

Complete list of SimBioSys™ Input parameters

| Input Parameter Name | Description |
|----------------------------------|--------------------------------------------------------------|
| [Cl-]i | intracellular chloride concentration |
| [Cl-]o | extracellular chloride concentration |
| [K+]i | intracellular potassium concentration |
| [K+]o | extracellular potassium concentration |
| [Na+]i | intracellular sodium concentration |
| [Na+]o | extracellular sodium concentration |
| Actin Length | Thin-Filament Length |
| Age | |
| Agonist – log [EC50] | Receptor Agonist EC50 |
| Agonist -log [Concentration] | Receptor Agonist Concentration |
| Airway Contractility | |
| Airway Diameter | Effective Diameter of Trachea and Larynx |
| Airway Length | Length of Upper Airway (trachea, larynx) |
| Altitude | |
| Amount of Solute | Solute Mass |
| Antagonist - log [Concentration] | Receptor Antagonist Concentration |
| Antagonist – log[EC50] | Receptor Antagonist EC50 |
| Antagonist Type | |
| Aortic Resistance | |
| Aortic leak | Aortic Valve Leak Conductance |
| Aortic Valve Jet | Aortic Valve Jet Resistance |
| Autonomic Decay Time | |
| Basal HR | Basal Heart Rate (before autonomic input) |
| Basal Perfusion Log SD | Log Standard Deviation of Pulmonary Blood Flow (Basal Value) |
| Body Weight | |
| BP Set Point | Set Point for Mean Arterial Pressure |

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|----------------------------|--------------------------------------------|
| Capacitance | Membrane Capacitance |
| Capillary Permeability | |
| Chest Elastance | Global Chest Wall Elastance |
| Chest Min Volume | Global Chest Wall Minimum Volume |
| Chest Pressure Offset | Global Chest Wall Offset |
| Chest Stiffness | Global Chest Wall Stiffness |
| Creatinine Excretion | Total Creatinine Production Rate |
| Critical ER | Critical Extraction Ration (50 |
| Crossbridge Number | Number of Crossbridges per half-sarcomere |
| CvCO2 | Mixed Venous Carbon Dioxide Content |
| Dead Space, Airway | Anatomic Dead Space |
| Diffusion Constant | |
| Diffusion Time | |
| Dosing Inerval Divisor | |
| Dosing Interval Divisor | |
| Drug Time Multiplier | |
| Dry Weight | |
| Endotracheal Tube Diameter | |
| ETT Leak | Endotracheal Tube Leak Conductance |
| Exponent | Receptor DRC Steepness |
| FIO2 | Oxygen Fraction in Inspired air |
| GF Conductance | Glomerular Filtration Conductance |
| Height | |
| Helium-Nitrogen Balance | Inspired Helium Fraction |
| HP Conduction Probability | Fration of His Purkinje Impulses Conducted |
| Infusion Rate Multiplier | |
| Inspiratory Flow Rate | |
| Inspiratory Pressure | |
| Inspiratory Pressure Limit | |

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|--------------------------------------|-------------------------------------------------------|
| L Pleural Bleed Cond. | |
| L Pneumothorax Vol. | |
| LA Functional Fx | LA Functional Fraction |
| Lactate Production | Lactate Production rate |
| LLL Basal Airway Conductance | |
| Lower Airway Conductance | Airway Conductance of Lower Airways |
| LUL Basal Airway Conductance | |
| Lung Closing Volume | Global Basal Volume |
| Lung Collagen Amt | Collagen in lung |
| Lung Elastin Amount | Amount of Elastin in Lung |
| Lung Membrane Diffusing Capacity | |
| Lung Recruitment Volume | Lung Critical Collapse Volume |
| Lung Surfactant | Surfactant Amount |
| LV Curvature | |
| LV Functional Fx | Left Ventricle Functional fraction |
| Max Urine Osms | Maximal Osmolality achievable in Urine |
| Membrane Diffusion Constant | |
| Membrane Thickness | |
| Membrane-Water Partition Coefficient | |
| Mitral leak | Mitral Valve Leak Conductance |
| Mitral Resistance | |
| Myosin Length | Thick Filament length |
| Nerve Temperature | Experimental Temperature for Action Potential Studies |
| O2 Demand, Basal | |
| O2 Demand, Muscle | |
| PA Compliance | Pulmonary Artery Compliance |
| PA Impedance | Characteristic Impedance of the Pulmonary Artery |
| PA VO | Pulmonary Arterial Unstressed Volume |
| Pacemaker | Electronic Pacemaker State |

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|-----------------------------------|--------------------------------------------------------------|
| Pacemaker Current | Current injected into heart for each pacemaker pulse |
| Pacemaker Rate | Rate of an Artificial Ventricular Pacemaker |
| PAO2 | |
| Parasymp HR Response | Parasymp HR Response Parameter |
| PCO2 | Tonometer PCO2 |
| PEEP | Positive End-Expiratory Pressure |
| Pericard. Bleed Cond | Conductance of Hemorrhage into Pericardium |
| Pericardial Capapcity | |
| Pericardial Infusion | Pericardial Infusion State |
| Pericardial Stiffness | Pericardial Stiffness (inverse ml) |
| Periton. Bleed Cond. | Conductance of Hemorrhage into Peritoneum |
| Permeability Time | |
| Plasma [Fibrinogen] | |
| Plasma Viscosity | |
| PO2 | Tonometer PO2 |
| Pulmonary Vein Compliance | Pulmonary Central Venous Compliance |
| Pulmonary Venule Basal Compliance | Basal Pulmonary Peripheral Venous Compliance (ml/Torr) |
| Pulmonic Curvature | |
| Pulmonic Resistance | |
| Pumonary Vein Basal Compliance | Basal Pulmonary Central Venous Compliance |
| Pumonary Venule Compliance | Pulmonary Peripheral Venous Compliance |
| Pumonic Leak | Pulmonic Valve Leak Conductance |
| R Pleural Bleed Cond | Right Pleural Hemorrhage Conductance |
| RA Curvature | Right Atrial Curvature Control |
| RA Functional Fx | RA Functional Fraction |
| Renal Afferent Fx | Fraction of Renal Arterial Resistance in Afferent Arterioles |
| Renal R | Renal Arterial Resistance, Actual |
| RLL Basal Airway Conductance | |
| RML Basal Airway Conductance | |

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|------------------------------|-------------------------------------------------------|
| RQ | Respiratory Quotient (dimensionless) |
| RUL Basal Airway Conductance | |
| RV Curvature | |
| RV Functional Fx | Right Ventricular Functional Fraction |
| Sarcomere Start length | Initial (pre-excitation) starting length of sarcomere |
| Sex | |
| Shunt, Anatomic | Anatomic Shunt (percent of total cardiac output) |
| Solute Concentration Side 1 | |
| Solute Concentration Side 2 | |
| Stimulation Current | |
| Stimulus Duration | |
| Symp BP Gain | Gain for Sympathetic BP response |
| Sympath HR Response | Sympath HR Response Parameter |
| Target Ventilation | |
| Temperature | Body Temperature |
| Tidal Volume, Ventilator | Tidal Volume of a Ventilator-Driven breath |
| Tricuspid Curvature | Tricuspid Valve-Pressure Curvature |
| Tricuspid Leak | Tricuspid Valve Leak Conductance |
| Tricuspid Resistance | |
| Urea Production | Systemic Urea Production Rate |
| Vant Hoff Q10 | |
| Ventilator Rate | |
| VR Obstructed | Venous Return is Obstructed |
| Water Surface Tension | Surface Tension of Water |

Complete list of SimBioSys™ Output parameters

| Output Parameter Name | Description |
|-------------------------------|-------------------------------------------------|
| [H]a | Arterial Hydrogen Ion Concentration |
| [H]v | Venous Hydrogen Ion Concentration |
| A-a PO2 Diff. | Alveolar -Arterial PO2 Difference |
| Afferent Limb | |
| Airway | |
| Alpha 1 Occupancy | Alpha 1 Receptor Occupancy |
| Alpha 1 Transmission | Alpha 1 Transmission - fraction of normal (1.0) |
| Alpha 2 Occupancy | Alpha 2 Receptor Occupancy |
| Alpha 2 Transmission | Alpha 2 Transmission-- fraction of normal (1.0) |
| Alveolar Fluid | |
| Alveolar Fluid Volume | |
| Alveolar Gases | |
| Anesthetic Activity | |
| Aortic Pressure - Diastolic | |
| Aortic Pressure – Mean | |
| Aortic Pressure – Systolic | |
| Aortic Pressure -Diastolic | |
| Arterial Blood | |
| Arterial Contractility | Degree of Contraction of Arterioles |
| Arterial pH | Arterial Blood pH |
| Arterial Pressure - Systolic | |
| Arterial Pressure - Diastolic | |
| Arterial Pressure – Diastolic | |
| Arterial Pressure – Mean | |
| Arterial Pressure – Systolic | |
| Arterial Pressure- Mean | |

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|----------------------|-----------------------------------------------------------------|
| Ascites Drained | Ascites Drainage Volume |
| Ascites Volume | Peritoneum Effusion Volume |
| AutoPEEP | |
| AV Nodal Conduction | |
| AV Nodal Conduction | |
| AV O2 Content Diff | Arteriovenous Oxygen Content Difference |
| Barometric Pressure | Atmospheric Pressure |
| Base Excess | Arterial Base Excess |
| Bdz Occupancy | Benzodiazepine Receptor Occupancy |
| Bdz Transmission | Benzodiazepine Receptor Transmission-- fraction of normal (1.0) |
| Beta 1 Occupancy | Beta 1 Receptor Occupancy |
| Beta 1 Transmission | Beta 1 Receptor Transmission-- fraction of normal (1.0) |
| Beta 2 Occupancy | Beta 2 Receptor Activity |
| Beta 2 Transmission | Beta 2 Receptor Transmission-- fraction of normal (1.0) |
| Bladder Total volume | Bladder Effusion Volume |
| Bladder Volume | Volume in Bladder |
| Blood Rheology | |
| Blood Viscosity | Blood Viscosity (cP) |
| Blood Volume | Total Cardiovascular Blood Volume |
| BUN | Blood Urea Nitrogen Concentration |
| CaCO2 | Arterial Carbon Dioxide Content |
| CaN2 | Arterial Nitrogen Content |
| CaO2 | Arterial Oxygen Content |
| Cardiac Output | |
| Cardiac Rhythm | |
| Cc'O2 | Ideal alveolar O2 content |
| Chloride Reuptake | Renal Tubular Chloride Uptake Transmission |
| Creatinine | Serum Creatinine Concentration |
| CvN2 | Mixed Venous Nitrogen Content ml N2/dl Blood |

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|-------------------------|--------------------------------------------------------------|
| CvO2 | Mixed Venous Oxygen Content |
| CVP - min | Systematic Central Venous pressure- min |
| CVP -max | Systematic Central Venous pressure- max |
| CVP -mean | Systematic Central Venous pressure- mean |
| Dead Space, Alveolar | alveolar dead space (percent of ventilated alveoli) |
| Dead Space, Physiologic | Physiologic (Bohr) Dead Space (percent of ventilation) |
| Dead Space, True | True Pulmonary Dead Space (percent of ventilation) |
| Digoxin Level | Plasma Digoxin Concentration |
| DLCO | |
| DLCO COrr | |
| DLCO Corr Pct Predicted | |
| DLCO Corr Predicted | |
| DLCO Pct Predicted | |
| DLCO Predicted | |
| Drug Effect | Receptor effect |
| E Cl | Chloride Reversal Potential |
| E K | Potassium Reversal Potential |
| E Na | Sodium Reversal Potential |
| End Ex Volume | |
| End Exp Pleur P | |
| End Exp Volume | End Expiratory Lung Volume |
| ER O2 | Oxygen Extraction Ratio (%: VO_2 / QO_2) |
| Exp Pause Pressure | Expiratory Pause Pressure |
| Extracardiac Pressure | |
| FEEF 25-75 | |
| FEF 25-75 | Forced Expiratory Flow between %25 and %75 of Vital Capacity |
| FEF 25-75 Pct Predicted | |
| FEF 25-75 Predicted | |
| FENa | Fractional Excretion of Sodium |

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|-------------------------|------------------------------------------------------------|
| FEV1 | Forced Expiratory Flow in 1 second |
| FEV1 Pct Predicted | |
| FEV1 Predicted | Forced Expiratory Flow in 1 second, Predicted normal value |
| FEV1/FVC | Percent of Forced Vital Capacity in first second |
| FEV1/FVC Pct Predicted | |
| FEV1/FVC Predicted | |
| Fluid Input | |
| Fluid Output | |
| Flux Through Membrane | Membrane Flux |
| FRC | Functional Residual Capacity |
| FRC Pct Predicted | |
| FRC Predicted | Functional Residual Capacity, predicted normal value |
| FVC | |
| FVC Pct Predicted | |
| FVC Predicted | Forced Vital Capacity, predicted normal value |
| G Cl (resting) | Chloride Conductance, Resting |
| G K (resting | Potassium Conductance, Resting |
| G Na (Resting) | Sodium Conductance, Resting |
| Ganglionic Transmission | Ganglionic Transmission - fraction of normal (1.0) |
| GFR | Glomerular Filtration Rate |
| Glomerular Function | |
| Glomular Pressure | |
| H2 Transmission | Histamine Type 2 Receptor Transmission |
| H2O Vapor Pressure | Vapor Pressure of Water at Body Temperature |
| Heart Rate (observed) | |
| Hematocrit | |
| Hemoglobin | Hemoglobin concentration for oxygen content vs PO2 Curve |
| Hemoglobin | Whole Blood Hemoglobin Concentration |
| Hemoglobin P50 | O2 Pressure for Half-Maximal Hemoglobin Saturation |

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|-------------------------|---------------------------------------------|
| I/E Ratio | Rate of Inspiratory Time to Expiratory Time |
| ICF [Ca] | Intracellular Fluid Calcium Concentration |
| ICF [Cl] | Intracellular Fluid Chloride Concentration |
| ICF [K] | Intracellular Fluid Potassium Concentration |
| ICF [Mg] | Intracellular Fluid Magnesium Concentration |
| ICF [Na] | Intracellular Fluid Sodium Concentration |
| ICF [Protein] | Intracellular Fluid Protein Concentration |
| ICF Phosphate | |
| ICF Volume | Intracellular Fluid Volume |
| Input/Output | Fluids I/O |
| ISF [Ca] | Interstitial Fluid Calcium Concentration |
| ISF [Cl] | Interstitial Fluid Chloride Concentration |
| ISF [K] | Interstitial Fluid Potassium Concentration |
| ISF [Mg] | Interstitial Fluid Magnesium Concentration |
| ISF [Na] | Interstitial Fluid Sodium Concentration |
| ISF [PO4] | Interstitial Fluid Phosphate Concentration |
| ISF [Protein] | Interstitial Fluid Protein Concentration |
| ISF Glucose | Interstitial Fluid Glucose Concentration |
| ISF Lactate | Interstitial Fluid Lactate Concentration |
| ISF Volume | Interstitial Fluid Volume |
| Jugular Pressure - mean | Jugular Vein Pressure - mean value in cycle |
| Jugular Pressure – min | Jugular Vein Pressure - min value in cycle |
| Jugular Pressure- max | Jugular Vein Pressure - max value in cycle |
| L pLeural Drainage | |
| LA Contractility | |
| LA Diastolic | Left Arterial Diastolic Pressure |
| LA EDV | left Arterial End-Diastolic Volume |
| LA pressure - Mean | mean left atrial pressure |
| LA Systolic | Left Atrial systolic pressure |

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|-------------------------|-------------------------------------------------------------|
| Left Pleural Effusion | LHT Effusion Volume |
| Lidocaine level | |
| Lung ISF Volume | Lung Interstitial Fluid Volume |
| LV Contractility | |
| LV EDP | Left Ventricular End-Diastolic Pressure |
| LV EDV | Left Ventricular End-Diastolic Volume |
| LV Ejection Fraction | |
| LV ESP | Left Ventricular End-Systolic Pressure |
| LV ESV | Left Ventricular End-Systolic Volume |
| LV Pressure – Diastolic | |
| LV Pressure - Mean | |
| LV Pressure - Systolic | |
| LV Pressure -Diastolic | |
| LV Pressure- Systolic | |
| Maximum Force | Maximum developed force of last contraction |
| Min Pleural Pressure | |
| Minute Ventilation | |
| Muscarinic Occupancy | Muscarinic Receptor Occupancy |
| Muscarinic Transmission | Muscarinic Receptor Transmission - Fraction of normal (1.0) |
| NIF | Negative Inspiratory Force |
| NMJ Transmission | NMJ Transmission -- fraction of normal (1.0) |
| O2 Demand, Total | |
| Oncotic Pressure | Plasma Oncotic P |
| Opiate Activity | Opiate Receptor Activity |
| Opiate Transmission | Opiate Receptor Activity - Fraction of Normal (1.0) |
| PA Contractility | Pulmonary Artery Vascular Contractility |
| PA Pressure – Diastolic | |
| PA Pressure – Mean | |
| PA Pressure - Systolic | |

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|-----------------------------|---------------------------------------------------------|
| PA Resistance | |
| PA Wedge Pressure | |
| PAO2 | |
| PaCO2 | Arterial Carbon Dioxide Partial Pressure |
| PaO2 | Ideal alveolar PO2 |
| Parasympathetic Tone | Parasympathetic Tone (0..1) |
| Peak Pao | Peak Airway Pressure |
| PEF | Positive Expiratory Force |
| PEFR | |
| PEFR Pct Predicted | Peak Expiratory Flow, predicted normal value |
| PEFR Predicted | Peak Expiratory Flow, predicted normal value |
| Perfusion Log SD | Log Standard Deviation of Pulmonary Blood Flow |
| Pericardial Effusion | Pericardial Effusion Volume |
| Pericardial Pressure – Mean | Mean Pericardial pressure |
| Peritoneal Fluid Hct | Hematocrit in Peritoneal Effusion |
| PIO2 | Inspired PO2 |
| Plasma Lactate | Serum Lactate Concentration |
| Plasma Lactate | |
| Plasma Protein | |
| Plasma SID | Plasma Strong Ion Difference |
| Plasma Volume | |
| Pleural Pressure- Mean | Mean Intra-Pleural Pressure |
| Pms | Mean Systematic Pressure |
| Ppl at FRC | Pleural Pressure at Functional Residual Capacity |
| PR Interval | Atrioventricular Delay (between P wave and QRS complex) |
| Protein Anions | |
| Pulm Vein Peri Pressure | |
| Pulse Pressure | |
| PvCO2 | Mixed venous carbon Dioxide Partial Pressure |

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|---------------------------------|---------------------------------------------------------|
| PvO2 | Mixed venous carbon Oxygen Partial Pressure |
| PVR | Pulmonary Vascular Resistance |
| QO2 (normalized) | Oxygen Delivery |
| QRS Duration | Ventricular Depolarization Time (length of QRS complex) |
| QT Interval | Repolarization Time (between QRS complex and T wave) |
| R Pleural Hematocrit | Hematocrit in Right Pleural Fluid |
| R Pneumothorax Vol. | Right Hemithorax Pneumothorax Volume |
| RA Contractility | Right Atrial Contractility |
| RA EDV | Right Atrial End-Diastolic Volume |
| RA Pressure – Diastolic | |
| RA Pressure – Mean | |
| RA Pressure - Systolic | |
| Raw | Airways Resistance |
| RBC Volume | |
| RBF | Renal Blood Flow Rate |
| Resp Rate Total | Observed Total Breaths per Minute |
| Respiratory Phase (Spontaneous) | Spontaneous Phase (Inspiration, Expiration, Waiting) |
| Respiratory Rate, Spont. | Measured Spontaneous Respiratory Rate |
| Respiratory Rate, Vent. | Observed Ventilator Breaths per Minute |
| Right Pleural Effusion | RHT Effusion Volume |
| RPF | Renal Plasma Flow Rate |
| RS Compliance | Respiratory System Compliance @ FRC |
| RS Compliance @ PEEP | Respiratory System Compliance @ End-Expiration |
| RV | Residual Lung Volume |
| RV Contractility | Right Ventricular Contractility |
| RV EDP | Right Ventricular End-Diastolic Pressure |
| RV EDV | Right Ventricular End-Diastolic Volume |
| RV Ejection Fraction | |
| RV ESP | Right Ventricular End-Systolic Pressure (torr) |

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|------------------------|------------------------------------------------|
| RV ESV | Right Ventricular End-Systolic Volume (ml) |
| RV Pct Predicted | |
| RV Predicted | Residual Volume, Predicted Normal Value |
| RV Pressure - Mean | |
| RV Pressure -Diastolic | |
| RV Pressure –Systolic | |
| RVR | Resistance to Venous Return |
| SaO2 | Arterial Oxygen Saturation |
| Serum [Ca] | |
| Serum [Cl] | |
| Serum [Glucose] | |
| Serum [K] | |
| Serum [Mg] | |
| Serum [Na] | |
| Serum [PO4] | |
| Serum Bicarbonate | |
| Sgaw | Specific airway conductance |
| Shunt, Alveolar | Alveolar shunt (percent of alveolar perfusion) |
| Shunt, Physiologic | Venous Admixture |
| Shunt, True | True Shunt (percent of total cardiac output) |
| SID | Strong Ion Difference |
| Sinus Rate | Rate for Normal Sinus Rhythm |
| Sodium Blockade | Sodium Channel Blockade Level |
| Steroid Activity | Steroid Receptor Activity |
| Stroke Volume | |
| Surface Area | Body Surface Area (Square Meters) |
| SVC | Vidal Capacity |
| SvO2 | Mixed Venous Oxygen Saturation |
| SVR | Systemic Vascular Resistance |

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|---------------------------|---------------------------------------------|
| Sympathetic Tone | |
| Systemic Venular Pressure | |
| Target Rate | |
| Theophylline Level | Plasma Theophylline Concentration |
| Tidal Volume, Expiratory | |
| Tidal Volume, Inspiratory | |
| Tidal Volume, Target | Target Depth |
| TLC | Total Lung Capacity |
| TLC Pct Predicted | |
| TLC Predicted | Total Lung Capacity, predicted normal value |
| Total Body Water | |
| Tubular Function | |
| Urine [Cl] | |
| Urine [K] | |
| Urine [Na] | |
| Urine Creatinine | |
| Urine Glucose | |
| Urine Hematocrit | |
| Urine Output | Renal Urine Production Rate |
| Urine Protein | |
| Urine Specific Gravity | |
| VCO2 (normalized) | Carbon Dioxide production |
| VCO2 (total) | Carbon Dioxide production (total) |
| Venous pH | Mixed Venous Blood pH (log molar) |
| Ventilator Mode | |
| Ventricular Escape Rate | |
| Vm -- Resting | Membrane Potential |
| VO2 (normalized) | Oxygen Consumption |
| VO2 (total) | Oxygen Uptake (total) |

