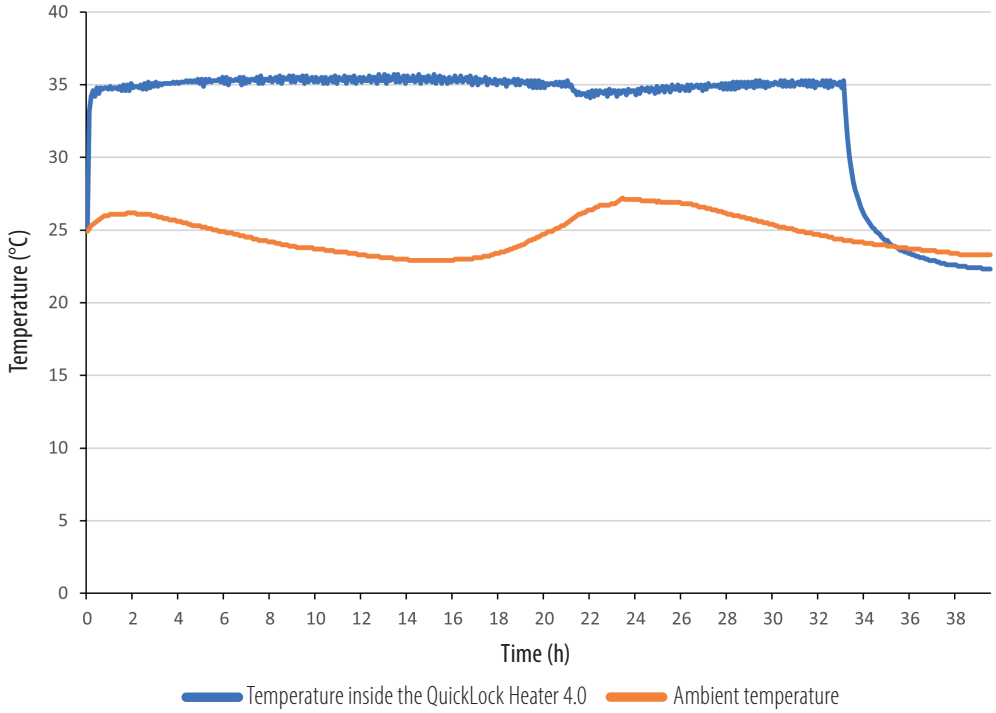


Table 1: Temperature profile and run-time of the QuickLock Heater 4.0 at room temperature (around +25°C), powered by a fully charged 20,000 mAh powerbank

Measurement at +10°C

In cooler conditions of about +10°C, the endurance rating came out at a respectable 14.5 hours. It took approximately 25 minutes to reach operating temperature, which was kept constant within 0.7°C for the duration of the test.

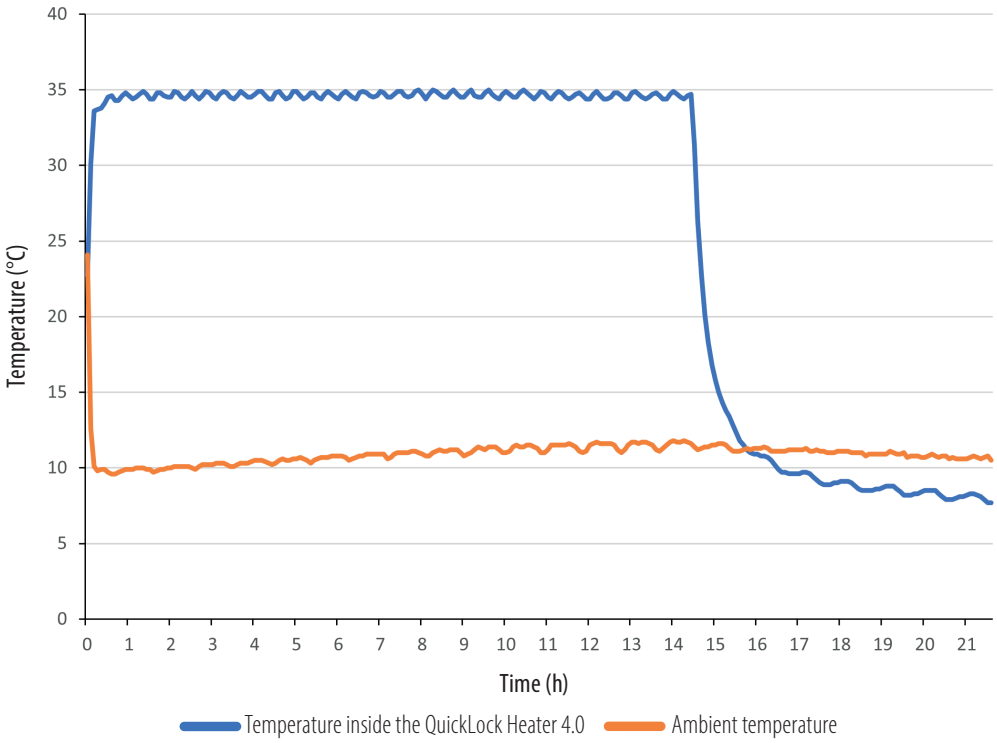


Table 2: Temperature profile and run-time of the QuickLock Heater 4.0 at +10°C, powered by a fully charged 20,000 mAh powerbank

Measurement at -10°C

As an extreme case, we tested endurance in deep winter conditions. At a highly challenging ambient temperature of about -10°C, the QuickLock Heater 4.0 still provided a perfectly suitable working temperature of +33°C for the semen dose with only 1.2°C fluctuation. Under these demanding conditions, the powerbank still lasted for more than 10 hours. Though most users will rarely encounter these conditions, even in this case the QuickLock Heater 4.0 proved itself to be a reliable device.

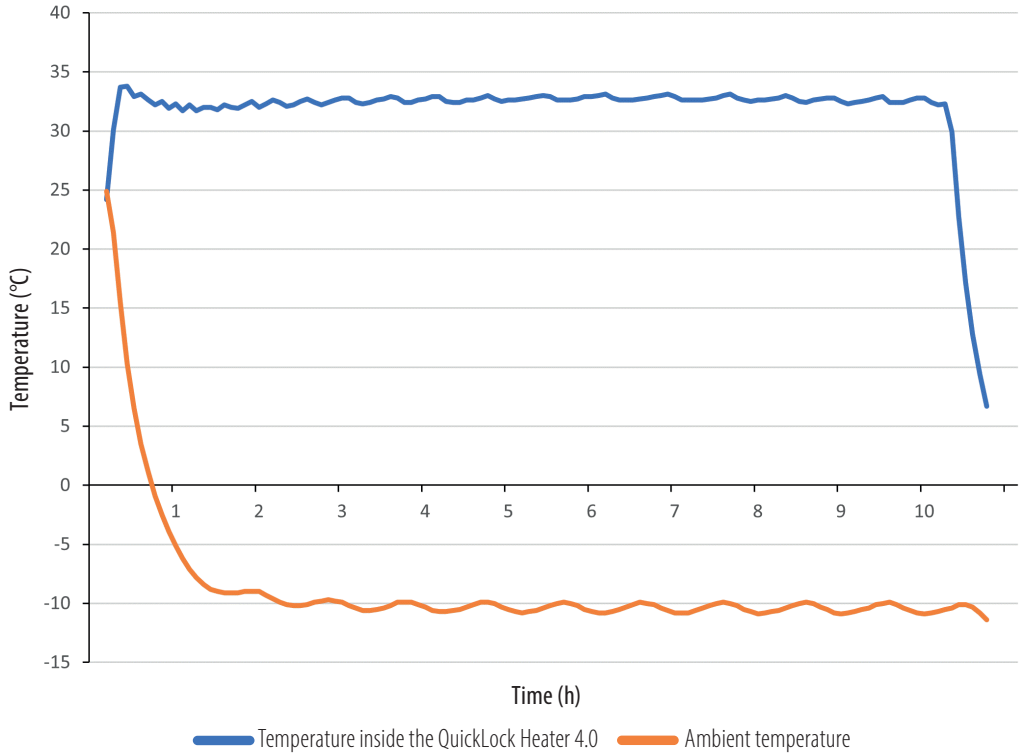


Table 3: Temperature profile and run-time of the QuickLock Heater 4.0 at -10°C, powered by a fully charged 20,000 mAh powerbank

Summary

Since the QuickLock Heater 4.0 will not usually operate constantly at the low temperatures of the tougher run-time tests, for example for 10 hours at -10°C, it is safe to assume that real life performance will significantly exceed the test conditions. Nonetheless, these tests give an indication of the capability of the device. For even more performance, a suitable larger powerbank can be used with the QuickLock Heater 4.0.

Even over long running times with a large difference to ambient temperatures, the measured curves show that the temperature of the semen dose is held very consistently, with fluctuation not exceeding 1.6°C. This ensures the quality of the semen dose at time of insemination, completing the chain of temperature management for that semen dose from collection to insemination.