# Contents



12/08/2019

# Triton Electronic Systems Ltd. is a unique Russian enterprise of full cycle:

- R&D Activities;
- Intensive Care and Anesthesia Equipment Manufacturing;
- OEM Medical Solutions.

All the processes on the enterprise are certified in accordance with international standard of Quality Management System ISO 13485.

Decades ago a large scientific and technical cluster was formed in the Urals. The region of Russia has accumulated scientific knowledge and R&D expertise in different sectors – from light industry to aerospace. Whole research institutes were relocated to the Urals, so new ideas and inventions amounted to thousands. As a result, the Ural Scientific School was founded. It trained excellent engineers and researchers capable of solving technical and scientific problems, develop high-precision instruments.

The company was founded in 1989 by biomedical researchers, engineers and physicians from Ural Scientific School. Our greatest achievements are closely connected with the name of MD Prof. Boris Zislin, who was the Chief anesthesiologist of Ural region for 37 years. Due to his cutting edge ideas we develop innovative medical technologies and manufacture a range of medical devices for anesthesiology and intensive care.

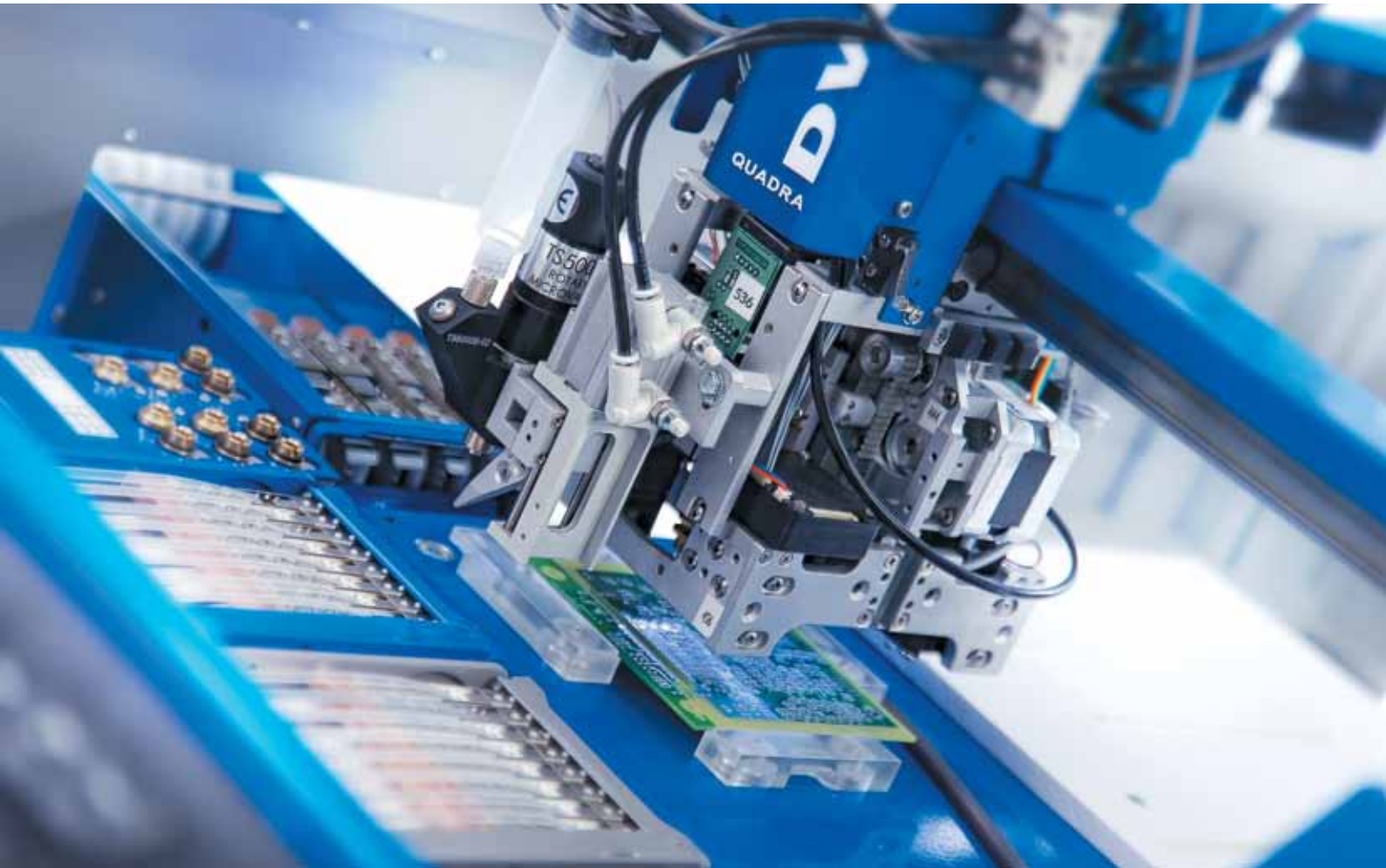
We are able to bring in unique and principally new solutions for global healthcare market. They are easier, more convenient and more reliable; moreover, they are the solutions that the market needs.

**Boris D. Zislin,** Professor, Doctor of Medicine, Honored doctor of Russian Federation.

One of founders of Ural anesthesiology and resuscitation school.

His research interest was high frequency jet ventilation (HFJV), he had made every effort to implement HFJV into the practice.

B. Zislin is the author of over 200 articles and four monographies.



# Intensive Care Ventilator MV300

**Intended use:**

Ventilator is intended for controlled and assisted artificial ventilation of lungs for all patient groups with tidal volume from 1 ml in resuscitation units, surgery and intensive care departments, and also at transportation within professional medical facilities.
**Categories of patients:** adults, children, newborn infants, including prematures.

**Display:** 15“, touchscreen, color, viewing angle adjustment.
**Gas supply:** built-in turbine; oxygen from central gas pipeline, cylinder or $O_2$ concentrator.
**Power:** 100–250 V, 50/60 Hz, built-in battery, up to 6 h of operation.
**Interface:** USB, Ethernet.

## Ventilation parameters

| | |
|---|---|
| Tidal volume, ml | 1–3000 |
| Breathing rate, bpm | 1–120 |
| Tinsp, sec | 0.2–10 |
| Flow trigger sensitivity, lpm | 0.1–20 |
| Pressure trigger sensitivity, $cmH_2O$ | 0.1–20 |
| PEEP, $cmH_2O$ | 0–50 |
| Inspiratory pressure, $cmH_2O$ | 0–100 |
| Pressure support, $cmH_2O$ | 0–80 |
| I:E ratio | 1:99–60:1 |

## Ventilation modes

| | | |
|---|---|---|
| **Mandatory ventilation** | volume controlled | CMV VCV |
| | pressure controlled | CMV PCV |
| | pressure controlled, volume guaranteed | PCV VG |
| **Synchronized intemittent mandatory ventilation** | volume controlled | SIMV VC (+PS) |
| | pressure controlled | SIMV PC (+PS) |
| | double-controlled | SIMV DC (+PS) |
| **Spontaneous breathing** | with continuous positive airway pressure | CPAP (+PS) |
| | two levels of PEEP | BiSTEP (+PS) |
| | airway pressure release ventilation | APRV (+PS) |
| **Noninvasive ventilation** | noninvasive ventilation with a mask | NIV |
| | nasal CPAP | nCPAP (+PS) |
| | high flow oxygen therapy | HF_$O_2$ |
| **Adaptive ventilation** | intelligent support ventilation with auto-control of ventilation | iSV |
| **Reserve mode** | apnea / backup ventilation | Apnea / backup |
| **Combined ventilation** | combined high-frequency jet and conventional ventilation | +HFJV |

## Features and advantages

| | |
|---|---|
| **Patient age groups: adults, children, newborn infants, including prematures** | Can be applied to all groups of patients: newborn infants, children and adults. The lowest tidal volume for neonates is 1 ml with digital proximal flow sensor. Built-in adult/pediatric flow sensor does not require replacement during the whole shelf life |
| **Neonatal option** | Specially designed ventilation mode for the extremely low weight neonates. Tidal volume is from 1 ml with ultrasensitive proximal flow sensor (from 0.1 lpm). The digital proximal flow sensor is very reliable and has a long life time. nCPAP ventilation mode with variable flow is available for the ventilation of neonates |
| **Combined mechanical ventilation** | Consolidates the advantages of jet and conventional mechanical ventilation. Jet ventilation enhances oxygenation of arterial blood in complicated situations and convective mechanical ventilation provides normal removal of carbon dioxide |
| **AutoETS** | Auto-detection of the optimal expiratory trigger sensitivity and time of spontaneous inspiration in support ventilation modes (CPAP, NIV, BiSTEP) provides patient comfort and reduces the work of breathing. It can be switched off and the desired sensitivity level of the expiratory trigger can be set manually |
| **AutoRAMP** | Auto-detection of pressure rise time allows to match the ventilator flow to the patient‘s respiratory needs |
| **Evaluation of metabolic needs** | The method of indirect calorimetry. Continuous measurement: oxygen consumption ($VO_2$), carbon dioxide elimination ($VCO_2$), respiratory quotient (RQ), resting energy expenditure (REE) |
| **Advanced monitoring of alveolar ventilation parameters** | Volumetric capnography ($VCO_2$), airway dead space volume ($V_d$), alveolar minute ventilation volume ($MV_{alv}$) |
| **Auxiliary pressure monitoring** | Measurement of esophageal pressure/trachea via esophageal catheter and transpulmonary pressure measuring channel via balloon catheter |
| **Stress index** | Integral parameter indicating correctness of PEEP and tidal volume VT settings |
| **Adaptive ventilation (iSV)** | Mode of intelligent adaptive ventilation supporting patients with any level of breathing activity. It automatically determines the parameters of control and support ventilation pressure. This mode is ideal from weaning of patient from the ventilator |
| **Mainstream capnometry** | Monitoring of $EtCO_2$, $FiCO_2$ and respiratory rate. Quick response QuRe™ sensor provides the highest precision of capnogram waveform for true clinical diagnostics and allows working even in HF ventilation mode up to 200 bpm |
| **Integrated calculator of cardiac output by Fick method** | Calculation of the cardiac output parameter (CO) based on the data of alveolar ventilation monitoring |
| **Pulse oximetry** | Measurement of oxygen saturation of arterial blood hemoglobin $SpO_2$, pulse rate (PR), photoplethysmogram |

# Intensive Care Ventilator MV200

**Intended use:**

Ventilator is intended for controlled and assisted artificial ventilation of lungs for all patient groups with tidal volume from 10 ml in resuscitation units, surgery and intensive care departments, and also at transportation within professional medical facilities.
**Categories of patients**: adults, children, infants.

**Display:** 12.1“ or 15“, touchscreen, color, viewing angle adjustment.
**Gas supply:** built-in turbine; oxygen from central gas pipeline, cylinder or $O_2$ concentrator.
**Power:** 100–250 V, 50/60 Hz, built-in battery, up to 6 h of operation.
**Interface:** USB, Ethernet.

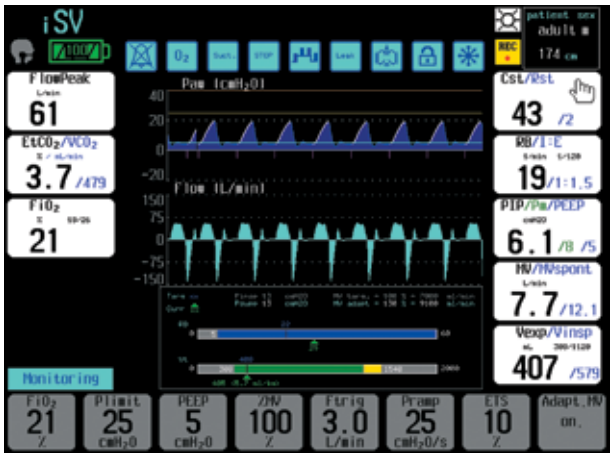
## Ventilation parameters

| | |
|---|---|
| Tidal volume, ml | 10–3000 |
| Breathing rate, bpm | 1–120 |
| Tinsp, sec | 0.2–10 |
| Flow trigger sensitivity, lpm | 0.5–20 |
| Pressure trigger sensitivity, $cmH_2O$ | 0.5–20 |
| PEEP, $cmH_2O$ | 0–50 |
| $Flow_{max}$, lpm | 180 |
| Inspiratory pressure, $cmH_2O$ | 0–100 |
| Pressure support, $cmH_2O$ | 0–80 |
| I:E ratio | 1:99–60:1 |

## Ventilation modes

| | | |
|---|---|---|
| **Mandatory ventilation** | volume controlled | CMV VCV |
| | pressure controlled | CMV PCV |
| | pressure controlled, volume guaranteed | PCV VG |
| **Synchronized intemittent mandatory ventilation** | volume controlled | SIMV VC (+PS) |
| | pressure controlled | SIMV PC (+PS) |
| | double-controlled | SIMV DC (+PS) |
| **Spontaneous breathing** | with continuous positive airway pressure | CPAP (+PS) |
| | two levels of PEEP | BiSTEP (+PS) |
| | airway pressure release ventilation | APRV (+PS) |
| **Noninvasive ventilation** | noninvasive ventilation with a mask | NIV |
| **Adaptive ventilation** | intellectual support ventilation with auto-control of ventilation | iSV |
| **Reserve mode** | apnea / backup ventilation | Apnea / backup |

## Monitoring of ventilation parameters




## Graphical monitoring:

- Curves: simultaneous displaying up to three curves (flow, pressure, volume, $CO_2$, $SpO_2$, $VCO_2$, $P_{aux}$, iSV).
- Monitoring parameters: simultaneous displaying up to 8 windows depending on user's choice.
- Loops: pressure–volume, flow–volume, flow–pressure, volume–auxiliary pressure.
- Controls: 8 parameters are displayed depending on ventilation mode.
- Hot keys: 9 icons for the fast access to special functions of ventilator.

## Basic monitoring:

- Peak inspiratory pressure, plateau pressure, average pressure, PEEP, auto PEEP.
- Minute volume of respiration.
- Inspiratory, expiratory volume.
- Respiratory rate, spontaneous breaths frequency.
- Compliance C.
- Resistance R.
- I:E ratio.
- Concentration of inspired oxygen $FiO_2$.
- Leakage.
- Maximum flow on inspiration.
- $EtCO_2$, $FiCO_2$.

## Advanced monitoring:

- AutoPEEP, total PEEP.
- Inspiratory time constant, expiratory time constant.
- Stress index.
- Index of respiratory effort.
- Work the patient's breathing, work of ventilator breathing.
- Inspiratory time.
- Coefficient of spontaneous breathing.
- Resistance to exhalation.
- Dynamic compliance.
- Circuit resistance.
- Circuit compliance.
- Shallow breathing index.
- $SpO_2$, pulse rate.
- Cardiac output.
- Volume of alveolar ventilation ($V_{alv\ min}$).

## Features and advantages

| | |
|---|---|
| **Evaluation of metabolic needs** | The method of indirect calorimetry. Continuous measurement: oxygen consumption ($VO_2$), carbon dioxide elimination ($VCO_2$), respiratory quotient (RQ), resting energy expenditure (REE) |
| **Advanced monitoring of alveolar ventilation parameters** | Volumetric capnography ($VCO_2$), airway dead space volume ($V_d$), alveolar minute ventilation volume ($MV_{alv}$) |
| **Auxiliary pressure monitoring** | Measurement of esophageal pressure/trachea via esophageal catheter and transpulmonary pressure measuring channel via balloon catheter |
| **Stress index** | Integral parameter indicating correctness of PEEP and tidal volume VT settings |
| **Adaptive ventilation (iSV)** | Mode of intellectual adaptive ventilation supporting patients with any level of breathing activity. It automatically determines the parameters of control and support ventilation pressure. This mode is ideal from weaning of patient from the ventilator |
| **Mainstream capnometry** | Monitoring of $EtCO_2$, $FiCO_2$ and respiratory rate. Quick response QuRe™ sensor provides the highest precision of capnogram waveform for true clinical diagnostics and allows working even in HF ventilation mode up to 200 bpm |
| **Integrated calculator of cardiac output by Fick method** | Calculation of the cardiac output parameter (CO) based on the data of alveolar ventilation monitoring |
| **Pulse oximetry** | Measurement of oxygen saturation of arterial blood hemoglobin $SpO_2$, pulse rate (PR), photoplethysmogram |

# High Frequency Jet Ventilator JV100 B

6

**Intended use:** high-frequency jet ventilation with extended monitoring of ventilation and respiratory parameters.

**Patient types:** adults, children with body weight from 15 kg.

**Display:** 12.1“ LCD, touchscreen, color, viewing angle adjustment.
Gas mixturer and $FiO_2$ control.
**Mainstream $CO_2$ sensor.**
**Power:** 220 V/50 Hz, built-in battery, from 1 h of operation.
**Gas supply:** oxygen from central gas pipeline, cylinder; air – from central gas pipeline or compressor.
**Humidification:** build-in automatic heating system with thermal control and humidification.

## Ventilation parameters

| | |
|---|---|
| $FiO_2$ control in non-injection and catheter modes, % | 21–100 |
| Respiratory rate, bpm | 30–300 |
| Minute volume (modes w/ or w/o Venturi jet injector), lpm | 5–30 |
| Minute volume (catheter mode), lpm | 3–20 |
| I:E ratio | 1:3; 1:2; 1:1; 3:2; 2:1 |

## Ventilation modes

| | | |
|---|---|---|
| High frequency jet | injection | HFJV |
| | catheter | |
| | non-injection | |

## Additional functions:

- The pulmonary percussion.
- The expiratory pause.
- The oxygenation.

## Monitoring of artificial pulmonary ventilation parameters:

- Monitoring of minute volume.
- Monitoring of respiratory rate.
- Monitoring of the carbon dioxide concentration.
- Monitoring of peak inspiratory pressure.
- Monitoring of positive end expiratory pressure.
- Ratio monitoring of inhalation duration to exhalation duration I:E.
- Monitoring of carbon dioxide partial pressure.
- Monitoring of oxygen concentration.
- Monitoring of the minimum, maximum and average airway pressure.
- Monitoring of the inspiration volume.

## Graphic display:

- Flow graphic.
- Volume graphic.
- Pressure.
- Capnogram.

# Depth of Anesthesia and Sedation Monitor
# MGA-06


Specially designed for patient depth of anesthesia and sedation monitoring.

## Technical specification

- Display 5“, touchscreen, color
- Built-in battery (2 h of operation)
- 24 hours of graphical trends
- Visual and sound alarm system
- Universal mounting on a horizontal surface, in vertical or horizontal poles
- Power supply: 100–250 V, 50/60 Hz
- Interface: Wi-Fi

## Main parameters

| | |
|---|---|
| **AI – Brain activity index** | indicates patient‘s depth of anesthesia and sedation level. Depth of anesthesia evaluation is based on analysis of electroencephalogram (EEG). Algorithm of EEG analysis keeps information about typical signs of influence of different groups of anesthetics – types of EEG suppression |
| **SR – EEG signal suppression rate** | reflects the suppression of EEG activity and determines level of the further deepening of anesthesia |
| **SQI – EEG signal quality index** | indicates the influence of impedance of cable electrodes, artifacts, high-frequency noise, power mains disturbances and decreases linearly from 100% to 0% |
| **EMG – Electromyographic component level** | electrical activity of facial muscles |

## Features and advantages

| | |
|---|---|
| **Universal** | Operates with inhalation and intravenous anesthetics |
| **Low cost in operation** | Kit from 3 standard ECG-electrodes is used for measurement |
| **Easy to use and safe for patient** | 3 ECG-electrodes are placed on the fronto-temporal lobes of the patient |
| **Efficient** | Using the device allows:<br>• reduce the consumption of anesthetics, as well reduce the awakening from anesthesia time by 35–50%;<br>• stably maintain the required depth of sedation (according to statistics, without AI-control more than 69% of patients have insufficient or excessive depth of sedation);<br>• mostly eliminate the risk of anesthesia awareness. |



| | |
|---|---|
| 90–100 | awake |
| 80–89 | light sedation |
| 60–79 | coma, sedation |
| 40–59 | surgical stage |
| 20–39 | deep anesthesia, burst-suppression patterns |
| 0–19 | extremely deep anesthesia |

| | |
|---|---|
| **Convenient** | Monitor is light and portable. It can be placed on the working surface or fixed on the rail or rack |

*The information is for reference only. The list of features is not complete. For the detailes information please contact the manufacturer. Not a public offer.*

# Patient Monitors MPR6-03
# Intended use: Intensive Care



Designed to monitor the main parameters of patient's vital signs.

**Applications:**

- Patient age groups: adults, children and infants.
- In operating rooms and intensive care units.
- In the wards of anesthesiology departments.
- In the specialized departments (neurology, cardiology and others).
- In the departments and offices of functional diagnostics.
- In the general admission departments of hospitals.

## Vital signs and modules

| | |
|---|---|
| **Electrocardiography (ECG)** | 12 leads: I, II, III, aVL, aVR, aVF, $V_1$–$V_6$<br>Heart rate variability analysis (HRV)<br>ST-analysis<br>Heart rate<br>Analysis and automatic detection of arrhythmia |
| **Pulse oximetry TREATON®** | Pulse rate<br>$SpO_2$<br>Photoplethysmogram |
| **Pulse oximetry Masimo SET®**<br>Masimo SET | Pulse rate<br>$SpO_2$<br>Photoplethysmogram |
| **Thermometry** | Two channels<br>Temperature difference measurement |
| **Impedance method of measuring respiration parameters** | Respiratory rate<br>Respirogram |
| **NIBP** | Sys / Mean / Dia arterial pressure |
| **Automatic continuous measurement of blood pressure (cNIBP)** | Sys / Mean / Dia arterial pressure, pulse rate transit time relative to QRS |
| **Noninvasive monitoring of central hemodynamics parameters** | CO, SV, CI, SVR, SVRI, SVI, LCW, LCWI, LSW, LSWI, LSP, LSPI, VSV<br>Original technology of volume-compression oscillometry |
| **Invasive measurement of blood pressure (2 IBP channels)** | Sys / Mean / Dia blood pressure<br>Selection of pressure type: ART, PA, CVP, ICP, RAP, LAP, RVP, UA<br>IBP1, IBP2 waveforms |
| **Minimally invasive measurement of CVP and other low blood pressures in various areas of the body (IIND 500/75)** | Measurement range, $mmH_2O$: –200…450 |
| **Mainstream capnography** | $EtCO_2$, $FiCO_2$, RR<br>Capnogram |
| **Sidestream capnography** | $EtCO_2$, $FiCO_2$, RR<br>Capnogram |
| **Sidestream oximetry** | $EtO_2$, $FiO_2$ |
| **Continuous monitoring of metabolic parameters (based on data from the respiratory mechanics module)** | Automatic calculation of oxygen consumption and $CO_2$ elimination with respiratory mechanics $VCO_2$, $VO_2$, REE, RQ |
| **Respiratory mechanics** | PIP, PEEP, Ve, MVe, flow and pressure waveforms<br>Volumetric capnogram |
| **Metabolic calculator** | $VO_2$, $VCO_2$, REE, RQ |
| **Depth of anesthesia (sedation level)** | Brain activity index AI<br>Electroencephalogram (EEG) |

**Expert technologies:**

- Continuous monitoring of the metabolic needs of the patient.
- Respiratory mechanics.
- Noninvasive monitoring of central hemodynamic parameters.
- Capnography in the mainstream.

## Basic functions

| | |
|---|---|
| **Touchscreen** | 12.1“ or 15“ |
| **Power supply** | 220 V/50 Hz |
| **Battery** | 2 h of operation |
| **Trends** | digital and graphic, 240 h |
| **Interface** | wired or wireless connection to the central monitoring station (up to 32 monitors)<br>wired connection to the hospital network<br>USB for transferring patient data to PC |
| **Alarm system** | three levels of priority<br>setting alarm limits<br>alarm history |
| **Data printing** | three channels thermal printer |
| **Medical calculators** | for drug doses<br>for oxygenation and ventilation parameters<br>for renal function<br>for hemodynamics parameters |

## Benefits

| | |
|---|---|
| **Metabolic monitoring** | Emergency and planned surgery is always accompanied by the development of hypermetabolism-hypercatabolism syndrome. Late and unadequate nutritional support of the critically ill patient after surgery leads to the development of a number of adverse effects and complications. Principles of early clinical nutrition and maximum adequacy to the specific metabolic needs of the operated patient are a good decision for successful healing process |
| | The method of indirect calorimetry without use of disposables. Easy to use – method based on gas analysis data |
| | Continuous measurement:<br>• oxygen consumption ($VO_2$);<br>• carbon dioxide elimination ($VCO_2$);<br>• respiratory quotient (RQ);<br>• resting energy expenditure (REE). |
| **Noninvasive monitoring of central hemodynamic parameters** | Cardiac output assessment by a non-invasive volumetric compressive oscillometry (VCO). VCO bases on measurements of the blood volume change under an inflatable cuff around a limb. VCO determines blood pressure by recording the volumetric arterial oscillograms allowing speed and character of pulse-wave increase and decrease evaluation, and judgment about heart pump condition and vascular walls elasticity |

# Patient Monitors MPR6-03
# Intended use: Anesthesiology



Designed to monitor the main parameters of patient's vital signs.

**Applications:**

- Patient age groups: adults, children and infants.
- In operating rooms and intensive care units during anesthesia care.
- In the wards of anesthesiology departments.
- In the specialized departments (neurology, cardiology and others).

## Vital signs and modules

| | |
|---|---|
| **Electrocardiography (ECG)** | 12 leads: I, II, III, aVL, aVR, aVF, $V_1$–$V_6$<br>Heart rate variability analysis (HRV)<br>ST-analysis<br>Heart rate<br>Analysis and automatic detection of arrhythmia |
| **Pulse oximetry TREATON®** | Pulse rate<br>$SpO_2$<br>Photoplethysmogram |
| **Pulse oximetry Masimo SET®**<br>Masimo SET | Pulse rate<br>$SpO_2$<br>Photoplethysmogram |
| **Thermometry** | Two channels<br>Temperature difference measurement |
| **Impedance method of measuring respiration parameters** | Respiratory rate<br>Respirogram |
| **NIBP** | Sys / Mean / Dia arterial pressure |
| **Automatic continuous measurement of blood pressure (cNIBP)** | Sys / Mean / Dia arterial pressure, pulse rate transit time relative to QRS |
| **Noninvasive monitoring of central hemodynamics parameters** | CO, SV, CI, SVR, SVRI, SVI, LCW, LCWI, LSW, LSWI, LSP, LSPI, VSV<br>Original technology of volume-compression oscillometry |
| **Invasive measurement of blood pressure (2 IBP channels)** | Sys / Mean / Dia blood pressure<br>Selection of pressure type: ART, PA, CVP, ICP, RAP, LAP, RVP, UA<br>IBP1, IBP2 waveforms |
| **Minimally invasive measurement of CVP and other low blood pressures in various areas of the body (IIND 500/75)** | Measurement range, $mmH_2O$: –200…450 |
| **Mainstream capnography** | $EtCO_2$, $FiCO_2$, RR<br>Capnogram |
| **Continuous monitoring of metabolic parameters (based on data from the respiratory mechanics module)** | Automatic calculation of oxygen consumption and $CO_2$ elimination with respiratory mechanics: $VCO_2$, $VO_2$, REE, RQ |
| **Respiratory mechanics** | PIP, PEEP, Ve, MVe, flow and pressure waveforms<br>Volumetric capnogram |
| **Metabolic calculator** | $VO_2$, $VCO_2$, REE, RQ |
| **Anesthetic agent module (multigas)** | Fi/Et: $CO_2$, $O_2$, $N_2O$, 5AA. RR, MAC<br>Selection of waveform: $CO_2$, $O_2$, anesthetic agents |
| **Depth of anesthesia (sedation level)** | Brain activity index AI<br>Electroencephalogram (EEG) |

**Expert technologies:**

- Anesthetic agent module (multigas).
- Depth of anesthesia (sedation level).
- Respiratory mechanics.
- Noninvasive monitoring of central hemodynamic parameters.
- Capnography in the mainstream.



## Basic functions

| | |
|---|---|
| **Touchscreen** | 12.1“ or 15“ |
| **Power supply** | 220 V/50 Hz |
| **Battery** | 2 h of operation |
| **Trends** | digital and graphic, 240 h |
| **Interface** | wired or wireless connection to the central monitoring station (up to 32 monitors)<br>wired connection to the hospital network<br>USB for transferring patient data to PC |
| **Alarm system** | three levels of priority<br>setting alarm limits<br>alarm history |
| **Data printing** | three channels thermal printer |
| **Medical calculators** | for drug doses<br>for oxygenation and ventilation parameters<br>for renal function<br>for hemodynamics parameters |

## Benefits

**Depth of anesthesia and sedation level monitoring**

Analyzing of patient‘s EEG in time and frequency domains and defines brain activity index (AI), which reflects patient‘s depth of anesthesia and sedation. Based on analysis of electroencephalogram (EEG). Algorithm of EEG analysis keeps information about typical signs of influence of different groups of anesthetics – types of EEG suppression



| | |
|---|---|
| 90–100 | awake |
| 80–89 | light sedation |
| 60–79 | coma, sedation |
| 40–59 | surgical stage |
| 20–39 | deep anesthesia, burst-suppression patterns |
| 0–19 | extremely deep anesthesia |

**Anesthesia agent analysis – continuous sidestream measurement and monitoring of gas concentration in the patient‘s airways**

Measured parameters:
- concentration of $CO_2$ at inspiration ($FiCO_2$) and at the end of expiration ($EtCO_2$);
- concentration of $O_2$ at inspiration ($FiO_2$) and at the end of expiration ($EtO_2$);
- concentration of $N_2O$ at inspiration ($FiN_2O$) and at the end of expiration ($EtN_2O$);
- concentration of anesthetic gas agents (Ax): Halothane (Hal), Enflurane (Enf), Isoflurane (Iso), Desflurane (Des), Sevoflurane (Sev) at inspiration (FiAx) and expiration (EtAx);
- respiration rate (RR).

*The information is for reference only. The list of features is not complete. For the detailes information please contact the manufacturer. Not a public offer.*

# Patient Monitors MPR6-03
# Intended use: Neonatology



Designed to monitor the main parameters of patient's vital signs.

**Applications:**

- Monitoring of newborn infants with extremely low body weight from 500 g.
- In neonatal operating rooms and intensive care units.
- In pediatric departments (neurology, cardiology and others).
- In admission pediatric departments.

## Vital signs and modules

| | |
|---|---|
| **Electrocardiography (ECG)** | 12 leads: I, II, III, aVL, aVR, aVF, $V_1$–$V_6$<br>Heart rate variability analysis (HRV)<br>ST-analysis<br>Heart rate<br>Analysis and automatic detection of arrhythmia |
| **Pulse oximetry TREATON®** | Pulse rate<br>$SpO_2$<br>Photoplethysmogram |
| **Pulse oximetry Masimo SET®**<br>Masimo SET | Pulse rate<br>$SpO_2$<br>Photoplethysmogram |
| **Thermometry** | Two channels<br>Temperature difference measurement |
| **Impedance method of measuring respiration parameters** | Respiratory rate<br>Respirogram |
| **NIBP** | Sys / Mean / Dia arterial pressure |
| **Automatic continuous measurement of blood pressure (cNIBP)** | Sys / Mean / Dia arterial pressure, pulse rate transit time relative to QRS |
| **Invasive measurement of blood pressure (2 IBP channels)** | Sys / Mean / Dia blood pressure<br>Selection of pressure type: ART, PA, CVP, ICP, RAP, LAP, RVP, UA<br>IBP1, IBP2 waveforms |
| **Minimally invasive measurement of CVP and other low blood pressures in various areas of the body (IIND 500/75)** | Measurement range, $mmH_2O$: –200…450 |
| **Mainstream capnography** | $EtCO_2$, $FiCO_2$, RR<br>Capnogram |
| **Sidestream capnography (sample rate 50 ml/min)** | $EtCO_2$, $FiCO_2$, RR<br>Capnogram |
| **Sidestream oximetry** | $EtO_2$, $FiO_2$ |
| **Metabolic calculator** | $VO_2$, $VCO_2$, REE, RQ |
| **Anesthetic agent module (multigas)** | Fi/Et: $CO_2$, $O_2$, $N_2O$, 5AA. RR, MAC<br>Selection of waveform: $CO_2$, $O_2$, anesthetic agents |

**Expert technologies:**

- Low sample flow capnography in the sidestream.
- Neonatal Oxygen-Cardio-Respirogramm.
- Pulse oximetry Masimo SET®.
- Anesthetic agent module (multigas).

## Basic functions

| | |
|---|---|
| **Touchscreen** | 12.1“ or 15“ |
| **Power supply** | 220 V/50 Hz |
| **Battery** | 2 h of operation |
| **Trends** | digital and graphic, 240 h |
| **Interface** | wired or wireless connection to the central monitoring station (up to 32 monitors)<br>wired connection to the hospital network<br>USB for transferring patient data to PC |
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| **Data printing** | three channels thermal printer |
| **Medical calculators** | for drug doses<br>for oxygenation and ventilation parameters<br>for renal function<br>for hemodynamics parameters |

## Benefits

| | |
|---|---|
| **Low sample flow capnography in the sidestream** | Necessary for neonatal patients. 50 ml/min sample volume is because of a small measuring chamber. Low sample flow improves capnography reliability in case of low respiratory flow (newborn infants and children) |
| **Neonetal Oxygen-Cardio-Respirogramm** | This is the simultaneous recording of heart rate, respiration rate, the blood oxygen saturation from newborn infants. Oxygen-Cardio-Respirogramm shows respiratory function, and maturity of the brain |
| **Pulse oximetry Masimo SET®** | The use of Masimo SET® pulse oximetry allows to assess real value of $SpO_2$ in cases of disturbed perfusion or high levels motor activity of the patient |
| Masimo SET® | Also, Masimo SET® pulse oximetry provides data to estimate the perfusion index. It is important in assessment of capillary blood flow |

Treaton

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