

CDI[®] System 500

Blood Parameter Monitoring System

Continuous blood parameter monitoring for improved blood gas management



pH		HCT	
7.40		32 %	
PCO ₂		Hgb	
44	mmHg	10.5	g/dl
PO ₂		SO ₂	
182	mmHg	72 %	
Temp		K ⁺	
24.0	°C	5.4	mmol/l
HCO ₃		V̇O ₂	
27	meq/l	120	ml/min
BE		Q̇	
3	meq/l	3.1	l/min
calc SO ₂			
97 %			

TERUMO

The world's most trusted and used continuous in-line blood gas monitor

For more than 15 years, the CDI® Blood Parameter Monitoring System 500 (CDI System 500) has been trusted and used by the world's leading cardiac hospitals to continuously measure and calculate vital blood parameters during cardiopulmonary bypass. Terumo Cardiovascular Group proudly continues to serve our customers with the leading technology available today.

Based on optical fluorescence and reflectance technologies, the CDI System 500 continuously measures or calculates 11 critical blood parameter values, including: pH, pCO₂, pO₂, potassium (K⁺), oxygen saturation, hematocrit, hemoglobin, and temperature.

The proven technology of the CDI System 500

Only the CDI System 500 shunt sensor measures pH, pCO₂, pO₂, and potassium

The CDI System 500 shunt sensor is designed to be placed in a shunt line where the blood is in direct contact with the system's sterile microsensors. Accurate measurements of these critical parameters provide clinicians with the information to improve patient care:

- **pH and pCO₂** – to monitor for and classify metabolic and respiratory alkalosis/acidosis
- **pO₂** – to more consistently control partial pressure of oxygen, avoiding hyper/hypoxia
- **pCO₂** – to monitor for excessive or deficient levels of carbon dioxide in the bloodstream, which could result in hyper/hypocapnia
- **Potassium (K⁺)** – to quickly identify conditions that may lead to hyper/hypokalemia

Constant monitoring of the patient's changing condition

Blood parameters can change rapidly during cardiopulmonary bypass-supported procedures due to a multitude of dynamic conditions. Blood gas analyzers only reflect the patient's clinical condition for the exact moment the sample is drawn. The blood sample results may not reflect recent changes in blood gas parameters and patient conditions.

The CDI System 500 provides continuous monitoring, and system alerts provide visual and audible indicators when parameters fall outside user-specified limits.

Quick recognition of fluctuations in critical physiological parameters

The system's average response time for measured parameters (pH, pCO₂, pO₂ and K⁺) is in seconds. These real-time system updates enable you to identify undesirable trends quickly.



The CDI® System 500 measures or calculates pH, pCO₂, pO₂, K⁺, temperature, SO₂, hematocrit, hemoglobin, base excess, bicarbonate, and oxygen consumption



Monitor

- Modular probes allow user to configure system to meet specific monitoring requirements.
- Large, color LCD display provides high visibility at a variety of viewing angles.
- Integrated battery pack ensures uninterrupted operation for 25 minutes.
- Monitors blood/patient in either actual or 37° C temperature mode to allow for Alpha stat or pH stat management.
- Displays blood parameter values in either numeric, graphic, or tabular formats.
- Integral monitor printer provides documentation of system's self-diagnostics and calibration verification, as well as displayed values.
- RS-232 serial interfaces accept inputs from pumping system to use and display blood flow, and provide outputs to data management systems or transmission to other external devices.
- Built-in handle for transportability.



Monitor Pole Clamps

Available in two arm lengths, 7 inches and 4½ inches, that attach to standard heart-lung machine poles.



Cable Head Bracket

Cable head assembly slides into the bracket for mounting to standard heart-lung machine poles.

Calibrator

- Fast 2-point gas calibration assures shunt sensor is performing to specifications.
- Small footprint and built-in handle for transportability.
- Mountable onto monitor pole clamp.

Shunt Sensor

- Unique fluorescence sensor technology measures pH, pCO₂, pO₂, and K⁺.
- Simple installation of the sensor into the shunt line using luer connections.
- May also be added after the initiation of bypass, facilitating set up in emergency cases.
- Treated with covalently bound, non-leaching heparin.

H/S Cuvette

- Optical reflectance technology provides accurate readings of venous SO₂/Hct/Hgb.
- Disposable cuvette clips easily to hematocrit/saturation probe.
- Available in three connector sizes: ¼ x ¼, ⅜ x ⅜, and ½ x ½ inches.



The CDI® System 500 quickly alerts you to changes in patient status

Continuous in-line monitoring during cardiopulmonary bypass surgery is a critical component of perfusion safety and improving patient outcomes. Studies have shown that appropriate regulation of blood gas parameters is essential to avoid the negative outcomes linked to sub-optimal blood gas parameter control. More precise and accurate control of blood gas parameters could potentially improve:

- Cardiac function
- Renal function
- Pulmonary function
- Cerebral function
- Transfusion requirements
- Ventilator requirements
- ICU stays
- Post-operative hospital stays

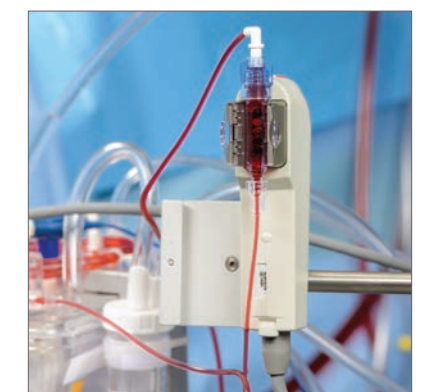
Fast, easy set up



The shunt sensor is placed in the cable head.



The cable head, with sensor attached, is placed in the calibrator.



The sensor and probe head are installed in the circuit with two luer connections. The design allows placement in a variety of circuit locations.

Learn why the world's leading Cardiac Centers trust only the CDI System 500. Ask your Terumo Cardiovascular Group representative for more information on peer-reviewed studies that link continuous monitoring to improved outcomes.



Specifications

Displayed Parameters	System Operating Ranges	Resolution
pH	6.8 to 7.8 pH units	0.01 pH units
pCO ₂	10 to 80 mm Hg (1.3 to 10.7 kPa)	1 mm Hg (0.1 kPa)
pO ₂	20 to 500 mm Hg (2.7 to 66.7 kPa)	1 mm Hg (0.1 kPa)
K ⁺	3.0 to 8.0 mmol/L	0.1 mmol/L
Temperature (T)	15° to 40° Celsius	0.1° C
Oxygen saturation (SO ₂)	60 to 100%	1%
Hematocrit (Hct) (15° < T < 40° C)	17 to 38%	1%
Total hemoglobin (Hgb)	5.6 to 12.6 g/dL	0.1 g/dL
Oxygen consumption (VO ₂)	10 to 400 mL/min	1 mL/min
Base Excess (BE)	-25 to 25 mEq/L	1 mEq/L
Bicarbonate (HCO ₃)	0 to 50 mEq/L	1 mEq/L
Blood flow (Q)	0 to 9.9 L/min	0.1 mL/min

Product Specification	Size (H x W x D)	Weight
Monitor	11" x 12.5" x 6"	16.1 lb.
Calibrator	12.5" x 8" x 8"	8.4 lb.

(Displayed Parameter Values apply to software version 1.69.)

Monitor power requirements and specifications

100-240 VAC, 50/60 Hz
 12 volt backup battery
 Data Output Port: RS-232 serial interface
 Pumping Systems Input Port: RS-232/RS-485 serial interface

System measurement cycle time

pH, pCO₂, pO₂ = one measurement per second
 K⁺ = one measurement per six seconds
 SO₂, Hct, Hgb = one measurement per eighteen milliseconds

System display update

Every six seconds

Model CDI510H Shunt Sensor

Sterile, heparin-treated
 Priming volume 1.2 mL

Ordering Information

Catalog #	Description	Units/Case
Monitor Configurations		
500A	Monitor with one blood parameter module	1
500AHCT	Monitor with one blood parameter module and one Hct/Sat probe	1
500AV	Monitor with two blood parameter modules	1
500AVHCT	Monitor with two blood parameter modules and one Hct/Sat probe	1
Calibrator		
540	Calibrator	1
Accessories for Use with CDI® System 500		
CDI506	Gas A, calibration gas for use with Calibrator 540	1
CDI507	Gas B, calibration gas for use with Calibrator 540	1
7310	Printer paper	5
CDI517	Monitor pole clamp, 7" (17.8 cm) arm length, calibrator mount	1
CDI518	Monitor pole clamp, 4.5" (11.4 cm) arm length	1
CDI519	Cable head bracket	1
Disposable Sensors for Use with CDI System 500		
CDI510H	Shunt Sensor for use with CDI System 500, heparin treated	20
Disposable H/S Cuvettes for Use with CDI System 500		
6914	¼" x ¼" connectors	20
6913	⅜" x ⅜" connectors	20
6912	½" x ½" connectors	20
6934	¼" x ¼" with 6" (15.2 cm) extension tube	10
6933	⅜" x ⅜" with 6" (15.2 cm) extension tube	10
6932	½" x ½" with 6" (15.2 cm) extension tube	10



For information on Terumo Cardiovascular Group products:

Terumo Cardiovascular Group

6200 Jackson Road
 Ann Arbor, MI 48103-9300
 USA
 Tel: +1.734.663.4145
 Fax: +1.734.663.7981
 www.terumo-cvgroup.com

Terumo Corporation

44-1, 2-chome, Hatagaya
 Shibuya-Ku, Tokyo 151-0072
 Japan
 Tel: +81.3.3374.8111
 Fax: +81.3.3374.8399
 www.terumo.co.jp

Terumo Europe N.V.

Authorized EC Representative
 Interleuvenlaan 40, 3001 Leuven
 Belgium
 Tel: +32.16.38.12.11
 Fax: +32.16.40.02.49
 www.terumo-europe.com

Terumo Europe N.V. Cardiovascular Division

Ludwig-Erhard-Strasse 6
 65760 Eschborn
 Germany
 Tel: +49.6196.8023.0
 Fax: +49.6196.8023.555

Terumo Latin America Corporation

8750 NW 36th Street, Suite 600
 Miami, FL 33178
 USA
 Tel: +1.305.477.4822
 Fax: +1.305.477.4872

Terumo Corporation

Dubai Branch
 Al Masraf Tower, 22nd Floor
 P.O. Box 20291, Dubai
 UAE
 Tel: +971.4.2212220
 Fax: +971.4.2213330

Terumo India Pvt. Ltd.

Unit No. 1601 & 1602 Tower B
 16th Floor, Unitech Cyber Park
 Sector-39
 Gurgaon, Haryana 122001
 India
 Tel: +91.124.4718700
 Fax: +91.124.4718718

Terumo Asia Holdings Pte. Ltd.

300 Beach Road
 #33-03 The Concourse 199555
 Singapore
 Tel: +65.6.295.1792
 Fax: +65.6.294.2329