

# Install optional outlet valves

## Instructions for Use

### Scope

This document describes how to install optional outlet valves on ÄKTA™ systems. See the table below for a list of optional valves for the different ÄKTA systems.

ÄKTA avant™ 25	ÄKTA avant 150	ÄKTA pure™ 25	ÄKTA pure 150	ÄKTA go™
Outlet valve V9-O2 (28957238)	Outlet valve V9H-O2 (28979332)	Outlet valve V9-O kit (29012261)	Outlet valve V9H-O kit (29050949)	Outlet valve V9-O kit (29012261)
Outlet valve V9-O3 (28957240)	Outlet valve V9H-O3 (28979337)	Outlet valve V9-Os kit (29011356)	Outlet valve V9H-Os kit (29090694)	Outlet valve V9-Os kit (29011356)
		Outlet valve V9M-Os (29502129)		

## Location of the outlet valves

### Introduction

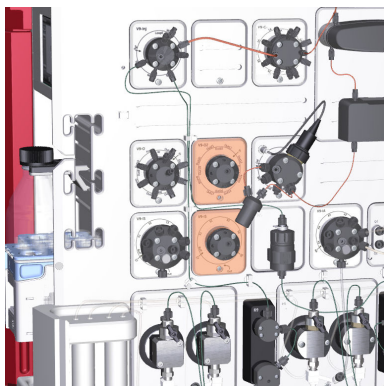
When using the ÄKTA avant standard configuration with one Outlet valve, 10 outlet positions are available. To increase the number of outlets, one or two extra Outlet valves can be connected, adding up to a total of 21 or 32 outlet positions. This optional configuration is convenient when collecting large fraction sizes outside the Fraction collector.

The ÄKTA pure instrument can be configured with Outlet valve **V9-O** or **V9H-O**, with Outlet valve **V9-Os**, **V9M-Os**, or **V9H-Os**, or without any installed outlet valve.

The ÄKTA go instrument can be configured with Outlet valve **V9-O**, or with Outlet valve **V9-Os**, or without any outlet valve.

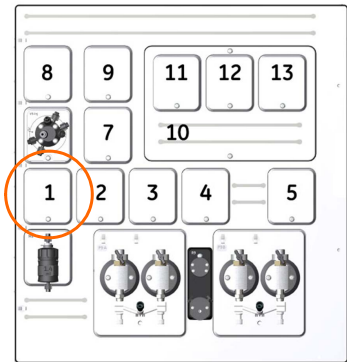
# ÄKTA avant

It is recommended to install the extra outlet valves in the middle and in the lower positions. The illustration below shows the recommended positions.



# ÄKTA pure

A module can be placed anywhere in the ÄKTA pure cabinet. Its function is determined by the node ID. To achieve a good flow path most modules have a dedicated location in the cabinet. The illustration below shows the dedicated location for the outlet valves. Any constraints are described in the table below.

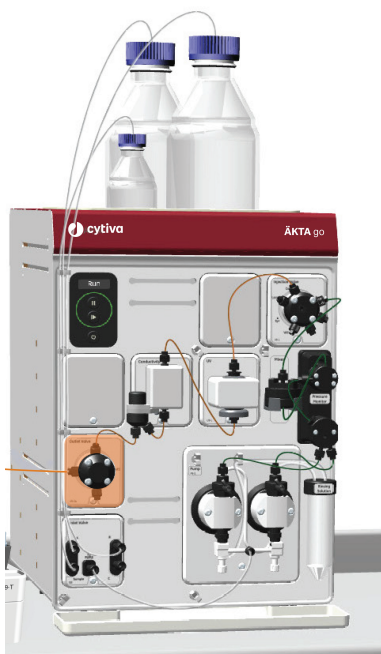


Module	Constraints
Outlet valve <b>V9-Os</b> , <b>V9M-Os</b> , or <b>V9H-Os</b>	Cannot be used at the same time as Outlet valve <b>V9-O</b> or <b>V9H-O</b> .

Module	Constraints
Outlet valve <b>V9-O</b> or <b>V9H-O</b>	Cannot be used at the same time as Outlet valve <b>V9-Os</b> , <b>V9M-Os</b> , or <b>V9H-Os</b> .

## ÄKTA go

A module can be placed anywhere in the ÄKTA go cabinet. The function of the module is determined by the node ID. To achieve a good flow path most modules have a dedicated location in the cabinet. The illustration below shows the dedicated location for the outlet valves. Any constraints are described in the table below.



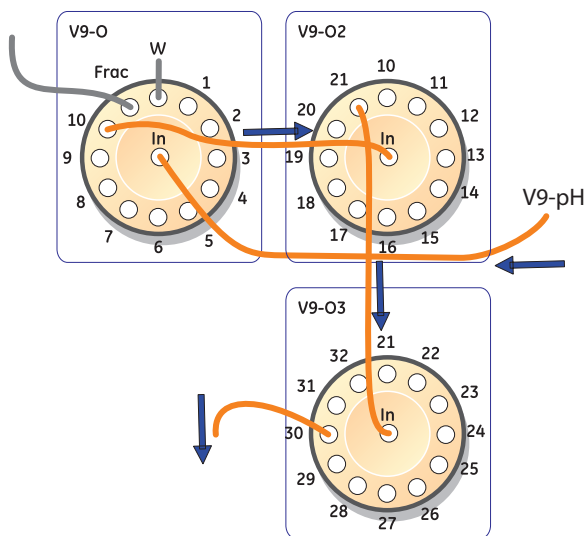
Module	Constraints
Outlet valve <b>V9-Os</b>	Cannot be used at the same time as Outlet valve <b>V9-O</b> .
Outlet valve <b>V9-O</b>	Cannot be used at the same time as Outlet valve <b>V9-Os</b> .

# Flow path

## ÄKTA avant

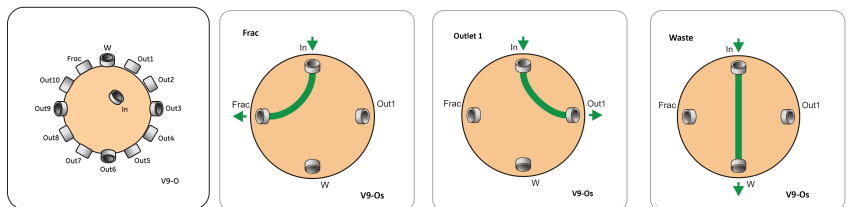
The tubing from the pH monitor is connected to the **In** port of the Outlet valve (**V9-O** or **V9H-O**). The **Out 10** port of the Outlet valve (**V9-O** or **V9H-O**) is connected to the **In** port of the extra Outlet valve (**V9-O2** or **V9H-O2**). The **Out 21** port of the first extra Outlet valve is connected to the **In** port of the second extra Outlet valve.

The illustration below shows the flow path with two extra Outlet valves installed on ÄKTA avant 25.



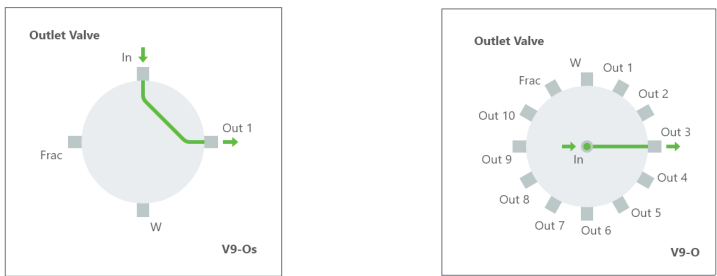
## ÄKTA pure

The tubing from the module upstream of the outlet valve is connected to the **In** port of Outlet valve **V9-O** or **V9H-O** or Outlet valve **V9-Os**, **V9M-Os**, or **V9H-Os**.



# ÄKTA go

The tubing from the module upstream of the outlet valve is connected to the **In** port of Outlet valve **V9-Os** or Outlet valve **V9-O**.



## Installing the outlet valve

Follow the steps below to replace or install a module or Module Panel. For any position that is not occupied, a Module Panel must be installed. The newly installed module is then added to the **System properties** in the UNICORN™ software.

**Note:** The illustrations show the principle of how to replace and install a module. The position of the module on the instrument depends on the type of the module.

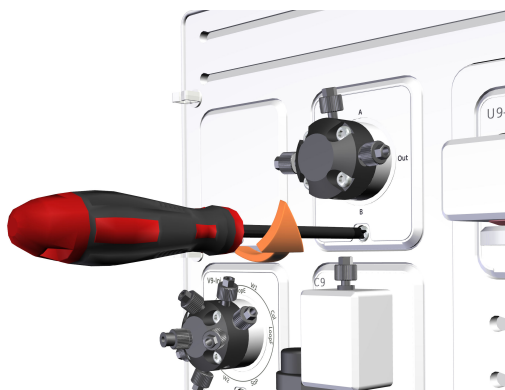


**CAUTION**  
**Disconnect power.** Always switch off power to the instrument before replacing any of its components, unless stated otherwise in the user documentation.

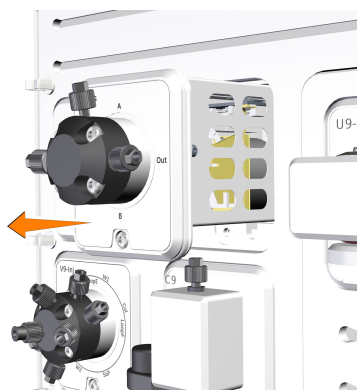
Step	Action
1	Disconnect power from the instrument by using the instrument power button.
2	If a module is to be replaced, loosen the tubing connectors and remove the tubing from the existing module.
<b>Note:</b> This step does not apply for a dummy module.	

Step	Action
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- |   |   |
|---|---|
| 3 | Loosen the screw in the module or Module Panel with a Torx T20 screwdriver. |
|---|---|

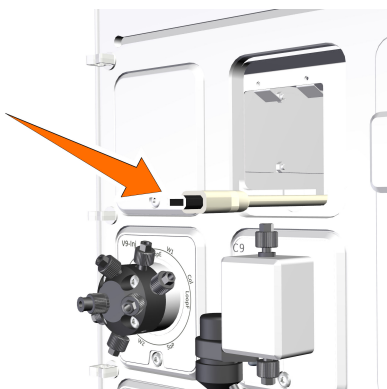


- |   |                                    |
|---|------------------------------------|
| 4 | Remove the module or Module Panel. |
|---|------------------------------------|



Step	Action
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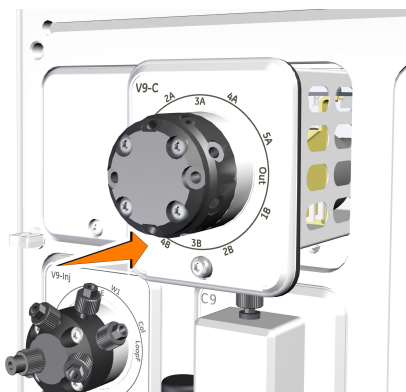
- |   |   |
|---|---|
| 5 | Disconnect the cable and secure it in the slit. |
|---|---|



- |   |  |
|---|--|
| 6 | Connect the cable to the new module or Module Panel. |
|---|--|

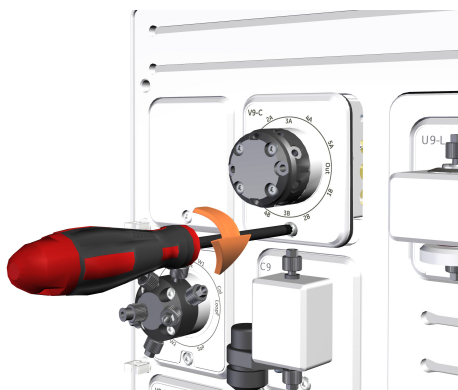


- |   |                                    |
|---|------------------------------------|
| 7 | Insert the module or Module Panel. |
|---|------------------------------------|



Step	Action
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8	Fasten it with a Torx T20 screwdriver.
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**Note:** A warning message is displayed at startup if a module has been installed in the instrument but not added to the current system configuration in UNICORN.

## Connect tubing

The tables below show the recommended connectors and tubing.

### ÄKTA avant 25

Tubing label	Connection	Tubing	Connector	Tubing length (mm)
10	Standard Outlet valve and first extra Outlet valve	PEEK, o.d. 1/16", i.d. 0.50 mm (orange)	Fingertight connector 1/16"	220
11	First extra Outlet valve and second extra Outlet valve			220

## ÄKTA avant 150

Tubing label	Connection	Tubing	Connector	Tubing length (mm)
<b>10</b>	Standard Outlet valve and first extra Outlet valve	PEEK, o.d. 1/16", i.d. 1 mm (beige)	Tubing connector 5/16" + Ferrule 1/16"	220
<b>11</b>	First extra Outlet valve and second extra Outlet valve			220

## ÄKTA pure 25

Tubing label	Connection	Tubing	Connector	Tubing length (mm)
<b>9</b>	Flow restrictor and Outlet valve	PEEK, o.d. 1/16", i.d. 0.50 mm (orange)	Fingertight connector 1/16"	135
<b>9pH</b>	pH valve and Outlet valve			160

For ÄKTA pure micro / Micro kit for ÄKTA pure 25 refer to *ÄKTA pure User Manual*, 29119969 or *ÄKTA pure Operating Instructions*, 29022997.

**Note:** If no Outlet valve is installed, remove the Union F/F between tubing **9** and tubing **W**. Connect tubing **9** to the **In** port on the Outlet valve and the waste tubing **W** to the **W** port on the Outlet valve.

## ÄKTA pure 150

Tubing label	Connection	Tubing	Connector	Tubing length (mm)
<b>9</b>	Flow restrictor and Outlet valve	PEEK, o.d. 1/16", i.d. 0.75 mm (green)	<b>V9H-0s:</b> Fingertight connector 1/16"	135

Tubing label	Connection	Tubing	Connector	Tubing length (mm)
<b>9pH</b>	pH valve and Outlet valve		<b>V9H-O:</b> Tubing connector 5/16" + Ferrule 1/16"	160

**Note:** If no Outlet valve is installed, remove the Union F/F between tubing **9** and tubing **W**. Connect tubing **9** to the **In** port on the Outlet valve and the waste tubing **W** to the **W** port on the Outlet valve.

**Note:** To install **V9H-O**, replace fingertight connector 1/16" with tubing connector 5/16" and ferrule 1/16" on tubing **9/9pH, frac** and **W**.

## ÄKTA go

Tubing label	Connection	Tubing	Connector	Tubing length (mm)
<b>9</b>	Flow restrictor and Outlet valve	PEEK, o.d. 1/16", i.d. 0.50 mm (orange)	Fingertight connector 1/16"	135
<b>9pH</b>	pH valve and Outlet valve			160

## Outlet tubing

Instrument	Description	Tubing label	Tubing	Tubing length (mm)
ÄKTA avant 25	Outlets from Outlet valve	<b>Out1 - Out32</b>	ETFE, o.d. 1/16", i.d. 1 mm	1000
ÄKTA avant 150	Outlets from Outlet valve	<b>Out1 - Out32</b>	ETFE, o.d. 1/8", i.d. 1.6 mm	1000
ÄKTA pure 25	Outlets from Outlet valve	<b>Out1 - Out10</b>	ETFE, o.d. 1/16", i.d. 1 mm	1500

Instrument	Description	Tubing label	Tubing	Tubing length (mm)
ÄKTA pure 150	Outlets from Outlet valve	<b>Out1 - Out10</b>	ETFE, o.d. 1/8", i.d. 1.6 mm	1500
ÄKTA go	Outlets from Outlet valve	<b>Out1 - Out10</b>	ETFE, o.d. 1/16", i.d. 1.0 mm	1500

## Node ID

All modules have a pre-configured Node ID according to their function. The Node ID is used by the instrument to distinguish between several units of the same type. The function of a module can be changed by changing its Node ID.

In a troubleshooting situation it can be useful to check the Node ID of the module.

**Note:** *The function of a module is defined by its Node ID, not by its physical position.*

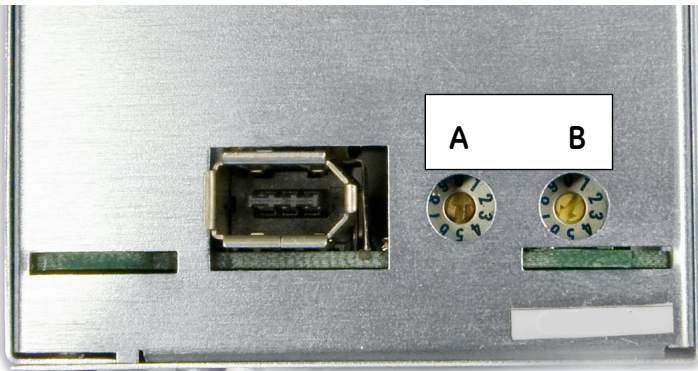
The table below lists Node ID for the optional outlet valves used in ÄKTA avant, ÄKTA pure and ÄKTA go.

Module	Label	Node ID
Outlet valve V9-O or V9H-O	<b>V9-O or V9H-O</b>	8
Outlet valve V9-O2 or V9H-O2	<b>V9-O2 or V9H-O2</b>	9
Outlet valve V9-O3 or V9H-O3	<b>V9-O3 or V9H-O3</b>	10
Outlet valve V9-Os, V9M-Os, or V9H-Os	<b>V9-Os, V9M-Os, or V9H-Os</b>	19

## Set the Node ID

The Node ID is set by positioning the arrows of the one or two rotating switches at the back of the valve. Use a screw driver to set the arrows of the switches to the desired number.

Follow the steps below to set, check, or change the Node ID of a module.

Step	Action
1	<p>Remove the existing or dummy module from the instrument according to the hardware installation instruction below.</p> <ul style="list-style-type: none"> <li>• The first rotating switch, labeled <b>A</b> sets the tens.</li> <li>• The second switch, labeled <b>B</b> sets the units.</li> <li>• Example: for Node ID <b>19</b>, the <b>A</b> switch is set to <b>1</b> and the <b>B</b> switch to <b>9</b>.</li> </ul>
	
2	Check the Node ID and compare it with the listed Node IDs in the table above.
3	Install the outlet valve in the instrument.

## Software configuration

When a new module has been installed, the **System properties** for the system has to be updated in UNICORN. The system restarts automatically when the configuration has been changed and the system can be reconnected.

Follow the instructions below to update the system in UNICORN.

Step	Action
1	<p><b>a.</b> In the <b>Administration</b> module, select <b>Tools</b> → <b>System Properties</b> or click the <b>System Properties</b> icon to open the dialog.</p> <p><i>Result:</i> The <b>System Properties</b> dialog is displayed.</p> <p><b>b.</b> Select the system of interest in the <b>System Properties</b> dialog.</p>

Step	Action
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c. Click the **Edit** button.

**Note:**

*Only active systems can be edited.*

**Result:**

The **Edit** dialog is displayed.

Component selection	Property
<input checked="" type="checkbox"/> Injection valve	V9M-J
<input type="checkbox"/> Sample pump S9	
<input checked="" type="checkbox"/> Inlet A	V9-IAB part A (2-por...
<input checked="" type="checkbox"/> Inlet B	V9-IAB part B (2-por...
<input type="checkbox"/> Sample inlet (V9-IS)	
<input type="checkbox"/> Inlet valve X1 (V9-IX)	
<input type="checkbox"/> Inlet valve X2 (V9-IX)	
<input type="checkbox"/> Mixer valve (V9-M)	
<input type="checkbox"/> Loop valve (V9-L)	
<input type="checkbox"/> V9-Cs (1-column)	
<input type="checkbox"/> V9-C (5-columns)	
<input type="checkbox"/> Column valve 2nd (V9-C2)	
<input type="checkbox"/> pH valve (V9-pH)	
<input checked="" type="checkbox"/> Outlet valve	V9-O (10-outlets)
<input type="checkbox"/> Versatile valve (V9-V)	
<input type="checkbox"/> Versatile valve 2 (V9-V2)	

2 a. Select **Valves** from the **Component types** list.

**Result:**

All available valves are shown in the **Component selection** list.

b. Click the **Outlet valve** checkbox.

c. Select the appropriate outlet valve **Property**.

**Note:**

*Instrument modules are referred to as **Components** in UNICORN.*

3 Click the **OK** button to apply the changes.

# Set the delay volume

The delay volume is the volume between the detector selected as fractionation source and the fraction collector or outlet that is used.

Adjust the delay volume in the **System Setting** dialog box in UNICORN when:

- A module has been installed after the module that is set as the peak fractionation source in the flow path.
- Another monitor than the default one is used as peak fractionation source. The default peak fractionation source is the primary wavelength of the primary UV monitor.

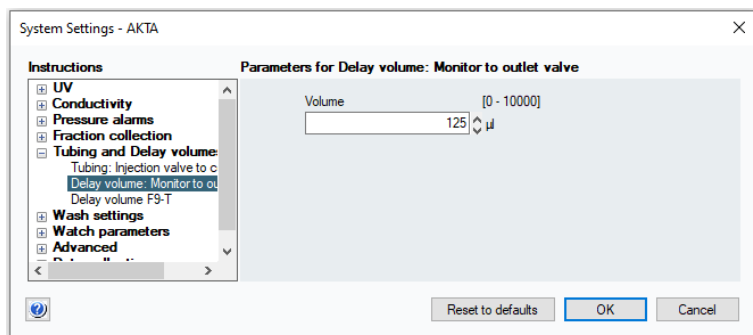
Delay volumes can be set for the options **Monitor to outlet valve**, **Monitor to frac**, **Monitor to frac 2**, and **pH valve**. Depending on the system configuration used, different delay volume options are available for selection in the **System Settings** dialog. The delay volume has to be set for all displayed options.

Delay volumes for the modules and standard tubing configurations for each ÄKTA system are found in the respective *User Manual*.

Follow the steps below to check or set the delay volumes:

Step	Action
1	<p>In the <b>System Control</b> module, choose <b>System</b> → <b>Connect to Systems</b> or click the <b>Connect to Systems</b> icon.</p> <p><i>Result:</i></p> <p>The <b>Connect to Systems</b> dialog opens.</p>
2	<p><b>a.</b> Select a system.</p> <p><b>b.</b> Select <b>Control</b> mode.</p> <p><b>c.</b> Click <b>OK</b>.</p> <p><i>Result:</i></p> <p>The selected instrument can now be controlled by the software.</p>
3	<p>When the system is in state <b>Ready</b>, select <b>System</b> → <b>Settings</b>.</p> <p><i>Result:</i></p> <p>The <b>System Settings</b> dialog is displayed.</p>

## Step Action



- 4
  - a. Select **Tubing and Delay Volumes** and select the delay volume option of interest.
  - b. Check the delay volume in the **Volume** field and enter a new value if necessary.
  - c. Click **OK**.

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