

Flow Control Cartridges

Powered by Sun **QuickPrint**, your on-demand, customized catalogue solution.

This information is subject to change without notice. Visit <u>www.sunhydraulics.com</u> for complete and up to date information.



FDEP	2-way, direct-acting electro- with reverse flow check	-proportional, pressure compensated flow control valve	1
FREL	3-way, fully adjustable, bypa	ass/restrictive, priority flow control	2
FREP	FLeX Series 3-way, direct-a control valve	acting, electro-proportional, bypass/restrictive, priority flow	3
FMDF	Electro-proportional 3-way f Series)	flow control valve, meter in (740	4
FMDG	Electro-proportional 3-way f Series)	flow control valve, meter in (740	5
FPBD	FLeX Series pilot-operated, 3000 psi (210 bar)	normally closed, electro-proportional throttle - flow 2-1 -	6
FPBE	FLeX Series pilot-operated, flow check - flow 2-1 - 3000	normally closed, electro-proportional throttle with reverse psi (210 bar)	7
FPBF	FLeX Series pilot-operated,	normally closed, electro-proportional throttle - flow 2	8
FPBG	FLeX Series pilot-operated, flow check - flow 2-1	normally closed, electro-proportional throttle with reverse	9
FPBI	FLeX Series pilot-operated,	normally open, electro-proportional throttle - flow 2	10
FPBJ	FLeX Series pilot-operated, flow check - flow 2-1	normally open, electro-proportional throttle with reverse	11
FPBM	FLeX Series pilot-operated, 3000 psi (210 bar)	normally open, electro-proportional throttle - flow 2-1 -	12
FPBN	FLeX Series pilot-operated, flow check - flow 2-1 - 3000		13
FPBU	FLeX Series electro-proport closed	tional, blocking poppet throttle - normally	14
FQBA	Fixed orifice, flow fuse valve		15
FQCA	Fixed orifice, flow fuse valve		16
FQEA	Fixed orifice, flow fuse valve		17
FQGA	Fixed orifice, flow fuse valve		18
FQIA	Fixed orifice, flow fuse valve		19
NFBC	Fully adjustable needle valve		20
NFCC	Fully adjustable needle valve		21



NFCD	Fully adjustable needle valve			22
NFDC	Fully adjustable needle valve			23
NFDD	Fully adjustable needle valve			24
NFEC	Fully adjustable needle valve			25
NFED	Fully adjustable needle valve			26
NFFC	Fully adjustable needle valve			27
NFFD	Fully adjustable needle valve			28
NCBB	Fully adjustable needle valve check	with reverse flow		29
NCCB	Fully adjustable needle valve check	with reverse flow		30
NCCC	Fully adjustable needle valve check	with reverse flow		31
NCCD	Fully adjustable needle valve check	with reverse flow		32
NCEB	Fully adjustable needle valve check	with reverse flow		33
NCEC	Fully adjustable needle valve check	with reverse flow		34
NCFB	Fully adjustable needle valve check	with reverse flow		35
NCFC	Fully adjustable needle valve check	with reverse flow		36
NCGB	Fully adjustable needle valve check	with reverse flow		37
NCGC	Fully adjustable needle valve check	with reverse flow		38
NFAB	Fully adjustable needle valve capacity	e - pilot		39
CNAC	Fixed orifice, non-pressure c check	ompensated, flow co	ontrol valve with reverse flow	40
CNCC	Fixed orifice, non-pressure c check	ompensated, flow co	ontrol valve with reverse flow	41
CNEC	Fixed orifice, non-pressure c check	ompensated, flow co	ontrol valve with reverse flow	42



CNGC	Fixed orifice, non-pressure compensated, flow control valve with reverse flow check	43
CNIC	Fixed orifice, non-pressure compensated, flow control valve with reverse flow check	44
FXAA	Fixed orifice, pressure compensated flow control	45
FXAG	Flush mount, pressure compensated flow control	46
FXAM	Insert style, pressure compensated flow	47
FXBA	Fixed orifice, pressure compensated flow control	48
FXCA	Fixed orifice, pressure compensated flow controlvalve	49
FXDA	Fixed orifice, pressure compensated flow control	50
FXEA	Fixed orifice, pressure compensated flow control	51
FXFA	Fixed orifice, pressure compensated flow control valve	52
FCBB	Fixed orifice pressure compensated flow control valve with reverse flow check	53
FCCB	Fixed orifice pressure compensated flow control valve with reverse flow check	54
FCDB	Fixed orifice pressure compensated flow control valve with reverse flow check	55
FCEB	Fixed orifice pressure compensated flow control valve with reverse flow check	56
FCFB	Fixed orifice pressure compensated flow control valve with reverse flow check	57
FDBA	Fully adjustable pressure compensated flow control valve with reverse flow check	58
FDCB	Fully adjustable pressure compensated flow control valve with reverse flow check	59
FDEA	Fully adjustable pressure compensated flow control valve with reverse flow check	60
FDFA	Fully adjustable pressure compensated flow control valve with reverse flow check	61
FXDA8	Ventable fixed orifice, pressure compensated flow control valve with integral T-8A control cavity	62
FRBA	Fixed orifice, bypass/restrictive, priority, flow control valve	63



Fixed orifice, bypass/restrictive, priority, flow control valve	64
Fixed orifice, bypass/restrictive, priority, flow control valve	65
Fixed orifice, bypass/restrictive, priority, flow control valve	66
Fixed orifice, bypass/restrictive, priority, flow control valve	67
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve	68
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve	69
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve	70
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve	71
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity	72
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity	73
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity	74
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity	75
Electro-proportional flow control valve - normally closed	77
Electro-proportional flow control valve - normally open	79
Pilot-operated, normally closed, electro-proportional throttle with reverse flow check	80
Pilot-operated, normally closed, electro-proportional throttle with reverse flow check	82
Electro-proportional 3-way flow control valve, meterin	83
Electro-proportional 3-way flow control valve, meterin	84
2-way, pilot-shifted, dual path, proportional throttle	85
2-way, pilot-shifted, dual path, proportional throttle	86
2-way, pilot-shifted, dual path, proportional throttle	87
	Fixed orifice, bypass/restrictive, priority, flow control valve Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity Ventable, fixed orifice, bypass/restri



FTFA	2-way, pilot-shifted, dual path, proportional
FTCAZ	2-way, pilot-shifted, dual path, proportional throttle with position
FTDAZ	2-way, pilot-shifted, dual path, proportional throttle with position
FTEAZ	2-way, pilot-shifted, dual path, proportional throttle with position
FTFAZ	2-way, pilot-shifted, dual path, proportional throttle with position
FKBA	2-way, pilot-shifted, proportional9 throttle
FKCA	2-way, pilot-shifted, proportional throttle, high capacity
FKDA	2-way, pilot-shifted, proportional9. throttle
FKEA	2-way, pilot-shifted, proportional throttle, high capacity
FKFA	2-way, pilot-shifted, proportional
FKGA	2-way, pilot-shifted, proportional throttle, high
FKHA	2-way, pilot-shifted, proportional
FKIA	2-way, pilot-shifted, proportional throttle, high
FKBB	2-way, pilot-shifted, proportional throttle with bleed
FKCB	2-way, pilot-shifted, proportional throttle with bleed down, high
FKDB	2-way, pilot-shifted, proportional throttle with bleed
FKEB	2-way, pilot-shifted, proportional throttle with bleed down, high
FKFB	2-way, pilot-shifted, proportional throttle with bleed
FKGB	2-way, pilot-shifted, proportional throttle with bleed down, high
FKHB	2-way, pilot-shifted, proportional throttle with bleed down
FKIB	2-way, pilot-shifted, proportional throttle with bleed down, high capacity



FSCD	Flow divider valve				 	109
FSDD	Flow divider valve				 	110
FSED	Flow divider valve				 	111
FSFD	Flow divider valve				 	112
FSBD	High accuracy flo	ow divider			 	113
FSDC	High accuracy flo	ow divider			 	114
FSEC	High accuracy flo	ow divider			 	115
FSFC	High accuracy flo	ow divider			 	116
FSCA	Closed center, flo	ow divider-cor	nbiner		 	117
FSDA	Closed center, flo	ow divider-cor	nbiner		 	118
FSEA	Closed center, flo	ow divider-cor	nbiner		 	119
FSFA	Closed center, flo	ow divider-cor	nbiner		 	120
FSAA	High accuracy, c	losed center,	flow divider-o	combiner	 	121
FSBA	High accuracy, c	losed center,	flow divider-o	combiner	 	122
FSDG	High accuracy, c	losed center,	flow divider-o	combiner	 	123
FSEG	High accuracy, c	losed center,	flow divider-o	combiner	 	124
FSFG	High accuracy, c	losed center,	flow divider-o	combiner	 	125
FSCH	High capacity, cl	osed center, f	low divider-c	ombiner	 	126
FSDH	High capacity, cl	osed center, f	low divider-c	ombiner	 	127
FSEH	High capacity, cl	osed center, f	low divider-c	ombiner	 	128
FSFH	High capacity, cl	osed center, f	low divider-c	ombiner	 	129



FSCS	Synchronizing, flow divider-combiner valve		.130
FSDS	Synchronizing, flow divider-combiner valve		.131
FSES	Synchronizing, flow divider-combiner valve		.132
FSFS	Synchronizing, flow divider-combiner valve		.133
FSAS	High accuracy synchronizing, flow dividual valve	der-combiner	.134
FSBS	High accuracy synchronizing, flow dividual valve	der-combiner	.135
FSDR	High accuracy synchronizing, flow dividual valve	der-combiner	.136
FSER	High accuracy synchronizing, flow dividual valve	der-combiner	.137
FSFR	High accuracy synchronizing, flow dividual valve	der-combiner	.138
LRBC	Normally closed, modulating element		.139
LRDC	Normally closed, modulating element		.140
LRFC	Normally closed, modulating element		.141
LRHC	Normally closed, modulating element		.142
LRJC	Normally closed, modulating element		.143
LRBA	Normally closed, modulating element w	vith pilot source from port	.144
LRDA	Normally closed, modulating element w	vith pilot source from port	.145
LRFA	Normally closed, modulating element w	vith pilot source from port	.146
LRHA	Normally closed, modulating element w	vith pilot source from port	.147
LRJA	Normally closed, modulating element w	vith pilot source from port	.148
LRDS	Normally closed modulating element w shuttle	ith	.149
LPBC	Normally open, modulating element		.150



LPDC	Normally open, modulatingelement		151
LPFC	Normally open, modulatingelement		152
LPFCL	Tuneable, normally open modulating element		153
LPHC	Normally open, modulatingelement		154
LPJC	Normally open, modulatingelement		155
LPBA	Normally open, modulating element with pilot 1	source from port	156
LPDA	Normally open, modulating element with pilot 1	source from port	157
LPFA	Normally open, modulating element with pilot 1	source from port	158
LPHA	Normally open, modulating element with pilot 1	source from port	159
LPJA	Normally open, modulating element with pilot 1	source from port	160
LPJA8	Normally open, modulating element with integ from port 1	ral T-8A control cavity and pilot source	161
LPDS	Normally open modulating element with shuttle		162
LHDT	Normally open, bi-directional, modulating element		163
LHFT	Normally open, bi-directional, modulating element		164
LHHT	Normally open, bi-directional, modulating element		165
LHDA	Bypass/restrictive, priority modulating element		166
LHFA	Bypass/restrictive, priority modulating element		167
LHHA	Bypass/restrictive, priority modulating element		168
LHJA	Bypass/restrictive, priority modulating element		169
RVBB	Normally closed modulating element valve wit function	h relief	170
RVCB	Normally closed modulating element valve wit function	h relief	171



RVEB	Normally closed modulating element valve with relief function
RVGB	Normally closed modulating element valve with relief function 173
RVIB	Normally closed modulating element valve with relief function
FCBC	Fixed-orifice pressure compensated flow control valve with reverse flow175 check
FXBC	Fixed-orifice, pressure compensated flow control
LRFCL	Tuneable, normally closed, modulating



Cavity Information

Series	Ports	Cavities
Series Z Cartridges 3/8-24 UNF Cartridge Thread 5 mm Valve Hex Size 11 - 14 Nm Valve Installation Torque	3-Port	T-382A
Series P Cartridges M16 Cartridge Thread 22,2 mm Valve Hex Size 27 - 33 Nm Valve Installation Torque	2-Port 2-Port (Deep) 3-Port	T-8A T-8DP T-9A
Series 0 Cartridges M16 Cartridge Thread 19,1 mm Valve Hex Size 25,4 mm Valve Hex Size 27 - 33 Nm Valve Installation Torque	2-Port 2-Port (Deep) 3-Port 3-Port 4-Port	T-162A T-162DP T-150A T-163A T-30A
Series 0C Cartridges 8/4-16 UNF Cartridge Thread 22,2 mm Valve Hex Size 19-22 lbf ft Valve Installation Torque	4-Port (Common)	SC-08-04
Series 1 Cartridges M20 Cartridge Thread 22,2 mm Valve Hex Size 41 - 47 Nm Valve Installation Torque	2-Port 2-Port 3-Port 4-Port 4-Port 6-Port	T-10A T-13A T-11A T-21A T-31A T-61A
Series 1C Cartridges 7/8-14 UNF Cartridge Thread 25,4 mm Valve Hex Size 23-26 lbf ft Valve Installation Torque	2-Port (Common) 4-Port (Common)	SC-10-02 SC-10-04
Series 2 Cartridges 1"-14 UNS Cartridge Thread 28,6 mm Valve Hex Size 61 - 68 Nm Valve Installation Torque	2-Port 2-Port 3-Port 4-Port 4-Port 4-Port (Dual path) 6-Port 6-Port	T-3A T-5A T-2A T-22A T-32A T-52AD T-52A T-62A
Series 3 Cartridges M36 Cartridge Thread B1,8 mm Valve Hex Size 203 - 217 Nm Valve Installation Torque	2-Port 3-Port 4-Port 4-Port 4-Port (Dual path) 6-Port 6-Port	T-16A T-17A T-23A T-33A T-53AD T-53A T-53A
Series 4 Cartridges M48 Cartridge Thread	2-Port (Undercut)	T-18AU

41,3 mm Valve Hex Size 474 - 508 Nm Valve Installation Torque

3-P0IT	I-19A
3-Port (Undercut)	T-19AU
4-Port	T-24A
4-Port (Undercut)	T-24AU
4-Port	T-34A
4-Port (Dual path)	T-54AD
6-Port	T-54A
6-Port	T-64A

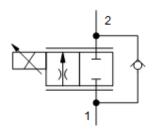


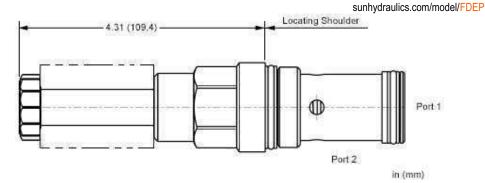


2-way, direct-acting electro-proportional, pressure compensated flow control valve with reverse flow check

SERIES 3 / CAPACITY: 30 gpm / CAVITY: T-16A







Normally closed, electro-proportional pressure-compensated flow control with reverse-flow check valves provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. They are proportional from nearly closed up to the maximum flow. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Viscosity Range	35 - 2000 SUS
Response Time - Typical	50 ms
Switching Frequency	3,600 max. cycles/hr
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: FDEPXBN

CONTROL	(X)	FLOW RATE	(B)	SEAL MATERIAL (N)	COIL*
X No Manual Override		B 11 gpm (42 L/min.)		N Buna-N	No coil
		C 19 gpm (72 L/min.)		V Viton	* Additional coil options are available

© 2023 Sun Hydraulics 1 of 177

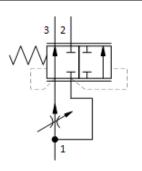


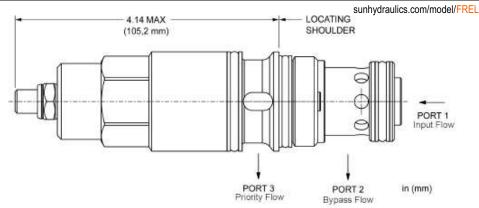


3-way, fully adjustable, bypass/restrictive, priority flow control valve

SERIES 3 / CAPACITY: 30 gpm / CAVITY: T-17A







This valve is a fully adjustable, bypass/restrictive, priority flow control valve. The valve takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority requirement, the excess is bypassed out port 2.

The valve pressure compensates the priority flow for precise flow regulation for applications where there may be wide pressure fluctuations. Port 2 may also be completely blocked so that the valve can be used as a 2-way, pressure compensated flow control from 1 to 3.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Viscosity Range	35 - 2000 SUS
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Typical Valve Leakage at 110 SUS (24 cSt) from port 1 to port 3 at 5000 psi (350 bar)	75 mL/min.
Rated Maximum Priority	17.6 gpm
Response Time - Typical	50 ms

CONFIGURATION OPTIONS

Model Code Example: FRELLAN

(L) ADJUSTMENT RANGE CONTROL (A) SEAL MATERIAL

L Standard Screw Adjustment

A .02 - 18 gpm

H Calibrated Handknob with Detent Lock

K Handknob

Y Tri-Grip Handknob

N Buna-N **V** Viton

© 2023 Sun Hydraulics 2 of 177

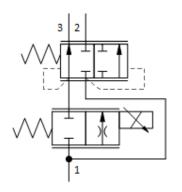


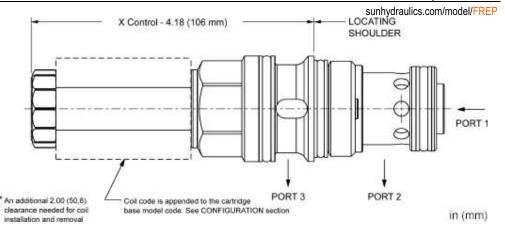


FLeX Series 3-way, direct-acting, electro-proportional, bypass/restrictive, priority flow control valve

SERIES 3 / CAPACITY: 30 gpm / CAVITY: T-17A







This valve is a normally closed, electro-proportional, bypass/restrictive, priority flow control valve. The valve takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority requirement, the excess is bypassed out port 2.

The valve pressure compensates the priority flow for precise flow regulation for applications where there may be wide pressure fluctuations. Port 2 may also be completely blocked so that the valve can be used as a 2-way, electro-proportional pressure compensated flow control from 1 to 3.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Viscosity Range	35 - 2000 SUS
Typical Valve Leakage at 110 SUS (24 cSt) from port 1 to port 3 at 1450 psi (100 bar)	30 mL/min.
Typical Valve Leakage at 110 SUS (24 cSt) from port 1 to port 3 at 5000 psi (350 bar)	110 mL/min.
Response Time - Typical	50 ms
Switching Frequency	3,600 max. cycles/hr
U.S. Patent #	10,969,033
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Viton: 990017006

NOTES

- Patents are pending for this product.
- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FREPXAN

(X) FLOW RATE (N) COIL* CONTROL (A) SEAL MATERIAL X No Manual Override N Buna-N A Nominal 8 gpm (30 L/min.) B Nominal 16 gpm (60 L/min.)

C Nominal 22 gpm (88 L/min.)

Viton

* Additional coil options are available

© 2023 Sun Hydraulics 3 of 177

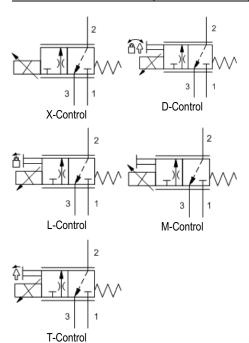


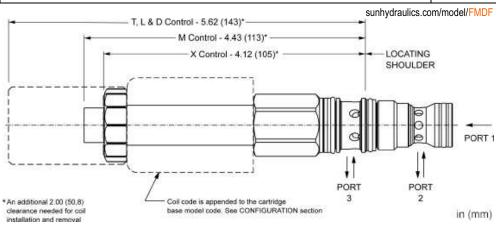


Electro-proportional 3-way flow control valve, meter in (740 Series)

SERIES 1 / CAPACITY: 9 gpm / CAVITY: T-11A







This valve is a 3-way, meter-in, electro-proportional throttle. The flow path, unenergized, has the supply blocked at port 1 and port 2 is drained to tank at port 3. Energizing the coil generates a closing force on the spool, creating a metering orifice in the 1 to 2 direction that is proportional to the coil command current. The valve self-compensates in the 1-to-2 direction and with the addition of an external compensator will provide pressure compensated flow

Flow in the 2-to-3 direction is not proportional and is limited in the interest of increased resolution and capacity. Flow capacity in the 2-to-3 direction is about 1.5 gpm (6 L/min). This valve is meant to be used in a circuit that has a separate passage to tank such as a cushion lock circuit. Two FMDFs in conjunction with a cushion lock circuit create a meter-in/meter-out 3-position 4-way.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Manual Override Stroke	.10 in.

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FMDFXDN

CONTROL	(X)	FLOW RATE	(D)	SEAL MATERIAL	(N)	COIL *
X No Manual Override		D .1 - 9 gpm (0,4 - 34 L/min.)		N Buna-N		No coil
D Twist/Lock (Dual) Manual Override		A .1 - 1.6 gpm (0.4 - 6.1 L/min.)		V Viton		* Additional coil ontions are available

L Twist/Lock (Detent) Manual Override

B .1 - 4 gpm (0,4 - 15 L/min.) M Manual Override

T Twist (Momentary) Manual Override

C .1 - 6 gpm (0,4 - 23 L/min.)

© 2023 Sun Hydraulics 4 of 177

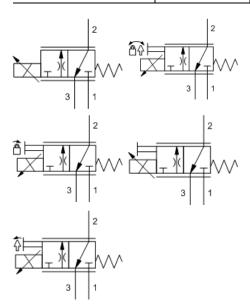


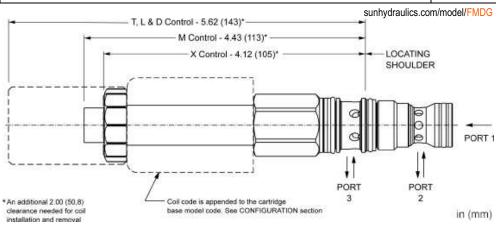
MODEL **FMDG**

Electro-proportional 3-way flow control valve, meter in (740 Series)

SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-11A







This valve is a 3-way, meter-in, electro-proportional throttle. The flow path, unenergized, has the supply blocked at port 1 and port 2 connected to tank at port 3. Energizing the coil generates a closing force on the spool, creating a metering orifice in the 1 to 2 direction that is proportional to the coil command current. The valve self-compensates in the 1 to 2 direction and with the addition of an external compensator will provide pressure compensated flow control. Flow in the 2 to 3 direction is not proportional.

TECHNICAL DATA

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

Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Manual Override Stroke	.10 in.
Seal kit - Cartridge	Buna: 990411007
Seal kit - Cartridge	Viton: 990411006

CONFIGURATION OPTIONS

Model Code Example: FMDGXCN

CONTROL (X) FLOW RATE (C) SEAL MATERIAL (N) COIL*

X No Manual Override

- D Twist/Lock (Dual) Manual Override
- L Twist/Lock (Detent) Manual Override
- M Manual Override
- T Twist (Momentary) Manual Override
- **C** .1 6 gpm (0,4 23 L/min.)
- **A** .1 1.6 gpm (0,4 6.1 L/min.)
- **B** .1 4 gpm (0,4 15 L/min.)
- N Buna-N V Viton

No coil

* Additional coil options are available

© 2023 Sun Hydraulics 5 of 177

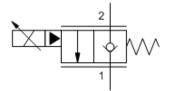


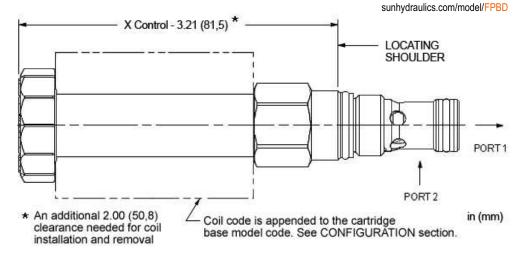
MODEL **FPBD**

FLeX Series pilot-operated, normally closed, electro-proportional throttle - flow 2-1 - 3000 psi (210 bar)

CAPACITY: 5 gpm / CAVITY: T-162A







This valve is a pilot-operated, normally closed, electro-proportional throttle with reverse free-flow check. Energizing the coil generates an opening force on the pilot stage which vents the main stage poppet to open proportionally, allowing flow from port 2 to 1. In the open condition, flow from 1 to 2 will cause the valve to auto-close and only pilot flow will pass from 1 to 2.

TECHNICAL DATA

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

* Additional coil options are available

Hysteresis (with dither)	15%
Linearity (with dither)	3%
Repeatability (with dither)	3%
Recommended dither frequency	140 Hz
Maximum Operating Pressure	3000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@3000 psi
Check Cracking Pressure	100 psi
Viscosity Range	35 - 2000 SUS
Deadband, nominal (as a percentage of input)	48%
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBDXDN

(X) FLOW RATE (D) SEAL MATERIAL (N) COIL * CONTROL D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.) X No Manual Override N Buna-N V Viton

© 2023 Sun Hydraulics 6 of 177

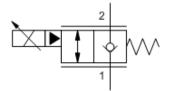


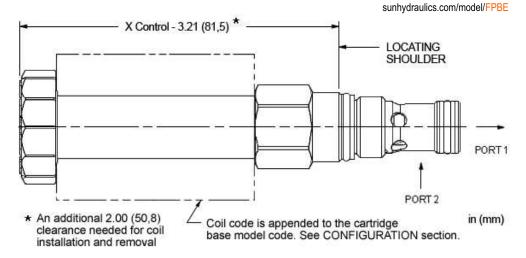


FLeX Series pilot-operated, normally closed, electro-proportional throttle with reverse flow check - flow 2-1 - 3000 psi (210 bar)

CAPACITY: 5 gpm / CAVITY: T-162A







This valve is a pilot-operated, normally closed, electro-proportional throttle with reverse free-flow check. Energizing the coil generates an opening force on the pilot stage which vents the main stage poppet to open proportionally, allowing flow from port 2 to 1. The check will allow flow from 1 to 2 in either the open or closed condition.

TECHNICAL DATA

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

Hysteresis (with dither)	15%		
Linearity (with dither)	3%		
Recommended dither frequency	140 Hz		
Maximum Operating Pressure	3000 psi		
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@3000 psi		
Check Cracking Pressure	100 psi		
Viscosity Range	35 - 2000 SUS		
Deadband, nominal (as a percentage of input)	48%		
Response Time - Typical	50 ms		
Switching Frequency	15,000 max. cycles/hr		
Seal kit - Cartridge	Buna: 990162007		
Seal kit - Cartridge	Viton: 990162006		

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBEXDN

(X) FLOW RATE (D) SEAL MATERIAL (N) COIL * CONTROL X No Manual Override

D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.)

N Buna-N V Viton

* Additional coil options are available

© 2023 Sun Hydraulics 7 of 177

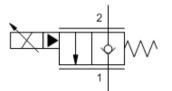


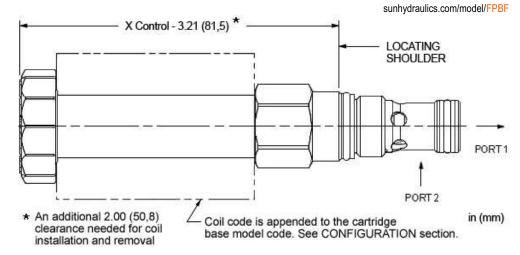


FLeX Series pilot-operated, normally closed, electro-proportional throttle - flow 2-1

CAPACITY: 5 gpm / CAVITY: T-162A







This valve is a pilot-operated, normally closed, electro-proportional throttle with reverse free-flow check. Energizing the coil generates an opening force on the pilot stage which vents the main stage poppet to open proportionally, allowing flow from port 2 to 1. In the open condition, flow from 1 to 2 will cause the valve to auto-close and only pilot flow will pass from 1 to 2.

TECHNICAL DATA

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

Hysteresis (with dither)	15%		
Linearity (with dither)	3%		
Repeatability (with dither)	3%		
Recommended dither frequency	140 Hz		
Maximum Operating Pressure	5000 psi		
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@3000 psi		
Check Cracking Pressure	100 psi		
Viscosity Range	35 - 2000 SUS		
Deadband, nominal (as a percentage of input)	48%		
Response Time - Typical	50 ms		
Switching Frequency	15,000 max. cycles/hr		
Seal kit - Cartridge	Buna: 990162007		
Seal kit - Cartridge	Viton: 990162006		

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBFXDN

 CONTROL
 (X)
 FLOW RATE
 (D)
 SEAL MATERIAL
 (N)
 COIL *

 X No Manual Override
 D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.)
 N Buna-N
 No coil

 V Viton
 *Additional coil options are available

© 2023 Sun Hydraulics 8 of 177

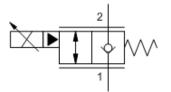


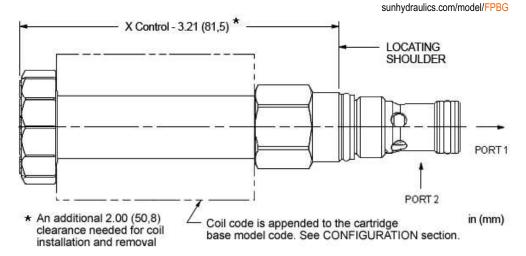
MODEL FPBG

FLeX Series pilot-operated, normally closed, electro-proportional throttle with reverse flow check - flow 2-1

CAPACITY: 5 gpm / CAVITY: T-162A







This valve is a pilot-operated, normally closed, electro-proportional throttle with reverse free-flow check. Energizing the coil generates an opening force on the pilot stage which vents the main stage poppet to open proportionally, allowing flow from port 2 to 1. The check will allow flow from 1 to 2 in either the open or closed condition.

TECHNICAL DATA

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

Hysteresis (with dither)	15%
Linearity (with dither)	3%
Repeatability (with dither)	3%
Recommended dither frequency	140 Hz
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@5000 psi
Check Cracking Pressure	100 psi
Viscosity Range	35 - 2000 SUS
Deadband, nominal (as a percentage of input)	48%
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBGXDN

CONTROL (X) FLOW RATE (D) SEAL MATERIAL (N) COIL*

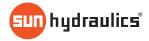
X No Manual Override

D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.)

N Buna-N
V Viton

* Additional coil options are available

© 2023 Sun Hydraulics 9 of 177



MODEL FPRI

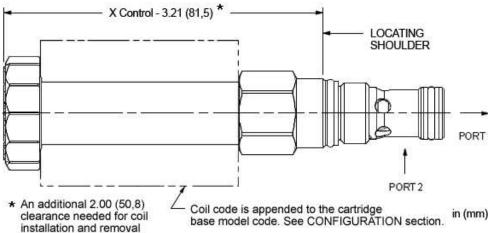
FLeX Series pilot-operated, normally open, electro-proportional throttle - flow 2-

CAPACITY: 5 gpm / CAVITY: T-162A



sunhydraulics.com/model/FPBI





This valve is a pilot-operated, normally open, electro-proportional throttle with reverse free-flow check. Energizing the coil generates a closing force on the pilot stage which pushes the main stage poppet against the seat, proportionally blocking flow from port 2 to 1. In the open condition, flow from 1 to 2 will cause the valve to autoclose and only pilot flow will pass from 1 to 2.

TECHNICAL DATA

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

Hysteresis (with dither)	15%
Linearity (with dither)	3%
Repeatability (with dither)	3%
Recommended dither frequency	140 Hz
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@5000 psi
Check Cracking Pressure	100 psi
Viscosity Range	35 - 2000 SUS
Deadband, nominal (as a percentage of input)	48%
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBIXDN

CONTROL (X) FLOW RATE (D) SEAL MATERIAL (N) COIL*

X No Manual Override

D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.)

V Viton

No coi

* Additional coil options are available

© 2023 Sun Hydraulics 10 of 177

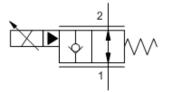


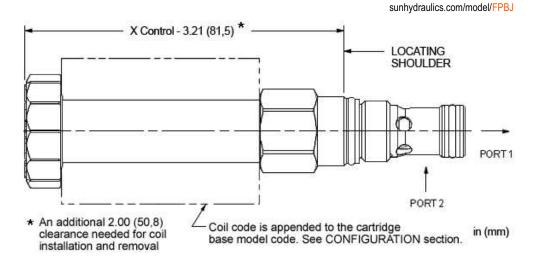
MODEL FPBJ

FLeX Series pilot-operated, normally open, electro-proportional throttle with reverse flow check - flow 2-1

CAPACITY: 5 gpm / CAVITY: T-162A







This valve is a pilot-operated, normally open, electro-proportional throttle with reverse free-flow check. Energizing the coil generates a closing force on the pilot stage which pushes the main stage poppet against the seat, proportionally blocking flow from port 2 to 1. The check will allow flow from 1 to 2 in either the open or closed condition.

TECHNICAL DATA

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

Hysteresis (with dither)	15%
Linearity (with dither)	3%
Repeatability (with dither)	3%
Recommended dither frequency	140 Hz
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@5000 psi
Check Cracking Pressure	100 psi
Viscosity Range	35 - 2000 SUS
Deadband, nominal (as a percentage of input)	48%
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBJXDN

CONTROL (X) FLOW RATE (D) SEAL MATERIAL (N) COIL *

X No Manual Override D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.) V Viton * Additional coil options are available

© 2023 Sun Hydraulics 11 of 177



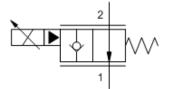
MODEL FPBM

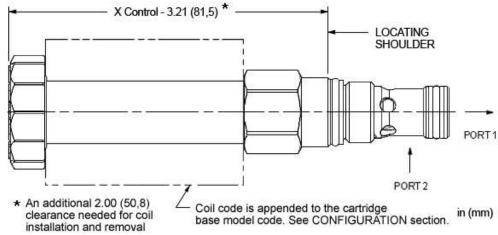
FLeX Series pilot-operated, normally open, electro-proportional throttle - flow 2-3000 psi (210 bar)

CAPACITY: 5 gpm / CAVITY: T-162A



sunhydraulics.com/model/FPBM





This valve is a pilot-operated, normally open, electro-proportional throttle with reverse free-flow check. Energizing the coil generates a closing force on the pilot stage which pushes the main stage poppet against the seat, proportionally blocking flow from port 2 to 1. In the open condition, flow from 1 to 2 will cause the valve to autoclose and only pilot flow will pass from 1 to 2.

TECHNICAL DATA

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

Hysteresis (with dither)	15%
Linearity (with dither)	3%
Repeatability (with dither)	3%
Recommended dither frequency	140 Hz
Maximum Operating Pressure	3000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@3000 psi
Check Cracking Pressure	100 psi
Viscosity Range	35 - 2000 SUS
Deadband, nominal (as a percentage of input)	48%
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBMXDN

X No Manual Override

D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.)

 N Buna-N
 No coil

 V Viton
 * Additional coil options are available

© 2023 Sun Hydraulics 12 of 177



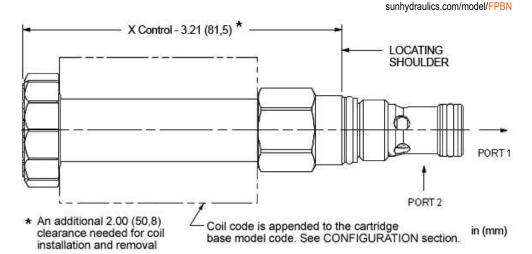


FLeX Series pilot-operated, normally open, electro-proportional throttle with reverse flow check - flow 2-1 - 3000 psi (210 bar)

CAPACITY: 5 gpm / CAVITY: T-162A



2



This valve is a pilot-operated, normally open, electro-proportional throttle with reverse free-flow check. Energizing the coil generates a closing force on the pilot stage which pushes the main stage poppet against the seat, proportionally blocking flow from port 2 to 1. The check will allow flow from 1 to 2 in either the open or closed condition.

TECHNICAL DATA

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

Hysteresis (with dither)	15%
Linearity (with dither)	3%
Repeatability (with dither)	3%
Recommended dither frequency	140 Hz
Maximum Operating Pressure	3000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in ³ /min.@3000 psi
Check Cracking Pressure	100 psi
Viscosity Range	35 - 2000 SUS
Deadband, nominal (as a percentage of input)	48%
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

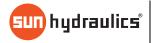
CONFIGURATION OPTIONS

Model Code Example: FPBNXDN

CONTROL (X) FLOW RATE (D) SEAL MATERIAL (N) COIL*

X No Manual Override D Nominal 5 gpm @ 200 psi (14 bar) differential (20 L/min.) V Viton *Additional coil options are available

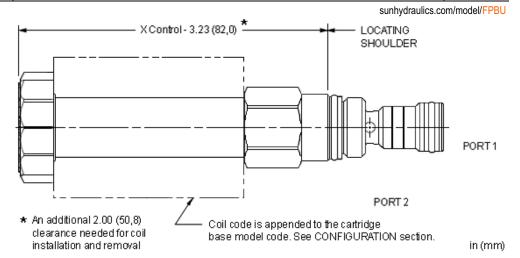
© 2023 Sun Hydraulics 13 of 177



MODEL **FPBU**

FLeX Series electro-proportional, blocking poppet throttle - normally closed CAPACITY: 2.6 gpm / CAVITY: T-162A





This valve is a normally closed, electro-proportional, blocking poppet throttle that is spring-biased closed. Energizing the coil generates an opening force on the poppet proportional to the command current, and this force is countered by the spring and flow forces. This force balance creates a metering orifice whose effective size is proportional to the current. The valve exhibits a large degree of self-compensation in the 2-to-1 direction and will provide proportional flow control in the 1-to-2 direction with the addition of an external compensator. Full reverse flow (1-to-2) with 100% command in the 1-to-2 direction is possible without a compensator under all conditions.

TECHNICAL DATA

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

* Additional coil options are available

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	0.004 in³/min.@5000 psi
Viscosity Range	35 - 2000 SUS
Response Time - Typical	50 ms
Switching Frequency	15,000 max. cycles/hr
U.S. Patent #	10,302,201
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006

NOTES

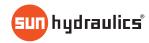
- Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.
- An additional 2.00 inches (50,8 mm) beyond the valve extension is needed for coil installation and removal.

CONFIGURATION OPTIONS

Model Code Example: FPBUXCN

(X) FLOW RATE (N) COIL * CONTROL (C) SEAL MATERIAL X No Manual Override C Nominal 2.6 gpm @ 200 psi (14 bar) differential (9.8 L/min) (9,8 L/min.) M Manual Override Viton

© 2023 Sun Hydraulics 14 of 177



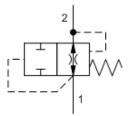
MODEL FQBA

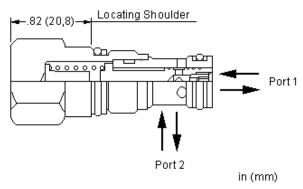
Fixed orifice, flow fuse valve

CAPACITY: 2.25 gpm / CAVITY: T-162A



sunhydraulics.com/model/FQBA





Flow fuse cartridges are used to maintain the position of a hydraulic actuator in the event of a hose or line break. The valve allows flow to and from the actuator but closes instantly if flow from the actuator exceeds the setting of the valve. NOTE: Because the valve responds so rapidly, it is sensitive to any transient flow above the valve setting.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 in³/min.@1000 psi
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006

CONFIGURATION OPTIONS

Model Code Example: FQBAXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

A Replaceable Orifice .5 - 2.25 gpm (2 - 8,5 L/min.)

N Buna-N
E EPDM
V Viton

Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 15 of 177



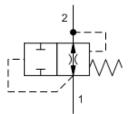
MODEL FQCA

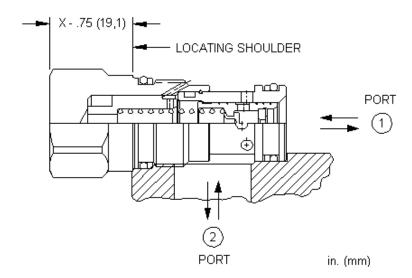
Fixed orifice, flow fuse valve

SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-13A



sunhydraulics.com/model/FQCA





Flow fuse cartridges are used to maintain the position of a hydraulic actuator in the event of a hose or line break. The valve allows flow to and from the actuator but closes instantly if flow from the actuator exceeds the setting of the valve. NOTE: Because the valve responds so rapidly, it is sensitive to any transient flow above the valve setting.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

CONFIGURATION OPTIONS

Model Code Example: FQCAXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

A Replaceable Orifice .5 - 6 gpm (2 - 23

N Buna-N
V Viton

Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 16 of 177

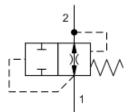


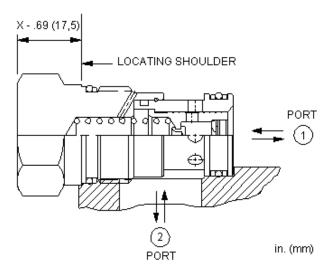
MODEL FQEA Fixed orifice, flow fuse valve

SERIES 2 / CAPACITY: 15 gpm / CAVITY: T-5A



sunhydraulics.com/model/FQEA





Flow fuse cartridges are used to maintain the position of a hydraulic actuator in the event of a hose or line break. The valve allows flow to and from the actuator but closes instantly if flow from the actuator exceeds the setting of the valve. NOTE: Because the valve responds so rapidly, it is sensitive to any transient flow above the valve setting.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	3 in ³ /min.@1000 psi
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006

CONFIGURATION OPTIONS

Model Code Example: FQEAXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable A Replaceable Orifice 1 - 15 gpm (4 - 60

N Buna-NStandard Material/CoatingV Viton/AP Stainless Steel, Passivated

© 2023 Sun Hydraulics 17 of 177



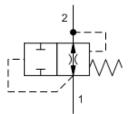


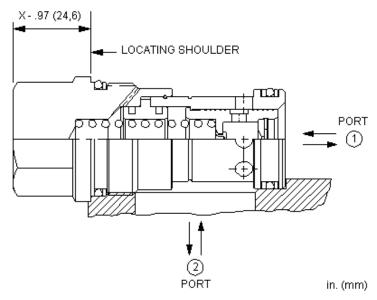
Fixed orifice, flow fuse valve

SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-16A



sunhydraulics.com/model/FQGA





Flow fuse cartridges are used to maintain the position of a hydraulic actuator in the event of a hose or line break. The valve allows flow to and from the actuator but closes instantly if flow from the actuator exceeds the setting of the valve. NOTE: Because the valve responds so rapidly, it is sensitive to any transient flow above the valve setting.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	4 in³/min.@1000 psi
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: FQGAXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

Not Adjustable

A Replaceable Orifice 1 - 25 gpm (4 - 95

N Buna-N V Viton

/AP Stainless Steel, Passivated

© 2023 Sun Hydraulics 18 of 177

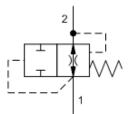


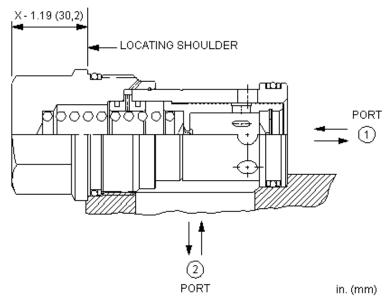
MODEL FQIA Fixed orifice, flow fuse valve

SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-18A



sunhydraulics.com/model/FQIA





Flow fuse cartridges are used to maintain the position of a hydraulic actuator in the event of a hose or line break. The valve allows flow to and from the actuator but closes instantly if flow from the actuator exceeds the setting of the valve. NOTE: Because the valve responds so rapidly, it is sensitive to any transient flow above the valve setting.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 in³/min.@1000 psi
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

CONFIGURATION OPTIONS

Model Code Example: FQIAXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

A Replaceable Orifice 1 - 50 gpm (4 - 200 L/min.)

N Buna-N V Viton Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 19 of 177

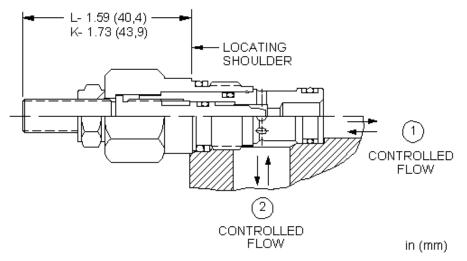
Fully adjustable needle valve

CAPACITY: 5 gpm (.16 inch) / CAVITY: T-162A



sunhydraulics.com/model/NFBC





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	1/2 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006

CONFIGURATION OPTIONS

Model Code Example: NFBCLCN

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

© 2023 Sun Hydraulics 20 of 177





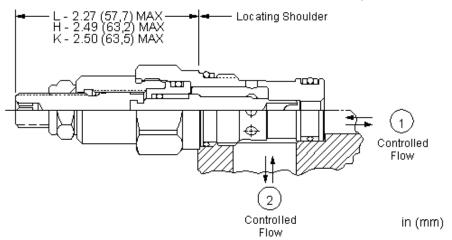
Fully adjustable needle valve

SERIES 1 / CAPACITY: 7 gpm (.19 inch) / CAVITY: T-13A



sunhydraulics.com/model/NFCC





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

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

	(N) MATERIAL/COATING
I Standard Screw Adjustment C 10 in (4.8 mm) N Runa-N Standard	Standard Material/Coatin

H Calibrated Handknob with Detent Lock
K Handknob

D .09 in. (2,3 mm)

N Buna-N
E EPDM
V Viton

/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

Y Tri-Grip Handknob, Flow Control

© 2023 Sun Hydraulics 21 of 177



MODEL

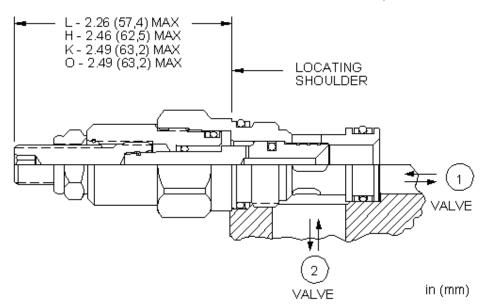
Fully adjustable needle valve

SERIES 1 / CAPACITY: 20 gpm (.33 inch) / CAVITY: T-13A



sunhydraulics.com/model/NFCD





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

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

CONFIGURATION OPTIONS

Model Code Example: NFCDLFN

CONTROL	(L) MAXIMUM ORIFICE DIAMETER	(F) SEAL MATERIAL	(N) MATERIAL/COATING
1 01 1 10 4 11 1	- 00: (0.4	M. D. M.	0/ / / / / / / / / / /

H Calibrated Handknob with Detent Lock

K Handknob

Y Tri-Grip Handknob

E EPDM V Viton

Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 22 of 177



MODEL NFDC

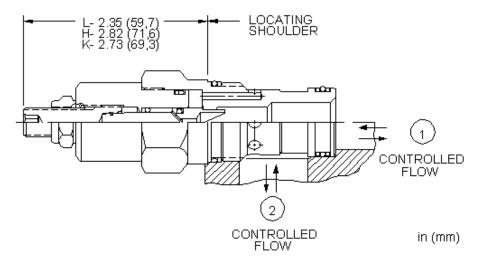
Fully adjustable needle valve

SERIES 2 / CAPACITY: 12 gpm (.25 inch) / CAVITY: T-5A



sunhydraulics.com/model/NFDC





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Viton: 990203006

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

Y Tri-Grip Handknob

Model Code Example: NFDCLAN

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

© 2023 Sun Hydraulics 23 of 177





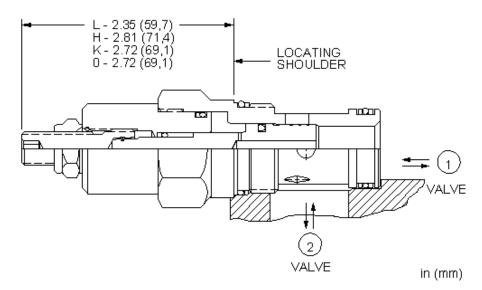
Fully adjustable needle valve

SERIES 2 / CAPACITY: 50 gpm (.5 inch) / CAVITY: T-5A



sunhydraulics.com/model/NFDD





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Polyurethane: 990203014
Seal kit - Cartridge	Viton: 990203006

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

CONTROL ((L) MAXIMUM ORIFICE DIAMETER		(G) SEAL MATERIAL		(N)	MATERIAL/COATING	
1	Standard Screw Adjustment		G .5 in. (12,7 mm)		N Buna-N		Standard Material/Coating	
Н	I Calibrated Handknob with Detent Lo	ck			E EPDM		/AP Stainless Steel, Passivated	
K	Handknoh				V Viton		/I H Mild Steel Zinc-Nickel	

Y Tri-Grip Handknob

© 2023 Sun Hydraulics 24 of 177



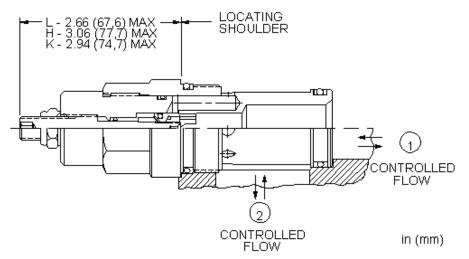


SERIES 3 / CAPACITY: 30 gpm (.38 inch) / CAVITY: T-16A



sunhydraulics.com/model/NFEC





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: NFECLEN

CONTROL (L) MAXIMUM ORIFICE DIAMETER (E) SEAL MATERIAL (N) MATERIAL/COATING

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

© 2023 Sun Hydraulics 25 of 177



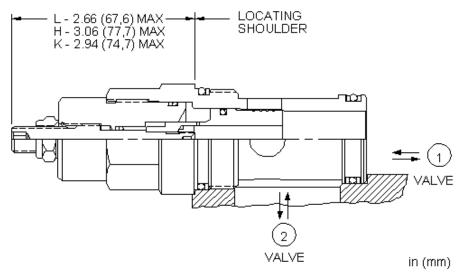


SERIES 3 / CAPACITY: 90 gpm (.69 inch) / CAVITY: T-16A



sunhydraulics.com/model/NFED





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: NFEDLHN

V Viton

CONTROL	(L) MAXIMUM ORIFICE DIAMETE	R (H) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	H .69 in. (17,5 mm)	N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent	Lock	E EPDM	/AP Stainless Steel, Passivated

H Calibrated Handknob with Detent Lock

K Handknob

Y Tri-Grip Handknob

IAP Stainless Steel. Passivated /LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 26 of 177





L - 3.31 (84,1) MAX -H - 3.50 (88,9) MAX K - 3.47 (88,1) MAX

SERIES 4 / CAPACITY: 60 gpm (.56 inch) / CAVITY: T-18A







ONTROLLED FLOW CONTROLLED in (mm)

LOCATING SHOULDER

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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

CONFIGURATION OPTIONS

Y Tri-Grip Handknob, Flow Control

Model Code Example: NFFCLGN

CONTROL	(L) MAXIMUM ORIFICE DIAMETER	(G)	SEAL MATERIAL	(N)	MATERIAL/COATING	
L Standard Screw Adjustment	G .56 in. (14,2 mm)		N Buna-N		Standard Material/Coating	
H Calibrated Handknob with Detent Lo	ck H .38 in. (9,7 mm)		E EPDM		/AP Stainless Steel, Passivated	
K Handknoh			V Viton		/I H Mild Steel Zinc-Nickel	

27 of 177 © 2023 Sun Hydraulics



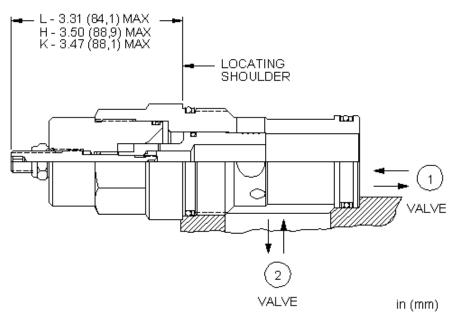


SERIES 4 / CAPACITY: 140 gpm (.85 inch) / CAVITY: T-18A



sunhydraulics.com/model/NFFD





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

CONFIGURATION OPTIONS

R Capped Screw AdjustmentY Tri-Grip Handknob

Model Code Example: NFFDLIN

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

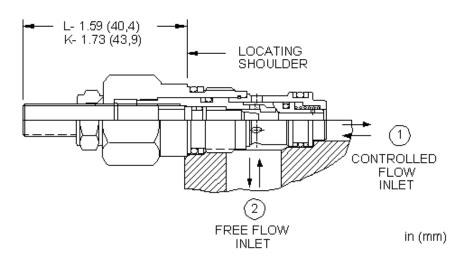
© 2023 Sun Hydraulics 28 of 177

CAPACITY: 5 gpm (.16 inch) / CAVITY: T-162A



sunhydraulics.com/model/NCBB





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006

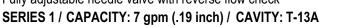
CONFIGURATION OPTIONS

Model Code Example: NCBBLCN

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
K Handknob		V Viton	/AP Stainless Steel, Passivated
			/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 29 of 177

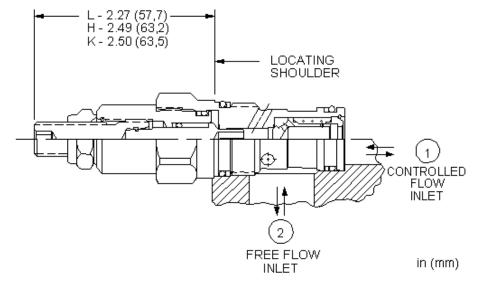
Fully adjustable needle valve with reverse flow check





sunhydraulics.com/model/NCCB





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

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

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

© 2023 Sun Hydraulics 30 of 177



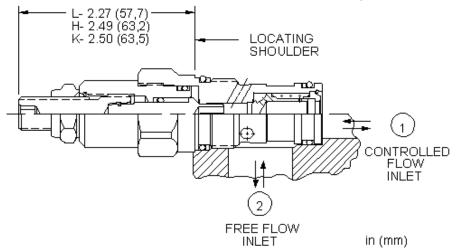
MODEL NCCC

Fully adjustable needle valve with reverse flow check SERIES 1 / CAPACITY: 2 gpm (.09 inch) / CAVITY: T-13A



sunhydraulics.com/model/NCCC





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

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

CONFIGURATION OPTIONS

Model Code Example: NCCCLCN

CONTROL (L) REVERSE FLOW CHECK (C) SEAL MATERIAL (N) MATERIAL/COATING

L Standard Screw Adjustment

C 30 psi (2 bar) **A** 4 psi (0,3 bar)

H Calibrated Handknob with Detent Lock K Handknob

E 75 psi (5 bar)

N Buna-N Standard Material/Coating V Viton /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

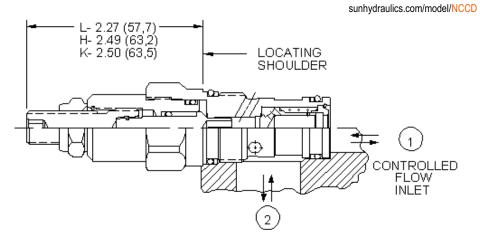
- O Handknob with Panel Mount
- R Capped Screw Adjustment
- Y Tri-Grip Handknob

© 2023 Sun Hydraulics 31 of 177 Fully adjustable needle valve with reverse flow check

SERIES 1 / CAPACITY: 1 gpm (.06 inch) / CAVITY: T-13A







FREE FLOW

INLET

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

E 75 psi (5 bar)

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

in (mm)

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

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

R Capped Screw Adjustment

Y Tri-Grip Handknob

Model Code Example: NCCDLAN

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

© 2023 Sun Hydraulics 32 of 177





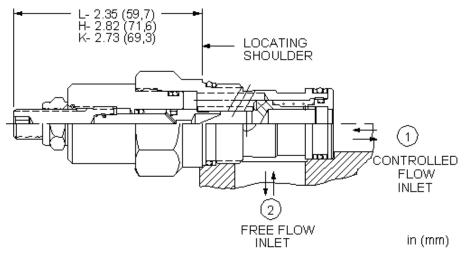
Fully adjustable needle valve with reverse flow check

SERIES 2 / CAPACITY: 12 gpm (.25 inch) / CAVITY: T-5A



sunhydraulics.com/model/NCEB





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Viton: 990203006

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

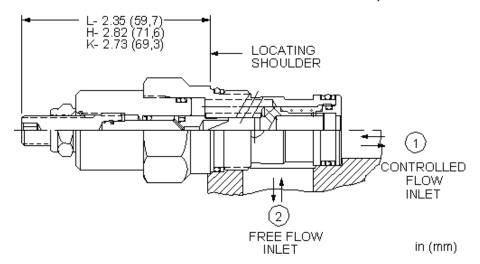
© 2023 Sun Hydraulics 33 of 177

Fully adjustable needle valve with reverse flow check SERIES 2 / CAPACITY: 3 gpm (.13 inch) / CAVITY: T-5A



sunhydraulics.com/model/NCEC





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006

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

CONFIGURATION OPTIONS

Model Code Example: NCECLCN

CONTROL	(L)	(C)	SEAL MATERIAL	(N)	MATERIAL/COATING

H Calibrated Handknob with Detent Lock

A 4 psi (0,3 bar) E 75 psi (5 bar)

V Viton

/LH Mild Steel, Zinc-Nickel

Y Tri-Grip Handknob

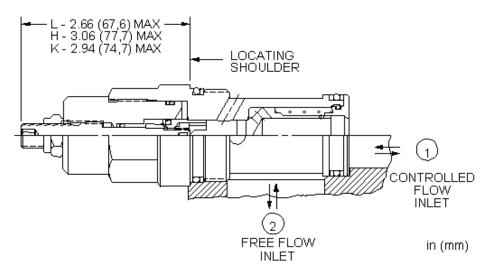
K Handknob

© 2023 Sun Hydraulics 34 of 177 SERIES 3 / CAPACITY: 30 gpm (.38 inch) / CAVITY: T-16A



sunhydraulics.com/model/NCFB





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Y Tri-Grip Handknob

Model Code Example: NCFBLCN

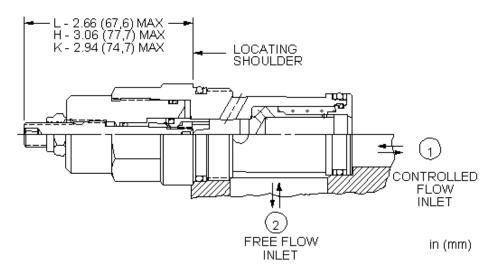
CONTROL	(L) REVERSE FLOW CHECK	(C)	SEAL MATERIAL	(N)	MATERIAL/COATING	
L Standard Screw Adjustment	C 30 psi (2 bar)		N Buna-N		Standard Material/Coating	
H Calibrated Handknob with Detent Lo	ck A 4 psi (0,3 bar)	<u> </u>	E EPDM		/AP Stainless Steel, Passivated	
K Handknob	E 75 psi (5 bar)		V Viton		/LH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

© 2023 Sun Hydraulics 35 of 177



sunhydraulics.com/model/NCFC





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: NCFCLCN

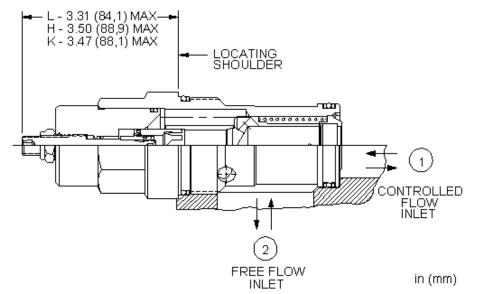
CONTROL (L)	REVERSE FLOW CHECK	(C) SEAL MATERIAL (N)	MATERIAL/COATING
L Standard Screw Adjustment	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent Lock	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
K Handknob	E 75 psi (5 bar)	V Viton	/LH Mild Steel, Zinc-Nickel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

© 2023 Sun Hydraulics 36 of 177



sunhydraulics.com/model/NCGB





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.

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

CONFIGURATION OPTIONS

Y Tri-Grip Handknob

Model Code Example: NCGBLCN

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 Lo	ck 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

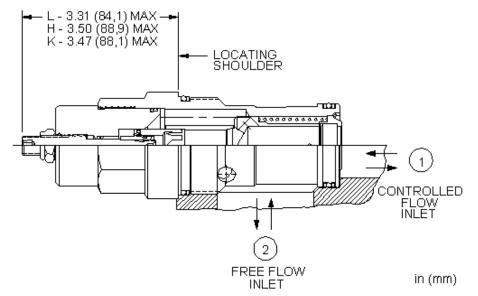
37 of 177 © 2023 Sun Hydraulics

SERIES 4 / CAPACITY: 30 gpm (.38 inch) / CAVITY: T-18A



sunhydraulics.com/model/NCGC





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.

Maximum Operating Pressure 5000 psi	
Maximum Valve Leakage at 110 SUS (24 cSt)	5 drops/min.
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

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

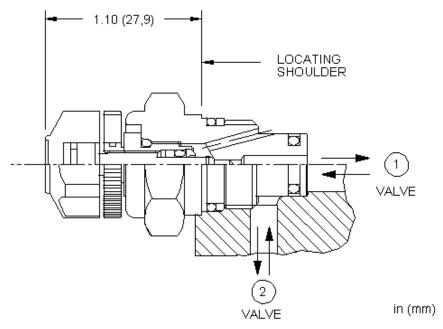
© 2023 Sun Hydraulics 38 of 177

SERIES P / CAPACITY: .2 gpm (.035 inch) / CAVITY: T-8A



sunhydraulics.com/model/NFAB





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.

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	3
Effective Orifice Size	.035 in.
Seal kit - Cartridge	Buna: 990008007
Seal kit - Cartridge	EPDM: 990008014
Seal kit - Cartridge	Polyurethane: 990008002
Seal kit - Cartridge	Viton: 990008006

CONFIGURATION OPTIONS

Model Code Example: NFABKXN

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

© 2023 Sun Hydraulics 39 of 177





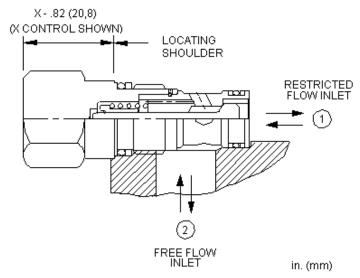
Fixed orifice, non-pressure compensated, flow control valve with reverse flow check

CAPACITY: 7.5 gpm / CAVITY: T-162A









This valve is a fixed-orifice, non-pressure-compensated flow control with a reverse flow check. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Orifice Range	.016062 in.
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006

CONFIGURATION OPTIONS

Model Code Example: CNACXCN

CONTROL (X) SETTING RANGE (C) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable C 30 psi (2 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)

.062 in. (0,4 - 1,6 mm) **A** 4 psi (0,3 bar) Cracking Pressure, .016

- .062 in. (0,4 - 1,6 mm)

E 75 psi (5 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)

N Buna-N V Viton Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 40 of 177



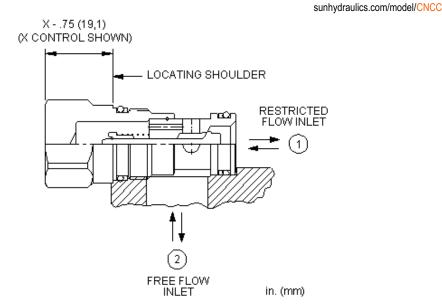


Fixed orifice, non-pressure compensated, flow control valve with reverse flow check

SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-13A







This valve is a fixed-orifice, non-pressure-compensated flow control with a reverse flow check. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Orifice Range	.016153 in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

CONFIGURATION OPTIONS

Model Code Example: CNCCXCN

CONTROL (X) SETTING RANGE (C) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

C 30 psi (2 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm)

153 in. (0,4 - 3,9 mm)

A 4 psi (0,3 bar) Cracking Pressure, .016
- .153 in. (0,4 - 3,9 mm)

- **B** 15 psi (1 bar) Cracking Pressure, .016 .153 in. (0,4 3,9 mm)
- **D** 50 psi (3,5 bar) Cracking Pressure, .016 .153 in. (0,4 3,9 mm)
- **E** 75 psi (5 bar) Cracking Pressure, .016 .153 in. (0,4 3,9 mm)
- **F** 100 psi (7 bar) Cracking Pressure, .016 .153 in. (0,4 3,9 mm)

N Buna-N V Viton

Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 41 of 177





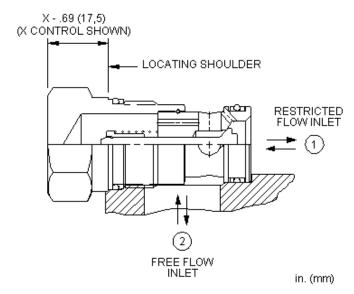
Fixed orifice, non-pressure compensated, flow control valve with reverse flow check

SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-5A



sunhydraulics.com/model/CNEC





This valve is a fixed-orifice, non-pressure-compensated flow control with a reverse flow check. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Orifice Range	.016135 in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006

CONFIGURATION OPTIONS

Model Code Example: CNECXCN

(X) SETTING RANGE CONTROL (C) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

.135 in. (0,4 - 3,4 mm) A 4 psi (0,3 bar) Cracking Pressure, .016

- C 30 psi (2 bar) Cracking Pressure, .016 -
- .135 in. (0,4 3,4 mm) B 15 psi (1 bar) Cracking Pressure, .016 -.135 in. (0,4 - 3,4 mm)
- **D** 50 psi (3,5 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)
- E 75 psi (5 bar) Cracking Pressure, .016 -.135 in. (0,4 - 3,4 mm)
- F 100 psi (7 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)

N Buna-N Standard Material/Coating **V** Viton /AP Stainless Steel, Passivated

© 2023 Sun Hydraulics 42 of 177





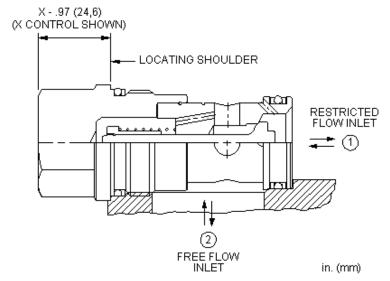
Fixed orifice, non-pressure compensated, flow control valve with reverse flow check

SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-16A



sunhydraulics.com/model/CNGC





This valve is a fixed-orifice, non-pressure-compensated flow control with a reverse flow check. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Orifice Range	.016218 in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: CNGCXCN

(X) SETTING RANGE (C) SEAL MATERIAL (N) MATERIAL/COATING CONTROL

X Not Adjustable

30 psi (2 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)

N Buna-N V Viton

Standard Material/Coating /AP Stainless Steel, Passivated

- A 4 psi (0,3 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)
- B 15 psi (1 bar) Cracking Pressure, .016 -.218 in. (0,4 - 5,5 mm)
- **D** 50 psi (3,5 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)
- E 75 psi (5 bar) Cracking Pressure, .016 -.218 in. (0,4 - 5,5 mm)
- F 100 psi (7 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)

© 2023 Sun Hydraulics

43 of 177



MODEL CNIC

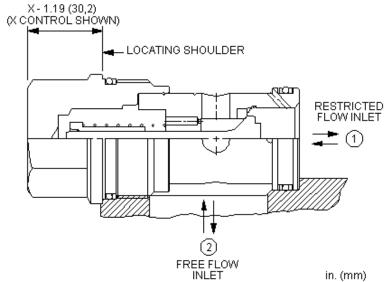
Fixed orifice, non-pressure compensated, flow control valve with reverse flow check

SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-18A



sunhydraulics.com/model/CNIC





This valve is a fixed-orifice, non-pressure-compensated flow control with a reverse flow check. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Orifice Range	.016218 in.
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

(N)

CONFIGURATION OPTIONS

CONTROL

Model Code Example: CNICXCN

X Not Adjustable C 30 psi (2 bar) Cracking Pressure, .016 -

(X) SETTING RANGE

(C) SEAL MATERIAL

- .218 in. (0,4 5,5 mm)
- A 4 psi (0,3 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)
- B 15 psi (1 bar) Cracking Pressure, .016 -.218 in. (0,4 - 5,5 mm)
- **D** 50 psi (3,5 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)
- E 75 psi (5 bar) Cracking Pressure, .016 -.218 in. (0,4 - 5,5 mm)
- F 100 psi (7 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)

N Buna-N

V Viton

© 2023 Sun Hydraulics 44 of 177

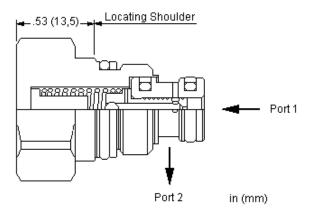


Fixed orifice, pressure compensated flow control valve SERIES P / CAPACITY: .5 gpm / CAVITY: T-8A



sunhydraulics.com/model/FXAA





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. A variety of flow rates are available.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990008007
Seal kit - Cartridge	EPDM: 990008014
Seal kit - Cartridge	Polyurethane: 990008002
Seal kit - Cartridge	Viton: 990008006

CONFIGURATION OPTIONS

Model Code Example: FXAAXAN

N Buna-N E EPDM

CONTROL	(X) FLOW RATE	(A) SEAL MATERIAL	(N) MATERIAL/COATIN	١G

Not Aujustable	A 13 III /11IIII. (230 66/11IIII.)
	B 20 in ³ /min. (330 cc/min.)
	D 40 in3/min (660 co/min)

D 40 in³/min. (660 cc/min.) F 60 in³/min. (1 L/min.)

H 80 in³/min. (1.3 L/min.)
 J 100 in³/min. (1.6 L/min.)
 L 120 in³/min. (2.0 L/min.)

60 cc/min.) **V** Viton L/min.)

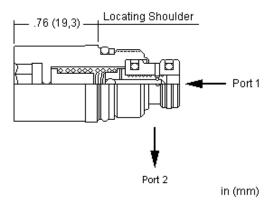
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 45 of 177



sunhydraulics.com/model/FXAG





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. A variety of flow rates are available.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Valve Internal Hex Size	5/16 in.
Seal kit - Cartridge	Buna: 990008007
Seal kit - Cartridge	Polyurethane: 990008002
Seal kit - Cartridge	Viton: 990008006

CONFIGURATION OPTIONS

Model Code Example: FXAGXAN

CONTROL	(X) FLOW RATE	(A) SEAL MATERIAL	(N)
X Not Adjustable	A 15 in³/min. (250 cc/min.)	N Buna-N	
	B 20 in ³ /min. (330 cc/min.)	V Viton	
	D 40 in ³ /min. (660 cc/min.)		
	F 60 in ³ /min. (1 L/min.)		

H 80 in³/min. (1.3 L/min.)
 J 100 in³/min. (1.6 L/min.)
 L 120 in³/min. (2.0 L/min.)

© 2023 Sun Hydraulics 46 of 177

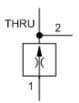


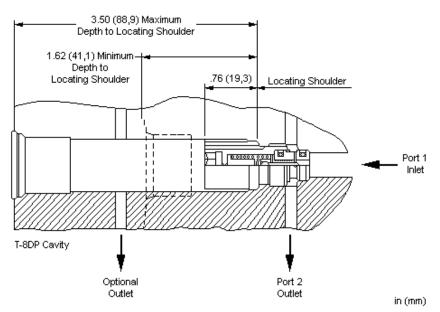


Insert style, pressure compensated flow control SERIES P / CAPACITY: .5 gpm / CAVITY: T-8DP



sunhydraulics.com/model/FXAM





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. A variety of flow rates are available. The THRU port at the top of the valve can be used as the outlet with port 2 blocked. See cavity drawing for details.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Valve Internal Hex Size	5/16 in.

CONFIGURATION OPTIONS

Model Code Example: FXAMXAN

CONTROL	(X) FLOW RATE	(A) SEAL MATERIAL	(N)
X Not Adjustable	A 15 in³/min. (250 cc/min.)	N Buna-N	
	B 20 in ³ /min. (330 cc/min.)	V Viton	
	D 40 in ³ /min. (660 cc/min.)		
	F 60 in ³ /min. (1 L/min.)		

H 80 in³/min. (1.3 L/min.)
 J 100 in³/min. (1.6 L/min.)
 L 120 in³/min. (2.0 L/min.)

© 2023 Sun Hydraulics 47 of 177

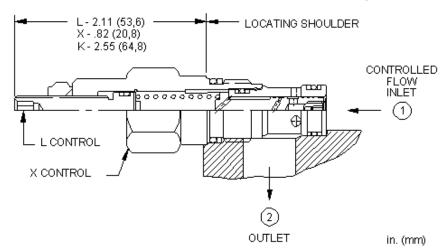
Fixed orifice, pressure compensated flow control valve

CAPACITY: 3 gpm / CAVITY: T-162A



sunhydraulics.com/model/FXBA





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006

CONFIGURATION OPTIONS

Model Code Example: FXBAXAN

CONTROL	(X) SETTING RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A Fixed Orifice .1 - 3 gpm (0,4 -	11 N Buna-N	Standard Material/Coating
L Tuning Adjustment	L/min.)	E EPDM	/AP Stainless Steel, Passivated
K Handknoh		V Viton	/I H Mild Steel Zinc-Nickel

© 2023 Sun Hydraulics 48 of 177

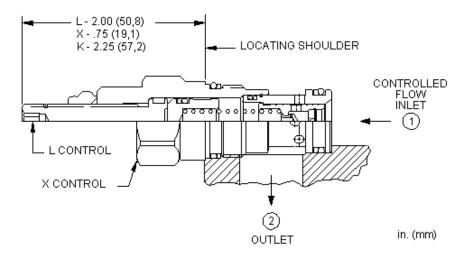
Fixed orifice, pressure compensated flow control valve

SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-13A



sunhydraulics.com/model/FXCA





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

CONFIGURATION OPTIONS

Model Code Example: FXCAXAN

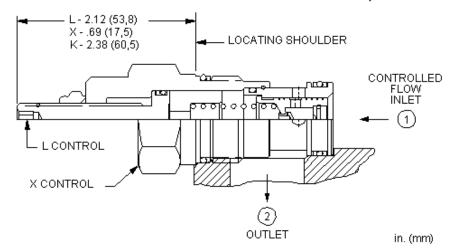
CONTROL (X) SETTING RANGE (A)	SEAL MATERIAL (N)	MATERIAL/COATING
X Not Adjustable	A Replaceable Orifice .1 - 6 gpm (0,4 - 23	N Buna-N	Standard Material/Coating
L Tuning Adjustment	L/min.)	E EPDM	/AP Stainless Steel, Passivated
K Handknob		V Viton	/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 49 of 177 Fixed orifice, pressure compensated flow control valve SERIES 2 / CAPACITY: 12 gpm / CAVITY: T-5A



sunhydraulics.com/model/FXDA





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Viton: 990203006

CONFIGURATION OPTIONS

Model Code Example: FXDAXAN

CONTROL	(X) SETTING RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A Replaceable Orifice .1 - 12	gpm (0,4 - N Buna-N	Standard Material/Coating
L Tuning Adjustment	45 L/min.)	E EPDM	/AP Stainless Steel, Passivated
K Handknob		V Viton	/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 50 of 177



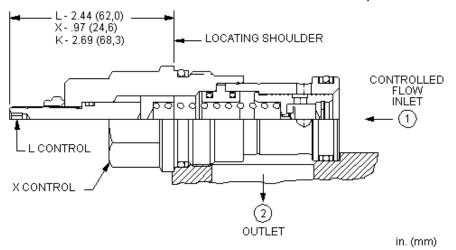


Fixed orifice, pressure compensated flow control valve SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-16A



sunhydraulics.com/model/FXEA





Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: FXEALAN

CONTROL (L) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

L	Tuning Adjustment
С	Tamper Resistant - Factory Set
K	Handknob

X Not Adjustable

A Replaceable Orifice .2 - 25 gpm (0,8 - 95 L/min.)

N Buna-N
E EPDM
V Viton

Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 51 of 177



2



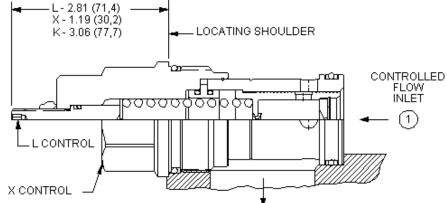
Fixed orifice, pressure compensated flow control valve SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-18A



sunhydraulics.com/model/FXFA

in. (mm)

. - 2.81 (71,4) X - 1.19 (30,2)



Fixed-orifice, pressure-compensated flow controls provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow setting is specified by the user and is set at the factory.

2 OUTLET

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990018007		
Seal kit - Cartridge	EPDM: 990018014		
Seal kit - Cartridge	Polyurethane: 990018002		
Seal kit - Cartridge	Viton: 990018006		

CONFIGURATION OPTIONS

Model Code Example: FXFAXAN

CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING	
X Not Adjustable		A Replaceable Orifice .2 - 50 gpm (1 -		N Buna-N		Standard Material/Coating	
L Tuning Adjustment		200 L/min.)		E EPDM		/AP Stainless Steel, Passivated	
K Handknob				V Viton			

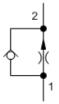
52 of 177 © 2023 Sun Hydraulics

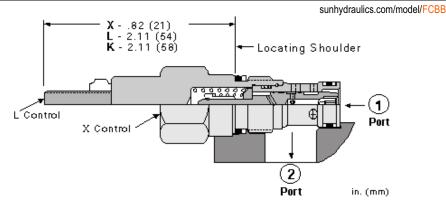




Fixed orifice pressure compensated flow control valve with reverse flow check CAPACITY: 3 gpm / CAVITY: T-162A







Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990162007		
Seal kit - Cartridge	Polyurethane: 990162002		
Seal kit - Cartridge	Viton: 990162006		

CONFIGURATION OPTIONS

Model Code Example: FCBBXAN

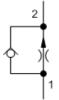
CONTROL	(X) SETTING RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING	
X Not Adjustable	A Replaceable Orifice .1 - 3 gp	om (0,4 - 11 N Buna-N	Standard Material/Coating	l
L Tuning Adjustment	L/min.)	V Viton	/AP Stainless Steel, Passivated	
K Handknob			/LH Mild Steel, Zinc-Nickel	

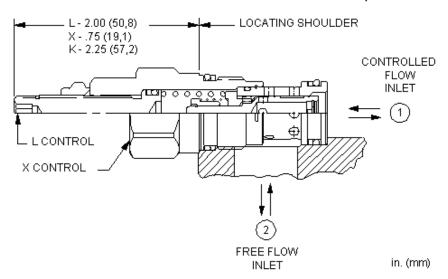
© 2023 Sun Hydraulics 53 of 177

Fixed orifice pressure compensated flow control valve with reverse flow check SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-13A



sunhydraulics.com/model/FCCB





Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990010007		
Seal kit - Cartridge	Polyurethane: 990010002		
Seal kit - Cartridge	Viton: 990010006		

CONFIGURATION OPTIONS

Model Code Example: FCCBXAN

CONTROL	(X) SETTING RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A Replaceable Orifice .1	- 6 gpm (0,4 - 23 N Buna-N	Standard Material/Coating
1 T ' A I' ()	1 /min)	N 100	/ABO(:: O: B ::

L Tuning Adjustment

K Handknob

/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

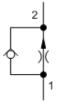
© 2023 Sun Hydraulics 54 of 177

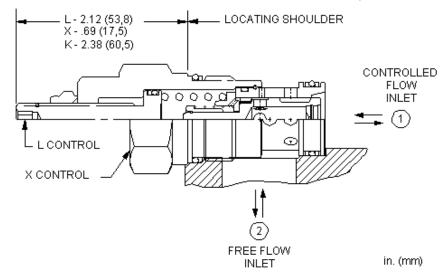
Fixed orifice pressure compensated flow control valve with reverse flow check

SERIES 2 / CAPACITY: 12 gpm / CAVITY: T-5A



sunhydraulics.com/model/FCDB





Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006

CONFIGURATION OPTIONS

Model Code Example: FCDBXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

X Not AdjustableL Tuning Adjustment

K Handknob

A Replaceable Orifice .1 - 12 gpm (0,4 - 45 L/min.)

N Buna-N V Viton Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 55 of 177

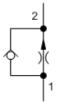


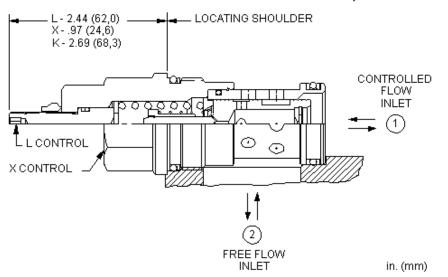


Fixed orifice pressure compensated flow control valve with reverse flow check SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-16A



sunhydraulics.com/model/FCEB





Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

95 L/min.)

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

Maximum Operating Pressure	5000 psi		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990016007		
Seal kit - Cartridge	Polyurethane: 990016002		
Seal kit - Cartridge	Viton: 990016006		

CONFIGURATION OPTIONS

Model Code Example: FCEBXAN

(A) SEAL MATERIAL (N) MATERIAL/COATING CONTROL (X) SETTING RANGE A Replaceable Orifice .2 - 25 gpm (0,8 -X Not Adjustable N Buna-N

L Tuning Adjustment

C Tamper Resistant - Factory Set

K Handknob

V Viton

/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 56 of 177

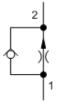


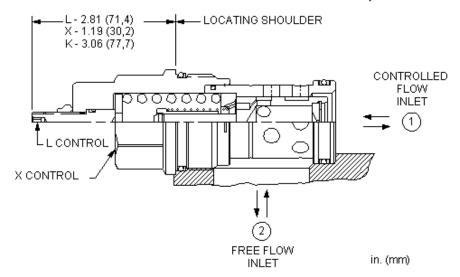


Fixed orifice pressure compensated flow control valve with reverse flow check SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-18A



sunhydraulics.com/model/FCFB





Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990018007		
Seal kit - Cartridge	Polyurethane: 990018002		
Seal kit - Cartridge	Viton: 990018006		

CONFIGURATION OPTIONS

K Handknob

Model Code Example: FCFBXAN

(A) CEAL MATERIAL

CONTROL	(X)	SETTING RANGE	A)	SEAL MATERIAL	(N)	MATERIAL/COATING	_
X Not Adjustable		A Replaceable Orifice .2 - 50 gpm (1 -		N Buna-N		Standard Material/Coating	ı
L Tuning Adjustment		200 L/min.)		V Viton		/AP Stainless Steel, Passivated	_

© 2023 Sun Hydraulics 57 of 177



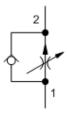
MODEL FDBA

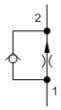
Fully adjustable pressure compensated flow control valve with reverse flow check

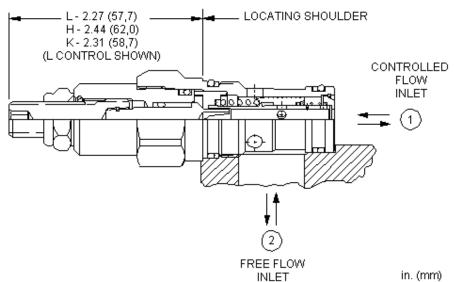
SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-13A



sunhydraulics.com/model/FDBA







Fully adjustable, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. They are infinitely adjustable from nearly closed up to the maximum flow. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006

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

Y Tri-Grip Handknob

Model Code Example: FDBALAN

CONTROL (L	ADJUSTMENT RANGE	(A)	SEAL MATERIAL (N)	MATERIAL/COATING
L Standard Screw Adjustment	A .1 - 6 gpm (0,4 - 23 L/min.)		N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent Lock	B .1 - 2 gpm (0,4 - 8 L/min.)		E EPDM	/AP Stainless Steel, Passivated
K Handknob			V Viton	/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 58 of 177



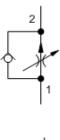


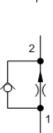
Fully adjustable pressure compensated flow control valve with reverse flow check

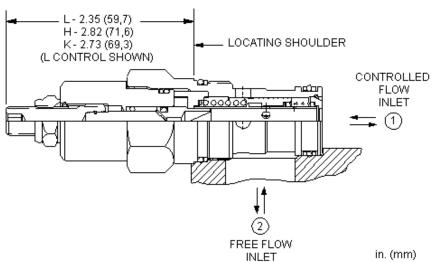
SERIES 2 / CAPACITY: 12 gpm / CAVITY: T-5A



sunhydraulics.com/model/FDCB







Fully adjustable, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. They are infinitely adjustable from nearly closed up to the maximum flow. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5	
Locknut Hex Size	9/16 in.	
Locknut Torque	80 - 90 lbf in.	
Seal kit - Cartridge	Buna: 990203007	
Seal kit - Cartridge	EPDM: 990203014	
Seal kit - Cartridge	Viton: 990203006	

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: FDCBLAN

CONTROL (L) ADJUSTMENT RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

H Calibrated Handknob with Detent Lock

B .2 - 3 gpm (0,8 - 11 L/min.)

N Buna-N **E** EPDM

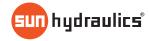
/LH Mild Steel, Zinc-Nickel

K Handknob

Y Tri-Grip Handknob

V Viton

© 2023 Sun Hydraulics 59 of 177



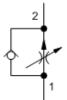


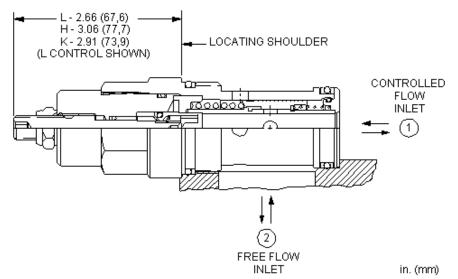
Fully adjustable pressure compensated flow control valve with reverse flow check

SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-16A



sunhydraulics.com/model/FDEA





Fully adjustable, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. They are infinitely adjustable from nearly closed up to the maximum flow. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: FDEALAN

CONTROL (I	.) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)	MATERIAL/COATING	
L Standard Screw Adjustment	A .2 - 25 gpm (0,8 - 95 L/min.)	N Buna-N		Standard Material/Coating	
H Calibrated Handknob with Detent Lock	B .2 - 16 gpm (0,8 - 60 L/min.)	E EPDM		/LH Mild Steel, Zinc-Nickel	
K Handknob		V Viton			

Y Tri-Grip Handknob

© 2023 Sun Hydraulics 60 of 177



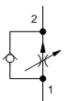


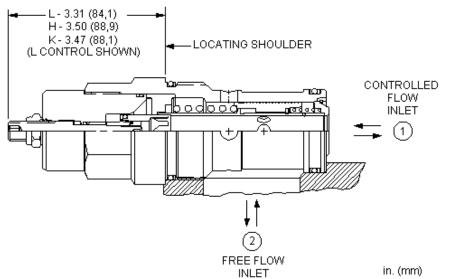
Fully adjustable pressure compensated flow control valve with reverse flow check

SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-18A



sunhydraulics.com/model/FDFA





Fully adjustable, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. They are infinitely adjustable from nearly closed up to the maximum flow. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

CONFIGURATION OPTIONS

Y Tri-Grip Handknob

Model Code Example: FDFALAN

CONTROL (L	.) ADJUSTMENT RANGE	A) SEAL MATERIAL (N)	MATERIAL/COATING
L Standard Screw Adjustment	A .2 - 50 gpm (1 - 200 L/min.)	N Buna-N	Standard Material/Coating
H Calibrated Handknob with Detent Lock		E EPDM	/LH Mild Steel, Zinc-Nickel
K Handknob		V Viton	

© 2023 Sun Hydraulics 61 of 177



MODEL

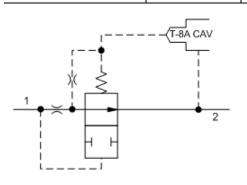
Ventable fixed orifice, pressure compensated flow control valve with integral T-8A control cavity

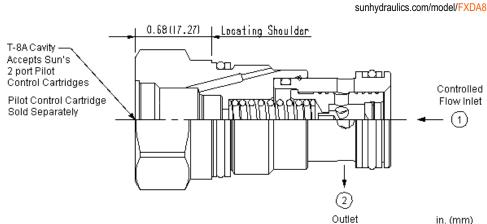
SERIES 2 / CAPACITY: 12 gpm / CAVITY: T-5A





in. (mm)





This valve is a fixed-orifice, pressure-compensated flow control valve with an integral pilot control cavity. The pilot control cavity will accept any T-8A pilot control cartridge. This type of valve provides precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow setting is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Pilot Control Cavity	T-8A
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006

NOTES

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

CONFIGURATION OPTIONS

Model Code Example: FXDA8AN

SETTING RANGE A Replaceable Orifice .1 - 12 gpm (0,4 - **SEAL MATERIAL**

45 L/min.)

N Buna-N **E** EPDM

B Permanent Orifice .1 - 12 gpm (0,4 - 45 L/min.)

© 2023 Sun Hydraulics 62 of 177

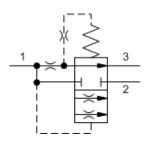


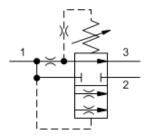
MODEL FRBA

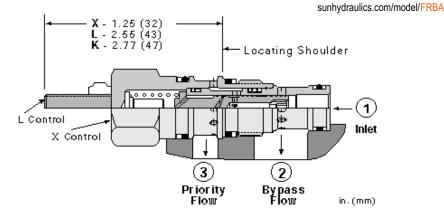
Fixed orifice, bypass/restrictive, priority, flow control valve

CAPACITY: 3 gpm / CAVITY: T-163A









Bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Input Flow	7.5 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006

CONFIGURATION OPTIONS

Model Code Example: FRBAXAN

CONTROL	(X) SETTING RANGE	(A) SEAL MATERIAL (N)
X Not Adjustable	A Replaceable Orifice .1 - 3 gpm (0	0,4 - 11 N Buna-N
L Tuning Adjustment	L/min.)	V Viton

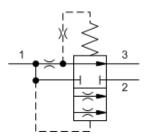
© 2023 Sun Hydraulics 63 of 177

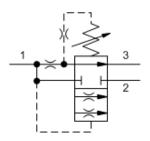
Fixed orifice, bypass/restrictive, priority, flow control valve

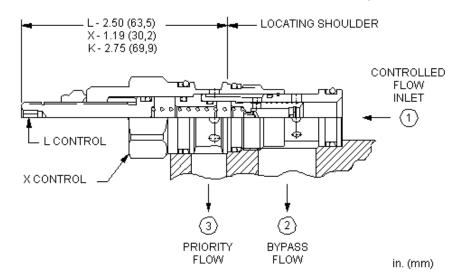
SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-11A



sunhydraulics.com/model/FRCA







Bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Input Flow	15 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006

CONFIGURATION OPTIONS

Model Code Example: FRCAXAN

(A) SEAL MATERIAL CONTROL (X) SETTING RANGE (N) MATERIAL/COATING

X Not Adjustable

L Tuning Adjustment K Handknob

A Replaceable Orifice .1 - 6 gpm (0,4 - 23

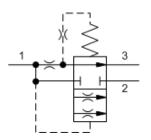
N Buna-N V Viton

Standard Material/Coating /AP Stainless Steel, Passivated

© 2023 Sun Hydraulics 64 of 177 SERIES 2 / CAPACITY: 12 gpm / CAVITY: T-2A

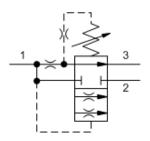


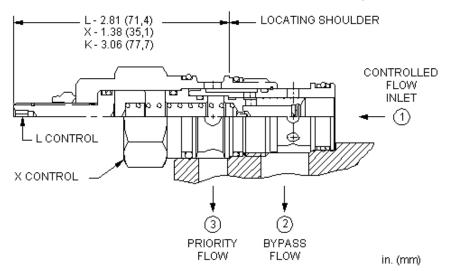
sunhydraulics.com/model/FRDA



MODEL

FRDA





Bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Input Flow	30 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

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: FRDAXAN

CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING	
X Not Adjustable		A Replaceable Orifice .1 - 12 gpr	m (0,4 -	N Buna-N		Standard Material/Coating	
L Tuning Adjustment		45 L/min.)		E EPDM		/AP Stainless Steel, Passivated	
K Handknob				V Viton			

© 2023 Sun Hydraulics 65 of 177

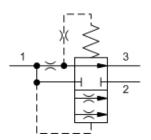


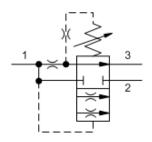


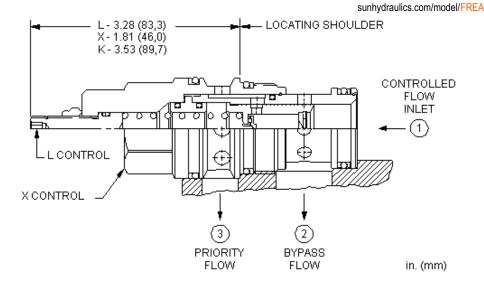
Fixed orifice, bypass/restrictive, priority, flow control valve

SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-17A









Bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Input Flow	60 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

CONFIGURATION OPTIONS

Model Code Example: FREAXAN

CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING	
X Not Adjustable		A Replaceable Orifice .2 - 25 g	gpm (0,8 -	N Buna-N		Standard Material/Coating	
I Tuning Adjustment		95 L/min.)		V Viton		IAD Stainless Steel Passivated	

Tuning Adjustment

K Handknob

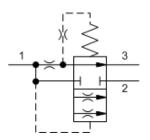
/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

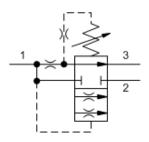
© 2023 Sun Hydraulics 66 of 177 Fixed orifice, bypass/restrictive, priority, flow control valve

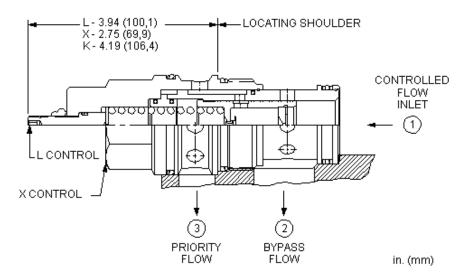
SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-19A



sunhydraulics.com/model/FRFA







Bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Input Flow	120 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

CONFIGURATION OPTIONS

Model Code Example: FRFAXAN

CONTROL (X) SETTING RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

X Not AdjustableL Tuning Adjustment

K Handknob

A Replaceable Orifice .2 - 50 gpm (1 - 200 L/min.)

N Buna-NV Viton

Standard Material/Coating /AP Stainless Steel, Passivated

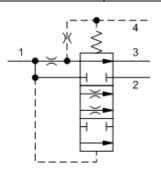
© 2023 Sun Hydraulics 67 of 177

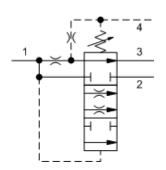
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve

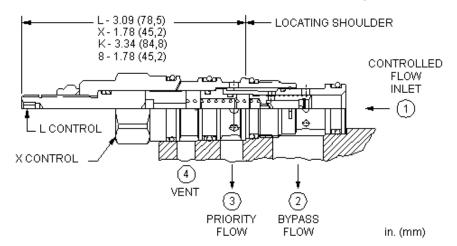
SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-21A



sunhydraulics.com/model/FVCA







Ventable, bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit. A vent port (port 4) allows these valves to be controlled remotely.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	15 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006

CONFIGURATION OPTIONS

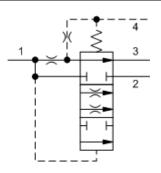
Model Code Example: FVCAXAN

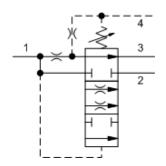
CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)
X Not Adjustable		A Replaceable Orifice .1 -	6 gpm (0,4 - 23	N Buna-N	
L Tuning Adjustment		L/min.)		V Viton	<u>.</u>

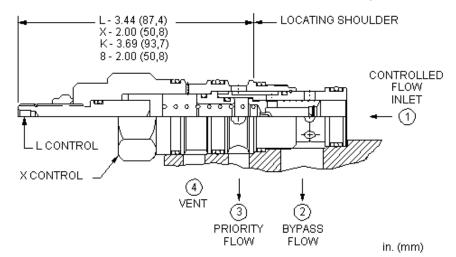
© 2023 Sun Hydraulics 68 of 177











Ventable, bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit. A vent port (port 4) allows these valves to be controlled remotely.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	30 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	EPDM: 990022014
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006

CONFIGURATION OPTIONS

Model Code Example: FVDAXAN

CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)
X Not Adjustable		A Replaceable Orifice .1 - 1:	2 gpm (0,4 -	N Buna-N	
L Tuning Adjustment		45 L/min.)		E EPDM	
				V Viton	

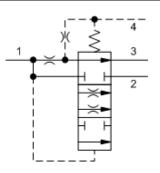
© 2023 Sun Hydraulics 69 of 177

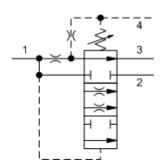
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve

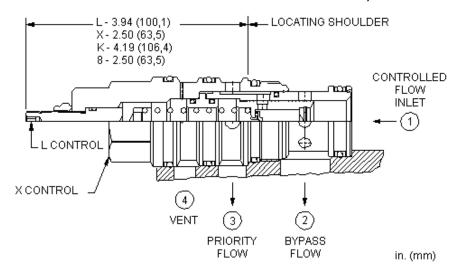
SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-23A



sunhydraulics.com/model/FVEA







Ventable, bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit. A vent port (port 4) allows these valves to be controlled remotely.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	60 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006

CONFIGURATION OPTIONS

L Tuning Adjustment

Model Code Example: FVEAXAN

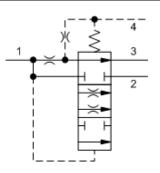
CONTROL	(X) SETTING RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING	
X Not Adjustable	A Replaceable Orifice .2 - 25 gp	om (0,8 - N Buna-N	Standard Material/Coating	
K Handknob	95 L/min.)	V Viton	/LH Mild Steel, Zinc-Nickel	

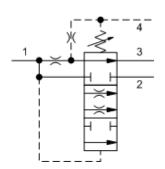
© 2023 Sun Hydraulics 70 of 177

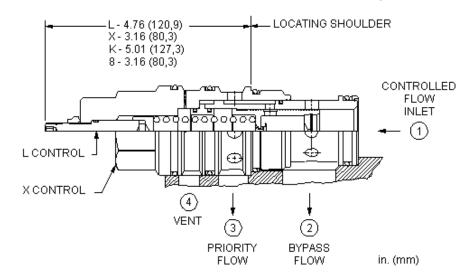
SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-24A



sunhydraulics.com/model/FVFA







Ventable, bypass/restrictive, fixed-orifice, priority flow controls take an input flow at port 1 and use it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess is bypassed out port 2. The bypass flow may be used in a secondary circuit. A vent port (port 4) allows these valves to be controlled remotely.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	120 gpm
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006

CONFIGURATION OPTIONS

Model Code Example: FVFAXAN

CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)
X Not Adjustable		A Replaceable Orifice .2 - 50 g	pm (1 -	N Buna-N	
L Tuning Adjustment		200 L/min.)		E EPDM	
				V Viton	

© 2023 Sun Hydraulics 71 of 177



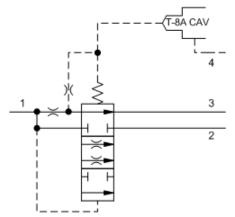


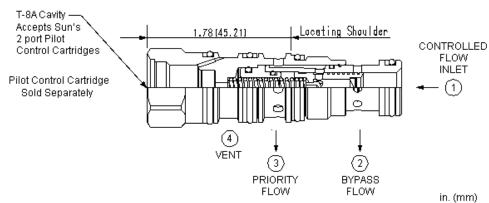
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity

SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-21A



sunhydraulics.com/model/FVCA8





This valve is a ventable, bypass/restrictive, fixed-orifice, priority flow control with an integral pilot control cavity. The pilot control cavity will accept any T-8A pilot pressure or directional control cartridge. It takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess flow is bypassed out of port 2. Bypass flow may be used for a secondary circuit. Depending on which pilot control valve is installed in the T-8A cavity, priority flow can be selected electrically, manually, hydraulically or pneumatically.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	15 gpm
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	20 - 25 lbf ft
Pilot Control Valve Hex Size	7/8 in.
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006

NOTES

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

CONFIGURATION OPTIONS

Model Code Example: FVCA8AN

SETTING RANGE

A Replaceable Orifice .1 - 6 gpm (0,4 - 23 L/min.)

N Buna-N V Viton

B Permanent Orifice .1 - 6 gpm (0,4 - 23 L/min.)

© 2023 Sun Hydraulics 72 of 177



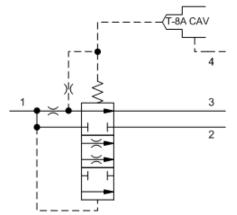


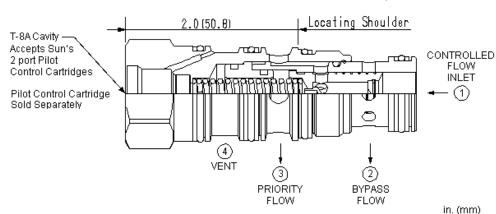
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity

SERIES 2 / CAPACITY: 12 gpm / CAVITY: T-22A



sunhydraulics.com/model/FVDA8





This valve is a ventable, bypass/restrictive, fixed-orifice, priority flow control with an integral pilot control cavity. The pilot control cavity will accept any T-8A pilot pressure or directional control cartridge. It takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess flow is bypassed out of port 2. Bypass flow may be used for a secondary circuit. Depending on which pilot control valve is installed in the T-8A cavity, priority flow can be selected electrically, manually, hydraulically or pneumatically.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	30 gpm
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	20 - 25 lbf ft
Pilot Control Valve Hex Size	7/8 in.
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	EPDM: 990022014
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006

NOTES

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

CONFIGURATION OPTIONS

Model Code Example: FVDA8AN

SETTING RANGE

(A) SEAL MATERIAL

(N)

A Replaceable Orifice .1 - 12 gpm (0,4 - 45 L/min.)

N Buna-N E EPDM

B Permanent Orifice .1 - 12 gpm (0,4 - 45 L/min.)

V Viton

© 2023 Sun Hydraulics 73 of 177



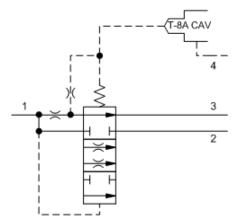


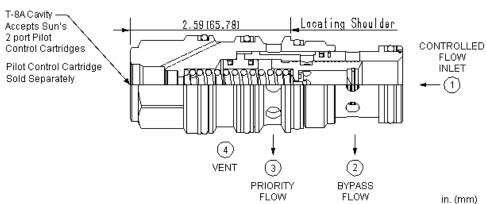
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity

SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-23A



sunhydraulics.com/model/FVEA8





This valve is a ventable, bypass/restrictive, fixed-orifice, priority flow control with an integral pilot control cavity. The pilot control cavity will accept any T-8A pilot pressure or directional control cartridge. It takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess flow is bypassed out of port 2. Bypass flow may be used for a secondary circuit. Depending on which pilot control valve is installed in the T-8A cavity, priority flow can be selected electrically, manually, hydraulically or pneumatically.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	60 gpm
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	20 - 25 lbf ft
Pilot Control Valve Hex Size	7/8 in.
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006

NOTES

SETTING RANGE

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

CONFIGURATION OPTIONS

Model Code Example: FVEA8AN

A Replaceable Orifice .2 - 25 gpm (0,8 -95 L/min.)

(A) SEAL MATERIAL

N Buna-N

V Viton **B** Permanent Orifice .2 - 25 gpm (0,8 - 95 L/min.)

© 2023 Sun Hydraulics 74 of 177



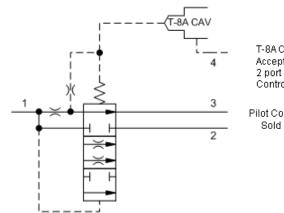
MODEL FVFA8

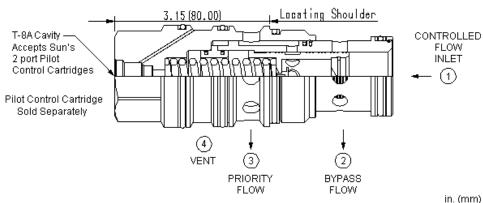
Ventable, fixed orifice, bypass/restrictive, priority, flow control valve with integral T-8A control cavity

SERIES 4 / CAPACITY: 50 gpm / CAVITY: T-24A



sunhydraulics.com/model/FVFA8





This valve is a ventable, bypass/restrictive, fixed-orifice, priority flow control with an integral pilot control cavity. The pilot control cavity will accept any T-8A pilot pressure or directional control cartridge. It takes an input flow at port 1 and uses it to satisfy the priority flow at port 3. If the input flow exceeds the priority flow requirement, the excess flow is bypassed out of port 2. Bypass flow may be used for a secondary circuit. Depending on which pilot control valve is installed in the T-8A cavity, priority flow can be selected electrically, manually, hydraulically or pneumatically.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Nominal Vent Flow	46 in³/min.
Maximum Input Flow	120 gpm
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	20 - 25 lbf ft
Pilot Control Valve Hex Size	7/8 in.
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006

NOTES

SETTING RANGE

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

CONFIGURATION OPTIONS

Model Code Example: FVFA8AN

A Replaceable Orifice .2 - 50 gpm (1 - 200 L/min.)

SEAL MATERIAL

(N

B Permanent Orifice .2 - 50 gpm (1 - 200 L/min.)

N Buna-N E EPDM

V Viton

© 2023 Sun Hydraulics 75 of 177



MODEL FPCC

Electro-proportional flow control valve - normally closed SERIES 1 / CAPACITY: 10 gpm / CAVITY: T-13A



INLET

(1)

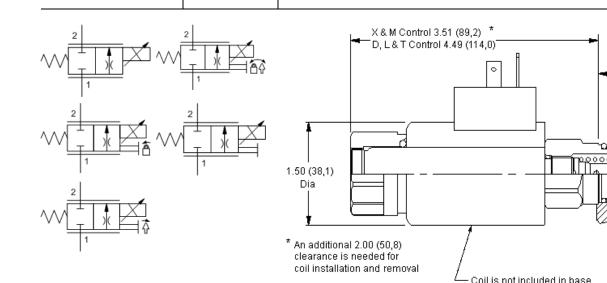
in. (mm)

sunhydraulics.com/model/FPCC

Locating Shoulder

(2)

OUTLET



This valve is a normally closed, electro-proportional throttle that is spring-biased closed. Energizing the coil generates an opening force on the spool proportional to the command current, and this force is countered by the spring and flow forces. This force balance creates a metering orifice whose effective size is proportional to the current. The valve exhibits a large degree of self-compensation in the 1-to-2 direction and will provide proportional flow control in the 2-to-1 direction with the addition of an external compensator. Full reverse flow (2-to-1) with 100% command in the 2-to-1 direction is possible without a compensator under all conditions.

model and must be specified

separately

TECHNICAL DATA

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

Maximum Valve Leakage at 110 SUS (24 cSt)	6 in³/min.@3000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Manual Override Stroke	.10 in.
Seal kit - Cartridge	Buna: 990413007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990413002
Seal kit - Cartridge	Viton: 990413006

NOTES

Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.

CONFIGURATION OPTIONS

Model Code Example: FPCCXCN

CONTROL	(X) FLOW RATE	(C) SFAI MATERIAI	(N) COII *

X No Manual Override D Twist/Lock (Dual) Manual Override E Twist (Extended) Manual Override

E Twist (Extended) Manual OverrideL Twist/Lock (Detent) Manual Override

M Manual Override

T Twist (Momentary) Manual Override

С	.25 - 7 gpm (1 - 28 L/min.)
^	1 15 apm (0.4 61/min)

B .15 - 3.5 gpm (0,6 - 14 L/min.)

D .25 - 10 gpm (1 - 40 L/min.)

SE/	٩L	MA	١I	<u>ER</u>	ΙAΙ	
						Ī
M	о.	ıno	N			

E EPDM V Viton

	NO COII
212	DIN 43650-Form A, 12 VDC
224	DIN 43650-Form A, 24 VDC
224NX01	DIN 43650-Form A, 24 VDC, r
	transient voltage suppression

IX01 DIN 43650-Form A, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

224NX02 DIN 43650-Form A, 24 VDC, no

transient voltage suppression (TVS) diodes, with XMD-02 driver

912 Deutsch DT04-2P, 12 VDC 912NX01 Deutsch DT04-2P, 12 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

912NX02 Deutsch DT04-2P. 12 VDC. no 76 of 177

© 2023 Sun Hydraulics

transient voltage suppression (TVS) diodes, with XMD-02 driver

924 Deutsch DT04-2P, 24 VDC

924NX01 Deutsch DT04-2P, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

924NX02 Deutsch DT04-2P, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-02 driver

© 2023 Sun Hydraulics 77 of 177

^{*} Additional coil options are available

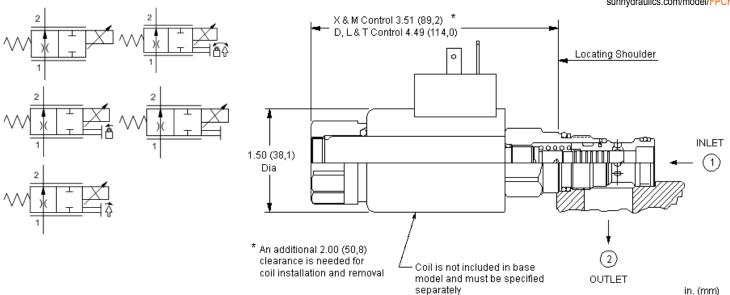




Electro-proportional flow control valve - normally open SERIES 1 / CAPACITY: 7 gpm / CAVITY: T-13A



sunhydraulics.com/model/FPCH



This valve is a normally open electro-proportional throttle that is spring-biased open. Energizing the coil generates an closing force on the spool proportional to the command current, and this force is countered by the spring and flow forces. This force balance creates a metering orifice whose effective size is proportional to the current. The valve exhibits a large degree of self-compensation in the 1-to-2 direction and will provide proportional flow control in the 2-to-1 direction with the addition of an external compensator. Full reverse flow (2-to-1) with no command in the 2-to-1 direction is possible without a compensator under all conditions.

TECHNICAL DATA

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

Maximum Valve Leakage at 110 SUS (24 cSt)	6 in³/min.@3000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Manual Override Stroke	.10 in.
Seal kit - Cartridge	Buna: 990413007
Seal kit - Cartridge	Polyurethane: 990413002
Seal kit - Cartridge	Viton: 990413006

NOTES

Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.

CONFIGURATION OPTIONS

Model Code Example: FPCHXCN

CONTROL (X) FLOW RATE	(C) SEAL MATERIAL	(N) COIL *
-----------------------	-------------------	------------

OCITINO E	I EOW IVAILE (O	<u> </u>	OLAL MATERIAL	
				Ξ
X No Manual Override	C .25 - 7 gpm (1 - 28 L/min.)		N Buna-N	
D Twist/Lock (Dual) Manual Override	A .1 - 1.5 gpm (0,4 - 6 L/min.)		E EPDM	

B .15 - 3.5 gpm (0,6 - 14 L/min.)

E Twist (Extended) Manual Override

L Twist/Lock (Detent) Manual Override

M Manual Override

T Twist (Momentary) Manual Override

Ν	Buna-N
Е	EPDM
٧	Viton

212 DIN 43650-Form A, 12 VDC DIN 43650-Form A, 24 VDC 224NX01 DIN 43650-Form A, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

224NX02 DIN 43650-Form A, 24 VDC, no transient voltage suppression

> (TVS) diodes, with XMD-02 driver

912 Deutsch DT04-2P, 12 VDC

912NX01 Deutsch DT04-2P, 12 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

912NX02 Deutsch DT04-2P, 12 VDC, no transient voltage suppression 78 of 177

(TVS) diodes, with XMD-02 driver

924 Deutsch DT04-2P, 24 VDC

924NX01 Deutsch DT04-2P, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

924NX02 Deutsch DT04-2P, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-02 driver

© 2023 Sun Hydraulics 79 of 177

^{*} Additional coil options are available



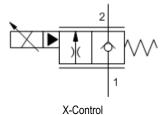
MODEL FPFK

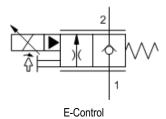
Pilot-operated, normally closed, electro-proportional throttle with reverse flow check

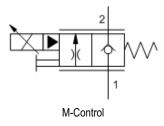
SERIES 2 / CAPACITY: 20 gpm / CAVITY: T-5A

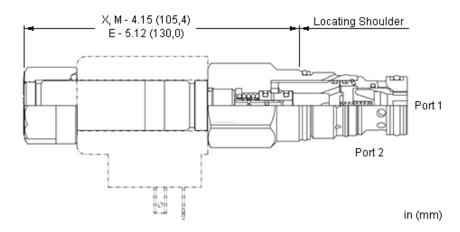


sunhydraulics.com/model/FPFK









This valve is a pilot-operated, normally closed, electro-proportional throttle with reverse free-flow check. Energizing the coil generates an opening force on the pilot stage which vents the main stage poppet to open proportionally. Metered flow is from port 1 to port 2 with reverse free flow from port 2 to port 1.

TECHNICAL DATA

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

Recommended dither frequency	100 Hz
Maximum Valve Leakage at 110 SUS (24 cSt)	20 drops/min.@5000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Deadband, nominal (as a percentage of input)	25%
Manual Override Stroke	.06 in.
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Viton: 990203006

CONFIGURATION OPTIONS

Model Code Example: FPFKXDN

(N) COIL * CONTROL (X) FLOW RATE (D) SEAL MATERIAL

X No Manual Override

- E Twist (Extended) Manual Override
- M Manual Override

- Nominal 20 gpm @ 200 psi (14 bar) differential (80 L/min.)
- B Nominal 10 gpm @ 200 psi (14 bar) differential (40 L/min.)

N Buna-N **E** EPDM

V Viton

212 DIN 43650-Form A, 12 VDC 224 DIN 43650-Form A, 24 VDC 912 Deutsch DT04-2P, 12 VDC 924 Deutsch DT04-2P, 24 VDC

* Additional coil options are available

© 2023 Sun Hydraulics 80 of 177



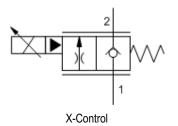
MODEL

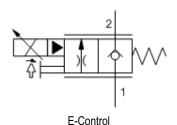
Pilot-operated, normally closed, electro-proportional throttle with reverse flow check

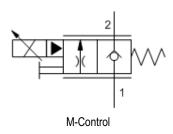
SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-16A

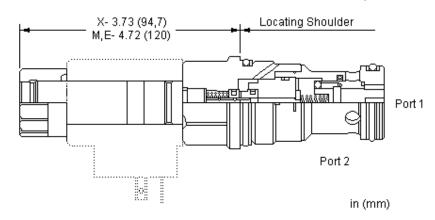


sunhydraulics.com/model/FPHK









This valve is a pilot-operated, normally closed, electro-proportional throttle with reverse free-flow check. Energizing the coil generates an opening force on the pilot stage which vents the main stage poppet to open proportionally. Metered flow is from port 1 to port 2 with reverse free flow from port 2 to port 1.

TECHNICAL DATA

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

Recommended dither frequency	100 Hz
Maximum Valve Leakage at 110 SUS (24 cSt)	20 drops/min.@5000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Deadband, nominal (as a percentage of input)	25%
Manual Override Stroke	.06 in.
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

CONFIGURATION OPTIONS

Model Code Example: FPHKXCN

CONTROL (X) FLOW RATE (C) SEAL MATERIAL (N) COIL *

X No Manual Override

- E Twist (Extended) Manual Override
- M Manual Override

- C Nominal 40 gpm @ 200 psi (14 bar) differential (160 L/min.)
- Nominal 20 gpm @ 200 psi (14 bar) differential (80 L/min.)
- E Nominal 60 gpm @ 200 psi (14 bar) differential (240 L/min.)

N Buna-N

E EPDM V Viton

No coil 212 DIN 43650-Form A, 12 VDC DIN 43650-Form A. 24 VDC 224NX01 DIN 43650-Form A, 24 VDC, no

transient voltage suppression (TVS) diodes, with XMD-01 driver

224NX02 DIN 43650-Form A, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-02 driver

912 Deutsch DT04-2P, 12 VDC

912NX01 Deutsch DT04-2P, 12 VDC, no transient voltage suppression (TVS) diodes, with XMD-01 driver

912NX02 Deutsch DT04-2P, 12 VDC, no

transient voltage suppression (TVS) diodes, with XMD-02 driver

Deutsch DT04-2P, 24 VDC 924NX01 Deutsch DT04-2P, 24 VDC, no transient voltage suppression

© 2023 Sun Hydraulics

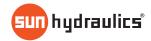
81 of 177

(TVS) diodes, with XMD-01 driver

924NX02 Deutsch DT04-2P, 24 VDC, no transient voltage suppression (TVS) diodes, with XMD-02 driver

* Additional coil options are available

© 2023 Sun Hydraulics 82 of 177

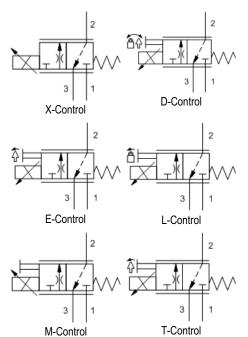


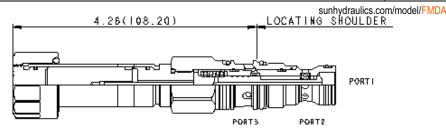


Electro-proportional 3-way flow control valve, meter in

SERIES 1 / CAPACITY: 9 gpm / CAVITY: T-11A







This valve is a 3-way, meter-in, electro-proportional throttle. The flow path, unenergized, has the supply blocked at port 1 and port 2 is drained to tank at port 3. Energizing the coil generates a closing force on the spool, creating a metering orifice in the 1 to 2 direction that is proportional to the coil command current. The valve self-compensates in the 1-to-2 direction and with the addition of an external compensator will provide pressure compensated flow control.

Flow in the 2-to-3 direction is not proportional and is limited in the interest of increased resolution and capacity. Flow capacity in the 2-to-3 direction is about 1.5 gpm (6 L/min). This valve is meant to be used in a circuit that has a separate passage to tank such as a cushion lock circuit. Two FMDAs in conjunction with a cushion lock circuit create a meter-in/meter-out 3-position 4-way.

TECHNICAL DATA

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

Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Manual Override Stroke	.10 in.
Seal kit - Cartridge	Buna: 990411007
Seal kit - Cartridge	Viton: 990411006

NOTES Please ver

Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.

CONFIGURATION OPTIONS

Model Code Example: FMDAXDN

CONTROL	(X) FLOW RATE	(D) SEAL MATERIAL	(N) COIL *
---------	---------------	-------------------	------------

^	No Manual Overnue
D	Twist/Lock (Dual) Manual Overrid

E Twist (Extended) Manual Override

L Twist/Lock (Detent) Manual Override

L TWISTLOCK (Deterit) Marida Override

M Manual Override

T Twist (Momentary) Manual Override

D .1 - 9 gpm (0,4 - 34 L/min.)

A .1 - 1.6 gpm (0,4 - 6.1 L/min.)

B .1 - 4 gpm (0,4 - 15 L/min.)

C .1 - 6 gpm (0,4 - 23 L/min.)

N Buna-N E EPDM

V Viton

No coil 212 DIN 43650-Form A, 12 VDC

224 DIN 43650-Form A, 24 VDC **912** Deutsch DT04-2P, 12 VDC

924 Deutsch DT04-2P, 24 VDC

* Additional coil options are available

© 2023 Sun Hydraulics 83 of 177

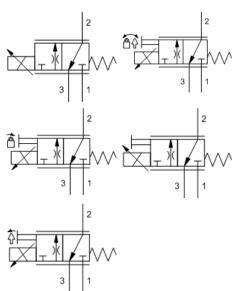


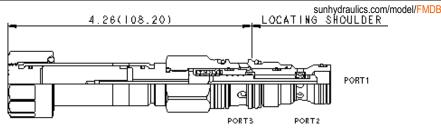


Electro-proportional 3-way flow control valve, meter in

SERIES 1 / CAPACITY: 6 gpm / CAVITY: T-11A







This valve is a 3-way, meter-in, electro-proportional throttle. The flow path, unenergized, has the supply blocked at port 1 and port 2 connected to tank at port 3. Energizing the coil generates a closing force on the spool, creating a metering orifice in the 1 to 2 direction that is proportional to the coil command current. The valve self-compensates in the 1 to 2 direction and with the addition of an external compensator will provide pressure compensated flow control. Flow in the 2 to 3 direction is not proportional.

TECHNICAL DATA

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

Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Manual Override Force Requirement	5 lbs/1000 psi @ Port 1
Manual Override Stroke	.10 in.
Seal kit - Cartridge	Buna: 990411007
Seal kit - Cartridge	Viton: 990411006

NOTES

Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances.

CONFIGURATION OPTIONS

Model Code Example: FMDBXCN

CONTROL (X) FLOW RATE (C) SEAL MATERIAL (N) COIL *

X No	Manual	Override

- D Twist/Lock (Dual) Manual Override
- E Twist (Extended) Manual Override
- L Twist/Lock (Detent) Manual Override
- M Manual Override
- T Twist (Momentary) Manual Override

C .1 - 6 gpm (0,4 - 23 L/min.) **A** .1 - 1.6 gpm (0,4 - 6.1 L/min.)

B .1 - 4 gpm (0,4 - 15 L/min.)

N Buna-N V Viton

212 DIN 43650-Form A, 12 VDC 224 DIN 43650-Form A, 24 VDC 912 Deutsch DT04-2P, 12 VDC

924 Deutsch DT04-2P, 24 VDC

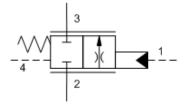
* Additional coil options are available

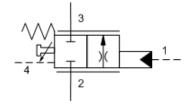
© 2023 Sun Hydraulics 84 of 177

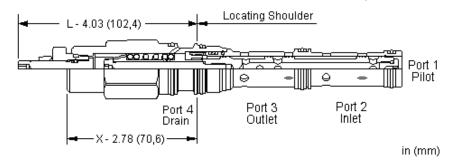
SERIES 2 / CAPACITY: 15 gpm / CAVITY: T-52AD



sunhydraulics.com/model/FTCA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 opposes the spring and creates a variable metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

The valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

TECHNICAL DATA

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

/LH Mild Steel, Zinc-Nickel

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 in³/min.@1000 psi
Pilot Volume Displacement	.05 in ³
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Hysteresis	35 %
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990152007
Seal kit - Cartridge	Viton: 990152006

NOTES When installed in Sun's standard T-52A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

L Stroke Adjustment

Model Code Example: FTCAXCN

CONTROL (X)	SPOOL CONFIGURATION (C)	SEAL MATERIAL (N)	MATERIAL/COATING
X Not Adjustable	C Normally Closed	N Buna-N	Standard Material/Coating

V Viton

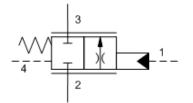
© 2023 Sun Hydraulics 85 of 177

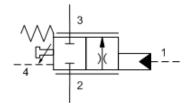


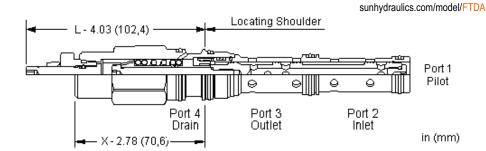
MODEL FTDA

2-way, pilot-shifted, dual path, proportional throttle SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-52AD









This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 opposes the spring and creates a variable metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

The valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 in³/min.@1000 psi
Pilot Volume Displacement	.05 in ³
Hysteresis	35 %
Seal kit - Cartridge	Buna: 990152007
Seal kit - Cartridge	Viton: 990152006

NOTES

When installed in Sun's standard T-52A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTDAXCN

CONTROL	(X)	SPOOL CONFIGURATION	(C)	SEAL MATERIAL	(N)
X Not Adjustable		C Normally Closed		N Buna-N	
L Stroke Adjustment				V Viton	

© 2023 Sun Hydraulics 86 of 177

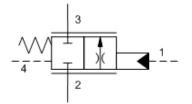


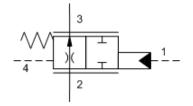


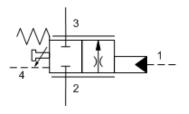
2-way, pilot-shifted, dual path, proportional throttle SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-53AD

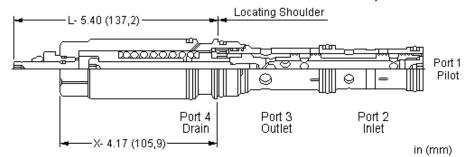


sunhydraulics.com/model/FTEA









This valve is a 2-way, 2-position proportional throttle. Pilot pressure at port 1 opposes the spring and creates a variable metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

The valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 in ³ /min.@1000 psi
Pilot Volume Displacement	.10 in ³
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Hysteresis	35 %
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990053007
Seal kit - Cartridge	Viton: 990053006

NOTES

When installed in Sun's standard T-53A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTEAXCN

CONTROL	(X) SPOOL CONFIGURATION	(C) SEAL MATERIAL	(N)
X Not Adjustable	C Normally Closed	N Buna-N	
L Stroke Adjustment	H Normally Open	V Viton	

© 2023 Sun Hydraulics 87 of 177

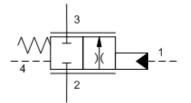


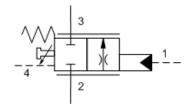


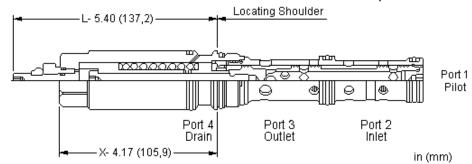
2-way, pilot-shifted, dual path, proportional throttle SERIES 3 / CAPACITY: 50 gpm / CAVITY: T-53AD



sunhydraulics.com/model/FTFA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 opposes the spring and creates a variable metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

The valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 in³/min.@1000 psi
Pilot Volume Displacement	.10 in ³
Adjustment - No. of CCW Turns from Fully Closed to Fully Open	5
Hysteresis	35 %
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990053007
Seal kit - Cartridge	Viton: 990053006

NOTES

When installed in Sun's standard T-53A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTFAXCN

CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N) MATERIAL/COATING

X Not AdjustableL Stroke Adjustment

C Normally Closed

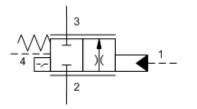
N Buna-NV Viton

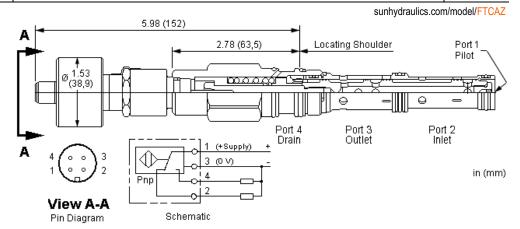
Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 88 of 177

SERIES 2 / CAPACITY: 15 gpm / CAVITY: T-52AD







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The metering passage is self-compensating.

This valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

This valve incorporates a position switch to provide confirmation that the valve is closed.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 in³/min.@1000 psi
Pilot Volume Displacement	.05 in ³
Seal kit - Cartridge	Buna: 990152007
Seal kit - Cartridge	Viton: 990152006

NOTES

When installed in Sun's standard T-52A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTCAZCN

SPOOL CONFIGURATION (C) SEAL MATERIAL (N

C Normally Closed N Buna-N

V Viton

© 2023 Sun Hydraulics 89 of 177

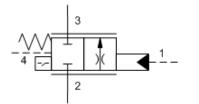


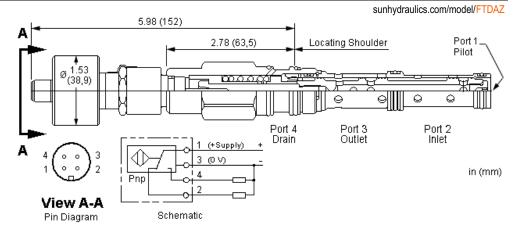


2-way, pilot-shifted, dual path, proportional throttle with position switch

SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-52AD







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The metering passage is self-compensating.

This valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

This valve incorporates a position switch to provide confirmation that the valve is closed.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 in³/min.@1000 psi
Pilot Volume Displacement	.05 in³
Seal kit - Cartridge	Buna: 990152007
Seal kit - Cartridge	Viton: 990152006

NOTES

When installed in Sun's standard T-52A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTDAZCN

SPOOL CONFIGURATION (C) SEAL MATERIAL

(N)

C Normally Closed

N Buna-N V Viton

© 2023 Sun Hydraulics 90 of 177

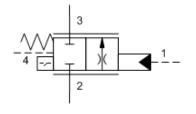


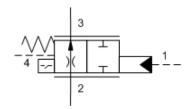


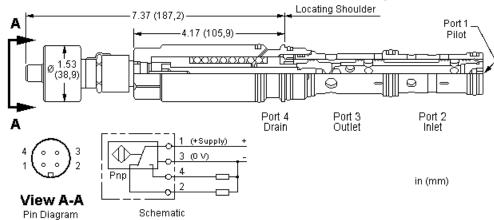
2-way, pilot-shifted, dual path, proportional throttle with position switch SERIES 3 / CAPACITY: 25 gpm / CAVITY: T-53AD











This valve is a 2-way, 2-position proportional throttle. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The metering passage is self-compensating.

This valve uses a dual-path design, Ports 2 and 3 incorporate a double-port area.

This valve incorporates a position switch to provide position confirmation.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 in³/min.@1000 psi
Pilot Volume Displacement	.10 in ³
Seal kit - Cartridge	Buna: 990053007
Seal kit - Cartridge	Viton: 990053006

NOTES

When installed in Sun's standard T-53A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTEAZCN

SPOOL CONFIGURATION (C) SEAL MATERIAL (N

C Normally Closed N Buna-N

H Normally Open V Viton

© 2023 Sun Hydraulics 91 of 177

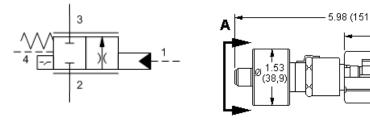


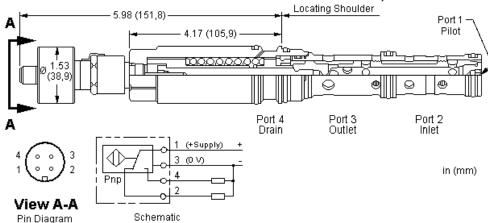
2-way, pilot-shifted, dual path, proportional throttle with position switch

SERIES 3 / CAPACITY: 50 gpm / CAVITY: T-53AD



sunhydraulics.com/model/F





This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The metering passage is self-compensating.

This valve uses a dual-path design. Ports 2 and 3 incorporate a double-port area.

This valve incorporates a position switch to provide confirmation that the valve is closed.

TECHNICAL DATA

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

Pilot Pressure Required for Full Shift at Rated Flow	290 - 340 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 in³/min.@1000 psi
Pilot Volume Displacement	.10 in ³
Seal kit - Cartridge	Buna: 990053007
Seal kit - Cartridge	Viton: 990053006

NOTES

When installed in Sun's standard T-53A line mount manifold, plug unused ports and expect higher pressure drops.

CONFIGURATION OPTIONS

Model Code Example: FTFAZCN

SPOOL CONFIGURATION (C)
C Normally Closed

N Buna-N
V Viton

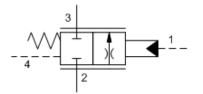
© 2023 Sun Hydraulics 92 of 177

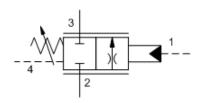
2-way, pilot-shifted, proportional throttle

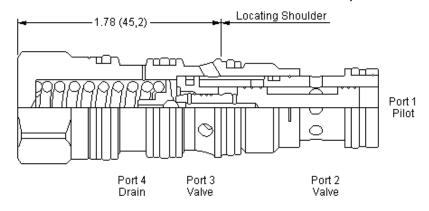
SERIES 1 / CAPACITY: 5 gpm / CAVITY: T-21A



sunhydraulics.com/model/FKBA







in (mm)

This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Pilot Volume Displacement	.02 in ³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006

CONFIGURATION OPTIONS

Model Code Example: FKBAXCN

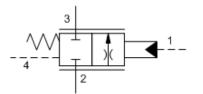
CONTROL	(X) SPOOL CONFIGURATION	ON (C) SEAL MATERIAL	(N) MATERIAL/COATING	
X Not Adjustable	C Normally Closed	N Buna-N	Standard Material/Coating	
L Tuning Adjustment		E EPDM	/AP Stainless Steel, Passivated	

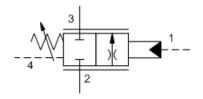
V Viton

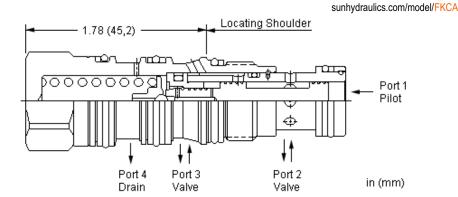
© 2023 Sun Hydraulics 93 of 177

SERIES 1 / CAPACITY: 9 gpm / CAVITY: T-21A









This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Pilot Volume Displacement	.02 in ³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006

CONFIGURATION OPTIONS

Model Code Example: FKCAXCN

CONTROL	(X) SPOOL CONFIGURATION	(C) SEAI	L MATERIAL	(N)
X Not Adjustable	C Normally Closed	N E	Buna-N	
L Tuning Adjustment			/iton	

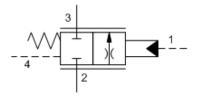
© 2023 Sun Hydraulics 94 of 177

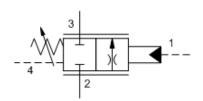
MODEL FKDA 2-way, pilot-shifted, proportional throttle

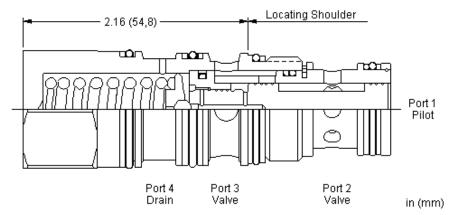
SERIES 2 / CAPACITY: 10 gpm / CAVITY: T-22A



sunhydraulics.com/model/FKDA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Pilot Volume Displacement	.03 in ³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990022002
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006

CONFIGURATION OPTIONS

Model Code Example: FKDAXCN

CONTROL	(X) SPOOL CONFIGURATION	(C) SEAL MATERIAL	(N)
X Not Adjustable	C Normally Closed	N Buna-N	
L Tuning Adjustment		V Viton	

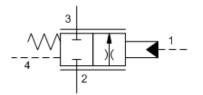
© 2023 Sun Hydraulics 95 of 177

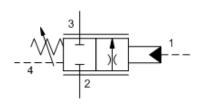


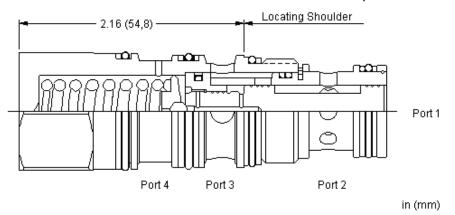
2-way, pilot-shifted, proportional throttle, high capacity SERIES 2 / CAPACITY: 20 gpm / CAVITY: T-22A



sunhydraulics.com/model/FKEA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Pilot Volume Displacement	.30 in ³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990022002
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006

CONFIGURATION OPTIONS

Model Code Example: FKEAXCN

CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N)

X Not Adjustable C Normally Closed N Buna-N

L Tuning Adjustment V Viton

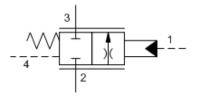
© 2023 Sun Hydraulics 96 of 177

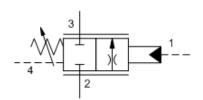
2-way, pilot-shifted, proportional throttle

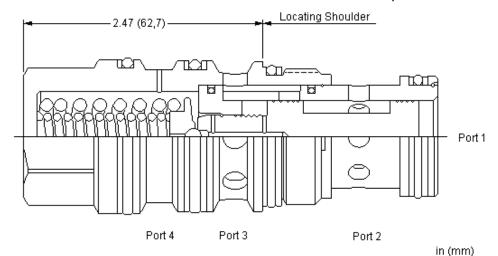
SERIES 3 / CAPACITY: 20 gpm / CAVITY: T-23A



sunhydraulics.com/model/FKFA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	4 in³/min.@1000 psi
Pilot Volume Displacement	.10 in³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006

CONFIGURATION OPTIONS

Model Code Example: FKFAXCN

CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N)

X Not Adjustable C Normally Closed N Buna-N

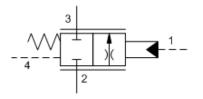
L Tuning Adjustment V Viton

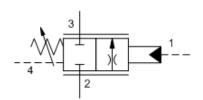
© 2023 Sun Hydraulics 97 of 177

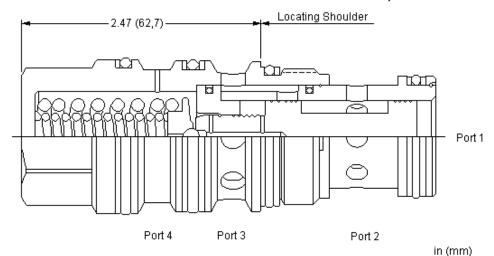
SERIES 3 / CAPACITY: 30 gpm / CAVITY: T-23A



sunhydraulics.com/model/FKGA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	4 in³/min.@1000 psi
Pilot Volume Displacement	.10 in³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	±2%
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006

CONFIGURATION OPTIONS

Model Code Example: FKGAXCN

CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N)

X Not Adjustable
C Normally Closed
N Buna-N
E EPDM
V Viton

© 2023 Sun Hydraulics 98 of 177

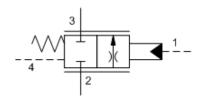


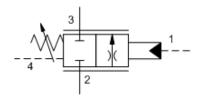


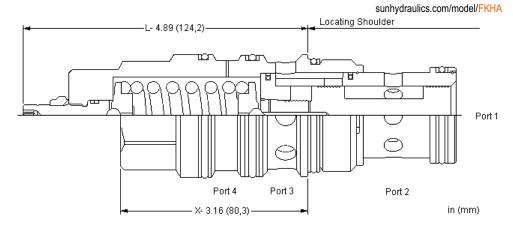
2-way, pilot-shifted, proportional throttle

SERIES 4 / CAPACITY: 40 gpm / CAVITY: T-24A









This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	6 in³/min.@1000 psi
Pilot Volume Displacement	.20 in ³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006

CONFIGURATION OPTIONS

Model Code Example: FKHAXCN

CONTROL	(X) SPOOL CONFIGURATION	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C Normally Closed	N Buna-N	Standard Material/Coating
L Tuning Adjustment		V Viton	/AP Stainless Steel, Passivated

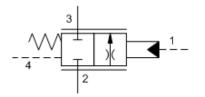
© 2023 Sun Hydraulics 99 of 177

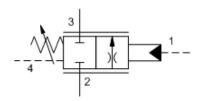


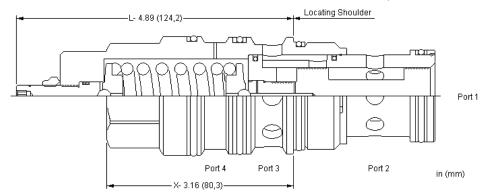
MODEL FKIA 2-way, pilot-shifted, proportional throttle, high capacity SERIES 4 / CAPACITY: 60 gpm / CAVITY: T-24A



sunhydraulics.com/model/FKIA







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	6 in³/min.@1000 psi
Pilot Volume Displacement	.20 in ³
Minimum Pilot Pressure to Operate	100 psi
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006

CONFIGURATION OPTIONS

Model Code Example: FKIAXCN

CONTROL	(X)	SPOOL CONFIGURATION (C)	SEAL MATERIAL	(N)	MATERIAL/COATING	_
X Not Adjustable		C Normally Closed		N Buna-N		Standard Material/Coating	
L Tuning Adjustment				V Viton		/AP Stainless Steel, Passivated	

© 2023 Sun Hydraulics 100 of 177



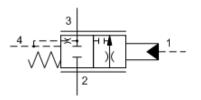


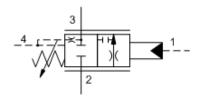
2-way, pilot-shifted, proportional throttle with bleed down

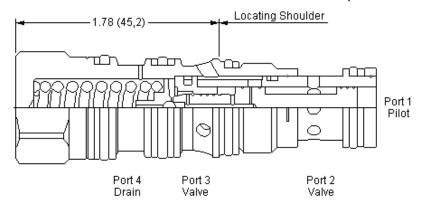
SERIES 1 / CAPACITY: 5 gpm / CAVITY: T-21A



sunhydraulics.com/model/FKBB







in (mm)

This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi		
Pilot Volume Displacement	.02 in ³		
Minimum Pilot Pressure to Operate	100 psi		
Bypass orifice	.03 in.		
Hysteresis	± 2 %		
Adjustment - No. of CW Turns from Min. to Max. setting	5		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990021007		
Seal kit - Cartridge	Polyurethane: 990021002		
Seal kit - Cartridge	Viton: 990021006		

CONFIGURATION OPTIONS

Model Code Example: FKBBXCN

CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

L Tuning Adjustment

C Normally Closed

N Buna-N V Viton Standard Material/Coating

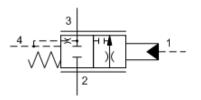
/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

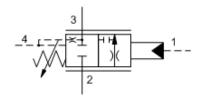
© 2023 Sun Hydraulics 101 of 177

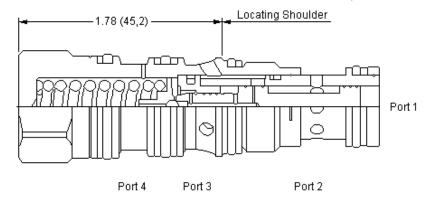
SERIES 1 / CAPACITY: 9 gpm / CAVITY: T-21A



sunhydraulics.com/model/FKCB







in (mm)

This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi		
Pilot Volume Displacement	.02 in ³		
Minimum Pilot Pressure to Operate	100 psi		
Bypass orifice	.03 in.		
Hysteresis	± 2 %		
Adjustment - No. of CW Turns from Min. to Max. setting	5		
Locknut Hex Size	9/16 in.		
Locknut Torque	80 - 90 lbf in.		
Seal kit - Cartridge	Buna: 990021007		
Seal kit - Cartridge	Polyurethane: 990021002		
Seal kit - Cartridge	Viton: 990021006		

CONFIGURATION OPTIONS

Model Code Example: FKCBXCN

 CONTROL
 (X)
 SPOOL CONFIGURATION
 (C)
 SEAL MATERIAL
 (N

 X
 Not Adjustable
 C
 Normally Closed
 N
 Buna-N

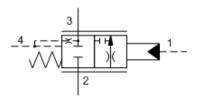
 L
 Standard Screw Adjustment
 V
 V Viton

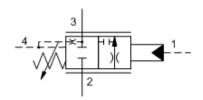
© 2023 Sun Hydraulics 102 of 177

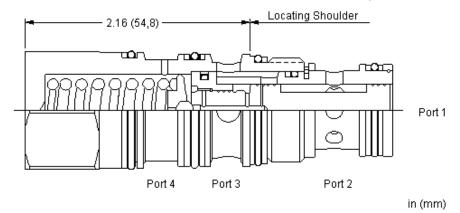
SERIES 2 / CAPACITY: 10 gpm / CAVITY: T-22A



sunhydraulics.com/model/FKDB







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi	
Pilot Volume Displacement	.30 in ³	
Minimum Pilot Pressure to Operate	100 psi	
Bypass orifice	.03 in.	
Hysteresis	± 2 %	
Adjustment - No. of CW Turns from Min. to Max. setting	5	
Locknut Hex Size	9/16 in.	
Locknut Torque	80 - 90 lbf in.	
Seal kit - Cartridge	Buna: 990022002	
Seal kit - Cartridge	Polyurethane: 990022002	
Seal kit - Cartridge	Viton: 990022006	

CONFIGURATION OPTIONS

Model Code Example: FKDBXCN

 CONTROL
 (X)
 SPOOL CONFIGURATION
 (C)
 SEAL MATERIAL
 (N)

 X
 Not Adjustable
 C
 Normally Closed
 N
 Buna-N

 L
 Tuning Adjustment
 V
 Viton

© 2023 Sun Hydraulics 103 of 177

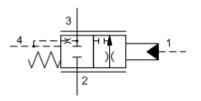


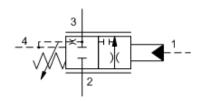
2-way, pilot-shifted, proportional throttle with bleed down, high capacity

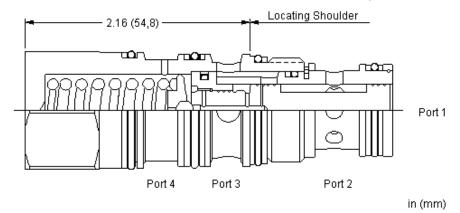
SERIES 2 / CAPACITY: 20 gpm / CAVITY: T-22A



sunhydraulics.com/model/FKEB







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi	
Pilot Volume Displacement	.30 in ³	
Minimum Pilot Pressure to Operate	100 psi	
Bypass orifice	.03 in.	
Hysteresis	± 2 %	
Adjustment - No. of CW Turns from Min. to Max. setting	5	
Locknut Hex Size	9/16 in.	
Locknut Torque	80 - 90 lbf in.	
Seal kit - Cartridge	Buna: 990022002	
Seal kit - Cartridge	Polyurethane: 990022002	
Seal kit - Cartridge	Viton: 990022006	

CONFIGURATION OPTIONS

Model Code Example: FKEBXCN

 CONTROL
 (X)
 SPOOL CONFIGURATION
 (C)
 SEAL MATERIAL
 (N)

 X
 Not Adjustable
 C
 Normally Closed
 N
 Buna-N

 L
 Tuning Adjustment
 V
 Viton

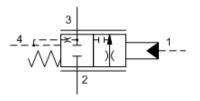
© 2023 Sun Hydraulics 104 of 177

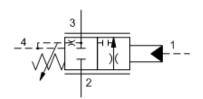
2-way, pilot-shifted, proportional throttle with bleed down

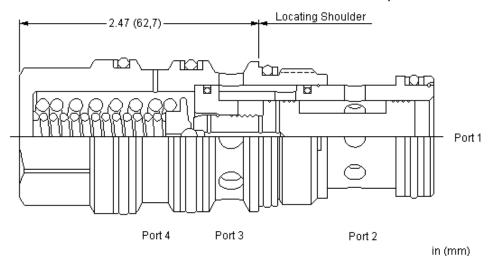
SERIES 3 / CAPACITY: 20 gpm / CAVITY: T-23A



sunhydraulics.com/model/FKFB







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	4 in³/min.@1000 psi
Pilot Volume Displacement	.10 in ³
Minimum Pilot Pressure to Operate	100 psi
Bypass orifice	.03 in.
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006

CONFIGURATION OPTIONS

Model Code Example: FKFBXCN

CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N

X Not Adjustable
L Tuning Adjustment

C Normally Closed

N Buna-N
E EPDM

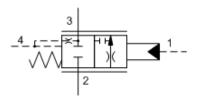
V Viton

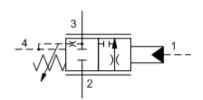
© 2023 Sun Hydraulics 105 of 177

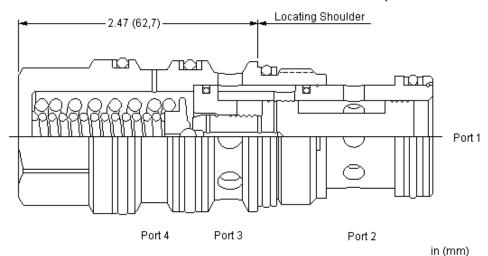
SERIES 3 / CAPACITY: 30 gpm / CAVITY: T-23A



sunhydraulics.com/model/FKGB







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	4 in³/min.@1000 psi
Pilot Volume Displacement	.10 in ³
Minimum Pilot Pressure to Operate	100 psi
Bypass orifice	.03 in.
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006

CONFIGURATION OPTIONS

Model Code Example: FKGBXCN

 CONTROL
 (X)
 SPOOL CONFIGURATION
 (C)
 SEAL MATERIAL
 (N)

 X Not Adjustable
 C Normally Closed
 N Buna-N

 L Tuning Adjustment
 V Viton

© 2023 Sun Hydraulics 106 of 177

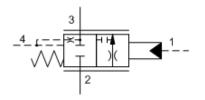


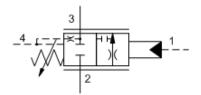


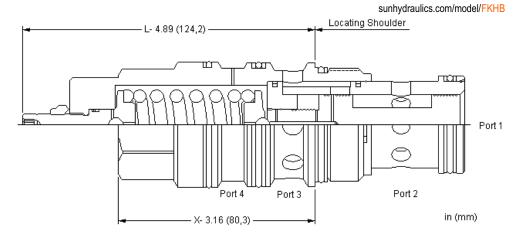
2-way, pilot-shifted, proportional throttle with bleed down

SERIES 4 / CAPACITY: 40 gpm / CAVITY: T-24A









This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	6 in³/min.@1000 psi
Pilot Volume Displacement	.20 in ³
Minimum Pilot Pressure to Operate	100 psi
Bypass orifice	.03 in.
Hysteresis	± 2 %
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006

CONFIGURATION OPTIONS

Model Code Example: FKHBXCN

V Viton

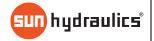
 CONTROL
 (X)
 SPOOL CONFIGURATION
 (C)
 SEAL MATERIAL
 (N)

 X
 Not Adjustable
 C
 Normally Closed
 N
 Buna-N

 L
 Tuning Adjustment
 E
 EPDM

L Tuning Adjustment

© 2023 Sun Hydraulics 107 of 177



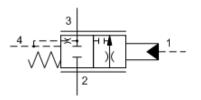


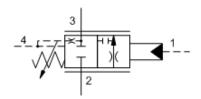
2-way, pilot-shifted, proportional throttle with bleed down, high capacity

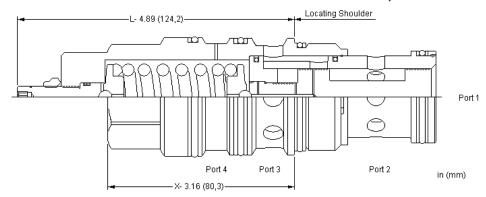
SERIES 4 / CAPACITY: 60 gpm / CAVITY: T-24A



sunhydraulics.com/model/FKIB







This valve is a 2-way, 2-position proportional throttle. Ports 2 and 3 are normally closed. Pilot pressure at port 1 creates a metering orifice between port 2 and 3 that is proportional to the pressure at 1. The force balance of the flow forces, spring and pilot pressure results in a degree of partial self-compensation as the load pressure changes.

This valve includes a bleed-down feature which connects ports 3 to 4 in the spring-biased position. The bleed-down feature is useful when the valve is used as a meter-in flow control in circuits which include counterbalance valves downstream of port 3. The bleed-down connection is closed as the valve is piloted with increasing pressure at port 1.

Pressure at port 4 directly opposes pressure at port 1.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Maximum Valve Leakage at 110 SUS (24 cSt)	6 in³/min.@1000 psi	
Pilot Volume Displacement	.20 in ³	
Minimum Pilot Pressure to Operate	100 psi	
Bypass orifice	.03 in.	
Hysteresis	± 2 %	
Adjustment - No. of CW Turns from Min. to Max. setting	5	
Locknut Hex Size	9/16 in.	
Locknut Torque	80 - 90 lbf in.	
Seal kit - Cartridge	Buna: 990024007	
Seal kit - Cartridge	EPDM: 990024014	
Seal kit - Cartridge	Polyurethane: 990024002	
Seal kit - Cartridge	Viton: 990024006	

CONFIGURATION OPTIONS

Model Code Example: FKIBXCN

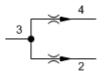
CONTROL (X) SPOOL CONFIGURATION (C) SEAL MATERIAL (N) X Not Adjustable C Normally Closed N Buna-N L Tuning Adjustment **E** EPDM V Viton

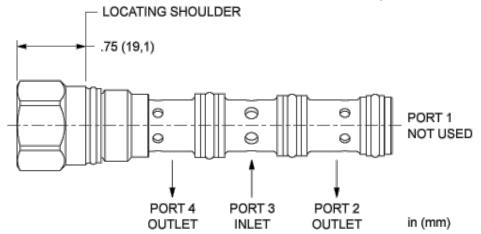
© 2023 Sun Hydraulics 108 of 177 Flow divider valve

SERIES 1 / CAPACITY: 1.5 - 8 gpm / CAVITY: T-31A



sunhydraulics.com/model/FSCD





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.

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Rated Input Flow with 50/50 Split	1.5 - 8 gpm
Rated Input Flow with 40/60 Split	1.4 - 7 gpm
Rated Input Flow with 33/67 Split	1.2 - 6 gpm
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

Model Code Example: FSCDXAN

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

© 2023 Sun Hydraulics 109 of 177



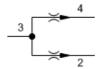
MODEL FSDD

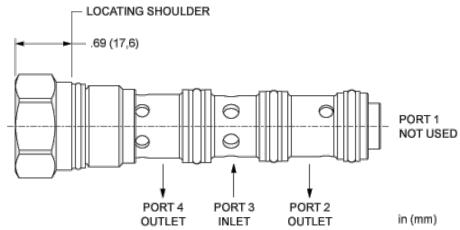
Flow divider valve

SERIES 2 / CAPACITY: 3 - 15 gpm / CAVITY: T-32A



sunhydraulics.com/model/FSDD





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.

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Rated Input Flow with 50/50 Split	3 - 15 gpm
Rated Input Flow with 40/60 Split	2.5 - 12.5 gpm
Rated Input Flow with 33/67 Split	2.2 - 11 gpm
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: FSDDXAN

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

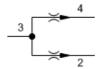
© 2023 Sun Hydraulics 110 of 177

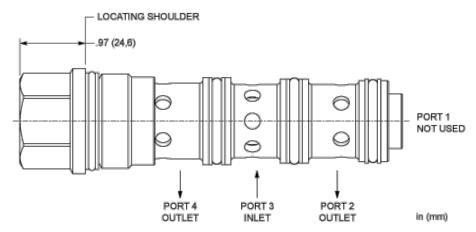
Flow divider valve

SERIES 3 / CAPACITY: 6 - 30 gpm / CAVITY: T-33A



sunhydraulics.com/model/FSED





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.

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Rated Input Flow with 50/50 Split	6 - 30 gpm
Rated Input Flow with 40/60 Split	5 - 25 gpm
Rated Input Flow with 33/67 Split	4.4 - 22 gpm
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: FSEDXAN

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

© 2023 Sun Hydraulics 111 of 177



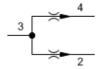


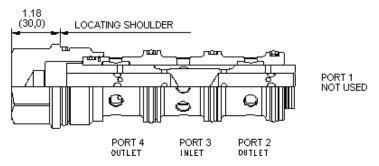
Flow divider valve

SERIES 4 / CAPACITY: 12 - 60 gpm / CAVITY: T-34A



sunhydraulics.com/model/FSFD





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.

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	±6.5%
Divisional Accuracy at Max Input Flow	±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Rated Input Flow with 50/50 Split	12 - 60 gpm
Rated Input Flow with 40/60 Split	10 - 50 gpm
Rated Input Flow with 33/67 Split	9 - 45 gpm
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

D 25/75

Model Code Example: FSFDXAN

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

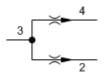
© 2023 Sun Hydraulics 112 of 177

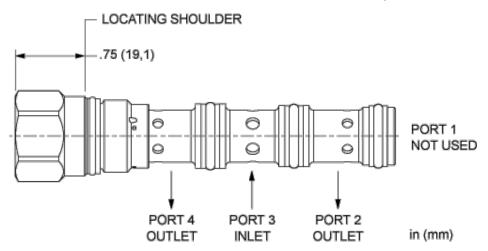
High accuracy flow divider valve

SERIES 1 / CAPACITY: .6 - 3 gpm / CAVITY: T-31A



sunhydraulics.com/model/FSBD





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.

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	±4.5%
Divisional Accuracy at Max Input Flow	±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Rated Input Flow with 50/50 Split	.6 - 3 gpm
Rated Input Flow with 40/60 Split	.5 - 2.5 gpm
Rated Input Flow with 33/67 Split	.45 - 2.2 gpm
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

Model Code Example: FSBDXAN

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

113 of 177 © 2023 Sun Hydraulics

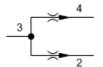
MODEL FSDC

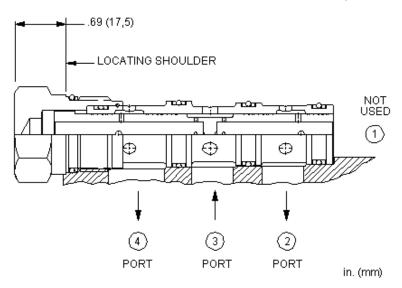
High accuracy flow divider valve

SERIES 2 / CAPACITY: 1.5 - 8 gpm / CAVITY: T-32A



sunhydraulics.com/model/FSDC





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.

Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: FSDCXAN

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

© 2023 Sun Hydraulics 114 of 177



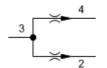
MODEL FSEC

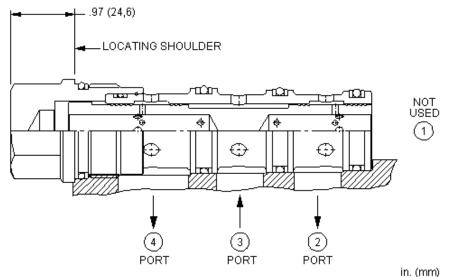
High accuracy flow divider valve

SERIES 3 / CAPACITY: 3 - 15 gpm / CAVITY: T-33A



sunhydraulics.com/model/FSEC





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.

Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: FSECXAN

CC	ONTROL (X	() FLOW SPLIT	(A)	SEAL MATERIAL (N	MATERIAL/COATING	-
X		A 50/50		N Buna-N	Standard Material/Coating	l
				V Viton	/AP Stainless Steel, Passivated	

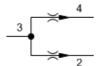
© 2023 Sun Hydraulics 115 of 177

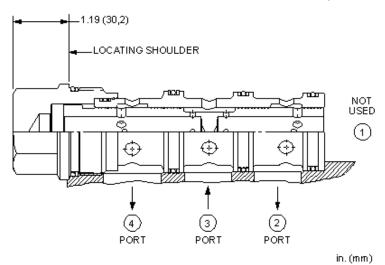
High accuracy flow divider valve

SERIES 4 / CAPACITY: 6 - 30 gpm / CAVITY: T-34A



sunhydraulics.com/model/FSFC





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.

Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	250 psi
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

Model Code Example: FSFCXAN

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

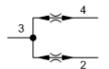
© 2023 Sun Hydraulics 116 of 177

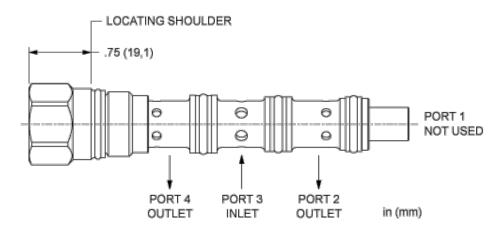
Closed center, flow divider-combiner valve

SERIES 1 / CAPACITY: 1.5 - 8 gpm / CAVITY: T-31A



sunhydraulics.com/model/FSCA





Closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

Model Code Example: FSCAXAN

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

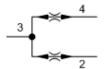
© 2023 Sun Hydraulics 117 of 177

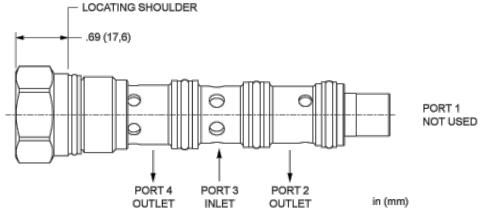
Closed center, flow divider-combiner valve

SERIES 2 / CAPACITY: 3 - 15 gpm / CAVITY: T-32A



sunhydraulics.com/model/FSDA





Closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	EPDM: 990032014
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: FSDAXAN

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

118 of 177 © 2023 Sun Hydraulics



MODEL FSEA

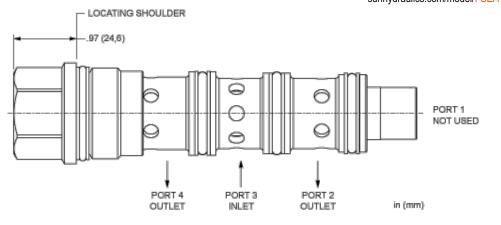
Closed center, flow divider-combiner valve

SERIES 3 / CAPACITY: 6 - 30 gpm / CAVITY: T-33A



3 = 4





Closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: FSEAXAN

 CONTROL
 (X)
 FLOW SPLIT
 (A)
 SEAL MATERIAL
 (N)

 X Not Adjustable
 A 50/50
 N Buna-N

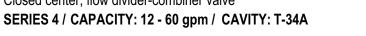
 V Viton

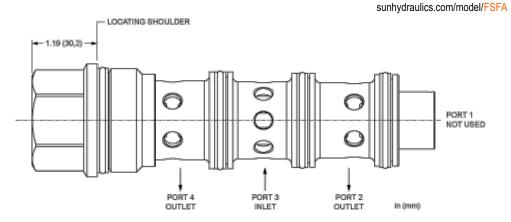
© 2023 Sun Hydraulics 119 of 177



Closed center, flow divider-combiner valve







Closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

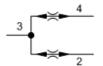
Model Code Example: FSFAXAN

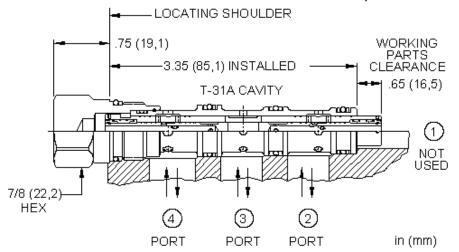
CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N)	MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N		Standard Material/Coating
		V Viton		

© 2023 Sun Hydraulics 120 of 177



sunhydraulics.com/model/FSAA





High accuracy, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±3.5%
Divisional Accuracy at Max Input Flow	50% ±2.0%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

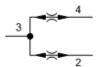
Model Code Example: FSAAXAN

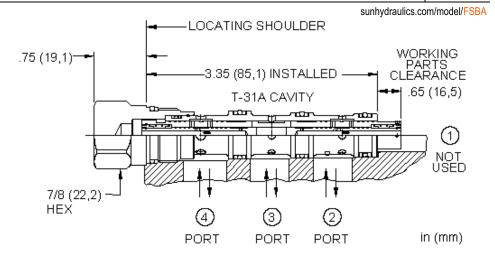
CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N)	MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N		Standard Material/Coating
		E EPDM		/AP Stainless Steel, Passivated
		V Viton		

© 2023 Sun Hydraulics 121 of 177

High accuracy, closed center, flow divider-combiner valve SERIES 1 / CAPACITY: .6 - 3 gpm / CAVITY: T-31A







Closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±3.0%
Divisional Accuracy at Max Input Flow	50% ±2.0%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

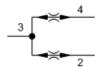
Model Code Example: FSBAXAN

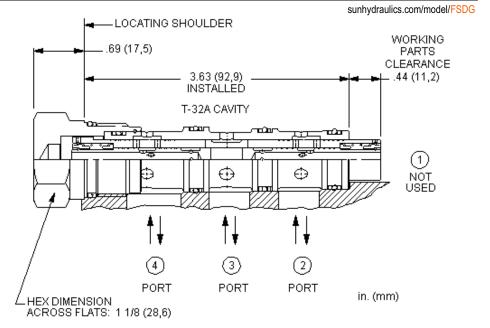
CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N	Standard Material/Coating
	-	V Viton	/AP Stainless Steel, Passivated
			/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 122 of 177

SERIES 2 / CAPACITY: 1.5 - 8 gpm / CAVITY: T-32A







High accuracy, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

/LH Mild Steel, Zinc-Nickel

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±2.5%
Divisional Accuracy at Max Input Flow	50% ±1.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: FSDGXAN

V Viton

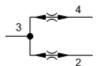
 CONTROL
 (X)
 FLOW SPLIT
 (A)
 SEAL MATERIAL
 (N)
 MATERIAL/COATING

 X
 Not Adjustable
 A 50/50
 N Buna-N
 Standard Material/Coating

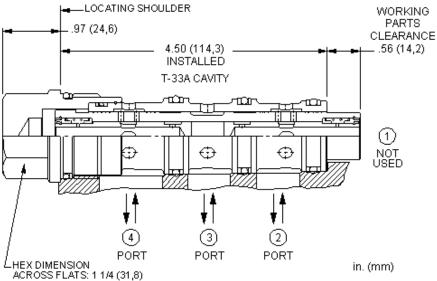
© 2023 Sun Hydraulics 123 of 177

SERIES 3 / CAPACITY: 3 - 15 gpm / CAVITY: T-33A









High accuracy, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±2.5%
Divisional Accuracy at Max Input Flow	50% ±1.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge Buna: 990033007	
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge Viton: 990033006	

CONFIGURATION OPTIONS

Model Code Example: FSEGXAN

 CONTROL
 (X)
 FLOW SPLIT
 (A)
 SEAL MATERIAL
 (N)

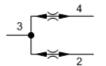
 X
 Not Adjustable
 A 50/50
 N Buna-N
 V Viton

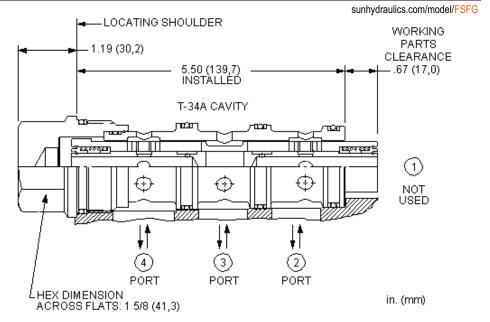
© 2023 Sun Hydraulics 124 of 177

High accuracy, closed center, flow divider-combiner valve

SERIES 4 / CAPACITY: 6 - 30 gpm / CAVITY: T-34A







High accuracy, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves may be used to accurately control two or more cylinders or hydraulic motors where bidirectional operation is required.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi		
Divisional Accuracy at Minimum Input Flow	50% ±2.5%		
Divisional Accuracy at Max Input Flow	50% ±1.5%		
Pressure Drop at Minimum Rated Input Flow	30 psi		
Pressure Drop at Maximum Rated Input Flow	350 psi		
Seal kit - Cartridge	Buna: 990034007		
Seal kit - Cartridge	Polyurethane: 990034002		
Seal kit - Cartridge	Viton: 990034006		

CONFIGURATION OPTIONS

Model Code Example: FSFGXAN

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

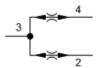
© 2023 Sun Hydraulics 125 of 177

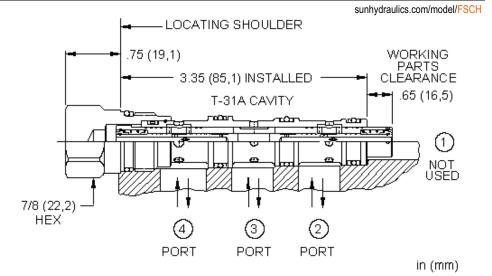


High capacity, closed center, flow divider-combiner valve

SERIES 1 / CAPACITY: 2 - 9 gpm / CAVITY: T-31A







High-capacity, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves have approximate 15% greater capacity than standard closed-center divider/combiners and are designed for use in tractive drive systems. Note: Accuracy on these cartridges is not equivalent to the accuracy of standard closed-center divider/combiners.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±6.5%
Divisional Accuracy at Max Input Flow	50% ±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

Model Code Example: FSCHXAN

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

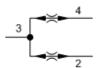
© 2023 Sun Hydraulics 126 of 177

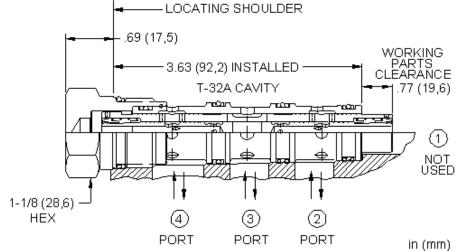


High capacity, closed center, flow divider-combiner valve SERIES 2 / CAPACITY: 4 - 17 gpm / CAVITY: T-32A



sunhydraulics.com/model/FSDH





High-capacity, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves have approximate 15% greater capacity than standard closed-center divider/combiners and are designed for use in tractive drive systems. Note: Accuracy on these cartridges is not equivalent to the accuracy of standard closed-center divider/combiners.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±6.5%
Divisional Accuracy at Max Input Flow	50% ±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: FSDHXAN

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

© 2023 Sun Hydraulics 127 of 177

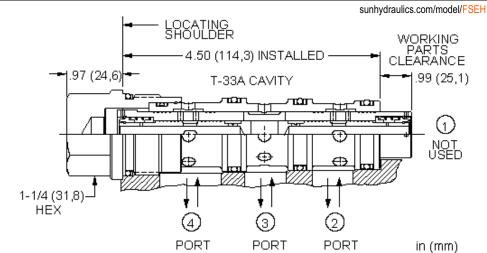




High capacity, closed center, flow divider-combiner valve SERIES 3 / CAPACITY: 8 - 35 gpm / CAVITY: T-33A



3



High-capacity, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves have approximate 15% greater capacity than standard closed-center divider/combiners and are designed for use in tractive drive systems. Note: Accuracy on these cartridges is not equivalent to the accuracy of standard closed-center divider/combiners.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±6.5%
Divisional Accuracy at Max Input Flow	50% ±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: FSEHXAN

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

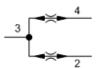
© 2023 Sun Hydraulics 128 of 177

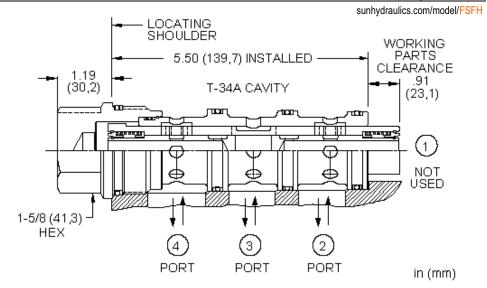


High capacity, closed center, flow divider-combiner valve

SERIES 4 / CAPACITY: 15 - 70 gpm / CAVITY: T-34A







High-capacity, closed-center flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. These valves have approximate 15% greater capacity than standard closed-center divider/combiners and are designed for use in tractive drive systems. Note: Accuracy on these cartridges is not equivalent to the accuracy of standard closed-center divider/combiners.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±6.5%
Divisional Accuracy at Max Input Flow	50% ±3.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

Model Code Example: FSFHXAN

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N	Standard Material/Coating
	-	V Viton	/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 129 of 177

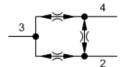


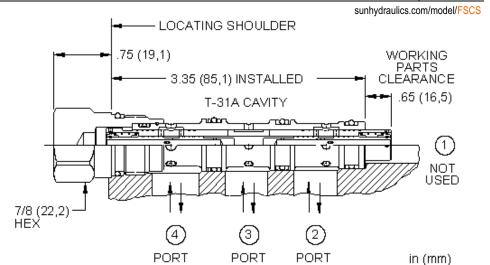
MODEL FSCS

Synchronizing, flow divider-combiner valve

SERIES 1 / CAPACITY: 1.5 - 8 gpm / CAVITY: T-31A







Synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

Model Code Example: FSCSXAN

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

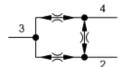
© 2023 Sun Hydraulics 130 of 177

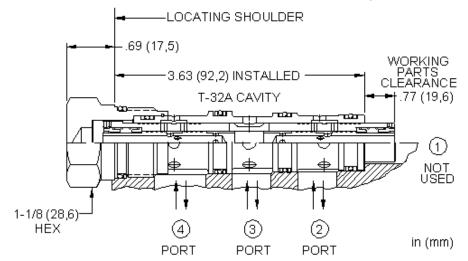
Synchronizing, flow divider-combiner valve

SERIES 2 / CAPACITY: 3 - 15 gpm / CAVITY: T-32A



sunhydraulics.com/model/FSDS





Synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: FSDSXAN

(A) SEAL MATERIAL CONTROL (X) FLOW SPLIT (N) MATERIAL/COATING

N Buna-N X Not Adjustable Standard Material/Coating V Viton /AP Stainless Steel, Passivated

/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 131 of 177

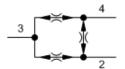




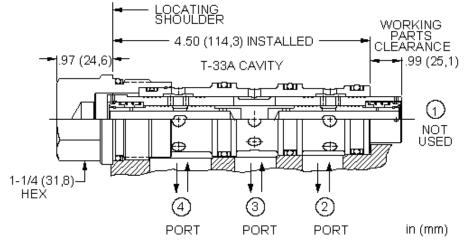
Synchronizing, flow divider-combiner valve

SERIES 3 / CAPACITY: 6 - 30 gpm / CAVITY: T-33A









Synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: FSESXAN

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

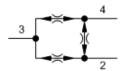
© 2023 Sun Hydraulics 132 of 177

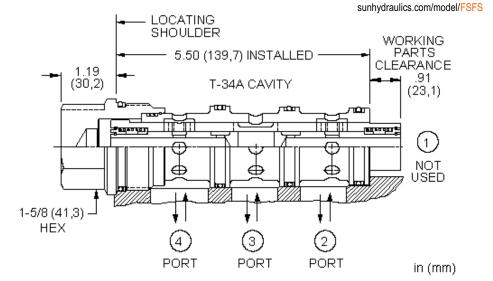


Synchronizing, flow divider-combiner valve

SERIES 4 / CAPACITY: 12 - 60 gpm / CAVITY: T-34A







Synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±4.5%
Divisional Accuracy at Max Input Flow	50% ±2.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

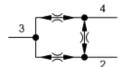
Model Code Example: FSFSXAN

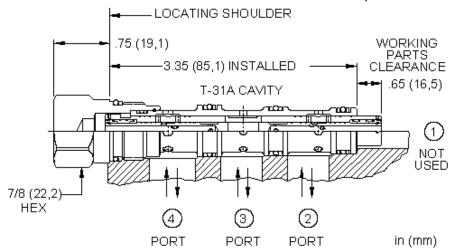
CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N) MATERIAL/CO	DATING
X Not Adjustable	A 50/50	N Buna-N	Standard I	Material/Coating
		V Viton	/AP Stainless	Steel, Passivated

© 2023 Sun Hydraulics 133 of 177



sunhydraulics.com/model/FSAS





High accuracy, synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±3.5%
Divisional Accuracy at Max Input Flow	50% ±2.0%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006

CONFIGURATION OPTIONS

Model Code Example: FSASXAN

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

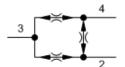
© 2023 Sun Hydraulics 134 of 177

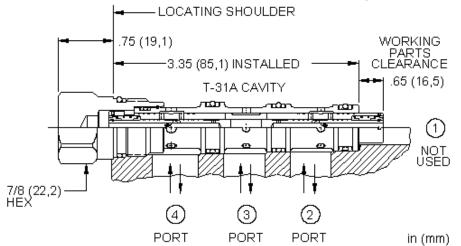


High accuracy synchronizing, flow divider-combiner valve SERIES 1 / CAPACITY: .6 - 3 gpm / CAVITY: T-31A



sunhydraulics.com/model/FSBS





Synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Divisional Accuracy at Minimum Input Flow	50% ±3.0%	
Divisional Accuracy at Max Input Flow	50% ±2.0%	
Pressure Drop at Minimum Rated Input Flow	30 psi	
Pressure Drop at Maximum Rated Input Flow	350 psi	
Seal kit - Cartridge	Buna: 990031007	
Seal kit - Cartridge	Polyurethane: 990031002	
Seal kit - Cartridge	Viton: 990031006	

CONFIGURATION OPTIONS

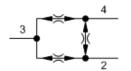
Model Code Example: FSBSXAN

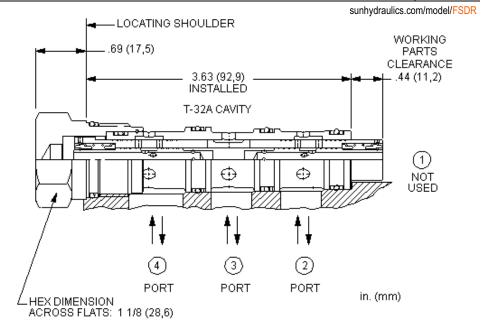
CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N)	MATERIAL/COATING	
X Not Adjustable	A 50/50	N Buna-N		Standard Material/Coating	
<u> </u>		V Viton		/AP Stainless Steel, Passivated	
				/LH Mild Steel, Zinc-Nickel	

© 2023 Sun Hydraulics 135 of 177

SERIES 2 / CAPACITY: 1.5 - 8 gpm / CAVITY: T-32A







High accuracy, synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±3.0%
Divisional Accuracy at Max Input Flow	50% ±2.0%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

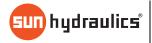
Model Code Example: FSDRXAN

 CONTROL
 (X)
 FLOW SPLIT
 (A)
 SEAL MATERIAL
 (N)
 MATERIAL/COATING

 X
 Not Adjustable
 A 50/50
 N Buna-N
 Standard Material/Coating

V Viton /AP Stainless Steel, Passivated

© 2023 Sun Hydraulics 136 of 177

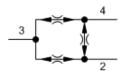


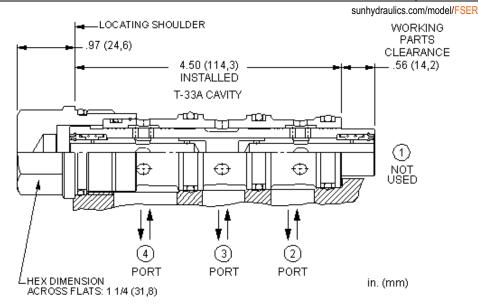


High accuracy synchronizing, flow divider-combiner valve

SERIES 3 / CAPACITY: 3 - 15 gpm / CAVITY: T-33A







High accuracy, synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±2.5%
Divisional Accuracy at Max Input Flow	50% ±1.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: FSERXAN

CONTROL	(X) FLOW SPLIT	(A) SEAL MATERIAL	(N)	MATERIAL/COATING
X Not Adjustable	A 50/50	N Buna-N		Standard Material/Coating
•		V Viton		/LH Mild Steel, Zinc-Nickel

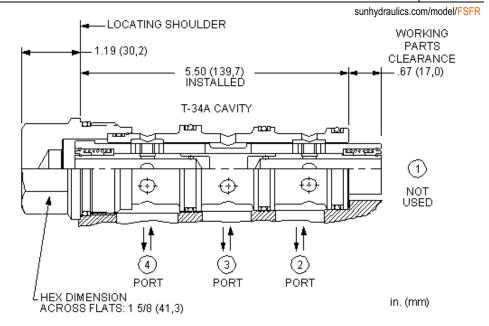
© 2023 Sun Hydraulics 137 of 177





High accuracy synchronizing, flow divider-combiner valve SERIES 4 / CAPACITY: 6 - 30 gpm / CAVITY: T-34A





High accuracy, synchronizing flow divider/combiners are sliding-spool, pressure-compensated devices used to split flow in one direction and combine flow in the opposite direction. With a sychronizing feature, these valves can be used to allow two hydraulic cylinders to fully stroke and synchronize at the end of the stroke. When the first cylinder has reached the end of its stroke, a pressure-compensated, reduced flow is metered to or from the second cylinder until it also reaches the end of its stroke.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Divisional Accuracy at Minimum Input Flow	50% ±2.5%
Divisional Accuracy at Max Input Flow	50% ±1.5%
Pressure Drop at Minimum Rated Input Flow	30 psi
Pressure Drop at Maximum Rated Input Flow	350 psi
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

Model Code Example: FSFRXAN

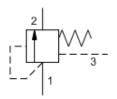
CONTROL (A) SEAL MATERIAL (X) FLOW SPLIT (N) MATERIAL/COATING X Not Adjustable N Buna-N Standard Material/Coating **V** Viton

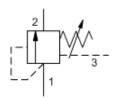
/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

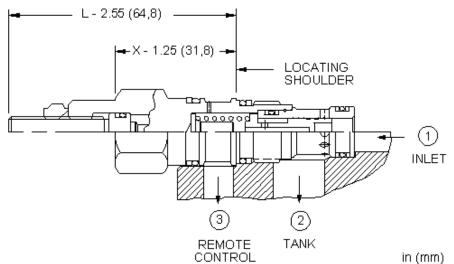
© 2023 Sun Hydraulics 138 of 177 CAPACITY: 7.5 gpm / CAVITY: T-163A











Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

F 100 psi (7 bar)

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006

CONFIGURATION OPTIONS

Model Code Example: LRBCXHN

CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
I Tuning Adjustment	D 50 nsi (3.5 har)	V Viton	/AP Stainless Steel Passivated

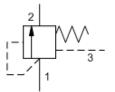
© 2023 Sun Hydraulics 139 of 177

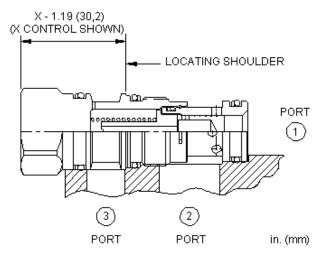


SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-11A



sunhydraulics.com/model/LRDC





Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006

CONFIGURATION OPTIONS

Model Code Example: LRDCXHN

CONTROL	(X)	DIFFERENTIAL PRESSURE	(H)	SEAL MATERIAL	(N)	MATERIAL/COATING

X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
_	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated
	F 100 psi (7 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	G 150 psi (10,5 bar)		

© 2023 Sun Hydraulics 140 of 177

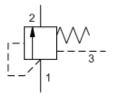


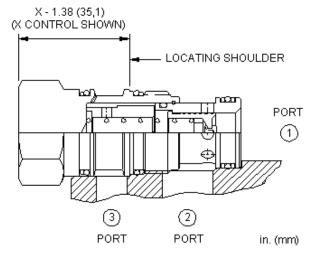


SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-2A



sunhydraulics.com/model/LRFC





Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

G 150 psi (10,5 bar)

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: LRFCXHN

CONTROL	(X) DIFFERENT	TIAL PRESSURE	(H)	SEAL MATERIAL	(N)	MATERIAL/COATING	
X Not Adjustable	H 200 psi	(14 bar)		N Buna-N		Standard Material/Coating	
	D 50 psi (3	5,5 bar)		E EPDM		/AP Stainless Steel, Passivated	
	F 100 psi	(7 bar)		V Viton		/LH Mild Steel, Zinc-Nickel	

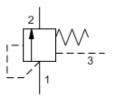
© 2023 Sun Hydraulics 141 of 177

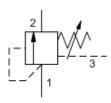


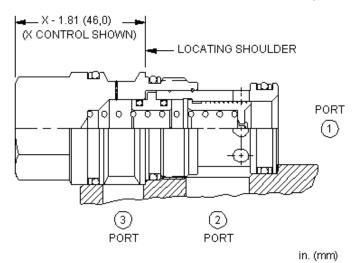
SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-17A



sunhydraulics.com/model/LRHC







Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

CONFIGURATION OPTIONS

Model Code Example: LRHCXHN

CONTROL (X) DIFFERENTIAL PRESSURE (H) SEAL MATERIAL (N) MATE	ATERIAL/COATING
--	-----------------

X Not Adjustable L Tuning Adjustment H 200 psi (14 bar) **D** 50 psi (3,5 bar)

N Buna-N V Viton

Standard Material/Coating /AP Stainless Steel, Passivated

F 100 psi (7 bar)

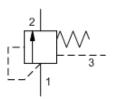
G 150 psi (10,5 bar)

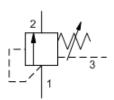
142 of 177 © 2023 Sun Hydraulics

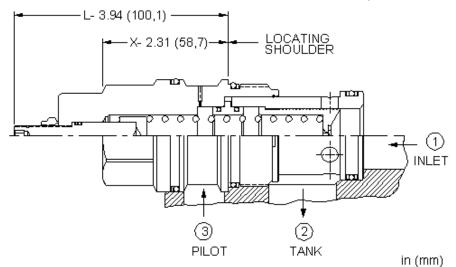
SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-19A



sunhydraulics.com/model/LRJC







Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

G 150 psi (10,5 bar)

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

CONFIGURATION OPTIONS

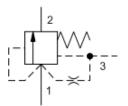
Model Code Example: LRJCXHN

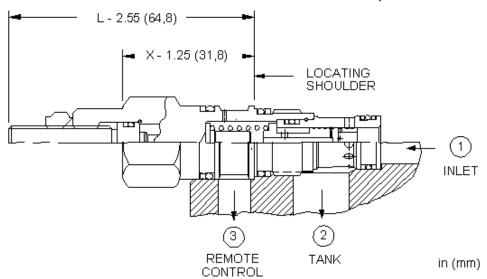
CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated
	F 100 psi (7 bar)	V Viton	

© 2023 Sun Hydraulics 143 of 177



sunhydraulics.com/model/LRBA





Normally closed modulating elements with an internal orifice between port 1 and port 3 can be used as a mainstage relief valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	10 - 15 in³/min.
Control Orifice Diameter	.016 in.
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006

CONFIGURATION OPTIONS

Model Code Example: LRBALDN

CONTROL	(L)	DIFFERENTIAL PRESSURE	(D)	SEAL MATERIAL	(N)
L Tuning Adjustment		D 50 psi (3,5 bar)		N Buna-N	
		F 100 psi (7 bar)		V Viton	_
		H 200 psi (14 bar)			

© 2023 Sun Hydraulics 144 of 177

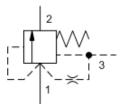


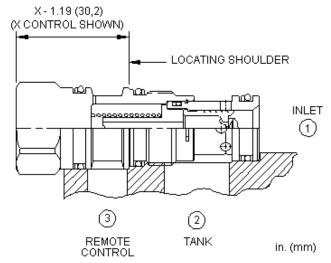
Normally closed, modulating element with pilot source from port 1

SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-11A



sunhydraulics.com/model/LRDA





Normally closed modulating elements with an internal orifice between port 1 and port 3 can be used as a mainstage relief valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Control Pilot Flow	10 - 15 in³/min.	
Maximum Valve Leakage at 110 SUS (24 cSt)	1 in³/min.@1000 psi	
Control Orifice Diameter	.016 in.	
Seal kit - Cartridge	Buna: 990011007	
Seal kit - Cartridge	Polyurethane: 990011002	
Seal kit - Cartridge	Viton: 990011006	

CONFIGURATION OPTIONS

Model Code Example: LRDAXHN

CONTROL (X) BIAS PRESSURE (H) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

H 200 psi (14 bar)

D 50 psi (3,5 bar)

F 100 psi (7 bar)

N Buna-N

V Viton

Standard Material/Coating
/AP Stainless Steel, Passivated

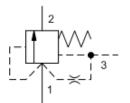
© 2023 Sun Hydraulics 145 of 177

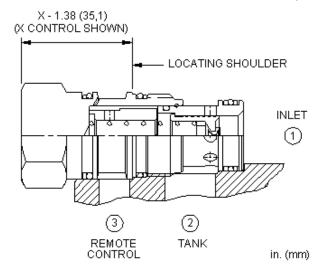
Normally closed, modulating element with pilot source from port 1

SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-2A



sunhydraulics.com/model/LRFA





Normally closed modulating elements with an internal orifice between port 1 and port 3 can be used as a mainstage relief valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	10 - 15 in³/min.
Control Orifice Diameter	.016 in.
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: LRFAXHN

CONTROL (H) SEAL MATERIAL (X) BIAS PRESSURE (N) MATERIAL/COATING

X Not Adjustable

H 200 psi (14 bar) **D** 50 psi (3,5 bar)

F 100 psi (7 bar) **G** 150 psi (10,5 bar) N Buna-N **V** Viton

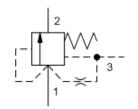
Standard Material/Coating

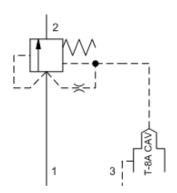
/AP Stainless Steel, Passivated

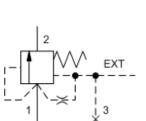
© 2023 Sun Hydraulics 146 of 177

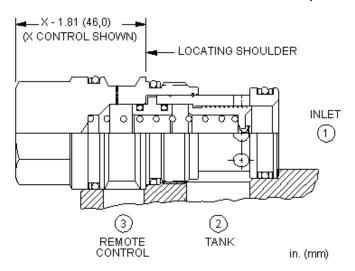


sunhydraulics.com/model/LRHA









Normally closed modulating elements with an internal orifice between port 1 and port 3 can be used as a mainstage relief valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Control Pilot Flow	15 - 30 in³/min.	
Control Orifice Diameter	.021 in.	
Seal kit - Cartridge	Buna: 990017007	
Seal kit - Cartridge	Polyurethane: 990017002	
Seal kit - Cartridge	Viton: 990017006	

CONFIGURATION OPTIONS

Model Code Example: LRHAXHN

CONTROL (X) BIAS PRESSURE (N) MATERIAL/COATING (H) SEAL MATERIAL

E External 4-SAE Port, Port 3 blocked

L Tuning Adjustment

D 50 psi (3,5 bar)

F 100 psi (7 bar)

G 150 psi (10,5 bar)

V Viton /AP Stainless Steel, Passivated

147 of 177 © 2023 Sun Hydraulics

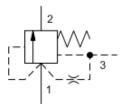


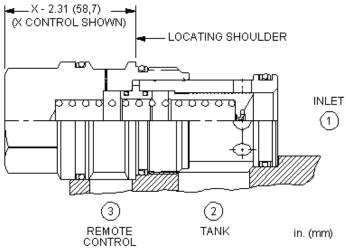
Normally closed, modulating element with pilot source from port 1

SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-19A



sunhydraulics.com/model/LRJA





Normally closed modulating elements with an internal orifice between port 1 and port 3 can be used as a mainstage relief valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	15 - 30 in³/min.
Control Orifice Diameter	.021 in.
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

CONFIGURATION OPTIONS

Model Code Example: LRJAXHN

CONTROL (X) DIFFERENTIAL PRESSURE (H) SEAL MATERIAL (N) MATERIAL/COATING

X Not Adjustable

H 200 psi (14 bar) A 12 psi

N Buna-N

V Viton

B 20 psi (1,5 bar)

C 30 psi (2 bar)

D 50 psi (3,5 bar)

Standard Material/Coating /AP Stainless Steel, Passivated

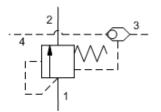
© 2023 Sun Hydraulics 148 of 177

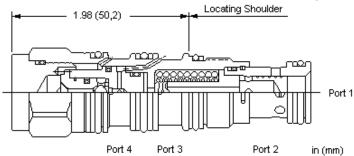
Normally closed modulating element with shuttle

SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-21A



sunhydraulics.com/model/LRDS





A normally closed modulating element, used as a bypass compensator, ensures a constant pressure drop across an external orifice to create a pressure compensated flow control. The resulting flow remains constant regardless of variations in upstream or downstream pressure.

A ball shuttle connects the after orifice signal from the higher of port 3 or 4 to the pilot area.

TECHNICAL DATA

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

Nominal Compensating Pressure	200 psi
Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006

CONFIGURATION OPTIONS

Model Code Example: LRDSXHN

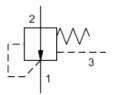
CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N)
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	
		V Viton	

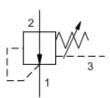
© 2023 Sun Hydraulics 149 of 177

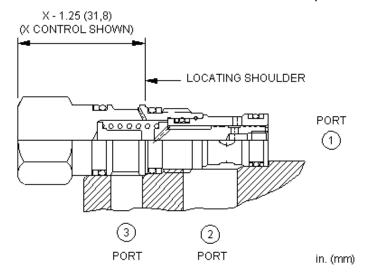
Normally open, modulating element CAPACITY: 7.5 gpm / CAVITY: T-163A



sunhydraulics.com/model/LPBC







Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Seal kit - Cartridge	Buna: 990163007	
Seal kit - Cartridge	Polyurethane: 990163002	
Seal kit - Cartridge	Viton: 990163006	

CONFIGURATION OPTIONS

Model Code Example: LPBCXHN

CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N)
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	
L Tuning Adjustment	D 50 psi (3,5 bar)	V Viton	
	F 100 psi (7 bar)		

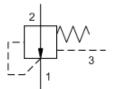
© 2023 Sun Hydraulics 150 of 177

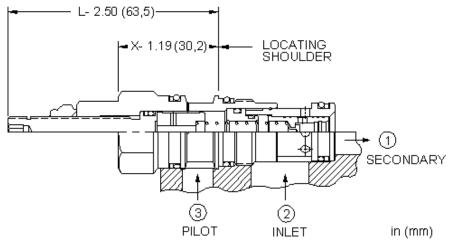


SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-11A



sunhydraulics.com/model/LPDC





Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006

CONFIGURATION OPTIONS

Model Code Example: LPDCXHN

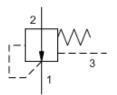
CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated
	F 100 psi (7 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	G 150 psi (10,5 bar)		

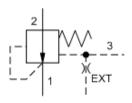
© 2023 Sun Hydraulics 151 of 177

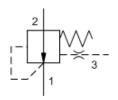
SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-2A

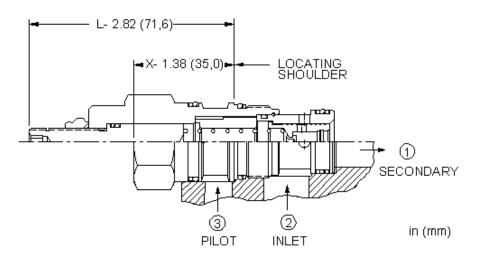


sunhydraulics.com/model/LPFC









Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: LPFCXHN

CONTROL	(X)	DIFFERENTIAL PRESSURE	(H)	SEAL MATERIAL	(N)	MATERIAL/COATING
		•				• •

 X Not Adjustable
 H 200 psi (14 bar)
 N Buna-N
 St

 D 50 psi (3,5 bar)
 E EPDM
 /AP St

F 100 psi (7 bar) **G** 150 psi (10,5 bar) N Buna-NStandard Material/CoatingE EPDM/AP Stainless Steel, PassivatedV Viton/LH Mild Steel, Zinc-Nickel

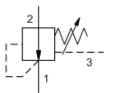
© 2023 Sun Hydraulics 152 of 177

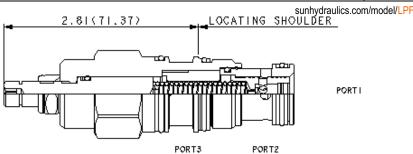




Tuneable, normally open modulating element SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-2A







Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: LPFCLDN

DIFFERENTIAL PRESSURE

(D) SEAL MATERIAL

(N) MATERIAL/COATING

D 50 psi (3,5 bar)

N Buna-N **E** EPDM

Standard Material/Coating /LH Mild Steel, Zinc-Nickel

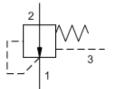
V Viton

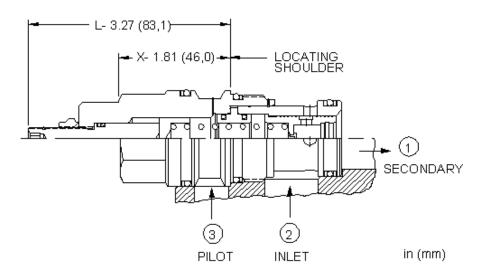
© 2023 Sun Hydraulics 153 of 177

SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-17A



sunhydraulics.com/model/LPHC





Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

G 150 psi (10,5 bar)

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

CONFIGURATION OPTIONS

Model Code Example: LPHCXHN

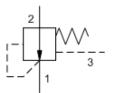
CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEA	L MATERIAL ((N)	MATERIAL/COATING	
X Not Adjustable	H 200 psi (14 bar)	N	Buna-N		Standard Material/Coating	
	D 50 psi (3,5 bar)	E	EPDM		/AP Stainless Steel, Passivated	
	F 100 psi (7 bar)	V '	Viton		/LH Mild Steel. Zinc-Nickel	

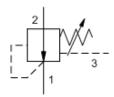
© 2023 Sun Hydraulics 154 of 177

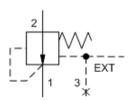
SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-19A

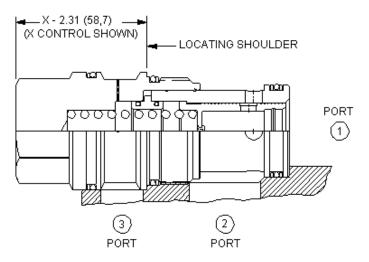


sunhydraulics.com/model/LPJC









in. (mm)

Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

CONFIGURATION OPTIONS

Model Code Example: LPJCXHN

N Buna-N

V Viton

(N) MATERIAL/COATING CONTROL (X) DIFFERENTIAL PRESSURE (H) SEAL MATERIAL

X Not Adjustable

External 1/4 NPTF Pilot Port, Port 3 Blocked

H 200 psi (14 bar) **D** 50 psi (3,5 bar) **F** 100 psi (7 bar)

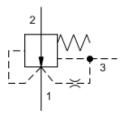
G 150 psi (10,5 bar)

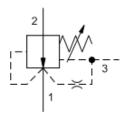
/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

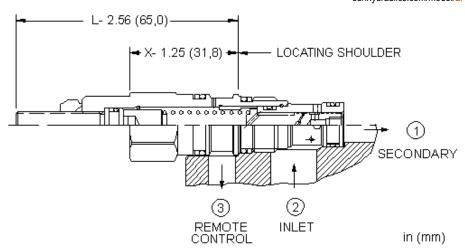
155 of 177 © 2023 Sun Hydraulics



sunhydraulics.com/model/LPBA







These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Control Orifice Diameter	.016 in.
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006

CONFIGURATION OPTIONS

Model Code Example: LPBAXHN

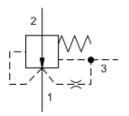
CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N)
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	
L Tuning Adjustment	D 50 psi (3,5 bar)	V Viton	
	F 100 psi (7 bar)		

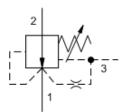
© 2023 Sun Hydraulics 156 of 177

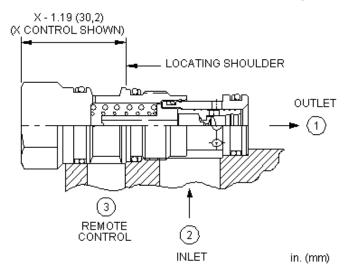
SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-11A



sunhydraulics.com/model/LPDA







These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

F 100 psi (7 bar)

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	10 - 15 in³/min.
Control Orifice Diameter	.016 in.
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006

CONFIGURATION OPTIONS

Model Code Example: LPDAXHN

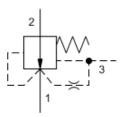
CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	D 50 psi (3,5 bar)	V Viton	/AP Stainless Steel, Passivated

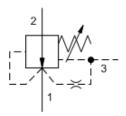
© 2023 Sun Hydraulics 157 of 177

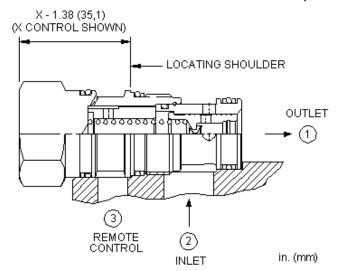
SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-2A



sunhydraulics.com/model/LPFA







These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	10 - 15 in³/min.
Control Orifice Diameter	.016 in.
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: LPFAXHN

CONTROL (X) BIAS PRESSURE (H) SEAL MATERIAL (N) MATERIAL/COATING

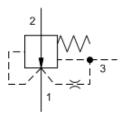
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	D 50 psi (3,5 bar)	V Viton	/AP Stainless Steel, Passivated

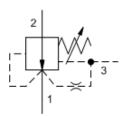
© 2023 Sun Hydraulics 158 of 177

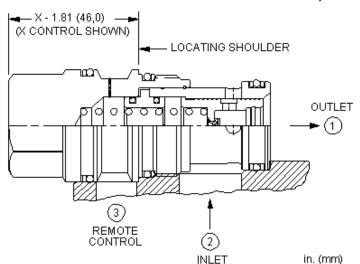
Normally open, modulating element with pilot source from port 1 SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-17A



sunhydraulics.com/model/LPHA







These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	15 - 30 in³/min.
Control Orifice Diameter	.021 in.
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

CONFIGURATION OPTIONS

Model Code Example: LPHAXDN

CONTROL	(X) BIAS PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3.5 bar)	N Buna-N	Standard Material/Coating

L Tuning Adjustment **F** 100 psi (7 bar)

G 150 psi (10,5 bar) H 200 psi (14 bar)

E EPDM V Viton

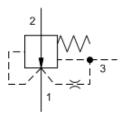
/AP Stainless Steel, Passivated

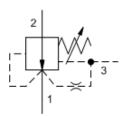
159 of 177 © 2023 Sun Hydraulics

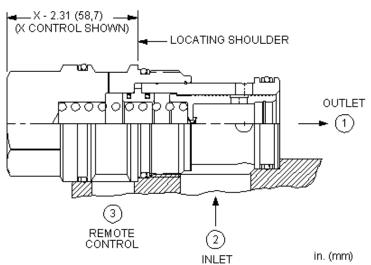
SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-19A



sunhydraulics.com/model/LPJA







These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

G 150 psi (10,5 bar)

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

Maximum Operating Pressure	5000 psi
Control Pilot Flow	15 - 30 in³/min.
Control Orifice Diameter	.021 in.
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

CONFIGURATION OPTIONS

Model Code Example: LPJAXHN

CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated
	F 100 psi (7 bar)	V Viton	

© 2023 Sun Hydraulics 160 of 177

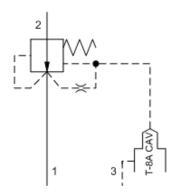


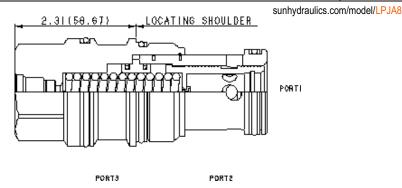
MODEL LPJA8

Normally open, modulating element with integral T-8A control cavity and pilot source from port 1

SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-19A







These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Control Pilot Flow	15 - 30 in³/min.	
Pilot Control Cavity	T-8A	
Control Orifice Diameter	.021 in.	
Seal kit - Cartridge	Buna: 990019007	
Seal kit - Cartridge	Polyurethane: 990019002	
Seal kit - Cartridge	Viton: 990019006	

NOTES

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

CONFIGURATION OPTIONS

Model Code Example: LPJA8DN

 BIAS PRESSURE
 (D)
 SE

 D 50 psi (3,5 bar)
 N

(D) SEAL MATERIAL

(N)

E EPDM

V Viton

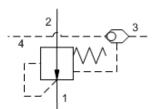
© 2023 Sun Hydraulics 161 of 177

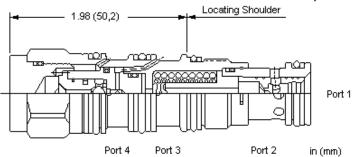


Normally open modulating element with shuttle SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-21A



sunhydraulics.com/model/LPDS





A normally open modulating element, used as a restrictive compensator, ensures a constant pressure drop across an external orifice to create a pressure compensated flow control. The resulting flow remains constant regardless of variations in upstream or downstream pressure.

A ball shuttle connects the after orifice signal from the higher of port 3 or 4 to the pilot area.

TECHNICAL DATA

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

Nominal Compensating Pressure	200 psi	
Maximum Operating Pressure	5000 psi	
Seal kit - Cartridge	Buna: 990021007	
Seal kit - Cartridge	Polyurethane: 990021002	
Seal kit - Cartridge	Viton: 990021006	

CONFIGURATION OPTIONS

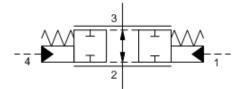
Model Code Example: LPDSXHN

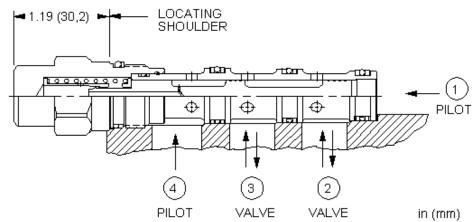
CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N)
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	
		V Viton	_

© 2023 Sun Hydraulics 162 of 177



sunhydraulics.com/model/LHDT





These bi-directional, normally open, modulating elements used with an external orifice, create a bi-directional, pressure compensated flow control.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Seal kit - Cartridge	Buna: 990031007	
Seal kit - Cartridge	EPDM: 990031014	
Seal kit - Cartridge	Polyurethane: 990031002	
Seal kit - Cartridge	Viton: 990031006	

CONFIGURATION OPTIONS

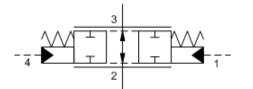
Model Code Example: LHDTXFN

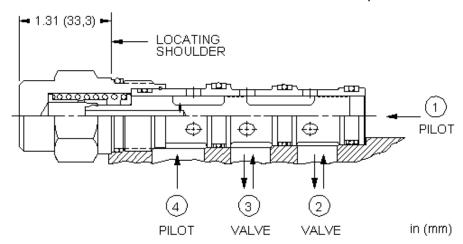
CONTROL	(X) NOMINAL CONTROL PR	ESSURE (F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar)	N Buna-N	
	D 50 psi (3,5 bar)	E EPDM	
	E 75 psi (5 bar)	V Viton	

© 2023 Sun Hydraulics 163 of 177



sunhydraulics.com/model/LHFT





These bi-directional, normally open, modulating elements used with an external orifice, create a bi-directional, pressure compensated flow control.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Seal kit - Cartridge	Buna: 990032007	
Seal kit - Cartridge	EPDM: 990032014	
Seal kit - Cartridge	Polyurethane: 990032002	
Seal kit - Cartridge	Viton: 990032006	

CONFIGURATION OPTIONS

Model Code Example: LHFTXFN

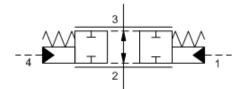
CONTROL	(X)	NOMINAL CONTROL PRESSURE	(F)	SEAL MATERIAL	(N)
X Not Adjustable		F 100 psi (7 bar)		N Buna-N	
		D 50 psi (3,5 bar)		E EPDM	
		E 75 psi (5 bar)		V Viton	

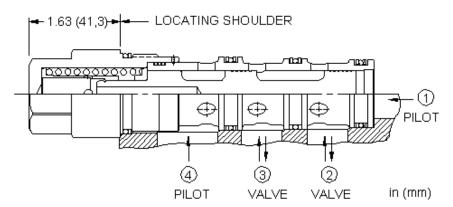
© 2023 Sun Hydraulics 164 of 177

Normally open, bi-directional, modulating element SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-33A



sunhydraulics.com/model/LHHT





These bi-directional, normally open, modulating elements used with an external orifice, create a bi-directional, pressure compensated flow control.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Seal kit - Cartridge	Buna: 990033007	
Seal kit - Cartridge	EPDM: 990033014	
Seal kit - Cartridge	Polyurethane: 990033002	
Seal kit - Cartridge	Viton: 990033006	

CONFIGURATION OPTIONS

Model Code Example: LHHTXFN

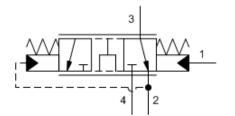
CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N) MATERIAL/COATING	
X Not Adjustable	F 100 psi (7 bar)	N Buna-N	Standard Material/Coating	ı
	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated	_
	E 75 psi (5 bar)	V Viton		

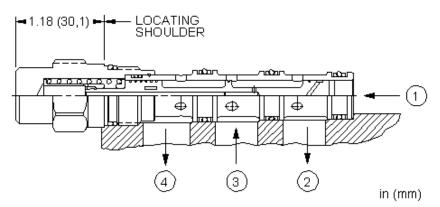
© 2023 Sun Hydraulics 165 of 177

Bypass/restrictive, priority modulating element SERIES 1 / CAPACITY: 15 gpm / CAVITY: T-31A



sunhydraulics.com/model/LHDA





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi	
Seal kit - Cartridge	Buna: 990031007	
Seal kit - Cartridge	Polyurethane: 990031002	
Seal kit - Cartridge	Viton: 990031006	

CONFIGURATION OPTIONS

Model Code Example: LHDAXFN

CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MA	TERIAL (N)
X Not Adjustable	F 100 psi (7 bar)	N Buna-N	N
	E 75 psi (5 bar)	E EPDM	
		V Viton	

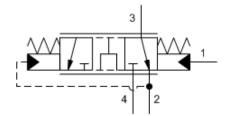
© 2023 Sun Hydraulics 166 of 177

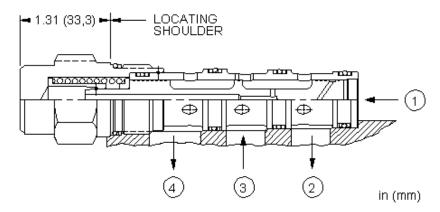
Bypass/restrictive, priority modulating element

SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-32A



sunhydraulics.com/model/LHFA





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	EPDM: 990032014
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006

CONFIGURATION OPTIONS

Model Code Example: LHFAXFN

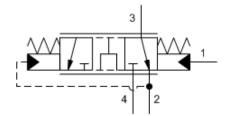
CONTROL	(X) DIFFERENTIAL PRESSURE	(F)	SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar)		N Buna-N	
	E 75 psi (5 bar)	<u>.</u>	E EPDM	
			V Viton	

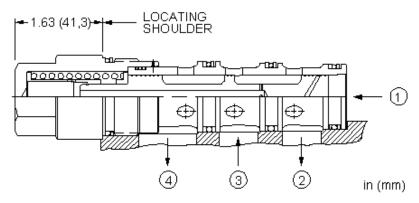
© 2023 Sun Hydraulics 167 of 177

Bypass/restrictive, priority modulating element SERIES 3 / CAPACITY: 60 gpm / CAVITY: T-33A



sunhydraulics.com/model/LHHA





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	EPDM: 990033014
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006

CONFIGURATION OPTIONS

Model Code Example: LHHAXFN

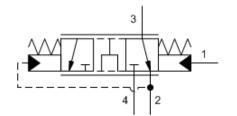
CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar)	N Buna-N	
	E 75 psi (5 bar)	E EPDM	
		V Viton	

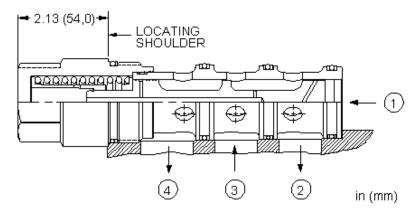
© 2023 Sun Hydraulics 168 of 177

Bypass/restrictive, priority modulating element SERIES 4 / CAPACITY: 120 gpm / CAVITY: T-34A



sunhydraulics.com/model/LHJA





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	EPDM: 990034014
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006

CONFIGURATION OPTIONS

Model Code Example: LHJAXFN

CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar)	N Buna-N	
	E 75 psi (5 bar)	E EPDM	
		V Viton	

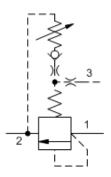
© 2023 Sun Hydraulics 169 of 177

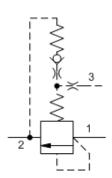
Normally closed modulating element valve with relief function

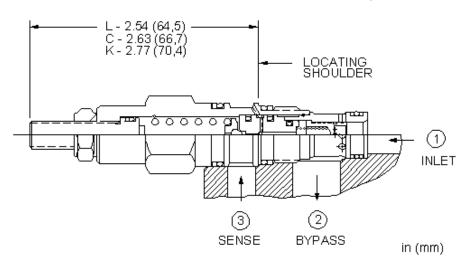
CAPACITY: 5 gpm / CAVITY: T-163A



sunhydraulics.com/model/RVBB







Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

TECHNICAL DATA

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

Factory Pressure Settings Established at	4 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006

CONFIGURATION OPTIONS

Model Code Example: RVBBLAN

CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)

L Standard Screw Adjustment

- C Tamper Resistant Factory Set
- K Handknob

- A 75 3000 psi (5 210 bar), 1000 psi (70 bar) Standard Setting
- **B** 75 1500 psi (5 105 bar), 1000 psi (70 bar) Standard Setting
- **C** 75 6000 psi (5 420 bar), 1000 psi (70 bar) Standard Setting
- **N** 75 800 psi (5 55 bar), 400 psi (28 bar) Standard Setting
- **Q** 75 400 psi (5 28 bar), 200 psi (14 bar) Standard Setting
- **W** 75 4500 psi (5 315 bar), 1000 psi (70 bar) Standard Setting

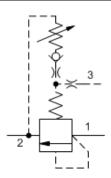
N Buna-N
V Viton

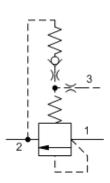
© 2023 Sun Hydraulics 170 of 177

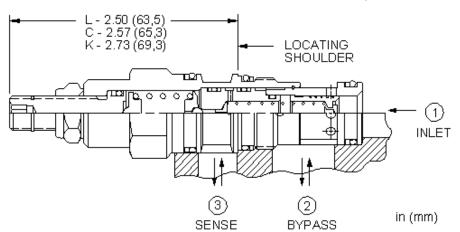
SERIES 1 / CAPACITY: 10 gpm / CAVITY: T-11A



sunhydraulics.com/model/RVCB







Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

TECHNICAL DATA

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

Factory Pressure Settings Established at	4 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	2 in³/min.@1000 psi
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006

CONFIGURATION OPTIONS

Model Code Example: RVCBLAN

CONTROL (L) ADJUSTMENT RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

L Standard Screw Adjustment

C Tamper Resistant - Factory Set

K Handknob

A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting

B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting

C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting

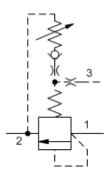
N Buna-NV Viton

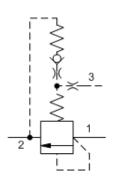
Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

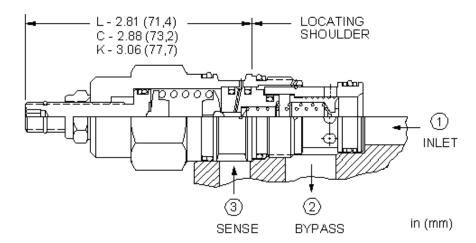
© 2023 Sun Hydraulics 171 of 177



sunhydraulics.com/model/RVEB







Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

TECHNICAL DATA

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

Factory Pressure Settings Established at	4 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	3 in³/min.@1000 psi
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: RVEBLAN

CONTROL (L) ADJUSTMENT RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

L Standard Screw Adjustment

- C Tamper Resistant Factory Set
- K Handknob
- W Hex Wrench Adjustment
- Y Tri-Grip Handknob

© 2023 Sun Hydraulics

- 100 3000 psi (7 210 bar), 1000 psi (70 bar) Standard Setting
- **B** 50 1500 psi (3,5 105 bar), 1000 psi (70 bar) Standard Setting
- C 100 6000 psi (7 420 bar), 1000 psi (70 bar) Standard Setting
- W 100 4500 psi (7 315 bar), 1000 psi (70 bar) Standard Setting

N Buna-N

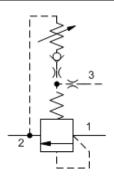
V Viton

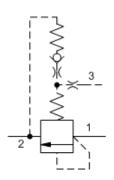
/AP Stainless Steel, Passivated

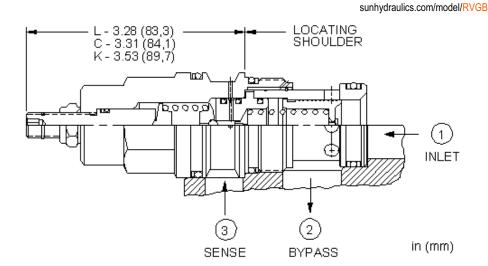
172 of 177

SERIES 3 / CAPACITY: 40 gpm / CAVITY: T-17A









Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

TECHNICAL DATA

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

Factory Pressure Settings Established at	4 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	4 in³/min.@1000 psi
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

CONFIGURATION OPTIONS

Model Code Example: RVGBLAN

CONTROL (L) ADJUSTMENT RANGE (A) SEAL MATERIAL (N) MATERIAL/COATING

L Standard Screw Adjustment

- C Tamper Resistant Factory Set
- **K** Handknob

- **A** 100 3000 psi (7 210 bar), 1000 psi (70 bar) Standard Setting
- **B** 150 1500 psi (10,5 105 bar), 1000 psi (70 bar) Standard Setting
- **C** 100 6000 psi (7 420 bar), 1000 psi (70 bar) Standard Setting

N Buna-N
V Viton

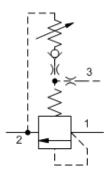
Standard Material/Coating

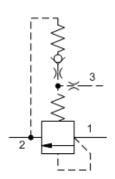
/AP Stainless Steel, Passivated

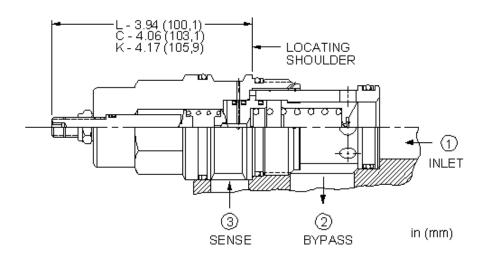
© 2023 Sun Hydraulics 173 of 177



sunhydraulics.com/model/RVIB







Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

TECHNICAL DATA

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

Factory Pressure Settings Established at	4 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 in³/min.@1000 psi
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

CONFIGURATION OPTIONS

Model Code Example: RVIBLAN

CONTROL (L) ADJUSTMENT RANGE (A) SEAL MATERIAL **A** 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting L Standard Screw Adjustment

C Tamper Resistant - Factory Set K Handknob

B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting

C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting

N Buna-N

E EPDM

V Viton

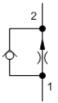
© 2023 Sun Hydraulics 174 of 177

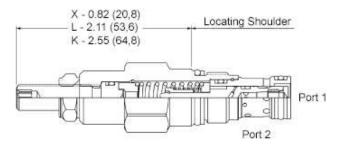


Fixed-orifice pressure compensated flow control valve with reverse flow check CAPACITY: 3 gpm / CAVITY: T-162A



sunhydraulics.com/model/FCBC





in (mm)

Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. An integral high-capacity check valve provides unrestricted flow from port 2 to port 1. The flow range is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006

CONFIGURATION OPTIONS

Model Code Example: FCBCLCN

CONTROL	(L)	FLOW RATE	(C)	SEAL MATERIAL	(N)
L Tuning Adjustment		C .106 gpm (.4 L/min.)		N Buna-N	
C Tamper Resistant - Factory Set		D .132 gpm (.49 L/min.)		V Viton	
K Handknob		F .198 gpm (.75 L/min.)			
X Not Adjustable		G .291 gpm (1.10 L/min.)			
		H .41 gpm (1.55 L/min.)			
		J .528 gpm (2.0 L/min.)			
		K .661 gpm (2.50 L/min.)			
		L .819 gpm (3.10 L/min.)			
		M 1.057 gpm (4.00 L/min.)			
		N 1.321 gpm (5.00 L/min.)			
		P 1.585 gpm (6.0 L/min.)			
		R 2.008 gpm (7.6 L/min.)			
		S 2.378 gpm (9.0 L/min.)			
		T 2.642 gpm (10.0 L/min.)			
		V 3.012 gpm (11.40 L/min.)			

© 2023 Sun Hydraulics 175 of 177





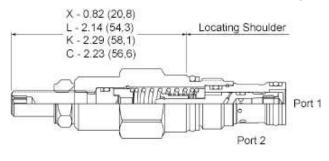
Fixed-orifice, pressure compensated flow control valve

CAPACITY: 3 gpm / CAVITY: T-162A



sunhydraulics.com/model/FXBC





in (mm)

Fixed-orifice, pressure-compensated flow controls with reverse-flow check provide precise flow regulation for meter-in or meter-out applications where there may be wide pressure fluctuations. The flow range is specified by the user and is set at the factory.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Locknut Hex Size	9/16 in.
Locknut Torque	80 - 90 lbf in.

CONFIGURATION OPTIONS

Model Code Example: FXBCLCN

CONTROL	(L) F	LOW RATE	(C)	SEAL MATERIAL	(N)
L Tuning Adjustment		C .106 gpm (.4 L/min.)		N Buna-N	
C Tamper Resistant - Factory Set		D .132 gpm (.49 L/min.)		V Viton	
K Handknob	1	F .198 gpm (.75 L/min.)			
X Not Adjustable		G .291 gpm (1.10 L/min.)			
	1	H .41 gpm (1.55 L/min.)			
	,	J .528 gpm (2.0 L/min.)			
	1	K .661 gpm (2.50 L/min.)			
	1	L .819 gpm (3.10 L/min.)			
	1	M 1.057 gpm (4.00 L/min.)			
	1	N 1.321 gpm (5.00 L/min.)			
	1	P 1.585 gpm (6.0 L/min.)			
	1	R 2.008 gpm (7.6 L/min.)			
	;	S 2.378 gpm (9.0 L/min.)			
		T 2.642 gpm (10.0 L/min.)			
	,	V 3.012 gpm (11.40 L/min.)			

© 2023 Sun Hydraulics 176 of 177

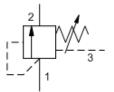


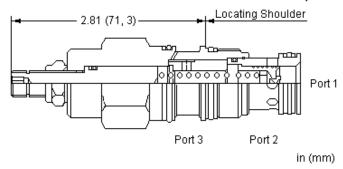


Tuneable, normally closed, modulating element SERIES 2 / CAPACITY: 30 gpm / CAVITY: T-2A



sunhydraulics.com/model/LRFCL





Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Maximum Operating Pressure	5000 psi
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

CONFIGURATION OPTIONS

Model Code Example: LRFCLDN

DIFFERENTIAL	PRESSURE
--------------	----------

(D) SEAL MATERIAL

(N) MATERIAL/COATING

ע	50 psi (3,5 bar)	
F	100 psi (7 bar)	

N Buna-NE EPDMV Viton

Standard Material/Coating
/AP Stainless Steel, Passivated
/LH Mild Steel, Zinc-Nickel

© 2023 Sun Hydraulics 177 of 177

driving fluid power innovation since 1970



www.sunhydraulics.com



Sun Hydraulics Headquarters Sarasota, Florida USA +1 941 362 1200

Custom Fluidpower Pty Ltd (A Sun Hydraulics Company) Newcastle, Australia +61 02 4953 5777 sales@custom.com.au Sun Hydraulics Limited Coventry, England +44 2476 217 400 sales@sunuk.com

Sun Hydraulics Korea Corp. Incheon, Korea +82 3281 31350 sales@sunhydraulics.co.kr Sun Hydraulik GmbH Erkelenz, Germany +49 2431 80910 sales@sunhydraulik.de

Sun Hydraulics China Co. Ltd. Shanghai, P.R. China +86 2162 375885 sunchinainfo@sunhydraulics.com Sun Hydraulics Corp. (India) Bangalore, India +91 8028 456325 sunindiainfo@sunhydraulics.com

Sun Hydraulics Corp. (S.America) Rosario, Argentina +54 9 341 584 3075 ventas@sunhydraulics.com