



## HYDRAULIC VALVES

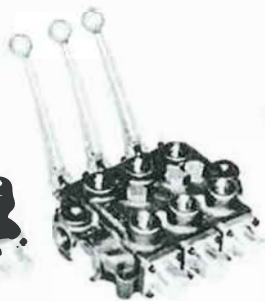
### DIRECTIONAL CONTROL B SERIES Specification Sheet



BA 1



BA 2



BA 3



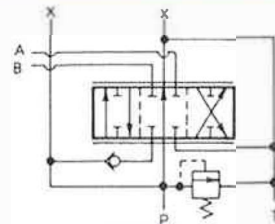
BA Solenoid



BA2 w/Joystick  
(SHA)



BC Flow Control



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) |

\* SAE threads only, 2500 psi for NPTF

### 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,  $\pm$  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.



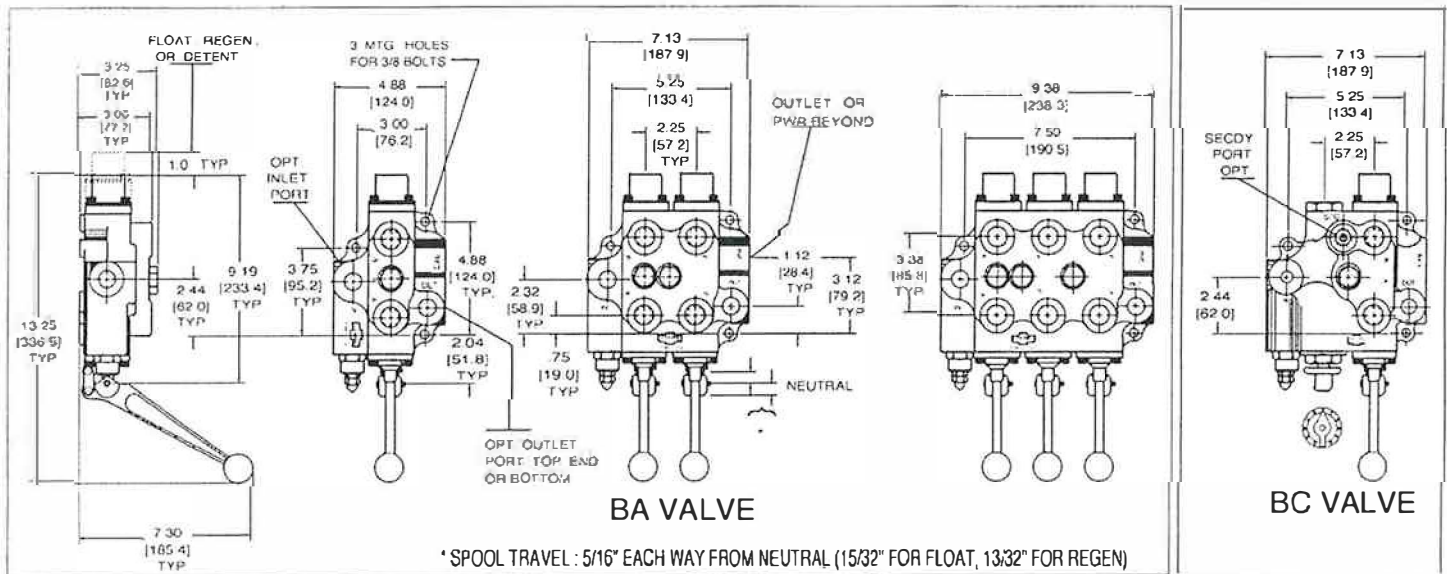
1800-OILSOL  
1800-645765

<https://oilsolutions.com.au/>

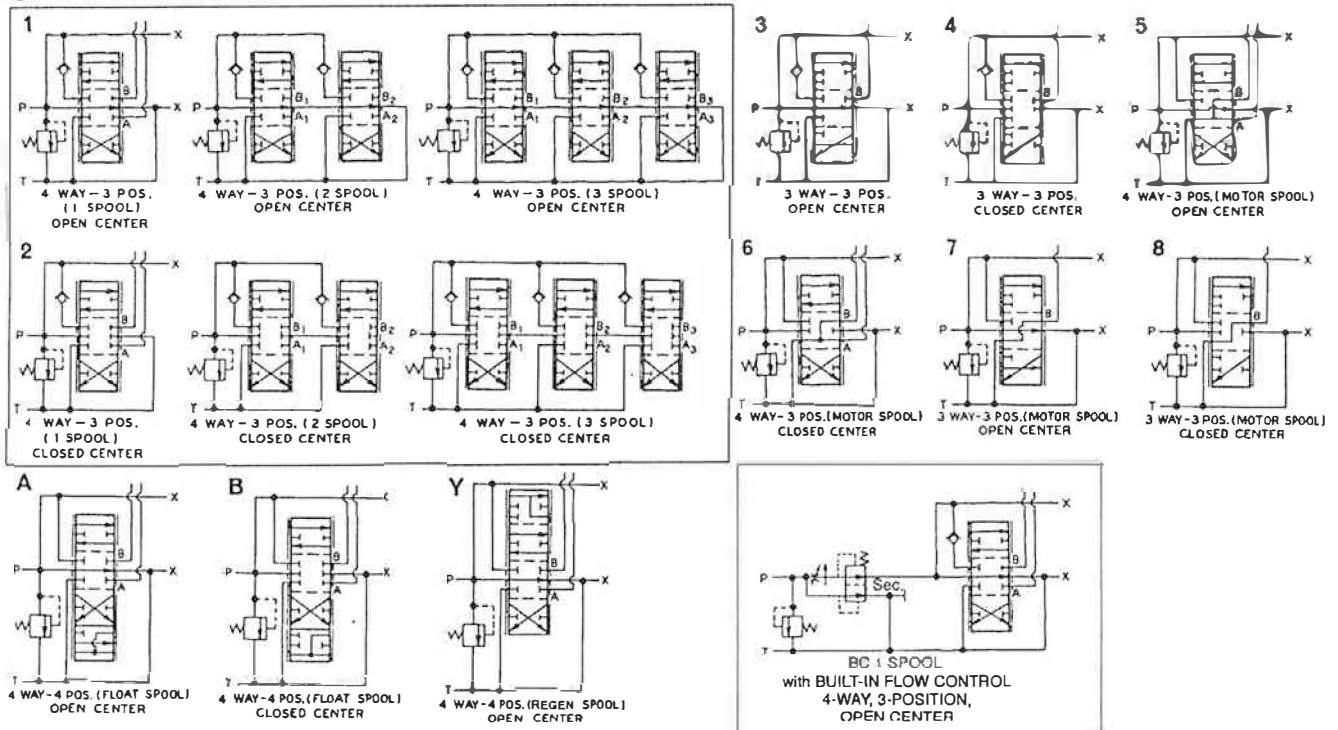
[sales@oilsolutions.com.au](mailto:sales@oilsolutions.com.au)



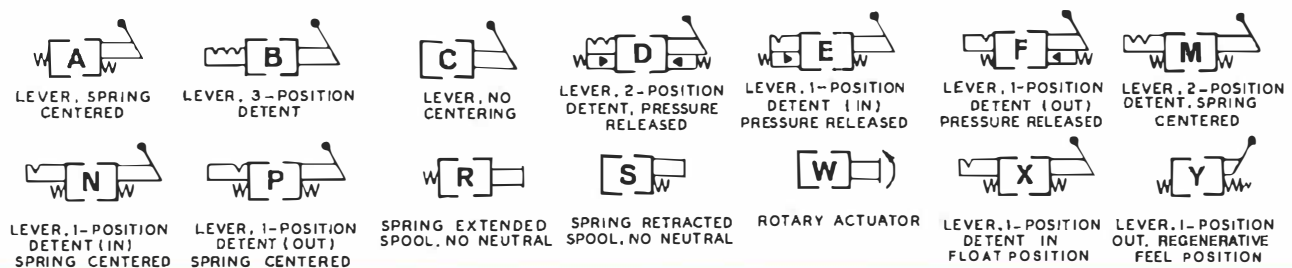
## DIMENSIONAL DATA in inches and (millimeters)



## SPOOL OPTIONS



## ACTUATOR OPTIONS





# HYDRAULIC VALVES

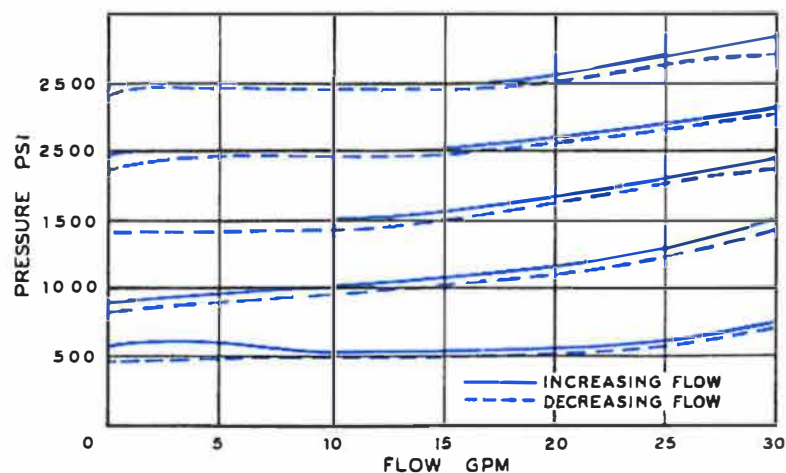
DIRECTIONAL CONTROL  
B SERIES  
Specification Sheet

## 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.)



1800-OILSOL  
1800-645765

<https://oilsolutions.com.au/>

[sales@oilsolutions.com.au](mailto:sales@oilsolutions.com.au)





## ORDERING INFORMATION

| MODEL NO. | # OF SPOOLS | SPOOL TYPE                                             | ACTUATOR OPTIONS                                 | RELIEF VALVE (4)             | POWER BEYOND                     | OUTLET PORT LOCATION              | SECONDARY FLOW OUTLET BC ONLY (OPTIONAL) | PORT SIZE & TYPE                                  | HANDLE                                            |
|-----------|-------------|--------------------------------------------------------|--------------------------------------------------|------------------------------|----------------------------------|-----------------------------------|------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| BA        | 1           | 1                                                      | A                                                | A                            | 0                                | O                                 | 0                                        | A                                                 | O                                                 |
| Manual    | Single      | 4-way, 3-position, open center                         | 3 position Spring centered                       | 1000 psi                     | None                             | End Outlet when P/B not specified | No Port (plugged)                        | In & Out 3/4" NPTF, Work 1/2" NPTF(8)             | Complete handle assy.-                            |
|           |             | 2 (1)                                                  | B                                                | B                            | 1 (6)                            | T                                 | 1                                        | B                                                 | 1                                                 |
|           | Double      | 4-way, 3-position, closed center                       | 3 position detent - no spring centering          | 1500 psi                     | 3/4" NPTF P/B sleeve port        | Top Outlet                        | 7/8-14 (SAE #10)                         | In & Out 3/4" NPTF, Work 3/4" NPTF C              | Less Complete handle assy.-                       |
|           |             | 3                                                      | C                                                | C                            | 2 (6)                            | B                                 | 2                                        |                                                   | 2                                                 |
|           | Triple      | 3-way, 3-position, open center                         | Manual - no detent - no centering spring         | 2000 psi                     | 1/16-12 SAE #12, P/B sleeve port | Bottom Outlet                     | 1/2" NPTF                                | In & Out 1 1/16-12 SAE #12, Work 3/4-16 SAE #8(8) | Less handle only (Links, pins & bracket included) |
|           |             | 4 (1)                                                  | D (3)                                            | D                            | 3 (6)                            | E                                 | 3                                        | D                                                 | 3 (9)                                             |
|           |             | 3-way, 3-position, closed center                       | Pressure detent "in & out"                       | None                         | Conversion plug                  | End Outlet                        | 3/4-16 (SAE #8)                          | In & Out SAE #12, Work SAE #12                    | Single Handle Actuator                            |
|           |             | 5                                                      | E (3)                                            | E                            | 4 (6)                            | G                                 | 4                                        | E                                                 | 4                                                 |
|           |             | 4-way, 3-position, open center w/motoring spool        | Pressure detent, "in" only, spring centering(4)  | Other                        | 7/8-14 SAE #10, P/B sleeve port  | Bottom Outlet with Grommet        | 3/4" NPTF                                | In & Out 3/4" NPTF, Work 3/8" NPTF                | No handle - solenoid operated                     |
|           |             | 6 (1)                                                  | F (3)                                            | F(5)                         | 5                                | P                                 | 5                                        | F                                                 | 5                                                 |
|           |             | 4-way, 3-position, closed center w/motoring spool      | Pressure detent, "out" only, spring centering(4) | Adj. 500-1500 (set at 1000)  | Closed center plug               | Top Inlet & outlet                | 1 1/16-12 (SAE #12)                      | Other                                             | Proportional                                      |
|           |             | 7                                                      | H                                                | G(5)                         | 6                                | H                                 | (OMIT ON BA)                             |                                                   | 6                                                 |
|           |             | 3-way, 3-position, open center w/motoring spool        | Solenoid, 12 volt DC                             | Adj. 1500-3000 (set at 2000) | Check valve for solenoid oper.   | Top Inlet                         |                                          |                                                   | Heavy Duty Steel Handle                           |
|           |             | 8 (1)                                                  | J                                                |                              |                                  | (7)                               |                                          |                                                   |                                                   |
|           |             | 3-way, 3-position, closed center w/motoring spool      | Solenoid, 24 volt DC                             |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             | A (2)                                                  | K                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             | 4-way, 4-position, open center detent float position   | Solenoid, 120 volt, AC                           |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             | B (1) (2)                                              | L                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             | 4-way, 4-position, closed center detent float position | Solenoid, 240 volt, AC                           |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             | C                                                      | M                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             | 4-way, 4-position, open center w/regen feel position   | 2 position detent, "in & out" spring centering   |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | N                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | 1 position detent, "in only" spring centering    |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | P                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | 1 pos. detent, "out only" spring centering       |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | R                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | Spring ext., no neutral                          |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | S                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | Spring retr., no neutral                         |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | X                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | 4-way, spr. center to neutral, detent in float.  |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | Y                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | 4-way, spring center with regen                  |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | W                                                |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        | Rotary actuator                                  |                              |                                  |                                   |                                          |                                                   |                                                   |
|           |             |                                                        |                                                  |                              |                                  |                                   |                                          |                                                   |                                                   |
| BC        |             | I (1)                                                  | A (1)                                            | A (1)                        | 3 (1)                            | E (1)                             | 2 (1)                                    | A (1)                                             | 0 (1)                                             |

Open Center Valve  
BA Solenoid Valve  
must be  
externally drained.

Part number building example:

**BA2A1XAB1EA0** is a 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 center spring centered. The non-adjustable relief is set at 1500 psi. 3/4" NPTF power beyond sleeve port, outlet port in end position. Inlet and outlet ports are 3/4" NPTF and the work ports are 1/2" NPTF. Complete handle assembly included.

**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 behind 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 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 models.



**CROSS MANUFACTURING**

100 James H. Cross Blvd.

Lewis, Kansas 67552

Phone 620/324-5525; FAX 620/324-5737

e-mail: [info@crossmfg.com](mailto:info@crossmfg.com)



1800-OILSOL  
1800-645765

<https://oilsolutions.com.au/>

[sales@oilsolutions.com.au](mailto:sales@oilsolutions.com.au)