Instruction Sheet

50237A-89

Cadmium Column for Nitrate Determination

Safety Information

Please read this entire document before unpacking, setting up or operating this equipment. Do not use or install this equipment in any manner other than that specified in this document.

Overview

The cadmium column for nitrate determination is a disposable alternative to repackable cadmium columns. Figure 1 shows the cadmium column and column tubing assembly.

For disposal instructions, refer to Disposal of used cadmium columns on page 4.

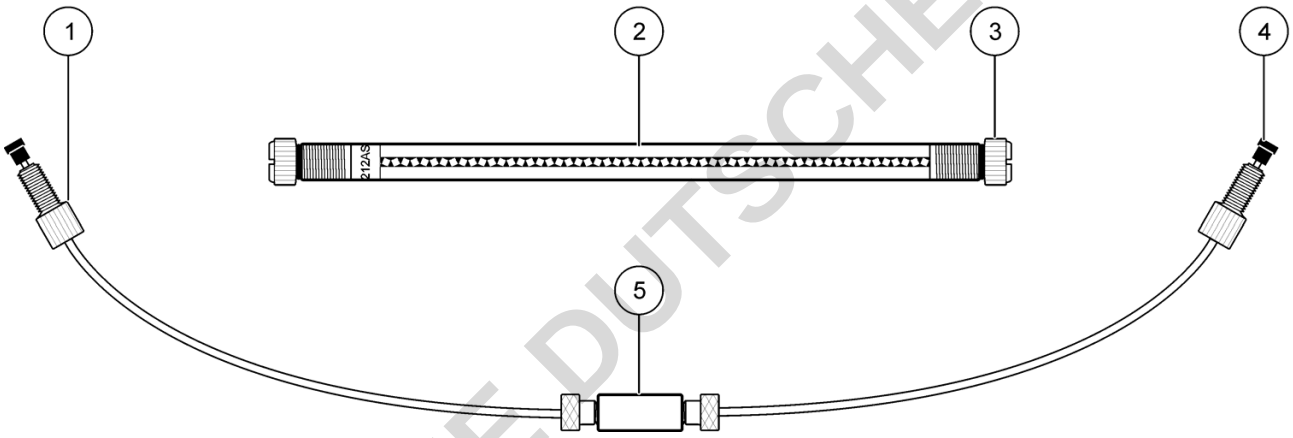


Figure 1 Cadmium column and column tubing assembly

1	Flangeless fitting	**4**	Rubber gasket
2	Cadmium column	**5**	Union
3	End cap		

Inspection

After unpacking the cadmium column, visually inspect for:

- Gaps in the column
- Changes in cadmium granule color (should be gray)
- Changes in the cadmium surface characteristics

If any of these problems are present, make sure to check the column efficiency before running samples (Column Efficiency on page 3).

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Installing the cadmium column for the first time

During the initial installation of the Lachat chemistry manifold, install the Cadmium column using the following procedure.

1. Disconnect the tubing from one end of the switching valve union.
2. Disconnect the tubing from one end of the column tubing assembly.
3. Connect the switching valve and the column tube assembly tubing (Figure 2, Item 4 and Item 8).
4. Open the switching valve until buffer solution fills the tubing assembly then close the valve (Figure 2, Item 2).
5. Remove the end plugs from the column (Figure 1, Item 3 on page 1).
6. Insert the flangeless fittings into the column.
7. Install the column on the nitrate manifold (Figure 3 on page 3).
8. Turn the switching valve to the open position.

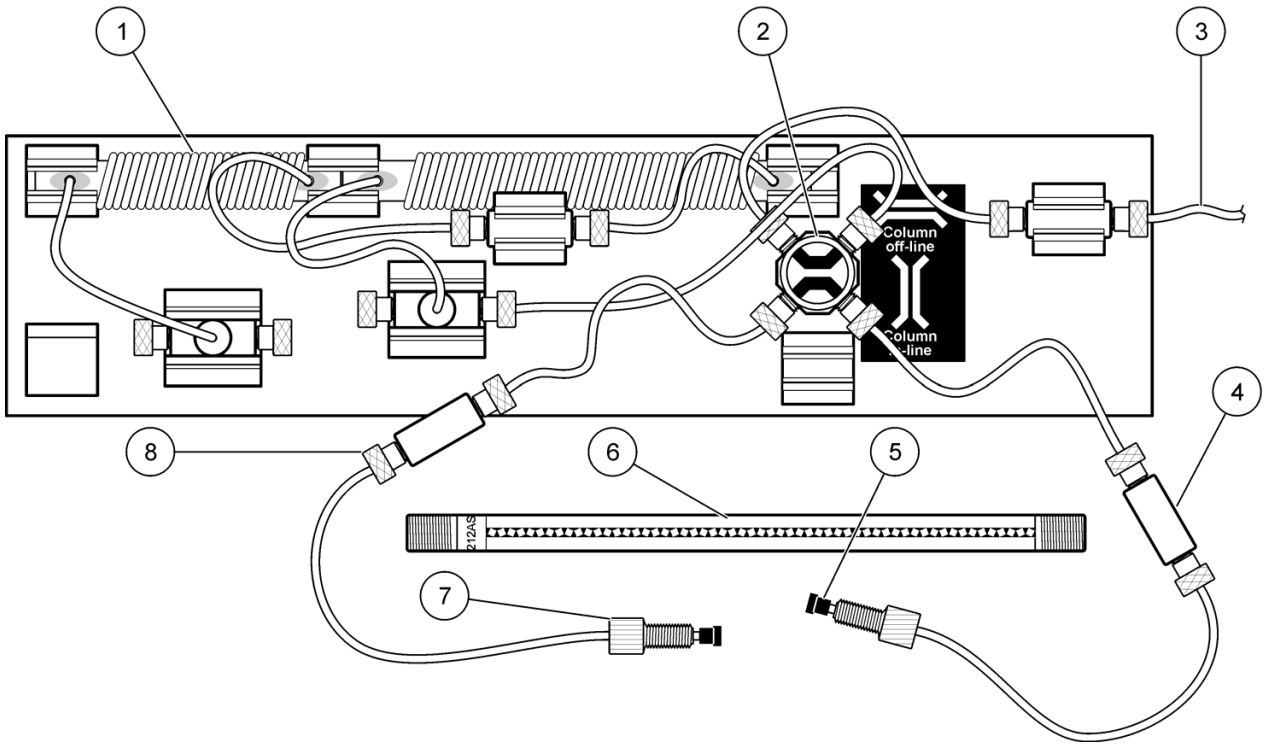


Figure 2 Cadmium column connections

1	Nitrate manifold	**5**	Rubber gasket
2	Switching valve	**6**	Cadmium column
3	Tubing to flow cell	**7**	Flangeless fitting
4	Supplied union	**8**	Existing union

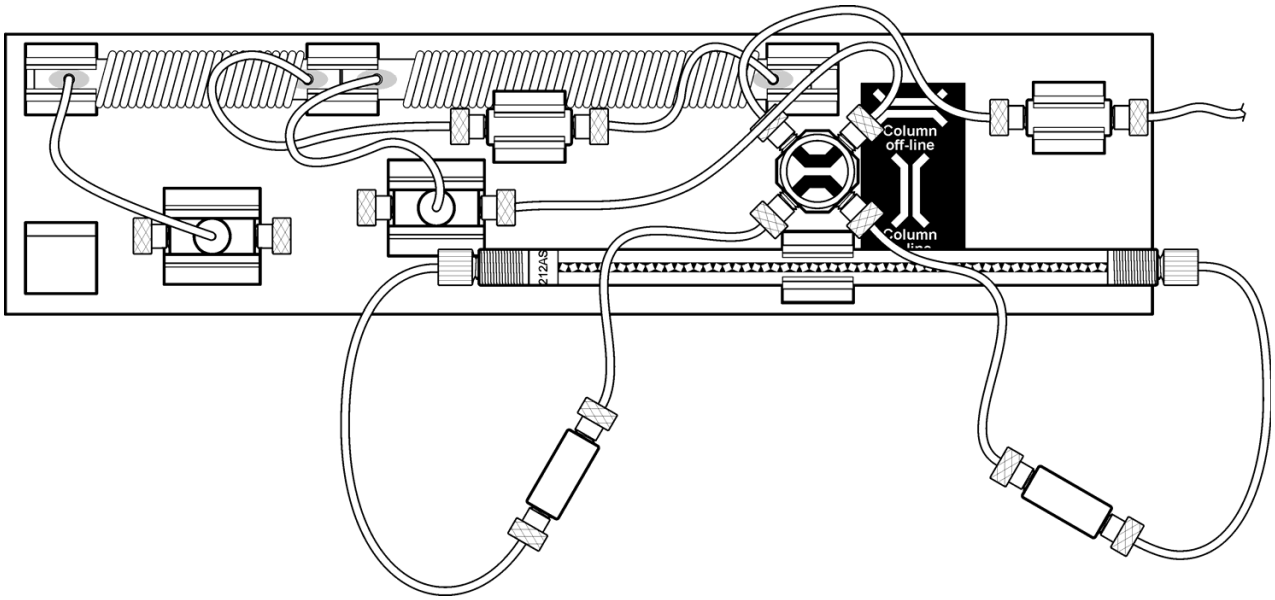


Figure 3 Cadmium column installed

Cadmium column replacement

To replace a cadmium column:

1. Remove the used cadmium column from the manifold.
2. Remove the flangeless fittings. Properly dispose of the used cadmium column (Disposal of used cadmium columns on page 4).
3. Remove the end plugs from the new column and install the flangeless fittings into the column. Tighten the flangeless fittings securely.
4. Install the cadmium column on the manifold.

Column Efficiency

Before running samples, column efficiency can be determined as follows:

1. Calibrate with nitrate (NO_3) standards.
2. Run a known concentration of nitrite (NO_2) standard as N.
3. Run a matching concentration of NO_3 standard as N.

The column efficiency is determined by the equation:

$$E = \frac{[NO_3]}{[NO_2]} ¥ 100$$

where:

E	= column efficiency
$[NO_3]$	= concentration of nitrate standard
$[NO_2]$	= concentration of nitrite standard

If the efficiency is less than 90%, do not use the cadmium column. Contact Lachat technical support or the local distributor.

Note: *New cadmium columns are guaranteed to have an efficiency of 90% or higher. The columns are individually inspected at the factory to ensure no air has been introduced. The actual efficiency of a new cadmium column is usually 98% or higher.*

Maintenance (switching valve)

The switching valve ports should be rinsed thoroughly with deionized water once a week. Thoroughly clean spills on the switching valve immediately.

1. Remove the cadmium column from the switching valve. Be careful not to introduce air into the column.
2. Turn the switching valve to the closed position.
3. Connect a pump tube line to one port of the valve and run deionized water through it for two minutes. Connect the outlet to a waste line or allow the deionized water to drip into a beaker.
4. Repeat for the three remaining ports.
5. Turn the switching valve to the open position.
6. Repeat steps 3 and 4.

Troubleshooting

Flow problems

To check the flow efficiency of the cadmium column:

1. Disconnect the cadmium column from the manifold and reconnect to a green-green pump tube.
2. Pump buffer through the packed column and collect it in a graduated cylinder.

The flow rate should be greater than 4.0 mL per minute. A low flow rate indicates that the column is partially clogged.

Leaks

If a leak is noticeable, tighten the flangeless fitting. The black column seal can be seen through the clear acrylic and should expand when the flangeless fitting is tightened.

Disposal of used cadmium columns

Refer to Cadmium column replacement on page 3 to replace a column. Once the cadmium column is depleted:

1. Remove the flangeless fittings from both ends of the column.
2. Install and tighten the end caps on the column.
3. Dispose of the column per local regulations for cadmium.

Note: *In most countries, the disposal of cadmium is restricted. Follow local regulations for proper disposal.*

Exchange policy

New cadmium columns from Lachat Instruments–Hach Company are guaranteed to have an efficiency of 90% or higher when received from the manufacturer. If the column is defective, contact Lachat Instruments–Hach Company for a column exchange.

The lifespan of Cadmium columns can vary considerably depending on the variety of samples being tested.

Make sure the following steps have been taken before contacting Lachat:

- Follow the troubleshooting procedures included in this document.
- Make sure that the column efficiency was calculated according to the procedure explained in this document.
- Verify that air was not introduced into the column.
- Verify that all initial efficiency testing was performed with standard solutions, not samples.

To exchange the column, the lot number of the column must be provided.

Note: *All returned columns are subject to evaluation. Exchanges and credits are contingent upon test results.*

Replacement Parts

Description	Part Number
Switching valve	24927
Column tubing assembly	50254
Cadmium column, without tubing	50237A

Note: *Lachat cannot guarantee the efficiency or lifespan of columns not packed by Lachat Instruments.*

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