

## Directional Control Valves Technical Information Using this manual

### ORGANIZATION AND HEADINGS

To help you quickly find information in this manual, the material is divided into sections, topics, subtopics, and details, with descriptive headings set in **red type**. Section titles appear at the top of every page in **large red type**. Topic headings appear in the left hand column in **BOLD RED CAPITAL LETTERS**. Subtopic headings appear in the body text in **bold red type** and detail headings in *italic red type*.

References (example: See *Topic xyz*, page XX) to sections, headings, or other publications are also formatted in *red italic type*. In **Portable Document Format (PDF)** files, these references represent clickable hyperlinks that jump to the corresponding document pages.

### TABLES, ILLUSTRATIONS, AND COMPLEMENTARY INFORMATION

Tables, illustrations, and graphics in this manual are identified by titles set in *blue italic type* above each item. Complementary information such as notes, captions, and drawing annotations are also set in *blue type*.

References (example: See *Illustration abc*, page YY) to tables, illustrations, and graphics are also formatted in *blue italic type*. In PDF files, these references represent clickable hyperlinks that jump to the corresponding document pages.

### SPECIAL TEXT FORMATTING

Defined terms and acronyms are set in **bold black type** in the text that defines or introduces them. Thereafter, the terms and acronyms receive no special formatting.

*Black italic type* is used in the text to emphasize important information, or to set-off words and terms used in an unconventional manner or alternative context. *Red* and *blue italics* represent hyperlinked text in the PDF version of this document (see above).

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An indented **Table of Contents (TOC)** appears on the next page. Tables and illustrations in the TOC set in *blue type*. In the PDF version of this document, the TOC entries are hyperlinked to the pages where they appear.

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#### FLEXIBILITY OF DESIGN

The Sauer-Danfoss directional control valves are designed to give customer flexibility over a broad range of flow and pressure capabilities. Actuator options include a range of levers, cable actuators, hydraulic and pneumatic pilot controls, two-axis joysticks, and electrohydraulic solenoids. Flow rates range from 0 to 100 l/min [26 US gal/min]. Configurations include compact monoblock and flexible modular styles.

#### CIRCUIT OPTIONS

- Parallel circuits
- Series circuits
- Tandem circuits
- Priority circuits
- Regenerative circuits
- Power beyond
- Open center
- Closed center

#### CAPABILITY

- Flow rates from 0 to 100 l/min [26 US gal/min]
- System pressure up to 240 bar [3500 psi]
- Up to 12 work sections for modular valves
- 12 cm<sup>3</sup>/min [0.7 in<sup>3</sup>/min] leakage (0.5 cm<sup>3</sup>/min [0.03 in<sup>3</sup>/min] for 1618)

#### ACTUATION OPTIONS

- Handles and levers
- Mechanical two-axis joystick
- Exposed or covered spool ends
- **Remote Hydraulic Control (RHC)**
- **ElectroHydraulic Control (EHC)** on/off solenoid
- Cable control
- Hydraulic or pneumatic pilot control
- Dual spool ends

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Refer to the quick selection matrix on pages 12 and 13 for specific options by model.

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**MODULAR VALVES**

Valve model	l/min [US gal/min]					Number of Spools	Circuit	Page
CDS-100						100 [26]	1 to 12	Parallel Tandem Series
CDS-60				60 [16]			1 to 12	Parallel Tandem Series
1125			38 [10]				1 to 8	Parallel

**MONOBLOCK VALVES**

Valve model	l/min [US gal/min]					Number of Spools	Circuit	Page
	20 [5]	40 [11]	60 [16]	80 [21]	100 [26]			
1612					76 [20]	1	Tandem	
1617			38 [10]			1	Parallel	
1627			38 [10]			2	Parallel	
1637			38 [10]			3	Parallel	
1618			38 [10]			1	Parallel	

 Indicates Maximum Working Pressure Rated At 210 bar [3000 psi]

**FEATURES AND RATINGS BY MODEL**

Category	Rating / feature	MonoBlock			Modular		
		1617/27/37	1618	1612	1125	CDS60	CDS100
Nominal flow	19 l/min [5 US gal/min]						
	38 l/min [10 US gal/min]	X	X		X		
	57 l/min [15 US gal/min]			X		X	
	76 l/min [20 US gal/min]						
	95 l/min [25 US gal/min]						X
	114 l/min [30 US gal/min]						
Nominal pressure	138 bar [2000 psi]						
	207 bar [3000 psi]	X	X	X	X	X	X
Circuit options	Parallel	X	X		X	X	X
	Series					X	
	Tandem			X		X	X
	Priority				X		
	Power beyond	X	X	X	X	X	X
	Closed center					X	X
Spools	Distance between (mm [in])	28.7 [1.13]	28.7 [1.13]	N/A	35 [1.38]	36 [1.42]	44.5 [1.75]
	Maximum number	3	3	1	8	12	12
Spool action options	Spring center	X	X	X	X	X	X
	1 position detent	X	X	X	X		
	2 position detent	X	X	X	X	X	X
	3 position detent	X	X	X	X	X	X
	Friction detent						
	Float detent	X	X	X		X	X
	Regenerative feel						
	Spring offset	X	X	X	X		
Spool options	3 pos. - 3 way	X	X	X	X	X	X
	3 pos. - 4 way	X	X	X	X	X	X
	4 pos. with float	X		X		X	X
	4 pos. regenerative						
Spool diameter	12.70 mm [0.500 in]						
	15.88 mm [0.625 in]	X	X	X	X		
	19.05 mm [0.75 in]					X	X
	25.40 mm [1.000 in]						
Relief valve options	Ball and spring	X	X	X	X		
	Direct acting poppet					X	X
	Pilot operated	X	X	X	X		
Work port neutral options	Closed to tank	X	X	X	X	X	X
	Open to tank	X	X	X	X	X	X
	Meter to tank	X			X	X	X



**FEATURES AND RATINGS BY MODEL**

Category	Rating / feature	MonoBlock			Modular		
		1617/27/37	1618	1612	1125	CDS60	CDS100
Actuation options	Handle	X	X	X	X	X	X
	Mechanical joystick	X	X			X	X
	Exposed spool end	X	X	X	X	X	X
	Covered spool end				X	X	
	RHC				X	X	X
	EHC on/off					X	X
	Cable control					X	X
	Hydraulic / pneumatic					X	X
	Dual spool ends					X	X
Maximum work port leakage	<1 cm <sup>3</sup> /min [0.061 in <sup>3</sup> /min]		X				
	1 to 3 cm <sup>3</sup> /min [0.061 to 0.183 in <sup>3</sup> /min]						
	4 to 6 cm <sup>3</sup> /min [0.244 to 0.366 in <sup>3</sup> /min]						
	7 to 10 cm <sup>3</sup> /min [0.427 to 0.610 in <sup>3</sup> /min]			X			
	11 to 13 cm <sup>3</sup> /min [0.71 to 0.793 in <sup>3</sup> /min]	X				X	X
	14 to 16 cm <sup>3</sup> /min [0.854 to 0.976 in <sup>3</sup> /min]				X		
	16 to 24 cm <sup>3</sup> /min [0.976 to 1.456 in <sup>3</sup> /min]						
Additional features	Load check	X	X	X	X	X	X
	P.O. check		X		X	X	X
	Flow control					X	X
	Meter in	X	X	X	X		
	Meter out	X		X			
	Hydraulic kickout		X			X	X
	Electric switch	X				X	X

## FLUIDS

Hydraulic fluid performs three basic functions in a hydraulic system: It transfers energy, lubricates moving components, and transports heat and contaminants out of the system.

### Base stock and additives

Sauer-danfoss valves are designed to operate with mineral-based fluids containing oxidation, rust, and foam inhibitors, compatible with fluoroelastomer seals. Consult your fluid supplier for information on seal compatibility.

### Viscosity

Viscosity is the most important property of a hydraulic fluid. It is a measurement of how the fluid resists flow. Low viscosity fluids increase internal leakage; high viscosity fluids increase pressure drop through the valve. Use a fluid that meets the viscosity limits published in this catalog. For specific requirements, see technical data in each section.

### Temperature

Temperature affects a fluid's viscosity. Higher temperature fluid has lower viscosity. Operating at excessive temperatures may have other detrimental effects on your hydraulic fluid. Design your hydraulic system to operate within the specified temperature range. Specific requirements are published in each section.

### For more information

For more information on hydraulic fluid selection refer to *Hydraulic Fluids and Lubricants Technical Information*, Sauer-Danfoss publication **520L0463**.

## FILTRATION

Effective filtration is critical to a hydraulic system's performance and working life. Employ system filtration capable of meeting the published requirements in each valve section. Be aware that other components in the system may have more stringent requirements. Design your filtration system to satisfy the requirements of the most sensitive component.

### Return line filtration

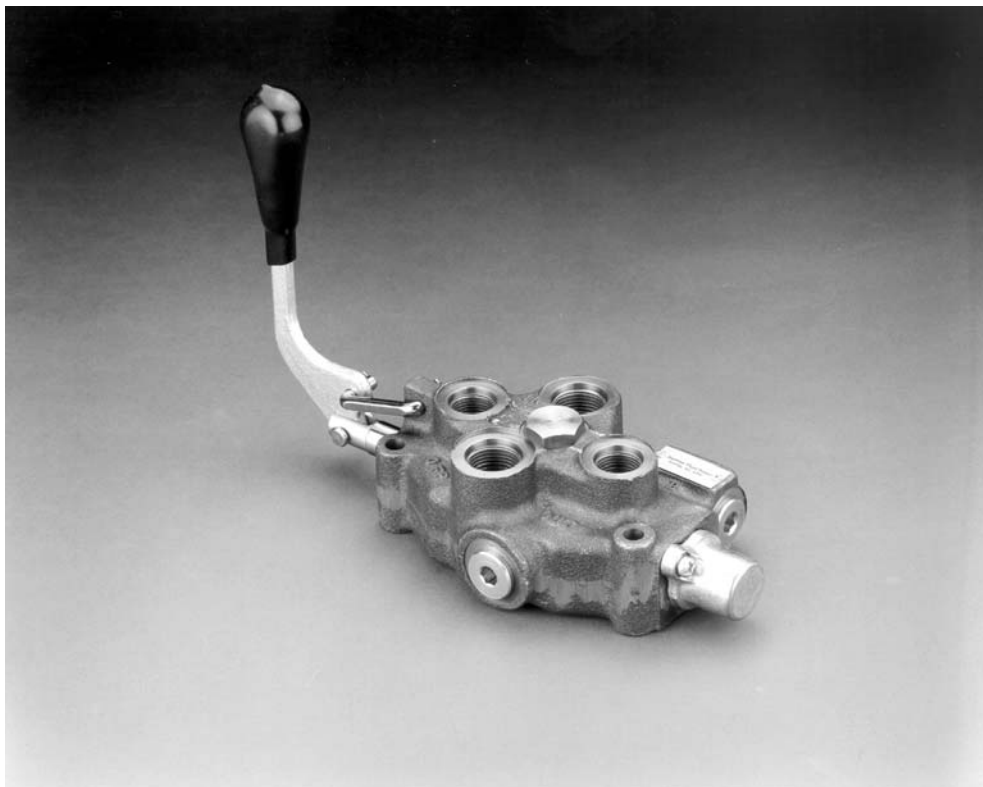
Return line filtration is generally adequate for Sauer-Danfoss valves. We recommend a 10 micron nominal (20 micron absolute) or finer filter. Insure the filter in your system is properly sized and maintained. To facilitate proper filter maintenance, use a pressure gauge or other indicator to signal when it is necessary to change the filter. Never allow filter to reach its bypass condition. Follow the filter manufacturer's maintenance recommendations.

### Cleanliness

Hydraulic system contamination must not exceed the limits published for each valve. Limits are specified per ISO 4406 (1999). When measuring system contamination, calibrate test equipment in accordance with the ACFTD method.

For more information

For more information on system filtration, refer to *Design Guidelines for hydraulic fluid cleanliness*, Sauer-Danfoss publication **520L0467**.



#### DESCRIPTION

Single spool monoblock valve. 76 l/min [20 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

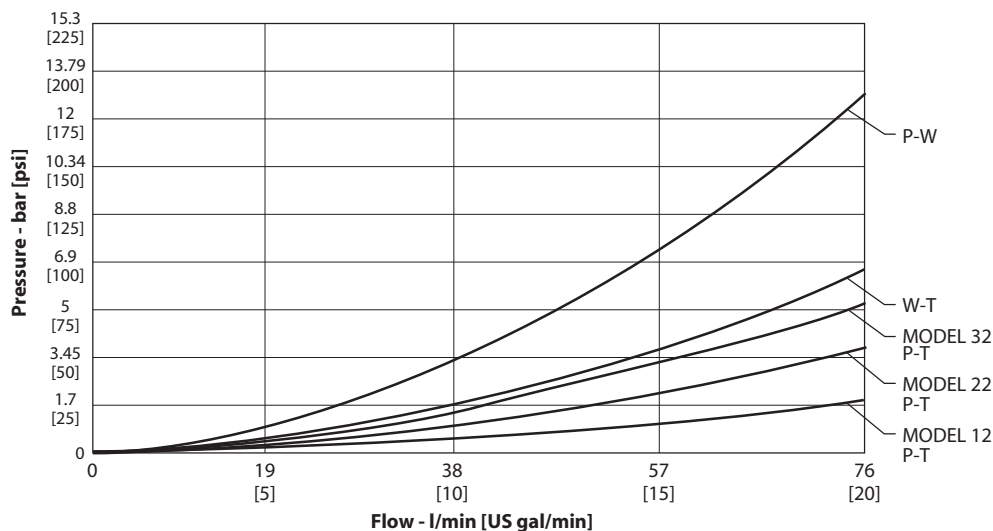
#### TYPICAL APPLICATIONS

Sweepers, mowers, agricultural equipment, auxiliary valves, tree removal equipment

#### STANDARD FEATURES

- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required)
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Paint color: black primer
- Load check for each spool to prevent drop before raise
- Individually boxed and labeled

**PRESSURE DROP**



**TECHNICAL DATA**

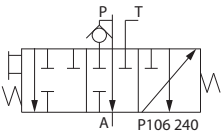
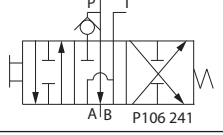
Maximum pressure	207 bar	[3000 psi]
Maximum tank line pressure	69 bar	[1000 psi]
Maximum oil flow	76 l/min	[20 US gal/min]
Spool travel in and out from neutral	6.3 mm	[0.25 in]
Spool travel to float position from neutral	12.6 mm	[0.50 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm <sup>2</sup> /sec (cSt) [102 SUS]	24 cm <sup>3</sup> /min	[1.46 in <sup>3</sup> /min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm <sup>2</sup> /sec (cSt) [102 SUS]	82 cm <sup>3</sup> /min	[82 cm <sup>3</sup> /min]
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature range	-29° to 60° C	[-20° to 140° F]
Minimum viscosity	6 mm <sup>2</sup> /sec (cSt)	[45 SUS]
Maximum viscosity	440 mm <sup>2</sup> /sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
typical spool effort: dry, full stroke	231 N	[53 lbf]
Weight	3.18 kg	[7 lbs]

**OPTIONS**

*Spool types*

Code	Symbol	Description
T		4-way, 3-position Open center Work ports blocked to tank in neutral position
V		4-way, 3-position Open center B port blocked to tank
F		4-way, 4-position Open center Work ports blocked to tank in neutral position, open to tank in fourth position or float

**OPTIONS**  
 (continued)

Code	Symbol	Description
<b>X</b>		3-way, 3-position Open center Work port blocked to tank in neutral position
<b>O</b>		4-way, 3-position Motor open center Work ports open to tank in neutral position

*Spool action*

Code	Description	Code	Description
A	Spring centered, detent in float	N	Spring centered, detent in
D	3-position detent	S	Spring centered
L	Spring centered, detent out		

**Relief valve**

- Pilot operated relief valve
- 0.4 bar per liter [20 psi per gallon] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard

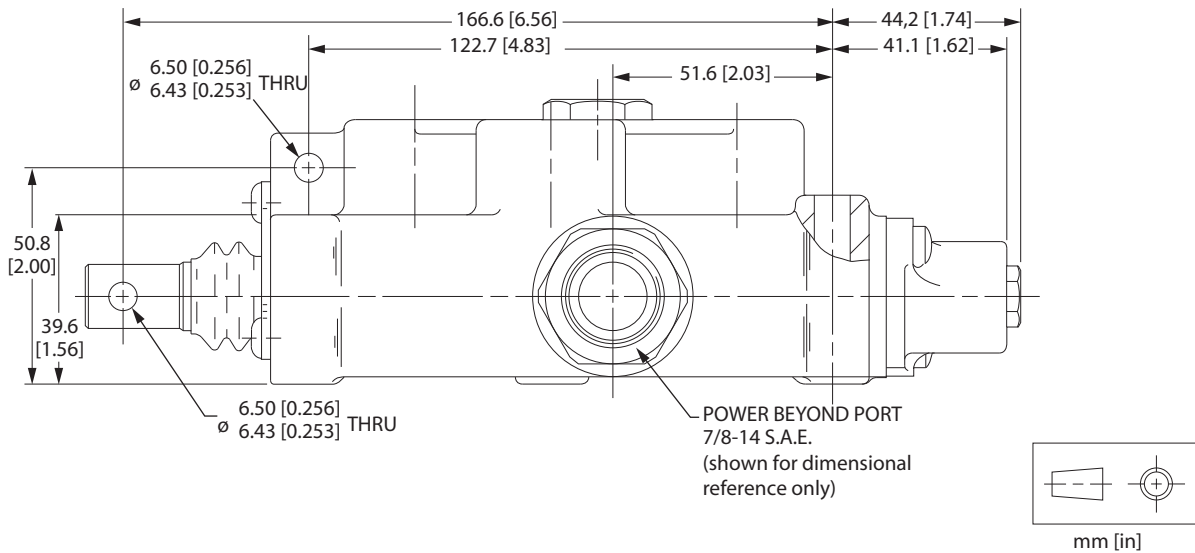
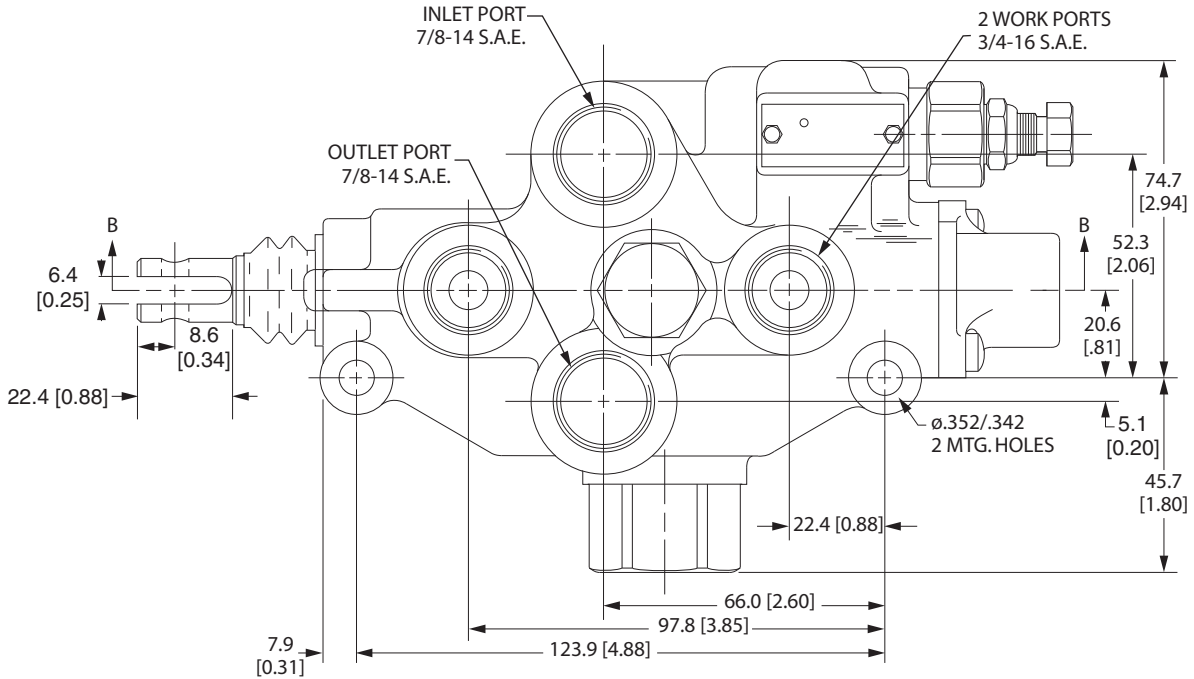
*Porting*

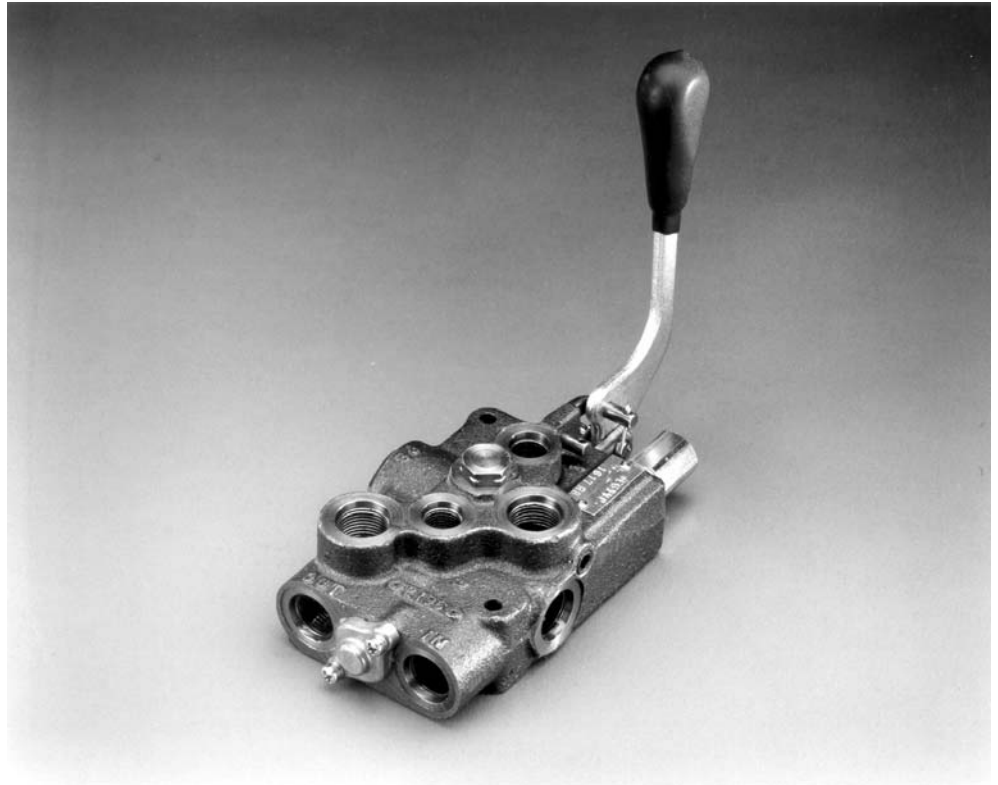
<b>Inlet/outlet</b>	7/8-14, SAE (standard) 3/4-16 SAE
<b>Locations available</b>	top and side
<b>Work ports</b>	3/4-16, SAE (standard)

**Handles**

- C-hook kit
- Standard handle with C-hook kit
- Pivot-block handle kit

**DIMENSIONS**





#### DESCRIPTION

Single spool directional control valve with parallel circuitry. 38 l/min [10 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

#### TYPICAL APPLICATIONS

Lawn and garden tractors, mowers, small tractor loader attachments, sweepers, utility trucks, trenchers, agricultural equipment

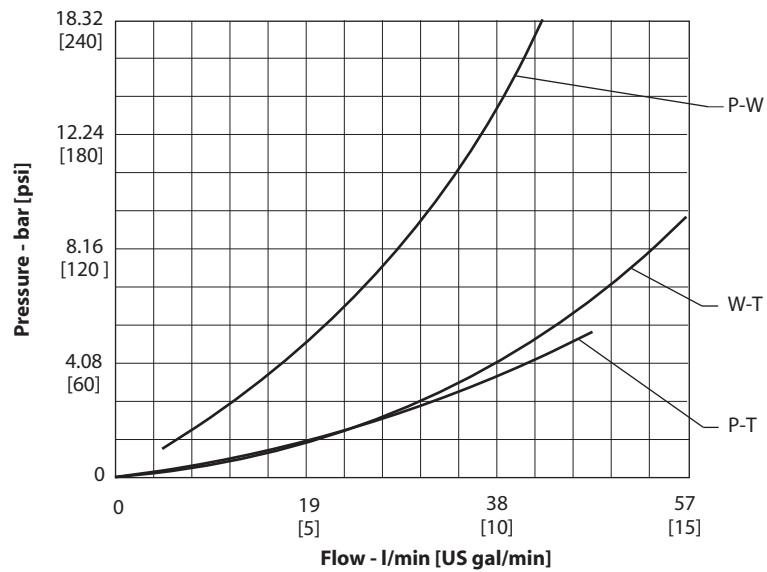
#### STANDARD FEATURES

- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required)
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Paint color: black primer
- Load check for each spool to prevent load drop before raise
- Float conversion (add float detent kit **A** to standard **T** spool)
- Open transition valve
- Individually boxed and labeled

#### OTHER FEATURES AVAILABLE

- Tang end spool for cable control
- Unidirectional or bidirectional drop-in work port orifice plates

**PRESSURE DROP**

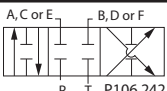
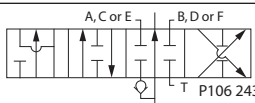
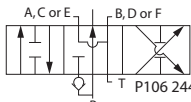


**TECHNICAL DATA**

Maximum pressure	207 bar	[3000 psi]
Maximum tank line pressure	69 bar	[1000 psi]
Maximum oil flow	38 l/min	[10 US gal/min]
Spool travel in and out from neutral	4.8 mm	[0.19 in]
Spool travel to float position from neutral	9.65 mm	[0.38 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm <sup>2</sup> /sec (cSt) [102 SUS]	16 cm <sup>3</sup> /min	[1 in <sup>3</sup> /min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm <sup>2</sup> /sec (cSt) [102 SUS]	82 cm <sup>3</sup> /min	[5 in <sup>3</sup> /min]
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature range	-29° to 60° C	[-20° to 140° F]
Minimum viscosity	6 mm <sup>2</sup> /sec (cSt)	[45 SUS]
Maximum viscosity	440 mm <sup>2</sup> /sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]
Weight	2.26 kg	[5 lbs]

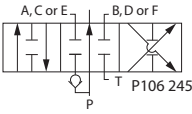
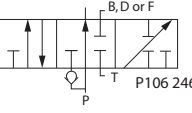
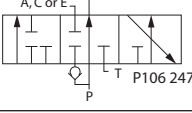
**OPTIONS**

*Spool types*

Code	Symbol	Description
<b>C</b>		4-way, 3-position Closed center Work ports blocked to tank in neutral position
<b>F</b>		4-way, 4-position Open center Work ports blocked to tank in neutral position Open to tank in fourth position or float
<b>O</b>		4-way, 3-position Motor open center Work ports open to tank in neutral position



**OPTIONS**  
**(continued)**

Code	Symbol	Description
<b>T</b>		4-way, 3-position Open center Work ports blocked to tank in neutral position
<b>V</b>		3-way, 3-position Open center Work ports blocked to tank in neutral position (B, D, or F)
<b>X</b>		3-way, 3-position Open center Work ports blocked to tank in neutral position (A, C, or E)

*Spool action*

Code	Description	Code	Description
A	Spring centered, detent in float	N	Spring centered, detent in
D	3-position detent	S	Spring centered
L	Spring centered, detent out		

*Relief valve*

Code	Description
2	Direct-acting ball and spring <ul style="list-style-type: none"> <li>• 1 bar/l [50 psi/gal] rise</li> <li>• Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> <li>• Not for use on setting over 30 l/min [8 US gal/min]</li> <li>• Full flow setting at 138 bar [2000 psi]</li> </ul>
3	Pilot operated relief valve <ul style="list-style-type: none"> <li>• 0.4 bar/l [20 psi/gal] rise</li> <li>• No restrictions on setting up to 210 bar [3000 psi]</li> <li>• Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> </ul>

*Porting*

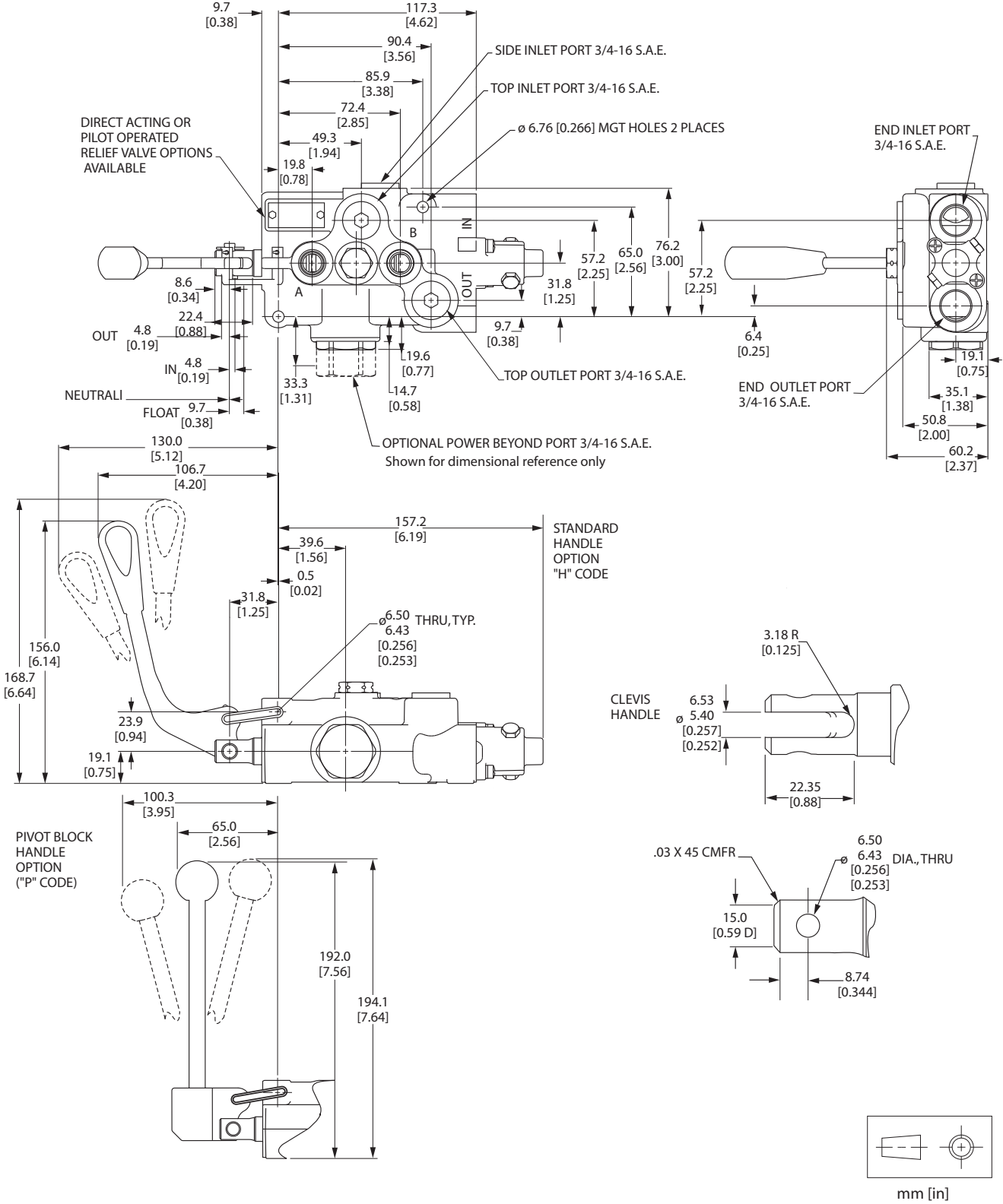
<b>Inlet/outlet</b>	3/4-16, SAE 8
<b>Locations available</b>	inlet-side, top, end outlet-top, end
<b>Work ports</b>	9/16-18, SAE-6

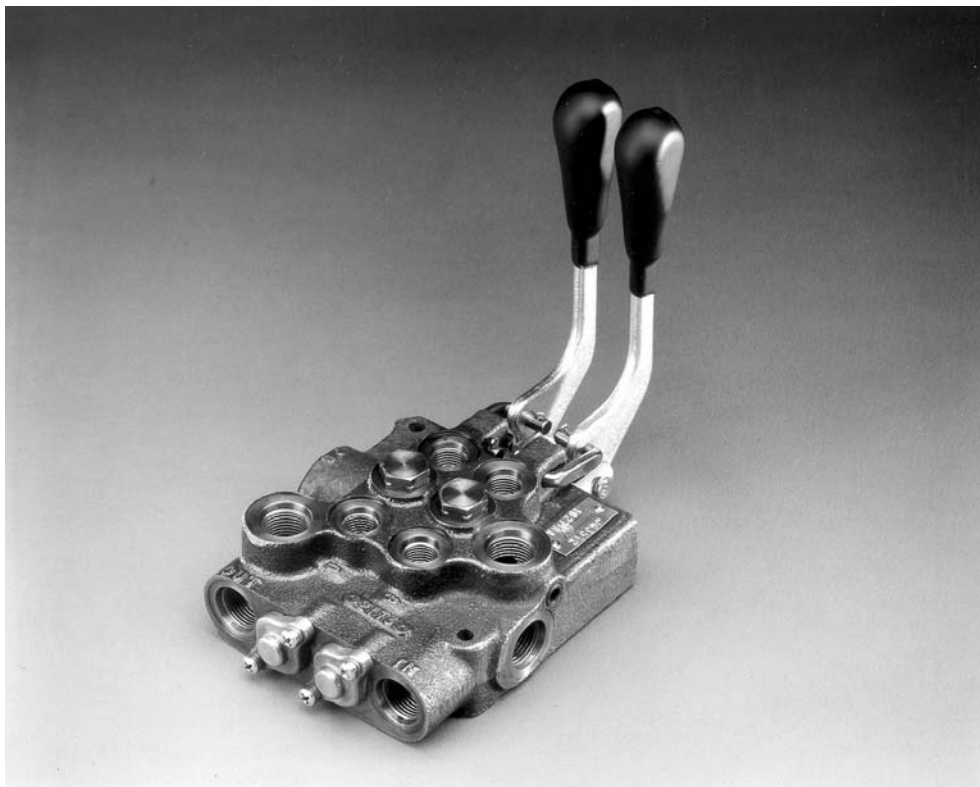
Power-beyond port machined and plugged. (Remove plug and install sleeve for power-beyond feature.)

*Handles*

Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
P	Pivot-block handle kit
N	No handles

**DIMENSIONS**





#### DESCRIPTION

Two-spool directional control valve with parallel circuitry. 38 l/min [10 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

#### TYPICAL APPLICATIONS

Lawn and garden tractors, mowers, small tractor loader attachments, sweepers, utility trucks, trenchers, agricultural equipment

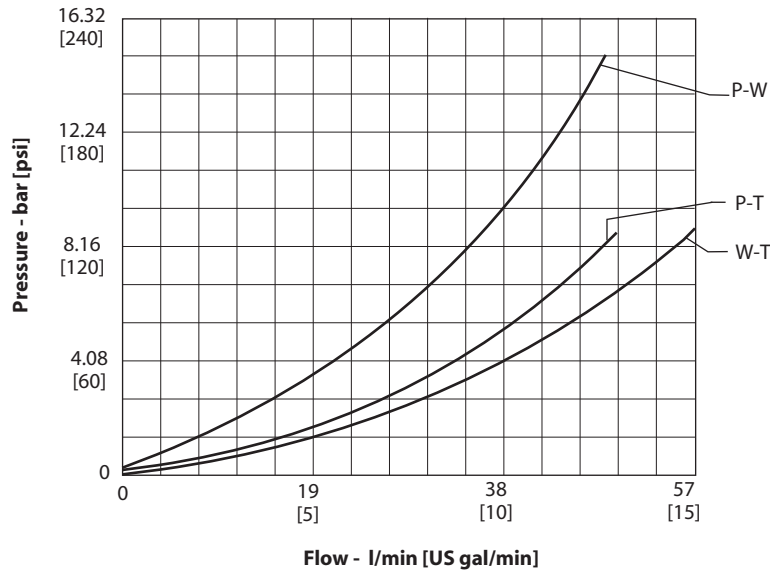
#### STANDARD FEATURES

- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required).
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Paint color: black primer
- Load-check for each spool to prevent load drop before raise
- Float conversion (add float detent kit **A** to standard **T** spool)
- Open transition valve
- Individually boxed and labeled

#### OTHER FEATURES AVAILABLE

- Tang-end spool (for cable control)
- Single handle, mechanical joystick control (model 1627)
- Unidirectional or bidirectional drop-in work port orifice plates
- Range of port sizes

**PRESSURE DROP**



**TECHNICAL DATA**

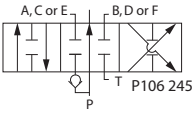
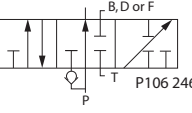
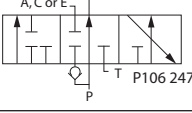
Maximum pressure	207 bar	[3000 psi]
Maximum tank line pressure	69 bar	[1000 psi]
Maximum oil flow	38 l/min	[10 US gal/min]
Spool travel in and out from neutral	4.8 mm	[0.19 in]
Spool travel to float position from neutral	9.65 mm	[0.38 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm <sup>2</sup> /sec (cSt) [102 SUS]	16 cm <sup>3</sup> /min	[1 in <sup>3</sup> /min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm <sup>2</sup> /sec (cSt) [102 SUS]	82 cm <sup>3</sup> /min	[5 in <sup>3</sup> /min]
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature range	-29° to 60° C	[-20° to 140° F]
Minimum viscosity	6 mm <sup>2</sup> /sec (cSt)	[45 SUS]
Maximum viscosity	440 mm <sup>2</sup> /sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]
Weight	3.62 kg	[8 lbs]

*Spool types*

**OPTIONS**

Code	Symbol	Description
<b>C</b>		4-way, 3-position Closed center Work ports blocked to tank in neutral position
<b>F</b>		4-way, 4-position Open center Work ports blocked to tank in neutral position Open to tank in fourth position or float
<b>O</b>		4-way, 3-position Motor open center Work ports open to tank in neutral position

**OPTIONS**  
 (continued)

Code	Symbol	Description
<b>T</b>		4-way, 3-position Open center Work ports blocked to tank in neutral position
<b>V</b>		3-way, 3-position Open center Work ports blocked to tank in neutral position (B, D, or F)
<b>X</b>		3-way, 3-position Open center Work ports blocked to tank in neutral position (A, C, or E)

*Spool action*

Code	Description	Code	Description
A	Spring centered, detent in float	N	Spring centered, detent in
D	3-position detent	S	Spring centered
L	Spring centered, detent out		

*Relief valve*

Code	Description
2	Direct-acting ball and spring <ul style="list-style-type: none"> <li>• 1 bar/l [50 psi/gal] rise</li> <li>• Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> <li>• Not for use on setting over 30 l/min [8 US gal/min]</li> <li>• Full flow setting at 138 bar [2000 psi]</li> </ul>
3	Pilot operated relief valve <ul style="list-style-type: none"> <li>• 0.4 bar/l [20 psi/gal] rise</li> <li>• No restrictions on setting up to 210 bar [3000 psi]</li> <li>• Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> </ul>

*Porting*

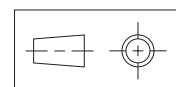
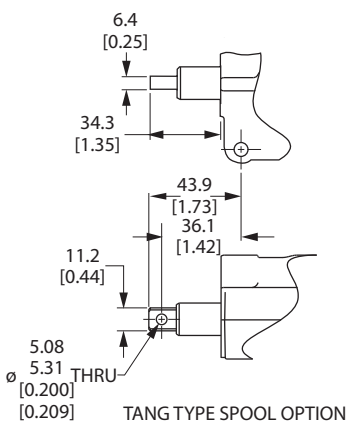
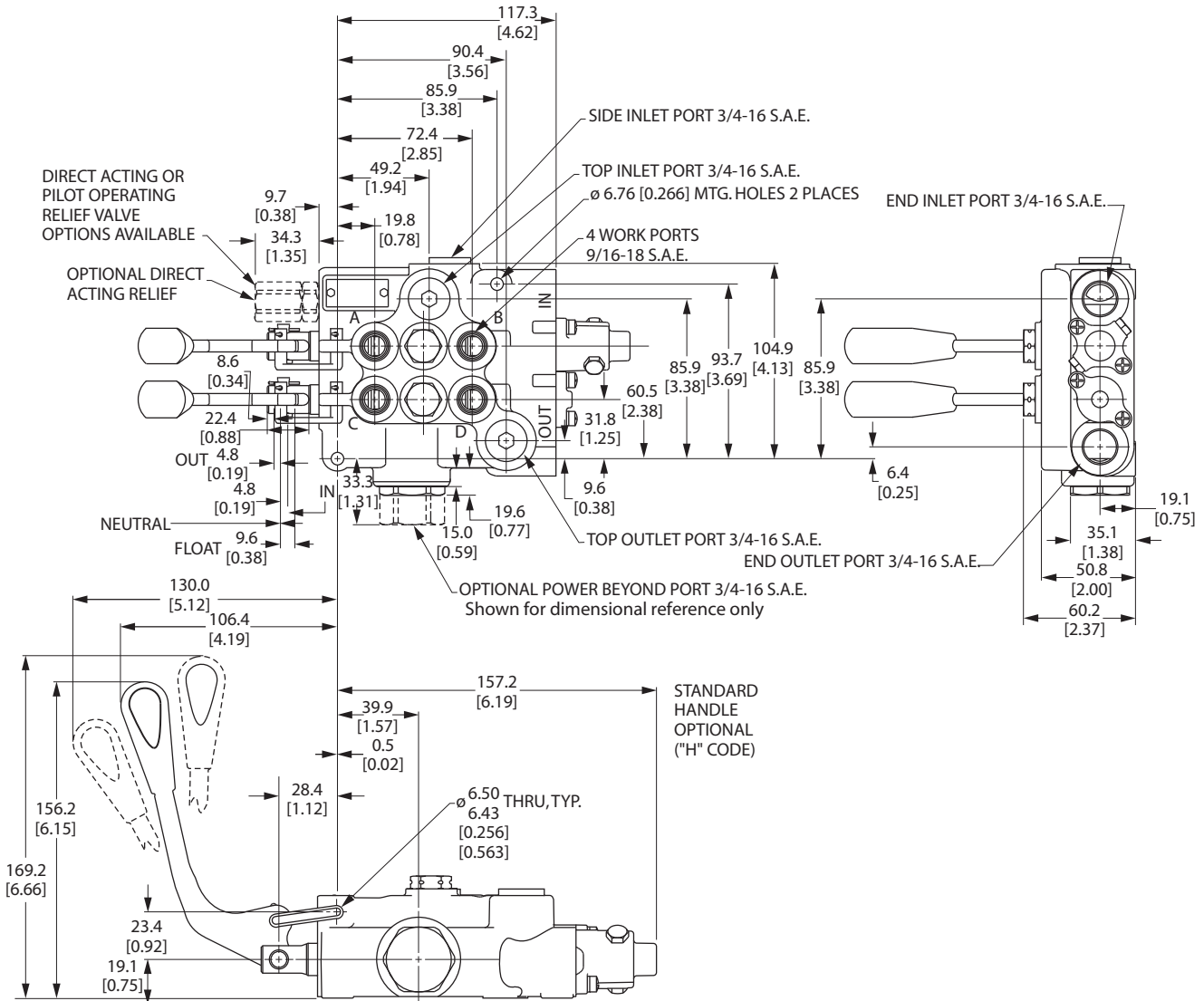
<b>Inlet/outlet</b>	3/4-16, SAE 8
<b>Locations available</b>	inlet-side, top, end outlet-top, end
<b>Work ports</b>	9/16-18, SAE-6

Power-beyond port machined and plugged. (Remove plug and install sleeve for power-beyond feature.)

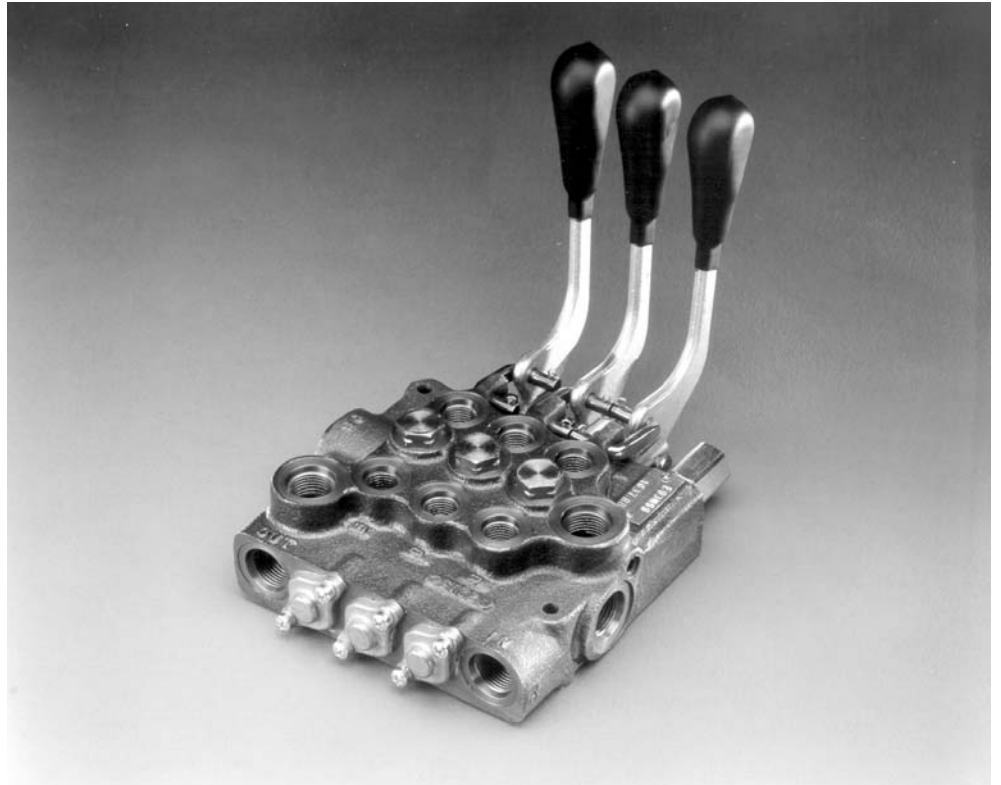
*Handles*

Code	Description
C	C-hook kit
F	Joystick (option)
H	Standard handle with C-hook kit
P	Pivot-block handle kit
N	No handles

**DIMENSIONS**



mm [in]



#### DESCRIPTION

Three spool directional control valve with parallel circuitry. 38 l/min [10 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

#### TYPICAL APPLICATIONS

Lawn and garden tractors, mowers, small tractor loader attachments, sweepers, utility trucks, trenchers, agricultural equipment

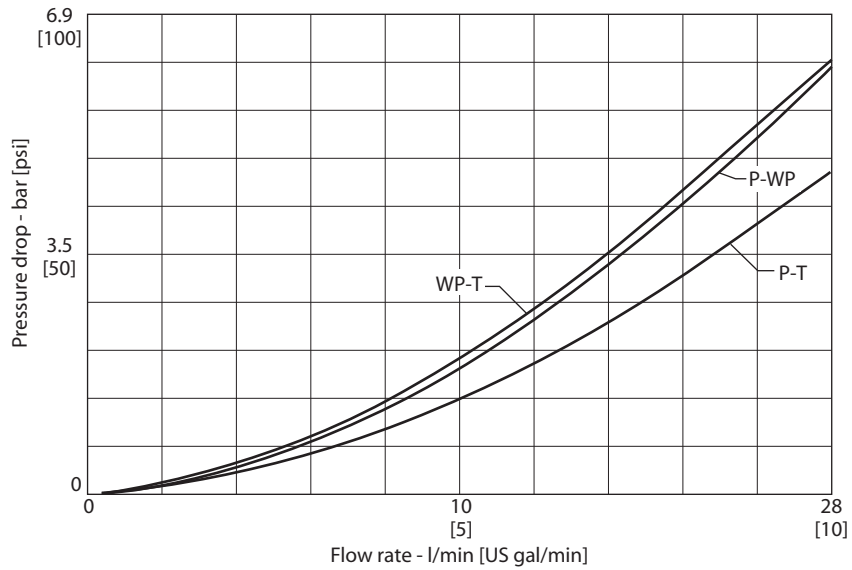
#### STANDARD FEATURES

- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required).
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Paint color: black primer
- Load-check for each spool to prevent load drop before raise
- Float conversion (add float detent kit **A** to standard **T** spool)
- Open transition valve
- Individually boxed and labeled

#### OTHER FEATURES AVAILABLE

- Tang-end spool (for cable control)
- Unidirectional or bidirectional drop-in work port orifice plates

**PRESSURE DROP**

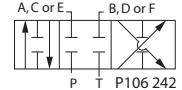
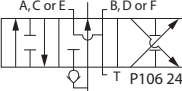
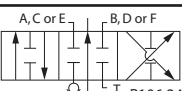


**TECHNICAL DATA**

<b>Maximum pressure</b>	207 bar	[3000 psi]
<b>Maximum tank line pressure</b>	69 bar	[1000 psi]
<b>Maximum oil flow</b>	38 l/min	[10 US gal/min]
<b>Spool travel in and out from neutral</b>	4.8 mm	[0.19 in]
<b>Spool travel to float position from neutral</b>	9.65 mm	[0.38 in]
<b>Maximum port leakage at 69 bar [1000 psi]</b> <b>21 mm<sup>2</sup>/sec (cSt) [102 SUS]</b>	16 cm <sup>3</sup> /min	[1 in <sup>3</sup> /min]
<b>Maximum lift check leakage at 69 bar [1000 psi]</b> <b>21 mm<sup>2</sup>/sec (cSt) [102 SUS]</b>	82 cm <sup>3</sup> /min	[5 in <sup>3</sup> /min]
<b>Minimum oil temperature</b>	-29° C	[-20° F]
<b>Maximum oil temperature</b>	82° C	[180° F]
<b>Ambient temperature range</b>	-29° to 60° C	[-20° to 140° F]
<b>Minimum viscosity</b>	6 mm <sup>2</sup> /sec (cSt)	[45 SUS]
<b>Maximum viscosity</b>	440 mm <sup>2</sup> /sec (cSt)	[2000 SUS]
<b>Fluid cleanliness per ISO 4406</b>	19/16	
<b>Typical spool effort: dry, full stroke</b>	231 N	[52 lbf]
<b>Weight</b>	5.44 kg	[12 lbs]

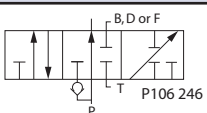
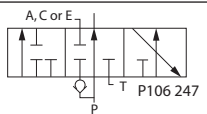
**OPTIONS**

*Spool types*

Code	Symbol	Description
<b>C</b>		4-way, 3-position Closed center Work ports blocked to tank in neutral position
<b>O</b>		4-way, 3-position Motor open center Work ports open to tank in neutral position
<b>T</b>		4-way, 3-position Open center Work ports blocked to tank in neutral position



**OPTIONS**  
 (continued)

Code	Symbol	Description
V		3-way, 3-position Open center Work ports blocked to tank in neutral position (B, D, or F)
X		3-way, 3-position Open center Work ports blocked to tank in neutral position (A, C, or E)

*Spool action*

Code	Description	Code	Description
A	Spring centered, detent in float	N	Spring centered, detent in
D	3-position detent	S	Spring centered
L	Spring centered, detent out		

*Relief valve*

Code	Description
2	Direct-acting ball and spring <ul style="list-style-type: none"> <li>• 1 bar/l [50 psi/gal] rise</li> <li>• Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> <li>• Not for use on setting over 30 l/min [8 US gal/min]</li> <li>• Full flow setting at 138 bar [2000 psi]</li> </ul>
3	Pilot operated relief valve <ul style="list-style-type: none"> <li>• 0.4 bar/l [20 psi/gal] rise</li> <li>• No restrictions on setting up to 210 bar [3000 psi]</li> <li>• Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> </ul>

*Porting*

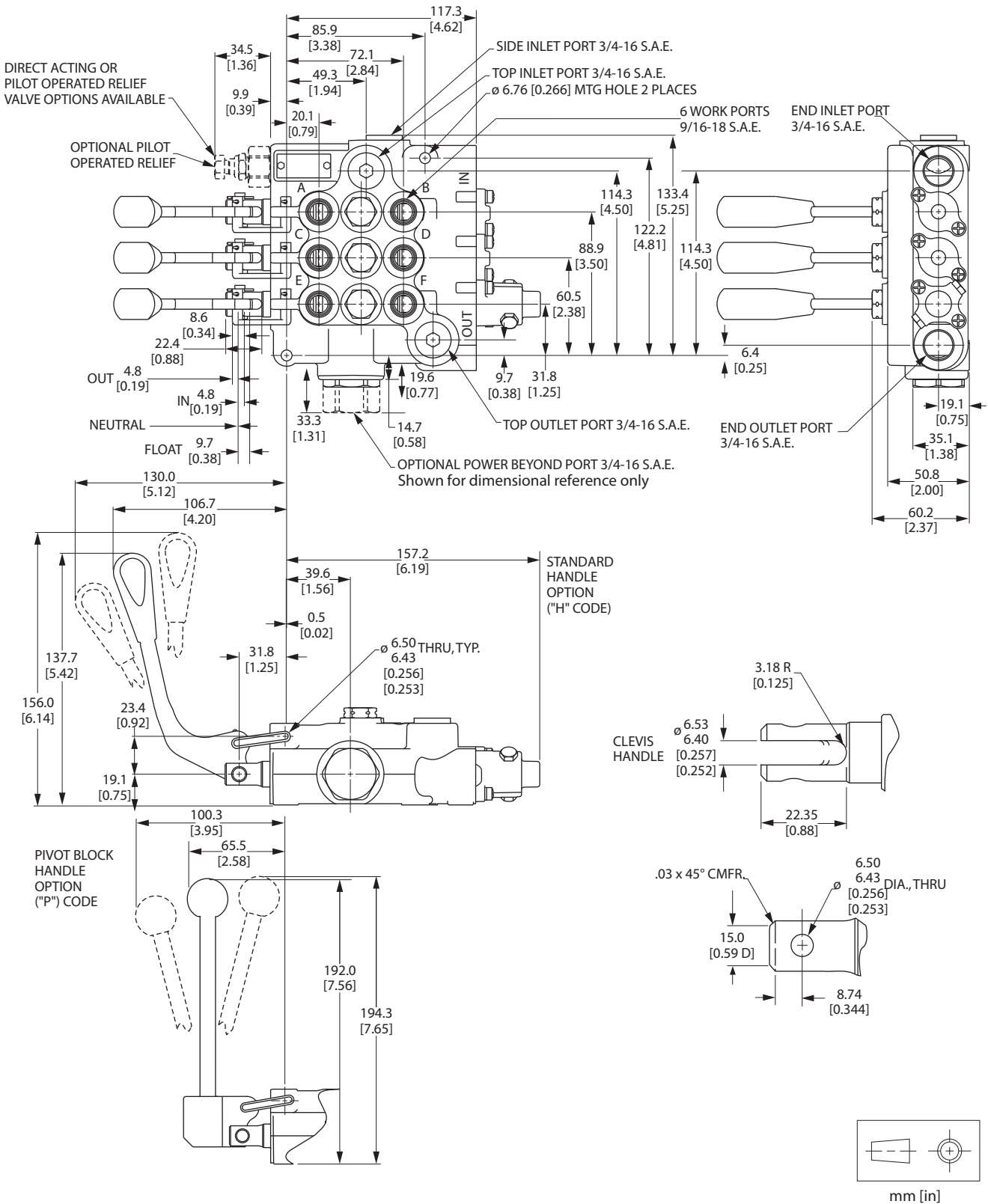
<b>Inlet/outlet</b>	3/4-16, SAE 8
<b>Locations available</b>	inlet-side, top, end outlet-top, end
<b>Work ports</b>	9/16-18, SAE-6

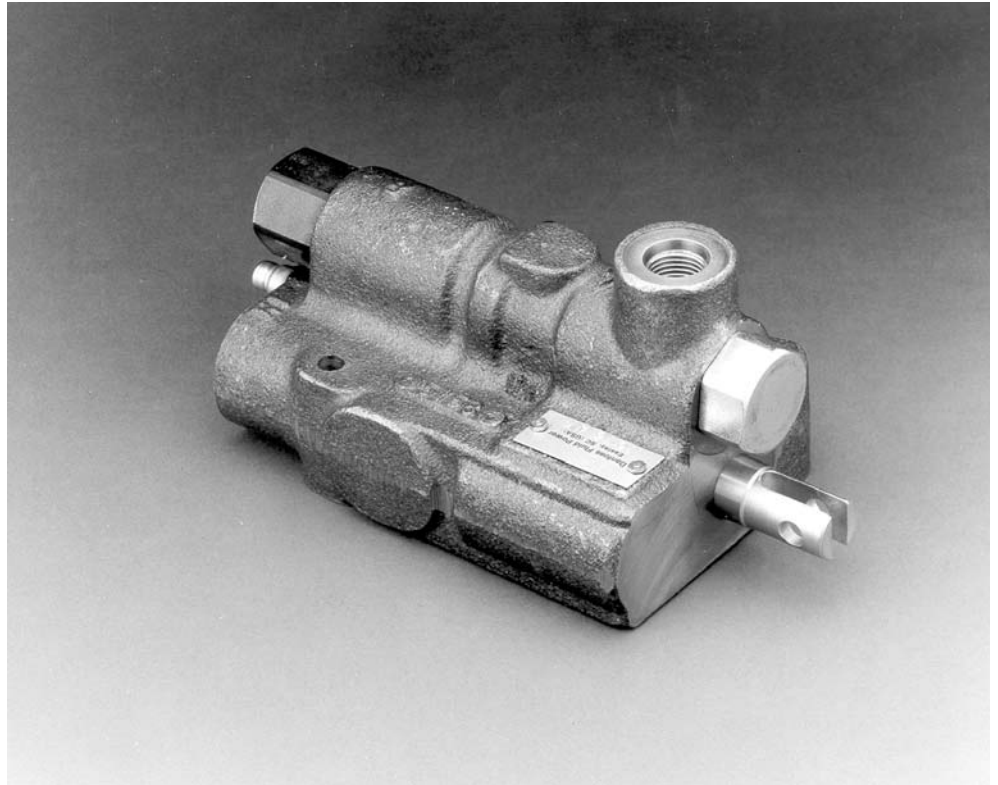
Power-beyond port machined and plugged. (Remove plug and install sleeve for power-beyond feature.)

*Handles*

Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
P	Pivot-block handle kit
N	No handles

**DIMENSIONS**





**DESCRIPTION**

Single spool monoblock valve. 38 l/min [10 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

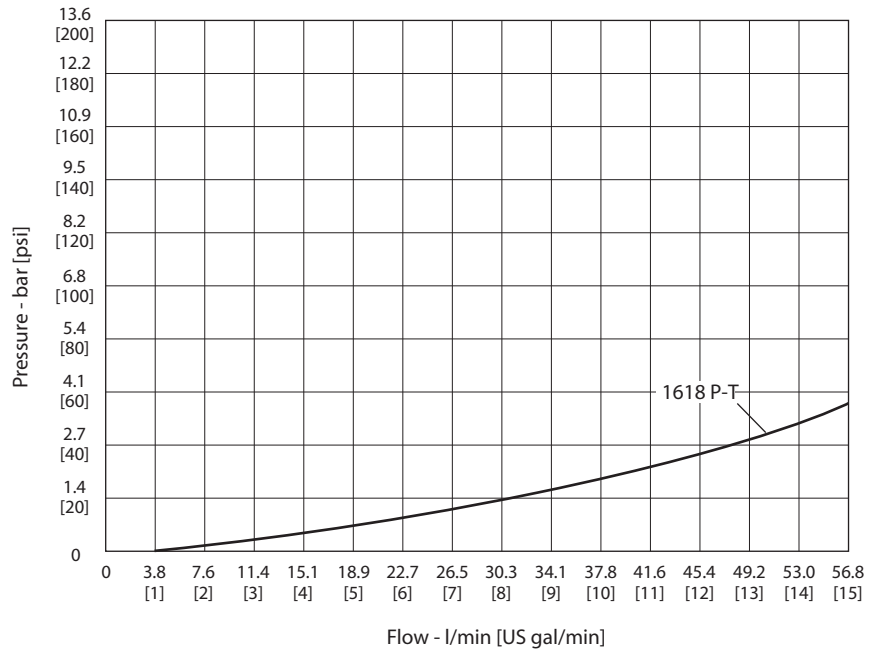
**TYPICAL APPLICATIONS**

Mowers, sweepers, fork lifts, aerial lift equipment, utility trucks, snow blades, trenchers, agricultural equipment

**STANDARD FEATURES**

- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required)
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Pilot operated checks for low leakage
- Paint color: black primer
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

**PRESSURE DROP**



**TECHNICAL DATA**

<b>Maximum pressure</b>	207 bar	[3000 psi]
<b>Maximum tank line pressure</b>	69 bar	[1000 psi]
<b>Maximum oil flow</b>	38 l/min	[10 US gal/min]
<b>Spool travel in and out from neutral</b>	4.8 mm	[0.19 in]
<b>Maximum standby leakage @ 69 bar [1000 psi] 21 mm<sup>2</sup>/sec (cSt) [102 SUS]</b>	300 cm <sup>3</sup> /min	[18 in <sup>3</sup> /min]
<b>Standard pilot check leakage @ 69 bar [1000 psi] 21 mm<sup>2</sup>/sec (cSt) [102 SUS]</b>	0.5 cm <sup>3</sup> /min	[0.03 in <sup>3</sup> /min]
<b>Minimum oil temperature</b>	-29° C	[-20° F]
<b>Maximum oil temperature</b>	82° C	[180° F]
<b>Ambient temperature range</b>	-29° to 60° C	[-20° to 140° F]
<b>Minimum viscosity</b>	6 mm <sup>2</sup> /sec (cSt)	[45 SUS]
<b>Maximum viscosity</b>	440 mm <sup>2</sup> /sec (cSt)	[2000 SUS]
<b>Fluid cleanliness per ISO 4406</b>	19/16	
<b>Typical spool effort: dry, full stroke</b>	231 N	[52 lbf]
<b>Weight</b>	2.72 kg	[6 lbs]

**OPTIONS**

*Spool types*

Code	Symbol	Description
<b>O</b>		4-way, 3-position Motor open center Work ports open to tank in neutral position

## Directional Control Valves

### Technical Information

### Model 1618

#### OPTIONS (continued)

#### Spool action

Code	Description	Code	Description
A	Spring centered, detent in float	N	Spring centered, detent in
D	3-position detent	S	Spring centered
L	Spring centered, detent out		

#### Relief valve

Code	Description
3	Pilot operated relief valve <ul style="list-style-type: none"> <li>• 0.4 bar/l [20 psi/gal] rise</li> <li>• No restrictions on setting up to 210 bar [3000 psi]</li> <li>• Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> </ul>

#### Porting

<b>Inlet/outlet</b>	9/16 -18 SAE, 3/4 - 6 SAE
<b>Locations available</b>	side, end B/D ports - end A/C ports - top, end
<b>Work ports</b>	9/16 -18 SAE

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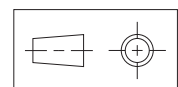
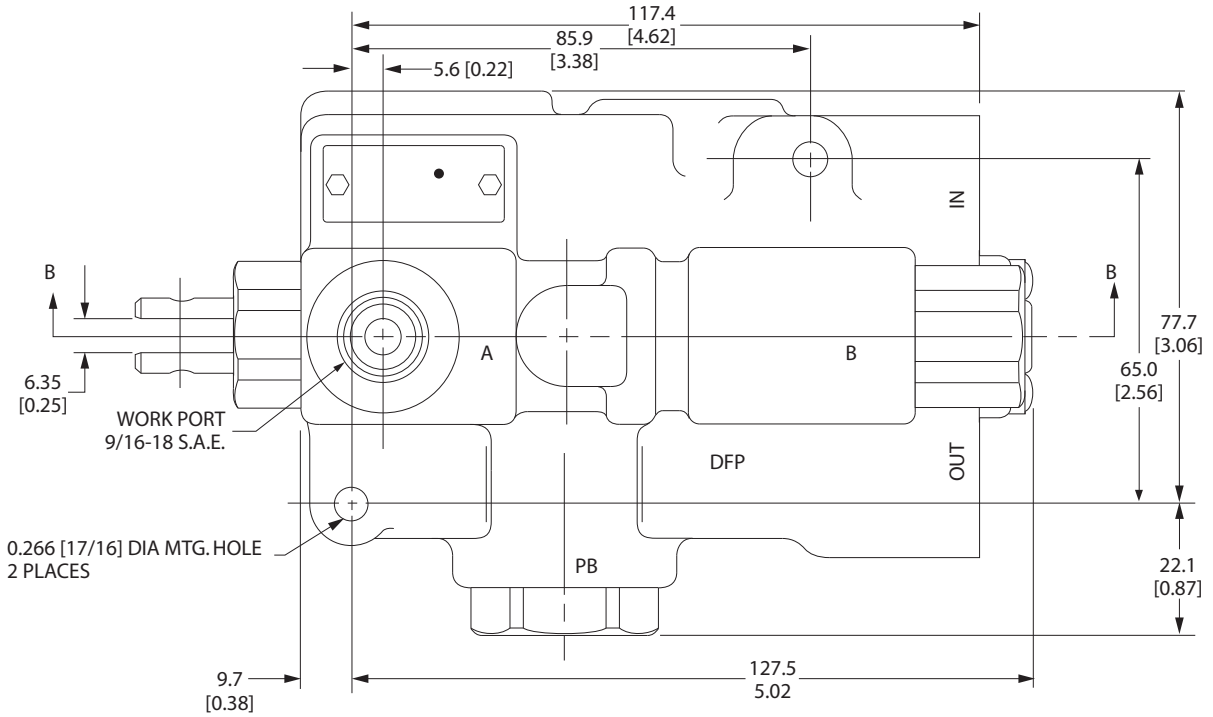
Power-beyond port machined and plugged. (Remove plug and install sleeve for power-beyond feature.)

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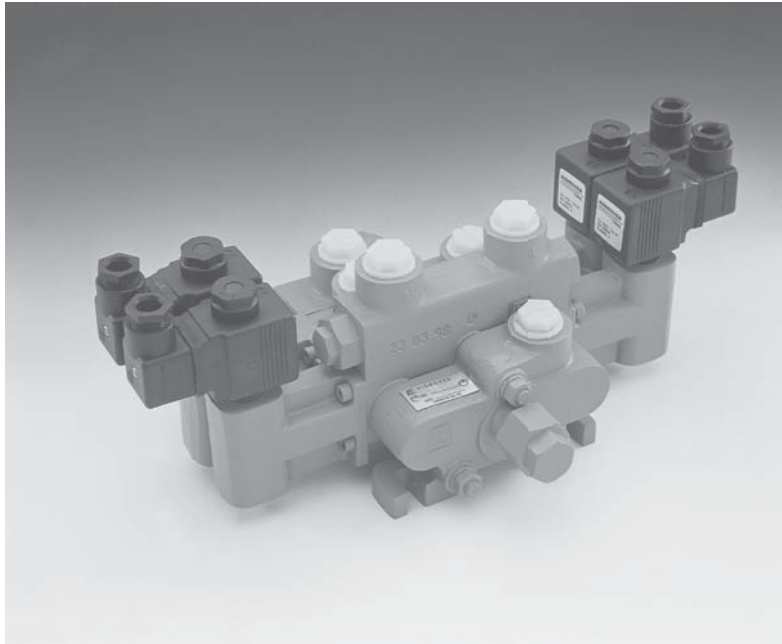
#### Handles

Code	Description
N	No handles

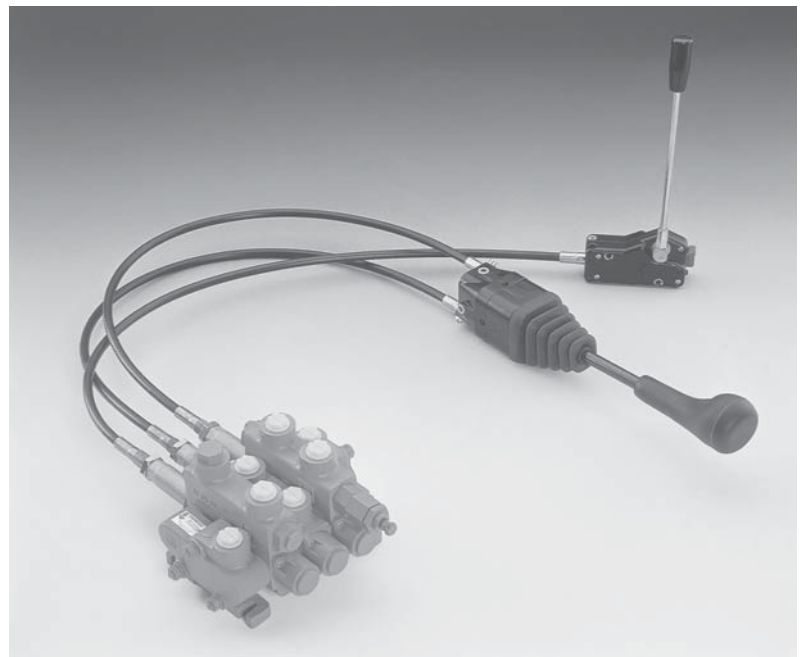
**DIMENSIONS**



mm [in]



CDS 100



CDS 60

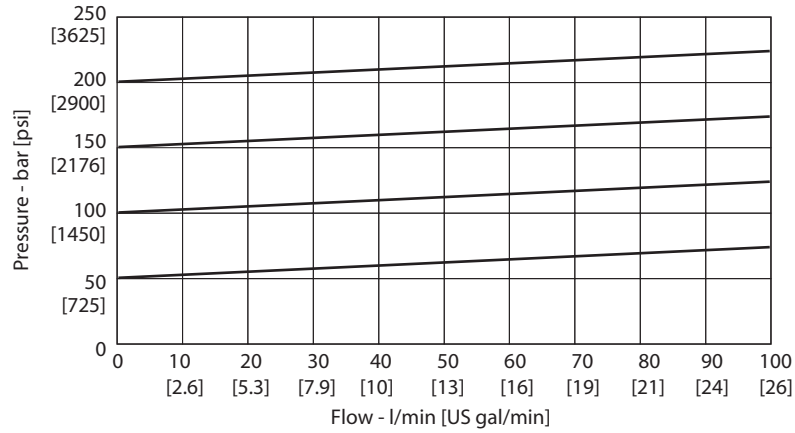
**SPECIFICATIONS**

<b>Maximum flow (CDS 100)</b>	100 l/min [26.4 US gal/min]
<b>Maximum flow (CDS 60)</b>	60 l/min [15.8 US gal/min]
<b>Work pressure</b>	210 bar [3050 psi]
<b>Maximum pressure</b>	250 bar [3625 psi]
<b>Maximum pressure (outlet section)</b>	40 bar [580 psi]
<b>Temperature range</b>	-40° to 80° C [-40 to 176° F]
<b>Recommended fluid type</b>	Mineral based hydraulic oil
<b>Recommended viscosity</b>	26-55 mm <sup>2</sup> /sec (cSt) [123-255 SUS]
<b>Minimum fluid cleanliness (per ISO 4406)</b>	19/16

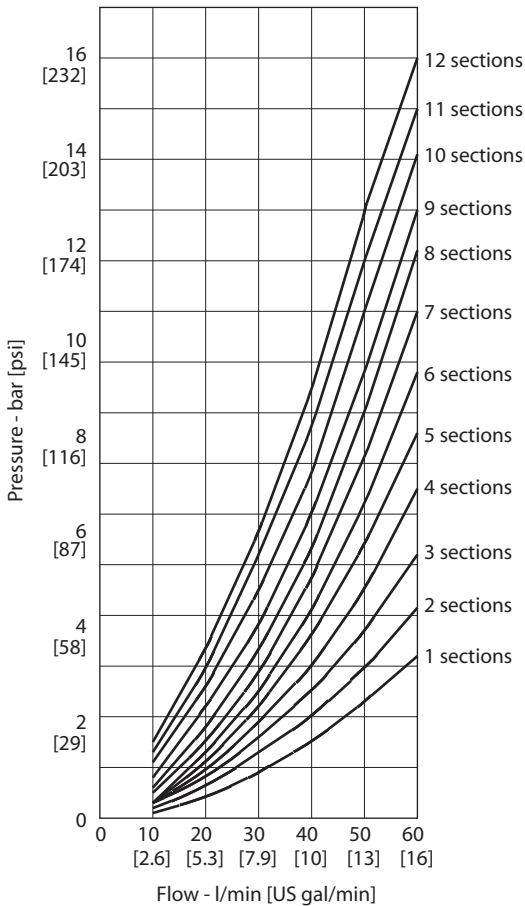
**TYPICAL PERFORMANCE**

Based on oil temperature of 45°–50°C [113°–122° F]. Viscosity 32 mm<sup>2</sup>/sec (cSt) [151 SUS]. CDS spool leakage (standard) at 70 bar [1015 psi], 50°C [122°F], ISO VG46: 10 cm<sup>3</sup>/min [0.61 in<sup>3</sup>/min]

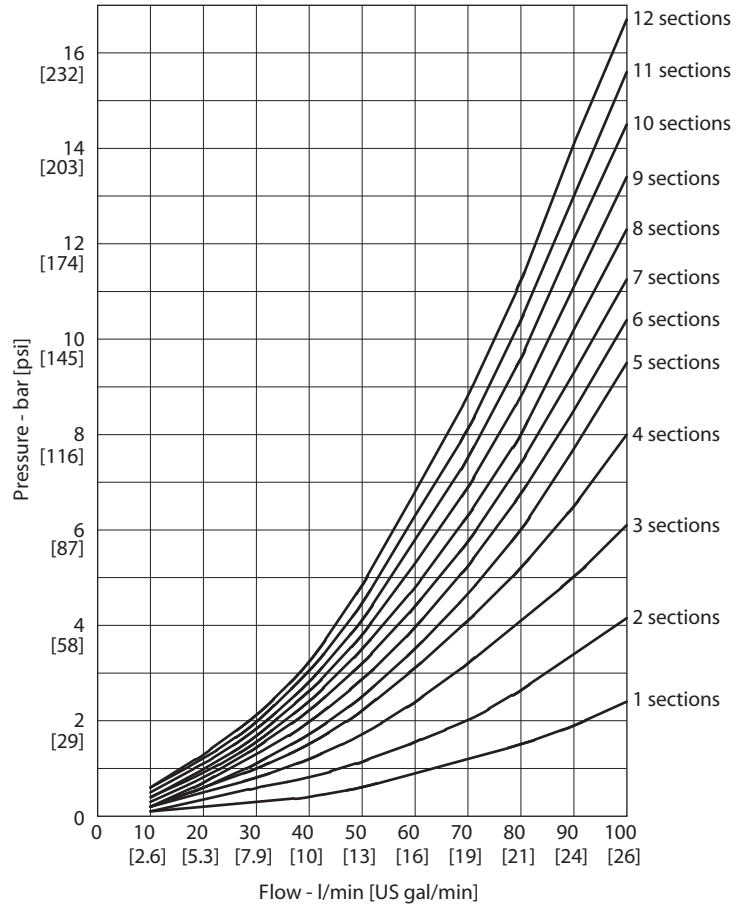
*Pressure vs. flow curves for main relief valve*



*Pressure drop (P-T) CDS 60*



*Pressure drop (P-T) CDS 100*





## Directional Control Valves Technical Information CDS 60 and 100

### INLET COVERS ORDER CODE

Inlet covers order code (example)

**E60 A C 2 140/40\***

#### Models

Code	Description
E100	CDS100
P100	CDS100 with priority flow control (contact Sauer-Danfoss)
E60	CDS60
P60	CDS60 with priority flow control (contact Sauer-Danfoss)

#### Port locations

Code	Description
A	Top port
B	Side port, top port plugged
C	Top port, with side gauge port (1/4-in NPT)
D	Top inlet and outlet ports (use H, I, J on outlet)

#### Main relief valves

Code	Description
A	No valve, with plastic plug
B	No valve, with special plug
C	Valve, with direct valve and external adjustment
D	Valve, with direct valve and internal adjustment

#### Port types

Code		1	2	3	4	5	6	7	8	9	X	
Threads		SAE - ORB			BSP - Parallel			Metric - ISO 6149			Special porting, specify	
		#8 3/4 -16UNF	#10 7/8 -14UNF	#12 1 1/16-12UNF	3/8 -19	1/2 -14	3/4 -14	M18x1.5	M22x1.5	M27x2		
Model CDS100	Inlet outlet		●	●		●	●		●	●		
	Section		●	●		●	●		●	●		
Model CDS60	Inlet outlet	●	●		●	●		●	●			
	Section	●	●		●	●		●	●			

● available

Note: At this time, North America only stocks SAE-Oring boss.

\* Default relief setting if not specified

**INLET PORTING AND  
 RELIEF VALVE OPTIONS**

Inlet covers order code (example)

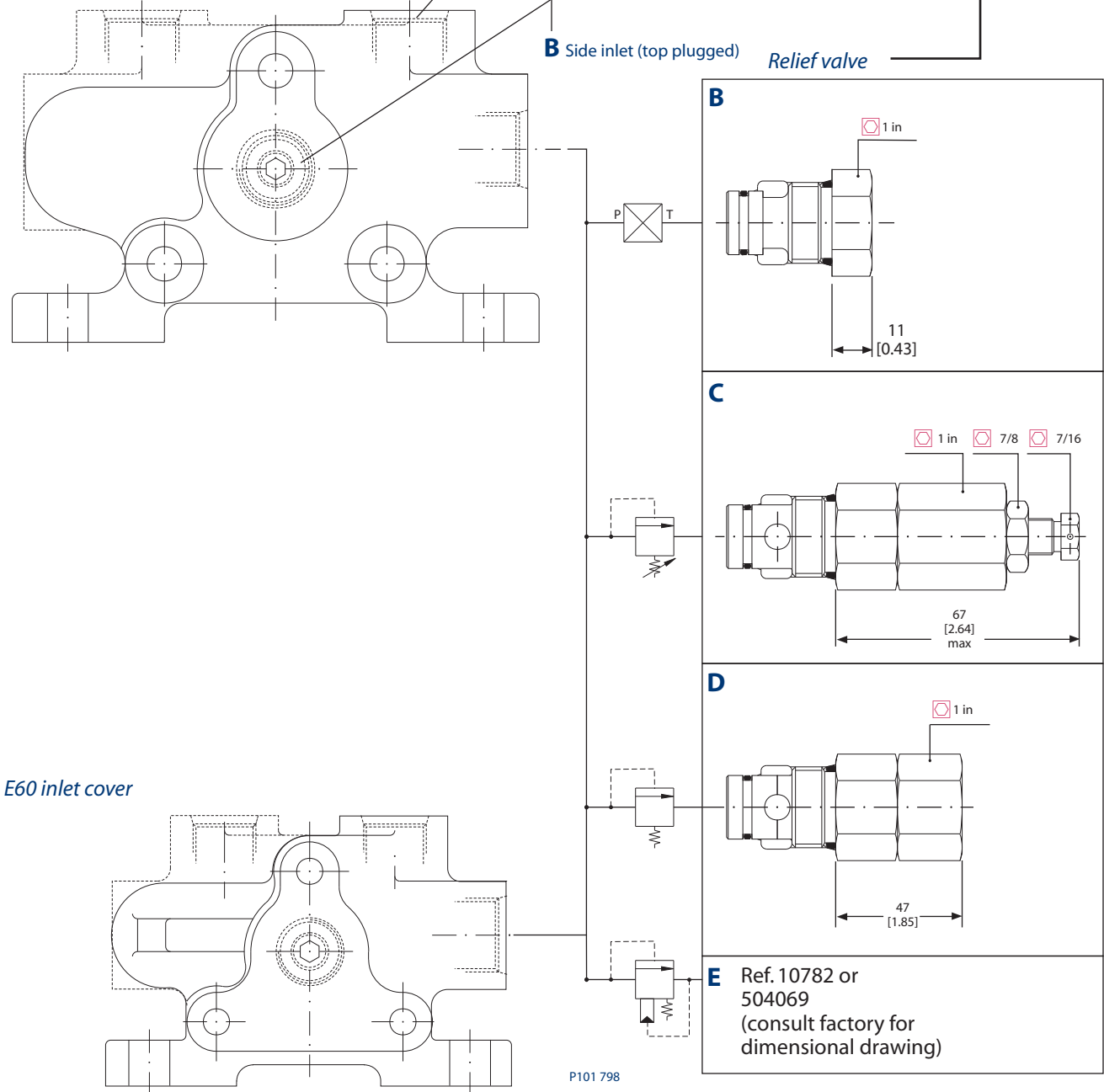
**E60 A C 2 140/40\***

Port location

- D** Top inlet and outlet (use with H,I,J, and L outlet covers)
- A** Top inlet
- C** Top inlet, gauge port side (1/4 in NPT)
- B** Side inlet (top plugged)

E100 inlet cover

Relief valve



E60 inlet cover

P101 798

mm [in]

\* Default relief setting if not specified

## Directional Control Valves Technical Information CDS 60 and 100

### MID-INLET FLOW DIVIDERS AND COMBINERS ORDER CODE

Mid-Inlet flow dividers/combiners order code (example)

**I60 1 2 2 140/40\***

#### Models

Code	Description
I60	CDS 60 mid-inlet
I100	CDS100 mid-inlet

#### Mid-inlet type

Code	Description
1	Flow divider
2	Flow combiner

#### Port types

Code		1	2	3
Threads		SAE - ORB		
		#8 3/4 -16UNF	#10 7/8 -14UNF	#12 1 1/16-12UNF
Model CDS100	Mid-inlet		●	●
Model CDS60	Mid-inlet	●	●	

● available

#### Main relief valves

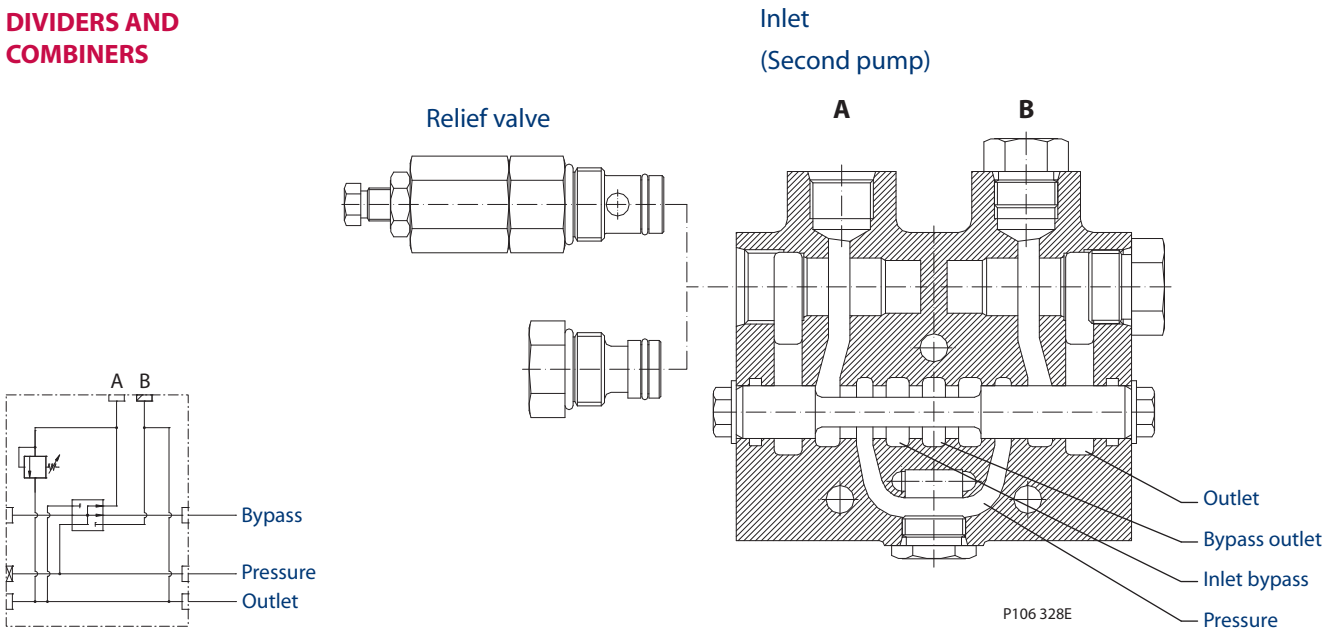
Code	Description
1	Plug
2	CDS 60 relief
3	CDS 100 relief

Note: At this time, North America only stocks SAE-Oring boss.

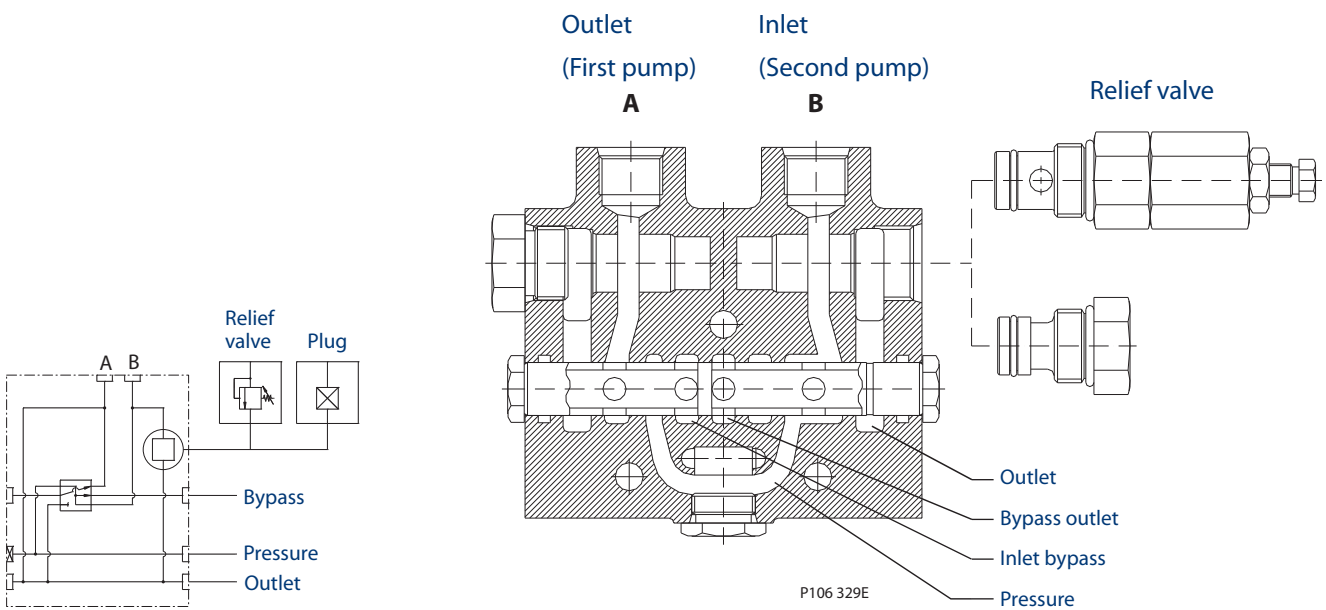
\* Default relief setting if not specified

**MID-INLET FLOW  
 DIVIDERS AND  
 COMBINERS**

*Min-inlet flow combiner*



*Min-inlet flow divider*



**OUTLET COVERS ORDER CODE**

Outlet covers order code (example)

**S60 A 2**

*Models*

Code	Description
S100	CDS 100
S60	CDS 60

*Ports*

Code	Description
A	Top outlet
B	Side outlet, top plugged
C	Side outlet for power beyond (top to tank)
D	Top outlet (with closed bypass)
E	Top outlet (for electrical control)
F	Top outlet (for electrical control, with power beyond)
G	Side outlet (for electrical control, top plugged)
H	Top plugged
I	Top plugged, use with power beyond
J	Top plugged for electrical control
L	Top plugged for electrical control, use with power beyond

*Port types*

Code		1	2	3	4	5	6	7	8	9	X
Threads		SAE - ORB			BSP - Parallel			Metric - ISO 6149			Special porting, specify
		#8 3/4 -16UNF	#10 7/8 -14UNF	#12 1 1/16-12UNF	3/8 -19	1/2 -14	3/4 -14	M18x1.5	M22x1.5	M27x2	
Model CDS100	Inlet outlet		●	●		●	●		●	●	
	Section		●	●		●	●		●	●	
Model CDS60	Inlet outlet	●	●		●	●		●	●		
	Section	●	●		●	●		●	●		

● available

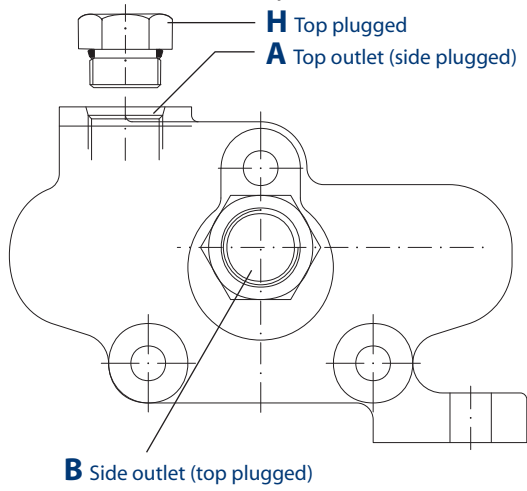
Note: At this time, North America only stocks SAE-Oring boss.

Outlet covers order code (example)

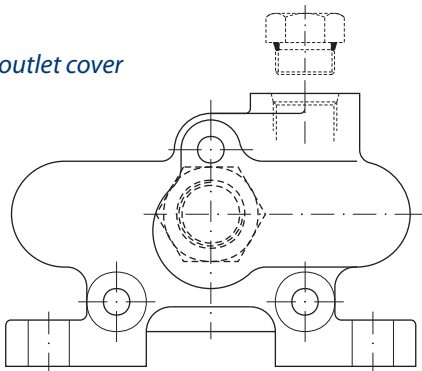
**S60 A 2**

**OUTLET PORTING AND PLUG OPTIONS**

S100 outlet cover



S60 outlet cover



P101 799E

<b>C</b>		
<b>I</b>		
<b>D*</b>		
<b>E</b>		
<b>J</b>		
<b>F</b>		
<b>L</b>		
<b>G</b>		

\*Typically used for high pressure standby.

mm [in]

Work section order code (example)

**A100** **1** **A** **E** **2** **A** **1** **A** **B** **A100** **140/40\***

**WORK SECTION ORDER CODE**

*Model*

<b>A100</b>	CDS 100 body for supporting valves
<b>B100</b>	CDS 100 normal body (no valves)
<b>A60</b>	CDS 60 body for supporting valves
<b>B60</b>	CDS 60 normal body (no valves)

*Circuit types, page 40*

<b>1</b>	Parallel (no priority)
<b>2</b>	Tandem (priority)
<b>3</b>	Series (no priority)

*Spool types, page 41 (also see Spool compatibility, next page)*

<b>A</b>	4-way, closed center
<b>B</b>	4-way, open center
<b>C</b>	4-way, closed center, port A plugged
<b>D</b>	4-way, closed center, port B plugged
<b>E</b>	3-way, closed center, port A plugged
<b>F</b>	3-way, closed center, port B plugged
<b>J</b>	4-way, open center, port A plugged
<b>H</b>	4-way, open center, port B plugged
<b>I</b>	Float-spool in (use centering option J)
<b>J</b>	Float-spool out (use centering option J)
<b>L</b>	4-way, closed center (metering spool)
<b>M</b>	4-way, open center (metering spool)
<b>N</b>	4-way, closed center, port A plugged (metering spool)
<b>P</b>	4-way, closed center, port B plugged (metering spool)
<b>Q</b>	3-way, closed center, port A plugged (metering spool)
<b>R</b>	3-way, closed center, port B plugged (metering spool)
<b>S</b>	4-way, open center, port A plugged (metering spool)
<b>T</b>	4-way, open center, port B plugged (metering spool)

*Spool actuation, pages 42–44*

<b>A</b>	No extension (spool actuation side and centering options omitted)
<b>B</b>	Female spool end
<b>C</b>	Male spool end
<b>D</b>	With support (no lever)
<b>E</b>	With lever
<b>F</b>	Pneumatic (use centering option A)
<b>G</b>	Cable with lever
<b>H</b>	Cable with joystick (use A for the adjacent body)
<b>I</b>	With mechanical joystick (use A for the adjacent body)
<b>J</b>	Electrical
<b>L</b>	Hydraulic
<b>M</b>	With mechanical joystick (use A for the adjacent body)
<b>N</b>	Enclosed lever — E (CDS 60 only)
<b>P</b>	Enclosed mechanical joystick — I (CDS 60 only)
<b>Q</b>	Enclosed mechanical joystick — M (CDS 60 only)

*Spool actuation mounting side, page 44*

<b>1</b>	Actuator mounted on A port side (or solenoid side A)
<b>2</b>	Actuator mounted on B port side (or solenoid side B)
<b>3</b>	Electrical A and B (use L centering type)

See cabling and electrical options, page 44.

\* Default relief setting if not specified

**WORK SECTION ORDER CODE (continued)**

Work section order code (example)

**A100 1 A E 2 A 1 A B A100 140/40\***

*Spool centering and detents, page 45*

<b>A</b>	Spring centered
<b>B</b>	3 position detent
<b>C</b>	Spring centered, detent in A
<b>D</b>	Spring centered, detent in B
<b>E</b>	Spring centered, detent in A and B
<b>F</b>	Spring centered, hydraulic kickout
<b>G</b>	Spring centered, adjustable stroke
<b>H</b>	Spring centered, female extension
<b>I</b>	Spring centered, male extension
<b>J</b>	Spring centered, detent in float: use for floatation spool
<b>L</b>	Spring centered, use for electrical command
<b>M</b>	By spring offset
<b>N</b>	2-position detent, spool in
<b>O</b>	2-position detent, spool out
<b>P</b>	With switch, activates spool in
<b>Q</b>	With switch, activates spool in and out
<b>R</b>	With switch, activates two motors

*Port types*

Code		1	2	3	4	5	6	7	8	9	X
<b>Threads</b>		<b>SAE - ORB</b>			<b>BSP - Parallel</b>			<b>Metric - ISO 6149</b>			Special porting, specify
		#8 3/4 -16UNF	#10 7/8 -14UNF	#12 1 1/16-12UNF	3/8 -19	1/2 -14	3/4 -14	M18x1.5	M22x1.5	M27x2	
<b>Model CDS100</b>	Inlet outlet		●	●		●	●		●	●	
	Section		●	●		●	●		●	●	
<b>Model CDS60</b>	Inlet outlet	●	●		●	●		●	●		
	Section	●	●		●	●		●	●		

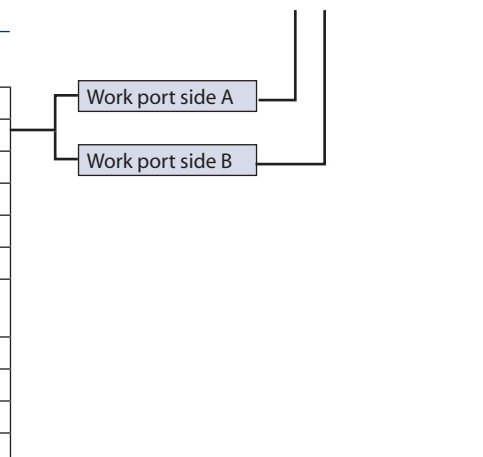
● available

Note: at this time, North America only stocks SAE O-ring boss.

*Auxiliary valves, page 46-47*

<b>A</b>	Plug
<b>B</b>	Direct relief with external adjustment (except electrical actuation)
<b>C</b>	Direct relief with internal adjustment
<b>D</b>	Pilot retaining
<b>E</b>	Flow control valve (electrical actuators mounted upside down)
<b>F</b>	Anti-cavitation
<b>G</b>	Direct relief with anti-cavitation and external adjustment (except electrical actuation)
<b>H</b>	Plastic plug
<b>I</b>	Direct relief with anti-cavitation and internal adjustment (electrical only)
<b>J</b>	Plug, for 3-way spools
<b>K</b>	Plug, for valves D and E
<b>L</b>	Plastic plug, for flow control valve
<b>M</b>	Plastic plug, for PO checks

For valves B, C, G, and I, specify pressure and flow  
Example: **B(140/40)** Pressure 140 bar flow 40 l/min



\* Default relief setting if not specified



**WORK SECTION ORDER  
 CODE (continued)**

*Spool compatibility*

Model	Spool types					
	A, C, D	B, G, H	E	F	I	J
A60/100 with pilot retaining	●	●				
A60/100 with pilot retaining and hydraulic unlock	●	●				
A60/100 with pilot retaining and electrical spool control	●	●				
A60/100 with flow control	●	●				
A60/100 with flow control and hydraulic unlock	●	●				
A60/100 with out pilot retaining	●▲	●▲	●▲	●▲	●▲	●▲
A60/100 with out pilot retaining with hydraulic unlock	●▲	●▲	▲	▲	▲	▲
A60/100 with out pilot retaining and electrical spool control	●▲	●▲	●▲	●▲	▲	▲
B60/100	●▲	●▲	●▲	●▲	●▲	●▲
B60/100 with hydraulic unlock	●▲	●▲	▲	▲	▲	▲
B60/100 with electrical spool control	●▲	●▲	●▲	●▲	▲	▲

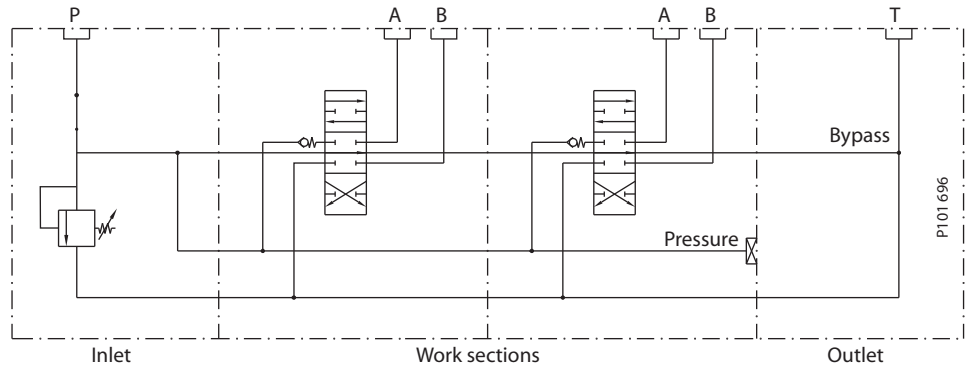
● Parallel and tandem  
 ▲ Series

**CIRCUIT TYPES**

Work section order code (example)

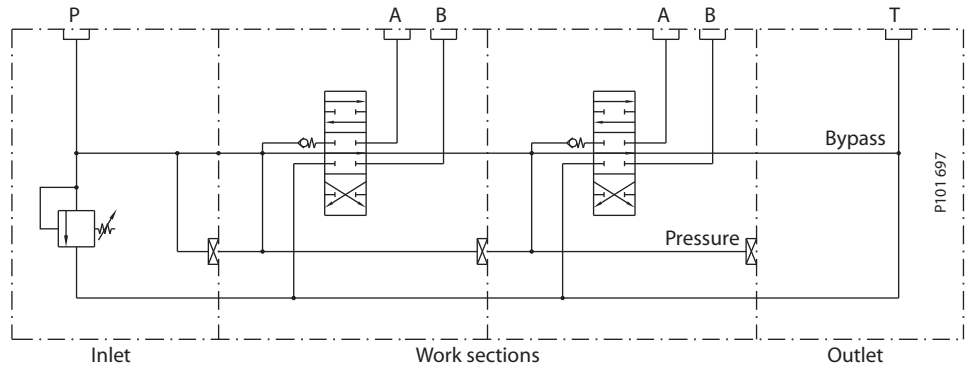
**A100 1 A E 2 A 1 A B A100 140/40\***

**1 Parallel circuit (no priority)**



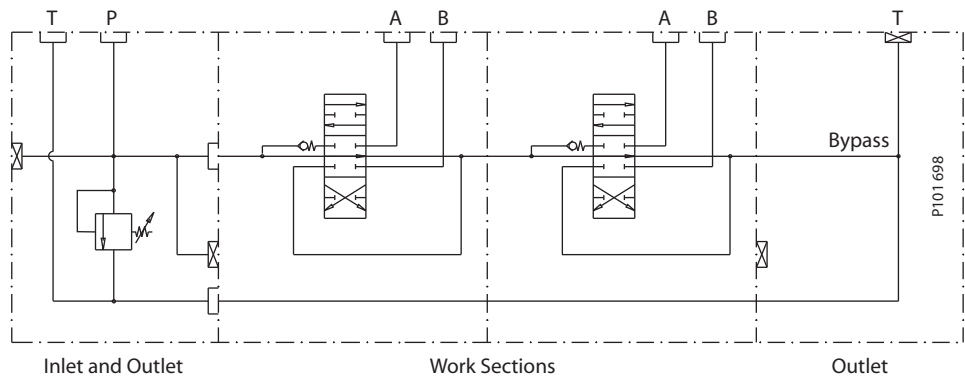
**When two or more sections operate simultaneously, flow favors the lowest pressure.**

**2 Tandem circuit (priority)**



**When two or more sections operate simultaneously, only the section closest to the inlet receives flow.**

**3 Series circuit (no priority)**



**When two or more sections operate simultaneously, the section closest to the inlet receives flow. Return flow feeds the sections downstream.**

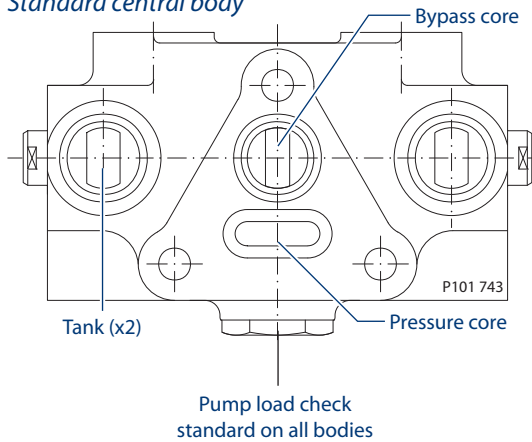
\* Default relief setting if not specified

Work section order code (example)

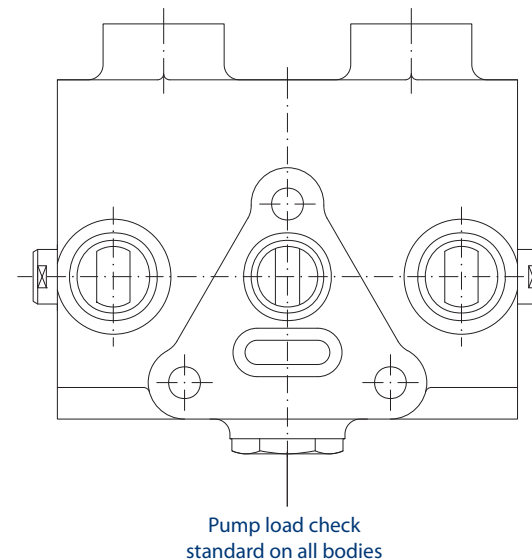
**A100 1 A E 2 A 1 A B A100 140/40\***

**SPOOL TYPES**

Standard central body



Central body for use with auxiliary valves

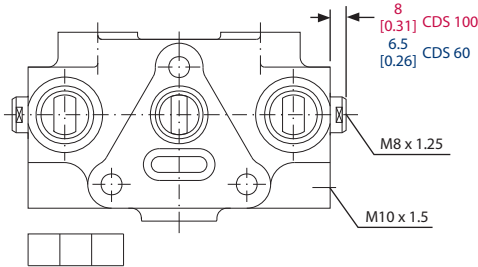


Ref.	Description	Symbol
<b>A</b>	4-way closed center	
<b>L</b>	4-way closed center metering spool	
<b>B</b>	4-way open center	
<b>M</b>	4-way open center metering spool	
<b>C</b>	4-way closed center port A plugged	
<b>N</b>	4-way closed center port A plugged metering spool	
<b>D</b>	4-way closed center port B plugged	
<b>P</b>	4-way closed center port B plugged metering spool	
<b>E</b>	3-way closed center port A plugged	
<b>Q</b>	3-way closed center port A plugged metering spool	
<b>F</b>	3-way closed center port B plugged	
<b>R</b>	3-way closed center port B plugged metering spool	
<b>G</b>	4-way open center port A plugged	
<b>S</b>	4-way open center port A plugged metering spool	
<b>H</b>	4-way open center port B plugged	
<b>T</b>	4-way open center port B plugged metering spool	
<b>I</b>	Float spool in (inner inverter)	
<b>J</b>	Float spool out (outer inverter)	

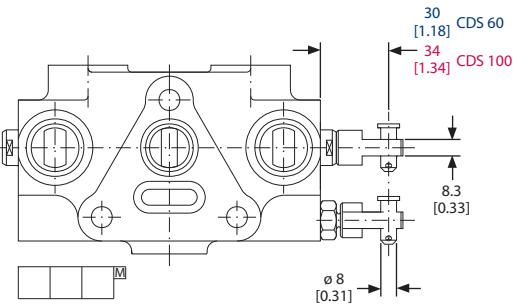
\* Default relief setting if not specified

**ACTUATION OPTIONS**

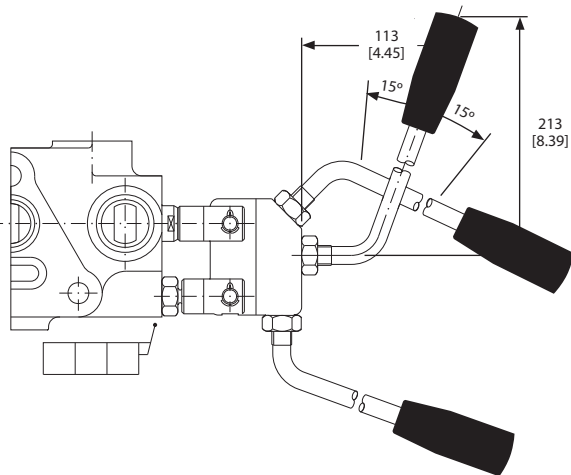
**A Without spool end**



**C Male spool end (tang)**

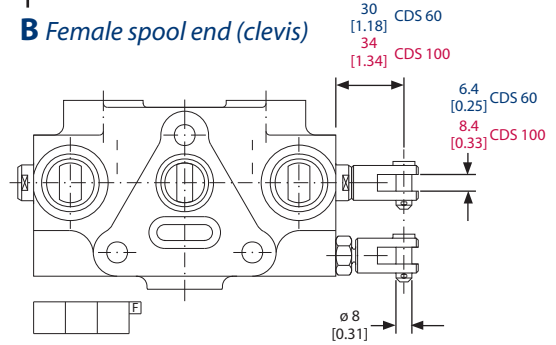


**E With lever**

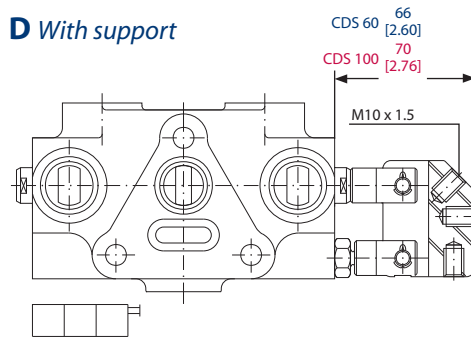


Work section order code (example)  
**A100 1 A E 2 A 1 A B A100 140/40\***

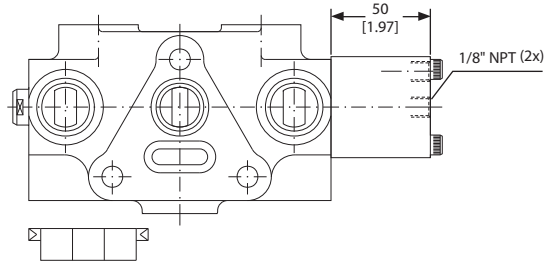
**B Female spool end (clevis)**



**D With support**

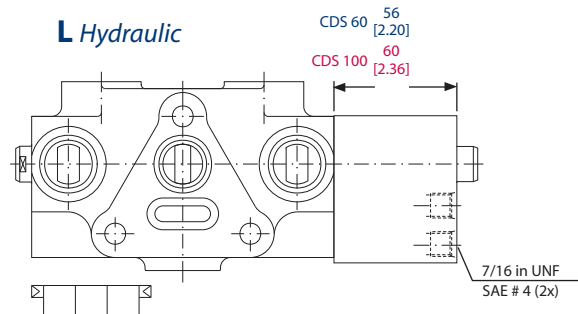


**F Pneumatic**



Minimum air pressure CDS 60: 5 bar [73 psi]  
 Minimum air pressure CDS 100: 8 bar [116 psi]  
 Maximum air pressure: 12 bar [174 psi]

**L Hydraulic**



Minimum pressure CDS 60: 8 bar [116 psi]  
 Minimum pressure CDS 100: 12 bar [174 psi]  
 Maximum pressure: 100 bar [1450 psi]

mm [in]

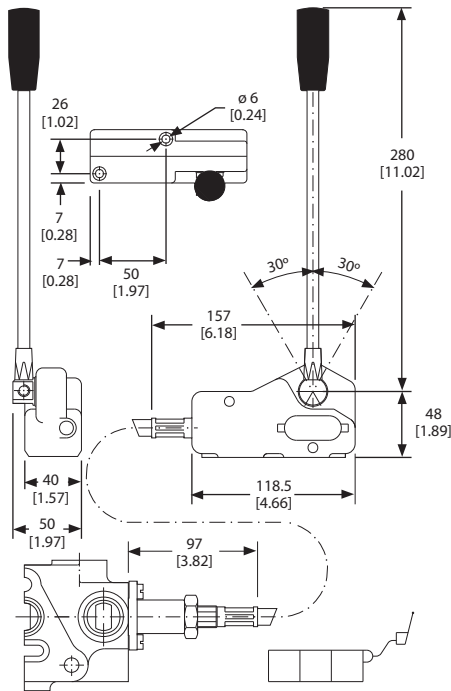
\* Default relief setting if not specified

Work section order code (example)

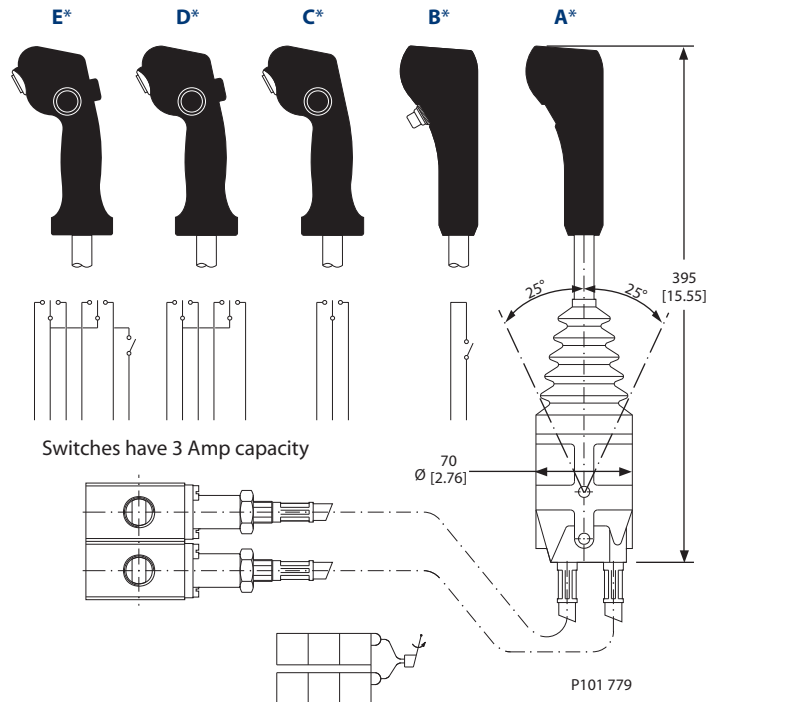
A100	1	A	E	2	A	1	A	B	A100	140/40*
------	---	---	---	---	---	---	---	---	------	---------

**ACTUATION OPTIONS (continued)**

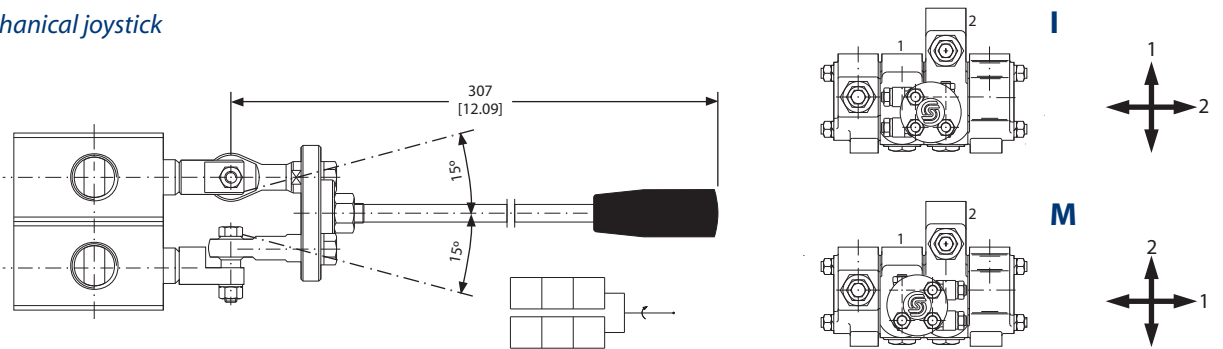
**G Cable with lever\***



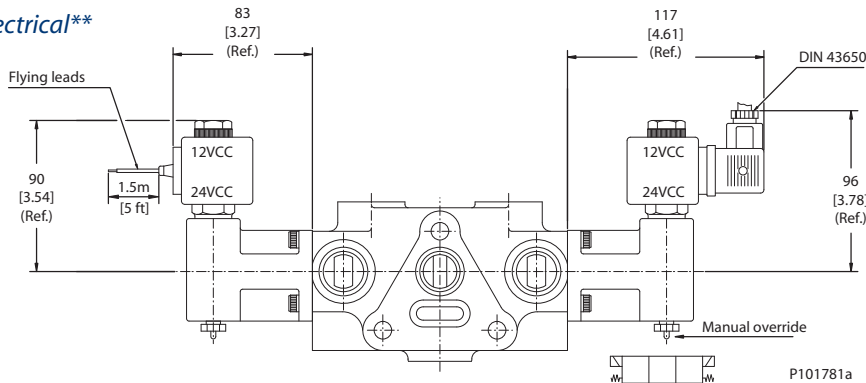
**H Cable with joystick\*\***



**I/M Mechanical joystick**



**J Electrical\*\***



\*\*See cabling and electrical options, next page.

Standard sections cannot be converted to electrical due to internal pilot.

Minimum pilot pressure to actuate: 35 bar [500 psi]

mm [in]

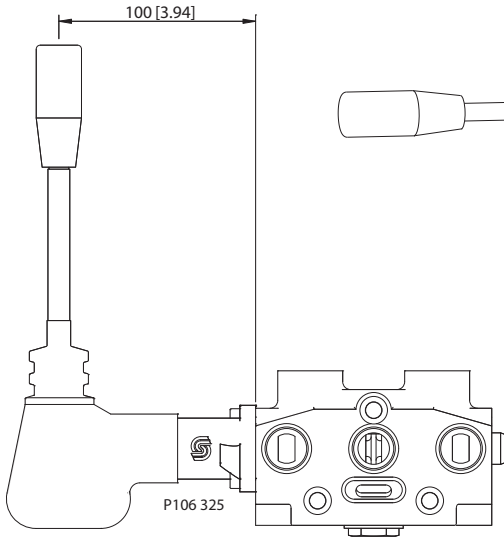
\* Default relief setting if not specified

**ACTUATION OPTIONS (continued)**

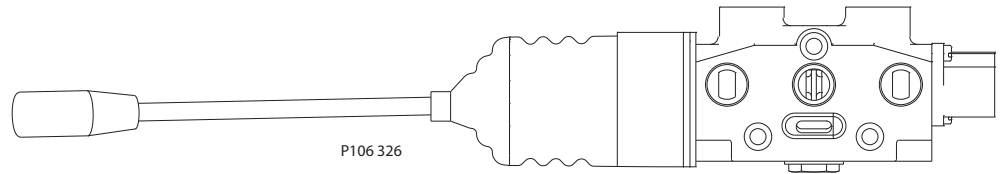
Work section order code (example)

A100	1	A	E	2	A	1	A	B	A100	140/40*
------	---	---	---	---	---	---	---	---	------	---------

**N** Enclosed lever



**P/Q** Enclosed mechanical joystick



For dimensions, see *I/M Mechanical joystick option*, previous page.

**CABLING AND ELECTRICAL OPTIONS FOR ACTUATOR TYPES G, H, AND J**

Work section order code (example)

**A100 1 A E 2 A 1 A B A100 140/40\***

**G: Flexible cable and lock options for spool control lever**

	A	B	C
<b>Lever lock options</b>	Without lock	Lock in A and/or B	Lock in central position
<b>Standard cables</b>	100 - 125 - 150 - 175 - 200 - 250 - 275 - 300 - 325 - 350 - 400 - 450 - 500 cm (other: consult)		
<b>Example: how to order</b>	A60 - 1AG2A1 - AB - <b>A100</b> - 140/40 (lever without lock, 100 cm cable)		

**H: Flexible cable and handle options controls for joystick**

	A	B	C	D	E
<b>Joystick handle options</b>	Without switches	On-Off switch	On-Off-On switch	Two On-Off-On switches	Two On-Off-On switches and one On-Off switch
<b>Standard cables</b>	100 - 125 - 150 - 175 - 200 - 250 - 275 - 300 - 325 - 350 - 400 - 450 - 500 cm (other: consult)				
<b>Example: how to order</b>	A60 - 1AH2A1 - AB - <b>A100</b> - 140/40 (handle without switches, 100 cm cable)				

**J: Electrical spool voltage and termination options**

<b>Voltage</b>	A	B	E	F
	12 VDC - lead wires	24 VDC - lead wires	12 VDC - DIN 43650 conn.	24 VDC - DIN 43650 conn.
<b>Example: how to order</b>	A60 - 1AJ3L1 - AC - <b>A</b> 140/40 (12 VDC coil with lead wires)			

**Force requirements**

kgf [lbf]	CDS 60	CDS 100
<b>Push/pull min.</b>	2 [4.4]	3.5 [7.7]
<b>Max. tension</b>	250 [551]	250 [551]

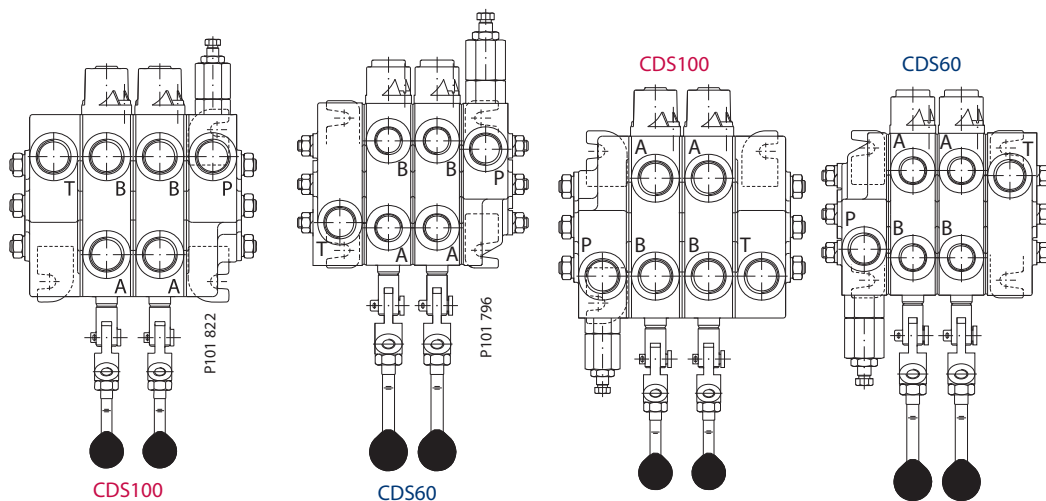
**Electrical specifications**

Voltage	Amperage (A)	Resistance (Ω)
12 VDC	1.75	6.85
24 VDC	0.88	27
Power: 21 W		

**ACTUATION MOUNTING SIDE**

**1 Actuation on A port side (RH inlet shown)**

**2 Actuation on B port side (LH inlet shown)**



\* Default relief setting if not specified

Work section order code (example)

**SPOOL CENTERING AND DETENT OPTIONS**

**A100 1 A E 2 A 1 A B A100 140/40\***

<p><b>A Spring centered</b></p> <p>32 [1.25] CDS 60 40 [1.57] CDS 100</p> <p>Spring force        CDS 60: 145-155 N [32-35 lbf]        CDS 100: 240-245 N [54-55 lbf]</p>	<p><b>B 3 position detent</b></p> <p>32 [1.25] CDS 60 40 [1.57] CDS 100</p>	<p><b>C Spring center in, detent out</b></p> <p>56 [2.20] CDS 60 73 [2.87] CDS 100</p>
<p><b>D Spring center out, detent in</b></p> <p>56 [2.20] CDS 60 73 [2.87] CDS 100</p>	<p><b>E Spring centered, detent in A and B</b></p> <p>56 [2.20] CDS 60 73 [2.87] CDS 100</p>	<p><b>F Spring centered, hydraulic unlock</b></p> <p>92 [3.62] CDS 60 96 [3.78] CDS 100</p> <p>Note: Unlock body section required for use with hydraulic unlock kit.</p>
<p><b>G Spring centered, adjustable stroke</b></p> <p>70 [2.76] CDS 60 81 [3.19] CDS 100</p> <p>Note: Adjustable in both directions.</p>	<p><b>H Spring centered, female extension</b></p> <p>88±5 [3.46±0.2] CDS 60 93±5 [3.66±0.2] CDS 100</p> <p>8 [0.31]        CDS 60 6.4 [0.251]        8.4 [0.331] CDS 100        20.5 [0.81]</p>	<p><b>I Spring centered, male extension</b></p> <p>88±5 [3.46±0.2] CDS 60 93±5 [3.66±0.2] CDS 100</p> <p>8 [0.31]        8.3 [0.33]        20 [0.79]</p>
<p><b>J Spring centered, floatation spool</b></p> <p>Note: Float body section required</p> <p>65 [2.56] CDS 60 78 [3.07] CDS 100 10 [0.39] CDS 60 12.5 [0.49] CDS 100</p> <p>82 [3.23] CDS 60 101 [3.97] CDS 100</p> <p>Float in        Float out</p>		

mm [in]



Work section order code (example)

**A100 1 A E 2 A 1 A B A100 140/40\***

**SPOOL CENTERING AND DETENT OPTIONS (continued)**

<p><b>M</b> Spring offset</p>	<p><b>N</b> Two-position detent: neutral and spool in</p>	<p><b>O</b> Two-position detent: neutral and spool out</p>
<p><b>P</b> Spring centered with switch: activates on spool in</p>	<p><b>Q</b> Spring centered with switch: activates on spool in and out</p>	<p><b>R</b> Spring centered with switch: activates two motors</p>

P106 330E

mm [in]

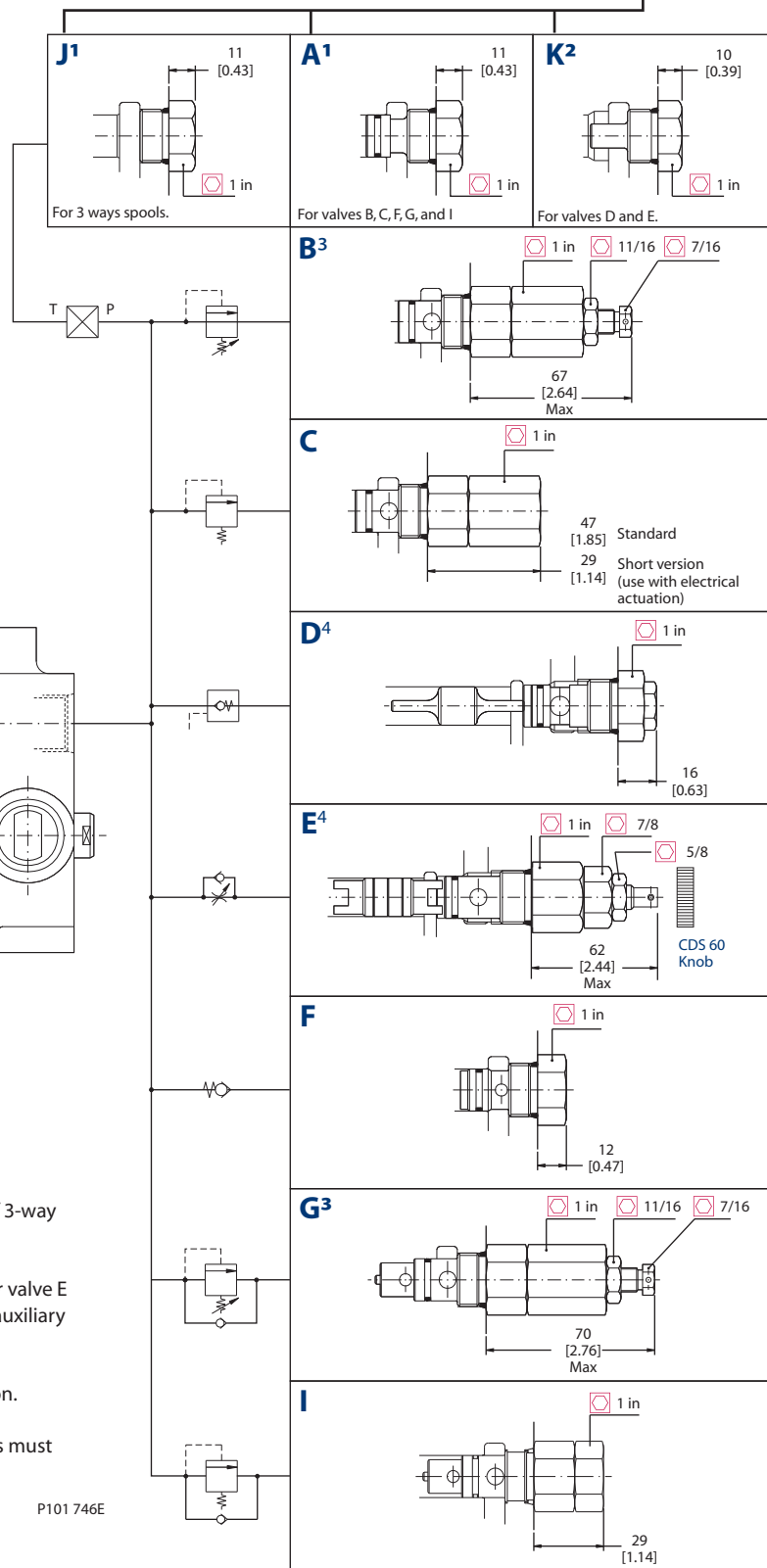
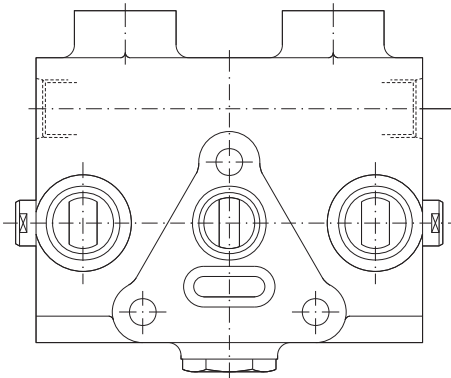
\* Default relief setting if not specified

**AUXILIARY VALVES**

Work section order code (example)

**A100 1 A E 2 A 1 A B A100 140/40\***

Central body for use with auxiliary valves



<sup>1</sup> Order code H for plastic plug in auxiliary port of 3-way spool and body for valves B, C, F, G, and I.

<sup>2</sup> Order code L for plastic plug in auxiliary port for valve E (flow control L). Order code M for plastic plug in auxiliary port for valve D (pilot retaining).

<sup>3</sup> Don't use valves B and G with electrical actuation.

<sup>4</sup> When using options D and E, electrical actuators must be mounted upside down.

mm [in]

\* Default relief setting if not specified

Work section order code (example)

**A100 1 A E 2 A 1 A B A100 140/40\***

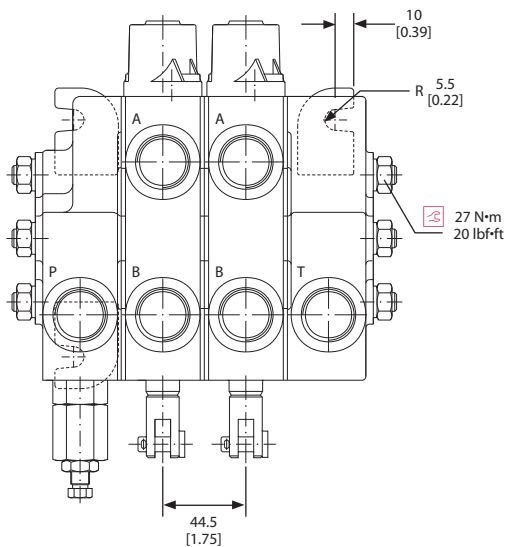
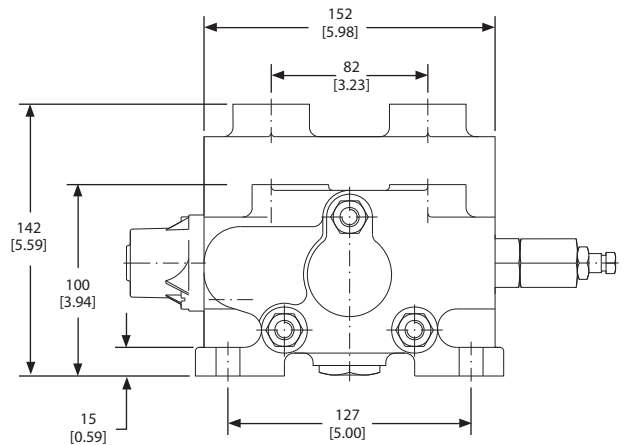
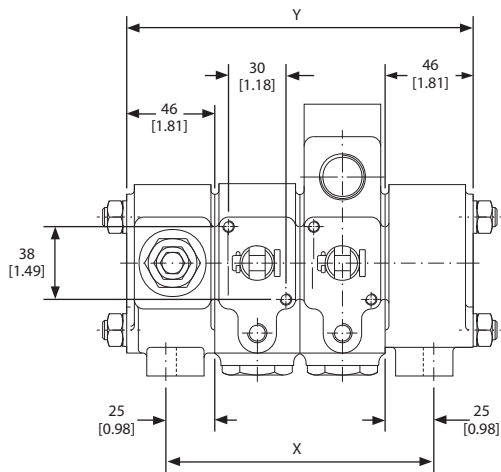
**AUXILIARY VALVES (continued)**

*Auxiliary valves compatibility*

	A	B	C	D	E	F	G	I	J	K
A	■	●	■	—	—	■	●	▲	—	—
B	●	●	●	—	—	●	●	—	●	—
C	■	●	■	—	—	■	●	▲	●	—
D	—	—	—	■	—	—	—	—	—	■
E	—	—	—	—	■	—	—	—	—	■
F	■	●	■	—	—	■	●	▲	●	—
G	●	●	●	—	—	●	●	—	●	—
I	▲	—	▲	—	—	▲	—	▲	▲	—
J	—	●	●	—	—	●	●	▲	—	—
K	—	—	—	■	■	—	—	—	—	■

— Not compatible                      ■ Compatible  
● Compatible (EXCEPT electrical)    ▲ Compatible (ONLY electrical)

**DIMENSIONS CDS 100**



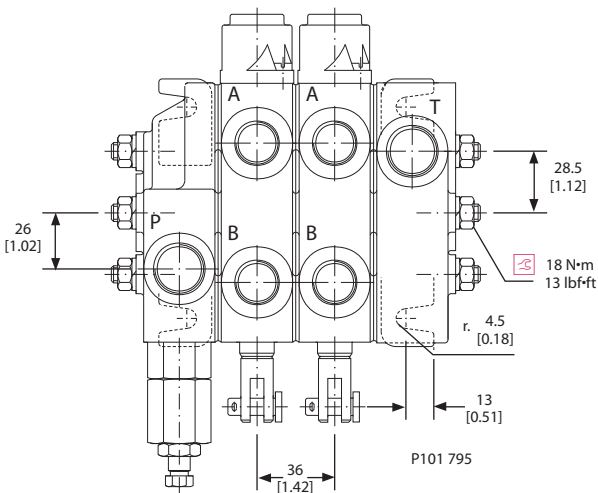
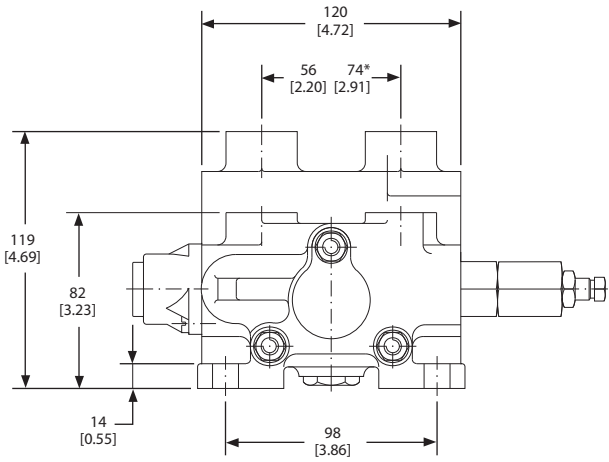
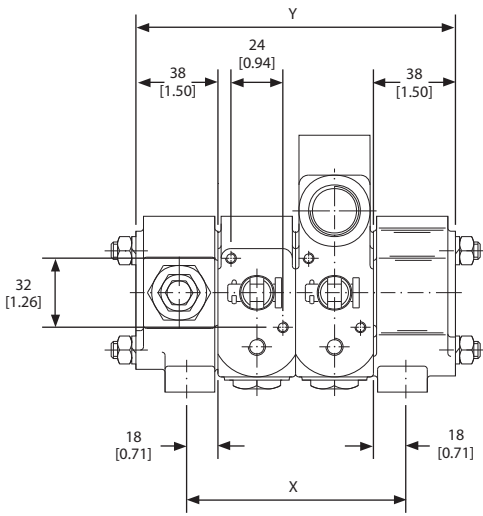
*Reference dimensions*

Number of sections	X	Y
1	95 [3.74]	137 [5.39]
2	139 [5.47]	181 [7.13]
3	184 [7.24]	226 [8.89]
4	229 [9.02]	270 [10.63]
5	273 [10.75]	314 [12.36]
6	318 [12.52]	359 [14.13]
7	362 [14.25]	403 [15.87]
8	406 [15.98]	448 [17.64]
9	451 [17.76]	492 [19.37]
10	495 [19.49]	537 [21.14]
11	540 [21.26]	581 [22.87]
12	584 [22.99]	626 [24.65]

mm [in]

\* Default relief setting if not specified

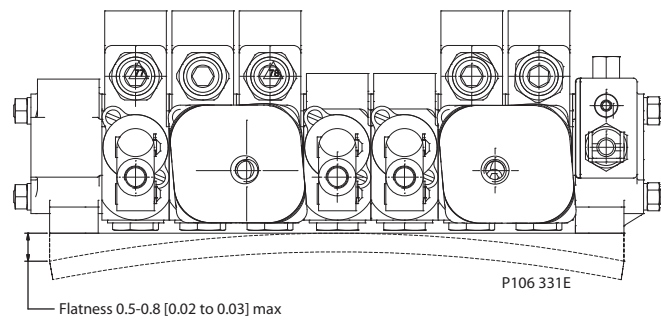
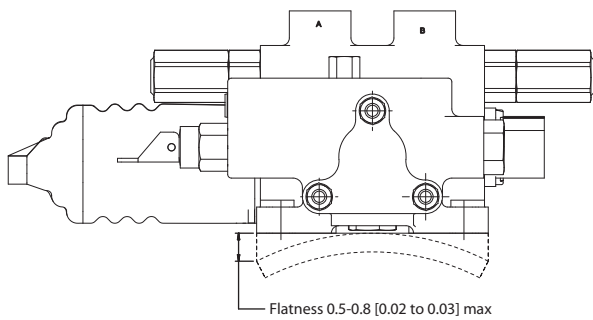
**DIMENSIONS CDS 60**

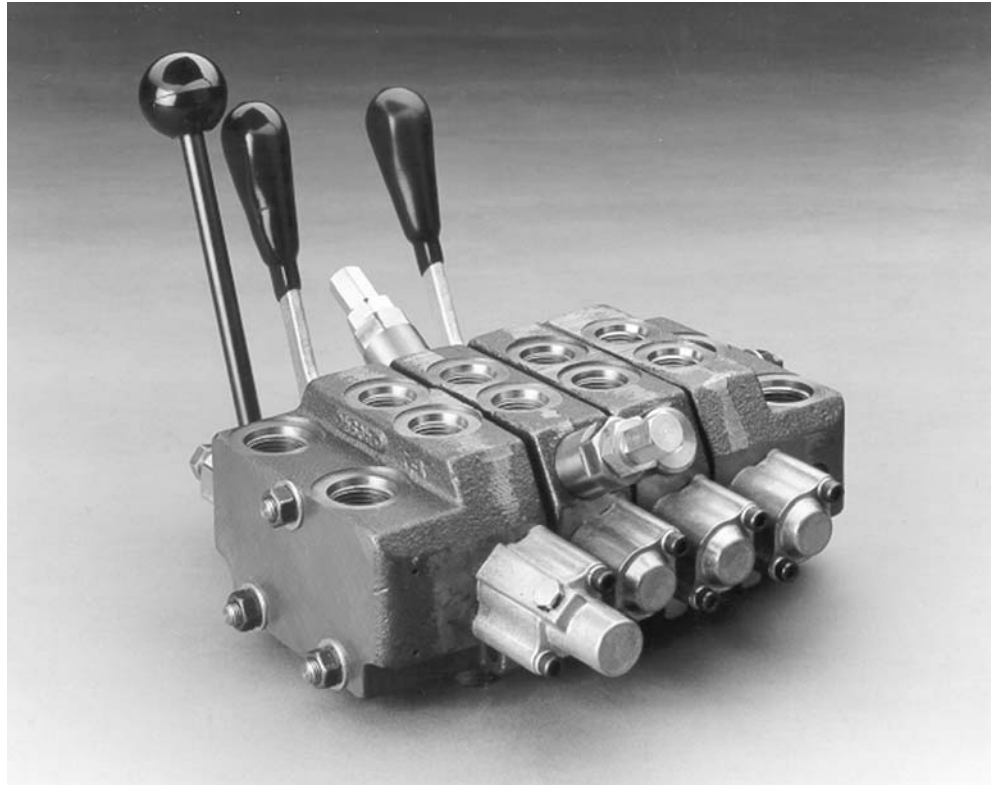


*Reference dimensions*

Number of sections	X		Y	
1	72	[2.83]	112	[4.41]
2	108	[4.25]	148	[5.83]
3	144	[5.67]	184	[7.42]
4	180	[7.09]	220	[8.66]
5	216	[8.50]	256	[10.08]
6	252	[9.92]	292	[11.50]
7	288	[11.34]	328	[12.91]
8	324	[12.76]	364	[14.33]
9	360	[14.17]	400	[15.75]
10	396	[15.59]	436	[17.17]
11	432	[17.01]	472	[18.58]
12	468	[18.43]	508	[20.00]

*Mounting requirements*





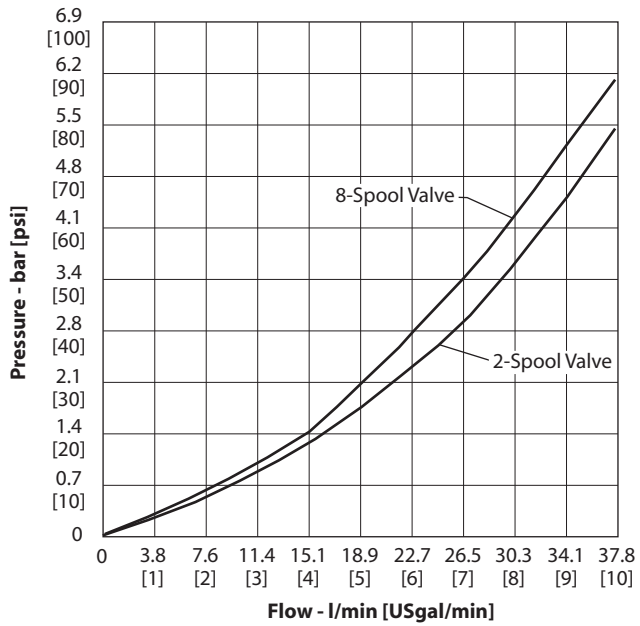
**TYPICAL APPLICATIONS**

Car transport haulers, small backhoes, utility trucks, and mini-excavators

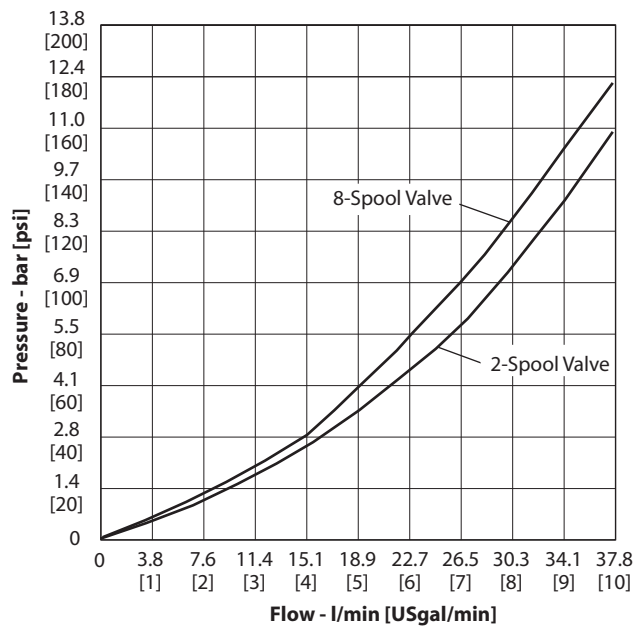
**STANDARD FEATURES**

- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required)
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Load-check for each spool to prevent load drop before raise
- All porting options machined and plugged
- Individually boxed and labeled

**PRESSURE DROP CURVES** *Pressure vs. flow P→T*

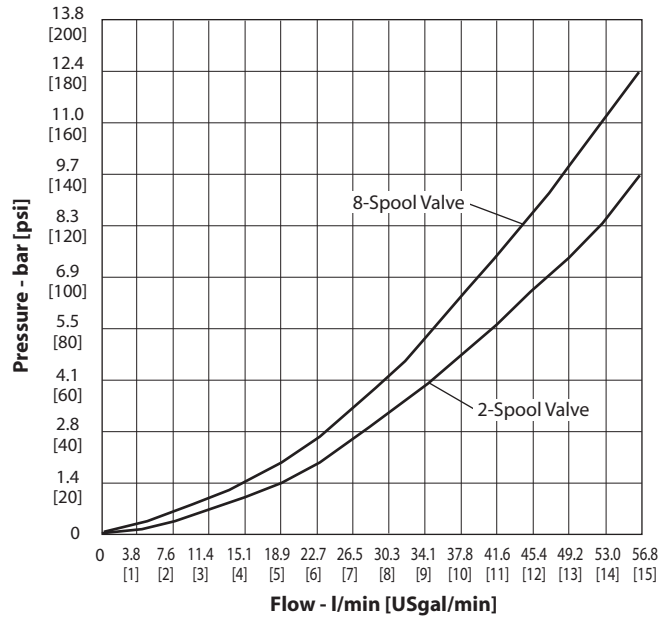


*Pressure vs. flow P→A/B*



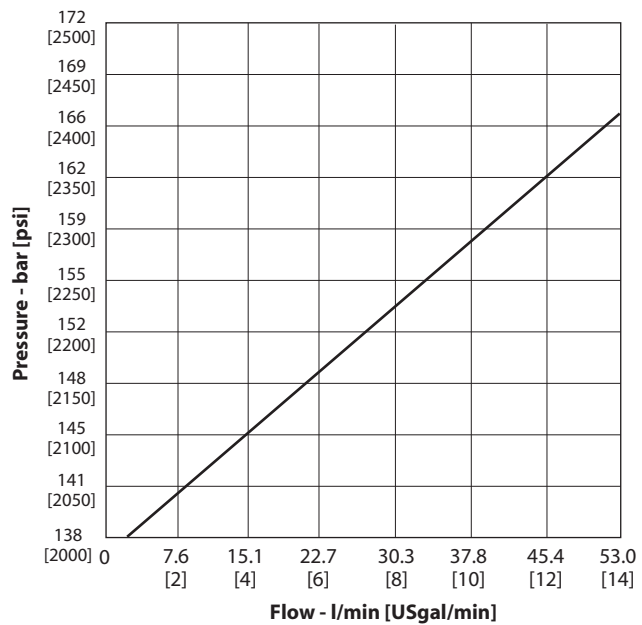
**PRESSURE DROP CURVES**  
 (continued)

Pressure vs. flow A/B→T



**PRESSURE RISE CURVES**  
 (SYSTEM RELIEF VALVE  
 SVPR)

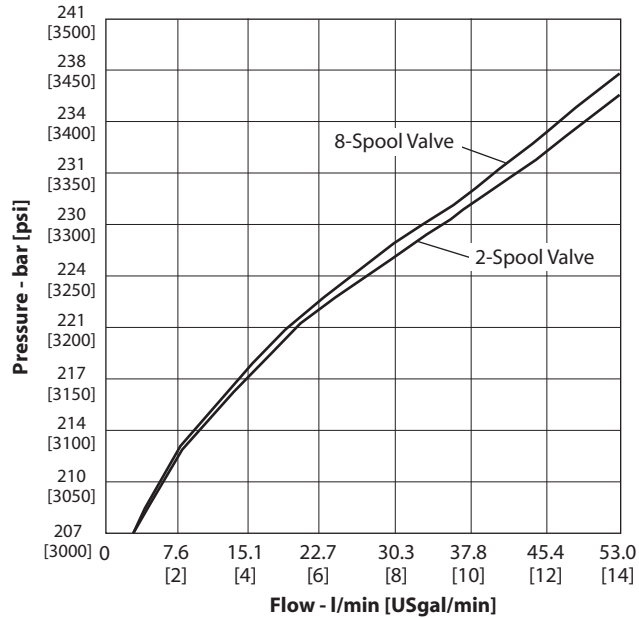
Pressure vs. flow P→T



With system relief SVPR set to 138 bar [2000 psi] at 2.8 l/min [0.75 US gal/min]

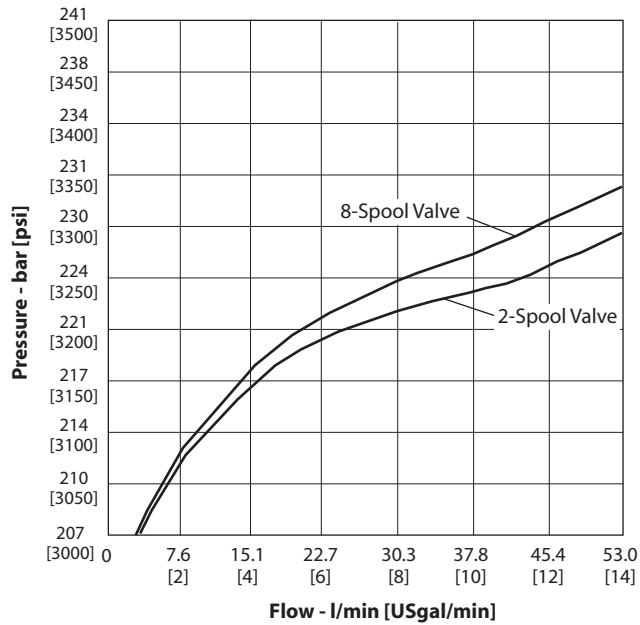
**PRESSURE RISE CURVES  
 (WORK PORT RELIEF  
 VALVE SVLP)**

*Pressure vs. flow P→A/B*



With work port relief SVLP set to 206 bar [3000 psi] at 2.8 l/min [0.75 US gal/min]

*Pressure vs. flow A/B→T*



With work port relief SVLP set to 206 bar [3000 psi] at 2.8 l/min [0.75 US gal/min]



**PORTING**

<b>SVPB</b>	<b>Inlet/outlet</b>	7/8-14 SAE 10
	<b>Locations available</b>	Inlet - top Outlet - top on both sections SVSB and SVPB
<b>SVB</b>	<b>Work ports</b>	3/4-16 SAE 8, 7/8-14 SAE 10
<b>SVHC</b>	<b>Power beyond</b>	Power-beyond port machined and plugged. Remove plug and install internal plug for power-beyond feature. 7/8-14 SAE 10

**HANDLES SVM**

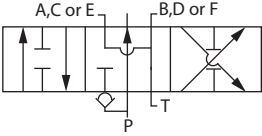
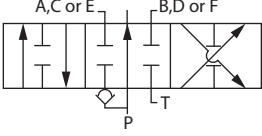
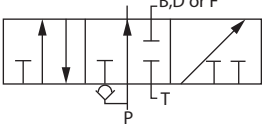
Code	Description
H	Standard handle with C-hook kit (156B8587)
P	Pivot-block handle kit (156B8302)

**TECHNICAL DATA**

<b>Maximum pressure</b>	205 bar	[3000 psi]
<b>Maximum tank line pressure</b>	70 bar	[1000 psi]
<b>Maximum oil flow</b>	38 l/min	[10 US gal/min]
<b>Spool travel in and out from neutral</b>	4.8 mm	[0.19 in]
<b>Maximum port leakage at 69 bar [1000 psi] 21 mm<sup>2</sup>/sec (cSt) [102 SUS]</b>	16 cm <sup>3</sup> /min	[1 in <sup>3</sup> /min]
<b>Maximum lift check leakage at 70 bar [1000 psi] 21 mm<sup>2</sup>/sec (cSt) [102 SUS]</b>	82 cm <sup>3</sup> /min	[5 in <sup>3</sup> /min]
<b>Minimum oil temperature</b>	-29 °C	[-20° F]
<b>Maximum oil temperature</b>	82 °C	[180° F]
<b>Ambient temperature range</b>	-29° to 60° C	[-20° to 140° F]
<b>Minimum viscosity</b>	6 mm <sup>2</sup> /sec (cSt)	[45 SUS]
<b>Maximum viscosity</b>	440 mm <sup>2</sup> /sec (cSt)	[2000 SUS]
<b>Fluid cleanliness per ISO 4406</b>	19/16	
<b>Standard spool forces: Dry</b>	205 N	[46 lbf]

**OPTIONS**

*Spool types*

Code	Symbol	Description
O		4-way, 3-position Closed center motor Work-ports open to tank in neutral position
T		4-way, 4-position Open center Work-ports blocked to tank in neutral position
V		3-way, 3-position Open center Work-ports blocked to tank in neutral - B port

**OPTIONS  
 (continued)**

*Spool actions SVMB*

Code	Description
D	3-position detent (156B8399)
S	Spring centered (156B8315)

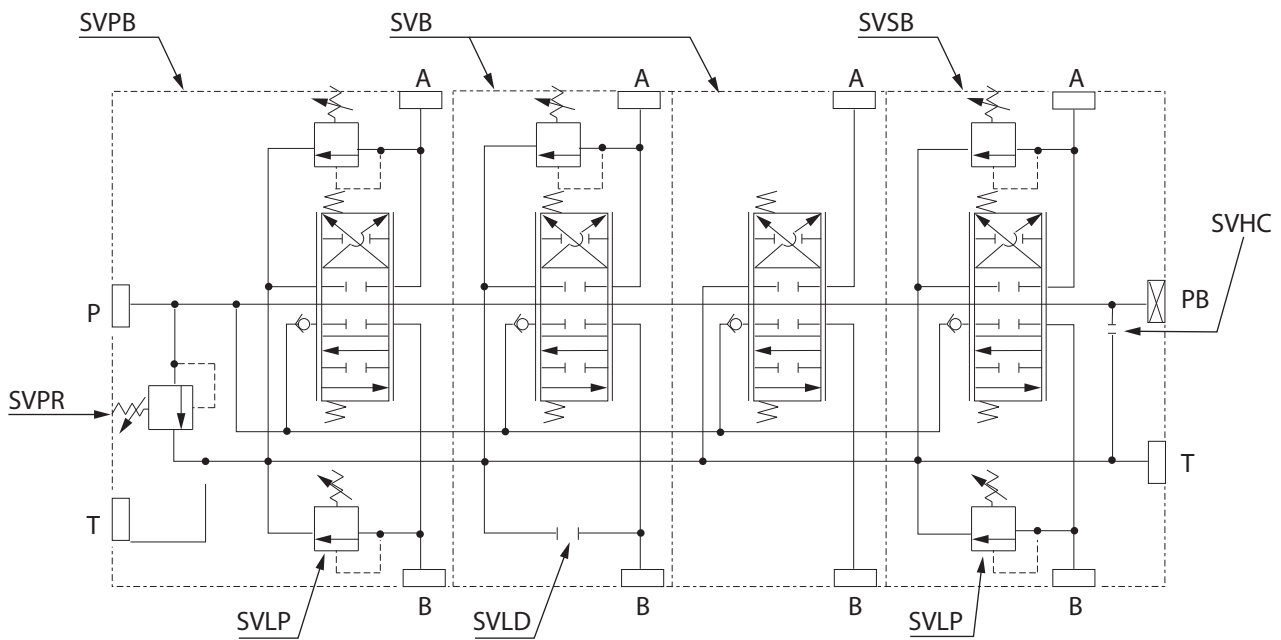
*Relief valve SVLP*

Code	Description
3	Pilot operated relief valve <ul style="list-style-type: none"> <li>• 0.4 bar/l [20 psi/gal] rise</li> <li>• No restrictions on setting up to 207 bar [3000 psi]</li> <li>• Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]</li> </ul>

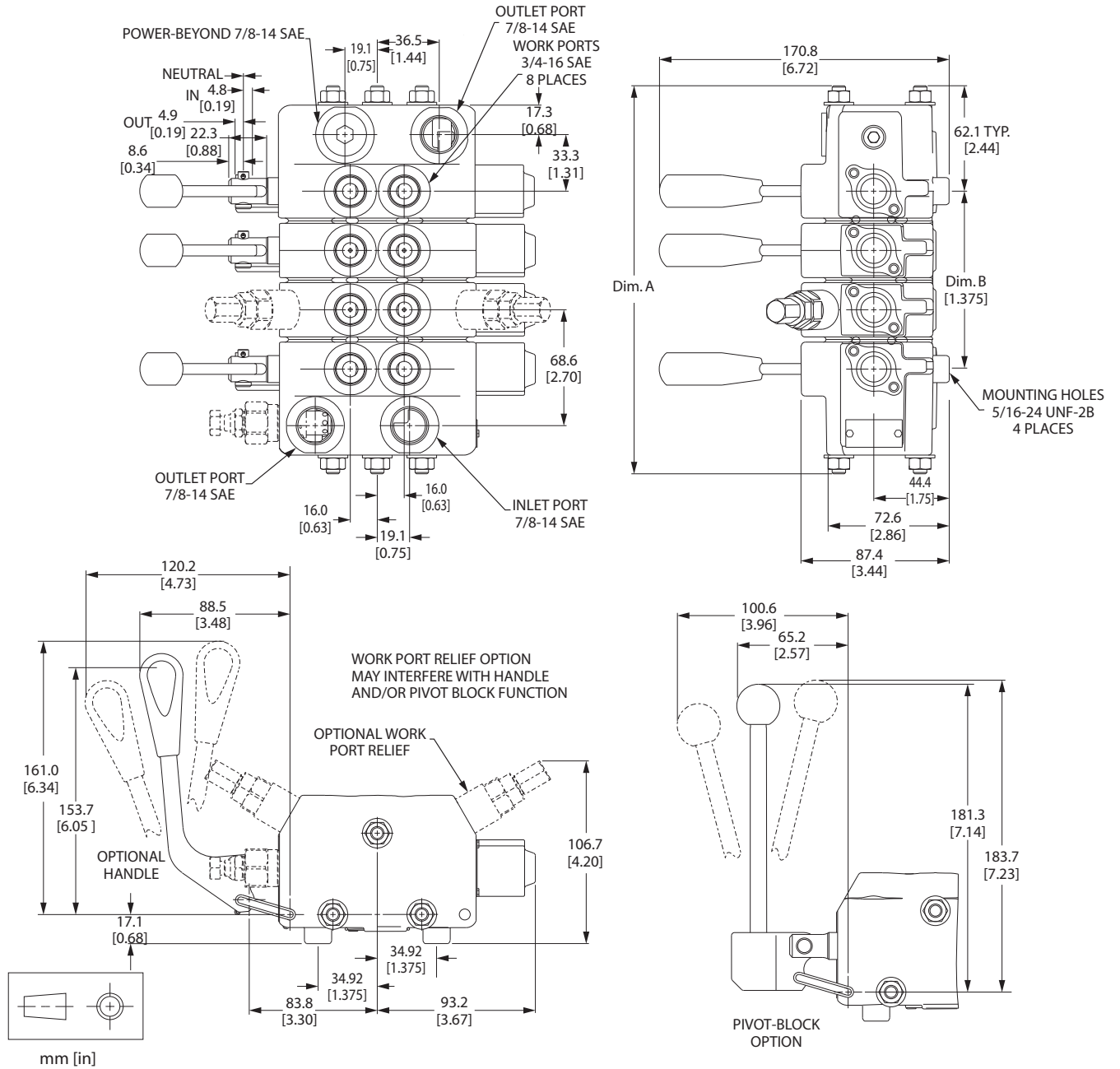
*Work port relief valve SVLP*

<b>156B8311</b> 34–172 bar [500–2500 psi]	Std. Setting - 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min]
<b>156B8312</b> 172–206 bar [2500–3000 psi]	Std. Setting - 172 bar [2500 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

**TYPICAL CIRCUIT**



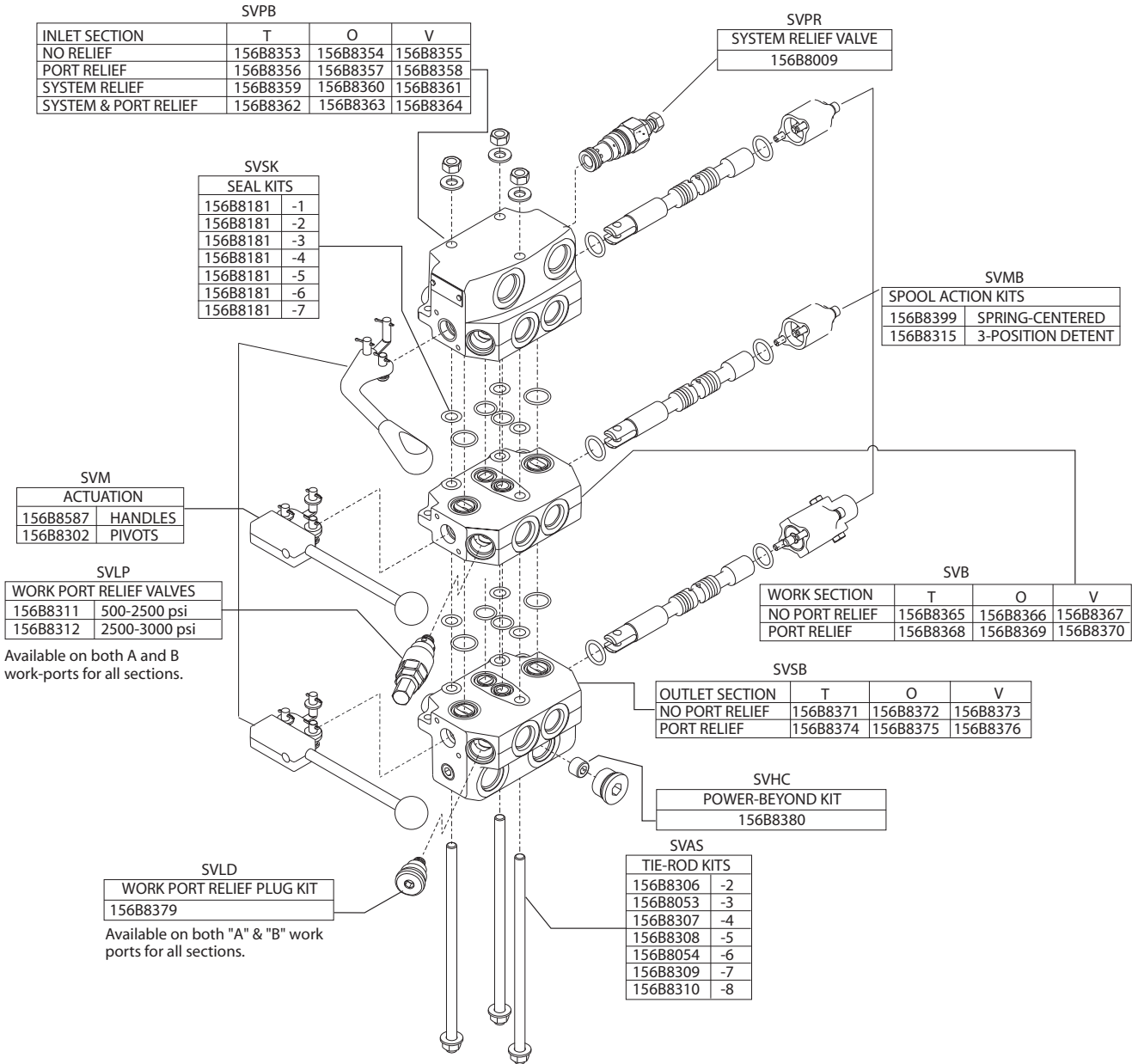
**DIMENSIONS**



Spools	Sections	Dimension A	Dimension B	Spools	Sections	Dimension A	Dimension B
2	I & O	158.8 [6.25"]	1.375	6	I & O & 4B	298.5 [11.75"]	6.875
3	I & O & B	193.5 [7.62"]	2.750	7	I & O & 5B	333.5 [13.13"]	8.250
4	I & O & 2B	228.6 [9.00"]	4.125	8	I & O & 6B	368.3 [14.50"]	9.625
5	I & O & 3B	263.7 [10.38"]	5.50	I = INLET O = OUTLET			

**EXPLODED VIEW**

Part numbers on this page are for service only.



**SPOOL VALVE ORDER FORM**

**Tandem Models: 1500, 1530, 1612, 1617, 1618, 1025, 1225, and 1421 (1618- PO Check Capable)**

**Parallel Models: 1627, 1637, 1638 And 1681. (1638- PO Check Capable)**

**Series Models: 1622, 1632, and 1635 (Contact Sauer-Danfoss)**

Ordering code:     -   -   -   -

1                      2 3                      2 3                      2 3                      4 4A 5 6 7 8

Relief Type/ Settings, Porting, Handles and Packing

Qty. \_\_\_\_\_

**1. Model (4 digits)** .....     #1 #2 #3

**2. Spool type T, X, O, V, C, R, F** (Standard spools are clevis type) .....    #1 #2 #3  
(Confirm spool type using table 1, next page)

**3. Spool action** .....    #1 #2 #3  
(\* Option not available with M handle kit)

- A** Spring center detent float
- C\*** 2- position detent
- D** 3 -position detent
- F\*** Friction pad
- K** Spring center, detent in & out
- L** Spring center, detent out
- M** Motor start switch in & out
- N** Spring center, detent in
- O** Spring offset
- S** Spring center

**4. Relief valve** .....

- 1.** No relief required
- 2.** Direct acting ball and spring (use for 30 l/min [8 US gal/min] and below)  
Standard setting is 83 bar [1200 psi] crack pressure at 2.85 l/min [0.75 US gal/min]
- 3.** Pilot operated relief valve (use for 30 l/min [8 US gal/min] and above)  
Standard Setting is 138 bar [2000 psi] crack pressure at 2.85 l/min [0.75 US gal/min]  
(See porting, table 2 next page, to ensure option availability)

**4A.** .....

- 0** Standard Setting
- 1** Special Setting  
(Specify Special Setting Required) \_\_\_\_\_ Pressure at \_\_\_\_\_ US gal/min

**5. Porting sizes 4, 5, or 6** .....   
(See table 2, next page, for standard port sizes offered for each model)

**6. Handles** .....

- C** C-hook link only
- F** Joystick available for 1627 (used with tang spools only)
- H** Standard handle with connecting hardware
- M** Cam (offered for 1421 only)
- N** No handle required (1530 has no handle option)
- P** Pivot block handle (offers three possible angles in one part)

**7. Packing** .....

- S** Individually boxed
- B** Bulked packed

**8. Power beyond sleeve** Isolates inlet to tank neutral flow, directs flow to desired function down stream of valve  
(Bushing required)

**Bushing port size**

- 0** None
- 1** 9/16 in
- 2** 3/4 in
- 3** 7/8 in

Prepared by \_\_\_\_\_ Date \_\_\_\_\_

Table 1 – spool type

	<p><b>T</b>          4-way, 3-pos.          open center          work ports blocked to          tank in neutral position</p>		<p><b>X</b>          3-way, 3-pos.          open center          work port blocked to tank          in neutral - A port</p>
	<p><b>O</b>          4-way, 3-pos.          open center          work ports open to tank          in neutral position</p>		<p><b>V</b>          3-way, 3-pos.          open center          work port blocked to tank          in neutral - B port</p>
	<p><b>C</b>          4-way, 3-pos          closed center          work ports blocked to tank          in neutral position</p>		<p><b>R</b>          4-way, 3-pos          closed center          work ports open to tank          in neutral position</p>
		<p><b>F</b>          4-way, 3-pos          open center          work ports blocked to tank in neutral          open to tank in fourth position float</p>	

Table 2 – porting

Model	4 - No Relief Valve	5 - Ball and Spring Relief Valve	6 - Pilot Operated Relief Valve
1617, 1627, 1637	End In and Out - top in and Out - side In All 3/4-16 SAE Work ports 9/16-18 SAE Power Beyond cavity machined and plugged with a solid plug at factory.	Same as 4, except with ball and spring relief valve installed at factory, set at 83 bar [1200 psi].	Same as 4 except with pilot operated relief cavity. (Non-standard).

**CDS60 AND CDS100 SPECIFICATION WORKSHEET**

<p style="font-size: 12px; margin: 0;">Valves with more value™ MEMBER OF THE SAUER-DANFOSS GROUP</p>		<p style="font-size: 14px; margin: 0;"><b>Directional Control Valves CDS60 and CDS100 Specification Order Form</b></p>		Control No.
Customer				Subsidiary/Dealer
Application				
<b>Inlet Section</b>		<b>Outlet Section</b>		
Model Side	Port Size	Main relief Valves	Threads	Port Side Pressure
Port Side Flow		None		
		Black Paint		
<b>Work Sections</b>				
Work section	Model	Model Size	Circuit Type	Spool Types
1st				
2nd				
3rd				
4th				
5th				
6th				
7th				
8th				
9th				
10th				
11th				
12th				
Number of sections =				
Price US \$:				Date:
Delivery:				

CDS60 AND CDS100 PRICE WORKSHEET

<p><b>Valmova</b> Valves with more value™ MEMBER OF THE SAUER-DANFOSS GROUP</p> <p><b>Directional Control Valves CDS60 and CDS100 Specification Order Form</b></p>		Control No.														
		Subsidiary/Dealer														
Customer		Application														
Inlet Section																
Model	Port Side	Main relief Valves	Threads													
	Port Size	Port Side Pressure	Port Side Flow													
Outlet Section																
Model	Model Size	Ports Options	Threads													
Work Sections																
Work section	Model	Model Size	Circuit Type	Spool Types	Spool Controls	Spool Control Side	Center Type	Threads	Aux Valves "A"	Aux Valves "B"	Cable or Electrical Control Options	Cable Length Centi-meters	"A" Port Side Pressure (Bar)	"A" Port Side Flow (l/min)	"B" Port Side Pressure (Bar)	"B" Port Side Flow (l/min)
1st																
2nd																
3rd																
4th																
5th																
6th																
7th																
8th																
9th																
10th																
11th																
12th																
Number of sections =																
Price:																



**1125 STACK VALVE SPECIFICATIONS**

Sauer-Danfoss: \_\_\_\_\_ Valve Number: \_\_\_\_\_

Revision: \_\_\_\_\_

Customer: \_\_\_\_\_ Application: \_\_\_\_\_

A-Port	SVPR _____ psi @ _____ US gal/min	B-Port
SVLP/D 156B _____ _____ psi @ _____ US gal/min SVM 156B _____	Inlet SVPB 156B _____ SVMB 156B _____	SVLP/D 156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156 _____ _____ psi @ _____ US gal/min SVM 156B _____	1 SVB 156B _____ SVMB 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156B _____ _____ psi @ _____ US gal/min SVM 156B _____	2 SVB 156B _____ SVMB 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156B _____ _____ psi @ _____ US gal/min SVM 156B _____	3 SVB 156B _____ SVMB 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156B _____ _____ psi @ _____ US gal/min SVM 156B _____	4 SVB 156B _____ SVMB 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156B _____ _____ psi @ _____ US gal/min SVM 156B _____	5 SVB 156B _____ SVMB 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156B _____ _____ psi @ _____ US gal/min SVM 156B _____	6 SVB 156B _____ SVMB 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
156B _____ _____ psi @ _____ US gal/min SVM 156B _____	Outlet SVB 156B _____ SVMB 156B _____ SVHC 156B _____	156B _____ _____ psi @ _____ US gal/min SVM 156B _____
	SVAS: 156B _____	
	SVSK: 156B _____	

Filled in by: \_\_\_\_\_

Date: \_\_\_\_\_

**1125 ORDER FORM  
INSTRUCTIONS**

An order form for Sauer-Danfoss SV 1125 hydraulic valve is shown on the next page. Photocopy this form and use it for ordering.

The order form is divided into fields.

Each module has its own field:

- 0: Combination pump and spool module, SVPB
- 1-6: Basic spool module, SVB
  - a: Mechanical actuation SVM
  - b: Spool action types, SVMB
  - c: Shock valve SVLP
- 7: Combination tank and spool module, SVAS

SVSB

- 9: Assembly kit SVAS

*Reordering*

The space at the top right-hand corner of the form is for Sauer-Danfoss to fill in. The code number for the whole of the 1125 group is entered here.

In the event of a repeat order all you have to do is enter the number Sauer-Danfoss has given on the initial confirmation of order.

Please state:

- Code number of all modules required
- Required setting (p) SVPR

Note:

If the 1125 is to be used with phosphate ester this must be stated on the order form.

