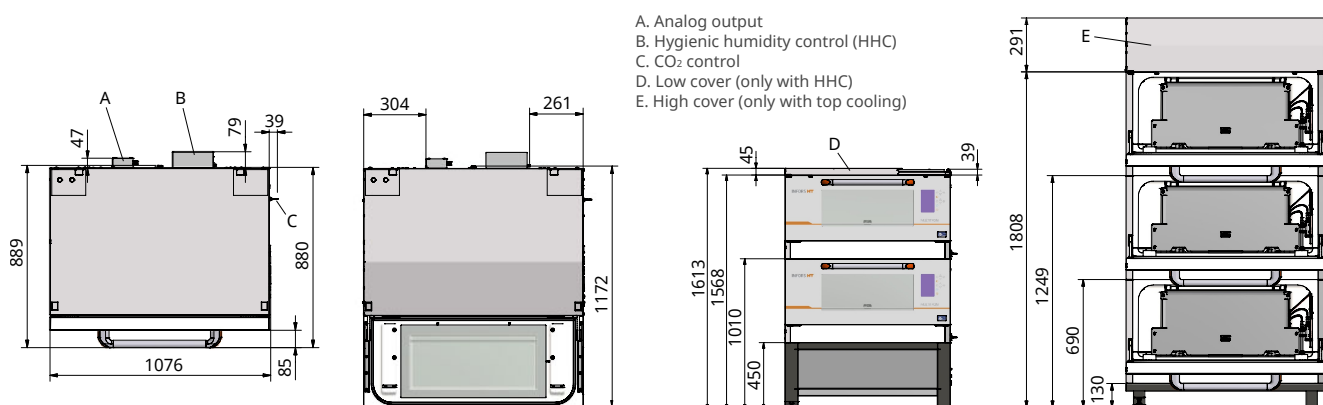


# Multitron

The Multitron is the number-one choice for reliable, convenient cultivation of microorganisms and cell cultures. The incubator shaker guarantees homogeneous conditions and delivers reproducible results, leaving nothing to be desired regarding its features and capacity.



## Dimensions and Weights



*Note: The dimensions above only apply to the 230 V version. The heights of the bases of the 115 V version are slightly different (high base = 406 mm instead of 450 mm; low base = 140 mm instead of 130 mm).*

Various		
Interior dimension (w x d x h)		935 mm x 570 mm x 380 mm <sup>1)</sup>
Volume	Total space	approx. 270 L
	Visible space	approx. 210 L
Tray size		M (850 mm x 470 mm)
Additional space for ventilation		Back: 100 mm, Side: 80 mm

<sup>1)</sup> With LED lighting option, the usable height is reduced by 30 mm

Weight single unit without base frame and options	
Single unit 3 mm throw	129 kg
Single unit 25 mm throw	137 kg
Single unit 50 mm throw	144 kg
Single unit adjustable throw	143 kg

Weight base frames	230 V	115 V
Low base	26 kg	31 kg
High base	42 kg	45 kg

Weight stacked units (throw = 50 mm) without options	230 V	115 V
2 units with low base	337 kg	342 kg
3 units with low base	481 kg	486 kg

Weight options and accessories	230 V	115 V
Cooling unit 900 W	45 kg	29 kg
Cooling unit 1800 W (only available for version 230 V)	80 kg	---
Hygienic Humidity Control (HHC)	3 kg	3 kg
CO <sub>2</sub> control	0.5 kg	0.5 kg
LED lighting	5 kg	5 kg
UV decontamination	1 kg	1 kg
Analog output	1 kg	1 kg
Universal tray	4.5 kg	4.5 kg

## Shaker Drive / Rotation Speed

Direction of rotation	Clockwise
Throw (fixed throw)	3, 25 or 50 mm
Throw (adjustable throw)	12.5, 19, 25 and 50 mm
Setting range (3 mm throw)	20 min <sup>-1</sup> to 1000 min <sup>-1</sup>
Setting range (25 mm throw)	20 min <sup>-1</sup> to 400 min <sup>-1</sup>
Setting range (50 mm throw)	20 min <sup>-1</sup> to 350 min <sup>-1</sup>
Increment setpoint	1 min <sup>-1</sup>
Accuracy control (at maximum rotation speed, full scale)	± 1 %

### Max. Rotation Speeds

Single unit	3 mm	12.5, 19 and 25 mm	50 mm
	1000 min <sup>-1</sup>	400 min <sup>-1</sup>	350 min <sup>-1</sup>
Two units stacked	3 mm	12.5, 19 and 25 mm	50 mm
Top unit	1000 min <sup>-1</sup>	400 min <sup>-1</sup>	350 min <sup>-1</sup>
Bottom unit	1000 min <sup>-1</sup>	400 min <sup>-1</sup>	350 min <sup>-1</sup>
Three units stacked	3 mm	12.5, 19 and 25 mm	50 mm
Top unit	1000 min <sup>-1</sup>	400 min <sup>-1</sup>	300 min <sup>-1</sup>
Middle unit	1000 min <sup>-1</sup>	400 min <sup>-1</sup>	350 min <sup>-1</sup>
Bottom unit	1000 min <sup>-1</sup>	400 min <sup>-1</sup>	350 min <sup>-1</sup>

## Hygienic Humidity Control (HHC) (Option)

General			
Setting range	20 % to 85 %		
Increment setpoint	1 %		
Accuracy control	± 3 %		
Water consumption (typical)	10 g h <sup>-1</sup>		
Max. temperature for use	40 °C		
Reachable values	AT <sup>1)</sup>	IT <sup>2)</sup>	
Max. value (without condensation)	20 °C	37 °C	80 %rH
	25 °C	37 °C	85 %rH
Min. value (dehumidification)	25 °C	30 °C	70 %rH
	25 °C	40 °C	50 %rH

<sup>1)</sup> AT = ambient temperature

<sup>2)</sup> IT = temperature in incubation chamber

## Temperature Control

Setting range	4 °C to 65 °C
Increment setpoint	0.1 °C
Accuracy control 4 °C to 50 °C	± 0.3 °C
Accuracy control > 50 °C	± 0.5 °C
Temperature distribution, deviation: max. – min. <sup>1)</sup>	± 0.4 °C
Temperature distribution, max. deviation to value on display <sup>1)</sup>	± 0.5 °C

<sup>1)</sup> at 37 °C, on tray with 5 flasks

### Lowest Attainable Temperature

Without cooling	Lowest attainable temp.
Single unit	10 °C above ambient temp.
Two units stacked	10 °C above ambient temp.
Three units stacked	10 °C above ambient temp.
Cooling unit 900 W	Lowest attainable temp.
Single unit	18 °C below ambient temp.
Two units stacked	17 °C below ambient temp.
Three units stacked	15 °C below ambient temp.
Cooling unit 1800 W (only 230 V)	Lowest attainable temp.
Single unit	25 °C below ambient temp.
Two units stacked	24 °C below ambient temp.
Three units stacked	22 °C below ambient temp.

## CO<sub>2</sub> Control (Option)

Setting range	0.1 % to 20 %
Increment setpoint	0.1 %
Accuracy control (at 1013 hPa, 20 °C to 40 °C, 0 % to 20 % CO <sub>2</sub> )	0.2 %
Gas consumption at 5 % CO <sub>2</sub> (air vent open)	< 2 NL h <sup>-1</sup>
Gas consumption at 10 % CO <sub>2</sub> (air vent open)	< 3.5 NL h <sup>-1</sup>
Gas consumption at 10 % CO <sub>2</sub> (air vent closed)	< 0.5 NL h <sup>-1</sup>
Max. temperature for use	60 °C

## LED Lighting (Option)

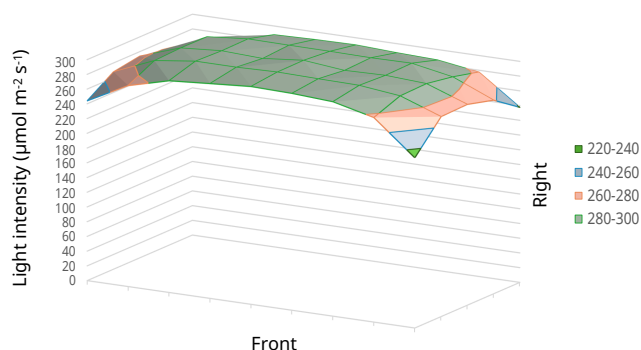
Setting range		1 % to 100 %
Increment setpoint		1 %
Light intensity <sup>1)</sup>	at 15 °C	2 to 240 $\mu\text{mol m}^{-2} \text{s}^{-1}$
	at 28 °C	2 to 240 $\mu\text{mol m}^{-2} \text{s}^{-1}$
	at 65 °C	2 to 220 $\mu\text{mol m}^{-2} \text{s}^{-1}$
Light distribution on the tray <sup>2)</sup>		$\pm 8 \%$
Nominal power (setpoint 100 %)		120 W
Cooling		Mandatory
Minimum temperature in the incubation chamber		10 °C below ambient temperature

<sup>1)</sup> Linear, setpoint 1 % to 100 %; temperature in the incubation chamber

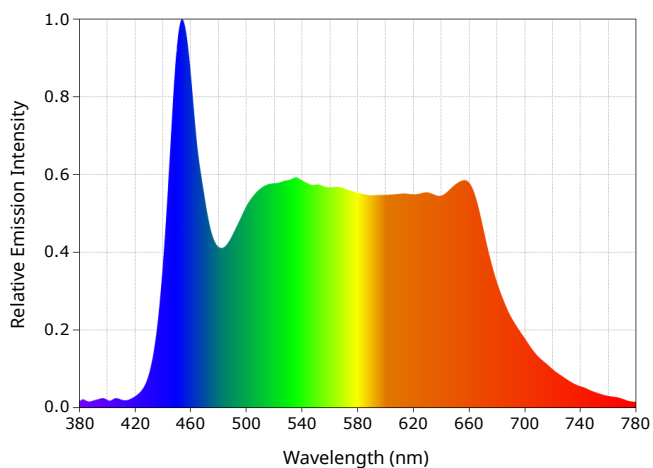
<sup>2)</sup> Relative standard deviation of the total number of 45 measuring points distributed evenly across the tray, with darkening foil

### Light Distribution on the Tray

The following figure shows the distribution of the light intensity on the tray. The measurement was carried out at 45 points evenly distributed on the tray at 100 % light intensity and 28 °C in the incubation chamber.



### Light Spectrum



## UV Decontamination (Option)

Wavelength UV-C radiation	200 nm to 280 nm
Wavelength at maximum emission	253.7 nm

## Operating Conditions

Load	
Load max.	55 kg
Load optimal (3 mm throw)	7 kg
Load optimal (25/50 mm throw)	15 kg

Ambient conditions	
Ambient temperature	10 °C to 30 °C
Ambient humidity	10 % to 85 %
Altitude operating location	max. 2000 m above sea level
Pollution degree as per EN 61010-1	2
Minimum distance side	80 mm
Minimum distance back	100 mm

## Materials

Housing	Polyurethane (PUR-IHS) with flame retardant
Door	PUR-IHS, safety glass
Cover plate temperature control	Stainless steel (AISI 304)
Shaking table and universal tray	Aluminium, anodized

## Electrical Connection and Power Values

General	230 V	115 V
Mains voltage	230 V ( $\pm 10\%$ )	115 V ( $\pm 10\%$ )
Mains frequency	50/60 Hz	60 Hz
Max. power consumption (all options)	1650 W	1700 W
Max. current consumption (all options)	7.2 A	15 A
Power consumption cooling 900 W	760 W	840 W
Power consumption cooling 1800 W	1520 W	---
Fuse (two 5 x 20 mm fuses, time lag)	10 A	---
Thermal protection switch	---	15 A

Average power consumption	
Single unit without cooling, 37 °C	130 W h <sup>-1</sup>
Single unit with cooling 900 W, 37 °C	240 W h <sup>-1</sup>
Single unit with cooling 900 W, 15 °C	290 W h <sup>-1</sup>
Single unit with cooling 1800 W, 37 °C	280 W h <sup>-1</sup>
Single unit with cooling 1800 W, 15 °C	270 W h <sup>-1</sup>
Single unit with cooling 1800 W, 4 °C	360 W h <sup>-1</sup>

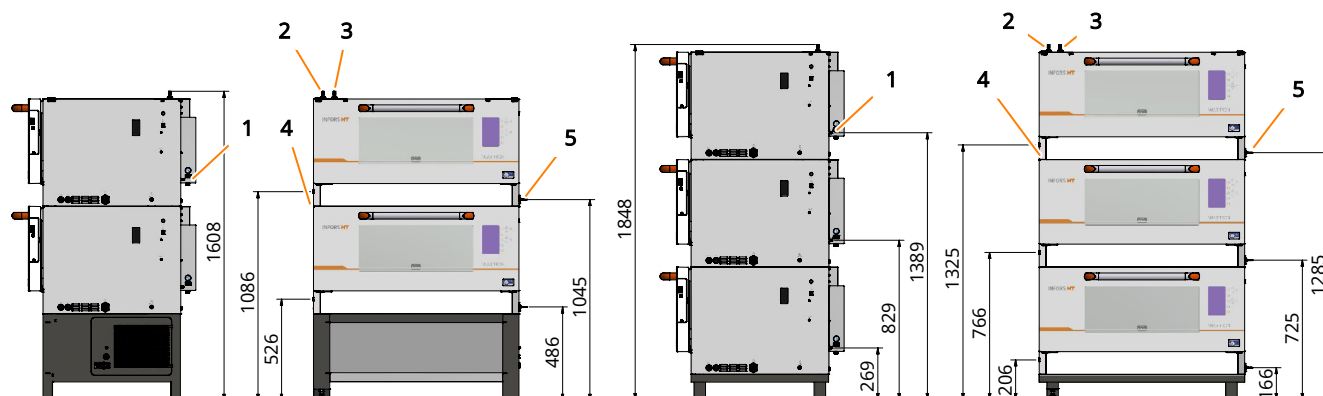
## Various

IP rating	IP20
Sound pressure	< 70 dB(C)
Cooling agent in compressor	R134a

## Interfaces

Alarm connection	Stereo jack, 3.5 mm, allows to send system alarms to an external system.
Ethernet interface	RJ45, 10/100 Mbps Ethernet
Analog output (optional)	8 channels, 4 mA to 20 mA; allows to control the device and record data.
Profibus DP gateway (optional)	Allows to connect the device to a SCADA system to control the device and record data.
Modbus TCP gateway (optional)	

## Connections/Utilities



Pos.	Connection	Size	Pressure	Requirements
1	Demineralised water In	UNF 1/4-28 for hoses 1/8" (= 3.2 mm)	max. 2.0 bar	<ul style="list-style-type: none"> <li>Water hardness (CaCO<sub>3</sub> equivalent): &lt; 0.01 mmol L<sup>-1</sup></li> <li>Dissolved solids: &lt; 10 mg L<sup>-1</sup></li> <li>Recommendation: Reverse osmosis water with a conductivity of approx. 5 µS cm<sup>-1</sup> or ultra-pure water/WFI. Do not use tap water, not even as an additive to ultra-pure water.</li> </ul>
2	Cooling liquid In	Hose nozzle DN10, for hose Ø = 10 mm	max. 4.0 bar	<ul style="list-style-type: none"> <li>Water hardness (CaCO<sub>3</sub> equivalent): 0 to 1.5 mmol L<sup>-1</sup>. For medium-hard to very hard water quality, use demineralised water as an alternative.</li> <li>Cooling liquid: Based on 1,2-propanediol with inhibitor (suitable for copper). Must be approved for the food and pharmaceutical sectors.</li> </ul>
3	Cooling liquid Out	Hose nozzle DN10, for hose Ø = 10 mm	pressureless	N/A
4	Discharge outlet	Internal thread G1/4", for hose Ø = 10 mm	N/A	N/A
5	CO <sub>2</sub> In	Hose nozzle DN4, for hose Ø = 3 mm to 4 mm	0.4 bar to 0.6 bar	<ul style="list-style-type: none"> <li>For best efficiency, it is recommended to use a gas with a high CO<sub>2</sub> concentration (e.g. 99.5 %).</li> </ul>

**eve®**



eve® is a platform software for planning, execution and analysis of bioprocesses. eve® allows you to record bioprocess data and store it in a central database. The software offers workflows from simple bioprocesses to the planning and execution of complex strategies with various phases.

eve® makes it possible to generate and store bioprocess knowledge. Various libraries for storing information on organisms and culture media are available. Thanks to soft-sensors, additional knowledge can be generated.

In addition to INFORS HT products, biotech machines and analysis devices from third-part manufacturers can be connected. This makes it possible to holistically control, monitor and analyse bioprocesses using a single software.

eve® is installed on a centralised server. Access takes place via a browser, no client side installation is required. Bioprocess data is therefore available directly via the browser and independent of the operating system.

Various packages of the software are available. This makes it possible to adapt it to the individual needs and requirements of its users. eve® (in the premium version) is also suitable for working in a validated environment as per FDA CFR 21 Part 11.