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INFORS HT
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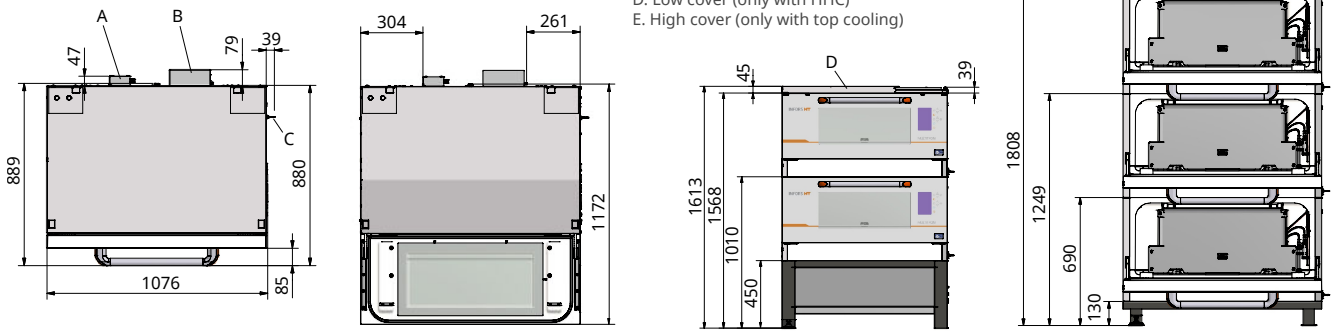
# Multitron

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 |
| Volume | approx. 270 L |
| Tray size | M (850 mm x 470 mm) |
| Additional space for ventilation | Back: 100 mm<br>Side: 80 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 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 base frames | 230 V | 115 V |
|---|---|---|
| Low base | 26 kg | 31 kg |
| High base | 42 kg | 45 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 |
| $CO_2$ control | 0.5 kg | 0.5 kg |
| UV decontamination | 1 kg | 1 kg |
| Analogue 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 $min^{-1}$ to 1000 $min^{-1}$ |
| Setting range (25 mm throw) | 20 $min^{-1}$ to 400 $min^{-1}$ |
| Setting range (50 mm throw) | 20 $min^{-1}$ to 350 $min^{-1}$ |
| Increment setpoint | 1 $min^{-1}$ |
| Accuracy control (at maximum rotation speed, full scale) | ± 1 % |

**Max. Rotation Speeds**

| Single unit | 3 mm throw | 25 mm throw | 50 mm throw |
|---|---|---|---|
| | 1000 $min^{-1}$ | 400 $min^{-1}$ | 350 $min^{-1}$ |

| Two units stacked | 3 mm throw | 25 mm throw | 50 mm throw |
|---|---|---|---|
| Top unit | 1000 $min^{-1}$ | 400 $min^{-1}$ | 350 $min^{-1}$ |
| Bottom unit | 1000 $min^{-1}$ | 400 $min^{-1}$ | 350 $min^{-1}$ |

| Three units stacked | 3 mm throw | 25 mm throw | 50 mm throw |
|---|---|---|---|
| Top unit | 1000 $min^{-1}$ | 400 $min^{-1}$ | 300 $min^{-1}$ |
| Middle unit | 1000 $min^{-1}$ | 400 $min^{-1}$ | 350 $min^{-1}$ |
| Bottom unit | 1000 $min^{-1}$ | 400 $min^{-1}$ | 350 $min^{-1}$ |

## Hygienic Humidity Control (HHC) (Option)

| General | | | |
|---|---|---|---|
| Setting range | | | 20 % to 85 % |
| Increment setpoint | | | 1 % |
| Accuracy control | | | ± 3 % |
| Water consumption (typical) | | | 10 g/h |
| Max. temperature for use | | | 40 °C |

| Reachable values | AT [1] | IT [2] | |
|---|---|---|---|
| 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 |

[1] *AT = ambient temperature*

[2] *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. [1] | ± 0.4 °C |
| Temperature distribution, max. deviation to value on display [1] | ± 0.5 °C |

[1] *at 37 °C, on tray with 5 flasks*

**Lowest Attainable Temperature**

| Without cooling | Lowest attainable temp. |
|---|---|
| Single unit | 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. |

## $CO_2$ 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 % $CO_2$) | 0.2 % |
| Gas consumption at 5 % $CO_2$ (air vent open) | 2 L/h |
| Gas consumption at 10 % $CO_2$ (air vent open) | 3.5 L/h |
| Max. temperature for use | 60 °C |

## 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 |

## Various

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

## Interfaces

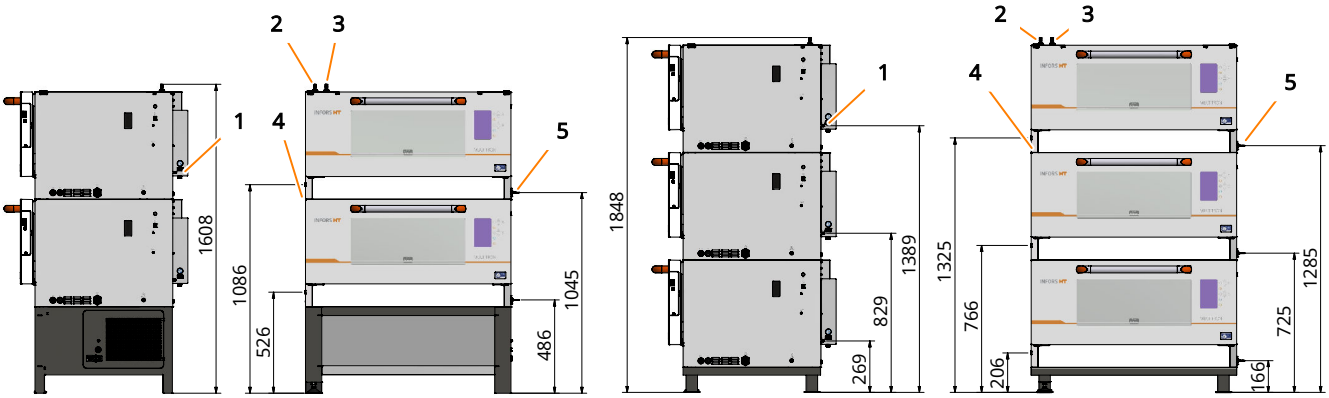
| | |
|---|---|
| Alarm connection | Stereo jack, 3.5 mm, allows to send system alarms to an external system. |
| Ethernet interface | RJ45, 10/100 Mbps Ethernet |
| Analogue output (optional) | 8 channels, 4 mA to 20 mA; allows to control the device and record data. |
| Profibus DP gateway (optional)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

## Electrical Connection and Power Values

| General | 230 V | 115 V |
|---|---|---|
| Mains voltage | 230 V (± 10%) | 115 V (± 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 |
| Single unit with cooling 900 W, 37 °C | 240 W/h |
| Single unit with cooling 900 W, 15 °C | 290 W/h |
| Single unit with cooling 1800 W, 37 °C | 280 W/h |
| Single unit with cooling 1800 W, 15 °C | 270 W/h |
| Single unit with cooling 1800 W, 4 °C | 360 W/h |

## 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 | ■ Water hardness ($CaCO_3$ equivalent): < 0.01 mmol $L^{-1}$<br>■ Dissolved solids: < 10 mg $L^{-1}$<br>■ Recommendation: Reverse osmosis water with a conductivity of approx. 5 µS $cm^{-1}$ or ultra-pure water/WFI. Do not use tap water, not even as an additive to ultra-pure water. |
| 2 | Cooling liquid In | Hose nozzle DN10, for hose Ø = 10 mm | max. 4.0 bar | ■ Water hardness ($CaCO_3$ equivalent): 0 to 1.5 mmol $L^{-1}$). For medium-hard to very hard water quality, use demineralised water as an alternative.<br>■ Cooling liquid: Based on 1,2-propanediol with inhibitor (suitable for copper). Must be approved for the food and pharmaceutical sectors. |
| 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 | $CO_2$ In | Hose nozzle DN4, for hose Ø = 3 mm to 4 mm | 0.4 bar to 0.6 bar | ■ For best efficiency, it is recommended to use a gas with a high $CO_2$ concentration (e.g. 99.5 %). |

## 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.