Kuhner shaker

ISF1-X (Climo-Shaker)

Stackable
incubator shaker

ISF1-X (Climo-Shaker)

1 Direct drive

- Up to three machines can be stacked
- Large shaking capacity with small footprint
- Adjustable shaking diameters
- Heating and cooling
- CO_2 and controlled humidity options available

The ISF1-X incubator shaker is suitable for many applications in laboratories, research centres and production facilities. It offers a large shaking capacity with a small footprint, as well as many features allowing straightforward, safe handling of product.

Reliability pays

All ISF1-X components are designed for durability and reliability. A Kuhner shaker is a cost effective investment in quality backed with a five year warranty.

A system that grows with your needs

Up to three ISF1-X shaking incubators can be stacked together for greater shaking capacity. Stacking is a simple procedure without the need for special tools or stacking kits. Each machine operates independently and can be equipped with cooling if required. The ISF1-X is available with CO_2 for cell cultivation. If using microtiter plates or particularly long cultivation times in shake flasks, the controlled humidity option will help reduce evaporation.

The Kuhner direct drive cannot be matched 1

The maintenance-free direct drive is both long lasting and economical. The drive is protected from spills and the all stainless steel interior has a drain at the back for quick removal of any unwanted liquids. The incubator chamber can be cleaned with chemicals or sterilized using optional UV lighting. Kuhner's direct drive system allows the shaking diameter to be changed at any time, as well as ensuring low energy consumption.

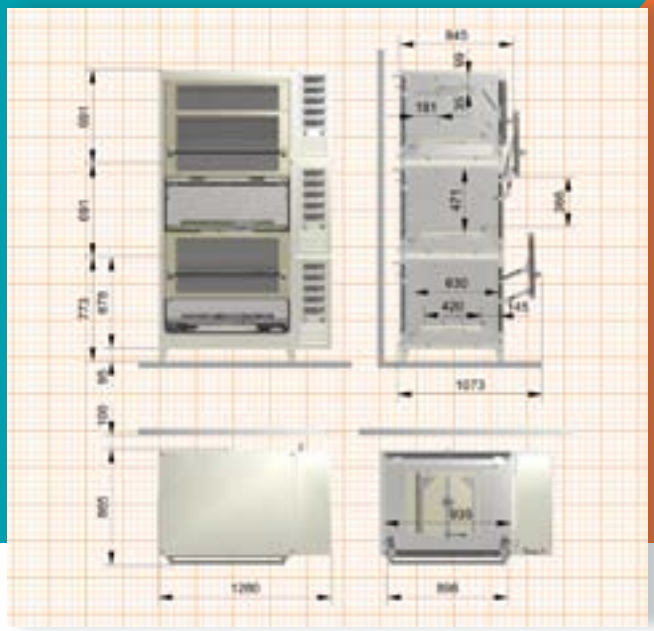
A safe system

An upward opening door fitted with a safety switch, means the ISF1-X is easy to load and unload. Automatic supervision of the mains voltage protects the shaker and in the event of a voltage spike the unit disconnects from the mains. The machine resumes operation at the set values once power is restored.

Innovation Partners

The ISF1-X sets today's standard for incubator shakers thanks to its technology and functionality. To keep it that way, Kuhner maintains close contact with well known universities and experts. We constantly investigate new developments looking for opportunities to further optimise the design and performance of our machines.

Dimensions



Technical data	SMX1500	SMX1501	SMX1503
	*SMX1500C**	*SMX1501C**	*SMX1503C**
Cooling	no	yes	yes
Humidity control	no	no	yes
Temperature minimum	ambient +10°C	ambient -15°C ***(-10°C)****	ambient -15°C ***(-10°C)****
Temperature maximum	80°C ***(60°C)****	80°C ***(60°C)****	80°C ***(60°C)****
Humidity maximum	-	-	85 % r.h.
Power consumption	< 1300W	< 1500W	< 2000W

Machine	
Gas volume	395 l
Weight (with cooling)	210 kg
Illumination	LED
Operation menu in	de, fr, it, en, es
Interface, standard	CAN-Bus
Interface, optional	USB, Ethernet, digital, analogue
Ambient temperature	10°C up to 35°C

Shaking unit	
Tray, size	F (800x420mm)
Loading, maximum	25kg
Setting, digital	1rpm
Accuracy, absolute	± 0.1 rpm
Timer	1s ... 999h
Acceleration	controlled
Active brake	adjustable
Stop on position	adjustable

Shaking motion	Speed
* orbital, Ø 12.5mm	20...500 rpm
* orbital, Ø 25.0mm	20...400 rpm
* orbital, Ø 50.0mm	20...300 rpm
* linear, 12.5mm	20...400 rpm
* linear, 25.0mm	20...300 rpm
* linear, 50.0mm	20...200 rpm
* can be changed/other diameters on request	

Temperature	
Setting, digital	0.1°C
Accuracy, absolute	± 0.30°C (37°C)
(across the tray)	***± 0.25°C (37°C)****
Principle of sensor	Pt-100
Power of heating	1000W
Power of cooling	155...270W
Air circulation	300m3/h

Humidity	(SMX1503)
max. at 25..55°C	85% r.h.
Setting, digital	1% r.h.
Accuracy, absolute	± 2% r.h.
Principle of sensor	capacitive
Water refill	automatic
Water heater	300W
Door heater	100W

CO_2	(SMX1034)
Principle of sensor	Infrared, NDIR
Measuring range	0...20% CO_2
Setting, digital	0.1%
Accuracy, absolute	± 0.40% at 5% CO_2
(including non-linearity, repeatability and calibration uncertainty)	
Temperature range	5...60°C
CO_2-supply	max. 2 bar overpressure

**** XC incubator shakers are optimised for cell cultivation***

+ CO_2 control (SMX1034) included as standard
+ Temperature max.: 60°C
+ Improved temperature accuracy: ± 0.25°C (37°C)

Mains connection	
SMX1021:	220-240 V / 50-60 Hz
SMX1022:	190-210 V / 50-60 Hz
SMX1023:	110-120 V / 50-60 Hz
SMX1024:	95-105 V / 50-60 Hz

2 Illumination unit for photosynthesis (LED)

Options

Multiple options for your shaker

Cooling

All Kuhner incubator shakers can be fitted with cooling. The refrigeration system is regulated by a fully digital PID control ensuring minimal energy consumption. The cooling is switched on only when required as determined by the chamber temperature and set point.

Humidity control

Humidity control is an important factor in successful fermentation. Evaporation from microtiter plates, or when cultivating in flasks for long periods (e.g. cell cultures), can be significantly reduced with humidification.

CO_2 control

CO_2 control is essential when working with mammalian cell cultures. Kuhner was the first company to manufacture and supply incubator shakers with CO_2 control more than ten years ago and continues to offer this option.

Illumination unit for photosynthesis (LED) 2

The ceiling of any Kuhner incubator shaker can be fitted with LED modules for the cultivation of phototrophic organisms. The control module allows full programming of night/day cycles and variable light intensity.

UV lamp

As in a biological safety cabinet, the chamber of a Kuhner incubator shaker can also be sterilized with an integrated UV lamp. The lamp is positioned for maximum irradiation of the chamber and shaking table. The UV lamp has a clearly marked external switch and when the door is opened, the UV-lighting is automatically switched off.

Black window

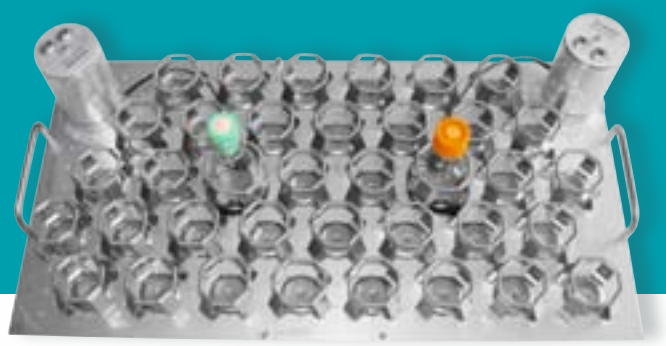
Available for light sensitive medium or organisms. Any Kuhner incubator shaker can be delivered with blackened windows to prevent unwanted daylight or UV radiation inside the incubator.

Kuhner XC series

Kuhner was the first company to manufacture incubator shakers with controlled CO_2 and humidity for the cultivation of mammalian cells. The «XC» series provides optimised shaking conditions for cell cultures. Improved temperature accuracy is achieved across the tray: ± 0.25°C @ 37°C. The CO_2 controlled atmosphere allows exact pH adjustment of the cell culture medium. With a CO_2 range up to 20%, as well as options for cooling and controlled humidity, the «XC» incubator shakers can be tailored to meet all requirements.

3 ISF1-X with a pull-out table

4 BPM-60



Pull-out table 3

The pull-out table is designed for the ISF1-X and ISF4-X incubator shakers as well as the Rack System. This remarkable device makes loading and unloading trays much easier.

Dual table

The dual table is an easy and economical way of doubling the shaking capacity. The dual shaking table consists of two levels. Each level will accept an E, EX or F size tray. However, with the dual table the shaking speed is limited to a maximum of 200 rpm.

Perspex cover

To prevent accidental operation of the controllers, the panel can be protected by a perspex cover.

IQ-OQ Documentation

IQ-OQ (Installation Qualification and Operation Qualification) is an equipment qualification required for GMP procedures. This service is available from Kuhner and can also be carried out at the customer`s premises.

BPM-60 4

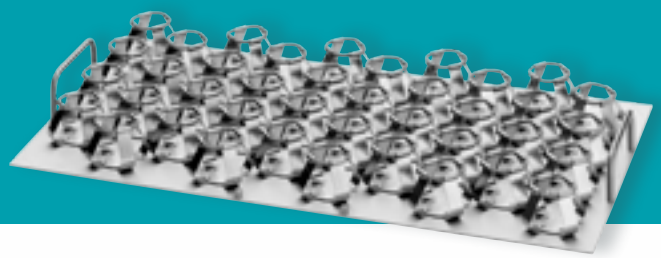
BPM-60 (Bioprocess Monitoring) is a non-invasive, online measurement of dissolved oxygen and pH in an Erlenmeyer flask. The system allows for one or both parameters to be recorded in the same flask. The values of dissolved oxygen and/or pH can be monitored simultaneously in eight different flasks. Compared to conventional sample taking, this continuous data logging is automatic and consistent.
An integrated socket (TabCom option) in the shaking table makes simple data communication and power supply possible without the risk of wiring breaking.

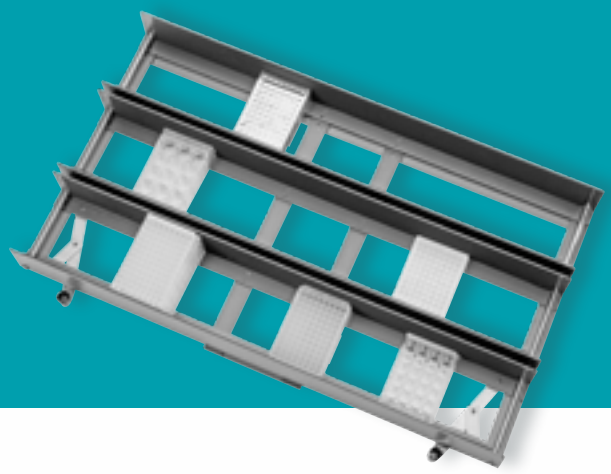
TabCom

The TabCom option from Kuhner consists of a cable for power and data with the connection port integrated in the shaking table. A cable guide prevents the cable breaking and ensures secure data recording. Online measuring technologies offered by Kuhner that use TabCom include BPM-60 (pH, dissolved oxygen) and RAMOS (OTR, CTR). The flexibility of TabCom means other measurement systems can be easily integrated.

5 Tray F-250 with fixed clamps

6 F-tray (800 x 420 mm) for microtiter plates





Accessories

To suit your application

Universal tray FU

Order number: SM3003

The universal tray can be fitted with clamps for Erlenmeyer flasks, test tube holders, microtiter plates, sticky strips, or custom made holders to suit your requirements.
Rearranging these clamps and holders is quick and simple.

Clamps for Erlenmeyer flasks

Order number for 1 clamp	Flask size	Max. number of clamps per FU
SM310025	25 ml	113
SM310050	50 ml	100
SM310100	100 ml	72
SM310125	125 ml	50
SM310150	150 ml	50
SM310200	200 ml	44
SM310250	250 ml	40
SM310300	300 ml	37
SM310500	500 ml	27
SM311000	1000 ml	16
SM311500	1500 ml	12
SM312000	2000 ml	9
SM312800F	2800 ml Fernbach	5
SM313000F	5 L Thomson/ 3 L Corning Fernbach	5
SM313000	3000 ml	8
SM314000	4000 ml	5
SM315000	5000 ml	4

F-tray with fixed clamps 5

The clamps are riveted onto this tray and cannot be removed.
It offers maximum security and will often hold a larger number of flasks rather than a universal tray.

Order number	Decription	# of clamps
SM330025	F-25 ml	153
SM330050	F-50 ml	100
SM330100	F-100 ml	74
SM330125	F-125 ml	60
SM330150	F-150 ml	60
SM330200	F-200 ml	40
SM330250	F-250 ml	40
SM330300	F-300 ml	30
SM330500	F-500 ml	26
SM331000	F-1000 ml	16
SM331500	F-1500 ml	12
SM332000	F-2000 ml	9
SM333000	F-3000 ml	8
SM334000	F-4000 ml	5
SM335000	F-5000 ml	4

F-tray for microtiter plates 6

Kuhner has designed trays specifically for microtiter plates. Handles at the front of the tray open and close the special clamping mechanism allowing plates to be loaded and unloaded. Trays of different heights (22, 47 and 77mm) allow the stacking of up to four microtiter plates. The tray is suitable for all types of plates (deep well, low well, 24, 48 and 96 well).

Order number	Description	Microtiter plates
SM3503.22	F-MT.22	24 - 48
SM3503.47	F-MT.47	24 - 96
SM3503.77	F-MT.77	24 - 144

7 F-tray for centrifuge tubes

8 Floor stand

F-tray for centrifuge tubes 7

Order number: SM3805

The use of centrifuge tubes (e.g. 50ml Falcon tubes and TPP 50ml tubes) in cell culture screening is well established. This F-tray has a capacity of 120 x 50ml centrifuge tubes (5 racks of 24).
Holders for 600ml TPP tubes are also available.

F-tray with sticky strips

Order number: SMX350001

A tray fitted with sticky strips is especially useful for flasks shaken at low speeds (up to 200 rpm). The flask is placed directly on the sticky strip without the need for any other support. Different flask sizes can be used. Sticky strips are available individually or in sets and can also be supplied already fitted to a tray. The F-size tray accepts eight strips.

F-tray with support bars

Order number: SM4130.6

This tray offers an alternative to both clamps and sticky mats and is ideal for tall containers. The tray is covered with a rubber mat and has an upright at each corner. The F-tray is fitted with six cross supports to securely clamp containers.

F-tray (800 x 420 mm) for separating vessels

Kuhner has also designed a special tray for shaking separating vessels. This very flexible tray can take vessels of various sizes. It is also possible to add a second layer and double the capacity.
Movable retaining rods allow vessels to be installed easily.

Order number	Description	# of vessels
SM430250	FS-250	10
SM4302502	FS-250/2	20 (2 layers)
SM430500	FS-500	8
SM4305002	FS-500/2	16 (2 layers)
SM431000	FS-1000	6
SM4310002	FS-1000/2	12 (2 layers)

F-tray with rubber mat

Order number: SM3603

The whole tray is covered with a rubber mat and is particularly suitable for shaking containers at low speed (e.g. blood bags).

Shelf

Order number: SMX1572

The ISF1-X incubator shakers can be fitted with a shelf allowing cultivation in petri dishes. One or two shelves can be placed above the shaking table and fixed to the chamber walls with four screws.

Floor stand 8

Order numbers: SM1560 (2 x ISF1-X), SM1561 (1 x ISF1-X)

For a comfortable working height Kuhner offers floor stands for the ISF1-X. These are available in a choice of 400mm or 765mm high.

Water bath

Order numbers: SMX1532 (ISF1-W), SMX1533 (ISF1-X)

To reduce evaporation from shake flasks or microtitre plates a stainless steel water bath can be placed inside the incubator. This water bath is not fitted with an automatic water supply and must be topped up manually.

ISIS-Software

Kuhner developed the user-friendly ISIS-Software for supervision, monitoring, and recording of data. The software is easy to operate.

Interfaces

Kuhner shakers are equipped with a CAN-bus. CAN-USB, CAN-Ethernet, EMI-60 and NET-60 are all well established interfaces.

Shakers & Accessories

www.kuhner.com

Kuhner

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