INFORS HT
We bring life to your laboratory

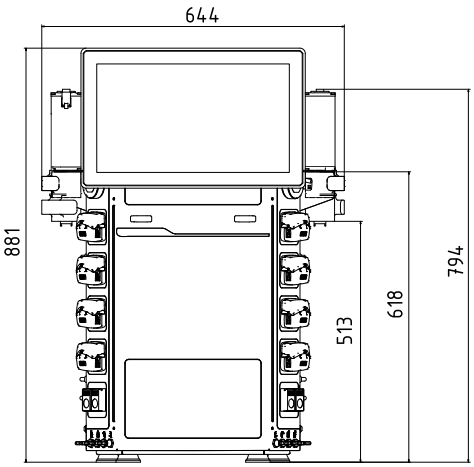
Multifors 3



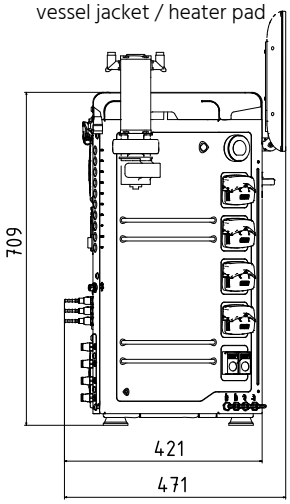
The Multifors 3 is a bench-top bioreactor platform for bioprocess development across a wide range of applications. Designed to support flexible process development today while adapting to future workflow requirements, it combines comprehensive process control, open communication, and scalable configurations in a single platform. This data sheet summarizes the key specifications, features, and available options for the Multifors 3 bioreactor.

Dimensions

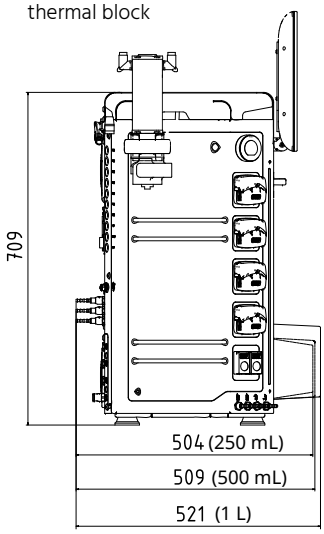
Dimensions Control Tower (in mm)



Temperature control vessel jacket / heater pad

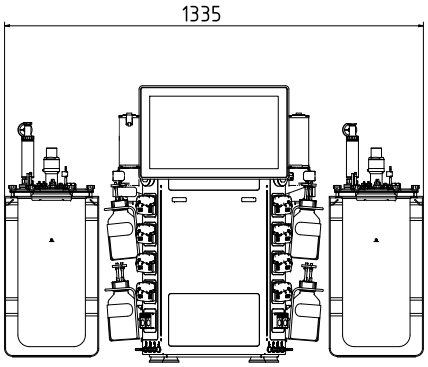


Temperature control thermal block

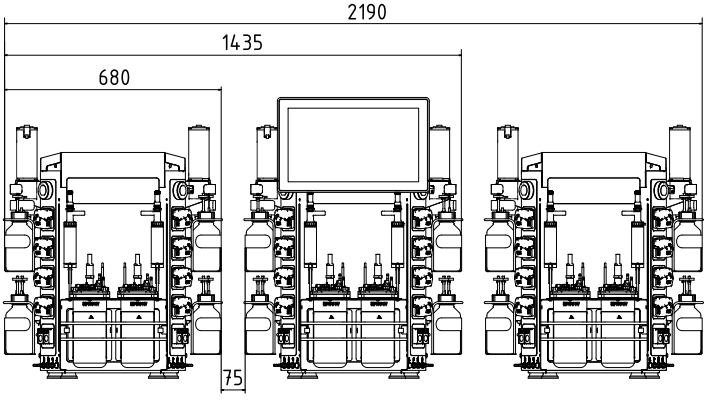


Dimensions Typical Configurations (in mm)

Control tower with two 10 L vessels



Control tower with two satellites and six 1 L vessels



Weight

Weight control tower (fully equipped) with touchscreen	approx. 68 kg
Weight control tower (fully equipped) without touchscreen	approx. 64.6 kg

Culture Vessel

Glass Vessels

INFORS HT offers glass vessels with a working volume range of 100 mL to 10 L.

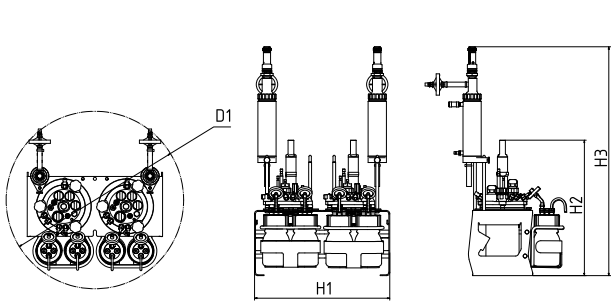
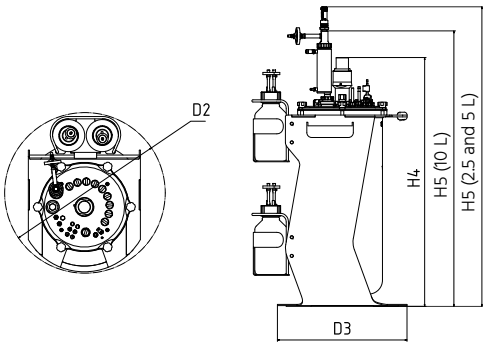
Vessel sizes and weight							
Total volume		375 mL	750 mL	1.5 L	3.75 L	7.5 L	15 L
Maximum working volume		250 mL	500 mL	1 L	2.5 L	5 L	10 L
Minimum working volume		100 mL	200 mL	0.33 L	0.83 L	1.75 L	3.3 L
Nominal diameter (DN, inner diameter vessel)		64 mm	73 mm	95 mm	125 mm	160 mm	201 mm
Height	Single walled	123 mm	186 mm	230 mm	315 mm	390 mm	490 mm
	Double walled	--	--	--	330 mm	405 mm	508 mm
Available models *(SW = single walled, DW = double walled)*		SW	SW	SW	SW, DW	SW, DW	SW, DW
Weight *(empty vessel in delivery state with vessel stand, equipped with default built-in-parts, approximate values)*	Single walled	6 kg	7.4 kg	9.2 kg	11.5 kg	15 kg	23 kg
	Double walled	--	--	--	12.5 kg	16.5 kg	25.5 kg

Form and materials	
Form	Cylindrical with flat bottom and rounded edges
Material glass vessel	Borosilicate glass
Material top plate and built-in-parts (in contact with product)	AISI 316L, electropolished
Material O-rings (in contact with product)	EPDM

Ports in top plate		Quantity according to vessel size					
Size	Typical usage	250 mL	500 mL	1 L	2.5 L	5 L	10 L
M10x0.5	Sparger, dip tubes and level/foam sensors	3	3	4	4	4	4
M10x1	Feed needles, temperature sensor (250 mL and 500 mL)	5	6	6	6	6	6
M12x1	Exit gas cooler (250 mL to 1 L), temperature sensor (1 L to 10 L)	1	1	2	1	1	1
Pg13.5	Sensors, septum collar, exit gas cooler (2.5 L and 5 L), safety valve (10 L)	4	4	5	8	10	10
M25x1	Exclusively for drive hub motor	1	1	1	--	--	--
M36x2 [1)]	Exclusively for exit gas cooler and cold finger	--	--	--	--	--	2
M40x2	Exclusively for drive hub motor	--	--	--	1	1	1
D = 4.3	Exclusively for baffles	--	--	--	4	4	4

[1)] *Equipped with adapters Rd28x1/8" / 19 mm*

Dimensions Culture Vessels

Small vessels	Large vessels
	

	Vessel 250 mL	Vessel 500 mL	Vessel 1 L		Vessel 2.5 L	Vessel 5 L	Vessel 10 L
D1	370 mm	370 mm	400 mm	D2	330 mm	360 mm	430 mm
H1	282 mm	298 mm	338 mm	D3	256 mm	296 mm	347 mm
H2	283 mm	333 mm	364 mm	H4	485 mm	565 mm	666 mm
H3	477 mm	521 mm	563 mm	H5 [1]	620 mm	700 mm	737 mm

[1] *For 2.5 L and 5 L vessels, the safety valve is installed on the exit gas cooler. For 10 L vessels, it is mounted in the vessel top plate.*

Single-Use Vessels

Besides the glass vessels available from INFORS HT, different single-use vessels from third-party manufacturers are supported. For each of these vessels, corresponding adapters are available to connect the motor. The following single-use vessels are supported:

Manufacturer	Eppendorf		Sartorius	Merck
Type	BioBLU® 3 c	BioBLU® 10 c	Univessel® SU 2 L	Mobius® Cellready 3 L
Max. working volume	3.75 L	10 L	2 L	2.4 L
Min. working volume	1.25 L	3.3 L	0.6 L	1 L

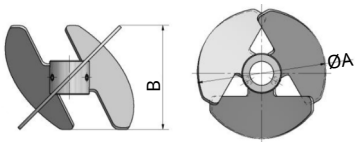
Stirrer

General specifications	
Motor type	Brushless DC servo motor (BG series)
Sealing concept	Hermetically sealed by means of a magnetic coupling and containment shell, ensuring complete separation of the process medium within the vessel from the surrounding atmosphere.

Stirrer for Glass Vessels – Cell

Specifications drive	250 mL to 1 L	2.5 L to 10 L
Direction of rotation (top view)	Clockwise/counter-clockwise	Counter-clockwise
Nominal power and torque of motor	91.9 W / 0.69 Nm	91.9 W / 4.31 Nm
Range rotation speed	0 to 650 min^{-1}	
Accuracy measurement	± 6 min^{-1}	
Accuracy control	± 10 min^{-1}	

Impellers for cell device version – general specifications	
Type	Pitched blade impeller with 3 blades, angled 45°
Material	AISI 316L, electropolished
Quantity	1
Flow direction blades	Down- or upflow (250 mL to 1 L: direction of rotation reversible; 2.5 L to 10 L: dedicated impellers for down- or upflow)

Impellers for cell device version – dimensions		250 mL	500 mL	1 L	2.5 L	5 L	10 L
	A	28 mm	32 mm	50 mm	65 mm	85 mm	105 mm
	B	16 mm	18.6 mm	27 mm	52 mm	65 mm	81 mm

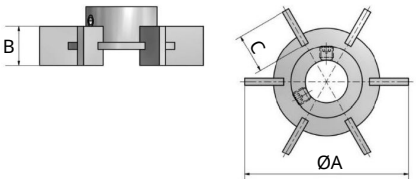
Stirrer for Glass Vessels – Microbial

Specifications drive	250 mL to 1 L	2.5 L to 10 L
Direction of rotation (top view)	Counter-clockwise	
Nominal power and torque of motor	91.9 W / 0.69 Nm	306 W / 3.06 Nm
Range rotation speed	0 to 1600 min^{-1}	2.5 L and 5 L: 0 to 1600 min^{-1} 10 L: 0 to 1000/1200 min^{-1} [2]
Accuracy measurement	± 6 min^{-1} or 0.6 % of SP [1]	
Accuracy control	± 10 min^{-1} or 1 % of SP [1]	

[1] *The higher of the two values applies.*

[2] *10 L vessel: Total flow rate sparger ≥ 10 L min^{-1}: max. 1200 min^{-1}; total flow rate sparger < 10 L min^{-1}: max. 1000 min^{-1}*

Impellers for microbial device version – general specifications		
Type		Rushton impeller, 6 blades
Material	Impeller for vessel 250 mL to 1 L	PEEK
	Impeller for vessel 2.5 L to 10 L	AISI 316L, electropolished
Quantity		Standard: 2, option: 3

Impellers for microbial device version – dimensions		250 mL	500 mL	1 L	2.5 L	5 L	10 L
	A	22.3 mm	30 mm	38 mm	46 mm	54 mm	70 mm
	B	6 mm	8 mm	9 mm	11 mm	11 mm	13 mm
	C	4.5 mm	8 mm	11 mm	11 mm	11 mm	19 mm

Stirrer for Single-Use Vessels

	BioBLU® 3 c	BioBLU® 10 c	Univessel® SU 2 L	Mobius® Cellready 3 L
Nominal power and torque of motor	91.9 W / 4.31 Nm			
Range rotation speed, min^{-1}	0 to 200	0 to 200	0 to 400	0 to 350
Direction of rotation [1]	CCW	CCW	CW	CCW

[1] *Valid for downwards flow direction; CW = clockwise, CCW = counter-clockwise.*

Gassing System

General specifications	
Gases	Air, O_2, N_2 and CO_2
Gas entry	Sparger and head space, fix or switchable via solenoid valve
Gas flow and gas mix control	Microbial processes: 1 MFC per gas; Cell processes: 1 or 2 MFC(s) per gas *(gas can be supplied via sparger and head space in parallel)*
Pressure safety	Safety valves 0.5 bar(g) in sparger and head space lines; additional safety valve on exit gas cooler or top plate

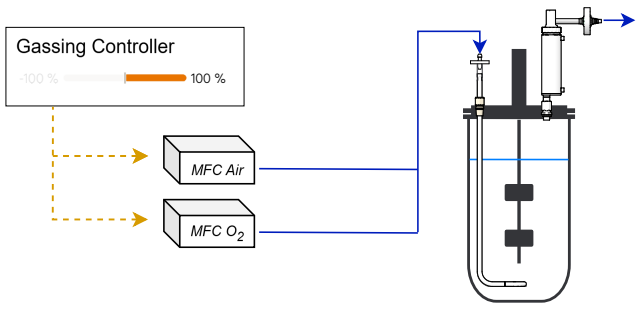
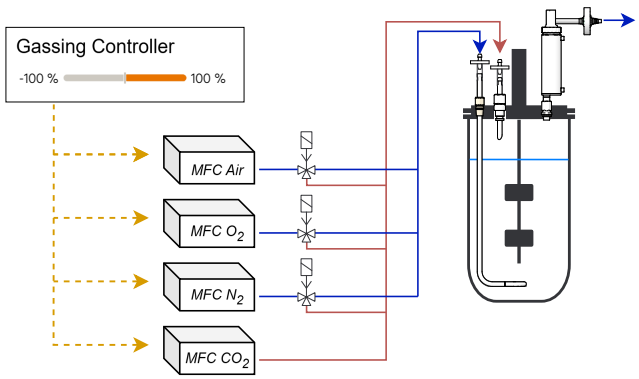
Measurement ranges and flow rates		250 mL to 1 L	2.5 L to 10 L
Measurement range mass flow controller	Sparger microbial and head space	3.75 to 2000 mL min^{-1}	375 to 20000 mL min^{-1}
	Sparger cell	0.375 to 200 mL min^{-1}	3.75 to 2000 mL min^{-1}
Maximum total flow (summed flow rate)	Sparger microbial and head space	2000 mL min^{-1}	20000 mL min^{-1}
	Sparger cell	200 mL min^{-1}	2000 mL min^{-1}
Specific gassing rate *(calculated for the max. working volume for all vessel sizes)*	Sparger microbial and head space	2 min^{-1}	
	Sparger cell	0.15 min^{-1}	

Control ranges and accuracy – glass vessels		250 mL	500 mL	1 L	2.5 L	5 L	10 L
Control range max., mL min^{-1} *(minimum is always 0 mL min^{-1})*	Sparger microbial and head space	500	1000	2000	5000	10000	20000
	Sparger cell	37.5	75	150	375	750	1500
Accuracy measurement and control	Sparger microbial and head space	± 4 mL min^{-1} or 2 % of SP [2]			± 40 mL min^{-1} or 2 % of SP [2]		
	Sparger cell	± 0.4 mL min^{-1} or 2 % of SP [2]			± 4 mL min^{-1} or 2 % of SP [2]		

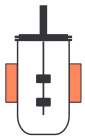
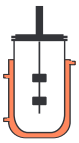
Control ranges and accuracy – single-use vessels		BioBLU® 3 c	BioBLU® 10 c	Univessel® SU 2 L	Mobius® Cellready 3 L
Control range max., mL min^{-1} *(minimum is always 0 mL min^{-1})*	Sparger	100/562.5 [3]	100/1500 [3]	300	360
	Head space	5000	5000	13000	--
Accuracy measurement and control	Sparger	± 4 mL min^{-1} or 2 % of SP [2]			
	Head space	± 40 mL min^{-1} or 2 % of SP [2]			

[2] *SP = setpoint; the higher of the two values applies.*

[3] *Lower value with microsparger, higher value with macrosparger.*

Example: Gassing strategy for microbial processes	Example: Gassing strategy for cell processes
In the following example, two gases (air and O_2) are available and supplied to the sparger.	In the following example, four gases (air, O_2, N_2 and CO_2) are available. Air, O_2 and N_2 can either be supplied to the sparger or head space (switchable via solenoid valve), CO_2 is supplied to the head space.
	

Temperature Control System

Overview options temperature control		Heating	Cooling	Compatible culture vessels
Thermal block		Two heating cartridges in thermal block, totally 200 W per vessel	Tap water [1] passing through thermal block	Single walled glass vessels with max. WV 250 mL to 1 L
Heater pad		Heater pad, 200 W to 300 W, depending on vessel size	Tap water [1] passing through cold finger (optional)	Single walled glass vessels with max. WV 2.5 L to 10 L and single-use vessels
Vessel jacket		Water circuit via vessel jacket, two heating cartridges integrated into the control tower, totally 300 W per vessel	Tap water [1] via water circuit in vessel jacket	All double walled glass vessels (max. WV 2.5 L to 10 L)

[1] *A recirculating chiller can be used instead of tap water for the cooling system.*

General specifications		
Sensor type		Pt100 1/3 DIN-B
Control range *(valid with a flow temperature of the cooling water of 5 °C)*	Glass vessels	10 to 60 °C
	Single-use vessels	10 to 40 °C
Accuracy measurement *(at 5 to 60 °C)*		± 0.2 °C
Accuracy control		± 0.5 °C

pH Control

General	
Control	Addition of acid and base via peristaltic pumps or with CO_2 instead of acid
Control range	pH 2 to 12
Accuracy measurement	pH ± 0.1

Measurement system HAMILTON (for glass vessels)	
Sensor type	Easyferm Plus ARC
Measurement range	pH 0 to 14

Measurement system METTLER (for glass vessels)	
Sensor type	InPro 3253i, ISM
Measurement range	pH 0 to 12

Measurement system HAMILTON (for single-use vessels)	
Sensor type	OneFerm pH VP NTC
Measurement range	pH 3 to 10

pO_2 Control

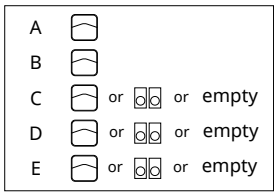
General	
Control via cascade	Stirrer, gas flow, gas mixture (addition of O_2)
Control range	0 to 100 %-sat.
Accuracy measurement	± 1 %

Measurement system HAMILTON (for glass vessels)	
Sensor type	VisiFerm RS485-ECS
Measurement range	0 to 300 %-sat.

Measurement system METTLER (for glass vessels)	
Sensor type	InPro6860i, ISM
Allowed temperature range	0 °C to 60 °C
Measurement range	0 to 285 %-sat.

Measurement system HAMILTON (for single-use vessels)	
Sensor type	VisiFerm SU RS485-ECS
Measurement range	0 to 300 %-sat.

Pumps

Quantity/arrangement of the pumps	
■ There are five installation positions on each side of the control tower. Each can either take one large or two small pumps. ■ The top two positions (A and B) are always equipped with large pumps. ■ Two culture vessels: same pump configuration for both vessels mandatory.	

Small Pumps

General specifications		
Type		Peristaltic, pump head Watson Marlow 400
Rotation speed	High speed *(for max. 10 min in any time window of 50 min)*	0.1 to 300 min^{-1}
	Low speed *(continuous pumping ≤ 28 d)*	0.1 to 12 min^{-1}
Accuracy		< 3 min^{-1}

Pump hoses and flow rates		
Inside diameter		1.85 mm
Wall thickness		0.85 mm
Material		Santoprene
Flow rate *(values valid for new santoprene tube element)*	Continuous pumping ≤ 10 min	0.008 to 25 mL min^{-1}
	Continuous pumping > 10 min to ≤ 28 d	0.008 to 1 mL min^{-1}

Large Pumps

General specifications		
Type		Peristaltic, pump head Watson Marlow 116DV
Rotation speed	High speed *(for max. 60 min in any time window of 90 min)*	0.1 to 400 min^{-1}
	Low speed *(continuous pumping ≤ 28 d)*	0.1 to 100 min^{-1}
Accuracy		< 2 min^{-1}

Pump hoses and flow rates		Option 1	Option 2	Option 3
Inside diameter		0.5 mm	2.4 mm	4.8 mm
Wall thickness		1.6 mm		
Material		Marprene		
Flow rate *(values valid for new marprene pump hoses)*	Continuous pumping ≤ 60 min	0.002 to 8 mL min^{-1}	0.03 to 120 mL min^{-1}	0.1 to 350 mL min^{-1}
	Continuous pumping > 60 min to ≤ 28 d	0.002 to 2 mL min^{-1}	0.03 to 30 mL min^{-1}	0.1 to 88 mL min^{-1}

Process Monitoring (Optional Sensors)

Turbidity / Total Cell Density Measurement	
Measurement system Optek	
Sensor type	ASD12-N
Optical path lengths (OPL)	5 mm (high cell densities) 10 mm (low cell densities)
Measurement range absorption	0 to 4 CU (*CU = Concentration Units*)
Measurement system Hamilton	
Sensor type	Dencytee Arc RS485
Measurement range absorption	0 to 4 AU (*AU = Absorption Units*)

Permittivity / Viable Cell Density Measurement	
Sensor type	Incyte ARC
Measurement range	0 to 700 pF cm^{-1}

Redox Measurement	
Sensor type	Easyferm Plus ORP ARC
Measurement range	-1500 to +1500 mV

Conductivity Measurement	
Sensor type	Conducell 4USF ARC with built-in electronics
Measurement range	1 to 300000 µS cm^{-1}

pCO_2 Measurement	
Sensor type	CO_2NTROL RS485
Measurement range	0.5 to 100 % vol

Glucose Measurement	
Sensor type	GlucoSense RS485
Measurement range	0.5 to 25.0 g L^{-1}

Exit Gas Analysis		
Sensor types		BlueInOne (Ferm and Cell), BlueVary
Measurement ranges, Vol. %	BlueInOne Ferm	CO_2: 0 to 10 , O_2: 1 to 50
		CO_2: 0 to 25, O_2: 1 to 50
	BlueInOne Cell	CO_2: 0 to 10, O_2: 0 to 100
		CO_2: 0 to 25, O_2: 0 to 100
	BlueVary (CO_2)	0 to 10 / 0 to 25 / 0 to 50
	BlueVary (O_2, ZrO_2)	0.1 to 25 / 0.1 to 50
	BlueVary (O_2, eC)	0 to 25 / 0 to 50 / 0 to 100

Antifoam/Level Control (Glass Vessels only)

Sensor	Conductive; available either as dosing needle or as rod; DC-free measurement
Control	Peristaltic pump assigned to the corresponding parameter

Perfusion Package (Optional)

The Perfusion Package enables long-term cultivation at high cell densities through continuous medium exchange while retaining the cells within the bioreactor. The Perfusion Package consists of the following components:

- LCO-i100 process control unit (Levitronix)
- LEVIFLOW® LFSC-iX clamp-on flow sensor (Levitronix)
- PuraLev® i30SU pump (Levitronix)
- 3 x PendoTECH® Pressure sensor (Mettler-Toledo)
- 2 x dip tubes with ID = 6 mm
- Tubing set including connectors
- List of recommended filters

Balances (Optional)

The following balance types are supported:

- KERN: KCP-compatible balances
- Mettler Toledo: MT-SICS-compatible balances

Balances are connected via Ethernet. Balances equipped with a serial interface can be integrated using a serial-to-Ethernet converter.

INFORS HT recommends and supplies the following models:

A: Mettler MX6002
B: Mettler MX32001L
C: Kern FKB 6K0.02-B
D: Kern DS 30K0.1-A

	A	B	C	D
Max. capacity, kg	6.2	32.2	6	30
Readability, g	0.01	0.1	0.02	0.1
Power supply	100 to 240 V, 50/60 Hz, 0.3 A			

Note: The weight of a fully equipped and filled 10 L vessel exceeds 32 kg. The balances listed above are therefore not suitable for 10 L vessels. A suitable balance will soon be available through INFORS HT. Please contact INFORS HT if additional information is required.

Control Tower

Material housing		AISI 304
Coating housing		Optionally white powder-coated or uncoated
IP rating	Overall device	IP42
	Front, top and sides of control tower	IP53

Electrical Connection and Power Values

	Variant 115 V	Variant 230 V
Mains input voltage	100 to 140 VAC	207 to 253 VAC
Mains input frequency	60 Hz	50/60 Hz

Maximum current [1)]	14.4 A	5.9 A
Maximum active power [1)]	1550 W	1450 W
Maximum apparent power [1)]	1850 VA	1485 VA

[1)] *Maximum values measured for a fully equipped system with two 10 L vessels and active heating and stirring. Values may vary depending on supply voltage and system configuration.*

Operating Panel

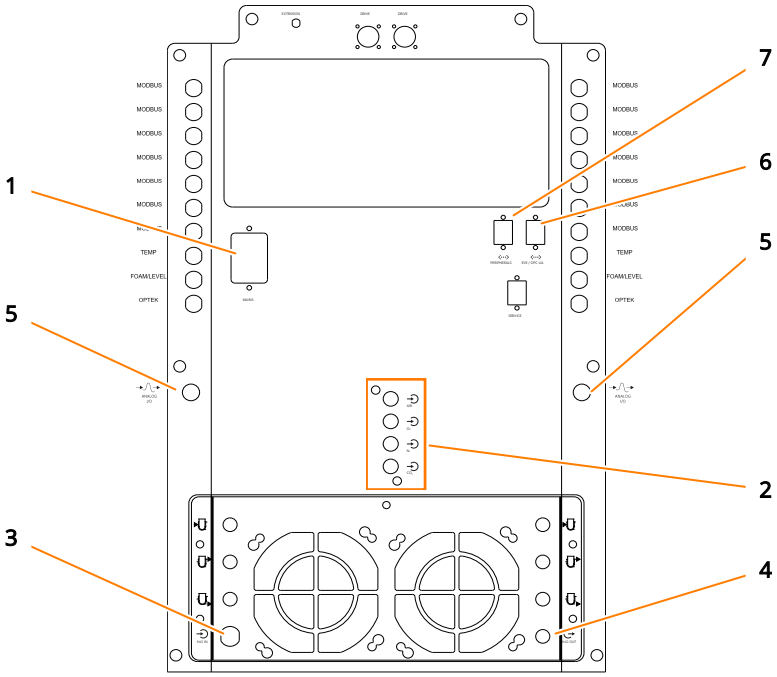
Control and display	IPC with full HD touchscreen
Screen size and resolution	18.5" / 1920 x 1080
Protection class as per DIN EN 60529	IP65 (I/O shield: IP30)
Controllable vessels with one panel	Up to 6

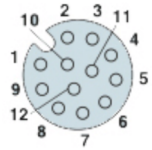
Operating and Transport Conditions

Operating conditions	
Ambient temperature	15 to 30 °C
Ambient humidity	20 to 90 %, non-condensing
Ambient pressure	780 to 1013 mbar(a)
Altitude operating location	max. 2000 m.a.s.l
Pollution degree as per EN 61010-1	2

Transport conditions (for max. 100 hours)	
Ambient temperature	5 to 55 °C
Ambient humidity	10 to 90 %, non-condensing

Connections/Utilities



Pos.	Connection	Type	Specifications and requirements
1	Power supply	C20 socket	■ 230 V version: 207 to 253 VAC, 50/60 Hz ■ 115 V version: 100 to 140 VAC, 60 Hz ■ Single-phase, constant power supply ■ The power supply of the device must be made safe by the use of an FI-switch (or RCD – Residual Current Device) of the kind RCCB, Type B on the customer's side.
2	Gas inlets	Hose nozzle 6 mm	■ Inlet pressure: 3 ± 0.5 bar(g) ■ Process gases must be dry, clean, and free of oil and dust. ■ Recommended compressed air quality for process air according to DIN ISO 8573-1: class 1.2.1
3	Water inlet	Push-in fitting	■ Inlet pressure: 2 ± 1 bar(g) ■ Water quality: $CaCO_3$ concentration 0 to 1.5 mmol L^{-1} ■ Inlet temperature: 5 to 15 °C ■ Manometer to check the primary pressure available
4	Water outlet	Push-in fitting	■ Heat-resistant (up to 130 °C) ■ Non-buckling and without backpressure (maximum allowed pressure on outlet is < 0.1 bar(g)).
--	Exit gas	Hose nozzle exit gas filter	■ Exit gas must be dissipated securely. ■ Exit gas line must be higher than exit gas filter.
5	Analog I/Os		■ 12 Pin M12 connector, female, A-coded ■ Pin 1 and Pin 2: auxiliary supply (24 V, 500 mA) ■ Pin 3 to Pin 10: galvanically isolated 4...20mA inputs/outputs (2 each), differential two-wire interface ■ Pin 11 and Pin 12: not connected
6	Ethernet eve / OPC UA	Used to integrate the device in the customer network via a switch (e.g. to connect it to eve® or other bioprocess software).	
7	Ethernet Peripherals	Used to connect the switch to integrate the following peripherals: Multifors 3 satellite devices, balances and perfusion systems.	

Multifors 3 Bioreactor and eve® Bioprocess Software



eve® is a powerful platform software for bioprocess planning, execution, and analysis. It centralizes process data, transforms it into actionable knowledge, and enables efficient management of bioprocesses from simple workflows to complex, multi-phase strategies.

Key benefits:

- Centralized bioprocess data and knowledge management
- Integrated planning, monitoring, control, and analysis in one platform
- Open connectivity with INFORS HT systems and third-party devices
- Advanced insights through soft-sensors
- Browser-based access with no local installation required
- Flexible software packages tailored to different user needs
- Premium version compliant with FDA 21 CFR Part 11 requirements

In short: eve® provides a connected, data-driven environment that helps organizations optimize bioprocesses, accelerate decision-making, and maximize the value of their process knowledge.

eve®: The intelligence inside Multifors 3

Multifors 3 and eve® work seamlessly together to plan, execute, and document the complete control strategy for every process, extending far beyond simple setpoint management. From recipe creation and controller presets to hardware configuration, process parameters, and documentation, every aspect of a process is planned, managed, and captured end-to-end. This comprehensive approach enhances reproducibility, streamlines technology transfer, and reduces the time, effort, and risk associated with manually configuring new experiments.

When used with eve®, Multifors 3 can continue executing the batch strategy independently, even if the network connection to the SCADA system is interrupted. Process data is buffered locally and automatically synchronized once connectivity is restored. This capability significantly improves process reliability and safety by ensuring uninterrupted operation during network outages or power-related disruptions.