

# **841 Micro Injection Module User's Guide**



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# Declaration of Conformity

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Application of Council Directives:

**89/336/EEC, 73/23/EEC**

Standards to which Conformity is Declared:

**EN50081-1, EN50082-1, EN61010-1 (IEC1010-1)**

Manufacturer's Name ..... Gilson, Inc.

Manufacturer's Address ..... 3000 W. Beltline Highway  
Middleton, WI 53562

EC Office Address ..... Gilson S.A.  
19 Avenue des Entrepreneurs, B.P. 45  
95400 Villiers-le-Bel, France

Type of Equipment ..... Laboratory Equipment


Model ..... **841 Micro Injection Module**

Beginning with Serial Number: **259E8C001**

Month and Year of Manufacture: **May 1998**

I, the undersigned, hereby declare that the equipment  
specified above conforms to the above Directives and Standards.

Place: Middleton, WI (USA)  
Issue Date: June 1998

  
Michael Jacquart  
Senior Vice President  
Corporate Technology Development



# Introduction

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1

The Gilson 841 Micro Injection Module is used with a Gilson Micro 215 Liquid Handler to enable injection of precise, low-volume samples onto an HPLC or other analytical system.

## Unpacking

The 841 Micro Injection Module is delivered with all major components already assembled.

The 841 Micro Injection Module, accessories, and plumbing kit are shipped in one container. Unpack the container and inspect for damage. Promptly report any damage to the carrier. Some carriers must receive concealed damage claims within seven days of delivery.

After unpacking the 841 Micro Injection Module, ensure you have the following:

- 841 Micro Injection Module with installed Rheodyne
- RV700-109 valve with internal 1  $\mu$ l sample loop, and PEEK injection port/seal
- Accessory Kit (includes GSIOC cable, two knurled screws, and AC adapter with power cords)
- Installation and Plumbing Kit (includes allen wrenches/tubing and fittings)

Keep the original container and packing material in case the 841 Micro Injection Module must be returned to Gilson.

### Customer Service

Gilson, Inc. and its worldwide network of authorized representatives provide customers with the following types of assistance: sales, technical, application, and instrument repair.

If you need assistance and are in the United States, please contact your Gilson representative or call the Gilson Customer Service Department at 800-445-7661 or 608-836-1551. You can also contact the Customer Service Department via its electronic mail (e-mail) address: [service@gilson.com](mailto:service@gilson.com)

Outside the United States, please contact your Gilson representative. Specific contact information can be found on the Gilson web site at [www.gilson.com](http://www.gilson.com).

To help us serve you quickly and efficiently, refer to **Before calling us in Chapter 5.**

## Safety Information

**Note:** Changes or modifications to this device not expressly approved by Gilson could void your factory-authorized warranty.




The 841 Micro Injection Module has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC commercial environment. This device generates, uses, and can radiate radio frequency energy. If the device is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference; you will be required to correct the interference at your own expense.

Shielded cables must be used with this device to ensure compliance with the Class A FCC limits.

Equipment connected to this device via the GSIOC connector must be protected throughout by double or reinforced insulation.

The DC power supply connected to this device must be protected throughout by double or reinforced insulation and must have been tested at 3250V DC minimum.

The following illustrates and describes safety symbols used on this device's rear panel:

<b><u>Symbol</u></b>	<b><u>Meaning</u></b>
	Direct current
	Equipment protected throughout by double insulation or reinforced insulation.
	Caution - Refer to safety information to prevent risk of personal harm and protect the device against damage.

<b>Technical Specification</b>	<b>Definition</b>
<b>Safety certification</b>	<ul style="list-style-type: none"> <li>• UL 3101-1</li> <li>• CSA 1010</li> <li>• EN 61010</li> </ul>
<b>EMC certification</b>	<ul style="list-style-type: none"> <li>• FCC Class A</li> <li>• EN 50082-1</li> </ul>
<b>EMI certification</b>	<ul style="list-style-type: none"> <li>• EN 50081-1</li> </ul>
<b>Front panel</b>	LOAD and INJECT LED lights
<b>Available valves</b>	Rheodyne RV700-109 analytical injection valve
<b>Valve switching speed</b>	Less than 0.1 second
<b>Available sample loops</b>	1 µl (ships with the instrument), 5 µl, 10 µl, 20 µl, 50 µl, 100 µl, 200 µl, 500 µl, 1 ml, 2 ml, and 5 ml
<b>Precision</b>	<p>CV &lt; 1.5%* with 1 µl internal sample loop, 100 µl syringe and total loop filling method</p> <p>*Value obtained using equipment and method described in <i>Appendix D</i></p>
<b>Carryover</b>	<p>Less than 0.05% with the following rinse volumes*</p> <ul style="list-style-type: none"> <li>• injection port rinse volume = 1000 µl</li> </ul> <p>*Values obtained using equipment and methods described in <i>Appendix D</i></p>
<b>Dead volume</b>	1.5 µl from injection port to sample loop
<b>Liquid contact materials</b>	316L stainless steel, 304 stainless steel, Ceramic, PEEK
<b>Remote control</b>	<p>Gilson Serial Input/Output Channel (GSIOC) port for computer control</p> <p><b>Note:</b> Equipment connected to the 841 Micro Injection Module must be protected throughout with double or reinforced insulation.</p>

Technical Specifications

<b>Power requirements</b>	+24V DC at 2.0A supplied via a 2.1 mm ID power plug; center contact is positive
<b>Environmental conditions</b>	Indoor use Altitude: up to 2000 m Temperature range: 5-40°C Air pressure: 75-105 kPa Pollution degree: 1 or 2, in accordance with IEC 66 Humidity: Maximum relative humidity 80% for temperatures up to 31° C, decreasing linearly to 50% relative humidity at 40°C
<b>Weight with installed valve</b>	3.9 kg (8 lb, 9 oz)



## Installing the 841 Micro Injection Module

To install the 841 Micro Injection Module onto the Micro 215 Liquid Handler, follow the steps below.

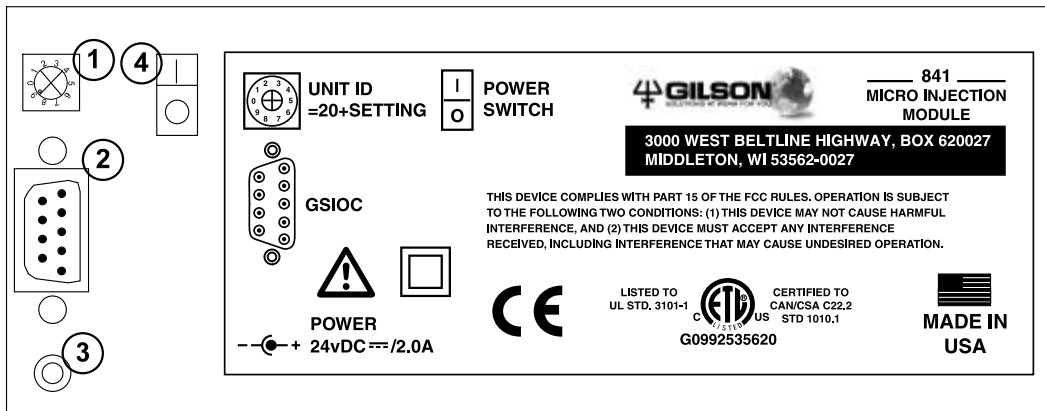
- 1 Place the 841 Micro Injection Module behind the last rack position on the locator plate, next to the right support of the Micro 215 Liquid Handler.
- 2 Secure the 841 Micro Injection Module onto the Micro 215 Liquid Handler by screwing the two knurled screws (supplied in the accessory package) into the valve mounting plate on the 841 Micro Injection Module.



## Making Electrical Connections

### Rear Panel

- 1 Unit ID selector
- 2 Gilson Serial Input/Output Channel (GSIOC) port
- 3 Power receptacle
- 4 Power switch

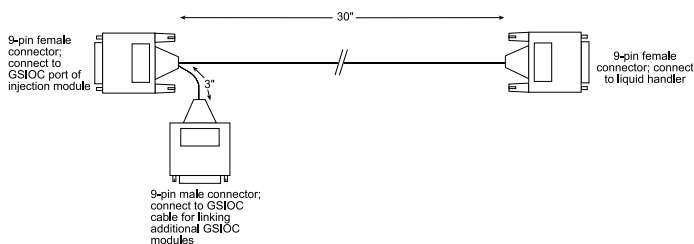


## GSIOC Port

Use the supplied GSIOC cable to connect the 841 Micro Injection Module to the Micro 215 Liquid Handler. This enables the 841 Micro Injection Module to be controlled by a program running on the computer connected to the Micro 215 Liquid Handler.

- 1 Locate the GSIOC cable in the accessory package.
- 2 Connect one of the female connectors on the GSIOC cable to the GSIOC port of the 841 Micro Injection Module. Tighten the retaining screws.
- 3 Connect the other female connector on the GSIOC cable to the GSIOC port of the Micro 215 Liquid Handler.

**Note:** If the Micro 215 Liquid Handler and 841 Micro Injection Module are part of a Gilson HPLC system, use the male connector of the GSIOC cable to connect additional devices along the GSIOC. Refer to the installation guide supplied with the Gilson system software.

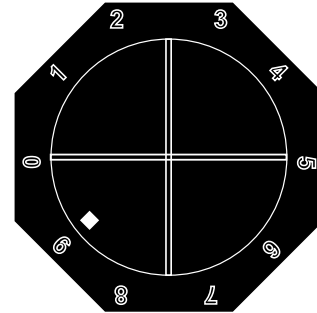


## Unit ID Selection

At the factory, Gilson set the unit ID to 29. The unit ID identifies the 841 Micro Injection Module to Gilson software packages that can issue GSIOC commands to Gilson devices. There is no need to change the unit ID unless it is the same as that assigned to another Gilson device connected along the GSIOC.

To change the unit ID:

- 1 Gently insert a small flat blade screwdriver into the unit ID selector on the rear panel and turn it.
- 2 Align the white dot with one of the indicated numbers. The unit ID is 20 plus the selected number.



Unit ID = 20 + setting

## Power Connection

Use the supplied AC adapter to connect the power receptacle on the 841 Micro Injection Module to an AC power source. Refer to the rear panel diagram on page 2-2.

## Making Plumbing Connections

### Sample Loop

The 841 Micro Injection Module is shipped with a 1  $\mu$ l internal sample loop and stator face assembly (reference 4967123227) installed. The loop runs between ports two and five of the valve. Refer to **Chapter 4, Maintenance** for details on installing an external loop.

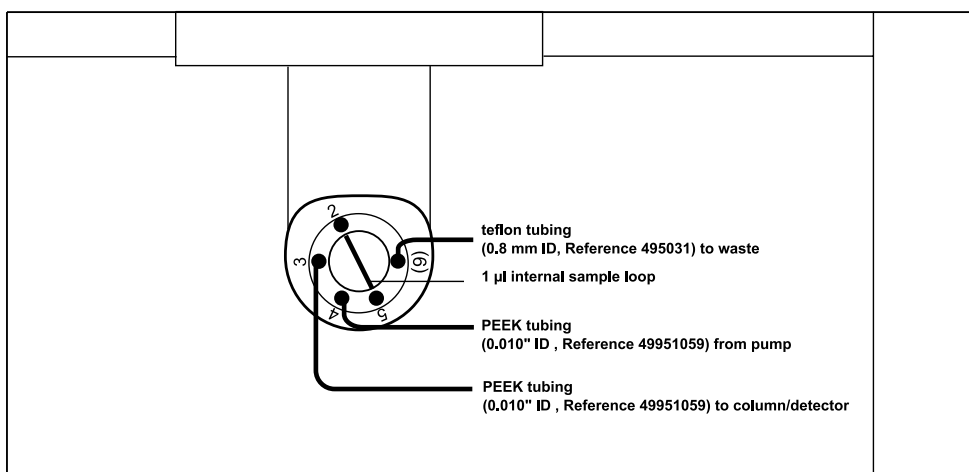
### Waste Tubing

Place the free end of the teflon waste tubing connected to port six of the injection valve into a waste receptacle. Make sure that the outlet of the waste tubing is lower than the waste port of the injection valve.

### Column and Pump Tubing

Connect the tubing from port three of the injection valve to your column/detector.

Connect the tubing from your pump to port four of the injection valve.



## Adjusting the Micro 215 Liquid Handler's Z-Arm Height

The following pages describe how to adjust the height of the Micro 215 Liquid Handler's Z-arm for use with the 841 Micro Injection Module. Setting the correct Z-arm height will help prevent imprecision during injection due to an improper probe alignment in the injection port seal.

### Adjusting Z-Arm Height

To adjust the Z-arm's height so the probe is properly lowered into the injection port/seal, follow the procedures below:

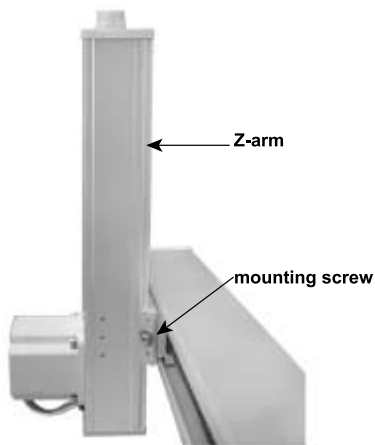
- 1 Turn off power to the Micro 215 Liquid Handler.
- 2 Locate the Z-height adjustment tool (shown left) in the accessory package. Refer to the table below to determine which tool you should use.

<i>Reference</i>	<i>Description</i>
25051094	The 124 mm Z-height adjustment tool. Used to adjust a 125 mm Z-arm for use with the 841 Micro Injection Module.
25051095	The 174 mm Z-height adjustment tool. Used to adjust a 175 mm Z-arm for use with the 841 Micro Injection Module.

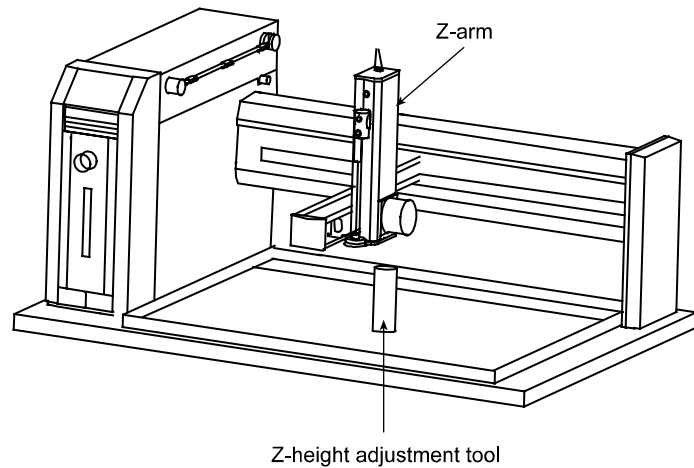


Z-height adjustment tool

Adjusting the Micro 215 Liquid Handler's Z-Arm Height



- 3 Place the Z-height adjustment tool on one of its ends near the center of the locator plate. (If necessary, remove any racks or accessories before doing this.)



- 4 Loosen the mounting screw on the Z-arm mounting bracket and slightly raise the Z-arm.
- 5 Manually move the liquid handler's arm so the Z-arm is centered over the Z-height adjustment tool.
- 6 While holding the Z-height adjustment tool flat against the locator plate, use your other hand to lower the Z-arm until it lightly rests on the adjustment tool.
- 7 Tighten the mounting screw on the Z-arm mounting bracket so the Z-arm is secure.
- 8 While holding the adjustment tool in place, slide the Z-arm off the tool. Ensure that the bottom of the Z-arm lightly rubs against the adjustment tool as it moves. Repeat steps four through seven until this is true.
- 9 Store the Z-height adjustment tool.



## Indicating Z-Height In Setup Program

Once the Z-arm's height is adjusted, modify the setup information for the Micro 215 Liquid Handler. You do this using the 215 Setup Utility Program supplied on CD-ROM with your liquid handler.

- 1 Ensure that the liquid handler is powered on and properly connected to the computer.
- 2 Start the 215 Setup Utility program.
- 3 Click on the Z Heights tab.
- 4 If you used the 124 mm Z-height adjustment tool to adjust the Z-arm, set the tower height to 125 mm and then set your clamp height to 125 mm. If you used the 174 mm Z-height adjustment tool, set the tower height to 175 mm and then set your clamp height to 175 mm. If you require a different clamp height for your specific application you can change it on this tab.
- 5 To store the clamp height to the liquid handler's memory, click *Ok*.
- 6 Click on the *x* in the upper right corner to close the utility.

## Verification for Injection Port Use

To ensure that the Z-arm is adjusted for use with the injection port/seal, run the 215 Injection Z-Height Utility program supplied on CD-ROM with your liquid handler.

- 1 Select the *841 with Tee Port* option in the Location of Injector field.
- 2 To position the probe over the injection port, click *Move to injection port*. If the probe does not stop above the injection port, select a different option button in the Location of Injector field and click *Move to injection port* again.
- 3 To see if the probe's Z height is aligned correctly, slide a small piece of paper between the probe's tip and the injection port/seal. The probe is aligned if the top of the paper catches the tip of the probe when you position the paper between the probe and the injection port/seal.
- 4 If the probe is not aligned, click on  or  to move the probe.
- 5 When the probe is aligned, click *Update* to store the new alignment into the liquid handler's memory.
- 6 Click *Done* to close the utility.

**Note:** If the probe requires adjustment along the X- or Y-axis, use the 215 Setup Utility. After starting the utility, click on the *Adjust XY* tab to see the appropriate options. Refer to the online help for assistance.

The 841 Micro Injection Module is controlled as follows:

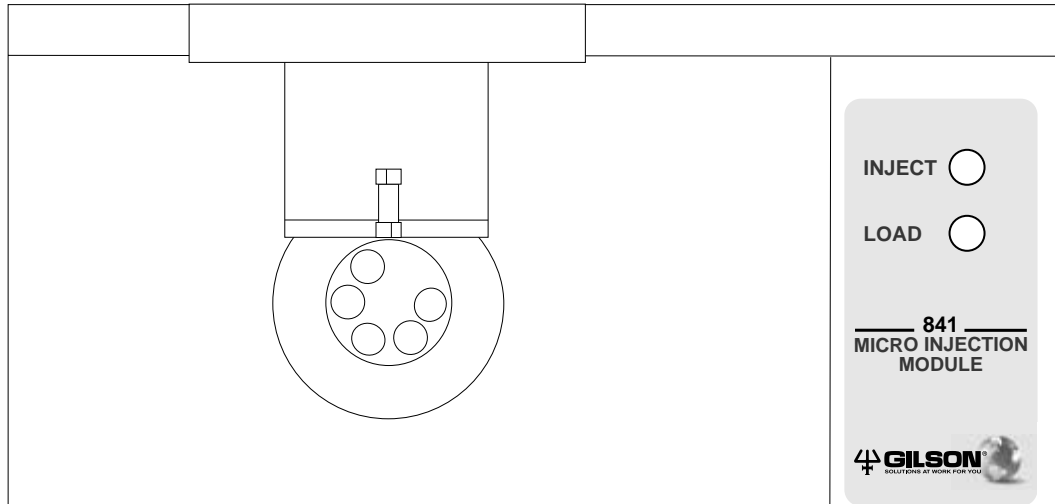
- Via a method running on a personal computer. You create the method using UniPoint™ System Software, 735 Instrument Control Software, or 709 Sampler Manager Software. All are ordered separately. See **Appendix A, Replacement Parts and Accessories** for reference numbers.
- Via an executable file running on a Gilson Keypad Controller. You create the executable file using the Gilson 709 Sampler Manager Software (ordered separately, reference 2106243).

If you have not already done so, install the UniPoint™ System Software, 735 Instrument Control Software, or 709 Sampler Manager Software. Refer to the *User's Guide* included with the software.

### Front Panel

The front panel of the 841 Micro Injection Module contains a LOAD light and an INJECT light. These lights identify the position of the injection valve:

LOAD light	INJECT light	Condition
On	Off	Valve at LOAD position
Off	On	Valve at INJECT position
On	On	Valve is turning
Blinking	Blinking	Valve error



### Start Up

To get the 841 Micro Injection Module ready for injections, turn the power ON using the power switch located on the rear panel. Refer to the rear panel diagram on page 2-3 if necessary.

## Example Methods

To control the 841 Micro Injection Module, refer to the example methods installed with the UniPoint™ System Software.

The programs described below are supplied with the Gilson UniPoint System Software. These files are copied to the computer as part of the standard UniPoint software installation. Refer to the *UniPoint System Software User's Guide* for information on how to view and modify these programs.

### MICT\_TOT.GIP

This protocol performs a total loop fill injection using an above seal rinse. The loop volume and air gap volume are entered as variables and can be set to any value by the user.

### MICT\_PAR.GIP

This protocol performs a partial loop injection with above seal rinse and prompts the user to enter the sample injection volume and air gap volume.

### MICT\_CEN.GIP

This protocol performs a centered loop injection with above seal rinse and prompts the user to enter the sample injection volume, air gap volume, and push volume. Only the sample injection volume is aspirated from the sample vial; it is pushed into the sample loop with a volume of reservoir solvent equal to the push volume.

The maintenance guidelines in this chapter are designed to help you obtain optimum performance and maximum life from the 841 Micro Injection Module.

## Maintenance Tips

In order to keep your 841 Micro Injection Module at peak performance, Gilson recommends that you do the following:

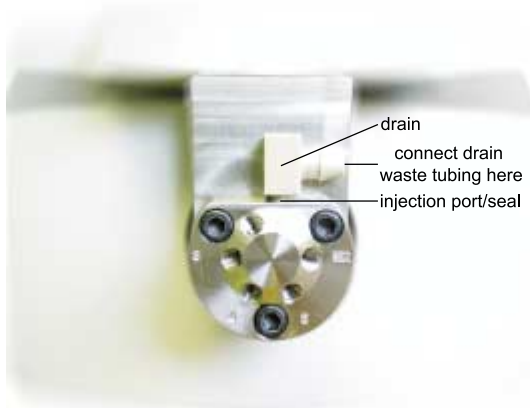
- Change tubing regularly
- Flush the injection port/seal, valve, and tubing daily with distilled or deionized water
- Check periodically to ensure that all fittings are tight
- Wipe up all spills immediately
- Warm all fluids to room temperature before running them through the system (cold fluids may cause leakage)

## Parts Replacement

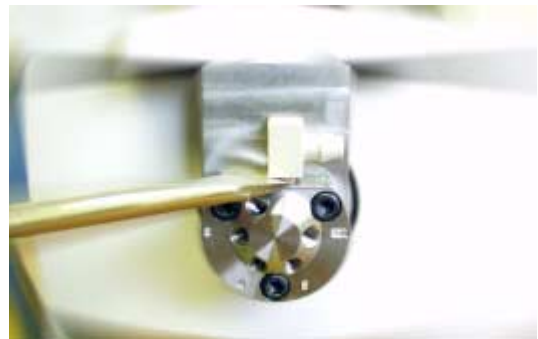
### Replacing the Injection Port/Seal

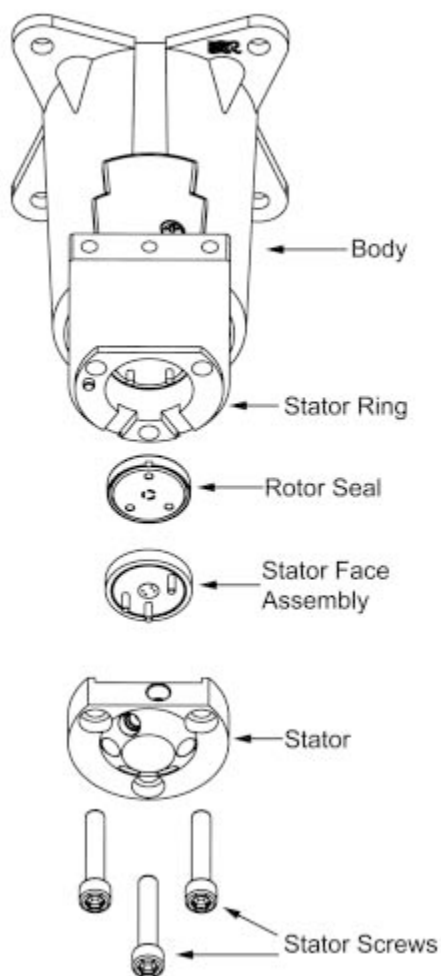
To replace the injection port/seal:

- 1 Obtain a replacement injection port/seal and drain (reference 25051109).
- 2 Disconnect the waste tubing from the injection port/seal drain.



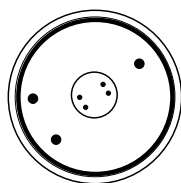
- 3 Insert a flat blade screwdriver head between the drain and the valve stator. Twist the screwdriver until the drain becomes loose and you are able to remove it.
- 4 Insert the 5/64" Allen wrench (reference 4310782) into the injection port/seal and turn it counterclockwise to remove the injection port/seal.
- 5 Install the replacement injection port/seal into port one of the injection valve by turning the Allen wrench clockwise until the injection port/seal is snug, taking care not to overtighten it.
- 6 Push the drain onto the top of the injection port/seal. It is a tight fit, but will snap onto the injection port/seal.
- 7 Reattach the waste tubing to the injection port/seal drain.



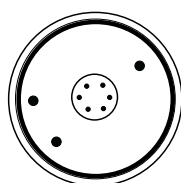


Exploded View of Motorized Valve

Internal Loop  
Stator Face Assembly  
(4 holes)



External Loop  
Stator Face Assembly  
(6 holes)



## Replacing the Rotor Seal and Stator Face Assembly

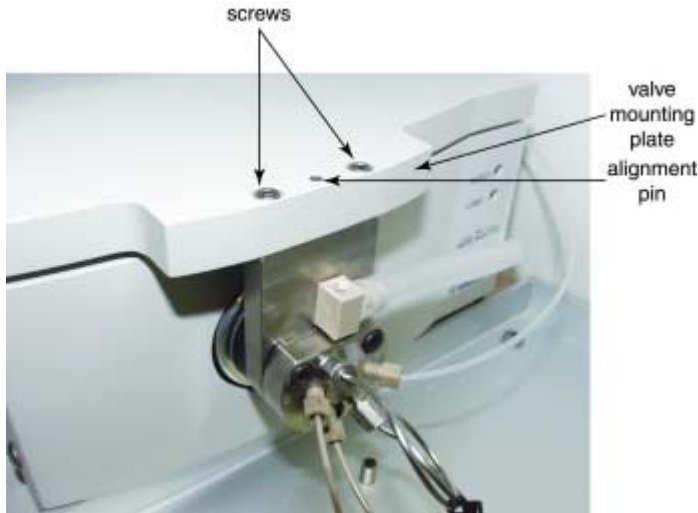
The 841 Micro Injection Module is shipped with a 1  $\mu$ l internal sample loop/stator face assembly (reference 4967123227) installed. To use an external sample loop on the 841 Micro Injection Module, replace the internal sample loop/stator face assembly with the appropriate stator face assembly for external loops (reference 496775027). Then install an external loop between ports two and five on the valve.

Refer to the diagrams when replacing the rotor seal (reference 496775055) and stator face assembly (reference 496775027 for external loop; 4967123227 for internal loop.)

To replace the rotor seal and/or stator face assembly:

- 1 To remove the 841 Micro Injection Module from the Micro 215 Liquid Handler first unscrew the two knurled screws (supplied in the accessory package) from the valve mounting plate on the 841 Micro Injection Module. Then pull the 841 Micro Injection Module from behind the last rack position on the locator plate, next to the right support of the Micro 215 Liquid Handler.
- 2 Remove the stator screws with the 9/64" Allen wrench provided (reference 4311402).
- 3 Remove the stator and stator face assembly from the stator ring.
- 4 Mount the new stator face assembly on the stator by inserting the three-pin side of the assembly into the corresponding holes on the stator. Skip to step twelve for reassembly instructions or continue to step five to replace the rotor seal.

- 5 Remove the two screws from the top of the valve mounting plate using a 7/64" Allen wrench (reference 4311092). Lift the valve mounting plate from the cover. The alignment pin located between the two screws may fall out. Retain this pin for reassembly.



- 6 Remove the stator ring.
- 7 Remove the rotor seal by pulling it off of its three-pin mounting on the shaft assembly in the body of the valve.
- 8 Mount the new rotor seal with the grooves facing you. The rotor seal fits onto the three pins on the shaft assembly only one way.
- 9 Replace the stator ring so the two short pins on the ring enter the unthreaded mating holes in the body.
- 10 Replace the valve mounting plate on the cover (you may need to replace the alignment pin between the two screws.) Replace the two screws in the valve mounting plate using the 7/64" Allen wrench.
- 11 Mount the new stator face assembly onto the stator. Confirm that the pins on the assembly fit in the mating holes on the stator.

- 12 Replace the stator and stator face assembly on the valve so that the pin in the stator ring enters the mating hole in the stator.
- 13 Replace the stator screws in the stator. Using the 9/64" Allen wrench, tighten each screw an equal amount until snug.
- 14 To reinstall the 841 Micro Injection Module onto the Micro 215 Liquid Handler, place the 841 Micro Injection Module behind the last rack position on the locator plate, next to the right support of the Micro 215 Liquid Handler. Secure the 841 Micro Injection Module onto the Micro 215 Liquid Handler by screwing the two knurled screws into the valve mounting plate on the 841 Micro Injection Module.





## Electrical Problems

If the problem persists after trying the following possible solutions, contact the Gilson Customer Service Department.

### Unit Not Operational

- Make sure power is turned ON
- Check the AC power connections
- Try a different AC outlet
- Check all 841 Micro Injection Module connections

### Lights Flashing On Front Panel

- Turn the unit OFF and then ON again

## Mechanical Problems

If the problem persists after trying the following possible solutions, contact the Gilson Customer Service Department.

### Liquid Bubbling from the Injection Port

- Remove the injection port/seal and drain from the valve (refer to **Chapter 2, Installation** for details)
- Check to see if the PEEK injection port/seal is plugged
  - If the injection port/seal is plugged, use a thin wire to clean out the hole at the bottom
- Check to see if the probe is aligned in the injection port/seal (refer to **Chapter 2, Installation** for details)
- Check the Z-arm height (refer to **Chapter 2, Installation** for details)
- Replace the injection port/seal and drain (refer to **Chapter 4, Maintenance** for instructions)

### Liquid Bubbling from Waste Port or Injection Port

- Replace injection valve's rotor seal (refer to **Chapter 4, Maintenance** or the instructions supplied with the replacement injection port/seal)

### Liquid Bubbling from the Syringe Pump Overflow Port or the Injection Port/Seal

- Check to see if the PEEK injection port/seal is plugged (follow instructions on previous page ). Replace the injection port/seal if necessary
- Check the probe and transfer tubing for blockages
  - Remove the probe from the probe holder and disconnect the transfer tubing; run a cleaning wire through the probe to remove any particles
  - Pump a cleaning solution through the transfer tubing and probe to remove any particles
  - If necessary, replace the transfer tubing

## Repair and Return Policies

### Before Calling Us

Gilson Customer Service personnel will be able to serve you more efficiently if you prepare the following information:

- the serial number (located on the rear panel) of your 841 Micro Injection Module.
- the installation procedure you used
- list of symptoms
- list of operating procedures and conditions you were using when the problem arose list of other devices connected to the Micro 215 Liquid Handler and a description of those connections
- list of other electrical connections in the room

### Warranty Repair

Units covered under warranty will be repaired and returned to you at no charge. If you have any questions about applicability, please contact the Gilson Customer Service Department or your authorized representative.

### Non-Warranty Repair

Contact your local Gilson representative or the Gilson Customer Service Department to discuss service options and make arrangements to return the instrument, if necessary.

### Rebuilt Exchange

For some units, rebuilt exchange components are available. Contact the Gilson Customer Service Department for details.

### Return Procedure

In the United States, contact the Gilson Customer Service Department to obtain a Return Goods Authorization (RGA) number before returning any Gilson equipment. To return a piece of equipment:

- Carefully pack the unit to prevent damage in transit. Check with Gilson regarding proper method of shipment. No responsibility is assumed by Gilson for damage caused by improperly packaged instruments. Indicate the RGA number on the carton and on the packing slip
- Always insure for the replacement value of the unit
- Include a description of symptoms, your name, address, phone number and purchase order to cover repair costs, return and shipping charges, if your institution requires it. Ship to:

Gilson, Inc.  
 Attention: Customer Service  
 RGA: (indicate your RGA number here)  
 3000 W. Beltline Highway  
 Middleton, WI 53562-0027

Outside the United States, contact your Gilson representative for return procedures.

# Replacement Parts and Accessories

# A

<u>Reference Number</u>	<u>Description</u>
25051094	124 mm Z-height adjustment tool. Use this tool to adjust a 125 mm Z-arm for use with the 841 Micro Injection Module.
25051095	174 mm Z-height adjustment tool. Use this tool to adjust a 175 mm Z-arm for use with the 841 Micro Injection Module.
36078143	Shielded GSIOC cable, 30"
25051109	PEEK injection port/seal with drain and drain tubing
4310782	5/64" Allen wrench; for removal and installation of the 841 PEEK injection port/seal
4967123227	Stator face assembly for internal loop on Rheodyne RV700-109 valve; incorporates 1 µl internal loop
496775027	Stator face assembly for external loop on Rheodyne RV700-109 valve; order external loop separately
496510	Rheodyne ferrule
496511	Rheodyne long bushing
496512	Rheodyne 1/16" extra long nut
43913658	5/16" offset screwdriver
4340254	1/4" angled open-end wrench
4311402	9/64" Allen wrench
4311092	7/64" Allen wrench
49656055	Rheodyne 6000-055; package of 5. RheFlex short fitting set (5 nuts, 5 ferrules.)
490410654	Upchurch P-654 extra long PEEK adapter; 1/4"-28 to 10-32
49951059	PEEK tubing; 5 ft x 0.010" ID; 0.062" (1/16") OD
490410630	Upchurch F-300 Fingertight fitting, PEEK, 10-32

## Stainless Steel Sample Loops

4967123227	1 $\mu$ l internal sample loop/stator face assembly
49677520	5 $\mu$ l Sample Loop, Stainless Steel
49677521	10 $\mu$ l Sample Loop, Stainless Steel
49677522	20 $\mu$ l Sample Loop, Stainless Steel
49677523	50 $\mu$ l Sample Loop, Stainless Steel
49677524	100 $\mu$ l Sample Loop, Stainless Steel
49677525	200 $\mu$ l Sample Loop, Stainless Steel
49677526	500 $\mu$ l Sample Loop, Stainless Steel
49677527	1 ml Sample Loop, Stainless Steel
49677528	2 ml Sample Loop, Stainless Steel
49677529	5 ml Sample Loop, Stainless Steel

## Titanium Sample Loops

49677521T	10 $\mu$ l Sample Loop, Titanium
49677522T	20 $\mu$ l Sample Loop, Titanium
49677523T	50 $\mu$ l Sample Loop, Titanium
49677524T	100 $\mu$ l Sample Loop, Titanium
49677525T	200 $\mu$ l Sample Loop, Titanium
49677526T	500 $\mu$ l Sample Loop, Titanium
49677527T	1 ml Sample Loop, Titanium
49677528T	2 ml Sample Loop, Titanium
49677529T	5 ml Sample Loop, Titanium

# GSIOC Commands

---

# B

The Gilson Serial Input Output Channel (GSIOC) is an asynchronous serial communications interface that enhances the flexibility of your Gilson equipment.

The GSIOC incorporates an EIA RS-485 interface and allows up to 32 slave devices to be controlled from a single master in a multi-drop configuration.

Each slave device is identified by a unique number which must be known to the device and to the controller. The default unit ID code of the 841 Micro Injection Module is 29.

To control the 841 Micro Injection Module via the GSIOC interface, you need the following:

- a personal computer with Microsoft Windows 98 or NT and any Gilson control software or 706 Device Driver Software installed
- an unused RS-232 communication port

From the controller, you:

- specify the 841 Micro Injection Module as the device you want to control
- issue commands that set operating parameters, control operation, or request information from that device

## GSIOC Commands

There are two kinds of commands that you can send over the GSIOC:

- **Buffered commands** send instructions to the injection module. These commands are executed one at a time.
- **Immediate commands** request status information from the injection module. These commands are executed immediately, temporarily interrupting other commands in progress.

### GSIOC Command List

In the command list below, the GSIOC command must be entered in the proper upper or lower case format. If a buffered command requires additional information, you see italicized text next to the command. The description of the command identifies what you need to enter in place of the italicized parameter.

I - Immediate

B - Buffered

<i>Command</i>	<i>Type</i>	<i>Description</i>
\$	I	Resets the 841 Micro Injection Module . Equivalent to turning power Off then On to the 841 Micro Injection Module.
%	I	Reads the current software version. Returns: "841vx.xx" where x.xx is the currently installed version.
E	I	Returns error code. 00 - No error 01- Position error 02- Communication error to Rheodyne Valve Controller
M	I	Returns total number of valve cycles.

Mn	B	Sets number of valve cycles to value specified for <i>n</i> .  For example, the command M0 sets the number of valve cycles to zero.
R	I	Returns VCU software version.  The time is updated after moving valve.
V	I	Returns the valve status: L - Load position I - Inject position M - Moving E - Error
VI	B	Rotates valve to Inject position
VL	B	Rotates valve to Load position



# Baud Rate

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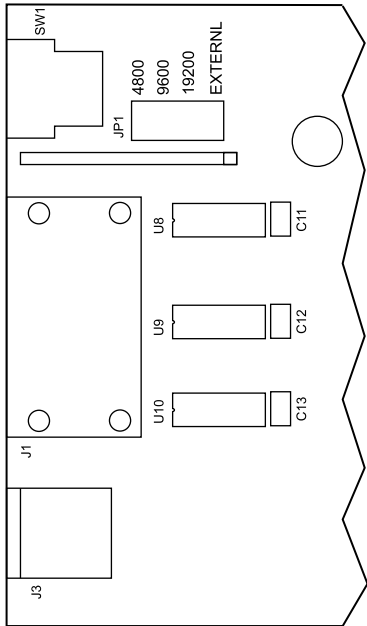
# C

As a default, the baud rate is set to external, indicating that the 841 Micro Injection Module is a slave device in a Gilson system and the baud rate is being clocked externally.

The following baud rate selections are available if the 841 Micro Injection Module is being controlled by non-Gilson applications:

- 19200
- 9600
- 4800

## Baud Rate

**To change the baud rate:**

- 1 Turn off then remove the 841 Micro Injection Module from the Micro 215 Liquid Handler.
- 2 Remove the valve mounting plate as described in **Chapter 4, Maintenance**.
- 3 Remove the four screws that secure the 841 Micro Injection Module's cover and then remove the cover.
- 4 Locate JP1 in the upper left corner of the rear-panel electronics board.
- 5 Reposition the jumper to connect the pins for the baud rate that you want to use.
- 6 Replace the cover and the four screws that secure it.
- 7 Replace the valve mounting plate.
- 8 Re-install the 841 Micro Injection Module onto the Micro 215 Liquid Handler. (Refer to **Chapter 2** for instructions.)



## Precision Methods/Data

The following are methods used to obtain the precision data listed in *Chapter 1*. They are organized by loop fill injection technique.

### Total Loop Injection

#### Precision Method

##### System

Gilson 306 Pump

Gilson 305 Pump

Gilson 805 Manometric Module

Gilson 811C Dynamic Mixer

Gilson Micro 215 Liquid Handler:

- 100  $\mu$ l syringe
- Micro Volume Probe (reference 2507248)

Gilson 841 Micro Injection Module:

- 1  $\mu$ l internal loop

Gilson 117 UV Detector

- wavelength: 254 nm
- sensitivity: 5 AUFS

##### Column

- Vydac RP C-18: 5  $\mu$ m, 2.1 x 150 mm

##### Mobile Phase

80% acetonitrile, 20% water (0.05% acetic acid)

##### Flow

0.5 ml/min

##### Injections

100 injections of 1 mg/ml 2-acetamidiphenol

### Injection Method

- 1 Aspirate 3  $\mu$ l air gap, 0.3 ml/min
- 2 Aspirate 10  $\mu$ l sample, 0.3 ml/min
- 3 Turn valve to load
- 4 Dispense 5  $\mu$ l 0.3 ml/min
- 5 Turn valve to inject

### Rinse Volumes

Probe at rinse station: 500  $\mu$ l

Injection port and valve: 300  $\mu$ l

### Precision Data

#### CV

< 1.5% with 100  $\mu$ l syringe and total loop filling method as described above

## Partial Loop Injection

### Precision Method

#### System

Gilson 306 Pump

Gilson 305 Pump

Gilson 805 Manometric Module

Gilson 811C Dynamic Mixer

Gilson Micro 215 Liquid Handler

- 100  $\mu$ l syringe
- Micro Volume Probe (reference 2507248)

Gilson 841 Micro Injection Module

- 20  $\mu$ l external loop

Gilson 117 UV Detector

- wavelength: 254 nm
- sensitivity: 5 AUFS
- flow cell: 5 mm, 12  $\mu$ l analytical

#### Column

- Vydac RP C-18: 5  $\mu$ m, 2.1 x 150 mm

#### Mobile Phase

80% acetonitrile: 20% water (0.05% acetic acid)

### Injection Method

- 1 Aspirate 3  $\mu\text{l}$  air gap, 0.3 ml/min
- 2 Aspirate sample volume, 0.3 ml/min
- 3 Aspirate 6  $\mu\text{l}$  flush volume, 0.3 ml/min + 8  $\mu\text{l}$  back volume, 0.3 ml/min
- 4 Aspirate 5  $\mu\text{l}$  front air gap, 0.3 ml/min into injection port
- 5 Turn valve to inject
- 6 Dispense 5  $\mu\text{l}$  front air gap + 6  $\mu\text{l}$  flush, 0.3 ml/min
- 7 Turn valve to load
- 8 Dispense sample volume, 0.3 ml/min into injection port
- 9 Turn valve to inject

### Flow

0.5 ml/min

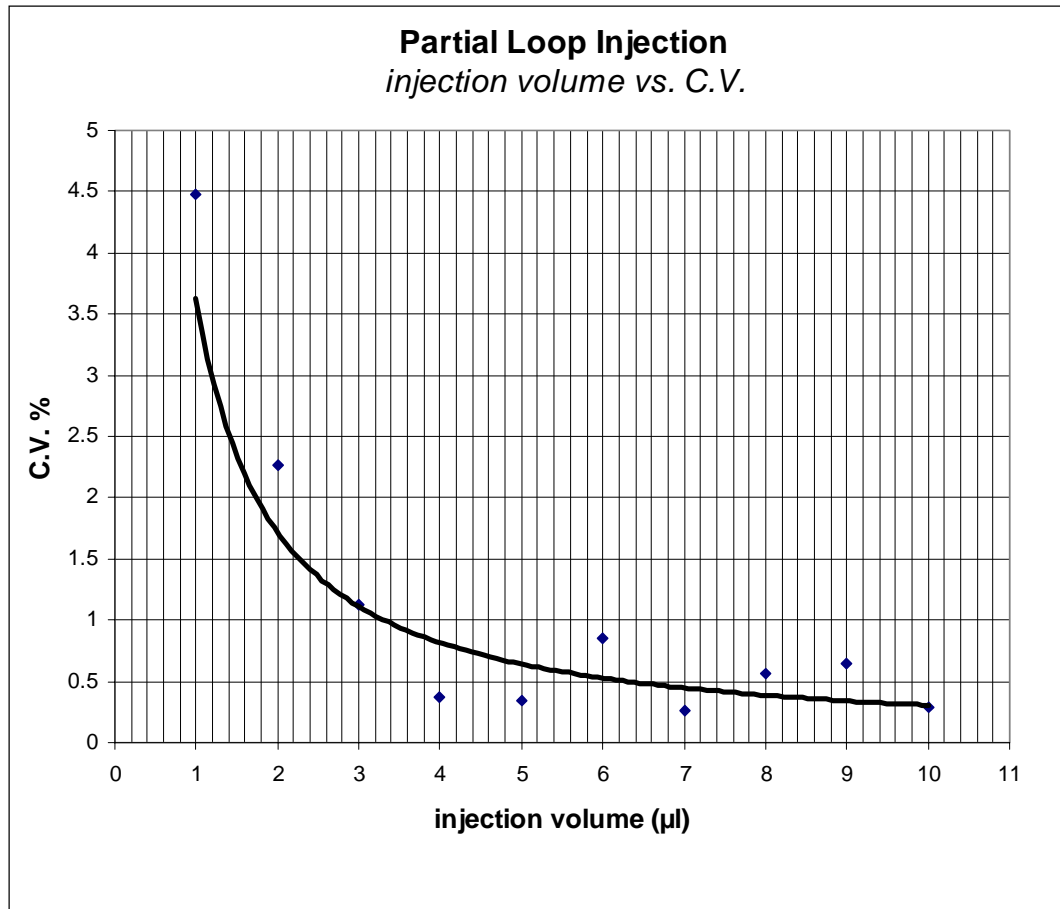
### Rinse Volumes

Probe at rinse station: 500  $\mu\text{l}$

Injection port and valve: 200  $\mu\text{l}$

### Precision Data

Please refer to the graph on the following page.



## Centered Loop Injection

### Precision Method

#### System

Gilson 306 Pump

Gilson 305 Pump

Gilson 805 Manometric Module

Gilson 811C Dynamic Mixer

Gilson Micro 215 Liquid Handler

- 100 µl syringe
- Micro Volume Probe (reference 2507248)

Gilson 841 Micro Injection Module

- 20 µl external loop

Gilson 117 UV Detector

- wavelength: 254 nm
- sensitivity: 5 AUFS
- flow cell: 5 mm, 12 µl analytical

#### Column

- Vydac RP C-18: 5 µm, 2.1 x 150 mm

#### Mobile Phase

80% acetonitrile, 20% water (0.05% acetic acid)

#### Flow

0.5 ml/min

**Injection Method**

- 1 Aspirate 3  $\mu\text{l}$  air gap, 0.3 ml/min
- 2 Aspirate sample volume, 0.3 ml/min
- 3 Aspirate 3  $\mu\text{l}$  air gap, 0.3 ml/min
- 4 Aspirate from reservoir, 8.5  $\mu\text{l}$  (push volume), 0.3 ml/min
- 5 Turn valve to load
- 6 Dispense sample volume + 6  $\mu\text{l}$  (air gap) + 8.5  $\mu\text{l}$  (push volume), 0.3 ml/min into injection port
- 7 Turn valve to inject

**Rinse Volumes**

Probe at rinse station: 500  $\mu\text{l}$

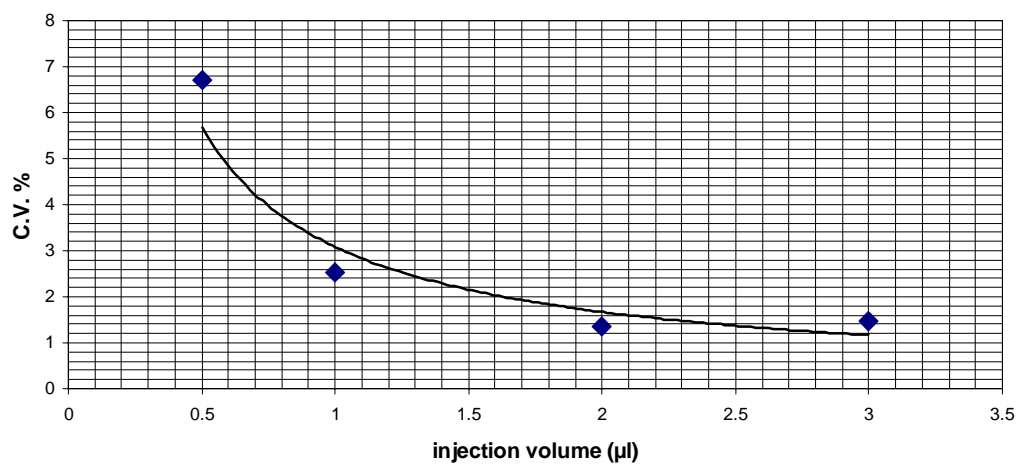
Injection port and valve: 200  $\mu\text{l}$

**Precision Data**

Please refer to the graph below.

**Centered Loop Injection**

*injection volume vs. C.V.*



## Carryover Methods/Data

The following method was used to determine carryover.

### Carryover Method

#### System

Gilson 306 Pump

Gilson 305 Pump

Gilson 805 Manometric Module

Gilson 811C Dynamic Mixer

Gilson Micro 215 Liquid Handler with 125 mm Z-arm

- Micro Volume Probe (reference 2507248)
- 100  $\mu$ l syringe
- 990 mm x 0.03 mm ID PEEK transfer tubing

Gilson 841 Micro Injection Module

- 1  $\mu$ l internal loop

Jasco FP-920 Intelligent Fluorescence Detector

- PMT Gain: 1,000
- Excitation: 254 nm
- Emission: 400 nm

YMC Column: 120Å, S-5, 4.6 x 150 mm (AM 12505-1546WT)

#### Mobile phase

methanol, 0.5 ml/min

#### Vials

300  $\mu$ l conical microvial

#### Injections

51  $\mu$ g/ml anthracene, followed by five blank injections of methanol

**Sample volume**

10  $\mu$ l

**Injection Method**

Total loop fill (1  $\mu$ l internal loop)

**Rinse volume**

Injection port and valve: 600  $\mu$ l

**Carryover data**

Lower than 0.05 % with the following rinse volumes:

- Inside probe rinse volume: 500  $\mu$ l
- Outside probe rinse volume: 500  $\mu$ l