Constant Volume Valve

P/N 402151

INSTALLATION INSTRUCTIONS

FLUKE®
Calibration

CONSTANT VOLUME VALVE, P/N 402151, INCLUDES:

QTY	PART NO	DESCRIPTION
1	402177	Valve, constant volume
2	103686	DH500 F x DH200-2 M adaptor
1	102159	10-32 UNF M x 1/8 in. barb adaptor
1	103426	10-32 UNF M x 1/8 in. quick connector
1	560076	Instruction Sheet

INTRODUCTION

The constant volume valve is a pneumatically actuated needle valve with a return line connecting the inlet to a coaxial compensator. Needle displacement is matched by an equal and opposite volume displacement on the compensator.

SPECIFICATIONS

Port A connection: DH200-2*
Port B connection: DH200-2*
Drive air connection (to open valve): 10-32 UNF F
Operating fluid: Oil
Maximum line pressure: 200 MPa (30 000 psi)
Maximum differential pressure on Port A or Port B: 200 MPa (30 000 psi)
Drive air pressure required to open valve:
- With zero differential: <500 kPa (70 psi)
- With 200 MPa differential, Port A:<400 kPa (60 psi)
- With 200 MPa differential, Port B: 750 kPa (110 psi)

Maximum drive air pressure: 850 kPa (125 psi)

Typical change in volume on port A or B when the valve is opened or closed: <0.2 mm^3

* DH200-2 is equivalent to HIP HF2 for 1/8 in. OD, coned and threaded stainless steel tube

INSTALLATION

❶ Connect the valve between the two pressure systems to be isolated using ports A and B. Use the DH200-2 M x DH500 F adaptors supplied if desired. To install the adaptors, remove the DH200-2 glands and collars from the DH200-2 connections.

❷ Connect a drive air supply to the drive air connection. Use the 10-32 UNF M x barb adaptor or 10-32 UNF M x quick connector supplied if desired.

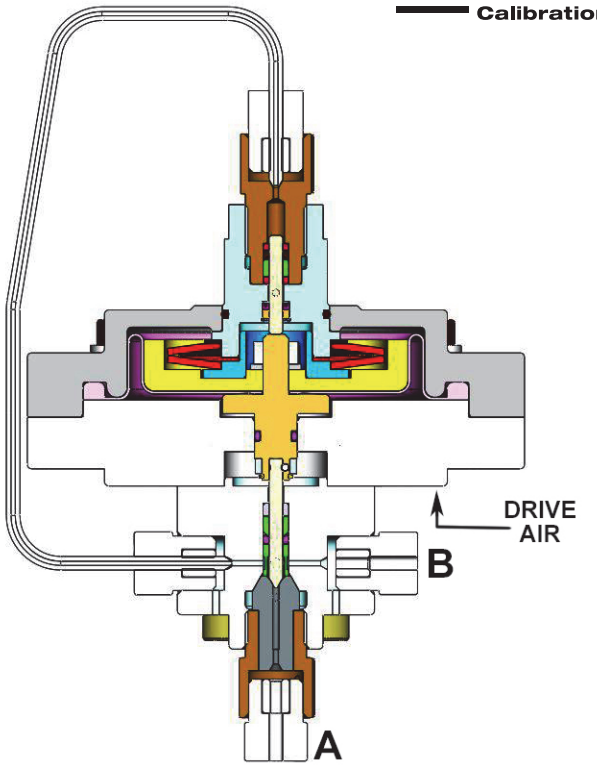

Figure 1. Constant volume valve cutaway view

APPLICATION NOTES

- To open the valve, supply drive air pressure to the drive air port. To close the valve, vent the drive air pressure.
- To reduce the opening/closing speed of the valve, put an adjustable restriction or fixed orifice on the drive air supply and exhaust. This can be useful to reduce pressure perturbations from the valve opening/closing.
- To automate opening and closing of the valve, use a three way, low pressure solenoid valve to control drive air/vent supply to the valve actuator.
- To reduce the relative effect of the small change in volume due to deformation of the valve seat after the valve closes, add volume to the pressurized system.
- After the valve closes, a small volume change occurs from elastic deformation of the seat. The deformation can be reduced by special shimming to reduce the force of the needle on the seat when the valve is closed, but the maximum differential pressure on port A is reduced.

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