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Operating Manual

UVP GelSolo

Imaging System

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General information

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Documentation number 81-1277-01

Edition Rev. C (April 2019)

Implementation of the Technical Documentation Analytik Jena US

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1 Basic Information

1.1 User manual notes

The UVP GelSolo is intended for operation by qualified specialist personnel observing this user manual.

The user manual informs about the design and function of the UVP GelSolo and provides the necessary know-how for the safe handling of the device and its components to personnel familiar with analysis. The user manual further includes notes on the maintenance and service of the equipment.

Conventions

Instructions for actions which occur in chronological order are numbered and combined in action units.

Warnings are marked by a warning triangle and a signal word. The type, source and consequences of the danger are stated together with notes on preventing the danger.

The elements of the **control and analysis program** are indicated as follows:

- Terms used in the program are identified with **bold letters** (e.g., Menu **File**).
- Buttons are set in quotes (e.g., "**OK**" button)

Symbols and signal words

The user manual uses the following symbols and signal words to indicate hazards or instructions. The safety instructions are always placed before an action.

WARNING

Indicates a potentially hazardous situation which might cause fatal or very serious injuries (deformations).

CAUTION

Indicates a potentially hazardous situation which might cause minor or moderate injuries.

NOTICE

Indicates potential damage to equipment or the environment.

1.2 Intended Use

The UVP GelSolo Imaging System enables simple documentation of fluorescent and non-fluorescent gels with the ability to save images to a USB flash drive or network location for later quantitative analysis or enhancement for publication.

Images are saved in a variety of selectable formats, allowing saved images to be read by most PC or Mac programs. The UVP GelSolo Imaging System is a cost effective solution for capturing quality images in a compact standalone package. No external computer is required.

The UVP GelSolo comes standard with the GelCam 315 camera, which offers 5 MP (2592 x 1944) resolution, an 8 - 48 mm f/1.2 zoom lens, and 16-bit file bit depth. Seven UV transillumination options are available: single UV (302 nm) with illumination areas of 20 cm x 20 cm, 21 cm x 26 cm, or 25 cm x 26 cm; 2UV (302 nm/365 nm) with illumination areas of 20 cm x 20 cm, or 21 cm x 26 cm; and 3UV (254 nm/ 302 nm/365 nm) with illumination areas of 20 cm x 20 cm, or 21 cm x 26 cm. A blue light transilluminator is also available.

1.3 Warranty and liability

The warranty duration and liability comply with the legal requirements and the provisions in the general terms and conditions of Analytik Jena AG. Tubes and filters are warranted for 90 days.

Deviations from the intended use described in this user manual result in limitations of warranty and liability during a damage event. Damage to wearing parts is not included in the warranty.

Warranty and liability claims are excluded for personal injury and property damage due to one or several of the following causes:

- use of the system other than intended
- improper commissioning, operation and service of the device
- modifications of the equipment without prior consultation with Analytik Jena US
- unauthorized intervention in the equipment
- operation of the device with faulty safety equipment or improperly fitted safety and protection equipment
- inadequate monitoring of the equipment components subject to wear
- use of other than original spare parts, wearing parts or consumables
- improper repairs
- faults due to the non-observance of this user manual

2 Safety instructions

2.1 General notes

For your own safety and to ensure error-free and safe operation of the Imaging System, please read this chapter carefully before commissioning.

Observe all safety notes listed in this user manual.

Besides the safety instructions in this user manual and the local safety regulations that apply to the operation of the device the general applicable regulations regarding accident prevention, occupational health and safety and environmental protection have to be observed and complied with.

References to potential dangers do not replace the work protection regulations which must be observed.

2.2 Safety markings at the Imaging System

Safety symbols have been attached to the Ultraviolet Transilluminator whose content must always be observed. Damaged or missing safety symbols can cause incorrect actions leading to personal injury or material damage! The safety symbols must not be removed! Damaged safety symbols must be replaced without delay!

The following safety symbols have been attached to the Ultraviolet Transilluminators:

Warning symbol	Meaning
	General Warning
	Caution: Ultraviolet radiation

2.3 Technical condition

The Imaging System corresponds in its design and construction to the current state of the art technology. Unauthorized modifications or changes, especially such that affect the safety of the staff and the environment, are generally not allowed.

Observe the following notes:

- The operator must only operate the device in a sound and operationally safe condition. The technical condition must always comply with the legal requirements and regulations.
- Prior to every use the device must be checked for damage and sound condition.
- Any changes in the device affecting its safety must be reported by the operating personnel to the operator without delay.

2.4 Requirements for the operating personnel

Observe the following notes:

- The Imaging System weighs over 48 lbs. It is recommended two or more people lift, move and/or handle the system to prevent injury and/or damage to the unit.
- The device must only be commissioned, operated and serviced by trained personnel instructed in technical safety.
- The operation or servicing of the device by minors or individuals under the influence of alcohol, drugs or medication is not permitted.
- It must be ensured that only authorized personnel work at the device.
- The operating personnel must be familiar with the dangers arising from samples to be used. The appropriate protective equipment must be used.
- The unit may include shortwave UV, which is a powerful source of UV radiation that will cause damage to unprotected eyes and skin. Before operating any unit, ensure all personnel in the area are properly protected and that instructions for use of this equipment are followed.

2.5 Safety instructions – transport and assembly

Observe the following notes:

- Clean the Imaging System.
- Allow for a sufficient cool-down of the light tubes of the transilluminator before transport.
- Protect the filter glass of the transilluminator against scratches and breakage by a suitable padding.

2.6 Handling of auxiliary and operating materials

The operator is responsible for the selection of substances used in the process as well as for their safe handling. This is particularly important for radioactive, infectious, poisonous, corrosive, combustible, explosive and otherwise dangerous substances.

Observe the following notes:

- Hazardous substances have to be handled according to the biosafety level of the laboratory. The relevant regulations and the notes in the EC safety data sheets of the manufacturers have to be observed as well as the national and international guidelines (WHO, "Laboratory Biosafety Manual").
- Wear protective equipment when operating the UV light.
- Obey all security instructions for decontaminating the Imaging System.

2.7 Safety instructions – maintenance

Observe the following notes:

- Disconnect the power supply before servicing the Imaging System.
- Allow for a sufficient cool-down of the light tubes of the transilluminator before maintaining them.

To clean the unit:

- Use only mild soap and a damp soft cloth or damp sponge to clean the unit surface.
- Never use organic based compounds, Alcohol, or Ammonia containing cleaners.
- Do not use abrasive pads or cleaners, they could damage the UV filter surface of the transilluminator.

2.8 Behavior during emergencies

In case of emergency disconnect immediately the plug of the Imaging System from the outlet!

Because a rapid response can save lives during an emergency, the following has to be ensured:

- The operating staff must be familiar with the location of safety equipment, accident and danger alarms, first aid and rescue equipment as well as their handling.
- The operator is responsible for the respective training of the operating staff.
- All equipment for first aid (first-aid kit, eyewash bottles, stretcher, etc.) as well as equipment for firefighting (fire extinguishers) must be within reach and easy to access. All equipment has to be in a sound condition and should be checked at regular intervals.

3 Function and setup

3.1 Components

Refer to the packing slip and pictured components for specific parts and components included with the system.

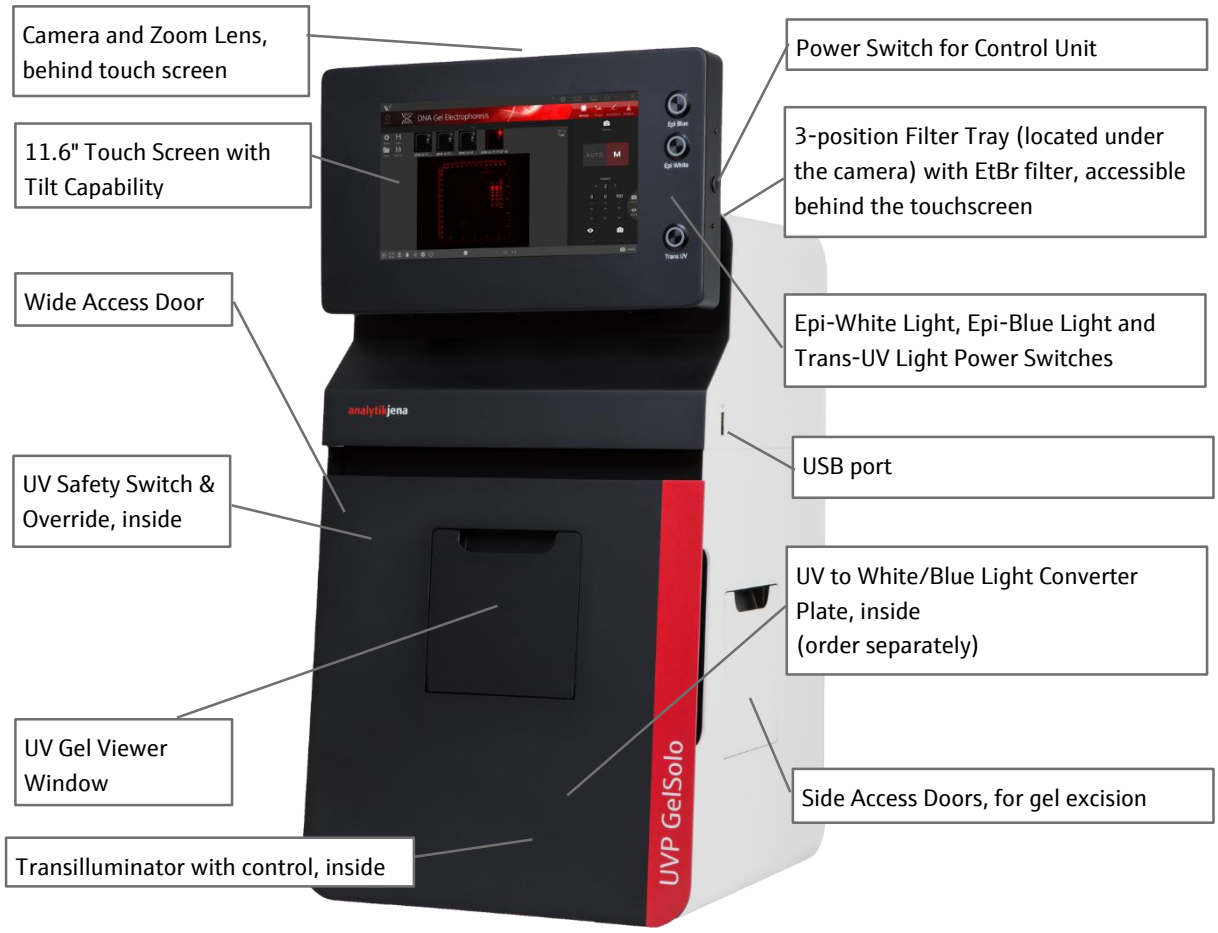


Fig. 1 Components of UVP GelSolo

3.2 Camera

The monochrome camera (5.0 MP resolution) uses a USB 2.0 interface. All camera settings are factory pre-set for optimum performance when viewing gels, films, or membranes under low light level conditions. Analytik Jena Technical Support should be contacted before making adjustments to the camera settings.

3.3 Lens

The 8 - 48 mm f/1.2 zoom lens is fitted with a close-up diopter and step-up ring. The diopter is for focusing on objects at the focus length of the UVP GelSolo system.

3.4 Ethidium Bromide (EtBr) emission filter

The Ethidium Bromide UV blocking bandpass interference filter (50 mm sq.) blocks UV and IR radiation emitted from the transilluminator.

The filter is placed in one of the three positions on the filter tray.

The filter allows visualization of fluorophores from 580 – 630 nm, targeting the EtBr emission which peaks at 605 nm. The EtBr filter can be substituted for other specific fluorophore filters or removed when imaging non-fluorescent media (protein gels, colony plates, etc.) in order to produce brighter images.

3.5 Darkroom

The darkroom is light tight to provide optimal imaging conditions. Darkroom features include:

- UV-safe gel viewer window built into the darkroom door
- Overhead LED white and LED blue lights
- Wide access door with UV safety switch
- Side doors for easy access to the interior of the darkroom (for placement or excision of samples)
- UV safety interlock switch to disable UV transillumination when the main darkroom door is opened.
- 3-position Filter tray
- Removable transilluminator

3.6 Transilluminator

Seven different UV Transilluminator options are available based on filter size and UV wavelength (Filter sizes: 20 x 20cm, 21 x 26cm or 25 x 26cm; Wavelength: 1UV 302nm, 2UV 302/365nm or 3UV 254/302/365nm).

A blue LED transilluminator is also available as an accessory.

3.7 Touch Screen

The display is an 11.6-inch color touch screen connected to the darkroom cabinet with tilt adjustment. The touch screen allows the user to perform a variety of tasks, including previewing, capturing, saving and printing images, as well as selecting preference options, without the use of an external mouse or keyboard.

For users who prefer not to use the touch screen interface, an external keyboard and mouse can be used via any available system USB ports. Users can also use their own PC by connecting it to the darkroom and installing the VisionWorks software on the PC.

3.8 Removable USB Stick

The removable USB stick has 8 GB memory (minimum) included with the system which connects to the system allowing for saving and transferring of images.

3.9 Fluorescent Focus Target

The Analytik Jena Fluorescent Focus Target fluoresces when placed on a UV transilluminator or when exposed to overhead UV. The Target provides sharp fluorescent images to aid in adjusting the lens and camera settings for ideal imaging results.

Remove the blue protection film from the Target before use.

Fig. 2 Fluorescent Focus Target

3.10 Optional equipment

Analytik Jena offers a variety of optional equipment to support the needs of varying laboratory environments. Refer to "Replacement parts and accessories" on page26 for optional equipment part numbers.

3.10.1 Converter Plates

The **Visi-White Converter Plate** allows imaging of non-fluorescent stained media with an ultraviolet transilluminator. The converter plate is specially coated to convert 302 nm UV to white light.

The **Visi-Blue Converter Plate** (not shown) converts UV to a safe 460 – 470 nm wavelength designed for use with blue excitation samples and SYBR Green, SYPRO Orange and GFP stains.

Fig. 3 Visi-White Converter Plate

4 Set-Up

4.1 Scope of supply

When unpacking the UVP GelSolo Imaging System, the following items will be included:

- UVP GelSolo darkroom
- Camera with zoom lens
- Ethidium bromide (EtBr) emission filter
- Transilluminator
- Main power cord, USB camera cable
- USB flash drive with VisionWorks Software
- Blank USB flash drive
- Supporting documentation
- Gel tray, Gel ruler, Gel cutter, Chemi tray

Unpack and carefully examine the instrument. Report any damage to Analytik Jena. Do not attempt to operate this device if physical damage is present.

Please keep the original packing material for return shipment in case of service issues. Place the UVP GelSolo on a stable, flat surface in a dry, safe environment.

WARNING

Risk of short circuits!

Do not attempt to perform any setup procedures while the system is plugged in or powered on unless otherwise instructed.

Notice

Do not install the system in areas with high moisture, dust or high temperatures. Keep the equipment away from motors or any other large magnetic equipment apparatus. This system is designed for indoor use only.

4.2 Connecting the power cables

1. Plug the main power cable into the back of the darkroom and the other end into a surge- protected power outlet.

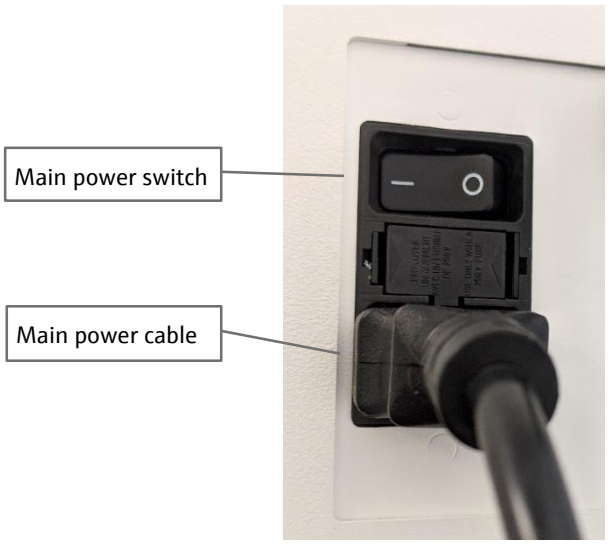


Fig. 4 Connecting the power cable

2. Connect the UV transilluminator to the darkroom by plugging the two attached cables into the outlets inside the darkroom as shown in the figure below.

   If you have a blue LED transilluminator, connect it to the darkroom by plugging the cable into the designated outlet inside the darkroom as shown in the figure below.

   Note: to place the blue LED transilluminator inside the darkroom, insert it at an angle and then place it flat on the floor of the darkroom.

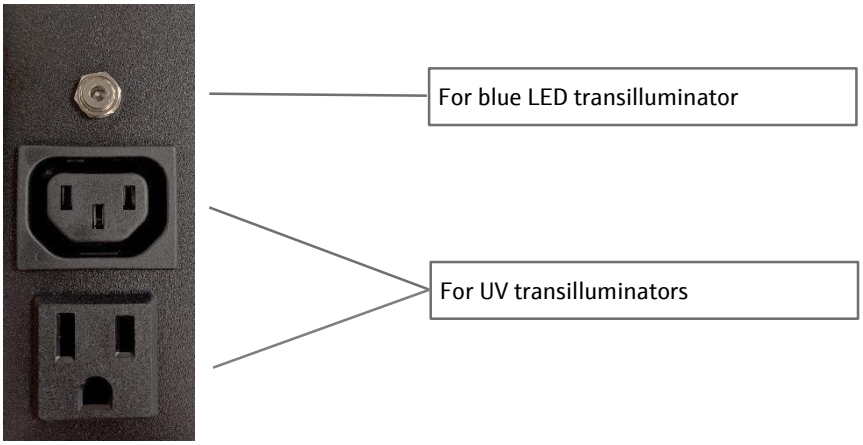


Fig. 5 Connecting the transilluminator cables

4.3 Installing emission filters

The UVP GelSolo Imaging Systems include a 50 mm sq. Ethidium Bromide (EtBr) filter. To install the 50 mm sq. EtBr filter:

3. Carefully remove the filter from the protective plastic case, holding the filter at the edges to prevent fingerprints.
4. The 3-position filter tray is located at the top of the system and can be accessed through either of the two access doors. Place the emission filter in the desired position by inserting the filter into the desired filter tray slot. Use lever to access the middle slot or to switch between the three filter positions during use.

4.4 Camera setup

The camera and zoom lens are pre-assembled to the mounting bracket.

1. To connect the bracket/camera/lens assembly to the unit, attach the three black screws provided, with a Philips screwdriver. Gently insert the lens into the orifice on the top of the darkroom — it will fit snugly.
2. To connect the camera/lens assembly, plug the camera cable into the camera and tighten the thumb screws. Plug the other end into one of the USB ports on the back of the darkroom.

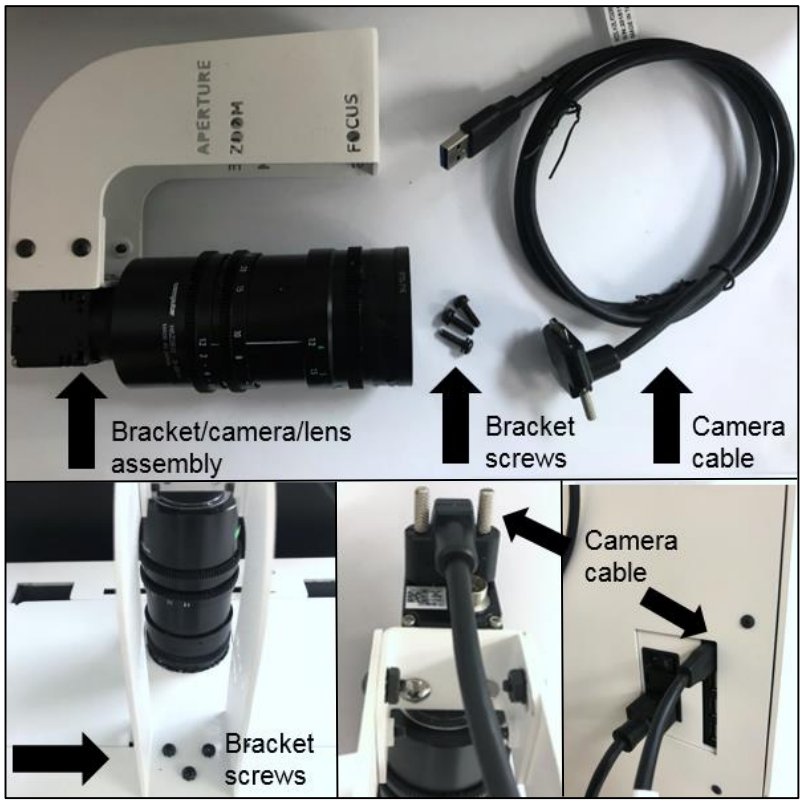


Fig. 6 Connecting the camera bracket/camera/lens assembly

4.5 Optional components

4.5.1 Connecting a printer

It is possible to connect a printer with USB 2.0 interface directly to one of the USB 2.0 ports on the back of the UVP GelSolo.

We recommend to use a thermal printer as e.g. Mitsubishi P95DE. This printer provides high resolution prints very similar to the TFT screen display. For installation please transfer the required drivers to a USB stick.

4.5.2 Install drivers or additional software, e.g. drivers for a printer

In the event that additional drivers need to be installed in the system, exit the software interface and go to Microsoft Windows by pressing the **Close ("X")** button located in the upper-right corner of the main screen.

To install drivers or additional software, copy them to a USB storage device, open Windows Explorer, navigate to the appropriate folder and run the desired program.

4.5.3 Connecting an external keyboard and mouse

It is possible to connect an external computer keyboard and mouse by USB cable to the USB 2.0 ports in the back of the UVP GelSolo. But for typical image acquisition purposes it is not necessary.

4.5.4 Connecting to a network

The UVP GelSolo Imaging Systems have built-in wireless networking capability. While it is fairly simple to connect the system to a network, it is highly recommended to obtain assistance from a network administrator to ensure that the process is completed properly.

Follow Microsoft or local standard network protocols for network configuration. To minimize the software interface and access Microsoft Windows for network configuration, press the **Minimize ("_")** button in the upper-right corner of the software.

4.5.5 General computer settings

For correct display and storing of date and time with the gel images it is necessary to set first the current date and time in the computer settings.

Please switch to the Windows desktop, choose "Start", "Control Panel", "Date and Time" and set the correct data.

5 Using the Imaging System

5.1 Powering up the tablet computer

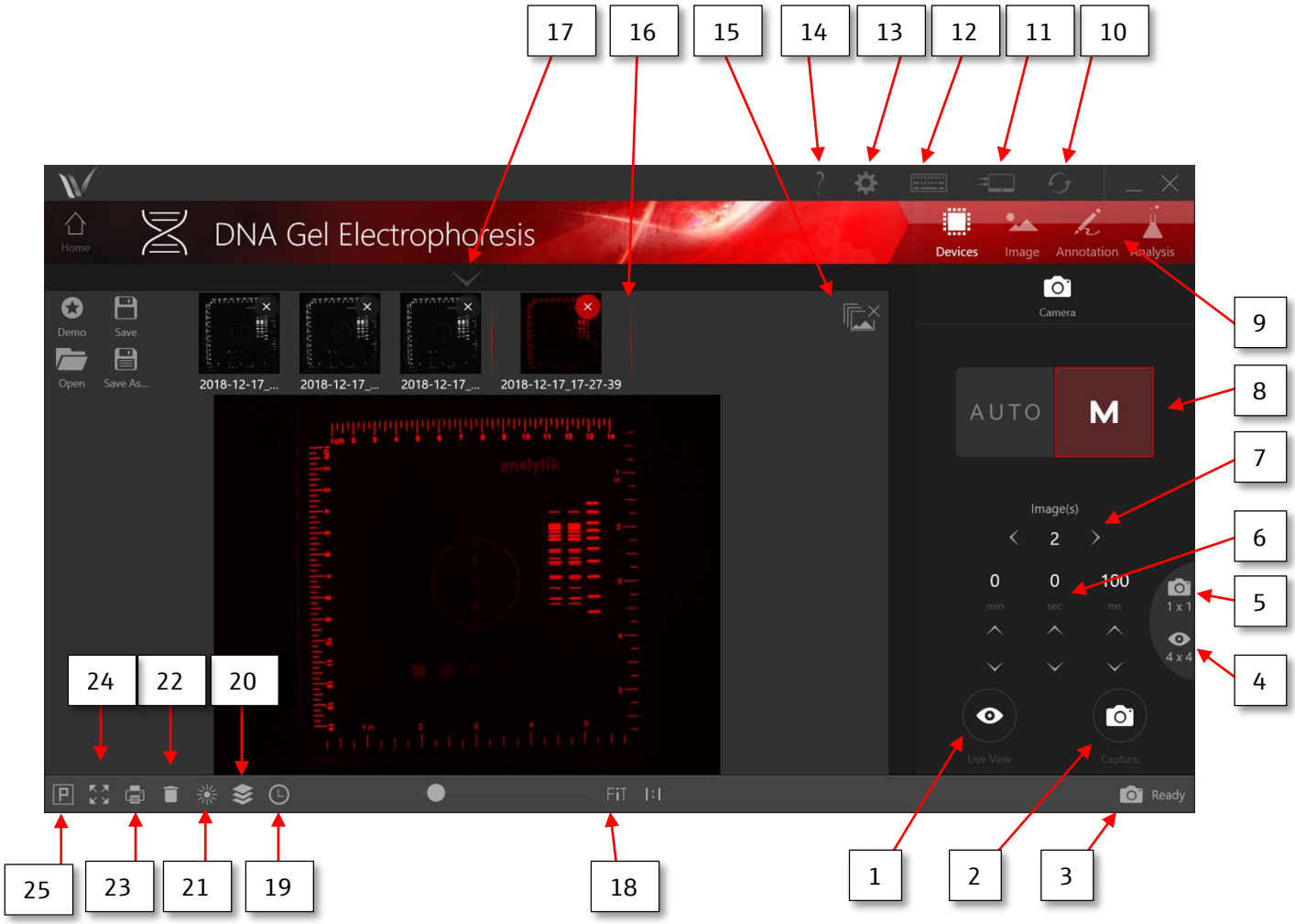
1. Turn on the power to the system by turning on the **MAIN POWER** switch at the back of the darkroom.
2. Once the darkroom is powered up, firmly press the **POWER** button on the right side of the touch screen housing to power up the internal computer. Wait for the Windows startup screen. This may take a few moments. Once the computer completely boots, the software will load automatically. If it does not, double click on the desktop software icon. (To SHUT DOWN the computer, briefly press the POWER button.)

Note: The computer will remain on battery power if the main power to the whole system is switched off or the main power cable is unplugged. If the battery runs out, the computer will turn off, unless the main power is turned on again.

3. Turn on epi-illumination (White LED or Blue LED) or transillumination using the respective buttons on the front of the touchscreen housing.

5.2 VisionWorks® Interface

Upon startup, the internal computer will proceed through the boot-up process. When complete, the Windows desktop will appear. Click the VisionWorks® icon, to open the

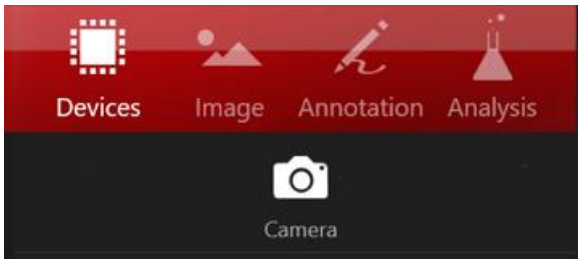


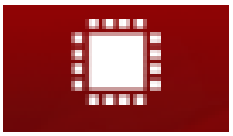
VisionWorks® Interface Legend

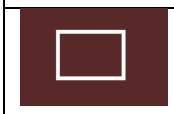
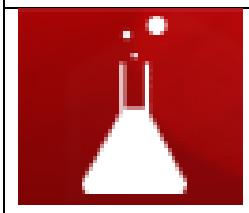
1	**Live View** – Shows a preview of the image before image is captured.
2	**Capture** – Captures an image at the defined exposure time.
3	**Camera Ready** – Indicates camera is connected and ready for captures.
4	**Live view binning** – Adjusts the binning level for live view images only. Used for more sensitive imaging.
5	**Capture binning** – Adjusts the binning level for image captures. Used for more sensitive imaging.
6	**Exposure Time** – Manually enter exposure time.
7	**Image(s)** – Select how many images to take during a capture. The number 2 indicated shows it will take two successive images when a capture is initiated. This would be used for when successive imaging is needed for a sample.

8	**Exposure setting** – Toggle between manual and auto exposure. Manual exposure allows manual entering of exposure time. Auto exposure allows for VisionWorks® to determine the exposure time.
9	**Navigation Bar** – Provides access to image editing tools, annotation tools and analysis tools within VisionWorks®.
10	**Check for updates** – This icon checks for VisionWorks® software updates. This feature will only work on systems connected to the internet.
11	**Scan for devices** – VisionWorks® will look for other compatible devices when tapped. This would only be used if the camera controls are not displayed.
12	**On-screen keyboard** – Brings up Windows 10 onscreen keyboard.
13	**Settings** – Stores the various settings that are able to change within VisionWorks. This should not be tapped unless a specific setting needs to be changed.
14	**Help** – The VisionWorks® software manual will appear in PDF format and may be referenced as needed.
15	**Close all** – Closes all images open within the image gallery.
16	**Image gallery** – All images that are open within VisionWorks® are viewed here.
17	**Pre-capture settings** – Image settings that are configurable prior to capturing an image is stored under this drop-down menu. This dropdown would be used to preview how a specific pseudocolor will look prior to capturing an image.
18	**Fit** – The slider next to the fit icon allow for the image in the image viewer to be zoomed in on. The “Fit” icon will restore the original size of the image in the viewer.
19	**Timestamp** – This will add a timestamp to the image so that it is viewed on the image.
20	**Flatten image** – This is VisionWorks® export feature. Any analysis, annotations, pseudocolors and image edits done by VisionWorks® will be exported to a jpg format. This will allow the features mentioned above to appear correctly in standard image viewing applications, such as, windows photo viewer.
21	**Saturation warning** – This will highlight areas with maximum pixel intensity in red. Pixels that are “saturated” have reached the maximum number of photons that pixel can handle. This feature is only relevant when analysis of an image is needed. Saturation warning helps maintain accurate pixel intensity counts for analysis applications.
22	**Delete** – Deletes any analysis and annotation layers currently on the image. This is best used when you want to clear/restore your image to the original captured image.
23	**Print** – Prints the image.
24	**Full screen** – Makes the image currently in the image viewer into fullscreen.
25	**Pixel intensity** – This feature allows for individual pixels to be selected on the image. This will give an intensity value out of how many pixels are possible. This feature is best used when quantitating an image and looking for differences between relevant image landmarks.

VisionWorks® Navigation Bar



	**"Devices"** gives access to the follow menu options:	
		**Camera** – This tab contains all camera modes, settings and parameters for image capture.
	**"Image"** gives access to the following menu options:	
		**Histogram** – Provides access to auto and manual histogram adjustment.
		**Pseudocolor** – Provides access to post capture coloring options.
		**Image Editing** – Provides access to image editing tools.
		**Image Corrections** – Provides access to image correction options.
		**Image Information** – Displays image metadata for reference.
	**"Annotations"** provides access to the following menu options:	
		**Drawing Tools –** 12 drawing tools are included as part of the annotations package, these include the following:
		 **Draw Line** – Draws a line from points A and B
		 **Draw Highlight** – Draws a highlight box
		 **Standard Bar** – Creates a standard calibration bar between points

			**Add Text** – Adds a text box
			**Line Measure** – Measures a distance between two points
			**Heat Map** – Creates a heat map from pixel intensities
			**Draw Rectangle** – Draws rectangle around areas of interest
			**Area Measure** – Measures the area within a box
			**Select and Edit Annotation** – Allows for the selection and editing of added annotation
			**Draw Ellipse** – Draws an ellipse around an area of interest
			**Angle Measure** – Measures an angle on interest
			**Drag and move image** – Moves the image around the screen with annotations
			**Settings** – Sync with zoom and import/export are available
	**"Image Analysis"** provides access to the following menu options:		
			**1D Analysis** – Provides access to 1D lanes and bands tools.
			**Colony Counting** – Provides access to colony counting algorithms and colony count calculations.
			**Area Density** – Provides access to area density calculations and reports.

To exit the software interface, press either the close (**X**) or minimize (_) buttons at the top right corner of the software (see red circle above). To power down the system, briefly press the **POWER** button located on the top right of the UVP GelSolo screen.

5.3 Adjusting the screen angle

1. Tilt the screen up or down until the desired angle is reached. The friction hinge will hold the screen in-place.

5.4 Using the transilluminator

CAUTION: Risk of UV exposure!

UV Transilluminators are powerful sources of UV radiation that will cause damage to unprotected eyes and skin.

- Before operating any unit, be sure all personnel in the area are properly protected.
- Protect your arms and hands by long-sleeved, tightly woven clothes and suitable gloves when working above UV radiation.
- Protect your eyes by wearing UV protective glasses or UV protective face shield.

To use the transilluminator, turn the transilluminator power on.

Use the switch on the front of the transilluminator to select from the available lighting wavelengths or intensities (transilluminator settings vary by model).

Intensity settings for single UV transilluminators

- **High**: allows for UV excitation of fluorophores on gels for routine photography and for excitation of gels with low sample concentration
- **Medium**: Excellent for viewing and quick single-band excision
- **Low**: Allows for positioning and preparation of gels, excising multiple bands and focusing for photography

Wavelength settings for 2UV/3UV transilluminators

- **Red LED:** indicates transilluminator wavelength set at 254nm
- **Blue LED:** indicates transilluminator wavelength set at 302nm
- **Green LED:** indicates transilluminator wavelength set at 365nm

After viewing/photographing the sample, turn the transilluminator off.

Note: The UVP GelSolo integrates a UV interlock switch which will inactivate the UV transilluminator when the main darkroom door is open. This switch is located on the upper right corner of the darkroom door opening and is only accessible when the main door is open.

5.5 Using the Epi (Overhead) Light

To use the epi-white LED light or the epi-blue LED light, turn on the respective switch on the front of the touchscreen housing.

5.6 Using the UV Gel Viewer Window

The **UV Gel Viewer Window**, built into the main darkroom door, allows users to view the interior of the darkroom without opening the main door. The window glass is UV blocking while providing a clear view to the transilluminator surface for sample viewing.

To open the window, pull down the door. To close, pivot it up until it reengages with the two small magnets.

When working directly with the UV light for a longer time, be sure to additionally use UV protection spectacles.

Note: Close the UV Gel Viewer Window prior to capturing light-sensitive images.

5.7 Image focusing

Prior to capturing any images, prepare the image focus capabilities of the system:

- Turn on the transilluminator and place the gel on the transilluminator surface.

  Note:
  The UVP GelSolo darkroom has a UV safety switch that turns the transilluminator off when the door is open. After closing the door, be sure the overhead white light switch is turned off.

- Using the software press **Preview** to begin viewing the sample within the system.
- While watching the screen, rotate the lens **Aperture** adjustment so that the image is bright enough to see on the screen.
- Rotate the **Focus** adjustment on the lens. Adjust this so that the image appears in clear focus on the monitor.

Note: Once the proper zoom range is set, the lens will have to be refocused when zoomed in completely.

5.8 Image Zooming

The UVP GelSolo is equipped with an optical zoom lens, meaning that the system uses the lens optics to make the sample appear closer/larger on the screen. Optical zoom is adjusted using the **Zoom** ring on the camera lens.

However, it may be desirable to use digital zooming to move in closer on the image. Digital zoom enlarges a portion of the image, simulating optical zoom. Thus, the camera crops a portion of the image and enlarges the cropped portion to fill the imaging area on the screen.

To use digital zoom functionality:

1. With a preview or captured image on the screen, use the **"+"** and **"–"** buttons located on the right side of the image.
2. Tap and drag to move around on the zoomed-inimage.

Notes regarding digital zoom operation:

- The software's digital zoom feature utilizes WYSIWYG, or "what you see is what you get," meaning that a zoomed preview image will result in a zoomed capture image.
- A zoomed capture image will save and print as shown on the screen (WYSIWYG).

Using maximum optical zoom and at the same time the largest lens aperture (small number) may lead to an image that is not properly focused. In that case please reduce the lens aperture (larger number) to achieve a larger depth of focus. Now it is possible to get a properly focused image.

Rotate the zoom lens adjustment on the lens, so that the image is as big as possible. Readjust the focus ring on the lens, making the image clear. Adjust the zoom so that the object of interest is within the picture on the monitor.

5.9 Cutting out of gels

CAUTION: Risk of UV exposure!

UV Transilluminators are powerful sources of UV radiation that will cause damage to unprotected eyes and skin.

- Before operating any unit, be sure all personnel in the area are properly protected.
- Protect your arms and hands by long-sleeved, tightly woven clothes and suitable gloves when working above UV radiation.
- Protect your eyes by wearing UV protective glasses or UV protective face shield.

Place the gel on top of the UV transilluminator. Close the door of the darkroom. Open the **gel viewing window** and both **side access doors** of the darkroom.

Switch the UV light on, recommended is reduced UV intensity of "Medium" or "Low".

Now you can take your arms through the side access doors for cutting the gel. The gel viewing window allows a safe view to the gel.

5.10 System shutdown

To shut down the software, firmly press the power button located on the right side of the touch screen housing

To turn the whole system off, press the power switch button, located on the back of the darkroom.

6 Maintenance, replacement parts/accessories

6.1 Care and cleaning

WARNING

Risk of electrical shock!

- Ensure that the system is turned OFF and unplugged during cleaning.

- Clean unit surface with a damp soft cloth or sponge. Use mild soap or detergent solution.

  Never use abrasive cleaners (can damage the UV filter surface of the transilluminator). Do NOT use oil- or petroleum-based cleaners for the cabinet.

- Clean the instrument only from outside.

  The imaging system or the transilluminator must not be dipped into water or other liquids!

6.1.1 Transilluminator

- To protect the filter glass and minimize moisture and liquids on the glass, it is recommended that you use a UV transmitting Gel-Tray. Refer to the Replacement Parts for ordering information.
- When the transilluminator features a UV Blocking Cover only cleaning with a damp cloth is allowed.

  Alcohol and glass cleaner detergents attack the plastic and damage the UV protection shield.

- Pay attention to wearing appropriate gloves when cleaning areas (as UV filter plate of the transilluminator, switches of the darkroom, darkroom door) which may have been in contact with carcinogens or toxic reagents (e.g. dye ethidium bromide)!

6.2 Replacement parts and accessories

Replacement parts and accessories are listed below. Only authorized Analytik Jena service personnel should perform repairs or replacements other than specified in these procedures.

For replacement parts of the transilluminator please refer the manual of the transilluminator.

For replacement parts or components not shown here, please call Analytik Jena Customer Service or place of purchase. Please have the transilluminator model number available when you call.

PART NUMBER	DESCRIPTION
89-0594-01	KIT, CAMERA, 315, 8-48 f/1.2 MANUAL, GelSolo
..89-0534-01	CAMERA, 315, 5MP CMOS, MONOCHROME, CASED, RoHS
..89-0081-03	LENS, MANUAL ZOOM, 1/2", 8-48mm,RoHS COMPUTAR "CC"
..60-0330-01	SCREW, M4 x 0.7mm, TRUSS HD, PHILLIPS RoHS
..60-0046-03	SCREW, M, 6-32 X 5/16 PH, PHS RoHS
..58-0243-01	USB 3.0 A MALE TO MICRO B MALE, 3', BD2, RoHS3
..38-0405-01	DIOPTER, 49mm CLOSE-UP,+2, LENS,"RoHS"
..20-2033-01	BRACKET, CAMERA, GelSolo
..20-1528-01	MOUNTING RING-C,CAMERA,SENTECH,#90272090, RoHS3
56-0022-04	FUSE, 3.15AMP/250V, 5 x 20mm, SLO-BLO, RoHS
38-0436-01	FILTER FRAME, EXCITATION, BLUE, GELSOLO
38-0220-01	FILTER 50MM SQ,580-630,Eth Brom,RFP,RoHS DEEP #9002100
95-0604-01	TRANSILLUMINATOR, M-20V, 110-230V, GelSolo
95-0605-01	TRANSILLUMINATOR, M-26V, 110-230V, GelSolo
95-0606-01	TRANSILLUMINATOR, M-26XV, 110-230V, GelSolo
95-0607-01	TRANSILLUMINATOR, LM-20, 110-230V, GelSolo
95-0608-01	TRANSILLUMINATOR, LM-26, 110-230V, GelSolo
95-0609-01	TRANSILLUMINATOR, LMS-20, 110-230V, GelSolo
95-0610-01	TRANSILLUMINATOR, LMS-26, 110-230V, GelSolo
95-0611-01	TRANSILLUMINATOR, BLUE LED, 12VDC, GelSolo
34-0006-01	LAMP, 8W, LW,365nm F8T5/BL H/C#8539.90.0000 JAPAN "CC" RoHS
34-0007-01	LAMP 8W GERMICIDAL 254nm,G8T5/SW 8539900000 JAPAN "CC" RoHS
34-0042-01	LAMP, 8W MIDRANGE 302nm G8T5E# 8539.90.0000 JAPAN "CC" RoHS
18-0121-01	CHEMI TRAY, GelSolo
85-0007-05	UVP Gel-Tray,BIODOC-IT,RoHS3 10.63"x9.06",#39069020 "D"
85-0003-02	UVP Gel-Ruler
98-0064-06	FOCUSING TARGET, IMAGING, UVITEC

6.3 Replacing tubes in the transilluminator

WARNING

Risk of electrical shock!

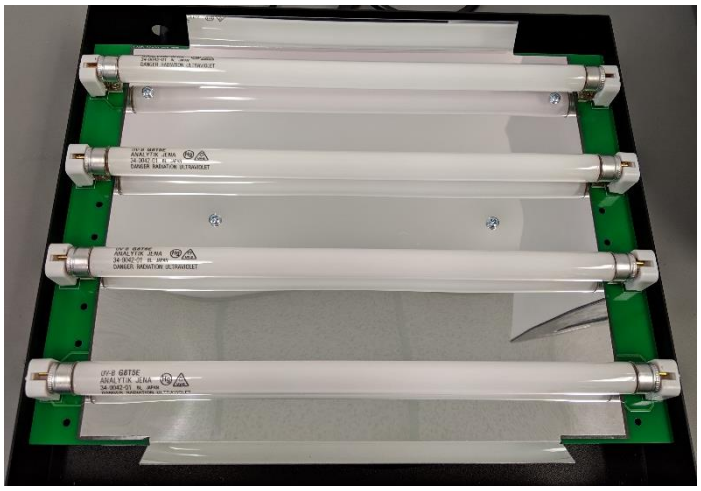
- Ensure that the system is turned OFF and unplugged during cleaning.

Notice

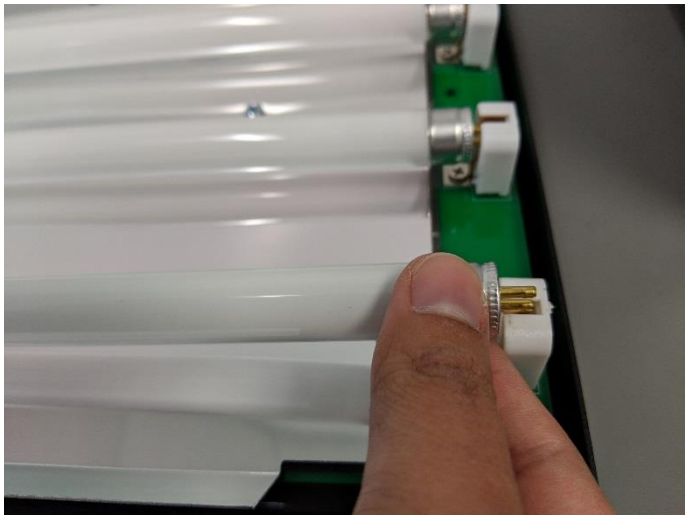
Allow for a sufficient cool-down of the light tubes before maintaining them.

Note: The single UV transilluminator is used as an example for the purpose of this manual. UV lamps in the 2UV and 3UV models should be replaced using the same procedure for each tube.

1. Remove the transilluminator from the darkroom.
2. Remove the filter cover from the base. Now the UV lamps are visible.



3. Carefully rotate the tube a quarter turn and slide it out of the socket. Replace with a new tube by sliding the tube into the socket and rotating into place by a quarter turn.



4. Replace the filter cover.

7 Troubleshooting

Error	Possible cause/Remedy
No power to the darkroom	■ Recheck main power cord connections to the darkroom. ■ Check fuses, located at the back of the unit, near the power port. Two fuses "2 Ampere Slow Blow" are included. You will need a flat-head screwdriver. Turn the cap and the fuse holder will "pop-out". Inspect the thin wire within the glass fuse to see if there is a break in the wire. If so, replace fuse(s). ■ If fuses are blown repeatedly, contact Technical Support Department for additional trouble- shooting
No image on the touch screen	■ To power up the software, firmly push the POWER button. It is located on the top right of the unit.
Transilluminator will not turn on	■ Be sure the darkroom cabinet's door is completely closed. There is a UV exposure safety cut-off switch that turns the transilluminator off when the darkroom cabinet's door is opened. ■ Be sure the darkroom cabinet's main power switch is lit. If not, refer to "No power to dark- room cabinet." ■ The transilluminator itself has a power switch; make sure that the transilluminator switch is in the **On** position. ■ Be sure the transilluminator's power jumper cord is securely connected at both the ends of the cable. ■ Check fuses, located at the back of the unit, near the power port.

8 Disposal

At the end of its service life the UVP GelSolo Imaging System and all its electronic components must be disposed of in accordance with the applicable regulations as electronic waste.

9 Specifications

General technical data

Dimension (H x W x D)	805 x 394 x 384 mm (31.7 x 15.5 x 15.1 inch)
Weight	22 kg
UV Intensity Style	variable
Interfaces	5 x USB 2.0
Fuses for Darkroom	2 x 3.15 amp/250 V, 5 x 20 mm, slow-blow
Fuses for UV table	1 x 2 amp/250 V, slow-blow
Pollution Degree	2
Installation Category	II
Environmental conditions	5 °C – 40 °C, max. 80 % air humidity for temperatures up to 31 °C, decreasing linearly to 50 % maximum relative humidity at 40 °C. Max. 2000 m NN
Power supply	100/115 V AC, 60 Hz 230 V AC, 50/60 Hz

Built-In Touch Screen Computer

Operating System	Windows 10
Touch screen	11.6" multi-touch
Connectivity Port:	1 USB 2.0 (front of system) 4 USB 2.0 (rear of system)
Wireless Network Capability	802.11 b/g/n Wi-Fi and Bluetooth 4.0
Software	VisionWorks software