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Benchtop bioprocessing solutions

Flexible, reliable bioreactor and control systems for laboratory applications

ThermoFisher SCIENTIFIC

Robust bioprocessing solutions for small-scale applications

Thermo Scientific™ HyPerforma™ bioprocess control systems are designed to optimize your process, from the laboratory bench to full cGMP manufacturing. Our innovative control platform combines a flexible operating system with scalable, modular hardware, and state-of-the-art bioreactors for strategic and streamlined bioprocess control.

HyPerforma benchtop solutions offer robust management of both cell culture and fermentation processes. The open architecture provides process flexibility, and dedicated hardware control allows for expansion. Thermo Scientific™ TruBio™ software is designed to support easy process control and scaling.

Standard system components for benchtop solutions

- Thermo Scientific™ TruBio™ Bioprocess Control Software solutions powered by the Emerson™ DeltaV™ Distributed Control Platform
- Thermo Scientific™ HyPerforma™ GXCore™ Bioprocess Controller
- Thermo Scientific™ HyPerforma™ G3Lab™ Bioprocess Controller
- Thermo Scientific™ Gas Mass Flow Controllers (MFCs)
- Thermo Scientific™ HyPerforma™ Glass and Rocker Bioreactors
- Sensors and pumps

TruBio Bioprocess Control Software

Automation software and control platforms

The technology and data transfer during the lifecycle of drug development, from bench-scale laboratory applications to large-scale production, is often challenging and time-consuming, and involves many different user requirements. The Thermo Scientific™ TruBio™ Bioprocess Automation and Control Software helps improve tech transfer time and validation costs by running on a consistent data model from R&D to commercial production.

Because TruBio software is powered by the Emerson™ DeltaV™ Discovery platform at lab scale and the DeltaV Distributed control platform (at pilot, clinical, and production scales), considerable savings have been achieved in risk mitigation by reducing, for example, training and validation costs. Standardizing with open architecture controllers simplifies data transfer and storage, resulting in the introduction of new products to market, faster.

For research and process development solutions

The TruBio Discovery Bioprocess Control software platform provides a simplified solution to meet the needs of research and process development labs. This platform provides the benefit of transferring to processes that require a higher level of qualification and control. A single workstation-based controller is utilized to execute process control strategies.

For production-scale solutions

TruBio Bioprocess Control software with the Thermo Scientific™ TruLogic™ controller provides flexible and reliable state-of-the art control capabilities. With multiple sensor loops as well as gas and liquid addition capabilities, this software can be used with both Thermo Scientific™ HyPerforma™ Single-Use Bioreactors (S.U.B.s), Single-Use Fermentors (S.U.F.s), and Single-Use Mixers (S.U.M.s), and third-party bioreactors to provide a process control platform from research through commercial manufacturing.

For downstream solutions

Based on the same robust, validated platform as TruBio Bioprocess Control software, Thermo Scientific™ TruChrom™ and TruPur™ customizable software platforms are designed specifically to control common third-party chromatography and purification skids. This allows for integration and control of downstream processes to help ensure transferability of data throughout the workflow.

HyPerforma GXCore Controller

Adaptable, modular technology

The HyPerforma GXCore Bioprocess Controller is an innovative, open-architecture, cost-effective controller offering a compact design while providing customers with access to our standard TruBio software on the Emerson DeltaV platform—enabling users to easily scale up and adapt to suit specific process and application goals.

The HyPerforma GXCore Bioprocess Controller can control most bench-scale single-use bioreactors and fermentors up to a 20 L total volume, regardless of manufacturer. Taking up a small footprint to allow for more room on the bench, the GXCore Bioprocess Controller is complete with all functionalities required by most research and process development applications.

True to the Thermo Scientific™ bioprocess controller portfolio, the HyPerforma GXCore Bioprocess Controller operates with TruBio Bioprocess Automation Software. This provides the research and process development scientist an easy and intuitive user interface to control the culture process, on a robust platform that maintains data integrity for process characterization and scalability from bench to pilot scale and commercial manufacturing.

HyPerforma GXCore Bioprocess Controller*	Cat. No.
Suitable for glass and bench-scale single-use bioreactors	F100-7000-000

* Control solution must be ordered. Contact your local sales representative for details.

Key features

- Open-architecture capabilities to integrate with vessels from other suppliers
- Reduced footprint and stackable system for saving space on the bench
- Suitable for both beginner and experienced researchers
- Auxiliary connections to allow future expansion and additional capabilities*
- User-defined LED strip lighting for status and alarm state
- TruBio Bioprocess Control software powered by the Emerson DeltaV platform, a common control platform that can be used from R&D to Manufacturing; capable of taking non-GMP research and process development applications to GMP commercial scale with ease
  - **For non-GMP research and process development applications:** TruBio Discovery Bioprocess Control Software powered by the DeltaV Discovery platform
  - **For GMP and typical scale-up to manufacturing applications:** TruBio Bioprocess Control Software powered by the conventional DeltaV platform

* Future options available for control of up to 30 L single-use fermentor (S.U.F.) and 50 L single-use bioreactor (S.U.B.)

HyPerforma GXCore Bioprocess Controller specifications		
Physical		
Utility tower dimensions (H x W x D)	30 x 25 x 36 cm (11.8 x 9.8 x 14.2 in.)	
Weight/shipping weight	5.5 kg/7.1 kg (12 lb/15.5 lb)	
Enclosure rating	IP5X	
Operating conditions		
Operating temperature	5–40°C (41–104°F)	
Relative humidity	5–95%, noncondensing	
Utility	**Connection**	
Liquid control	Watson-Marlow™ 114 series variable-speed peristaltic pumps	
	Tubing ID: 0.8 mm (wall thickness: 1.6 mm)	Tubing ID: 4.8 mm (wall thickness: 1.6 mm)
Flow range	Minimum: 0.16–5.5 mL/min	Maximum: 3–104 mL/min
Gas control	Choice of HyPerforma GXCore MFC 4 x 2 or Thermo Scientific™ TruFlow™* MFC with up to 6 x 3 gases* (see the **benchtop solutions brochure** for specifications)	
Ancillaries		

- One discrete I/O for external foam/level pump
- Scales available for vessel weight
- Foam sensor

Compliance

- CE, TUV(Rheinland), RoHS

Watson-Marlow 114 series variable-speed peristaltic pump specifications	
Power supply	24 V DC
Max. current (at 25°C)	0.25 A
Average current (at 25°C)	0.2 A
Speed	5–160 rpm
Accuracy	±2 rpm or ±2% of setpoint
Tubing (thickness, ID)	1.6 mm wall thickness, ID range: 0.8 mm (min.) to 4.8 mm (max.)

Watson-Marlow 114 series peristaltic pump speeds	
Speed (rpm)	**Minimum/maximum flow rate (mL/min)**
1	0.16/3
10	0.3/6
50	1.7/30
100	3.4/57.5
160	5.5/104

Maximum pump speed is 175 rpm at a flow rate of 6 mL/min, or 111 rpm depending on tubing.

*For additional gases, please contact your sales representative for further details.

HyPerforma G3Lab Controller

Reliable process control

The HyPerforma G3Lab Bioprocess Controller can control most brands of single-use or autoclavable bioreactors or fermentors that are ≤50 L, including stirred-tank and rocking models. The controller operates using TruBio automation platforms, which make a scale-up or scale-down process easy and feature the configurability to modify your control strategy along with your process. The enclosure contains state-of-the-art transmitters along with power supplies, pumps, I/O modules, and the hardware required to connect to the control network, providing maximum control capability.

Key features

- Open architecture capabilities to integrate with vessels from other suppliers
- Coupled with TruBio software and DeltaV control platform allow for data transfer and scalability from R&D, to production, to manufacturing
- The ability to build and manage complex, multifeed dosing strategies
- Allows for third-party peripheral integration as needed

Ordering information

HyPerforma G3Lab Controller*	Cat. No.
HyPerforma G3Lab Controller for the use with DeltaV or DeltaV Discovery and TruBio software licenses with 4 Watson-Marlow 114 series pumps, suitable for glass and benchtop single-use bioreactors	ATO-G3Lab-Std
HyPerforma G3Lab Controller for the use with DeltaV or DeltaV Discovery and TruBio software licenses, with 4 Watson-Marlow 114 series pumps, suitable for glass and benchtop single-use and rocker bioreactors	G3Lab-Full-Config

* Each HyPerforma G3Lab Controller needs to be operated using the TruFlow MFC and appropriate automation platform.
Please contact your Thermo Fisher Scientific sales representative for more information on standard package options suitable for your requirements.

HyPerforma G3Lab Controller specifications		
Cover description		
Top cover material	Stainless steel cover, aluminum chassis	
Physical		
Utility tower dimensions (H x W x D)	438.4 x 240 x 482.6 mm (17.25 x 9.38 x 19 in.)	
Weight/shipping weight	16.4 kg/21.4 kg (36.5 lb/47 lb)	
Enclosure rating	Standard: NEMA 2	
Operating conditions		
Operating temperature	5°C to 40°C (41°F to 104°F)	
Storage temperature	5°C to 40°C (41°F to 104°F)	
Relative humidity	5% to 95% (noncondensing)	
Utility	**Connection**	
Liquid control	Watson-Marlow 114 series peristaltic pumps	
	Tubing ID: 0.8 mm (wall thickness 1.6 mm)	Tubing ID: 4.8 mm (wall thickness 1.6 mm)
Flow range	Minimum: 0.16 mL/min to 5.5 mL/min	Maximum: 3 mL/min to 104 mL/min
Gas control (TruFlow controller)	Up to four MFCs with output connectors (please see MFC page for details)	

Watson-Marlow 114 series variable-speed peristaltic pump specifications	
Power supply	24 V DC
Max. current (at 25°C)	0.25 A
Average current (at 25°C)	0.2 A
Speed	5–160 rpm
Accuracy	±2 rpm or ±2% of setpoint
Tubing (thickness, ID)	1.6 mm wall thickness, ID range: 0.8 mm (min.) to 4.8 mm (max.)

Watson-Marlow 114 series peristaltic pump speeds	
Speed (rpm)	**Minimum/maximum flow rate (mL/min)**
1	0.16/3
10	0.3/6
50	1.7/30
100	3.4/57.5
160	5.5/104

Maximum pump speed is 175 rpm at a flow rate of 6 mL/min, or 111 rpm depending on tubing.

Gas mass flow controllers (MFCs)

Strategic gas management

MFC for the HyPerforma G3Lab Bioprocess Controller

The TruFlow gas MFC is designed to work with all of the HyPerforma bioreactor control systems. Its compact assembly provides up to six standard mass flow controllers and three associated solenoid valves. When connected, the TruFlow gas MFC is instantly recognized by TruBio software to help provide precise control of gas flow, without requiring any configuration, even at extremely low flow rates.

Key features

- Variety of flow rate options*
- Flow range configurability
- Plug-and-play connectivity

TruFlow gas MFC for HyPerforma G3Lab Bioprocess Controller specifications	
Enclosure dimensions (H x W x D)	Six mass flow controllers: 9.1 x 7.4 x 6.2 in.
Rating	NEMA 1, IP 51 (liquid wipedown)
Maximum gas flow rate	Configurable up to 30 L/min*
Weight/shipping weight	5.8 kg/9.1 kg (12.8 lb/20 lb)
Operating temperature	5ºC to 40ºC (41ºF to 104ºF)
Storage temperature	–25ºC to 70ºC (–15ºF to 158ºF)
Relative humidity	5% to 95% (noncondensing)
Certifications	EN 61010-1 and EN 61326-1
Inlet pressure	1.6 to 2.3 bar/25 to 35 psig
Outlet pressure	0 to 1.38 bar/0 to 20 psig
Accuracy	±0.8% of flow rate and ±0.3% full scale (Burkert)
Repeatability	±0.1% full scale (Burkert)
Cable assembly	2 m (6 ft) standard

MFCs with flow rates higher than 50 L/min are mounted as individual units and are not part of the main MFC block.

* May require additional configuration for specific flow rate. Please consult with your local Thermo Fisher sales representative for more information.

Gas MFC for the HyPerforma GXCore Bioprocess Controller

The MFC for the HyPerforma GXCore Bioprocess Controller is a compact assembly providing 4 MFCs and two associated solenoid valves for gas sparge and overlay. When connected, the MFC is instantly recognized by TruBio software to provide precise control of gas flow.

- Option of 0.002–1 slpm or 0.03–15 slpm in aluminum or stainless steel
- Plug-and-play connectivity

Gas MFC for HyPerforma GXCore Bioprocess Controller specifications	
Enclosure dimensions (H x W x D)	15.6 x 16.5 x 16.5 cm (6.1 x 6.4 x 6.4 in.)
Power requirements	24 V DC, 1.0 A (min.)
Enclosure rating	IP5X
Maximum gas flow rate	0.002–1 slpm or 0.03–15 slpm
Weight/shipping weight	3.0 kg (6.5 lb)/3.6 kg (8.0 lb)
Operating temperature	10–60°C
Storage temperature	10–40°C (50–104°F)
Relative humidity	0–95%, noncondensing
Certifications	NIST-traceable flow calibration certificates are included for each MFC
Inlet pressure/outlet pressure	1.5–2.0 bar (21.8–29.0 psi)/0–1.0 bar (0–14.5 psi)
Mass flow accuracy at calibration conditions	0.2% of full scale
Manifold ports (in and out)	Tapped G 1/8 in.

Note: MCFs and manifolds are cleaned for oxygen service.

Ordering information	Cat. No.
0–1 slpm; suitable for all bioprocess gases; aluminum flow path	F100-7001-100
0–1 slpm; suitable for all bioprocess gases; stainless steel flow path	F100-7001-200
0–15 slpm; suitable for all bioprocess gases; aluminum flow path	F100-7015-100
0–15 slpm; suitable for all bioprocess gases; stainless steel flow path	F100-7015-200

Refer to our **Benchtop bioprocessing solutions brochure** for information on available vessels and sensors.

HyPerforma Glass Bioreactors

Thermo Scientific™ HyPerforma™ Glass Bioreactors are available in 1 L, 3 L, 7 L, and 15 L total volume sizes. They offer easy operation and rapid assembly and are manufactured with the highest standards for materials and surface finish. Developed using a computational fluid dynamics (CFD) simulator, the HyPerforma Glass Bioreactor impellers provide maximum mixing with minimum shear force, resulting in a higher average $k_L a$.

HyPerforma Glass Bioreactor key features

- The motor adapter uses coupling windows and an alignment marker for easy assembly
- Ergonomic head plate design provides easy assembly and disassembly of components for rapid reconfiguration

Accessories

- Kits to help enable the end user to configure the vessel according to the intended use
- Heating blanket: designed for rapid thermal transfer; a bimetallic temperature-limiting switch embedded in the blanket helps protect against overheating or fires
- Common accessories kit: includes blind stoppers for vessel reconfiguration

Ordering information

HyPerforma Glass Bioreactor*			
Size	**Voltage**	**Description**	**Cat. No.**
1 L	120 V	Heat only	F100-2684-002
		Heat and cool	F100-2684-004
	240 V	Heat only	F100-2684-102
		Heat and cool	F100-2684-104
3 L	120 V	Heat only	F100-2680-002
		Heat and cool	F100-2680-004
	240 V	Heat only	F100-2680-102
		Heat and cool	F100-2680-104
7 L	120 V	Heat only	F100-2681-002
		Heat and cool	F100-2681-004
	240 V	Heat only	F100-2681-102
		Heat and cool	F100-2681-104
15 L	120 V	Heat only	F100-2685-002
		Heat and cool	F100-2685-004
	240 V	Heat only	F100-2685-102
		Heat and cool	F100-2685-104

Note: All bioreactors listed are manufacturing according to GMP. Each lab-scale bioreactor needs to be operated using a HyPerforma Bioprocess Controller and appropriate automation platform. Please contact your Thermo Fisher Scientific sales representative for more information on standard package options suitable for your requirements.

HyPerforma Glass Bioreactor specifications

Size	1 L	3 L	7 L	15 L
Inner tank height	200 mm (8.1 in.)	250 mm (9.8 in.)	380 mm (14.9 in.)	455 mm (17.9 in.)
Vessel stand + motor height	412 mm (16.2 in.)	473 mm (18.6 in.)	600 mm (23.6 in.)	720 mm (28.3 in.)
Inner tank diameter	100 mm (3.94 in.)	130 mm (5.1 in.)	160 mm (6.3 in.)	222 mm (8.7 in.)
Vessel stand diameter	160 mm (6.3 in.)	190 mm (7.5 in.)	240 mm (9.5 in.)	340 mm (13.4 in.)
Total volume	1.5 L	3.2 L	7.4 L	17.2 L
Total loaded volume (available volume = total volume–installations)	1.3 L	2.9 L	7.2 L	16.8 L
Working volume	1 L	2 L	5 L	10 L
Minimal working volume	~0.3 L	~1.2 L	~2.8 L	~6.0 L
Weight	8.6 lb	11.6 lb	17.4 lb	51.4 lb
Drilled pipe sparger	5 holes (0.8 mm)	7 holes (0.8 mm)	13 holes (0.8 mm)	23 holes (0.8 mm)
Ring sparger	NA	18 holes (0.85 mm)	42 holes (0.85 mm)	90 holes (0.85 mm)
Frit pore sparger	Pore size: 12–15 µm Length: 7 mm Diameter: 7.9 mm	Pore size: 12–15 µm Length: 7 mm Diameter: 7.9 mm	Pore size: 12–15 µm Length: 18 mm Diameter: 7.9 mm	Pore size: 12–15 µm Length: 25.4 mm Diameter: 12.7 mm
Material	Borosilicate glass, 316L stainless steel			
Foam sensor cable assembly	1 m (3 ft)			
Agitator kit	Triple-stack motor (adapter included)			
	Agitator assembly: Teknic™ NEMA 23 Single to HyPerforma Glass Bioreactor Cable assembly: 2 m (6 ft)			
Agitator speed	1,250 rpm can be configured to lower values via TruBio software			

HyPerforma Rocker Bioreactors

The HyPerforma Rocker Bioreactors bring control and measurement to rocking bioreactor applications. The rocker is controlled by a HyPerforma G3Lab Controller and TruBio software, providing a complete solution for research, process development, or seed train production applications. The HyPerforma Rocker Bioreactors use BPCs with working volumes of 5, 10, and 25 L are available with or without the novel Thermo Scientific™ pH+dO_2 sensor and reader.

Key features

- Compatible with most cell culture applications
- Rocking motion is customizable to your specific workflow—from a smooth waveform that minimizes shear forces for sensitive cell lines, through four intermediate steps, to an aggressive motion that maximizes oxygen transfer for robust cells with high oxygen demands
- Quick, simple setup with a HyPerforma Bioprocess Controller and TruBio software
- Optional tray adapter allows the use of 10 L and 20 L BPCs
- Each HyPerforma Rocker BPC is available in 10, 20, and 50 L sizes and is delivered with all relevant certificates, gamma-irradiated (25 to 40 kGy) and conforming to USP Class 6 specifications
- Standard service packages
- cGMP-compliant capabilities
- Load cell for weight control
- The pH+dO_2 sensor provides measurement and control of critical process parameters: pH, dissolved oxygen (DO), and temperature

Ordering information

HyPerforma Rocker Bioreactors and BPCs	Cat. No.
HyPerforma Rocker Bioreactor, with load cells	F100-2683-001
HyPerforma Rocker Bioreactor, without load cells	F100-2683-002
10 L HyPerforma Rocker BPC, LDPE film, cGMP	F100-2544-001
20 L HyPerforma Rocker BPC, LDPE film, cGMP	F100-2545-001
50 L HyPerforma Rocker BPC, LDPE film, cGMP	F100-2546-001
10 L HyPerforma Rocker BPC, Aegis5-14 film, cGMP, without sensor	SH31187.01
20 L HyPerforma Rocker BPC, Aegis5-14 film, cGMP, without sensor	SH31187.02
50 L HyPerforma Rocker BPC, Aegis5-14 film, cGMP, without sensor	SH31187.03

HyPerforma Rocker Bioreactor and BPC specifications

HyPerforma Rocker BPC sizes	10 L	20 L	50 L
Rocker BPC dimensions	549.4 x 330.2 mm (21.6 x 13.0 in.)	549.4 x 660.1 mm (21.6 x 26.0 in.)	711.2 x 723.9 mm (28.0 x 28.5 in.)
Working volume	5 L	10 L	25 L
HyPerforma Rocker Bioreactor	Rocker bioreactor assembly, load cell, GMP, stainless steel (includes rocker base, tray base, 50 L tray)		
Bag adapter	10 L/20 L BPC mounting adapter for 50 L rocker tray		
Heat only	BPC filter heater (quantity: 2)		
Dimensions (H x W x D)	264 x 782 x 701 mm (10.4 x 30.8 x 27.6 in.); 490 x 835 x 712 mm (19.3 x 32.9 x 28.0 in.) with cover		
Weight (base + tray)	38.5 kg (85 lb)		
Rocking angle	2° to 12° per side		
Rocking rate	2 to 40 cycles per minute		
Electrical power	110–120 V, 220–240 V, 50/60 Hz, powered by the G3Lab Controller		
Operating temperature	0°C to 45°C (32°F to 158°F)		
Storage temperature	–40°C to 70°C (–40°F to 158°F)		
Humidity	5% to 95%, noncondensing		
Acoustic noise level	<70 dBA		
pH sensor range	pH 5.5 to 8.5		
pH sensor relative accuracy	±0.1 pH units over calibration range after a 2-point calibration having 0.3 to 0.8 pH units of separation		
DO sensor range (percent saturation)	0% to 250%		
DO sensor limit of detection	0.03% O_2		
DO accuracy	At 25°C: ±1.1% at 20.95% O_2		
Temperature	10°C to 45°C (50°F to 113°F)		
Temperature accuracy	±0.15°C at 15°C to 40°C (±0.25°F at 59°F to 104°F)		

Sensors for superior process control

Single-use and reusable sensors

Thermo Fisher Scientific offers single-use and reusable sensors for the measurement of pH, DO, biomass, and headspace pressure—designed for higher reliability and superior performance for cell culture and fermentation process monitoring that meet all of your process analytical technology (PAT) needs.

To further enhance your processes, digital integration is possible with the use of our bioprocess controllers paired with the TruBio Bioprocess Control Software.

We offer a range of intuitive process sensors—whether you're incorporating them into a single-use bioprocess container or autoclavable vessel process—to help you monitor processes, reduce failures, and gain efficiencies.

TruSens transmitter blade

The Thermo Scientific™ TruSens™ transmitter blade is a combined technology designed to monitor all conventional pH and DO sensors. It allows the connection of a resistance temperature detector (RTD) or a thermistor inputs to suit the user's preferred sensor technology in upstream processes.

This transmitter blade with TruBio software allows for temperature compensation and is compatible with electrochemical sensors and digital sensors that output nAmp or mV signals.

Features

- Compatible with most single-use or reusable sensors
- Designed to easily integrate with TruBio Bioprocess Control software
- Easily incorporated into the HyPerforma Bioprocess Controllers
- Minimal maintenance

TruSens transmitter blade specifications	
Physical	
Case material	Aluminum bracket
Rating	NEMA 1 (when mounted, same rating as enclosure)
Dimensions (H x W x D)	130 x 35 x 128 mm (5.1 x 1.4 x 5.0 in.)
Weight/shipping weight	0.1/0.3 kg (0.2/0.6 lb.)
Mounting	Enclosure mounted within utility tower
Display	TruBio Bioprocess Control Software (GAMP5)
RFI/EMI	EN 61326-1
Operating temperature	5°C to 45°C (41°F to 113°F) ambient
Storage temperature	0°C to 65°C (32°F to 149°F)
Relative humidity	10% to 90% (noncondensing)
Electrical	
Power supply	24 VDC at 150 mA
Signal outputs*	6 analog 4–20 mA (1 electrochemical pH, 1 electrochemical dissolved oxygen, 2 PT100 RTD, 2 thermistor)
Signal inputs	pH (–520–520 mV), DO (0–500 nA) , PT100 RTD (0–100 °C), thermistor (0–100 °C for 10KΩ, 15–130 °C for 22kΩ)
Output accuracy	Analog: ±0.1 mA Digital: NA
Transmitter diagnostics	Internal diagnostics for sensor and loop*

* If a sensor loop is activated but no sensors are attached, the following errors will be seen: The DO current will drop and produce a low "%SAT" reading, the pH will be unstable and indeterminate, RTD channels will read "maximum temperature", and the thermistor channels will read "minimum temperature".

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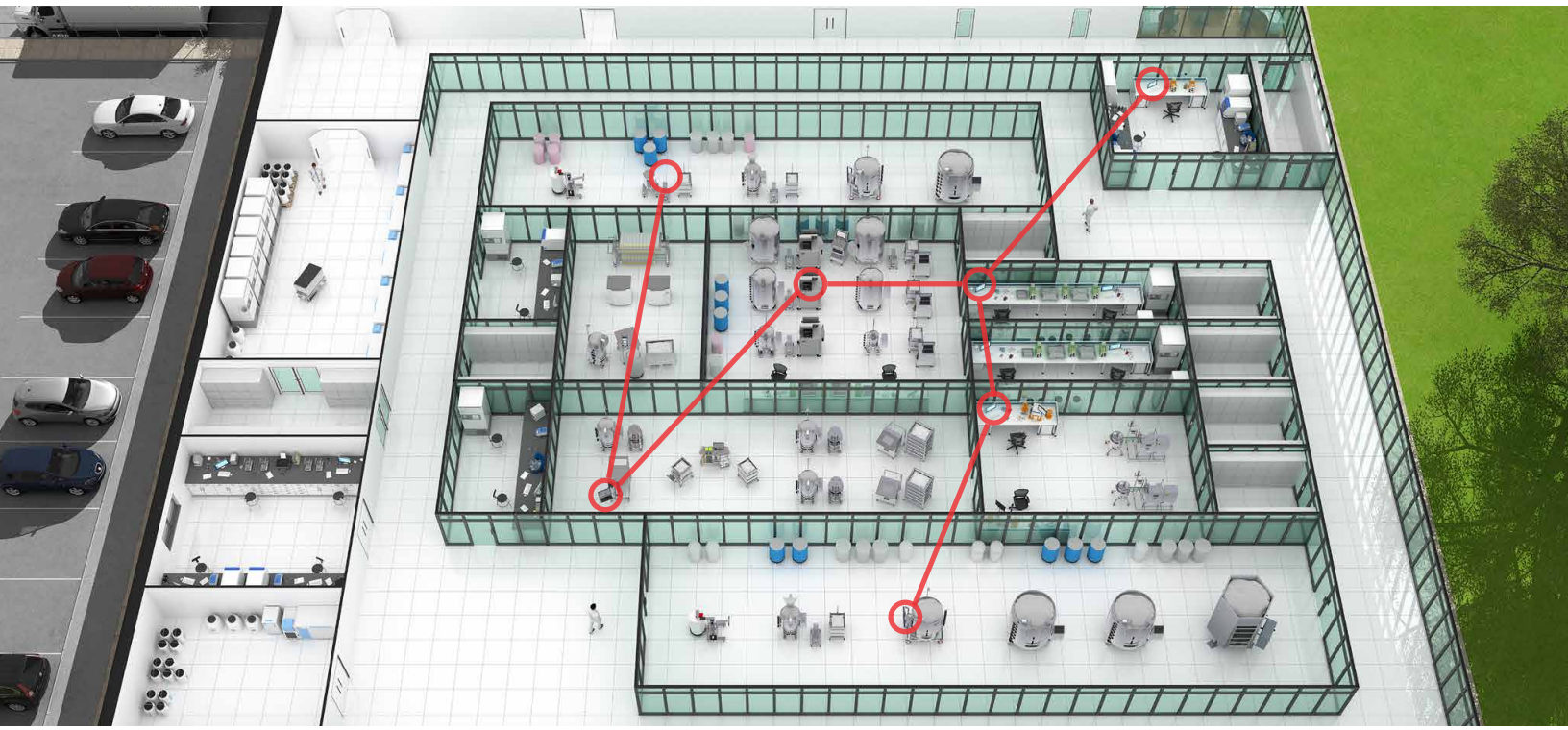

Consistent, accurate data management

Consistent, accurate data management should play an important role for organizations and individuals in bioprocessing process development and scale-up. Dedicated data management platforms and automation solutions are a vital component of data governance, and We offer flexible TruBio software solutions–powered by the DeltaV platform—to help manage your mammalian cell culture and microbial fermentation processes.

Robust data management helps to mitigate risks during all stages in biopharmaceutical scale-up. Efficient, process-specific measuring of critical parameters as well as the aggregation of this data enables you to get your final product to market quickly. We help you focus on your process optimization and scale-up, rather than worry about the software tools needed to get you there.

Find out more at **thermofisher.com/automationsoftware**

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