The Terumo® Advanced Perfusion System 1 has been the market leader since its introduction, bringing uncompromised safety, flexibility, and an intuitive platform to the perfusion community.

Now, after years of clinical feedback and engineering improvements, Terumo re-introduces its System 1.

**Key Enhancements**
- New Central Control Monitor with a faster processor, higher resolution and updated software
- Newly designed metallic components for added durability
- Flexible brackets provide options to mount system components

Its legendary engineering and durable craftsmanship will give you confidence in your new System 1. The best continues to get better.

**Basic configuration meets current needs**

Terumo System 1 configures quickly and simply to adapt to new protocols or individual patient needs. You can choose exactly how you’re going to manage a case, where you’ll locate each device, and how you’ll configure the display on the Central Control Monitor.
- Choose the number of pumps and safety connections.
- View information on either the pump’s local control or the Central Control Monitor.
- Choose the hardware configuration on your base platform.

The Terumo System 1’s flexibility addresses all the needs of a perfusionist. Its redundant safety features and integrated battery backup provide a reliable platform.
**Safety and monitoring modules plug into base**

Terumo System 1’s compact safety and monitoring modules can be plugged into any of the slots in the system’s base. The ease of access and ability to backup each module enhances safety and provides an uncluttered working environment. Select as many as 18 modules that monitor or operate up to:

- 1 electronic venous line occluder
- 1 ultrasonic level detector (alert/alarm)
- 4 ultrasonic air bubble detectors
- 4 flow sensors
- 8 pressure sensors
- 8 temperature sensors
- 1 interface module for TLink™ Data Management System
- Interface modules for all CDI™ Monitoring Systems

**Roller pumps enhance flexibility**

The Terumo Advanced Perfusion System 1 supports up to 8 roller pumps:

- Roller pumps can be controlled from the speed control knob or the Central Control Monitor.
- Available in large and small raceways to adjust to different perfusion protocols.
- Occlusion mechanism with audible feedback can be adjusted while the pump is running.
- Designed to allow choice of base or pole mounting with rotating raceway to allow for optimal circuit length.
- Front panel displays operating status, and alert or alarm messages affecting operation.
- Self-adjusting tube clamp mechanism eliminates the need to change the tube inserts.
- Uni-directional hand crank ensures correct blood flow direction.
- Advanced functions can be performed using any roller pump:

  - Pulsatile flow operation (arterial pump only)
  - Servo-regulation to maintain a constant flow or a constant positive or negative pressure setpoint
  - Master/Follower operation of any two pumps for delivering multi-ratio cardioplegia
  - Automatic cardioplegia dose delivery by time or volume
The new Central Control Monitor (CCM) is a high resolution touch screen computer that serves as a safety monitor, and can be used as the central area for controlling the system components. The CCM uses an intuitive graphic interface to organize information and help users quickly and easily view current perfusion parameters on one monitor, without having to look at multiple displays.

Customized configurations
Users can configure up to 12 perfusion screens that can be customized to accommodate different perfusion setups — to help the user move easily between procedures as needed.

Priority messaging area
All safety messages are displayed both on the CCM and the local pump displays. The CCM message area—located at the top of the perfusion screen—displays alarms, alerts, status and error messages in order of priority. The color-coded priority message display eliminates confusion while running a case, and assists in understanding alerts and alarms when they occur.

Intuitive design and central control
The layout of the perfusion screen provides easy navigation through the CCM user interface which centralizes all functions and simplifies system control.
The system supports up to 2 centrifugal pumps

- Pumps can be controlled from the speed control knob or the CCM.
- Remote-mounted pump motor helps optimize tube lengths.
- Non-invasive flow sensor eliminates need for a disposable flow probe.
- Front panel display shows pump operating status and alarms.
- The centrifugal system is capable of the following advanced functions:
  - Pulsatile flow operation (arterial pump only)
  - Servo-regulation to maintain a constant flow or a constant positive or negative pressure
  - User-selectable Coast™ response that allows more time to react to alerts/alarms

Integrated electronic gas blender

A unique technology allows the gas blender to be integrated into the base and controlled through the Central Control Monitor or locally. It offers added safety and flexibility:

- An integrated oxygen analyzer that measures the oxygen content of the blended gas and displays it on the CCM.
- Settable low FiO₂ alarm which will display on the screen in case of an out-of-range level.
- High and low gas source pressure alarms that will display on the CCM if the gas supply is outside the recommended pressures.
- A multi-colored LED that provides status indications.
- The ability to send gas data for electronic charting to TLink Data Management System.
Configurability with advanced functions for an evolving practice

As perfusion techniques evolve, perfusionists can use the advanced functions of the Terumo System 1. It redefines the notion of customization, with quick and simple configurability to easily adapt new protocols for individual patient needs. With many safety features that can be incorporated in every setup, this system becomes the product of choice for an evolving practice.

The same components can be reconfigured to keep pace with the changes in your practice.

Base- or pole-mount options
Pole-mount a pump closer to the patient to minimize the circuit size. Control the pump remotely using the CCM.

Servo-regulation to pressure/flow
Maintain the pump flow setpoint or pressure setpoint (negative or positive) by activating the servo-regulation feature.

Cardioplegia delivery
By selecting the Master/Follower operation, any two pumps can be used to deliver cardioplegia to minimize hemodilution and optimize myocardial protection. New bracket options allow users to remote mount the pumps.

More customized safety features
Choose to integrate more safety systems such as additional air detectors and select an individual response for each one.

Integration with venous line occluder
Occluder can respond to events from the primary pump (Open, Close or Go to % Flow).
Ordering Information

System 1 Base

1* 100/120V System 1 801763
or 220/240V System 1 801764
* Shaded items are included with System 1
Programmed PC card system configuration 803739
2 Hand crank (includes 2 hand cranks) 801016
3 Hand crank bracket 802089
4 Central Control Monitor 816300
39 Central Control Monitor Cover 816261

Base Options

5 Electronic O2 blender/analyzer* 801188
6 Pole-mounted blender* 164235
* Each blender requires a hose kit and adaptor set
Hose kits
U.S. hose kit (3 hoses: green, yellow, black) 814475
Non-U.S. hose kit (3 hoses: blue, yellow, black) 814474
Hose adaptor sets
7 NCG hose adaptor set 144207
8 D.I.S.S. hose adaptor set 144215
9 Ohio Diamond hose adaptor set 144223

Center Poles and accessories

10 Crossbar fitting (required for each additional pole) 145980
11 2 ft (0.6 m) pole 16553301
11 3 ft (0.9 m) pole 131115
11 4 ft (1.2 m) pole 16553401
12 System 1 shelf 816489
40 Metallic sliding back cover panel kit 816370

Flexible Halogen Lamp

13 33 in (83.8 cm) flexible halogen lamp 801238
13 15 in (38.1 cm) flexible halogen lamp 801558

Roller Pumps

14 Roller pump 6 in (15.2 cm) diameter 816571
15 Roller pump 4 in (10.2 cm) diameter 816570
16 Pole mount pump rest with bracket 801093
17 Dual pumps pole mount bracket 816477
18 Descending pole mount pump bracket 816483

Integrated Centrifugal System

19 Drive motor 164267
20 Control unit
   Manual drive 816572
   Pole mount centrifugal display bracket 804372
21 Flexible mounting arm 816620

TLink Data Management System

Data management software 814850

Flow Sensing

22 Flow module 802018
23 Non-invasive flow sensor 3/8 in (9.5 mm) ID x
   3/32 in (2.4 mm) wall, reusable 6382
24 Mounting bracket (holds 2 modules) 801550

Level Detection

(One each included with System 1)
25 Level detect module 802111
26 Yellow transducer (alert) 195215
26 Red transducer (alarm) 195274
   Level sensor pads (60 per box), gel included 195240

Air Bubble Detection

(One each included with System 1)
27 Air bubble detect module 802110
28 Cable assembly
   Pole clip sensor holder 149892
   149876
   * One sensor required per air bubble detection system

Ultrasonic air sensor (choose 1 of 3)
29 3/8 in x 3/32 in (9.5 mm x 2.4 mm) 5773
29 1/4 in x 3/32 in (6.4 mm x 2.4 mm) 5791
29 1/4 in x 1/16 in (6.4 mm x 1.6 mm) 5786
30 Air sensor bracket (optional) 5793
**Venous Occluder**

- **31** Occluder module 803480
- **32** Occluder head 806455
- **21** Flexible mounting arm 816620

**Pressure Monitoring**

- **33** Pressure module (2 pressures per module) 802112
- **34** Reusable pressure transducer 16433301
  - Pressure monitoring kit (10 per case) 16066100
  - Pressure transducer holder 22300030

**Temperature Monitoring**

- **35** Temperature module, YSI® series 400 compatible (2 temperatures per module) 802114
  
  YSI® is a registered trademark of Yellow Springs Instruments

**Data Interface Modules**

- **36** Interface module for CDI™ System 100 802558
- **36** Interface module for CDI™ System 500 803479
- **37** Serial interface module RS-232 802113
- **38** Serial interface module RS-485 803518

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Shaded items included with System 1
## Specifications

### System 1 Base

<table>
<thead>
<tr>
<th>801763</th>
<th>801764</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>100/115V 50/60 Hz</td>
</tr>
<tr>
<td>Height</td>
<td>22.6 in (57.4 cm)</td>
</tr>
<tr>
<td>Width</td>
<td>35.2 in (89.4 cm)</td>
</tr>
<tr>
<td>Depth</td>
<td>26.5 in (67.3 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>262 lbs (118.8 kg)</td>
</tr>
</tbody>
</table>

### Electronic O2 Blender/Analyzer

<table>
<thead>
<tr>
<th>801188</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating range: Flow 0 – 10 L/min, FiO2 0.21 – 1.00, Measured O2 21% – 100%</td>
</tr>
</tbody>
</table>

### Central Control Monitor

<table>
<thead>
<tr>
<th>816300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height 13.7 in (34.8 cm)</td>
</tr>
<tr>
<td>Width 15.7 in (39.9 cm)</td>
</tr>
<tr>
<td>Depth 3.4 in (8.6 cm)</td>
</tr>
<tr>
<td>Weight 15 lbs (6.8 kg)</td>
</tr>
</tbody>
</table>

### Roller Pumps

<table>
<thead>
<tr>
<th>816570 (small)</th>
<th>816571 (large)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pumphead diameter</td>
<td>4 in (10.2 cm)</td>
</tr>
<tr>
<td>Voltage</td>
<td>24VDC</td>
</tr>
<tr>
<td>Height</td>
<td>12.5 in (31.8 cm)</td>
</tr>
<tr>
<td>Width</td>
<td>7.1 in (18.0 cm)</td>
</tr>
<tr>
<td>Depth</td>
<td>11.8 in (30.0 cm)</td>
</tr>
<tr>
<td>Weight</td>
<td>21 lbs (9.5 kg)</td>
</tr>
<tr>
<td>Operating range</td>
<td>0 – 4 L/min</td>
</tr>
</tbody>
</table>

### Centrifugal Control Unit

<table>
<thead>
<tr>
<th>816572</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage 24VDC</td>
</tr>
<tr>
<td>Height 3.1 in (8.0 cm)</td>
</tr>
<tr>
<td>Width 7.3 in (18.4 cm)</td>
</tr>
<tr>
<td>Depth 8.5 in (21.6 cm)</td>
</tr>
<tr>
<td>Weight 2.4 lbs (1.1 kg)</td>
</tr>
<tr>
<td>Operating range 0 – 7 L/min</td>
</tr>
</tbody>
</table>

### Flexible Halogen Lamps

<table>
<thead>
<tr>
<th>801238</th>
<th>801558</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>33 in (83.8 cm)</td>
</tr>
<tr>
<td>Voltage</td>
<td>24VDC</td>
</tr>
</tbody>
</table>

### Functional Modules

<table>
<thead>
<tr>
<th>Flow module 802018</th>
<th>Other modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>6.30 in (160.0 mm)</td>
</tr>
<tr>
<td>Width</td>
<td>3.63 in (92.2 mm)</td>
</tr>
<tr>
<td>Depth</td>
<td>1.33 in (33.8 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.95 lbs (0.43 kg)</td>
</tr>
</tbody>
</table>

### Pressure

<table>
<thead>
<tr>
<th>802112</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two pressure transducers per module</td>
</tr>
<tr>
<td>Operating range; [-250] mmHg – 900 mmHg</td>
</tr>
<tr>
<td>Maximum of 8 transducers</td>
</tr>
</tbody>
</table>

### Temperature

<table>
<thead>
<tr>
<th>802114</th>
</tr>
</thead>
<tbody>
<tr>
<td>YSI 400, two temperature sensors per module</td>
</tr>
<tr>
<td>Operating range; 0 – 50° C</td>
</tr>
<tr>
<td>Maximum of 8 sensors</td>
</tr>
</tbody>
</table>

### Flow

<table>
<thead>
<tr>
<th>802018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-invasive flow measurement, one per module</td>
</tr>
<tr>
<td>Operating range; [-9.9] L/min to 9.9 L/min</td>
</tr>
<tr>
<td>Maximum of 4 modules</td>
</tr>
</tbody>
</table>

### Ultrasonic Level Detection

<table>
<thead>
<tr>
<th>802111</th>
</tr>
</thead>
<tbody>
<tr>
<td>One alarm sensor, one alert sensor per module</td>
</tr>
<tr>
<td>Reservoir: Functions with hardshell reservoirs that have a wall thickness of 0.07 in – 0.15 in (1.8 mm – 3.8 mm)</td>
</tr>
<tr>
<td>Maximum of 1 module</td>
</tr>
</tbody>
</table>

### Ultrasonic Air Bubble Detector

<table>
<thead>
<tr>
<th>802110</th>
</tr>
</thead>
<tbody>
<tr>
<td>One per module</td>
</tr>
<tr>
<td>Operating range; 3/8 in – 0.5 cc or larger up to 6 L/min</td>
</tr>
<tr>
<td>1/4 in – 0.3 cc or larger up to 3 L/min</td>
</tr>
<tr>
<td>Maximum of 4 modules</td>
</tr>
</tbody>
</table>

### Electronic Venous Occluder

<table>
<thead>
<tr>
<th>803480</th>
</tr>
</thead>
<tbody>
<tr>
<td>One per module</td>
</tr>
<tr>
<td>Operating range; 0 – 100% flow on 1/4 in to 1/2 in tubing</td>
</tr>
<tr>
<td>Maximum of 1 module</td>
</tr>
</tbody>
</table>

### Interface Module for CDI System 100

<table>
<thead>
<tr>
<th>802558</th>
</tr>
</thead>
<tbody>
<tr>
<td>One CDI System 100 monitor per module</td>
</tr>
<tr>
<td>Maximum of 1 module (either CDI System 100 or CDI System 500)</td>
</tr>
</tbody>
</table>

### Interface Module for CDI System 500

<table>
<thead>
<tr>
<th>803479</th>
</tr>
</thead>
<tbody>
<tr>
<td>One CDI System 500 monitor per module</td>
</tr>
<tr>
<td>Maximum of 1 module (either CDI System 100 or CDI System 500)</td>
</tr>
</tbody>
</table>

### Interface Module for RS-232

<table>
<thead>
<tr>
<th>802113</th>
</tr>
</thead>
<tbody>
<tr>
<td>One TLink Data Management System per module</td>
</tr>
<tr>
<td>Maximum of 1 module (either RS-232 or RS-485)</td>
</tr>
</tbody>
</table>

### Interface Module for RS-485

<table>
<thead>
<tr>
<th>803518</th>
</tr>
</thead>
<tbody>
<tr>
<td>One data management system per module</td>
</tr>
<tr>
<td>Maximum of 1 module (either RS-232 or RS-485)</td>
</tr>
</tbody>
</table>
**Flexible:** meets basic needs through easy and simple configurations; evolves as needs change

**Durable:** new metallic surfaces for added durability

**Modular:** design ensures each component will function individually and be controlled as needed

**Centralized control:** Central Control Monitor serves as a safety monitor and central control for system components

**Reliable:** added safety connections, customized pump responses and integrated electronic gas blender provide a safe and reliable platform

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