

**3M** Science.  
Applied to Life.™

3M Health Care

# **3M™ Ranger™ blood & fluid warming systems: Smart, intuitive dry heat technology solution**

# 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 500 mL/min or 30 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

One of our latest innovations, the redesigned 3M™ Ranger™ pressure infusor has important safety features that are a part of the re-design, including 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 500 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>

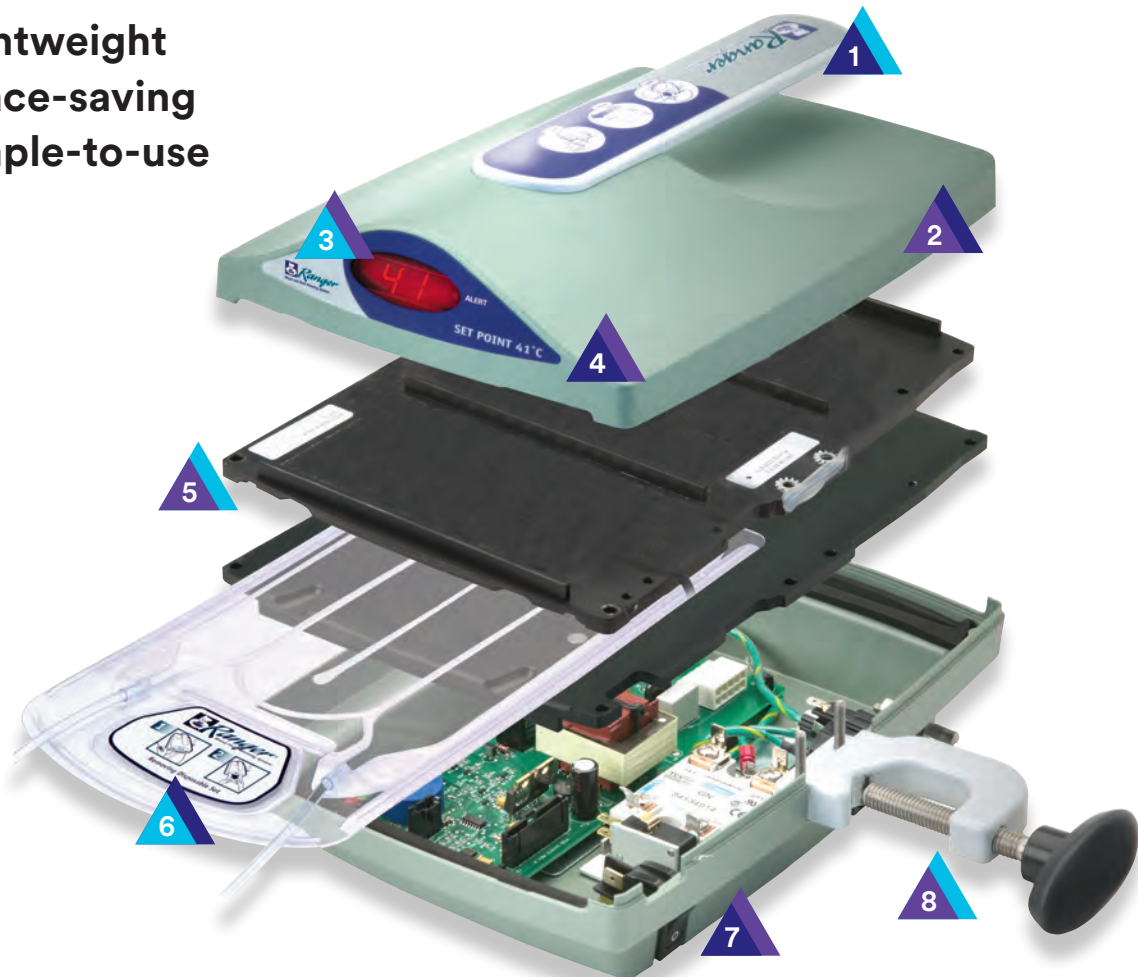
In contrast, fluid warming can minimize heat loss when large amounts of fluid or blood are needed. It is not a stand-alone option for patient warming (or normothermia maintenance), but it may offer a benefit when used with other patient warming modalities.

## Sustainability

In the Health Care Business, 3M 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-ethylhexy] phthalate).

# Inspired Design

Lightweight  
Space-saving  
Simple-to-use



1	Integrated handle for easy transport
2	Compact, space-saving design
3	Large, easy-to-read temperature display
4	Audible/visible over-and under-temperature alerts
5	Highly conductive aluminium plates for maximum heat transfer and no hotspots
6	Inexpensive, simple-to-use disposable warming sets
7	Convenient over-temperature test function
8	Built-in IV pole clamp for secure hold

# 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 revolutionary 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 Point Temperature** 41°C

**Flow Rates**

Pediatric KVO – 100 mL/min  
 Standard Flow KVO – 150 mL/min  
 High Flow KVO – 500 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

**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.

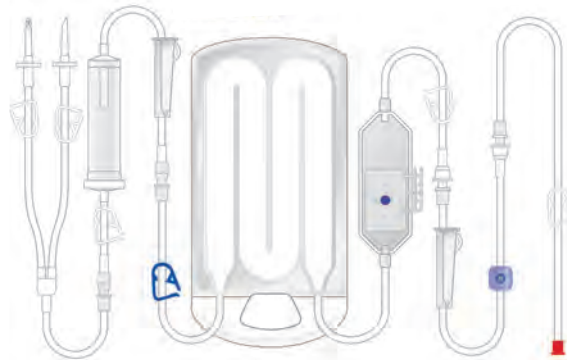
## High Flow Warming Sets: KVO - 500 mL/min or 30 L/hr

### 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

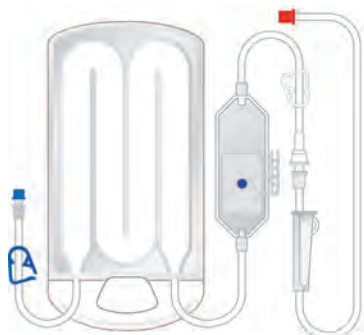


### Model 24370

**Priming volume** 89 mL

**Components**

Cassette, auto-venting bubble trap, roller clamp  
 121 cm (1.21 m) / 48 in (4 ft) patient line



### Model 24365

**Priming volume** 65 mL

**Components**

Cassette  
 auto-venting bubble trap



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

### Model 24200

Priming volume 39 mL

#### Components

cassette  
 needle injection port  
 bubble trap  
 roller clamp  
 76 cm (0.76 m) / 30 in (2.5 ft) patient line

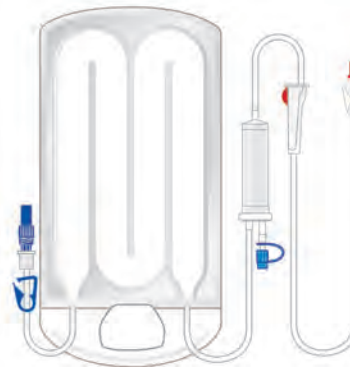


### Model 24240

Priming volume 44 mL

#### Components

cassette  
 needleless air bubble trap aspiration port  
 roller clamp  
 152 cm (1.52 m) / 60 in (5 ft) patient line

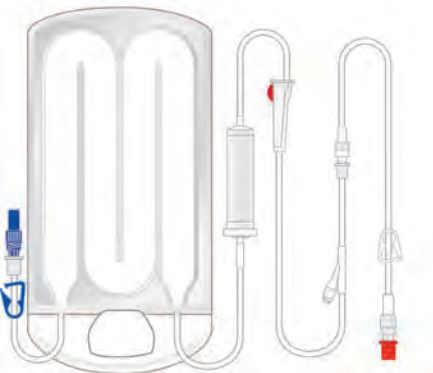


### Model 24250

Priming volume: 44 mL

#### Components

cassette  
 roller clamp  
 bubble trap  
 152 cm (1.52 m) / 60 in (5 ft) patient line



### Model 24550 (Pediatric/Neonate)

Priming volume 20 mL

#### Components

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



### 3M™ Ranger™ Warming Unit Cleaning Tool

#### 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 3M™ Ranger™ pressure infusor system is designed for use with the 3M™ Ranger™ blood/fluid warming unit and 3M™ 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



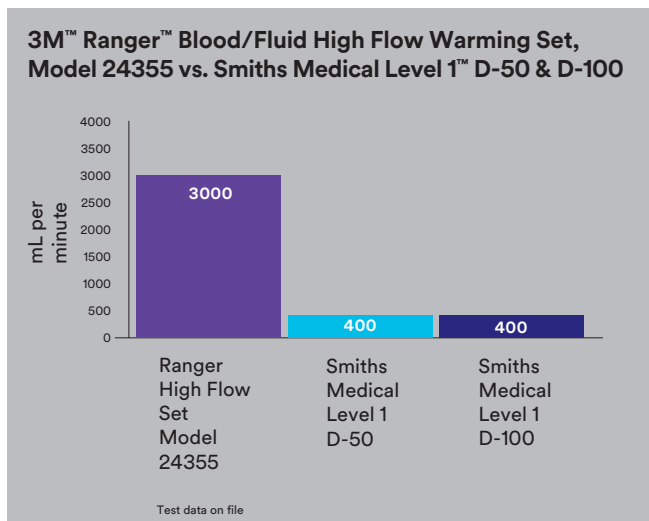
The Centers for Disease Control and Prevention (CDC) guidelines recommend against medical devices containing water in the O.R. and suggest that facilities remove potential sources of contaminated water whenever possible.<sup>3</sup>

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>

## Eliminate more air per minute



### 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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