Xuri™ W25

Operating Instructions

Original instructions

cytiva.com

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1 Introduction

About this chapter

This chapter contains important user information and the intended use of Xuri™ W25.

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1.1 Important user information

Introduction

This section contains important user information about the product and this manual.

Read this before operating the product

All users must read the entire *Operating Instructions* before installing, operating, or maintaining the product.

Always keep the *Operating Instructions* at hand when operating the product.

Do not install, operate, or perform maintenance on the product in any other way than described in the user documentation. If you do, you may be exposed or expose others to hazards that can lead to personal injury and you may cause damage to the equipment.

Intended use

The Xuri W25 system is intended to be used as laboratory and manufacturing equipment for cell cultivation. The system may not be used for clinical or diagnostic purposes.

Prerequisites

In order to operate Xuri W25 in the way it is intended:

- The user has a general understanding of how the client computer and Microsoft Windows operating systems work.
- The user is acquainted with the use of general laboratory equipment and with handling of biological materials.
- The user must read and understand the Safety Instructions chapter in the *Operating Instructions*.
- Xuri W25 must be installed in accordance with the site requirements and instructions in the *Operating Instructions*.
- A user account has been created according to *UNICORN Administration and Technical manual*.

1.2 About this manual

Introduction

This section contains information about the purpose and scope of this manual, notes and tips, and typographical conventions.

Purpose of this manual

This manual provides information needed to install, operate and maintain the product in a safe way.

Scope of this manual

This manual covers the entire Xuri W25, including the main unit (rocker), CBCU and pump, as well as accessories.

Notes and tips

Note: *A note is used to indicate information that is important for trouble-free and optimal use of the product.*

Tip: *A tip contains useful information that can improve or optimize your procedures.*

Typographical conventions

Software items are identified in the text by ***bold italic*** text.

Hardware items are identified in the text by **bold** text.

Tip: *The text can include clickable hyperlinks to reference information.*

1.3 Associated documentation

Introduction

This section describes the user documentation that is delivered with the product, and how to find related literature that can be downloaded or ordered from Cytiva.

User documentation for Xuri W25

The table below describes the user documentation for Xuri W25, which is available from the ***Help*** menu in UNICORN™ or on the user documentation CD.

Documentation	Main contents
Xuri W25 Operating Instructions (29064612) (this document)	Instructions needed to install, operate and maintain the Xuri W25 system in a correct and safe way. System overview, site requirements, and instructions for moving the system within the same building. Instructions for basic maintenance and troubleshooting. Includes basic UNICORN 7.x system control functions.
Xuri W25 User Manual (29064622)	Additional information in order to get the optimal performance from the system. Functional description of modules. Instructions for maintenance and troubleshooting activities. Includes UNICORN 7.x system control functions, method creation and handling, together with evaluation and presentation of data.
Xuri W25 Cue Card (29087822)	Brief instructions providing an overview of how to run the system.
UNICORN Quick Installation Guide (29414475)	Guide for installation of UNICORN.
UNICORN Administration and Technical manual	Overview and detailed description of network setup and complete software installation. Administration of UNICORN and the UNICORN database.
UNICORN Online Help	Dialog descriptions for UNICORN

Documentation	Main contents
User Documentation CD	CD containing the listed manuals and translated versions of *Xuri W25 Operating Instructions*.

1.4 Abbreviations

Concepts and abbreviations used in this manual are explained in the table below.

Concept/ abbreviation	Explanation	Translation
Cellbag™ bioreactors	The disposable container in which the cells are cultured.	The disposable container in which the cells are cultured.
DO	Dissolved oxygen.	Dissolved oxygen.
DO sensor	Optical sensor for measurement of dissolved oxygen. Attached to DO configured Cellbag bioreactors.	Optical sensor for measurement of dissolved oxygen. Attached to DO configured Cellbag bioreactors.
Single mode	Operating mode with one Cellbag bioreactors on the rocker.	Operating mode with one Cellbag bioreactors on the rocker.
Dual mode	Operating mode with two Cellbag bioreactors on the same rocker. Cultivation is monitored and controlled independently in the two bioreactors.	Operating mode with two Cellbag bioreactors on the same rocker. Cultivation is monitored and controlled independently in the two bioreactors.
pH sensor	Optical sensor for pH measurement. Attached to pH configured Cellbag bioreactors.	Optical sensor for pH measurement. Attached to pH configured Cellbag bioreactors.
Xuri W25 CBCU	Control unit for gas mixing, pH and DO control.	Control unit for gas mixing, pH and DO control.
Xuri W25 Pump	The pump unit.	The pump unit.
Xuri W25 rocker	The rocker.	The rocker.
Tray	Tray for Cellbag, mounted on the rocker. Different tray sizes are available for different culture capacities.	Tray for Cellbag, mounted on the rocker. Different tray sizes are available for different culture capacities.

Concept/ abbreviation	Explanation	Translation
The bioreactor system	The entire system, including rocker, CBCU, and pump, together with Cellbag bioreactor and filter heater.	The entire system, including rocker, CBCU, and pump, together with Cellbag bioreactor and filter heater.
UNICORN	The software used for controlling and monitoring the system.	The software used for controlling and monitoring the system.

2 Safety instructions

About this chapter

This chapter describes safety precautions, labels and symbols that are attached to the equipment. In addition, the chapter describes emergency and recovery procedures.

In this chapter

Section		See page
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Important

WARNING

All users must read and understand the entire contents of this general safety chapter, and the specific safety precautions information in each subsequent chapter of this manual to become aware of the hazards involved.

2.1 Safety precautions

Introduction

Xuri W25 is powered by mains voltage and handles materials that can be hazardous.

Before installing, operating or maintaining the system, you must be aware of the hazards described in this manual.

Definitions

This user documentation contains safety notices (WARNING, CAUTION, and NOTICE) concerning the safe use of the product. See definitions below.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. It is important not to proceed until all stated conditions are met and clearly understood.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. It is important not to proceed until all stated conditions are met and clearly understood.

NOTICE

NOTICE indicates instructions that must be followed to avoid damage to the product or other equipment.

General precautions

The following general precautions must be considered at all times. There are also context related precautions, which are written in their respective chapters.

WARNING

Do not operate the product in any other way than as described in the user documentation.

WARNING

Only properly trained personnel are allowed to operate and maintain the product.

WARNING

Accessories. Use only accessories supplied or recommended by Cytiva.

WARNING

Do not use the product if it is not working properly, or if it has suffered any damage including:

- damage to the power cord or its plug,
- damage caused by dropping the product,
- damage caused by splashing liquid onto the product.

NOTICE

Any computer used with the equipment must comply with IEC 60950 or IEC 62368-1 and be installed and used according to the manufacturer's instructions.

Personal protection

WARNING

Always use appropriate Personal Protective Equipment (PPE) during operation and maintenance of this product.

WARNING

Hazardous substances. When using hazardous chemical and biological agents, take all suitable protective measures, such as wearing protective glasses and gloves resistant to the substances used. Follow local and/or national regulations for safe operation, maintenance and decommissioning of the system.

WARNING

Spread of biological agents. The operator must take all necessary actions to avoid spreading hazardous biological agents. The facility must comply with the national code of practice for biosafety.

Installing and moving the equipment

CAUTION

Heavy object. Because of the significant weight of Xuri W25 rocker, assistance from another person is highly recommended when lifting or moving the equipment. Use the handles on the sides of the rocker when possible. Do not lift Xuri W25 rocker with tray attached.

CAUTION

Due to the size and weight of Tray 50, at least two persons are recommended for installing the tray.

CAUTION

Falling equipment. Do not stack more than one Xuri W25 CBCU and/or Xuri W25 Pump unit on top of each other.

Power supply

WARNING

Supply voltage. Before connecting the power cord, make sure that the supply voltage at the wall outlet corresponds to the requirements for the instrument.

WARNING

Protective ground. The stand-alone products must always be connected to a grounded power outlet.

WARNING

Only use grounded power cords delivered or approved by Cytiva.

WARNING

Access to power switch and power cord. The power switch must always be easy to access. The power cord must always be easy to disconnect.

WARNING

Disconnect power. Always disconnect power from the equipment before connecting the product units to any other instrument.

System operation

WARNING

Suffocation hazard. The product must only be used in locations with forced ventilation. When N_2 and/or CO_2 are connected, make sure that:

- the pressure over the gas connections does not exceed 1.5 bar.
- the gas connections are tightly secured.
- Inlet tubing and connections are subject to regular visual inspection.

Exceeding pressure or loose connections may cause the gas tubing to disconnect, resulting in dangerous leakages.

WARNING

Prevent gas leakage. To prevent any gas leakage, always switch off all gas supplies when the system is not in use.

WARNING

Fire hazard. O_2 leakage in combination with heat may cause ignition. To avoid O_2 leakages, make sure that:

- the pressure over the gas connections does not exceed 1.5 bar.
- the gas connections are tightly secured. Visually inspect the inlet tubing regularly.

CAUTION

Only Cellbag bioreactors approved by Cytiva for the product may be used together with the equipment.

CAUTION

Heavy object. The filled Cellbag bioreactor is heavy and must be lifted with care. This also applies to optional equipment such as calibration weights.

CAUTION

Leakage risk of biological substances. Before every use, check the integrity of all tubing and connections.

CAUTION

Leakage risk of biological substances. Always enter the correct Cellbag bioreactor size in the system software settings. Failure to do this may cause overpressure and subsequent rupture of the Cellbag bioreactor.

CAUTION

Pinch hazard. Body parts may be caught between the rocker base and tray.

CAUTION

Pinch hazard. Be careful not to trap any fingers between the rocker platform and tray when repositioning Tray 10 from tilt position. Move the tray by firmly gripping both sides of the tray.

CAUTION

Pinch hazard. Moving parts in Xuri W25. Do not open any pump head flip tops during operation.

CAUTION

Falling equipment. To prevent the bioreactor system units from accidentally being pulled from the bench, make sure that all tubing is kept inside the bench area.

NOTICE

If UniNet cables are disconnected during a run, the run will be interrupted and must be restarted. Make sure that cables are properly secured before starting a run and avoid moving system units during a run.

Maintenance

WARNING

Electrical shock hazard. All repairs must be done by service personnel authorized by Cytiva. Do not open any covers or replace parts unless specifically stated in the user documentation.

WARNING

Disconnect power. Always disconnect power from the instrument before performing any maintenance task.

WARNING

Always clean the equipment in a well ventilated area. Never immerse any part of the equipment in liquid or spray liquid on the equipment. Always make sure that the equipment is completely dry before connecting to a mains power source. Make sure to follow all environmental, health, and safety guidelines pertaining to the materials used.

WARNING

Use only approved parts. Only spare parts and accessories that are approved or supplied by Cytiva may be used for maintaining or servicing the product.

CAUTION

Falling equipment. Due to pinch and crush hazards, calibration weights should not be stacked on top of each other. Remove calibration weights before the power is turned off.

CAUTION

Hazardous substances. Before maintenance, service and decommissioning, clean the product with an appropriate cleaning agent to remove any hazardous substances.

2.2 Labels and symbols

Introduction

This section describes the nameplate, labels, and other safety and regulatory information attached to the product.

Instrument labels

The table below describes the different instrument labels and their positions on the different equipment. The instrument label identifies the equipment and shows electrical data, regulatory compliance, and warning symbols.

Label	Position on instrument
Xuri W25 rocker label	Attached on the back of the rocker and underneath the rocker platform.
Filter heater label	Attached to the filter heater.
Tray label	Attached to the trays.
Lid label	Attached to the lids.
Xuri W25 CBCU label	Attached on the underside of the unit. The labels on the CBCU units may have different looks depending on the CBCU unit configuration.
Xuri W25 Pump label	Attached on the rear panel of the pump.

Symbol description

The following symbols are used in the labels.

Label	Description
	**Warning!** Read the user documentation before using the system. Do not open any covers or replace parts unless specifically stated in the user documentation.
Voltage **Frequency** **Max. Power**	Electrical requirements: • Voltage (VAC ~) • Voltage (VDC ⎓) • Frequency (Hz) • Max. power (VA)

Label	Description
Protection Class	Degree of protection provided by the enclosure.
Mfg. Year	Year (YYYY) and month (MM) of manufacture

Safety labels

Safety labels on Xuri W25 rocker

The following symbols can be found on the rocker.

Label	Description
	**Warning!** Read the user documentation before using the system. Do not open any covers or replace parts unless specifically stated in the user documentation. Indicates a risk for body parts getting caught between two parts of the system and that care must be taken to avoid injury.

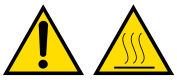
Safety labels on Xuri W25 Pump

The following symbols can be found on the pump.

Label	Description
	**Warning!** Indicates a risk for fingers getting caught between moving parts in the pump and that care must be taken to avoid injury.

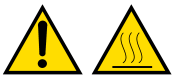
Safety labels on filter heater

The following symbols can be found on the filter heater.

Label	Description
	**Warning!** Indicates a hot surface and that care must be exercised to prevent injury.

Safety labels on tray

The following symbols can be found on the tray.

Label	Description
 LEFT	**Warning!** Indicates a hot surface and that care must be exercised to prevent injury. **LEFT** indicates the left side of the tray.
 RIGHT	**Warning!** Indicates a hot surface and that care must be exercised to prevent injury. **RIGHT** indicates the right side of the tray.

Additional labels

The table below describes the different additional labels and their positions on the different equipment.

Label	Position on equipment
Cellbag label	Attached to the cellbag.
DO sensor label	Attached to the cellbag next to the DO sensor.
pH sensor label	Attached to the cellbag next to the pH sensor.
Lid label	Attached to the lids.
Fiber cable label for DO sensor	Attached to the fiber cable of the DO sensor.
Fiber cable label for pH sensor	Attached to the fiber cable of the pH sensor.
Pump head label	Attached to the pump head. The label indicates the pumping direction of the pump.

2.3 Emergency procedures

Introduction

This section describes how to perform an emergency shutdown of Xuri W25. This section also describes the result in the event of power failure or network interruption.

Precautions

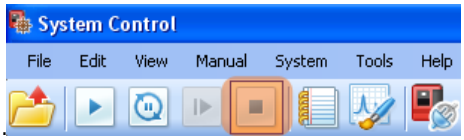
WARNING
Access to power switch and power cord. The power switch must always be easy to access. The power cord must always be easy to disconnect.

Emergency shutdown

In an emergency situation, stop the run in one of the following ways:

- Stop the run from ***System Control*** by clicking the ***Stop*** icon, if UNICORN is in control of the system.

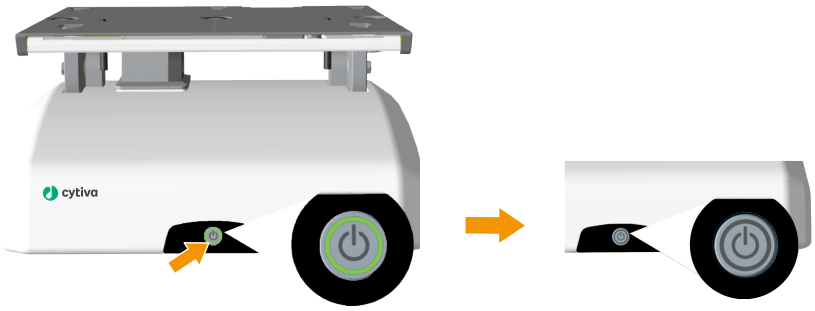
  Result: The current run is ended and the instrument will go to ***Ready*** state, indicating that it is ready for a new run.



  or

- Switch off power by pressing the **Power** button on the rocker front panel.

  Result: The run is interrupted. The light in the **Power** button is turned off.



Green light: power is ON. No light: power is OFF.

Normal and forced shutdown

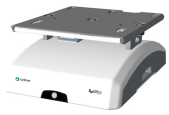
If the **Power** button is pressed once, a normal shutdown is performed. If the button is pressed and held, a forced shutdown is performed.

The following table describes normal shutdown and forced shutdown.

Type of shutdown	Description
Normal shutdown: press the **Power** button once.	All processes are stopped. The system waits for acknowledgement from the processes before shutting down the instrument.
Forced shutdown: press and hold the **Power** button.	All processes are stopped. The instrument is shut down immediately.

Power failure

The result of a power failure or emergency shutdown depends on which unit is affected.

Power failure to...	will result in...
Xuri W25 	• The run is interrupted immediately. • The data collected before the power failure is stored in the instrument and can be saved when power returns.
Client computer	The cell cultivation run continues without interruption. The operator will not, however, be able to view system status, change settings or send manual instructions during power failure of client computer. The software retains the run settings when the power is restored.

Restart after emergency shutdown or power failure

If ***System Settings*** →***Auto start*** →***Rocker*** and ***System Settings*** →***Auto start*** →***CBCU*** are set to ***Resume activity***, the following will happen when the system is re-energized:

- The rocker and the CBCU(s) will restart using the same values as before the power interruption.

- UNICORN will ask if you want to save or discard the run data collected before the power interruption.

Note: *Data collection, media control, and regulation of pH and DO must be reinitiated manually by reconnecting to the system and starting a new run.*

Uninterruptible power supply (UPS)

It is highly recommended to connect the system to a UPS. A UPS can postpone power failure, which allows time for a controlled shut-down of the bioreactor system and prevents data and/or culture loss. It is highly recommended to connect the system to a UPS.

For UPS power requirements, see the system specifications in *Xuri W25 User Manual*. Take the specifications for the client computer and monitor into account. Refer to the manufacturers' documentation.

3 System description

About this chapter

This chapter gives a brief overview of Xuri W25. For more detailed information, refer to *Xuri W25 User Manual*.

In this chapter

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3.1 System overview

Introduction

Xuri W25 is intended for cell cultivation.

A disposable Cellbag bioreactor is placed on a rocker and filled with gas, partially filled with culture medium, and inoculated with cells. Gas transfer and mixing of culture is accomplished by wave-induced agitation, performed by the rocker unit.

The cell culture volume range per Cellbag bioreactor is 0.3 to 25 L depending on bioreactor size, and working volume may be expanded up to 10 times during one cultivation.

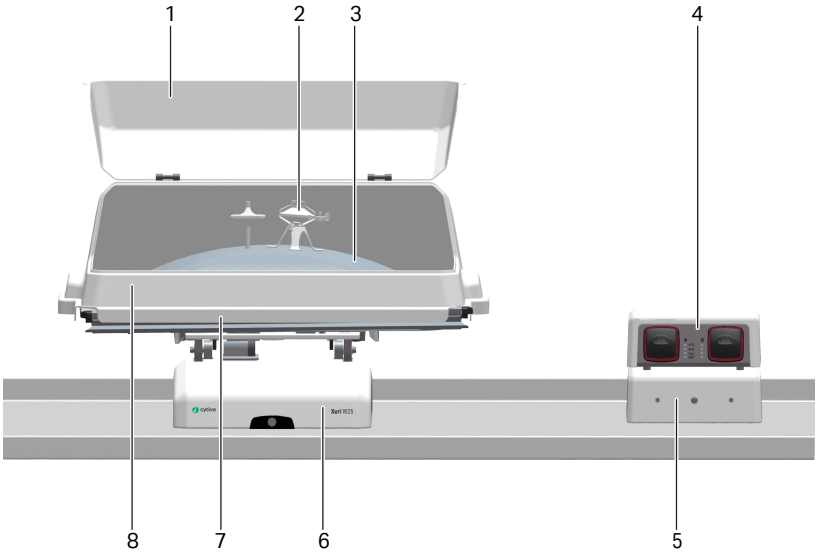
The system, composed of the rocker, Xuri W25 CBCU and Xuri W25 Pump, enables measurement and control of pH, DO, weight and media distribution, and provides different gas flow and gas mixing possibilities.

- In ***single mode*** , the system supports culture in one Cellbag bioreactor at one time. The rocker is connected to one Xuri W25 CBCU and up to three Xuri W25 Pump units.
- In ***dual mode*** , the system supports culture in two Cellbag bioreactors placed on the same tray. The rocker is connected to up to two Xuri W25 CBCU units and up to three Xuri W25 Pump units for independent control of culture conditions in the two bioreactors.

The system is controlled from a PC running UNICORN software version 7 or later. The system can also be controlled from a supervisory control and data acquisition (SCADA) system, such as the DeltaV™ control system, using the integrated OPC server. Contact Cytiva for instructions and guidance for OPC.

Illustration of the system

The illustration below shows the main system units for use in single mode with one Xuri W25 Pump. Dual mode uses two Xuri W25 CBCU units for controlling the two Cellbag bioreactors independently. Both single and dual modes can support up to three Xuri W25 Pump units.



Part	Description
1	Hatch
2	Filter heater
3	Cellbag bioreactor
4	Xuri W25 Pump
5	Xuri W25 CBCU
6	Xuri W25 rocker
7	Tray
8	Lid

3.2 Xuri W25 rocker

Introduction

The rocker is the main unit of the system. Through the rocker, weight is measured, and temperature, rocking speed, rocking angle and rocking motion are controlled.

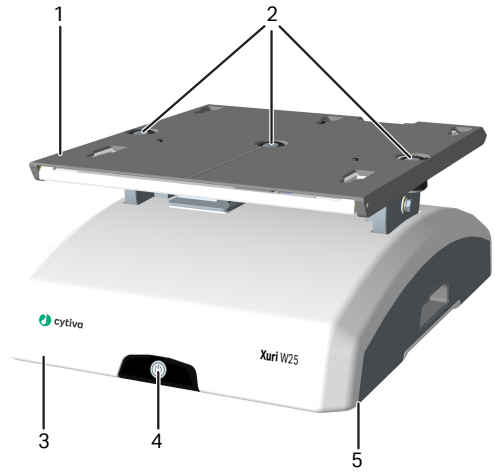
The rocker contains four load cells for monitoring the weight of the Cellbag bioreactor and content. The placement of the load cells allows independent weight measurement of the two Cellbag bioreactors in dual mode.

The rocker also contains an embedded microprocessor, which allows the system to be controlled independently of the performance of the connected network and client computer.

For specifications of the rocker, refer to the *Xuri W25 User Manual* or the data file for Xuri W25, available for download from cytiva.com.

Front view of the rocker

The illustration below shows the front view of the rocker.



Part	Description
1	Rocker platform
2	Temperature sensors
3	Rocker base
4	**Power** button
5	Location of adjustable foot

Power button

The **Power** button indicates the status of the rocker according to the list below.

Light indicator	Image	Description
No light		The power is OFF.
Green flashing light		The rocker is starting up.
Green steady light		The power is ON and the rocker is operational.
Red flashing light		The rocker failed to connect to other components in the system.
Red steady light		Indicates an error of the rocker.

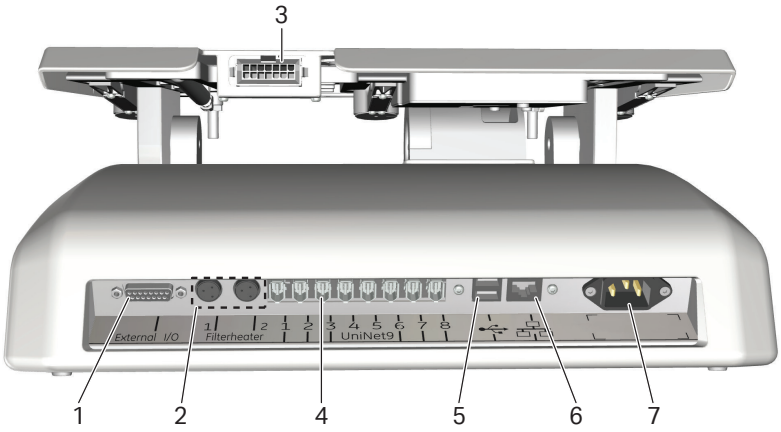
Adjustable foot

The adjustable foot is placed in the front right corner of the rocker base when viewed from the front. It is used to distribute weight evenly over the four rocker feet.

Use the supplied adjustable foot wrench to adjust the foot.

Rear view of the rocker

The illustration below shows the rear panel of the rocker.



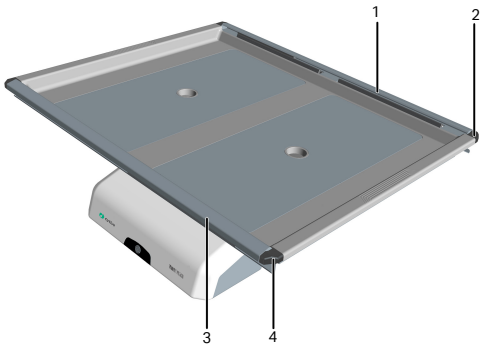
Part	Description
1	15-pin D-sub connector, used for digital and analog I/O signals
2	Filter heater connectors
3	Tray connector
4	UniNet-9 ports
5	USB ports
6	Ethernet connector
7	Power connector ***Note:*** *The rocker is fitted with internal electrical fuses that are not user-replaceable.*

Tray and lid sizes

Trays and lids are available in the different sizes listed below:

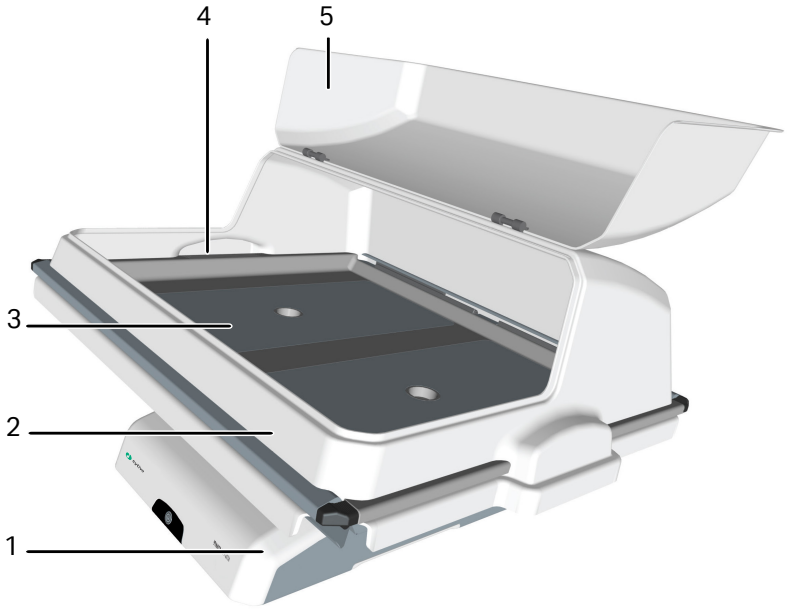
Trays	Lids
Tray 10	Lid 10
Tray 20	Lid 20
Tray 50	Lid 50

Illustrations of tray and lid



Part	Description
1	Bag clamp (upper)
2	Bag clamp opener (one in each upper corner)
3	Bag clamp opener (one in each lower corner)
4	Bag clamp (lower)

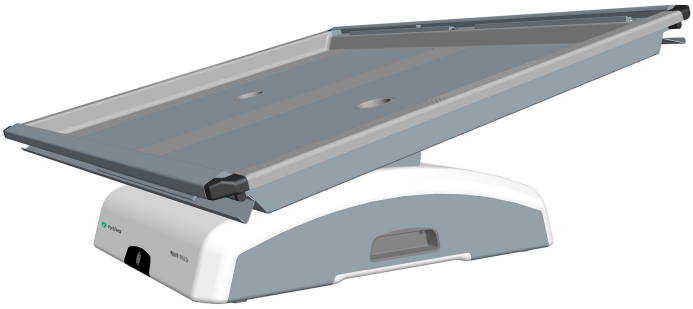
The illustration below shows the rocker with Tray 50 and Lid 50 mounted.



Part	Description
1	Rocker base
2	Lid
3	Tray
4	Tubing exit
5	Hatch

Prepare for tilt

When the system enters ***END*** mode, the tray prepares for tilt if ***System Settings*** →***Rocker*** →***Prepare for tilt at END*** is set to ***Yes***. This moves the rocker to the mechanical end position, which is 14 degrees from horizontal. This position can also be set by executing the manual instruction ***Rocker*** →***Prepare for tilt***. See illustration below.



Tilt position

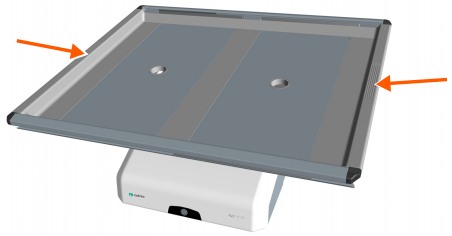
In order to facilitate tray change in system setup and sampling and harvest during and after cell cultivation, it is possible to position the tray with the attached Cellbag bioreactor(s) into an upright position called tilt position. Follow the instructions below to put the tray into tilt position.

The tray is shown without attached Cellbag in the images below.

NOTICE

Take care when tilting the rocker tray with full Cellbag bioreactor(s) attached.

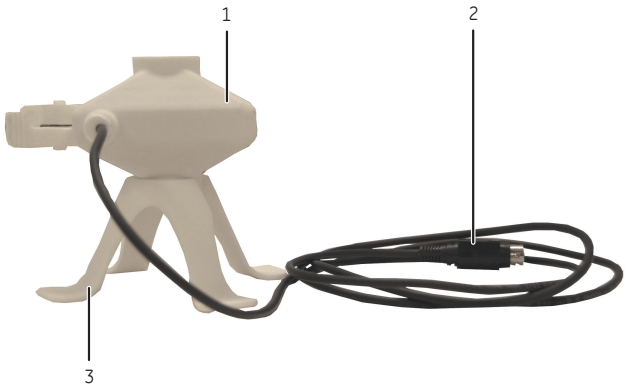
Step	Action
1	Prepare for tilt as described above or select the largest possible angle in UNICORN. Do not tilt the tray from an angle lower than 12°.
2	Hold the textured grip area on each side of the tray and pull the tray towards you.



The illustration below shows the tilt position:

Filter heater

The filter heater prevents condensation and clogging of the outlet vent filter on the Cellbag bioreactor.



Part	Description
1	Filter heater
2	Connector for connection to the rocker
3	Filter heater stand

3.3 Xuri W25 CBCU

Introduction

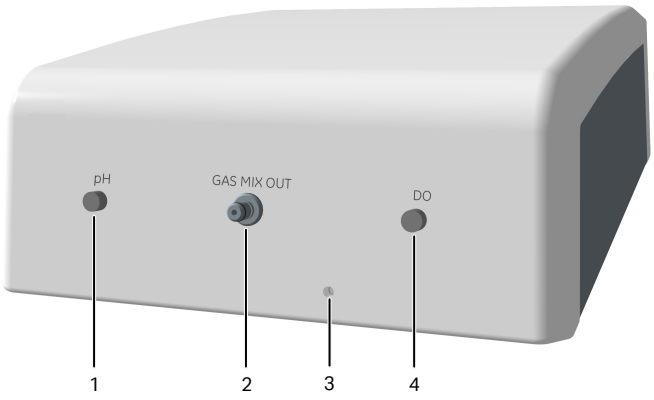
The control unit, Xuri W25 CBCU, is connected to the rocker via a UniNet-9 connector. The full configuration mixes air/N_2, O_2, and CO_2 gas, and contains O_2 and CO_2 sensors, a mass flow controller, an optical pH sensor reader, and an optical DO sensor reader. Three configurations are available:

- *Xuri W25 CBCU pH*: CO_2, O_2 and pH.
- *Xuri W25 CBCU DO* : CO_2, O_2 and DO.
- *Xuri W25 CBCU Full*: CO_2, O_2, pH and DO.

For specifications of the CBCU, refer to the *Xuri W25 User Manual* or the data file for Xuri W25, available for download from cytiva.com.

Front view of Xuri W25 CBCU

The illustration below shows the front panel of a fully configured CBCU. The configuration of your CBCU may vary from the configuration shown below.



Part	Component	Description
1	**pH** port	Connector for pH sensor fiber cable.
2	**GAS MIX OUT**	Gas outlet for connection to Cellbag bioreactor.
3	Status LED	Indicates the CBCU operating status.
4	**DO** port	Connector for DO sensor fiber cable.

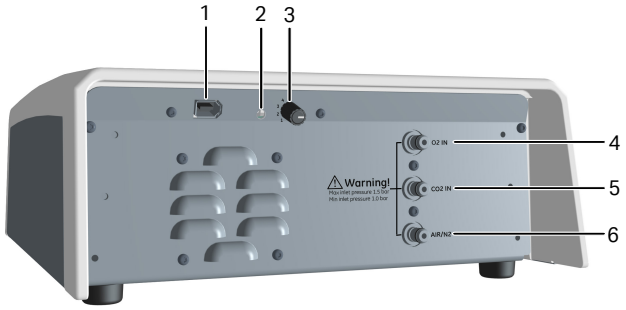
Status LED

The status LED indicates the CBCU operating status according to the following table.

Light indicator	Description
Steady green light	The CBCU is ready for operation.
Green flashing light	The CBCU is operating.
Red flashing light	Indicates an internal error, but the CBCU is still operating.
Steady red light	Indicates an internal error, and the CBCU is not operating.

Rear view of Xuri W25 CBCU

The illustration below shows the rear panel of a fully configured CBCU.



Part	Component	Description
1	UniNet-9 port	Power connection to the rocker.
2	CAN indicator LED	Indicates system connection status.
3	CAN ID switch	Switch for setting the CBCU unit number for system recognition.
4	**O2 IN**	Inlet connection for O_2 supply.
5	**CO2 IN**	Inlet connection for CO_2 supply.
6	**AIR/N2**	Inlet connection for air or N_2 supply.

CAN ID

The CAN ID is a unit number used by UNICORN to recognize the CBCU that is connected to the system.

The CAN ID is set by turning a switch on the CBCU rear panel (see illustration above). The CAN ID should always be set to position 1 for use in single mode. For dual mode, set the CAN ID to 1 for the CBCU connected to the left Cellbag bioreactor, and to 2 for the CBCU connected to the right Cellbag bioreactor.

Tubing and connectors

Tubing and connectors for gas flow as listed below are delivered with the Xuri W25 CBCU. The gas sources to the inlets on the rear panel of the CBCU are the customer's responsibility. Tubing and connectors for liquid flow must be obtained separately.

Tubing

Item	Inner diameter	Outer diameter	Length
Tygon E3603	1/8" (3.2 mm)	1/4" (6.4 mm)	147.6" (375 cm)
Silicone	3/16" (4.8 mm)	3/8" (9.5 mm)	7.9" (20 cm)

Connectors

Item	Inner diameter
Reducer connector, gas tubing	1/8" to 3/16" (3.2 to 4.8 mm)
Connector, CBCU	1/8" (3.2 mm)

3.4 Xuri W25 Pump

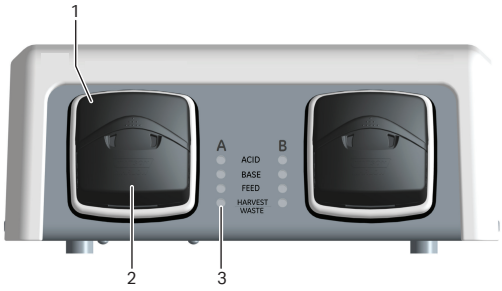
Introduction

Xuri W25 Pump is a peristaltic pump unit that includes two roller pumps. It pumps fluid for feed, harvest/waste, and pH control with acid and base.

For specifications of the pump, refer to the *Xuri W25 User Manual* or the data file for Xuri W25, available for download from cytiva.com.

Front view of the pump

The illustration below shows the front panel of the pump.



Part	Description
1	Pump head flip top
2	Pump head
3	Status LEDs for pumping function per pump head

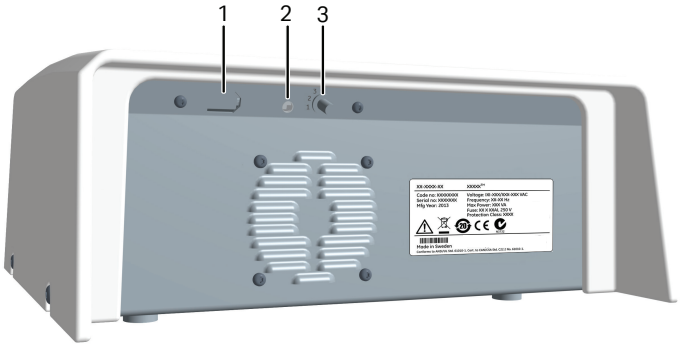
Status LEDs

The status LEDs indicate the pumping function status according to the following table.

Light indicator	Description
Steady green light	The pumping function is ready for operation.
Green flashing light	Pumping is ongoing.
Red flashing light	Indicates an internal error, but the pump is still operating.
Steady red light	Indicates an internal error, and the pump is not operating properly.

Rear view of the pump

The illustration below shows the rear panel of the pump.



Part	Component	Description
1	UniNet-9 port	Power connection to the rocker.
2	CAN indicator LED	Indicates system connection status.
3	CAN ID switch	Shows the unit number of the pump for recognition by the system.

CAN ID

The CAN ID is a unit number used by UNICORN to recognize the particular pump unit that is connected. If more than one pump unit is connected, the units are distinguished by their CAN IDs.

The CAN ID is set by turning a switch on the pump rear panel (see illustration above). The switch has four CAN ID positions, marked 1, 2, 3, and 4, respectively. The CAN ID should be set to position 1 for the first pump, position 2 for the second pump and so on.

Tip: *The pumps are identified in UNICORN by their CAN ID. Label each pump unit with its CAN ID to simplify identification of the physical pump.*

3.5 Cellbag bioreactor

Introduction

Cell cultivation is performed inside the Cellbag bioreactor. The Cellbag bioreactor is delivered gamma irradiated and ready for use. It is intended for single use only and should be discarded after use.

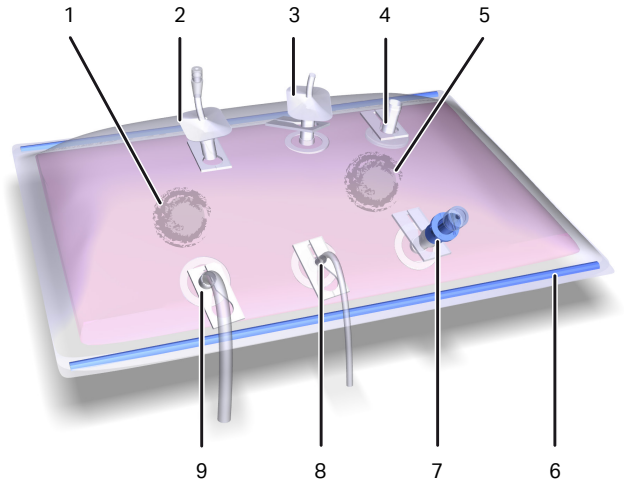
Cellbag bioreactor options

The Cellbag bioreactors are available in different configurations, of varying sizes and equipped with various ports. Cellbag bioreactors with internal cell retention filters are available for perfusion culture. If required, it is possible to customize the Cellbag bioreactors. The following bag sizes are available for Xuri W25 :

- 2 L
- 10 L
- 20 L (single mode only)
- 50 L (single mode only)

Illustration of Cellbag bioreactor

The illustration shows a general Cellbag bioreactor. The configuration of your Cellbag bioreactor may vary from the configuration shown below.



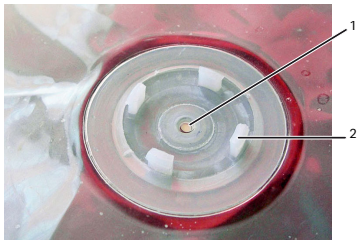
Part	Description
1	pH bag sensor port, located on the underside of the bag
2	Outlet vent filter with pressure control valve
3	Inlet vent filter

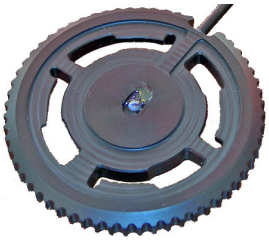
Part	Description
4	Addition port
5	DO bag sensor port, located on the underside of the bag
6	Cellbag rod
7	Clave™ sampling port
8	Addition port
9	Addition/harvest port

Note: *The inlet and outlet vent filters are distinguished by the pressure control valve on the outlet filter.*

pH and DO sensors

The Cellbag bioreactor may be equipped with optical sensors for monitoring pH and dissolved oxygen (DO). The sensors are light sensitive and should be protected from excessive light. The sensors are located in the center of a sensor port on the Cellbag Xuri W25 and must be coupled to a sensor adapter, see table below.

Part	Description
Bag sensor port	The sensor port is located on the underside of the Cellbag bioreactor. The actual sensor (white/yellow for pH, pink/black for DO is located in the center (1) of the sensor port, see image below. The sensor adapter is attached to the sensor port by the four pins (2). 

Part	Description
Sensor adapter	The sensor adapter is located at one end of an optical fiber cable. The optical lens of the fiber cable is located in the center of the sensor adapter. The fiber cable is connected to a sensor reader in the CBCU. The fiber cable is connected to the pH or DO port on the CBCU front panel. 

3.6 UNICORN software overview

This section gives an overview of the general operation of the UNICORN software: a complete package for control, supervision and evaluation of cell cultivation runs. It also describes how to access the help utility that is included in UNICORN.

Note: *Software illustrations in these instructions are examples, and may differ from your software in some details.*

In this section

Section		See page
3.6.1	General UNICORN operation	44
3.6.2	Administration	47
3.6.3	System control	48
3.6.4	Evaluation	54

3.6.1 General UNICORN operation

UNICORN modules overview

UNICORN consists of four modules: ***System Control***, ***Evaluation***, ***Administration*** and ***Method Editor***.

The main functions of the modules are described in the table below.

Module	Main functions
System Control	Start, view and control runs.
Evaluation	Open results, evaluate runs and create reports.
Administration	Perform user and system setup, system log and database administration.
Method Editor	Create and edit methods.

Enter a UNICORN module

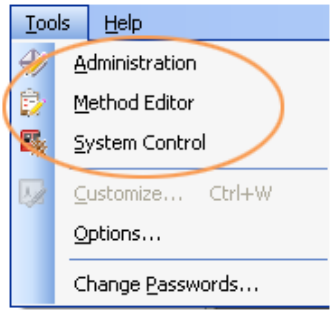
To enter a module:

- click the ***Taskbar*** button of the module of interest,

or

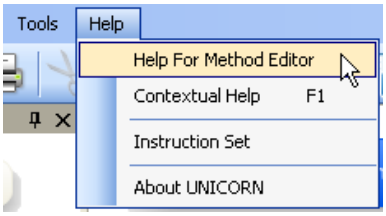
- choose the module of interest in the ***Tools*** menu in any of the other software modules.

  The illustration below shows the ***Tools*** menu of the ***Evaluation*** module.



Access the help utility

A comprehensive help utility is included in the UNICORN software. The table below describes how to access the different parts of the help utility.

If you want to...	then...
find information about a UNICORN module	select ***Help*** →***Help for...*** in the UNICORN module of interest 
find information about the item currently selected and in focus (e.g., a pane, a dialog, or a method phase)	• press the **F1** key with the item of interest selected and in focus or • click the ***Help*** icon in the open dialog 
navigate the online help	• select ***Help*** →***Help for...*** in any of the UNICORN modules (see illustration above) • in the ***TOC*** (Table of contents) pane, expand the headings of interest to navigate the content structure • click the heading of interest to open a section
search for a specific term in the online help	• select ***Help*** →***Help for...*** in any of the UNICORN modules (see illustration above) • in the ***Search*** pane, enter the term of interest in the input field • click the ***Search*** button 
access manuals in PDF format	• select ***Help*** →***Help for...*** in any of the UNICORN modules (see illustration above) • in the ***TOC*** pane, expand the heading ***UNICORN 7.x online documentation portal*** and select ***Documentation overview*** • in the ***PDF manuals*** section, click one of the text links

If you want to...	then...
find information about an instruction	In the ***Method Editor*** module: • open a method • select the instruction of interest in the ***Instruction box*** in the ***Text instruction*** pane • press the **F1** key In the ***System Control*** module: • select ***Manual*** →***Execute Manual Instructions*** • expand a heading and select the instruction of interest • press the **F1** key *or* click the ***Help*** icon in the dialog 

3.6.2 Administration

Introduction

The ***Administration*** module is used to manage all functions of the UNICORN software. Refer to *UNICORN Administration and Technical manual* for more information.

Icons in the Administration module

The table below shows the ***Administration*** module icons.

Icon	Function
	***User Setup*** is used to manage user access to UNICORN.
	***Access Groups and Network Users*** is used to manage access groups and network users.
	***E-mail Setup*** is used to set up an e-mail account for automated system messages.
	***UNICORN and System Log*** provides the system administrator with records of usage and activity.
	***System Properties*** is used to define the system and edit system properties.
	***Database Management*** is used for maintenance of the database.

3.6.3 System control

Introduction

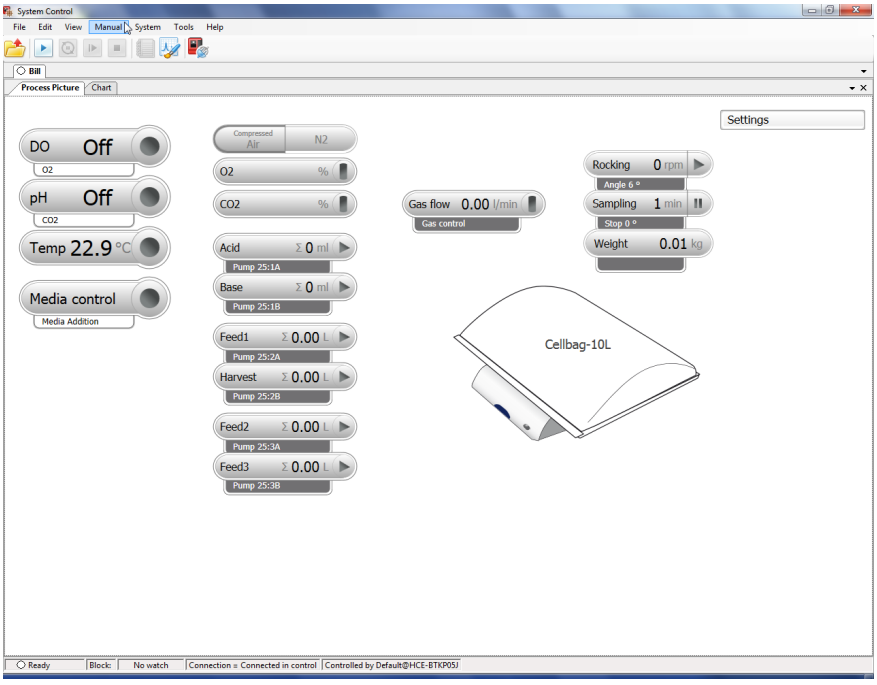
The ***System Control*** module is used to start, view, and control a manual or method run.

System Control panes

As illustrated below, two tabs are available in the ***System Control*** module by default. The ***Process Picture*** tab allows manual interactions with the system and provides feedback on run parameters. The ***Chart*** tab shows a graphical presentation of data throughout the run. Process picture, charts, run logs, and run data can be displayed either as separate tabs or as docked panes in the same window.

See *Section 5.4 Perform cultivation, on page 115* for information on how to perform a run.

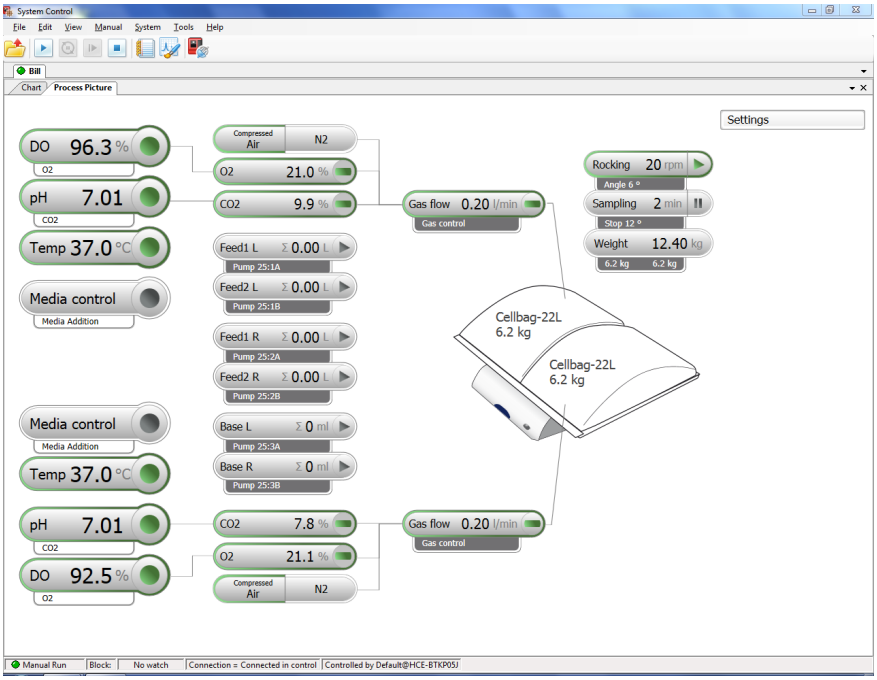
Tip: *To get more information than is shown in the **Process Picture**, select **View** →**Run Data** to open the **Run Data** pane which presents current data in numerical values.*



Items in the process picture reflect the components included in the system (for example, the illustration above shows a system in single mode equipped with three pumps).

In dual mode, the process picture shows two Cellbag bioreactors on the rocker picture, with separate control icons for the individually controlled parameters in each bioreactor. Icons for the left-hand bioreactor are in the upper half of the process picture and icons for the right-hand bioreactor in the lower half.

Note: ***UNICORN*** *displays the regulated pressure (compressed air/N2) in a process picture chart, not the inlet pressure from supply.*



Identifying system components in the process picture

This section describes how to identify the units in the process picture with respect to the Cellbag bioreactors in single and dual mode.

- The left- and right-hand Cellbag bioreactors in dual mode are controlled by the CBCU units with CAN ID 1 and 2 respectively. They are shown on the left and right sides of the tray in the process picture. To avoid confusion, place the physical CBCU units on the left and right sides of the tray as viewed from the front of the rocker.
- Connections between the Cellbag Xuri W25(s) and the respective monitor and active control units are indicated by connection lines in the process picture.
- Pump units are identified in the process picture as ***1, 2*** or ***3*** according to their CAN ID setting, and the pump heads on each unit are designated ***A*** (left) and ***B*** (right).

  In dual mode, pump roles for the left and right Cellbag bioreactors are labelled ***L*** and ***R*** respectively.

Examples:
Pump 25 →1B refers to the right-hand pump head on the pump unit with CAN ID 1.

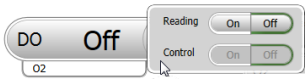
Pump 25 →2A refers to the left-hand pump head on the pump unit with CAN ID 2.

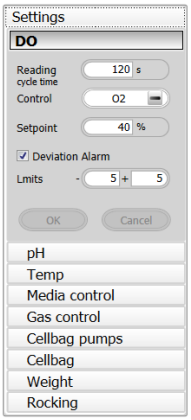
Tip: *Label the CBCU and pump units with their CAN ID settings to simplify correlation of the physical units with the process picture.*

In dual mode, place the pumps connected to the left and right Cellbag bioreactors on the left and right sides of the rocker respectively.

Actions in the Process Picture pane

It is possible to interact with the ***Process Picture*** pane in the following ways:

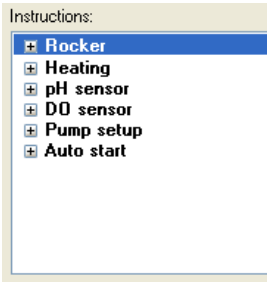
If you want to...	then...
Activate or deactivate pH and DO measurement and control	Hold the cursor over the right-hand side of the button, and turn ***Reading*** and/or ***Control*** on or off as required. You can only switch the ***Control*** setting if ***Reading*** is on, and you cannot turn ***Reading*** off if ***Control*** is on. 
Activate or deactivate other functions	Click on the right-hand side of the button. The text on the button shows the current value of the function. 

If you want to...	then...
Open the settings for a function	Click on the left-hand side of the button.  The example below shows the settings for dissolved oxygen, ***DO***. 
Adjust the settings	Enter appropriate values in the ***Settings*** dialog and click ***OK*** or press enter.

System settings

Each installed instrument has a set of default parameter values, called system settings. The ***System Settings*** dialog in ***System Control*** is used to view and edit the system setting for the currently selected instrument before the run is started. Follow the instructions below to change the ***System Settings***.

Step	Action
1	In the ***System Control*** module, select ***System*** →***Settings***.

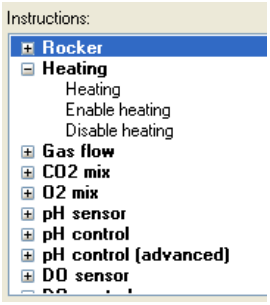
Step	Action
	Result: The ***System Settings*** dialog opens with the ***Instructions*** displayed. An example is shown below. 
2	Select the instruction to edit from the list. Click the + symbol to show the instructions for each category. The instructions in each category differ depending on the instrument configuration.
3	Select settings and choose parameter values for the selected instruction. Click ***OK***. Settings will apply until they are changed.
4	To return to the default values defined in the instrument configuration, click ***Set Parameters To Strategy Default Values***.

Manual instructions

It is possible to interact manually with an ongoing run using ***Manual instructions***. Follow the instructions below to perform manual instructions.

Note: *It is also possible to interact with the system manually directly from the* ***Process Picture****.*

Step	Action
1	In the ***System Control*** module: • select ***Manual*** →***Execute Manual Instructions*** or • use the shortcut **Ctrl+M**.

Step	Action
	Result: The ***Manual instructions*** dialog opens. 
2	In the ***Manual instructions*** dialog: **a.** Click the + symbol to show the instructions for the instruction group that you want to modify. **b.** Select the instruction that you want to modify. **c.** Enter the new values for the instruction.
3	To execute several instructions at the same breakpoint, select and edit an instruction and click ***Insert***. Repeat for several instructions. ***Note:*** *To update parameter fields during run, check the* ***Auto update...*** *box.*
4	To perform the instructions, click ***Execute***.

Run data

The ***Run Data*** pane shows the current values of some parameters, for example rocking motion and accumulated time. To change the ***Run Data*** display, select ***View*** →***Run Data***, right click in the ***Run Data*** pane and:

- select ***Run Data Groups*** →***Detailed*** to show more details

  or
- select ***Customize*** to customize the appearance of the ***Run Data*** pane.

3.6.4 Evaluation

The ***Evaluation*** module is used to evaluate the results from bioreactor runs. Evaluation is described in detail in the *Xuri W25 User Manual* and *UNICORN Online Help*.

4 Installation

About this chapter

This chapter provides required information to enable users and service personnel to:

- unpack the bioreactor system delivered from the factory
- install the system units
- install UNICORN 7.x software
- edit system properties

Read the entire installation chapter before starting to install Xuri W25.

NOTICE

The rocker contains load cells for weight measurements and should be handled with extra care. Do not place the rocker on any parts that may move. Avoid exposing the load cells to lateral forces, such as pushing the unit sideways on the bench, which may cause disturbances in the measurement or damage the load cells.

In this chapter

Section		See page
4.1	Site preparation	56
4.2	Hardware installation	64
4.3	Software installation	70

4.1 Site preparation

About this section

This section describes the site planning and the preparations necessary before installation of Xuri W25. The purpose is to provide planners and technical staff with the data needed to prepare the laboratory for the installation.

In this section

Section		See page
4.1.1	Delivery and storage	57
4.1.2	Site requirements	58
4.1.3	Client computer specifications	62

4.1.1 Delivery and storage

When you receive the delivery boxes

- Record on the packing slip if there is any apparent damage on the delivery boxes. Inform your Cytiva representative of any such damage.
- Move the delivery boxes to a protected location indoors.

Storage requirements

The delivery boxes should be stored in a protected location indoors. The following storage requirements must be fulfilled for the unopened boxes.

Parameter	Allowed range
Ambient temperature, storage	-25°C to 50°C
Humidity, storage	5% to 95% (non-condensing)

4.1.2 Site requirements

Space requirements

Prepare a clean working area on a stable laboratory bench. The bench must fulfill the following requirements:

- Recommended minimum bench space: 80 x 180 cm.
- The bench must be clean, level, flat and sufficiently stable to withstand vibration from the rocking.
- Do not place any other vibrating equipment on the same bench, since vibrations might affect the weight reading.
- The bench must be able to support the total weight of the system, including the filled Cellbag bioreactor. See *Equipment dimensions and weight, on page 59*. If other optional instruments are installed, their weights must also be included.
- Do not place soft material, paper sheets or similar under the system, as this can block the ventilation inlet.

WARNING

Access to power cord. Do not block access to the power cord. The power cord must always be easy to disconnect.

Illustration of system setup, single mode

The illustration below shows the recommended setup of the bioreactor system on the laboratory bench for operation in single mode.

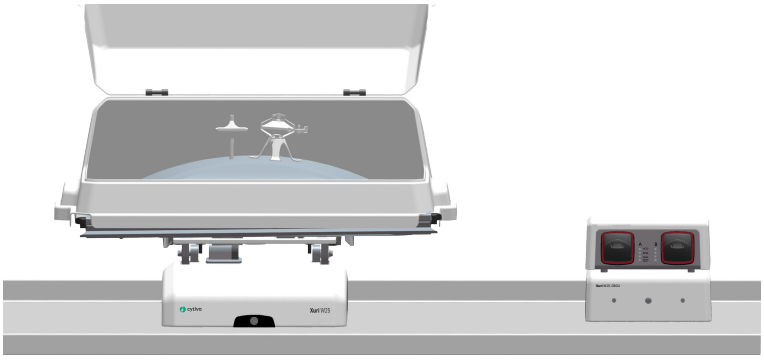
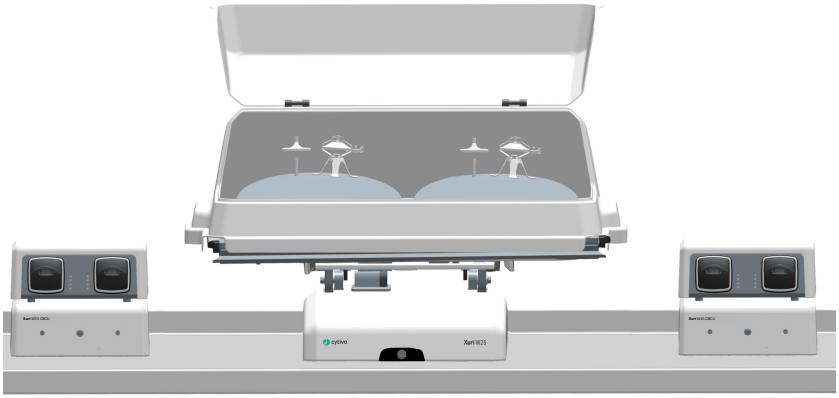


Illustration of system setup, dual mode

In dual mode, place the Xuri W25 CBCU and Xuri W25 Pump units on either side of the rocker to correspond with the ***L*** and ***R*** designations in the software.



Equipment dimensions and weight

The table below lists the outer dimensions and weights of the bioreactor system units.

System unit	Dimensions, W x D x H (mm)	Weight (kg)
Rocker	404 x 560 x 205	24.0
CBCU	276 x 360 x 117	4.8
Pump	275 x 280 x 115	3.8
Tray 10	475 x 430 x 60	4.5
Tray 20	740 x 480 x 70	7.3
Tray 50	800 x 610 x 70	9.5
Lid 10	511 x 294 x 554	1.7
Lid 20	823 x 308 x 557	3.0
Lid 50	881 x 326 x 686	4.0

Environmental conditions

The following general requirements must be fulfilled:

- The room must have forced ventilation, adapted for use of CO_2, O_2 and N_2.

- The system units should not be exposed to sources of heat, such as direct sunlight

The installation site must comply with the following specifications.

Environmental requirements

Parameter	Requirement
Allowed location	Indoor use only
Ambient temperature, operation	15°C to 32°C
Relative humidity, operating	20% to 80%, noncondensing
Atmospheric pressure	800 to 1060 mbar
Altitude, operation	Up to 2000 m
Pollution degree of the intended environment	Pollution degree 2

Note: *For satisfactory temperature control, the ambient temperature must be at least 5°C lower than the desired culture growth temperature.*

Note: *The load cells in the rocker are sensitive to changes in temperature. The ambient temperature should be maintained as constant as possible for reliable weight measurements.*

Electrical power requirements

The table below specifies the power requirements:

Parameter	Specification
Supply voltage	100 to 120 V AC ±10% 200 to 240 V AC ±10%
Frequency	50/60 Hz
Transient overvoltages	Overvoltage category II
Max power	1500 VA
Mains connection	EU or US plug, outlet fused or protected by equivalent circuit breaker. UK mains cable available on request.
Length of mains cable	2 m. Extension cables may be used if required.

WARNING

Protective ground. The product must be connected to a grounded power outlet.

Noise level

- The noise level of the operating bioreactor system is below 65 dBA.
- Audio warning signals have a higher noise level than the operating system.

Heat output

The heat output data is listed in the table below.

Component	Heat output
Bioreactor system, including the rocker unit, CBCU and pump.	Maximum 1500 W

Gas supply

The table below lists the gas supply required for each installed CBCU.

Gas	Pressure (bar)	Flow (L/min) Normal mode	Flow (L/min) Fast fill mode
Compressed air/N_2	1.0 to 1.5	1.3	3.5
CO_2	1.0 to 1.5	0.2	0.5
O_2	1.0 to 1.5	0.7	1.7

4.1.3 Client computer specifications

Introduction

Xuri W25 is supplied with UNICORN instrument server. Computer/Setup with compatible UNICORN client and database is required for use with Xuri W25. This section describes some general technical specifications for UNICORN computers.

General computer specifications

For information on computer specification, see *http://www.cytiva.com/UNICORNspecifications*.

For information about compatibility between UNICORN versions and the supported operating systems and database versions, see the UNICORN compatibility matrix at *http://www.cytiva.com/UNICORNcompatibility*.

The following applies:

- A screen resolution of 1280x1024 or higher is recommended. Parts of the UNICORN user interface cannot be displayed properly using a lower resolution.
- Changing the default font and changing the font size from 100% in Windows can cause problems in the UNICORN user interface.
- Windows power saving features must be turned off to avoid conflicts with system operations.
- UNICORN is not compatible with the Windows feature High DPI Awareness, which allows the graphic user interface to be scaled. The interface scale must remain at 100% to avoid issues with clipping and misaligning of parts of the UNICORN user interface. Normally, the scale is set at 100% by default.

Note:

- *UNICORN is tested using the English (U.S.) Code 1033 operating system language version. Using other language versions of the operating system may cause errors.*
- *A screen resolution of 1280x1024 or higher is recommended. Parts of the UNICORN user interface may not be displayed properly using a lower resolution.*
- *Changing the default font and changing the font size from 100% in Windows may cause problems in the UNICORN user interface.*
- *The Windows basic color scheme is recommended[1].*
- *Using the Windows 7 Aero color scheme is not recommended.*
- *Windows power save features should be turned off to avoid conflicts with system operations.*

[1] *UNICORN must be closed when the color scheme is changed.*

- *UNICORN is not compatible with the Windows 7 feature High DPI Awareness, which allows the graphic user interface to be scaled. The interface scale must remain at 100% to avoid issues with clipping and misaligning of parts of the UNICORN user interface. Normally, the scale is set at 100% by default.*

4.2 Hardware installation

About this section

This section describes the installation procedure for Xuri W25.

In this section

Section		See page
4.2.1	Unpack the system units	65
4.2.2	Connect the system components	67

4.2.1 Unpack the system units

Unpacking instruction

Follow the instructions below to unpack each box and to lift the system units onto the bench.

Step	Action
1	Place the box on a smooth and flat surface with the correct side facing upwards.
2	Open the packaging with a knife and remove the pieces of foam from around the system unit.
3	Lift the system unit by the handles on each long side and place it on the bench.

Note: *Keep each unit in an upright position during unpacking. Protect units from bumping into other objects.*

CAUTION

Heavy object. Because of the significant weight of Xuri W25 rocker, assistance from another person is highly recommended when lifting or moving the equipment. Use the handles on the sides of the rocker when possible, and do not lift Xuri W25 rocker with tray attached.

NOTICE

The rocker has a scale function (load cells) and should therefore be handled with extra care. The rocker shall not be placed on any parts that may move. Avoid exposing the load cells to lateral forces, such as pushing it sideways on the bench, which may cause disturbances in the measurement, or damage the load cells.

Install the client computer equipment

Install the client computer equipment according to the manufacturer's instructions. The computer is either supplied as part of the bioreactor system delivery or obtained locally.

IP settings for standalone installation

For a standalone installation, the client computer's network card that is connected to the rocker should have the static IP 192.168.1.3. Refer to *UNICORN Administration and Technical manual*, *Appendix D* for instructions on how to change these settings.

NOTICE

Any computer used with the equipment shall comply with IEC 60950 and be installed and used according to the manufacturer's instructions.

4.2.2 Connect the system components

Connect system units to the rocker

Xuri W25 Pump and Xuri W25 CBCU units are connected to the rocker with UniNet cables. Power to the units is supplied from the rocker.

Follow the instructions below to connect the system units to the rocker.

NOTICE

If UniNet cables are disconnected during a run, the run will be interrupted and must be restarted. Make sure that cables are properly secured before starting a run and avoid moving system units during a run.

See *Rear view of the rocker, on page 30* for the location of connectors on the rear panel of the rocker.

Step	Action
1	**Connect the Xuri W25 CBCU unit(s) to the rocker.**

a. Connect the supplied UniNet cable between the UniNet-9 port on the CBCU rear panel (see *Rear view of Xuri W25 CBCU, on page 36*) and the first available UniNet-9 port on the rocker rear panel. Up to two Xuri W25 CBCU units are used for operation in dual mode.

b. For single mode, set the CAN ID switch on the CBCU to position 1. For dual mode using two CBCU units, set the CAN ID switches on the two CBCU units to positions 1 and 2 respectively.

Tip:

In dual mode, label the CBCU units with their respective CAN ID to simplify identification in the UNICORN software.

2 **Connect the Xuri W25 Pump unit(s) to the rocker.**

a. Connect the supplied UniNet cable from the UniNet-9 port on the rear panel of the each pump (see *Rear view of the pump, on page 39*) to the next available UniNet-9 port on the rocker rear panel.

b. Set the pump CAN ID to position 1 for the first pump, position 2 for the second pump, and position 3 for the third pump.

Tip:

Label the pump units with their respective CAN ID to simplify identification in the UNICORN software.

Step	Action
3	**Connect the filter heater(s) to the rocker.** Connect the filter heater cable to the filter heater port on the rocker rear panel. Two filter heaters are used in dual mode, one connected to each filter heater port. ***Note:*** *The filter heater connector snaps into place in the socket to prevent it from being disconnected by a sudden pull. To release the connector, pull the connector sleeve away from the socket.*

Jumpers

Insert jumpers into any unused UniNet-9 ports on the rocker. Jumpers are provided with the system.

Connect to network or computer

The system can be connected to a stand-alone computer, or to a network using either Ethernet or wireless connection. Follow the appropriate instruction in the table below.

Connection	Instruction
Stand-alone computer	Connect a network cable between the Ethernet connector on the rear panel of the rocker and the Ethernet port on the computer.
Ethernet	Connect a network cable between the Ethernet connector on the rear panel of the rocker and the network. Connect the computer to the network. Contact your Cytiva representative for support on how to establish and configure the network connection.
Wireless	Connect a WiFi USB adapter to the USB port on the rear panel of the rocker. Contact your Cytiva representative for support on how to establish and configure the network connections.

Additional I/O connections

The 15-pin D-sub connector on the rear panel of the rocker provides two analog inputs, four digital inputs and four digital outputs for controlling and monitoring additional equipment. See the *Xuri W25 User Manual* for details.

Connect to mains power

Step	Action
1	Connect the supplied power cord between the power inlet on the rear panel of the rocker and a grounded power outlet.
2	Follow the manufacturer's instruction to connect power to computer, monitor and local printer (if used).

Prepare gas tubing

Tubing for gas connections (Tygon E3603 and silicone, see *Tubing and connectors, on page 37*) is supplied with the Xuri W25 CBCU.

For gas distribution with full gas mixing functionality (N_2/air, CO_2 and O_2), four pieces of gas tubing are needed for each Xuri W25 CBCU. Three pieces are used to connect the gas sources to the inlets on the rear panel of the CBCU, and one piece is used to connect the gas mix outlet on the front panel of the CBCU to the Cellbag bioreactor.

Follow the instructions below to prepare tubing for gas distribution.

Step	Action
1	Cut the Tygon tubing into pieces of appropriate length, one piece for connecting gas distribution from the CBCU to the Cellbag bioreactor and as many pieces as required for connecting the gas mix sources to the CBCU.
2	Insert a CPC tubing connector into one end of each piece. 
3	For the tubing used to connect the CBCU to the Cellbag bioreactor, connect the end without the CPC connector to the silicone tubing using the supplied reducer connector. 

4.3 Software installation

Refer to *UNICORN Quick Installation Guide (29414475)* for information about how to perform a complete UNICORN 7.x installation on a stand-alone workstation (Full installation). Instructions on how to configure an e-license and to define a system are also included.

Note: *For this system, the IP address is 192.168.1.1.*

Note: *For other types of installations, contact your Cytiva representative for support. This includes network installations when you want to access the Xuri W25 system from several client computers or control more than one system from a single computer, or to run the system from a third-party controller.*

Additional information about software installation and configuration is available in the *UNICORN Administration and Technical manual*.

5 Operation

About this chapter

This chapter describes how to operate Xuri W25.

In this chapter

Section		See page
5.1	Set up the system	72
5.2	Start and configure the system	90
5.3	Prepare for cultivation	106
5.4	Perform cultivation	115

5.1 Set up the system

About this section

This section describes how to prepare the bioreactor system for cell cultivation. For illustrations and descriptions of the system, see *Chapter 3 System description, on page 25*.

In this section

Section		See page
5.1.1	Select the tray and Cellbag bioreactor	73
5.1.2	Attach and detach tray	74
5.1.3	Prepare pH and DO sensors	77
5.1.4	Attach the Cellbag bioreactor	80
5.1.5	Prepare the pump	82
5.1.6	Connect gas to the system	86
5.1.7	Connect the filter heater to the rocker	89

5.1.1 Select the tray and Cellbag bioreactor

Select the Cellbag bioreactor size and corresponding tray according to application requirements and system configuration. See the table below for guidelines.

Culture volume/ bioreactor (L)	Cellbag bioreactor size (L)	Tray	
		Single mode	Dual mode
0.3 to 1	2	Tray 10, Tray 20	Tray 20
0.5 to 5	10	Tray 10, Tray 20	Tray 20
1 to 10	20	Tray 20	N/A
1 to 10	22	Tray 50	Tray 50
5 to 25	50	Tray 50	N/A

Note: *To use a 20 L or 50 L Cellbag bioreactor, the system must be configured for single mode.*

Note: *Depending on application and configuration it might be possible to cultivate below the recommended minimum volume. However, it is highly recommended to stay above this volume for applications that require high agitation, and pH and DO control. The temperature, pH, and DO sensors need to be submerged in liquid throughout the complete rocking cycle to function correctly.*

5.1.2 Attach and detach tray

Introduction

This section describes how to attach and detach a tray to and from the rocker platform. These operations should preferably be performed without a Cellbag bioreactor on the tray.

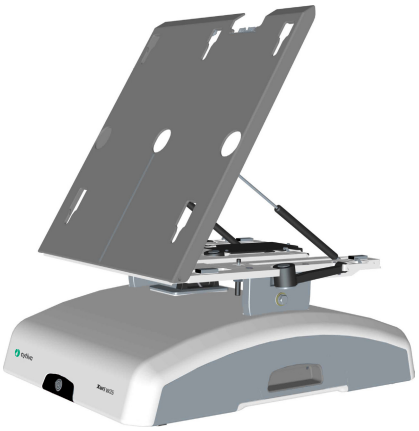
CAUTION

Due to the size and weight of Tray 50, at least two persons are recommended for installing the tray.

Attach tray

The tray can be attached to the rocker platform in tilt position and in normal position. Tilt position is recommended, as described in the instructions below.

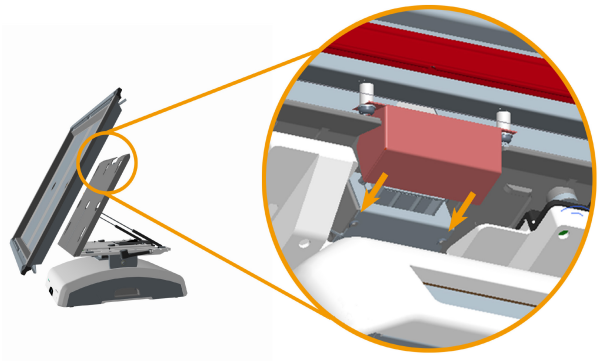
Step	Action
1	Tilt the rocker platform by pulling the upper edge towards you.



2	Lift the tray into the same angle as the rocker platform.
3	Fit the tray on to the rocker platform. The attachment pins on the tray engage with the holes in the platform. Attach the pins on the upper edge first, then slide the tray down making sure that the lower pins engage with the respective holes. Attach the upper part of the tray onto the upper part of the rocker platform and slide the tray downwards into place.

Step	Action
	Note: *Make sure that the holes for the temperature sensors on the rocker platform fit into the holes in the tray.*

4	Make sure that the connector on the tray is plugged into the tray connector on the back of the rocker platform.



Detach tray

The tray can be detached from the rocker platform in tilt position and in normal position. Tilt position is recommended, as described in the instructions below.

Step	Action
1	Hold the textured grip area on each side of the tray and slide it upwards so that the attachment pins on the tray disengage from the holes in the rocker platform.

2	Pull the tray towards you.

Note:

If the tray is detached with the rocker in normal position, you will need to lift the tray by the upper edge before sliding it away from you.

5.1.3 Prepare pH and DO sensors

Instructions

Follow the instructions below to connect the sensor adapters to the pH and DO bag sensor ports.

NOTICE

Be careful to connect the sensors to the correct ports on Xuri W25 CBCU. Identification stickers are provided to label the connectors.

NOTICE

In dual mode, be careful to connect the sensors for the left and right Cellbag bioreactors to the correct Xuri W25 CBCU. This is easier if the respective Xuri W25 CBCU units are placed on the left and right sides of the rocker respectively.

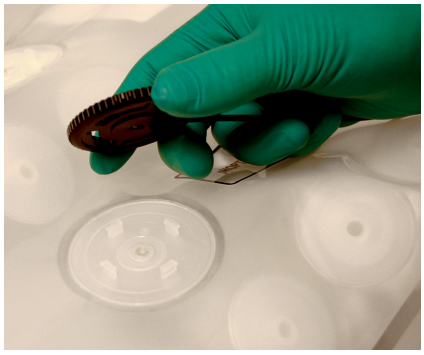
Step	Action
1	Remove the Cellbag bioreactor from its protective cover bag.

NOTICE

Exposure to intense light will cause deterioration of the optical sensors on the Cellbag bioreactor. To avoid unnecessary light exposure, remove the protective cover bag just prior to use.

2	Place the Cellbag bioreactor on a steady surface with the bag sensor ports facing upwards. The optical sensor spots have different colors. The spot on the pH sensor bag port is white/yellow and the spot on the DO sensor port is pink/black. If both pH and DO sensors are used, a separate fiber cable is needed for each sensor.

Step	Action
3	Attach the sensor adapter, with the optical lens facing the sensor port, by inserting the four pins of the port into the corresponding holes of the adapter.



Note:

The sensor adapter can be fastened in any of four orthogonal directions. Select the most convenient direction.

4	Rotate the sensor adapter clockwise to fix the pins on the sensor port to the adapter. A distinct "click" will indicate that the adapter is securely fastened.

Note:

When rotating the sensor adapter, make sure not to exert any force on the fiber cable.

Step	Action
5	Place the Cellbag bioreactor on the tray with the optical sensors facing downwards.

> **NOTICE**
>
> Make sure that the optical fiber cables are not placed between the Cellbag bioreactor and the temperature sensor on the tray. This could lead to erroneous temperature reading and control, resulting in overheating.

6	To keep track of the optical fiber cables, mark the cables with the supplied stickers.
7	Bundle the optical fiber cables on one side of the tray. Fit the lid and make sure the tubing and cables are placed in the tubing exit. See *Illustrations of tray and lid, on page 31*.
8	Connect the pH sensor cable to the **pH** port on the CBCU front panel.

9	Connect the DO sensor cable to the **DO** port on the CBCU front panel.

5.1.4 Attach the Cellbag bioreactor

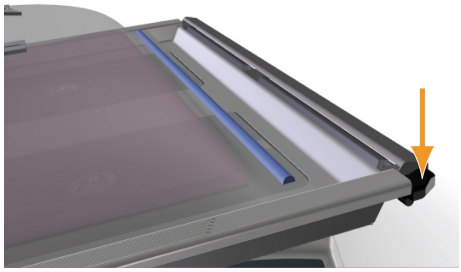
Instructions

Follow the instructions below to attach the Cellbag bioreactor to the tray.

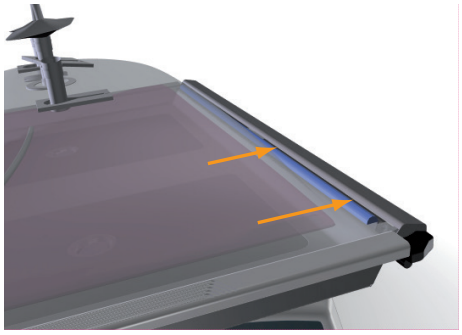
Note: *When using a Cellbag bioreactor that only covers half of the tray in single mode, such as a 10 L bag on Tray 20, position the bag on the left side of the tray.*

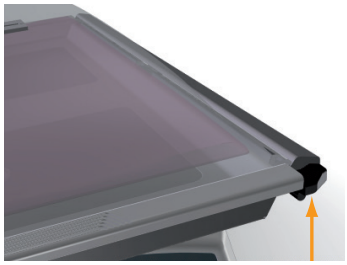
Note: *In dual mode, ensure that each Cellbag bioreactor is centrally positioned on the respective grey heating pad. Weight measurement resolution will be compromised if the bioreactor is not correctly placed.*

Step	Action
1	Push the bag clamp openers in the upper corners of the tray downwards. This opens the upper bag clamps. ***Note:*** *For a Cellbag bioreactor that covers the whole tray, open both bag clamps. In dual mode or with a bioreactor that covers only half the tray, only one clamp needs to be opened.*



2	Insert the upper Cellbag rod into the opened bag clamp.



Step	Action
3	If the clamp does not close automatically, gently push the bag clamp opener upwards to secure the upper end of the Cellbag bioreactor. Do not use force. Gently pull on the bioreactor to make sure it is attached. 
4	Repeat the above steps to attach the lower Cellbag rod to completely secure the Cellbag bioreactor on the tray.
5	Mount the lid on top of the tray.

NOTICE

Keep the Cellbag bioreactor covered with the lid throughout the cultivation to protect the optical sensors from excessive light exposure.

5.1.5 Prepare the pump

Tubing holder positions

The pump head has two different holder positions to accommodate tubing with different sizes. The inner position is for small tubing and the outer position is for large tubing (see *Pump tubing sizes, on page 82*).

Inner position for small tubing.

Outer position for large tubing

Pump tubing sizes

The table below lists tubing sizes supported by Xuri W25 Pump, with the range of flow rates provided by each size. The wall thickness of the tubing should be 1.6 mm (1/16").

Note: *Pump tubing is not supplied with the system. Suitable tubing must be purchased separately.*

Tubing inner diameter		Tubing holder position	Flow rate range (mL/min)[1]
Millimetres	Inches		
0.5	1/50	Inner	0.01 to 4.6
0.8	1/32	Inner	0.02 to 8.6
1.6	1/16	Inner	0.07 to 28
2.4	3/32	Inner	0.15 to 58
3.2	1/8	Inner	0.24 to 95
4.0	5/32	Outer	0.34 to 135
4.8	3/16	Outer	4.3 to 170

[1] Flow rates are limited in media control. Maximum flow rates can be achieved in manual control.

NOTICE

Using larger tubing with the tubing holder in its inner position will reduce flow rate and tubing life.

Using smaller tubing with the tubing holder in its outer position will not secure the tubing correctly and may lead to rupture.

Adjust tubing holder position

Use a pointed tool such as a ball pen to adjust the tubing holder positions on both sides of the pump head. Follow the instructions below to change the tubing holder position.

Step	Action
1	Make sure that the pump is not running.
2	Open the flip top of the pump head completely.
3	Place the pointed tool in the small depression in the tubing holder on one side of the pump head.

4	Press down and move the tubing holder to the required position until it clicks into place.

5	Release the pressure. The tubing holder rises into the new position.

Step	Action
6	Repeat the above steps to adjust the tubing holder on the other side of the pump head.

NOTICE

Make sure that the tubing holder position is the same on both sides of the pump head.

NOTICE

Make sure that the tubing holder position is not caught in between the inner or outer position, as this may cause erroneous flow rates and abnormal tube wear.

Load tubing

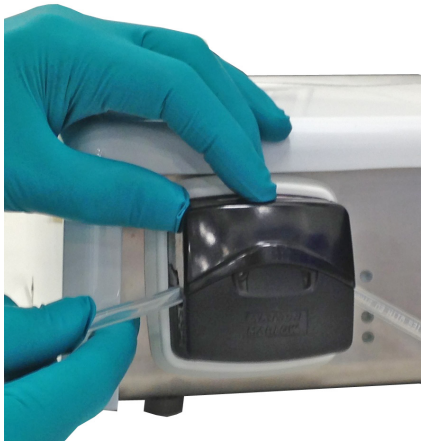
Follow the instructions below to load tubing in the pump head and connect tubing to the Cellbag bioreactor.

Step	Action
1	Make sure that the pump is switched off.
2	Open the flip top of the pump head completely.

3	Check that the tubing holder is adjusted to the correct position for your size of tubing. See instructions above.

Step	Action
4	Place the tubing between the rotor rollers and the track, pressed against the inner wall of the pump head.

5	Lower the flip top until it clicks into its fully closed position.



6	Connect inlet and outlet tubing to the Cellbag bioreactor, for example acid, base, feed and harvest/waste.

Note: *The pumping direction is indicated by the arrow on the pump head.*

5.1.6 Connect gas to the system

Gas mix

The Cellbag bioreactor requires gas flow to stay inflated and to provide ventilation. The CBCU enables different gas mixing possibilities. Compressed air or N_2 can be mixed with CO_2 and/or O_2 to obtain the desired gas mix.

Compressed air or N_2 is connected to **AIR/N2** on the CBCU. CO_2 and O_2 are connected to **CO2 IN** and **O2 IN**, respectively, on the CBCU rear panel.

NOTICE

In dual mode, be careful to connect the air and gas for the left and right Cellbag bioreactors to the correct CBCU. This is easier if the respective CBCU units are placed on the left and right sides of the rocker respectively.

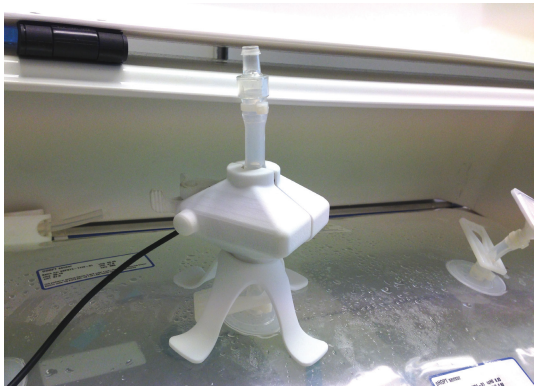
Set up aeration and gas supply

Follow the instructions below to connect gas to the bioreactor system.

Step	Action
1	Attach the filter heater to the outlet vent filter of the Cellbag bioreactor. In dual mode, make sure that the filter heaters are correctly placed with respect to the left and right bioreactors. ***Note:*** *The inlet and outlet vent filters are distinguished by the pressure control valve on the outlet filter (indicated by an arrow in the illustration below). Do not attach the filter heater to the inlet vent filter.* 

Step	Action

The image below shows the filter heater mounted on the stand on the Cellbag bioreactor.



2 Connect tubing from the **GAS MIX OUT** on the CBCU front panel to the inlet vent filter of the Cellbag bioreactor.

3 Connect the desired gas source, air or N_2, at 1.0 to 1.5 bar to **AIR/N2** on the CBCU rear panel.

Step	Action
4	If applicable, connect the CO_2 gas source at 1.0 to 1.5 bar to **CO2 IN** on the CBCU rear panel.

5	If applicable, connect the O_2 gas source at at 1.0 to 1.5 bar to **O2 IN** on the CBCU rear panel.

NOTICE

Make sure to keep the inlet pressures within the stated limits (1.0 to 1.5 bar). Excessive pressure may cause internal tubing to loosen.

NOTICE

An unsteady inlet pressure will affect the speed of the gas flow and also the gas mix.

5.1.7 Connect the filter heater to the rocker

Follow the steps below to connect the filter heater(s) to the rocker.

Step	Action
1	Connect the filter heater cable to the filter heater port on the rocker rear panel.
2	Attach the filter heater to the outlet vent filter of the cellbag bioreactor. In Single mode for Bag 20 L and Bag 50 L, Filter heater (L) is enabled by default. To use two filter heaters during single mode, Filter heater (R) must be enabled.
3	Activate Filter Heater (R) in Single mode, if applicable. **a.** Select ***System settings***. **b.** Click ***Rocker***. **c.** Click ***Enable Filter heater (R)***.

5.2 Start and configure the system

About this section

This section describes how to start the system, log on to UNICORN, connect the system to UNICORN and configure the system in the software.

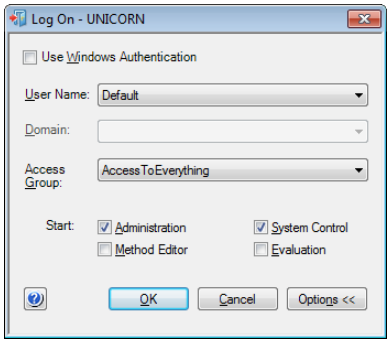
In this section

Section		See page
5.2.1	Start the system and log on to UNICORN	91
5.2.2	Connect to the system	92
5.2.3	Configure system settings	95
5.2.4	Start a run	102

5.2.1 Start the system and log on to UNICORN

Follow the instructions below to start the system and log on to UNICORN. The workstation must have a valid e-license.

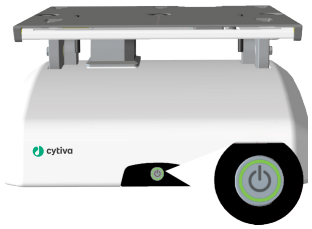
Step	Action
1	Switch on the client computer.
2	Start the UNICORN software.
3	Provide your ***User Name*** and ***Password*** to log on to UNICORN. Access credentials are assigned by your UNICORN administrator. According to the properties of your user account, you may be able to select an ***Access Group***.



Note:

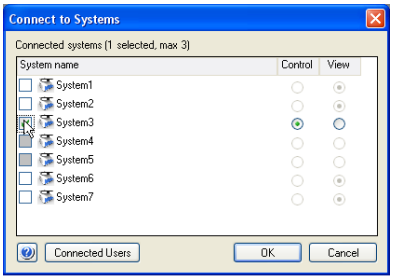
*If **Use Windows Authentication** is checked, you may log on using your Windows username and password.*

4	Press the **Power** switch to start the rocker. *Result:* The **Power** button flashes green during start-up, and then lights steadily when the rocker is operational.



5.2.2 Connect to the system

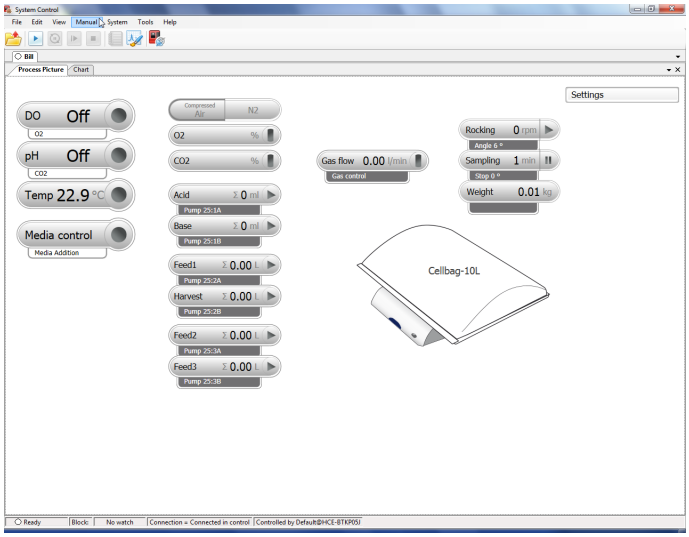
Follow the instructions below to connect the system to UNICORN.

Step	Action
1	When the indicator light on the rocker front panel shows a steady green light, click the ***Connect to Systems*** icon in the ***System Control*** module.  *Result:* The ***Connect to Systems*** dialog opens. 
2	In the ***Connect to Systems*** dialog: **a.** Select the system. **b.** Select ***Control*** mode. **c.** Click ***OK***.

Step	Action

Result:

The ***Process Picture*** appears.



Note:

The detailed appearance of the process picture will vary according to your system setup.

Tip:

If UNICORN is unable to connect to the selected system, see Section 7.5 UNICORN System Control, on page 135.

Configure system properties

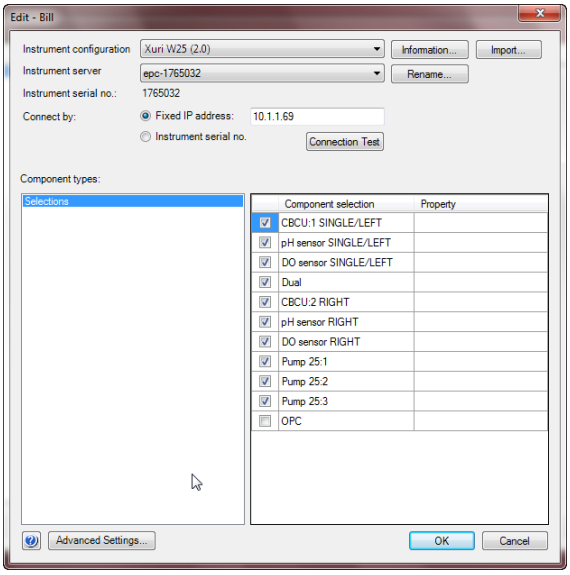
Edit the system properties whenever the configuration of the system is changed, for example, to

- switch between single and dual modes.
- change the system setup, for example if a CBCU or pump has been added or removed.
- change the ***Instrument Configuration*** of the system.

  The ***Instrument Configuration*** is the system specific control software. It is available for download from the website. Contact your Cytiva representative if you need help to download the ***Instrument Configuration***.

Follow the instructions below to edit the system properties.

Step	Action
1	Open the ***Administration*** module in the ***Tools*** menu.
2	Click ***System Properties***.
3	Select your system in the ***System Properties*** dialog and click ***Edit***. ***Note:*** *Only systems that are switched on and connected to the computer can be edited.*



4	All available components are shown in the ***Component selection*** list. **a.** Click the check-boxes to select or de-select components. **b.** Make sure the components selected match the units connected to the system.
5	Click ***OK*** to apply the changes.

5.2.3 Configure system settings

Introduction

In ***System Settings***, system parameters are defined, such as:

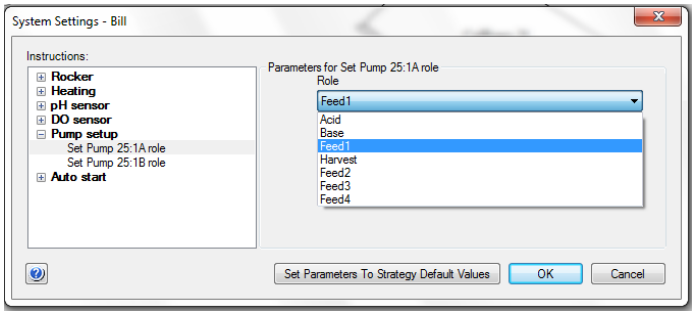
- pump roles, which need to be assigned to the individual pump heads before starting a run;
- whether heating should be automatically enabled when the rocking starts (IC 2.0.4.0 and lower versions);
- whether heating should be automatically disabled when the rocking starts (IC 2.0.5.1 and higher versions);
- whether calibration values for pH and/or DO sensors should be reset at the end of the run;
- whether rocking, gas mix and temperature control should be resumed on restart after power loss;
- whether voltage or current should be used for analog inputs.

Assign pump roles to pump heads

Pump roles need to be assigned to the individual pump heads before starting a run. Follow the instructions below to assign pump roles.

See *System settings, on page 51* for general instructions on how to configure the system settings.

Step	Action
1	Select ***System*** →***Settings*** in the ***System Control*** module.
2	Select ***Pump setup*** from the list and click the ***+*** symbol to view the available pump heads.



Step	Action
3	Assign roles to pump heads according to the requirements of the cultivation process. In single mode, available roles are ***Acid***, ***Base***, ***Feed1***, ***Harvest***, ***Feed2***, ***Feed3*** and ***Feed4***. In dual mode, available roles are ***Acid***, ***Base***, ***Feed1***, ***Harvest***, ***Feed2***, ***Feed3*** for the left and right functions separately, identified by the suffix ***L*** and ***R***. ***Note:*** *Media addition in media control and perfusion mode uses only* ***Feed1*** *of the available* ***Feed*** *roles. Do not select other* ***Feed*** *roles for pump heads intended for these purposes.* ***Examples:*** **a.** For pH control using acid and base in single mode, assign ***Acid*** to one pump head and ***Base*** to another. **b.** For pH control using acid and base in dual mode, assign ***Acid L*** and ***Base L*** to separate pump heads for the left Cellbag bioreactor, and ***Acid R*** and ***Base R*** to separate pump heads for the right bioreactor. **c.** For media addition in dual mode, assign ***Feed1 L*** to a pump head for the left Cellbag bioreactor, and ***Feed1 R*** to a pump head for the right bioreactor.
4	Check the assignment of all pump heads to make sure that there are no conflicts before clicking ***OK***. A given pump role cannot be assigned to more than one pump head. If a role that is already assigned to a pump head is given to a second pump head, the second assignation will apply and the first pump head will be set to ***Not defined***.
5	To return to the default values defined in the instrument configuration, click ***Set Parameters To Strategy Default Values***.

Enable heating

Follow the steps below to confirm that the system setting ***Heating: Parameters for Heater enabling*** is set to ***Enabled***, and to store these values.

Note: *For heating to be on, the system must be actively rocking, a bag must be selected, and heating must be enabled. Setting* ***Heating*** *to* ***Enabled*** *will not by itself cause heating to remain on.*

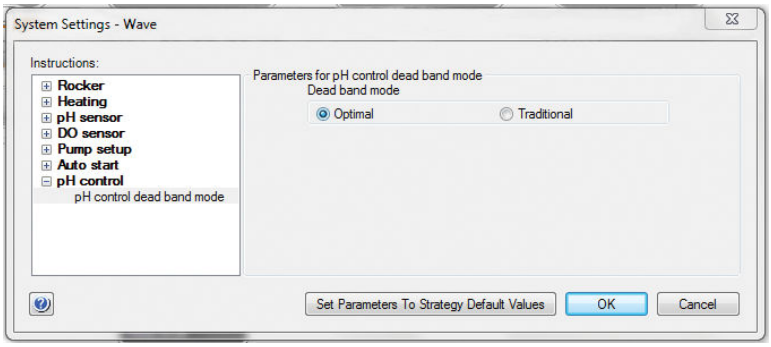
Step	Action
1	Select ***System*** →***Settings*** in the ***System Control*** module.

Step	Action
2	Select ***Heating*** from the list and click the ***+*** symbol.
3	Confirm that ***Heating*** is set to ***Enabled***.
4	Click the ***OK*** button to store the value. *Result:* The system default setting is changed to enabled even in the event of a power failure.

Verify that ***Heating*** is set to ***Enabled*** before starting each run.

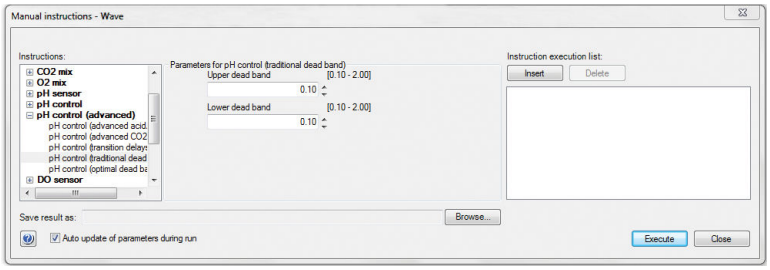
Select mode of pH control in deadband

Follow the instructions below to select the mode of pH control in deadband.

Step	Action
1	Select ***System*** →***Settings*** in the ***System Control*** module.
2	Select ***pH control*** from the list and click the ***+*** symbol to view the available alternatives.
3	Click on alternative ***pH control deadband mode***.
4	Click one of the radio buttons ***Optimal*** or ***Traditional*** to select mode. ***Note:*** *The selected mode of deadband cannot be changed during a run.* 
5	Click ***OK*** to confirm the selection.

Select upper and lower limits of traditional deadband

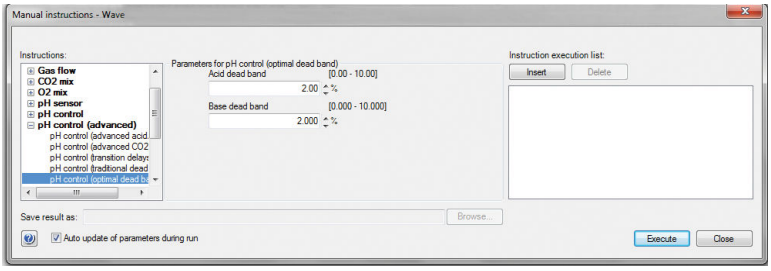
Follow the instructions below to select the upper and lower limits of traditional deadband before starting a run.

Step	Action
1	Select ***System*** →***Manual Instructions*** in the ***System Control*** module.
2	Select ***pH control (advanced)*** from the list and click the ***+*** symbol to view the available alternatives..
3	Click on alternative ***pH control (deadband)***.
4	In the ***Upper dead band*** field, select the upper limit by clicking the small arrows to the right of the field. The limits are selected in the range of 0.10 to 2.00 pH units.
5	In the ***Lower dead band*** field, select the lower limit by clicking the small arrows to the right of the field. The limits are selected in the range of 0.10 to 2.00 pH units. 
6	Click ***Execute*** to apply the selection.

Select acid/base deadband in optimal mode of pH control

Follow the instructions below to select the acid/base deadband in optimal mode of pH control before starting a run.

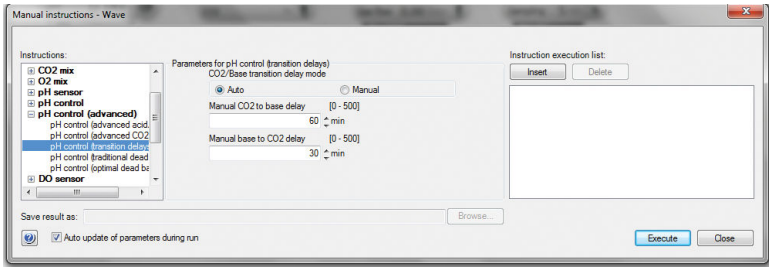
Step	Action
1	Select ***System*** →***Manual Instructions*** in the ***System Control*** module.
2	Select ***pH control (advanced)*** from the list and click the ***+*** symbol to view the available alternatives.
3	Click on alternative ***pH control (optimal deadband)***.

Step	Action
4	In the ***Acid dead band*** field, select the acid range of optimal deadband in % cycle time by clicking the small arrows to the right of the field. The limits are selected in the range of 0.00% to 10.00%.
5	In the ***Base dead band*** field, select the base range of optimal deadband in % cycle time by clicking the small arrows to the right of the field. The limits are selected in the range of 0.00% to 10.00%. 
6	Click ***Execute*** to apply the selection.

Select transition delays in CO2/Base in optimal mode of pH control

Follow the instructions below to select the transition delays in Auto/Manual mode before starting a run.

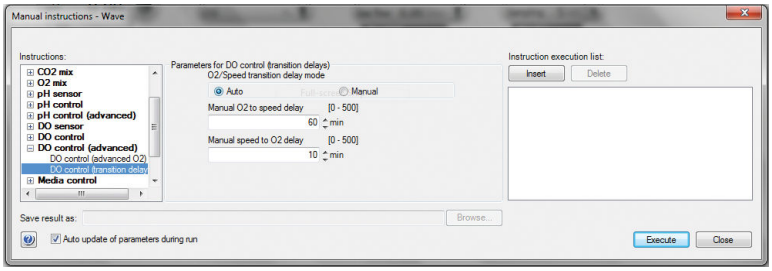
Step	Action
1	Select ***System*** →***Manual Instructions*** in the ***System Control*** module.
2	Select ***pH control (advanced)*** from the list and click the ***+*** symbol to view the available alternatives.
3	Click on alternative ***pH control (transition delays)***.
4	Click one of the radio buttons ***Auto*** or ***Manual*** to select mode. ***Note:*** *In the Manual mode of DO control, the transition delay may be changed to ranges mentioned in the respective tabs for both CO2 to Speed and Speed to CO2 transitions.*

Step	Action
5	In the ***Manual CO2 to base delay*** and ***Manual base to CO2 delay*** fields, select the transition delays by clicking the small arrows to the right of the field. The limits are selected in the range of 0 to 500 minutes. The transition delay times set in the Auto mode of DO control (advanced) can be visualized under the ***CO2 to Speed*** and ***Speed to CO2*** tabs. 
6	Click ***Execute*** to apply the selection.

Select transition delays in DO Control

Follow the instructions below to select the transition delays in DO/Speed mode before starting a run.

Step	Action
1	Select ***System*** →***Manual Instructions*** in the ***System Control*** module.
2	Select ***DO control (advanced)*** from the list and click the ***+*** symbol to view the available alternatives.
3	Click on alternative ***DO control (transition delays)***.
4	Click one of the radio buttons ***Auto*** or ***Manual*** to select mode. ***Note:*** *In Manual mode of DO control, the transition delay may be changed to ranges mentioned in the respective tabs for both O2 to Speed and Speed to O2 transitions.*

Step	Action
5	In the ***Manual O2 to speed delay*** and the ***Manual speed to O2 delay*** fields, select the transition delays by clicking the small arrows to the right of the fields. The limits are selected in the range of 0 to 500 minutes. The transition delay times set in Auto mode of DO control (advanced) can be visualized under the ***O2 to Speed*** and ***Speed to O2*** tabs. 
6	Click ***Execute*** to apply the selection.

5.2.4 Start a run

Introduction

This section describes how to start a manual or method-controlled run. Data collection begins when the run starts.

For further information on methods, refer to *Xuri W25 User Manual*.

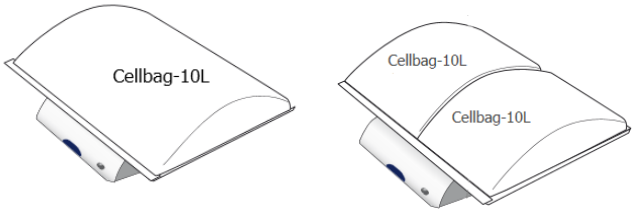
Note: *Pressing the **Power** button on the rocker while the rocker is switched on will shut down the system and stop any ongoing run.*

Start a manual run

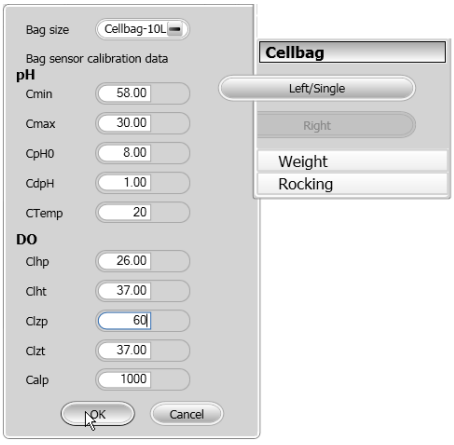
Follow the instructions below to start a manual run.

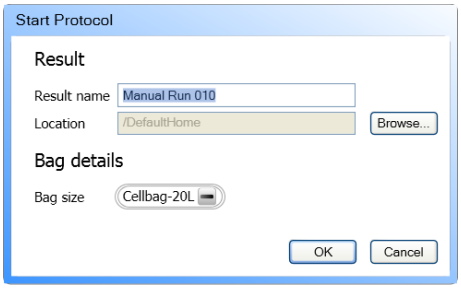
Step	Action
1	Change the Cellbag settings as required. In dual mode, make sure the settings are correctly entered for both bioreactors.

a. Click the Cellbag icon. In dual mode, click the appropriate side of the icon.



b. If pH and/or DO control will be used, enter the appropriate calibration data (printed on the Cellbag label).



Step	Action
	c. Click ***OK***. *Result:* The ***Start Protocol*** dialog for the manual run opens. 
2	On the displayed page in the ***Start Protocol***: **a.** Type the ***Result name*** and click ***Browse*** to change the ***Location*** of where the result is saved if necessary. **b.** Select the correct ***Bag size*** (two sizes are listed in dual mode). **c.** Click ***OK***. *Result:* The manual run starts.

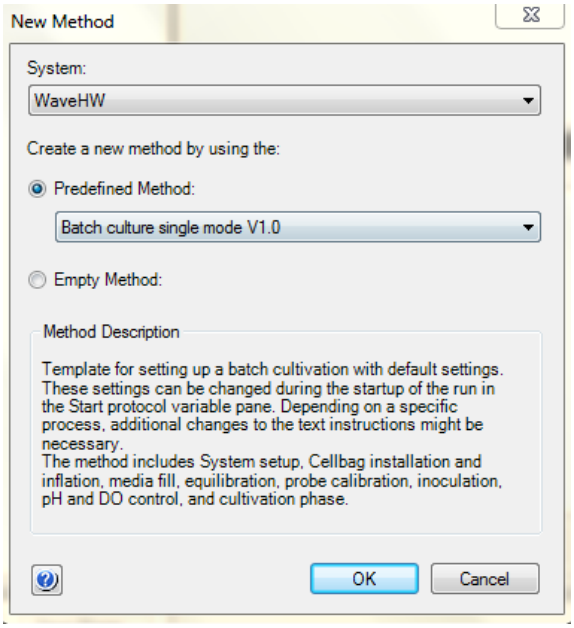
Start a method run

To start a run, perform one of the following tasks:

- select one of the predefined method templates provided, or
- select from the saved methods in the system, or
- follow the instructions below to create a new method using a predefined method as template.

Step	Action
1	In ***Method Editor*** do either of the following: • click the ***Create a new method*** icon in the ***Toolbar*** or • select ***File:New Method*** *Result:* The ***New Method*** dialog opens.

Step	Action
2	In the ***New Method*** dialog, select a System.



3	Select one of the predefined method templates.
4	Click ***OK***. *Result:* The ***Method Outline*** pane shows the mandatory ***Method Settings*** phase for the chosen method. The ***Text Instructions*** pane shows all the instructions that define the method. The ***Phase Properties*** pane shows the default settings for the currently highlighted phase.

Hold or stop the run

To interrupt a method during a run you may use the ***Hold*** or ***End*** icons in ***System Control***. A held method run can be resumed by using the ***Continue*** icon. See the instructions in the table below.

At the end of a method the run stops automatically. All functions stop, including rocking and data logging, and an acoustic end signal sounds and ***End*** is displayed in the ***Run Log***. This also applies when ending a manual run.

If you want to...	then...
temporarily hold the method	click the ***Hold*** icon.  ***Note:*** *When a method is put on hold, the system control is maintained, but no new instructions are given.*
resume a method run	click the ***Continue*** icon.  ***Note:*** *An ended method cannot be continued.*
permanently end the run	click the ***End*** icon. 

Note: *When you end a method run prematurely, you will be prompted to save or discard the partial result.*

5.3 Prepare for cultivation

About this section

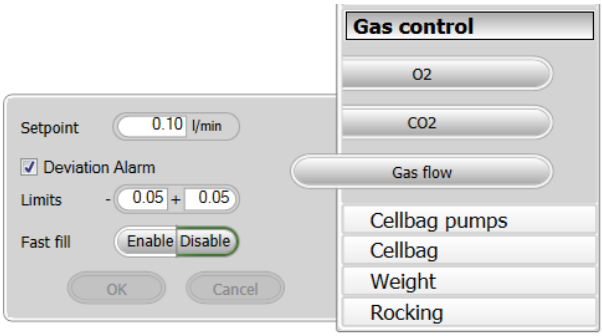
This section describes the how to prepare the system for cell cultivation. For illustrations and descriptions of the system, see *Chapter 3 System description, on page 25*.

In this section

Section		See page
5.3.1	Inflate the Cellbag bioreactor	107
5.3.2	Adjust pump parameters	108
5.3.3	Add and equilibrate culture medium	109
5.3.4	Prepare the sensors	112

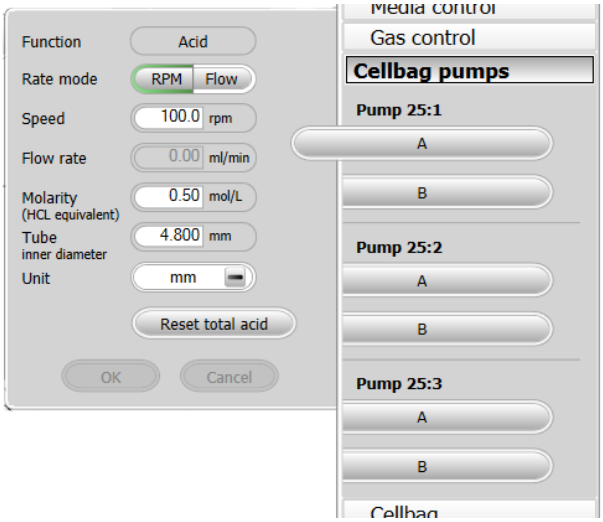
5.3.1 Inflate the Cellbag bioreactor

Follow the instructions below to inflate the Cellbag bioreactor.

Step	Action
1	Make sure that all ports on the Cellbag bioreactor are closed and that inlet and outlet filters are open.
2	Open ***Settings*** →***Gas control*** →***Gas flow*** from the ***Process Picture*** in ***System Control***.
3	Enable ***Fast fill***. This will maximize the gas flow during the first 20 minutes. ***Note:*** *Fast fill is disabled in the illustration below.* 
4	Turn on ***Gas flow*** from the ***Process Picture*** by pressing the right-hand side of the ***Gas flow*** button. ***Note:*** *If **Fast fill** is enabled, the gas flow is maximized during the first 20 minutes.* *Result:* The Cellbag is inflated.

5.3.2 Adjust pump parameters

Follow the instructions below to adjust the pump parameters.

Step	Action
1	Adjust the pump parameters for each pump under ***Settings*** →***Cellbag pumps***. Enter the ***Tube inner diameter*** and if the pump function is acid or base, enter the molarity. ***Note:*** *The acid/base control is tuned with NaOH and HCl. If you are using acid or base with a different pK value you should set the* ***Molarity*** *parameter to the equivalent molarity of NaOH or HCl for optimal pH control.* 
2	If you are preparing a perfusion cultivation, calibrate the feed and harvest/ waste pumps to reach optimal precision.

5.3.3 Add and equilibrate culture medium

Tare the scale

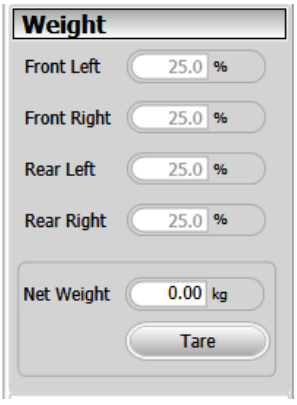
Tare the scale with all the equipment on the tray, such as lid, Cellbag bioreactor, and filter heater before starting a run. For optimal control, the measured weight should be the same as the weight of the culture. The weight measurement is used as input for the regulation of temperature, pH, and media control.

In dual mode, it is important for correct weight measurement to tare the scale, even if the weight distribution appears to be even.

Note: *Load cells are temperature-sensitive. Keep the ambient temperature constant to minimize effects on weight measurement.*

Follow the instructions below to tare the scale.

Step	Action
1	Set the rocker stop angle to 0° and check that the tray is in a horizontal position.
2	Open ***Settings*** →***Weight*** from the ***Process Picture*** in ***System Control***.



In dual mode, the weights of the two bioreactors are displayed separately.

3	Check that the weight distribution is even by reading the weight percentage values for the rocker feet. The values should not differ more than ±5%, and the optimal weight distribution is 25% on each load cell. Turn the adjustable foot if necessary, see section Adjustable foot in *Front view of the rocker, on page 28*.
4	Make sure that the lid and all other equipment that will be used during the run is placed on the tray, and that no tubing weighs down the tray.
5	Click ***Tare***.

Add culture medium

Follow the instructions below to fill the Cellbagbioreactor with culture medium.

Note: *The high pressure alarm may be triggered as the bioreactor is filled, depending on gas and liquid flow rates. The alarm may be ignored provided that it is no longer active when filling is complete.*

Step	Action
1	Open ***Rocking*** from the ***Process Picture***. Set the ***Stop Angle*** to ***12.0*** and click ***OK***. ***Note:*** *The risk that air bubbles are trapped by the optical sensors is minimized with the tray at an angle. The angle can be adjusted to make sure that the medium reaches all optical sensors during filling. Using medium at room temperature or culture temperature reduces the risk of air bubble formation.*
2	Slowly transfer the desired volume of medium into the Cellbag bioreactor using a pump or gravity flow. ***Tip:*** *To automatically fill the bag to a desired weight, use* ***Media Addition*** *from* ***Settings →Media control*** *in the* ***Process Picture****.*
3	Check if there are visible gas bubbles on the optical sensors. See pH reading and DO reading, respectively, in *Section 7.3 Xuri W25 CBCU, on page 133* for advice on how to remove bubbles. ***Note:*** *Such bubbles may be difficult to see. For the pH sensor, an indication of gas bubbles is that the initial pH reading deviates more than about 0.5 units from a reference measurement.*

Equilibrate to operating conditions

Follow the instructions below to equilibrate the medium to operating conditions.

For recommendations on operating conditions, refer to *Xuri W25 User Manual*.

Step	Action
1	Set the desired rocking speed and angle in ***Settings →Rocking*** in the ***Process Picture***. Start the rocking by clicking the right-hand side of the ***Rocking*** button. 

Step	Action
	Note: *When using Tray 50, the value of rocking speed multiplied by rocking angle may not exceed 240 (e.g., with a rocking angle of 12° the rocking speed is limited to 20 rpm).*
2	Set the desired gas flow in ***Settings*** →***Gas control*** →***Gas flow*** in the ***Process Picture***. Start the gas flow by clicking the right-hand side of the ***Gas flow*** button.
3	If applicable, turn on CO_2 mixing by clicking the right-hand side of the ***CO2*** button in the ***Process Picture***.
4	Set the required temperature set-point.
5	Click the right-hand side of the ***Temp*** button to start heating.
6	Equilibrate the medium for at least 2 hours.

5.3.4 Prepare the sensors

Important

Do not start pH or DO reading until the medium is fully equilibrated to operating conditions. The sensors do not give reliable measurements until then.

Equilibrate the culture medium with 100% air to calibrate DO sensors for 100% air saturation. If you use air mixed with 0% to 10% CO_2, the sensors can be calibrated over the range 100% to 90% air saturation.

Do not calibrate DO sensors for 100% air saturation if N_2 is used instead of air.

Note: *CO_2 regulation is slow, so it takes some time before the CO_2 concentration reaches the setpoint.*

NOTICE

Do not move the rocker during a run, since this could damage the scale function and disturb the weight measurement.

Prepare the DO sensor

Follow the instructions below to prepare the DO sensor.

Note: *In dual mode, adjust the sensor calibration on each Cellbag bioreactor separately.*

Step	Action
1	When the medium is equilibrated to operating conditions, move the cursor over the DO sensor icon in the ***Process Picture***, and set ***Reading On*** in the menu that appears. Wait until the value is stable.
2	Select ***System*** →***Calibrate*** in ***System Control***.
3	Select ***DO sensor*** in the ***Monitor to calibrate*** drop down menu.
4	Enter percentage of air saturation (90% to 100% depending on CO_2 concentration) in the ***Enter reference DO*** field.
5	Click ***Calibrate***.
6	Close the ***Calibration*** dialog.
7	Select ***Settings*** →***DO*** in the ***Process Picture***.
8	Enter the desired values for ***Control*** and ***Setpoint***. Check the ***Deviation Alarm*** and set the alarm limits if desired.

Step	Action
9	Click ***OK***.

Prepare the pH sensor

Follow the instructions below to prepare the pH sensor.

Note: *In dual mode, adjust the sensor calibration on each Cellbag bioreactor separately.*

Step	Action
1	When the medium is equilibrated to operating conditions, move the cursor over the pH sensor icon in the ***Process Picture***, and set ***Reading On*** in the menu that appears. Wait until the value is stable.
2	Click the right-hand side of the ***Sampling*** button to prepare for sampling. *Result:* The system will enter sampling mode. ***Note:*** *The system will be in sampling mode as many minutes as set in* ***Settings →Rocking →Sampling →Pause*** *and at an angle set in* ***Settings →Rocking →Sampling →Stop angle*** *in the* ***Process Picture****.*
3	Take a sample to verify that the pH value shown by the system matches the pH measured with a calibrated reference instrument. If the deviation is larger than approximately 0.5 pH units, make sure that no air bubble is present. For instructions on how to remove air bubbles, refer to the troubleshooting chapter in *Xuri W25 User Manual*.
4	Continue with the calibration adjustment only if the deviation is less than 0.5 pH units.
5	Select ***System →Calibrate*** in ***System Control***.
6	Select ***pH sensor*** in the ***Monitor to calibrate*** drop down menu.
7	Enter the actual pH value in the ***Enter reference pH*** field.
8	Click ***Calibrate***.
9	Close the ***Calibration*** dialog.
10	Select ***Settings →pH*** in the ***Process Picture***.

Step	Action
11	Enter the desired values for ***Control*** and ***Setpoint***. Check the ***Deviation Alarm*** and set the alarm limits if desired.
12	Click ***OK***.

5.4 Perform cultivation

About this section

This section describes the basics of performing a cultivation. During the cultivation, key parameters are monitored and the settings can be adjusted.

In this section

Section		See page
5.4.1	Inoculate the culture	116
5.4.2	Monitor and control the run	117
5.4.3	End a run	120

5.4.1 Inoculate the culture

Instructions

Follow the instructions below to inoculate the Cellbag bioreactor.

Note: *Make sure that the key culture parameters pH, DO and temperature are stable before inoculation.*

Step	Action
1	Make sure that the inlet tubing and the tubing connected to the inoculum container are clamped.
2	Using sterile techniques, connect tubing from the inoculum container to the inlet tubing, using e.g. tube fusing equipment or a ReadyMate™ connector.
3	Unclamp the inlet tubing and inoculum container tubing.
4	Transfer the desired volume of inoculum into the bag using a pump or gravity flow.

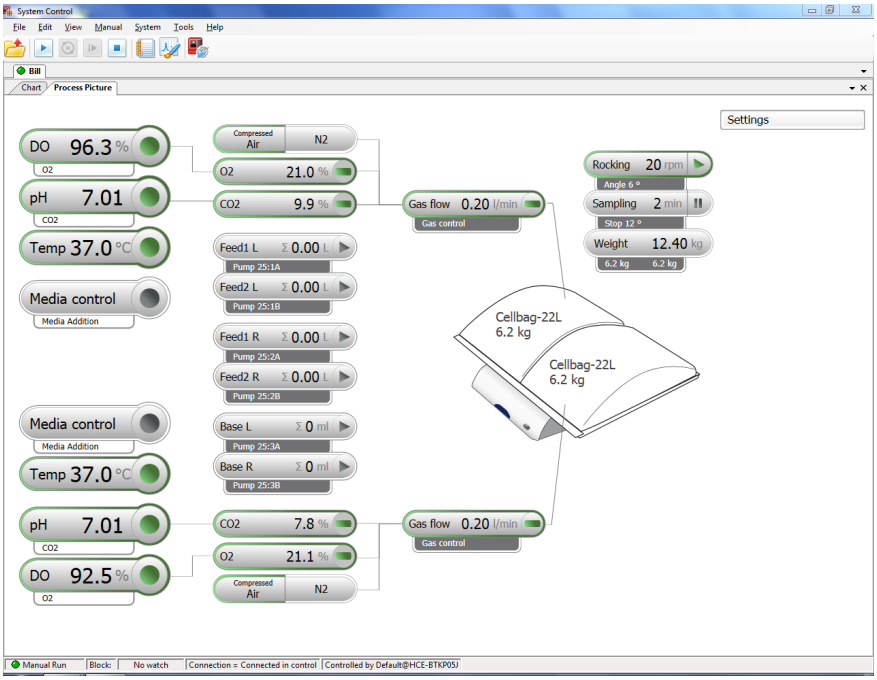
5.4.2 Monitor and control the run

Introduction

You may follow and control the ongoing run in the ***System Control*** module. The current system status is shown in the ***System state*** panel in the ***Run Data*** pane. For example, it may show ***Ready***, ***Manual Run*** or ***Method Run***, whether optimal or traditional deadband is used for pH control.

Process picture

The ***Process Picture*** displays the real-time process parameters during a run, and can be used to control the run. An example of the ***Process Picture*** is shown in the illustration below. Details vary according to the system configuration.



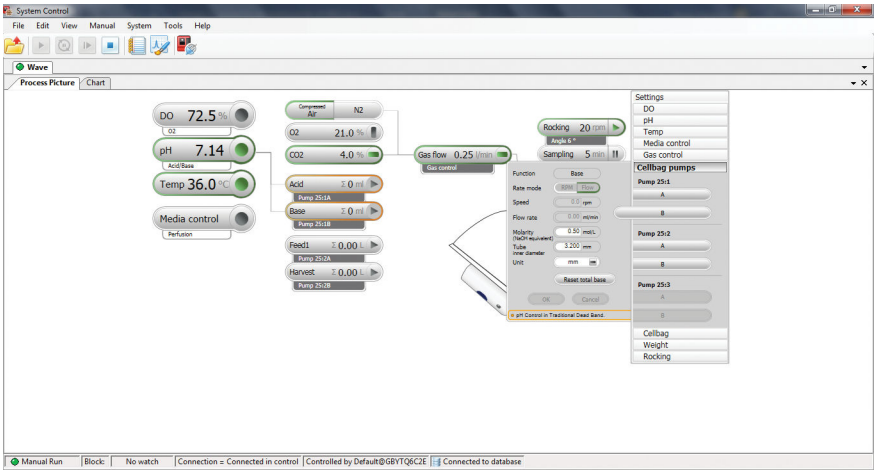
The button colors indicate the current state of the respective function as shown in the table below.

Color	Indication
White	The function is inactive.
Gray	The function is disabled due to higher level control
Green	The function is active and is working normally.
Orange	The function needs attention. Click on the button to open the related settings and to see more information.
Red	The function is not working properly. Click on the button to open the related settings and to see an explanation of the problem.

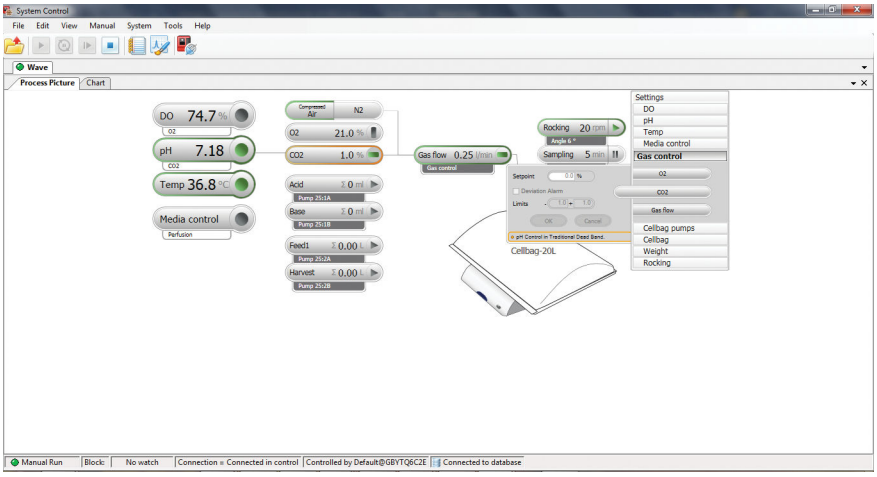
Process picture when in traditional deadband mode

A few examples of different ***Process Picture*** displays when the system is in traditional deadband mode are shown below.

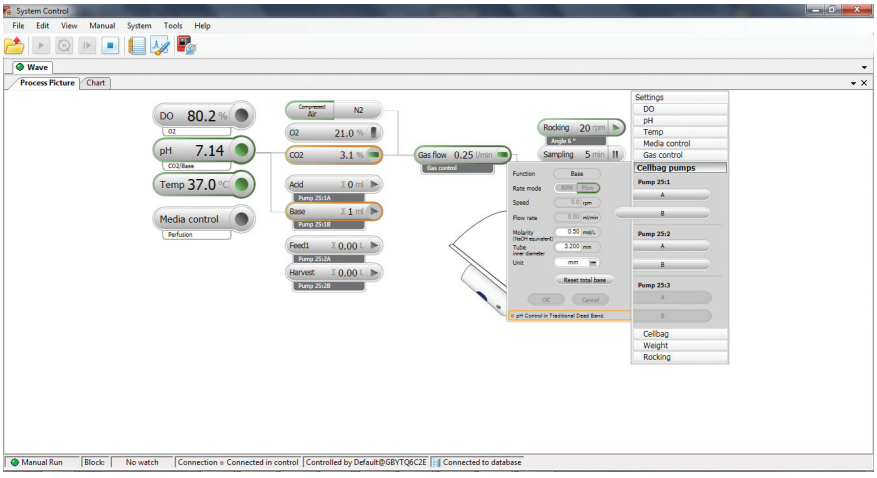
The following example shows the ***Process Picture*** display when the system is in acid/base deadband mode.



The following example shows the ***Process Picture*** display when the system is in CO_2 deadband mode.



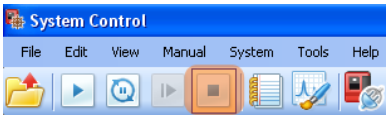
The following example shows the ***Process Picture*** display when the system is in CO_2/Base deadband mode.



5.4.3 End a run

End cultivation and harvest the culture

Follow the instructions below to end the run and harvest the culture.

Step	Action
1	Prepare the harvest vessel.
2	Click the stop button in the toolbar in ***System Control*** to stop the run.  When asked if you want to end the run, click ***OK***. ***Note:*** *By default, the tray will prepare for tilt at the end of the run. This setting can be changed in* ***System Settings →Rocker →Prepare for tilt at END****.*
3	Hold the textured grip area on each side of the tray, and in one movement, pull the tray upwards and against you to position the tray into tilt position.
4	Connect tubing from the Cellbag bioreactor to the harvest vessel.
5	Empty the Cellbag bioreactor using a pump or gravity flow.
6	Disconnect the tubing from the Cellbag bioreactor to the harvest vessel.

Procedures after harvest

Follow the instructions below when the cultivation is finished and the culture is harvested.

Step	Action
1	Clamp off the inlet and outlet vent filters of the Cellbag bioreactor.
2	Disconnect the tubing from the inlet vent filter on the Cellbag bioreactor.
3	Disconnect any other tubing and cables still connected to the Cellbag bioreactor.
4	Release and remove the empty Cellbag bioreactor from the tray by pressing down the bag clamp opener.

Step	Action
5	Follow applicable national and/or local regulations for disposal of the Cellbag bioreactor.
6	Turn off all gas supplies.

Shut down the system

Follow the instructions below to shut down the system.

Step	Action
1	Disconnect the software from the system in UNICORN.
2	Press the **Power** button on the rocker front panel. The light flashes green while shutting down. ***Note:*** *If the rocker fails to shut down, press and hold the **Power** button pressed for more than 4 seconds to force a shutdown.*
3	Clean the bioreactor system units.

6 Maintenance

About this chapter

This chapter describes the required maintenance procedures for Xuri W25. It also gives an overview of the calibration procedures needed for the system to function properly.

In this chapter

Section		See page
6.1	Calibration	123
6.2	Cleaning	125
6.3	Cleaning before planned service	126

Maintenance manager

The maintenance manager in UNICORN keeps track of the usage of different components and shows alerts when it is time for maintenance and service. For detailed information about the maintenance manager, refer to *UNICORN Administration and Technical manual*.

6.1 Calibration

Calibration schedule

For the system to function properly, several calibrations may be performed. See tables below.

Before each cultivation

Perform the following calibrations and adjustments before each cultivation

Calibration	Instruction
Pump	Enter tubing inner diameter in the ***Settings*** →***Cellbag pumps*** dialog. For perfusion cultivation, enable auto-calibration or calibrate the feed and harvest pumps. see *Section 5.3.2 Adjust pump parameters, on page 108*.
DO sensor	Adjust the calibration, see *Section 5.3.4 Prepare the sensors, on page 112*.
pH sensor	Adjust the calibration, see *Section 5.3.4 Prepare the sensors, on page 112*. Repeat the calibration adjustment during cultivation if required.

When required

Perform the following calibrations when required or at least once a year.

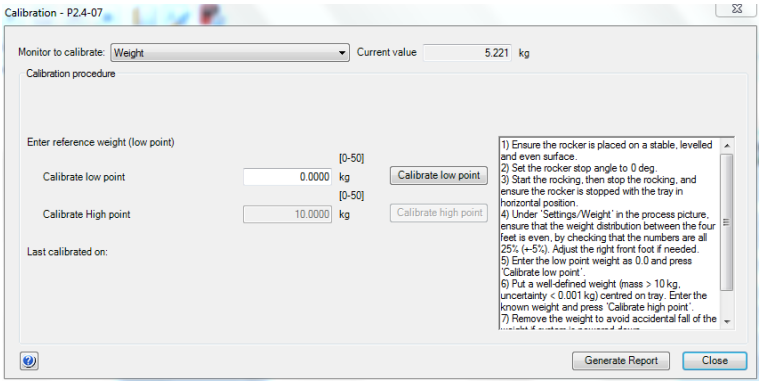
Calibration	Instruction
Scale	Contact Cytiva service personnel for assistance if needed. ***Note:*** *Scale calibration is recommended after moving the rocker, or when the load is changed considerably. For* ***Calibrate High point****, use a weight that is as close as possible to the load that will be applied to the tray during use.*
Tempera-ture	Contact Cytiva service personnel for assistance if needed. Service personnel use special equipment to achieve more accurate calibration.
CO_2 and O_2 sensors	Calibration of CO_2 and O_2 sensors requires special competence and may impair system performance if performed incorrectly. Contact Cytiva service personnel for assistance.

Calibration instruction

Follow the instructions below to perform a calibration. The example is a scale calibration.

Note: *For OPC users, calibration can be accessed from the manual instruction dialog by selecting the OPC component.*

Step	Action
1	Select ***System*** →***Calibrate*** in ***System Control***. *Result:* The ***Calibration*** dialog opens.
2	Select the appropriate monitor in the ***Monitor to calibrate*** drop down menu.
3	Follow the instructions in the right-hand field and enter the correct values in the ***Calibration procedure*** field, and click ***Calibrate*** for each value.
4	Close the ***Calibration*** dialog.



6.2 Cleaning

Cleaning procedure

To prevent microbial or cross contamination, Xuri W25 should be cleaned after each cultivation. The system must be turned off and unplugged before cleaning.

- Clean the exterior of the system units with a damp cloth and a suitable cleaning agent.
- Make sure to clean the temperature sensor arms on the underside of the rocker platform. If dirt accumulates in these arms, they may not function properly, which could cause incorrect temperature regulation.

Recommended cleaning agents

All system units can be cleaned with ethanol, isopropanol and Virkon at suitable concentrations. See *Section 8.1 Chemical resistance, on page 138*.

6.3 Cleaning before planned service

Cleaning before planned maintenance/service

To ensure the protection and safety of service personnel, all equipment and work areas must be clean and free of any hazardous contaminants before a Service Engineer starts maintenance work.

Complete the checklist in the *On Site Service Health and Safety Declaration Form* or the *Health and Safety Declaration Form for Product Return or Servicing*, depending on whether the instrument is going to be serviced on site or returned for service, respectively.

Health and safety declaration forms

Health and safety declaration forms are available for copying or printing in the *Reference information* chapter of this manual, or on digital media supplied with the user documentation.

7 Troubleshooting

About this chapter

This chapter provides information to assist users and service personnel to identify and correct problems that may occur when operating the product.

If the suggested actions in this guide do not solve the problem, or if the problem is not covered by this guide, contact your Cytiva representative for advice.

In this chapter

Section		See page
7.1	Xuri W25	128
7.2	Xuri W25 rocker	129
7.3	Xuri W25 CBCU	133
7.4	Xuri W25 Pump	134
7.5	UNICORN System Control	135

7.1 Xuri W25

Alarm messages

For many of the problems that may occur, UNICORN displays an alarm message on the screen. Follow the instruction shown to resolve the problem.

System units not recognized

Error symptom	Possible cause	Corrective action
CBCU not recognized by UNICORN.	Incorrect CBCU CAN ID.	Check and if necessary change CAN ID using the switch on the CBCU rear panel. See *CAN ID, on page 37* for details. The system must be switched off before the CAN ID is changed, and then restarted.
	CBCU is not selected as a component.	Click ***Edit*** in ***System Properties*** in the ***Administration*** module and add the CBCU as a component.
Pump not recognized by UNICORN.	Incorrect pump CAN ID.	Check and if necessary change CAN ID using the switch on the pump rear panel. See *CAN ID, on page 37* for details. Each pump must have a unique CAN ID value. The system must be switched off before the CAN ID is changed, and then restarted.
	Pump is not selected as a component.	Click ***Edit*** in ***System Properties*** in the ***Administration*** module and add the pump as a component.
CBCU and/or pump not recognized by UNICORN.	Gap between occupied UniNet-9 ports on the rocker rear panel.	Reposition the connectors or insert jumpers in the unused positions between the occupied ports. See *Connect system units to the rocker, on page 67*.
	One or more connected pumps is not defined in UNICORN.	Read the displayed message when you connect to the system in ***System Control***. Make sure all available components are selected for the system. See *Configure system properties, on page 93*.

7.2 Xuri W25 rocker

Rocking

Error symptom	Possible cause	Corrective action
Rocker does not initialize properly.	Faulty safety fuses.	Try to restart the system a few times. If the system still does not initialize properly, shut it down and contact Cytiva service personnel.
When starting the run, the rocker moves too slowly during the first cycle.	It takes a while for the rocker to initialize after turning on the power.	None. This is normal.
Rocker is not rocking.	Rocker is in an error state.	• Check the current alarms. • Reset power to the unit. • If you still get motor alarms, contact Cytiva service personnel.
	Tray is in tilt position.	• Make sure that the tray is in normal position. • If this does not help, contact Cytiva service personnel.
Rocker stops rocking.	Rocker is mechanically restricted from moving.	Locate and remove the restricting object.
Incorrect rocking angle.		
Rocking speed varies.	DO control using speed is enabled. If the DO deviates from the setpoint, the rocking speed changes.	This is normal when DO control is enabled. If not required, disable DO control from the process picture.
Power button flashes red.	Rocker does not have any connection to the UNICORN database.	Verify the connection between the rocker and the client computer or network.
	System units such as CBCU or pump defined in the system setup in UNICORN are not connected to the rocker.	Disable the missing components in UNICORN. See *Configure system properties, on page 93*.
		Connect the missing components to the rocker. See *Connect system units to the rocker, on page 67*.

Error symptom	Possible cause	Corrective action
	An internal error has occured in the embedded computer of the rocker.	Read any warning message carefully and follow the instructions. If problem persists, contact Cytiva service personnel.
System does not shut down when the power button is pressed.	The embedded computer of the rocker fails to shut down.	• Wait one minute. If the system still does not shut down, keep pressing the power button to force system shut down. • If problem persists, contact Cytiva service personnel.
Rocking starts when sending another command than ***Start rocking***.	At the first command sent to the system, the system enters ***Run*** state and the rocker is initialized and makes a few movements.	None. This is normal.

Temperature

Error symptom	Possible cause	Corrective action
No heating although heating is enabled in UNICORN. Frame around the temperature button is orange.	Rocker is not rocking.	Make sure that the rocker is rocking. The heater is automatically turned off when rocking is turned off.
	The tray size is not recognized.	Contact Cytiva service personnel.
	Bag size is not set.	Set the bag size in ***Settings*** →***Cellbag*** in the ***Process Picture***.
	The heater is in an error state.	Contact Cytiva service personnel.
Too slow or too fast heating.	Bag size setting is incorrect.	Check and if necessary reset the bag size setting. When changing the bag size, the rocking must be turned off.
	Incorrect weight measurement.	• Make sure that the rocker is placed in a horizontal position. • Check that the weight shown in the ***Process Picture*** matches the actual weight of the culture medium. If not, tare the scale with the weight of the content in the Cellbag entered as ***Net Weight***.

Error symptom	Possible cause	Corrective action
Temperature control is not functioning or displayed temperature appears to be incorrect.	Temperature sensor is not in contact with the culture medium.	• Make sure that there is enough culture medium in the Cellbag bioreactor to cover the temperature sensor, also when the rocker is rocking. • Check that no crease with resulting air pocket has formed on the Cellbag bioreactor film covering the sensor. • Make sure that the pH or DO cables are not in contact with the temperature sensor.
	Temperature sensor needs calibration.	Calibrate the temperature sensor. See *Section 6.1 Calibration, on page 123*. If needed, contactCytiva service personnel.

Weight

Error symptom	Possible cause	Corrective action
No weight reading.	Scale does not function properly.	Contact Cytiva service personnel.
Incorrect weight displayed.	The weight distribution on the rocker feet is not even.	Use the tare functionality and even the weight distribution according to the instructions in *Section 5.3.3 Add and equilibrate culture medium, on page 109*.
	The rocker is not placed on a horizontal surface.	Place the rocker on a horizontal surface.
	The tare was not done before adding the load (Cellbag bioreactor etc.).	Enter correct net weight and press tare. If correct weight is unknown remove all load (Cellbag bioreactor etc.) from tray and tare (zero) the scale.
	Mechanical obstructions to the rocker.	• Check that the tray is firmly locked in position. • Check that no tubing is pulling on the Cellbag bioreactor during rocking. • Check that the movement of the rocker is not obstructed.
	Scale needs calibration.	Calibrate the scale. See *Section 6.1 Calibration, on page 123*. If needed, contactCytiva service personnel.

Error symptom	Possible cause	Corrective action
Incorrect readings in dual mode.	Cellbag bioreactors not centred on the respective halves of the tray.	Check bioreactor placement.
	Tare omitted or incorrectly performed.	Tare the scale before or after filling the Cellbag bioreactors. See *Tare the scale, on page 109*.
Weight reading fluctuates or drifts.	Rocker support unstable.	Check that the table is rigid, flat and horizontal.

pH

Error symptom	Possible cause	Corrective action
Incorrect pH control mode.	When the desired pH control behaviour is not observed after pH control is turned on.	Check if the correct mode of pH control is selected by checking selections from ***System Settings*** →***pH control*** →***pH control deadband mode*** →***Optimal or Traditional***

Other components

Troubleshooting for pH and DO measurement and control and for media control is described in the *Xuri W25 User Manual*.

7.3 Xuri W25 CBCU

For more detailed troubleshooting, see the *Xuri W25 User Manual*.

Error symptom	Possible cause	Corrective action
Status LED flashes red.	An internal error has occurred, but the CBCU is still operating.	Check any warning message and follow the instruction. If problem persists, contact Cytiva service personnel.
Status LED shows a steady red light.	An internal error has occurred, and the CBCU is not operating.	Check any warning message and follow the instruction. If problem persists, contact Cytiva service personnel.
CAN indicator LED flashes.	An internal error has occurred, and the CBCU is not operating properly. ***Note:*** *This is normal the first seconds during power up.*	Contact Cytiva service personnel.

7.4 Xuri W25 Pump

Error symptom	Possible cause	Corrective action
Status LED on the pump rear panel flashes red.	An internal error has occurred, but the pump is still operating.	Check any warning message and follow the instruction. If problem persists, contact Cytiva service personnel.
Status LED on the pump rear panel shows a steady red light.	An internal error has occurred, and the pump is not operating.	Check any warning message and follow the instruction. If problem persists, contact Cytiva service personnel.
CAN indicator LED flashes.	An internal error has occurred, and the pump is not operating properly. ***Note:*** *This is normal the first seconds during power up.*	Contact Cytiva service personnel.

7.5 UNICORN System Control

User Access

Problem description	Solution
Username and password not accepted.	• The UNICORN administrator should check if the user account is locked (for example after too many unsuccessful log on attempts). • The UNICORN administrator can try to set a new password. • If a password reset does not work, the user profile may have to be deleted and a new profile created.
The log on dialog is inactive and a password cannot be entered.	1. Verify that no UNICORN window or module is opened. 2. Log off from Windows and log on again.

Access to UNICORN functions

Problem description	Solution
The ***Execute manual instruction*** menu command in the ***System Control*** module is gray. This means that you can establish a connection but cannot control the system.	• Check that no other user has a control mode connection. • Check that you have access rights to control the system manually.
The help viewer cannot be opened using help buttons or the **F1** key.	1. Open the MadCap help viewer from the Windows desktop icon. This is described in *The help viewer application in UNICORN Administration and Technical manual*. 2. Try the help button or **F1** key again.

System connections

Problem description	Solution
The connections are not available, i.e. the selection checkbox is grayed out.	• Check if the system has been deactivated. • Check that the power to the system is turned on. • Check that the rocker power button shows a steady green light. • Check the connection between the client computer and the system. • Check the firewall settings on the client computer. Refer to *UNICORN Administration and Technical manual*.
The connections are not available even though • the connection between the PC and system appears to be correct, and • the power is turned on.	1. Switch off the system. 2. Exit UNICORN. 3. Restart the system. 4. Log on to UNICORN.
A system is not available when you attempt to establish a connection.	• Check that you have access rights to the system. Access rights are not automatically assigned for a newly defined system. • The system may not be active. • Log off and log on again for access rights changes to be applied.
You receive the error message "Cannot connect to system..." in a network installation.	• Check that the rocker power button shows a steady green light. • Check that the computer from which you try to establish a connection is logged on to the network. • Check that the limit of five simultaneous connections to the system has not been exceeded. • Check the firewall settings on the client computer. Refer to *UNICORN Administration and Technical manual* .
You receive the error message "Warning, system occupied" when trying to connect.	This error message is displayed if a system is defined and active in two different UNICORN database instances and is already connected in the other instance. It is not recommended to have a system defined and active in more than one UNICORN database instance.

8 Reference information

About this chapter

This chapter provides a chemical resistance guide for Xuri W25 and Health and Safety Declaration forms for service.

For system and component specifications, wetted materials and chemical resistance information, refer to the *Xuri W25 User Manual*, the *Xuri W25 Product Documentation* and the data file for Xuri W25, available for download from cytiva.com.

In this chapter

Section		See page
8.1	Chemical resistance	138
8.2	Recycling information	139
8.3	Regulatory information	140
8.4	Health and Safety Declaration Form	151

8.1 Chemical resistance

The chemicals listed below have been approved for use with the bioreactor system.

Chemical	Concentration	Use	CAS no./EC no.
Alconox	N/A	Cleaning/Disinfection	N/A
DesiDos	N/A	Cleaning/Disinfection	N/A
Ethanol	70%	Cleaning/Disinfection	75-08-1/200-837-3
Hydrochloric acid	1 M	pH control	7647-01-0/231-595-7
Isopropanol	70%	Cleaning/Disinfection	67-63-0/200-661-7
Klercide	N/A	Cleaning/Disinfection	N/A
PBS solution	10×	Testing	N/A
Sodium bicarbonate	7.5%	pH control	144-55-8/205-633-8
Sodium carbonate	1 M	pH control	497-19-8/207-838-8
Sodium chloride	5 M	Testing	7647-14-5/231-598-3
Sodium hydroxide	1 M	pH control	1310-73-2/215-185-5
Sodium hypochlorite	1%	Cleaning/Disinfection	7681-52-9/231-668-3
Virkon	1%	Cleaning/Disinfection	N/A

8.2 Recycling information

Introduction

This section contains information about the decommissioning of the product.

CAUTION

Always use appropriate personal protective equipment when decommissioning the equipment.

Decontamination

The product must be decontaminated before decommissioning. All local regulations must be followed with regard to scrapping of the equipment.

Disposal of the product

When taking the product out of service, the different materials must be separated and recycled according to national and local environmental regulations.

Recycling of hazardous substances

The product contains hazardous substances. Detailed information is available from your Cytiva representative.

Disposal of electrical components

Waste electrical and electronic equipment must not be disposed of as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of the equipment.

8.3 Regulatory information

Introduction

This section lists the regulations and standards that apply to the product. Your system is marked or listed according to the applicable regulatory requirements for your region. Local language translations are only provided according to regulatory requirements.

In this section

Section		See page
8.3.1	Contact information	141
8.3.2	European Union and European Economic Area	142
8.3.3	Great Britain	143
8.3.4	Eurasian Economic Union (Евразийский экономический союз)	144
8.3.5	North America	146
8.3.6	Regulatory statements	147
8.3.7	Declaration of Hazardous Substances (DoHS)	148
8.3.8	Other regulations and standards	150

8.3.1 Contact information

Contact information for support

To find local contact information for support and sending troubleshooting reports, visit *cytiva.com/contact*.

Manufacturing information

The table below summarizes the required manufacturing information.

Requirement	Information
Name and address of manufacturer	Cytiva Sweden AB Björkgatan 30 SE 751 84 Uppsala Sweden
Telephone number of manufacturer	+ 46 771 400 600

8.3.2 European Union and European Economic Area

Introduction

This section describes regulatory information for the European Union and European Economic Area that applies to the product.

Conformity with EU Directives

See the EU Declaration of Conformity for the directives and regulations that apply for the CE marking.

If not included with the product, a copy of the EU Declaration of Conformity is available on request.

CE marking

The CE marking and the corresponding EU Declaration of Conformity is valid for the product when it is:

- used according to the *Operating Instructions* or user manuals, and
- used in the same state as it was delivered, except for alterations described in the *Operating Instructions* or user manuals.

8.3.3 Great Britain

Introduction

This section describes regulatory information for Great Britain that applies to the product.

Conformity with UK Regulations

See the UK Declaration of Conformity for the regulations that apply for the UKCA marking.

If not included with the product, a copy of the UK Declaration of Conformity is available on request.

UKCA marking

The UKCA marking and the corresponding UK Declaration of Conformity is valid for the product when it is:

- used according to the *Operating Instructions* or user manuals, and
- used in the same state as it was delivered, except for alterations described in the *Operating Instructions* or user manuals.

8.3.4 Eurasian Economic Union (Евразийский экономический союз)

This section describes the information that applies to the product in the Eurasian Economic Union (the Russian Federation, the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, and the Kyrgyz Republic).

Introduction

This section provides information in accordance with the requirements of the Technical Regulations of the Customs Union and (or) the Eurasian Economic Union.

Введение

В данном разделе приведена информация согласно требованиям Технических регламентов Таможенного союза и (или) Евразийского экономического союза.

Manufacturer and importer information

The following table provides summary information about the manufacturer and importer, in accordance with the requirements of the Technical Regulations of the Customs Union and (or) the Eurasian Economic Union.

Requirement	Information
Name, address and telephone number of manufacturer	See *Manufacturing information*
Importer and/or company for obtaining information about importer	Cytiva RUS LLC 109004, Moscow internal city area Tagansky municipal district Stanislavsky str., 21, building 5, premises I, offices 24,25,29 Russian Federation Telephone: +7 985 192 75 37 E-mail: *rucis@cytiva.com*

Информация о производителе и импортере

В следующей таблице приводится сводная информация о производителе и импортере, согласно требованиям Технических регламентов Таможенного союза и (или) Евразийского экономического союза.

Требование	Информация
Наименование, адрес и номер телефона производителя	См. *Информацию об изготовлении*
Импортер и/или лицо для получения информации об импортере	ООО "Цитива РУС" 109004, г. Москва вн. тер. г. муниципальный округ Таганский ул. Станиславского, д. 21 стр. 5, помещ. I, ком. 24,25,29 Российская Федерация Телефон: +7 985 192 75 37 Адрес электронной почты: *rucis@cytiva.com*

Description of symbol on the system label
Описание обозначения на этикетке системы

This Eurasian compliance mark indicates that the product is approved for use on the markets of the Member States of the Customs Union of the Eurasian Economic Union

Данный знак о Евразийском соответствии указывает, что изделие одобрено для использования на рынках государств-членов Таможенного союза Евразийского экономического союза

8.3.5 North America

Introduction

This section describes the information that applies to the product in the USA and Canada.

FCC compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: *The user is cautioned that any changes or modifications not expressly approved by Cytiva could void the user's authority to operate the equipment.*

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

8.3.6 Regulatory statements

Introduction

This section shows regulatory statements that apply to regional requirements.

General statement

NOTICE

This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

South Korea

Regulatory information to comply with the Korean technical regulations.

NOTICE

Class A equipment (equipment for business use).

This equipment has been evaluated for its suitability for use in a business environment.

When used in a residential environment, there is a concern of radio interference.

유의사항

A급 기기 (업무용 방송통신 기자재)

이 기기는 업무용환경에서 사용할 목적으로 적합성평가를 받은 기기

로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

8.3.7 Declaration of Hazardous Substances (DoHS)

This section describes the information that applies to the product in China.

根据 SJ/T11364-2014《电子电气产品有害物质限制使用标识要求》特提供如下有关污染控制方面的信息。

The following product pollution control information is provided according to SJ/T11364-2014 Marking for Restriction of Hazardous Substances caused by electrical and electronic products.

电子信息产品污染控制标志说明
Explanation of Pollution Control Label

该标志表明本产品含有超过中国标准 GB/T 26572《电子电气产品中限用物质的限量要求》中限量的有害物质。标志中的数字为本产品的环保使用期，表明本产品在正常使用的条件下，有毒有害物质不会发生外泄或突变，用户使用本产品不会对环境造成严重污染或对其人身、财产造成严重损害的期限。单位为年。

为保证所申明的环保使用期限，应按产品手册中所规定的环境条件和方法进行正常使用，并严格遵守产品维修手册中规定的定期维修和保养要求。

产品中的消耗件和某些零部件可能有其单独的环保使用期限标志，并且其环保使用期限有可能比整个产品本身的环保使用期限短。应到期按产品维修程序更换那些消耗件和零部件，以保证所申明的整个产品的环保使用期限。

本产品在使用寿命结束时不可作为普通生活垃圾处理，应被单独收集妥善处理。

This symbol indicates the product contains hazardous materials in excess of the limits established by the Chinese standard GB/T 26572 Requirements of concentration limits for certain restricted substances in electrical and electronic products. The number in the symbol is the Environment-friendly Use Period (EFUP), which indicates the period during which the hazardous substances contained in electrical and electronic products will not leak or mutate under normal operating conditions so that the use of such electrical and electronic products will not result in any severe environmental pollution, any bodily injury or damage to any assets. The unit of the period is “Year”.

In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly.

Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures.

This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

有害物质的名称及含量
Name and Concentration of Hazardous Substances

产品中有害物质的名称及含量
Table of Hazardous Substances' Name and Concentration

部件名称 Compo-nent name	有害物质 Hazardous substance					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
29064568	X	0	0	0	0	0
29064571	X	0	0	0		0
29064600	X	0	0	0		0
29064599	X	0	0	0		0
29064602	X	0	0	0		0

0: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

- 此表所列数据为发布时所能获得的最佳信息.

0: Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572.

X: Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in GB/T 26572

- Data listed in the table represents best information available at the time of publication.

8.3.8 Other regulations and standards

Introduction

This section describes the additional standards that apply to the product.

Software declaration of conformity

UNICORN 6.3, 7.0 and later versions are technically compatible with all relevant sections of FDA 21 CFR Part 11.

A part 11-system assessment checklist is available on request from your local Cytiva representative.

8.4 Health and Safety Declaration Form

On site service

cytiva

On Site Service Health & Safety Declaration Form

Service Ticket #:	

To make the mutual protection and safety of Cytiva service personnel and our customers, all equipment and work areas must be clean and free of any hazardous contaminants before a Service Engineer starts a repair. To avoid delays in the servicing of your equipment, complete this checklist and present it to the Service Engineer upon arrival. Equipment and/or work areas not sufficiently cleaned, accessible and safe for an engineer may lead to delays in servicing the equipment and could be subject to additional charges.

Yes	No	Review the actions below and answer "Yes" or "No". Provide explanation for any "No" answers in box below.
○	○	**Instrument has been cleaned of hazardous substances**. Rinse tubing or piping, wipe down scanner surfaces, or otherwise make sure removal of any dangerous residue. Make sure the area around the instrument is clean. If radioactivity has been used, perform a wipe test or other suitable survey.
○	○	**Adequate space and clearance is provided to allow safe access** for instrument service, repair or installation. In some cases this may require customer to move equipment from normal operating location prior to Cytiva arrival.
○	○	**Consumables, such as columns or gels, have been removed or isolated from the instrument and from any area that may impede access to the instrument.**
○	○	**All buffer / waste vessels are labeled. Excess containers have been removed from the area to provide access.**
Provide explanation for any "No" answers here:		

Equipment type / Product No:		Serial No:	

I hereby confirm that the equipment specified above has been cleaned to remove any hazardous substances and that the area has been made safe and accessible.

Name:		Company or institution:	
Position or job title:		Date (YYYY/MM/DD):	
Signed:			

Product return or servicing

cytiva

Health & Safety Declaration Form for Product Return or Servicing

Return authorization number:		*and/or* **Service Ticket/Request:**	

To make sure the mutual protection and safety of Cytiva personnel, our customers, transportation personnel and our environment, all equipment must be clean and free of any hazardous contaminants before shipping to Cytiva. To avoid delays in the processing of your equipment, complete this checklist and include it with your return.

1. Note that items will NOT be accepted for servicing or return without this form
2. Equipment which is not sufficiently cleaned prior to return to Cytiva may lead to delays in servicing the equipment and could be subject to additional charges
3. Visible contamination will be assumed hazardous and additional cleaning and decontamination charges will be applied

Yes	No	Specify if the equipment has been in contact with any of the following:	
◯	◯	Radioactivity (specify)	
◯	◯	Infectious or hazardous biological substances (specify)	
◯	◯	Other Hazardous Chemicals (specify)	

Equipment must be decontaminated prior to service / return. Provide a telephone number where Cytiva can contact you for additional information concerning the system / equipment.

Telephone No:		
Liquid and/or gas in equipment is:	☐	**Water**
	☐	**Ethanol**
	☐	**None, empty**
	☐	**Argon, Helium, Nitrogen**
	☐	**Liquid Nitrogen**
	Other, specify	

Equipment type / Product No:		**Serial No:**	

I hereby confirm that the equipment specified above has been cleaned to remove any hazardous substances and that the area has been made safe and accessible.

Name:		**Company or institution:**	
Position or job title:		**Date (YYYY/MM/DD)**	
Signed:			

For local office contact information, visit cytiva.com/contact.
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To receive a return authorization number or service number, call local technical support or customer service.

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