



## Cavro<sup>®</sup> Omni Robot

Flexible liquid handling robotics component

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## Cavro Omni Robot – flexible liquid handling robotics component

The Cavro Omni Robot is a general purpose liquid handling component designed to offer reliable pipetting for a wide range of applications, including clinical diagnostics, life sciences and analytical chemistry. Its flexible, modular construction makes the Cavro Omni Robot easy to integrate into almost any instrument design, with a range of options to suit your pipetting needs.

### Modularity for flexibility

The Cavro Omni Robot's modular design is unique among laboratory automation components and offers superior flexibility, making the Cavro Omni Robot easily configurable for many different applications and customer needs. Various lengths and orientations of all three axes are available, and can be combined with a choice of single- or 8-channel pipetting arms, plus a gripper module, ensuring that the robot has been built with the features you require.

### Easy integration

Integrating the Cavro Omni Robot into an enclosed instrument or a table top standalone unit is straightforward by design. Its flexible mounting options and ethernet interface allow easy installation, making the Cavro Omni Robot the ideal choice of OEM robotics component.

### High payload

The Cavro Omni Robot offers a high payload capacity, which opens up a broad range of capabilities for automation solutions.



Cavro Omni Robot – modular design for a complete OEM liquid handling solution



#### **Robustness for reliability**

The simple design of the Cavro Omni Robot promises the same high levels of reliability and reduced maintenance that is characteristic of all Tecan Cavro products, offering consistent performance during long hours of continuous use. Compact linear motion slides combine high precision and smooth movements, while industry-proven stepper motors and self-lubricating bearings add to the durability of the low-maintenance Cavro Omni Robot.

#### **Closed-loop positioning**

The positioning system on the Cavro Omni Robot provides you with the security and assurance of knowing exactly where the pipetting probe is located at all times. Feedback signals are used to verify that the target position has been reached successfully.

#### **Quality and experience**

Tecan Cavro brand components have provided innovative and reliable liquid handling for instrument designers in almost any application. Tecan Cavro OEM components are designed and manufactured to high quality standards, meeting ISO 13485 requirements and the EU RoHS Directive. Tecan Systems is a leading supplier of OEM components for laboratory automation and liquid handling instruments, and you can have confidence in the performance, workmanship and dependability of Tecan Cavro products.



Gripper with eccentric fingers

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## Cavro Omni Robot – for your most important applications

### Features

The Cavro Omni Robot is designed specifically for OEM applications, offering the flexibility and features you need to ensure seamless integration into your application. With an enclosed design and highly configurable mechanics – allowing almost any combination of axes in a single- or multi-axis set-up – you can be sure that the Cavro Omni robot will offer precise pipetting in a reliable, professional looking package that can grow with your application.



Low-maintenance stepper motors and closed-loop positioning offer repeatability down to less than 0.12 mm for X- and Y-axes, and either fixed probes or disposable tips can be chosen to suit your application. Onboard tip detection increases process security, and tips can be ejected at any Z-axis position. The Cavro Omni Robot also features capacitive (cLLD) liquid level detection, with adjustable sensitivity to minimize cross-contamination.

The Cavro Omni Robot's firmware and software have been developed with ease of integration in mind, with a command set optimized for liquid handling to enable shorter development and faster time-to-market. The Cavro Omni Robot's configurable firmware simplifies programming of the robot, allowing instrument designers to concentrate on applications rather than control of individual robotic axes. The robot's software also provides a range of pipetting and sample handling features, as well as the drivers for easy integration with other Tecan Cavro components and third party devices.



The Cavro Fusion software tool gives users the ability to easily connect to and operate Tecan Cavro modules for performance evaluation, offering both a straightforward graphical user interface (GUI) for basic control of the robot, and a scripting environment for writing automated scripts, bench testing, application testing and on-site troubleshooting.

## Cavro Omni Robot – customized to your needs

### Configurable XY axes

The Cavro Omni Robot is designed to be highly configurable, allowing numerous combinations of standard axes, with up to two arms per X-axis. Left- and right-oriented Y-axes and corresponding Z-drives are available, ensuring there is a Cavro Omni Robot to meet the demands of your application.

X-axis			
Travel (mm)	Dimension (mm)	Single-arm	Dual-arm
1,250	1,450		
750	950		
500	750		

Y-axis (left and right orientations available)		
Travel (mm)	Dimension (mm)	Y-axes
300	585	
150	435	

### Z-axis (left and right orientations available)

The Cavro Omni Robot is available with Standard or Universal Z-axis options to extend the flexibility of the system.

#### The Standard Z-axis offers:

- Force: capabilities for picking and ejecting disposable tips, and cap piercing
- Flexible probe options using single probe or disposable tips with liquid detection capabilities



#### The Dual Z-axis offers:

- Improved productivity with two standard Zs on the same arm
- Configurable to 9 mm or 18 mm spacing between each axis
- Flexible probe options using single probe or disposable tips with liquid detection capability



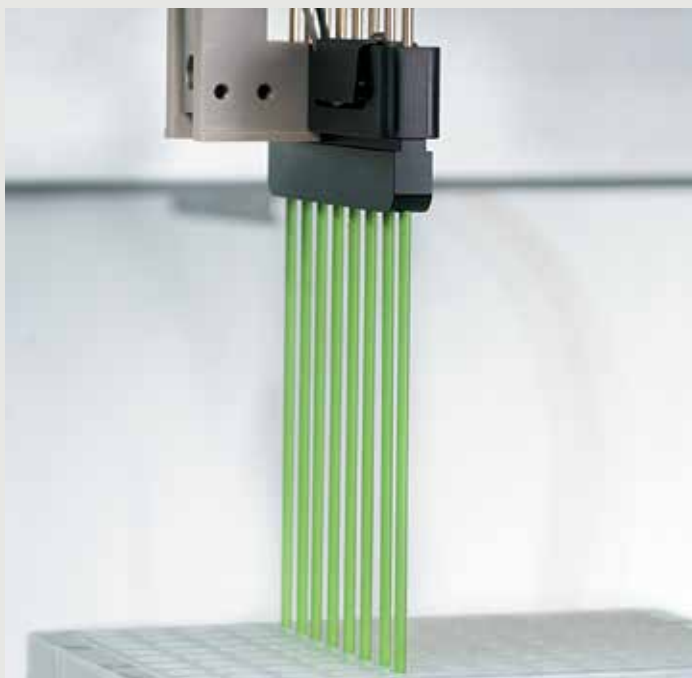
#### The Universal Z-axis offers:

- Higher payload capacity for maneuvering sample tubes and microplates or attaching your own custom payload
- Easy mechanical integration of an 8-channel pipetting head, a Gripper option, or an ADP
- A wide flex chain is available with higher capacity for routing of 8-channel tubing



## Cavro Omni Robot – versatile liquid handling

### Omni options that can be used with the Universal Z



Universal Z with 8-channel pipetting head

#### 8-channel pipetting head

The Cavro Omni Robot is available with single- or 8-channel pipetting heads, offering greater application and throughput flexibility. The 8-channel head features 9 mm inter-channel spacing to suit most common microplate formats, and can be mounted in landscape orientation. It is also enabled for cLLD, helping to enhance process security and minimize the risk of cross-contamination.



Gripper with Centric fingers



Gripper with Tube fingers

#### Gripper

Using the Universal Z-axis, the Cavro Omni Robot can be equipped with a Gripper head to allow automated manipulation of standard tube and microplates formats, in either landscape or portrait orientations. This option can be used to significantly enhance walkaway times for your application by reducing the need for manual intervention during processing.



Omni with ADP option

#### ADP

The Cavro Omni Robot can be fully integrated with the Cavro Air Displacement Pipettor (ADP), a pneumatically-driven pipetting option for integration into instruments requiring minimal maintenance or where space is at a premium. Designed to provide process security to your instrument and application, the ADP has on-board tip detection, tip ejection, and a pressure sensor for liquid level detection (pLLD).

- Pipetting range: < 1 - 1,000  $\mu$ l
- Tip compatibility: Tecan LiHa disposable tips 10, 50, 200, and 1,000  $\mu$ l

## Specifications

<b>Power requirements</b>			
Operating voltage	24V DC		
Peak current	≤ 3.0 A (in XYZ single-arm configuration) ≤ 6.0 A (in XYZ dual-arm configuration)		
<b>Communications</b>			
To other Tecan Cavro devices	RS485		
To host	Ethernet, TCP/IP		
<b>Mechanical</b>	<b>*X-axis</b>	<b>Y-axis</b>	<b>Z-axis</b>
Travel length/overall dimension	500/700 mm 750/950 mm 1,250/1,450 mm	150/435 mm 300/585 mm	210/655 mm
	*Note: travel length of X-axes for dual arms is reduced by: 113 mm when both z-axes face away from each other 135 mm when two Universal Z axes face toward each other 165 mm when two Dual Z axes face toward each other		
Maximum payload for each axis	6.6 kg (incl. Y- and Z-axes)	3.2 kg (incl. Z-axis)	Universal Z: 1.5 kg Standard Z: Tecan tip options
Accuracy for each axis (at the tip)	±0.3 mm up to 1,000 mm ±0.4 mm up to 1,250 mm	±0.3 mm	Universal Z: ±0.25 mm Standard Z: ±0.4 mm
Repeatability to devices	XYZ, (at the tip) bi-directional X: ≤0.2 mm Y ≤0.2 mm Z: ≤0.4 mm (Standard Z) Z: ≤0.15 mm (Universal Z)		
Operating conditions	10 – 40 °C (50 – 104 °F), 30 – 80 % RH		
Storage temperature	-20 – 70 °C (-4 – 158 °F)		
<b>Options</b>			
Disposable tips	Requires Standard Z-axis		
8-channel head	Requires Universal Z-axis		
Gripper	Requires Universal Z-axis		

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