

BalanceTutor™

Technical Specification

May 2018



BalanceTutor a dynamic and static postural control trainer

This technical specification covers all critical components and physical elements for the following MediTouch product:

BalanceTutor BT100

The BalanceTutor dynamic and static postural control trainer has been tested to IEC medical standards for electrical safety. It is a Class I, Type BF device.

Type BF Medical Equipment



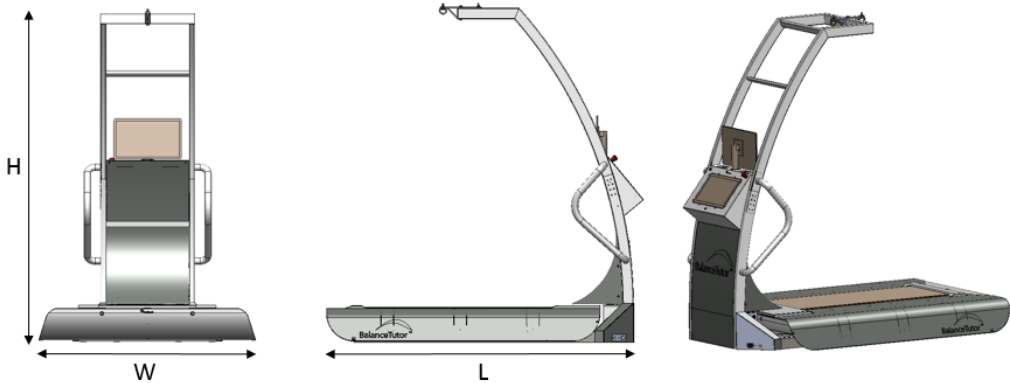
IEC 60601-1-1 compliant

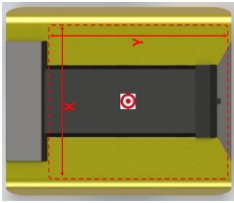
IEC 60601-1-2 compliant

IPX-0

Date	Change description	Written by	Ver.
01 Jan 2014	Initial version	Ziv K.	140101
13 Mar 2016	US ratings clarifications	Ziv K.	160313
23 Jun 2016	Voltage supply modification, OS change from Win7Pro to Win7Emb (WS7E), Transformer change from 2→2.3 kVA, Name plate label, Lanyard addition, Wireless Interfaces, and other minor updates.	Ziv K.	160623
13 Sep 2016	Adding sensors sample rates, Change Bluetooth type from 2.0 to 4.0.	Ziv K.	160913
25 Oct 2016	Update Storage Temperature parameter, Adding SPL measure.	Ziv K.	161025
19 Jan 2017	Adding: Power consumption, warnings remarks	Ziv K.	170119
28 Jun 2017	Adding: Wireless sensors Service Time	Ziv K.	170628
06 Sep 2017	Updating product and shipping box weight	Ziv K.	170906
22 May 2018	Updating 3 Phase ratings	Ziv K.	180522

E&EO

PARAMETER	DESCRIPTION
Product name	BalanceTutor
Product model	BT100
Order P/N	HMBT100A
Applications	Rehabilitation, fall prevention, sports medicine and cardiology. User touch screen display terminal for data input, setting parameters, data recordings and analysis.
Overall dimensions	L: 233 cm (91.73") W: 161 cm (63.38") H: 245 cm (96.45")
	
Effective running belt surface	<ul style="list-style-type: none"> L: 140 cm (55") W: 56 cm (22") Shock load reduction for the joints Belt surface with anti-slip material Max. Permissible load: 150 kg (330 lbs.)
Device weight	485 kg (1070 lbs.) $\pm 1\%$
Gross weight	665 kg (1466 lbs.) $\pm 2\%$
Shipping box size	L211 X W166 X H110 cm ³
Treadmill Speed	0... ± 7.0 km/h (0... ± 2 m/s)
Treadmill perturbation kinematics	<p>Treadmill Speed: 3...239 cm/s</p> <p>Acceleration: 15...475 cm/s²</p> <p>Deceleration: 5...389 cm/s²</p> <p>Forward Distance: 3...87 cm</p> <p>Backward Distance: 1...146 cm</p>
Lateral perturbation kinematics	<p>Speed: 5...60 cm/s</p> <p>Acceleration: 25...200 cm/s²</p> <p>Deceleration: 25...200 cm/s²</p> <p>Distance: ± 18 cm</p>
Perturbation intensity	30 levels combining Acceleration, Deceleration, Distance, and target speed.
Walking direction	<ul style="list-style-type: none"> Forward and Backward In case of walking direction change, remove buckles from upper bridge hooks, place the person on the opposite side and fasten again the buckles to the same bridge hooks.
Power consumption	Min: 280W Max: 2300W
Voltage supply	<p>1 Phase 230 Volt AC L/N/PE 50/60Hz 16A circuit breaker, dedicated line.</p> <p>3 Phase 190-230 Volt AC L1/L2/PE 50/60Hz 2x10A circuit breaker, dedicated line.</p>
Electrical outlet	<p>Worldwide According local standards</p> <p>USA 6-20R NEMA</p>
Motor system	<p>Treadmill: Servo motor, 1.7kW, 3kRPM, 5.9Nm</p> <p>Perturbation: Servo motor, 0.6kW, 3kRPM, 2.1Nm</p>

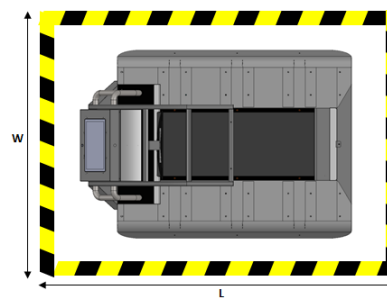
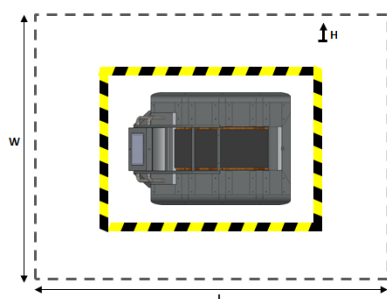
Power transmission	Treadmill:	Gearbox ratio 5:1				
	Perturbation:	Gearbox ratio 5:1				
Motor drivers	Treadmill:	Servo digital drive, CPR 1610W, CC 6.5A, PC 13.0A				
	Perturbation:	Servo digital drive, CPR 1140W, CC 4.0A, PC 8.0A				
Electrical safety	External isolated transformer: Up to 230v/230v 50/60Hz 2.3kVA Under IEC-60601-1, B-3 UL Recognized, CE.					
Leakage current	< 0.2mA					
Safety power off switch	Emergency-off-switch (mains off), switch for immediate disconnection of motor and motor controllers power supply.					
Safety stop switch	Stops lateral perturbation if ranges exceed from norm. Norm = ±20 cm					
Force sensors	Type:	Aluminum-Alloy IP65 single point load cell. X4 units				
	Sensitivity:	2.0 ± 0.2 mV/V				
	Force range:	0...250 kg				
	Location range:	X: -65...+65 cm, Y: -80...+80 cm X: -25"...+25", Y: -31"...+31"				
						
Motion feedback sensors	<u>Device name</u>	<u>Model</u>	<u>Body part</u>	<u>Connection</u>	<u>Technology</u>	<u>Remark</u>
	IMU	3DT100	Leg (R+L)	Bluetooth	6DOF (Acc & Gyro)	Optional add-on sensors
	Heart Rate Sensor	Rhythm+	Arm	Ant+	PerformTek™	Supplied 1Sensor + 1Strap
Sensors parameters			<u>COP</u>		<u>IMU</u>	<u>Heart Rate</u>
	CPU Analysis	[Sample/Sec]	125		125	1
	Write to Log	[Sample/Sec]	100		100	N/A
	Service Time	[Hours]	N/A		4	6
	Charging current	[mA]	N/A		< 500	< 100
	Operational Indications		Net & Total Load in [Kg]		Connection Yes/No, Battery level	Connection Yes/No, Heart Rate in [bps]
Interface	<ul style="list-style-type: none"> PC power On/Off switch with blue indication LED Ethernet connection port: RJ45 10/100/1000 Wireless connection1: Bluetooth 4.0 USB dongle Wireless connection2: Bluetooth Ant+ USB dongle USB charging ports x2 for IMU only Power in socket connector: C20 Standard 					
Operator display	Type:	Touch screen Projected Capacity technology				
	Characteristics:	Active matrix TFT LCD, 18.5", 16:9, 1366x768, 5ms, 1000:1				
User display	22" 16x9 LED display, Stereo built-in speakers, Screen elevation adjustment up to 20cm, Functional for visual output only					
Internal computer	Type:	BoxPC				
	Characteristics:	Fanless, Intel Core i5 1.9 GHz, 2.5" 64GB SSD Drive, 2G DDR3-1066, Gigabit Ethernet, Intel GT2-4400 Graphics, Win7Embedded x64 (WS7E), DC 12V power input.				
Software	<ul style="list-style-type: none"> Touch user interface oriented Perturbation triggered treatments Perturbation intensity scale 1-30 Treatment protocol builder COP (Center of Pressure) treatments Treatment row data record and export (to csv format) Patient/Therapist feedback and status data: Treatment parameters, heartrate, gait phase, Load 					

Safety harness belt	<ul style="list-style-type: none"> ▪ Sized full body harnesses provide the ultimate in comfort and safety ▪ Tough nylon webbing and forged hardware means long-term wear ▪ Fall protection support lanyard with height adjustment
Sound Pressure Level (SPL)	78dB Test condition: A maximum measured value sampled at 1m Euclidian distance around the device.
Ambient condition	Usage temperature: +10...+40°C Storage temperature: -20...+50°C Relative humidity: 30...70 % (non-condensing!) Atmospheric pressure: 700...1060 hPa

User dimensions	Maximal weight: 135kg (297 lbs.)
	Height range: 120cm (47") ... 190cm (75")

Facilitation Minimal room dimensions
 L: 400cm (160") W: 300cm (120") H: 265cm (104")
 Device centered at middle of the room.

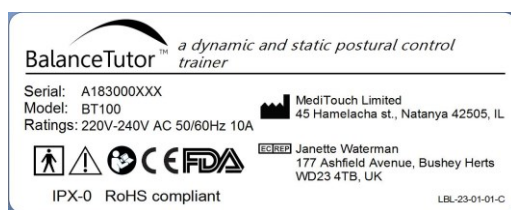
Keep out zone
 L: 270cm (106") W: 230cm (90")
 To avoid collision at perturbation mode.



Floor
 Any floor type, avoid carpet.

- Warnings**
- No children under age of 12 allowed being on or near to the device as well as operate it.
 - It is mandatory to fasten the user with harness to prevent injury cause by a fall.
 - The exercise constantly has to be supervised by a physiotherapist or a medical doctor in the field of orthopedics and/or neurology.
 - Patient is not allowed on the BalanceTutor with open shoes such as sandals. We strongly recommend running shoes.
 - Cables and cuffs must not be used for the patients' hands.
 - Disregard of warnings and/or the use of the BalanceTutor without a fall protection system is strictly. Prohibited and may lead to accidents and injuries with fatal consequences.

Device Recognition



Safety Directive 93/42/EEC; EN 60601-1; EN 60601-1-1; EN 60601-1-2 (EMC approved); ISO 9001; EN ISO 13485; Emergency-off-switch (mains off), transformer for potential-isolation from the mains under IEC-601-60601-1, B-3 UL Recognized. GMDN® Code 33015

Safety class / category I / B

Classification Class I Medical device (MDD)

Manufacturer

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