

MiDP Valves



Humphrey

2-Port S390/S391 Stepper Operated Inert Diaphragm Poppet Proportional Valves

Introducing Humphrey MiDP Series Proportional Valves, designed to precisely control flow of a wide range of aggressive liquids and gases. The wetted flow path utilizes Humphrey's 350 Series diaphragm isolated design with medical industry proven reliability (20+ years), including applications such as kidney dialysis and endoscope reprocessing. Safely isolated from the media is Humphrey's new stepper motor operator delivering precise positioning and control of flow, with outstanding repeatability and low hysteresis.

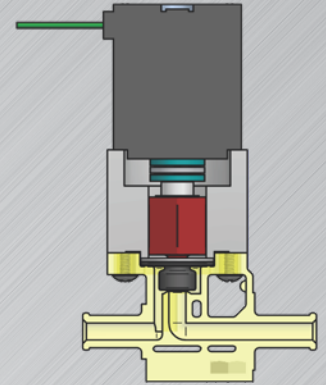
A perfluoroelastomer (FFKM) highlights the range of diaphragm materials available, housed within an inert Radel® body.

FEATURES

- Field proven and reliable diaphragm separated body construction of the Humphrey 350 Series iDP Valves.
- Inert wetted flow path of a Radel® body and either FFKM, EPDM, or Viton™GF diaphragms ensures broad chemical and temperature compatibility.
- Extremely repeatable variable flow control. Expect 2% or less of full scale.
- Precise. Hysteresis measured at <2%. Open loop control applications are possible.
- Not susceptible to cavitation / water hammer (liquids).
- Low or zero holding current when positioned.
- Long life. Expect >1 million cycles.
- Custom performance configurations are available (consult factory).
- Inline/direct piping and Manifold/subbase mount bodies available.



S390
2-Port
Inline, Direct Piping



S391
2-Port
Manifold Mount



Scan for additional product details on our online catalog.



How to Order

MiDP S390/S391 Series

S390	4	1	0	5	0	S39041050
MODEL S390: Inline S391: Manifold	BODY/SEALS 3: Radel®-EPDM 4: Radel®-Viton™GF 5: Radel®-FFKM	BODY STYLE (IN-OUT) 0: Manifold (No Barbs) 1: Barb-Barb 5: 8mm-8mm (5/16") (Quick Disconnect)	ORIFICE 0: Inline (0.150") 1: Manifold STD (0.150") 2: Manifold (0.094") 3: Manifold (0.050")	ORIENTATION 5: Standard 7: Rotate 180°	OPTIONS 0: Standard	ORDER EXAMPLE

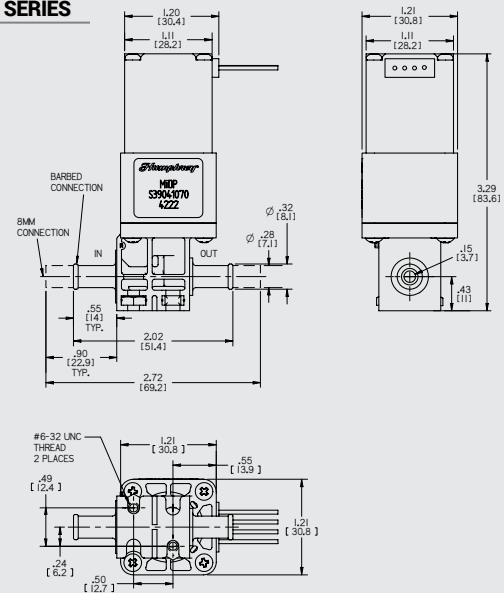
MiDP Valves

2-Port S390/S391 Series

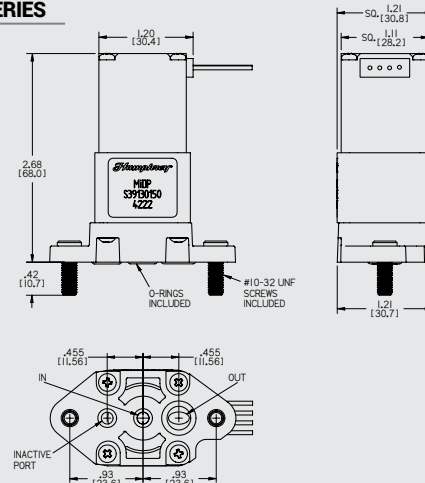
SPECIFICATIONS	MiDP S390, MiDP S391
TYPE OF OPERATION	Stepper Motor, Media Isolated
MEDIA	Aggressive Liquid or Gas
PRESSURE RANGE – PSI (BAR)	0 - 60 (0 - 4.1)
TYPICAL HYSTERESIS	< 2%
TYPICAL FLOW RANGE (0.150" ORIFICE)	0-8.5 SLPM Water / 0-325 SLPM Air @ 60 PSI
TYPICAL FLOW ADJUSTMENT PER STEP @ 40 PSI (0.150" ORIFICE)	AIR: 5.3 SLPM
Cv (0.150" ORIFICE)	0.31
AMBIENT TEMPERATURE	0 - 50°C
FLUID TEMPERATURE	0 - 95°C
CYCLE TIME (TYP) – OPEN TO CLOSE OR CLOSE TO OPEN	2 seconds
CYCLE LIFE (TYP)	> 1 million
STEP RESPONSE TIME (TYP)	< 40 milliseconds
REPEATABILITY (TYP)	< 2% of full scale
STROKE (in)	0 - 0.024
POSITION RESOLUTION (in)	0.0004 / STEP
WETTED MATERIAL	Radel® and EPDM, Viton™ GF, FFKM
POWER CONSUMPTION (WATTS)	2.6 MAX
CURRENT / PHASE	600 mA standard; Consult factory for other.
DRIVER (CUSTOMER SUPPLIED)	Chopper or linear driver required.

DIMENSIONAL DRAWINGS

S390 SERIES



S391 SERIES



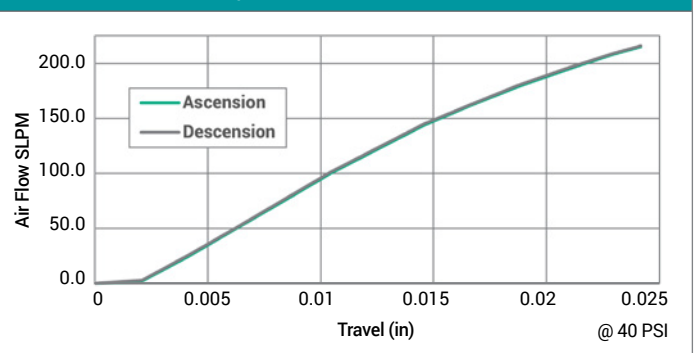
MEDIA COMPATIBILITY

- Citric Acid
- Formaldehyde
- Biological Solutions
- Sodium Hypochlorite
- Dextrose/Sugars
- Dialysate
- Hydrogen Peroxide
- Acetic Acid
- Bleach/Lye
- Most aggressive medias

APPLICATIONS & MARKETS

- Kidney Dialysis
- Diagnostic Systems
- Environmental Monitoring
- Food and Beverage
- Gaseous Flow Control
- Water Purification
- Clinical Equipment Waste Systems
- Ratio Control of Mixing Multiple Liquids
- Dosing Additives for Process Control

MiDP S390/S391 Typical Air Flow vs. Stroke 0.150" Orifice



Certified: ISO 9001:2015



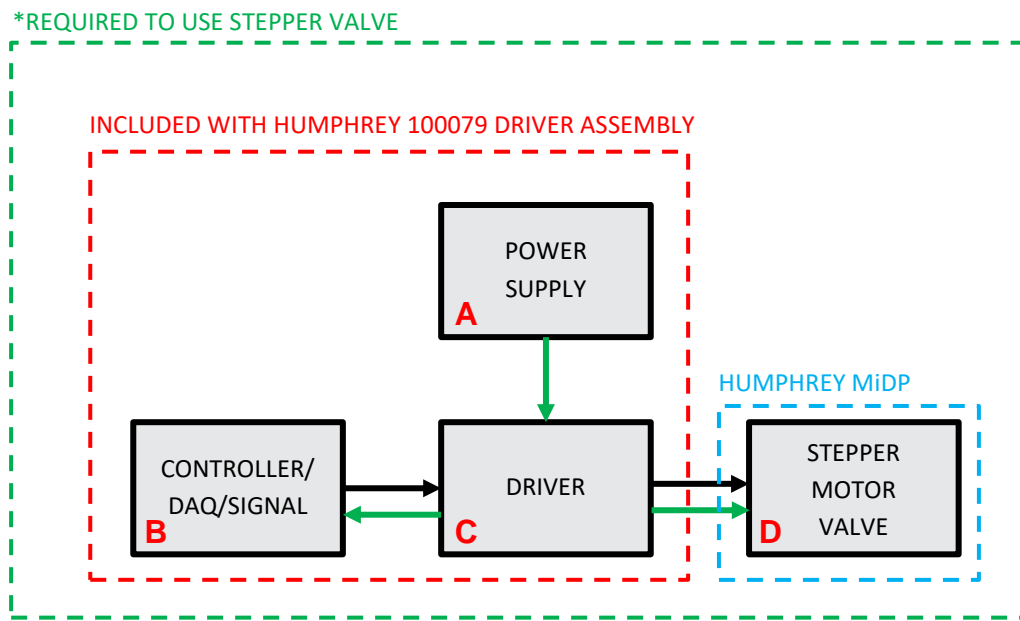
Operational Guidelines: MiDP Stepper Motor Valve

Overview

Humphrey MiDP is a proportional valve utilizing a stepper motor as its operator. All stepper motors require an appropriate driver to function properly. A third-party driver or Humphrey Products' stepper motor driver assembly, part number 100079, may be used.

Stepper motor / driver combinations require an initialization cycle, at application temperature, to ensure the stepper valve performs as intended. This cycle sets the seat position with appropriate preload for valve shut off. The initialization cycle is critical regardless of using the Humphrey driver assembly or third-party stepper motor driver.

Without a proper initialization cycle, the MiDP valve can 1) be damaged, 2) remain in open position when not desired, or 3) not function as intended.



*Humphrey 100079 driver assembly contains everything needed to operate MiDP valve.



Humphrey MiDP driver assembly

The control box (C) may be driven with either an external 0-5VDC control power signal, or with the supplied pendant (B) that provides an internal 0-5VDC supply. Connect pendant to box via color-coded banana plugs.

The pendant knob will adjust the valve stem's lift in 0.0004 inch increments (steps) and for a total movement of 0.024 inches. The initialization cycle sets the seat with 0.002" to 0.004" of preload on the valve seat (minimum lift required to start flow).

Sequence of operation:

1. With power and pressure off, connect valve to controller.
2. With pressure off, and knob rotated fully to stopped counter - clockwise position (or external voltage set to 0), turn on the control unit. The initialization cycle will begin, setting valve to its seated condition.
3. Apply pressurized media to valve. Turn knob clockwise to desired flow rate.
4. Adjust valve flow (modulate) with the knob or with variable control voltage, taking care not to exceed 5.0VDC.

CAUTION: When hooking up, disconnecting, or changing valves, make sure the power is off. Failure to do so may risk damage to the drive circuitry. If using an external voltage supply, max voltage must be no greater than 5.2 VDC or risk damage to the microprocessor.

Operational considerations using other valve drivers

System Set Up

1. Set media pressure to zero PSI at valve inlet for best results. Otherwise, seat depth will be impacted when initializing against pressure.
2. Begin initialization cycle, setting position of the seat.
Recommended initialization current: 350 mA
3. Apply pressurized media to valve. Move valve stem to desired position.
Recommended moving current: 600 mA
4. Hold valve stem at desired position.
Recommended hold current: 100 mA

Driver Settings

- Max Speed – 150 steps per second
- Acceleration – 50 steps per second²
- Deceleration – 50 steps per second²

Follow driver manufacturer's instructions, with our valve specifications and capabilities in consideration.

