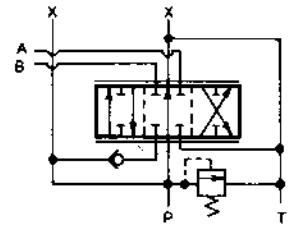
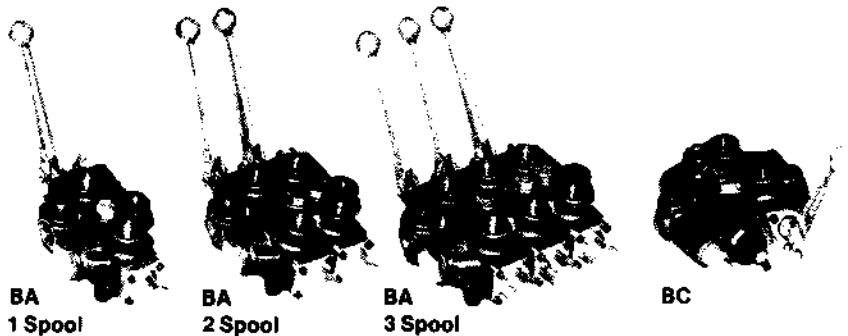




# HYDRAULIC VALVES

## DIRECTIONAL CONTROL B SERIES Specification Sheet



The CROSS series B directional control valves provide good metering characteristics and long dependable service life. Optimum versatility is provided due to the many standard and optional features. Balanced spools are select-fit for minimum leakage and load holding checks prevent load drop when shifting. Parallel flow path permits spools to be operated independently or simultaneously.

### GENERAL SPECIFICATIONS

Number of spools .....	one, two or three
Rated working pressure .....	3000 psi (206 bar)
Maximum shock and surge pressure.....	4000 psi (276 bar)
Rated flow capacity .....	30 gpm (114 l/m)
Maximum spool leakage (at 1000 psi w/100 SUS oil at 120° F).....	16 cc/min.
Mounting, any position .....	Three mounting holes for 3/8" dia. bolts
Weight .....	1 spool: 13 lbs. (6 Kg); 2 spool: 21 lbs. (9.5 Kg); 3 spool: 33 lbs. (15 Kg)

### MATERIAL SPECIFICATIONS

Body .....	High tensile strength cast iron
Spools .....	Ground, plated and polished steel alloy
Seals .....	Buna N

### STANDARD FEATURES

- Integral load holding check valves (prevent reverse flow through valve when shifting)
- Integral differential poppet type relief valve, adjustable (set at 2000 psi, 10 gpm)
- Balanced, select-fit spools (provide minimum leakage, smooth operation)
- External spool seals (permit easy replacement, reduced maintenance cost)
- 3/4" NPTF inlet and outlet ports; 1/2" NPTF work ports
- Complete handle assembly • 1, 2, or 3 spools

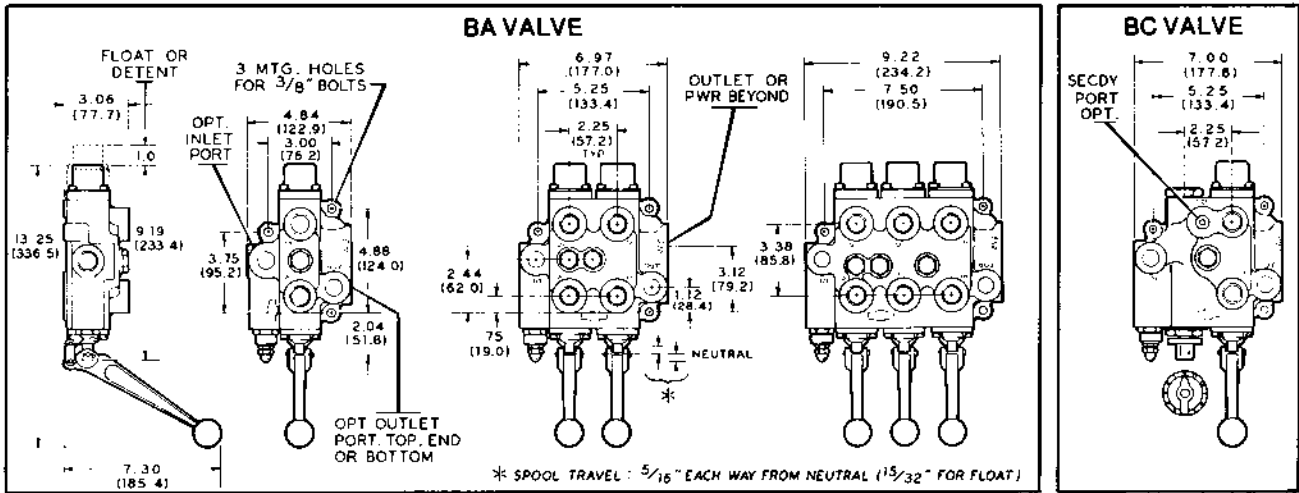
### OPTIONAL FEATURES AVAILABLE

- Open or closed center positions, 3-way or 4-way operation, 3-position or 4-position (float position), full open center (motoring spool) and other spool options
- Power beyond (permits use of neutral flow at system pressure); also permits field conversion from closed center to open center (tandem) operation
- Top, bottom or end location of outlet port
- Top or end location of inlet port
- Pressure release detent, in either or both work positions
- Integral pressure compensated flow control (Model BC), adjustable from 0 to 25 gpm, ± 5% flow regulation. Available in 1-spool version only. 21 lbs. (9.5 Kg)

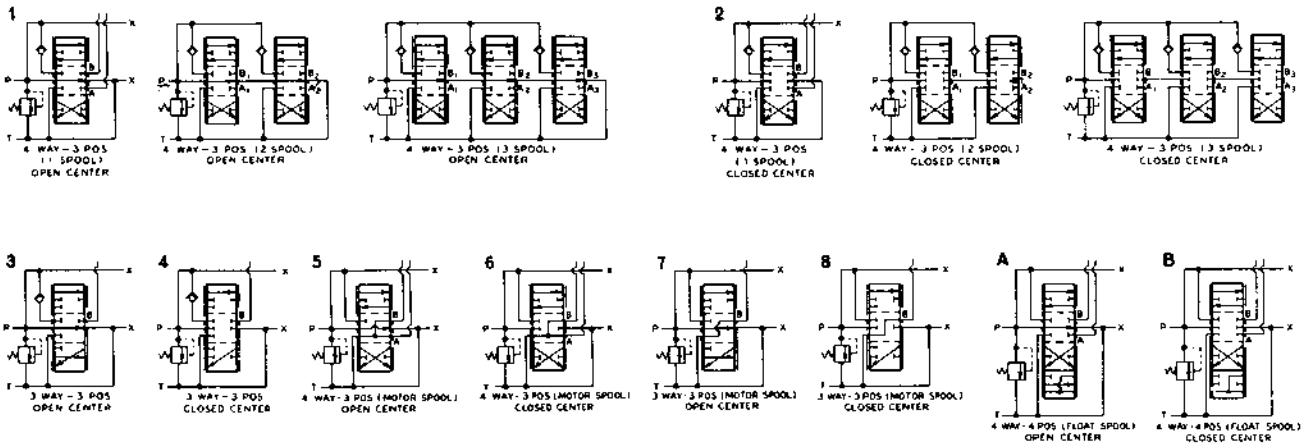
NOTE: Refer to CROSS Valve Technical/Service Sheet for recommendations and limitations.



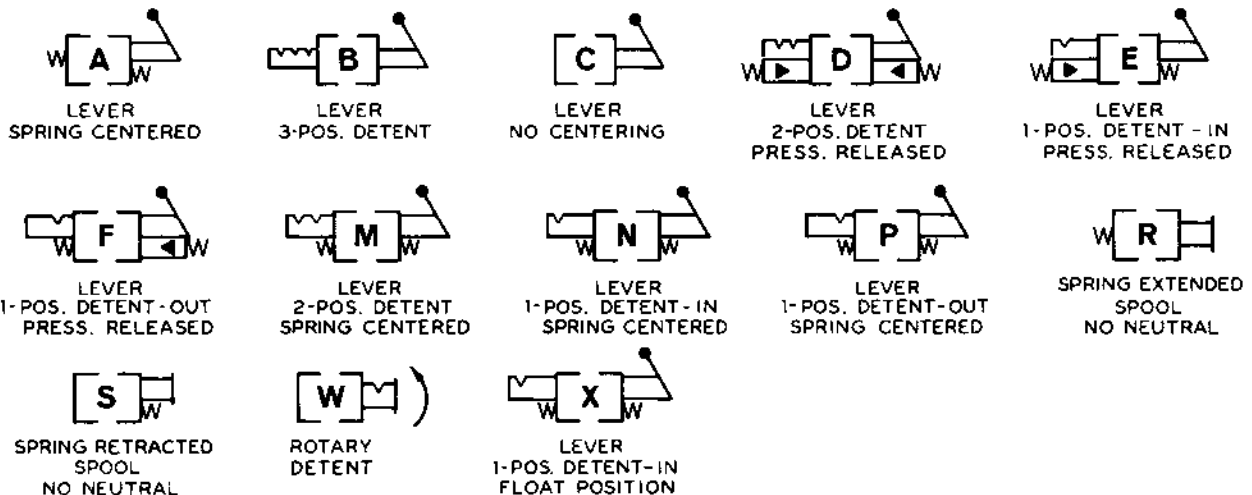
**DIMENSIONAL DATA in inches and (millimeters)**



**SPOOL OPTIONS**



**ACTUATOR OPTIONS**





# HYDRAULIC VALVES

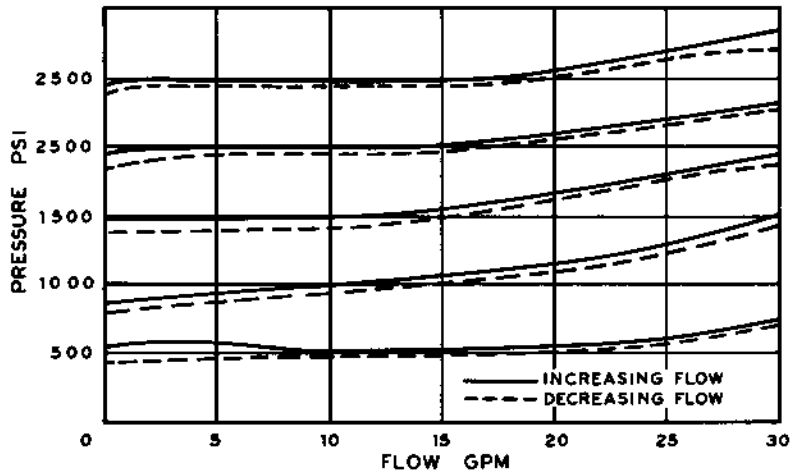
**DIRECTIONAL CONTROL  
B SERIES**  
Specification Sheet

## TYPICAL PERFORMANCE DATA

PRESSURE DROP (with 100 SUS oil at 120° F, 3/4" NPTF in & out, 1/2" work ports)

FLOW RATE		P to T		P to A or B		A <sub>1</sub> or B <sub>1</sub> to T		A <sub>2</sub> or B <sub>2</sub> to T		A <sub>3</sub> or B <sub>3</sub> to T		
GPM	l/m	PSI	bar	PSI	bar	PSI	bar	PSI	bar	PSI	bar	
5	19	—	—	8	.6	2	.1	—	—	—	—	ONE SPOOL
10	38	3	.2	20	1.4	6	.4	—	—	—	—	
15	57	6	.4	36	2.5	13	.9	—	—	—	—	
20	76	11	.8	55	3.8	23	1.6	—	—	—	—	
25	95	17	1.2	83	5.7	35	2.4	—	—	—	—	
30	114	25	1.7	120	8.3	48	3.3	—	—	—	—	
35	132	33	2.3	159	11.0	64	4.4	—	—	—	—	
5	19	—	—	10	.7	6	.4	2	.1	—	—	TWO SPOOL
10	38	5	.3	20	1.4	15	1.0	6	.4	—	—	
15	57	10	.7	38	2.6	33	2.3	14	1.0	—	—	
20	76	18	1.2	60	4.1	58	4.0	22	1.5	—	—	
25	95	29	2.0	90	6.2	92	6.3	33	2.3	—	—	
30	114	41	2.8	127	8.8	133	9.2	36	2.5	—	—	
35	132	54	3.7	174	12.0	184	12.7	64	4.4	—	—	
5	19	—	—	8	.6	8	.6	6	.4	2	1.1	THREE SPOOL
10	38	12	.8	16	1.1	24	1.7	16	1.1	6	.4	
15	57	24	1.7	28	1.9	48	3.3	33	2.3	10	.7	
20	76	41	2.8	44	3.0	84	5.8	58	4.0	18	1.2	
25	95	64	4.4	64	4.4	134	9.2	93	6.4	28	1.9	
30	114	92	6.3	88	6.1	202	13.9	140	9.7	42	2.9	
35	132	124	8.6	120	8.3	276	19.0	196	13.5	58	4.0	

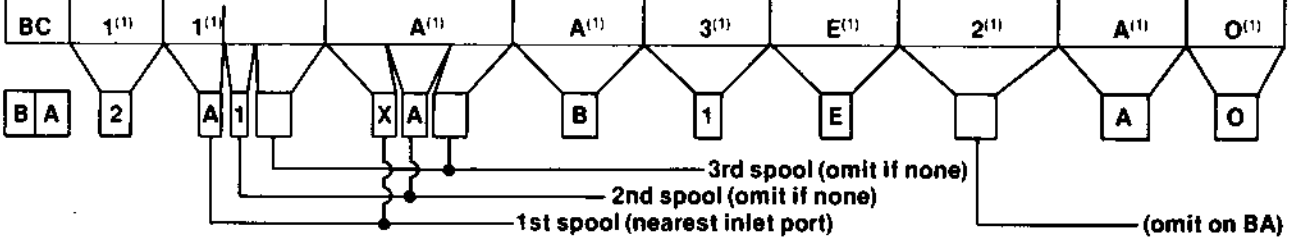
## RELIEF VALVE CHARACTERISTICS (100 SUS oil at 120° F.)





**ORDERING INFORMATION**

MODEL NO.	NO. OF SPOOLS	SPOOL TYPE	SPOOL ACTION (ACTUATOR OPTIONS)	RELIEF VALVE (4)	POWER BEYOND	OUTLET PORT LOCATION	SECONDARY FLOW OUTLET PORT (8C ONLY) (OPTIONAL)	PORT SIZE & TYPE	HANDLE
<b>BA</b> Manual	<b>1</b> Single	<b>1</b> 4-way, 3-position open center	<b>A</b> 3-position spring centered	<b>A</b> 1000 psi	<b>O</b> None	<b>O</b> End Outlet when P/B not specified	<b>O</b> No Port (Plugged)	<b>A</b> In & Out 1/4" NPTF work-1/2" NPTF <sup>(8)</sup>	<b>O</b> Complete Handle Assembly
	<b>2</b> Double	<b>2</b> <sup>(1)</sup> 4-way, 3-position closed center	<b>B</b> 3-position, detent no centering spring	<b>B</b> 1500 psi	<b>1</b> <sup>(6)</sup> 1/4" NPTF P/B sleeve port	<b>T</b> Top outlet	<b>1</b> 1/4"-14 (SAE #10)	<b>B</b> "in & out" 1/4" NPTF work-1/2" NPTF	<b>1</b> Less Complete Handle Assembly
	<b>3</b> Triple	<b>3</b> 3-way, 3-position open center	<b>C</b> manual, no detent no centering spring	<b>C</b> 2000 psi	<b>2</b> <sup>(6)</sup> 1 1/4"-12 SAE #12 P/B sleeve port	<b>B</b> Bottom outlet	<b>2</b> 1/2" NPTF	<b>C</b> "in & out" 1 1/4"-12 SAE #12 work-1/2-16 SAE #8 <sup>(8)</sup>	<b>2</b> Less Handle Only (link, pins & bracket included)
		<b>4</b> <sup>(1)</sup> 3-way, 3-position closed center	<b>D</b> <sup>(3)</sup> Pressure release detent "in & out"	<b>D</b> None	<b>3</b> <sup>(6)</sup> Conversion plug	<b>E</b> End outlet	<b>3</b> 1/4"-16 (SAE #8)	<b>D</b> "in & out" 1 1/4"-12 SAE #12 work-1 1/4-12 SAE #12	<b>3</b> <sup>(9)</sup> Single Hdl. Actuator
		<b>5</b> 4-way, 3-position open center w/motoring spool	<b>E</b> <sup>(3)</sup> Pressure release detent "in" only	<b>E</b> Other	<b>4</b> <sup>(6)</sup> 1/4"-14 SAE #10	<b>G</b> Bottom outlet with grommet	<b>4</b> 1/4" NPTF	<b>E</b> "in & out" 1/4" NPTF work-3/8" NPTF	
		<b>6</b> <sup>(1)</sup> 4-way, 3-position closed center w/motoring spool	<b>F</b> <sup>(3)</sup> Pressure release detent "out" only	<b>F</b> <sup>(5)</sup> Adjustable 500-1500 psi (Set at 1000 psi)	<b>5</b> Closed ctr. plug	<b>P</b> Top inlet & outlet	<b>5</b> 1 1/4"-12 (SAE #12)	<b>F</b> Other	
		<b>7</b> 3-way, 3-position open center w/motoring spool	<b>M</b> 2-position detent "in & out", spring center	<b>G</b> <sup>(5)</sup> Adjustable 1500-2500 psi (Set at 2000 psi)		<b>H</b> Top inlet			
		<b>8</b> <sup>(1)</sup> 3-way, 3-position closed center w/motoring spool	<b>N</b> 1-position detent "in" only, spring center			<b>(7)</b>			
		<b>A</b> <sup>(2)</sup> 4-way, 4-position open center Detent Float Position	<b>R</b> Spring extended no neutral						
		<b>B</b> <sup>(1)(2)</sup> 4-way, 4-position closed center Detent Float Position	<b>S</b> Spring retracted no neutral						
			<b>W</b> Rotary detent						
			<b>X</b> 4-pos sprg ctr to neutral Detent in float position						



EXAMPLE: BA2A1XAB1EAO is a BA manually operated double spool valve, the first spool being 4-way, 4 position, open center, spring centered with detent in float position; the second spool being 4-way, 3-position, open centered, spring centered. The non-adjustable relief valve is set at 1500 psi. 1/4" NPTF power beyond sleeve port, outlet port in end position. Inlet & outlet ports are 1/2" NPTF; work ports 1/4" NPTF. Complete handle assembly.

NOTES: (1) Model BC is a one-spool combination adjustable priority flow divider and directional control valve, open centered, with conversion plug installed; available power beyond capability by adding kit. Not available as closed center. (2) Float position A or B is available on 1st spool only on 2 or 3-spool valves. (3) Specify detent kick-out pressure if other than 1,000 psi. (4) Pressure settings at 10 gpm. (5) If other setting is desired, specify on order. (6) Top, end or bottom outlet (specify). (7) Specify T, B, or E when ordering closed center spool, power beyond, or conversion plug. (8) Machined for unidirectional orifice plates. (9) Available for BA2 and BA3 spool models.



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