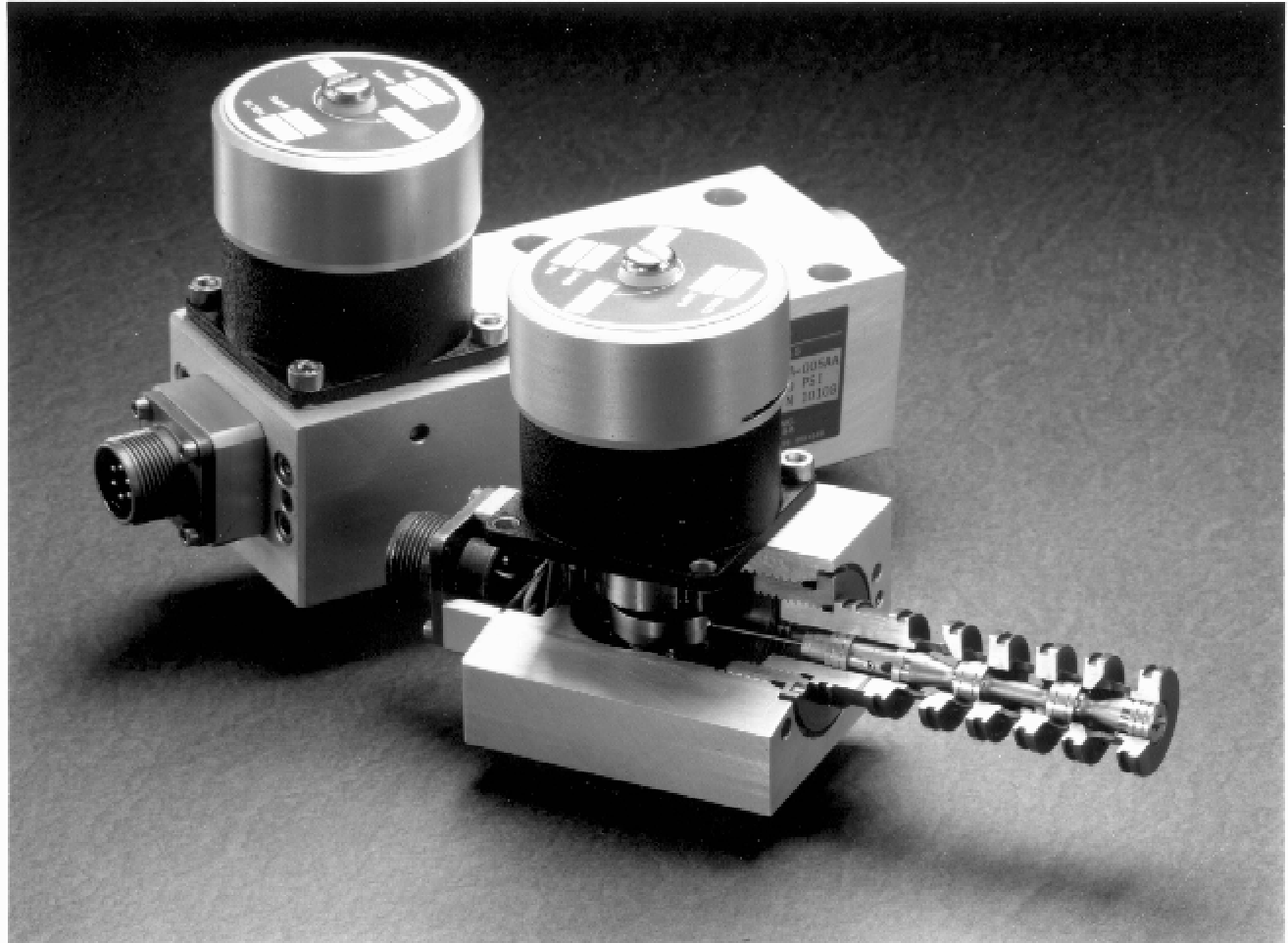


Victory Controls, LLC

DIGITAL VALVES for FLUID CONTROL

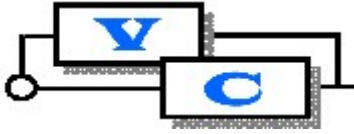


Direct Drive Digital Servo Valves

**Contamination Tolerant
Single Stage**

True Digital Actuation

Fluid Controls for Position, Velocity and Force - <http://www.victorycontrols.com>



DIGITAL VALVES for FLUID CONTROL

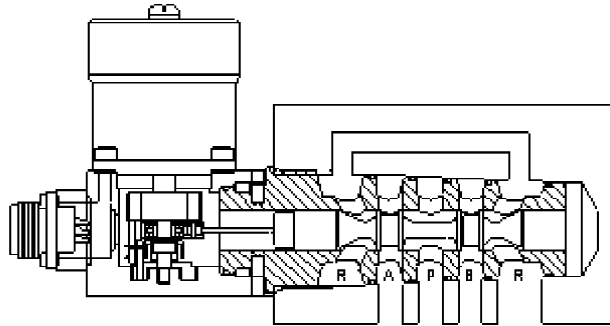
Features

- ✓ High tolerance to contamination
- ✓ Single stage construction
- ✓ Direct Drive Digital Actuation
- ✓ Rugged industrial design

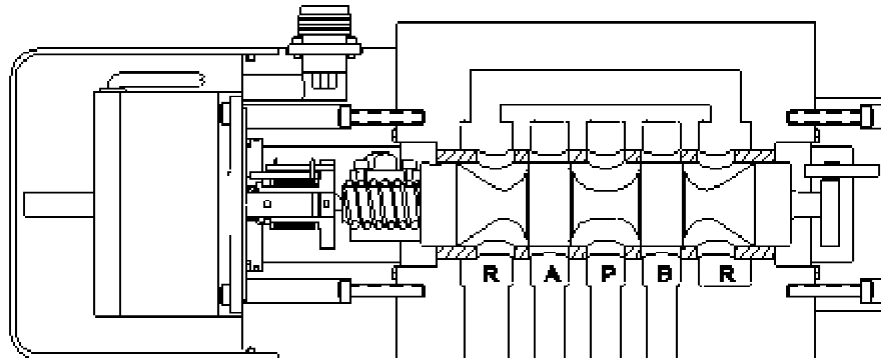
Benefits

- ✓ Replaces high maintenance valves
- ✓ Inherently Stable, min. phase lag
- ✓ Precise, repeatable spool position
- ✓ Less down time, field repairable

TYPE B
Bent Axis
Spool Actuation



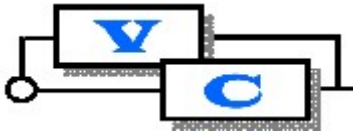
TYPE A
Axial Spool
Actuation



The **MICRO-DRIVE™ Direct Drive Digital Servo Valve** consists of only three major components: an electric DC stepping motor, a rotary to linear translation coupling and a four-way spool valve.

The stepping motor provides an inherently stable digital means to position the valve spool in discrete, precise and repeatable increments. Depending on the valve drive used, these increments may be varied from .005 to 3.0 % of a specific valves rated flow. This method of valve actuation eliminates the typical problems exhibited by two stage valves that use flapper-nozzle or jet-pipe pilots.

Using a four-way spool valve allows both direction and proportional flow control of the fluid media using a single valve. The rotary to linear coupling is arranged to translate the rotary motion of the stepping into a precise linear position of the spool relative to the valves pressure, control and return ports. Valve flows are available from 2 to 200 GPM (7.6 to 760 lpm) at a 1000 psi (70 bar) P to R pressure drop.



DIGITAL VALVES for FLUID CONTROL

MICRO-DRIVE™ Direct Drive Digital Servo Valves

VALVE MOUNTING TYPE

NFPA 'D0' Subplate Mounting	D03	D05	D07	D08	D10
ISO - 4401 (equivalent #)	03	05	07	08	10
Cetop - R35H (equivalent #)	3	5	7	8	10
NG (equivalent #)	6	10	16	25	32
VC Cylinder Body	C03	C05	C07	n/a	n/a
VC Motor Body	M03	M05	M07	n/a	n/a
Standard Servo Subplate Mounting	S03	S05	S07	n/a	n/a
Port Circle (equivalent in inches)	0.625	0.875	1.000	n/a	n/a
Victory Controls Direct Drive Actuator Type	B	B	B	A	A

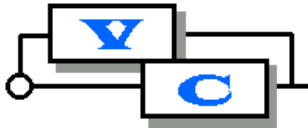
PARAMETER

UNITS

Hydraulic Flow @ 1,000 psi (70 bar)	gpm	2, 4, 6	4, 8, 12, 16	30, 45	60, 120	200
	lpm	8, 15, 23	15, 30, 45, 61	114, 170	227, 454	757
Operating Pressure Range	psi (bar)	0 to 3000 (0 to 207)				
Pneumatic Maximum Flow Coefficient Cv		0.30	0.83	2.30	na	na
Spool Configurations	Line - Line	x	x	x	x	
	Deadband	x	x	x	x	x
	P to A/B	x	x	x	x	x
	T to A/B	x	x	x	x	x
Feedback Options	Electronic	x	x	x	x	x
	Mechanical				x	x
Command Input Options	Digital	x	x	x	x	x
	Mechanical	x	x	x		
Frequency Response		See Individual Specification Sheets for Details				
Time to Full Stroke	mSec					
Rated Flow Tolerance	%	+10, -0				
Linearity (flow)	%	-- Depends on Spool and Sleeve Configuration --				
Hysteresis	%	Less than 1 %				
Null Shift per 100 Deg F (38Deg C)	%	Less than 1.5 %				

Notes:

Typical specifications using Texaco Tellus 32 @ 100 Deg F and a Victory Controls **MICRO-DRIVE™** Valve Controller. Extended ranges are available, please call, fax, or eMail the factory (see back of brochure for contact information).
Filtration Requirements: Internal valve filters are not required.



Victory Controls, LLC

MICRO-DRIVE™ Digital Position Control Valve DSNV- D03

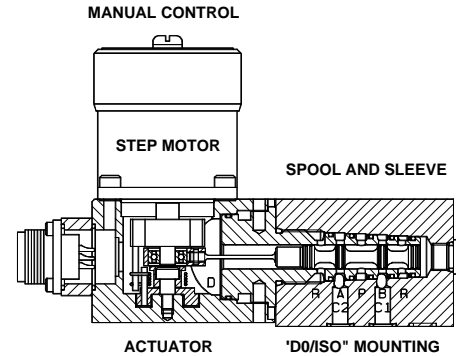
MAJOR FEATURES

- ☑ **Very high tolerance to contamination** minimizes down time.
- ☑ **Single stage**, Digital Direct Drive for positive valve operation.
- ☑ High spool actuation force across full spool travel.
- ☑ Spool spring return to adjustable center position.
- ☑ **Hardened** and Ground steel spool and sleeve assures long life.
- ☑ NFPA "D0" and ISO 4401 Subplate Mounting.
- ☑ No spool feedback required reduces complexity of valve.
- ☑ **Two year Warranty** on parts and labor.

Hydraulic Flows - 2, 4 & 6 GPM at 1000 DP
Pneumatic Flows - Cv = 0.3

PRODUCT DESCRIPTION

The Victory Controls **MICRO-DRIVE™** DSNV-D0 Series Valves are manufactured to a high pressure gain specification to assure the best servo response for motion control positioning applications. Digital Direct Drive of this single stage valve provides high spool forces resulting in the highest tolerance to contamination while minimizing lag to less than 5 degrees. All elements of these valves are designed for tough industrial automation applications. They may be used with hydraulic cylinders, motors or rotary actuators over a broad range of speeds and positional accuracies.



NFPA D03, ISO 4401-03-02
FOUR-WAY, HIGH GAIN DIGITAL VALVE
IP 65 / NEMA 4 WITH "MIL" CONNECTOR

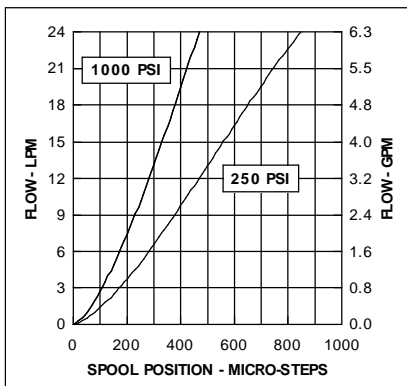


Fig. 1 - FLOW GAIN

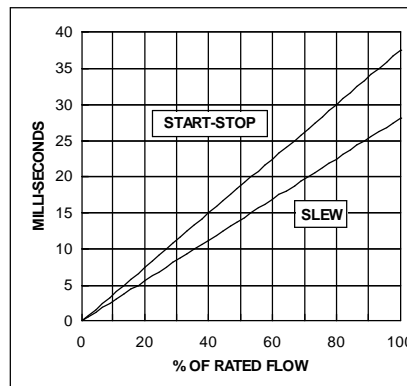


Fig. 2 - STEP FUNCTION

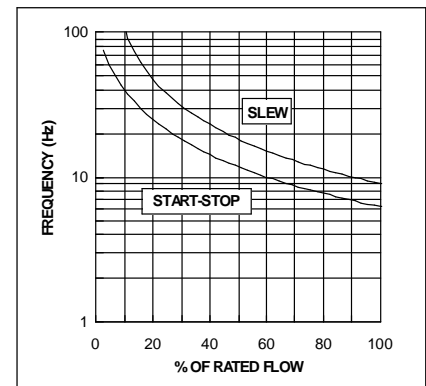


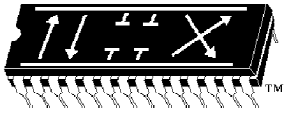
Fig. 3 - RESPONSE

GENERAL SPECIFICATIONS (Please consult factory for available options.)

Flow					
Rated	23 (6)	LPM (GPM)	Inductance Per Winding		
Tolerance	+10/- 0	%	Enclosure/Connector Rating		
Gain	See Graph	Fig. 1	Feedback		
Hysteresis	+/- 1	%	Leakage @ 70 Bar (1000 PSI) System		
Linearity (10% to 90% Rated)	+/- 5	%	Pressure to Tank (@ Center)	Less than 0.30 (0.08)	LPM (GPM)
Resolution	1/888	Micro-steps	Pressure to Drain (@ Center)	Less than 0.04 (0.01)	LPM (GPM)
Threshold	+/- 0.25	% of Stroke	Fluid Power Supply		
Port A to Port B Ratio	1 : 1		System Pressure	210 (3000)	Bar (PSI)
Spool (4-Way)			(Consult factory for extended pressure ranges.)		
Stroke at Rated Flow	444	Micro-steps	Proof Pressure (Pressure and Return)	310 (4500)	Bar (PSI)
Stroke (Max)	1066	Micro-steps	Pilot Pressure		Not Required
Spool Edge Configuration	0	% Lap	Drain Pressure (Max)	3.4 (50)	Bar (PSI)
Pressure Gain (50% of System Pressure)	< 12	Micro-steps	Viscosity Range	10 to 48 cST @ 38 °C	°F
Pressure Crossover (+/- 10%)	50	% System		60 to 250 SUS @ 100 °F	
Pressure vs Tank Edges	Equal		Minimum Operating Temperature	- 18 (0)	°C (°F)
Null Shift (Over Operating Range)	Less than 1	% of stroke	Maximum Operating Temperature	82 (160)	°C (°F)
Step Motor			Filtration Recommended	Return 25 Micron	β = 75
Current Per Winding	1.2	Amps	Seal Material (Standard)		Buna-N
Resistance Per Winding	5.1	Ohms			

Specifications @ 70 Bar (1000PSI), Tellus 32 Oil, 38°C (100°F), 1 Full Step = 1.8", 1 Micro-step = 1.8"/32 using VC Valve Drivers.

Digital Fluid Control for Positioning, Velocity & Force - www.victorycontrols.com

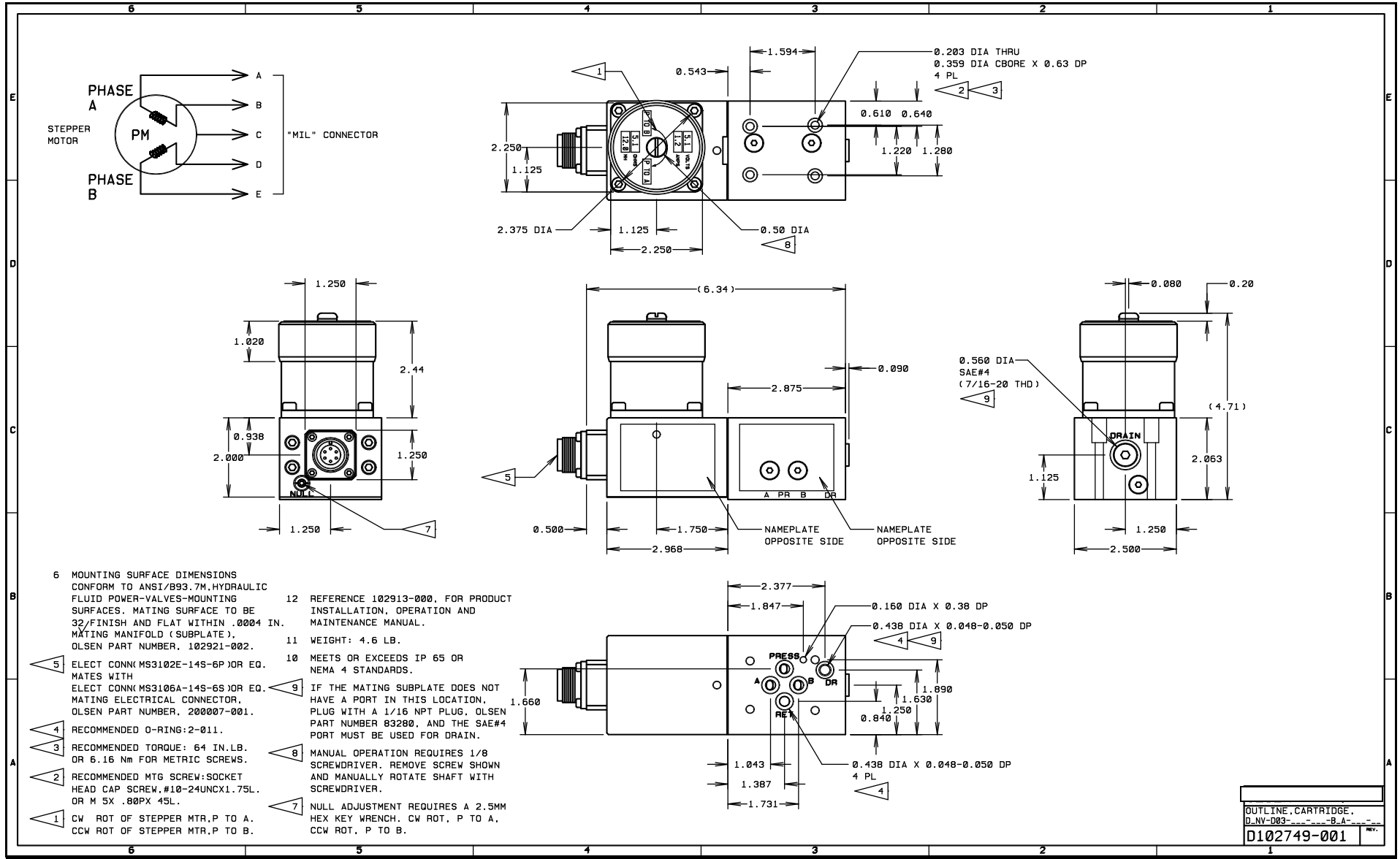


MICRO-DRIVE

Victory Controls, LLC.

Direct Digital Drive Subplate Valve

DSNV-D03 Outline



OUTLINE, CARTRIDGE.	
D_NV-D03	B_A
D102749-001	REV.



Victory Controls, LLC

MICRO-DRIVE™ Digital Position Control Valve

DSNV-D05

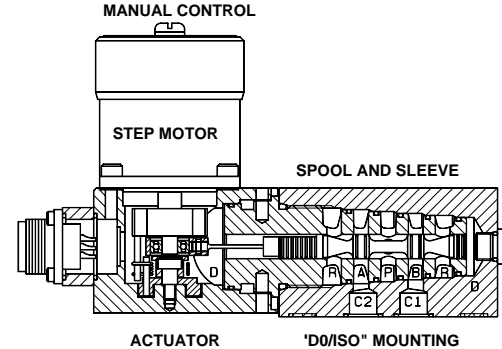
MAJOR FEATURES

- ☑ **Very high tolerance to contamination** minimizes down time.
- ☑ **Single stage**, Digital Direct Drive for positive valve operation.
- ☑ **High, constant spool actuation force** across full spool travel.
- ☑ **Spool is spring returned** to adjustable center position.
- ☑ **Hardened** and Ground steel spool and sleeve assures long life.
- ☑ NFPA "D0" and ISO 4401 Subplate Mounting.
- ☑ **No spool feedback required** reduces complexity of valve.
- ☑ **Two year Warranty** on parts and labor.

Hydraulic Flows - 4, 8, 12 & 16 GPM at 1000 DP
Pneumatic Flows - Cv = 0.83

PRODUCT DESCRIPTION

The Victory Controls **MICRO-DRIVE™** DSNV-D0 Series Valves are manufactured to a high pressure gain specification to assure the best servo response for motion control positioning applications. Digital Direct Drive of this single stage valve provides high spool forces resulting in the highest tolerance to contamination while minimizing lag. All elements of these valves are designed for tough industrial automation applications. They may be used with hydraulic or pneumatic cylinders, motors or rotary actuators over a broad range of speeds and positional accuracies.



NFPA D05, ISO 4401-05-04/05
FOUR-WAY, HIGH GAIN DIGITAL VALVE
IP 65 / NEMA 4 WITH "MIL" CONNECTOR

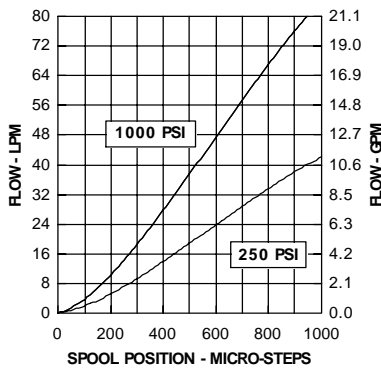


Fig. 1 - FLOW GAIN

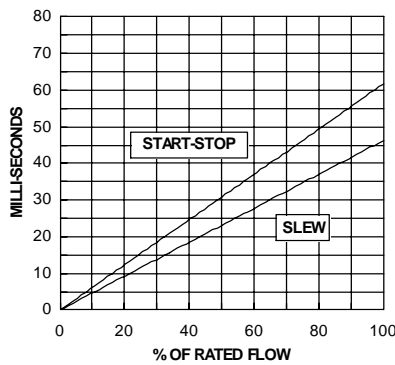


Fig. 2 - STEP FUNCTION

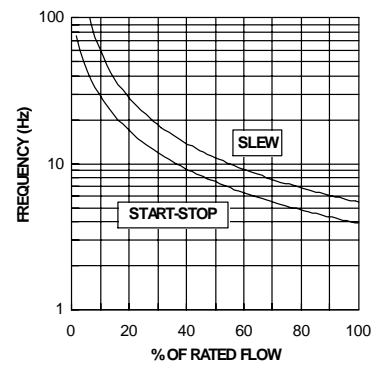


Fig. 3 - RESPONSE

GENERAL SPECIFICATIONS (Please consult factory for available options.)

Flow			
Rated	61 (16)	LPM (GPM)	Inductance Per Winding
Tolerance	+10/- 0	%	12 mH
Gain	See Graph	Fig. 1	Enclosure/Connector Rating
Hysteresis	+/- 1	%	IP 65
Linearity (10% to 90% Rated)	+/- 5	%	Feedback
Resolution	1/1480	Micro-steps	Not Req'd
Threshold	+/- 0.25	% of Stroke	
Port A to Port B Ratio	1 : 1		
Spool (4-Way)			
Stroke at Rated Flow	740	Micro-steps	Leakage @ 70 Bar (1000 PSI) System
Stroke (Max)	1066	Micro-steps	Pressure to Tank (@ Center)
Spool Edge Configuration	0	% Lap	Less than 0.30 (0.08)
Pressure Gain (50% of System Pressure)	< 12	Micro-steps	LPM (GPM)
Pressure Crossover (+/- 10%)	50	% System	Pressure to Drain (@ Center)
Pressure vs Tank Edges	Equal		Less than 0.04 (0.01)
Null Shift (Over Operating Range)	Less than 1	% of stroke	LPM (GPM)
Step Motor			
Current Per Winding	1.2	Amps	Fluid Power Supply
Resistance Per Winding	5.1	Ohms	System Pressure
			210 (3000)
			Bar (PSI)
			(Consult factory for extended pressure ranges.)
			Proof Pressure (Pressure and Return)
			310 (4500)
			Bar (PSI)
			Pilot Pressure
			Not Req'd
			Drain Pressure (Max)
			3.4 (50)
			Bar (PSI)
			Viscosity Range
			10 to 48 cST @ 38 °C
			60 to 250 SUS @ 100 °F
			Minimum Operating Temperature
			- 18 (0) °C (°F)
			Maximum Operating Temperature
			82 (160) °C (°F)
			Filtration Recommended
			Return 25 Micron
			Seal Material (Standard)
			Buna-N

Specifications @ 70 Bar (1000 PSI), Tellus 32 Oil, 38°C (100°F), 1 Full Step = 1.8°, 1 Micro-step = 1.8°/32 using OCI Valve Drivers.

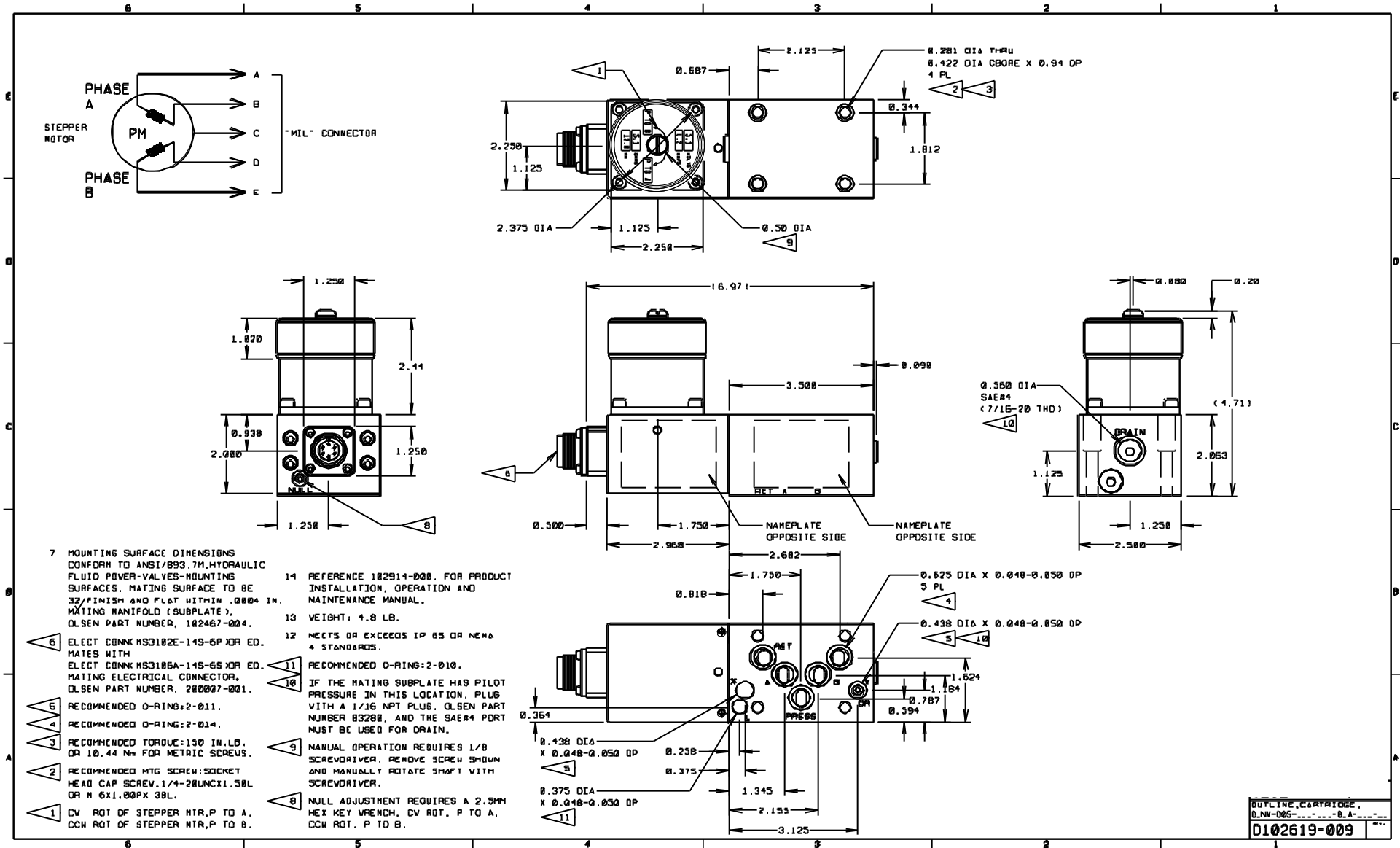
Digital Fluid Control for Positioning, Velocity & Force - www.victorycontrols.com



Victory Controls, LLC

Direct Digital Drive Subplate Valve

DSNV-D05 Outline





Victory Controls, LLC

MICRO-DRIVE™ Digital Position Control Valve

DHNV-D07

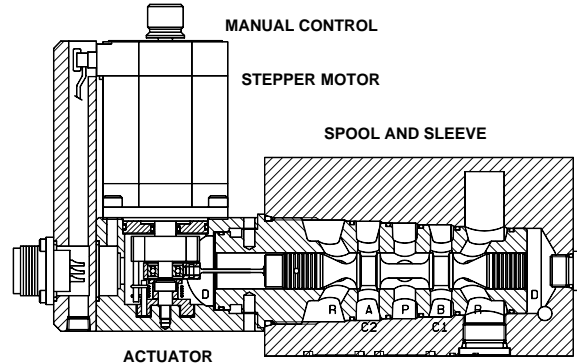
MAJOR FEATURES

- ☑ **Very high tolerance to contamination** minimizes down time.
- ☑ **Single stage**, Digital Direct Drive for positive valve operation.
- ☑ **High, constant spool actuation force** across full spool travel.
- ☑ **Spool is spring returned** to adjustable center position.
- ☑ **Hardened** and Ground steel spool and sleeve assures long life.
- ☑ **NFPA "D0" and ISO 4401 Subplate Mounting**.
- ☑ **No spool feedback required** reduces complexity of valve.
- ☑ **Two year Warranty** on parts and labor.

PRODUCT DESCRIPTION

The Victory Controls **MICRO-DRIVE™** DSNV-D0 Series Valves are manufactured to a high pressure gain specification to assure the best servo response for motion control positioning applications. Digital Direct Drive of this single stage valve provides high spool forces resulting in the highest tolerance to contamination while minimizing lag. All elements of these valves are designed for tough industrial automation applications. They may be used with hydraulic or pneumatic cylinders, motors or rotary actuators over a broad range of speeds and positional accuracies.

Hydraulic Flows - 30 & 45 GPM at 1000 DP
Pneumatic Flows - Cv = 2.3



NFPA D07, ISO 4401-07-06
FOUR-WAY, HIGH GAIN / RESPONSE
DIGITAL VALVE

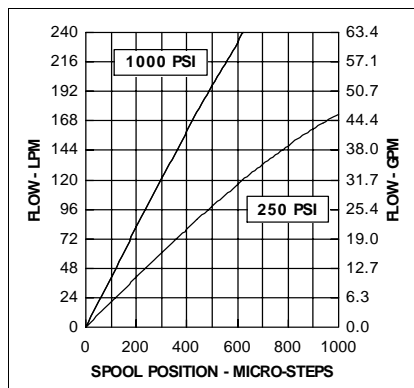


Fig. 1 - FLOW GAIN

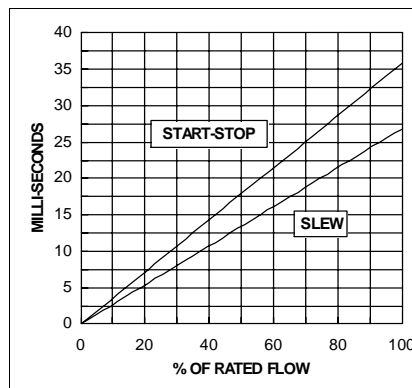


Fig. 2 - STEP FUNCTION

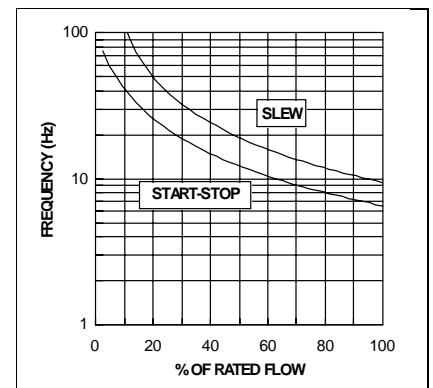


Fig. 3 - RESPONSE

GENERAL SPECIFICATIONS (Please consult factory for available options.)

Flow			
Rated	170 (45)	LPM (GPM)	Inductance Per Winding
Tolerance	+10/- 0	%	15.6 mH
Gain	See Graph	Fig. 1	Enclosure/Connector Rating
Hysteresis	+/- 0.5	%	IP 40
Linearity (10% to 90% Rated)	+/- 5	%	Feedback
Resolution	1/860	Micro-steps	Not Req'ed
Threshold	+/- 0.25	% of Stroke	Leakage @ 70 Bar (1000 PSI) System
Port A to Port B Ratio	1 : 1		Pressure to Tank (@ Center)
Spool (4-Way)			Less than 0.30 (0.08)
Stroke at Rated Flow	430	Micro-steps	Pressure to Drain (@ Center)
Stroke (Max)	1066	Micro-steps	Less than 0.04 (0.01)
Spool Edge Configuration	0	% Lap	Fluid Power Supply
Pressure Gain (50% of System Pressure)	< 12	Micro-steps	System Pressure
Pressure Crossover (+/- 10%)	50	% System	210 (3000)
Pressure vs Tank Edges	Equal		Bar (PSI)
Null Shift (Over Operating Range)	Less than 1	% of stroke	(Consult factory for extended pressure ranges.)
Step Motor			Proof Pressure (Pressure and Return)
Current Per Winding	1.55	Amps	310 (4500)
Resistance Per Winding	3.12	Ohms	Pilot Pressure
			Not Req'ed
			Drain Pressure (Max)
			3.4 (50)
			Bar (PSI)
			Viscosity Range
			10 to 48 cST @ 38 °C
			60 to 250 SUS @ 100 °F
			Minimum Operating Temperature
			- 18 (0) °C (°F)
			Maximum Operating Temperature
			82 (160) °C (°F)
			Filtration Recommended
			Return 25 Micron
			Seal Material (Standard)
			Buna-N

Specifications @ 70 Bar (1000 PSI), Tellus 32 Oil, 38°C (100°F), 1 Full Step = 1.8°, 1 Micro-step = 1.8°/32 using OCI Valve Drivers.

Digital Fluid Control for Positioning, Velocity & Force - www.victorycontrols.com

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Victory Controls, LLC

MICRO-DRIVE™ Digital Position Control Valve

DSNV-D08

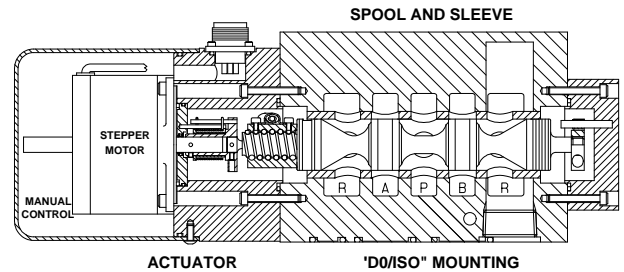
MAJOR FEATURES

- ☑ **Very high tolerance to contamination** minimizes down time.
- ☑ **Single stage**, Digital Direct Drive for positive valve operation.
- ☑ **High, constant spool actuation force** across full spool travel.
- ☑ **Spool is spring returned** to adjustable center position.
- ☑ **Hardened** and Ground steel spool and sleeve assures long life.
- ☑ NFPA "D0" and ISO 4401 Subplate Mounting.
- ☑ **No spool feedback required** reduces complexity of valve.
- ☑ **Two year Warranty** on parts and labor.

Hydraulic Flows - 60, 120 GPM at 1000 DP
Pneumatic Flows - Cv = 6.4

PRODUCT DESCRIPTION

The Victory Controls **MICRO-DRIVE™** DSNV-D08 Series Valves are manufactured to a high pressure gain specification to assure the best servo response for motion control positioning applications. Digital Direct Drive of this single stage valve provides high spool forces resulting in the highest tolerance to contamination while minimizing lag. All elements of these valves are designed for tough industrial automation applications. They may be used with hydraulic or pneumatic cylinders, motors or rotary actuators over a broad range of speeds and positional accuracies.



NFPA D08, ISO SIZE 8, 454 LPM (120 GPM)
FOUR-WAY, HIGH GAIN DIGITAL VALVE
IP 65 / NEMA 4 WITH "MIL" CONNECTOR

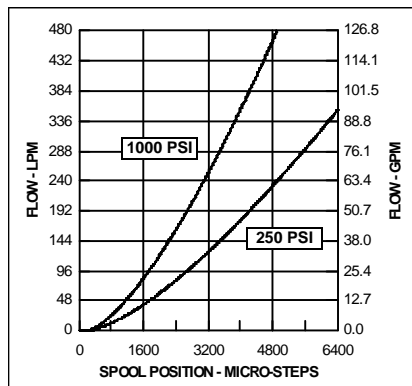


Fig. 1 - FLOW GAIN

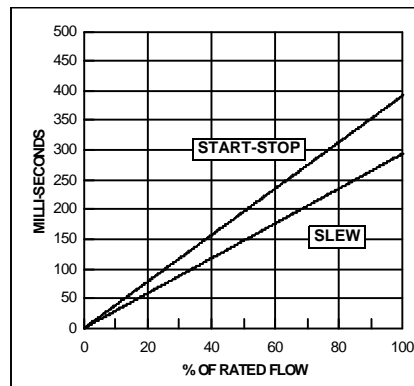


Fig. 2 - STEP FUNCTION

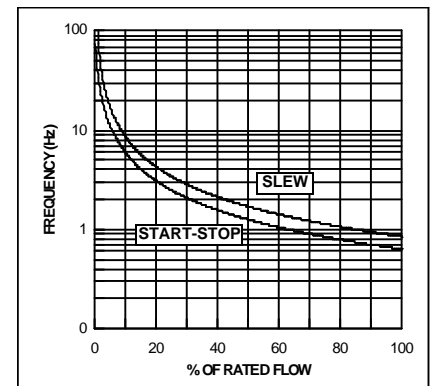


Fig. 3 - RESPONSE

GENERAL SPECIFICATIONS (Please consult factory for available options.)

Flow

Rated	454 (120) lpm (gpm)
Tolerance	+10/- 0 %
Gain	See Graph Fig. 1
Hysteresis	+/- 2 %
Linearity (10% to 90% rated)	+/- 10 %
Resolution	2 micro-steps
Port A to Port B Ratio	1 : 1

Spool (4-Way)

Stroke at Rated Flow	4710 micro-steps
Stroke (maximum)	6400 micro-steps
Spool Edge Configuration	0 % Lap
Pressure Vs Tank Edges	Equal
Pressure Gain (50% of System Pressure)	< 12 Micro-steps
Pressure Crossover (+/- 10%)	50 % System
Null Shift (Over Operating Range)	Less than 1 % of stroke

Step Motor

Current Per winding	1.6 Amps
Resistance Per Winding	3.3 Ohms

Inductance Per Winding	12.5 mh
Enclosure/ Connector Rating	IP 65 NEMA 4
Spool Feedback	Not required

Leakage @ 70 bar (1000 psi) System

Pressure to Tank (@ center) ..	Less than 0.38 (0.10) lpm (gpm)
Pressure to Drain (@ center) ..	Less than 0.04 (0.01) lpm (gpm)

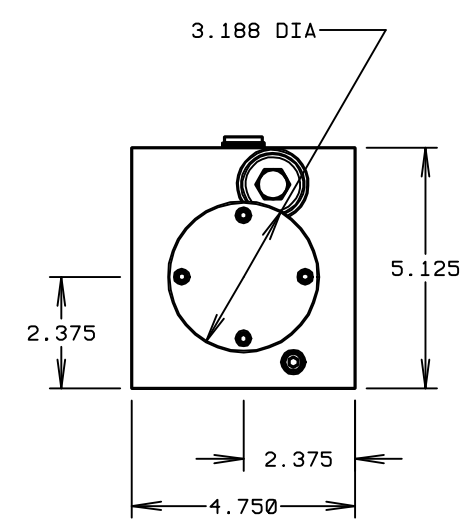
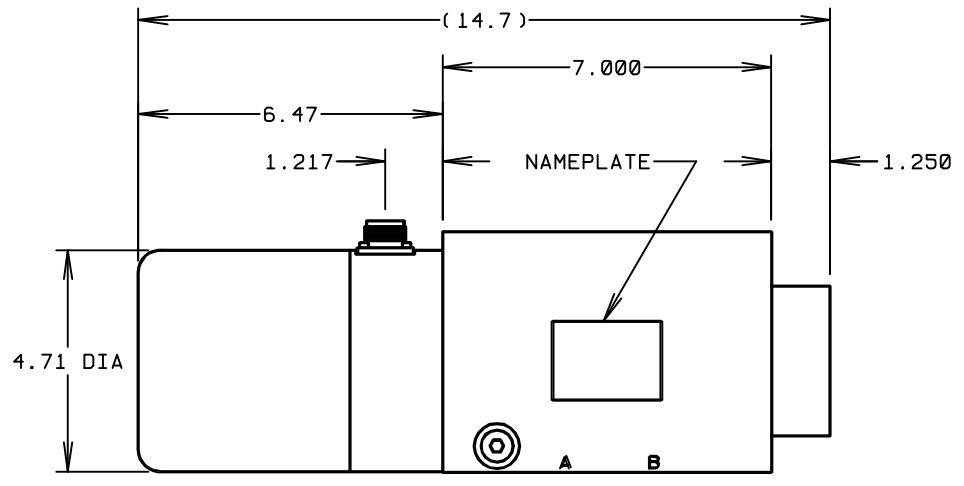
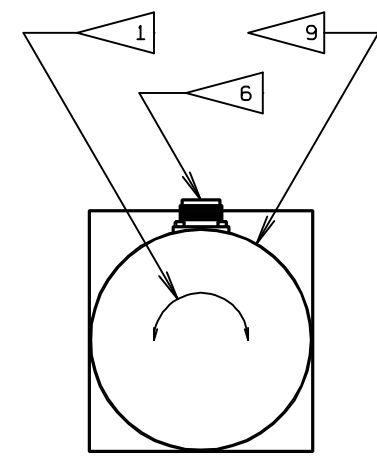
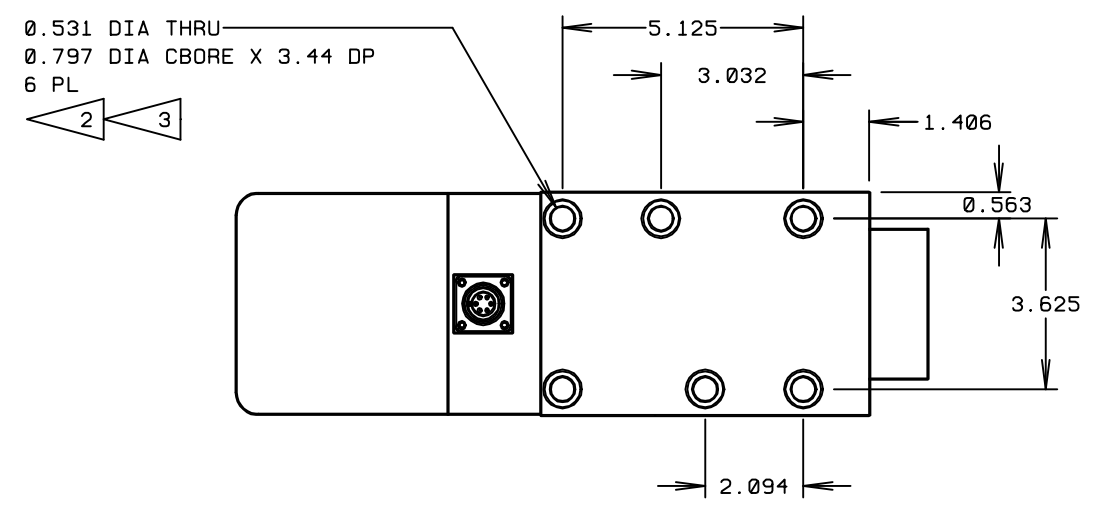
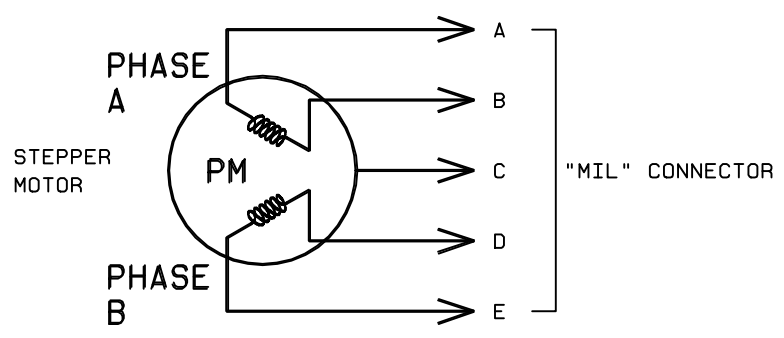
Fluid Power Supply

System Pressure	210 (3000) bar (psi)
(Consult Factory for extended pressure ranges)	
Proof Pressure (Press. & Return)	310 (4500) bar (psi)
Pilot Pressure	Not required
Drain Pressure (max.)	3.4 (50) bar (psi)
Viscosity Range	10 to 48 cST @ 38° C
	60 to 250 SUS @ 100° F
Minimum Operating Temperature	-18° (0°) C (F)
Maximum Operating Temperature	82° (160°) C (F)
Filtration Recommended	Return 25 micron b = 75
Seal Material (Standard)	BUNA N

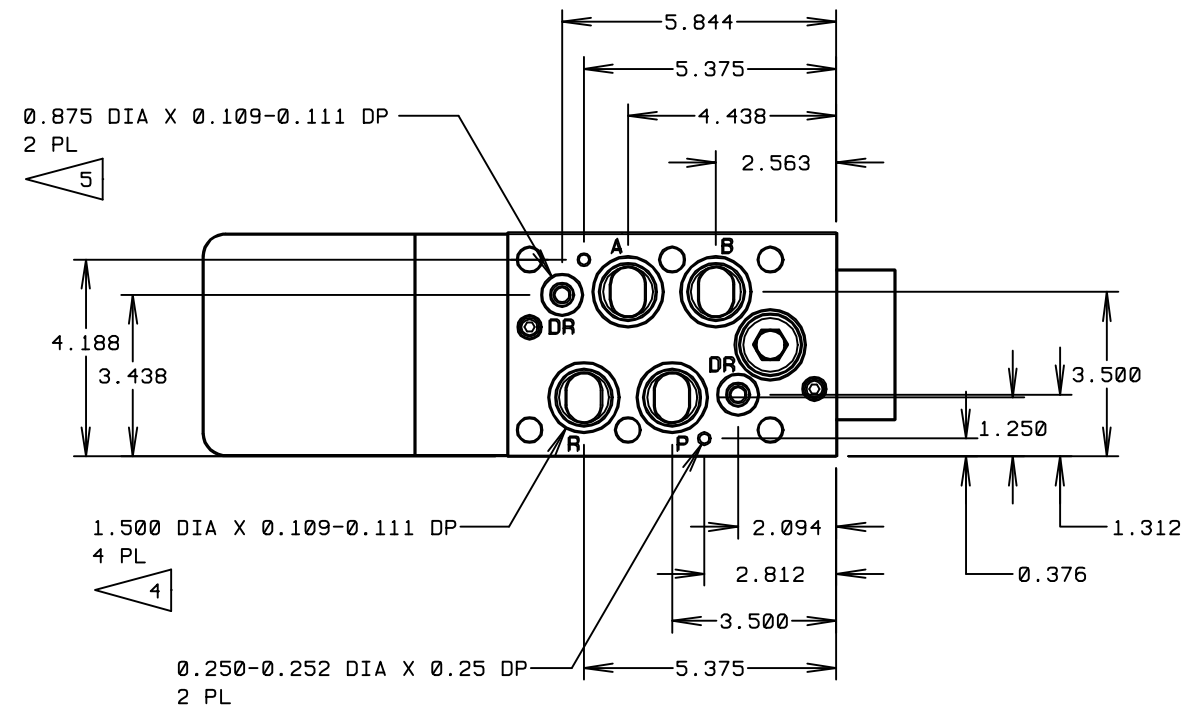
Specifications @ 70 bar (1000 psi), Tellus 32 Oil, 38° C (100° F), 1 Full step = 1.8°, 1 Micro-step = 1.8°/32 using OCI Valve Drivers.

Digital Fluid Control for Positioning, Velocity & Force - www.victorycontrols.com

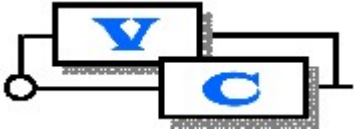
Victory Controls, LLC, CT, USA 06010 • Tel 860-589-4230 • Fax 860-584-9802



- 11 WEIGHT: 26.0 LB.
- 10 MEETS OR EXCEEDS IP 65 OR NEMA 4 STANDARDS.
- 9 MANUAL OPERATION REQUIRES REMOVAL OF THE COVER. MANUALLY ROTATE SHAFT.
- 8 MOUNTING SURFACE DIMENSIONS CONFORM TO ANSI/B93.7M, HYDRAULIC FLUID POWER-VALVES-MOUNTING SURFACES. MATING SURFACE TO BE 32/FINISH AND FLAT WITHIN .0004 IN.
- 6 ELECT CONN (MS3102E-14S-6P) OR EQ. MATES WITH ELECT CONN (MS3106A-14S-6S) OR EQ.
- 5 RECOMMENDED O-RING: 2-208.
- 4 RECOMMENDED O-RING: 2-218.
- 3 RECOMMENDED TORQUE: 55-60 FT.LB. OR 75.0-82.0Nm FOR METRIC SCREWS.
- 2 RECOMMENDED MTG SCREW: SOCKET HEAD CAP SCREW, 1/2-13UNCX2.50L OR M12X1.75PX 65L.
- 1 CW ROT OF STEPPER MTR, P TO A. CCW ROT OF STEPPER MTR, P TO B.



OPTIONS:
SEE UNIT SPEC SHEET



DIGITAL VALVES for FLUID CONTROL

Typical Fluid Control Applications for Victory Control's **MICRO DRIVE™** Digital Valves & Controllers

Automation	High payload carriers, Forging manipulators, Primary load conveyers, Assembly line synchronization
Lumber	Band mills, Edgers, Carriage networks, Planers, Lathe chargers, Clippers, Conveyor control
Machine Tool	Drilling, Broaching, Milling, Honing, Shaping, Turning, Grinding
Material Handling	Assembly machines, Pallet movers, Positioning devices
Metal Cutting	Steel Fabrication, Punching, Billet cut-off, Flying shears, Press feeds
Metal Forming	Metal spinning, Hydro-forming, Tube bending, Draw bench, Extrusion, Coil/spring winding, Rolling mill screw down, NIP roll coaters
Mobile Equipment	Wheel drives, Man-lifts, Levelers, Steering control, Scraped grade and slope control, Pavers/curbers
Plastics	Injection molding clamp and screw control, RIM molding component feed, Blow molding parisen control, Mold motion and pressure control
Special Equipment	Auger drives, Weight-basis conveyers, Shoe manufacturing, High speed brush inserting, Propeller pitch control, Turbine controls
Test Equipment	Rheometry, Fatigue testing, Compression cycling
Textiles	Tensioning, Edge-guiding, Multi-screen print synchronization, Material handling, Cross Lappers

Other Victory Controls Products

Digital Hydraulic Flow Control Valves

- Digital Direct Drive Proportional Valves
- Digital Direct Drive Servo Valves

Digital Valve Controllers

- Closed Loop Controllers
- Open Loop Controllers

Closed Loop Actuator Packages

- Digital Hydraulic Positioning Cylinders
- Digital Hydraulic Motors

Digital/Mechanical Servo Packages

- Electro-hydraulic Stepping Cylinders
- Electro-hydraulic Stepping Motors

Digital & Mechanical Input Valves

- Digital Rotary Input Valves
- Linear Mechanical Input Valves

Linear Displacement Transducers

- Digital magnetostrictive Transducers
- Analog Transducer Interfaces

Victory Controls, LLC

P.O. Box 9038 215 Dolphin Road
Bristol, Connecticut 06010 USA
Tel: 860-589-4230 Fax: 860-584-9802
eMail: sale@victorycontrols.com
<http://www.victorycontrols.com>

The information in this brochure is subject to change at any time. Please contact factory for latest specifications.
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