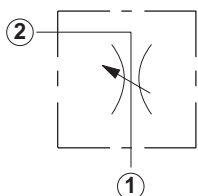


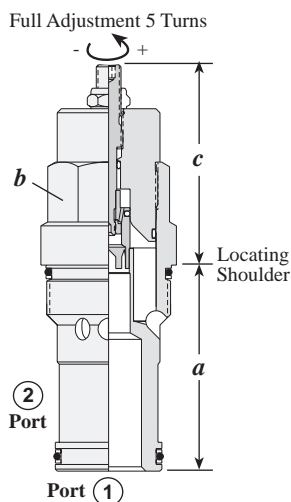
## Needle Valves

### FULLY ADJUSTABLE NEEDLE



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	c			
0-4,0 mm	NFBC – LCN	T - 162A	31	19,1	L	H	K	35/40
0-4,8 mm	NFCC – LCN	T - 13A	34,9	22,2	58	64	64	40/50
0-6,3 mm	NFDC – LAN	T - 5A	41,1	28,6	67	72	73	60/70
0-9,6 mm	NFEC – LEN	T - 16A	61,9	31,8	73	79	79	200/215
0-14,2 mm	NFFC – LGN	T - 18A	79,4	41,3	84	90	90	465/500

#### OPTION ORDERING INFORMATION

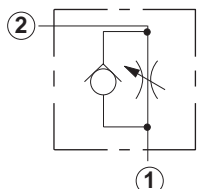


**NF \* C - \* \* \***

Nominal Capacity	Control**	Maximum Diameter Orifice	Seal
<b>B</b> 0-4,0 mm	<b>L</b> Standard Screw	<b>C</b> 4 mm	<b>N</b> Buna-N
<b>C</b> 0-4,8 mm	<b>H</b> Calibrated Handknob with Detent Lock	<b>C</b> 4,8 mm	<b>V</b> Viton
<b>D</b> 0-6,3 mm	<b>K</b> Handknob	<b>D</b> 2,3 mm	
<b>E</b> 0-9,6 mm		<b>A</b> 6,3 mm	
<b>F</b> 0-14,2 mm		<b>B</b> 3,2 mm	
		<b>E</b> 9,6 mm	
		<b>F</b> 7,1 mm	
		<b>G</b> 14,2 mm	
		<b>H</b> 9,6 mm	

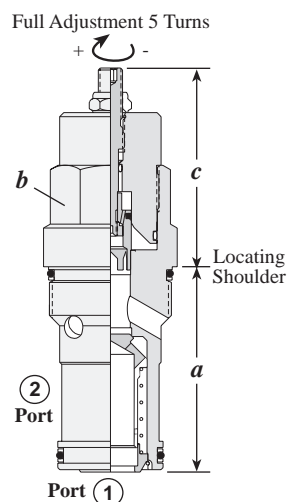
\*\* See page 244 for information on Control Options

### FULLY ADJUSTABLE NEEDLE WITH REVERSE FREE FLOW CHECK



Capacity	Typical Cartridge Model Code	Cavity	Cartridge Dimensions					Installation Torque (Nm)
			a	b	L	H	K	
0-4,0 mm	NCBB – LCN	T - 162A	31	19,1	41	-	45	35/40
0-4,8 mm	NCCB – LCN	T - 13A	34,9	22,2	58	64	64	40/50
0-6,3 mm	NCEB – LCN	T - 5A	41,1	28,6	67	72	73	60/70
0-9,6 mm	NCFB – LCN	T - 16A	61,9	31,8	73	79	79	200/215
0-14,2 mm	NCGB – LCN	T - 18A	79,4	41,3	84	90	90	465/500

#### OPTION ORDERING INFORMATION



**NC \* B - \* \* \***

Nominal Capacity	Control**	Cracking Pressure*	Seal
<b>NCBB*</b> 0-4,0 mm	<b>L</b> Standard Screw	<b>A</b> 0,3 bar	<b>N</b> Buna-N
<b>NCCB</b> 0-4,0 mm	<b>H</b> Calibrated Handknob with Detent Lock	<b>C</b> 2,0 bar	<b>V</b> Viton
<b>NCCC</b> 0-2,3 mm	<b>K</b> Handknob	<b>E</b> 5,0 bar	
<b>NCEB</b> 0-6,3 mm			
<b>NCEC</b> 0-3,2 mm			
<b>NCFB</b> 0-9,6 mm			
<b>NCFC</b> 0-7,1 mm			
<b>NCGB</b> 0-14,2 mm			
<b>NCGC</b> 0-9,6 mm			

\*\* See page 244 for information on Control Options

\*Cracking Pressure Ranges:  
A and E ranges are not available in T-162A cavity

## TECHNICAL TIPS / PERFORMANCE CURVES

### Needle Valves, Fully Adjustable

#### Applications

These adjustable needle valves offer accurate and precise flow control because of their balanced adjustment design. They may be used for bi-directional operation.

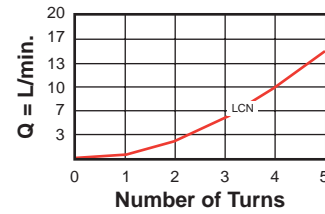
#### Design Concepts and Features

- Sharp-edge orifice minimizes flow variation with viscosity changes.
- Optional needle orifice ranges. See page 110.
- Positive shut-off of flow when closed.

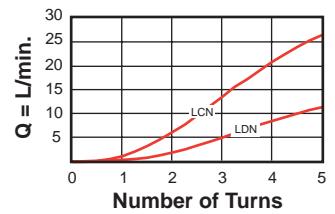
#### Performance Curves

##### Adjustment Sensitivity at 7 bar Differential

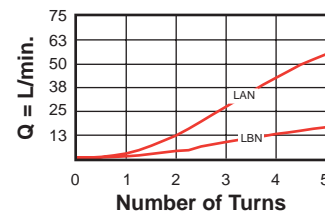
#### NFBC-L\*N



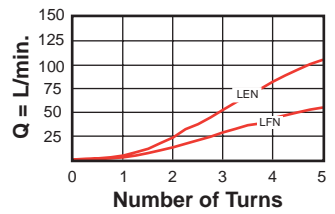
#### NFCC-L\*N



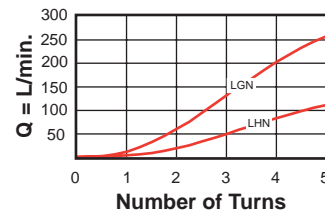
#### NFDC-L\*N



#### NFEC-L\*N



#### NFFC-L\*N



### Needle Valves, Fully Adjustable with Reverse Free Flow Check

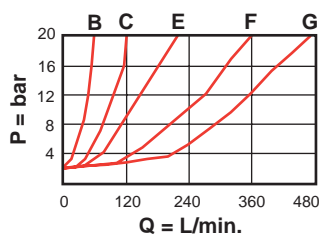
#### Applications

These adjustable needle valves with integral reverse free flow check fit the same cavity as the needle valve without check.

#### Design Concepts and Features

- Performance parameters of the adjustable needle cartridge with check are similar to the NF\*C.
- However, the leakage rate when closed is approximately 5 drops / min. or less.

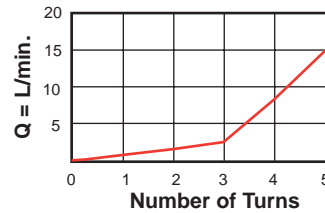
Reverse Flow Pressure Drop with Needle Closed



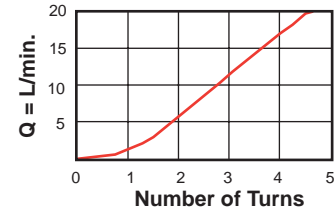
#### Performance Curves

##### Adjustment Sensitivity at 7 bar Differential

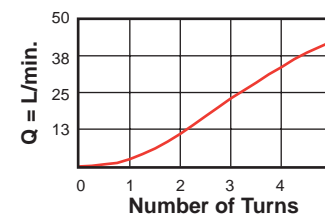
#### NCBB-L\*N



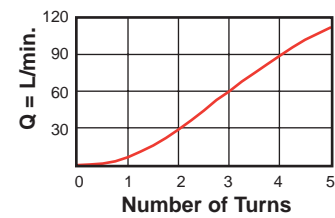
#### NCCB-L\*N



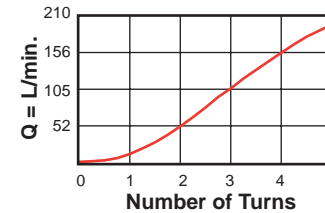
#### NCEB-L\*N



#### NCFB-L\*N



#### NCGB-L\*N



### General Application Requirements

- Operating Temperature Range: Buna-N seals -45° C to 90° C, Viton seals -15° C to 120° C.
- Viscosity Range: 10-600 centistokes.
- Fluid Contamination Level: ISO 4406 18/15 or better; Recommend  $\beta_{10} \geq 75$  to achieve ISO 18/15 or better in most systems.
- Factory Pressure Setting for cartridge is established at a 15 L/min. flow rate.