



UV-90 monitor

User Manual

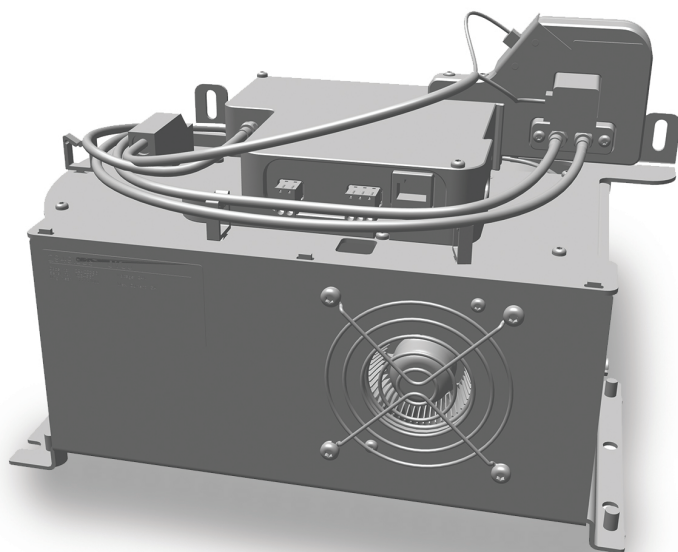


Table of Contents

1	Introduction	3
1.1	Important user information	4
1.2	About this manual	5
1.3	Associated documentation	6
2	Safety instructions	7
2.1	Safety precautions	9
2.2	Symbols and abbreviations	10
3	UV monitor description	11
3.1	Overview	12
3.2	Illustrations	13
3.2.1	<i>Monitor unit</i>	14
3.2.2	<i>Monitor principle</i>	16
4	Operation	19
5	Maintenance	21
5.1	Replacement of the UV flow cell	22
5.2	UV-90 monitor tests	24
5.3	Calibration	25
5.4	Cleaning before planned service	26
5.5	Cleaning of the flow cell and optical connectors	27
5.6	Storage	28
6	Troubleshooting	29
7	Reference information	35
7.1	Technical specifications	36
7.2	Procedures for decommissioning	38
7.3	Health and Safety Declaration Form	39
7.4	Accessories and spare parts	41

1 Introduction

About this chapter

This chapter contains information about this manual and associated user documentation, important user information and intended use of UV-90 monitor.

In this chapter

Section		See page
1.1	Important user information	4
1.2	About this manual	5
1.3	Associated documentation	6

1.1 Important user information

Read this before operating the product



Before operating or maintaining the product, all users must read the entire *UV-90 monitor User Manual* and the *Operating Instructions* of the system where the UV-90 monitor is installed.

When operating the product, always keep the *UV-90 monitor User Manual* and the system *Operating Instructions* at hand.

Do not 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 of the product

UV-90 monitor is a UV absorption monitor for use in bioprocess equipment.

The monitor can continuously measure the UV absorbance of the process fluids.

The monitor is not intended for any clinical or diagnostic procedures.

Prerequisites

In order to follow this manual and use the system in the manner it is intended, it is important that the following applies:

- You have a general understanding of how the computer and Microsoft Windows work.
- You understand the concepts of liquid chromatography.
- You have read and understood all safety precautions in the *Operating Instructions* of the system where the UV-90 monitor is installed.

1.2 About this manual

Purpose of the User Manual

This *User Manual* provides you with the information needed to operate and maintain the UV-90 monitor in a safe way. It does not provide information about the use of the system where the monitor is installed.

Scope of this manual

The *User Manual* covers the UV-90 monitor. In this manual, the UV-90 monitor is also referred to as UV transmitter (AE-131).

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.*

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.*

1.3 Associated documentation

System-specific documentation

Examples of user documentation that can be found in the product documentation package with regard to technical aspects of UV-90 monitor are listed below.

User documentation	Content
<i>System Operating Instructions</i>	Instructions needed to safely and correctly prepare and operate the system where the UV monitor is installed.
<i>UV Flow Cell Instructions for Use</i>	Instructions needed to prepare and maintain the UV flow cell.
EU Declaration of Conformity for UV-90 monitor	Document whereby the manufacturer states that the product is designed according to and conforms with the requirements of the applicable directives.

2 Safety instructions

About this chapter

This chapter describes safety precautions, labels and symbols that are attached to the equipment.

In this chapter

Section	See page
2.1 Safety precautions	9
2.2 Symbols and abbreviations	10

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.

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.

2.1 Safety precautions

Introduction

The UV-90 monitor is powered by mains voltage and handles pressurized liquids that may be hazardous. Before operating or maintaining the monitor, you must read and understand the *Safety instructions* chapter to be aware of the hazards involved. You must also read and understand all of the safety precautions in the *Operating Instructions* for the system where the UV-90 monitor is installed. Follow the instructions provided to avoid personal injury or damage to the equipment.

General precautions

Always follow these General precautions to avoid injury when using the UV-90 monitor.



WARNING

The customer must make sure that all installation, maintenance, operation and inspection is carried out by qualified personnel who are adequately trained, understand and adhere to local regulations and the operating instructions, and have a thorough knowledge of the system and the entire process.



WARNING

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



WARNING

Only personnel authorized by Cytiva may perform service, installation, and maintenance of components inside the electrical cabinet of the system.



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 system components.

2.2 Symbols and abbreviations

Introduction

This section describes the information on the nameplate and other safety or regulatory labels that are attached to UV-90 monitor.

Nameplate

The nameplate is located on the front panel of the UV-90 monitor. The nameplate identifies the equipment and shows electrical data.

The following symbols and text may be present on the nameplate:

Label text	Description
Product no:	Order number for the product.
Code no:	Instrument Assembly number.
Serial no:	Serial number.
Mfg Date:	Year (YYYY) and month (MM) of manufacture.
Voltage:	Supply voltage.
Max Current:	Maximum current consumption of the monitor.

3 UV monitor description

About this chapter

This chapter gives an overview of UV-90 monitor and a brief description of its function.

In this chapter

Section		See page
3.1	Overview	12
3.2	Illustrations	13

3.1 Overview

Introduction

The UV-90 monitor is used to measure the absorbance of target molecule in bioprocess operations. The UV monitor includes a monitor unit, a detector, and UV flow cell. Up to two UV flow cells can be connected and run simultaneously, dependent on the system layout.

Function

The UV monitor is used to measure the UV/Vis absorbance at up to three wavelengths simultaneously, in the range 190 to 700 nm.

UV flow cell

The UV flow cells are available in two flow path diameters (8 and 22 mm) for three path lengths (1, 2, and 5 mm) to accommodate different expected maximum analyte concentrations.

For more information on UV flow cells, refer to the *Industrial UV Flow Cell Instructions for Use*.

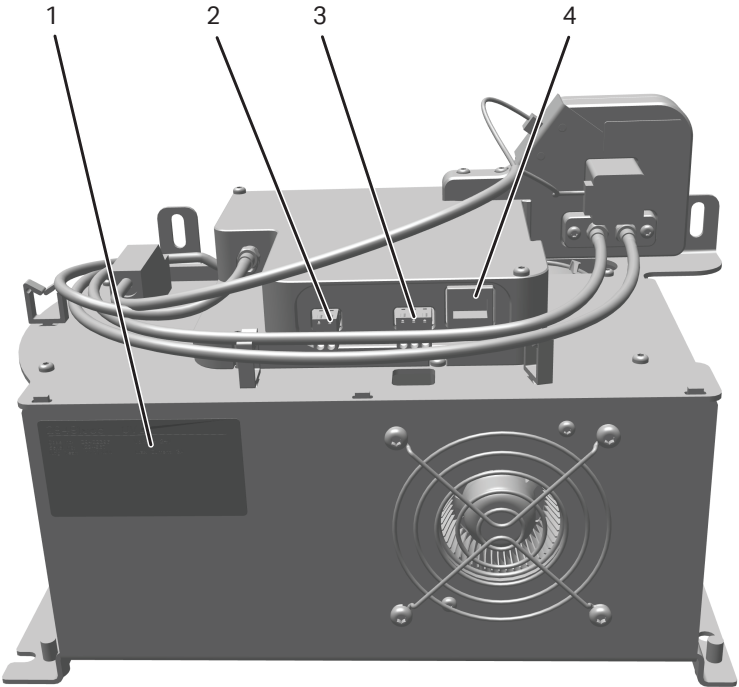
3.2 Illustrations

In this section

Section		See page
3.2.1	Monitor unit	14
3.2.2	Monitor principle	16

3.2.1 Monitor unit

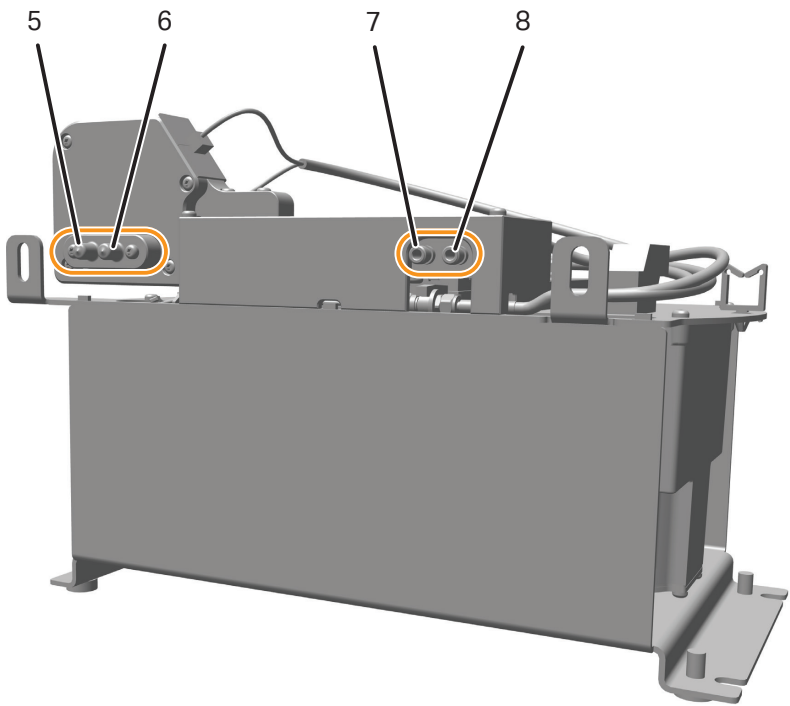
Front panel



Part	Function
1	Nameplate.
2	Mains power inlet. Supply voltage, grounded.
3	Connection to the fan.
4	EtherNet/IP connection.

Rear panel

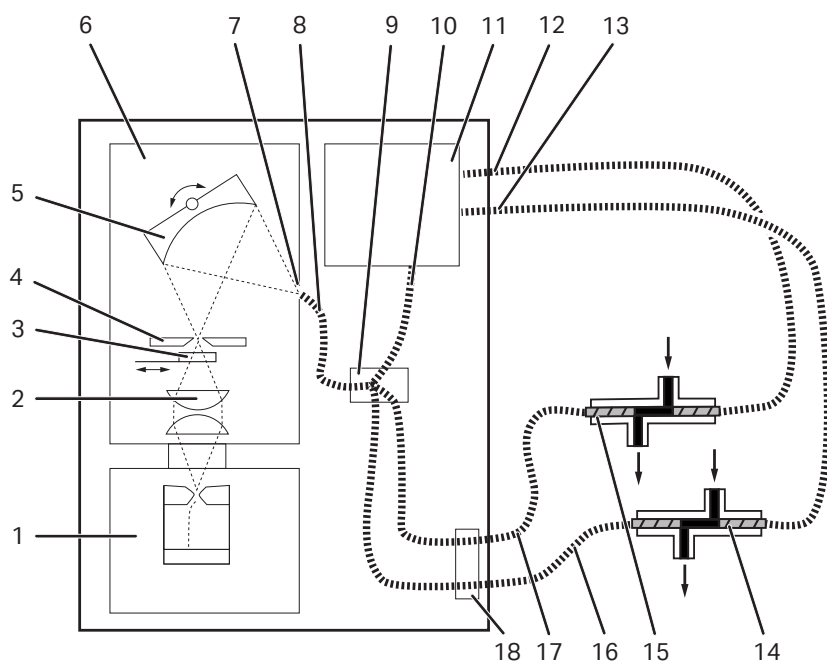
The monitor is equipped with two fiber connections, **S1** and **S2**, to allow the connection of two different UV flow cells.



Part	Function
5	S2 optical fiber connection to the lamp.
6	S1 optical fiber connection to the lamp.
7	S2 optical fiber connection to the detector.
8	S1 optical fiber connection to the detector.

3.2.2 Monitor principle

Functional diagram of the UV monitor



Part	Function
1	Flash lamp 100 Hz
2	Imaging optics
3	Blocking filter
4	Entrance slit
5	Aberration corrected holographic grating
6	Monochromator
7	Exit slit
8	Mode fiber
9	Beam splitter
10	Reference fiber
11	Detectors electronics

Part	Function
12	Detector optical fiber for S1
13	Detector optical fiber for S2
14	Flow cell 2
15	Flow cell 1
16	Lamp optical fiber for S2
17	Lamp optical fiber for S1
18	Linearity calibration unit

Light source and monochromator

A Xenon flash lamp gives a high intensity, continuous spectrum throughout the range 160–2000 nm. The light enters a monochromator which includes imaging optics, blocking filter, entrance slit and a concave aberration corrected holographic grating. Monochromatic light from the grating is directed to an optical fiber. The grating is turned by a stepping motor for wavelength selection between 190–700 nm, in three steps per 1 nm. Up to 3 wavelengths can be monitored simultaneously.

Blocking filter

A blocking filter is used to suppress second order diffraction light when running the detector at wavelength above 360 nm. The blocking filter is also used to suppress over-intense light at 230 nm and 247 nm.

Beam splitter

The light from the monochromator is guided by an optical fiber to the flow cell and another optical fiber guides the light from the flow cell to the detector. The full intensity of the light is focused on the liquid flow path, maximizing the sensitivity of the monitor. Before entering the external fiber, the monochromatic light is split in a beam splitter. The beam splitter has three arms, two sample beams (**S1** and **S2**) and one reference beam (**R**). A third of the light pass through each sample fiber and flow cell and a third of the light is directed through the reference fiber to the reference photodiode. Three photodiodes with identical characteristics monitor the intensities of the samples and reference beams.

Calibration

In the optical fibers, the light transmitted from the lamp passes through the linearity calibration device before reaching the flow cells. Four different absorption filters can be rotated into the light path for linearity calibration. There is no filter in the light path for normal measurement.

Detection system

The UV-90 monitor can be configured to handle two flow cells simultaneously.

To accommodate different detection requirements, the options of two flow path diameters (8 and 22 mm) and three path lengths (1, 2 and 5 mm) are available for the UV flow cells.

Different optical fiber lengths are available to allow UV measurement in different places along the flow path.

Flow cells with shorter path length and for different flow rates can be ordered on request.

Contact Cytiva for more information.

Initiation

During the monitor initiation, the monitor automatically finds two persistent lines in the spectrum of Xenon. The wavelengths of these known lines are used to calibrate the stepper motor that turns the grating.

4 Operation

About this chapter

This chapter provides the information required to safely operate the UV-90 monitor. The available functions of the UV-90 monitor are also described in this chapter.

Note: *The available functionality is dependent on the control system. Some of the functionality described in this manual may not be available for your system.*

Precautions



WARNING

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



WARNING

High intensity UV light. The UV monitor uses high intensity ultra-violet light. Do not operate the UV monitor with disconnected optical fibers.



NOTICE

The flow cells must not be used at pressures above specified pressure. At higher pressures the flow cell may break.

Filter and wavelength selection

To reduce measurement noise, an averaging filter can be used. The filter length (in seconds) can be changed during run. The number of wavelengths and the respective wavelengths can be changed during measurement.

UV cell path length selection

The UV flow cell path length setting must be entered when a flow cell is changed.

Absorbance and optical density measuring

The user can choose to perform the absorbance measurements in AU (normalized to the nominal path length of the UV flow cell mounted in the system) or OD for easy comparison between different UV flow cells (normalized to the path length of 1 cm).

Autozero

When the measurement is running, an autozero request can be done per cell. This offsets the absorbance and optical density output to zero for the active wavelength instances. The offset value is available together with the measurement values. The offset values are wavelength specific, thus a new offset value is needed when the selected wavelength is changed.

Sample scan

This function generates sample spectra of the liquid in the enabled cells. The wavelength range, step between wavelengths, and averaging time can be chosen and must not be changed after autozero is performed.

UV lamp manual switch off

The UV lamp can be turned off manually if not needed during a run. This is suitable for example during column or system conditioning or equilibration over long time, column or system cleaning, or sanitization. The UV lamp is turned on automatically in the next run.

Control software

The operation of the UV-90 monitor is performed using the control software of the system in which the monitor is installed. Refer to the system and control software user documentation for more information.

5 Maintenance

About this chapter

This chapter provides maintenance information for UV-90 monitor.

In this chapter

Section	See page
5.1 Replacement of the UV flow cell	22
5.2 UV-90 monitor tests	24
5.3 Calibration	25
5.4 Cleaning before planned service	26
5.5 Cleaning of the flow cell and optical connectors	27
5.6 Storage	28

Precautions



WARNING
Decontaminate before maintenance. To avoid personnel being exposed to potentially hazardous substances, make sure that the system and components are properly decontaminated and sanitized before maintenance or service.



WARNING
Hazardous chemicals during maintenance. When using hazardous chemicals for system and component cleaning, wash the system and components with a neutral solution in the last phase or step.

5.1 Replacement of the UV flow cell

The optical fibers and the UV flow cell are delivered pre-installed in the system. The flow cell is mounted in the flow path and connected to the UV-90 monitor using the optical fibers. Use the following instructions for flow cell replacement when necessary.

Changing the flow cell

The flow cell can be changed when required. For example, change the flow cell from 2 mm to 5 mm path length when the sensitivity of the measurement must be increased due to a low sample titer. Or change the flow cell from 5 mm to 2 mm path length when a lower sensitivity is desired due to output signals that are above the linear dynamic range of the UV monitor.

Follow the next instructions to change the flow cell.

Step	Action
1	Turn off the UV monitor.
2	Disconnect the connection between the detector optical fiber and the existing flow cell.
3	Disconnect the connection between the lamp optical fiber and the existing flow cell.
4	Remove the existing flow cell from the flow path.
5	Connect the new flow cell to the flow path. See Connecting the flow cell to the flow path, on page 23 .
6	Connect the new flow cell to the detector and lamp optical fibers.
7	Tighten the nuts of both connectors between the optical fibers and the flow cell until finger tight using the fiber detachment tool shown below. Do not overtighten.



NOTICE

Do not twist the optical fibers during tightening.

Tip:

It is recommended to use the fiber detachment tool to avoid damaging the fiber. If it is not provided with the system, the tool can be ordered separately.

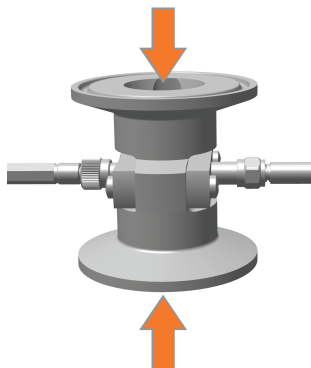
Step	Action
8	Enter the nominal path length and the exact path length found on the flow cell into the control software.

Connecting the flow cell to the flow path

Step	Action
1	Connect the appropriate opaque tubing from the system to the inlet and outlet of the flow cell. The inlet is at the bottom of the flow cell.

Tip:

On ÄKTA process™ polypropylene systems, a tubing cover is provided.



2	Connect the tubing with TC-connectors.
---	--

Changing the UV optical fibers

The UV optical fibers can be changed when required. Contact Cytiva Service representative for changing the UV optical fibers.

5.2 UV-90 monitor tests

Introduction

There are tests that can be performed to verify the function of the UV monitor when applicable, e.g. before or after a run.

UV linearity calibration

The linearity calibration test measures the absorbance with four different built-in absorbance filters with known damping at 280 nm. The test result shows deviation from the nominal absorption, presented as percentage of full scale, for each filter. The results of the last ten calibrations for each cell are retrievable from the UV-90 monitor memory and presented on request.

Wavelength accuracy test

This test measures the wavelength accuracy. The test determines the 229.6 nm, 459.2 nm and 541.9 nm peaks and reports the deviation from nominal value for each peak.

UV lamp condition test

The UV lamp condition is displayed as percentage value in comparison to a new lamp (shown as 100%). When the lamp reaches 20%, the monitor is still functioning, but it is recommended to contact Cytiva to plan for a lamp replacement. The UV-90 monitor is fully functional until the lamp condition is 0%.

5.3 Calibration

Wavelength calibration

Wavelength calibration of the UV monitor is automatically performed every time the system is turned on. If the system has been switched on for a couple of days or more, and the ambient temperature and/or the humidity has changed, it is recommended to use the control software command or restart the system to perform the wavelength calibration of the UV monitor.

5.4 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.

5.5 Cleaning of the flow cell and optical connectors

Clean the flow cell in-place

Step	Action
1	Run water for injection (WFI) into the inlet of the flow cell.
2	Run cleaning solution (1 M NaOH or 20% ethanol) through the flow cell at low flow rate for 30 minutes.
3	Wash out the flow cell with WFI.

Alternatively, use the recommended cleaning procedure for the system which the flow cell is attached to.

Clean the flow cell off-line

Follow the instructions below to clean the flow cell off-line.

Step	Action
1	Flush 10 flow cell volumes of water for injection (WFI) into the inlet of the flow cell.
2	Flush 9 flow cell volumes of a 10% surface active detergent solution (e.g., Decon 90, Deconex 11, RBS 25, or equivalent) through the flow cell.
3	Fill the flow cell with the detergent solution and leave it in the flow cell for 0.5 to 2 hours.
4	Drain the detergent solution from the flow cell.
5	Flush the flow cell with at least 10 flow cell volumes of WFI.

Cleaning the optical fiber connectors

When required, wipe the optical fiber connectors with 30% to 100% isopropanol or ethanol on lens paper.

5.6 Storage



NOTICE

Keep UV flow cell clean. Do not allow solutions containing dissolved salts, proteins or other solid solutes to dry out in the flow cell. Do not allow particles to enter the flow cell, as damage to the flow cell may occur.

Overnight

It is recommended to fill the flow cell with buffer, preferably with 20% ethanol or 0.01 to 0.1 M NaOH.

Weekend and long term storage

Flush the flow cell with distilled water and then fill it with 20% ethanol or 0.01 to 0.1 M NaOH.

The flow cell can also be stored dry by flushing as above with distilled water and then blowing a compressed inert gas such as nitrogen (N₂) through the cell. Replace the protective caps. Never use compressed air to dry the flow cell as it may contain droplets of oil.

6 Troubleshooting

About this chapter

This chapter provides information required to enable users and service personnel to identify and correct problems that may occur when operating UV-90 monitor.

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.

Precautions



WARNING

Before attempting to perform any of the procedures described in this chapter, you must read and understand all contents of the corresponding sections listed below:

- [General precautions, on page 9](#)
- [Chapter 4 Operation, on page 19](#)
- [Chapter 5 Maintenance, on page 21](#)

Faults and actions

If the suggested actions do not correct the fault, contact Cytiva Service representative.

Fault	Possible cause	Recommended action
Noisy signal.	Auto-zero on high level.	1. If the absorbance value of auto-zero is higher than 0.5, make sure the flow cell is clean and filled with buffer and redo the auto-zero. 2. If the absorbance value remains high after performing step 1 above, restart the system. If problem persists, contact Cytiva Service representative.
	Loose fiber connectors.	Check the connections of the UV optical fibers to the UV monitor and the UV flow cell.

Fault	Possible cause	Recommended action
	Broken fan.	Restart the system. If the problem persists, contact Cytiva Service representative.
	Broken fibers.	Contact Cytiva Service representative.
High absorption level.	Loose fiber connectors.	Check the connections of the UV optical fibers to the UV monitor and the UV flow cell.
	Air in the system.	Make sure that there are no air bubbles in the system flow path.
	Buffer with high absorption value.	Check the liquid.
	Contaminated UV cell.	Clean the UV cell, see Section 5.5 Cleaning of the flow cell and optical connectors, on page 27 .
	Wrong UV flow cell path length	Make sure the correct cell path length is entered into the system software.
	Broken fibers.	Contact Cytiva Service representative.
Low absorption level	Loose fiber connectors.	Check the connections of the UV optical fibers to the UV monitor and the UV flow cell.
	Wrong UV flow cell path length.	Make sure the correct cell path length is entered into the system software.
	High auto-zero absorbance value.	• Check the buffer. • Check the baseline using non-absorbing buffer.
Low repeatability of linearity measurements.	Loose fiber connectors or moving fibers.	Check the connections of the optical fibers to the UV monitor and the UV flow cell.
	UV flow cell is not correctly filled with water.	Make sure the UV flow cell is filled with water and repeat the test.
	Broken Linearity Calibration Unit.	Contact Cytiva Service representative.
High drift	Broken fan.	Restart the system. If problem persists, contact Cytiva Service representative.
Unexpected shifts in the signal.	Loose fibers.	Make sure the fibers are fixed to the frame.

Fault	Possible cause	Recommended action
	Broken fiber.	Contact Cytiva Service representative.
Dips or spikes in the signal	Air in the flow path.	Make sure that air is removed from the flow path.
	Detector issues.	Restart the system. If the problem persists, contact Cytiva Service representative.

Error messages

Note: One hardware fault can result in two or three error messages from different parts of the software.

If the suggested actions do not correct the error, contact your Cytiva Service representative.

Alarm or error message	Possible cause	Recommended action
UV transmitter (AE-131) detected a measuring error.	Problems with light guiding fibers to the UV flow cell.	- Check and clean the UV flow cell. - Check that the UV fibers are connected correctly. - Check that the unused channels are properly plugged. If error persists, note the error message and contact Cytiva Service representative.
	Problems with the UV flow cell.	
The UV transmitter (AE-131) has an absorbance above 2 AU. Auto-zero UV is not possible to perform.	Too high absorbance in the UV flow cell.	- Clean the UV flow cell. - Check that there are no aggregates in the stream. - Check that the liquid in the flow cell is transparent at the selected wavelength.

Alarm or error message	Possible cause	Recommended action
The UV transmitter (AE-131) has too high OD. Auto-zero UV is not possible to perform.	Too high absorbance in the UV flow cell.	• Clean the UV flow cell. • Check that there are no aggregates in the stream. • Check that the liquid in the flow cell is transparent at the selected wavelength.
UV transmitter (AE-131) electronics has too high temperature. Note: <i>The UV monitor continues to measure UV absorbance.</i>	• The temperature in the UV monitor is too high. • The electronics board is overheated.	Check that the cabinet ventilation is not blocked. If problem persists, contact Cytiva Service representative.
UV transmitter (AE-131) processor has too high temperature.	Overheated processor.	• Check that the cabinet ventilation is not blocked. • Stop the use of the UV monitor until it has cooled down. If error persists, note the error message and contact Cytiva Service representative.
UV transmitter (AE-131) cooling fan is not cooling sufficiently.	Problems with the cooling fan.	• Switch off the system and let the UV monitor to cool down. • Restart the system. If error persists, note the error message and contact Cytiva Service representative.

Alarm or error message	Possible cause	Recommended action
UV transmitter (AE-131) has a motor error in the block filter function, in the linear calibration filter function, or the wavelength control.	Internal motor problems.	Switch off the system, wait for a few minutes, then switch on the system. If error persists, note the error message and contact Cytiva Service representative.
UV transmitter (AE-131) has a startup error.	Internal startup problems.	Wait for a few minutes and then restart the system. If error persists, note the error message and contact Cytiva Service representative.
UV transmitter (AE-131) has lost connection.	Connection problems.	Check that the connectors are properly connected, and restart the system. If error persists, note the error message and contact Cytiva Service representative.
UV transmitter (AE-131) Not ready.	Timing problems.	Wait for a few minutes and then restart the system. If error persists, note the error message and contact Cytiva Service representative.
UV transmitter (AE-131) has an internal measuring error.	Internal problems.	Wait for a few minutes and then restart the system. If error persists, note the error message and contact Cytiva Service representative.
UV transmitter (AE-131) has an internal error.	Internal problems.	Wait for a few minutes and then restart the system. If error persists, note the error message and contact Cytiva Service representative.

Alarm or error message	Possible cause	Recommended action
UV transmitter (AE-131) has detected an internal UV command error.	Internal problems.	Wait for a few minutes and then restart the system. If error persists, note the error message and contact Cytiva Service representative.

7 Reference information

About this chapter

This chapter provides technical reference information and a list of spare parts and accessories for UV-90 monitor.

In this chapter

Section		See page
7.1	Technical specifications	36
7.2	Procedures for decommissioning	38
7.3	Health and Safety Declaration Form	39
7.4	Accessories and spare parts	41

7.1 Technical specifications

Operating data

Wavelength range	190 to 700 nm in steps of 1 nm, 3 wavelengths simultaneously
Wavelength accuracy	±2 nm
Wavelength precision	±0.03 nm
Wavelength switch time	< 1 s (one full cycle of three arbitrary wavelengths from 280 nm to 490 nm and back to 280 nm)
Filter bandwidth	< 4 nm
Linearity	< 2% deviation up to 2 AU at 280 nm determined with neutral density filter kit.
Dynamic noise (specified for 5 mm flow cell), single wavelength, short term (0.5 min to 1 min) ^{1 2}	< 8×10^{-5} AU at 280 nm
Dynamic noise (specified for 5 mm flow cell), single wavelength, long term (1 min to 10 min) ^{1 2}	< 8×10^{-5} AU at 280 nm
Dynamic noise (specified for 5 mm flow cell), triple wavelengths, short term (0.5 min to 1 min) ^{1 2}	< 2×10^{-4} AU at 215, 254 and 280 nm (215 nm 500/700 mm fiber length)
Dynamic noise (specified for 5 mm flow cell), triple wavelengths, long term (1 min to 10 min) ^{1 2}	< 2×10^{-4} AU at 215, 254 and 280 nm (215 nm 500/700 mm fiber length)
Drift ²	< 2×10^{-4} AU/h at 280 nm
Temperature drift	1 mAU/°C
Absorbance range	-6 to 6 AU
Environment	4°C to 40°C 20% to 95% relative humidity (non condensing)

¹ Measured with water at 100 mL/min, time constant 2.5 seconds, 5 mm flow cell.

² Typical values at room temperature after 1 hour with lamp on.

Physical data

Light source	Xenon flash lamp
Lamp lifetime	> 10000 hours
Control	From the system the UV monitor is installed in. The connection between the system and the monitor is through EtherNet/IP connection.
Power supply	24 V DC
Maximum current	3 A
Analog output	Depends on the system where the monitor is integrated.
Enclosure protective class	IP20
Digital inputs	Depends on the system where the monitor is integrated.
Dimensions (W × D × H)	294 × 168 × 198 mm
Weight	8.5 kg
Acoustic noise	< 80 dB A
Allowed location	Indoor use only.

7.2 Procedures for decommissioning

Introduction

This section contains information about the decommissioning of UV-90 monitor.

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

UV-90 monitor contains hazardous substances. Detailed information is available from your Cytiva representative.

Disposal of electrical components

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



7.3 Health and Safety Declaration Form

On site service



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:		

Cytiva and the Drop logo are trademarks of Global Life Sciences IP Holdco LLC or an affiliate.

© 2020 Cytiva.
All goods and services are sold subject to the terms and conditions of sale of the supplying company operating within the Cytiva business. A copy of those terms and conditions is available on request. Contact your local Cytiva representative for the most current information.

For local office contact information, visit cytiva.com/contact.
28980026 AD 04/2020

Product return or servicing



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:			

Cytiva and the Drop logo are trademarks of Global Life Sciences IP Holdco LLC or an affiliate.

© 2020 Cytiva.

All goods and services are sold subject to the terms and conditions of sale of the supplying company operating within the Cytiva business. A copy of those terms and conditions is available on request. Contact your local Cytiva representative for the most current information.

For local office contact information, visit [cytiva.com/contact](https://www.cytiva.com/contact).
29590027 AD 04/2020

To receive a return authorization number or service number, call local technical support or customer service.

7.4 Accessories and spare parts

List of accessories and spare parts

Item	Product code no.
UV Flow cell PEEK ID8mm TC25 PL1mm	29659503
UV Flow cell PEEK ID8mm TC25 PL2mm	29659504
UV Flow cell PEEK ID8mm TC25 PL5mm	29659505
UV Flow cell PEEK ID22mm TC50 PL1mm	29659506
UV Flow cell PEEK ID22mm TC50 PL2mm	29659821
UV Flow cell PEEK ID22mm TC50 PL5mm	29659822
UV fiber tapered 600 µm L: 500 mm	29659824
UV fiber straight 1000 µm L: 700 mm	29659825
UV fiber tapered 600 µm L: 1000 mm	29659826
UV fiber straight 1000 µm L: 1000 mm	29659827
UV fiber seal kit	29659828
Flow cell bypass tool	29659829
Lens	29171938
O-ring kit UV Flow cell FPM/FKM	29107994
Fiber detachment tool	18111116

For up to date information on spare parts and accessories, visit [cytiva.com](https://www.cytiva.com).

Ordering information

For ordering information, visit [cytiva.com](https://www.cytiva.com).



cytiva.com

Cytiva and the Drop logo are trademarks of Life Sciences IP Holdings Corp. or an affiliate doing business as Cytiva.

ÄKTA process is a trademark of Global Life Sciences Solutions USA LLC or an affiliate doing business as Cytiva.

EtherNet/IP is a trademark of ODVA Inc. Microsoft and Windows are trademarks of Microsoft group of companies.

Decon is a trademark of Decon Laboratories Inc. Deconex is a trademark of Borer Chemie AG. RBS is a trademark of Chemical Products R. Borghgraef S.A.

Any other third-party trademarks are the property of their respective owners.

© 2021–2023 Cytiva

For local office contact information, visit cytiva.com/contact

29595773 AB V:2 03/2023