

DARVALL**We Warm Animals****Getting Started Guide****Using the
HBC /ZDS****Warm Inspired Air Control Unit**

Use with

Darvall Heated Smooth-Wall Circuits (HBC)

On Circle Systems for Cats, Dogs and other small animals up to 80Kgs

or

Darvall Heated Qubes (ZDS)

A Non-Rebreathing System for Rodents, Birds, Exotics, Reptiles, Pups and Kittens

For Veterinary Use Only

(Not intended, evaluated, or approved for Human Medical purposes)

Certified By MET Laboratories to IEC / EN 61010-1

(Electrical equipment for measurement, control, and laboratory use)

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1. What's in the box

1.1. Tube heating

1	HBC controller
2	IEC mains cable with regional appropriate plug
3	USB cable (USB A to USB mini B plugs)
4	USB flash drive containing HBC software
5	Cable HBC to breathing tube (15 pin D connector to 4pin block)
6	Heated breathing tube
7	Auxiliary temperature probe

1.2. Qube heating

2. 1	HBC controller
2	IEC mains cable with regional appropriate plug
3	USB cable (USB A to USB mini B plugs)
4	USB flash drive containing HBC software
5	Cable HBC to breathing Qube (15 pin D connector to 4pin mini XLR)
6	Qube heating block
7	Auxiliary temperature probe

2. How to connect the Heated Breathing Circuit controller to a breathing tube

Connect the IEC power cable to the rear of the HBC unit (Figure 1) and plug into a mains supply.



Figure 1 HBC controller rear view

Connect the breathing tube cables' 15pin plug (Figure 3a) to the front panel of the controller (Figure 2).



Figure 2 HBC controller - front view

Connect the other end of this cable to the tube (Figure 3 a,b,c). The tube connector proximal to this electrical connection is proximal to the breathing canister in the breathing circuit (i.e. distal to the animal).



Figure 3a,b,c Cable connection to Heated breathing tube

If the controller is now switch on, it will begin heating to the stored preset temperature. The default setup should be applied ([see section Setting up Tube circuit or Qube defaults](#))

Whilst the heating tube is attached, the CIRCUIT LED on the front panel is illuminated and the display shows the temperature of the inspiratory tube sensor. An additional HEATING LED on the controller shows heating activity.

The controller heating can be enabled or disabled by pressing the Heater Enable button. In the disabled mode temperatures may be monitored without heating.

Temperature units are selected with the C/F button. The default unit is software set (see user manual).

An auxiliary temperature probe may also be used for additional information such as rectal temperature or expiratory tube temperature. The general-purpose auxiliary probe ([Figure 4](#)) can be connected into the jack socket on the controller's front panel. For the measurement of expiratory temperature, a heated breathing tube is used for that limb of the breathing circuit and an auxiliary expiratory sensor cable is use ([Figure 5](#))

Whilst an auxiliary probe is attached, the PROBE LED on the front panel is illuminated, and the display shows the temperature of the auxiliary probe.

If both heater tube and auxiliary probe are used, the display switches between the two temperatures every 3 seconds, and the illumination of the PROBE or CIRCUIT LED indicate the current measurement source.



Figure 4 General purpose Auxiliary temperature probe



Figure 5 Auxiliary Expiratory tube sensor cable

3. How to connect the Heated Breathing Circuit controller to a Qube

Connect the IEC power cable to the rear of the HBC unit (Figure 1) and plug into a mains supply.

Connect the Qube cables' 15pin plug (Figure 6) to the front panel of the controller (Figure 2).



Figure 6 Cable connection to Qube

If the controller is now switched on, it will begin heating to the stored preset temperature. The default setup should be applied ([see section Setting up Tube circuit or Qube defaults](#))

Whilst the Qube is attached, the CIRCUIT LED on the front panel of the controller is illuminated and the display shows the temperature of the inspiratory tube sensor. An additional HEATING LED on the controller shows heating activity. A Heating activity LED on the Qube mirrors the controller LED and visibly indicates power is being supplied to the Qube.

The controller heating can be enabled or disabled by pressing the Heater Enable button. In the disabled mode temperatures may be monitored without heating.

Temperature units are selected with the C/F button. The default unit is software set (see user manual).

An auxiliary temperature probe may also be used for additional information such as rectal temperature or expiratory tube temperature. The general-purpose auxiliary probe (Figure 4) can be connected into the jack socket on the controller's front panel. Whilst an auxiliary probe is attached, the PROBE LED on the front panel is illuminated, and the display shows the temperature of the auxiliary probe.

If both heater tube and auxiliary probe are used, the display switches between the two temperatures every 3 seconds, and the illumination of the PROBE or CIRCUIT LED indicate the current measurement source.

4. How to install the software

Note that the HBC controller will operate with or without the computer connection. Unconnected to a computer, no data is stored for data logging, and the setup values will be the last ones applied (or factory defaults).

The HBC software is compatible with Windows 10 operating systems. The computer must also have the dotNET framework library (version 4.0 or higher) loaded, which is included as part of a Windows 10 installation and should not be a problem. When using the HBC software on older versions of windows, it may be necessary to update the dotNET framework library (available free from Microsoft.com). The only computer hardware requirement apart from being able to run Windows 10, is a free USB port.

The HBC software can be installed directly from the USB flash drive by double clicking the AASHBCxvxx.exe icon. (where xvxx is the version number; for example, 1v43). Follow the installation prompts.

5. How to operate the Heated Breathing Circuit controller connected to a computer

The HBC controller can be plugged into the computer via a USB cable. The port on the controller is shown in (Figure 7)



Figure 7 HBC right hand side view (note USB port)

The first time the HBC controller is connected to a computer there may be a short delay whilst Windows enumerates the new USB device, subsequently Windows will recognise the device immediately. Note that additional no drivers to those that are already built into Windows are required.

The computer software provides full monitoring, charting and data logging facilities. It also allows the controller to be configured to a different target temperature and measurement units. The software also manages the firmware¹ upgrade process, including automated internet downloads of upgrades. Operation of the software is detailed in the user manual.

¹ Firmware is the software contained in the controller (not the Windows software)

6. Setting up Tube circuit or Qube defaults

When the software is installed on the computer and there is a USB link between the computer and the HBC controller, the controller defaults should be set up. In the Setup menu, select controller options (Figure 8).

Current HBC Setup		Required HBC Setup	
Product	8445	8445	8445
Serial #	0000	0000	0000
Version	0812	0812	0812
Batch	1	1	1
Load Type	Tube	Tube	Qube
SampleRate (s)	1	1	1
Control Temperature	45 C / 113.0 F	45.0 C / 113.0 F	45.0 C / 113.0 F
Hysteresis Temperature	1 C / 1.8 F	1.0 C / 1.8 F	1.0 C / 1.8 F
Estimated ET Offset	10	10	10
Default Unit (C/F)	C	C	C
Get Current Setup		Save Setup	
		Reset Options	
Firmware Version: 1.16		Close	

Figure 8 HBC controller Setup screen

The Required HBC Setup column of this form should be adjusted to the defaults shown (Figure 9, Figure 10) depending on whether a Tube circuit or Qube will be used. Note that greyed out fields cannot be altered.

Required HBC Setup	Required HBC Setup
8445	8445
0000	0000
0812	0812
1	1
Tube	Qube
1	1
45.0 C / 113.0 F	40.0 C / 104.0 F
1.0 C / 1.8 F	1.0 C / 1.8 F
10	10
C	C

Figure 9 Recommended Tube circuit default settings

Figure 10 Recommended QUBE default settings

When the column is completed, click the Save Setup button and the Required HBC Setup will be written to non-volatile memory in the controller. The software then reads the controllers setup data and writes it into the Current HBC Setup column to confirm a correct setup write.

7. Parts for replacement and consumables

Part Number	Photo	Description
Controller Parts		
8445		Heated Breathing Circuit controller ONLY
Aus/NZ - 8970 UK – 8971 US - 8998 EU – 8999		IEC mains cable with regional appropriate plug
8968		USB cable (USB A to USB mini B plugs)

<p>Heated Breathing Circuit Parts</p>		<p>Heated Breathing Circuits</p>
<p>2-20kg – 8347 20-80kg – 8348</p>		
<p>8615</p>		<p>Cable HBC to breathing tube (15 pin D connector to 4pin block)</p>
<p>Qube Parts</p>		
<p>Qube ONLY – 8270 Qube + Rodent Masks – 8437 Qube + Exotics Masks – 8457</p>		<p>Heated Qube</p>
<p>8619</p>		<p>Cable HBC to Qube (15 pin D connector to 4pin mini XLR)</p>
<p>Auxiliary temperature measurement Parts</p>		
<p>4.0mm Cat/Dog – 8617 3.2mm Rodent – 8618</p>		<p>Auxiliary temperature probe</p>
<p>8616</p>		<p>Auxiliary Expiratory tube cable</p>