Brinsea

HUMIDITY MANAGEMENT MODULE TYPES H22 and H222

USER INSTRUCTIONS

Contents

1.0 INTRODUCTION

These instructions detail the installation and operation of you new H22 or H222 Automatic Humidity Management Control Module. Please read them carefully before setting up your machine to achieve best results and keep these instructions safe for future reference. The H22 and H222 offer convenient and refined measurement and control of incubation humidity.

The H22 is specifically designed to compliment Brinsea Octagon 20 and 40 incubators but can be used with any forced draught (fan assisted) incubator of capacity up to 1,000 hens eggs approx. The high capacity H222 version is identical to the H22 except that the pumping capacity is much greater making it suitable for incubators of between 500 and 10,000 hen eggs capacity (approximately). The installation of both types is similar although the H222 is not compatible with the Octagon 20 or other small incubators. For convenience the following instructions referring to the H22 also apply to the H222. Any differences are noted in the text.

FEATURES

- Continuous, permanent metering of relative humidity
- Proportional control easily set against scale
- Sensor unit with high accuracy bulk polymer sensor
- Pumped water flow - not level dependent

PRINCIPLE OF OPERATION

The sophisticated bulk polymer sensor provides a highly accurate, linear signal of the relative humidity level within the incubator back to the Humidity Module which then displays this level on the large meter.

The control system operates a tiny in-built water pump which transfers exactly the amount of water required into the incubator to maintain the required relative humidity which is set by the user. The control system compensates for changes in relative humidity level and, within working limits, will maintain a constant relative humidity level.

2.0 UNPACKING

The H22 comprises:

1 **Type H22 humidity module control unit**
Free standing unit for mains electrical supply containing control and indication functions and pump.

1 **Sensor unit**
Fits inside the incubator or through the incubator wall. Contains the (removable) sensor, signal lead socket and mounting clip.

1 **Water tube (2.5m)**
Silicone rubber tube for interconnecting and for peristaltic pump replacement.

1 **Signal lead (1m)**
Flex with jack plugs for connecting between control unit and sensor unit.

2 **Evaporating pads (300 x 200mm)**
To be cut to suit incubator type.

(Note: A bulk water reservoir is not supplied. Any plastic or glass food container may be suitable.)

2.1 Remove all tape and packing from the module and parts. Retain the carton and packing materials to enable the unit to be repacked. Please take care not to discard the pack of heavy white evaporating pad paper. Note also that the white sensor fits into a socket in the sensor unit and can be pulled to remove. Take care not to lose the sensor, replacements are expensive.

2.2 Identify each part and check that they are all present and undamaged. If there are any parts damaged or missing please contact your retailer or Brinsea Products (at the address at the end of the document)

3.0 INSTALLATION

Mounting the sensor unit

3.1 The sensor unit can either be mounted inside the incubator or through the incubator wall.
Important: the water connections must be close to horizontal.

3.2 The sensor must be in a representative place in the incubator, with air movement over it. The sensor unit must be higher than the evaporating pad. Flow from the sensor unit to the pad is by gravity.

3.3 Wall mounting for thin walled incubators (e.g. Octagon 20)

For the Octagon 20 MkIII, Digital and Octagon 40, remove the plastic blanking plate on the end of the clear cover, and fit the clip in its place from the outside.

3.4 For other incubators with walls less than 3mm thick the mounting clip can be fixed directly on the outside of the incubator. Choose a place where the clearance inside is at least 30mm to leave room for the sensor. Cut a 25mm (1") diameter hole using a Q-max punch or hole saw. Locate the circular flange on the clip in the hole the correct way up as shown below.

3.5 Mark the two 3mm mounting screw holes. Drill the two holes and fix the clip with the countersink screws provided to the outside of the cabinet.. Be sure the fit is good. If necessary, use silicone sealant to bed the clip.

3.6 Wall mounting for thick walled incubators (e.g. Multihatch)

If the incubator wall is thicker than 3mm, follow the procedure for thin walled incubators but mount to a thin plastic panel (available as an option) fixed on the inside of the incubator wall. It will be necessary to cut a hole about 60mm (2½") diameter through the thick wall to pass the complete sensor unit through.

This procedure is necessary to ensure that the sensor is well into the incubator air stream.

3.7 Mounting inside incubator

The sensor unit can be mounted completely inside the incubator by making a suitable bracket drilled as described above. Provision must be made to seal around the flex and the water tube where they pass through the incubator cabinet wall. Bracket design will depend upon the incubator. Observe the important notes on mounting the sensor unit.

3.8 **Fitting the evaporating pad**

Most incubators are provided with water pans for humidification - usually in the base. This would be the obvious place to put the pads. The pad area needs to be as large as possible, certainly as large as the area provided for water (see humidity and ventilation). A short length of rubber tube should be cut to

link between the sensor unit outlet and the evaporating pad. This tube must run continuously downwards.

Caution: Be sure to arrange the pad and the tube so that water will not spill onto electrical equipment even if the pump overruns.

3.9 Octagon 20

Octagon 20 MkIII, Digital and Octagon 40 machines have a fan guard below which the evaporating pad is suspended in a "V" arrangement, located in the recess through the underside of the fan guard. The pad is retained by plastic clips. The tube from the sensor unit terminates in the centre of the "V".
Older Octagon 20 incubators can be fitted in the same way by adding a MkIII fan guard. Ask for instruction note.
Recommended size for evaporating pad is 60 x 140mm, scored and folded longways.

3.10 **Connecting up**

Place the control unit alongside the incubator as near as possible to the sensor unit. Place your water reservoir below or adjacent to the sensor unit (not above or water may siphon when changing pump tubes). Keep tube connections as short as possible. Connect tubes as shown below.
Use the flex provided to connect the socket on the sensor unit to the socket on the control unit (item 10).

Octagon 20: be sure to allow sufficient flex and tube to let the incubator turn unimpeded.
Connect the control unit to the mains supply.

4.0 OPERATION

The module will be factory calibrated but may be returned to the address below for re-calibration if necessary.

4.1 Fill a suitable container with water and place the pump inlet tube into the container.

4.2 Press the power supply switch . Power indicator will light. Turn the humidity control knob anti-clockwise to minimum.

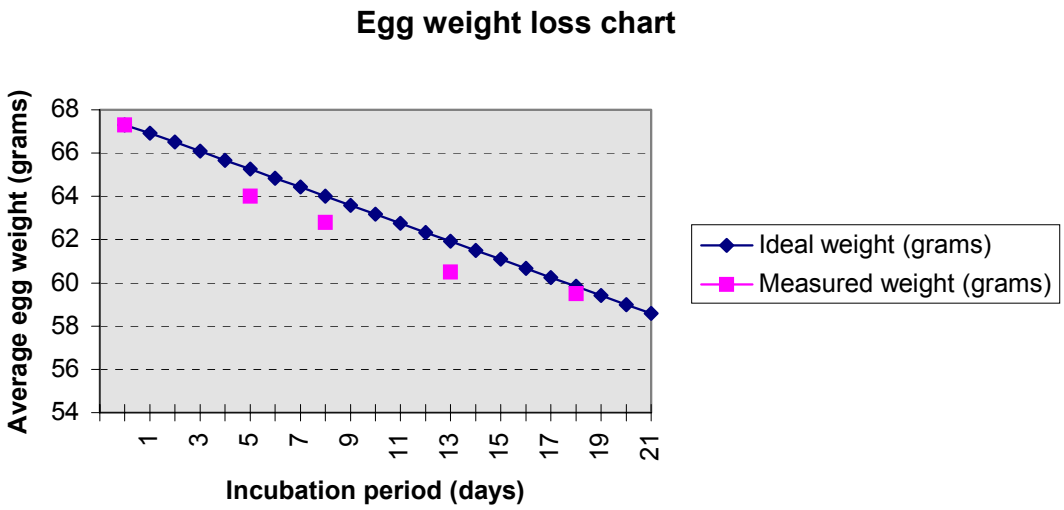
4.3 The meter will give a readout of humidity, at incubation temperature this will usually be a fairly low figure. Allow 5 minutes for the reading to stabilise and adjust the humidity control knob to raise the humidity, the pump will run and the 'pump run' indicator will light. To achieve the desired relative humidity level allow 30minutes between adjustments and use the meter reading as your guide to turning the control knob up or down.

4.4 When the humidity level is stable the pump will cut in and out evenly, pumping small amounts of water to offset moisture losses as incubator air is passed out through ventilation holes.

4.5 Guidelines for incubation humidity levels:

During incubation:	Poultry	40-50%
	Waterfowl	50%
	Ratites	30-45%
	Parrots	35-45%

To determine the correct humidity level for any given species either consult available literature (a range of bird keeping and breeding books is available from Brinsea Products at the address below), experiment with different humidity levels and record which proved most successful or weigh eggs during incubation. Eggs lose moisture through their shells and the rate of evaporation depends on the humidity levels around the eggs. During incubation eggs need to lose a fixed amount of water which corresponds to a loss in weight of around 13-16% depending on species. By weighing eggs periodically during incubation it is possible to monitor and, if necessary, correct humidity levels to achieve the correct weight loss.
Weigh the eggs on the day they are set in the incubator, take the average weight and plot this on a graph (see example below). The ideal weight loss line can be plotted by joining the point representing initial average weight with the ideal hatch weight (13-16% less depending on species) with the x-axis representing the incubation period (in days).



By measuring actual average weights every few days the actual weight loss can be plotted and compared to the ideal weight loss line and corrections can be made. For example if the actual weight loss was greater than ideal (see graph above) then the air has been too dry and humidity levels need to be increased to compensate.

Typical ideal weight losses for species groups:	Poultry	13%
	Ratites	15%
	Parrots	15%
	Waterfowl	14%

5.0 ROUTINE MAINTENANCE

5.1 Changing the pump tube

The peristaltic pump will need to have its tube replaced about every 3 months. Cut a length of tube to about 140mm (5½"). Remove the connectors and pull off the old tube. Replace with the new tube,

avoiding twists. Use the diagram on the product label to thread the tube correctly over the pump head. The tension must be sufficient to ensure complete occlusion of the tube without unnecessary flattening between the pump rollers. Adjust tube length as necessary. Ensure that the tube does not stick together if left for long periods.

5.2 **Changing the evaporating pad**

Change the pad as necessary to maintain good evaporating efficiency. If chicks are to be hatched in the incubator, change the pad after each hatch to avoid bacterial contamination.

6.0 TROUBLESHOOTING

The control module is calibrated from 0 to 100% RH and is theoretically capable of controlling throughout most of the range. However, the minimum and maximum levels of humidity achievable in an incubator depend upon several factors, particularly the fresh air ventilation rate. You may need to allow 24 hours for humidity to stabilise after making changes.

If you cannot get the level of RH you want, consider these notes:

6.1 **Humidity will not go low enough**

First increase the fresh air ventilation level - enlarge ventilation holes in the incubator cabinet. This will help to dilute the moisture given up by the eggs. There will still remain a lower limit determined by the moisture content of the ambient air, particularly in warm humid conditions. This can only be countered by dehumidification of the room air outside the incubator with proprietary dehumidifier but is rarely a problem in practice.

6.2 **Humidity will not go high enough**

Restrict fresh air ventilation to the minimum safe level. Remember chicks need to breathe! Increase evaporating pad area. If the pad is too small, you may have a flood in your incubator.
Do not attempt to achieve higher than 80% RH.
Check that water is reaching the incubator when the pump runs – if not check the whole length of the tubing for kinks and check that the tubing around the pump has not become permanently flattened. If it has, replace the pump tube.

7.0 SPECIFICATIONS

Sensing method:	Precision bulk polymer. Sensor accuracy +/- 3%. Hysteresis 0% r.H. Response time 2 minutes
Water Transfer:	In-built peristaltic pump

Maximum water flow rate 33ml/hour (H22), 240ml/hour (H222)

Control setting and metering:
Indicated in % RH (linear)

Electrical supply: 220-240v 50Hz or 115v 60Hz

Dimensions: 170 x 200 x 90mm (WxDxH)

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