

**astem**

# TOE-20

Multichannel Instantaneous Tissue Oximeter



## 3 Convenient Features

### Non-invasive

Tissue oxygen saturation ( $rSO_2$ ) can be easily measured by attaching the sensor probe to skin surface.

### Real-time display

TOE-20 connects to the display device using Bluetooth and provides real-time trend graph and figures of each channel.

### Multichannel

TOE-20 can connect maximum three sensor probes at once for instantaneous  $rSO_2$  assessment of multiple regions.

## Bluetooth Data Transfer



### 3 in 1 display

Both trend graph and figures of each channel are individually displayed in one display.

### Marker function

Up to 3 markers can be inserted anytime during measurement. Marker function can be used as an indicator for measurement.

### Selectable display items

Display items can be selected from  $rSO_2$ /T-Hb/Oxy-Hb/Deoxy-Hb.

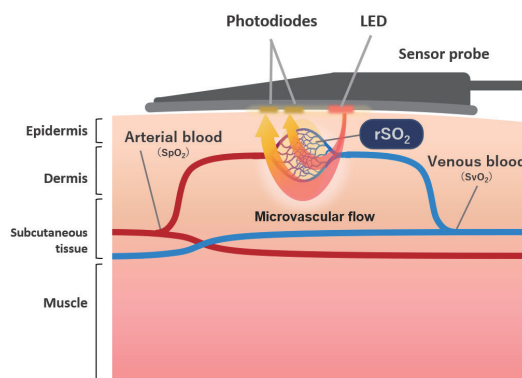
## Easy and Precise Assessment of rSO<sub>2</sub>

TOE-20 reveals the oxygen saturation of all blood including the microcirculation and both arterial and venous, or tissue oxygen saturation (rSO<sub>2</sub>: Regional Saturation of Oxygen), whereas the pulse oximeter measures the oxygen saturation only in the pulsatile arteries (SpO<sub>2</sub>).

### Mechanism

TOE-20 non-invasively assesses the oxygen saturation in tissue by detecting reflected LED light that went through the human body. The sensor probe has two LED chips that irradiate two different wavelengths of infrared light and two photodiodes that receive the reflected light.

The measurement precision is within 2-3 % as unstable values interfered by subcutaneous fat can be removed by separately placing two photodiodes.



Measurement mechanism of TOE-20

## Specifications

<b>Components</b>	Body: TOE-20 Sensor probe: TOE-20P Display terminal: MD101 (by Onyx, EN60601-1 compliant product) Application: TOE-20
<b>Measurement items</b>	Regional Saturation of Oxygen (rSO <sub>2</sub> ) Total Hemoglobin Index (T-Hbl) Oxy-Hemoglobin Index (Oxy-Hb) Deoxy-Hemoglobin Index (Deoxy-Hb)
<b>Measurement range</b>	rSO <sub>2</sub> : 0 ~ 99 (%) T-Hbl : 0 ~ 0.99 Oxy-Hbl : 0 ~ 0.99 Deoxy-Hbl : 0 ~ 0.99
<b>Sampling rate</b>	0.5 sec. (Fixed)
<b>Battery duration</b>	Body : 10 hours Display terminal : 10 hours
<b>Light source</b>	LED (770 nm, 830 nm : nominal values)
<b>Optical output</b>	Less than 1 mW
<b>Measurement method</b>	SRS-NIRS (Spatially Resolved Near-Infrared Spectroscopy)
<b>Battery</b>	Body : 2 AA batteries Display terminal : DC15V
<b>Connection method</b>	Bluetooth 4.1
<b>Bluetooth connection distance</b>	Within 5 m
<b>Sensor probe</b>	Measurement depth : approx. 5 mm Cable length : 40 cm It is a patient-coupled and interconnect cable.
<b>Brand name</b>	TOE-20
<b>Medical device approval number</b>	303ADBZX00017000 Controlled medical devices requiring special maintenance
<b>Japanese Medical Device Nomenclature (JMDN)</b>	Functional oximeter

This product was developed and commercialized by Hamamatsu University School of Medicine and ASTEM Co., Ltd. based on the patent possessed by Shizuoka University with the support of Japan Agency for Medical Research and Development (AMED).

## Manufacturer and Distributor

Second-class marketing license for medical devices: 14B2X10026

Licenses for Selling and Leasing Operations for Specially-Controlled Medical Devices: #745116

ISO13485: 2016

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