

AD-5000 Digital Anesthesia System





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SCAN FOR DEMO VIDEO

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EMC / EMI. This equipment has been tested and found to comply with the limits for a Class A Equipment, pursuant to part 15 of the FCC rules.	

IEC 61326-1:2005 / EZ 61326-1:2006

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DISCLAIMER

THIS MANUAL MUST BE READ BEFORE SETTING UP AND OPERATING THE E-Z

ANESTHESIA SYSTEM. The user should be thoroughly familiar with the contents of this manual prior to using the system with animals. Only technicians that are properly certified should operate the System.

The user/owner of this equipment shall have the sole responsibility for any damage or injury resulting from operation that is not in accordance with the authorized instructions. This includes, but is not limited to, operating the equipment outside of recommended safety levels, variation from specified operating instructions and not following standard laboratory safety procedures when working with anesthetic agents and volatile compressed gases.

The system and its components must only be modified or repaired by Euthanex-authorized service technicians. Improper modification or repair may result in danger to personnel, harm or death to animals and/or equipment damage. The user/owner of this equipment shall have the sole responsibility for any damage or injury resulting from improper maintenance and repair that is not done by authorized maintenance and repair personnel.

Parts that have failed, in whole or in part, exhibit excessive wear, are contaminated or are otherwise at the end of their useful life, should not be used and should be replaced with parts supplied by Euthanex Corporation. Tampering with the controller unit by unauthorized personnel voids all warranties and specifications. The manufacturer assumes no responsibility for any malfunction or failure of the unit if tampering is suspected.

IMPORTANT SAFETY INFORMATION

THIS MANUAL MUST BE READ BEFORE SETTING UP AND OPERATING THE EZ-

ANESTHESIA SYSTEM. The user should be thoroughly familiar with the contents of this manual prior to using the system with animals.

Only technicians that are properly certified to use Isoflurane vaporizer and anesthetic equipment should operate the EZ-Anesthesia system.

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Parts that have failed, in whole or in part, exhibit excessive wear, are contaminated or are otherwise at the end of their useful life, should not be used and should be replaced with replacements parts supplied by Euthanex Corporation.

Opening the vaporizer unit by unauthorized personnel automatically voids all warranties and specifications. The manufacturer assumes no responsibility for any malfunction or failure of the unit if the seal is broken. Do not open or remove screws that secure cover on the unit. Doing so may create electric shock hazard and will void all warranties and specifications on the unit.

BUILT IN EZ-HEAT SYSTEM OVERVIEW

The EZ-Heat System is an advanced automated heating bed and controller that has been developed specifically for maintaining small rodents' temperature during procedures. The system incorporates two key components, the Built in EZ-Heat Controller and the electronic heating bed.

The system works with settable temperature for up to 3 heating beds. The controller regulates the temperature of the bed thermostatically to ensure the heating beds remain at set temperature. Safety for runaway heat is built into the software.

USING AN ISOFLURANE VAPORIZER

- 1. Pay attention to all Warnings and Cautions as this draw attention to potentially harmful or dangerous results.
- 2. The vaporizer must **ONLY be used with Isoflurane**. No other agent is acceptable and may be dangerous.
- 3. **Isoflurane should only be used by licensed personnel**. Wear appropriate facemask and follow safety procedures as recommended by OSHA and your facility safety officers. Pregnant women should not be exposed to Isoflurane. If you have any questions regarding safety, please contact Euthanex for assistance.
- 4. During use, frequently check that the Isoflurane level is between the minimum and maximum marks on the sight glass level indicator. Refill the vaporizer before the liquid level reaches the minimum mark.
- 5. The vaporizer must **NEVER** be modified, dismantled, calibrated or serviced by unauthorized personnel. The vaporizer MUST be serviced at an approved Service Center. The unit should be serviced for cleaning and calibration every one to two years.
- 6. The vaporizer **MUST** be connected so that the flow of gas to the animal is as indicated by the arrows on the device. The incorrect flow direction will result in wrong dosage.
- 7. Before use, ALL connections must be checked for leaks and functional tests MUST be performed, as is the normal procedure for an anesthetic device.
- 8. **WARNING:** Keep the vaporizer upright at all times and do not carry the vaporizer by holding the dial control.
- 9. WARNING: High Isoflurane to Oxygen ratio can result in harm or death to animals.

FIRE SAFETY:

Oxygen vigorously accelerates the burning of combustible materials. In an oxygen-enriched atmosphere, many materials that do not burn in normal air require only a slight spark or moderate heat to set them aflame.

If cautery or electrosurgical equipment is to be used with this system the system must be operated inside a flow hood rated for use with flammable materials.



symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

- 1. Read these instructions.
- 2. Keep these instructions.
- 3. Heed all warnings.
- 4. Follow all instructions.
- 5. Do not use this unit near water.
- 6. Do not clean by spraying liquid directly onto unit.
- Do not block any ventilation openings. Install in accordance with the manufacture's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other unit that produce heat.
- 9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the unit.
- Unplug this unit during lightning storms or when unused for long periods of time.
- 12. Refer all servicing to qualified service personnel. Servicing is required when the unit has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the unit, the unit has been exposed to rain or moisture, does not operate normally, or has been dropped.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

Warning!

- To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.
- Use line cord supplied with the product.
- Be advised that different operating voltages require the use of different types of line cord and attachment plugs. The unit was shipped with the requested plug. If the installation requirements change please contact us for the correct plug.
- This equipment should be installed near the socket outlet and disconnection of the device should be easily accessible.
- Do not install in a confined space.
- Do not open the unit risk of electric shock inside.

Caution:

You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.

Service

- There are no user-serviceable parts inside.
- All service must be performed by qualified personnel.

Voltage 100-240 v ac 50-60hz 7 amp Max (auto select) Temp 0 to 40°C <> 10 to 85% RH (no condensation)

SYSTEM SETUP:



- 1. Attach the Regulator to the Oxygen Tank:
 - a. Use the EZ-320 Oxygen Regulator (1) for oxygen cylinders with a threaded CGA-540 connection.
 - b. Use the EZ-330 Oxygen Regulator for oxygen cylinders with a CGA-870 Yoke style connection.
 - c. ENSURE THAT THE REGULATOR AND CYLINDER ARE SECURE PRIOR TO OPERATING THE SYSTEM.
- 2. Attach the Oxygen source to the Anesthesia Machine:
 - a. Using the Green Oxygen Hose, connect the threaded DISS fitting to the outlet of the Oxygen Regulator(1). If using house gas, connect the DISS fitting to the house gas outlet instead.
 - b. Connect the Female Quick-Disconnect on the Green Oxygen Hose to the fitting on the Anesthesia Machine (2) labelled *Oxygen In.*
- 3. Connect the Induction Chamber (3):
 - a. Connect one end of the EZ-260-N Chamber Hose to the fitting on the Anesthesia Machine labelled *Induction Chamber.*
 - b. Connect the other end of the Chamber Hose to the male metal fitting on the chamber inlet.
 - c. Slip the open end of the large-diameter chamber exhaust tube over the plastic outlet fitting on the chamber outlet.
 - d. Attach the white plastic fitting on the other end of the chamber exhaust tube to the inlet of the ReFresh Carbon Filter (4).
- 4. Connect the Breathing Device (5):
 - a. Connect the Female Quick-Disconnect on the breather inlet tube to one of the fittings on the Anesthesia Machine labelled *Breather 1* or *Breather 2*.
 - b. Attach the white plastic fitting on the breather outlet tube to a Refresh Carbon Filter (4).
 - c. Slip the desired Nosecone over the front of the Breathing Device (5).
 - d. Insert the black rubber nosecone plug into the front of the nosecone.
- 5. Set up the Heated Beds (6):
 - a. NOTE: The Heated Beds (6) have been color coded for convenience:
 - i. Black = Chamber Warmer
 - ii. Yellow = Bed 1
 - iii. Red = Bed 2
 - b. Caution: Do not plug in or unplug heating bed with the Anesthesia Machine powered on. DAMAGE TO THE UNIT WILL OCCUR.
 - c. Using the black connection cable, connect the Chamber Warmer (7) to the fitting on the Anesthesia Machine labeled *Warmer*. Secure the connectors with the locking ring.
 - d. Using the yellow connection cable, connect the Heated Bed (6) to the fitting on the Anesthesia Machine labeled *Bed 1*. Secure the connectors with the locking ring.
 - e. Using the red connection cable, connect the Heated Bed (6) to the fitting on the Anesthesia Machine labeled *Bed 2*. Secure the connectors with the locking ring.

f. This step is done at the time of configuration of your system for shipping from the factory. If any error occurs the following needs to be checked.

Each bed has a unique ID # associated with it. The ID is found on the bottom of the bed. Pair the IDs of the Chamber Warmer and Heated Beds to the Anesthesia Machine as shown in the Changing Operating Specifications/Admin Functions section of this manual.



- 6. Fill the Vaporizer (8) with Isoflurane:
 - a. Control Dial must be in **OFF** position.
 - b. Drain plug must be closed.
 - c. Remove Filler Cap by turning counterclockwise.
 - d. Verify that the liquid agent is Isoflurane.
 - e. Slowly pour agent into opening.
 - f. Observe proper liquid level through the sight glass on front of vaporizer.
 - g. Replace Filler Cap and tighten.
- 7. Connect the Anesthesia Machine to power:
 - a. Plug the power cord into an electrical outlet, then insert the power adaptor into the fitting on the Anesthesia Machine labeled *Power*. Secure the adaptor with the locking ring. The main power is on the cord from the power brick and the unit.

OPERATING THE SYSTEM:

CAUTION: Before using the system, be sure to verify that all elements are set up and functioning properly, following safety checks as recommended by OSHA and your safety officer. Follow the Pre-Operation Checklist found in the Suggested SOP section of this manual.

THE OPERATIONS SCREEN:



This is the Operations Screen. All anesthetic procedures will take place from this screen. The Operations screen is accessed by pressing the Start button on the Home screen.

- A) <u>Outlet Label</u>: Identifies the outlet. Parameters below the label belong to the outlet identified above.
- B) <u>Outlet Run Button</u>: Tapping this button turns the outlet on or off. It has two modes: *Off* and *Running*.
- C) Timer: Displays the amount of time that the outlet has been Running.
- D) <u>Heater Label</u>: Identifies the heated bed. Parameters below this label pertain to the heated bed identified above.
- E) <u>Heater Run Button</u>: Tapping this button turns the heated beds on or off. It has two modes: *Off* and *Warming*.
- F) <u>Temp Set</u>: Displays the current temperature setting for each heated bed. Tap this button to make adjustments to set temperature during a procedure.
- G) <u>Temp Actual</u>: Displays the actual measured temperature from the sensor inside the heated bed.
- H) <u>Chamber Flush</u>: Tapping this button will clear the induction chamber of anesthetic by introducing rapid flow of fresh oxygen. The Chamber Flush will automatically deactivate after 20 seconds.
- <u>Set Flow Rate</u>: This feature allows adjustment of gas flow to each outlet. Flow is displayed in liters per minute (lpm). Tap the + and – buttons next to the displayed flow rate to adjust the flow up or down in 0.25 lpm increments.
- J) <u>Flow Rate</u>: Displays the current flow rate to each outlet. For example: If the Induction Chamber and Breather 1 outlets are set to *Running* and Flow Rate is displayed as 0.50 LPM, both the Induction Chamber and Breather 1 outlets are receiving 0.50 LPM of gas.
- K) <u>Home</u>: Tap this button to return to the Home screen.
- L) <u>Done Button</u>: Tapping this button will initiate a shutdown sequence. Gas will run for several seconds to clear the lines of anesthetic and relieve and pressure on the machine. Then, all outlets and heated beds will be turned to *Off*. The unit will return to idle. To power unit down you will need to use the switch located on the power cord.

PRE-OPERATION CHECKLIST:

- 1. Verify that all system components are installed and configured correctly according to the SYSTEM SETUP section of this manual
- 2. Ensure that your oxygen source contains adequate oxygen for the length of your procedure (>300 psi remaining in an oxygen tank)
- 3. Ensure that the vaporizer contains adequate anesthetic for the length of your procedure
- 4. Turn the Vaporizer dial to the OFF position
- 5. Insert the black rubber plug into any nosecones that will be used
- 6. Check carbon filters for saturation (100g increase)
- 7. Ensure that the AD-5000 Anesthesia Machine is powered On

SUGGESTED SOP:

- **WARNING:** The following anesthetic concentrations and flow rates are a suggested starting point for developing your protocols. **All settings should be refined and adjusted based on your own testing.** Factors specific to your laboratory context may impact on protocols. Protocols should be developed based on your requirements and careful observation of animals during anesthesia. Check reflexes of the animal before transferring to surgical table.
 - 1) Go through the Pre-Operation Checklist outlined above.
 - 2) Open the valve to your oxygen source.
 - 3) If on the Home Screen, press the Start button to access the Operations Screen.

4) Perform Induction:

- a. Turn the Chamber Warmer on, the heater run button will display: Warming.
- b. Set the Flow Rate to 1.0 LPM.
- c. Turn the Induction Chamber outlet on, the outlet run button will display: Running.
- d. Place animals into the Induction Chamber, close and latch the lid.
- e. Turn the vaporizer dial to 5%.
- f. Observe the animals closely, when the animals have lost the ability to right themselves, turn the vaporizer dial to the appropriate maintenance concentration:

Mice:	1.5%
Rats <300gms:	2%
Rats >300gms:	2 - 3%
Rabbits:	3 - 4%
	T 1

- g. Allow animals to remain in the Induction Chamber for an additional 3 to 5 minutes prior to transfer to the nosecone/mask.
- 5) Transfer animals to the nosecone/mask:
 - a. Turn the desired Heated Bed on, the heater run button will display: *Warming*.
 - b. Turn the desired Breather outlet on (Breather 1 or 2), the outlet run button will display: *Running*.
 - c. Activate the Chamber Flush.
 - d. When the Chamber Flush has finished: open the Induction Chamber, remove animals and secure the lid.
 - e. Remove the black rubber plug from the nosecone, place animals on the heated bed and gently secure the animal's nose into the nosecone. Adjust height and tilt of the nosecone if needed.
 - f. If no animals remain in the chamber, turn the Induction Chamber outlet to Off.
- 6) Adjust Flow Rate if needed:
 - a. For mice and rats: If both the Induction Chamber and one or more Breathers are *Running*, set the Flow Rate to 0.75 1.0 LPM. If only one or more Breathers are *Running*, set the Flow Rate to 0.50 LPM.
 - b. For rabbits and guinea pigs: If both the Induction Chamber and one or more Breathers are *Running*, set the flow to 1.5 2.0 LPM. If only one or more Breathers are *Running*, set the Flow Rate to 0.75 1.0 LPM.
- 7) Shut the system down:
 - a. Turn the vaporizer dial to Off.
 - b. Press the Done button and wait for the shutdown sequence to be finished.
 - c. Press the Home button to return to the Home screen.
 - d. Press the red Power button in the top left corner of the Home Screen.
 - e. Once the screen has turned off, power may be shut off to the machine.

Changing Operating Specifications Admin Functions:



1. From the Home Screen press Admin.

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	Ente	er Pass	word	
	7	8	9	
	4	5	6	
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	С	0		
Back			1	Next

2. Enter the Administrator 4 digit password (default is 7777 and can be changed once in the admin settings screen) and press Next.



- 3. The Admin Options Screen will appear.
 - a. Change System Parameters
 - b. Change Admin Password
 - c. Change Temperature Setting
 - i. Use to change Exhaust time and basic system settings.
 - d. Transducers Pairing
- 4. (A) Change System Parameters, select from admin screen
 - a. Set to allow .25lpm instead of the default .5 lpm A.
 - b. If you need us to connect to your unit for service support, this is the ID that we will need to connect to the unit. B
 - c. Adjust system language. As more translations are added we will update the software. C

	ANESTHESIA &								
	Set System Parameters								
	Deactivate Gas Connection Warning								
Α	✓ Increment flowrate by 0.25 lpm								
В	Teamviewer ID: 1 338 929 100 Reset Password								
	Inactivity Timeout 60 + mins Flushing Timeout 5 + secs								
	Date and Time - 9/18/19 1:58 PM +								
	No Gas Warning Timeout - 1 + mins - 15 + secs								
	Heaters Auto Shutdown Time 9 + hours - 2 + mins								
E	Backup Restore Serial								
С	Set Lang. D Update Wifi	F							
	Mail Org. Name								
	Back Save								

d. Highlight the language that you would like to use then hit ok. The system will restart in the selected language.

ANESTHESIA'
Set System Parameters
Deactivate Gas Connection Warning
☑ Increment flowrate by 0.25 lpm
Teamviewer ID: 1 338 929 100 Reset Password
^{In} . Select Langugae
English
Czech
Energh
German
Portugues
Hi Cancel OK
Backup Restore Serial
Set Lang. Update Wifi
Mail
Back Save

- e. When all changes are made select OK.
- f. Update, used to update the software if the unit is connected to the internet. D

g. Backup / Restore, the system can be backed up to our service and support server. All of the setting parameters will be saved. You can restore the parameters at any time as long as you are connected to WIFI. E

h.	WIFI settings.	Used to connect the unit to your WIFI network.	F
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=	A	IEST	HES	SIA° Z	5	
Wif	i Settin	gs	F	Re Scan	<u>نې</u> (
Select	Network:					WIFI is connected
	Security:	NONE WPA- WPA- IEEE8	PSK EAP 3021X			WIFI in NOT connected
P	assword:	EZ*9	344bet	th!		
1	2	3	4	5	6	
7	8	9	0	()	X
а	b	С	d	е	f	The networks that are in range will
g	h	i	j	k		appear here.
m	n	0	р	q	r	
S	t	u	V	W	x	Select the one you want to connect
у	z	+	-	1	*	±
			2	!	п	
Û		SPAC	E		\boxtimes	
Back					Save	

Select the network and security protocol then enter the password. Hit Save.

i. When all changes are made select Save.

5. (C) Heaters Set ID

Caution: Do not plug in or unplug heating bed with the unit powered on. DAMAGE TO THE UNIT WILL OCCUR.

a. From the admin menu select Heater Settings

ANESTHESIA 25					
Tempe	erature Settings				
Temperature:	-100 + Off				
Sensor:	01186e98bcff -				
- Warming Bed 1					
Temperature:	-100 + Off				
Sensor:	01186d93fdff -				
- Warming Bed 2-					
Temperature:	- 100 + Off				
Sensor:	01142fadf146 -				
Unit: °F -	Offset: -0.00 +				
Max-Temp: - 110 +					
Back Save					

b. Use the drop down to select the heater ID that is attached to the associated heating circuit. It is crucial that the id is properly associated to the channel, if not the bed will not regulate correctly.

ANESTHESIA" 25					
Linduction Chamber I	erature Settings Bed				
Temperature:	- 100 + Off				
Sensor:	01186e98bcff 01142fadf146 01186d93fdff				
Temperature:	-100 + Off				
Sensor:	01186d93fdff -				
Warming Bed 2					
Temperature:	- 100 + Off				
Sensor:	01142fadf146 -				
Unit: °F -	Offset: -0.00 +				
Max-Ter	np: - 110 +				
Back	Save				

c. Repeat this for each heater connected. Hit save when complete.

6. (B) Change Admin Password

E	AN	IESTH	ESIA®	60
ſ	Ente	er Pass	word	
	7	8	9	
	4	5	6	
	1	2	3]
	С	0]
Back			1	Next

a. Input current Admin password, change to new password and hit save.

CLEANING AND MAINTAINANCE PROCEDURES

1. EZ-Vaporizer

A.) **Every two weeks**, the vaporizer should be drained into appropriately marked containers and disposed of properly. Less frequent intervals may be used when the anesthetic agent does not contain additives or a stabilizing agent.

WARNING: Do not drain the vaporizer into a container that is not properly marked.

B.) Draining the vaporizer:

- 1) Control dial should be in the OFF position.
- 2) Remove filler cap from the fill cylinder to reveal bottom drain plug.
- 3) Place a suitable container under the drain outlet under the fill cylinder.
- 4) Slowly unscrew the drain plug until liquid begins to flow into container. DO NOT unscrew the drain plug all the way out.
- 5) When all of the liquid agent has been drained, tighten the drain plug and replace the filler cap.
- C.) Vaporizer must be **fully serviced and calibrated at least every three years**. Servicing must be done by an authorized service technician. WARNING: DO NOT MODIFY, TAMPER WITH OR DISASSEMBLE THE VAPORIZER. THIS UNIT MUST ONLY BE SERVICED BY AUTHORIZED PERSONNEL.

TROUBLESHOOTING

System will not turn on:

- 1) Make sure power cord is properly plugged in.
- 2) Make sure the power switch on the back of the unit is turned in the "ON" position.

Heat is not being generated at the bed:

Caution: Do not plug in or unplug heating bed with the unit powered on. DAMAGE TO THE UNIT WILL OCCUR.

- 1) Check that the controller is in a run cycle and the red heat indicator is going on and off.
- 2) Check that the bed cable is connect to the back of the controller.
- 3) Check that the bed ID is selected for the channel that the cable is plugged into.

Bed temperature is not at correct:

- 1) Check that the bed temperature is set correctly.
- 2) Each bed can be set to a different temperature, verify settings.

If this troubleshooting guide does not resolve your problem, contact Euthanex Tech Support at 1-877-559-0159, or **info@euthanex.com**.



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