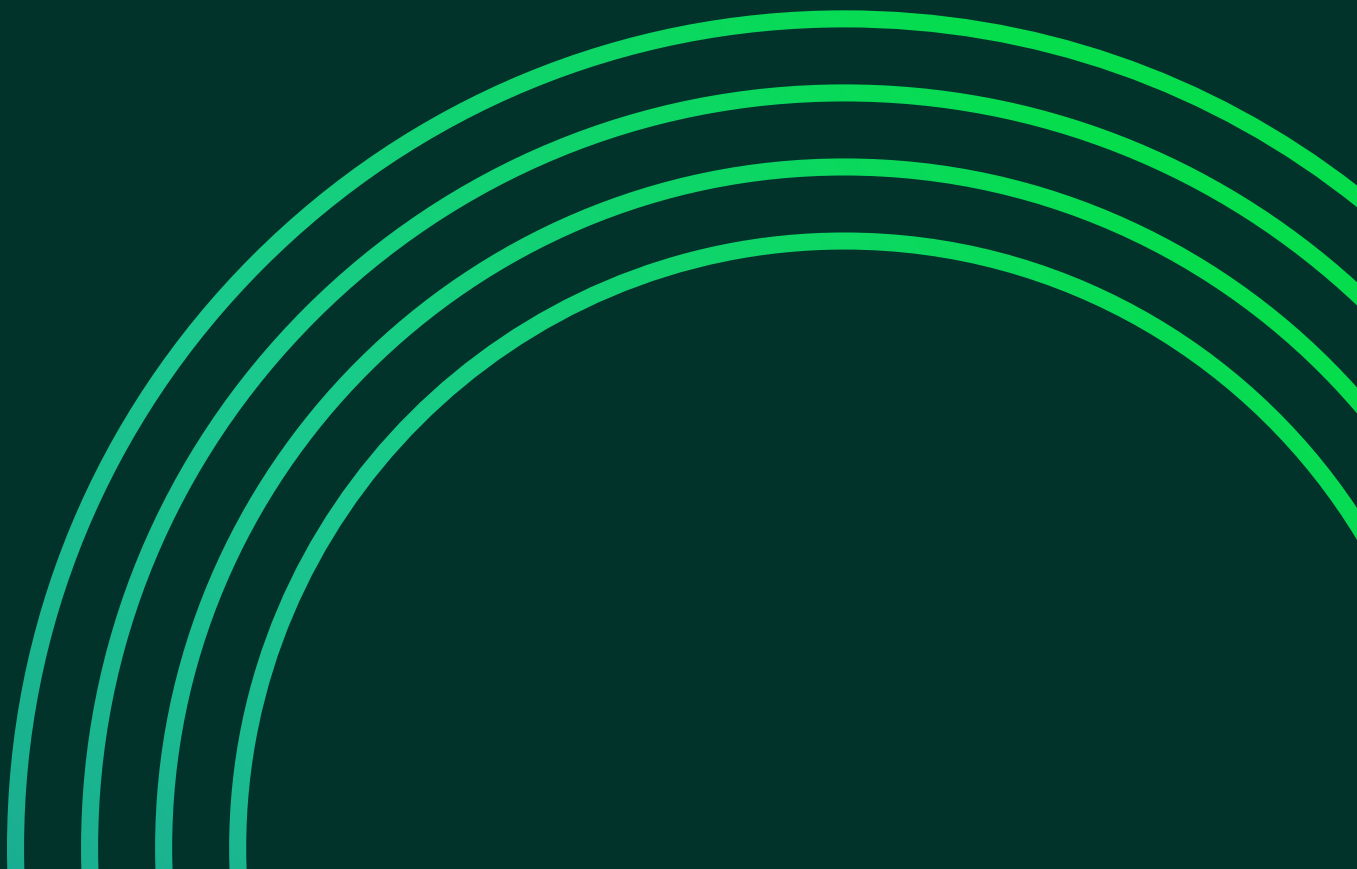




# Smart, intuitive dry heat technology solution

Ranger™ Blood/Fluid Warming System



# Make your job easier with no hassle blood and fluid warming

## A flexible solution

The Ranger™ blood and fluid warming system uses dry heat technology to help make your job easier and optimize patient care. Dry heat technology adapts to virtually any fluid warming need from KVO (keep vein open) to 333 mL/min or 20 L/hour. That means fast, accurate heat control which minimizes the risk of overheating fluids while avoiding the potential for cross contamination associated with traditional water bath systems.<sup>1</sup>

## Safe and secure

The Ranger™ pressure infusor has important safety features that includes visual and audible alerts to let you know if a chamber's pressure drops below or exceeds the desired pressure range. By applying 300 mmHg of consistent, controlled pressure to IV fluid bags, the Ranger pressure infusor provides secure and simple administration of fluids to a flow rate up to 333 mL/min. Two independent chambers accommodate a variety of fluid bag sizes, from 250 mL to 1000 mL.

## Save time and money

To save time and money in training and system maintenance, just one warming unit is used for all flow rates – from pediatric cases to standard flow rates to high volume flow rates – all cases follow the same setup process. Disposable warming sets slide easily into the warming unit and only fit in one direction, so setup is intuitive.

Because the Ranger system uses dry heat technology, there are no unsightly water reservoirs to change and maintenance is easy. One simple tool is all that's required to clean the Ranger warming unit in a matter of minutes.

## Clinically proven

It can be so important to warm your surgical patients' fluid or blood. Infusing cold fluids can produce hypothermia.<sup>2</sup> In fact, infusing one liter of room temperature fluid (21°C) or one unit of refrigerated blood (4°C) can decrease the patient's mean body temperature by 0.25°C<sup>2</sup> and the effects are additive. So the higher the infusion volume, the more drastic the drop in mean body temperature.<sup>2</sup>

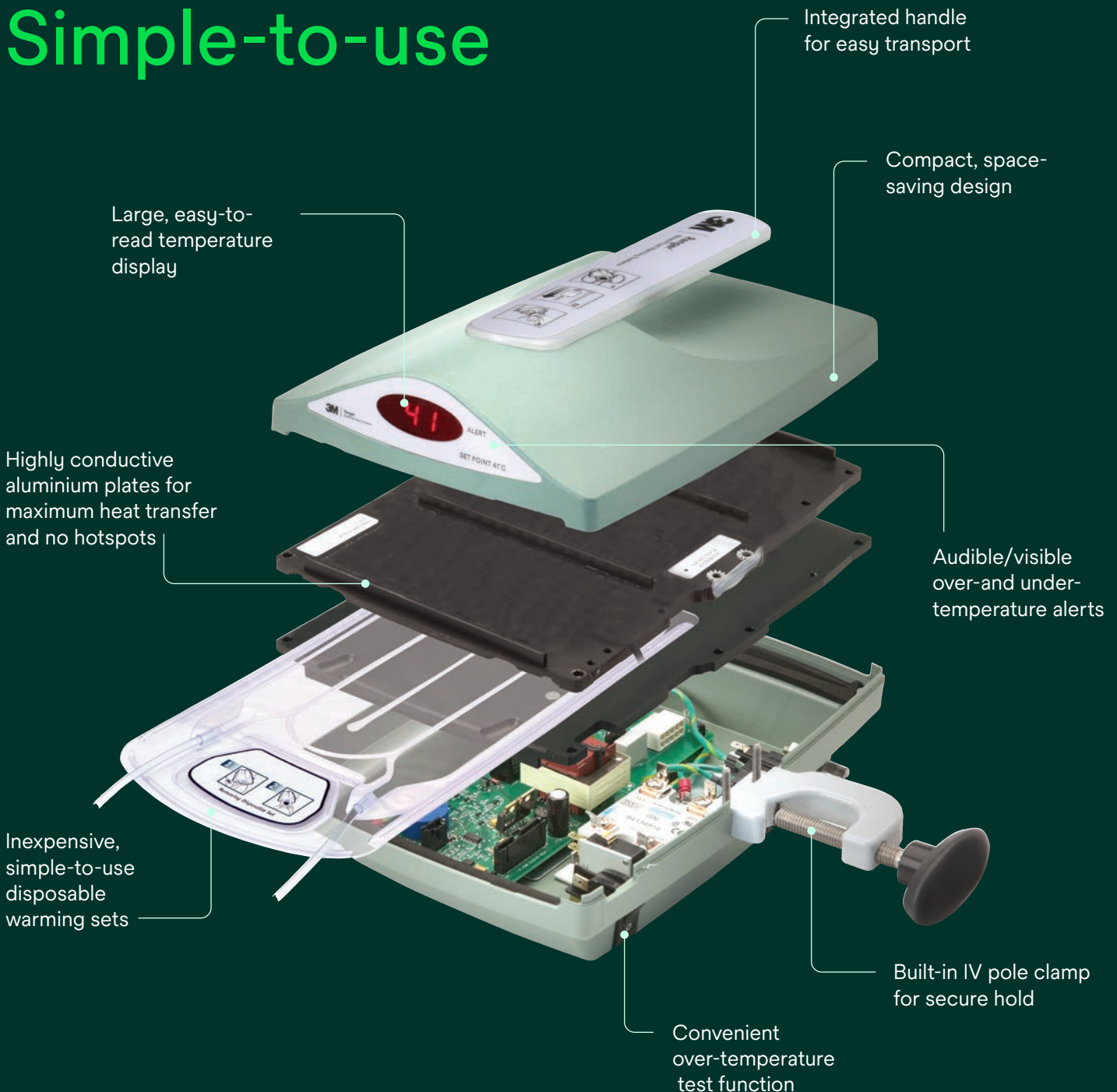
In contrast, fluid warming can minimize heat loss when large amounts of fluid or blood are needed. It is not a stand-alone option for patient warming (or normothermia maintenance), but it may offer a benefit when used with other patient warming modalities.

## Sustainability

In the Medical Surgical Business, Solventum is working to make our manufacturing processes and internal operations more sustainable. We took it one step further and worked with suppliers to rid the entire warming set of components that are made of materials that contain DEHP (di-[2-ethylhexyl] phthalate).

Inspired design

# Lightweight Space-saving Simple-to-use



# Eliminate a potential source of water-related infection with advanced dry heat technology

You and your staff work hard to remove potential sources of nosocomial pathogens and healthcare associated infections. Warm water has long been identified as a potential source of gram-negative bacilli.<sup>1</sup> Endocarditis, bacteremia and peritonitis with *Pseudomonas* or *Acinetobacter* have also been traced to contaminated 37°C waterbaths.<sup>1</sup>

Dry heat fluid warming devices like the 3M™ Ranger™ blood/fluid warming system uses aluminum plates within the warming unit. No water bath. No risk of potential water-related infection due to a warm water bath.

The design and aluminum plates in the Ranger blood/fluid warming system are ideally spaced to create maximum contact area with the warming set while allowing unrestricted fluid flow. The tightly coupled heat system is highly responsive to changes in flow rates under all fluid warming conditions. A microprocessor based controller monitors the system temperature four times per second and is sensitive to variations as small as 0.1°C. This allows the warming unit to either increase or decrease heat as fluid temperature and flow rates change.



# 3M™ Ranger™ Blood/Fluid Warming Unit

## Model 245 Specifications

Set	Inlet Fluid Temperature	Flow Rate
Pediatric	4°C-20°C	KVO - 100 mL/min
Standard Flow	4°C-20°C	KVO - 150 mL/min
High Flow	4°C	KVO - 167 mL/min
High Flow	20°C (ambient temperature)	KVO - 333 mL/min

### Alarms (audible and visual)

Over-temperature primary setpoint: 43°C

Over-temperature secondary setpoint: 44°C

### Device rating

100 - 120 VAC, 50/60 Hz

220 - 240 VAC, 50/60 Hz

### Leakage current

Meets leakage current requirements in accordance with UL / IEC 60601-1

**Set point temperature: 41°C**

### Dimensions

19 W x 11 H x 25 D cm  
(7.5 W x 4.5 H x 10 D in)

### Weight

3.4 kg (7.7 lb)

### Packaging

1/Box

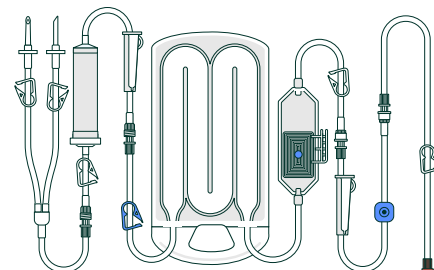


## 3M™ Ranger™ Blood/Fluid Warming Sets

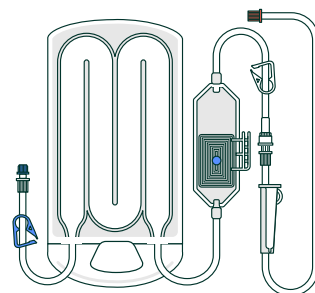
Warming sets accommodate up to 300 mmHg of pressure and are made without natural rubber latex and without DEHP. There are 10 warming sets contained in each case, that are sterilized - EtO. For single use only.

### High Flow Warming Sets: KVO - 333 mL/min or 20 L/hr

Model 24355	
Priming volume	150 mL
Components	two bag spikes, drip chamber with 150 micron blood filter, roller clamps, cassette, auto-venting bubble trap, needleless injection port 52 cm (1.52 m) / 60 in (5 ft) patient line



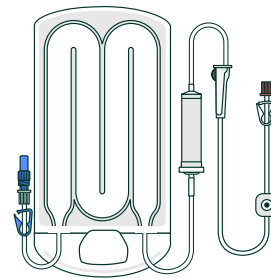
Model 24370	
Priming volume	89 mL
Components	Cassette, auto-venting bubble trap, roller clamp 121 cm (1.21 m) / 48 in (4 ft) patient line



## Standard Flow Warming Sets: KVO - 150 mL/min or 9 L/hr

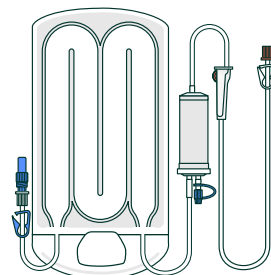
### Model 24200

<b>Priming volume</b>	39 mL
<b>Components</b>	cassette, needle injection port, bubble trap, roller clamp 76 cm (0.76 m) / 30 in (2.5 ft) patient line



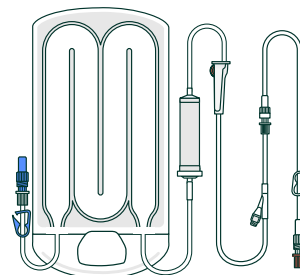
### Model 24240

<b>Priming volume</b>	44 mL
<b>Components</b>	Cassette, needleless air bubble trap aspiration port, roller clamp 152 cm (1.52 m) / 60 in (5 ft) patient line



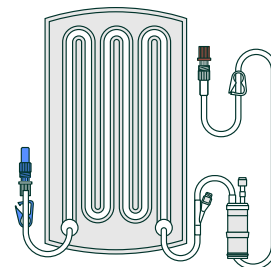
### Model 24250

<b>Priming volume</b>	44 mL
<b>Components</b>	Cassette, roller clamp, bubble trap 152 cm (1.52 m) / 60 in (5 ft) patient line



### Model 24450 (Pediatric/Neonate)

<b>Priming volume</b>	20 mL
<b>Components</b>	Cassette, needleless injection port, bubble trap with air aspiration port 60 cm (0.6 m) / 24 in (2 ft) patient line





## 3M™ Ranger™ Fluid Warming Accessories

### 3M™ Ranger™ High Flow Blood/Fluid Warming Set Drip Chamber with 150 Micron Filter

Model 90029	
Priming volume	64 mL
Components	150 micron filter made without natural rubber latex, 10 warming sets/case, EtO, Single-use only

Model 90030	
Use	Clean heating plates of the Ranger blood/fluid warming unit, Model 245 and the Ranger Irrigation warming unit, Model 247
Case quantity	12 Cleaning tools/case



## 3M™ Ranger™ Pressure Infusor System

The Ranger pressure infusor system is designed for use with the Ranger blood/fluid warming unit and Ranger high flow warming sets. The pressure infusor system can accept 250 mL to 1000 mL fluid bags and provides maximum dynamic operating pressure of 300 mmHg.

The pressure infusor system includes three separate pieces: the pressure infusor, IV pole and IV pole base.

3M™ Ranger™ Pressure Infusor Model 145	
For use with	Pressure infusor IV pole (model 90068) and Ranger IV pole base (model 90124)
Dimensions	40 L x 51 W x 20 H cm (15.75 L x 20 W x 7.75 H in)
Weight	7.7 kg (17 lbs)
Case quantity	1/Box

3M™ Ranger™ Pressure Infusor IV Pole Model 90068	
For use with	Ranger pressure infusor (model 145) and Ranger pressure infusor base (model 90124)
Dimensions	187 L x 11 W x 4 H cm (73-1/2 L x 4-1/2 W x 1-3/4 H in)
Weight	2.8 kg (6.2 lb)
Case quantity	1/Box

3M™ Ranger™ Pressure Infusor IV Pole Base Model 90124	
For use with	Ranger pressure infusor (model 145) and Ranger pressure infusor IV pole (model 90068)
Dimensions	81 L x 76 W x 20 H cm (32 L x 30 W x 8 H in)
Weight	16.1 kg (35.5 lb)
Case quantity	1/Box



The Centers for Disease Control and Prevention (CDC) guidelines recommend against medical devices containing water in the O.R. and suggest that facilities remove potential sources of contaminated water whenever possible.<sup>3</sup>

Air emboli are amongst the list of the Centers for Medicare and Medicaid Services (CMS) 'never events' - those deemed reasonably preventable through proper care.<sup>4</sup>

The 3M™ Ranger™ high flow blood/fluid warming sets were designed with an auto-venting bubble trap which automatically vents up to 3000 mL of air per minute – a critical feature for the high flow rates used in trauma situations.

The forward-thinking Ranger blood/fluid warming system also meets all requirements of the American Association of Blood Bank (AABB) standards for infusion of blood products.<sup>5</sup>

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## References

1. Rutala WA, Weber DJ. Water as a reservoir of nosocomial pathogens. *Infection Control and Hospital Epidemiology* September 1997; 18: 609-616.
2. Sessler DI. Consequences and treatment of perioperative hypothermia. *Anesthesia Clinics of North America* 1994; 12(3): 425-56.
3. Centers for Disease Control and Prevention. *Guidelines for Environmental Infection Control in Health-Care Facilities*. Recommendations of CDC and Healthcare Infection Control Practices Advisory Committee (HICPAC). 2003.
4. Centers for Medicare & Medicaid Services. [www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2008-Fact-Sheets-Items/2008-08-042.html](http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2008-Fact-Sheets-Items/2008-08-042.html). Accessed Oct. 8, 2013.
5. American Association of Blood Banks. *Standards for Blood Banks and Transfusion Services*. 27th Edition; 2011



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