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## HABITAT cell

/// Data Sheet

The HABITAT cell control tower package is particularly suitable for HABITAT's cell culture applications and is used to monitor and control the bioprocess. It includes the control unit with all connection options for gas supply, liquid addition, sensors and temperature control as well as a tablet for easy and clear operation of the bioreactor.

### Control and monitoring

The bioprocess and all associated test parameters can be easily controlled and monitored via the tablet attached to the control unit and with the help of the intuitive and easy-to-use software. Depending on the type of cultivation, you can choose between the operating modes batch, fed-batch and perfusion/continuous. The new Chaotic Mixing function



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ensures faster and more effective mixing when required. The 10.4-inch tablet allows direct access to all actuators directly on the main screen. A clear calibration management, a diagram overview and the complete documentation of the process round off the operation. A software version that meets FDA CFR Part 11 requirements is available as an option.

#### Gas supply

Built in mass flow controllers for 4 separate gas lines (for N<sub>2</sub>, O<sub>2</sub>, air and CO<sub>2</sub>) ensure precise, individually adjustable gassing, ideally tailored to the needs of your cells. Flow rates of 0.01 - 2 l/min can be achieved.

#### Liquid supply

4 integrated Watson Marlow pumps, adjustable in direction and speed, give you the variability to pump in and pump out different liquids (like acid, base, anti-foam agent, feeding solutions).

#### Sensors

HABITAT cell enables the measurement of the following parameters by means of sensors:

- pH
- DO (dissolved oxygen)
- temperature
- filling level
- foam

#### Temperature control

The constant and precise temperature control during the cultivation is guaranteed by the heating sleeve, which is adapted to the respective vessel size. (Heating sleeve is included with the HABITAT cell vessel package).

#### All features at a glance

- > compact, space-saving design, dimensions: 223 x 402 x 450 mm (WxDxH)
- > large tablet for clear operation (10,4 inch)
- > intuitive, easy-to-use software with a lot of functionalities.
- > 4 integrated fast-load pumps (Watson Marlow)
- > connectivity: USB, PC, RS232, ethernet, external signal input, external pump, single-use unit, thermostat
- > data storage
- > gas supply with 4 built-in mass flow controllers: e.g. for O<sub>2</sub>, Luft, N<sub>2</sub>, CO<sub>2</sub>
- > Status LED display: direct error display by indicator light

Note: Only a control tower package and the separately available vessel package make up a functional unit.

## Technical Data

Controller	Cell Growth
Operating mode	timer, continuous and program operation
Display	Tablet PC
Operation	touch screen
Data memory size [GB]	32
Auto restart after power failure	yes
Ethernet interface	yes
Single use reactor interface	yes
Thermostat interface	yes
Ext. pump interface	yes
Gravimetric feeding	yes
Exponential feeding	yes
Biomass feeding	yes, with CGQ BioR Sensor
OPC UA interface	yes
Filter heater	yes
LED light panel	Accessory
Stirring motor	yes
Calibration guide temperature	yes
Calibration guide pH	yes
Calibration guide pO <sub>2</sub>	yes
pH - temperature compensation	yes
Mode hose filling	yes
Stirrer control mode	off, manual, profile, Cascade-pO <sub>2</sub> control, chaotic
Speed range [rpm]	1 - 2200
Speed deviation >= 100 rpm [%]	±2
Speed deviation <= 100 rpm [rpm]	±5
Speed display	TFT
Reversible direction of rotation	yes
Timer	yes
Timer display	TFT
Time setting range [min]	1 - 120
Heating blanket	yes
Heat output [W]	250
Heat control	TFT
Temperature control	PID
Working temperature [°C]	5 - 80
Connection for ext. temperature sensor	PT1000
Temperature display	yes
Temperature measuring range [°C]	0 - 100
Temperature measurement resolution [K]	0.1
Temperature control accuracy [°C]	±0.2
Temperature limit min. [°C]	0
Temperature limit max. [°C]	110
pH measurement	yes
pH control mode	off, auto, profile
pH value display	TFT
pH measuring range [pH]	0 - 14
pH measurement resolution [pH]	0.01



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Accuracy of pH measurement [pH]	±0.02
Set resolution pH value [pH]	0.01
pH control accuracy [pH]	±0.05
Connction for pO2 sensor	yes
pO2 control mode	off, manual, auto, profile
Measurement range pO2 min. [%sat]	0
Measurement range pO2 max. [%sat]	200
Resolution pO2 measurement [%sat]	0.01
Accuracy of pO2 measurement [%sat]	±0.3
pO2 control accuracy [%sat]	0.3
Exhaust Gas Analyzer	yes, with Blue Vary Sensor
OUR,CER,RQ calculation	yes, with Blue Vary Sensor
RQ feeding	yes, with Blue Vary Sensor
Digital pH sensor	yes, with EasyFerm Bio Arc Sensor
Measuring Range min. digital pH [pH]	0
Measuring Range max. digital pH [pH]	14
Accuracy digital pH [pH]	±0.02
Digital DO sensor	yes, with OxyFerm FDA Arc
Measuring Range min. digital DO [%sat]	0
Measuring Range max. digital DO [%sat]	200
Accuracy digital DO [%]	±2
Optical DO sensor	yes, with VisiFerm RS485-ECS
Measuring Range min. optical DO [%sat]	0
Measuring Range max. optical DO [%sat]	300
Accuracy optical DO [%]	±1
Biomass sensor	yes, with CGQ BioR Sensor
Measuring Range min. Biomass [OD]	0.5
Measuring Range max. Biomass [OD]	50
Digital Redox / ORP sensor	yes, with EasyFerm Plus ORP Arc
Measuring Range min. digital ORP [mV]	-1500
Measuring Range max. digital ORP [mV]	1500
Digital biomass sensor	yes, with Excell Sensor
Measuring Range min. digital biomass [AU]	0
Measuring Range max. digital biomass [AU]	6
Accuracy digital biomass [%]	±1
Viable Cell Density Sensors	yes, with Incyte Sensor
Measuring Range min. cell density [cells/mL]	5 x 10 <sup>5</sup>
Measuring Range max. cell density [cells/mL]	8 x 10 <sup>9</sup>
Accuracy cell density [%]	±1
Gas in connection Air [mm]	6
Gas out connection Air [mm]	6
Gas in connection O2 [mm]	6
Gas out connection O2 [mm]	6
Gas in connection N2 [mm]	6
Gas out connection N2 [mm]	6
Gas in connection CO2 [mm]	6
Gas out connection CO2 [mm]	6
Aeration mode	continuous & automatic
Display flowrate	l/min, cc/min
Input pressure [mbar]	200 - 3000
Pressure out min. [mbar]	200
Pressure out max. [mbar]	1000



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Flowrate Air min. [cc/min]	1
Flowrate Air max. [cc/min]	2000
Flowrate O2 min. [cc/min]	1
Flowrate O2 max. [cc/min]	2000
Flowrate N2 min. [cc/min]	1
Flowrate N2 max. [cc/min]	2000
Flowrate CO2 min. [cc/min]	1
Flowrate CO2 min. [cc/min]	2000
Measuring and control accuracy of the gas control units [% fsr]	±2
Peristaltic pump	yes
Numbers of pump heads	4
Pump head function	Acid, Base, AntiFoam, Level
Pump head	Watson Marlow 114DV
Number of pump tubes	4
Number of pump rollers	4
Flow rate min. [ml/min]	0.3
Flow rate max. [ml/min]	270
Flow rate control accuracy [ml/min]	±0.3
Pump Speed min. [rpm]	33
Pump Speed max. [rpm]	400
Pump reversible direction of rotation	yes
Pump speed display	TFT
Inner tube diameter min. [mm]	0.5
Inner tube diameter max. [mm]	4.8
Tube outer diameter min. [mm]	4.1
Tube outer diameter max. [mm]	8.4
Tube material	Silicone
Tube hardness [Shore A]	50 - 60
Dimensions (W x H x D) [mm]	224 x 624 x 405
Weight [kg]	14
Packing unit [pcs]	1
Permissible ambient temperature [°C]	5 - 40
Permissible relative humidity	80% (up to 31°C), decreasing linearly to max. 50 (@40°C)
Protection class according to DIN EN 60529	IP 20
RS 232 interface	yes
USB interface	yes
WiFi Interface	yes
Voltage [V]	100 - 240
Frequency [Hz]	50/60
Power input [W]	300
Power input max. [W]	1100
Power input standby [W]	10
Fuse	2x T5.0A 250V