

# IV Fluid Warmer



# User Guide

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## ***General Information***

The IV Fluid Warmer is a dry-heat device designed to warm IV fluids via a heating plate. This device does not provide flow rate control. Fluids can be warmed up to temperatures between 71.6-98.2°F (22.0-36.8°C). Because this device can cause fluids to reach temperatures of 107.6°F (42.0°C) it is not recommended for use with blood or blood products. This device is intended only for the animal health market.

## ***IV Fluid Warmer Features***

- Portable and light weight.
- Capable of warming all I.V. fluids except transfusion fluids.
- Convenient hanging belt and clamp.
- Temperature displayed in Fahrenheit or Celsius.
- Temperature overheating protection.
- Single IV routing option allows for quick and easy set up.
- LED display.
- Compatible with standard IV sets.
- Not recommended for use with blood products.
- 1 year limited warranty.

# Warnings and Precautions

1. Before using the IV Fluid Warmer, please read and understand this User Guide. If you have any questions, please contact Midmark at 1-800-643-6275 or visit the website at midmark.com.
2. All air must be purged from the fluid lines prior to connection to the patient. Monitor the fluid lines to ensure they are air free. Never administer fluids if there are air bubbles in the line between the drip chamber and the patient connection. Ensure tubing does not kink during operation.  
**Failure to do so could result in the administration of air to the patient which can lead to serious injury or death.**
3. This equipment is designed to be used with IV sets compliant with ISO 8536.4. IV sets should have a diameter between 3.4-4.5 mm.
4. This device is designed to warm IV fluids for animals and should only be utilized by trained veterinary personnel.
5. This device is not intended to be used with analgesics, chemotherapy drugs, insulin solutions or any other heat-sensitive medicines.
6. This device is not recommended to be used with blood or blood products.
7. This device uses RF energy for its internal function. The RF emissions have been tested to appropriate safety standards and have been found to be very low. They are not likely to cause interference with other devices; however, it is not recommended to use this device directly next to other devices that are sensitive to RF emissions (MRI scanners, X-ray generators, ECG monitors, etc.)
8. Perform periodic checks and cleaning as specified later in this manual.
9. If alarm sounds, stop use and troubleshoot the error. Further troubleshooting instructions table 2 of this manual.
10. Unplug the device while not in use. Only use the device with properly grounded outlets.
11. The temperature the device is set to is not necessarily the temperature of the fluid delivered to the patient. There are a variety of factors that affect fluid temperature including: flow rate, distance from the output of the device to the patient, ambient air temperature, etc. Reference table 1 for fluid output temperatures.
12. Do not wrap the cord tightly around the device. Fluid warmer may malfunction or cord damage may result form improper storage.
13. Device should not be serviced in the field.

## Packaging List

1. IV Fluid Warmer
2. Power Adapter
3. Pole mount clamp and knob
4. Lanyard mounting clip
5. User Guide
6. Warranty registration card

# **Technical Specifications**

## **Safety and Compliance**

- This device has an IPX1 rating for protection against splashing and fluids. It is fluid and water resistant, not waterproof. Never fully submerge or soak the unit.
- Device has been subjected to various tests in accordance with IEC 60601-1 & IEC 61000 ensuring pertinent RF emissions and Electrical safety standards are met.
- Input Voltage: 100-240V
- Frequency: 50Hz/60Hzs
- Power: 85 VA

## **Recommended Device Transport and Storage Conditions**

- Temperature: 41°F-86°F (5°C-30°C)
- Relative Humidity: 20-80%

## **Physical Specifications**

- Device dimensions: 7.08 inches x 2.75 inches x 1.37 inches
- Weight: 0.44 pounds (just the IV Fluid Warmer)  
0.88 pounds with pole clamp and lanyard.
- LED display.

## **Safety and Compliance**

- To be used with PVC IV sets with flow rates of 20 and 60 d/mL. IV sets should be compliant with ISO 8536.4. IV set outer diameters to be between 3.4-4.5 mm.
- Warm up duration: Less than 2 minutes.
- Overheat protection activates at 43°C (109.4°F).
- Temperature accuracy:  $\pm 1^{\circ}\text{C}$  or  $\pm 1.8^{\circ}\text{F}$ .



# ***Instruction for Use***

1. Hang or clamp the IV Fluid Warmer vertically. If an infusion pump is used, the warmer should be located slightly under the IV line's exit from the pump.
2. Plug the power cord into a properly grounded outlet.
3. Open the device and route the IV line through the grooved path on the heating plate. Then close and lock the latch.
4. Use buttons (5) and (11) to lower and raise to desired temperature setting.
5. Use button (6) to toggle between °C & °F.
6. Press button (10) to begin heating the device. Light (4) will flash as the device warms up. Once device reaches set temperature, light (4) will remain on.
7. The display temperature on the screen is the temperature at the exit of the warmer after reaching steady state. It is NOT necessarily the temperature of fluid being delivered to the patient. There are a variety of factors that can impact the temperature of fluid delivered to the patient such as: distance from device output to the patient, flow rate, and ambient room temperature. Please reference table 1 for desired output value.
8. When finished, unplug the device and allow it to cool. Lightly dampen a soft washcloth with either: warm water, diluted soap, diluted Ammonia water, Sodium Hypochlorite, Hydrogen Peroxide (3%), Ethanol (70%), Isopropyl Alcohol (70%) and wipe down the device.  
**Do not fully soak or submerge the device.**

## Temperature Output Chart

The values obtained in table 1 below were obtained in a room that was 20°C (68°F) with measurements taken 10 cm from the output of the device.

**Table 1: Output Temperatures**

<b>Flow Rate (mL/H)</b>	<b>Set Temp: 35°C (98.6°F)</b>	<b>Set Temp: 37°C (98.6°F)</b>	<b>Set Temp: 42°C (107.6°F)</b>
25	25.1°C (77.2°F)	25.2°C (77.4°F)	25.3°C (77.5°F)
100	29.2°C (84.6°F)	30.8°C (87.4°F)	32.6°C (90.7°F)
200	32.7°C (90.9°F)	33.6°C (92.5°F)	36.8°C (98.2°F)
400	31.6°C (88.9°F)	33.1°C (91.6°F)	35.7°C (96.3°F)
600	30.8°C (87.4°F)	32.2°C (90.0°F)	33.9°C (93.0°F)
1000	29.8°C (85.6°F)	31.0°C (87.8°F)	31.9°C (89.4°F)



# Alarm and Error Troubleshooting

When an alarm sounds, please complete the following task:

1. Ensure the patient is okay.
2. Identify the type of alarm that is sounding.
3. The mute button can be pressed to silence the alarm for up to two minutes.
4. Troubleshoot the alarm or error per table 2 below.
5. If additional assistance is required, please contact Midmark Technical Service at 1-844-856-1232.

**Table 2: Troubleshooting Scenarios**

<b>Issue</b>	<b>Possible Cause</b>	<b>Potential Solution</b>
<b>Device is not heating up past room temperature.</b>	Door is not closed properly [E002]	Ensure door latch is secured and device is shut properly.
	Device is not started	Press the start/stop button.
	Faulty component in heating system.	Contact Midmark Technical Support.
<b>Overheat Alarm is sounding [E004]</b>	Device is sitting in direct sunlight or next to another body capable of producing heat.	Remove device from direct sunlight or away from external heating sources.
	RF emissions of nearby components cause issues with device.	Do not use this device next to objects that are known to emit large amounts of RF waves.
	Room temperature is outside of specified operating conditions.	This device is only intended for use in settings that are between 41-89.6°F (5-32°C).
	Faulty component in heating system.	Contact Midmark Technical Support.
<b>Lower Temperature Alarm is sounding [E003]</b>	Device has not had proper time to heat up.	Give device at least 2 minutes to warm up before use.
	Room temperature is outside of specified operating conditions.	This device is only intended for use in settings that are between 41-89.6°F (5-32°C)
	Faulty component in heating system.	Contact Midmark Technical Support.
<b>System Error appears on screen [E001]</b>	Hardware or Software System error	Contact Midmark Technical Support.

# **Warranty Information**

## **Registration**

Register your IV Fluid Warmer at [midmark.com/vet-register](http://midmark.com/vet-register) to:

- Log your product warranty with Midmark
- Keep you informed on important warranty information and product updates
- Provide you with faster, more convenient service in the event you experience a problem
- Enhance customer service benefits tailored to your product or account

## **Scope of Warranty**

Midmark Corporation (“Midmark”) warrants to the original retail purchaser that it will repair or replace components of the animal health products manufactured by Midmark (except for products and components not warranted under “Exclusions”) that are defective in material or workmanship under normal use and service. The sole remedy under this limited warranty is the repair or replacement, at Midmark’s option, of the applicable products or components. This limited warranty shall only apply to defects that: (i) are reported to Midmark within the applicable warranty period; and (ii) are determined to exist upon examination by Midmark. This limited warranty extends only to the original retail purchaser of a product, and is not transferable or assignable.

## **Applicable Warranty Period**

The applicable warranty period for each Midmark product commences on the date of delivery to the original retail purchaser of the product and shall continue for the period specified.

The IV Fluid Warmer is warranted against defect in material and workmanship for a period of one year from the time of delivery.

The power cord is warranted against defect in material and workmanship for a period of six months from the time of delivery.

# Warranty Information continued...

## Exclusions

This warranty does not cover and Midmark shall not be liable for the following:

- Defects, damage, or other conditions caused, in whole or in part, by misuse, abuse, negligence, alteration, accident (including animal acts of any kind), freight damage, tampering, or failure to seek and obtain repair or replacement in a timely manner.
- Use of spare parts not provided or approved by Midmark for use with this device.
- Serviced by external personnel not authorized by Midmark.

## After-sale Service and Support

To obtain service or product support, please contact Midmark at 1-800-643-6275 or visit the website at [midmark.com](http://midmark.com). Have the following information available:

- Model and serial number of the equipment
- Date of purchase and distributor name

*It is the retail purchaser's obligation to arrange for delivery of a product to Midmark or one of its authorized dealers for warranty service which delivery shall be at retail purchaser's expense. It is also the retail purchaser's obligation to comply with the warranty service instructions provided either by Midmark or its authorized dealer.*

**Table 3: Service Items**

Item Name	Kit Number
Power Supply, Standard	002-10628-00
Power Supply, EU	002-10628-01

**Midmark Corporation**

60 Vista Drive

Versailles, OH 45380 USA

1-800-643-6275

1-937-526-3662

[www.midmark.com](http://www.midmark.com)

