

Flow dividers are sliding-spool, pressure-compensated devices used to split oil flow to two different branches of a circuit in a designated ratio. These valves are suitable for applications that use the following: unidirectional hydraulic motors, hydraulic cylinders where flow division in one direction only is required, and multiple circuits that are serviced from one pump supply.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-31A
Series	1
Capacity	2,5 - 12 L/min.
Maximum Operating Pressure	350 bar
Divisional Accuracy at Minimum Input Flow	±4.5%
Divisional Accuracy at Max Input Flow	±2.5%
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Rated Input Flow with 50/50 Split	2,5 - 12 L/min.
Rated Input Flow with 40/60 Split	2,8 - 9,5 L/min.
Rated Input Flow with 33/67 Split	1,7 - 8,5 L/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006
Model Weight	0.15 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: FSBDXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>X</b> Not Adjustable	<b>A</b> 50/50 <b>B</b> 40/60 <b>C</b> 33/67	<b>N</b> Buna-N <b>V</b> Viton	<b>Standard Material/Coating</b> <b>/AP</b> Stainless Steel, Passivated

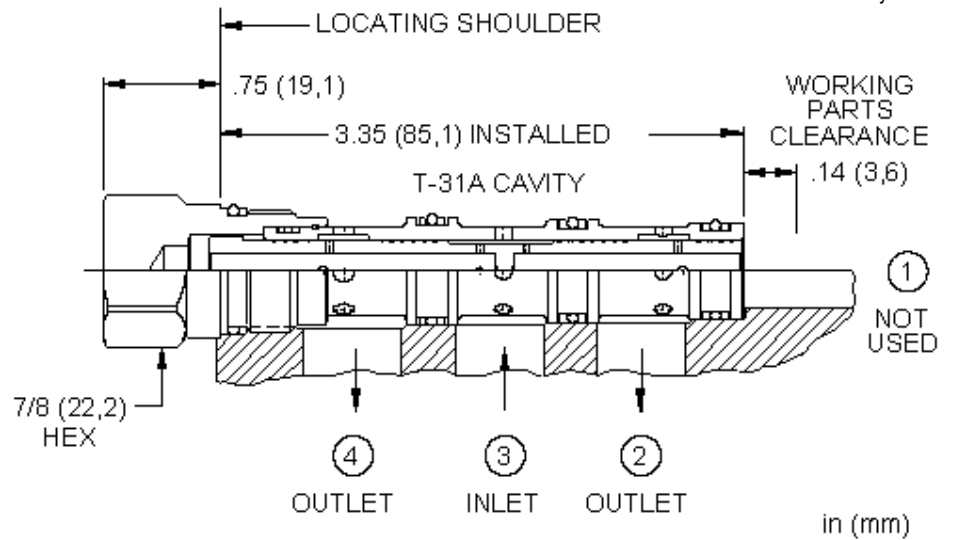
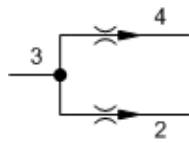
## TECHNICAL FEATURES

- All flow divider and divider/combiner cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size).
- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
- In applications involving rigid mechanisms between multiple actuators, operating inaccuracy will cause the eventual lock-up of the system. If the mechanical structure is not designed to allow for the operating inaccuracy inherent in the valve, damage may occur.
- In motor circuits, rigid frames or mechanisms that tie motors together, and/or complete mechanical synchronized motion of the output shaft of the motors, either by wheels to the pavement or sprockets to conveyors, will contribute to cavitation, lock-up and/or pressure intensification.
- Variations in speed and lock-up can be attributed to differences in motor displacement, motor leakage, wheel diameter variance and friction of wheels on the driving surface.
- This valve is a divider only; any attempt to flow backwards through the valve is not advised.
- Dividers with unequal ratios have the higher flow at port 4.
- Below the minimum flow rating there is not enough flow for the valve to modulate. It is effectively a tee. If flow starts at zero and rises, there will be no dividing control until the flow reaches the minimum rating.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variations	
				High Flow Leg	Low Flow Leg
50:50	Max Rated	3 gpm	±2.5%	1.42 - 1.58 gpm	
		11 L/min		5,2 - 5,8 L/min	
	Min rated	.6 gpm	±4.5%	.27 - .33 gpm	
		2,5 L/min		1,1 - 1,4 L/min	
40:60	Max Rated	2.5 gpm	±2.5%	1.44 - 1.56 gpm	.94 - 1.06 gpm
		9,5 L/min		5,4 - 5,9 L/min	3,6 - 4,0 L/min
	Min rated	.5 gpm	±4.5%	.28 - .32 gpm	.18 - .22 gpm
		2,8 L/min		1,6 - 1,8 L/min	1,0 - 1,2 L/min
33:67	Max Rated	2.2 gpm	±2.5%	1.42 - 1.53 gpm	.67 - .78 gpm
		8,5 L/min		5,5 - 5,9 L/min	2,6 - 3,0 L/min
	Min rated	.45 gpm	±4.5%	.28 - .32 gpm	.13 - .17 gpm
		1,7 L/min		1,06 - 1,22 L/min	0,48 - 0,64 L/min

The maximum variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow.



Flow dividers are sliding-spool, pressure-compensated devices used to split oil flow to two different branches of a circuit in a designated ratio. These valves are suitable for applications that use the following: unidirectional hydraulic motors, hydraulic cylinders where flow division in one direction only is required, and multiple circuits that are serviced from one pump supply.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-31A
Series	1
Capacity	6 - 30 L/min.
Maximum Operating Pressure	350 bar
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Rated Input Flow with 50/50 Split	6 - 30 L/min.
Rated Input Flow with 40/60 Split	5,3 - 26,5 L/min.
Rated Input Flow with 33/67 Split	4,5 - 22,7 L/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006
Model Weight	0.15 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: FSCDXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>X</b> Not Adjustable	<b>A</b> 50/50 B 40/60 C 33/67	<b>N</b> Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

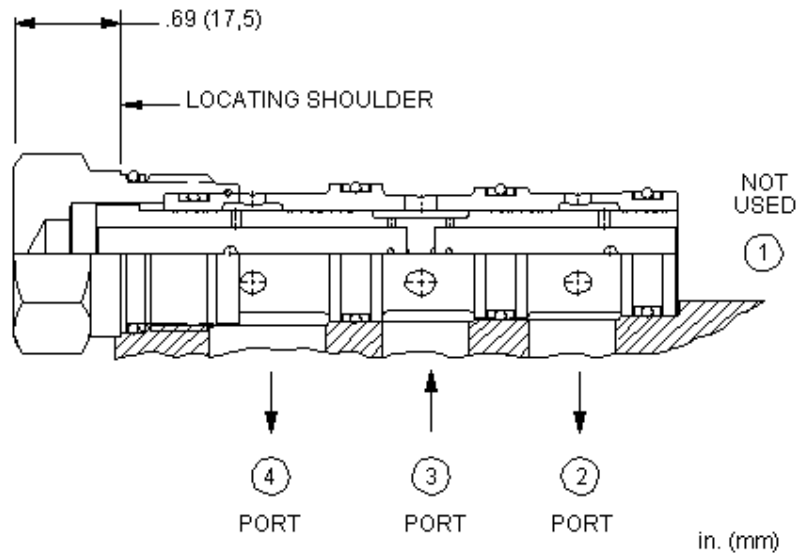
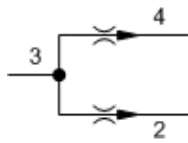
## TECHNICAL FEATURES

- All flow divider and divider/combiner cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size).
- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
- In applications involving rigid mechanisms between multiple actuators, operating inaccuracy will cause the eventual lock-up of the system. If the mechanical structure is not designed to allow for the operating inaccuracy inherent in the valve, damage may occur.
- In motor circuits, rigid frames or mechanisms that tie motors together, and/or complete mechanical synchronized motion of the output shaft of the motors, either by wheels to the pavement or sprockets to conveyors, will contribute to cavitation, lock-up and/or pressure intensification.
- Variations in speed and lock-up can be attributed to differences in motor displacement, motor leakage, wheel diameter variance and friction of wheels on the driving surface.
- This valve is a divider only; any attempt to flow backwards through the valve is not advised.
- Dividers with unequal ratios have the higher flow at port 4.
- Below the minimum flow rating there is not enough flow for the valve to modulate. It is effectively a tee. If flow starts at zero and rises, there will be no dividing control until the flow reaches the minimum rating.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variations	
				High Flow Leg	Low Flow Leg
50:50	Max Rated	8 gpm	±3.5%	3.72 - 4.28 gpm	
		30 L/min		14,1 - 15,9 L/min	
	Min rated	1.5 gpm	±6.5%	.65 - .85 gpm	
		6 L/min		2,5 - 3,5 L/min	
40:60	Max Rated	7 gpm	±3.5%	4.0 - 4.4 gpm	2.6 - 3.0 gpm
		26,5 L/min		15,0 - 16,8 L/min	9,7 - 11,6 L/min
	Min rated	1.4 gpm	±6.5%	.81 - .87 gpm	.53 - .59 gpm
		5,3 /min		2,8 - 3,5 L/min	1,8 - 2,5 L/min
33:67	Max Rated	6 gpm	±3.5%	3.8 - 4.2 gpm	1.8 - 2.2 gpm
		22,7 L/min		14,4 - 16 L/min	6,7 - 8,3 L/min
	Min rated	1.2 gpm	±6.5%	.72 - .88 gpm	.32 - .50 gpm
		4,5 L/min		2,7 - 3,3 L/min	1,2 - 1,8 L/min

The maximum variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow.



Flow dividers are sliding-spool, pressure-compensated devices used to split oil flow to two different branches of a circuit in a designated ratio. These valves are suitable for applications that use the following: unidirectional hydraulic motors, hydraulic cylinders where flow division in one direction only is required, and multiple circuits that are serviced from one pump supply.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-32A
Series	2
Capacity	6 - 30 L/min.
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006
Model Weight	0.26 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: FSDCXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

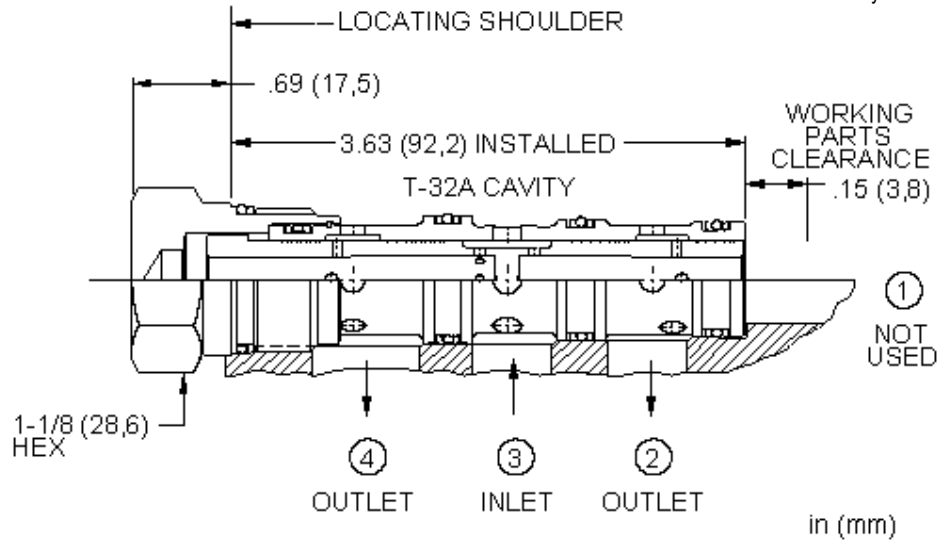
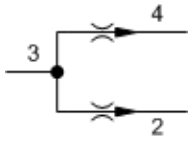
## TECHNICAL FEATURES

- All flow divider and divider/combiner cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size).
- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
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- In motor circuits, rigid frames or mechanisms that tie motors together, and/or complete mechanical synchronized motion of the output shaft of the motors, either by wheels to the pavement or sprockets to conveyors, will contribute to cavitation, lock-up and/or pressure intensification.
- Variations in speed and lock-up can be attributed to differences in motor displacement, motor leakage, wheel diameter variance and friction of wheels on the driving surface.
- This valve is a divider only; any attempt to flow backwards through the valve is not advised.
- Below the minimum flow rating there is not enough flow for the valve to modulate. It is effectively a tee. If flow starts at zero and rises, there will be no dividing control until the flow reaches the minimum rating.
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## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variation
	Max Rated	Min rated		
50:50	8 gpm	30 L/min	±2%	3.84 - 4.16 gpm
				14,4 - 15,6 L/min
	1.5 gpm	6,0 L/min	±3%	.70 - .80 gpm
				2,8 - 3,2 L/min

The maximum possible variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow.



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**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-32A
Series	2
Capacity	12 - 60 L/min.
Maximum Operating Pressure	350 bar
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Rated Input Flow with 50/50 Split	12 - 60 L/min.
Rated Input Flow with 40/60 Split	9,4 - 47 L/min.
Rated Input Flow with 33/67 Split	8,4 - 42 L/min.
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006
Model Weight	0.26 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: FSDDXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N)
<b>X</b> Not Adjustable	<b>A</b> 50/50 B 40/60 C 33/67	<b>N</b> Buna-N V Viton	

## TECHNICAL FEATURES

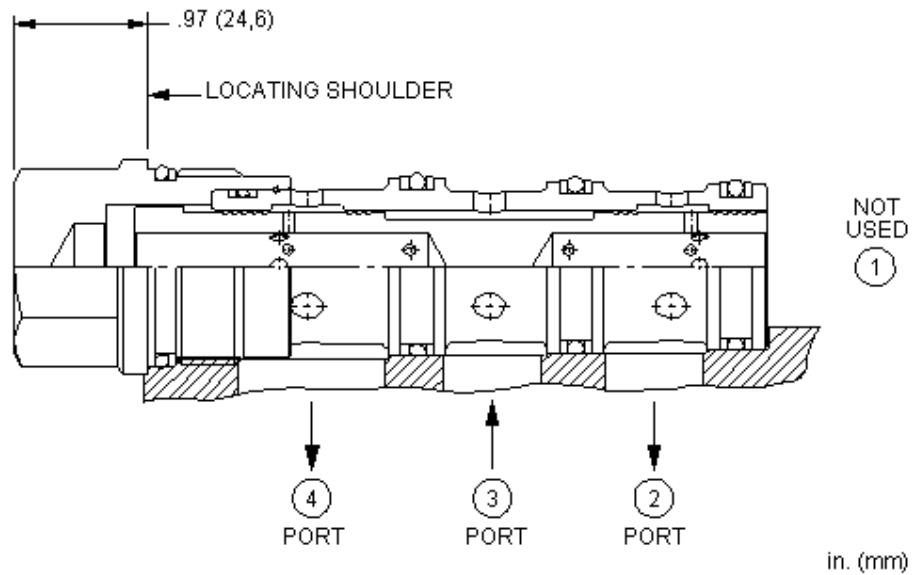
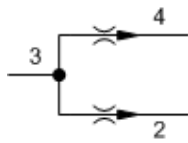
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- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variations	
				High Flow Leg	Low Flow Leg
50:50	Max Rated	15 gpm	±3.5%	6.98 - 8.02 gpm	
		60 L/min		28 - 32 L/min	
	Min rated	3 gpm	±6.5%	1.30 - 1.70 gpm	
		12 L/min		5,2 - 6,7 L/min	
40:60	Max Rated	12.5 gpm	±3.5%	7.1 - 7.9 gpm	4.6 - 5.4 gpm
		47 L/min		26,6 - 29,8 L/min	17,2 - 20,4 L/min
	Min rated	2.5 gpm	±6.5%	1.34 - 1.66 gpm	.84 - 1.16 gpm
		9,4 L/min		5,0 - 6,2 L/min	3,2 - 4,4 L/min
33:67	Max Rated	11 gpm	±3.5%	7.0 - 7.8 gpm	3.2 - 4.0 gpm
		42 L/min		26,5 - 29,5 L/min	12,5 - 15,5 L/min
	Min rated	2.2 gpm	±6.5%	1.3 - 1.6 gpm	.6 - .9 gpm
		8,4 L/min		5,1 - 6,2 L/min	2,2 - 3,3 L/min

The maximum variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow.





Flow dividers are sliding-spool, pressure-compensated devices used to split oil flow to two different branches of a circuit in a designated ratio. These valves are suitable for applications that use the following: unidirectional hydraulic motors, hydraulic cylinders where flow division in one direction only is required, and multiple circuits that are serviced from one pump supply.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-33A
Series	3
Capacity	12 - 60 L/min.
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006
Model Weight	0.61 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: FSECXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

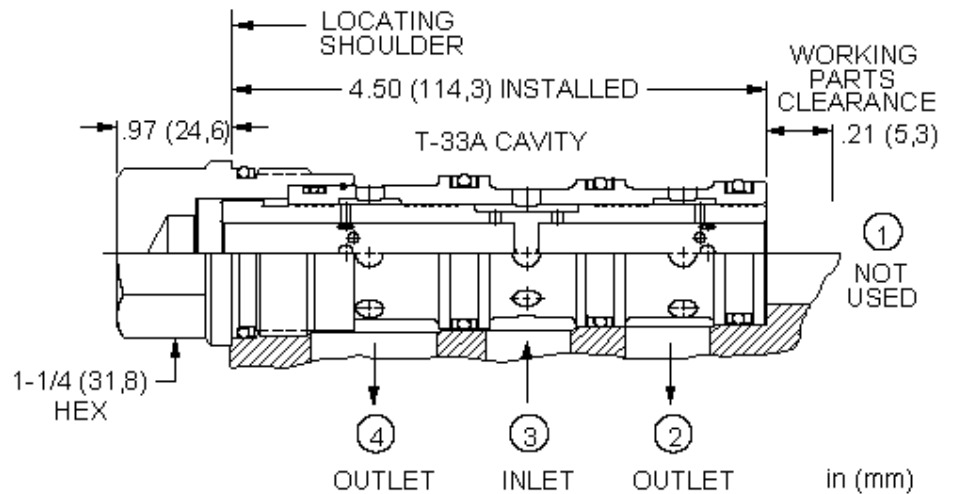
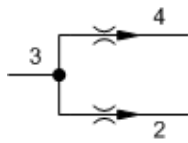
## TECHNICAL FEATURES

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- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
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## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variation
50:50	Max Rated	15 gpm	±2%	7.2 - 7.8 gpm
		60 L/min		28,8 - 31,2 L/min
	Min rated	3 gpm	±3%	1.41 - 1.59 gpm
		12 L/min		5,6 - 6,4 L/min

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**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-33A
Series	3
Capacity	23 - 120 L/min.
Maximum Operating Pressure	350 bar
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Rated Input Flow with 50/50 Split	23 - 120 L/min.
Rated Input Flow with 40/60 Split	19 - 95 L/min.
Rated Input Flow with 33/67 Split	17 - 85 L/min.
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006
Model Weight	0.61 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: FSEDXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 50/50 B 40/60 C 33/67	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

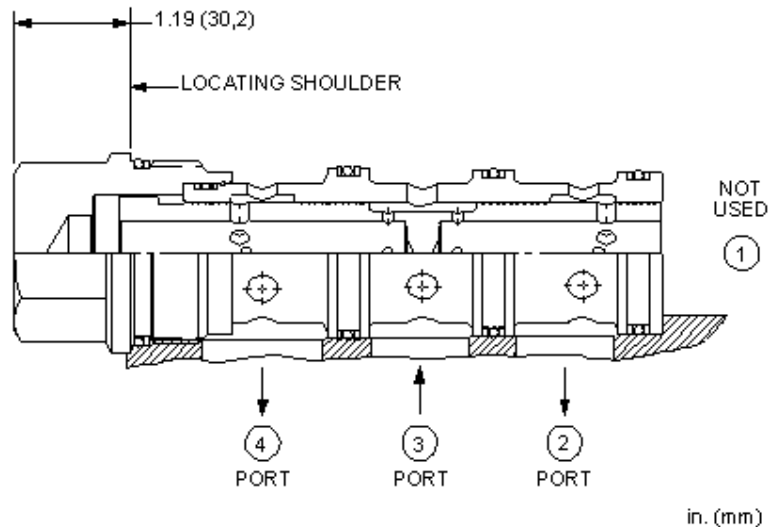
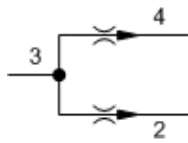
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- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variations	
				High Flow Leg	Low Flow Leg
50:50	Max Rated	30 gpm	±3.5%	14 - 16 gpm	
		120 L/min		56 - 64 L/min	
	Min rated	6 gpm	±6.5%	2.6 - 3.4 gpm	
		23 L/min		10 - 13 L/min	
40:60	Max Rated	25 gpm	±3.5%	14.1 - 15.9 gpm	9.1 - 10.9 gpm
		95 L/min		54 - 60 L/min	35 - 41 L/min
	Min rated	5 gpm	±6.5%	2.7 - 3.3 gpm	1.7 - 2.3 gpm
		19 L/min		10.2 - 12.6 L/min	6,4 - 8,8 L/min
33:67	Max Rated	22 gpm	±3.5%	14.0 - 15.5 gpm	6.5 - 8.0 gpm
		85 L/min		54 - 60 L/min	25 - 31 L/min
	Min rated	4.4 gpm	±6.5%	2.7 - 3.3 gpm	1.1 - 1.7 gpm
		17 L/min		10,3 - 12,5 L/min	4,5 - 6,7 L/min

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**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-34A
Series	4
Capacity	23 - 120 L/min.
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006
Model Weight	1.28 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: FSFCXAN**

<b>CONTROL</b>	<b>(X) FLOW SPLIT</b>	<b>(A) SEAL MATERIAL</b>	<b>(N)</b>
<b>X</b> Not Adjustable	<b>A</b> 50/50	<b>N</b> Buna-N	
		<b>V</b> Viton	

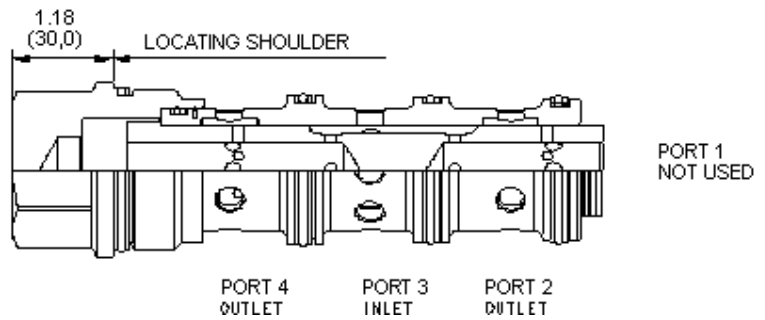
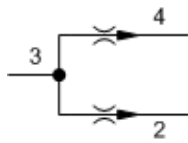
## TECHNICAL FEATURES

- All flow divider and divider/combiner cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size).
- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
- In applications involving rigid mechanisms between multiple actuators, operating inaccuracy will cause the eventual lock-up of the system. If the mechanical structure is not designed to allow for the operating inaccuracy inherent in the valve, damage may occur.
- In motor circuits, rigid frames or mechanisms that tie motors together, and/or complete mechanical synchronized motion of the output shaft of the motors, either by wheels to the pavement or sprockets to conveyors, will contribute to cavitation, lock-up and/or pressure intensification.
- Variations in speed and lock-up can be attributed to differences in motor displacement, motor leakage, wheel diameter variance and friction of wheels on the driving surface.
- This valve is a divider only; any attempt to flow backwards through the valve is not advised.
- Below the minimum flow rating there is not enough flow for the valve to modulate. It is effectively a tee. If flow starts at zero and rises, there will be no dividing control until the flow reaches the minimum rating.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variation
50:50	Max Rated	30 gpm	±2.0%	14.4 - 15.6 gpm
		120 L/min		57,6 - 62,4 L/min
	Min rated	6 gpm	±3.0%	2.8 - 3.2 gpm
		24 L/min		11,3 - 12,7 L/min

The maximum possible variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow.



Flow dividers are sliding-spool, pressure-compensated devices used to split oil flow to two different branches of a circuit in a designated ratio. These valves are suitable for applications that use the following: unidirectional hydraulic motors, hydraulic cylinders where flow division in one direction only is required, and multiple circuits that are serviced from one pump supply.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-34A
Series	4
Capacity	45 - 240 L/min.
Maximum Operating Pressure	350 bar
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	2 bar
Pressure Drop at Maximum Rated Input Flow	18 bar
Rated Input Flow with 50/50 Split	45 - 240 L/min.
Rated Input Flow with 40/60 Split	38 - 200 L/min.
Rated Input Flow with 33/67 Split	36 - 180 L/min.
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006
Model Weight	1.27 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: FSFDXAN**

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>X</b> Not Adjustable	<b>A</b> 50/50 B 40/60 C 33/67 D 25/75	<b>N</b> Buna-N V Viton	Standard Material/Coating /LH Mild Steel, Zinc-Nickel

## TECHNICAL FEATURES

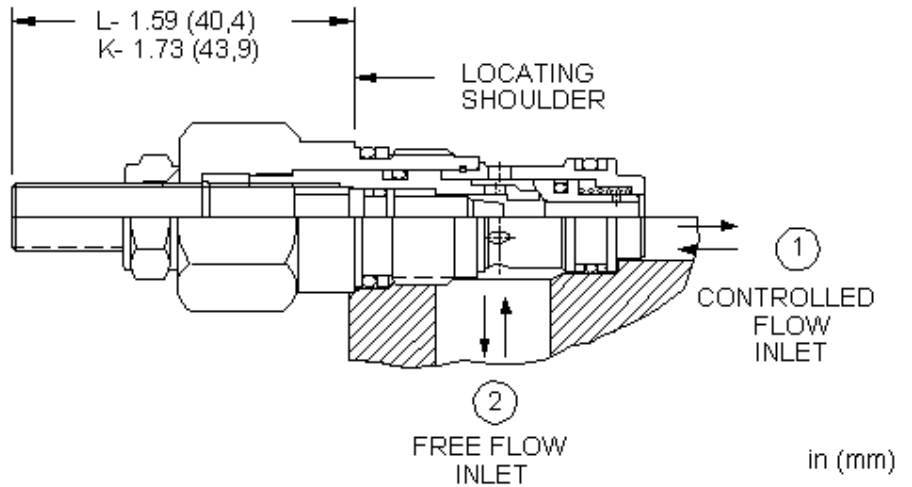
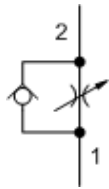
- All flow divider and divider/combiner cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size).
- Operating characteristics cause the leg of the circuit with the greatest load to receive the higher percentage of flow in dividing mode. If a rigid mechanism is used to tie actuators together, the lead actuator may pull the lagging actuator and cause it to cavitate.
- In applications involving rigid mechanisms between multiple actuators, operating inaccuracy will cause the eventual lock-up of the system. If the mechanical structure is not designed to allow for the operating inaccuracy inherent in the valve, damage may occur.
- In motor circuits, rigid frames or mechanisms that tie motors together, and/or complete mechanical synchronized motion of the output shaft of the motors, either by wheels to the pavement or sprockets to conveyors, will contribute to cavitation, lock-up and/or pressure intensification.
- Variations in speed and lock-up can be attributed to differences in motor displacement, motor leakage, wheel diameter variance and friction of wheels on the driving surface.
- This valve is a divider only; any attempt to flow backwards through the valve is not advised.
- Dividers with unequal ratios have the higher flow at port 4.
- Below the minimum flow rating there is not enough flow for the valve to modulate. It is effectively a tee. If flow starts at zero and rises, there will be no dividing control until the flow reaches the minimum rating.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

Split	Input Flow		Rated Accuracy	Maximum Possible Flow Variations	
				High Flow Leg	Low Flow Leg
50:50	Max Rated	60 gpm	±3.5%	28 - 32 gpm	
		240 L/min		112 - 128 L/min	
	Min rated	12 gpm	±6.5%	5.2 - 6.8 gpm	
		45 L/min		19,6- 25,4 L/min	
40:60	Max Rated	50 gpm	±3.5%	28 - 32 gpm	18 - 22 gpm
		200 L/min		113 - 127 L/min	73 - 87 L/min
	Min rated	10 gpm	±6.5%	5.4 - 6.6 gpm	3.4 - 4.6 gpm
		38 L/min		20,3 - 25,3 L/min	12,7 - 17,7 L/min
33:67	Max Rated	45 gpm	±3.5%	28 - 32 gpm	13 - 17 gpm
		180 L/min		114 - 126 L/min	54 - 66 L/min
	Min rated	9 gpm	±6.5%	5.4 - 6.6 gpm	2.4 - 3.6 gpm
		36 L/min		22 - 26 L/min	10 - 14 L/min

The maximum variation is at 5000 psi (350 bar) differential between legs with the high pressure leg being the higher flow.





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-162A
Series	0
Capacity	20 L/min. (4 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,7 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.08 kg.

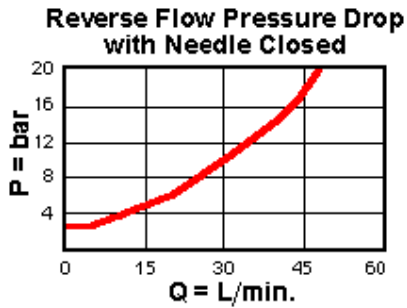
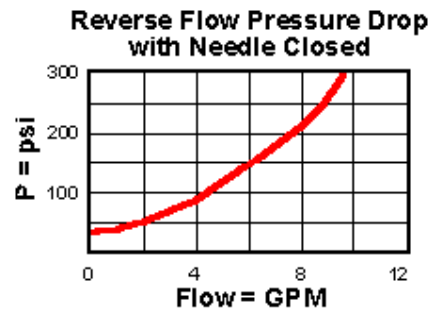
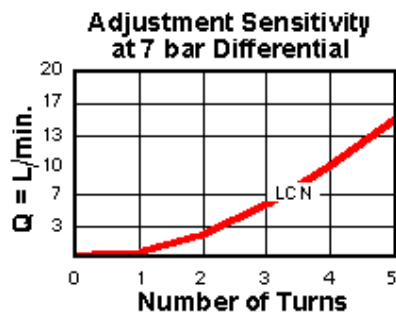
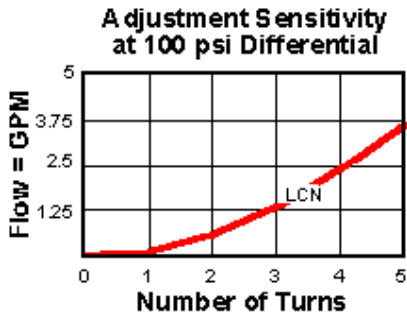
**CONFIGURATION OPTIONS**
**Model Code Example: NCBBLCN**

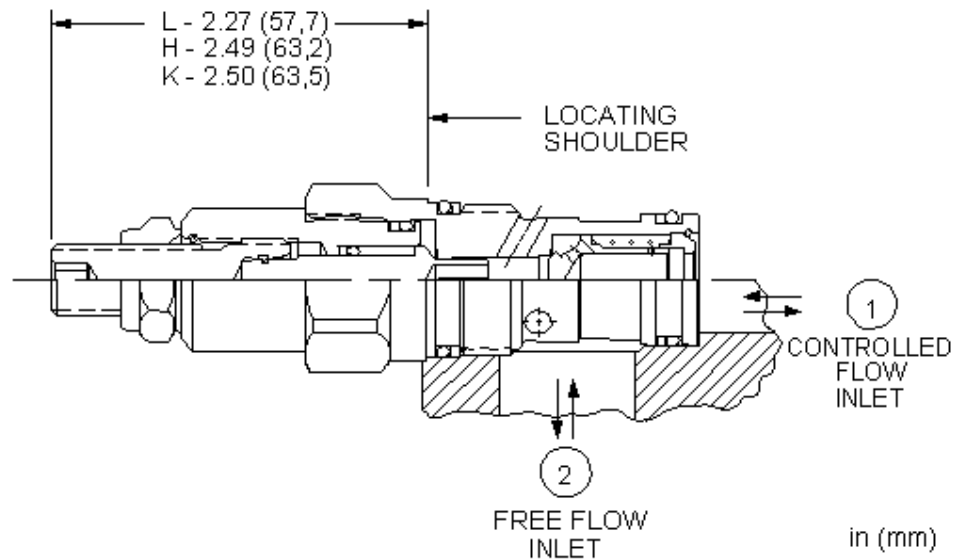
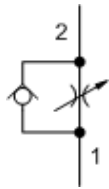
CONTROL	(L) REVERSE FLOW CHECK	(C) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment K Handknob	C 30 psi (2 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-13A
Series	1
Capacity	28 L/min. (4,8 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,7 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

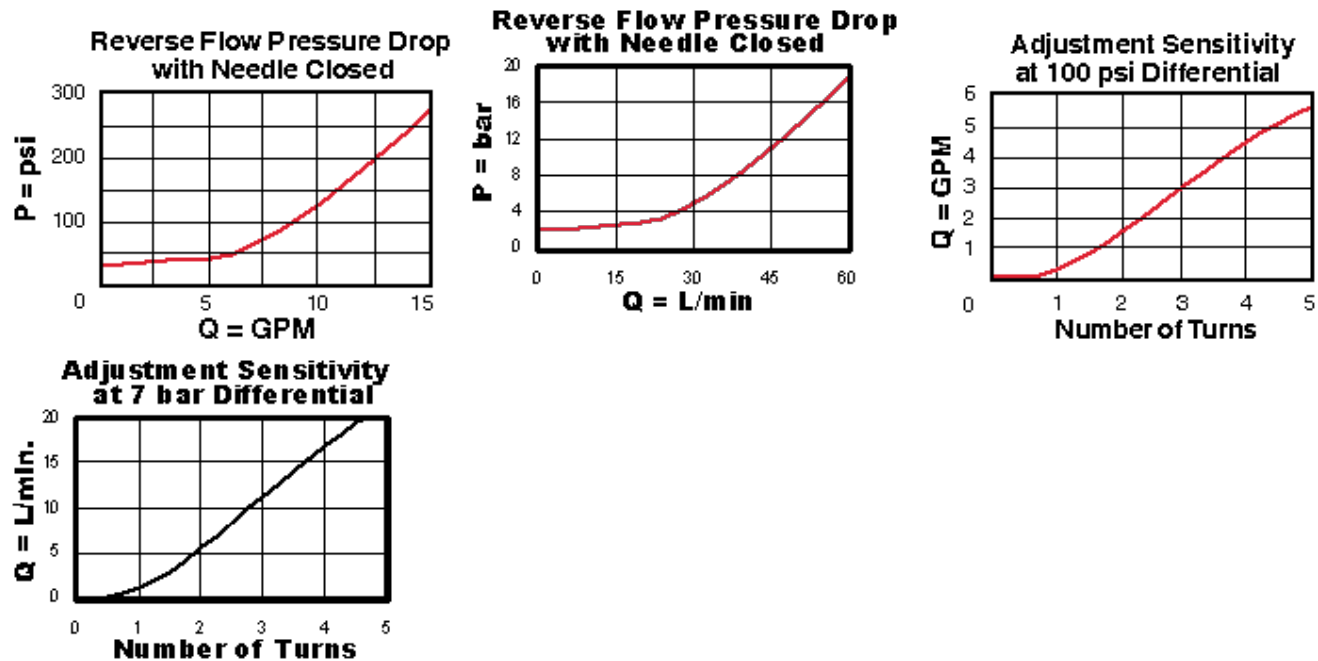
Model Code Example: NCCBLCN

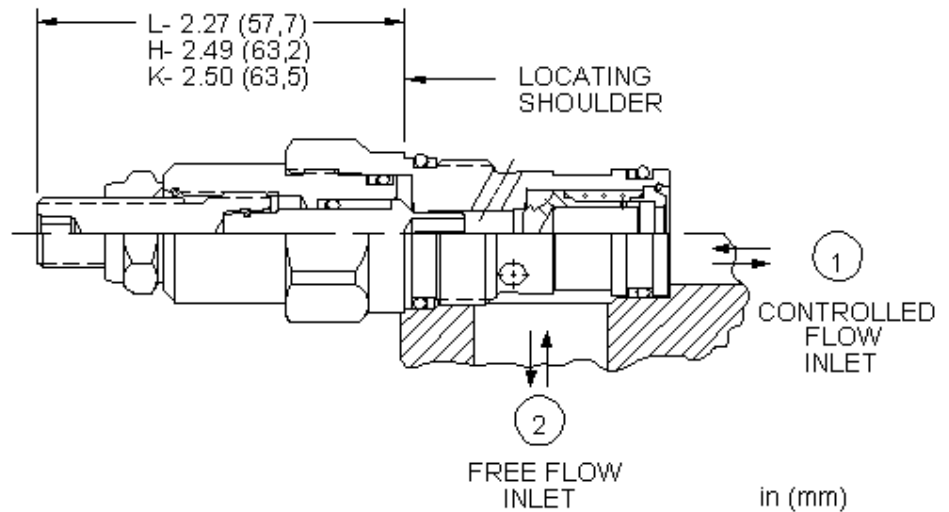
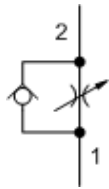
CONTROL	(L) REVERSE FLOW CHECK	(C) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent Lock	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
K Handknob	E 75 psi (5 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
R Capped Screw Adjustment			
Y Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-13A
Series	1
Capacity	8 L/min. (2,3 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

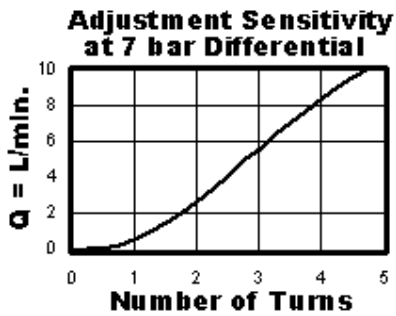
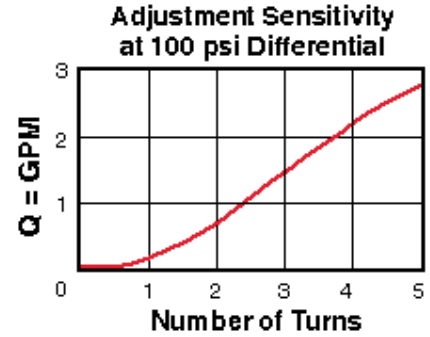
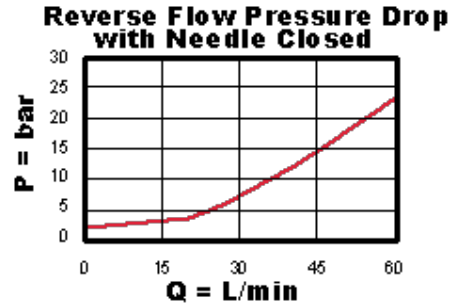
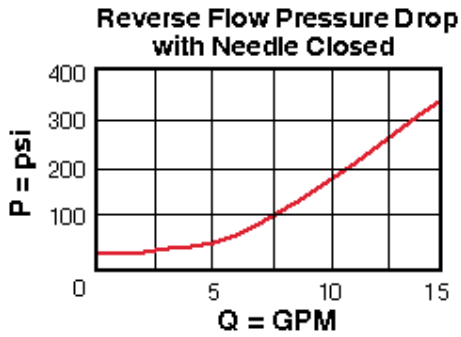
**CONFIGURATION OPTIONS**
**Model Code Example: NCCCLCN**

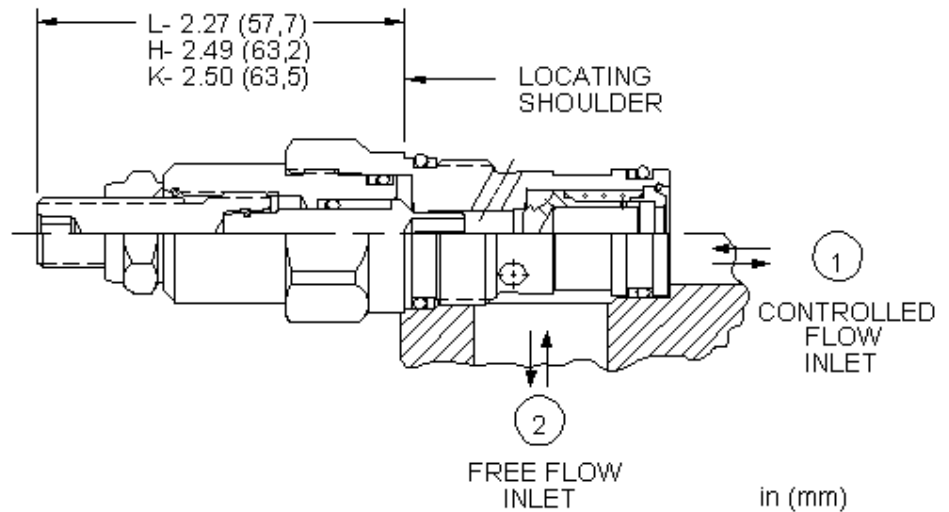
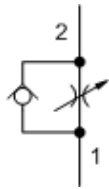
<b>CONTROL</b>	<b>(L) REVERSE FLOW CHECK</b>	<b>(C) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>C</b> 30 psi (2 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>A</b> 4 psi (0,3 bar)	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>E</b> 75 psi (5 bar)		/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount			
<b>R</b> Capped Screw Adjustment			
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-13A
Series	1
Capacity	4 L/min. (1,5 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

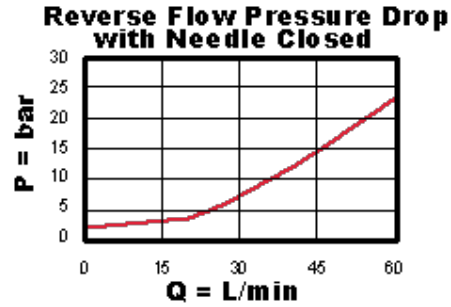
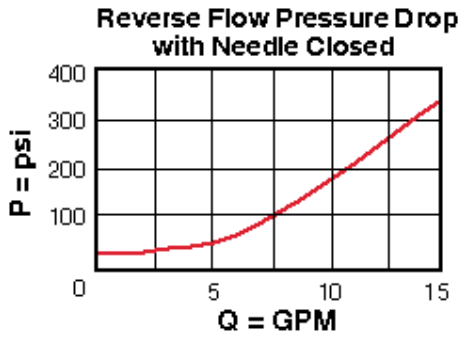
**CONFIGURATION OPTIONS**
**Model Code Example: NCCDLAN**

<b>CONTROL</b>	<b>(L) REVERSE FLOW CHECK</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 4 psi (0,3 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>B</b> 15 psi (1 bar)	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 30 psi (2 bar)		/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>D</b> 50 psi (3,5 bar)		
<b>R</b> Capped Screw Adjustment	<b>E</b> 75 psi (5 bar)		
<b>Y</b> Tri-Grip Handknob			

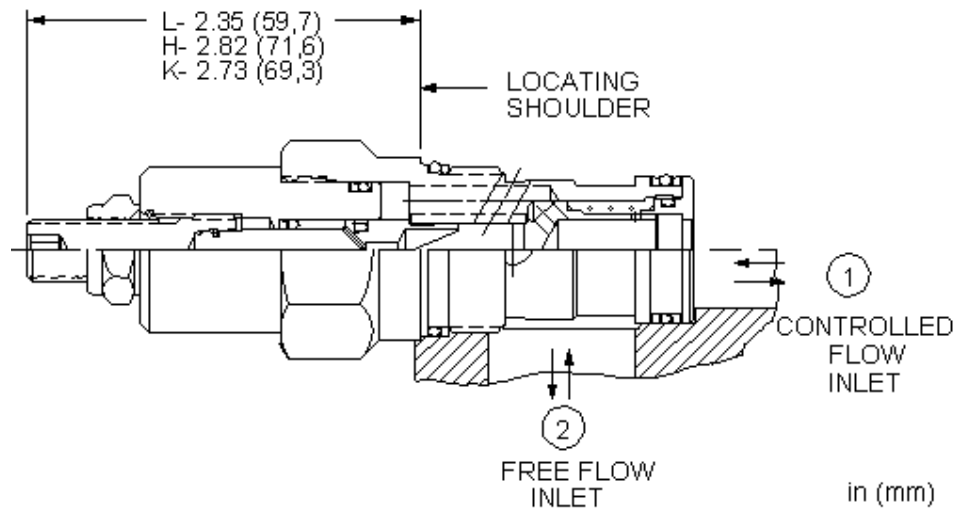
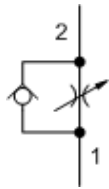
## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.

## PERFORMANCE CURVES







Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-5A
Series	2
Capacity	45 L/min. (6,4 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,7 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.27 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

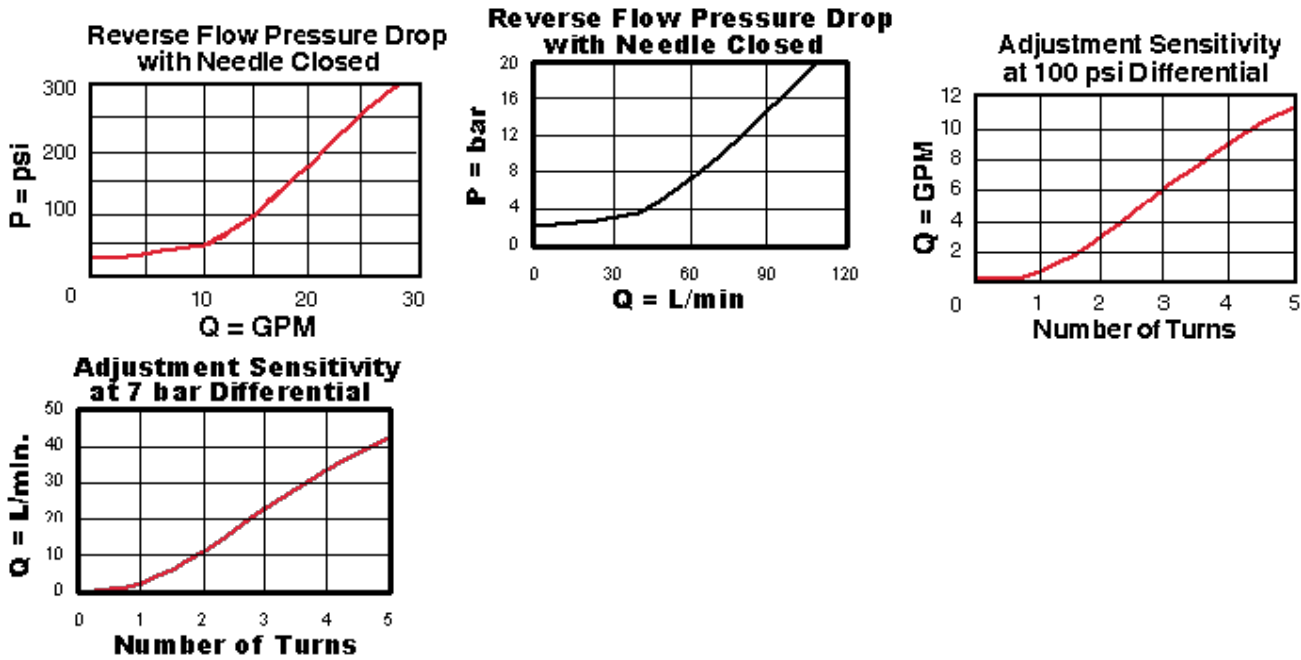
**Model Code Example: NCEBLCN**

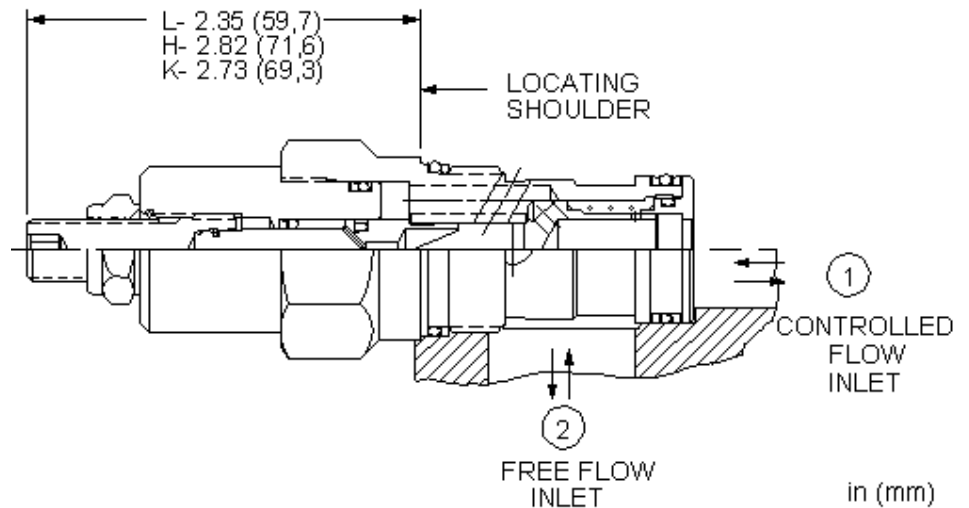
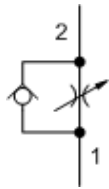
CONTROL	(L) REVERSE FLOW CHECK	(C) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent Lock	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
K Handknob	E 75 psi (5 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
Y Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-5A
Series	2
Capacity	11 L/min. (3,3 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.27 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

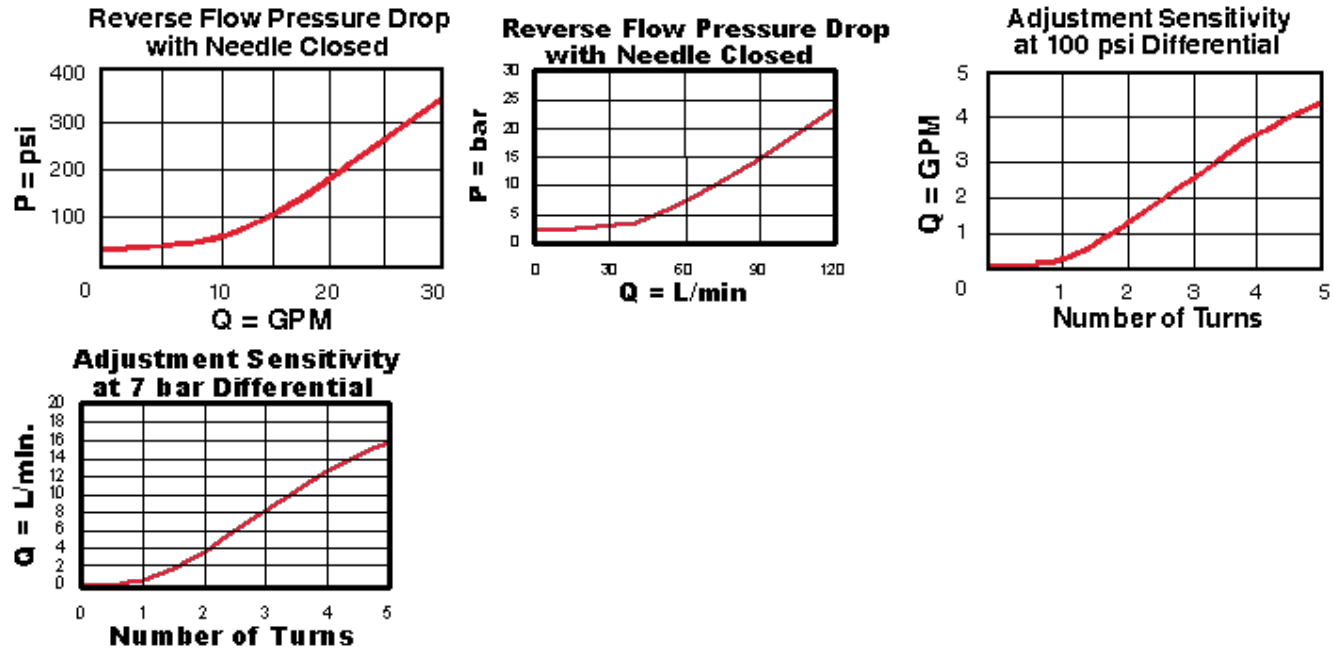
**CONFIGURATION OPTIONS**
**Model Code Example: NCECLCN**

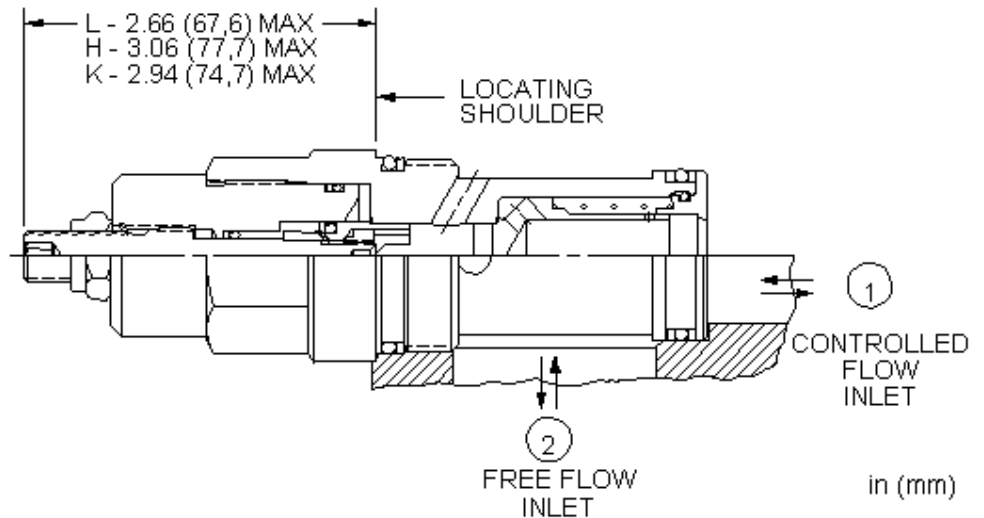
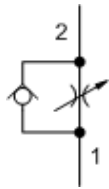
CONTROL	(L) REVERSE FLOW CHECK	(C) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent Lock	A 4 psi (0,3 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
K Handknob	E 75 psi (5 bar)		
Y Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	120 L/min. (9,7 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,7 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.57 kg.

**CONFIGURATION OPTIONS**

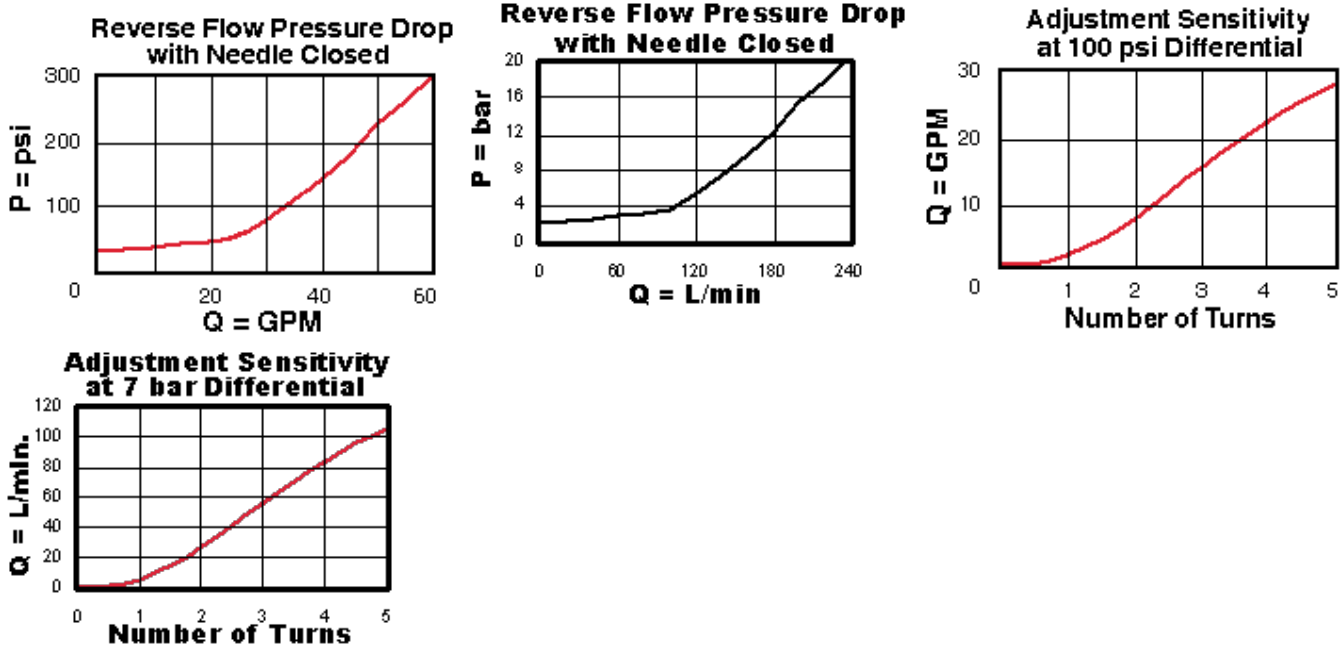
**Model Code Example: NCFBLCN**

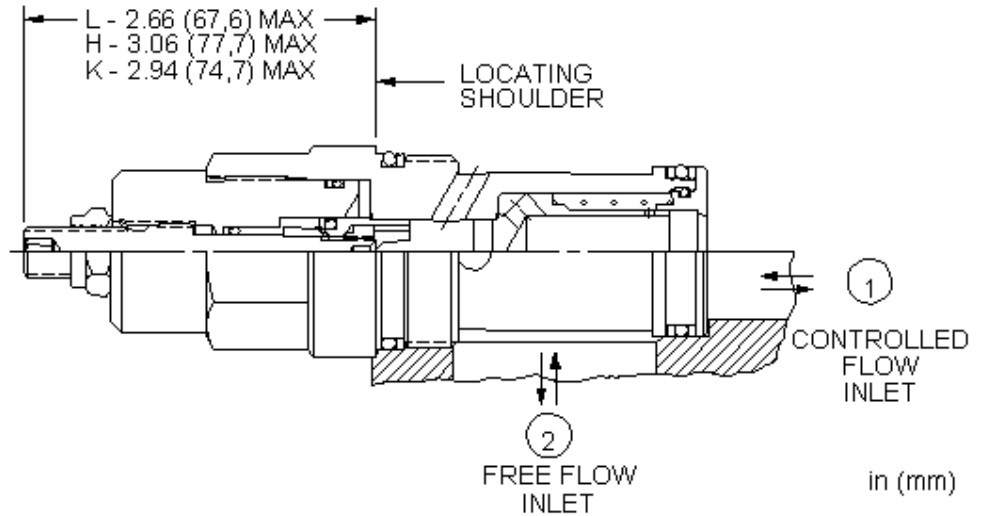
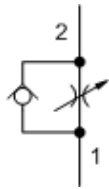
CONTROL	(L) REVERSE FLOW CHECK	(C) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>C</b> 30 psi (2 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>A</b> 4 psi (0,3 bar)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>E</b> 75 psi (5 bar)	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	60 L/min. (7,1 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.57 kg.

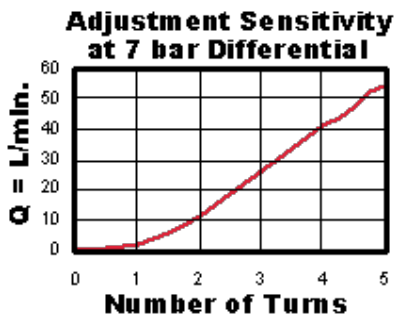
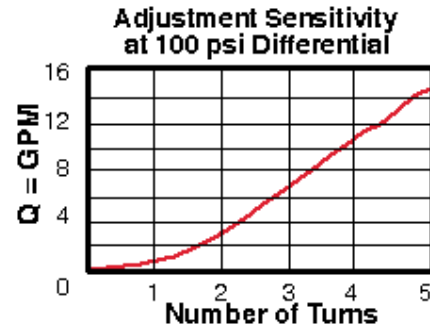
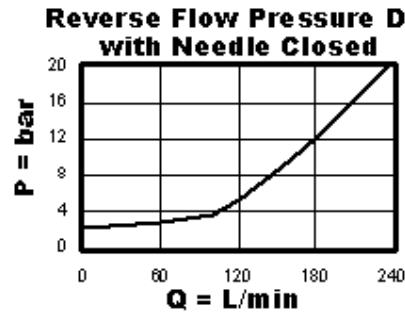
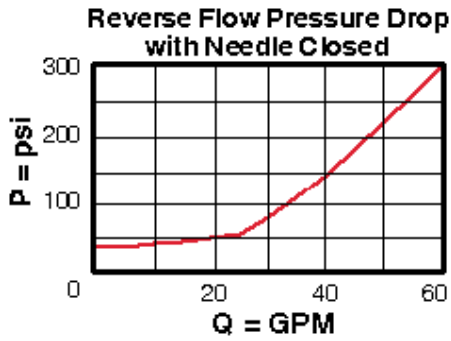
**CONFIGURATION OPTIONS**
**Model Code Example: NCFCLCN**

<b>CONTROL</b>	<b>(L) REVERSE FLOW CHECK</b>	<b>(C) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>C</b> 30 psi (2 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>A</b> 4 psi (0,3 bar)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>E</b> 75 psi (5 bar)	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

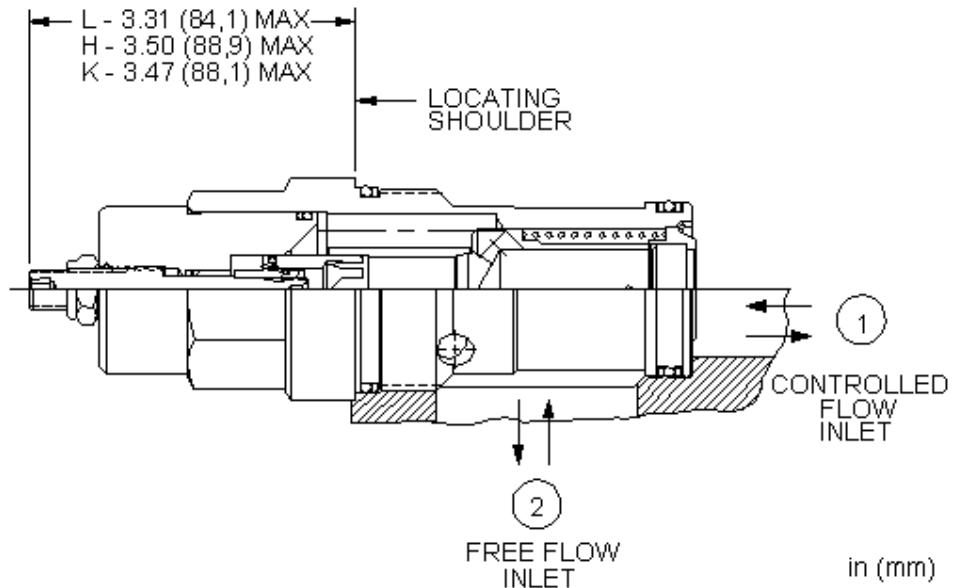
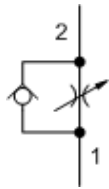
## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	240 L/min. (14,2 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,7 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.21 kg.

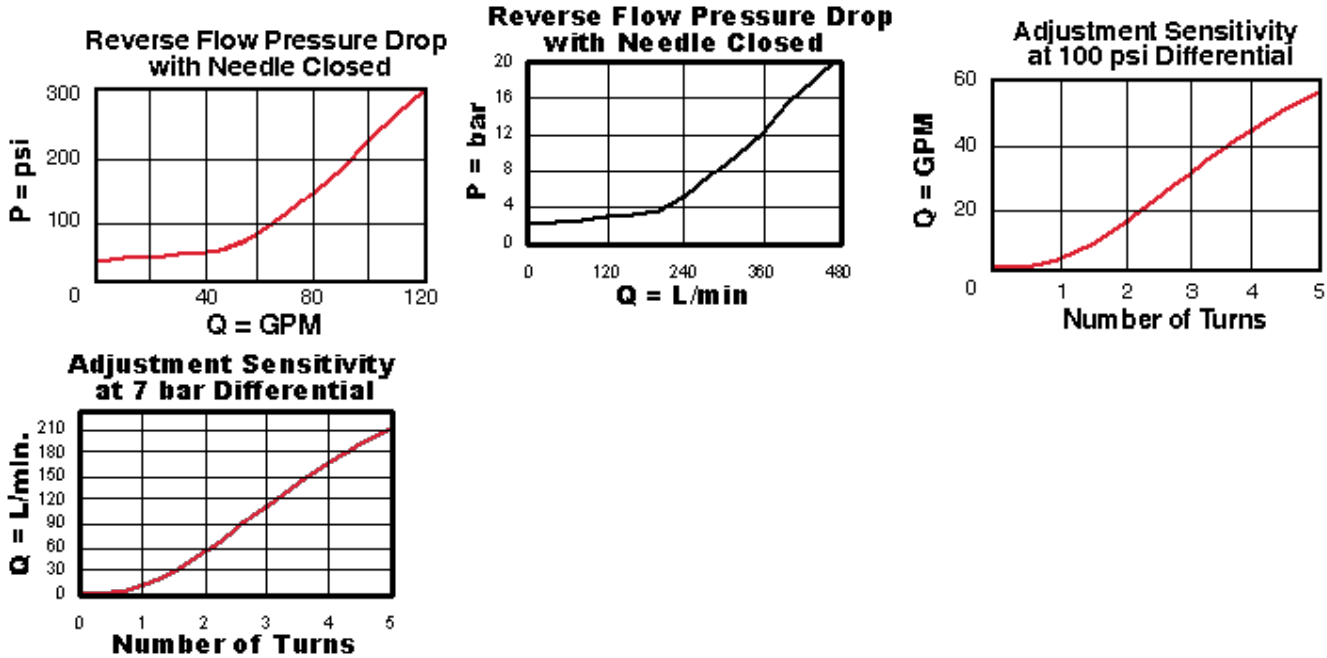
**CONFIGURATION OPTIONS**
**Model Code Example: NCGBLCN**

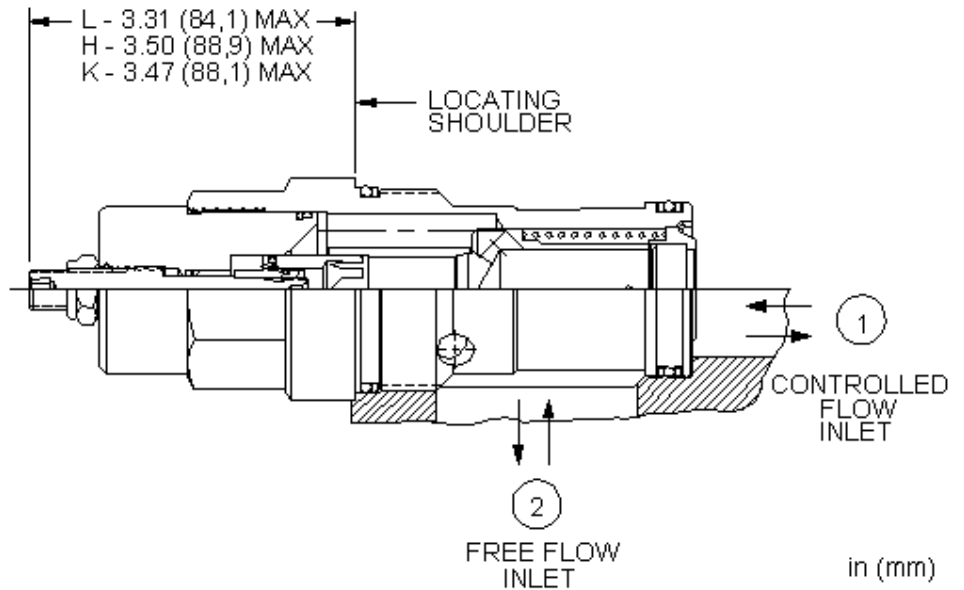
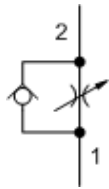
<b>CONTROL</b>	<b>(L) REVERSE FLOW CHECK</b>	<b>(C) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>C</b> 30 psi (2 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>A</b> 4 psi (0,3 bar)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>E</b> 75 psi (5 bar)	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Needle valves with reverse-flow check are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. They are not pressure compensated.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	120 L/min. (9,7 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.21 kg.

**CONFIGURATION OPTIONS**

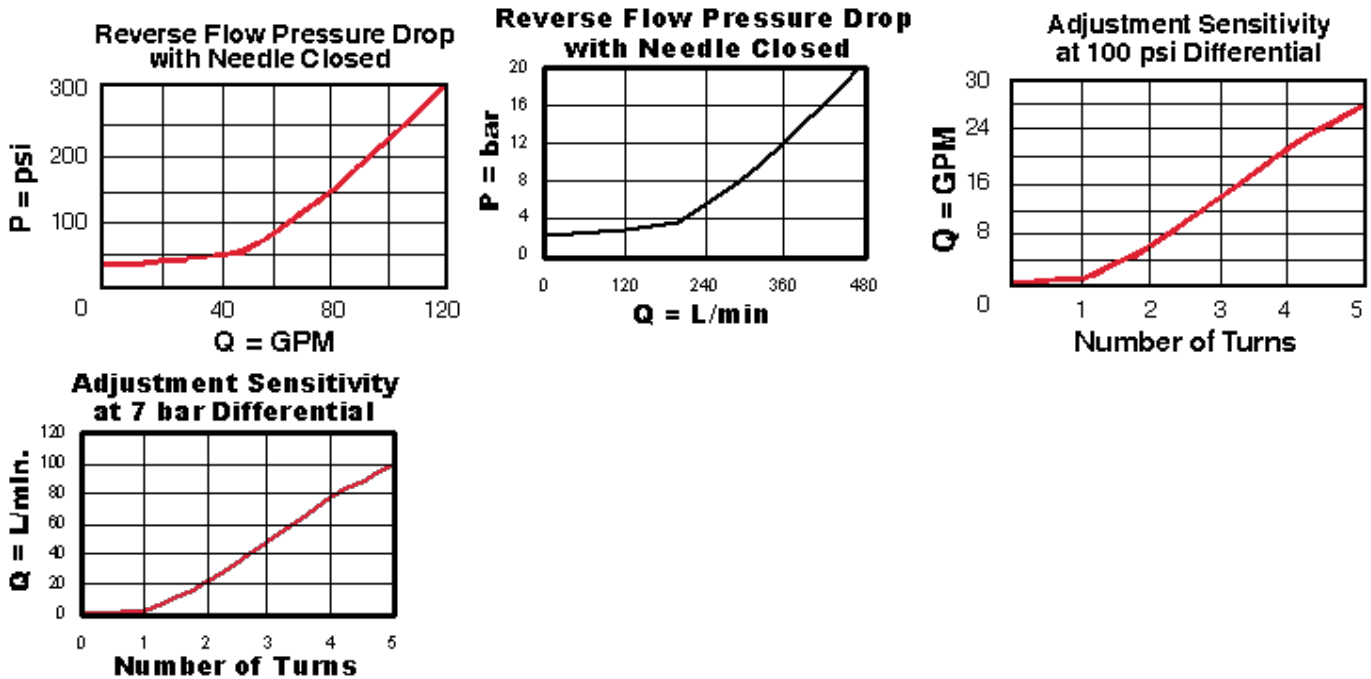
Model Code Example: NCGCLCN

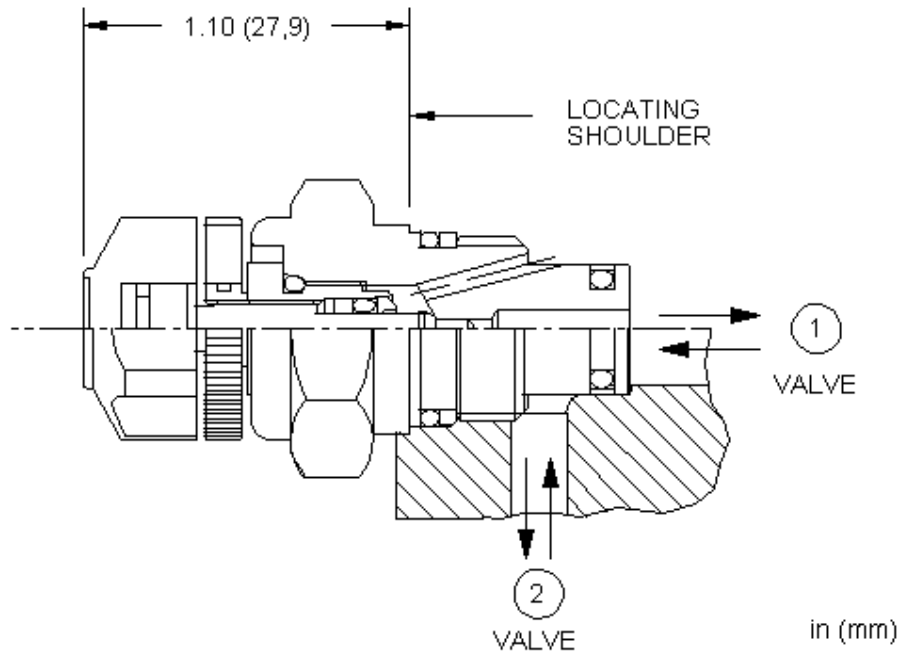
CONTROL	(L) REVERSE FLOW CHECK	(C) SEAL MATERIAL	(N)
L Standard Screw Adjustment	C 30 psi (2 bar)	N Buna-N	
H Calibrated Handknob with Detent Lock	A 4 psi (0,3 bar)	V Viton	
K Handknob	E 75 psi (5 bar)		
Y Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Two-port, pilot-stage needle valves are fully adjustable devices used to regulate pilot flow in a main-stage valve or to meter in/out flow in low flow applications. These cartridges are designed for pilot flow applications and utilize Sun's T-8A cavity so they can be used in conjunction with Sun's pilot-operated, main-stage valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-8A
Series	P
Capacity	0,8 L/min. (0,9 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	3
Effective Orifice Size	0,9 mm
Valve Hex Size	22,2 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990008007
Seal kit - Cartridge	EPDM: 990008014
Seal kit - Cartridge	Polyurethane: 990008002
Seal kit - Cartridge	Viton: 990008006

**TEST SPECIFICATION DATA**

Adjustment - No. of CCW Turns from Fully Closed to Fully Open	3
Valve Installation Torque	27 - 33 Nm
Model Weight	0.07 kg.

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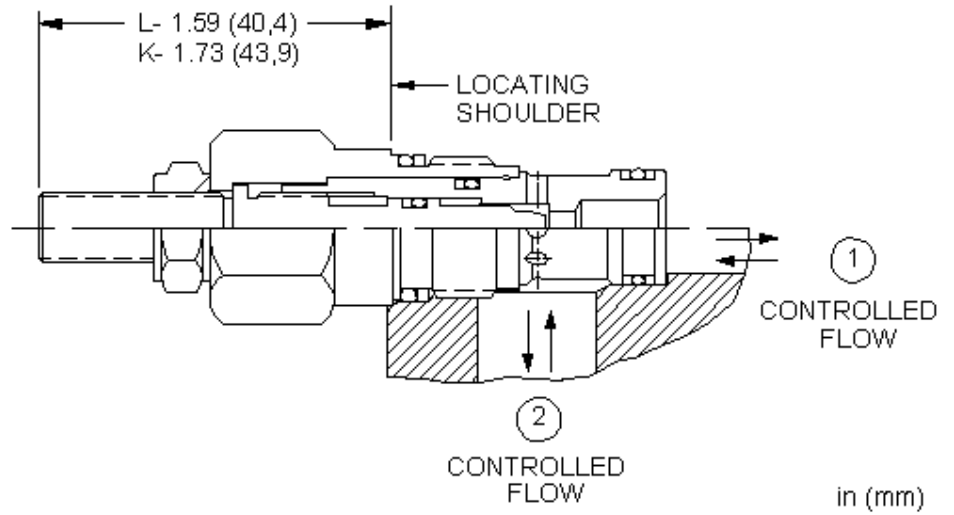
## CONFIGURATION OPTIONS

Model Code Example: NFABKXN

CONTROL	(K)	MAXIMUM ORIFICE DIAMETER	(X)	SEAL MATERIAL	(N)
<b>K</b> Handknob		<b>X</b> .03 in. (0,8 mm)		<b>N</b> Buna-N	
				E EPDM	
				V Viton	

## TECHNICAL FEATURES

- Utilizes the Sun T-8A 2-port cavity making it the ideal choice to use in conjunction with Sun's main stage pilot or vent-to-operate cartridges. Separate pilot lines are eliminated and only one cavity needs to be machined to accommodate both the control and primary function. Note: All 2-position, 2-way pilot stage control cartridges utilize the same cavity and are physically interchangeable. Functionality is the only consideration.
- Note: The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.
- Ports 1 and 2 may be pressured to 5000 psi (350 bar).
- Needle adjusts from fully closed to fully open in three complete turns resulting in extremely fine resolution.
- Adjustment mechanism equipped with locking device to maintain consistent orifice dia/flow rate.
- Leakage rate at shutoff is less than 1 drop/min.



Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-162A
Series	0
Capacity	20 L/min. (4 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.08 kg.

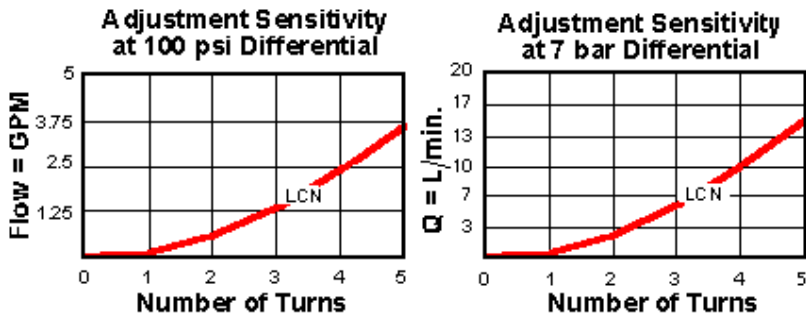
**CONFIGURATION OPTIONS**
**Model Code Example: NFBCLCN**

<b>CONTROL</b>	<b>(L) MAXIMUM ORIFICE DIAMETER</b>	<b>(C) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>C</b> .16 in. (4 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>K</b> Handknob		<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>W</b> Hex Wrench Adjustment		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel

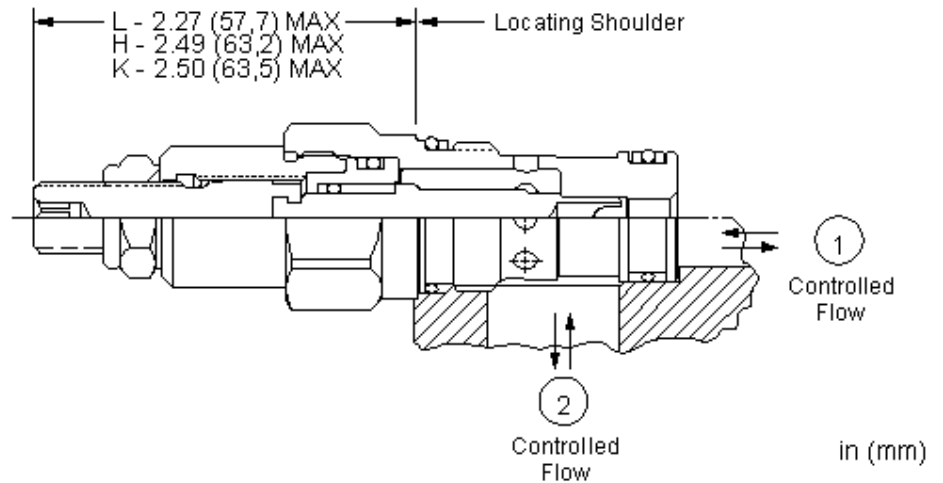
## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-13A
Series	1
Capacity	28 L/min. (4,8 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.15 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

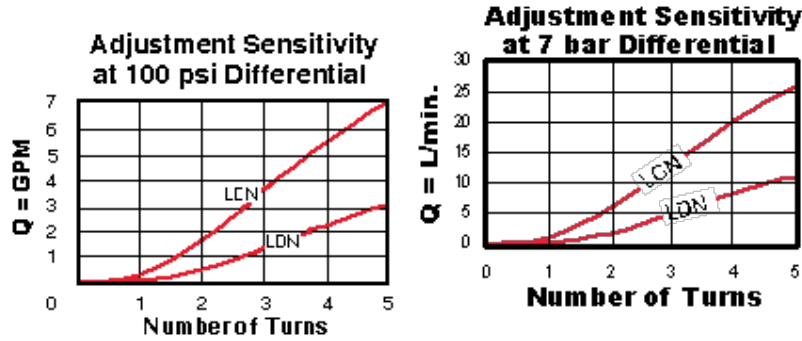
**CONFIGURATION OPTIONS**
**Model Code Example: NFCCLCN**

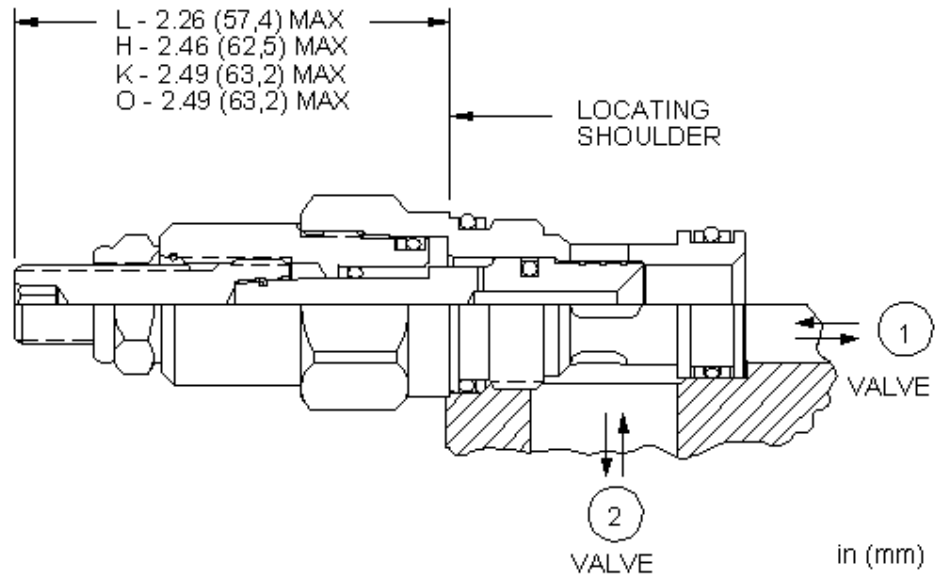
CONTROL	(L) MAXIMUM ORIFICE DIAMETER	(C) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>C</b> .19 in. (4,8 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>D</b> .09 in. (2,3 mm)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob, Flow Control			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-13A
Series	1
Capacity	80 L/min. (8,4 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

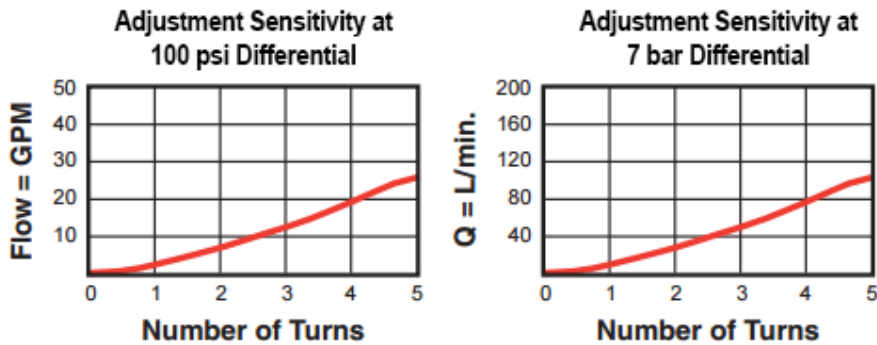
**CONFIGURATION OPTIONS**
**Model Code Example: NFCDLFN**

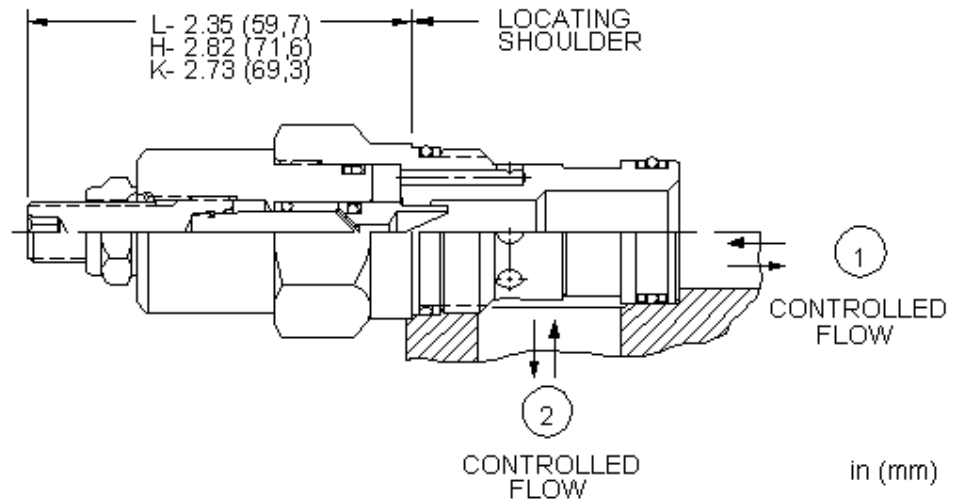
<b>CONTROL</b>	<b>(L) MAXIMUM ORIFICE DIAMETER</b>	<b>(F) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>F</b> .33 in. (8,4 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock		<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-5A
Series	2
Capacity	45 L/min. (6,4 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.28 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

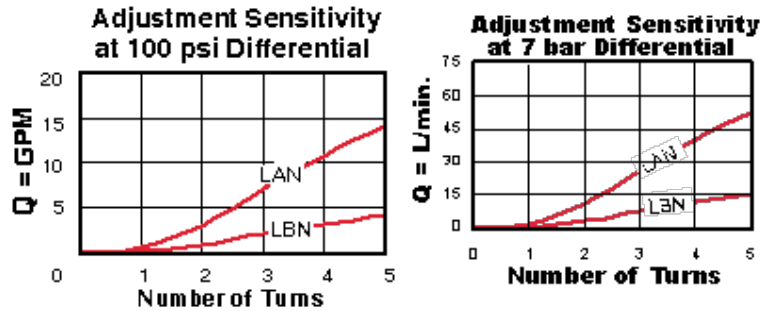
**CONFIGURATION OPTIONS**
**Model Code Example: NFDCLAN**

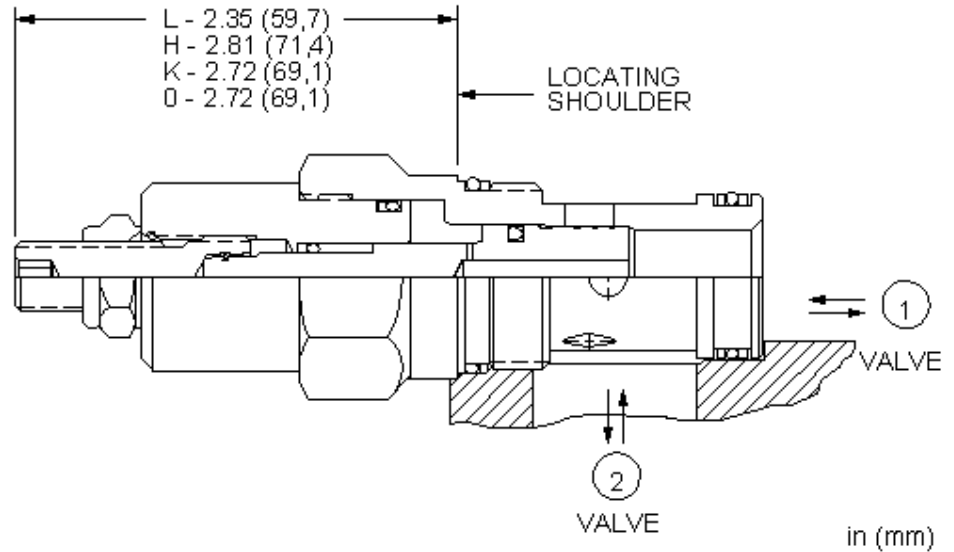
<b>CONTROL</b>	<b>(L) MAXIMUM ORIFICE DIAMETER</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> .25 in. (6,4 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>B</b> .12 in. (3,0 mm)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-5A
Series	2
Capacity	200 L/min. (12,7 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Polyurethane: 990203014
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.28 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

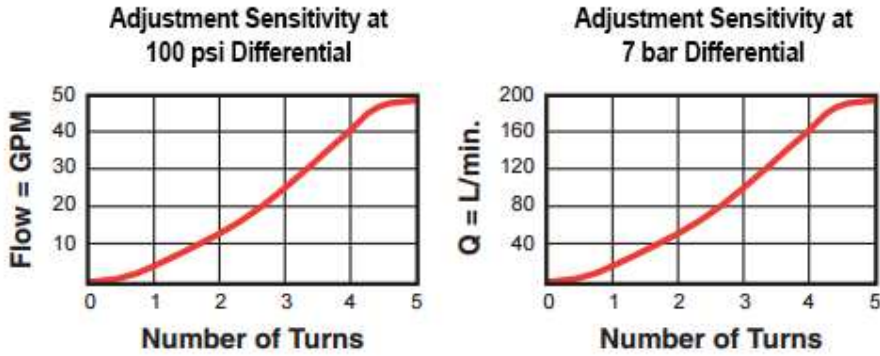
**CONFIGURATION OPTIONS**
**Model Code Example: NFDDLGN**

<b>CONTROL</b>	<b>(L) MAXIMUM ORIFICE DIAMETER</b>	<b>(G) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>G</b> .5 in. (12,7 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock		<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

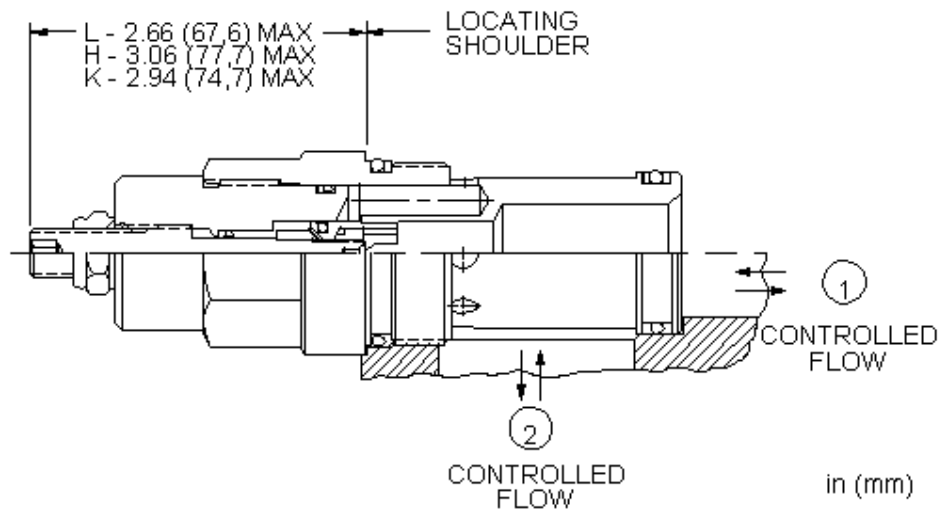
## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES







Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	120 L/min. (9,7 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.55 kg.

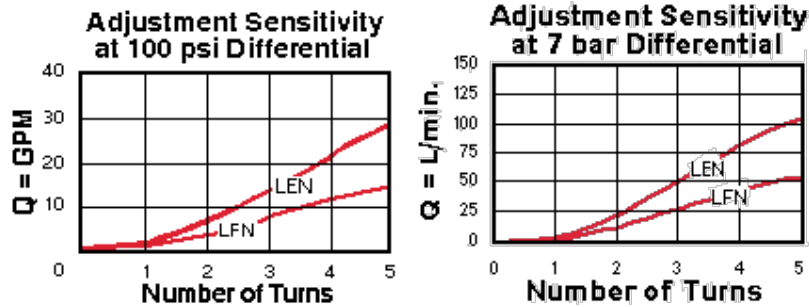
**CONFIGURATION OPTIONS**
**Model Code Example: NFECLEN**

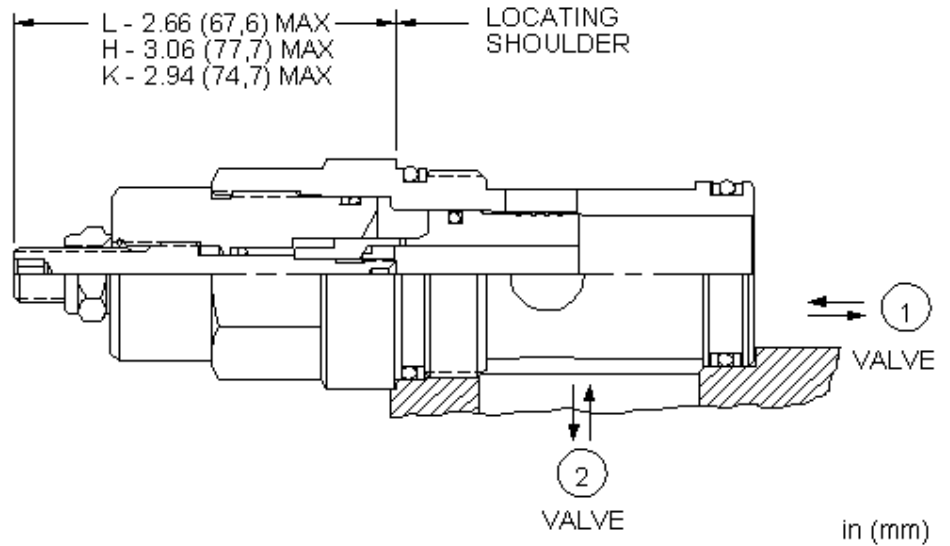
<b>CONTROL</b>	<b>(L) MAXIMUM ORIFICE DIAMETER</b>	<b>(E) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>E</b> .38 in. (9,7 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>F</b> .28 in. (7,1 mm)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	340 L/min. (17,5 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.56 kg.

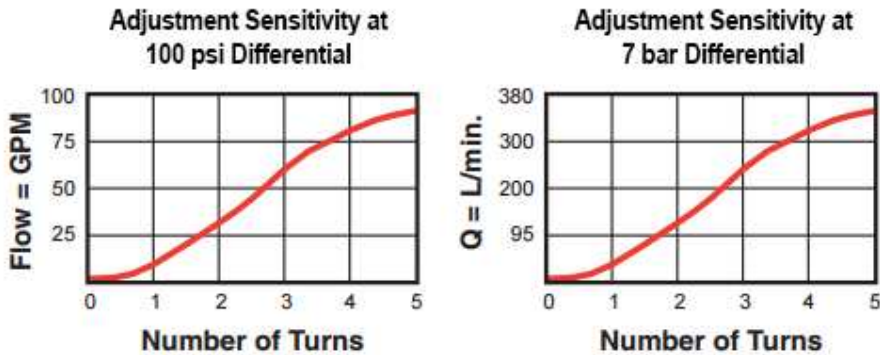
**CONFIGURATION OPTIONS**
**Model Code Example: NFEDLHN**

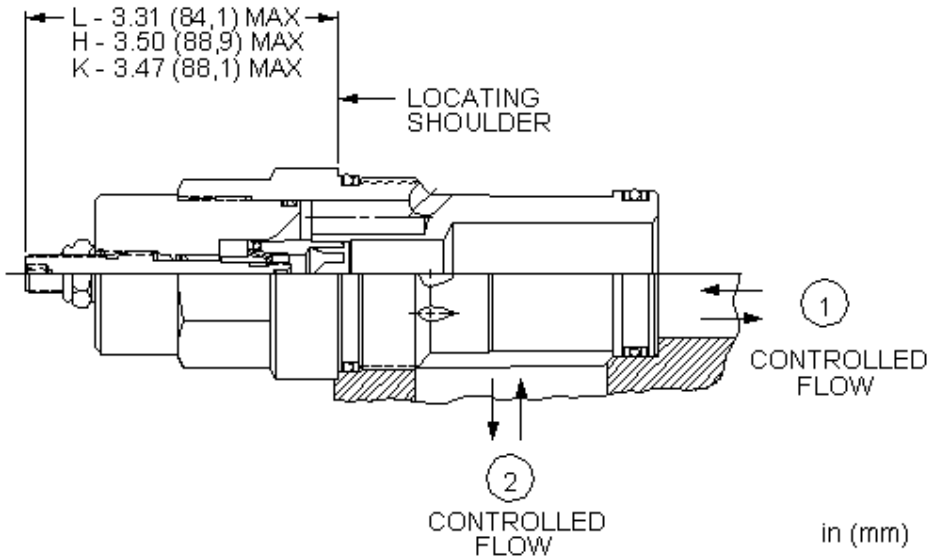
CONTROL	(L) MAXIMUM ORIFICE DIAMETER	(H) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>H</b> .69 in. (17,5 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock		<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	240 L/min. (14,2 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.15 kg.

**CONFIGURATION OPTIONS**

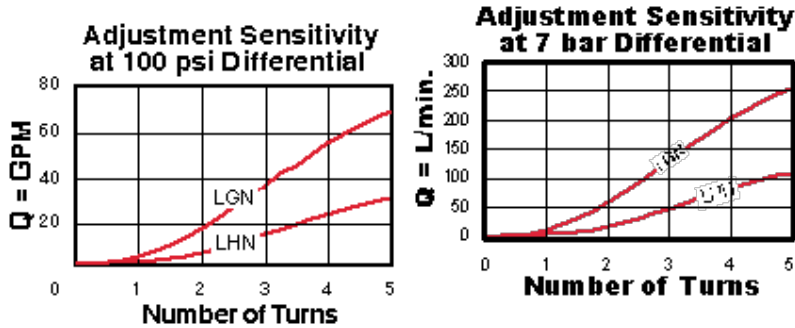
Model Code Example: NFFCLGN

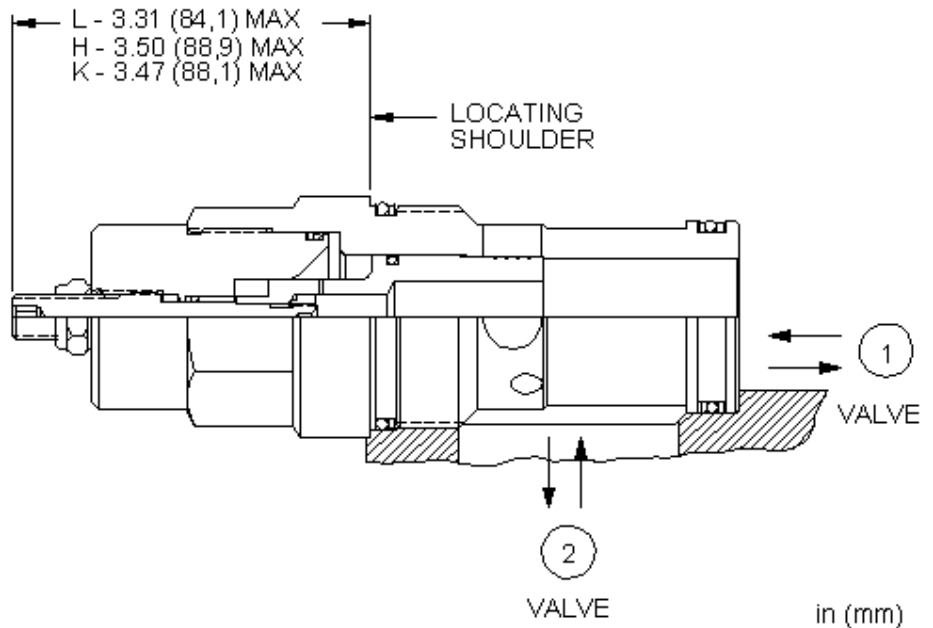
CONTROL	(L) MAXIMUM ORIFICE DIAMETER	(G) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>G</b> .56 in. (14,2 mm)	<b>N</b> Buna-N	Standard Material/Coating
<b>H</b> Calibrated Handknob with Detent Lock	<b>H</b> .38 in. (9,7 mm)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob		<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob, Flow Control			

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES





Needle valves are fully adjustable orifices used to regulate flow. They are infinitely adjustable from fully closed up to the maximum orifice diameter. They are not pressure compensated and may be used as flow controls or as shutoff valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	530 L/min. (21,6 mm)
Maximum Operating Pressure	350 bar
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.21 kg.

## CONFIGURATION OPTIONS

Model Code Example: NFFDLIN

CONTROL	(L) MAXIMUM ORIFICE DIAMETER	(I) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment H Calibrated Handknob with Detent Lock K Handknob R Capped Screw Adjustment Y Tri-Grip Handknob	I .85 in. (21,6 mm)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

## TECHNICAL FEATURES

- All 2-port flow control cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Because needle valves are non-compensating devices, the fixed orifice size will regulate flow through the valve in proportion to the square root of the pressure differential across ports 1 and 2.
- A balanced adjustment mechanism allows for easy adjustment even at high pressures.
- The sharp-edged orifice design minimizes flow variations due to viscosity changes.
- The flow path through this valve is bi-directional. The preferred path is port 1 to 2, to allow interchangeability with other flow controls.
- There is no leakage when the adjustment mechanism is turned to the shut-off position.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.

## PERFORMANCE CURVES

