

MRI Monitor Hemodynamic Options

Excellence in hemodynamic measurement

The MRI Monitor transforms the MR diagnostic setting by offering a variety of unique clinical solutions and a comprehensive range of parameters. The hemodynamic parameters cover key physiological functions giving you a complete view of your patient even in the most complex patient cases. The Hemodynamic module is optimized for performance in MRI.



Features

Six different monitoring options including multiparameter hemodynamic module with two invasive blood pressures, simultaneous measurement of 3-lead ECG with ST segment analysis, pulse oximetry and non-invasive blood pressure.

ECG

- Continuous 3-lead ECG measurement with three MRI-specific leadwires includes ST segment analysis
- Excellent ECG signal quality due to advanced electrical interference filtering and Artifact Aware Down Sampling (AADS) algorithm
- Compatible with GE MRI ECG accessories
- Lethal arrhythmia analysis is standard; extended arrhythmia recognition is available as a software option

SpO₂

- MRI-specific SpO₂ sensors for adult and pediatric patients
- The scale of plethysmographic waveform can be fixed or set to autoscale according to the user's selection

NIBP

- Adult, child and infant non-invasive blood pressure compatibility
- Venous stasis for easy cannulation
- Visual indicator for elapsed time from previous measurement

IBP

- Options for labeling up to two invasive blood pressures
- Waveforms displayed with combined or individual scales
- Adjustable cursor to detect changes in the invasive pressure waveform



Physical specifications

Dimensions and weight (E-MRIPSM)

Dimensions (H x W x D)	112 x 75 x 186 mm (4.4 x 3.0 x 7.3 in)
Weight	0.7 kg (1.5 lb)

Performance specifications

ST segment analysis

ST segment measured and displayed simultaneously for up to 7 ECG leads

ST level range	-9 to 9 mm (-0.9 to 0.9 mV)
Display resolution	0.1 mm (0.01 mV)
Averaging	Calculated from 8 QRS complexes
Display update interval	5 seconds
ST trends	Up to 24 hours
QRST complex storage	One complex stored every 10 minutes and manual storing of 6 complexes

ECG*

Measurement method	3-lead ECG with 3 leadwires
ECG lead selection	Possible to simultaneously monitor the following leads I, II, III

Heart rate

Measurement range	30 to 250 bpm
Measurement accuracy	±5% or ±5 bpm
Display resolution	1 bpm
Display averaging time	5 seconds
Display update time	5 seconds
Alarms	Asystole, leads-off detection, adjustable high and low alarm limits for heart rate, V Fib, V Tachy, (optional with extended arrhythmia option V Run, V Couplet, V Bigeminy, V Trigeminy, R on T PVC, Missing Beat, Multifocal PVCs, PVC rate alarm)

Filter modes

50 Hz power supply frequency

Monitoring filter	0.5 to 30 Hz
ST filter	0.05 to 30 Hz
Diagnostic filter	0.05 to 150 Hz

60 Hz power supply frequency

Monitoring filter	0.5 to 40 Hz
ST filter	0.05 to 40 Hz
Diagnostic filter	0.05 to 150 Hz
MRI artifact removal	AADS
Defibrillation protection	5000 V, 360 J
Sweep speed	12.5, 25 or 50 mm/s (12.1 in screen)
Gain range	0.2 to 5.0 cm/mV
CMRR	> 90dB at 50/60Hz (lead balanced)
Pacemaker pulse detection	No pacemaker pulse detection

* ECG monitoring is indicated only with use of the MRI ECG lead set.

Pulse oximetry (SpO₂)*

Measurement method	Red and infrared light absorption SpO ₂
Measurement and display range	0 to 100%
Calibration range	70 to 100%, calibrated against functional oxygen saturation
Display resolution	1 digit (1% of SpO ₂)
Measurement accuracy**	100 to 70% SpO ₂ , ±3 digits, 69 to 0%, unspecified
Display averaging time	Adjustable 10 s, 20 s or beat-to-beat
Alarms	Adjustable high and low alarm limits for SpO ₂ probe off, no probe

Pulse rate

Measurement and display range	30 to 250 bpm
Display resolution	1 digit (1 bpm)
Measurement accuracy	±5% or ±5 bpm

Plethysmographic pulse waveform

Scales	2, 5, 10, 20, 50 mod % or automatic scaling
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* SpO₂ monitoring is indicated only with use of the MR SpO₂ sensors

** Accuracy is based on deep hypoxia studies with volunteered subjects over a wide range of arterial blood oxygen saturations as compared to arterial blood CO-Oximetry.

Note: For each SpO₂ accessory, refer to the instructions for use in the accessory package for patient weight limits.

NIBP

Numerical display	Systolic, diastolic and mean arterial pressure
Measurement principle	Oscillometric with linear deflation
Deflation speed	Heart rate dependent, 3 to 8 mmHg/s

Measurement range

Adult	25 to 260 mmHg
Child	25 to 195 mmHg
Infant	15 to 145 mmHg
Pulse rate range	30 to 250 bpm
Measurement intervals	Manual and selectable intervals 1, 2.5, 3, 5, 10, 15, 30 min, 1 h, 2 h, 4 h or continuous STAT mode

Typical measurement time

Adult	23 seconds
Infants	20 seconds

Safety features

Initial inflation pressure (mmHg)

Adult	170
Child	150
Infant	120

Maximum inflation pressure (mmHg)

Adult	280
Child	200
Infant	145

Overpressure limit (maximum 2 s; mmHg)

Adult	320
Child	220
Infant	160

Maximum measurement time

Adult	120
Child	120
Infant	75

NIBP measurement meets or exceeds AAMI SP10, 2002 standard

Note NIBP measurement is intended for patients weighing over 5 kg (11 lb)

IBP†

Measurement range -40 to 320 mmHg

Measurement accuracy $\pm 5\%$ or ± 2 mmHg

Numerical display

Range -40 to 320 mmHg

Resolution 1 mmHg

Averaging Over 5 s, updated every 5 s,
or end-expiratory filtering

Waveform display

Range -30 to 300 mmHg

Scales Adjustable in 10 mmHg
increments

Alarms Adjustable high and low
alarm limits for systolic,
diastolic and mean
pressures, or off

Pulse rate

Measurement range 30 to 250 bpm

Resolution 1 bpm

Accuracy $\pm 5\%$ or ± 5 bpm

Transducer sensitivity $5 \mu\text{V}/\text{V}/\text{mmHg}$

† Available only with N-PSN, N-PSNG, N-PSNGV

Configuration Information

Hemodynamic configurations

Frame option	ECG	SpO ₂ /pleth	NIBP	InvBP x 2
N-PSN	•	•	•	•
N-SN	•	•	•	

Configurations with gas measurement

Frame option with gas	ECG	SpO ₂ /pleth	NIBP	InvBP x 2
N-PSNG *	•	•	•	•
N-SNG *	•	•	•	

Airway gas option	CO ₂	Patient O ₂	N ₂ O	Agents	Agent identification
E-MRICO	•	•	•		
E-MRICAiO	•	•	•	•	•

Configurations with gas and spirometry

Frame option with gas and spirometry	ECG	SpO ₂ /pleth	NIBP	InvBP x 2
N-PSNGV **	•	•	•	•
N-SNGV **	•	•	•	

Airway gas option	CO ₂	Patient O ₂	N ₂ O	Agents	Agent identification	Spirometry
E-MRICAiOV	•	•	•	•	•	•

For accessories, please refer to the Accessories and Supplies catalog.

* N-PSNG, N-SNG, N-PSNGV or N-SNGV needed for CO₂, N₂O, O₂, and AA measurement

** N-PSNGV or N-SNGV needed for spirometry option

N-PSN or N-PSNG or N-PSNGV needed for InvBP measurement

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Healthcare Re-imagined

GE is dedicated to helping you transform healthcare delivery by driving critical breakthroughs in biology and technology. Our expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, and biopharmaceutical manufacturing technologies is enabling healthcare professionals around the world to discover new ways to predict, diagnose and treat disease earlier. We call this model of care “Early Health.” The goal: to help clinicians detect disease earlier, access more information and intervene earlier with more targeted treatments, so they can help their patients live their lives to the fullest. Re-think, Re-discover, Re-invent, Re-imagine.

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GE imagination at work