

# IVARO Tube Handler

Automated workflow solutions



# THE IVARO TUBE HANDLER

- ✓ Relief from monotonous routine procedures
- ✓ Increased productivity and reliability
- ✓ Maximum transparency and safety
- ✓ Optimal integration with existing laboratory processes

Filling, labeling, scanning, sorting, weighing – demanding and delicate laboratory processes require a precise, specialized, yet flexible system. The innovative IVARO Tube Handler provides an automation system that can be perfectly adapted to your applications.

You can equip the two standard devices, IVARO FD (for filling and dosing) and IVARO AP (for aliquoting and pipetting), with modules tailored to your procedures. This enables you to automate complex manual steps in your laboratory – easily and safely.

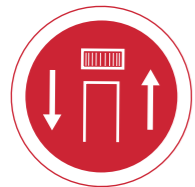
Whether you use screw cap micro tubes, cryotubes or special containers, the IVARO can be adapted to your requirements and procedures. Work with open or closed tubes, load containers and caps separately or place them in the same rack – the flexible system allows you to choose.

The intuitive and user-friendly software helps you organize your process. It will document, manage and plan your sample processing and can be seamlessly integrated into your existing procedures and software solutions.

The IVARO Tube Handler is your automation solution for quick, safe and reproducible sample processing.



# THE IVARO FUNCTIONS



## Capping

The innovative gripper guarantees optimal process speed when you need to open or close tubes. Closed tubes can be processed and open tubes can be made ready. Required screw caps are quick and easy to load in bulk into the appropriate cap feeder. The IVARO sorts them and automatically prepares them for closure.



## Tube feeding

When dealing with high throughput rates, you want to keep set-up and processing times as short as possible. One of the most time-intensive and monotonous procedures is placing tubes in racks. The IVARO Tube Feeder does the work for you. Just place tubes in the Tube Feeder, and it sorts and loads them onto the IVARO as needed.



## Labeling

The tubes are reliably labeled by a variably programmable label printer. It can print barcodes, data matrix codes or other identification markers onto a label and apply them to the tube at any time. Current information such as a recently measured weight or the exact time can also be included in the automatic labeling. The label design is simple to adapt.



## Filling

A classic dispenser module based on a peristaltic pump allows you to fill the tubes with a precise reagent volume. Typical dilution or dissolving steps ranging from a few microliters to several milliliters can be performed quickly and safely.



## Pipetting

The precise pipetting module transfers liquids from tube to tube (vial to vial). Sensor systems such as capacity- and pressure-based Liquid Level Detection (cLLD and pLLD) and Qualitative Pipetting Monitoring (QPM) guarantee excellent and accurately documented pipetting results. Clot and foam detection allows you to pipette even challenging liquids.



## Weighing

The 0.01 mg precision of the scales adds a further control step. The weight of a sample or of an empty container can be determined automatically. This provides additional certainty for analyses and very delicate applications. The measurement results for individual tubes can be clearly documented and tracked.

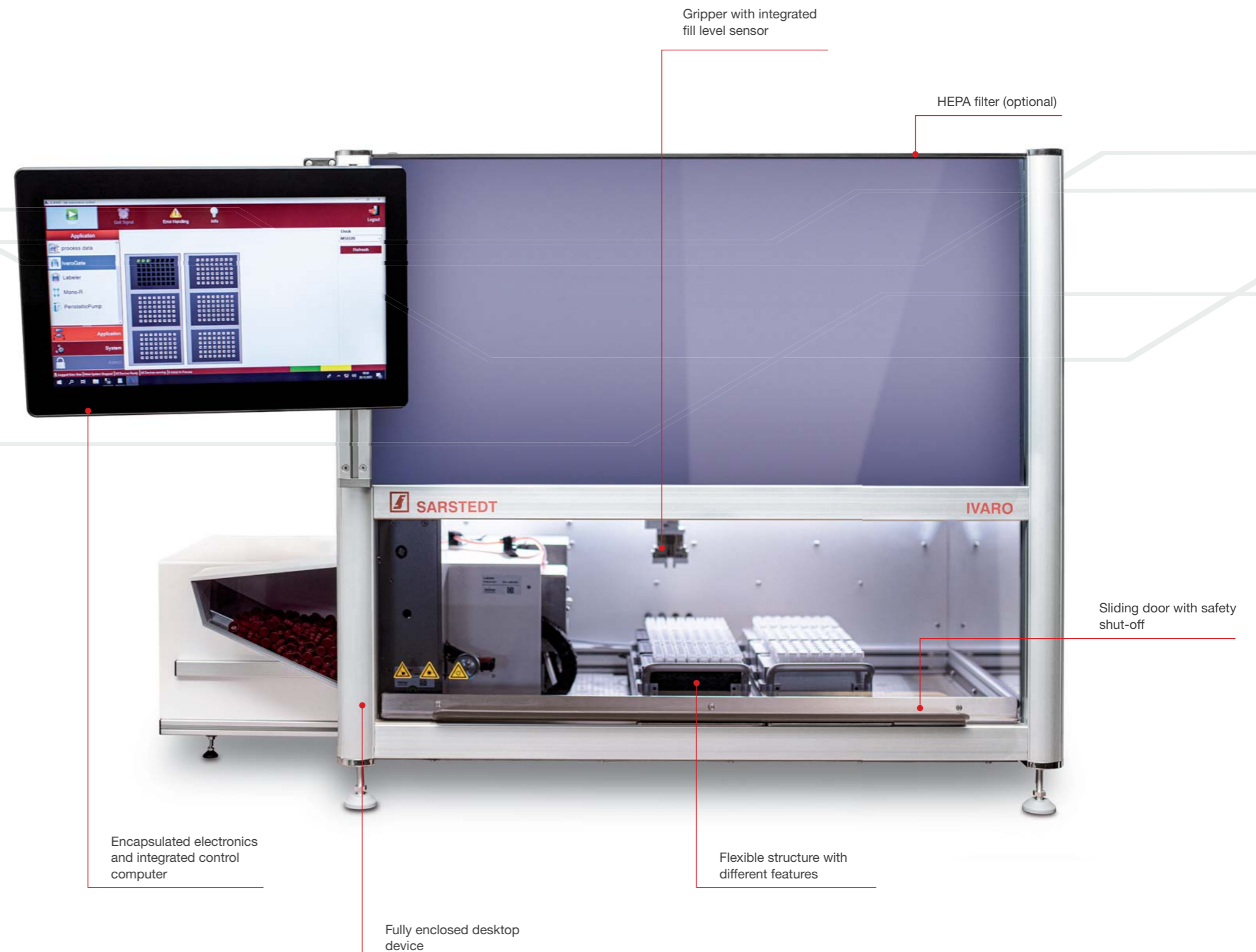
# THE IVARO BASIC UNIT

The IVARO Basic Unit is the basis for your customized Tube Handler. With its variable structure and flexible parameter settings, the IVARO Tube Handler can be individually adjusted to nearly every application and workflow. Time-intensive, complex and monotonous procedures can now be conveniently controlled by one device.

The IVARO Tube Handler meets the requirements of maximum reliability, safety and transparency. Technically sophisticated, fully rotating grippers move your samples securely from one rack to the other. Sensors monitor the filling of each individual rack.

The integrated PC system facilitates full documentation for each sample. The associated software has a database and is intuitive to operate.

The compact device design of the IVARO Tube Handler fits into confined spaces. The work surface is fully enclosed and the sliding door is closed with a handle. This provides you with a completely enclosed working space that protects you and your samples. Self-contained, space-saving and flexible, the IVARO Tube Handler is the ideal automated solution for your workflow.





- ✓ Precise filling
- ✓ Short process times
- ✓ Complete documentation

# THE IVARO FD

## OPTIMAL FILLING AND DOSING

The IVARO FD is the ideal solution for filling small containers with stock solutions, buffers and other liquids. Preparing samples, producing small product series, manufacturing kits and other time-intensive applications are simplified with the IVARO FD. With no manual effort, optimal speed and complete documentation, the IVARO FD supports you in your processes.

The IVARO FD quickly and safely doses and fills containers with several milliliters of liquid. For additional filling quantity control and documentation, the IVARO FD can optionally be fitted with scales.

When dealing with high throughputs, the IVARO Tube and Cap Feeder module automates the time-intensive and monotonous tube set-up process. Just place tubes into the Tube Feeder, and it sorts and loads them onto the IVARO as needed.

Parallel processing of several steps enables optimal process speed, thus saving time and increasing your throughput.





# THE IVARO AP

## PRECISE ALIQUOTING AND PIPETTING

The IVARO AP is more than a liquid handler. It supports you in all types of sample preparation. It can easily fill several identical tubes simultaneously with liquid and aliquot specimens into different containers.

Whether open or closed tubes are to be processed or labeled, the IVARO AP is suitable for your process. The IVARO AP works with a wide range of tube formats, from small diameter screw cap micro tubes to larger containers such as 15 or 50 ml tubes.

A modern pipetting system is at the heart of the IVARO AP. Equipped with a capacity- and pressure-based Liquid Level Detection System (cLLD and pLLD) and precise Qualitative Pipette Monitoring (QPM), pipetting inaccuracies are minimized and dosing processes optimized. Clot and foam recognition allows you to pipette even challenging liquids. This guarantees excellent pipetting results, even with volatile or foaming substances.

The precise and flexible processing of your specimens by the IVARO AP ensures maximum safety and seamless documentation for every specimen and aliquot.

- ✓ Reliable pipetting /aliquoting
- ✓ Safe processing
- ✓ Reproducible process



# LAB AUTOMATION CONTROL

## THE INTERFACE OF THE IVARO TUBE HANDLER

The modern, database-based lab automation control software not only controls the IVARO Tube Handler, it also forms a communication platform between you and your device.

With the possibility to define your own procedure programs, monitor the operation of the IVARO Tube handler and file data in an exportable database structure, it is a reliable tool and a perfect addition to your laboratory documentation. Its secure user management, comprehensive logs and database-based data filing mean that the lab automation control meets the requirements of the FDA CFR 21 Part 11.

Numerous options to customize the device to your individual needs, such as application-based reports, selected device drivers and individual surfaces, combine to enable a process-optimized automation solution.

The "continuous workflow" concept ensures the high availability and capacity of the device. Lab automation control enables different procedures to run simultaneously for different specimens. Unloading and loading a new rack while another rack is still being processed is very easy.

The touchscreen user interface and the clear design ensure an intuitive connection between the user and the IVARO Tube Handler.

Lab automation control is therefore just as innovative and efficient as the IVARO Tube Handler and provides the optimal basis to master every application.



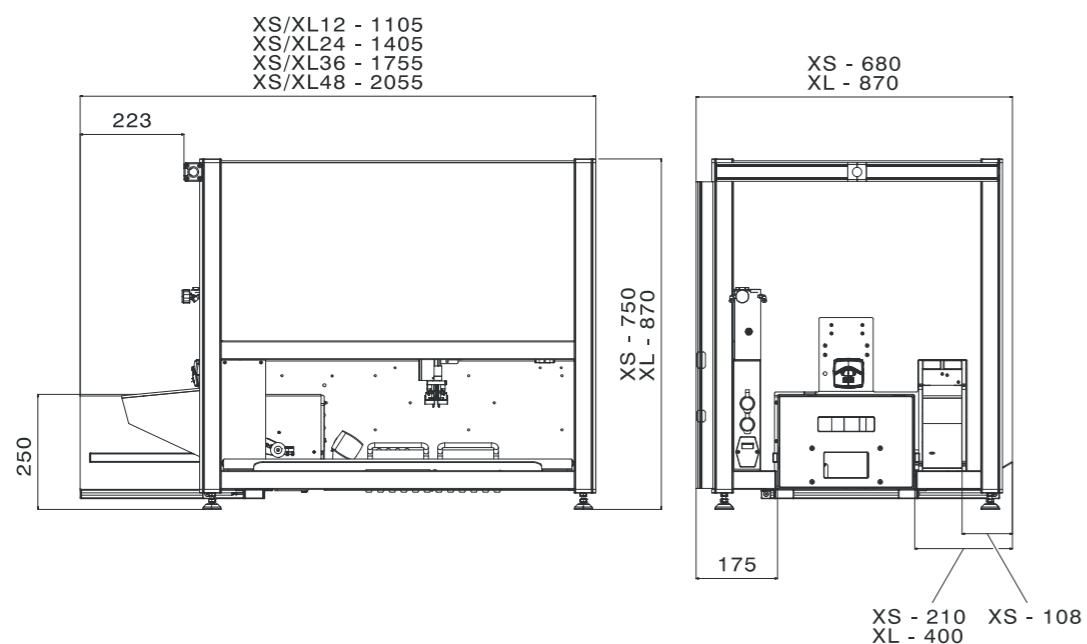
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## MORE THAN JUST A PRODUCT: A SOLUTION

The IVARO Tube Handler is not just a device, it's a solution. SARSTEDT is your partner in designing automation solutions and creating applications. We support you with helpful documentation for installation and operation qualification (IQ/OQ) and user training. This means that nothing stands in the way of using these devices in regulated environments such as GLP or GMP.

You can also protect yourself against unexpected operational costs and simplify the order process with a maintenance and service contract. Our established and extensive service structure allows us to help you quickly and simply with any questions or concerns. We continue to be your reliable partner, even following your purchase of the IVARO.

# IVARO FD TECHNICAL DATA



## DEVICE DIMENSIONS

Device type	Device dimensions			Number of rack places (SBS format)
	Height	Width	Length	
IVARO XS	750 mm	680 mm	1,105 mm	6
			1,405 mm	12
			1,755 mm	18
			2,055 mm	24
IVARO XL	870 mm	870 mm	1,105 mm	10
			1,405 mm	20
			1,755 mm	30
			2,055 mm	40

## TUBE COMPATIBILITY

Device type	Diameter	Length
IVARO XS	10–25 mm	30–80 mm
IVARO XL	10–25 mm	30–120 mm

## LABELING UNIT

Printing principle	Thermal transfer		
Print resolution	600 dpi		
Carrier tape	Width	Thickness	Width
	24–28 mm	0.03–0.16 mm	12–25 mm
Label	Length	Thickness	
	from 25 mm	0.03–0.16 mm	
Roll	Core diameter	External diameter	
	38.1–76 mm	up to 205 mm	

Note: You can find compatible labels on page 18.

## DISPENSING PUMP

Type of system	Hose pump		
Operation principle	Peristaltic		
Hoses	Internal diameter	Wall thickness	
	0.5–4.8 mm	1.6 mm	

Accuracy and precision			
Hose internal diameter	Tested volume	Accuracy	Precision
0.8 mm	10 µl	< 2%	< 50%
	50 µl	< 2%	< 20%
	100 µl	< 2%	< 4%
	500 µl	< 2%	< 2%
	1,000 µl	< 1%	< 1%
	5,000 µl	< 1%	< 1%
	10,000 µl	< 1%	< 1%
2.4 mm	50,000 µl	< 1%	< 1%
	10 µl	< 20%	< 100%
	50 µl	< 15%	< 20%
	100 µl	< 10%	< 15%
	500 µl	< 2%	< 2%
	1,000 µl	< 1.5%	< 2%
	5,000 µl	< 1%	< 1%
	10,000 µl	< 1%	< 1%
	50,000 µl	< 1%	< 1%

## TUBE FEEDER (optional)

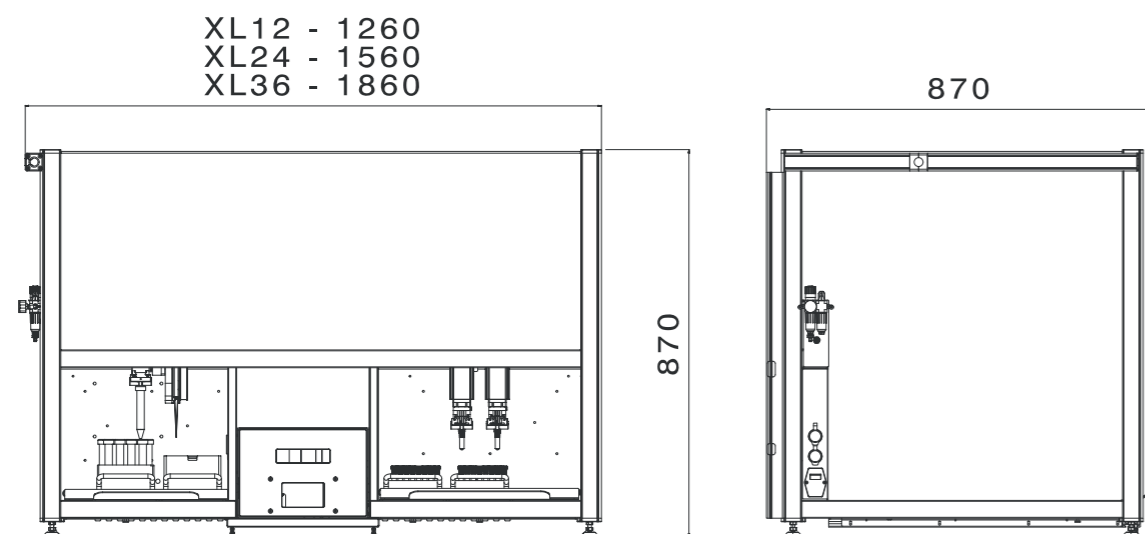
Capacity	Tube type
500 pieces	SARSTEDT screw cap micro tubes

## CAP FEEDER (optional)

Capacity	Cap type
500 pieces	SARSTEDT screw caps for screw cap micro tubes



# IVARO AP TECHNICAL DATA



## DEVICE DIMENSIONS

Device type	Device dimensions			Number of rack places Primary side (SBS format)	Number of rack places Secondary side (SBS format)
	Height	Width	Length		
IVARO XL	870 mm	870 mm	1,260 mm	6	10
			1,560 mm	12	20
			1,860 mm	24	30

## TUBE COMPATIBILITY

Tubes	Diameter	Length
Secondary	10–25 mm	30–120 mm
Primary	10–28 mm	30–120 mm

## TUBE FEEDER (optional)

Capacity	Tube type
500 pieces	SARSTEDT screw cap micro tubes

## PIPETTING UNIT

Type of system	Pipette
Operation principle	Piston stroke
Tips	300 µl slim, 1,000 µl

Pipetting capacity			
Tip volume	Pipetting volume	Accuracy	Precision
300 µl	10 µl	5.00%	2.00%
	50 µl	2.00%	0.75%
	300 µl	1.00%	0.75%
1,000 µl	10 µl	7.50%	3.50%
	100 µl	2.00%	0.75%
	1,000 µl	1.00%	0.75%

## DISPENSING PUMP

Type of system	Hose pump		
Operation principle	Peristaltic		
Hoses	Internal diameter	Wall thickness	
	0.5–4.8 mm	1.6 mm	

Accuracy and precision			
Hose internal diameter	Tested volume	Accuracy	Precision
0.8 mm	10 µl	< 2%	< 50%
	50 µl	< 2%	< 20%
	100 µl	< 2%	< 4%
	500 µl	< 2%	< 2%
	1,000 µl	< 1%	< 1%
	5,000 µl	< 1%	< 1%
	10,000 µl	< 1%	< 1%
	50,000 µl	< 1%	< 1%
	2.4 mm	10 µl	< 20%
50 µl		< 15%	< 20%
100 µl		< 10%	< 15%
500 µl		< 2%	< 2%
1,000 µl		< 1.5%	< 2%
5,000 µl		< 1%	< 1%
10,000 µl		< 1%	< 1%
50,000 µl		< 1%	< 1%

## LABELING UNIT

Printing principle	Thermal transfer		
Print resolution	600 dpi		
Carrier tape	Width	Thickness	Width
	24–28 mm	0.03–0.16 mm	12–25 mm
Label	Length	Thickness	
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Roll	Core diameter	External diameter	
	38.1–76 mm	up to 205 mm	

Note: You can find compatible labels on page 18.

# ORDER INFORMATION

## IVARO Tube Handler

With the IVARO Tube Handler, we have developed a very modern and innovative solution for laboratory automation. We would be delighted to advise you and help with design and implementation; we remain your constant partners for service and support.

### LABELS

Order no.	Name	Packaging
84.2620.001	Label 12 x 33 mm, unprinted	4,000 pc./roll 8,000 pc./box
84.2620.002	Label 12 x 42 mm, unprinted	4,000 pc./roll 8,000 pc./box
84.2620.003	Label 20 x 30 mm, unprinted	3,500 pc./roll 7,000 pc./box
91.2620.020	Thermal transfer ribbon, 300 x 40 mm, black	2 rolls / box

*Note: We can supply customized label formats upon request.*

### HOSE SET

Order no.	Name	Packaging
92.2620.301	Hose set, Bioprene, 2.4x1.6 mm	1 pc. / bag 10 pc./box
92.2620.302	Hose set, Bioprene, 0.8x1.6 mm	1 pc. / bag 10 pc./box
92.2620.303	Hose set, silicone, 2.4x1.6 mm	1 pc. / bag 10 pc./box
92.2620.304	Hose set, silicone, 0.8x1.6 mm	1 pc. / bag 10 pc./box

### PIPETTE TIPS

Order no.	Name	Packaging
70.1193.150	Filter tips, 1,000 µl, black	5x 96 pc./rack 3,840 pc./box
70.1193.350	Filter tips; 300 µl slim, black	5x 96 pc./rack 3,840 pc./box





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