

Micra™

Transcatheter Pacing System
MC1VR01

PRODUCT SPECIFICATIONS

Physical characteristics

Volume	0.8 cc
Length	25.9 mm
Outer diameter	6.7 mm (20.1 Fr)
Mass	1.75 g
Materials in chronic contact with human tissue ^a	Titanium, titanium nitride, parylene C, primer for parylene C, PEEK, siloxane, nitinol, platinum, iridium, liquid silicone rubber, and silicone medical adhesive
Steroid	Dexamethasone acetate, < 1.0 mg, MCRD release mechanism
Fixation mechanism	Nitinol FlexFix™ Tines
Battery	Lithium-hybrid CFx silver vanadium oxide
Nominal pacing cathode	2.5 mm ² , Pt sintered, TiN coated
Minimum pacing anode	22 mm ² , TiN coated
Cathode to anode spacing	18 mm

^a These materials have been successfully tested for the ability to avoid biological incompatibility. The device does not produce an injurious temperature in the surrounding tissue during normal operation.

Battery characteristics

Manufacturer	Medtronic Energy and Component Center
Model	M957651A001
Chemistry	Lithium-hybrid CFx silver vanadium oxide
Initial voltage	3.2 V
Mean usable capacity	120 mAh
Estimated time from RRT to EOS	6 months (180 days)

Replacement indicators

Recommended Replacement Time (RRT)	6 months (180 days) before EOS
Elective Replacement Indicator (ERI)	3 months (90 days) after RRT
End of Service (EOS)	≤ 2.5V on 3 consecutive daily automatic measurements



- MR Conditional
- Single Chamber
- SureScan™ Technology (VVIR)

Medtronic

Longevity

Projected service life in years*					
VVIR or VVI pacing %	Amplitude	Pacing Rate	Impedance	Longevity in Years	
				Pulse width 0.24 ms	Pulse width 0.4 ms
0%	1.5 V	60 min ⁻¹	500 Ω	14.6	14.5
50%	1.0 V	60 min ⁻¹	500 Ω	13.3	12.5
	1.5 V	60 min ⁻¹	500 Ω	11.7	10.4
	2.0 V	60 min ⁻¹	500 Ω	9.6	8.1
100%	1.0 V	60 min ⁻¹	500 Ω	11.8	10.5
	1.5 V	60 min ⁻¹	500 Ω	9.6	8.0
	2.0 V	60 min ⁻¹	500 Ω	7.1	5.5
	2.5 V	60 min ⁻¹	500 Ω	5.8	4.3
100%	1.5 V	60 min ⁻¹	400 Ω	9.0	7.4
	1.5 V	60 min ⁻¹	600 Ω	10.0	8.4
100%	1.5 V	70 min ⁻¹	500 Ω	9.1	7.5
	1.5 V	100 min ⁻¹	500 Ω	8.0	6.4
100%	2.5 V	60 min ⁻¹	600 Ω	6.3	4.7
	3.5 V	60 min ⁻¹	500 Ω	3.6	2.4
	5.0 V	60 min ⁻¹	500 Ω	1.8	1.2

* Projected service life estimates are based on accelerated battery discharge data and device modeling as specified. Do not interpret these values as precise numbers.

Note: The longevity projections are based on typical shelf storage time. Assuming worst-case shelf storage time (18 months), longevity is reduced by approximately 5.4%.

Stored data and diagnostics

Battery and device measurement data
The device automatically and continuously monitors its battery, pacing, and sensing performance throughout the life of the device. You can view the following data on the programmer screens and print reports:
Battery and Device Measurements: Battery Voltage, Remaining Longevity, Sensing Integrity Counter, Electrode Impedance, Capture Threshold, Sensing Electrode Impedance Trend, Capture Threshold Trend, R-Wave Amplitude Trend, Rate Histogram

Device performance trend data
The device stores the daily measurements for 15 days. After 15 days, the device stores the weekly high and low measurements up to 80 weeks. Beyond 80 weeks, the data is maintained on a first collected, first-deleted basis.
Electrode Impedance Trend, Capture Threshold Trend, R-Wave Amplitude Trend

Rate Histogram data
Rate histogram data is available to view on the programmer and print as a printed report. The Rate Histogram data shows the percent of total time for ventricular pacing and sensing. This data also shows the distribution of ventricular rate for paced and sensed events recorded since the last patient session.

Device parameters

Emergency VVI settings	
Parameter	Selectable values
Mode	VVI
Lower Rate	70 min ⁻¹
Sensitivity	2.0 mV
Amplitude	5 V
Pulse Width	1 ms
Refractory	Off
Blank Post VP	240 ms
Blank Post VS	120 ms
Rate Hysteresis	Off

Pacing parameters

Modes, rates, and intervals	
Parameter	Programmable values
Mode	VVIR ⚡; VVI; VOO; OVO; Device Off
Lower Rate ^{a,b,c}	30; 35; 40 ... 60 ⚡ ... 80; 90 ... 170 min ⁻¹ (± 4%)
Refractory ^d	Off ⚡; 160; 170 ... 330 ... 500 ms (+4% +10 ms)/ (−4% −25 ms)

^a The corresponding Lower Rate Interval can be calculated as follows:
Lower Rate Interval (ms) = 60,000/Lower Rate.

^b Programmable values for Lower Rate do not include 65 min⁻¹.

^c If an EMI source interferes with the R-wave detection, the device starts pacing at the programmed lower rate in the VVI mode and at the programmed lower rate or sensor rate in the VVIR mode. When measured according to the standard ISO 14708-2:2012, clause 6.1.5, the escape interval is within −10 and 25 ms of the programmed lower rate interval.

^d Blank Post VP and Blank Post VS parameters must be programmed to values lower than the programmed value for Refractory. If Refractory is programmed to Off, the refractory period is determined by the programmed value for Blank Post VP or Blank Post VS.

RV sensing and pacing parameters	
Parameter	Programmable values
Amplitude	0.13; 0.25 (± 0.06 V); 0.38; 0.50; 0.63; 0.75; 0.88; 1.00; 1.13 ... 1.50 ⚡ ... 5.00 V (± 15%)
Pulse Width	0.09; 0.15; 0.24 ⚡; 0.40 (± 0.025 ms); 1.00 ms (± 0.04 ms)
Sensitivity ^{a,b}	0.45; 0.60; (± 50%); 0.90; 1.50; 2.00 ⚡; 2.80; 4.00; 5.60; 8.00; 11.30 mV (± 30%)
Sensing Assurance	Off ⚡; On

^a This setting applies to all sensing for bradycardia pacing operations.

^b With a 40 ms sine² waveform. When using the waveform, according to the standard ISO 14708-2:2012, clause 6.1.3, the sensing threshold value is 1.5 times the sine² sensing threshold.

RV Capture Management™ parameters	
Parameter	Programmable values
Capture Management	Adaptive ; Monitor; Off
Amplitude Safety Margin ^a	0.25; 0.50 ; 0.75; 1.00; 1.25; 1.50 V
RV Acute Phase Remaining	Off; Device Repositioned (112 days)

^a Amplitude safety margin is 1.5V during RV Acute Phase

Blanking periods	
Parameter	Programmable values
V. Blank Post VP ^a	150; 160 ... 240 ... 450 ms (+4% +10 ms)/(-4% -25 ms)
V. Blank Post VS ^a	120 ; 130 ... 350 ms (+4% +10 ms)/(-4% -25 ms)

^a Blank Post VP and Blank Post VS must be programmed to values lower than the programmed value for the Refractory parameter. If Refractory is programmed to Off, the refractory period is determined by the programmed value for Blank Post VP or Blank Post VS.

Rate response pacing parameters	
Parameter	Programmable values
Upper Sensor Rate ^a	80; 90; 100 ... 120 ... 170 min ⁻¹ (± 4%)
ADL Rate	60; 65 ... 95 ... 160 min ⁻¹ (± 4%)
Rate Profile Optimization	On ; Off
ADL Response	1; 2; 3 ; 4; 5
Exertion Response	1; 2; 3 ; 4; 5
Activity Acceleration	15; 30 ; 60 s
Activity Deceleration	Exercise ; 2.5; 5; 10 min

Exercise test parameters ^b	
Activity Vector	Vector 1; Vector 2; Vector 3
LR Setpoint	0; 1; 2 ... 40; 42 ... 50
ADL Setpoint	5; 6 ... 40; 42 ... 80; 85 ...100
UR Setpoint	15; 16 ... 40; 42 ... 80; 85 ... 200

^a If Rate Response is enabled, the Upper Sensor Rate must be greater than the ADL Rate, which must be greater than the Lower Rate.
^b Exercise test parameters, Activity Vector and rate-response setpoints, can be programmed only from the Exercise test screen.

MRI SureScan parameters	
Parameter	Programmable values
MRI SureScan	On; Off
MRI Pacing Mode	VOO; OVO
MRI Pacing Rate	60; 70; 75; 80; 90 ... 120 min ⁻¹

Additional pacing features	
Parameter	Programmable values
Rate Hysteresis ^a	Off ; 30; 40 ... 80 min ⁻¹

^a The programmed value for Rate Hysteresis must be lower than the Lower Rate value unless Rate Hysteresis is programmed to Off.

Data collection parameters	
Data collection parameters	
Parameter	Programmable values
Device Date/Time ^a	(enter current date and time)
Holter Telemetry	Off ; 0.5; 1; 2; 4; 8; 16; 24; hr

^a The times and dates stored in episode records and other data are determined by the Device Date/Time clock.

System test parameters	
System test parameters	
Parameter	Selectable Values
Pacing Threshold Test parameters	
Threshold Test	Capture Management ^a Amplitude — Auto Decrement
Decrement after	2; 3 ... 15 pulses
Mode ^b (RV test)	VVI; VOO
Lower Rate	30; 35 ... 60; 70; 75; 80; 90 ... 170 min ⁻¹
Amplitude	0.13; 0.25; 0.38; 0.50; 0.63 ... 5.00 V
Pulse Width	0.09; 0.15; 0.24; 0.40; 1.00 ms
V. Pace Blanking ^c	150; 160 ... 450 ms

Sensing test parameters	
Mode	VVI; OVO
Lower Rate	30; 35 ... 60; 70; 75; 80; 90 ... 170 min ⁻¹

Exercise test parameters	
Duration	5 min; 20 min
Activity Vector	Vector 1; Vector 2; Vector 3
LR Setpoint	0; 1; 2 ... 40; 42 ... 50
ADL Setpoint	5; 6 ... 40; 42 ... 80; 85 ...100
UR Setpoint	15; 16 ... 40; 42 ... 80; 85 ... 200

^a If the permanently programmed pacing mode is VOO, Capture Management is not available for selection.
^b The selectable test values for this parameter depend on the permanently programmed pacing mode.
^c The selectable values for V. Pace Blanking depend on the programmed value for the Refractory parameter.

Temporary test parameters	
Temporary test parameters	
Parameter	Selectable values
Mode	VVI; VOO; OVO
Lower Rate	30; 35; 40 ... 60; 70; 75; 80; 90 ... 170 min ⁻¹
Amplitude	0.13; 0.25; 0.38; 0.50; 0.63 ... 5.00 V
Pulse Width	0.09; 0.15; 0.24; 0.40; 1.00 ms
Refractory	Off; 250; 260; 270 ... 500 ms
Sensitivity	0.45; 0.60; 0.90; 1.50; 2.00; 2.80; 4.00; 5.60; 8.00; 11.30 mV

Nonprogrammable parameters

Nonprogrammable parameters

Parameter	Value
Pacing rate limit (runaway pacing rate protection)	195 min ⁻¹ (± 8%)
Minimum input impedance	150 k Ω
Pacing output capacitance	2.2 μ F (± 15%)

Brief Statement

See the device manual for detailed information regarding the implant procedure, indications, contraindications, warnings, precautions and potential adverse events.



www.medtronic.com/manuals

Consult instructions for use at this website.

Manuals can be viewed using a current version of any major internet browser. For best results, use Adobe Acrobat® Reader with the browser.

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