OLYMPUS

Instructions for use

VS200

Research Slide Scanner

Version InstructionsForUse_VS200_en_09_HW-Rev_25022025

Manufactured by
EVIDENT Technology Center Europe GmbH
Wilhelm-Schickard-Straße 3
48149 Münster, Germany

Phone: +49 251 - 798 00 0
Email: etce.info@evidentscientific.com

Contents

1 About this manual

This manual for the VS200 system is for qualified personnel that have been trained and authorized by Evident as well as for general users. The manual contains important information on how to operate the VS200 system safely and correctly.

In addition, this manual describes how to unbox and install the system as well as how to install further components. These tasks must expressly only be performed by Evident. As a user you are not allowed to unbox or install the VS200 system by yourself!

To ensure the safety, obtain optimum performance and to familiarize yourself fully with the use of this product, study this manual thoroughly before installing this product, and always keep this manual at hand when operating this product.

Retain this instruction manual in an easily accessible place near the work area for future reference.

Installing and configuring a liquid dispenser, and upgrading to a VS200 loader are not in the scope of this document. These must only be installed and adjusted by an Evident service technician.

1.1 Notes on qualifications

Evident personnel	Instructions for tasks that must only be performed by Evident are identified with the following note: The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

1.2 Intended use

The system is intended to be used for the acquisition of virtual slide images. The system is intended to be used for research only.

If the VS200 system is used in a manner not specified by this manual, the safety of the user may be at risk. In addition, the VS200 system may also be damaged. Always use the VS200 system according to this instruction manual.

Foreseeable misuse

The system is not intended to be used for primary diagnosis.

1.3 Other applicable documents

Familiarize yourself with all of the other manuals for the components of the system. Take special note of the safety instructions they contain.

1.4 Symbols in this documentation

	Tools required for performing the steps
✓	Preconditions for the subsequent steps

2 Safety

If the product is used in a manner not specified by this manual, the safety of the user may be imperiled. In addition, the product may also be damaged. Always use the product as outlined in this manual.

2.1 Categories and symbols in the safety instructions

The safety instructions in this manual use symbols and keywords that are divided into the following categories:

CAUTION
This warning sign and the word **CAUTION** indicate dangerous situations that can lead to minor injury if ignored.

ATTENTION
The exclamation mark and the word **ATTENTION** indicate situations where irreparable damage to the product can occur if ignored.

Useful tips and important information

This symbol indicates useful notes, tips and important information.

2.2 Caution labels

Indicates a non-specific general hazard.

This warning sign indicates that there is a pinching hazard.

Laser warning symbol

2.3 Caution labels on the product

Caution labels have been placed at positions where special care is required when handling and operating the system. Always pay attention to the caution labels.

CAUTION
Moving components can cause injury
Components move around inside the scanner. Gaps open and close. Hands and fingers can get pinched.

- Keep hair, fingers, hands, other body parts, clothes and other objects out of the VS200 system when the VS200 is connected to the power supply.

CAUTION

Moving components can cause injury

Components move around inside the loader. Gaps open and close. Hands and fingers can get pinched.

- Keep hair, fingers, hands, other body parts, clothes and other objects out of the system when it is connected to the power supply.

CAUTION

The microscope stage poses a pinching hazard when it moves

Gaps open and close when the microscope stage moves. Hands and fingers can get pinched.

- Make sure that you are not within the microscope stage's range of movement when it is moving.
- Try never to put your hands or fingers into any gaps.

CAUTION

Pinching hazard when inserting the tray into the VS200 scanner

The motorized drive of the door flap in the scanner poses a pinching hazard. Your hands and fingers are at risk of being pinched when you insert a tray.

- Make sure that the VS200 ASW software isn't performing any functions while you are inserting the tray.

CAUTION

Pinching hazard when replacing the objectives

If the nosepiece or the Z-axis is moving while you are replacing the objectives, hands and fingers can get pinched.

- Make sure that hands and fingers are not within the range of movement.
- Make sure that the VS200 ASW software isn't performing any functions while you are replacing the objectives.

Position of caution labels	
	U-FFWO
	VS200 loader
	SCARA robot arm
	In the stage area of the VS200 scanner
	Nosepiece
	Door flap
	Door flap motor

2.4 General safety instructions

- Do not plug anything into or unplug anything from the ports when the system is connected to the power supply.
- The system is not intended to be used for general microscopy tasks.
- Natural disasters are not covered by the warranty of this product.
- No guarantee can be provided for image files. It will not be possible to restore images or to offer compensation if any of the following conditions occur. This is regardless of whether they occur during normal operation or are attributable to user error, malfunctioning of the device, or a potential or actual system failure.
    1. Defective image
    2. Defective file information such as file name or file date and time
    3. Loss of image
- The user is responsible for backing up images. Note that electronic recording media such as USB memory, HDD and DVD-R may become obsolete and saved files may therefore become irretrievable in the future.
- Furthermore, the system is not designed to guarantee authenticity or to be tamper-proof.
- Avoid exposing the system to strong vibrations as they can impair image quality.
- With 3-axis control units for scanning stages and motorized focus drive make sure to:
    1. Handle these components with care.
    2. Avoid exposure to strong vibrations or risk of explosion.
    3. Avoid exposure to extremes of temperature, direct sunlight or strong heat sources.
    4. Avoid exposure to high humidity, moisture or water.
    5. Avoid exposure to magnetic or electromagnetic radiation from sources in close proximity. Avoid exposure to radioactive contamination.
    6. Avoid exposure to chemicals/ toxic substances that are corrosive, potentially infectious, toxic, or otherwise hazardous to health.
- With the monitor:
    1. Do not use this product near water.
    2. Do not place this product on an unstable cart, stand or table. If the product falls, it could be seriously damaged.
    3. Slots and openings are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. These openings must not be blocked or covered. The openings should never

be blocked by placing the product on a bed, sofa, rug or other similar surface. This product should never be placed near or over a radiator or heat register, or built-in to a unit unless proper ventilation is provided.

4. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short-out parts. This could result in a fire or electric shock. Never spill liquid of any kind onto or into the product.

» The system must not be used for primary diagnosis.

» Possible data loss or invalid hardware states when forcing the computer to shutdown. The software has no means of resisting a "forced shutdown" (for example, due to a forced "Windows Update" or software kill via the "Task Manager", power loss, or a computer reboot). The user is generally required to not initiate such a forced shutdown. If the software is forced to shut down without being properly closed anyway, the following problems may occur:

The system may not be able to save and restore the current status of the software (including any non-saved states / images / settings).

It may be necessary for a service technician to check the system to make it operational again.

» Photobleaching possible

The system has a fluorescence light source with high light intensity. Photosensitive samples might become photo-bleached if exposed to high-intensity light for long periods (e.g. 60 s). This can happen when the sample is being viewed in live mode or if it is scanned repeatedly (e.g. 10 times) on the specimen sites that are auto-focused a lot of times. The photobleaching is often only faint and only visible if the 16 bit display limits are set very narrowly. In order to prevent this, it can be useful to create alternative observation methods with reduced light intensity in order to only use as much light as necessary and avoid "overloading" the sample with excitation light.

» Shading / uneven light intensity

For specimens with very sparse samples with a lot of background and rather small fluorescence emittance (e.g. FISH samples), it can occur that images acquired with fluorescence illumination show a variance in background illumination ("shading").

» If the product is being used in a network environment, note the following points.

Make sure that the network has appropriate virus protection.

The installation of operating system service packs, security patches or third party software updates (including runtime libraries) can cause malfunctions.

If anti-virus software is running while you are acquiring images, it can lead to the loss of individual images. It can also slow down the acquisition process or even cause it to be aborted altogether.

2.5 Safety instructions for the laser

1. The loader of the VS200 system uses a laser sensor. Never remove the caution labels on the product. The semiconductor laser for loader incorporated in this product is designated as a product of the following class.

   CLASS 1 LASER PRODUCT (IEC 60825-1:2007 / IEC 60825-1:2014 / EN 60825-1:2014/A11:2021)

   Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

2. Never attempt to remove the cover using a tool. There is a risk of exposure to the internal strong laser beam as well as other malfunction or failure.

2.6 Safety instructions for fluorescence light sources

CLASS 1 LASER PRODUCT (IEC 60825-1:2007 / IEC 60825-1:2014 / EN 60825-1:2014/A11:2021)

Follow the safety precautions at all times during operation and maintenance of this product. Non-observance may result in eye injury or damage to the system.

CAUTION
Risk of injury to the eyes

- Do not look at operating lamp/LED as it can emit UV light.
- Never look into the light emitting end of the light guide. The light could severely damage the eye if the light is observed directly.

» Always make sure that the liquid light guide and light guide adapters are securely attached to the VS200 system. This will minimize the risk of exposure to the UV light.

» If the light source has a malfunction, please contact Evident, Excelitas or Cobolts customer support. If the light source is serviced always make sure that the power cord is disconnected.

» Place the unit onto a hard, stable surface and make sure the ventilation openings are not covered by something.

2.7 Safety - VS200 system with SILA

Position of safety labels for the VS200 system with SILA using the VS20-LASER and C-FLEX C6 laser combiner

	Laser class safety label - 3R (for VS20-LASER)
	For the VS20-LASER: The picture shows the laser class safety label 3R placed at the metal frame under the top front panel of the base unit.
	Laser class safety label - 3B (for C-FLEX C6 laser combiner)
	For the C-FLEX C6 laser combiner: The picture shows the laser class safety label 3B placed at the metal frame under the top front panel of the base unit.

VS20-SPADA

	On the VS20-SPADA unit Laser class safety label - 3B for the VS20-LASER and for the C-FLEX C6 laser combiner.
	The picture shows the laser class safety label 3B on the VS20-SPADA unit.

The picture shows the laser class safety label 3B placed above the opening where the optical fiber is connected to VS20-SPADA, at the upper right corner of the back panel.

2.7.1 General safety precautions for using the VS200 system with SILA

The VS200 system with SILA should be installed exclusively by trained service personnel.

After the installation of the VS200 system with SILA module is complete, exposure to laser radiation is limited to Class 1 levels. Be aware that removing any parts of the VS200 casing and any microscope components with tools is strictly prohibited for any user.

Any handling or modification of the system other than what is explicitly allowed in this manual is strictly prohibited and may lead to hazardous laser beam exposure.

2.7.2 Laser safety concept of VS200 system with SILA

Control or adjustments using procedures other than those prescribed in this manual will lead to hazardous laser beam exposure. If any damage of, or modification to, the VS200 system with SILA is apparent, do not use the system and contact your local Evident representative immediately.

The laser safety concept of the VS200 system with SILA consists of the following modules:

- A laser-safe front door of the base unit, which is electrically connected to VS20-LASER/C-FLEX C6
- Laser-safe casings of the base unit
- A black metal plate at the glass opening of the loader door
- The camera-locking TV adapter U-TV1X or filter wheel U-FFWO

Additional safety features on VS20-LASER/C-FLEX C6 are summarized here and can be found in detail in the manufacturer's manual.

» Safety interlock
» Remote interlock jumper
» Mechanical safety shutter
» Key control switch

Strictly follow the laser safety instructions below to avoid hazardous situations.

1. Before operating a VS200 system with SILA, check that all devices are attached correctly and all casings are closed.
2. Installation and alignment procedures may only be carried out by trained Evident personnel.
3. When operating the VS200 system with SILA as intended by a user the VS200 system with SILA is treated as Laser Safety Class 1 equipment.
4. For the list of actions permitted to a user, see the VS200 manual Instructions for use.
5. Do not bend, step on or pull excessively on the optical fiber. This could damage a fiber and cause hazardous beam leakage. In case of a damaged fiber, switch off the laser immediately and contact Evident.
6. Never cover the air outlet of the laser to prevent overheating.

If any part of the system is damaged or illicitly modified, danger of laser exposure is possible at the following positions:

» The C-FLEX C6/VS20-LASER's housing at the fiber port if the fiber is removed.
» The exit of the laser fiber.
» The beam path of the microscope, if the base unit casing is open.

2.7.3 Further safety precautions for VS200 with SILA

1. Always use power cords and power supplies provided by Evident or the supplier of the device.
2. Provide unimpaired access to the remote interlock jumper at the VS20-LASER/C-FLEX C6 and to the main power switches.
3. Always make sure that the grounding terminal of the laser system and the wall outlet are connected properly. If the system is not grounded, EVIDENT Technology Center Europe cannot warrant the electrical safety and proper performance of the product.
4. Refer to the user manuals of the respective laser manufacturer for adequate safety precautions and proper usage.

5. If the equipment is not used as specified in this manual, the safety and performance may be impaired. In addition, the equipment may be damaged and warranty may be lost. Use the equipment only as outlined in this manual.

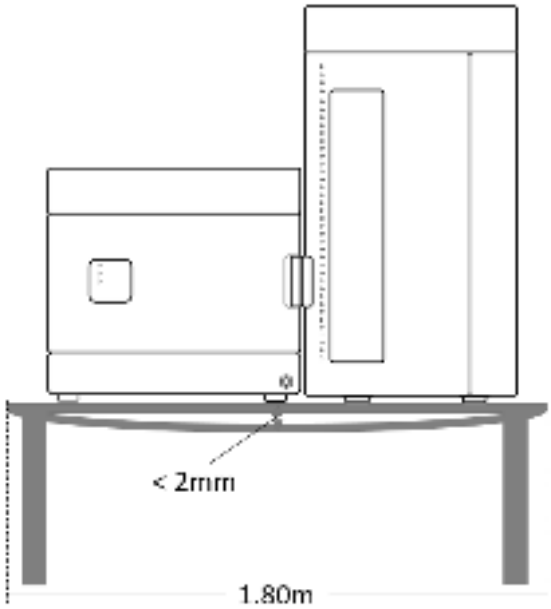
EVIDENT Technology Center Europe GmbH accepts no liability for any health or financial damages caused by improper use of the lasers and laser related setup.

3 Notes on placement

» A fully equipped VS200 system weighs approx. 200 kg, so the surface that you place the system on must be able to support at least 200 kg.

» To ensure proper functioning of the system it is mandatory that the VS200 system is placed on a sturdy level table or bench.

» Evident can only guarantee the functionality of loading and unloading trays from the VS200 loader to the VS200 scanner if the table does not bend more than 2 mm in the middle of a 1800 mm length.



» When placing the VS200 system on a sturdy level table or bench, take care not to block the ventilation slots of the VS200 scanner and loader. Make sure that there is a minimum distance of 30 cm to the wall and 20 cm to other devices.

» Keep in mind the weight of the VS200 system and the components when you lift them. See Specifications on page 32.

» Do not move or reposition the VS200 loader without installed transportation locks.

» The devices must only be moved using the designated handles to avoid damage to the device or personal injury.

» Due to the weight of the devices, carry the devices only with two or more people.

» The VS200 system should not be repositioned by the end user. If the system has to be repositioned an Evident sales representative has to be contacted first.

3.1 Conditions for operating and storing

Positioning the system	Only use the system indoors and in a laboratory or laboratory-like environment
Elevation	2000 m maximum
Ambient temperature	The maximum permissible range for the ambient temperature during operation of the VS200 system is 12 to 28°C.
Humidity	The maximum permissible humidity during operation of the VS200 system is 80% for temperatures up to 31°C (88°F, condensation free) decreasing linearly through 70% at 34°C (93°F) and 60% at 37°C (99°F).
Power supply voltage fluctuation	The power supply should not fluctuate by more than 10% of the nominal voltage.
Pollution degree	2 (in accordance with IEC60664)
Installation category (overvoltage category)	II (in accordance with IEC60664)

Space required for the system

VS200 System without loader		
	Without fluorescence	With fluorescence or camera cover
Height	530 mm	885 mm
Area of work surface (table)	1500 mm x 800 mm	1500 mm x 800 mm

VS200 System with loader		
	Without fluorescence	With fluorescence
Height	885 mm	885 mm
Area of work surface (table)	1800 mm x 800 mm	1800 mm x 800 mm

Storage conditions

The maximum permissible range for the ambient temperature for storage of the VS200 system is -25 to 55°C.
The maximum permissible relative humidity range for storage is 10% to 95%.
The maximum permissible temperature change rate for storage is 30°C/h.
The maximum permissible atmospheric pressure for storage is 70 to 106 kPa.

4 Tools and accessories

» 2,5 mm, 3 mm with ball end, 4 mm, 5 mm hex keys

5 Scope of supply

The exact scope of delivery and packaging of the items depend on your order.

VS200 ST (Single Tray) or VS200 MTL (Multi Tray Loader)

The term VS200 ST (scanner only) mentioned in this manual is equivalent to the model VS200-BU and item name VS200-BU-V2 which are used on the packaging or system.
VS200 MTL (scanner and loader) mentioned in this manual is equivalent to the model VS200-BU-L, item name VS200-BU-L-V2 (scanning unit) and model VS200-LOADER, item name VS200-LOADER_V2 (loading unit). Both model and item name are used on the packaging or system.

Pallet	VS200 scanner with front door mounted (VS200-BU or VS200-BU-L)
	four handles to carry the system
Monitor	HP TFT 32 inch monitor
Computer	VS200 standard computer with mouse and keyboard
Accessories	Calibration slide v2.0
	UPLANXAPO20x objective
	PLN2x objective
	U-TLD top lens
	one 1x3 inch tray
	ODB CAN bus cable (30 cm)
	Caution labels for U-FFWO T3
	Set of hex keys
	Olympus standard 3 mm hex key
	Red spacer sleeve (spare part for VS200 scanner in combination with VS200 loader)
	Colored cable clips
	Tray guide rails (spare part for VS200 scanner in combination with VS200 loader)
	Instructions for use VS200 system
	Instruction manual BX3-UCD8A
	Instruction manual U-TV0.63XC camera adapter
	Manual for the camera
Additional box	Power supply (not available in all countries)
	Optional hardware

Camera cover (optional)

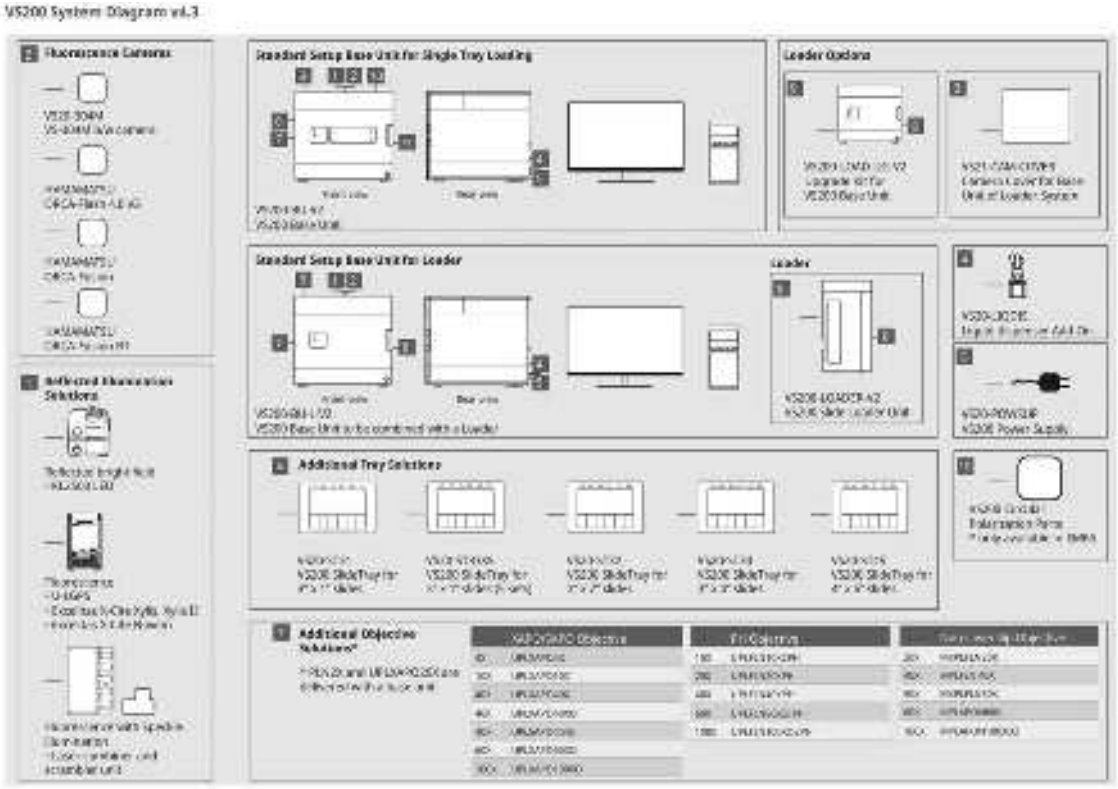
The camera cover must only be installed by an Evident service technician.

	Camera cover frame
	Camera cover front cover
	Camera cover side cover
	Camera cover rear cover
	Bag of mounting accessories

VS200 loader

Pallet	VS200 loader
	four 1x3 inch trays
	four black round plastic caps

6 System diagram



6.1 Available reflected light components

The VS200 system can be ordered with either of the following reflected illumination options:

» Reflected bright field

» Fluorescence (with LED light source)

» Fluorescence with speckle illumination (with laser light source)

All options require the following components:

» Mirror turret - IX3-RFACA

» Illuminator - IX3- RFAL (for reflected BF); IX3-RFALFE (for fluorescence)

The individual components are described below.

6.1.1 Reflected bright field

Component	Description
KL2500 LED	Light source with USB interface
KL-BL18/1000-TL-3/LG-SF	Single fiber light guide
U-LGAD	Light guide adapter for reflected light
U-RBF	Filter cube for reflected light

6.1.2 Fluorescence

The fluorescence configurations are further divided into four different add-on variants: A, B, C, D. A, B uses white light LEDs so excitation filter wheel and single band excitation filters are required. A uses multi-band emission filters while B uses single band emission filters. C, D uses switchable LEDs. Excitation filters are mounted directly in the light source. See X-Cite NOVEM on page 79. C uses single band emission filters, D uses multi-band emission filters.

In all variants, a filter cube with multi-band dichroic mirror is required.

Individual components				
Component	A	B	C	D
TV1XC	X			X
U-FFWR	X	X		
U-FFWO T3		X	X	
U-LGPS white or X-Cite Xylis (IR) whitelight LED	X	X		
U-LGPS color or X-Cite NOVEM, switchable LED			X	X

6.1.3 Fluorescence with speckle illumination

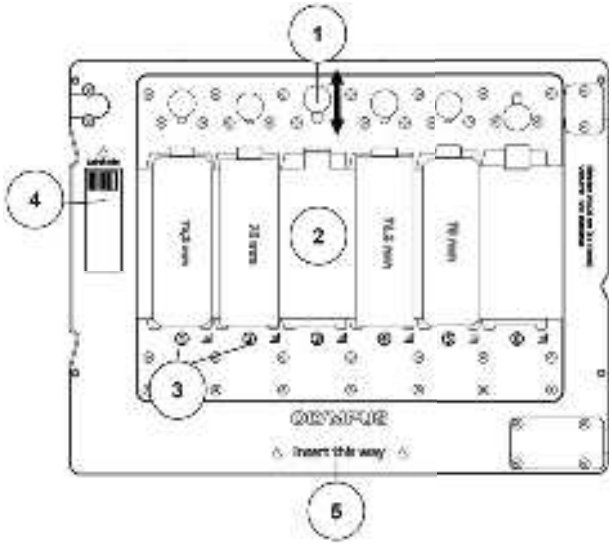
Please refer to the dedicated speckle illumination chapters. See VS200 Speckle Illumination Acquisition (SILA) on page 230.

7 Trays

ATTENTION
Risk of unsatisfactory scan results due to incompatible trays and slides
Using incompatible equipment with the VS200 can result in unsatisfactory scan results or damage to the system.
- Make sure to use the equipment that is described in this manual.

The exact scope of delivery and packaging of the items depend on your order.

7.1 Tray description

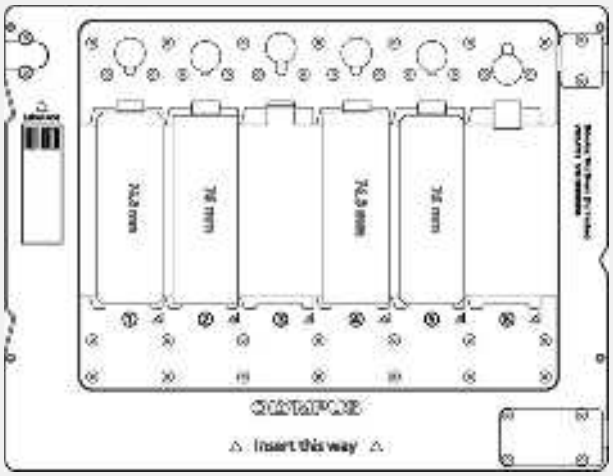


(1)	Button to open/close the spring for inserting a slide
(2)	Slide pocket
(3)	Slide position
(4)	Indicator for label area
(5)	Indicator for tray insertion

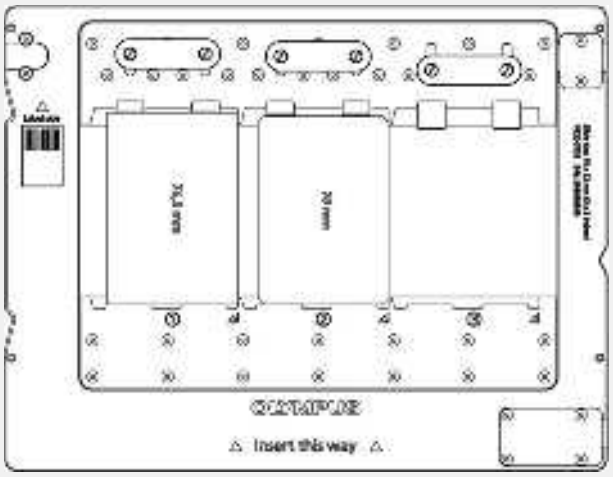
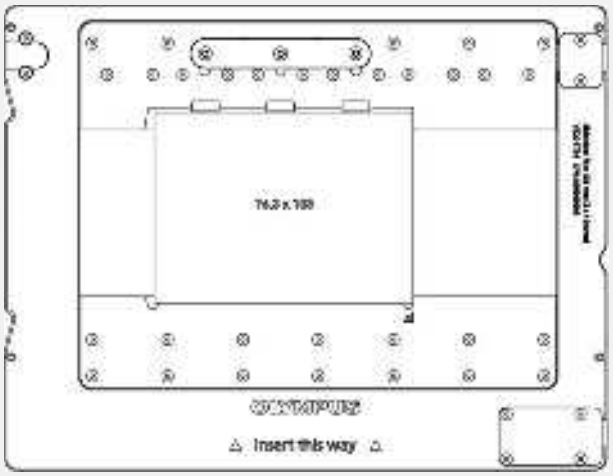
7.2 VS200 Tray types

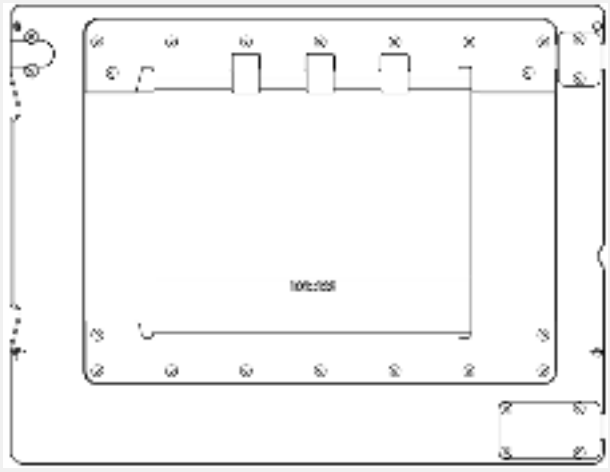
ATTENTION
Risk of damage to device due to improperly inserted tray
If a tray is inserted into the VS200 scanner improperly, the top lens can be damaged.
- When inserting a tray, refer to the [Insert this way] lettering and the orientation of the triangles on the tray.

The VS200 systems can be equipped with four different tray types for different slide formats. All trays can be used either with the VS200 ST (Single Tray Load) system or VS200 MTL (Multi Tray Loader) system.

By default every VS200 system is equipped with at least one tray for six 1x3 inch slides (76 × 26 mm, DIN ISO 8037-1).	

Additional tray types

three 2x3 inch slides (52 x 76.3 mm)	
one 3x4 inch slide (76 x 103 mm)	

one 4x5 inch slide (103 x 127 mm) (max. possible scan area 76 x 127 mm)	

8 Specifications

		VS200 ST (Single Tray)	VS200 MTL (Multiple Tray Loader)
Intended samples	Observable samples	Glass slide with coverslip and without coverslip*1	
	Size of glass slide	Standard slide tray: width 25 mm - 26.5 mm, length: 75 mm – 76.5 mm, thickness: 0.9 mm - 1.2 mm (6 slides) Optional trays 1) Width: 51 mm - 53 mm, length: 75 mm – 76.5 mm, thickness: 0.9 mm - 1.2 mm (6 slides) 2) Width: 100 mm – 102 mm, length: 75 mm – 76.5 mm, thickness: 0.9 mm - 1.2 mm (6 slides) 3) Width: 126 mm - 128 mm, length: 75 mm – 76.5 mm, thickness: 1.1 mm - 1.4 mm (1 slide)	
	Thickness of coverslip	0.12 mm - 0.17 mm	
	Observation methods	Brightfield, Reflected brightfield (Optional*2), Darkfield, Phase Contrast (Optional*3), Simple Polarization (Optional*4), Fluorescence (Optional), Fluorescence optical sectioning with Speckle Illumination (SILA, Optional)	
Optical frame	Illuminator	Built-in Koehler illumination for transmitted light, High intensity and high color rendering LED (up to 50,000 hours)	
	Objectives	Compatible objectives 2x, 4x, 10x*5, 20x, 40x*5, 50x*5, 60x*5 and 100x*5 6 position motorized nosepiece (incl. selected oil immersion and silicon oil immersion, phase contrast, no cover glass objectives) Optional automatic liquid dispenser	
	Motorized stage	XY stage with automatic control	
	Focusing	Motorized focusing with automatic control	
	Color camera	Integrated 2/3 inch CMOS, 3.45 µm x 3.45 µm pixel size, high sensitivity, high resolution	
Scanner	Capacity	1 slide tray, 6 slides maximum Upgradable to multiple tray loader model	Up to 35 slide trays, 210 slides maximum
	Pixel resolution (color camera)	UPLXAPO20X (NA 0.8): 0.274 µm/pixel Options: UPLXAPO4X (NA 0.16): 1.37 µm/pixel UPLXAPO10X (NA 0.4): 0.548 µm/pixel UPLXAPO40X (NA 0.95): 0.137 µm/pixel UPLXAPO40XO (NA 1.25): 0.137 µm/pixel UPLXAPO60XO (NA 1.42): 0.091 µm/pixel	

		VS200 ST (Single Tray)	VS200 MTL (Multiple Tray Loader)
		UPLXAPO100XO (NA 1.45): 0.055 µm/pixel	
	Scan time	Brightfield: Approx. 1.5 minutes (20x objective, scan area 15 mm x 15 mm) Fluorescence Widefield NOVEM: Approx. 14 minutes (20x objective scan area 15 mm x 15 mm, 4 channels, 50 ms exposure each)	
	Software	Automatic sample detection (generic and TruAI deep learning), automatic barcode reading, automatic focus mapping, automatic scanning, automatic stitching, pause and resume scanning, Z stack imaging, extended focus imaging (EFI), deblurring processing, image format: vsi, JPEG, TIFF, DICOM, synchronized multi-image display, stepless zooming, zooming while scanning, annotations, screen capture, slide loader control (multiple tray loader only)	
Fluorescence (Optional)	Fluorescence components	UPLFLN4X objective, illuminator with fly-eye lens, motorized mirror turret, motorized filter wheel Widefield light source options: U-LGPS, Excelitas X-Cite XYLIS, X-Cite Novem SILA: up to 6-line laser combiner and scrambler unit Motorized dual lamp housing	
	Monochrome camera	Options: VS-304M, 1 inch CMOS, 3.45 µm x 3.45 µm pixel size HAMAMATSU ORCA Flash4.0 V3 HAMAMATSU ORCA Fusion HAMAMATSU ORCA Fusion BT	
Solutions for scanner software (optional)	Solution license	Batch image format converter DICOM converter Fluorescence SILA acquisition	
Desktop software (optional, separate solution for analysis)	Solution license	Batch image format converter DICOM converter Detection and analysis Deep learning 3D deconvolution	
Environment	Weight	Optical frame: 75 kg (165.3 lb) 1 slide tray: 0.6 kg (1.3 lb)	Optical frame and multiple tray loader: 149 kg (328.4 lb) 35 slide trays: 21 kg (46.3 lb)
		Fluorescence: 8 kg (17.6 lb) Computer and monitor: 19 kg (41.9 lb) Camera cover (optional): 9 kg (19.8 lb)	

		VS200 ST (Single Tray)	VS200 MTL (Multiple Tray Loader)
	Operating environment	Temperature: 12 – 28 °C (including other devices) Humidity: up to 80% (31 °C)	
	Power supply *5	Input: AC 100 - 240 V, 50/60 Hz, 4 A Output: DC 24 V, 9.2 A	
	Power consumption	221W	

*1 Optional compatible objectives are required

*2 Optional light source, illuminator, motorized mirror turret and mirror unit are required

*3 Optional phase contrast objectives are required

*4 Optional analyzer mirror unit and motorized mirror turret are required

*5 Sold separately

9 Unboxing

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

9.1 VS200 Scanner

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

CAUTION

Risk of injury and risk of device damage if components are dropped

The scanner or other components might drop when you are moving them. Injury to your feet or damage to the device can result.

- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

✓ At least two people are required to lift the VS200 scanner onto a table.

1. First remove the cover of the packaging. Remove the outer cardboard packaging (consists of one part) and then take the box with the 32 inch monitor out of the packaging first.
2. Remove the cardboard wraps that served as supports for the monitor cardboard.
3. Remove the workstation and remove the associated cardboard wraps.
4. Remove the manuals, box of accessories and the handles from the black cover tray.
5. Remove the cover tray from the VS200 scanner.
6. If the handles are not yet fixed to the appliance, unpack the handles.
7. Open the foil at the top and slide it downwards until you reach the two screw-in holes on the sides to access the threads for the lifting handles.
8. Screw in the handles, two on each side. The flexible plastic inserts in the side parts of the housing must not be removed, but the handles must be guided through these covers.
9. Remove all blue tape stripes for the faston terminals as well as the tape that secures the front door.
10. Remove the blue tape which secures the top lens holder in the middle of the XY stage as well as the tape around the adjustment lock at the field stop of the condenser underneath the XY stage.

11. In case you have a VS200 loader system, remove the blue tape from the VS200 scanner/VS200 loader connector which you will find at the bottom right side of the scanner unit.
12. Open the door and remove the five desiccant bags. The desiccant bags are located in the following places: Two on the top left and right from the camera adapter, one on the XY stage and two on the bottom left and right of the condenser unit.

ATTENTION
The system should not be repositioned by the end user. If the system has to be repositioned, an Evident sales representative has to be contacted first.

9.1.1 Mounting of handles - VS200 scanner

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

CAUTION
Risk of injury and risk of device damage if components are dropped
The scanner or other components might drop when you are moving them. Injury to your feet or damage to the device can result.
- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

1. Mount the four handles (2 on each side) as shown in the image below.
   » Make sure that all handles for transportation are screwed in completely and tight.

2. Lift the system with at least two people onto a stable table. The main center of gravity is at the back of the system.
3. Make sure that there is a gap of 30 cm between the backside of the system and the wall.

4. Remove the handles and keep them as they will be needed in the future. The plastic inserts in the side parts of the housing must not be removed as the openings must be sealed for laser safety.

9.2 Transportation locks for the VS200 scanner

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes how to remove the transportation locks from the VS200 scanner after shipping.

1. Remove the locking screw (see figure below).

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

ATTENTION
Risk of device damage if operated with transportation locks in place
If the scanner is operated without first completely removing the transportation locks, the device can be damaged.

- Make sure to remove all of the transportation locks before operating the scanner.

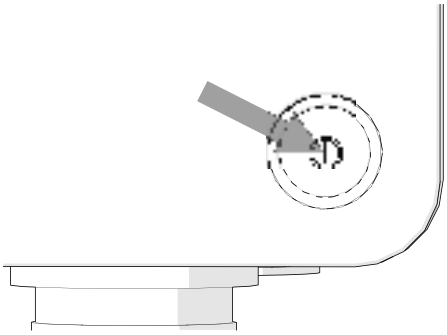
9.2.1 Removing the transportation lock from the stage

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

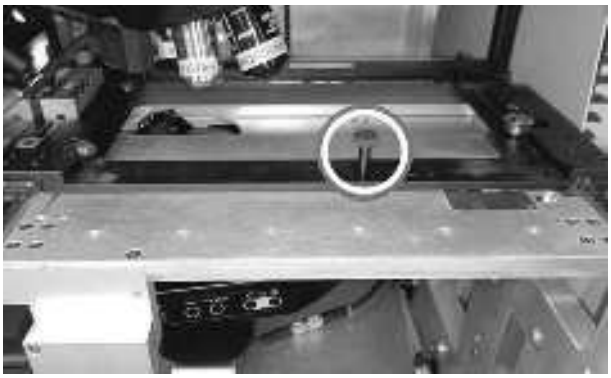
ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

» Hex screwdriver (size 2.5 mm)

1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.



2. The transport lock consists of a screw that must be removed. Keep the screw in a safe place so that it can be used again if the stage needs to be transported. Without the transport lock, the stage may be damaged during transportation.



3. Reconnect the VS200 scanner to the power supply.

9.3 VS200 Loader

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

CAUTION

Risk of injury and risk of device damage if components are dropped

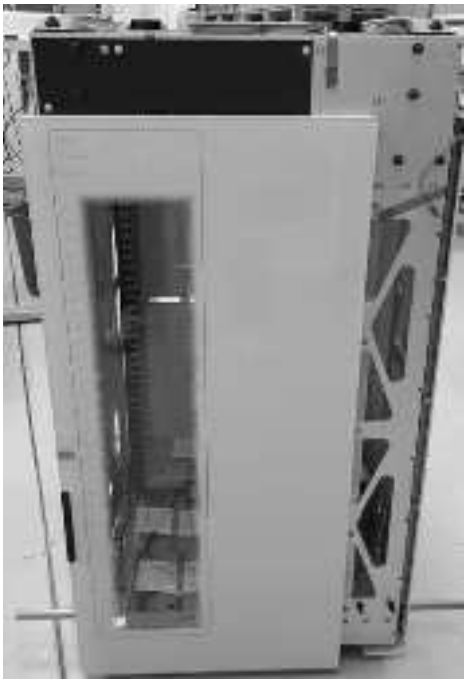
The loader or other components might drop when you are moving them. Injury to your feet or damage to the device can result.

- Make sure that all handles for transportation are screwed in completely and tight.
- The system must be carried by two people.

✓ At least two people are required to lift the VS200 loader system onto a table.

1. Remove the cover from the outer cardboard packaging, take out the two vertical cardboard wraps and the outer cardboard ring that covers the inner packaging.
2. Now remove the remaining cardboard wrapping and take out the white cardboard with the trays.
3. Remove the four handles from the lid tray and unpack the handles.
4. Remove the cover tray from the packaging of the VS200 loader.
5. Open the film at the top and slide it downwards until you can reach the plastic covers. Screw the four lifting handles (2 on each side) through the cover into the thread.

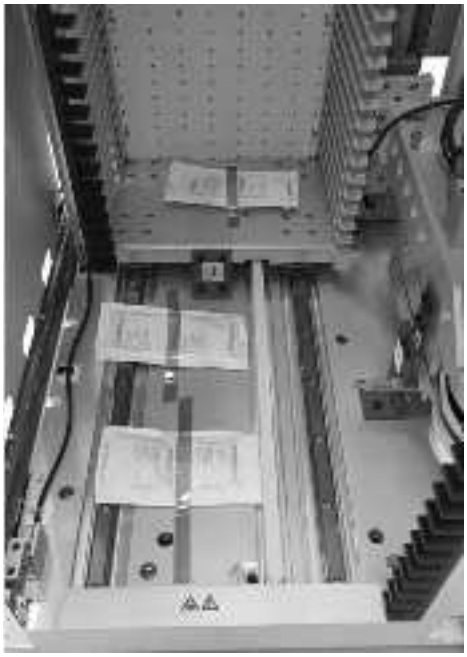
6. Make sure that all handles are fully screwed in and secure for transport and tight.
7. Remove all blue tape stripes for the faston terminals as well as the tape that secures the front door.



8. Remove the tape at the bottom left corner and take out the bubble foil pocket which contains the cable for the VS200 loader connection.

9. Open the door and remove the five desiccant bags.

The desiccant bags are located in the following places: Two bags in the tray hotel, two bags in between the rails on the bottom of the VS200 loader and one bag on the SCARA robot arm.



10. Lift the VS200 loader with at least two people onto a very stable table to the right side of the VS200 scanner. The center of gravity is at the right backside of the system.
11. Remove the handles and keep them as they might be needed in the future. The plastic inserts in the side parts of the housing must not be removed, as the openings must be sealed for laser safety.
12. Cover the two holes on the right side panel of the loader with the two black round plastic caps.

ATTENTION
The system should not be repositioned by the end user. If the system has to be repositioned, an Evident sales representative has to be contacted first.

9.3.1 VS200 Trays

1. Unbox the VS200 trays carefully and handle them with care. Avoid bending or dropping of a tray at any time.
2. Put the trays aside for later use.

9.3.2 PC and monitor

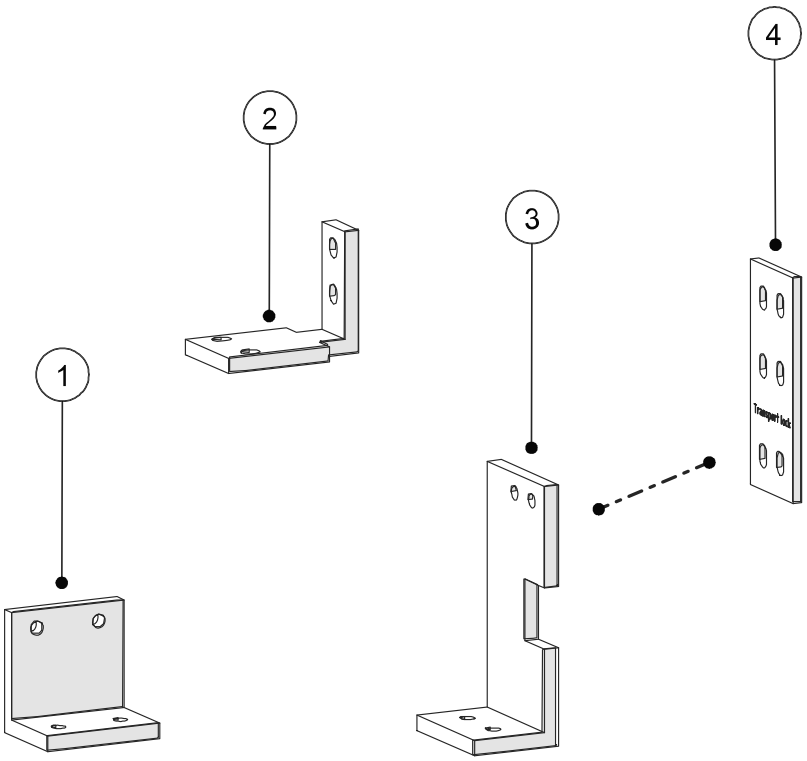
The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. Take the PC out of it's cardboard packaging.
   » Inside the PC cardboard packaging you find the mouse and keyboard as well.
2. Take the monitor out of it's cardboard packaging and put it onto the table.
   » All necessary cables are inside the cardboard packaging.

9.4 Transportation locks for the VS200 loader

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

This chapter describes how to remove the transportation locks from the VS200 loader after shipping and how to mount them before transporting it.



Overview - transportation locks

Transportation lock (rear)

!

ATTENTION

Risk of device damage if operated with transportation locks in place

If the loader is operated without first completely removing the transportation locks, the device can be damaged.

- Make sure to remove all of the transportation locks before operating the loader.

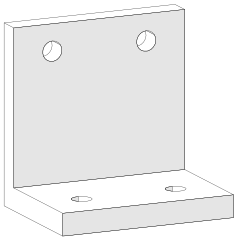
!

ATTENTION

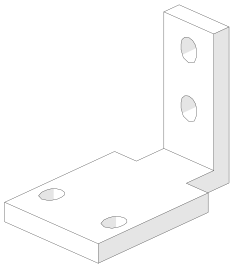
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

9.4.1 Removing the transportation lock from the VS200 loader's tray hotel

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.



Transportation lock (1)

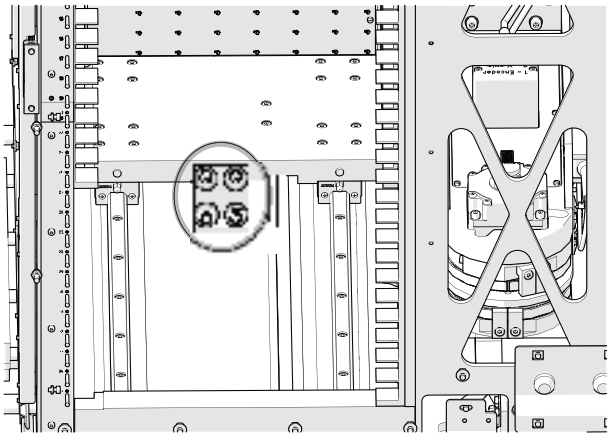


Transportation lock (2)

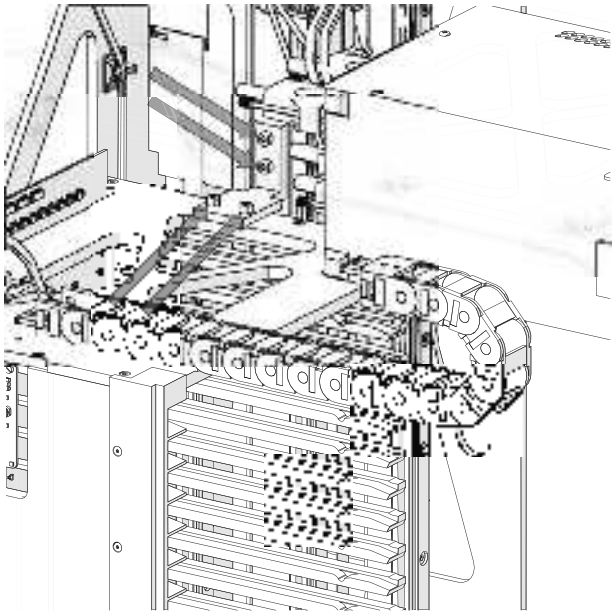
! ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

» Hex screwdriver (size 3 mm)

1. Remove the red transportation lock from the bottom of the VS200 loader's tray hotel. To do so, loosen the 4 hex screws (size 3 mm hex screwdriver) indicated in the figure.



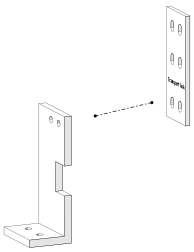
2. Remove the red transportation lock on the VS200 loader's tray hotel that connects the top right of the VS200 loader's tray hotel with the frame. To do so, loosen the 4 hex cylinder screws (size 3 mm hex screwdriver) indicated in the figure.



3. Move the VS200 tray hotel into the park position all the way at the back. To do so, grasp the bottom plate of the VS200 tray hotel.

9.4.2 Removing the transportation lock from the SCARA robotic arm

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

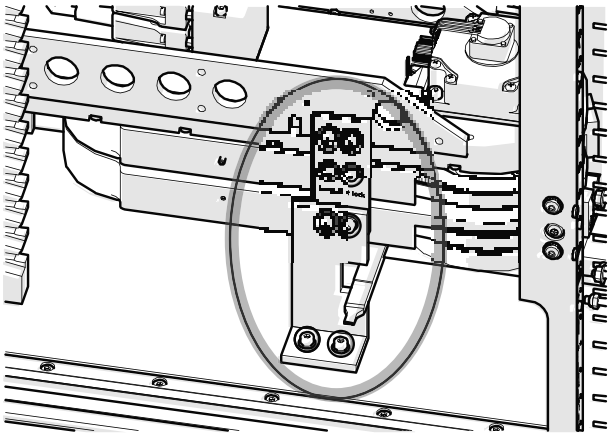


Transportation locks (3) and (4)

ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

» Hex screwdriver (size 3 mm)

1. Remove the red two-part transportation locks from the SCARA robot arm. To do so, loosen the 8 hex screws (size 3 mm hex screwdriver) indicated in the figure.



9.4.3 Removing the transportation lock from the counterweight of the SCARA robotic arm

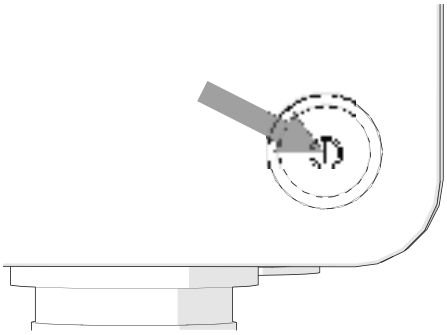
The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

Transportation lock (rear)

! ATTENTION
The transportation locks must be remounted each time before the unit is transported. Make absolutely sure not to lose the transportation locks and the mounting material.

» Hex screwdrivers (size 3 mm and 5 mm)

1. Switch the VS200 system off using the main power switch and disconnect the system from the power supply. To do so, disconnect the external power supply unit from the power supply.



2. Remove the transportation lock from the counterweight of the SCARA arm. To do this, loosen the 4 hex cylinder screws (size 3 mm hex screwdriver) indicated in the figure and remove them. Then loosen and remove the hex cylinder screw in the middle (size 5 mm hex screwdriver) and the plate.

» The unit comprised of the SCARA robot arm and counterweight can now move freely.

3. Reconnect the VS200 scanner to the power supply.

10 Mounting of components

10.1 VS200 Scanner

10.1.1 Objectives

The VS200 system is shipped with no objective mounted in the IX3-nosepiece.

1. Make sure that the power of the VS200 system is switched off!
2. Open the door of the VS200 scanner.
3. Make sure that the objective is clean and dust free before you mount it.
4. Depending on your VS200 kit you need to mount different objectives.

   The objectives should be mounted into fixed positions. See Position list for objectives on page 50. You can rotate the nosepiece revolver in any direction so that it is easier to mount an objective

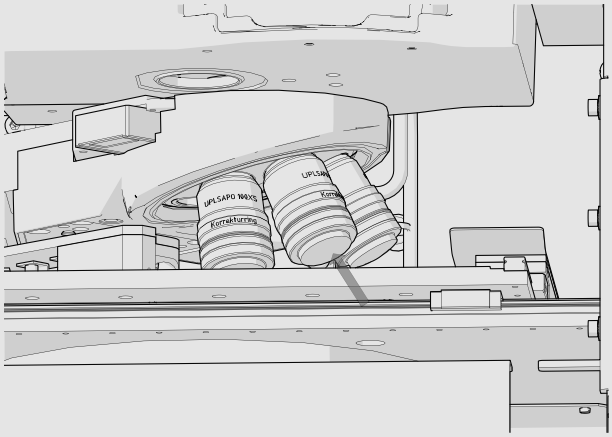
   By default a VS200 system is shipped with a 2x and 20x objective. Additionally recommended objectives are the 10x and 40x UPLXAPO. The majority of Olympus objectives that fit into the IX3-nosepiece can be used and are supported.

5. Remove the small plastic protection cover from the objective position.
6. Screw in the objectives counter clockwise and make sure that the objective is screwed in tightly.

Position list for objectives

The position of the nosepiece is indicated at the center of the IX3-nosepiece.

Nosepiece position	Objective
1	2x PLN
2	20x UPLXAPO
3	10x UPLXAPO
4	40x UPLXAPO
5	Any additional objective
6	4x UPLFLN



If you mount objectives in a different order you must subsequently adjust all device settings and observation methods. In this case refer to chapter Device settings - objectives on page 116 and Device customization on page 121.

If you have an objective on Position 5, do not mount it first as it will need to be removed during the slide position Z-offset calibration. See Slide Position Z-Offset on page 143.

If you have a brightfield system only, please continue with chapter Assembly of the housing for the VS200 scanner on page 81.

10.1.2 Immersion Objectives

Pay attention to the following notes when using an immersion medium.

CAUTION
Certain immersion media can contain harmful substances. Make sure to read the manufacturer's safety data sheet before using your immersion medium.

ATTENTION

- It is not possible to change the type of immersion medium once the glass laboratory bottle has been filled with either oil or silicone immersion medium. Otherwise damage can occur to the liquid dispenser.
- Before the VS200 system can be shipped (e.g. for repair) all liquids have to be removed from the system. Please contact the Evident Customer Support for detailed information.
- Be very careful when using immersion objectives not to contaminate other dry objectives with immersion medium.

As the liquid dispenser was tested with Olympus immersion media the best performance will be obtained with Olympus immersion media (Olympus Type-F Immersion Oil or Olympus Silicon Immersion Oil SIL300CS-30SC).

The VS200 system can be equipped with an automatic liquid dispenser capable of dispensing different types of immersion medium. Once a particular type of immersion medium has been used, you can no longer switch to a different type.

The liquid dispenser can only be installed by an Evident service technician.

The immersion objectives, oil or silicone, can be installed by anybody however.

Mount the e.g. 60x UPlanXApo O objective into an empty position (e.g. pos. 5) of the IX3 nosepiece.

Refer to chapter Device settings - objectives on page 116 to configure this objective into the device settings.

10.1.3 Phase Contrast (PH) objectives

The default configuration of a VS200 system includes 3 phase contrast inserts in the filter wheel of the BX3 condenser.

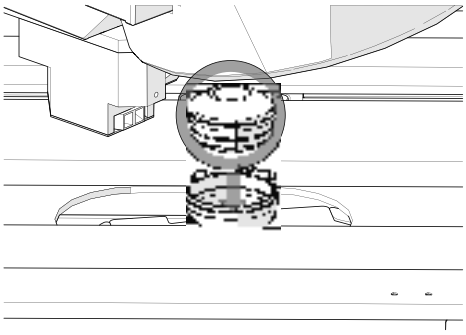
BX3 condenser pos.	Insert
1	U-PH1-S
2	U-PH2-S
3	U-PH3-S

Mount e.g. the 20x UPlanFL N Ph1 objective into an empty position (e.g. pos. 5) of the IX3 nosepiece. Refer to chapter Device settings - objectives on page 116 to include this objective into the device settings.

10.1.4 Mounting the top lens

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

1. Take the top lens out of it's packaging.
2. Open the front door of the VS200 scanner and make sure that the black tamper protection plate is removed.
3. Bring the holder of the top lens manually into the middle position and hold it firmly.
4. Screw the top lens into the round top lens receptive thread.



11 Mounting fluorescence components

Skip this chapter if you have a brightfield system only.

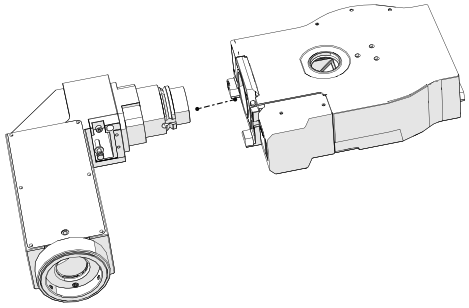
The fluorescence components are ordered separately. Carefully unbox all components following the instructions below.

11.1 IX3-RFACA and IX3-RFALFE

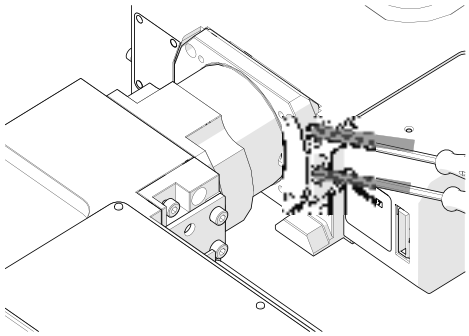
The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

» 2.5 mm, 3 mm and 4 mm hex key

1. Take the IX3-RFACA out of its packaging.
2. Take the IX3-RFALFE out of its packaging.
3. Assemble the IX3-RFACA and IX3-RFALFE as shown in the image below. Make sure that the two components are exactly parallel to each other.

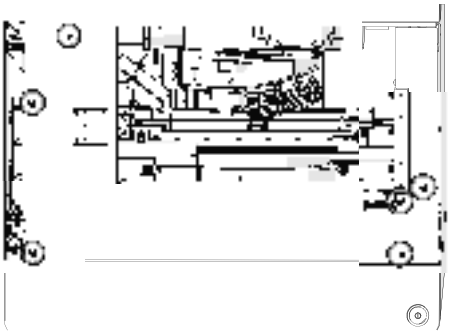


4. Screw the 2 hex screws (size 3mm hex key) at the junction hand-tight.

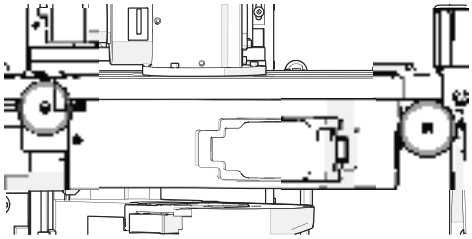


5. Make sure that the field stop is pushed in completely.
6. Go to the VS200 scanner and open the front door.

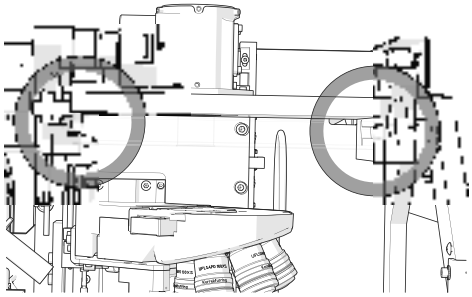
7. Remove the 6 hex screws (size 2.5 mm hex key) which hold the black tamper protection plate as indicated in the figure.



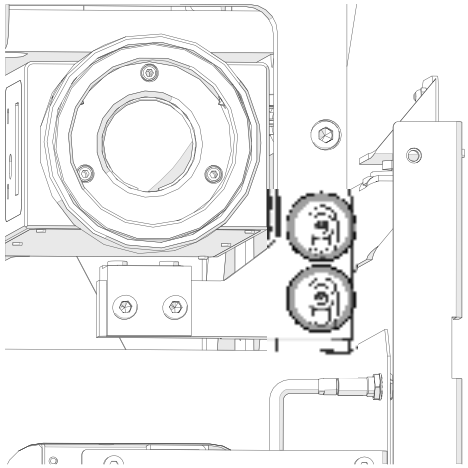
8. Remove the 2 hex socket screws (size 3 mm hex key) from the left and right securing brackets in the VS200 system as indicated in the figure.



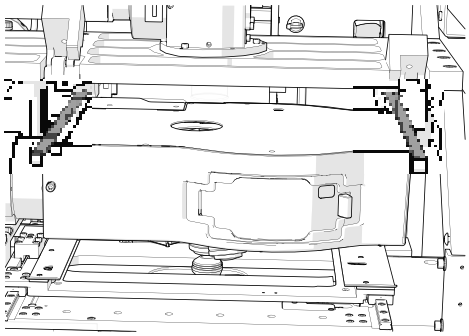
9. Fold up the two securing brackets.

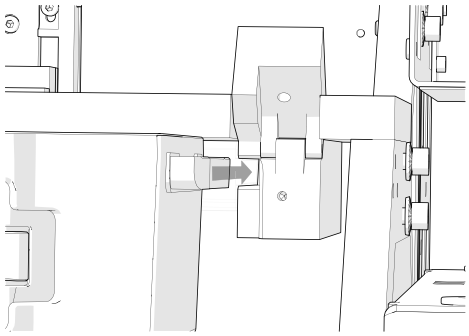


10. Remove the 2 hex socket screws (size 4 mm hex key) from the RFAA supporting bracket, which is attached to the frame at the back of the system.

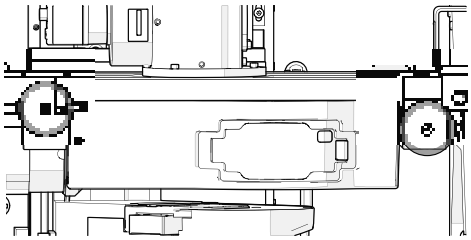


11. Insert the IX3-RFACA/IX3-RFALFE unit into the system. Make sure that it fits into the rails on the left and the right side and flip down the brackets.

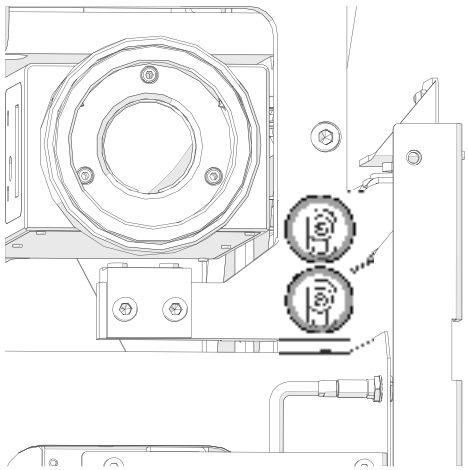




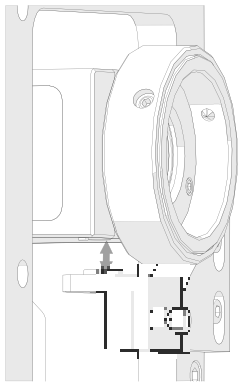
12. Tighten the 2 hex socket screws (size 3 mm hex key) to fix the brackets.



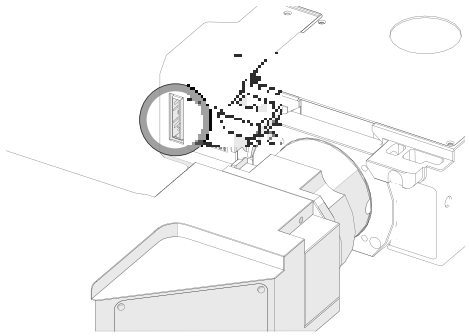
13. Attach the RFALFE supporting bracket again at the back of the system's frame. Insert the 2 hex socket screws (size 4 mm hex key) but don't tighten them.



14. Push the bracket upwards until it attaches to the IX3-RFALFE and tighten the two hex socket screws.

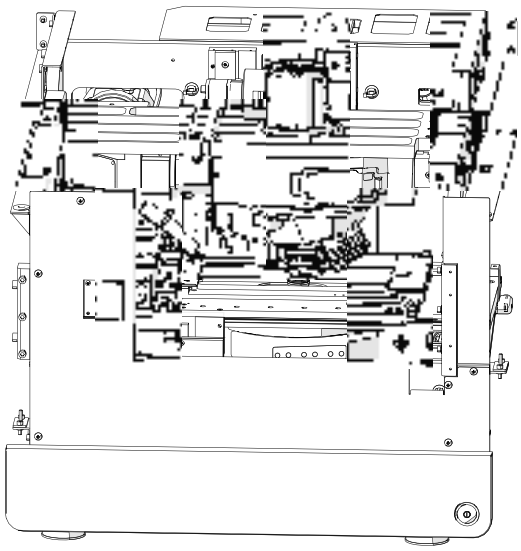


15. Make sure the power is switched off and attach the IX3-RFACA cable to the socket at the back of the IX3-RFACA.



16. Attach the black tamper protection plate again and tighten the 6 hex screws.

» Finally the system should look like on the image below.



11.2 Dual lamp housing

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

If you are required to mount a double light source with the dual lamp housing, refer to the dual lamp housing manual.

11.3 Fluorescence filter wheels or camera adapter for monochrome camera

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

Depending on the customer's configuration you either have to mount only one or two fast filter wheels. The following chapter describes how to mount the different filter wheels.

11.3.1 U-FFWR (Motorized fast reflected light filter wheel)

The units described below must be assembled and adjusted by Evident. If these units are assembled or adjusted by the customer, the operations are not ensured.

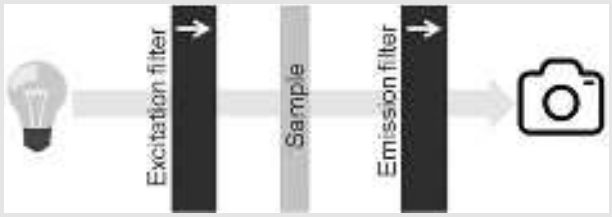
IMPORTANT

Before you mount the U-FFWR make sure you insert all excitation filters into the filter wheel. Note the position of the individual filters as you might need them later for the observation method adjustment. If you mount them as set out in the table below, less adjustments will have to be made later.

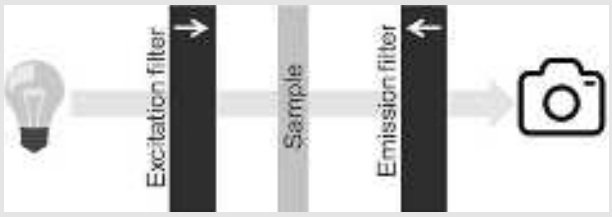
U-FFWR position	25 mm excitation filter
1	DAPI
2	FITC
3	CY3
4	CY5
5	CY7
6	Black-out filter
7	Black-out filter
8	Black-out filter

Refer to the chapter about filter insertion in the U-FFWR instruction manual for more information.

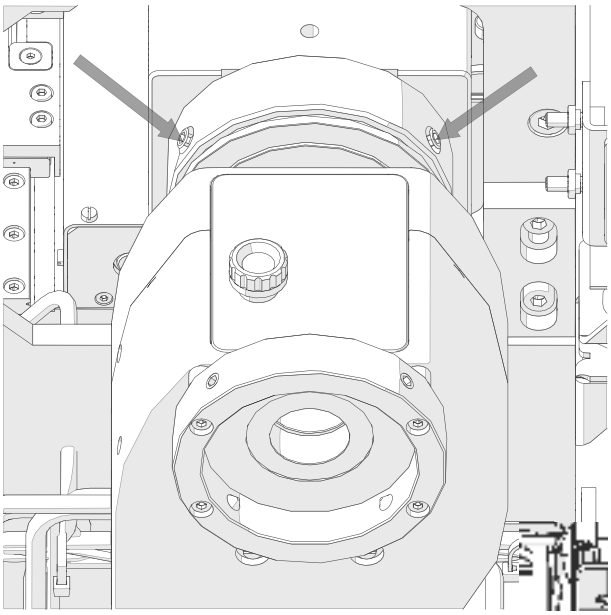
The orientation for Semrock emission filters is with the arrow towards the camera.



The orientation for Chroma emission filters is with the arrow pointing away from the camera.



1. Attach the U-FFWR to the flange of the IX3-RFALFE at the back of the system and tighten the two 3 mm headless hex screws.



2. Remove the CAN-terminator from the connector. Keep the CAN-terminator for later use.