Hallowell EMC

Anesthesia WorkStation

Operating Manual

PN 000a2770 Anesthesia WorkStation

A compact (9" W x 9" D x 15" H), convenient system for use on animals under 7 kg (15 lb.)

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In clinical trials the AWS is being used for long term anesthetic procedures on 150-400gm rodents. The AWS has been shown to be effective with the induction, stabilization, and maintenance of patients for neurophysiological testing using inhalant anesthetics for daily 8 to 12-hour procedures. Using the AWS, rats under isoflurane anesthesia have been subject to extended electrophysiological recordings of cortical responses. Throughout these procedures the AWS has been shown to facilitate the administration of anesthetics, holding the subject in a very smooth, controllable anesthetic plane, as well as providing precise respiratory control. Other successful preliminary clinical trials using the AWS have included anesthetic procedures on a number of mammalian (rabbit and woodchuck) and avian (crow, Cooper's hawk, duck, Canada goose) species.

The Hallowell EMC Anesthesia WorkStation is easy to use as BOTH a basic respirator (irrespective of anesthetic regime) and delivery source for inhalant anesthetics. It incorporates a time-cycled volume ventilator with an adjustable pressure safety limit. The only additional component necessary for immediate utilization is a vaporizer for the agent of your choice.

Free yourself from the restraints of the operating room, work on your bench top when appropriate.

Preparation and Setup

Set the AWS on your work surface. Place the vaporizer of your choice on the surface to the left of the WorkStation.

The connections to be made are:

In the front:

TO the **VAP**orizer.

FROM the **VAP**orizer.

To the patient

From the patient.

The four connections in the front are 15mm tapered ports that will accept standard 15mm endotracheal tube adapters. Two 6.0mm ET adapters are supplied with the AWS to be used with ¼" ID tubing (not supplied) to and from the vaporizer. Two 8.5mm endotracheal tube adapters are supplied to connect the 10mm breathing system tubes to and from the patient wye.

In the rear:

SUPPLY GAS.

SCAVANGING PORT.

Electrical power.

The supply gas connection in the rear is a standard male DISS O_2 connector. The scavenging port will accept either the 19mm scavenger tubing or a 15mm ET adapter. The electrical power inlet is the standard IEC320 connector. The power supply in the AWS is a universal supply that will accept any standard power source as noted on the rear panel.

Filling the Absorber Canister:

Open the AWS cover. Remove the two thumbscrews that hold the absorber top to the top mount on the chassis. Lift the canister from the unit and remove the top. Fill the canister with 300cc of CO_2 absorbent, replace the cover and return the canister to the unit. Secure the retaining screws and close the cover.

Turn the VENTILATE/STANDBY switch to standby.

Turn the AWS on.

After a short pause a lamp test will run for 2 seconds, verify that all indicators, all display segments and decimal points illuminate. Also verify that the audio alarm sounds with the lamp test.

Set the HIGH LIMIT safety, next to the airway pressure bar graph, to 25.

Set the respiratory RATE in breaths-pre-minute (BPM) to 40.

Turn the VOLUME control all the way down, fully clockwise.

With the patient connection occluded, use the FLUSH button to fill the breathing system until the floating puck in the ventilator tube reaches the top of the ventilator tube.

Switch the VENITLATE/STANDBY switch to ventilate.

Verify that the Low Breathing System Pressure (LO BSP) alarm sounds.

Slowly, increase the VOLUME control until the peak inspiratory pressure (PIP) reaches about 15 cmH_2O.

Verify the system is leak free confirming that, with no fresh gas flow (FGF), the ventilator puck returns to the same position at the top for several cycles.

If the AWS does not perform as described above, DO NOT use the unit. Resolve the discrepancy or remove the unit for service.

Warm Up Period

The breathing system chamber inside the hinged cover is heated to help keep the humidity of breathing gases at saturation near body temperature and to reduce condensation within the ventilator tube. It requires about 5 minutes for this chamber to come up to temperature. This will occur with the unit on and in the standby mode. Care should be taken to avoid opening the chamber during operation.

Alarms

The AWS is equipped with the following alarms:

All alarms may be silenced for a maximum period of 3 minutes by pressing the **ALARM SILENCE** pushbutton. During that time, every 20 seconds a short reminder beep will sound indicating that an alarm condition still exists. If an alarm condition clears that had previously been silenced the "alarm silence" itself will also clear. Thus if the alarm condition goes away when it happens again the alarm will sound.

Low Supply Pressure Alarm- Although the AWS will operate to it's declared specifications with an inlet pressure as low as 10 psig (69 kPa) the system will alarm when the supply pressure drops to 40 psig (275 kPa). The recommended input pressure is 50psi (345 kPa) and at NO time should exceed 65 psig (448 kPa)

Low Breathing System Pressure Alarm- This alarm sounds and the bargraph flashes on the very first breath in which the PIP does not rise 5 cmH_2O from the baseline of the previous breath. This alarm auto resets when the condition clears.

High Breathing System Pressure Alarm- This alarm sounds should the airway pressure sensed equal the HIGH LIMIT setting. This causes the inspiratory cycle to be terminated and the expiratory phase to be entered along with a short audio indication and a flashing bargraph display.

Cleaning and Maintenance

Use no alcohol on or near any plastic parts. Clean only with a damp cloth and mild detergent. All passages of the lower manifold block may be cleaned as needed with a 6" cotton tipped applicator. Access to some of the passages may be gained by removing the threaded plugs, two on the front and one on the right side. Both a sample of 4 applicators and the required Allen key are included.

Both the valve discs and valve seats of the inspiratory and expiratory valves located under the 2 domes in front of the CO_2 absorber tube should be cleaned as needed to prevent them from sticking due to dried condensation.

Very small amounts of O-ring lube may be used on the absorber top if required for a smooth fit.

NO O-ring lube should be used on the ventilator tube. Caution should be taken when handling the ventilator tube and puck to avoid touching the inside of the tube or the OD of the puck. Cleaning both with alcohol is recommended should the puck begin to drag within the tube. NOTE: the puck and ventilator tube is a matched set of parts and must remain together as a set. Do not interchange one or the other from other WorkStations.

Caution should also be taken when removing and handling the ventilator tube. This tube is made of **GLASS** not plastic; tilting it to far during removal **will** cause the tube to break. This type of breakage will **not** be covered by our warranty.

Miscellaneous

Note that two spare unidirectional valve discs have been included. These are the very small round plastic disks. We've marked them with an "X" on each for better visibility.

In the event that shipping the AWS is necessary, be sure to **REMOVE** all CO_2 absorbent and seal the AWS in a plastic bag. Double boxing the unit with plenty of packing material is requested.

Specifications:

Operational Characteristics
Rate 4-80 bpm
Tidal Volume 0-100 ml, option 0-200 ml (PN 000a3393)
I:E Ratio 1:2 (preset)
Supply Gas Oxygen
Supply Gas Pressure 40-65 psig [275 – 448 kPa]
Controls
Rate Linear, 4-80 bpm
Volume 10-turn metering valve
Adjustable Pressure Limit Linearly Adjustable, 10 - 30 cm H_2O
Indicators
Power On Front Panel-mounted green LED
Standby Mode Front Panel-mounted yellow LED
Alarm, Visual Front Panel-mounted yellow LED
Alarm, Audio Internal audio transducer
PHYSICAL
Unit Weight 16 lbs [7.3 kg]
Dimensions 9"W x 10"D x14.5"H [228mm W x 254mm D x 368mm H]
Power Requirements 90-240 Vac, 47-440 Hz