

Humphrey[®]

iDP Series



In Control of Your Difficult Media

ISO 9001:2008 Registered
ISO 13485:2003 Registered for Medical Device

Humphrey Products Company
PO Box 2008, Kalamazoo, MI 49003 • P: 269.381.5500 F: 269.381.4113
www.humphrey-products.com

iDP3-2017; Copyright © 2017 Humphrey Products Company, Inc.

Humphrey iDP INERT DIAPHRAGM-POPPET VALVES

Introducing **Humphrey iDP**, a series of inert media separation valves, specifically designed for aggressive liquids and gases.



Humphrey iDP 300 SERIES

Small 2- and 3-Port Type
Inline or Manifold Mount
Pin or Lead Wire
Coil Connection



Humphrey iDP 350/351 SERIES

2-Port Type
Barb or 8mm Porting
Spade or Lead Wire
Coil Connection



Humphrey iDP 370/371 SERIES

3-Port Type
Barb or 8mm Porting
Spade or Lead Wire
Coil Connection



Humphrey iDP 390/391 SERIES

2-Port Type
Barb or 8mm Porting
Spade or Lead Wire
Coil Connection

TYPICAL MARKETS AND APPLICATIONS

- Clinical Diagnostics
- Analytical Chemistry
- Agent Detection
- Environmental Monitoring
- Food and Beverage
- Gaseous Flow Control

ENGINEERED SOLUTION WITH MEDIA SEPARATION VALVES

- Custom Proportional diaphragm isolation valve (390 series) option
- Body rotation configurations
- Multiple "wetted" material choices
- Custom wire termination
- Valve integration into your custom system
- Value added designs integrating multiple valves and/or sensors



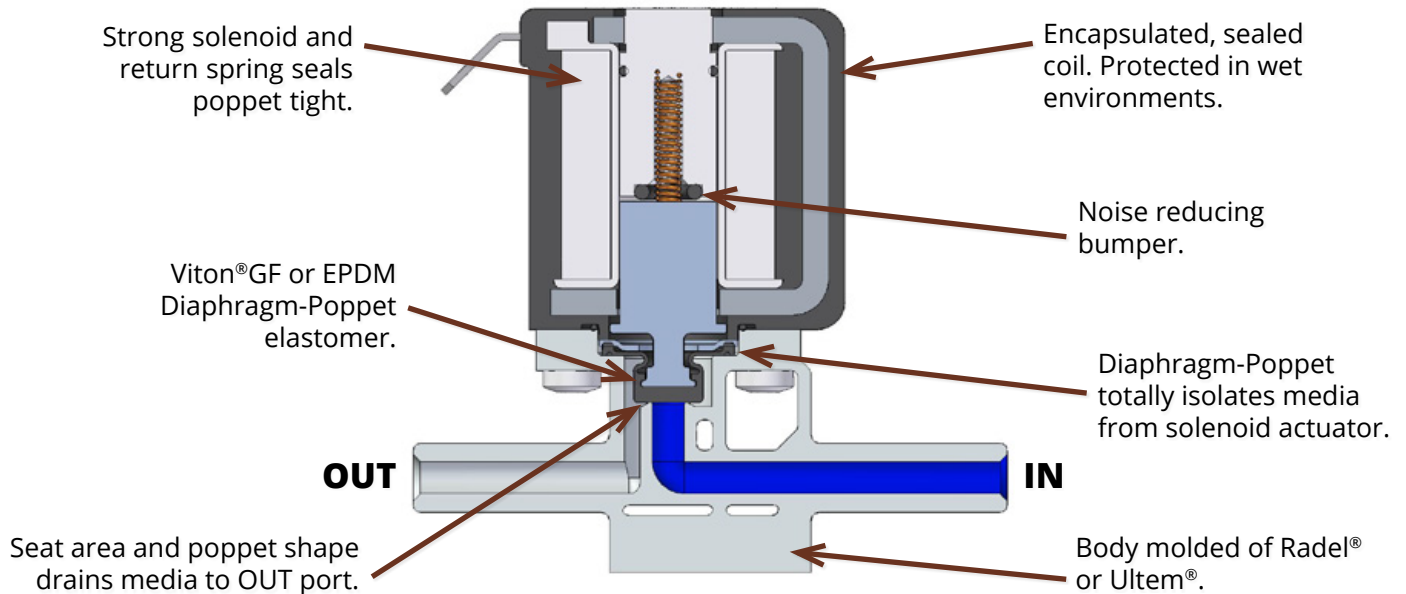
EXAMPLES OF COMPATIBLE MEDIA

Blood and Bio-Fluids	Dialysate
Reagents and Solvents	Renaline®
Ultra Pure Water	Formaldehyde
Ethyl, Methyl Alcohols	Saline
Sodium Hypochlorite	Dextrose/Sugars
Lye (Sodium Hydroxide)	Hydrogen Peroxide
Ethylene Glycol	Citric Acid
Formaldehyde	Acetic Acid
Biological Solutions	Others

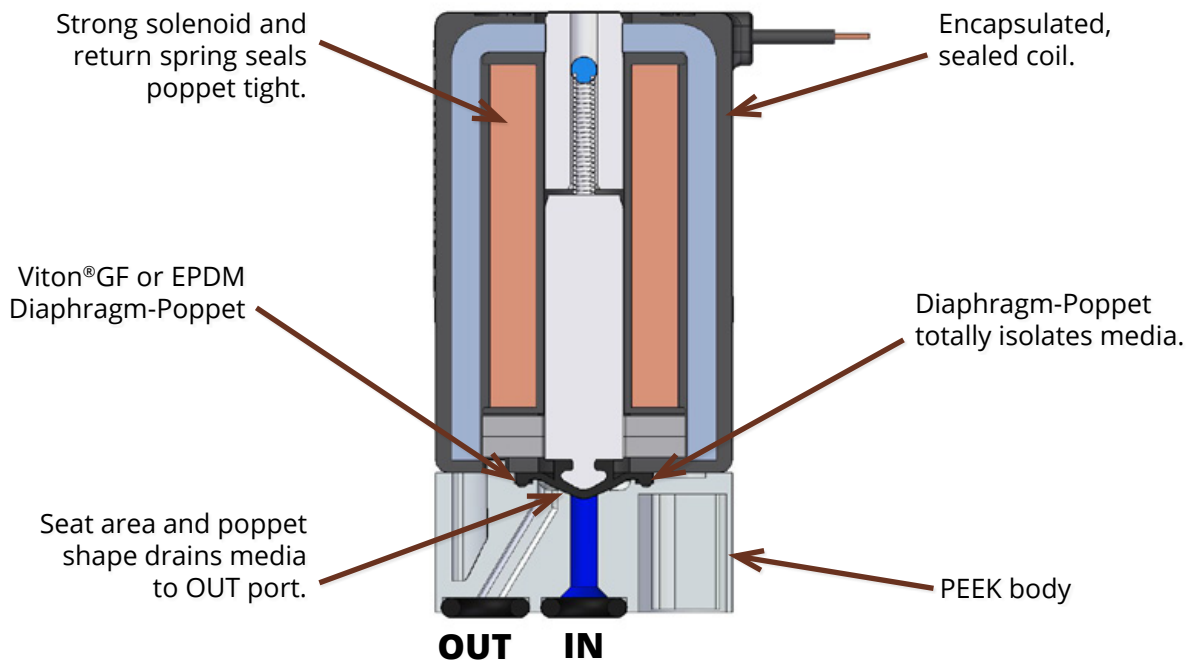


Humphrey iDP are efficient 2- and 3-port valves containing features ideal for aggressive media applications. Valves are constructed of materials suitable for bodily fluids, aggressive chemicals and cleaning fluids, and elevated fluid temperatures. The flexing diaphragm-poppet design isolates the solenoid from media penetration, while the inert body material ensures long life and sustained performance.

350 SERIES



300 SERIES



Humphrey iDP

300 SERIES

PRODUCT FEATURES

- Inert wetted materials provide broad chemical compatibility
Body/Fitting Elements – PEEK (Polyethylene glycol ether ketone)
Diaphragm-Poppet/Seals – Viton®-GF or EPDM
- Max pressure: 40 PSI [2.4 bar] standard
- Flow: Up to 1830 ml/min of water or similar fluid,
Up to 62 lpm of air or similar gas
- Integral diaphragm-poppet isolates flow path from solenoid
- Coil encapsulation protects from corrosive external fluid exposure
- Suitable for high fluid temperatures – up to 203°F (95°C)
- Various port types and manifold mounting provides design flexibility
- Robust design; Tested to beyond 20 million cycles



**2-Port
Inline**

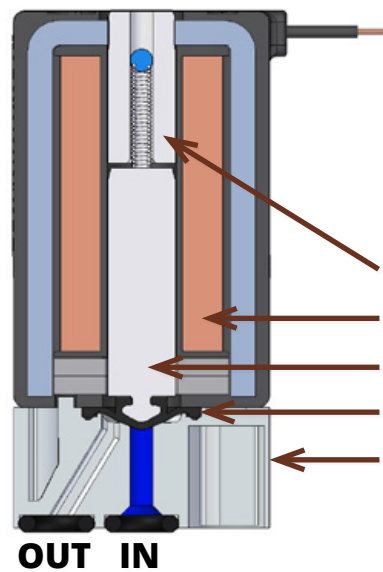
**3-Port
Inline**



**2-Port
Manifold**

TYPICAL FLUIDS

Blood and Bio-fluids
Reagents and Solvents
Ultra Pure Water
Sodium Hypochlorite
Lye (Sodium Hydroxide)
Ethylene Glycol
Formaldehyde
Ethyl, Methyl Alcohols



CONSTRUCTION

- Pole Piece
- Coil
- Armature
- Diaphragm-Poppet
- Body

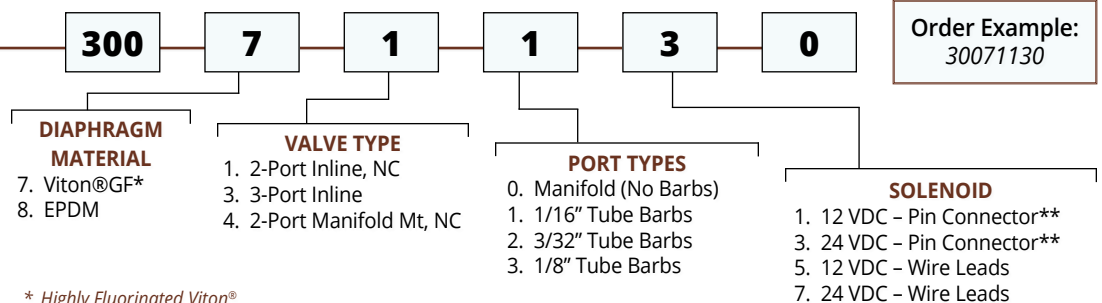
OUT IN

HOW TO ORDER

Humphrey iDP 300 SERIES



**2-Port
Inline 3-Port
Inline 2-Port
Manifold**

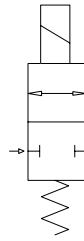


* Highly Fluorinated Viton®

** Tyco 640442-2; Molex 22-01-2027

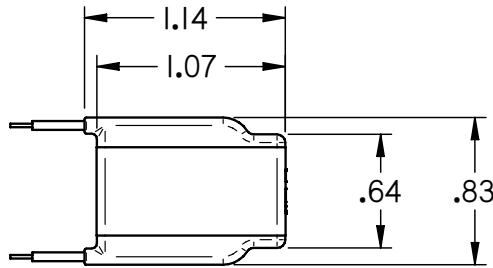
Humphrey iDP

2-PORT MANIFOLD

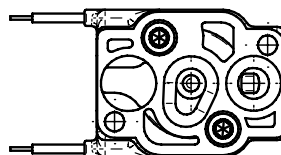
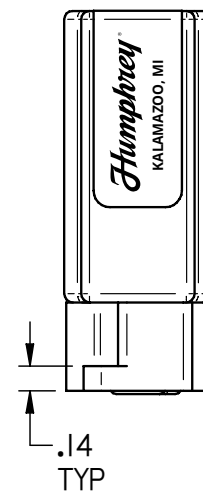
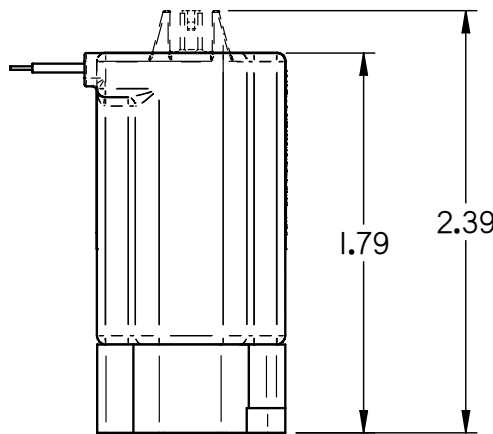
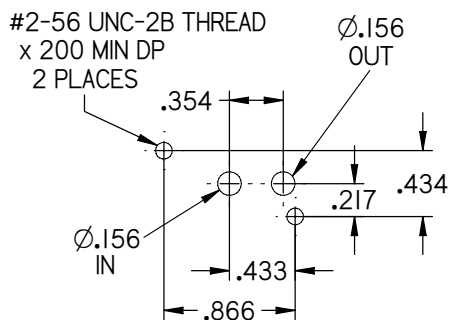


Humphrey 300 MANIFOLD SPECIFICATIONS

Valve Function:	Normally Closed
Wetted Parts (Body and Diaphragm-Poppet):	PEEK, Viton®GF or EPDM
Number of Ports:	2
Number of Positions:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Manifold, Sub-base Piping
Media:	Aggressive Liquids (Gases)
Internal Volume:	Unactuated Under Poppet: 0.004in ³ Actuated: 0.012in ³
Max Flow (Water) @ 40 PSI:	1.83 LPM
Max Flow (Air) @ 40 PSI:	62 LPM
Pressure Range:	Vacuum to 40 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Max Cycles/Min:	300
Response Time:	25msec @ 40 PSI
Electrical Entry:	Plug-In or Lead Wires
Available Voltages:	12VDC, 24VDC
Voltage Tolerance:	±10%
Power Consumption:	3.5W
Weight:	0.27 lbs



FOOTPRINT



RECOMMENDED MOUNTING HARDWARE:

Screws: SHCS #2-56 x 5/16 with 5/64 Hex Head Screw Install
Tool: 5/64 Hex Head Ball End Screw Driver (McMaster-Carr 5497A24; Grainger 29RU75)

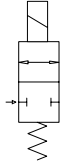
RECOMMENDED MATING ELECTRICAL CONNECTION:

Pins: Tyco 640442-2; Molex 22-01-2027
Lead Wire: Connect to 22 AWG x 24" length

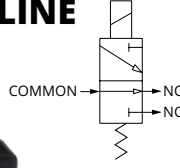
Humphrey iDP

Humphrey 300 2-,3-PORT INLINE SPECIFICATIONS

2-PORT INLINE

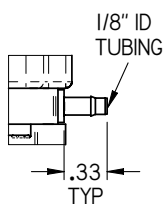
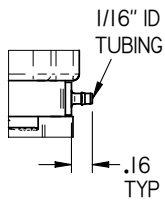
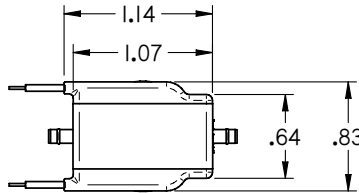


3-PORT INLINE

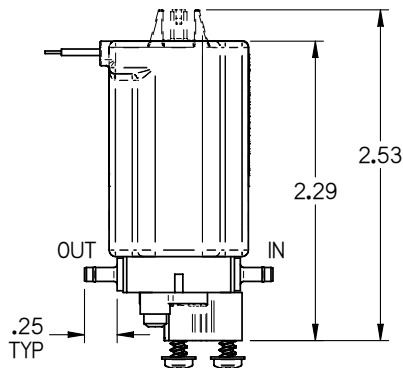


Valve Function:	Normally Closed	
Wetted Parts (Body and Diaphragm-Poppet):	PEEK, Viton®GF or EPDM	
Number of Ports:	2	3
Number of Positions:	2	2
Type of Operation:	Direct Solenoid, Media Separated	
Piping Type:	Inline, Direct Piping	
Media:	Aggressive Liquids and Gases	
Max Flow (Water) @ 40 PSI:	1.45 LPM	
Max Flow (Air) @ 40 PSI:	50 LPM	
Pressure Range (Common 2-, 3-Port):	Vacuum to 40 PSI	
Reverse Pressure Range, 3-Port (NO or NC):	Vacuum to 10 PSI	
Fluid Temp Range:	-20°C to 95°C	
Ambient Temp Range:	-20°C to 65°C	
Maximum Cycles/Min:	300	
Response Time:	25msec @ 40 PSI	
Port Size (Barbs, Tubing ID):	1/16", 3/32" or 1/8"	
Electrical Entry:	Plug-In or Lead Wires	
Available Voltages:	12VDC, 24VDC	
Voltage Tolerance:	±10%	
Power Consumption:	3.5W	
Weight:	0.22 lbs	

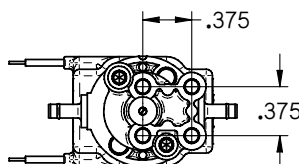
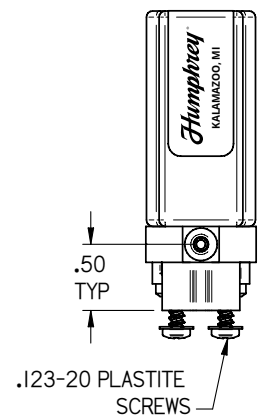
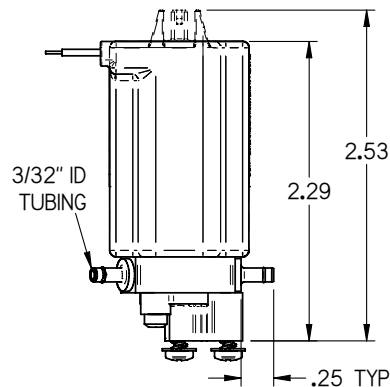
Internal Volumes	1/16" Barb Body	3/32" Barb Body	1/8" Barb Body
2-Way Unactuated Under Poppet	0.007in ³	0.007in ³	0.009in ³
2-Way Actuated	0.013in ³	0.014in ³	0.017in ³
3-Way Unactuated (Common & NO)	0.010in ³	0.012in ³	0.014in ³
3-Way Unactuated (Common & NC)	0.009in ³	0.010in ³	0.022in ³



2-PORT



3-PORT



RECOMMENDED MATING ELECTRICAL CONNECTION:
 Pins: Tyco 640442-2; Molex 22-01-2027
 Lead Wire: Connect to 22 AWG x 24" length

Humphrey iDP

350 SERIES

PRODUCT FEATURES

- Inert wetted materials provide broad chemical compatibility
- Max pressure: 40 PSI (2.76 bar) standard
- Flow rates @ 40 PSI: 0 – 220 slpm air or 0 – 5.3 lpm water
- Integral diaphragm-poppet isolates flow path from solenoid
- Continuous-duty encapsulated coil for operation in wet environments
- Suitable for high fluid temperatures – up to 203°F (95°C)
- Robust design; Long service life
- Factory testing ensures reliability and repeatability
- Porting and mounting options offer design flexibility
- Manifold version available (see iDP 351)



350
2-Port Inline



351
2-Port Manifold

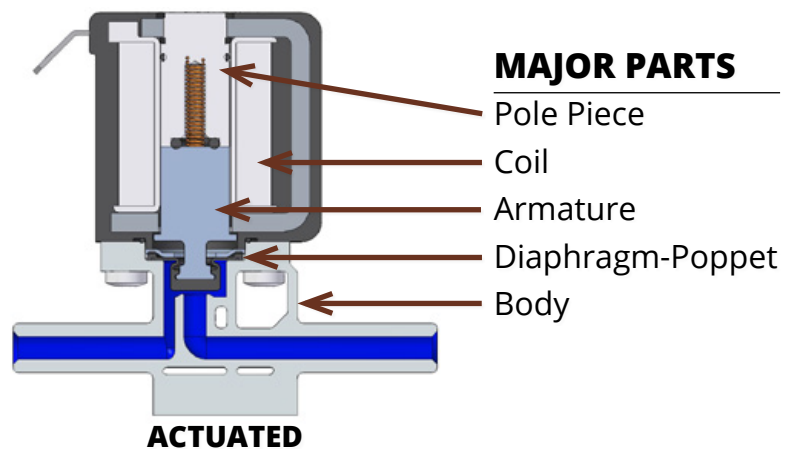
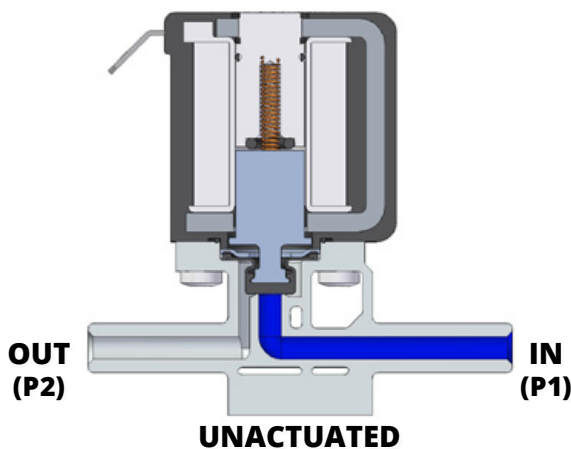
TYPICAL FLUIDS*

Biological Solutions
Dialysate
Renaline®
Formaldehyde

Saline
Dextrose/Sugars
Hydrogen Peroxide
Citric Acid

Acetic Acid
Sodium Hypochlorite

*Consult factory for assistance.



HOW TO ORDER

Humphrey iDP 350 SERIES



350
2-Port Inline

351
2-Port Manifold

350

BASE MODEL
350 - Inline
351 - Manifold

2

MATERIAL (BODY-SEALS)

1. Ultem®-EPDM
2. Ultem®-Viton®GF
3. Radel®-EPDM*
4. Radel®-Viton®GF*

* Manifold Options

1

BODY STYLE (IN-OUT)

0. Manifold (No Barbs)
1. Barb-Barb
5. 8mm-8mm (5/16") (Quick Disconnect)

5

00

COIL TYPE & ORIENTATION (IN RELATION TO OUT/P2 PORT)

1. 1/4" Spade Terminal/Standard*
3. 1/4" Spade Terminal/Rotate 180°
5. Lead Wire/Standard*
7. Lead Wire/Rotate 180°

Order Example:
35021500

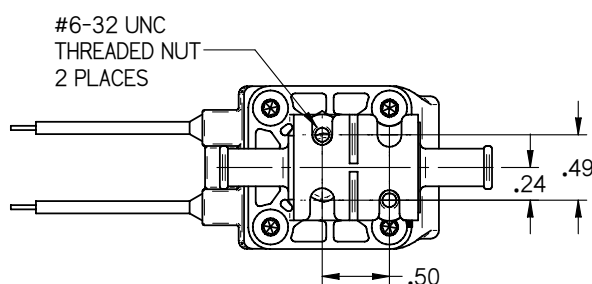
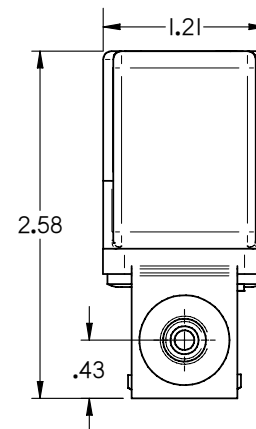
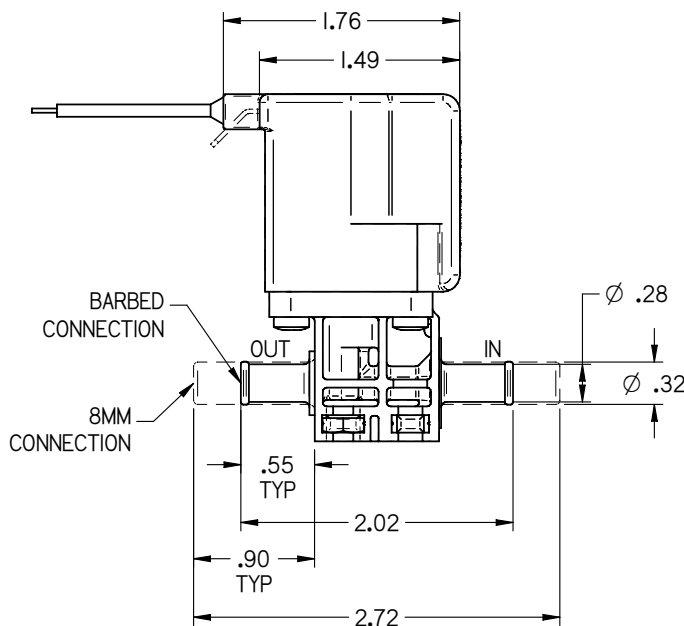
Humphrey iDP

2-PORT INLINE

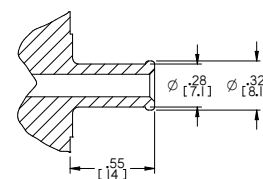


Humphrey 350 SERIES SPECIFICATIONS

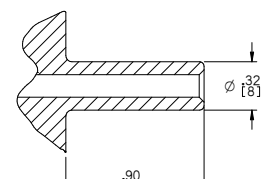
Valve Function:	Normally Closed
Wetted Parts (Body & Diaphragm-Poppet):	Radel® or Ultem® and Viton®GF or EPDM
Number of Ports:	2
Number of Positions:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Inline, Direct Piping
Media:	Aggressive Liquids (Gases)
Internal Volume (Barb Body):	Unactuated Under Poppet: 0.026in ³ Actuated: 0.062in ³
Max Flow (Water) @ 40 PSI:	5.3 LPM
Max Flow (Air) @ 40 PSI:	220 LPM
Pressure Range:	Vacuum to 40 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Max Cycles/Min:	300
Response Time:	16msec @ 40 PSI
Port Size:	5/16" Barb; 8mm Quick Disconnection
Electrical Entry:	Spade Terminals or Lead Wires
Voltage:	24VDC
Voltage Tolerance:	±10%
Power Consumption:	8.3W
Weight:	0.38 lbs



BODY STYLE OPTIONS



5/16" Barb



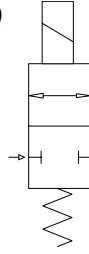
8mm Quick Disconnection

RECOMMENDED MATING ELECTRICAL CONNECTION:

Spade Size: 1/4 inch Terminal
Lead Wires: Connect to 20 AWG x 45" length

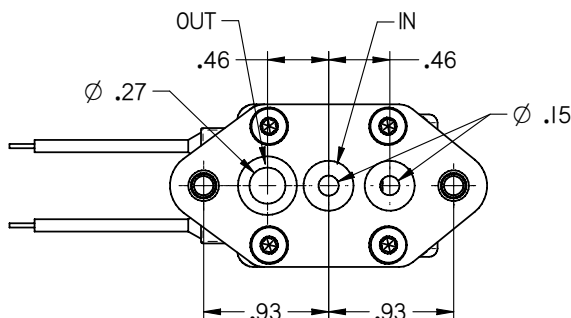
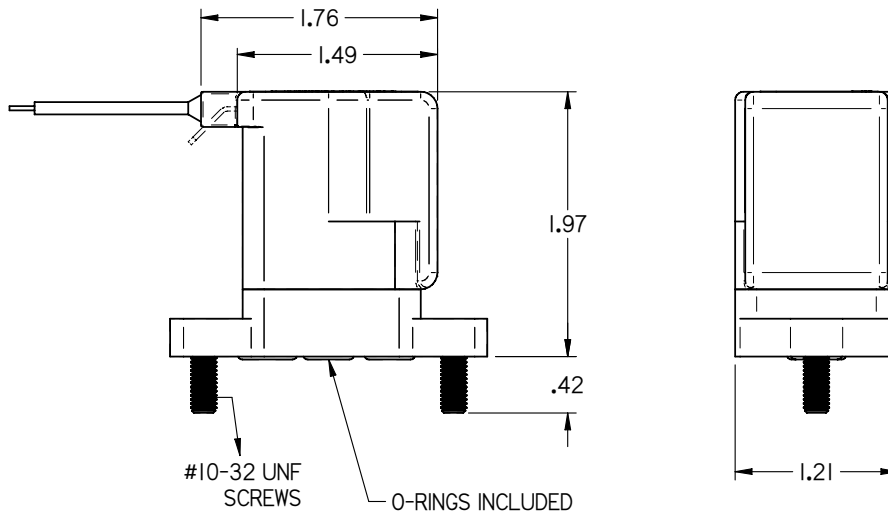
Humphrey iDP

2-PORT MANIFOLD



Humphrey 351 SERIES SPECIFICATIONS

Valve Function:	Normally Closed
Wetted Parts (Body & Diaphragm-Poppet):	Radel® and Viton®GF or EPDM
Number of Ports:	2
Number of Positions:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Manifold Mount
Media:	Aggressive Liquids (Gases)
Internal Volume:	Unactuated Under Poppet: 0.004in ³ Actuated: 0.037in ³
Max Flow (Water) @ 40 PSI:	5.3 LPM
Max Flow (Air) @ 40 PSI:	220 LPM
Pressure Range:	Vacuum to 40 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Max Cycles/Min:	300
Response Time:	16msec @ 40 PSI
Electrical Entry:	Spade Terminals or Lead Wires
Voltage:	24VDC
Voltage Tolerance:	±10%
Power Consumption:	8.3W
Weight:	0.39 lbs



RECOMMENDED MATING ELECTRICAL CONNECTION:
Spade Size: 1/4 inch Terminal
Lead Wires: Connect to 20 AWG x 45" length

Humphrey iDP

370 SERIES

PRODUCT FEATURES

- Inert wetted materials provide broad chemical compatibility
- Max pressure: 40 PSI (2.76 bar) standard
- Flow rates @ 40 PSI: 0 – 220 slpm air or 0 – 5.3 lpm water
- Integral diaphragm-poppet isolates flow path from solenoid
- Continuous-duty encapsulated coil for operation in wet environments
- Suitable for high fluid temperatures – up to 203°F (95°C)
- Robust design; Long service life
- Factory testing ensures reliability and repeatability
- Porting and mounting options offer design flexibility
- Manifold version available (see iDP 371)



371
3-Port
Manifold



370
3-Port
Inline

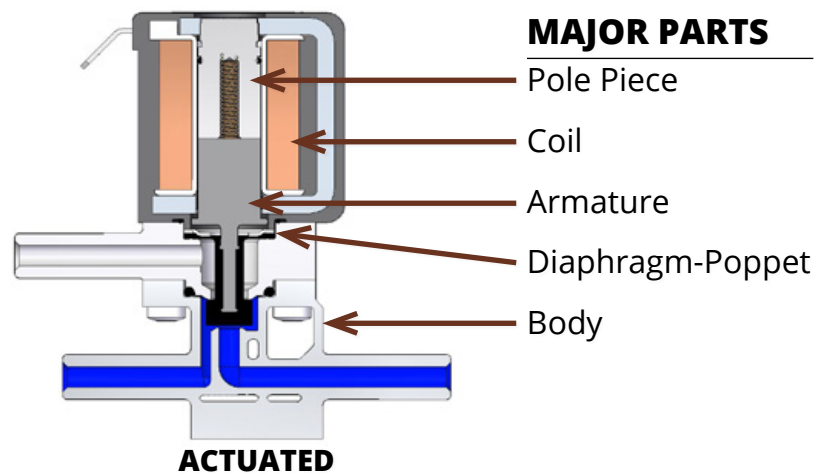
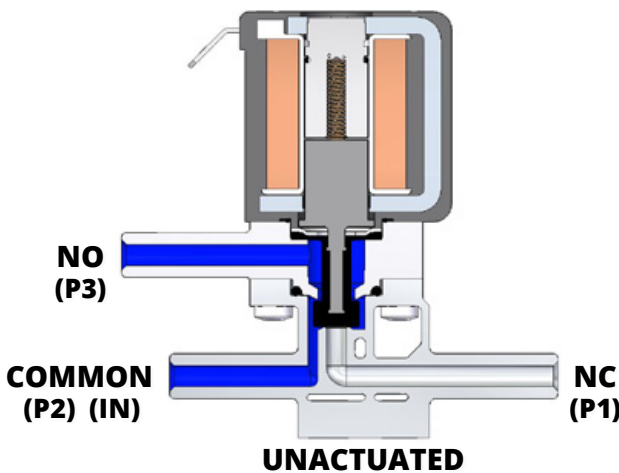
TYPICAL FLUIDS

Biological Solutions
Dialysate
Renaline®
Formaldehyde

Saline
Dextrose/Sugars
Hydrogen Peroxide
Citric Acid

Acetic Acid
Sodium Hypochlorite

**Consult factory for assistance.*



MAJOR PARTS

- ← Pole Piece
- ← Coil
- ← Armature
- ← Diaphragm-Poppet
- ← Body

HOW TO ORDER

Humphrey iDP 370 SERIES



370

BASE MODEL
370 - Inline
371 - Manifold

2

MATERIAL (BODY-SEALS)
1. Ultem®-EPDM
2. Ultem®-Viton®GF
3. Radel®-EPDM*
4. Radel®-Viton®GF*

** Manifold Options*

1

BODY STYLE (IN-OUT)
0. Manifold (No Barbs)
1. Barb-Barb
5. 8mm-8mm (5/16")
(Quick Disconnect)

5

1

COIL TYPE & ORIENTATION (IN RELATION TO OUT/P2 PORT)
1. 1/4" Spade Terminal/Standard*
3. 1/4" Spade Terminal/Rotate 180°
5. Lead Wire/Standard*
7. Lead Wire/Rotate 180°

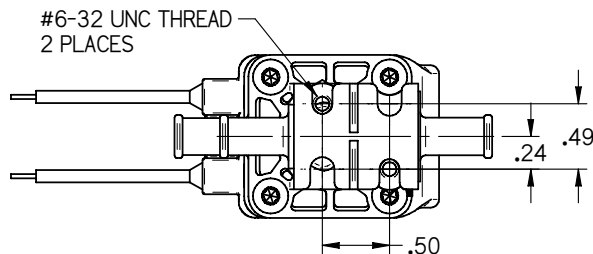
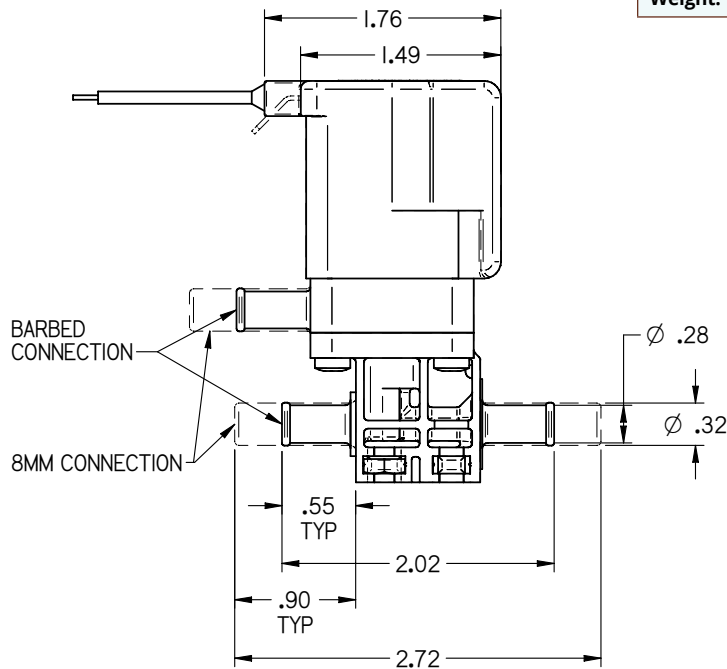
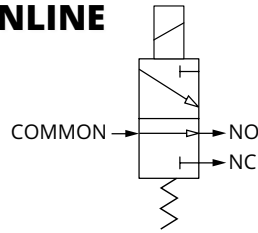
0

Order Example:
37021510

N.O. PORT
0. Manifold *
1. Inline
3. Rotate 180°

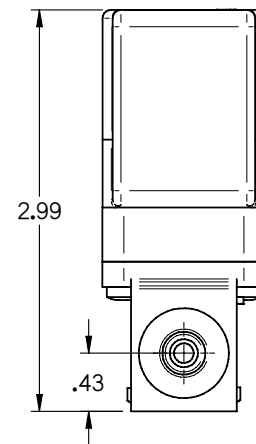
Humphrey iDP

3-PORT INLINE

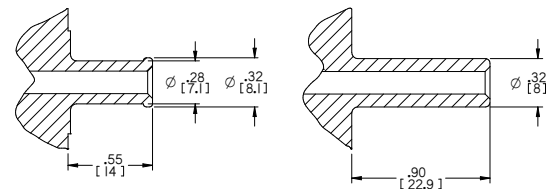


Humphrey 370 SERIES SPECIFICATIONS

Valve Function:	Normally Closed
Wetted Parts (Body & Diaphragm-Poppet):	Radel® or Ultem® and Viton®GF or EPDM
Number of Ports:	3
Number of Positions:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Inline, Direct Piping
Media:	Aggressive Liquids (Gases)
Internal Volume (Barb Body):	Unactuated (Common & NO): 0.086in ³ Actuated (Common & NC): 0.062in ³
Max Flow (Water) @ 40 PSI:	5.3 LPM
Max Flow (Air) @ 40 PSI:	220 LPM
Pressure Range (common):	Vacuum to 40 PSI
Reverse Pressure Range (NO or NC):	Vacuum to 20 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Max Cycles/Min:	300
Response Time:	20msec @ 40 PSI
Port Size:	5/16" Barb; 8mm Quick Disconnection
Electrical Entry:	Spade Terminals or Lead Wires
Voltage:	24VDC
Voltage Tolerance:	±10%
Power Consumption:	8.3W
Weight:	0.40 lbs



BODY STYLE OPTIONS



5/16" Barb

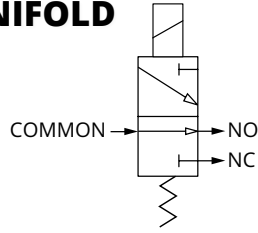
8mm Quick Disconnection

RECOMMENDED MATING ELECTRICAL CONNECTION:

Spade Size: 1/4 inch Terminal
Lead Wires: Connect to 20 AWG x 45" length

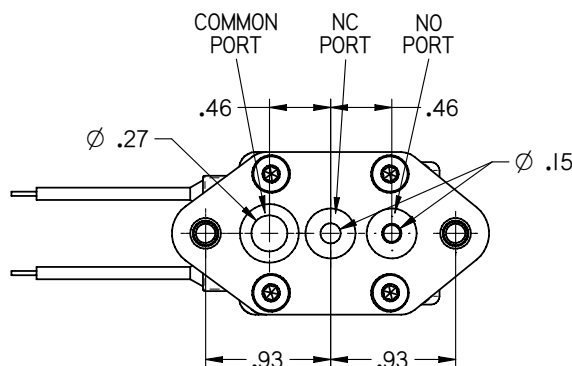
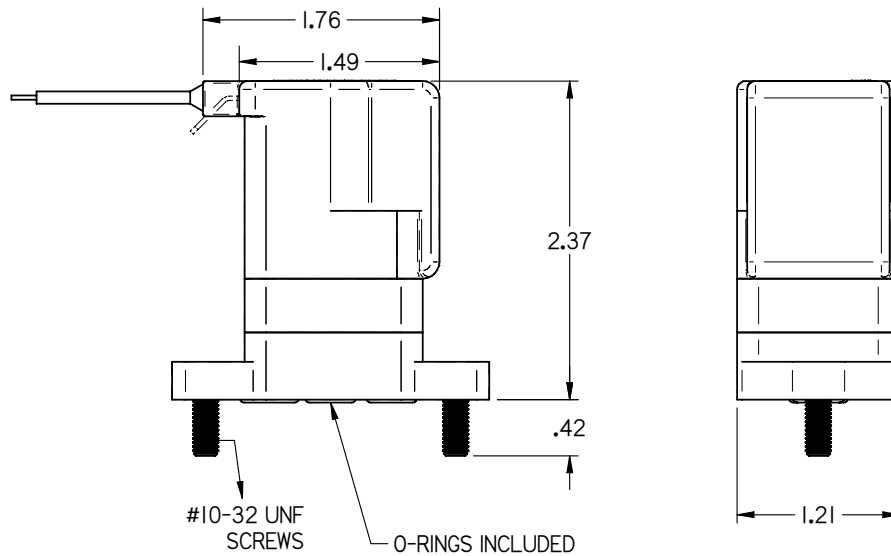
Humphrey iDP

3-PORT MANIFOLD



Humphrey 371 SERIES SPECIFICATIONS

Valve Function:	Normally Closed
Wetted Parts (Body & Diaphragm-Poppet):	Radel® and Viton®GF or EPDM
Number of Ports:	3
Number of Positions:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Inline, Direct Piping
Media:	Aggressive Liquids (Gases)
Internal Volume:	Unactuated (Common & NO): 0.077in ³ Actuated (Common & NC): 0.035in ³
Max Flow (Water) @ 40 PSI:	5.3 LPM
Max Flow (Air) @ 40 PSI:	220 LPM
Pressure Range (common):	Vacuum to 40 PSI
Reverse Pressure Range (NO or NC):	Vacuum to 20 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Max Cycles/Min:	300
Response Time:	20msec @ 40 PSI
Electrical Entry:	Spade Terminals or Lead Wires
Voltage:	24VDC
Voltage Tolerance:	±10%
Power Consumption:	8.3W
Weight:	0.42 lbs



RECOMMENDED MATING ELECTRICAL CONNECTION:

Spade Size: 1/4 inch Terminal
Lead Wires: Connect to 20 AWG x 45" length

Humphrey iDP

390 SERIES

Proportional Diaphragm Isolation Valve

PRODUCT FEATURES

- Flow increase proportional to current increase
- Inert wetted materials provide broad chemical compatibility
- Max pressure: 40 PSI (2.76 bar) standard – Consult factory for higher pressure applications
- Flow rates: 0 – 80 SLPM air or 0 – 1.5 LPM water
- Integral diaphragm-poppet isolates flow path from solenoid
- Encapsulated coil for operation in wet environments
- Suitable for high fluid temperatures – up to 203°F (95°C)
- Individual testing insures reliability and repeatability
- Porting and mounting design flexibility



390
2-Port
Inline



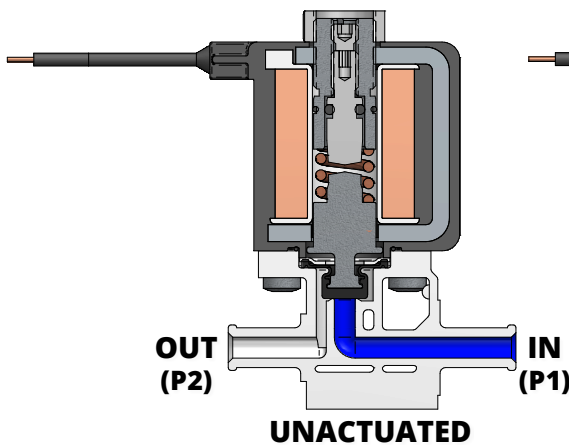
391
2-Port
Manifold

TYPICAL FLUIDS*

Biological solutions
Dialysate
Renaline®
Formaldehyde

Saline
Dextrose/Sugars
Hydrogen Peroxide
Citric Acid

Acetic Acid
Sodium Hypochlorite
**Consult factory for assistance.*



MAJOR PARTS

- Pole Piece
- Coil
- Armature
- Diaphragm-Poppet
- Body

HOW TO ORDER Humphrey iDP 390 SERIES 390 2-Port Inline 391 2-Port Manifold	390	2	1	5	10	Order Example: 39021510
	BASE MODEL 390 - Inline 391 - Manifold	MATERIAL (BODY-SEALS) 1. Ultem®-EPDM 2. Ultem®-Viton®GF 3. Radel®-EPDM* 4. Radel®-Viton®GF*	BODY STYLE (IN-OUT) 0. Manifold (No Barbs) 1. Barb-Barb 5. 8mm-8mm (5/16") (Quick Disconnect)	COIL TYPE & ORIENTATION (IN RELATION TO OUT/P2 PORT) 1. 1/4" Spade Terminal/Standard* 3. 1/4" Spade Terminal/Rotate 180° 5. Lead Wire/Standard* 7. Lead Wire/Rotate 180°	PRESSURE SETTING 10. 10 PSI 20. 20 PSI 40. 40 PSI	

** Manifold Options*

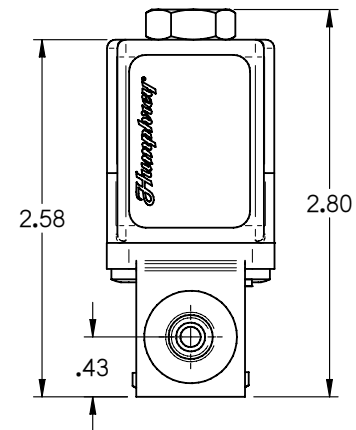
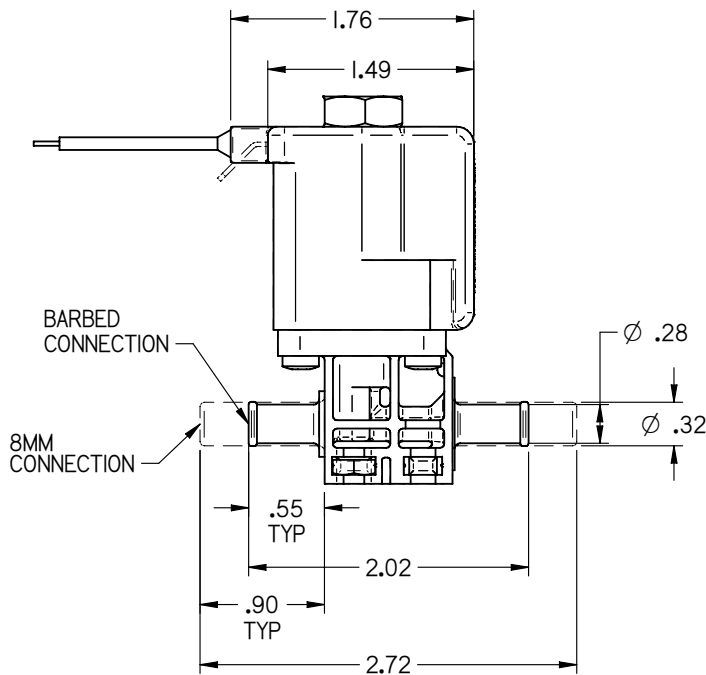
Humphrey iDP

2-PORT INLINE

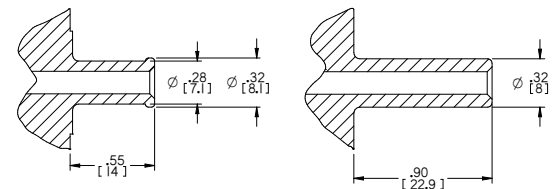


Humphrey 390 SERIES SPECIFICATIONS

Valve Function:	Normally Closed
Wetted Parts (Body & Diaphragm-Poppet):	Ultem® or Radel® and Viton®GF or EPDM
Number of Ports:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Inline, Direct Piping
Media:	Aggressive Liquids (Gasses)
Internal Volume (Barb Body):	Unactuated Under Poppet: 0.026in ³ Actuated: 0.062in ³
Internal Volume (8mm Male Body):	Unactuated Under Poppet: 0.026in ³ Actuated: 0.074in ³
Max Flow (Water) @ 40 PSI:	1.5 LPM
Max Flow (Air) @ 40 PSI:	80 LPM
Pressure Range:	Vacuum to 40 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Port Size:	5/16" Barb; 8mm Quick Disconnection
Electrical Entry:	Spade Terminals or Lead Wires
Voltage:	24VDC
Operating Current Range:	0-250 mA
Voltage Tolerance:	±10%
Power Consumption:	8.3W
Weight:	0.42 lbs

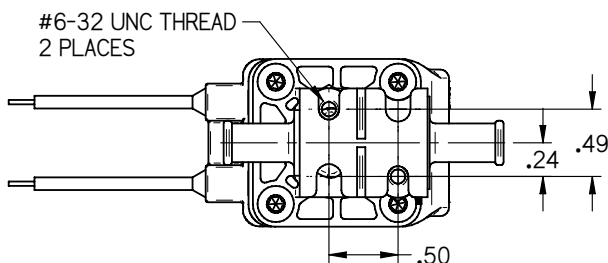


BODY STYLE OPTIONS



5/16" Barb

8mm Quick Disconnection



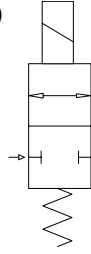
RECOMMENDED MATING ELECTRICAL CONNECTION:

Spade Size: 1/4 inch Terminal

Lead Wires: Connect to 20 AWG x 45" length

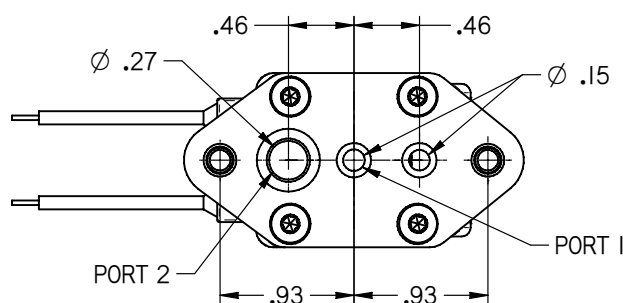
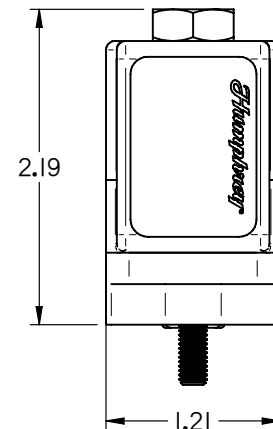
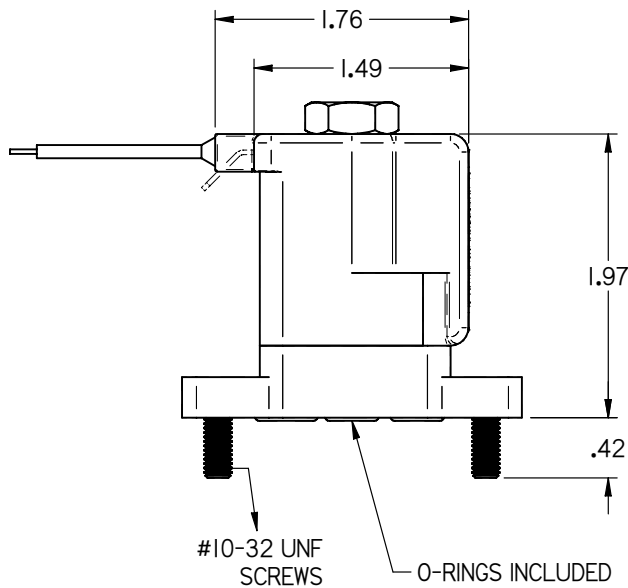
Humphrey iDP

2-PORT MANIFOLD



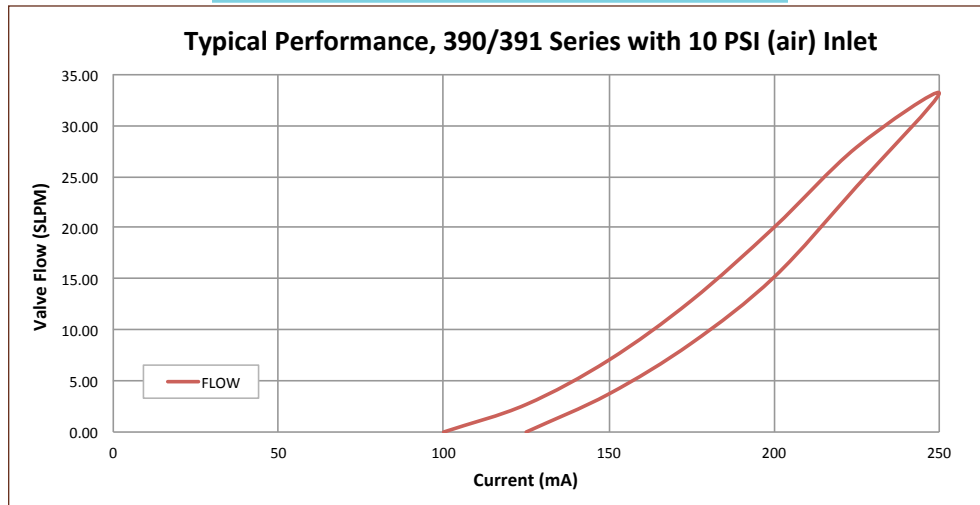
Humphrey 391 SERIES SPECIFICATIONS

Valve Function:	Normally Closed
Wetted Parts (Body & Diaphragm-Poppet):	Ultem® or Radel® and Viton®GF or EPDM
Number of Positions:	2
Type of Operation:	Direct Solenoid, Media Separated
Piping Type:	Manifold
Media:	Aggressive Liquids (Gasses)
Max Flow (Water) @ 40 PSI:	1.5 LPM
Max Flow (Air) @ 40 PSI:	80 LPM
Pressure Range:	Vacuum to 40 PSI
Fluid Temp Range:	-20°C to 95°C
Ambient Temp Range:	-20°C to 65°C
Electrical Entry:	Spade Terminals or Lead Wires
Voltage:	24VDC
Operating Current Range:	0-250 mA
Voltage Tolerance:	±10%
Power Consumption:	8.3W
Weight:	0.42 lbs

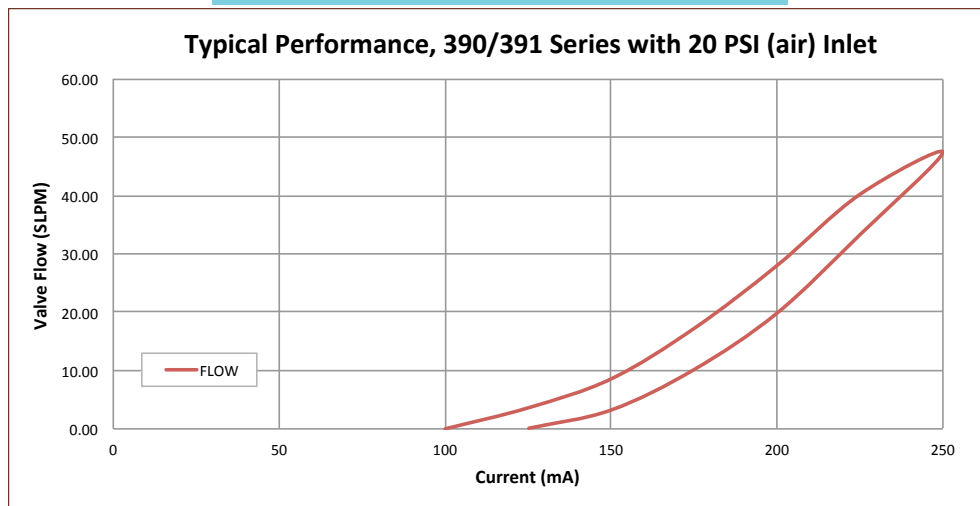


RECOMMENDED MATING ELECTRICAL CONNECTION:
Spade Size: 1/4 inch Terminal
Lead Wires: Connect to 20 AWG x 45" length

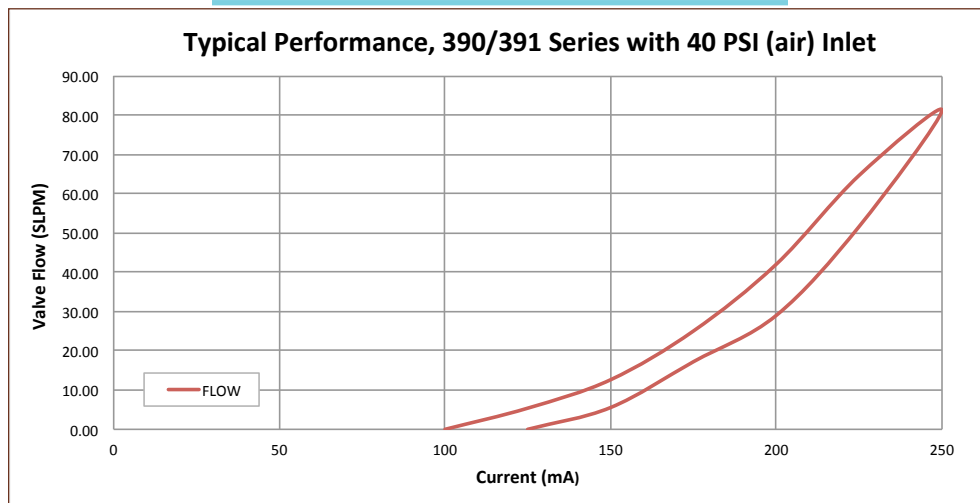
10 PSI SET



20 PSI SET



40 PSI SET



390/391 series valves are 100% factory calibrated and tested utilizing pneumatic DAQ driven system. This process insures a more stringent evaluation and precision calibration utilizing higher fidelity pneumatic instrumentation.