A3

Anesthesia system

Physical Specifications

Dimensions and Weight of Standard Version

Height	1410 mm
Width	762 mm
Depth	767 mm
Weight	≤120 kg (with 3 yokes, without vaporizers and gas cylinders)

Dimensions and Weight of Pendant Version

Height	1169 mm
Width	745 mm
Depth	827 mm
Weight	≤135 kg (with 1 yoke and Pendant adapter, without vaporizers and gas cylinders)

Dimensions and Weight of Compact Version

Height	1410 mm
Width	775 mm
Depth	659 mm
Weight	≤100 kg (with 3 yokes, without vaporizers and gas cylinders)

Dimensions and Weight of Wall Mount Version

Height	1095 mm
Width	765 mm
Depth	630 mm
Weight	≤115 kg (with wall mount adapter, without vaporizers and gas cylinders)

Work Surface of Standard Version

Height	827 mm
Width	430 mm
Depth	345 mm
Weight limit	30 kg

Flip-up Work Surface

Length	379 mm
Width	303 mm
Weight limit	15 kg

Drawer (2 or 3 drawers, Internal Dimension) of Standard and Pendant Version

Height	123 mm/ 72 mm
Width	275 mm
Depth	340 mm
Weight limit	5 kg

Storage Basket of Wall Mount and Compact Version

Height	78 mm
Width	398 mm
Depth	200 mm
Weight limit	2.5 kg

Bag Arm

Height	1108 mm
Length	510 mm
Swiveling angle	±90 degrees

Casters

Diameter	125 mm
Brake	All four casters with brakes

Work Light

Settings	OFF, Low, High

Main Screen

Display size	12.1 inch
Display type	Capacitive touch screen
Resolution	1280x 800
Display parameters	All setting and alarm parameters (including Breath rate, I/E ratio, Tidal volume, Minute volume, PEEP, MEAN, PEAK, PLAT, and O_2 concentration, $EtCO_2$, N_2O, Anesthesia gas concentration)
Graphic waveforms	Pressure, Flow, Volume, CO_2, O_2, Anesthetic gas, N2O Up to 3 waveforms display simultaneously
Spirometry loops	Pressure-Volume, Flow-Volume and Pressure-Flow
Timer	Display on screen timer

Ventilator Specifications

Modes of Ventilation

Manual/Spontaneous ventilation/CPB
Volume Control Ventilation (VCV) with PLV function
Pressure Control Ventilation (PCV)
Pressure Control Ventilation with volume guarantee (PCV-VG)
Continuous Positive Airway Pressure/Pressure Support Ventilation with apnea backup (CPAP/PS)
Pressure Support Ventilation (PS) with apnea backup
Synchronized Intermittent Mandatory Ventilation (SIMV-Volume Controlled and SIMV-Pressure Controlled)

Compensation

Circuit gas leakage compensation and automatic compliance compensation

Ventilation Parameters Range

Tidal volume	10 to 1500 mL (VCV, SIMV-VC) 5 to 1500 mL (PCV-VG) With TV/IBW indicator
Pinsp	3 to 80 cmH2O
Plimit	10 to 100 cmH_2O
ΔPsupp	0, 3 to 60 cmH_2O (CPAP/PS)
Respiration rate	2 to 100 bpm

I:E	4:1 to 1:10
Tpause	OFF, 5% to 60%
Tinsp	0.2 to 10.0 s
Trigger window	5% to 90%
Flow trigger	0.2 to 15 L/min
Pressure trigger	-20 to -1 cmH_2O
Exp%	5% to 80%
Min rate	2 to 60 bpm
Tslope	0.0 to 2.0 s
Apnea I: E	4:1 to 1:10
ΔPapnea	3 to 60 cmH_2O

Positive End Expiratory Pressure (PEEP)

Type	Integrated, electronic controlled
Range	OFF, 2 to 50 cmH_2O

Monitoring Parameters

Tidal volume	0 to 3000 ml
Minute volume	0 to 100 L/min
Peak pressure	-20 to 120 cmH_2O
Mean pressure	-20 to 120 cmH_2O
Plateau pressure	-20 to 120 cmH_2O
I:E	50:1 to 1:50
Rate	0 to 150 bpm
PEEP	0 to 70 cmH_2O
Delta Tidal volume	0 to 3000 ml
Minute volume leakage	0 to 10.0 L/min
Resistance (R)	0 to 600 cmH_2O/(L/s)
Compliance (C)	0 to 300 ml/cmH_2O
Inspired oxygen (FiO_2)	18% to 100%

Control Accuracy

Volume delivery	≤60 ml: ± 10 ml >60 ml and ≤ 210 ml: ±15 ml >210 ml: ±7 % of the set value
Pressure delivery	± 2.5 cmH_2O or ± 7% of the set value, whichever is greater
PEEP	± 2.0 cmH_2O or ± 7% of the set value, whichever is greater
Rate	± 1bpm or ± 10% of the reading, whichever is greater

Monitoring Accuracy

Volume monitoring	≤60 mL: ± 10 mL >60 and ≤210 mL: ± 15 mL >210 mL: ± 7% of the reading
Pressure monitoring	± 2.0 cmH_2O or ± 4% of the reading, whichever is greater
Rate	± 1bpm or ± 5% of the reading, whichever is greater
MV	± 0.1L/min or ± 8% of the reading, whichever is greater

Alarm Setting

Paw High	2 to 100 cmH_2O
Paw Low	0 to 98 cmH_2O
TV High	5 to 1600 mL
TV Low	OFF, 0 to 1595 mL
MV High	0.2 to 100 L/min
MV Low	0 to 99 L/min
Rate High	4 to 100 bpm, OFF
Rate Low	OFF, 2 to 98 bpm
FiO_2 High	20% to 100%, OFF
FiO_2 Low	18% to 98 %
Apnea alarm	No breath has been detected within the apnea time.
Apnea delay time	5 to 60 s (by volume or pressure) 10 to 40 s (by CO2 waveform)

Data Storage and Recording

Configuration storage	up to 10 customized profiles
Log storage	10000 entries of alarm and activity logs
History trend	48 hours of continuous trend data
Screenshot	up to 50

Pneumatic Specifications

Pipeline Supply

Gas type	O_2, N_2O and Air
Pipeline input range	280 to 600 kPa (40 to 87 psi)
Pipeline connections	DISS or NIST

Pipeline Supply Pressure Monitoring

Display type	Mechanical or Electronic
Ranges	0 to 1000kPa (0 to 140 psi)
Accuracy	± (4% of the full scale reading + 8% of the actual reading)

Cylinder Supply

Cylinder supply	E Cylinder (American style or UK style)
O2 input range	6.9 to 20 MPa (1000 to 2900 psi)
N2O input range	4.2 to 6 MPa (600 to 870 psi)
Air input range	6.9 to 20 MPa (1000 to 2900 psi)
Cylinder connections	Pin-Index Safety System (PISS)
Yoke configuration	O2, N2O, Air

Cylinder Supply Pressure Gauges

Display type	Mechanical or Electronic
Air range	0 to 25 MPa (0 to 3500 psi)
O2 range	0 to 25 MPa (0 to 3500 psi)
N2O range	0 to 10 MPa (0 to 1400 psi)
Accuracy	± (4% of the full scale reading+8% of the actual reading)

Ventilator Performance

Peak gas flow	180 L/min + Fresh Gas Flow

O_2 Controls

Supply failure alarm	≤ 220 kPa

ACGO (Auxiliary Common Gas Outlet)

Control type	Mechanical
Safety pressure	A relief valve limits fresh gas pressure at ACGO outlet port to not more than 12.5 kPa

O_2 Flush

Flow rate	25 to 75 L/min

Auxiliary Flowmeter (2 options)

Auxiliary O_2 Flowmeter

Range	0 ~ 15 L/min
Indicator	Flow tube

High Flow Nasal Cannula

Flow range	0 to 60 L/min
Indicator	Flow tube

Anesthetic Gas Scavenging System (AGSS)

Type of disposal system	Passive Active: High-flow or low-flow
Pump rate	75 to 105 L/min (High-flow) 25 to 50 L/min (Low-flow)

Venturi Suction Regulator

Supply	Air, from system gas source
Gas supply range	280 to 600 kPa
Maximum vacuum	≥50 kPa
Maximum flow	≥25 L/min

Continuous Suction Regulator

Supply	External vacuum
Gas supply range	-72 to -40 kPa
Maximum vacuum	≥ 65 kPa with external vacuum applied of 72 kPa
Maximum flow	≥ 40 L/min with external vacuum applied of 72 kPa

Electronic Flow Meters

O2 flow range	0 to 15 L/min
Air flow range	0 to 15 L/min

N2O flow range	0 to 12 L/min
Accuracy	± 10% of the indicated value or ± 0.12L/min, whichever is greater

O2 concentration range in the O2/N2O mixed gas: ⩾ 25%

Breathing System Specification

Breathing system volume

Automatic ventilation	1800 ml
Manual ventilation	1950 ml

CO_2 Absorber Assembly

Absorber capacity	1500 ml
Absorber type	1 Pre-Pak canister or Loose fill absorbent

Inspiratory Airway Pressure Gauge

Range	-20 to 100 cmH_2O
Accuracy	± (2% of the full scale reading + 4% of the actual reading)

Flow Sensor

Type	Variable orifice flow sensor
Location	Inspiratory and expiratory port

Oxygen Sensor

Type	Galvanic fuel cell
FiO_2 displayed	18% to 100%
Accuracy	± (volume fraction of 2.5 % +2.5 % gas level)
Response time	< 20 seconds

Breathing System Connectors

Exhalation	22 mm OD / 15 mm ID conical
Inhalation	22 mm OD /15 mm ID conical
Manual bag port	22 mm OD /15 mm ID conical

Bag-to-Ventilator Switch

Type	Bi-stable
Control	Switch between manual and mechanical ventilation

Adjustable Pressure Limiting (APL) Valve

Type	Manually control with quick relief function
Range	Approximately 0 (SP), 5 to 70 cmH_2O

Tactile knob indication ≥ 30 cmH_2O

Breathing Circuit Parameters

System compliance	≤ 2 mL/cmH_2O in manual ventilation Automatically compensates for compression losses within the breathing circuit in automatic ventilation mode
Expiration resistance	< 6.0 cm H_2O @60 L/min
Inspiration resistance	< 6.0 cm H_2O @60 L/min
Leakage	≤ 50 mL @ 3 kPa

System safety pressure on patient circuit 110 ± 10 cmH_2O

Breathing System Temperature Controller

Breathing system temperature maintained at least 31°C typical at 20°C ambient temperature in normal condition

Materials

All materials in contact with exhaled patient gases are autoclavable up to a maximum temperature of 134°C, except O_2 sensor and mechanical pressure gauge.
All materials in contact with patient gas are latex free.

Vaporizers

Anesthetic agent delivery

Vaporizer	Mindray V60/V80 Anesthetic Vaporizer
Support agents	Halothane, Isoflurane, Sevoflurane, Desflurane
Position	Max.3 positisons (2 active, 1 inactive)
Mounting mode	Selectatec®, with interlocking function

Monitor Modules

Side-stream CO_2 Module

CO2 Measurement range	0 ~ 152 mmHg (0 to 20%)
CO2 Accuracy	±2 mmHg (0 ~ 40 mmHg) ± 5% of the real reading (41 ~ 76 mmHg) ± 10% of the real reading (77 ~152 mmHg)
CO2 Resolution	1 mmHg
O2 Measurement range	0 to 100%
O2 Accuracy	±1% (V/V) (0 ~ 25%) ±2% (V/V) (25 ~ 80%) ±3% (V/V) (80 ~ 100%)
O2 Resolution	1%
Pump rate	Neonatal: 100 mL/min or 120 mL/min Adult/Pediatric: 120 mL/min or 150 mL/min
Response time	<4.5 s@100 mL/min; <4.5 s@120 mL/min <5 s@120 mL/min; <5 s@150 mL/min

Anesthesia Gas (AG) Module

Measurement mode	Infrared absorption, side-stream
Monitor gases	CO_2, O_2 (Paramagnetic O_2 module), N_2O, and any of the five anesthetic agents: DES, ISO, ENF, SEV and HAL
Warm-up time	<45 s (ISO accuracy mode) <10min (full accuracy mode)
Sample rate	Adu/Ped: 150, 180, 200 ml/min Neo: 100, 110, 120 ml/min
Monitoring range	CO_2: 0 to 30% (0.0 to 226mmHg) O_2/N_2O: 0 to 100% HAL, ISO, ENF: 0 to 30% SEV: 0 to 30% DES: 0 to 30%

Electrical Specifications

Main Electrical Power

Power input	220-240 V~, 50/60 Hz, 8A max 100-240 V~, 50/60 Hz, 8A max
Power consumption	OFF mode: <4W Standby mode: <40W Active mode: <45W (under typical condition) Maximum: <80W
Power cord	5 m (length)

Battery Power

Battery type	Li-ion, 10.8VDC, 5.2Ah per battery
Run-time	One new battery: minimum 120 minutes under typical operating conditions Two new batteries: minimum 240 minutes under typical operating conditions
Battery charge time	≤ 8 hours

Time to shut down from the first Lower Battery Alarm

	5 minutes minimum (new fully-charged battery)
Safety feature	in case of electricity and battery failure, manual ventilation, gas delivery and agent delivery are possible

Auxiliary Electrical Outlets

Number of outlets	2 or 3
Output current	3 A max. for each outlet, 5 A max. for total

Communication Port

Communication port	RS-232 compatible serial interface
LAN port	RJ-45 network port
USB port	2 USB ports
Video signal port	HDMI port for inputting the video signal of the main to external display

Environmental Specifications

Operating

Temperature	**10 to 40°C**
Relative humidity	**15 to 95% (noncondensing)**
Barometric	**70 to 106.7 kPa**

Storage

Temperature	**-20 to 60°C for main unit, -20 to 50°C for O_2 sensor**
Relative humidity	**10 to 95% (noncondensing)**
Barometric	**50 to 106.7 kPa**

Resistance to Ingress of Fluids

Complies with the requirements of clause 11.6.3 in IEC 60601-1 and also the requirements in IEC 60529 for protection against vertically falling water drops equipment (IPX1)

Not all features are for sale in all countries.
Please contact your local Mindray sales representative for the most current information.

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P/N:ENG-A3 Datasheet -210285X4P-20240510

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