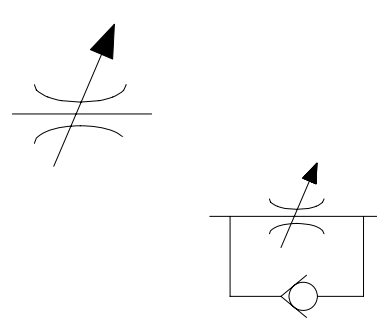


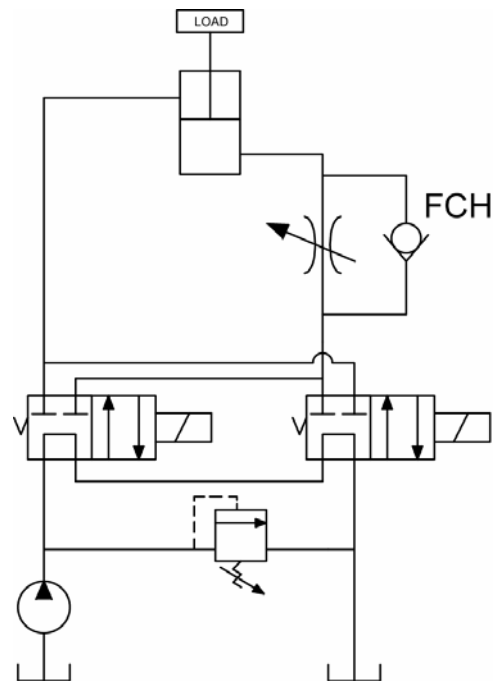
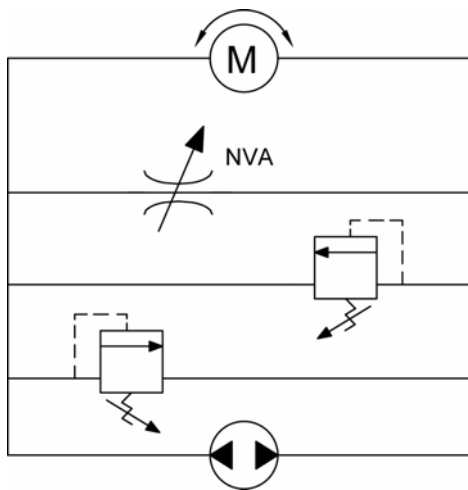
Needle Valves – Flow Restrictors

	GPM	PSI	LPM	BAR	MODEL	PAGE
	12	3500	45	241	DE-FCH	208
	6	3500	23	241	MA-NVA	210
	6	3500	23	241	PB-NVA	212
	10	3500	38	241	DE-NVA	214
	35	5000	132	345	HT-NVA	216
	40	3500	151	241	SJ-NVA	218
	3	3500	11	241	PB-NVB	220
	15	3500	57	241	DE-NVB	222

Typical Schematic

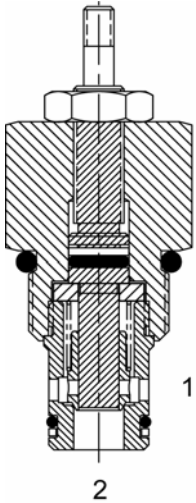
Typical application for the NVA is to meter flow giving speed or full pass control of a fluid motor.

Typical application for the FCH is to meter flow in one direction while allowing free flow in the opposite direction.



WARNING: The specifications/application data shown in our catalogs and data sheets are intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DE-FCH Adjustable Flow Control Valve, Spool Type, Free Reverse Flow



DESCRIPTION

10 size, 7/8-14 thread, "Delta" adjustable needle flow control valve with free reverse flow.

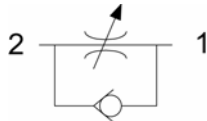
OPERATION

The DE-FCH increases its orifice value from fully closed to fully open turning screw counterclockwise. When adjusted open the valves regulates flow (1) to (2). When fully closed the valve restricts flow from (1) to (2).

FEATURES

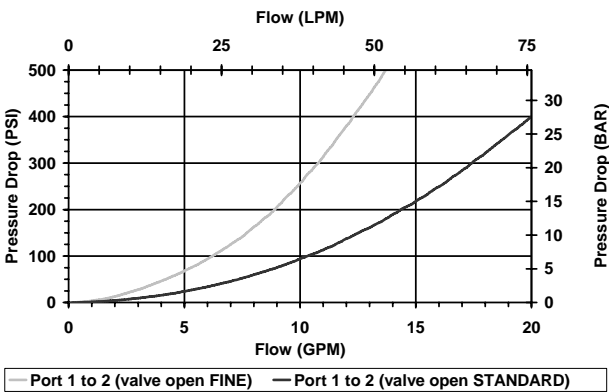
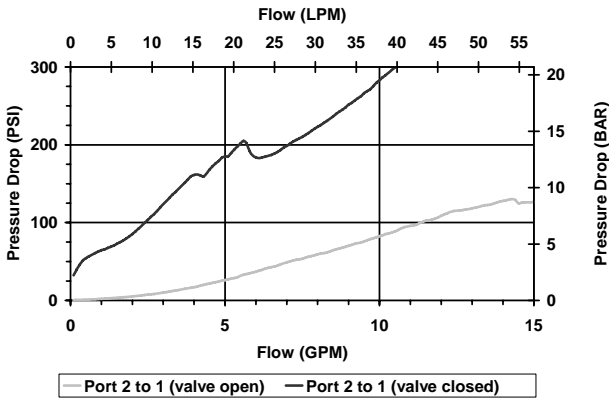
- Hardened parts for long life.
- Industry common cavity.

HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

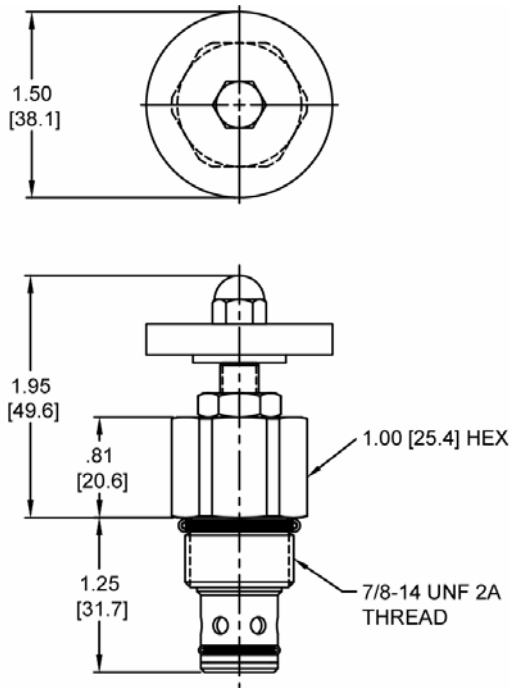


VALVE SPECIFICATIONS

Nominal Flow	12 GPM (45 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.32 lbs. (.15 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191200

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DE-FCH		-	-	
OPTIONS				BODIES
Buna Standard	00		Blank	Without Body
Viton Standard	V0		N	3/8" BSP Ports
Buna, Knob	0K		S	#8 SAE Ports
Viton, Knob	VK			
Buna, Screen	A0			
Viton, Screen	W0			
Buna, Screen, Knob	AK			
Viton, Screen, Knob	WK			

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

MA-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

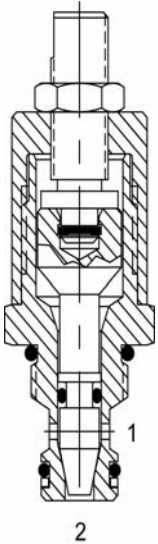
7 size, 5/8-18 thread, "Mini" series, needle flow control valve.

OPERATION

The MA-NVA adjusts from fully open to fully closed turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

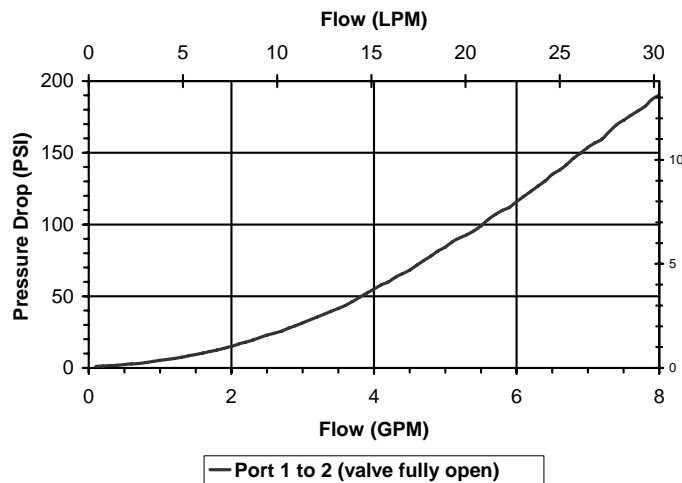


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

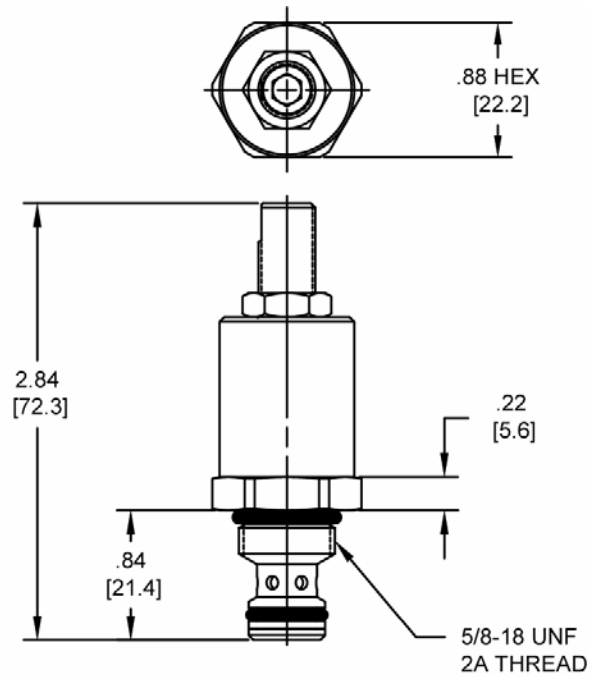


VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.24 lbs. (.11 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	15 ft-lbs (20.3 Nm)
Cavity	MINI 2W
Cavity Tools kit (form tool, reamer, tap)	40500003
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

MA-NVA - - -			
OPTIONS			BODIES
Buna Standard	00	Blank	Without Body
Viton Standard	V0	N	¼" BSP Ports
Buna, Knob	0K	S	#6 SAE Ports
Viton, Knob	VK		

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

PB-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

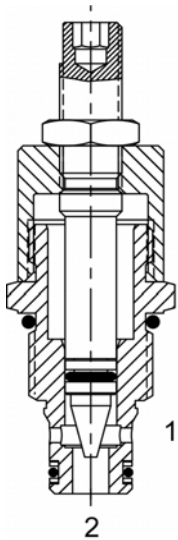
8 size, 3/4-16 thread, "Power" series, needle flow control.

OPERATION

The PB-NVA adjusts from fully open to fully closed turning adjusting screw clockwise. When adjusted open the valve allows flow from (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

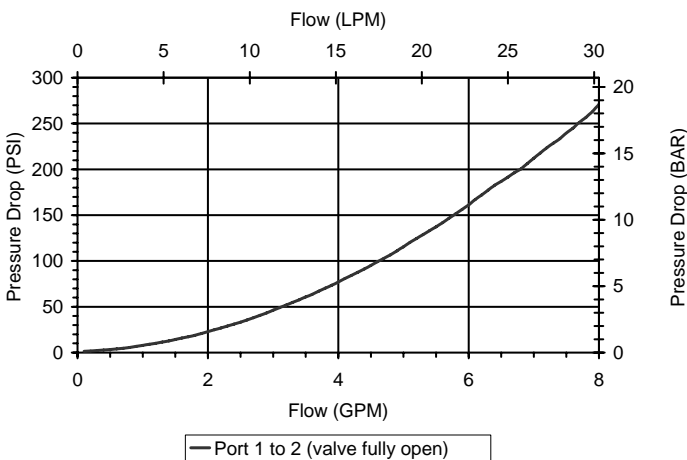


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

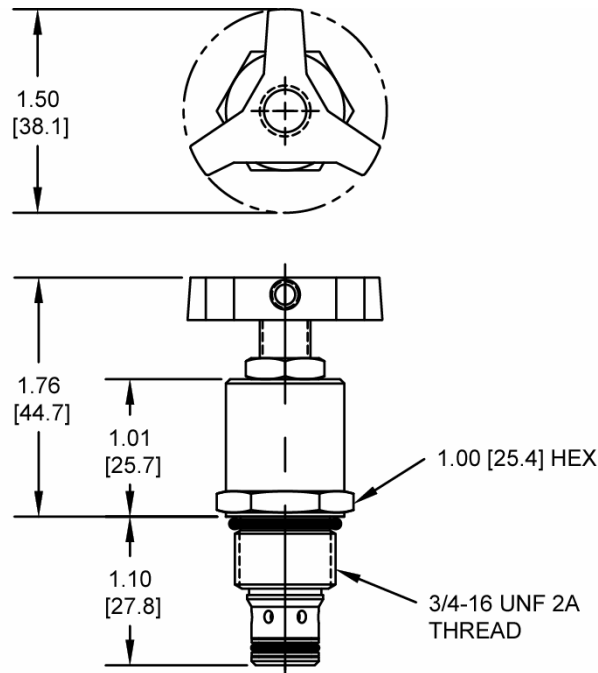


VALVE SPECIFICATIONS

Nominal Flow	6 GPM (23 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.22 lbs. (.10 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	25 ft-lbs (34 Nm)
Cavity	POWER 2W
Cavity Tools kit (form tool, reamer, tap)	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

PB-NVA		-	-	
OPTIONS				BODIES
Buna Standard	00		Blank	Without Body
Viton Standard	V0		N	1/4" BSP Ports
Buna, Knob	0K		S	#6 SAE Ports
Viton, Knob	VK			
Buna, Screen	A0			
Viton, Screen	W0			
Buna, Screen, Knob	AK			
Viton, Screen, Knob	WK			

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DE-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

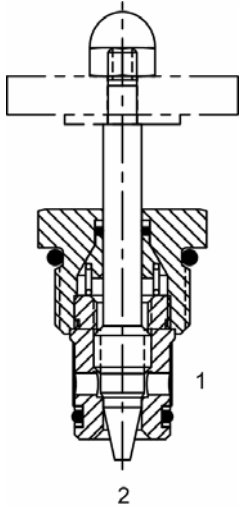
10 size, 7/8-14 thread, "Delta" series needle flow control valve.

OPERATION

The DE-NVA adjusts from fully open to fully closed turning adjusting screw counterclockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

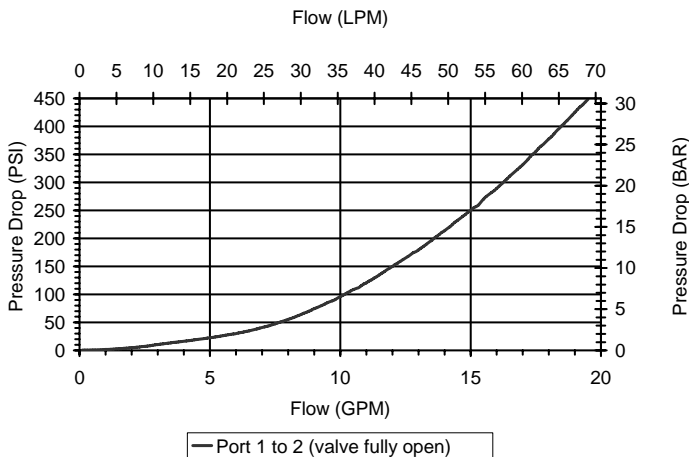


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

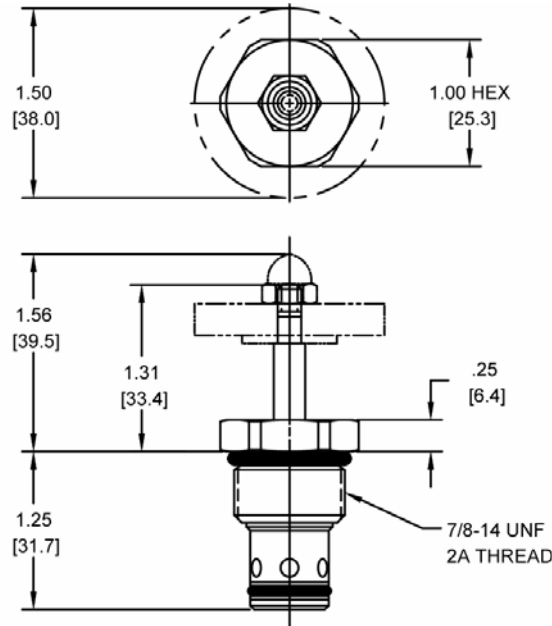


VALVE SPECIFICATIONS

Nominal Flow	10 GPM (38 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.19 lbs. (.09 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DE-NVA - - -			
OPTIONS		Blank	BODIES
Buna Standard	00	N	Without Body
Viton Standard	V0	S	3/8"BSP Ports
Buna, Screen	A0		#8 SAE Ports
Viton, Screen	W0		
Buna, Knob	0K		
Viton, Knob	VK		
Buna, Knob, Screen	AK		
Viton, Knob, Screen	WK		

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

HT-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

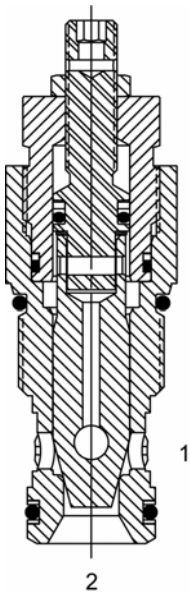
"High Pressure" 12 size, 1 1/16-12 thread, "Tecnorm" series, needle flow control valve.

OPERATION

The HT-NVA adjusts from fully open to fully closed turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.



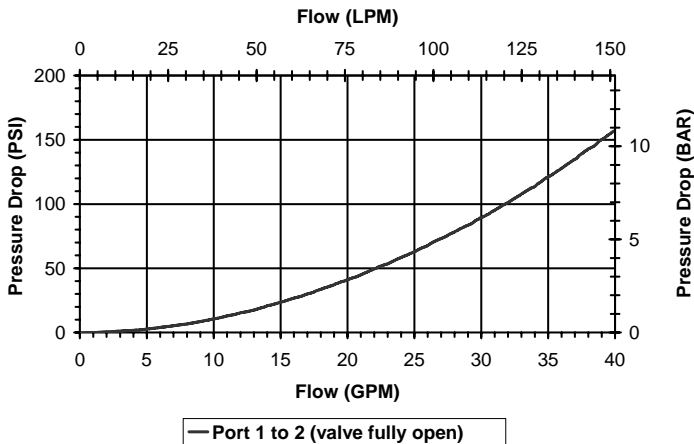
HYDRAULIC SYMBOL



Note: valves with the knob option are NOT to be adjusted under pressure.

PERFORMANCE

Actual Test Data (Cartridge Only)

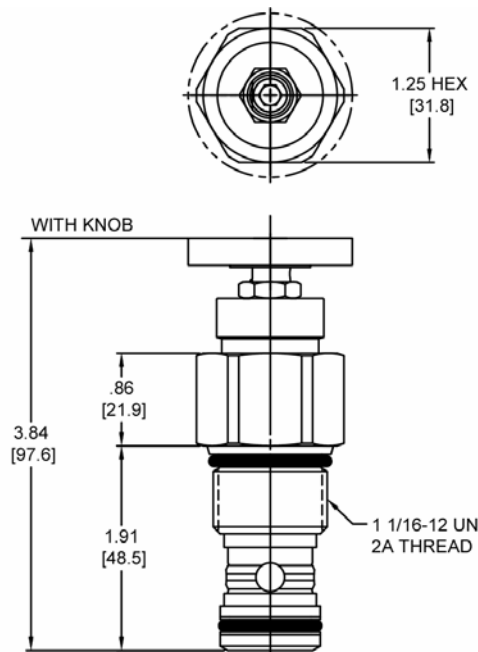


VALVE SPECIFICATIONS

Nominal Flow	35 GPM (133 LPM)
Rated Operating Pressure	5000 PSI (345 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.72 lbs. (.32 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	50 ft-lbs (67.8 Nm)
Cavity	TECNORD 2W
Cavity Tools kit (form tool, reamer, tap)	40500032
Seal Kit	21191302

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

HT-NVA - - -			
OPTIONS			BODIES
Buna Standard	00	Blank	Without Body
Viton Standard	V0	N	3/4" BSP Ports
Buna, Screen	A0	S	#12 SAE Ports
Viton, Screen	W0		
Buna, Knob	0K		
Viton, Knob	VK		
Buna, Screen, Knob	AK		
Viton, Screen, Knob	WK		

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

SJ-NVA Adjustable Flow Control Valve, Needle Type

DESCRIPTION

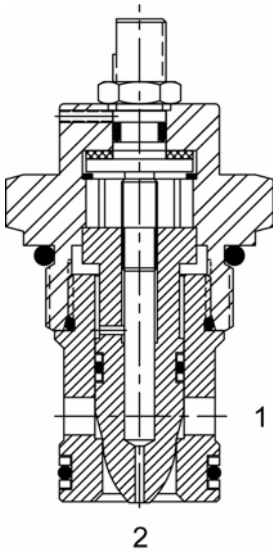
16 size, 1 5/16-12 thread, "Super" series, needle flow control valve.

OPERATION

The SJ-NVA adjusts from fully open to fully closed turning the adjustment screw clockwise. When adjusted open the valves regulates flow (1) to (2) or (2) to (1). When fully closed the valve blocks flow from (1) to (2) or (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

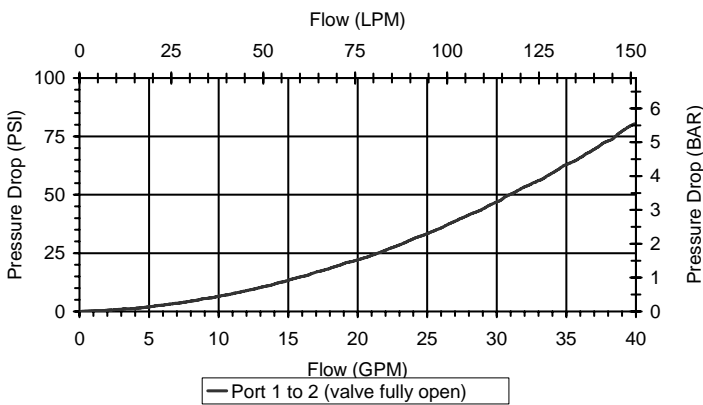


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

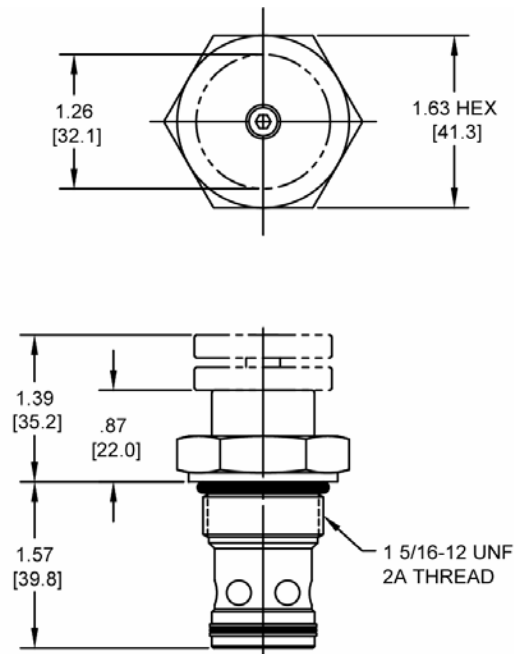


VALVE SPECIFICATIONS

Nominal Flow	40 GPM (151 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-35° to 200° F (-37.2° to 93.3° C)
Weight	.83 lbs. (.37 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	90 ft-lbs (122 Nm)
Cavity	SUPER 2W
Cavity Tools kit (form tool, reamer, tap)	40500017
Seal Kit	21191402

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

SJ-NVA		-	-	
OPTIONS				BODIES
Buna Standard	00		Blank	Without Body
Viton Standard	V0		N	3/4" BSP Ports
Buna, Knob	0K		S	#12 SAE Ports
Viton, Knob	VK			
Internally Adj. Buna	0I			
Internally Adj. Viton	VI			
Tamper Proof Buna	0T			
Tamper Proof Viton	VT			

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

PB-NVB Adjustable Flow Control Valve, Needle Type, Fine Adjust

DESCRIPTION

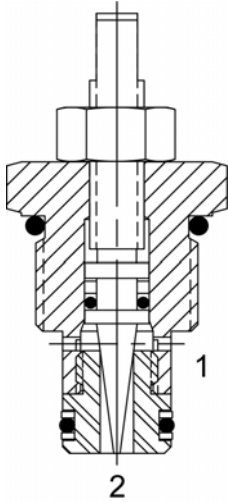
8 size, 3/4-16 thread, "Power" series, fine adjust needle flow control.

OPERATION

The PB-NVB adjusts from fully open to fully closed turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

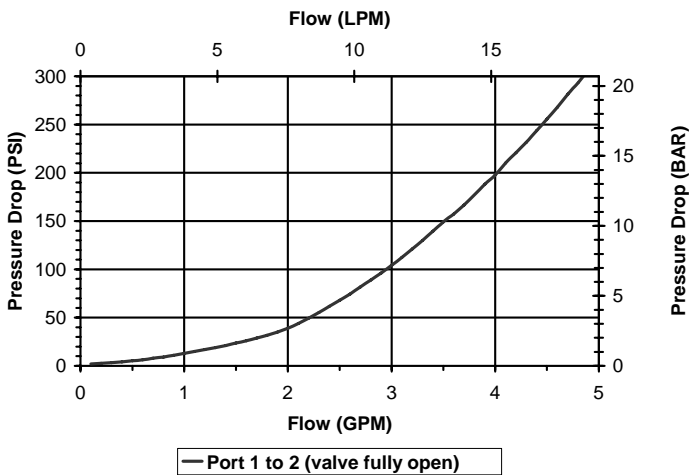


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

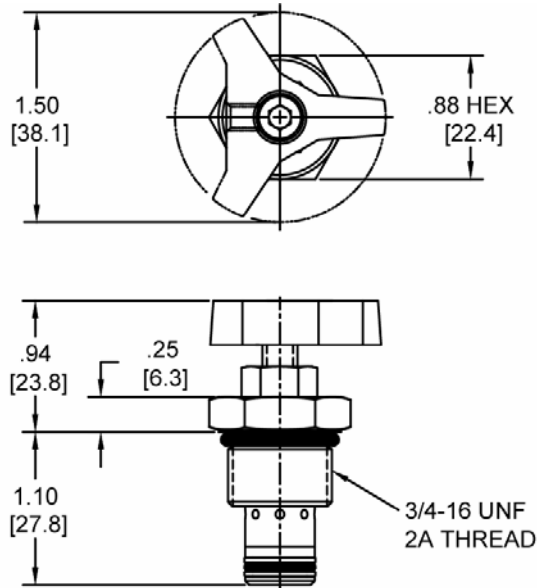


VALVE SPECIFICATIONS

Nominal Flow	3 GPM (11 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.13 lbs. (.06 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	POWER 2W
Cavity Tools kit (form tool, reamer, tap)	40500005
Seal Kit	21191102

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

PB-NVB		-	-	
	OPTIONS			BODIES
Buna Standard	00		Blank	Without Body
Viton Standard	V0		N	¼" BSP Ports
Buna, Knob	OK		S	#6 SAE Ports
Viton, Knob	VK			
Buna, Screen	A0			
Viton, Screen	W0			
Buna, Screen, Knob	AK			
Viton, Screen, Knob	WK			

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DE-NVB Adjustable Flow Control Valve, Coarse Adjust

DESCRIPTION

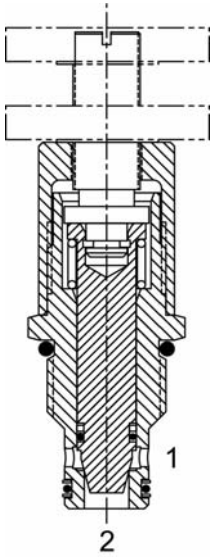
10 size, 7/8-14 thread, "Delta" series, coarse adjust needle flow control valve.

OPERATION

The DE-NVB adjusts from fully open to fully closed turning adjusting screw clockwise. When adjusted open the valve allows flow (1) to (2) and (2) to (1). When fully closed the valve blocks flow from (1) to (2) and (2) to (1).

FEATURES

- Hardened parts for long life.
- Industry common cavity.

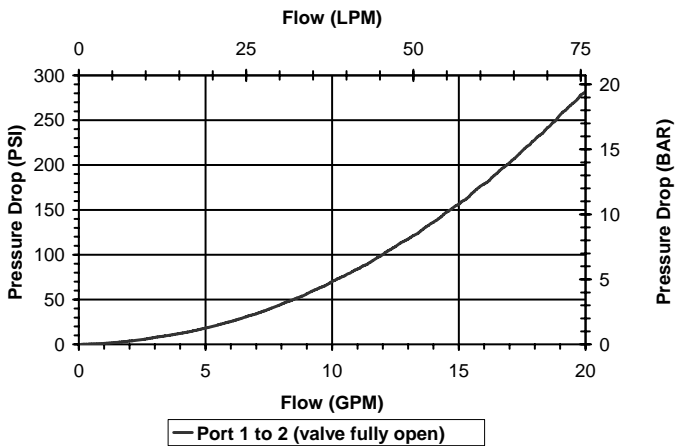


HYDRAULIC SYMBOL



PERFORMANCE

Actual Test Data (Cartridge Only)

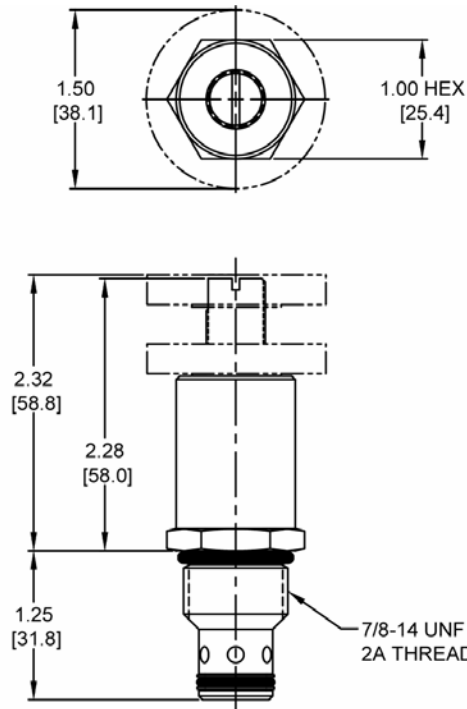


VALVE SPECIFICATIONS

Nominal Flow	15 GPM (57 LPM)
Rated Operating Pressure	3500 PSI (241 bar)
Viscosity Range	36 to 3000 SSU (3 to 647 cSt)
Filtration	ISO 18/16/13
Media Operating Temperature Range	-40° to 250° F (-40° to 120° C)
Weight	.47 lbs. (.21 kg)
Operating Fluid Media	General Purpose Hydraulic Fluid
Cartridge Torque Requirements	30 ft-lbs (40.6 Nm)
Cavity	DELTA 2W
Cavity Tools kit (form tool, reamer, tap)	40500000
Seal Kit	21191202

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.

DIMENSIONS



(for bodies style and sizes see section "Accessories")

ORDERING INFORMATION

DE-NVB		-	-	
<u>OPTIONS</u>				<u>BODIES</u>
Buna Standard	00		Blank	Without Body
Viton Standard	V0		N	3/8" BSP Ports
Buna, Screen	A0		S	#8 SAE Ports
Viton, Screen	W0			
Buna, Knob	OK			
Viton, Knob	VK			
Buna, Knob, Screen	AK			
Viton, Knob, Screen	WK			

NOTE: Use Screen Only if Flow Direction is From 1 to 2

WARNING: The specifications/application data shown in our catalogs and data sheets is intended only as a general guide for the product described (herein). Any specific application should not be undertaken without independent study, evaluation, and testing for suitability.