

IVARO Tube Handler XS

Innovative automation for tube processing



IVARO Tube Handler XS

The IVARO Tube Handler XS is a sample processing system for small laboratory vessels such as screw cap micro tubes and cryo tubes. Its unique design and variability mean that diverse operations that used to be performed manually can now be automated simply and safely.

The IVARO Tube Handler XS is the ideal tool for labelling, scanning, sorting, weighing and pipetting a large number of sample tubes in the lab. By eliminating manual processing steps, this system reduces the workload for laboratory staff and also ensures a greater degree of reliability in the analysis. Due to the unique sample ID with barcode and the logging of all processing steps, transparency and traceability during sample processing are increased.

The patented concept of having two arms working in parallel and the numerous module options combined with the compact and functional design of the system allows for fast, reproducible and above all safe processing of samples, even in complex applications. Powerful database-linked control software supports the user with an extensive range of standard functions. And with so many custom adaptations, this system enjoys maximum integration in existing laboratory workflows.

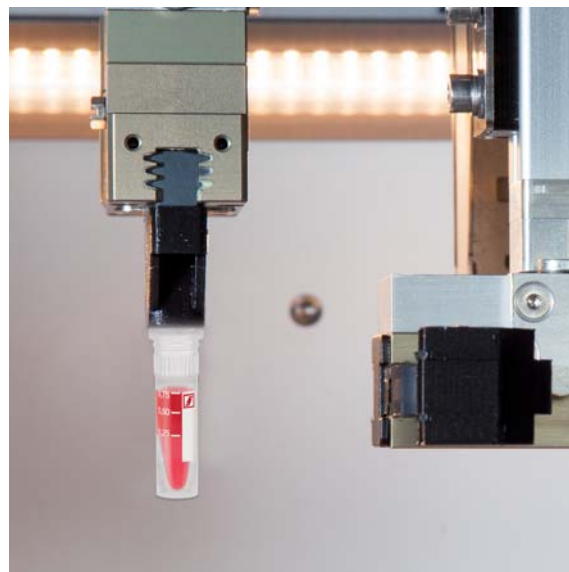


Individual customisation

The IVARO Tube Handler XS has a flexible deck setup that, combined with finished module and rack supports, allows it to be individually adapted to suit specific customer needs for different applications and rack formats. It features numerous modules for equipping the system to meet customer requirements. As a result, this equipment series is optimally suited to a wide range of uses.

Sample preparation in scientific laboratories

The integrated labeller gives the micro tubes a unique barcode. Samples are either added externally or via the pipetting module. One or more solutions can be added by the dispensing module.



Sample handling for biobanks and compound libraries

Sample tubes can be recorded and sorted using the integrated barcode reader or the bottom barcode reader module. New tubes can be labelled with the labeller. The additional four-digit or five-digit weighing module records initial weights and monitors changes in weight during storage. Samples can be aliquoted and reformatted using the pipetting module.



Suitable modules and solutions for your applications

- Sample identification and cherry picking with rack resorting
- Labelling of tubes and vials
- Reforming (vial-to-vial, vial-to-MTP)
- Sample preparation
- Aliquoting of samples (vial-to-vial, vial-to-MTP)
- Initial weight determination and sample monitoring
- Capping and decapping of individual samples and complete racks for further processing, e.g. on a pipetting robot



Available modules

- Label printer with thermotransfer printing, 600 dpi and applicator
- Lid separator
- Pipetting module (1000 µl, LLD)
- Weighing module (four-digit, 0.1 mg, 220 g)
- Dispenser (different systems can also be combined)
 - Syringe modules
 - Peristaltic pumps
 - Gear pumps
 - Positive pressure systems
- Bottom barcode scanner module for reading tubes with 2D codes on the bottom



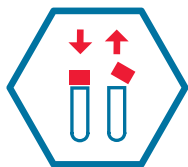
Custom solutions

If our wide range of standard solutions cannot successfully perform your application, we welcome the challenge. Our engineers are ready to help you navigate uncharted territory and develop and implement the software adaptations and modules you may need. Let us know your questions and requirements.



Sample identification, reforming and cherry picking

The IVARO Tube Handler XS features an arm with a mounted barcode scanner (1D, 2D) for removing tubes from any rack arrangement. The arm rotates even as it transports the tube to the target position in order to read the barcode on the sample tube. After samples are identified, new rack arrangements can be compiled or the processing of the sample can start.



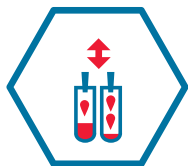
Capping and decapping

The unique double arm design of the IVARO Tube Handler XS allows it to unscrew the cap from the tube during transportation (decapping). After the screw cap is opened a sensor checks the vial to ensure that there is no septum or lid on the tube. The IVARO Tube Handler XS can screw the cap back on the vessel (capping), there is also the option of discarding the caps completely or storing them temporarily.



Dispensing liquids

The IVARO Tube Handler XS optionally features one or more dispensing channels for liquids which can be dispensed by a peristaltic, piston or gear pump, or using the 'positive air pressure' principle depending on your application. Typical dilution or solution techniques involving volumes from 0.1 μ l to several millilitres – as is required in the chemical analysis of HPLC measurements, for example – can be performed safely and quickly.



Pipetting

An optional pipetting module is available for transferring liquids from tube to tube (vial-to-vial), tube to microplate (vial-to-MTP) or microplate to tube (MTP-to-vial). Thanks to the disposable tips in different sizes (with and without filters), the excellent pipetting technology with liquid level detection (cLLD and pLLD) and qualitative pipetting monitoring (QPM), this module produces excellent pipetting results both during aliquoting and serial dilution as well as during other sample reforming and preparation operations.



Weighing

Many applications in the world of analysis or substance libraries call for initial weight determinations. The IVARO Tube Handler XS provides support here through the fully automated weighing of empty tubes and initial samples. Depending on the application, this system can be optionally equipped with a four-digit or five-digit balance or weigh cell (up to 0.01 mg).



Labelling

The label printer labels tubes with a barcode for subsequent identification of the sample. The information on the label can be transmitted immediately before labelling and can contain a timestamp, for example, or even the previously determined weight of the sample. The label is easy to customise and can include plain text, 1D and 2D codes, and logos. Different label sizes and materials are available, including materials that are solvent resistant and temperature resistant to -196°C.



Label printer

Solvent resistant labelling of labware (tubes and vials), cryo labels to -196°C possible, prints.

Logos and text, barcode (1D/2D), measurement results and timestamp among other things. For the use of new vials in the lab.

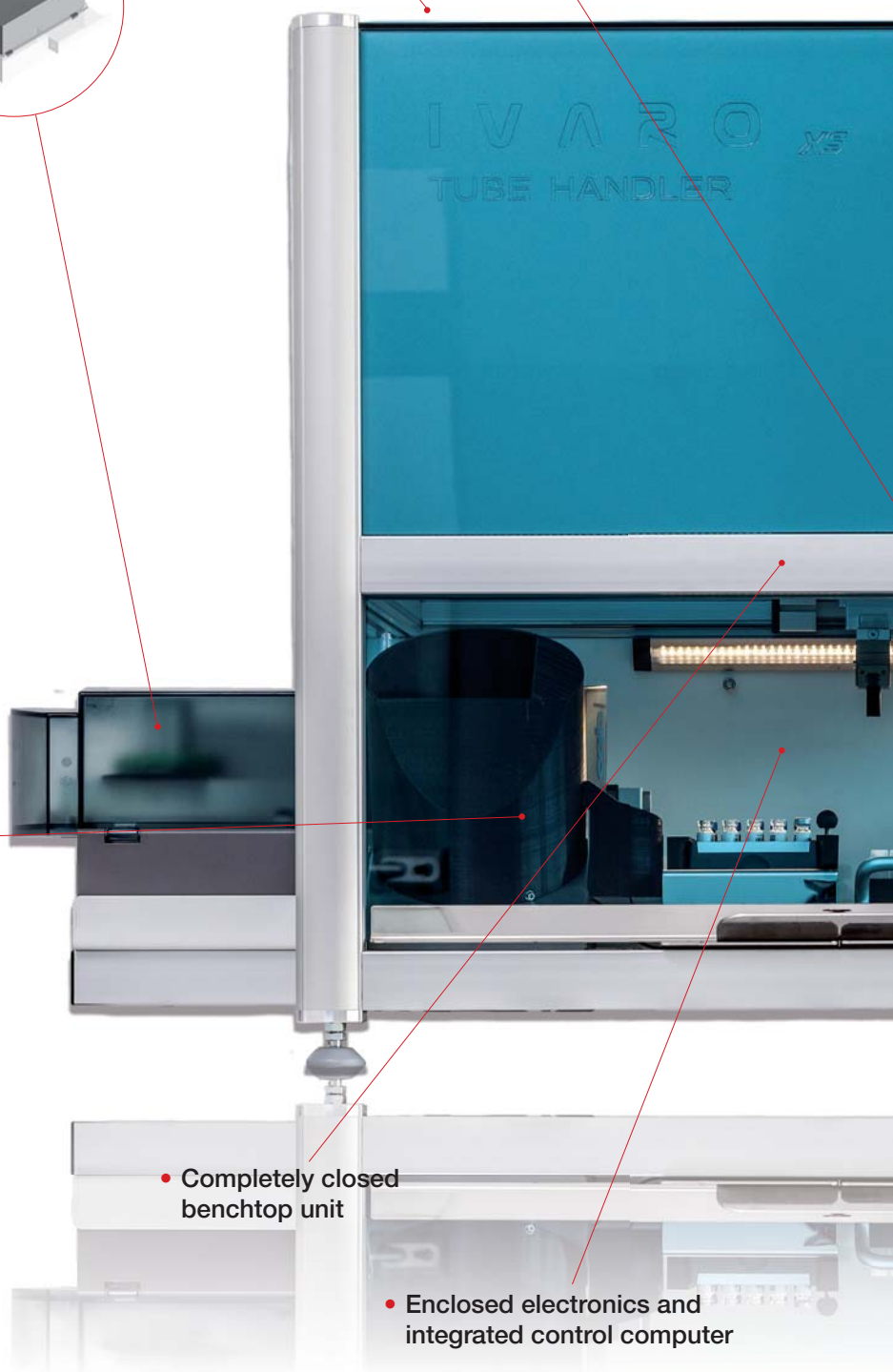


Lid separator

Preparation of screw caps for further processing, sample preparation and aliquoting.

• Optional extraction opening

• Double robotic arm with integrated barcode reader and fill level sensor



• Completely closed benchtop unit

• Enclosed electronics and integrated control computer

Overview of system features

- Flexible deck setup with different support holders



Pipetting module

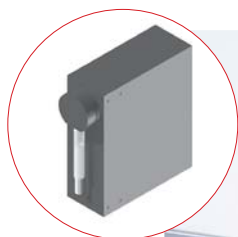
Transfer of liquids up to 1,000 μ l for sample preparation and aliquoting.



Weigh cell

For determination of initial and final weight; four-digit or five-digit balance with and without draft shield. Suitable for applications such as:

initial weight determination, product filling, documentation and QC.



Dispenser

Different systems for any application (peristaltic, syringe and gear pumps, positive pressure systems). For creating mixture solutions and product filling.

- Sliding door with safety shutdown during loading

A.WARE lab automation control

A.WARE lab automation control – an innovative control concept that makes the equipment work exactly how you want it to

The modern, database-linked A.WARE lab automation control software not only controls the IVARO Tube Handler XS but also represents an intuitive user interface thanks to its optimised touchscreen and simple setup.

A.WARE lab automation control supports different data formats (XML, CSV) for smooth data import and export, and therefore seamless integration into existing systems. With countless options for individual customisation to suit your requirements, such as application related reports, selected device drivers and customised interfaces, this automation solution is a welcome addition to the lab that is quick to get to grips with.

The concept of a 'continuous workflow' ensures maximum availability and utilisation of the equipment, enabling A.WARE lab automation control to process different workflows for different samples all at the same time. The system also allows for racks to be unloaded and new racks to be loaded, while other racks are still being processed. The safety conditions prevent accidents in the system, while the self-organisation functions ensure maximum performance for the IVARO Tube Handler XS. A.WARE lab automation control can also be used to control other instruments and even multiple IVARO Tube Handler XS units so the same inventory of samples can be processed.

Secure user management, comprehensive logging and database linked data storage mean that A.WARE lab automation control meets the requirements of regulation FDA CFR 21 Part 11.



Orders can also be generated without software operation using an index service or corresponding variables, sensors and switches. Users can create and even edit processes themselves using the easy graphic editor. There are a number of options for handling errors via both the process control in the editor and in the controls, where steps can be repeated or skipped, or orders can be deleted.

A.WARE lab automation control is therefore just as innovative and powerful as the IVARO Tube Handler XS and provides an optimal basis for managing any application safely and reliably.

A solution, not just a product

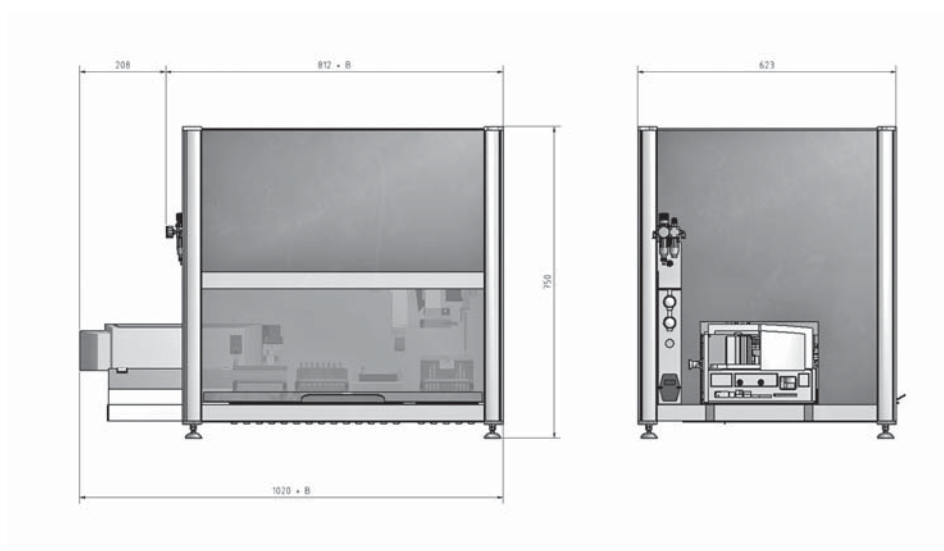
By purchasing the IVARO Tube Handler XS you gain more than just a piece of equipment – you get a comprehensive solution. We are your partner when it comes to designing automation solutions and creating applications. We provide helpful documentation for installation and operation qualification (IQ/OQ). We also offer user training and routine product servicing, so your new equipment can even be used in regulated environments such as GLP or GMP with no problems.

You can also protect yourself from unexpected operating costs and minimise orders by signing a maintenance and service agreement, which will also minimise system downtime. Software updates which normally need to be purchased are included in the service agreement, along with free application support to help you clarify any questions or concerns relating to your application.



Dimensions

Height	750 mm
Depth	623 mm
Width of IVARO 20* basic unit	812 mm
+ W for IVARO 25	150 mm
+ W for IVARO 30	300 mm
+ W for IVARO 35	450 mm
+ W for IVARO 40	600 mm
+ Label printer (optional)**	208 mm



Unit configuration

Vertical arm, infinite rotation	1
Horizontal arm, infinite rotation	1
Barcode scanner for tubes – 2D, 3D	1
Fill level sensor, ultrasound	1
Depth sensor for detecting rack usage	1
PC system (integrated)	1

Throughput***

Read barcode, open screw cap, dispense, close and reset	approx. 25 seconds per sample approx. 140 samples per hour
Read barcode, weigh, label	approx. 20 seconds per sample approx. 180 samples per hour

* This number indicates how many grid points are available in the deck. For example, an MTP rack has five grid points. The right five grid points cannot be reached by the vertical arm and are available to the pipetting module. The left five grid points cannot be reached by the pipetting module.

** The label printer has five grid points from the left.

*** Values may vary depending on the tubes and required accuracy.

1. Basic system

Consisting of a self-supporting housing, duplex lifter unit (DLU) and FlexDeck with grid points. The number indicates how many grid points are available in the deck*. For example, an MTP rack has five grid points.

IVARO-XS 20 – 20 grid points for racks and modules (standard)	IVXS20
IVARO-XS 25 – 25 grid points for racks and modules	IVXS25
IVARO-XS 30 – 30 grid points for racks and modules	IVXS30
IVARO-XS 35 – 35 grid points for racks and modules	IVXS35
IVARO-XS 40 – 40 grid points for racks and modules	IVXS40
IVARO-XS 45 – 45 grid points for racks and modules	IVXS45

2. Add-on options for DLU

Pipetting module	-PM
Crimper for 11 mm caps	-CR

3. Modules (deck setup)

Label printer (five grid points from the left)	-LM
Bottom barcode scanner	-BB
Weigh cell – four digits (three grid points)	-WZ
Lid separator crimp caps 11 mm (five grid points from the left)	-LS
Shaker for SBS format	-SH
Shaker for individual tubes	-MI
Dispenser	-DI

4. FlexDeck holders and rack supports

FlexDeck holder for rack supports with a width of four grid points	FDS4
FlexDeck holder for rack supports with a width of five grid points	FDS5
FlexDeck holder for 50-well HPLC and GC racks with four grid points	FD50
Rack support for 2x81-well (9x9) racks – requires FlexDeck holder FDS5	RT81
Rack support for 3xSBS (horizontal) – requires FlexDeck holder FDS5	RT3S
Rack support for 2xSBS (vertical) – requires FlexDeck holder FDS4	RT2S

This is only a selection of the available holders and rack supports. The range is constantly growing. Please do not hesitate to ask for the right holder for your labware.

5. Software and support

A.Ware – lab automation control software	AW
IQ/OQ – adapted IQ and OQ templates for the selected system	IOQ
Application support	
Maintenance and service agreements	

* Please note: the right five grid points cannot be reached by the vertical arm and are available to the pipetting module. The left five grid points cannot be reached by the pipetting module.



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