

# Install Versatile valve V9-V or V9H-V and Mixer valve V9-M or V9H-M

## Instructions

### Scope

Instructions on how to install optional Versatile valves V9-V (29011353) or V9H-V (29090691) in ÄKTA™ avant or ÄKTA pure, or an optional Mixer valve V9-M (29011354) or V9H-M (29090692) in ÄKTA pure.

# Description

## Introduction

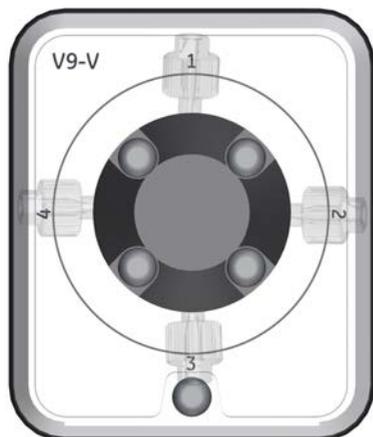
The Versatile valve (**V9-V** or **V9H-V**) and the Mixer valve (**V9-M** or **V9H-M**) increases the system flexibility. The Versatile valve is a 4-port, 4-position valve, which can be used to add advanced features to the flow path. It is possible to install up to four Versatile valves in ÄKTA avant or ÄKTA pure.

The Mixer valve is a specialized version of the Versatile valve used in ÄKTA pure when a System pump is used for sample loading. It bypasses the mixer to avoid unnecessary band broadening of the sample. A Mixer valve or a Versatile valve can also be used when a sample is re-injected.

## Location of Versatile valve in ÄKTA avant or ÄKTA pure

Versatile valve **V9-V** or **V9H-V** can be installed in any position in the instrument or in an Extension box (29110806).

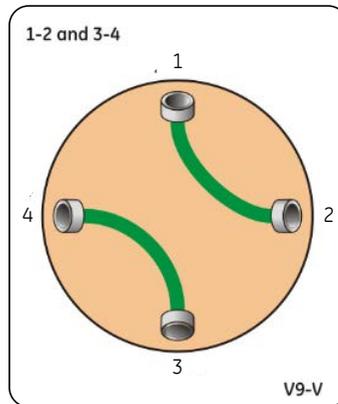
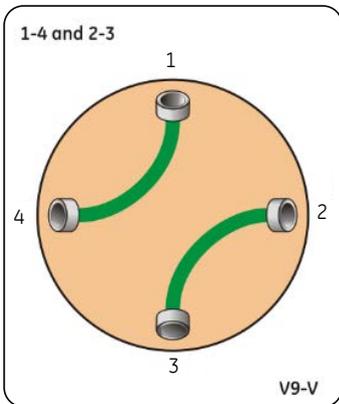
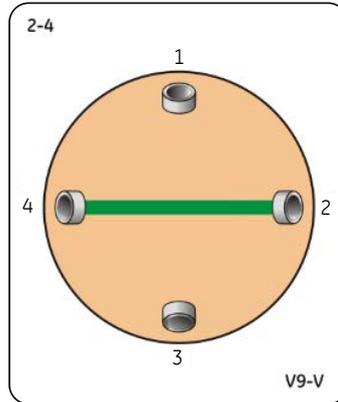
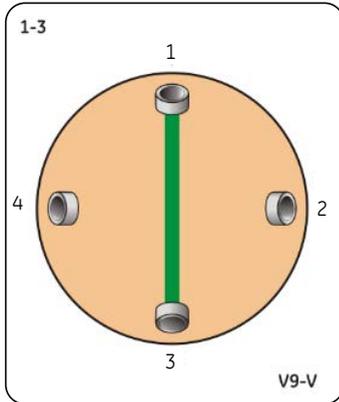
The illustration below shows a detailed view of Versatile valve **V9-V**.



## Flow paths through Versatile valve

Versatile valve (**V9-V** or **V9H-V**) has four available sets of flow paths; two where a single flow channel is used and two where the flow can be directed through two different channels simultaneously.

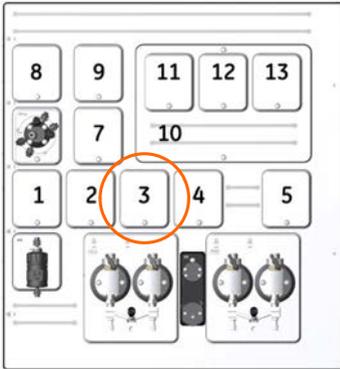
The illustration below shows different flow paths through Versatile valve **V9-V**.



Flow path	Description
<b>1-3</b>	A single flow channel where the flow is directed between port <b>1</b> and port <b>3</b> .
<b>2-4</b>	A single flow channel where the flow is directed between port <b>2</b> and port <b>4</b> .
<b>1-4 and 2-3</b>	Two simultaneously used flow channels where the flow is directed between port <b>1</b> and port <b>4</b> and between port <b>2</b> and port <b>3</b> .
<b>1-2 and 3-4</b>	Two simultaneously used flow channels where the flow is directed between port <b>1</b> and port <b>2</b> and between port <b>3</b> and port <b>4</b> .

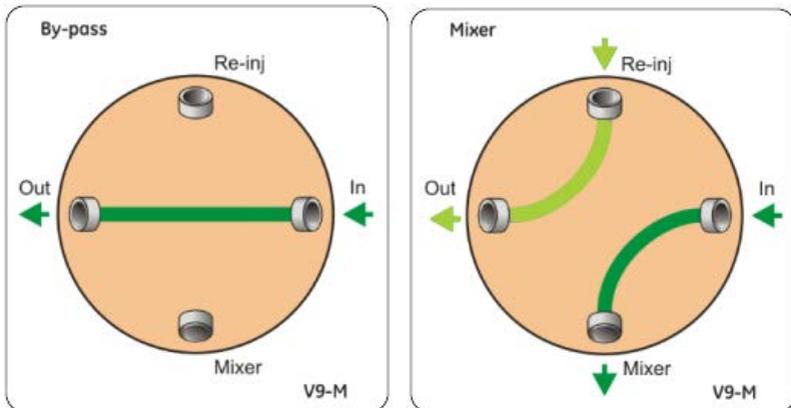
## Location of Mixer valve in ÄKTA pure

Position 3 in the illustration below indicates the recommended position for Mixer valve **V9-M** or **V9H-M** in ÄKTA pure.



## Flow paths through Mixer valve

The Mixer valve (**V9-M** or **V9H-M**) has two available flow paths: **By-pass**, and **Mixer**. The illustration below shows the different flow paths through the Mixer valve **V9-M**.



- Primary flow path
- Alternative flow path

Flow path	Description
<b>By-pass</b>	The flow from the system pumps bypasses the mixer and goes directly to the <b>SaP</b> inlet on the Injection valve.
<b>Mixer</b>	The flow from the system pumps is directed to the Mixer. <b>Mixer</b> is the default flow path.

See *ÄKTA pure User Manual* for more information about how to connect the Mixer valve.

# Installation

## Introduction

Optional modules are easy to install in the instrument. The existing module or dummy module is removed with a Torx™ T20 screwdriver and the cable is disconnected. The cable is then connected to the optional module, which is subsequently inserted into the instrument. The newly installed module is then added to the **System properties** in UNICORN™.

If an optional module is installed in an Extension Box (29110806), see Extension box instruction for installation and cable connection information.

## Node ID

All of the available optional modules are preconfigured to give the desired function. However, the function of a module can be changed by changing its Node ID. Node ID is a unit number designation that is used by the instrument to distinguish between several units of the same type.

In a troubleshooting situation it may be useful to check a module's Node ID.

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

## Node ID for Versatile valve and Mixer valve

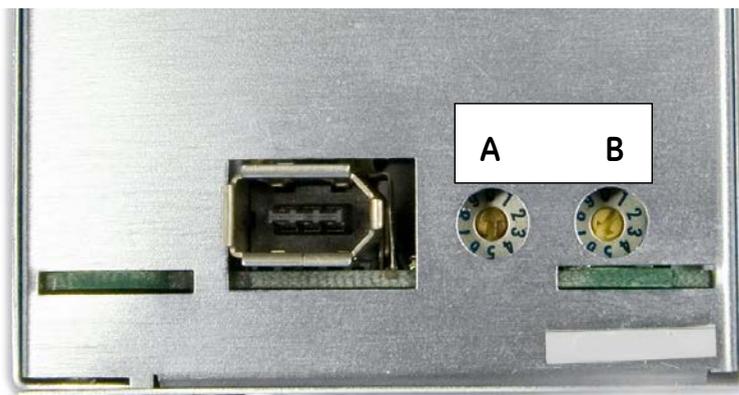
The table below indicates Node ID for Versatile valve (**V9-V** or **V9H-V**) and Mixer valve (**V9-M** or **V9H-M**).

Module	Label	Node ID
Versatile valve	<b>V9-V</b> or <b>V9H-V</b>	20
Versatile valve 2	<b>V9-V</b> or <b>V9H-V</b>	21
Versatile valve 3	<b>V9-V</b> or <b>V9H-V</b>	23
Versatile valve 4	<b>V9-V</b> or <b>V9H-V</b>	24
Mixer valve	<b>V9-M</b> or <b>V9H-M</b>	22

## Check/change Node ID

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

Step	Action
1	Remove the existing or dummy module from the instrument according to the hardware installation instruction below.
2	<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>20</b>, the <b>A</b> switch is set to <b>2</b> and the <b>B</b> switch to <b>0</b>.</li> </ul>



- 3 Check the Node ID and compare it with the listed Node IDs in the table above.
- 4 Install the valve in the instrument.

## Hardware installation of a module

The instruction below describes how to install a module in the instrument.

**Note:** *The illustrations show the principle how to install an optional module. The position of the module on the instrument and the used type of module will depend on the module being installed.*



### CAUTION

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

Step	Action
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1	Disconnect power from the instrument by switching off the instrument <b>Power</b> switch.
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2	Loosen the connectors and remove the tubing from the existing module.
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**Note:**

*This step does not apply for a dummy module.*

3	Loosen the module with a Torx T20 screwdriver.
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4	Remove the module.
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5	Disconnect the cable and secure it in the slit.
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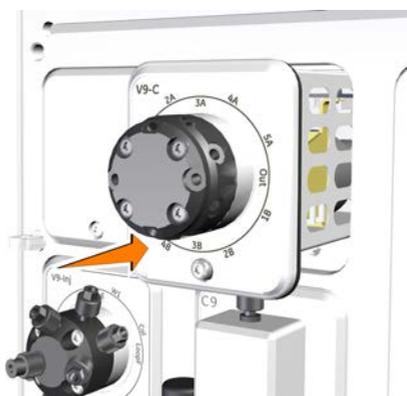
Step	Action
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6 Connect the cable to the module to be installed.

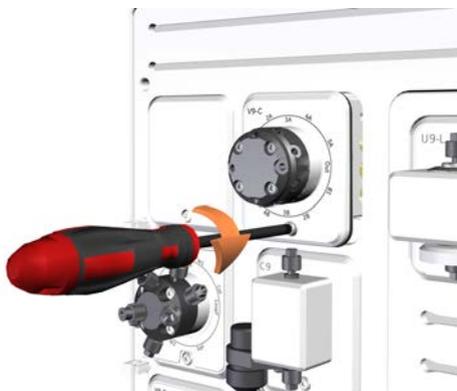


7 Insert the module.



8 Fasten it with a Torx T20 screwdriver.

Step	Action
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**Note:** A warning message is displayed at start up if a module has been installed in the instrument but not added to the current system configuration in UNICORN.

## Software configuration

When a new module has been installed, the **System Properties** have to be updated in UNICORN.

Follow the instructions below to update the system in UNICORN. Update UNICORN before the instrument is powered on.

The menu options in the instruction are not identical for ÄKTA pure and ÄKTA avant, but it is the same principle in both systems.

Step	Action
------	--------

- 1
  - On the **Tools** menu in the **Administration** module, click **System Properties** or click the **System Properties** icon to open the dialog.

*Result:*

The **System Properties** dialog is displayed.

- Select the system of interest in the **System Properties** dialog.
- Click **Edit**.

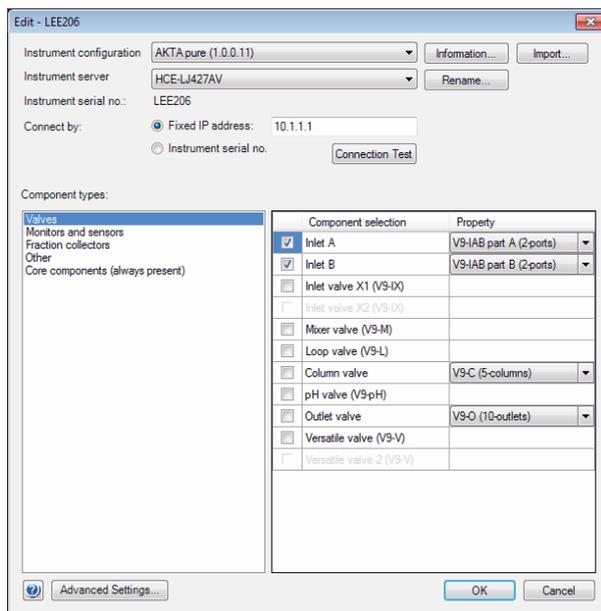
**Note:**

*Only active systems can be edited.*

*Result:*

## Step Action

The **Edit** dialog is displayed. The ÄKTA pure dialog is shown in the example below.



- 2 • Select **Valves** from the **Component types** list.

*Result:*

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

- Click the **Mixer valve (V9-M)** (or **Mixer valve (V9H-M)**) or **Versatile valve (V9-V)** (or **Versatile valve (V9H-V)**) checkbox to select the added valve.

### **Note:**

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

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

## Check/Set delay volume

When a module has been installed after the UV monitor in the flow path, the delay volume has to be adjusted in the **System Settings** dialog in UNICORN, to make sure that the collected fractions correspond to the fractions indicated in the chromatogram.

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 will be available for selection in the **System Settings** dialog. The delay volume has to be set for all displayed options.

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

Follow the instructions below to check/set the delay volumes for ÄKTA pure. The principle is the same for ÄKTA avant.

Step	Action
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- |   |   |
|---|---|
| 1 | On the <b>System</b> menu in the <b>System Control</b> module, click <b>Connect to Systems</b> or click the <b>Connect to Systems</b> icon. |
|---|---|

*Result:*

The **Connect to Systems** dialog opens.

- |   |   |
|---|---|
| 2 | <ul style="list-style-type: none"><li>• Select a system.</li><li>• Select <b>Control</b> mode.</li><li>• Click <b>OK</b>.</li></ul> |
|---|---|

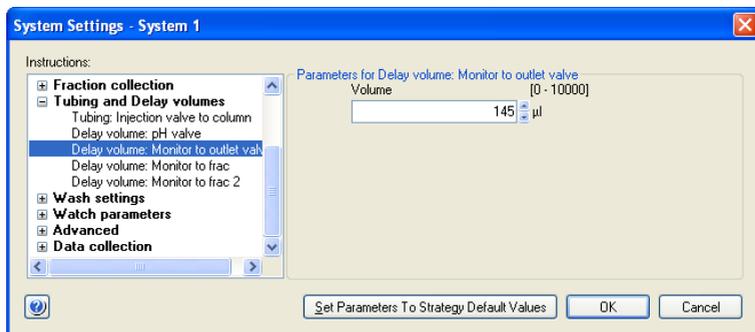
*Result:*

The selected instrument can now be controlled by the software.

- |   |   |
|---|---|
| 3 | On the <b>System</b> menu, click <b>Settings</b> when the system is in state <b>Ready</b> . |
|---|---|

*Result:*

The **System Settings** dialog is displayed. The ÄKTA pure dialog is shown in the example below.



- |   |  |
|---|--|
| 4 | <ul style="list-style-type: none"><li>• Select <b>Tubing and Delay Volumes</b> and select the delay volume option of interest.</li></ul> |
|---|--|

Step	Action
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**Note:**

For ÄKTA avant the **Delay Volumes** settings are found under **Fraction Collector**.

- Check the delay volume in the **Volume** field and enter a new value if necessary.
- Click **OK**.

## Connect tubing

### Tubing for Versatile valve

The tubing for Versatile valves **V9-V** and **V9H-V** is not supplied with the valve. This tubing must be cut manually.

### Tubing for Mixer valve - ÄKTA pure 25

The table below shows recommended tubing for Mixer valve **V9-M** when using the recommended position described in [Location of Mixer valve in ÄKTA pure, on page 4](#).

Tubing label	Description	Tubing	Connector	Tubing length (mm)
<b>3-1</b>	Pressure monitor R9 to Mixer valve V9-M port <b>In</b>	PEEK i.d. 0.75 mm (green)	Fingertight connector, 1/16"	160
<b>3-2</b>	Mixer valve V9-M port <b>Mixer</b> to Mixer M9	PEEK i.d. 0.75 mm (green)	Fingertight connector, 1/16"	330
<b>3-3</b>	Mixer valve V9-M port <b>Out</b> to Injection valve V9-Inj port <b>SaP</b>	PEEK i.d. 0.75 mm (green)	Fingertight connector, 1/16"	260

### Tubing for Mixer valve - ÄKTA pure 150

The table below shows recommended tubing for Mixer valve **V9H-M** when using the recommended position described in [Location of Mixer valve in ÄKTA pure, on page 4](#).

Tubing label	Description	Tubing	Connector	Tubing length (mm)
<b>3-1</b>	Pressure monitor R9 to Mixer valve V9H-M port <b>In</b>	PEEK i.d. 1.0 mm (beige)	Fingertight connector, 1/16"	160
<b>3-2</b>	Mixer valve V9H-M port <b>Mixer</b> to Mixer M9	PEEK i.d. 1.0 mm (beige)	Fingertight connector, 1/16"	330
<b>3-3</b>	Mixer valve V9H-M port <b>Out</b> to Injection valve V9H-Inj port <b>SaP</b>	PEEK i.d. 1.0 mm (beige)	Fingertight connector, 1/16"	260

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