



Kuhner shaker



LS-Z with Kuhner Kelvin⁺

shakes **reliably**, shakes **a lifetime**

LS-Z with Kuhner Kelvin⁺

New modular system
with a small footprint

Lab-Shaker LS-Z and incubator Kuhner Kelvin⁺ combine proven Kuhner quality in a new modular system to provide maximum flexibility to our customers. There are three different options:



LS-Z shaker: benchtop only

The LS-Z shaker will accept loads up to 25 kg and the shaking diameter can be adjusted at any time. There are three standard shaking diameters (12.5, 25 and 50 mm) and other diameters are available on request.



LS-Z with Kuhner Kelvin⁺ incubator

The Kuhner Kelvin⁺ is a compact-sized incubator with a precise temperature control and an excellent temperature distribution – for reliable and reproducible cultivation processes.



LS-Z in combination with incubators from other manufacturers

Due to low energy dissipation, the LS-Z is perfectly suited for incubator-chambers without cooling, local temperature gradients are not formed. With the detachable electronics (controller unit and power cube), the LS-Z shaker unit can be placed in a lab incubator or in a temperature controlled room with high relative humidity (up to 90%) and high CO₂-concentrations (up to 20%).



Multiple options for all your needs

Key options

Light shading plate: The light shading plate is easily placed in front of the door window to prevent radiation from affecting the contents of the incubator chamber. It protects light sensitive media from UV, artificial and / or daylight.

Kuhner TOM: Kuhner TOM (Transfer-Rate Online Measurement) measures online oxygen transfer rate (OTR), carbon dioxide transfer rate (CTR) and the respiratory quotient (RQ) in up to 16 individual shake flasks for a better process understanding and informed process development. TOM is easily installed in any Kuhner shaker and can be operated with various flask types and sizes including single use shake flasks.

Dual-table: The dual-table is an easy and economical solution system to double the shaking capacity (only applicable for LS-Z). The dual-shaking-table consists of two levels (different distances between the levels are adjustable). With the dual-table the shaking speed is limited depending on your application.

Other options at a glance

- Black window
- EPFL table
- IQ/OQ



Application areas

- Microbial cultures

The robust and maintenance-free direct-drive system of the LS-Z enables very high shaking frequencies ensuring high kLa-values for a good oxygen supply for microbial cultures. By adjusting the shaking diameter, optimal vessel-specific shaking conditions are promoted by the user. For example: out-of-phase mixing phenomena can be prevented by installing a bigger shaking diameter for cultivations with higher viscosity (fungi, biopolymers).

- Mammalian/human cell cultures

The LS-Z with Kuhner Kelvin+ is also suitable for the cultivation of mammalian and human cell cultures. In combination with the Kuhner FlowCon and AerationSystem, LS-Z and Kuhner Kelvin+ provide a humidified and CO₂/O₂ controlled environment (also hypoxic conditions possible: e.g. for stem cells).

- Plant cell cultures

The LS-Z can be integrated in rack systems with light panels located in a temperature constant room or a large incubator. The low energy dissipation of the Kuhner direct-drive to the room / incubator will have a positive effect on the temperature control and the running costs.

For all applications in

- Laboratories
- Research centres/Universities
- Production facilities
- Automatization
- GMP



Features

of the LS-Z with Kuhner Kelvin⁺ at a glance

LS-Z shaker:



Quality – Reliable technology by Kuhner

The in-house designed magnetic drive system of the LS-Z shaker guarantees accurate control and low energy consumption/heat dissipation even at high speeds. The maintenance-free direct drive is long lasting, robust, and economical.



Flexibility – Can be placed almost anywhere

The LS-Z is extremely flexible regarding its installation site: it can be placed in a lab incubator or temperature-controlled room. The removable control unit may be clamped to the shaker itself while the power unit may be stowed beside or behind the shaker.



Automation – Features for automated processes

The LS-Z shaker has a fixed and contactless stop position which is especially useful for automated processes. The integration in a liquid handling system has been successfully demonstrated. Due to the flexible Net60 interface option, the LS-Z shaker can be controlled by nearly every external software system.

Kuhner Kelvin⁺ incubator:



Small Size and Compact – High Quality

Kuhner Kelvin⁺ can be placed on, or under, any table or lab bench. The incubator has a flat front and a space-saving door mechanism. The large window provides a good view of cultivation vessels. For static experiments, a fixed shelf may be placed above the shaking tray inside the chamber. The 40 mm feedthrough port provides enough space for tubing and cables needed for the cultivation process. An exterior side-mounted document holder adds convenience to the Kuhner Kelvin⁺.



Hygienic Design – Easy Cleaning

The stainless-steel chamber of the Kuhner Kelvin⁺ is easily cleaned. The drive of the shaker unit is protected from spills and the Kuhner Kelvin⁺ incubator may easily be dismantled for cleaning the entire surface or for the removal of any unwanted liquids.



General:



Application – Starter model with great options

The LS-Z shaker and Kuhner Kelvin+ incubator is the perfect starter set for universities or start-ups with limited space and resources. They are ideally suited for cultivation of microbial, plant, human and animal cell cultures.



Warranty – Quality guaranteed

As with all Kuhner products, the LS-Z and the Kuhner Kelvin+ are cost-effective investments in quality backed with a five year warranty.



Kuhner shaker



Kuhner shaker – a family-owned business

Kuhner shaker, founded in 1949 in Basel, Switzerland, is a science-first shaker manufacturer renowned worldwide for our uncompromising shakers, incubator shakers, and orbitally-shaken bioreactors. From bench top shakers to large scale industrial shaking machines, we offer machines of the highest quality. We commit to earning trusting client relationships which will span decades.



Custom-made solutions

Does our existing range of products not meet your requirements? Simply contact us - custom-solutions are our daily business and we would like to hear about your distinct request. We generate the optimal solution for your shaking machine or orbitally-shaken bioreactor system (OSB).



Comprehensive consulting, lab trainings and seminars

Consultations are free of charge for our customers and are confidential. Based on our long-time experience and our partnerships with research facilities, we provide application-oriented support and lab trainings for our products. Kuhner also offers quality workshops either at the customer's premises or at our head office in Basel.

The Shaking Technology Forum operated by Kuhner is a helpful resource for users of shaken bioreactors, providing support, information and a publication database. www.shakingtechnology.com



Services

We provide support and advice for each customer right from the start. Our services are performed by our trained service team personally at your premises. We support our customers in implementation, maintenance and repair of all Kuhner products. This includes upgrades of functionalities and updates of software for all Kuhner shakers. We offer one-time services or service contracts extending over several years, depending on our customer's needs. We also perform calibrations specific to our customer's requirements.



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Accessories

Trays:

- Universal tray
- Tray with fixed clamps
- Tray for microtiter plates
- Tray for microtiter plates (springs)
- Tray with pins
- Tray with rubber mat
- Tray with sticky strips
- Tray with PC-plate for sticky strips
- Dual tray
- Tray with support bars
- Tray for separating vessels
- Tray for centrifuge tubes
- 2D-Bag-tray (Cryo)
- 2D-Bag-tray (Flex)

Software:

- **Kuhner Insight Software**
- **Interfaces**

More (only for Kuhner Kelvin⁺):

- **Stacking adapter**
- **Shelf**

LS-Z parts with Kuhner Kelvin⁺



Kuhner Kelvin⁺



LS-Z



LS-Z Controller



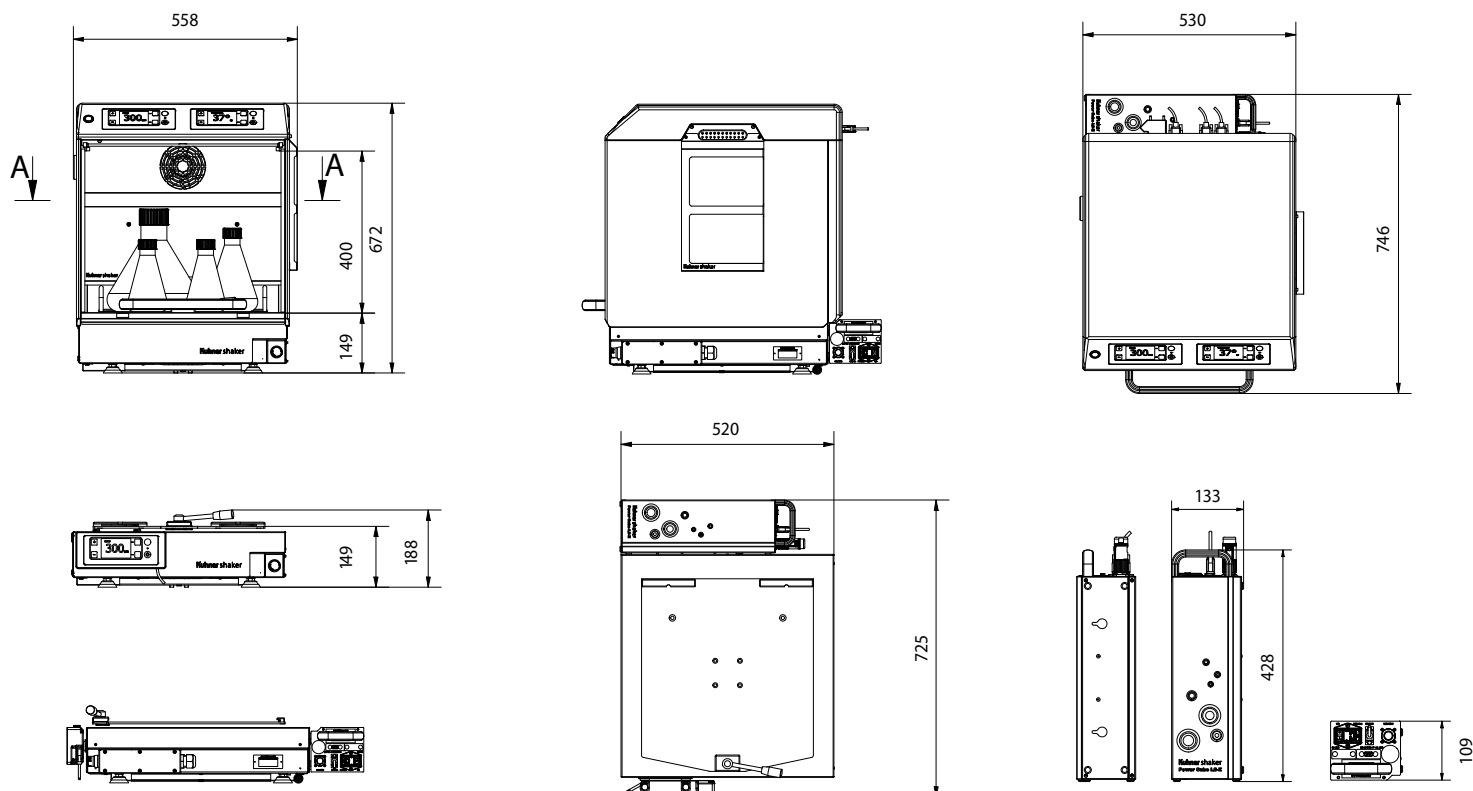
Power Cube

Technical data

	Lab-Shaker LS-Z	Kuhner Kelvin+
Temperature minimum	-	ambient + 3°C
Temperature maximum	-	60°C
Temperature distribution	-	+/- 0.5°C (at 37°C, 100 rpm)
Principle of sensor	-	Pt-100
Power of heating	-	400 W
Air circulation	-	190 m ³ /h
Power consumption typical	approx. 25 W	approx. 130 W
Gas volume	-	130 L
Weight shaker	46 kg	28 kg
Weight Power Cube	6.5 kg	-
Drive to cube cable length	3 m (>3 m available)	-
Diameter of drive cable	26 mm (≧ min. feedthrough)	-
Weight Controller	0.6 kg	Controller not included
Illumination	-	LED
Ambient temperature	-20 up to 80°C	10 up to 35°C
Ambient relative humidity	up to 90 % (shaking unit)	-
Operating menu in	DE, FR, EN, IT, ES	DE, FR, EN, IT, ES
Interface standard	CAN-Bus	CAN-Bus
Tray, size	E (420 × 420 mm) EX (500 × 420 mm) F (800 × 420 mm)	E (420 × 420 mm) - -
Loading maximum	up to 25 kg	-
Setting, digital	1 rpm	0.1°C
Control accuracy, absolute	+/- 0.5 rpm	< +/- 0.3°C
Timer	1 s – 999 h	1 s – 999 h (shaker only)
Acceleration	controlled	-
Active break	adjustable	-
Stop on position	adjustable	-
Mains Connection	220 - 240 V / 50 - 60 Hz 190 - 210 V / 50 - 60 Hz 110 - 120 V / 50 - 60 Hz 5 - 105 V / 50 - 60 Hz	220 - 240 V / 50 - 60 Hz 190 - 210 V / 50 - 60 Hz 110 - 120 V / 50 - 60 Hz 95 - 105 V / 50 - 60 Hz
Shaking motion	orbital, Ø 12.5 mm* 20...500 rpm orbital, Ø 25.0 mm* 20...400 rpm orbital, Ø 50.0 mm* 20...300 rpm	-
Material	Stainless steel cover	Inner chamber stainless steel, outer chamber PUR (insulation), door polycarbonate

*can be changed / other diameters on request

Technical data subject to change



Dimensions (in mm)

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Shakers & Accessories

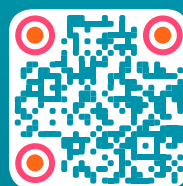
Represented by:



Adolf Kühner AG • since 1949

Dinkelbergstrasse 1
CH – 4127 Birsfelden (Basel)
Switzerland

phone +41 (0) 61 319 93 93
fax +41 (0) 61 319 93 94
office@kuhner.com



www.kuhner.com