

Product profile

Part number	2016-0600
Article name	BioShake Q1
Description	Automation friendly Shaker with temperature control function and Edge Locking Mechanism. Designed to be integrated in liquid handling and automation platforms to process labware in chemical and biological laboratories.
Recommended use	Automation Shaking Heating Cooling Tubes, Vials, Microplates
Scope of delivery	BioShake Q1 External power supply Power cords Europe & US 2x screws to mount device (M3 x 18 DIN 912) Calibration certificate Operation & Integration manual
Conforming use	System is operated by qualified and trained research and laboratory personnel. Applicable safety standards or rules need always be fulfilled.
Country of origin	DE
Customs tariff code	8479 82 00

Mixing

Frequency range	200 to 3000 rpm with a resolution of 1 rpm		
Maximum frequency*	< 80 g: 3000 rpm	< 120 g: 2500 rpm	< 150 g: 2200 rpm
	< 300 g: 1800 rpm	< 500 g: 1500 rpm	> 500 g: 1000 rpm
Orbit	constant 2.0 mm diameter		
Regulation accuracy	± 25 rpm		
Acceleration range	1 - 30 seconds with a resolution of 1 second		
Zero position	Locked zero position with ± 0.1 mm accuracy		

* Feasible frequency heavily depends on load weight **and** height. **Always** start with low frequencies and iterate upwards.

Temperature control

Temperature range*	From up to 24 Kelvin under RT to 99.9 °C; typically 4 to 99.9 °C (39.2 to 211.82 F) with a resolution of 0.1 °C (adjustable between -20 to 99.9 °C)			
Temperature sensor accuracy **	± 0.2 °C (max) from -10 - 85 °C		± 0.25 °C (max) from -20 - 100 °C	
Temperature uniformity*	± 1.0 K at 4 °C	± 0.5 K at 15 °C	± 0.5 K at 40 °C	± 1.0 K at 90 °C
Temperature control speed	~ 16 K/min heating		~ 12 K/min heating	
above RT below RT*	~ 12 K/min cooling		~ 3 K/min cooling	

* Value depends on the used thermo-adapter. Conditions for values: RT=21 °C, Adapter=2016-1041 (96-well PCR), Temperature measured in the adapter

** Sensor resolution=0.008 °C

ELM positioning

Description	Patented Edge Locking Mechanism (ELM) for repeatable and accurate positioning of microplates on a liquid handling or automation platform. With the ELM, labware can either easily be exchanged manually/automatically or it is strongly fixed in a diagonal centered position.
ELM position accuracy	± 0.1 mm

Thermo-adapter plates for different labware

Description	An adapter is required for optimal temperature transfer to and/or optimal fixation of labware and needs to be purchased separately. The adapter can be exchanged by the user.
Microplates	All microplates according ANSI-SLAS format 4-, 6-, 8-, 12-, 24-, 48-, 96-, 384-, and 1536-well microplates, deep well plates, PCR plates
Tubes and Vials	0.2, 0.5, 1.5, 2.0 ml standard tubes 2.0, 4.0, 6.0, 8.0, 10.0 ml cylindrical shaped vials
Others	Custom made adapter on request

Device control

Description	Required electronic for remote control is build in the device. No external controller required.
Operation control	Remote controlled as described in the Integration Manual
Peripheral interface	EIA-232 / RS-232 interface (2 m cable with RS-232 plug-in connector) optional: USB via USB-Serial Adapters (Exp. DIGITUS DA-70156) or USB via MOXA USB-to-Serial Hub
Status	LED at corner area (GREEN = ok RED = error BLUE = booting YELLOW = no communication)

Electrical

Operating voltage	24 V DC I _{max} : 4.5 A P _{eff} : 85 Watt P _{max} : 108 Watt
Power supply	Input: 100 - 240 V AC 50 - 60 Hz Output: 24 V DC I _{max} : 5.0 A P _{max} : 120 Watt External power supply unit (CE/UL/CSA approved, 85-264 V AC, 47-63 Hz, IEC/EN60320-1 C14 Degree of protection: IP20)
Power connection*	Cable connection length 2 m hollow connector (ID 2.5 mm x OD 5.5 mm)

* Only use the device with the delivered power cord. If another power cord is used ensure the wire diameter is adequate.

Operating, transport and storage conditions

Operating range	15 °C - 32 °C (59 - 89 F) 10 - 80 % RH up to 2000 m above sea level non-condensing
Operating conditions	stable (resonance free) horizontal dry inside buildings even well ventilated and no direct exp. to sunlight
Transportation and storage	-10 °C - 60 °C (14 - 140 F) 10 - 80 % RH non-condensing

General properties

Housing material	Aluminum anodized
Degree of protection	IP20 (Protected against solid objects up to 12 mm No protection against water)
Pollution degree	1 (no contamination or only dry, non-conductive contamination contamination has no influence)
Airborne sound emission	< 70 db (A)

Dimension and weight

Dimensions	(W x D x H) 142 x 99 x 97.3 mm 5.59 x 3.9 x 3.83 inch
Weight	1.65 kg 3.64 lbs
Packaging size	(W x D x H) 347 x 252 x 131 mm 13.66 x 9.92 x 5.16 inch cardboard box
Packaging weight	3 kg 6.61 lbs

Certifications

Regulatory compliance	2011/65/EU, 2014/30/EU, 2014/35/EU, 2015/863/EU, DIN EN 61010-1:2020-03, DIN EN IEC 61010-2-051:2023-01, DIN EN IEC 61010-2-010:2022-12, DIN EN IEC 61326-1:2022-11, DIN EN 55011:2022-05, DIN EN IEC 63000:2019-05
Patents pending	WO2008135565, US8323588, EP2144716, WO2011113858, US9126162, EP2547431, WO2013113847, US10052598, EP2809436, WO2013113849, US9371889, EP2809435, WO2014207243, US20160368003, EP3013480, WO002022128814A1, WO002022128809A2 Please notify us or our designated agent, if you believe that a user has infringed our intellectual property rights.

Drawing

