1110 Valves

Introduction

Specific part numbers are not given in this portion of the service manual. For all replacement part numbers, refer to the IPB portion of this document.

This document does not provide instruction for first time installation of any of the options discussed. The add-on sheets, which accompany the various options, exist for just this purpose, and should be referenced when performing a first time installation.

The valves described in this manual are W-series minivalves, manufactured by VALCO Instruments Co, Houston, Texas. The valve body is made of Nitronic-60 nickel steel with 1/16-inch fittings.

Proper instrument operation will prolong the life of the valve system. Read all the accompanying information and avoid the following operational abuses:

- Exceeding the specified temperature and pressure ranges
- Plugging a valve with column packing or sample precipitation
- Scoring valve surfaces with column packing or particulates in liquid or gas sample
- Contaminating the system with samples (non-eluting materials) or poor quality support gases

Because valves operate best at a constant temperature, the 6890 GC places valves in their own heated compartment.

WARNING To reduce the fire hazard when sampling flammable gases or liquids under pressure, operators should routinely make pressure-leak tests of the plumbing, fitting and valves. Both valve positions should be checked. Depending on the nature and pressure of the sample stream, periodic pressure leak test and visual inspection should be made since wear or use could cause leaks to develop. Leaks may occur inside the valve box and be concealed from the operators view.

Valco W-series minivalves

Valves consist of a driver, valve body, rotor, and preload assembly.

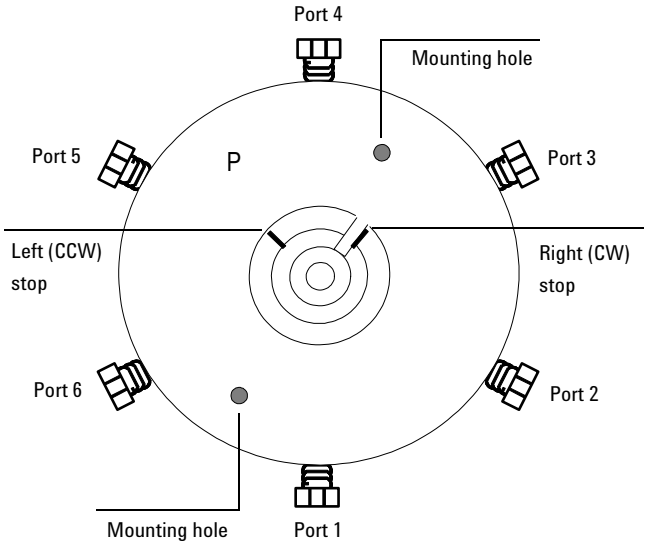

Figure 1110-1 Valco W-series minivalve

Table 1110-1 Part Numbers for 6890 Valves

General purpose (Gas Sample) valves

Ports	Low temp	High temp
6	5062-9508	0101-0584
10	5062-9510	0101-0585

Liquid sampling valves

Ports	Volume	Pressure	Valve
4	0.2 µL	1000	0101-0636
4	0.5 µL	1000	0101-0637
4	1.0 µL	1000	0101-0638
4	0.5 µL	5000	0101-0639

Valve bodies

Body parts are made from Nitronics 60 nickel steel. If required, the valve may also be produced from Hastelloy C. External tubing (plumbing) is connected to the valve body ports by ferrules and fittings provided with the instrument.

The left (CCW, counterclockwise) and right (CW, clockwise) stops on general purpose valve bodies limit rotor rotation so the correct flow path results when the index pin is close to or against either stop of the index lip.

Caution Intermediate positions of the rotor may result in an interrupted flow path which could cause damage to the valve or other components in the chromatograph.

Valve rotors

Rotor type can be identified by color:

- An **off-white** rotor is made of a PTFE composite and may be used from room temperature to 200°C.
- A **black** rotor is made of polyimide and may be used from 100 to 350°C.

Caution The life of a valve is shortened if used outside its specified temperature range Do not mix rotor types in the same system.

The rotor seats on a highly polished conical surface. When properly seated, the polished surface prevents leakage around the rotor and between non-selected ports. The finish precludes adsorption of most GC samples.

The rotor assembly is a one-piece part with an integral molded and machined conical hub and the parts necessary for proper seating. The sample contacts only the PTFE composite (low temperature) or polyimide (high temperature) as well as the stainless steel of the valve.

Grooves in the rotor surface form the paths between specific ports. The index pin prevents rotation beyond either stop of the index lip. Valve ports are connected by the grooves only when the index pin is close to or against either stop. Intermediate positions result in flow shutoff through the valve and possible damage if left in this position.

General purpose valves

The 6- and 10-port general purpose valves are suitable for column switching, isolation, backflushing, and other uses as well as gas sampling.

Gas sample valves

The standard gas sample valves have 1/16-inch zero dead volume fittings and an internal port diameter of 0.016-inch.

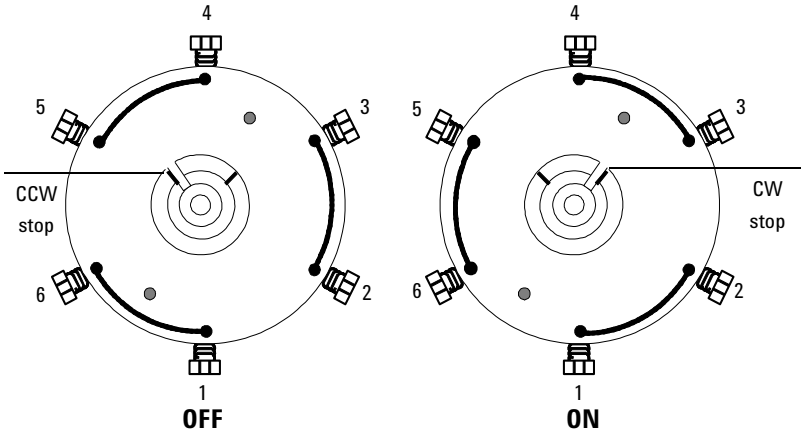

Figure 1110-2 6-port valve (actuator side view) showing flow path grooves

Gas sample loops

A 0.25 mL sample loop is included with all gas sampling valve systems. 10 mL and 5 mL loops occupy one valve position, limiting the number of valves that can be housed in a valve compartment.

Adjustable restrictor valves

Adjustable restrictors are used to balance flow resistance between the two valve positions. They are available with ambient to 225°C (part no. 0101-0633) or ambient to 350°C (part no. 0101-0948) operating ranges.

Liquid sample valves

Agilent Technologies offers 4-port LSVs with 0.2, 0.5, or 1 µL internal loops.

These valves are designed for liquefied gases under pressure such as ethane, propane, butane, LNG, etc. They are not intended for nonvolatile liquids (at room conditions) where a concealed leak could allow an accumulation or pool of liquid to form that may present a significant fire hazard.

All liquid sample valves have 1/16-inch fittings. The 0.5 µL size is available in low- (1000 psig limit) and high-pressure (5000 psig) versions; the other sizes are low-pressure (1000 psig) only.

An adjustable restrictor may be used on the sample outlet line to maintain internal sample pressure to keep a compressed gas liquefied.

Temperature ranges

1/16-inch Teflon rotor valves	0 to 200°C
Adjustable restrictor valves	Ambient to 225°C

Caution The life of an LSV is shortened if used outside its specified pressure and temperature ranges. Highly dangerous leaks can occur if the valve box temperature ever exceeds the specified temperature limits.

Adjustable restrictor valve

The adjustable restrictor supplied with a liquid sample valve is designed for temperatures up to 225°C; it is NOT compatible with high-temperature valves.