

ProConnex[®] MixOne RG-X System

User Guide



TD0010_01JUN2026

repligen.com

© 2026 Repligen Corporation. All rights reserved. The trademarks mentioned herein are the property of Repligen Corporation and/or its affiliate(s) or their respective owners.



The information contained in this document is subject to change without notice.

With respect to documentation accompanying Product Repligen makes no warranty, express or implied. Any and all warranties related to the documentation accompanying Product are expressly disclaimed. Customer shall refer to the terms and conditions of sale governing the transaction for any and all warranties for the Product.

Repligen Corporation shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Repligen Corporation.

Products are not intended for diagnostic or therapeutic use or for use in vivo with humans or animals.

For further information, please contact Repligen Corporation at www.repligen.com.

©2026 Repligen Corporation. All rights reserved. The trademarks mentioned herein are the property of Repligen Corporation and/or its affiliate(s) or their respective owners.

Customer Support

customerserviceUS@repligen.com

781-250-0111

For US scheduling and resource availability: serviceschedulingus@repligen.com

For US technical support: TechSupportUS@Repligen.com

customerserviceEU@repligen.com

+31 (0) 76 5719 419

For EU scheduling and resource availability: serviceschedulingeu@repligen.com

For EU technical support: TechSupportEU@repligen.com

Repligen Corporation

US

41 Seyon Street

Building 1 Suite 100

Waltham, Massachusetts , USA, 02453

Europe

P.O. Box 3262

4800 DG, Breda

The Netherlands

www.repligen.com

Contents

1. Introduction	6
2. About This Document	6
3. Safety Precautions	8
3.1 Environmental Management	9
3.2 Lockout/Tagout Procedures	9
3.3 Electrical Connections and Protective Grounding	9
3.4 Ingress Protection (IP) Rating	9
3.5 Environmental Conditions	9
3.6 Regulatory Compliance	10
3.7 References to Other Documents	10
4. Product Information	10
4.1 System Overview	10
4.2 Primary System Components	11
4.2.1 ProConnex MixOne RG-X Vessel	11
4.2.2 Drive Unit	15
4.2.3 Mixer Bag	16
4.2.4 Control Unit	18
4.3 Optional Accessories	20
5. Hardware Installation and Setup	22
5.1 Hardware Unpacking	22
5.2 System Placement	22
5.3 Connecting the System to Utilities	23
5.4 Connecting the Temperature Control Unit and Filling the Jacket	24
5.5 Emergency Stop Function	24
5.6 Initial System Setup	25
5.6.1 Attach the Drive Unit Holder	25
5.6.2 Install the Powder Bag Holder	26
5.7 Weight Transmitter Load Cells	29
5.7.1 Calibrating the Load Cells	31
6. Operation Procedures	32
6.1 System Startup	32
6.2 ProConnex MixOne RG-X Bag Handling, Storage, and Transportation	33
6.3 ProConnex MixOne RG-X Bag Installation	34
6.4 ProConnex MixOne RG-X Drive Unit Installation and Usage	38
6.5 Connecting Sensors	40
6.6 AseptiQuik Aseptic Connections	41
6.7 Connections for Small Volume Additions (if applicable)	41
6.8 Taring the System	41
6.9 ProConnex MixOne RG-X Bag Filling Guidelines	42
6.9.1 Filling the ProConnex MixOne RG-X Bag	42
6.10 Initiating Mixing	43
6.11 Powder Additions (if applicable)	45
6.12 Small Volume Additions using Onboard Addition Pumps (if applicable)	45
6.13 Transfer out of Mixer	46
6.14 Shutdown and Bag Disposal	46
7. Maintenance, Calibration, and Troubleshooting	47
7.1 Routine Maintenance and Cleaning	47
7.2 Preventive Maintenance	47
7.3 Calibrations	48
7.4 Troubleshooting	49
8. Index	50

List of Tables

Table 1. Explanation of User Attention Phrases	6
Table 2. Explanations of Symbols.....	7
Table 3. Safety Precautions Described.....	8
Table 4. Vessel Material Options	11
Table 5. Locking Sheet Postitions.....	13
Table 6. Standard Sensor Options.....	18
Table 7. Automation Platform Software	20
Table 8. Key Volumes.....	42
Table 9. Calibration Schedule	48
Table 10. Troubleshooting Issues and Solutions.....	49

List of Figures

Figure 1. ProConnex MixOne RG-X Product Family	10
Figure 2. Primary Components of the ProConnex MixOne RG-X System	11
Figure 3. Vessel Material Options.....	12
Figure 4. Docking Station	12
Figure 5. Locking Sheet	13
Figure 6. Vessel Door	13
Figure 7. Probe Belt.....	14
Figure 8. Load Cells	14
Figure 9. Casters.....	15
Figure 10. Positioning Pins for Bag Fixation	15
Figure 11. Drive Unit Components.....	16
Figure 12. Mixer Bag	17
Figure 13. Mix Head Assembly.....	17
Figure 14. Control Unit.....	18
Figure 15. HMI Screen.....	19
Figure 16. Connection Ports.....	19
Figure 17. Powder Bag Holder	20
Figure 18. Probe Support Brackets	21
Figure 19. Locking Plate	21
Figure 20. Drive Unit Holder	21
Figure 21. Bottle Holder and Bag Holder	22
Figure 22. Warning Label	23
Figure 23. Emergency Stop and Reset Button	24
Figure 24. Vessel Ground Connection.....	25
Figure 25. Drive Unit Holder	26
Figure 26. Bottle Holder and Bag Holder	26
Figure 27. Removal of M10 Bolts.....	27
Figure 28. Powder Bag Holder Base Fixation for Stainless Steel Vessels	27
Figure 29. Powder Bag Holder Base Fixation for Plastic and Hybrid Vessels	27
Figure 30. Top Holder Hook Installation	28
Figure 31. Nylon Washer and Locking Rings Installation	28
Figure 32. TC Holder Arm Installation	28
Figure 33. Top Holder Adjustment.....	29
Figure 34. Weight Transmitter Cable (WIT90A, WIT90B)	29
Figure 35. Disengaging Shipping Clip	29
Figure 36. Load Cell Transport Lock Nuts.....	30
Figure 37. Disengaging Load Cell Transport Lock Nuts	30
Figure 38. Engaging Load Cell Transport Lock Nuts	31
Figure 39. Visible Gap Between Load Cell and Mounting Block: 200/500 L & 1000 L	31
Figure 40. Summing Box	31

Figure 41. Secure Desktop Toolbar	32
Figure 42. Settings Screen.....	33
Figure 43. Mixer Bag Fully Supported on a Cart	34
Figure 44. Opening the Box.....	35
Figure 45. Removing the Outer Packaging Bag	35
Figure 46. Removing the Bubble Wrap and Vinyl Tank Plate Cover	35
Figure 47. Bag Inspection.....	36
Figure 48. Removing the Drain Cover	36
Figure 49. Installing Mixer Bag into the Vessel	36
Figure 50. Outlet Tubing and Drain Cover	37
Figure 51. Installing the Tank Plate.....	37
Figure 52. Connecting the Bag Tabs to the Positioning Pins.....	37
Figure 53. Clamping the Outlet Tubing and AQQ Probe Ports.....	38
Figure 54. Drive Unit Holder	38
Figure 55. Drive Unit Insertion into Docking Station	39
Figure 56. Drive Unit Locked into Lower Position.....	39
Figure 57. Drive Unit Engaged	39
Figure 58. Installing Multi-Use Probes.....	40
Figure 59. Installing Single-Use Probes	41
Figure 60. Pump and Tubing	41
Figure 61. Key Volumes.....	42
Figure 62. Initial Bag Fill Above Probe Belt	43
Figure 63. Closing the Door and Latches.....	43
Figure 64. Installing the security pin.....	43
Figure 65. Mixer Docking Status Indications.....	44
Figure 66. Mixer Control Faceplate.....	45
Figure 67. Addition Pumps Setting.....	46
Figure 68. Pull the Ring to Release the Drive Unit	47

Abbreviations

AI	Analog Input
E-stop	Emergency Stop
ETOP	Electronic Turn Over Package
HMI	Human-Machine Interface
IP	Ingress Protection
PC	Personal Computer
PI	Pressure Indicator
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
SIC	Speed Indicating Controller
SOM	Software Operation Manual
SOP	Standard Operating Procedure
SS	Stainless Steel
SU	Single-use
TCU	Temperature Control Unit
TI	Temperature Indicator
USB	Universal Serial Bus
WI	Weight Indicator

1. Introduction

This manual provides information on the handling, installation, operation, maintenance and troubleshooting of the ProConnex® MixOne RG-X System. Adhering to the guidelines within this manual is essential to ensure operator safety, proper use of the equipment as intended in the design, and prevent equipment damage.

Users are responsible for implementing all necessary safety measures for personnel working with or near the system. These safety measures must comply with applicable regulations considering potential hazards when operating the ProConnex MixOne RG-X System.

This documentation should be securely stored by authorized personnel and must always be accessible for reference. If the manual is lost or damaged, please request a replacement directly from Repligen Corporation.

Key sections of the manual and important specifications are marked with symbols, which are explained in [Section 2](#).

For traceability, all major units and components are marked with an individual identification number or serial number.

The system is available in the following sizes: 200 L, 500 L, and 1000 L.

The system includes the following units, depending on configuration ordered:

- ProConnex MixOne RG-X Vessel (stainless steel version and polypropylene version)
- ProConnex MixOne RG-X Control Unit
- ProConnex MixOne RG-X Drive Unit

The following consumables are used with the system:

- ProConnex MixOne RG-X Bag Assembly

2. About This Document

This manual uses several different phrases. Each phrase should draw the following level of attention:

Table 1. Explanation of User Attention Phrases

Phrase	Description
Note:	Points out useful information.
IMPORTANT	Indicates information necessary for proper instrument operation.
PRECAUTION	Cautions users of potential physical injury or equipment damage if the information is not heeded.
WARNING!	Warns users that serious physical injury can result if warning precautions are not heeded.

Table 2. Explanations of Symbols

Symbol	Description	Type	Source
	Safety alert for WARNING and CAUTION	Safety alert	SEMI S1-0701
	CAUTION: Refer to accompanying documents (is used on article labels for reference to manual)	Refer to manual	ISO 3864
	General warning	Hazard identification	ISO 3864
	Toxic material, poison	Hazard identification	IEC 61310
	Corrosive material, corrosion	Hazard identification	IEC 61310
	Cut/sever hand, sharp object	Hazard identification	ANSI Z535.3
	Strong positioning tabs magnetic field	Hazard identification	SEMI S1-0701
	Danger: electricity, electrical hazard	Hazard identification	IEC 61310, ISO 3864
	Wear safety gloves	Hazard avoidance: Mandatory action	IEC 61310
	Unplug power line	Hazard avoidance: Mandatory action	SEMI S1-0701
	Do not touch	Hazard avoidance: Prohibition	ANSI Z535.4 ISO 3864
	No pacemakers	Hazard avoidance: Prohibition	SEMI S1-0701
	Risk of crushing from moving parts	Hazard identification	ISO 3864

3. Safety Precautions

Table 3. Safety Precautions Described

Symbol		Description
	WARNING	Commissioning, installation and maintenance of the system must only be performed by qualified personnel.
	WARNING	Ensure that all the ancillary components such as motors, pumps, sensor connections, and vessels are properly installed before operation.
	WARNING	Emergency switches are necessary where the normal operation of technical systems could result in hazards which neither appropriate system design nor appropriate safety precautions are able to prevent. Users or technical personnel should verify and acknowledge the location of emergency stop push buttons prior to using the equipment.
	WARNING	Use appropriate personal protective equipment when operating the system.
	WARNING	Read and understand this manual before using this equipment. Failure to follow operating instructions can result in injury.
	WARNING	Only trained and authorized personnel is allowed to operate the ProConnex MixOne RG-X System.
	WARNING	Burst hazard. It is the responsibility of the end user to monitor the operation of the systems and use proper settings to avoid any pressure building.
	WARNING	Potential chemical and biological hazard. Users operating or servicing the ProConnex MixOne RG-X System need to be aware of any chemical or biological hazard that may be present. Use general hazard communication techniques such as safety data sheets, labels and pictograms to communicate any hazards.
	ELECTRICAL HAZARD	Hazardous internal voltage. Motors, controllers, pumps, instrumentation and control panels all have electrical components. There is a risk of electrocution and injury. Service should be performed by certified and trained personnel only. Repligen recommends using standard lockout procedures when working on electrical components.
	ELECTRICAL HAZARD	Hazardous voltage may be present. Electrical maintenance activities may only be performed by an authorized electrician. The mixer, drive unit and vessel must be properly grounded. Always isolate the electrical power supply before making or changing connections to the unit.
	RISK OF CRUSHING FROM MOVING PARTS	Entanglement and pinch hazards. Rotating, pinching and moving parts can cause injury. Keep your hands, fingers and/or other body parts clear of and away from moving parts. Do not operate this equipment without supplied and properly functioning guard mechanisms in place. It is the responsibility of the end user to assess this equipment and ensure that equipment and safeguards are in good working condition and that all operators are trained and aware of entanglement hazards, associated protective devices and safety measures such as hazard signs and guarding.
	STRONG MAGNETIC FIELD	Powerful magnets in the mix head. The mix head contains strong magnets. The magnetic parts may attract other magnetic parts causing damage or personal injury.
	CAUTION	Do not run the mixer without liquid in the vessel. This can lead to excessive wear.
	CAUTION	The drive unit should be handled with care to avoid personal injury.

3.1 Environmental Management

This product complies with the European Directive on Waste Electrical and Electronic Equipment (2002/96/EC). In line with Environmental Certification ISO 14001, we recommend the following disposal methods:



- Scrapped drive unit components: Deliver to authorized centers for metal object collection.
- Drained oils and lubricants: Deliver to oil recycling centers.
- Packaging materials (pallets, carton boxes, paper, plastic, etc.): Deliver to recycling centers, separating waste into appropriate categories for authorized companies.

3.2 Lockout/Tagout Procedures

To prevent injury when servicing equipment, use your company's lockout/tagout procedures for isolating or eliminating electrical, mechanical, pneumatic, hydraulic, chemical, thermal or gravitational hazards.

3.3 Electrical Connections and Protective Grounding

It is important to note that ProConnex MixOne RG-X System, which includes devices such as variable frequency drives and AC motor controllers, may have an electrical leakage current. As a precautionary measure, it is not recommended to plug these systems into outlets protected by Ground Fault Circuit Interrupters (GFCIs) as these devices are sensitive to electrical leakage.

Prior to plugging the single-use system into any electrical outlet, it is essential to verify that protective grounding is in place. It is important to ensure that the receptacle is properly grounded to prevent any potential electrical hazards.

3.4 Ingress Protection (IP) Rating

This system is rated IP54 according to IEC 60529.



WARNING: IP Protection: Incorrect installation or damaged seals can reduce IP54 protection. Do not expose the equipment to heavy dust or direct water spray.

Description of IP54:

- First digit (5): The equipment has limited protection against dust. Dust can enter, but it will not stop the equipment from working.
- Second digit (4): The equipment is protected against water splashing from any direction.

Operating conditions:

The IP54 rating applies only when:

- All covers and seals are installed correctly.
- The equipment is not exposed to strong water spray or immersion.
- Do not immerse the equipment in water. IP54 does not protect against submersion or high-pressure cleaning.

Non-operating conditions: Store the equipment indoors in a dry place to keep its IP54 protection.

3.5 Environmental Conditions

- Operating conditions: 2°C to 30°C; 20% to 80% relative humidity, non-condensing
- Indoor use only
- Rated voltage range: 120 – 230 VAC (MXCTRL1) or 200 – 230 VAC (MXCTRL2)
- Acceptable mains fluctuation: ±10%
- Allowable input: 108 – 253 VAC (MXCTRL1) or 180 – 253 VAC (MXCTRL2)
- Storage conditions: 0°C to 40°C
- Installation category II (over-voltage) in accordance with IEC 664
- Altitude limit: 2,000 meters (6,562 ft)
- Dust and water protection rating: IP54

3.6 Regulatory Compliance

The ProConnex MixOne RG-X System complies with the following regulations:

- REACH: Regulation No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization, and Restriction of Chemicals
- RoHS: Commission Delegated Directive (EU) 2015/863 Inclusive and Amendment to Annex II of Directive 2011/65/EU of the European Parliament and of the Council regarding the list of restricted substances.
- 2014/35/EU: Low Voltage Directive
- 2014/30/EU: Electromagnetic Compatibility (EMC) Directive
- UL 508A Standard for Industrial Control Panels, C22.2 No. 14-13 Standard for Industrial Control Equipment (For Controller Only).

3.7 References to Other Documents

The system is supplied from Repligen Corporation with an electronic turn over package (ETOP) that includes all relevant documents that describe the system, such as piping and instrumentation drawings (P&ID), general arrangement drawings (GA), electrical schematics, software operation manual, and datasheets. When using this manual, please refer to the TOP Documentation & Drawing Index in the ETOP folder to find relevant file locations.

4. Product Information

4.1 System Overview

The ProConnex MixOne RG-X System is intended for use in biotech and pharmaceutical production. It can operate independently or be integrated into a larger process control system. The magnetically coupled system is designed to address various mixing challenges, with different approaches suited to specific requirements ([Section 6](#)).

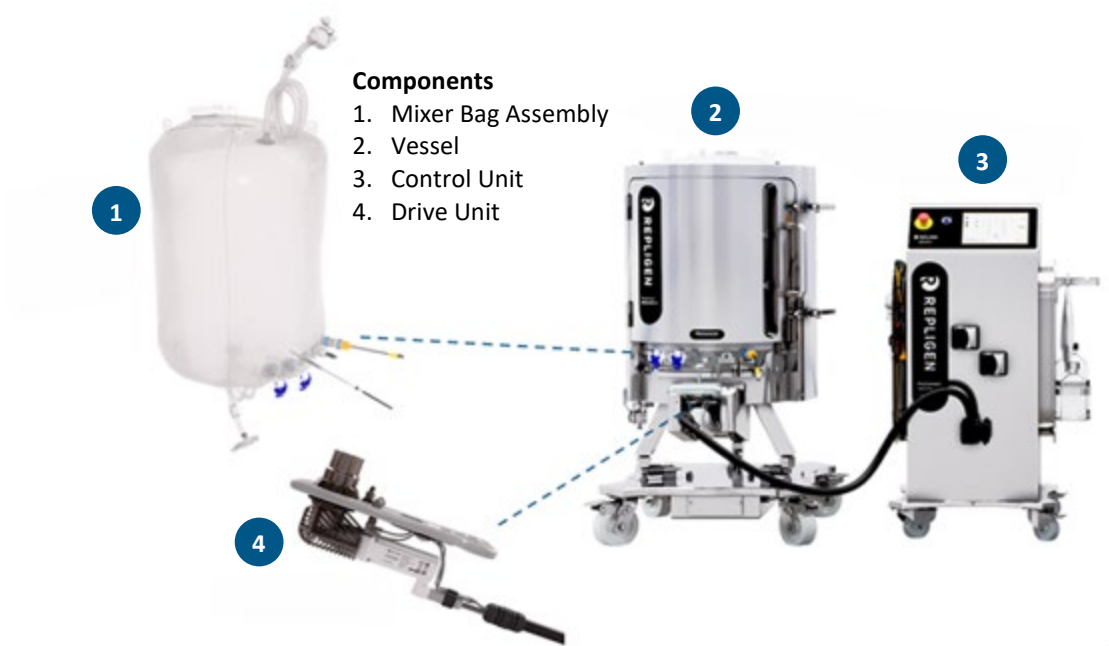
Figure 1. ProConnex MixOne RG-X Product Family



4.2 Primary System Components

The ProConnex MixOne RG-X System primarily consists of a vessel, drive unit, mixer bag, and control unit ([Figure 2](#)).

Figure 2. Primary Components of the ProConnex MixOne RG-X System



4.2.1 ProConnex MixOne RG-X Vessel

The ProConnex MixOne RG-X Vessel is a critical component of the system. It securely holds the mixer bag in place, ensuring proper alignment with all tubes, probes, and sensors. Additionally, it enables the drive unit to connect to the mixer bag mixer via the docking station. Vessels are available in 200L, 500L and 1000L sizes.



CAUTION: Hot Surface. The heating jacket is designed to heat the inner vessel wall. During normal operation, it generates heat and can create hot surfaces. Hot surface inside. Contact with surfaces may cause burns. Use caution while in operation.

The ProConnex MixOne RG-X Vessel is available in in three material options to meet various customer requirements ([Table 4](#), [Figure 3](#)).

Table 4. Vessel Material Options

Type	Vessel Material	Temperature Control Jacket	Load Cells
Stainless steel	304/304L stainless steel	Yes	Yes
Polypropylene	Polypropylene	No	No
Hybrid	Polypropylene	No	Yes

Figure 3. Vessel Material Options



Docking Station: The docking station ([Figure 4](#)) is located on the underside of the vessel and interfaces with the drive unit for engagement with the mixer bag. It includes a lifting mechanism to provide controlled movement of the drive unit during docking and undocking of the drive unit. In its docked position, the drive unit engages with the tank plate, which is the base of the mix head assembly inside the mixer bag.

Figure 4. Docking Station



Locking Sheet: The locking sheet ([Figure 5](#)) is a plastic sheet with handle located at the top of the docking station with features to secure the drive unit and tank plate when engaged. This mechanism has three positions ([Table 5](#)).

Figure 5. Locking Sheet



Table 5. Locking Sheet Positions

Position	Description	Bag (Tank Plate) Engagement	Drive Unit Engagement
 0	Both the tank plate and drive unit are disengaged. Used after a mixing operation when the bag is ready to be removed from the vessel.	No	No
 1	Only the bag is engaged. Used to secure the base of the bag when mixing is not required (e.g. if the drive unit is moved to another vessel that does require mixing).	Yes	No
 2	Fully engaged to enable mixing. Used during bag installation and prior to engaging the drive unit.	Yes	Yes

Vessel Door: The vessels feature wide openings ([Figure 6](#)) to allow operators to easily reach inside and properly position the mixer bag.



CAUTION: Risk of hand injury. Keep hands clear of door edges and latch mechanism when closing the vessel door.

Figure 6. Vessel Door



Probe Belt: The probe belt ([Figure 7](#)) allows access to the probes, sampling line, and other ports at the front of the vessel. A rail is positioned horizontally across the bottom of the probe belt opening to interface with probe support brackets.

Figure 7. Probe Belt



Load Cells: Three load cells ([Figure 8](#)) are integrated into the applicable ProConnex MixOne RG-X Vessels to provide accurate weight measurement. Before first use, tare the load cells.

Note: Load cells are installed on all the stainless steel vessels and offered as an option for the plastic vessels.

Functionality:

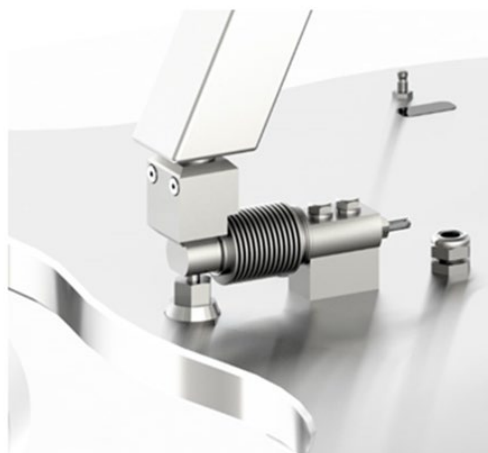
- The load cell transmitter is mounted on the vessel and powered by the control unit. If power is lost, the last weight value is retained.
- Before planned disconnection, record the current value or tare the load cells if the vessel is empty to set a new reference.
- Load cells provide live weight data during operation and log values when a batch is running (Refer to Software Operation Manual).
- Each load cell contains a lock nut to protect the load cell from damage during transport



CAUTION: Do not move the vessel without engaging the lock nuts to prevent damaging the load cells.

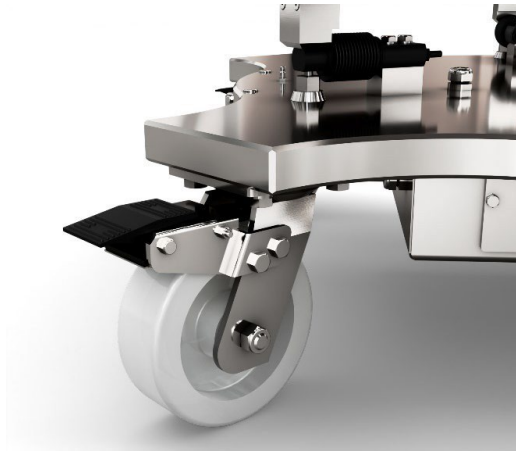
WARNING: Avoid pinching injuries when engaging and disengaging the lock nuts using a wrench.

Figure 8. Load Cells



Casters: The base of the vessel is equipped with sanitary, lockable casters ([Figure 9](#)). These casters should be in the locked position during mixing operations.

Figure 9. Casters



Positioning Pins: The ProConnex MixOne RG-X Vessel features four small openings in the lower section of the side wall, each containing a mounting pin. Four additional positioning pins are located in the top frame of the vessel ([Figure 10](#)). The bag positioning tabs are looped onto these positioning pins to ensure the correct orientation of the mixer bag.

Figure 10. Positioning Pins for Bag Fixation



Temperature Control Unit Connections: If the process requires temperature control, a jacketed stainless steel vessel can be used with a temperature control unit (TCU). A TCU regulates the temperature of the fluid circulating through the vessel jacket, thereby controlling the temperature of the vessel contents. Jacketed stainless steel vessels include 1.5" tri-clamp connections for the jacket inlet and outlet, as well as a ball valve connected to the jacket vent line.

WARNING: Hot surfaces—Use Caution. During normal operation, the heating jacket generates heat and can create hot surfaces. Contact with these surfaces may cause burns. Use caution while in operation.

4.2.2 Drive Unit

The drive unit ([Figure 11](#)) is connected to the control unit and rotates the single-use, magnetic mix head assembly inside the mixer bag while docked in the docking station. Using a servo motor paired with a gearbox, the drive unit provides precise and reliable control of the magnetic drive head. A position sensor verifies correct installation of the drive unit, while an RPM sensor monitors the actual impeller speed inside the mixer bag. The same drive unit is compatible with 200L, 500L, and 1000L vessels.

WARNING: Hot surfaces—Use Caution. During normal operation, the drive unit generates heat and can create hot surfaces. Contact with these surfaces may cause burns. Use caution while in operation.

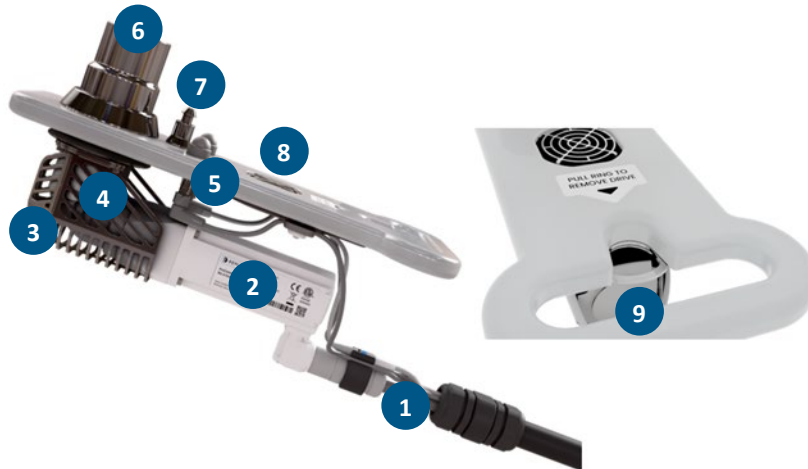


WARNING: The mix head and drive unit contains magnets with high field strength. Pacemakers or other sensitive electrical and electronic equipment may be influenced, and magnetic forces may lead to damage and failure. Keep distance from pacemakers and sensitive electrical equipment and handle the mix head and drive unit with care.

Figure 11. Drive Unit Components

Components

1. Cable and connectors
2. Servo motor
3. Heat guard
4. Gearbox
5. Sensors (rpm and position)
6. Magnetic drive head
7. Lock mechanism
8. Cooling fan



4.2.3 Mixer Bag

The mixer bag ([Figure 12](#)) is a 3-D bag assembly constructed of Repligen ProConnex RG-V film. Mixer bag assemblies are available in 200L, 500L, and 1000L sizes in a variety of standard designs for powder-liquid and liquid-liquid mixing with varying sensor configurations. Bag assemblies be customized with a wide range of options to meet user requirements. For a given size, the same bag assembly is compatible with any of the available vessel types.

Figure 12. Mixer Bag

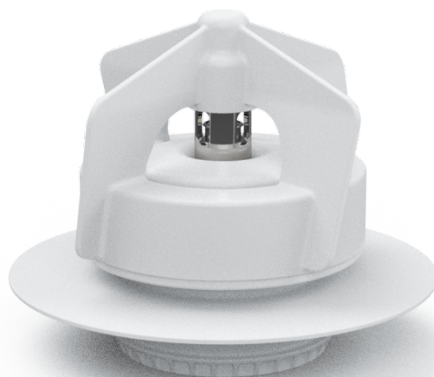
Components

1. Powder addition port
2. Inlet line
3. Bag positioning tab
4. Outlet line
5. Impeller
6. Probe belt
7. Sensors

**Key Features**

- **Material Composition:** Repligen ProConnex RG-V is a single-ply, 5-layer, 14-mil thick film, developed specifically for stringent upstream and downstream single-use bioprocessing applications. Refer to the separate datasheet and validation guide for RG-V film for additional information.
- **Mix head assembly:** The magnetically coupled mix head ([Figure 13](#)) is positioned off-center and designed to efficiently mix liquids inside the mixer bag.

Figure 13. Mix Head Assembly



- **Sensor options:** The front of the bag contains a probe belt with up to five ports for sensors, sampling lines, and other fluid transfer lines as required. Standard sensor options are listed in [Table 6](#).

Table 6. Standard Sensor Options

Sensor Description	Sensor Type	Sensor Make/Model
Temperature	Multi-use	Burns 21140 RTD
pH	Single-use	Mettler Toledo® inSUS310i
Conductivity	Single-use	Broadley-James® SU400-16-M1
pH	Multi-use	Mettler Toledo InPro3250i/SG/225
Conductivity	Multi-use	Mettler Toledo InPro7100i/12/225/4435
Pressure	Single-use	PendoTECH® PREPS series

Note: Multi-use pH and conductivity sensors are used with probe sheaths, which are connected to the mixer bag via an aseptic connector (genderless AseptiQuik G connectors). If required, autoclave the probe within a probe sheath before connecting to the mixer bag per the bag installation instructions.

4.2.4 Control Unit

The ProConnex MixOne RG-X System features a stand-alone control unit that may serve as the central hub for controlling and monitoring the entire system ([Figure 14](#)). This control unit integrates with all components of the ProConnex MixOne RG-X System, including the mixer bag, vessel, drive unit, and any other connected devices or accessories, allowing operators to manage and oversee the mixing process with ease and precision.

Figure 14. Control Unit



Most components of the process control hardware are mounted onto the ProConnex MixOne RG-X Control Unit while some components are part of the vessel (i.e., load cells). The ProConnex MixOne RG-X Control Unit features several configurable hardware options.

For a detailed component list, specifications, and drawings of a mixer control panel, please refer to the system technical specifications document, general assembly drawings, and electrical schematics included in the electronic turnover package (ETOP). For more information on additional options and accessories, please consult the Repligen Corporation sales department.

Components

- **User Interface** (with integrated HMI, optional): If selected, the control unit features an HMI (Human-Machine Interface) screen, which includes buttons and indicators for easy manual intervention ([Figure 15](#)). The HMI screen provides clear system status, including ready-to-operate, active, or error states. Additionally, it offers a graphical interface for operators to interact with the system, monitor real-time data, and adjust settings. Once the instrument power source is turned on, the HMI screen will start automatically.

Figure 15. HMI Screen



- **PLC (Programmable Logic Controller)**: The system utilizes a PLC to manage the control logic and sequence of operations, ensuring precise and reliable automation of various components such as mixing speed, temperature, and pressure. PLC comes with integrated HMI option.
- **Remote Access** (without integrated HMI, optional): Some versions of the control unit offer remote monitoring and control capabilities, allowing users to access system data and adjust settings remotely via secure network connections.
- **Pre-programmed Recipes**: The control unit can store and run predefined process recipes for specific tasks, reducing the need for manual adjustments and ensuring consistent outcomes across batches. Refer to Software Operation Manual.
- **Communication Ports and Connectivity**: The control unit is equipped with various communication ports (e.g., Ethernet, USB, [Figure 16](#)) for connecting to external devices, network infrastructure, or a process control system. This ensures that the ProConnex MixOne RG-X System can be integrated into existing bioprocessing automation environments.

Figure 16. Connection Ports



- **Process Control Software:** The ProConnex MixOne RG-X System operates as a standalone, recipe-driven unit and does not require any external connectivity to execute required functions. The automation platform uses WonderWare (HMI) and Allen-Bradley® hardware, i.e. PLC and related components. Its components and features are summarized in [Table 7](#) and described in more detail in the Software Operation Manual found in the ETOP.

Table 7. Automation Platform Software

Feature	Description
Operating system	Windows 11 LTSC
SCADA System	Aveva System Platform 2023
Programmable Logic Controller	Rockwell CompactLogix 5380 (5069-L350ERM)
Reporting	SQL Server Reporting Services (Excel, PDF, HTML, CSV)
Compliance	21 CFR Part 11, EU Annex 11

4.3 Optional Accessories

Powder Bag Holder: The powder bag holder ([Figure 17](#)) is an adjustable accessory designed to support a powder bag above the vessel and secure it to the powder addition port, reducing ergonomic strain and ensuring precise and consistent dispensing.

Figure 17. Powder Bag Holder



Probe Support Brackets: When required, probe support brackets (available in single-use probe and multi-use versions, [Figure 18](#)) to support and angle the associated probes appropriately in the probe belt area at the front of the vessel.

Figure 18. Probe Support Brackets



Locking Plate: The locking plate ([Figure 19](#)) is designed to connect the base of the vessel to the base of the control unit.

Figure 19. Locking Plate



Drive Unit Holder: The drive unit holder ([Figure 20](#)) mounts to the side of the control unit and enables convenient storage of the drive unit when it is not in use.

Figure 20. Drive Unit Holder



Bottle Holder and Bag Holder: The bottle holder and bag holder ([Figure 21](#)) are mounted to the side of the control unit and designed to support containers for small volume additions (e.g. acid and base). The bottle holder is designed to support bottles up to 2L and the bag holder is designed to support 2D bags up to 5L.

Figure 21. Bottle Holder and Bag Holder



5. Hardware Installation and Setup

5.1 Hardware Unpacking

The ProConnex MixOne RG-X System hardware ships in fit for purpose packaging. Be sure to follow the unpacking instructions included in the ETOP and retain all packaging for possible future use.

All hardware crates are designed for user-friendly unpacking with minimal tools required. Features include an integrated ramp for safe product removal, a removable top panel for full access, and easily detachable inner restraints to simplify unloading while maintaining product protection during transit.

5.2 System Placement

To place the ProConnex MixOne RG-X System:

1. Unlock the casters.
2. Move the ProConnex MixOne RG-X System components to their required location. The vessel and control unit must be placed adjacent to each other (either left or right).
3. After positioning the units, lock the casters in the desired location.
4. Connect the vessel PE ground cable (green/yellow) between the vessel and the control unit.



WARNING: Always position the control unit on either side of the vessel to allow easy access to the main switch, vessel door and drive unit engagement.



WARNING: Tipping hazard. Moving the vessel or the control unit too quickly can cause it to tip, potentially resulting in equipment damage or personal injury. To minimize the risk of tipping, ensure the vessel is moved slowly over smooth, flat surfaces by at least two qualified personnel. During movement, retract any locking feet and ensure the casters are unlocked and that the load cell transportation locks are secured. Do not move the vessel by pulling it in any manner.

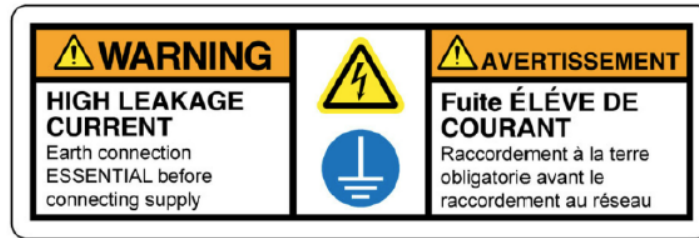


WARNING: Movements of the hardware should be over smooth surfaces with the system completely empty and disconnected from the power, network, and process connections. System modules (vessels, control unit) must be moved

separately and disconnected from other parts of the system. For safe and convenient operating and maintenance activities, ensure there is at least 1 meter of open space between all sides of the system and any objects, such as a wall.

5.3 Connecting the System to Utilities

Figure 22. Warning Label



WARNING: To avoid risk of electric shock, this equipment must only be connected to AC mains with protective earth using an IEC 60309 industrial pin-and-sleeve type connector. No modification of this equipment is allowed. Installation shall be performed only by qualified personnel in accordance with applicable local electrical codes and regulations. Use only suitably rated UL Listed/CSA Certified industrial connectors and cord components.



WARNING: Danger of electrical shock. To perform any procedures that require the control unit to be open, all power sources must be disconnected. Additionally, any procedures performed within the control unit must only be carried out by qualified electricians.



IMPORTANT: Cover connection ports with protective caps when not in use to maintain IP rating.

The RG-X control unit is available in two different models for specific geographic regions: MXCTRL1 for U.S. and Canada and MXCTRL2 for the EU and other regions. The following steps apply to both models unless specified otherwise.

General Requirements

- The equipment shall be supplied from a 120 – 230 VAC, 50 – 60 Hz, single-phase (1PH), 15A service line.
- This equipment shall be connected to the AC mains using a protective earth (PE) conductor.
- Connection shall be made using a 2P+E plug compliant with IEC 60309 or equivalent nationally recognized industrial pin-and-sleeve standard.
- The protective earth conductor shall be connected prior to energizing the equipment.

MXCTRL1 Model (U.S./Canada)

- The MXCTRL1 power cord is shipped without a power connector attached to the power cord cable. It is supplied with insulated flying leads intended for field installation of the supply connector by qualified personnel.
- The field-installed connector shall be a nationally recognized (UL Listed/CSA Certified) IEC 60309 industrial pin-and-sleeve type connector installed in accordance with applicable national and local electrical codes, including:
 - NFPA 70 (National Electrical Code, NEC) in the United States
 - Canadian Electrical Code (CEC) in Canada
- Acceptable connector configurations include:
 - IEC 60309, 120 VAC, 2P+PE, 20A, 4h, yellow
 - IEC 60309, 200 – 230 VAC, 2P+PE, 20A, 6h, blue
- Typical connector series include:
 - Hubbell® HBL® series industrial pin-and-sleeve devices
 - Mennekes® PowerTOP®/AM-TOP series
 - Meltric® DSN series

MXCTRL2 Model (EU/Rest of World)

- A complete power cord assembly incorporating a CEE type pin-and-sleeve IEC 60309 compliant plug intended for direct connection to the customer facility mains receptacle.

For detailed information regarding ethernet connector types, country-specific power plug configuration, and auxiliary equipment connections, please refer to the *Utility Requirement List* included in the ETOP.

5.4 Connecting the Temperature Control Unit and Filling the Jacket

Connect the jacket supply and return ports to the temperature control unit (TCU) and connect the digital and analog cables from the control unit to the TCU. The supply port and the return are found on the bottom of the vessel. Ensure water lines hang freely and out of any movement areas. Touching water lines while using the system may influence load cell readings.

For the correct setup and operating of the TCU please refer to the manufacturer manual.



CAUTION: A pulsating or uneven flow of cooling liquid will impact the system scale readout which can influence your process.

To fill the jacket, follow manufacturer instructions for operating a temperature control unit (TCU).

1. Open the vent valve at the base of the vessel to enable air exhaust as jacket fills.
2. Turn on the TCU.
3. Start filling the vessel jacket using the TCU with the specified heat transfer medium according to TCU operating instructions.
4. Close the vent valve once a steady stream of fluid is observed.

5.5 Emergency Stop Function

The ProConnex MixOne RG-X System has one emergency stop (E-stop) push button located at the front panel on the control unit ([Figure 23](#)). The E-Stop will immediately stop the system in an emergency, preventing potential hazards or accidents. Pressing the E-stop will light up the blue reset button.



WARNING: Electrical shock hazard. The control unit remains powered even when the emergency stop (E-stop) is activated.

Figure 23. Emergency Stop and Reset Button

Components

1. Emergency Stop
2. Reset Button



The E-stop will turn off the pumps, the mixer drive unit, and the analog outputs of the PLCs. The TCU, the sensors, the 24 VDC instrument power, and signals will not be de-energized. The pumps, vessel mixer and all analog outputs of the PLC cannot be started or switched on again until the E-stop is reset.

The E-stop can be deactivated by turning/releasing the E-stop button, after which the reset button must be pressed in order to re-enable control of the pumps and mixer drive. The reset button is located on the front panel.

A signal from the E-stop safety relay also goes to one digital input of the control system used for the visualization of the E-stop on the HMI screen. Users can see from the HMI screen if the E-stop is activated. While the E-stop is activated, all devices in the system are software interlocked to ensure a consistent state with the hardwired interlock. In addition, if a recipe is active at the time of the E-stop, it will be automatically set on hold. The recipe may be restarted when the E-stop is cleared and reset.

5.6 Initial System Setup

Complete the following steps in preparation for initial operational setup:

1. Become familiar with the ProConnex MixOne RG-X System component datasheets/manuals before starting the system, performing maintenance activities, or operating the system.
2. Verify that the system is in the desired location and that the system is level.
3. Lock the casters on the system.
4. Verify that electrical supplies in the facility are sufficient to support the power requirements of the system.
5. Verify that the main switch is in the OFF position.
6. Verify that the ground cable from the control unit is connected to the vessel ([Figure 24](#)).



WARNING: Only trained and authorized personnel should execute the initial setup.



WARNING: When setting up the ProConnex MixOne RG-X System, wear proper personal protective equipment (PPE), such as safety shoes, safety glasses with side shields, and protective clothing as required by the standard operating procedures (SOPs) for your site.

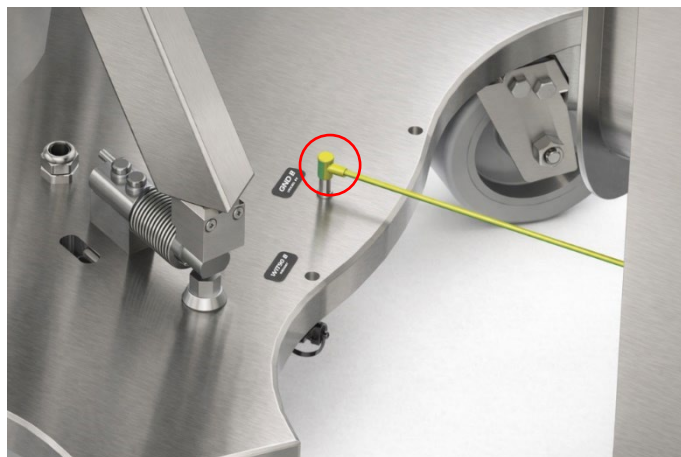


WARNING: Ensure access to ETOP, including drawings and data sheets, before installation. Review technical information.



WARNING: Connecting any auxiliary equipment should be done only when the system is powered off.

Figure 24. Vessel Ground Connection



5.6.1 Attach the Drive Unit Holder

Attach the drive unit holder (standard, [Figure 25](#)), bottle holder and bag holder (both optional, [Figure 26](#)) to either side of the control unit. The drive unit should be on the side of the control unit facing the vessel.

Figure 25. Drive Unit Holder



Figure 26. Bottle Holder and Bag Holder

Components

1. Bag holder
2. Bottle holder

**5.6.2 Install the Powder Bag Holder**

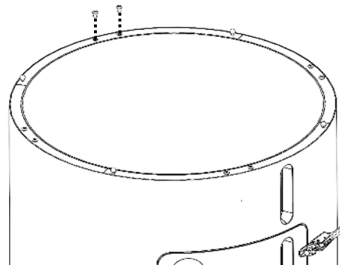
CAUTION : For larger systems with capacities of 1000 L, it is advisable to have two operators manage the loading process. These systems may necessitate the use of a safety ladder or other elevated platform to ensure safe and efficient handling.



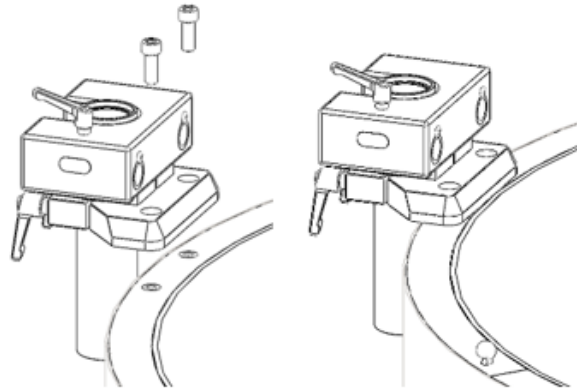
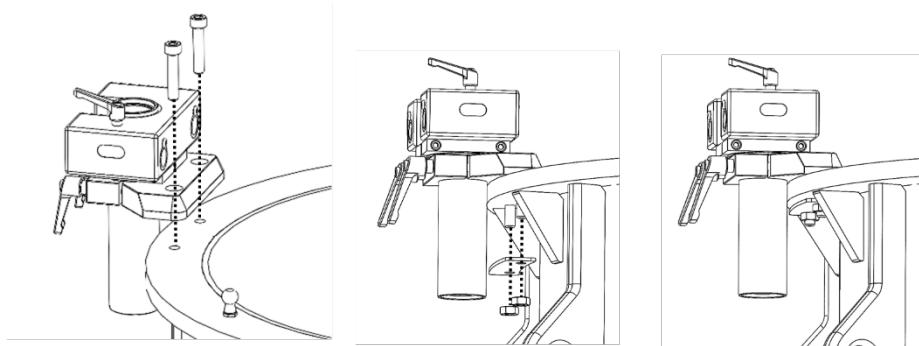
IMPORTANT: Before installation, ensure there is sufficient clearance between the vessel and the ceiling to accommodate the powder bag holder, if applicable.

1. At the top of the vessel, opposite the door/probe belt window, remove the two M10 bolts in the back with a hex key ([Figure 27](#)).

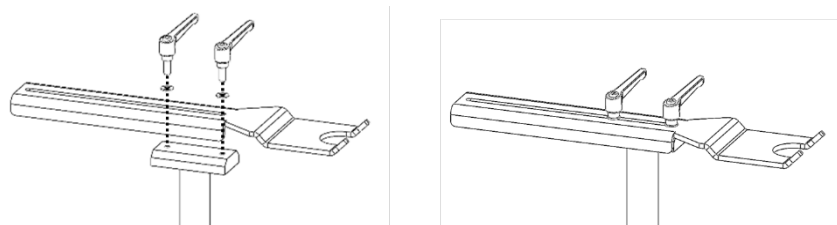
Note: This step is not applicable to Plastic and Hybrid vessels.

Figure 27. Removal of M10 Bolts

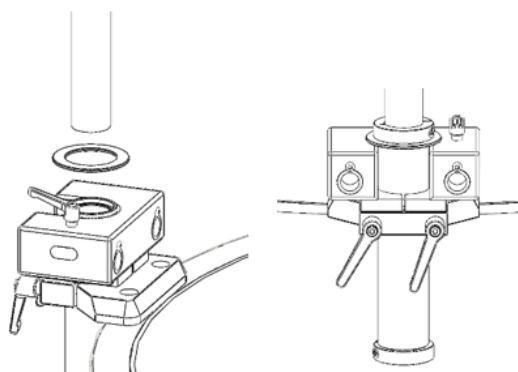
2. Align the holes in the Powder Bag Holder base with the holes on the vessel and place the Powder Bag Holder Base on the vessel. For stainless steel vessels ([Figure 28](#)), use the shorter bolts included with the Powder Bag Holder and tighten it all the way down with a hex key. For plastic and hybrid vessels ([Figure 29](#)), use the longer bolts along with the nuts and washer to attach the Powder Bag Holder Base to the top of the vessel.

Figure 28. Powder Bag Holder Base Fixation for Stainless Steel Vessels**Figure 29. Powder Bag Holder Base Fixation for Plastic and Hybrid Vessels**

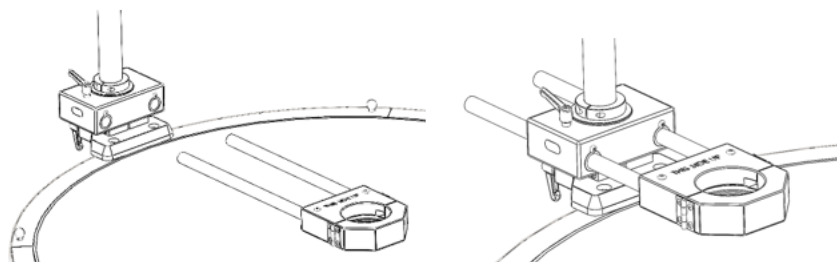
3. Attach the top holder hook to the top of the longer pole with washers and locking levers ([Figure 30](#)).

Figure 30. Top Holder Hook Installation

4. Place the nylon washer on the top of the base place the large pole with the upper locking ring attached ([Figure 31](#)). Attach the lower locking ring afterwards.

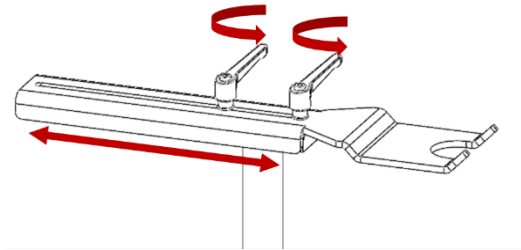
Figure 31. Nylon Washer and Locking Rings Installation

5. Attach the holder arm with the desired TC sizing, 3 or 4 inches ([Figure 32](#)). Lock holder arm in the desired position by tightening the locking lever.

Figure 32. TC Holder Arm Installation

6. Adjust the top holder so that the hook is aligned straight up from the powder port and the holder arm ([Figure 33](#)).

Figure 33. Top Holder Adjustment



5.7 Weight Transmitter Load Cells

Connect the weight cable (WIT90) from the control unit to the vessel weight transmitter located on either side (depending on vessel placement) on the base of the vessel ([Figure 34](#)).

Figure 34. Weight Transmitter Cable (WIT90A, WIT90B)



Upon delivery, the load cell transport lock nuts will be engaged and fitted with a shipping clip ([Figure 35](#)), to protect the load cells from damage during shipment. Cut the cable tie on the back of the shipping clip and remove the clip and cable tie from the load cell.

Figure 35. Disengaging Shipping Clip

Components

1. Cable Tie
2. Shipping Clip

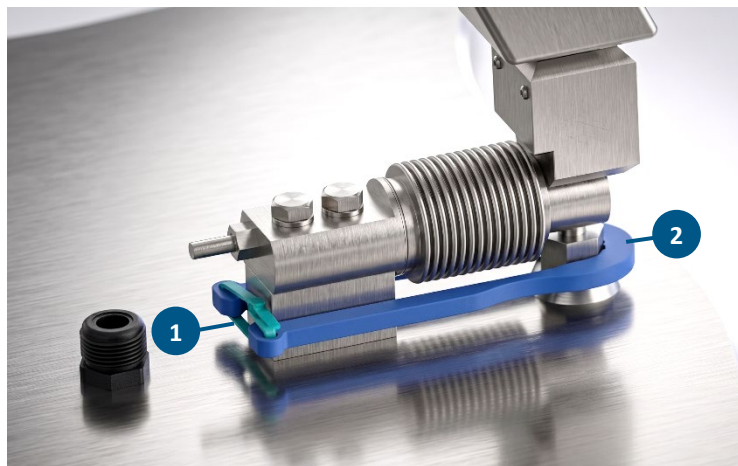
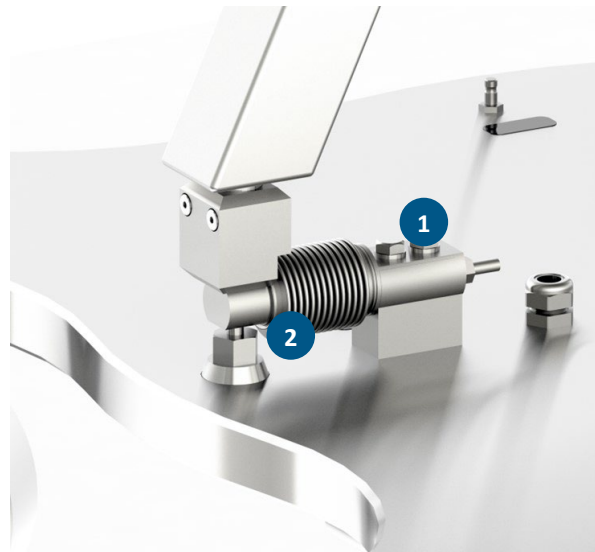


Figure 36. Load Cell Transport Lock Nuts

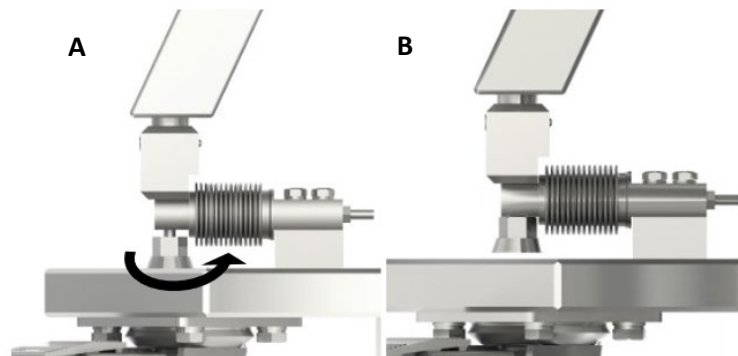
Components

1. Load Cell
2. Lock Nut



To disengage, turn the lock nut counter-clockwise using a wrench until it spins freely ([Figure 37-A](#)). Continue turning counter-clockwise by hand until the lock nut reaches the highest point and engages the load cell ([Figure 37-B](#)). Repeat for each of the three load cells. The load cells are now ready for calibration ([Section 5.7.1](#)).

Figure 37. Disengaging Load Cell Transport Lock Nuts



To engage the lock nuts ([Figure 38](#)) and protect the load cells during transport of the vessel ensure the lock nut rotates freely by hand and confirm that the area beneath the lock nut is clear and free from debris. Turn the lock nut clockwise by hand to the lowest point where the nut engages the vessel base plate. Turn the lock nut clockwise additional turns using a wrench. A small gap should be visible between the load cell and mounting block ([Figure 39](#)) Repeat for all lock nuts. The lock nuts are now engaged, protecting the load cells.



CAUTION: To avoid damaging the load cells, do not overtighten the nut.

Figure 38. Engaging Load Cell Transport Lock Nuts

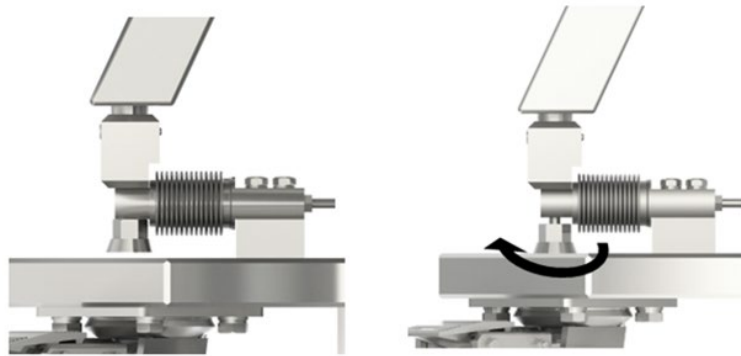
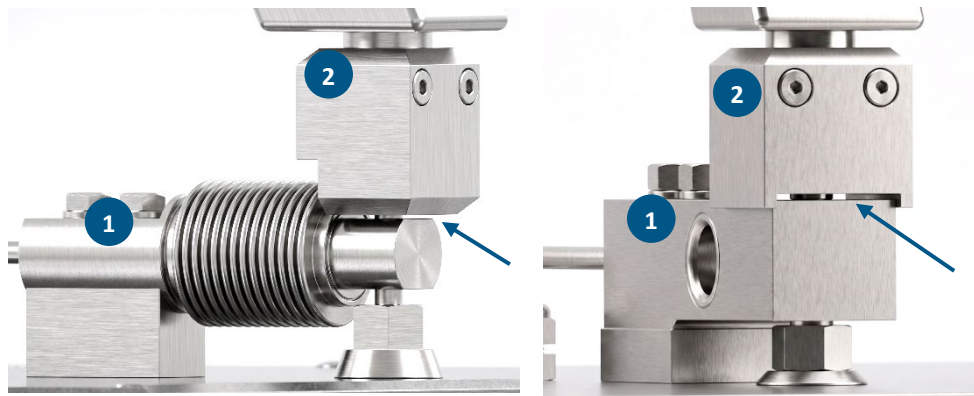


Figure 39. Visible Gap Between Load Cell and Mounting Block: 200/500 L & 1000 L

Components

1. Load Cell
2. Lock Nut



5.7.1 Calibrating the Load Cells

Vessels with load cells are equipped with three load cells that are combined into a single Laumas® TLB4 Series Weight Transmitter within a summing box (Figure 40) underneath the vessel base.

Figure 40. Summing Box



Required equipment:

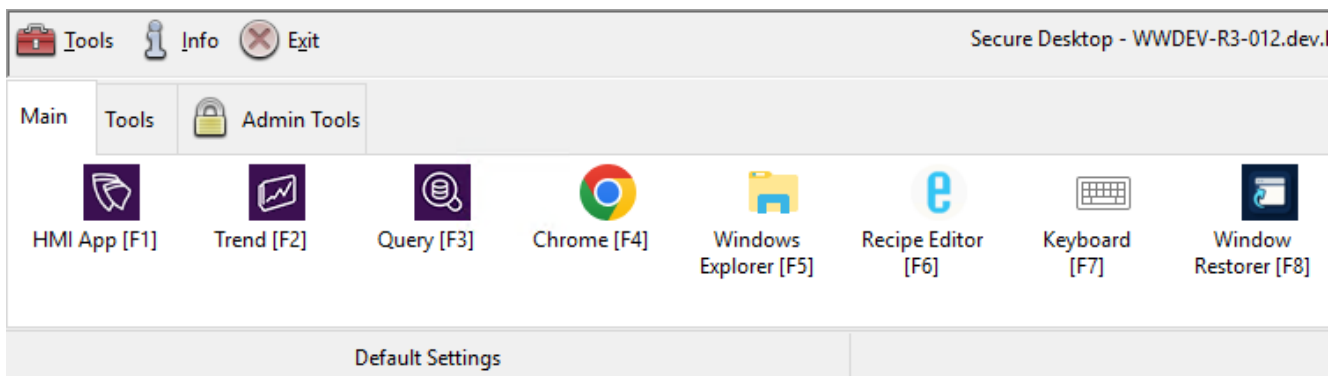
- USB A to USB A cable (for connection to vessel service port)
 - Laumas TLB4 Weight Transmitter Instrument Manager software and associated Instrument Manager user manual (find at laumas.com).
 - Calibration weights or calibrated flow sensor
1. Make sure the control unit is powered on and connected to the vessel load cell connection WIT90.
 2. Connect a service laptop to the Service USB port on the front of the load cell summing box using a male-male USB A cable.
 3. Launch the Laumas Instrument Manager software and follow the **Real Calibration** section of the user manual to complete the calibration.

6. Operation Procedures

6.1 System Startup

1. Connect the drive unit cable to the front of the control unit and hang the drive unit on the drive unit holder.
2. Open the door to the control unit and confirm that the circuit breakers are ON.
3. Connect the main power line to the facility power.
4. Power On: Turn on the control unit using the power switch located on the back side below the control unit door. For units without HMI, continue with local system setup. For units with HMI, wait for the system to initialize and the HMI screen to load, and follow the steps in this section.
5. Launch HMI application: After the system is powered on, the HMI application will launch automatically. Alternatively, the operator can launch the HMI manually via the HMI app function on the secure desktop toolbar.

Figure 41. Secure Desktop Toolbar



Note: For further description of Secure Desktop items please refer to the System Operating Manual

6. Log into HMI application: To operate the system, log into the HMI application using the login button on the footer of the user interface.
 - a. All system features are secured using Windows user groups. Both local and domain Windows users can be assigned to specific named groups on the local workstation. Any user who is a Windows administrator can manage Windows users and groups to assign or revoke permissions to specific login credentials.
7. Configure System Options: Use the settings screen to configure connected components and equipment. These options must be set correctly according to the installed/connected hardware for the system to operate properly.

Figure 42. Settings Screen

The screenshot displays the 'Settings Screen' of the ProConnex MixOne RG-X system. It features a sidebar with navigation icons (Home, Mail, Bell, Settings, Help) and a 'Load Recipe' button. The main content area is organized into several panels:

- Heartbeat:** Includes a 'Configuration' button and a 'Heartbeat In Enables' section with a checked 'Local HMI' option.
- Options:** Contains a 'Vessel Size' dropdown menu set to '500L' and a list of sensor installation checkboxes:
 - ☒ AI90 (Bag Conductivity Sensor) Is Installed
 - ☒ AI91 (Bag pH Sensor) Is Installed
 - ☒ PI90 (Bag Pressure Sensor) Is Installed
 - ☒ WI90 (Vessel Weight) Is Installed
 - ☒ TI90 (Bag Temperature Sensor) Is Installed
 - ☒ TCU91 (Jacketed Temp Control Unit) Is Installed
 A 'Control Unit Hardware Configuration' button is located below these options.
- Sensor Settings:** A sub-panel with input fields for:
 - AI90 K-Factor: 1.00
 - AI90 Offset: 0.000 mS/cm
 - AI91 K-Factor: 1.00
 - AI91 Offset: 0.000 pH
 - TI90 Offset: 0.000 °C
 It also includes 'Impeller Speed Deviation Alarms' with fields for Hi Limit (5.0 RPM), Hi Delay (10.0 sec), Hi-Hi Limit (15.0 RPM), and Hi-Hi Delay (15.0 sec).
- Miscellaneous Settings:** Includes checkboxes for 'System Annunciation Alerts' (checked), 'External Batch Mode Active' (unchecked), 'Show Controller SP on HMI' (unchecked), 'Show Mini-trends on Analogs' (checked), and 'In-App Trend Duration (min)' (10). It also has a 'Default Alarm Sort Criteria' dropdown set to 'Time' and a 'Vessel ID' field with a note: 'Note: Vessel ID is not configurable if WI90 is marked as installed'.
- Simulation:** A 'Global Simulation' checkbox, currently unchecked.
- Parameters:** A vertical stack of buttons: 'Global Parameters', 'Report Records', 'OP Parameters', 'UP Parameters', and 'External Parameters'.

The bottom right corner displays the date and time '12-Feb-2026 14:59:46', the operator name 'hlaunius', and 'Login', 'Logout', and 'Password' buttons.

- a. Select the following process dependent options for each new process:
- Vessel Selection:** Use this dropdown to select the size of the connected vessel. This setting will influence alarm limit scaling for the vessel weight reading, which varies depending on the size of the vessel.
 - TI90 Is Installed:** Check the box if the bag temperature (TI90) analog input module is connected and/or intended to be used. When this setting is checked, graphical elements for TI90 will be displayed and alarm monitoring for the module will be enabled.
 - WI90 Is Installed:** Check the box if the vessel weight (WI90) analog input module is connected and/or intended to be used. When this setting is checked, graphical elements for WI90 will be displayed and alarm monitoring for the module will be enabled.

Note: Marking WI90 as uninstalled will remove the ability to operate the mixer in weight-based control modes, limiting operation to fixed output control.

- PI90 Is Installed:** Check the box if the bag pressure (PI90) analog input module is connected and/or intended to be used. When this setting is checked, graphical elements for PI90 will be displayed and alarm monitoring for the module will be enabled.
- TCU90 Is Installed:** Check the box if the jacketed temperature control unit (TCU90) analog output module is connected and/or intended to be used. When this setting is checked, graphical elements for TCU90 and TI91 will be displayed and alarm monitoring for these modules will be enabled.
- AI90 Is Installed:** Check the box if the bag conductivity (AI90) analog input module is connected and/or intended to be used. When this setting is checked, graphical elements for AI90 will be displayed and alarm monitoring for the module will be enabled.
- AI91 Is Installed:** Check the box if the bag pH (AI91) analog input module is connected and/or intended to be used. When this setting is checked, graphical elements for AI91 will be displayed and alarm monitoring for the module will be enabled.

6.2 ProConnex MixOne RG-X Bag Handling, Storage, and Transportation

- Environmental Protection:** Store mixer bags in a controlled environment, protected from light, extreme temperatures, and humidity.
- Storage in Original Packaging:** Keep mixer bags in their original packaging whenever possible.

- **Surface Requirements for Storage and Transfer:** Store and transfer mixer bags on smooth, clean surfaces (e.g., a rack or cart) that are free of sharp edges, corners, or burrs.
- **Stacking Restrictions:** Do not stack mixer bags or place any items on top of them during storage or transfer.
- **Support During Handling:** Ensure mixer bags are fully supported during storage and transfer so that no part of the film, tubing, or other components hangs over the edge of a surface ([Figure 43](#)).

Figure 43. Mixer Bag Fully Supported on a Cart



6.3 ProConnex MixOne RG-X Bag Installation

When handling the mixer bags, adhere to the following guidelines to ensure their quality and durability:



WARNING: High magnetic field strength of mixer rotor. The mix head and drive unit contain magnets with high field strength. Pacemakers or other sensitive electrical and electronic equipment may be influenced, and magnetic forces may lead to damage and failure. Keep distance from pacemakers and sensitive electrical equipment and handle the mix head and drive unit with care.



CAUTION: Install the drain cover gently to avoid pinching the mixer bag, which may cause a leak.



CAUTION: Use a safety cutter when opening outer packaging bag to prevent injury and avoid damaging the contents.



CAUTION: When handling, storing, or transporting a mixer bag, ensure it is well supported and does not contact sharp edges, corners, or burrs that could cause damage.



CAUTION: Some sensors may contain glass components that can break if mishandled. Handle sensors carefully and ensure proper alignment during insertion. Do not apply excessive force. Do not use sensors that are dropped, cracked, or damaged. Broken glass may cause injury and process contamination.



CAUTION: Never open the ProConnex MixOne RG-X Vessel door while the bag is filled. Ignoring this warning can lead to serious personal injury.



CAUTION: For larger systems with capacities of 1000 L, it is advisable to have two operators manage the loading process. These systems may necessitate the use of a safety ladder or other elevated platform to ensure safe and efficient handling.

IMPORTANT: Always lift the mixer bag by supporting it from the bottom to prevent stress and tearing of the bag.

1. Open the box using a safety cutting tool to avoid damaging the mixer bag inside ([Figure 44](#)). Do not use box cutters, scissors, or similar non-safety cutting tools. Similarly, remove the outer packaging bag using a safety cutting tool ([Figure 45](#)).

Figure 44. Opening the Box**Figure 45. Removing the Outer Packaging Bag**

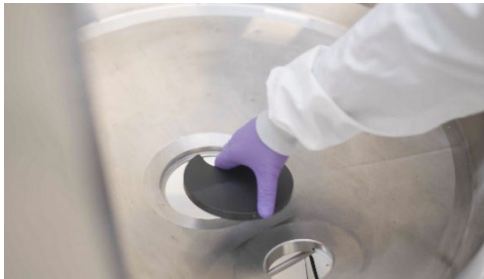
2. Transfer mixer bag to an inspection table (or similar) that is large enough to support the entire bag so that it does not hang off when unfolded and extended flat. The table should be smooth and free of sharp edges, corners, or burrs that could damage the bag.
3. Remove the protective bubble wrap from the powder port, connectors, and other components. Gently turn the mixer bag over on the inspection table and remove the bubble wrap and vinyl cover from the tank plate ([Figure 46](#)).

Figure 46. Removing the Bubble Wrap and Vinyl Tank Plate Cover

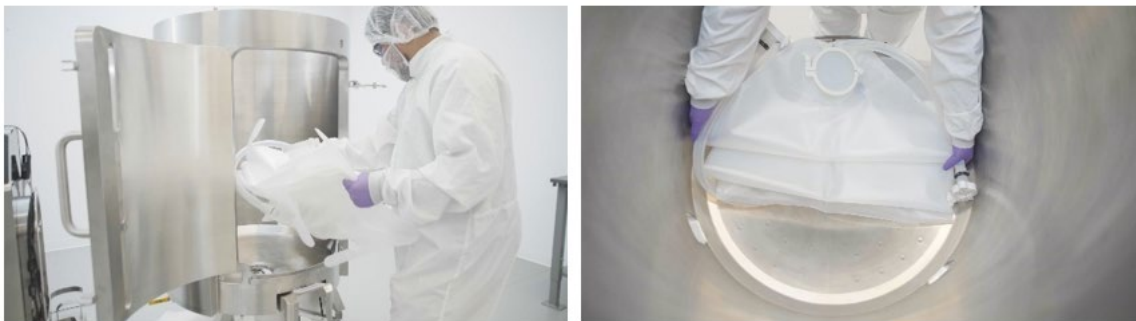
4. Unfold and extend the mixer bag on the inspection table to perform a pre-use visual inspection for defects or damage as specified per the end user's procedures ([Figure 47](#)).

Figure 47. Bag Inspection

5. Remove the drain cover from the bottom of the vessel prior to installation of the mixer bag ([Figure 48](#)).

Figure 48. Removing the Drain Cover

6. Pick up the folded mixer bag with the powder port facing up and the tank plate facing down. Gently place the bag into the bottom of the vessel ([Figure 49](#)). Be careful not to drop the bag roughly or scrape it against the sides of the door opening to avoid impact and abrasion damage on the bag film and components.

Figure 49. Installing Mixer Bag into the Vessel

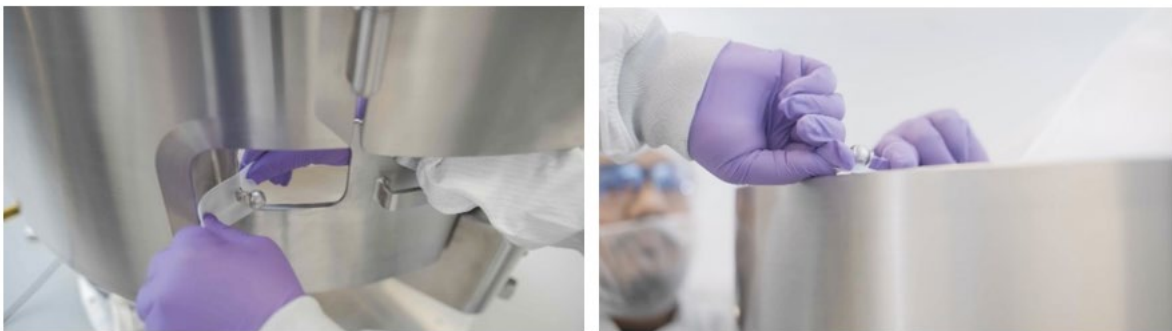
7. Place the outlet tubing through the drain hole ([Figure 50](#)). Replace the drain cover, being careful not to pinch the tubing or bag film. The drain cover is keyed to only fit in one direction.

Figure 50. Outlet Tubing and Drain Cover

8. Engage the tank plate locking sheet by pushing it forward until only the #2 is visible. Install the tank plate through the tank plate hole, very gently applying pressure from the top until it clicks into place ([Figure 51](#)).

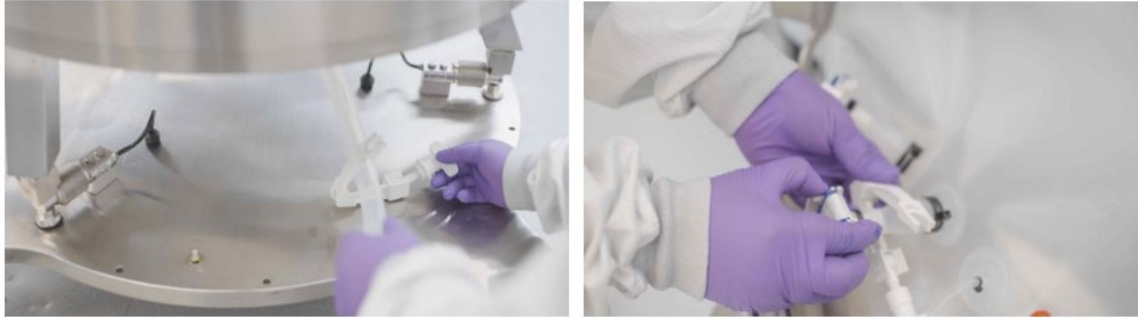
Figure 51. Installing the Tank Plate

9. Connect all eight positioning tabs on the mixer bag (four on top, four on bottom) to the upper and lower positioning pins on the vessel ([Figure 52](#)). Temporary wrinkles or folds may be visible on the bag. Do not attempt to manually remove these wrinkles unless they interfere with proper placement. Ensure the bag remains centered and upright, with the bottom surface flat, unrotated, and evenly distributed to maintain optimal contact with the vessel interior.

Figure 52. Connecting the Bag Tabs to the Positioning Pins

10. Attach a tubing clamp to the bottom outlet tubing ([Figure 53](#)). Attach tubing clamps to the AQG probe ports between the hosebarb and bag (if applicable), being careful not to pinch down on the end of the hosebarbs. If applicable, engage the tubing clamp for the sample line.

Figure 53. Clamping the Outlet Tubing and AQG Probe Ports



6.4 ProConnex MixOne RG-X Drive Unit Installation and Usage



WARNING: Hot surface—Use Caution. During normal operation, the drive unit generates heat and can create hot surfaces: Contact with surfaces may cause burns. Use caution while in operation.



CAUTION: Dock the drive unit with a firm movement. Avoid excessive force.

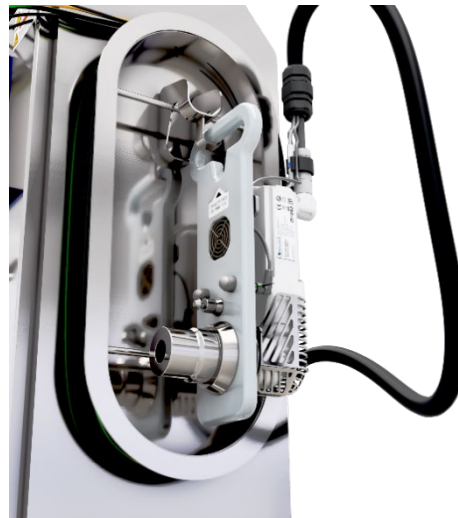


CAUTION: The drive unit can cause personal injury and/or damage the equipment if dropped or handled incorrectly. Support it carefully with two hands.

To engage the drive unit:

1. Remove the drive unit from its designated storage location on the control unit ([Figure 54](#)).

Figure 54. Drive Unit Holder



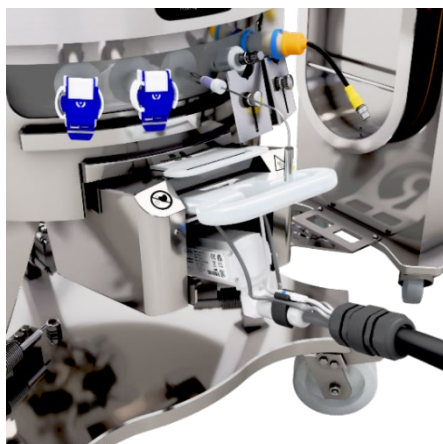
2. Holding the drive unit with one hand on the handle and the other hand underneath to support it, bring it over to the docking station underneath the vessel for docking.

Figure 55. Drive Unit Insertion into Docking Station

3. Slide inwards until the drive unit locks into a fixed position. An audible click confirms the drive unit is installed correctly in its lower position ([Figure 56](#)).

Figure 56. Drive Unit Locked into Lower Position

4. Confirm the locking sheet is in position 2. Lift the handle to engage the drive unit into position for mixing. A second audible click confirms proper engagement ([Figure 57](#)).

Figure 57. Drive Unit Engaged

6.5 Connecting Sensors



CAUTION: Sensors containing glass components must be handled with care during removal and re-insertion. Remove and insert sensors slowly and without excessive force. Inspect the sensor before re-use and do not reinstall damaged sensors.

Various sensors may be used with the mixer, depending on the configuration of the controller and the mixer bag. These may include pressure, temperature, conductivity, and pH.

1. Pressure: Connect the corresponding cable from the Control Unit to the PendoTECH pressure sensor on the mixer bag.
2. Temperature: Install the RTD into the thermowell of the mixer bag and turn the luerlock to make a secure connection
3. Conductivity and pH:
 - a. Multi-use probes ([Figure 58](#)): Multi-use probes should be prepared in a probe sheath assembly. If applicable for certain operations, they can be autoclaved prior to installing into the vessel.
 - i. The position of the support brackets can be adjusted with the screw to raise and lower the front plate to tilt the probe to a desired angle. Start with the front plate in the lowered position by loosening the locking screw and sliding the front fully down. Note: pH probes should be angled to >15° for proper measurement.
 - ii. Attach the support bracket to the rail at the probe belt.
 - iii. Engage the AQC connectors on the bag and the probe sheath, and insert the probe into the vessel by slowly and gently compressing the bellows section of the probe sheath. Then rest the probe on the support bracket.
 - iv. Raise the front plate to achieve the desired probe angle and tighten the screw. A cable tie may be gently looped through the slots on the sides for the support bracket and over the probe to secure it in place.
 - v. Connect the corresponding cables from the control unit to the probe.

Figure 58. Installing Multi-Use Probes



- b. Single-use probes come installed in the mixer bag ([Figure 59](#)).
 - i. The position of the support brackets can be adjusted with the screw to raise and lower the front plate to tilt the probe to a desired angle. Start with the front plate in the lowered position by loosening the locking screw and sliding the front fully down.
 - ii. Attach the support bracket to the rail at the probe belt.
 - iii. Rest the probe on the support bracket.
 - iv. Raise the front plate to achieve the desired probe angle and tighten the screw. A cable tie may be gently looped through the slots on the sides for the support bracket and over the probe to secure it in place.

Figure 59. Installing Single-Use Probes



6.6 Aseptic Connections

Aseptic connectors on the mixer bag should be engaged following the manufacturer's (Colder Product Company) instructions.

6.7 Connections for Small Volume Additions (if applicable)



CAUTION: The peristaltic pump contains moving and rotating components. Contact with the pump mechanism during operation may cause personal injury and/or damage to the equipment. Do not touch the pump while it is running. Keep hands, fingers, and loose objects away from moving parts at all times.

If necessary, refer to the pump manual in the ETOP for instructions on adjusting tubing size settings on the pump. Position/secure containers for small volume additions (e.g., bottle holder and/or bag holder accessories mounted to the control unit). Connect addition line tubing to the appropriate port on the mixer bag. To install the tubing in the peristaltic pump, fully open the flip top cover, insert tubing into the pump head, and close the flip top cover.

The peristaltic pump is configured for counterclockwise rotation.

Figure 60. Pump and Tubing



6.8 Taring the System

To ensure accurate weight measurements, ProConnex MixOne RG-X System should be tared prior to liquid fill of the bag. Make sure that all instruments and accessories are installed before proceeding. Taring can be done manually from the control unit by a user with the required security permissions, or automatically via a recipe. Refer to Software Operations Manual for detailed taring steps.

6.9 ProConnex MixOne RG-X Bag Filling Guidelines

Important: Each ProConnex MixOne RG-X System is designed to function within a defined working volume range. To achieve optimal performance, ensure that the actual working volumes remain within the specified rated range. Key volumes are summarized in [Figure 61](#) (assuming fluid density of 1 g/mL).

Figure 61. Key Volumes

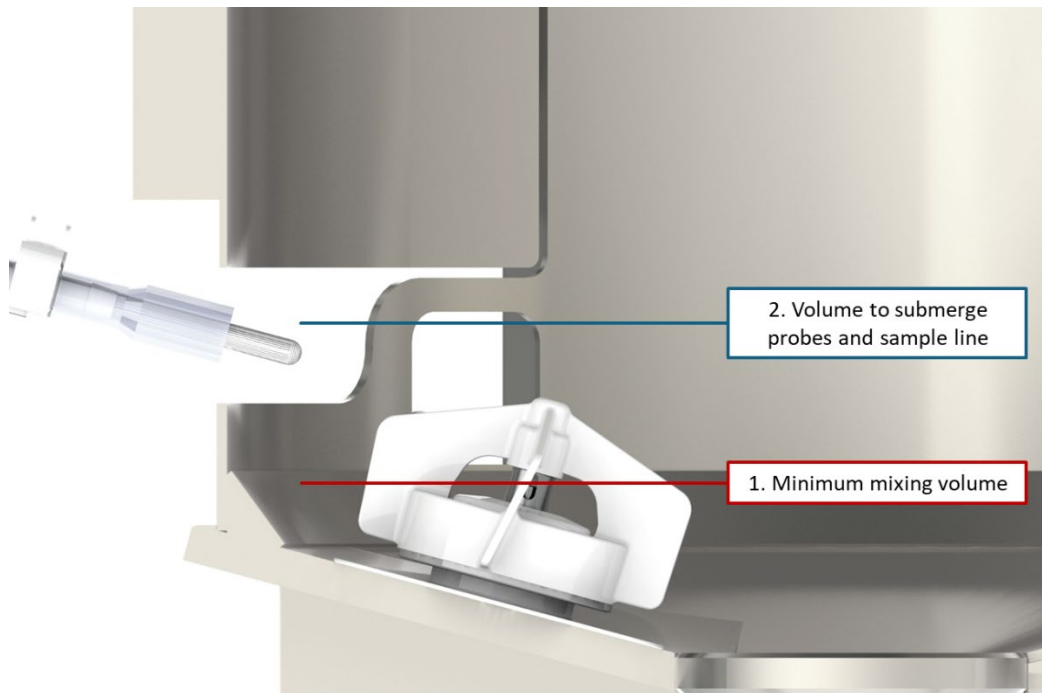


Table 8. Key Volumes

Description	200L	500L	1000L
1. Minimum mixing volume	12 L	20 L	29 L
2. Volume to submerge probe belt	34 L	72 L	127 L
3. Nominal mixing volume	200 L	500 L	1000 L
4. Maximum fill volume	224 L	545 L	1070 L

- 1. **Minimum mixing volume:** minimum volume required to ensure mixer performance.
- 2. **Volume to submerge probe belt:** volume at which ports at the probe belt (e.g., pH and conductivity sensors, sample lines, other transfer lines) are submerged for proper function.
- 3. **Nominal mixing volume:** recommended maximum mixing volume.
- 4. **Maximum fill volume:** volume at which the bag is filled to the vessel rim.



CAUTION: After the initial fill, do not open the door. Opening the door at this stage may result in bag integrity being compromised and/or risk of injury.

6.9.1 Filling the ProConnex MixOne RG-X Bag

Inspect the outlet tubing and all ports. Ensure they are properly clamped to avoid any unintended fluid discharge during the filling process. Minor manual manipulation of the bag during the initial fill may be required to ensure the probe belt stays in position.

1. Begin the filling process according to site procedure. Connect water or process fluid to the inlet line and begin transfer. Constantly monitor the filling to make sure the mixer bag is not overfilled. The weight displayed on the load cells (if applicable) will help accurately track the amount of fluid being added. User-defined weight alarms can be configured.
2. Fill water or process fluid to just above the probe ports ([Figure 62](#)) and gently situate the ports through the probe belt opening. Minimal manual manipulation is needed to settle the bag in place.

Figure 62. Initial Bag Fill Above Probe Belt

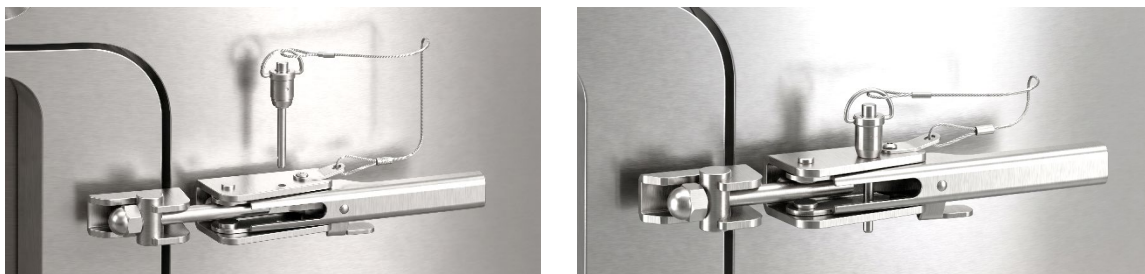


3. Close the door, being careful to avoid pinching the probe ports or bag film. Close the top and bottom latches ([Figure 63](#)) and install the security pin on both latches ([Figure 64](#)) to prevent accidental opening during use. This must be completed after the liquid level reaches the top of the probe belt area.

Figure 63. Closing the Door and Latches



Figure 64. Installing the security pin



4. Continue to fill to the desired setpoint, then stop the flow of water or process fluid and clamp the inlet line.

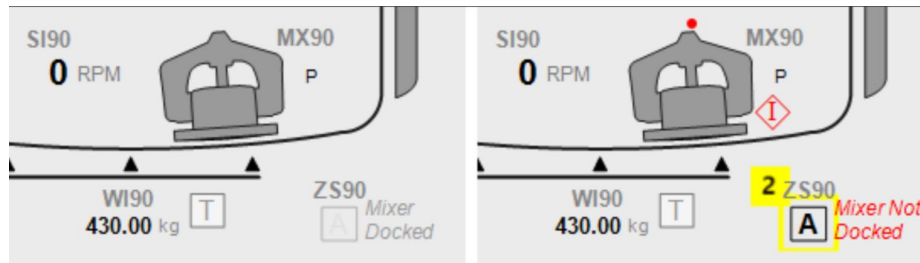
6.10 Initiating Mixing

Note: For shorter duration (≤ 1 day continuous mixing) applications (e.g., solution preparation) requiring high efficiency mixing and vortex formation, the maximum mixing speed is 450 rpm. For applications requiring longer durations, higher density solutions, and/or shear sensitive materials, please consult a Repligen technical sales specialist.

Ensure that the drive unit is docked before proceeding ([Section 6.4](#)). For control units equipped with an HMI screen, the status of the drive unit docking will be displayed on the screen ([Figure 65](#)):

- **Mixer docked (in gray):** Indicates that the drive unit is docked.
- **Mixer not docked (in red):** Indicates, with associated alarm, that the drive unit is not docked

Figure 65. Mixer Docking Status Indications



On the Control Unit, disengage the Emergency Stop if it is engaged, then press Reset to energize the drive unit and any installed pumps. All alarms shall be cleared and all faults shall be reset on the HMI before the system is ready for operation. Refer to the Software Operation Manual.

Begin mixing. Depending on the mixing need for the batch, the mixing process can be started manually or automatically via the recipe system. Refer to the Recipe Editor Software Operations Manual for instructions on setting up recipes.

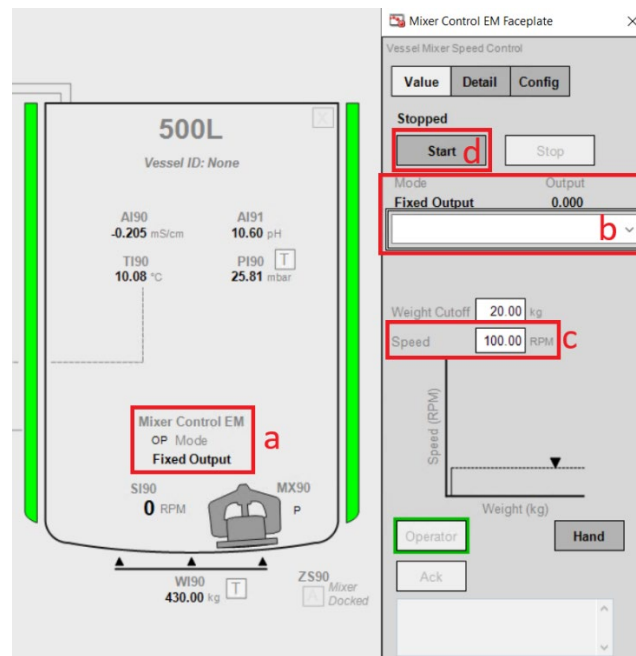
For manual mixing:

1. Open the SIC90 Mixer Control faceplate by clicking on the graphic located in the lower-middle section of the vessel graphic.
2. Place the module in 'Fixed Output' mode.
3. Set the desired mixing speed from the faceplate.
4. Press the Start button to run the mixer.

IMPORTANT: Use caution to avoid contact between the bag film and the rotating impeller at low volumes.

5. Adjust the mixing rate as needed for the application.
 - a. Allow the speed to stabilize before making any fine adjustments, if needed.
 - b. Monitor process values using HMI for expected process behavior and intervene, if necessary, by using HMI functionality.

Figure 66. Mixer Control Faceplate



6.11 Powder Additions (if applicable)



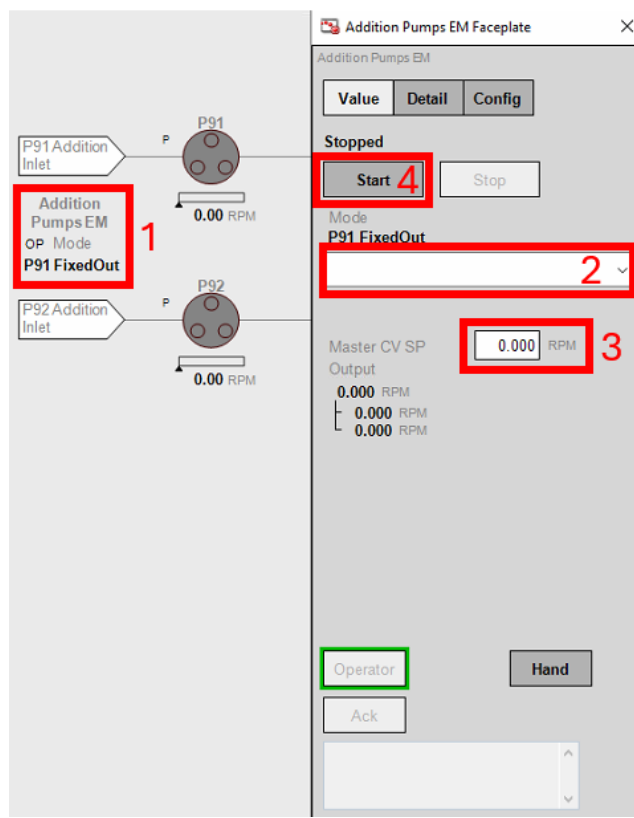
CAUTION: For larger systems with capacities of 1000 L, it is advisable to have two operators manage the loading process. These systems may necessitate the use of a safety ladder or other elevated platform to ensure safe and efficient handling.

1. Ensure that the clamp on the powder bag is completely closed.
2. Suspend the powder bag from the powder bag holder by its handle.
3. If necessary, adjust the powder bag holder height and position to align the powder bag outlet with the powder addition port.
4. Unlock the lock mechanism from the powder bag holder.
5. Remove the cap from the mixer bag powder port making sure the gasket stays in place.
6. Remove the cap from the powder bag opening.
7. Align the powder bag opening and the powder port on the mixer bag.
8. Close the the bag holder lock mechanism to connect to ports.
9. To begin adding solids, release the clamp at the bottom of the feed bag. Ensure the entire contents of the feed bag are transferred before detaching the powder bag. If no additional dry ingredients are needed, replace the powder port cover, gasket, and clamp.

6.12 Small Volume Additions using Onboard Addition Pumps (if applicable)

1. Ensure the mixer is running at the desired speed.
2. Open the Addition pumps control faceplate by clicking on the graphic located to the left section of the vessel graphic.
3. To operate in manual mode, select P91 FixedOut or P92 FixedOut on the module, based on the pump to be started.
4. Set the desired pump speed from the faceplate.
5. Start the pump.

Figure 67. Addition Pumps Setting



6.13 Transfer out of Mixer

IMPORTANT: If the mixer bag does not have a vent line, the mixer bag will gradually collapse during the draining phase. Use caution to avoid contact between the bag film and the rotating impeller at low volumes.

1. Confirm that the outlet line is clamped.
2. Connect the outlet line to the downstream assembly using the appropriate connection method and ensure that all connections to the downstream operation are made.
3. Unclamp the mixer bag outlet line and any other clamps on the transfer line to the downstream operation.
4. Initiate the transfer and walk down the transfer line to verify the absence of leaks.
5. The mixer can continue operating during draining, provided that the mixer bag chamber does not interfere with the rotating impeller. It may be necessary to reduce the mixer speed at lower working volumes to minimize splashing.
6. As the liquid level approaches the minimum working volume, stop the mixer by pressing Stop on the SIC90 Mixer faceplate. If the mixer is running in recipe control, complete the recipe to stop the mixer.
7. Drain the mixer bag until the bag is completely empty.

6.14 Shutdown and Bag Disposal

1. Disengage the drive unit by pulling the handle of the locking sheet to position 1, which triggers the drive unit to be lowered within the docking station.
2. To remove the drive unit from the vessel, pull the release ring and the handle away from the vessel (Figure 68).

Figure 68. Pull the Ring to Release the Drive Unit

3. Hang the drive unit on its dedicated bracket on the control unit.
4. After lifting out the drive unit, release the mixer bag tank plate:
 - a. Pull the locking sheet out to position 0.
 - b. Open the vessel door and ensure the locking sheet is disengaged and that the mixer bag mix head is detached from the vessel.
5. Disconnect the probe cables and coil them to the cable spool on the control unit.
6. Clean multi-use sensors, if used, according to the SOP.
7. Remove the mixer bag, refer to these steps:
 - a. Remove all tabs from the positioning pins.
 - b. Clamp all tubing and fittings, and disconnect tubing connectors.
 - c. Remove the powder bag holder.
 - d. Lift out the mixer bag and dispose according to SOP. .
8. Close the HMI application using the close button at the top right of the screen.
9. Once the application is closed, press the Exit button on the secure desktop shell and sign out of the system.
10. Once at the windows login screen, shut down the system PC.
11. Once the PC has shut down successfully, turn off the main power switch.

7. Maintenance, Calibration, and Troubleshooting



WARNING: Service and repair work on the system must be performed exclusively by Repligen Corporation personnel.

7.1 Routine Maintenance and Cleaning



WARNING: Before cleaning the controller, ensure the system is shut down according to [Section 6.14](#).

These systems are constructed with industrial-grade components and a robust design that requires minimal routine maintenance. Regular cleaning of exterior surfaces can help extend equipment life. As the system is rated to IP54, mild cleaning methods such as a 70% isopropyl alcohol wipe-down are recommended. External surfaces are easy to clean and compatible with typical cleanroom cleaning solutions without adversely affecting mechanical integrity. The system is not intended for high-pressure washdown or other intensive cleaning methods. To protect stainless-steel surfaces, avoid abrasive cleaners and prolonged exposure to chlorine or bleach.

7.2 Preventive Maintenance

The following preventive maintenance procedures are recommended and should be performed quarterly:

- Check all bolted connections on the equipment and instrumentation and tighten, if necessary, as vibrations may cause bolts to loosen over time.
- Check cabling, wires, and pneumatic tubing. Adjust and reconnect if necessary.

7.3 Calibrations

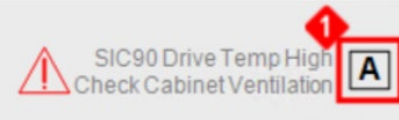
The following calibration schedule is recommended for the listed components.

Table 9. Calibration Schedule

Component	Model	Manufacturer	Recommended Recalibration Schedule
Load cells	Varies depending on vessel size	Mettler Toledo	Calibrated in accordance with customer company policy, typically annually with verification upon moving the vessel.
Single-use pH sensor	inSUS310i	Mettler Toledo	N/A. Single-use component with factory calibration that is valid until the expiration date of the single-use component.
Conductivity sensor	InPro7100i/12/225/4435	Mettler Toledo	Max. 1 year
Single-use conductivity sensor	SU400-16-M1	Broadley-James	N/A. Single-use component with factory calibration that is valid until the expiration date of the single-use component.
pH sensor	InPro3250i/SG/225	Mettler Toledo	Max. 1 year
Temperature sensor	21140 Bioreactor RTD	Burns Engineering®	12 months (initial), application dependent thereafter
Pressure sensor	PREPS-N-050	PendoTECH	N/A. Single-use component with factory calibration that is valid until the expiration date of the single-use component.
RPM sensor	BIM-EM12E-AP6X-H1141/S1751	Turck®	N/A. The sensor is a binary sensor, not intended to be calibrated.

7.4 Troubleshooting

Table 10. Troubleshooting Issues and Solutions

Issue Observed	Recommended Solution
System does not power up.	Verify that: • The control unit is plugged in • The main power switch is in the On position • The E-stop button is not engaged • The circuit breakers inside the control unit are in the On position
Load cells not responding.	Verify that: • The cable from the load cell junction box (under the mixer base) to the weight input on the control unit is connected • The transport lock nuts are not engaged
Mix drive does not turn on and/or impeller does not turn	Verify that: • The drive unit is properly engaged in the docking station • The locking sheet is in position 2 to engage the drive unit and the bag tank plate • The drive unit appears docked on the HMI • There are no alarms active that may be interlocking the drive unit • The load cell settings are properly selected (e.g., if load cells are selected but no weight cable is connected to the controller the drive will be interlocked)
Conductivity, pH, temperature, or pressure values are not displayed on the HMI process screen	Verify that: • The relevant sensor is properly selected in the settings menu • The correct make/model of sensor is connected to the cable
SIC90 Drive Temperature High alarm observed 	Verify that: • There is nothing positioned underneath the control unit that obstructs air flow into the control unit • There is ventilation air flow coming out of the exhaust port on the back of the control unit 

8. Index

AseptiQuik.....	41	Positioning Pins.....	15, 37
Bag Filling.....	42	Powder Bag Holder.....	26
Calibration.....	48	Probe Belt.....	14
Connection Ports.....	19	Probe Ports.....	38
Control Unit.....	18	Regulatory.....	10
Drive Unit.....	15, 38	Safety.....	7, 8
Emergency Stop.....	24	Sensor.....	18, 40
Installation.....	22, 34, 38	Setup.....	25
Load Cells.....	14, 29	Shutdown.....	46
Locking Sheet.....	12	Startup.....	32
Maintenance.....	47	Storage.....	33
Mix head.....	17	TCU.....	15, 24
Mixer Bag.....	16	Troubleshooting.....	49
Mixing.....	43	Utilities.....	23
Operation.....	32	Vessel.....	11
Overview.....	10	Vessel Door.....	13



(781) 250-0111



customerserviceUS@repligen.com



41 Seyon Street
Waltham, MA, USA 02453

TD0010_01JUN2026



(781) 250-0111



customerserviceUS@repligen.com



41 Seyon Street
Waltham, MA, USA 02453

TD0010_01JUN2026