G1160A Agilent 1100 Series Multiple Purpose Switching Valve

Description:

The G1160A Agilent 1100 Series Multiple Purpose Switching Valve is a stainless steel 12-position, 13-port motorized valve operated by a microprocessor and controlled via CAN interface for the seamless integration to the 1100 Series system.

This valve is initially intended for the operation of multiple fraction collectors in parallel (up to 3), but in general it directs the liquid flow from 1 inlet port to 12 different outlet ports or from 12 different inlet ports to 1 outlet. More possible applications for this device will be introduced and supported in the near future.

The valve is automatically controlled via the Agilent ChemStation Software, Rev. A.09.01 or higher.

Delivery Checklist

The product consists of:

- Agilent 1100 Series Multiple Purpose Switching Valve, G1160A
- Organizer Rail Assembly (5065-4450), for installation to the Column Organizer G1383A
- Accessory Kit, G1160-68705 (for a detailed list of the parts, please refer to “Accessory Kit G1160-68705” on page 8)
- Manual, G1160-90000
- Declaration of Conformity, G1364-90501

Specifications

Table 1 **Physical Specifications - for 1100 Series Purification System Modules**

Type	Specification	Comments
Dimensions	92 x 84 x 200 mm, (3.3 x 3.3 x 7.9 “) (W x H x D)	Without Organizer Rail Assembly
Weight	1.8 kg	Without Organizer Rail Assembly
Line voltage	24 VAC, ± 5 %	Operated via CAN-DC-IN
Power consumption	24V/1A max.	
Liquid Contacts	Stainless steel and PEEK	
Port Size	10-32 male threaded fittings	
Flow Passage Diameters	1.0-mm (.040")	
Volume in Flow Passages	Stator- (includes stator face assembly)- 6.4-µL/hole, Rotor Seal -4.0-µL/groove	
Maximum Pressure	207 bar	Don’t exceed the specified maximum backpressure at the flow cell installed in the detector!
Ambient operating temperature	4 – 55 °C (41 – 131 °F)	
Ambient non-operating temperature	-40 – 70 °C (-4 – 158 °F)	
Humidity	< 95 %, at 25 – 40 °C (77 – 104 °F)	Non-condensing
Operating Altitude	Up to 2000 m (6500 ft)	
Non-operating altitude	Up to 4600 m (14950 ft)	For storing the valve
Safety standards: IEC, CSA, UL	Installation Category II, Pollution Degree 2	

Installing the Multiple Purpose Switching Valve

The valve can either be mounted to the G1383A Column Organizer or it can be placed on a free bench space near the HPLC system.

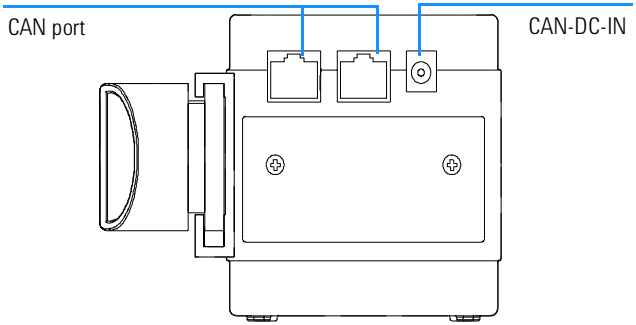
To install the G1160A Multiple Purpose Switching Valve on the G1383A Column Organizer the Organizer Assembly, it must be installed to the two mounting poles, with the help of the clips present on the organizer rail assembly 5065-4450. The valve has a bracket on the side which slides over the metal part of the Organizer Assembly.

CAUTION

When installing the G1160A Multiple Purpose Switching Valve on the bench consideration has to be given to the handling of any eventual leakage. The front of the Valve should be placed above the G1383A Column Organizer base plate in such a manner that any eventual leakage would be collected by the base plate.

On the rear of the Multiple Purpose Switching Valve there is provision for two CAN cables and a CAN-DC-Cable (See Figure 1).

Figure 1 **Rear of G1160A Multiple Purpose Switching Valve**



Connect the CAN-Cable (PN 5181-1519) between a free CAN-Port on one of the 1100 Series system modules and one of the CAN-Ports of the Valve. The other CAN-Port can be used to add additional valves or modules.

The CAN-DC-Cable (PN 5181-1533) should be connected between the connector at the back of the valve (CAN-DC-IN) and an appropriate connector (CAN-DC-OUT) on one of the following modules: G1361A Preparative Pump, G1364A Fraction Collector or G1367A/68A Well Plate Sampler.

- To connect the valve to either the VWD or the DAD, the waste tubing included in the detectors' accessory kits should be used. It is important to use tubing or capillaries with an internal diameter of at least 0.5mm to minimize the backpressure generated by the tubing.
- For low flow applications a tubing of an internal diameter of 0.25mm can also be used for connecting the detector outlet to the valve inlet.
- The G1160A Accessories Kit is delivered with finger-tight fittings. When choosing other fittings these should be of a long-neck type to allow multiple fittings to be installed in the ports next to each other.
- When installing multiple G1364A Fraction Collectors to the G1160A Multiple Purpose Switching Valve the Fraction Collectors should be attached to ports adjacent to each other, to make the valve movements as short as possible. Ports not in use should be capped.

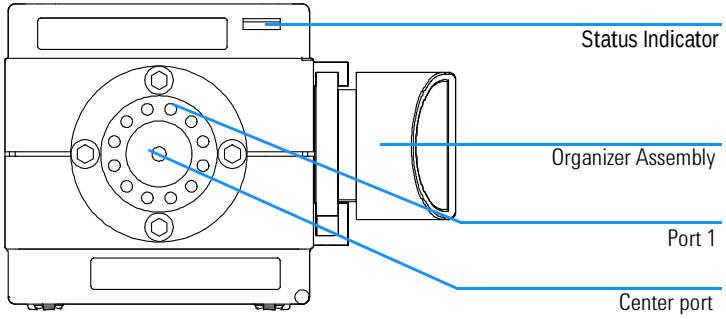
Valve flow switching pattern

A schematic of the valve flow switching pattern is shown below. The numbered circles represent the ports in the valve stator and stator face assembly. The slots represent the connecting passages in the rotor seal. Incrementing the valve 30° lines up one of the 12 ports with the common port in the center of the valve.

NOTE

To ensure that any additional Fraction Collectors will have the same delay time, it is important to ensure the exact same delay volume between the valve and each of the fraction collectors. This can be achieved for the same type of Fraction Collector by having the same length of tubing.

Figure 2 **Front of G1160A Multi Purpose Switching Valve**



Operation

The valve is integrated into the 1100 series system via CAN-cable and it is automatically detected, configured and operated by the ChemStation, if present during the boot-up process of the ChemStation.

The user has to configure which of the multiple Fraction Collectors used together with the G1160A Multiple Purpose Switching valve is to be configured as the main Fraction collector (see also the Chemstation help files). This main Fraction Collector's vessels will be filled by the ChemStation with fractionated samples, first. As soon, as all Fraction locations of the main Fraction Collector are filled with fractionated samples, the valve switches automatically to the second Fraction Collector. If the second Fraction Collector is filled, the valve automatically switches to the third Fraction Collector (if present). If all Fraction collectors are filled with sample fractions, the run is automatically aborted with any potential additional fraction-peaks remaining in the system.

Status Indicator

The instrument status indicator indicates the instrument conditions:

- Status indicator *OFF* (and power switch light is on): The instrument is in a prerun condition, and is ready to begin an analysis.
- *Green*: the instrument is performing an analysis (run mode).
- *Yellow*: a not-ready condition. The instrument is in a not-ready state when it is waiting for a specific condition to be reached or completed (for example, front door not closed), or while a self-test procedure is running.
- *Red*: An error condition. An error condition indicates the instrument has detected an internal problem which affects correct operation of the instrument. Usually, an error condition requires attention (for example, leak, defective internal components). An error condition always interrupts the analysis.

Replacing the Valve Firmware

The installation of new firmware is required if the new version solves problems of the currently installed version.

To upgrade the Valve firmware follow the procedures and instructions given on the Internet at: **http://www.agilent.com/chem**

To download and install always the newest available version of the firmware on your system call your local service provider for assistance.

Maintenance

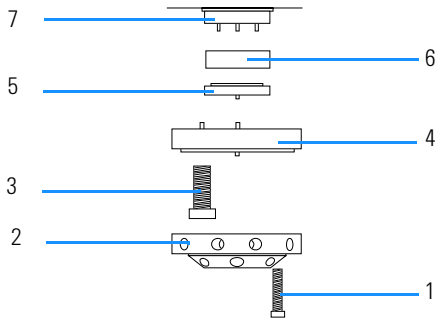
Under normal operation the valve will perform many thousands of actuations without any visible signs of wear. The main cause of early failures, which are seen as valve leakages, are abrasive particles in the sample and/or mobile phase or crystallization of buffer solutions. Either can cause scratches on the rotor seal and stator face assembly.

NOTE If an electrical problem is encountered, please contact your local Agilent Technologies service office.

Valve Head Disassembly

To disassemble the valve head, please refer to Figure 3 and Figure 4 and proceed as follows:

Figure 3 **Valve Parts**



1. With the Hex Key provided, remove the Stator Screws (1) from the Stator (2).
2. Remove the Stator and Stator Face Assembly (5) from the Stator Ring (4). The Stator Face Assembly usually remains on the Stator.

3 Use the Hex Key to remove the three Stator Ring Screws (3) from the Stator Ring.

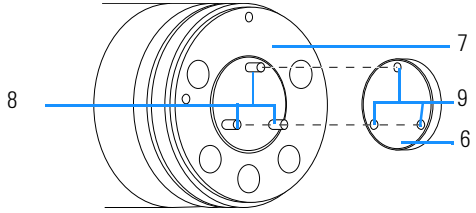
4 Remove the Stator Ring (4).

5 Remove the Rotor Seal (6) from the valve body (7). The Rotor Seal is mounted on three pins, and can be pulled off.

Valve Reassembly

To reassemble the valve, please refer to Figure 3 and Figure 4 and proceed as follows:

Figure 4 **Mounting a New Rotor Seal**



1 Mount the new Rotor Seal(6) with the slots facing the Stator (2). The three pins(8) on the Shaft Assembly fit into the matching holes (9) in the Rotor Seal only one way.

2 Replace the Stator Ring (4) so the two short pins on the ring enter the matching holes in the body (7).

3 Replace and tighten the three Stator Ring Screws (3). Tighten each an equal amount until the Screws are finger-tight, then turn another half turn.

4 Mount the new Stator Face Assembly (5) onto the Stator (2). The pins on the assembly fir into the matching holes in the Stator.

5 Replace the Stator (2) and Stator Face Assembly (5) on the valve so that the pin in the Stator Ring enters the matching hole in the Stator.

6 Replace the Stator Screws (1) into the Stator. Tighten each an equal amount until the screws are finger-tight, then turn another half turn.

Parts and Materials

Table 2 **Rebuild Kit 0101-1288**

Description
Stator face
Rotor seal
Isolation seal
Tool, Hex Key

Table 3 **Accessory Kit G1160-68705**

Description	Part Number
Rheflex fitting, 5/pk	0100-1631
CAN Cable, 1m long	5181-1519
CAN-DC-Out Cable	5181-1533
Hex-key wrench, 0.141”	8710-0060
Tool, Wrench	8710-0510

Table 4 **Cables**

Description	Part Number
CAN Cable, 0.5m long	5181-1516
CAN Cable, 1m long	5181-1519
CAN-DC-Out Cable	5181-1533

Part number G1160-90000
Printed in Germany 12/01