BD Rhapsody™ Express Instrument and BD Rhapsody™ Scanner Site Preparation Guide

Doc ID: 47391 Rev. 4.0
08/2018

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Regulatory information

For Research Use Only. Not for use in diagnostic or therapeutic procedures.

FCC information

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. BD is not responsible for any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment. This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Patents

The BD Rhapsody™ Targeted mRNA and AbSeq Reagent Kit is covered by one or more of the following U.S. patents: 8835358, 9315857, 9290808, 9290809, 9567646, and 9598736.

Revision history

Revision	Date	Change made
Doc ID:47391 Rev. 1.0	09/2017	Initial release.
Doc ID:47391 Rev. 2.0	01/2018	Rebranded guide.
Doc ID:47391 Rev. 3.0	04/2018	—Changed *Single Cell Targeted Library Preparation with the BD Rhapsody™ Single-Cell Analysis System User Guide* to the *BD Rhapsody™ Single-Cell Analysis System User Guide*. —Added instrument depth dimensions to diagram. —Replaced "BD Rhapsody™ Sample Loading Station" with "BD Rhapsody™ Express instrument." The instrument remains the same.
Doc ID: 47391 Rev. 4.0	08/2018	—Replaced "*BD Rhapsody™ Single-Cell Analysis System User Guide* (Doc ID: 47395)" with "*BD Rhapsody™ Single-Cell Analysis System Instrument User Guide* (Doc ID: 214062)."

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Contents

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1

Introduction

About this guide

Purpose

This guide is intended for BD Rhapsody™ Express instrument and BD Rhapsody™ Scanner users. Read this guide prior to installation of the system to ensure that all site requirements are met.

For intended use of the BD Rhapsody™ Single-Cell Analysis system, see the *BD Rhapsody™ Single-Cell Analysis System Instrument User Guide* (Doc ID: 214062).

Use the *BD Rhapsody™ Express Instrument and BD Rhapsody™ Scanner Site Preparation Guide* to obtain information on:

- Dimensions of the instruments
- Preparation of the site

Genomics technical publications are available for download from the BD Genomics Resource Library at bd.com/genomics-resources.

Physical characteristics

Introduction

This topic describes the physical dimensions and weight of the BD Rhapsody Express instrument and its accessories.

Dimensions and weight of the BD Rhapsody Express instrument

Item	Dimensions (W x D x H)	Weight (kg)
Boxed BD Rhapsody Express instrument	40.0 x 45.2 x 30.5 cm (15.7 x 17.8 x 12.0 in.)	7.0 (15.4 lb)
Unboxed BD Rhapsody Express instrument	25.3 x 34.1 x 20.5 cm (9.96 x 13.4 x 8.07 in.)	5.5 (12.1 lb)

Dimensions and weight of the BD Rhapsody Scanner

Item	Dimensions (W x D x H)	Weight (kg)
Boxed BD Rhapsody Scanner	87.5 x 70.5 x 93.0 cm (34.4 x 27.8 x 36.6 in.)	115 (254 lb)
Unboxed BD Rhapsody Scanner	45.0 x 59.9 x 69.4 cm (17.7 x 23.4 x 27.3 in.)	58.0 (128 lb)
Peripherals: width on bench[a]	30.5 cm (12.0 in.)	5 (11 lb)

a. Peripherals include the BD Rhapsody™ P1200M pipette, BD Rhapsody™ P5000M pipette, Hemocytometer Adapter, DC power supply brick, and power cord.

BD Rhapsody Scanner technical specifications

General imaging characteristics

Item	Specification
Light source	LEDs
Imaging modes	Brightfield: 530 nm Two fluorescence channels

Fluorescence characteristics

Item	Specification
Fluorescence excitation wavelengths	Blue: 482 nm Red: 635 nm
Fluorescence emission wavelength ranges	Green: 513–563 nm Red: 662.5–707.5 nm

Control PC

Item	Specification
Operating system	Microsoft® Windows® 10
Network interface	Gigabit Ethernet

Equipment moving policy

Introduction

This topic describes the BD Biosciences policy for moving the BD Rhapsody Express instrument and the BD Rhapsody Scanner.

General policy

Contact BD Biosciences to arrange installation, relocation, and removal of instruments.

Contact information

researchapplications@bd.com

Safety

Restrictions

Any use of the BD Rhapsody Single-Cell Analysis system other than the procedures described in the user guides may result in damage to the instrument, loss of reagents or samples, or personal injury.

BD denies any responsibility for damage caused by the following:

- Any use of a BD Rhapsody™ instrument that does not comply with the procedures described in its user guide.
- Unauthorized alterations or adjustments to the instrument hardware or software.
- Any use of an instrument that violates locally applicable laws, rules, or regulations.
- Evidence of any deviation from intended use voids the BD Rhapsody instrument warranty.

Disclaimer

The instruments, external components, software, and consumables in the BD Rhapsody Single-Cell Analysis system are provided for research purposes only. BD disclaims all express and implied warranties including, but not limited to, merchantability and fitness for use for a particular purpose.

Customer safety requirements

Prior to installation or service of a BD Rhapsody instrument, the customer should contact the security or safety department to advise the department of the service visit by a BD field application specialist (FAS) or field service engineer (FSE). Before the service visit, the customer should inform the FSE or FAS of the need to complete any induction or security vetting.

For more information on safety, see the *BD Rhapsody™ Express Instrument and BD Rhapsody™ Scanner Safety and Limitations Guide* (Doc ID: 42061).

2

Site requirements

Space and clearance requirements

Introduction

This topic describes the laboratory space needed for the BD Rhapsody™ Express instrument and the BD Rhapsody™ Scanner.

Required workspaces in the laboratory

Dedicate two isolated workspaces in the laboratory to run high-sensitivity, single cell sequencing experiments:

- Pre-amplification workspace
- Post-amplification workspace

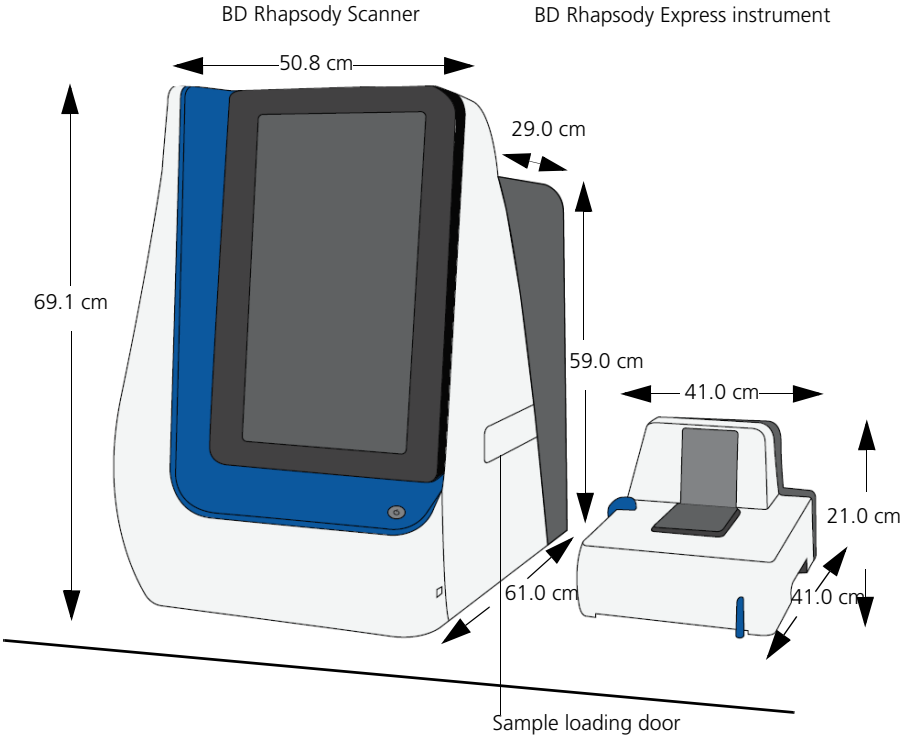
For detailed information on laboratory workspace use, see the *BD Rhapsody™ Single-Cell Analysis System Instrument User Guide* (Doc ID: 214062).

Required workspace for instruments

The following table provides information on workspace dimensions for the BD Rhapsody Express instrument and the BD Rhapsody Scanner.

Components	Width (cm)	Depth (cm)	Height (cm)
BD Rhapsody Express instrument	41.0 (16 in.)	41.0 (16 in.)	21.0 (8.3 in.)
BD Rhapsody Scanner	50.8 (20 in.)	61.0 (24 in.)	59.0/69.1 (23 in./27 in.)

The following drawing shows workspace clearances:



- Access to sample loading is on the sample loading door side of scanner.
- Locate the scanner close to the Express instrument. You should be able to view the scanner display while being able to access the tray of the Express instrument.
- Place the Express instrument on the sample loading door side of the scanner for easy access to the Express instrument cartridge tray and front and left slider controls.

Structural requirements

Introduction	This topic describes the specific structural features that must be present at the site.
Structure for the BD Rhapsody Express instrument and accessories	• Laboratory bench space on the sample loading door side of the BD Rhapsody Scanner • Stable surface free of vibrations • No external air, water, or vacuum lines required
Structure for the BD Rhapsody Scanner	• Laboratory bench space so that the BD Rhapsody Express instrument is on the sample loading door side of the scanner. • Laboratory bench space with front access to the scanner display and access to the Express instrument on the sample loading door side of the scanner. • Stable surface free of vibrations, including vibrations from vortexers and centrifuges. BD Biosciences strongly recommends placing the scanner on a laboratory bench that has no known sources of vibration. • Doorways and hallways that are at least 88.9 cm (35 in.) wide. • No external air, water, or vacuum lines required. • Bench can support ≥70 kg.
Lighting for the BD Rhapsody Express instrument	None
Lighting for the BD Rhapsody Scanner	The scanner optics and detectors are shielded from room lighting and have no specific requirements.

Waste disposal for the BD Rhapsody Express instrument and BD Rhapsody Scanner

Set up appropriate waste disposal facilities according to good laboratory practices.

Communications for the BD Rhapsody Express instrument and BD Rhapsody Scanner

BD Biosciences recommends the following communication tools:

- A telephone in proximity to the scanner to communicate with BD Biosciences technical support regarding system operation and function.
- The BD Rhapsody instrument should not be connected to the customer facility local area network (LAN) without prior discussion with BD Biosciences technical support. Connection to your LAN may require special considerations and software exceptions. Any attempt to connect a LAN without specific direction from BD Biosciences technical support has the potential to degrade instrument performance and cause loss of reagents not covered under service or warranty agreements.

Environmental requirements

Introduction

This topic describes the environmental conditions necessary for the BD Rhapsody Express instrument and BD Rhapsody Scanner to operate optimally.

Requirements for the BD Rhapsody Express instrument

Condition	Requirement
Temperature	The Express instrument has an operating range between 15°C (59°F) and 30°C (86°F).
Humidity	No special requirements. Follow good laboratory practices.
Heat dissipation	No special requirements. Follow good laboratory practices.
Ventilation	No special requirements. Follow good laboratory practices.
Noise	No special requirements. Follow good laboratory practices.

Requirements for the BD Rhapsody Scanner

Condition	Requirement
Temperature	The scanner has an operating range between 15°C (59°F) and 30°C (86°F). BD Biosciences recommends that the lab temperature fluctuate less than 5°C within a day for best operation.
Humidity	The operating humidity tolerance is between 5% and 95% relative humidity (non-condensing).
Heat dissipation	The heat dissipation is less than 240 W.
Ventilation	No special requirements. Follow good laboratory practices.
Noise	The audible noise generated by the system has an 8-hour time-weighted average sound pressure level of ≤65 dBA under normal operating conditions.

Power requirements

Introduction

This topic describes the power requirements necessary for the BD Rhapsody Scanner to operate uninterrupted in any location worldwide.

The BD Rhapsody Express instrument does not require power.

Requirements

Voltage	Frequency	Current	Power
100–240 ±10% VAC	50–60 ±10% Hz	3 A[a]	240 W

a. BD Biosciences recommends that you plug the scanner into an outlet with a minimum fused 10 A current supply.

(Optional) Backup power

In areas where the power is unstable or intermittent, both the base scanner and the accessory instruments require a universal power supply (UPS) with auto-switching capability.

These are the UPS requirements to support the BD Rhapsody scanner:

Condition	Requirement
General	Suggested: USB 2.0 interface, compatible with Microsoft Windows 10 or later that can be installed without a driver
Minimum run time on battery	15 minutes at nominal load of 220 W
Battery recharge time	4 hours maximum (recommended)
Outputs	120–240 VAC 50/60 Hz

Rating of insulation of external circuits

All USB/serial and other data connectors shall only be connected to a device providing double or reinforced insulation between mains circuits and these data connections.

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3

Checklist

Checklist

Use this checklist to confirm that the site meets necessary requirements:

Checklist items	Acceptable (Y, N, N/A)
Required	
Customer must ensure that the delivery vehicle has a lift gate (tail lift) when a fork truck is not available	
Customer has sufficient space and equipment to unload and move crates, as described, at their facility. Doorways and hallways are ≥88.9 cm (35 in.) wide	
Temperature is between 15°C (59°F) and 30°C (86°F)	
Humidity is between 5% and 95% (non-condensing)	
Appropriate waste disposal solutions are in place	
Power (BD Rhapsody™ Scanner only) 100–240 ±10% VAC, 50–60 ±10% Hz, 3 A, 240 W	
Power socket outlet rated for a minimum of fused 10 A current supply	
Power sources located ≤2 m of designated bench space for the BD Rhapsody Scanner	
No vibration sources close to or in contact with the designated work bench for the BD Rhapsody Scanner	
Dedicated pre-amplification and post-amplification workspaces in the laboratory	
Bench space for BD Rhapsody™ Express instrument with clearance: (W x D x H) 41 x 41 x 21 cm (16 x 16 x 8.3 in.)	

Checklist items	Acceptable (Y, N, N/A)
Bench space for BD Rhapsody Scanner with clearance: (W x D x H) 51 x 61 x 69 cm (20 x 24 x 27 in.)	
Customer requires that all visiting BD personnel complete site training	
A LAN line or mobile telephone is available at the instrument installation site	
Customer provides a contact for installation inquiries to BD personnel	
Optional	
Recommended bench height of 75 cm (29.5 in.)	
Internet connection of ≥100 Mbps (BD Rhapsody Scanner only)	
Storage space available for BD Rhapsody Scanner crate after installation in case of future instrument relocation	
Backup power (UPS) (BD Rhapsody Scanner only) • USB 2.0 interface, compatible with Microsoft Windows 10, and able to be installed without a driver • Minimum run time on battery of 15 minutes at nominal load of 200 W • Outputs of 120–240 VAC 50/60 Hz	

Notes