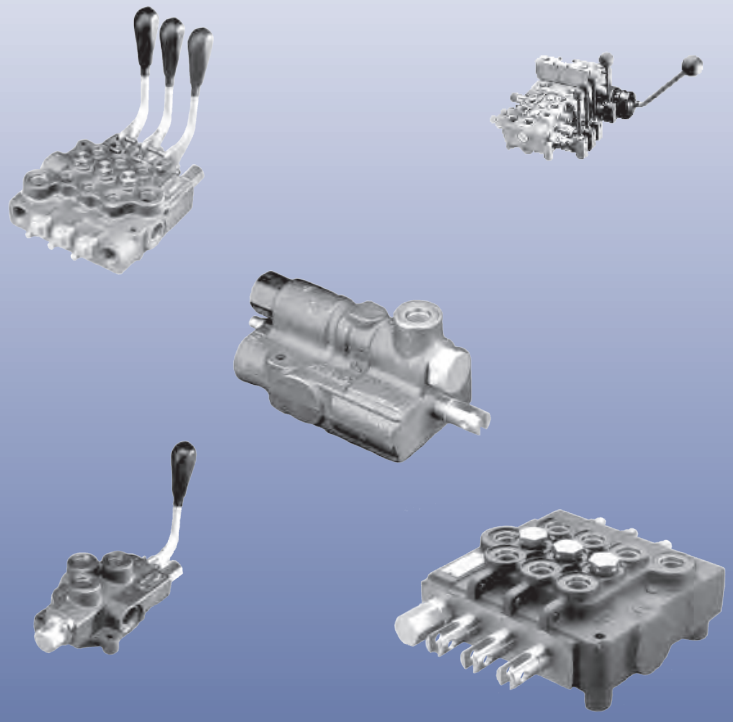
Directional Control Valves

dukes fluid power



Monoblock and Modular

Technical Information

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 **P**ortable **D**ocument **F**ormat (**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).

TABLE OF CONTENTS

An indented **T**able **o**f **C**ontents (**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.

Front cover illustrations: F101 077, F101 130, F101 128, F101 080, F101 127, F101 131, F101 129, F101 079, F101 084, P101 964

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Directional Control Valves
Technical Information
Product overview

FLEXIBILITY OF DESIGN

The QCC 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
- As low as to 3 cm^3/min leakage

ACTUATION OPTIONS

- Handles and levers
- Mechanical two-axis joystick
- Exposed or covered spool ends
- **R**emote **H**ydraulic **C**ontrol (**RHC**)
- **E**lectro**H**ydraulic **C**ontrol (**EHC**) on/off solenoid
- Cable control
- Hydraulic or pneumatic pilot control
- Dual spool ends

Refer to the quick selection matrix on pages 10 and 11 for specific options by model.

MODULAR VALVES

Valve model	l/min [US gal/min] 20 [5]	40 [11]	60 [16]	80 [21]	100 [26]	Number of Spools	Circuit	Page
1681	■	■	■	60 [16]			1 to 7	Parallel	71
1125	■	■	38 [10]				1 to 8	Parallel	76

MONOBLOCK VALVES

Valve model	l/min [US gal/min] 20 [5]	40 [11]	60 [16]	80 [21]	100 [26]	Number of Spools	Circuit	Page
1421	■	■	■	■	■	100 [26]	1	Tandem	13
1025	■	■	■	■	80 [21]		1	Tandem	17
1225	■	■	■	■	80 [21]		2	Tandem	21
1612	■	■	■	■	80 [21]		1	Tandem	25
1622	■	■	■	64 [17]			2	Series	29
1632	■	■	■	64 [17]			3	Series	34
1617	■	■	38 [10]				1	Parallel	39
1627	■	■	38 [10]				2	Parallel	43
1637	■	■	38 [10]				3	Parallel	47
1618	■	■	38 [10]				1	Parallel	51
1638	■	■	38 [10]				3	Parallel	55
1635	■	■	26 [7]				3	Tandem	59
1500	■	■	26 [7]				1	Tandem	63
1530	■	■	23 [6]				1	Tandem	67

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

■ Indicates Maximum Working Pressure Rated At 104 bar [1500 psi]

FEATURES AND RATINGS BY MODEL

		MonoBlock										Modular		
Category	**Rating / feature**	**1530**	**1500**	**1617/ 27/37**	**1618/ 38**	**1025**	**1225**	**1421**	**1625/35**	**1612**	**1622/32**	**1125**	**1325**	**1681**
Nominal flow	19 l/min [5 US gal/min]	X	X											
	38 l/min [10 US gal/min]			X	X				X			X		
	57 l/min [15 US gal/min]									X	X			X
	76 l/min [20 US gal/min]					X	X						X	
	95 l/min [25 US gal/min]													
	114 l/min [30 US gal/min]							X						
Nominal pressure	138 bar [2000 psi]	X												
	207 bar [3000 psi]		X	X	X	X	X	X	X	X	X	X	X	X
Circuit options	Parallel			X	X							X	X	X
	Series								X		X			
	Tandem	X	X			X	X	X		X				
	Priority											X	X	X
	Power beyond		X	X	X	X	X	X	X	X	X	X	X	X
	Closed center													
Spools	Distance between (mm [in])	N/A	N/A	28.7 [1.13]	28.7 [1.13]	N/A	35 [1.38]	N/A	28.7 [1.13]	N/A	41.4 [1.63]	35 [1.38]	38.1 [1.50]	35 [1.38]
	Maximum number	1	1	3	3	1	2	1	3	1	3	8	8	8
Spool action options	Spring center	X	X	X	X	X	X	X	X	X	X	X	X	X
	1 position detent	X	X	X	X	X	X	X	X	X	X	X	X	X
	2 position detent			X	X	X	X	X	X	X	X	X	X	X
	3 position detent			X	X	X	X	X	X	X	X	X	X	X
	Friction detent													
	Float detent			X	X	X	X		X	X	X		X	X
	Regenerative feel								X		X			X
	Spring offset			X	X	X	X	X	X	X	X	X	X	X
Spool options	3 pos. - 3 way			X	X	X	X	X	X	X	X	X	X	X
	3 pos. - 4 way	X	X	X	X	X	X	X	X	X	X	X	X	X
	4 pos. with float			X		X	X		X	X	X		X	X
	4 pos. regenerative								X		X			X
Spool diameter	12.70 mm [0.500 in]	X	X											
	15.88 mm [0.625 in]			X	X	X	X		X	X	X	X	X	X
	19.05 mm [0.75 in]													
	25.40 mm [1.000 in]							X						
Relief valve options	Ball and spring		X	X	X	X	X	X	X	X	X	X	X	X
	Direct acting poppet													
	Pilot operated			X	X	X	X		X	X	X	X	X	X
Work port neutral options	Closed to tank	X	X	X	X	X	X	X	X	X	X	X	X	X
	Open to tank	X	X	X	X	X	X	X	X	X	X	X	X	X
	Meter to tank			X								X	X	X

FEATURES AND RATINGS BY MODEL

		MonoBlock										Modular		
Category	**Rating / feature**	**1530**	**1500**	**1617/ 27/37**	**1618/ 38**	**1025**	**1225**	**1421**	**1625/35**	**1612**	**1622/32**	**1125**	**1325**	**1681**
Actuation options	Handle		X	X	X	X	X	X	X	X	X	X	X	X
	Mechanical joystick			X	X				X					X
	Exposed spool end	X	X	X	X	X	X	X	X	X	X	X	X	X
	Covered spool end											X		
	RHC											X		
	EHC on/off													
	Cable control													
	Hydraulic / pneumatic													
	Dual spool ends													
Maximum work port leakage	<1 cm^3/min [0.061 in^3/min]				X									
	1 to 3 cm^3/min [0.061 to 0.183 in^3/min]	X												
	4 to 6 cm^3/min [0.244 to 0.366 in^3/min]		X											
	7 to 10 cm^3/min [0.427 to 0.610 in^3/min]							X	X	X	X			X
	11 to 13 cm^3/min [0.71 to 0.793 in^3/min]			X										
	14 to 16 cm^3/min [0.854 to 0.976 in^3/min]											X	X	
	16 to 24 cm^3/min [0.976 to 1.456 in^3/min]					X	X							
Additional features	Load check			X	X				X	X	X	X	X	X
	P.O. check				X							X	X	X
	Flow control													
	Meter in	X	X	X	X	X	X	X	X	X	X	X	X	X
	Meter out			X					X	X	X			
	Hydraulic kickout				X									
	Electric switch			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

QCC 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.

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 QCC 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.

Directional Control Valves
Technical Information
Model 1421

DESCRIPTION

Single spool directional control valve. 95 l/min [25 US gal/min] nominal flow. 207 bar [3000 psi] maximum pressure.

TYPICAL APPLICATIONS

Refuse trucks, utility trucks, power units, industrial presses, and agricultural equipment

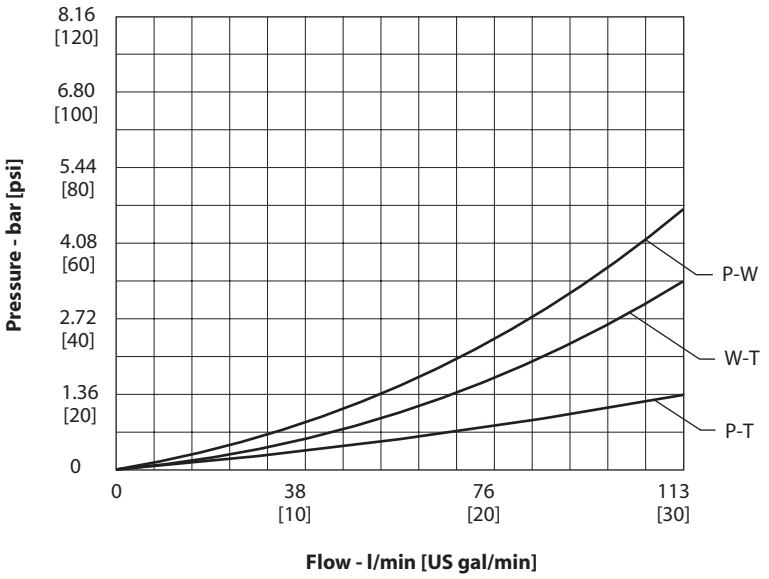
STANDARD FEATURES

- All valves supplied with clevis end spools
- Cast iron body
- Chrome plated spools select fit to body for leakage control
- Paint color: black primer
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

OTHER FEATURES AVAILABLE

- Cam operation
- Custom metering
- A range of port sizes

PRESSURE DROP



PORTING

Inlet/outlet	7/8-14, SAE 10
Locations available	inlet-side outlet-top
Work ports	3/4-16, SAE 8

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

BSP and other port configurations available upon request.

HANDLES

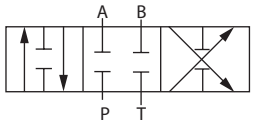
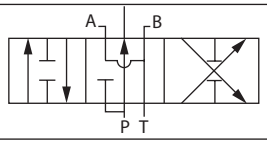
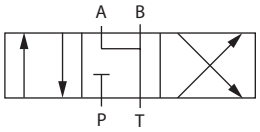
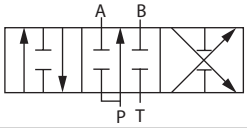
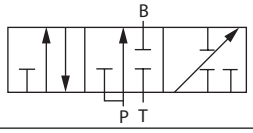
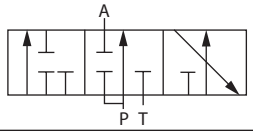
Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
M	Cam

TECHNICAL DATA

Maximum pressure	207 bar	[3000 psi]
Maximum tank-line pressure	69 bar	[1000 psi]
Maximum oil flow	95 l/min	[25 US gal/min]
Spool travel in and out from neutral (minimum)	6.4 mm	[0.25 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm^2/sec (cSt) [102 SUS]	40 cm^3/min	2.44 in^3/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^2/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm^2/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	235 N	[53 lbf]

OPTIONS

Spool types

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

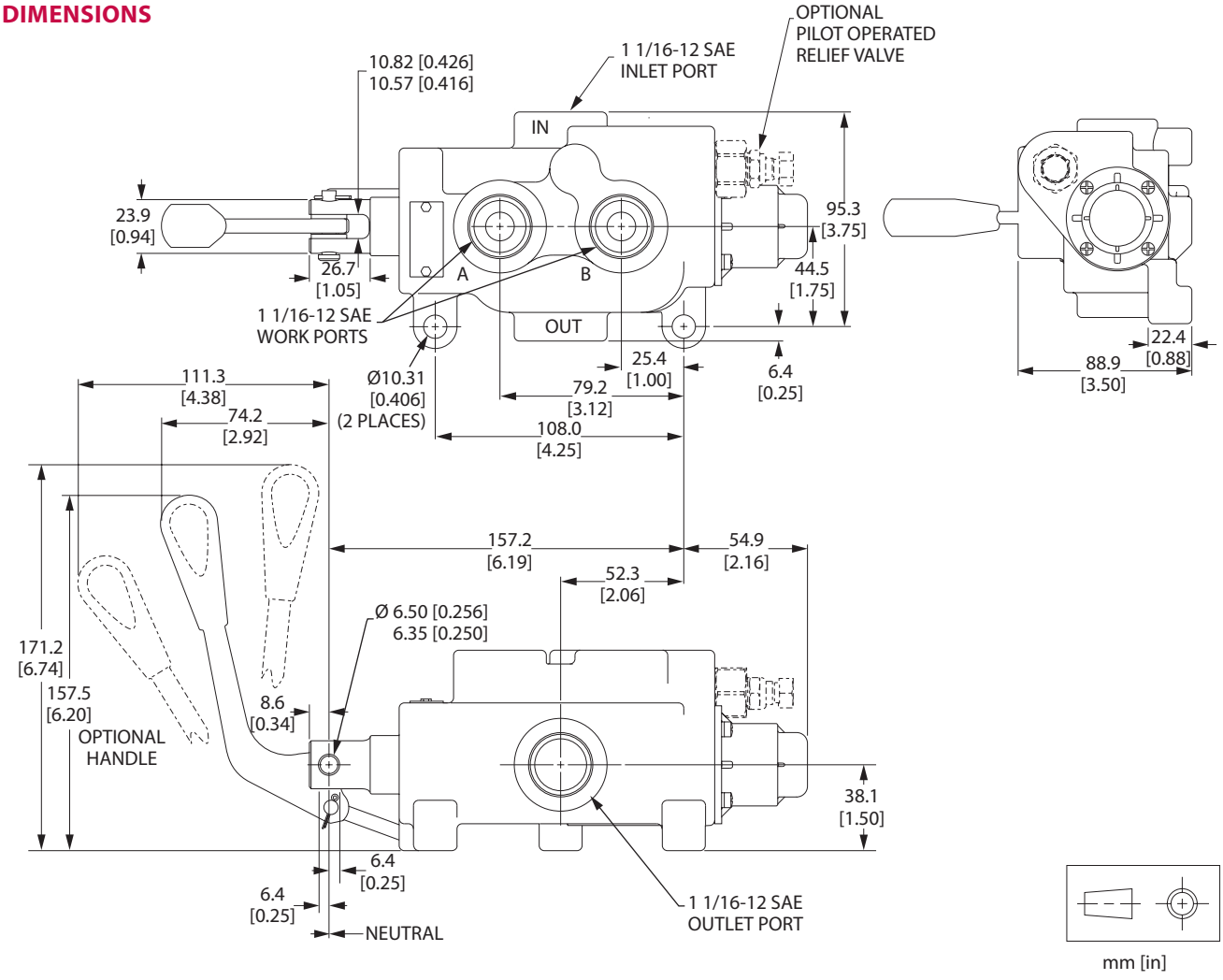
Spool action

Code	Description	Code	Description
C	2-position	O	Spring offset
D	3-position detent	S	Spring centered
F	Friction pad (no spring)		

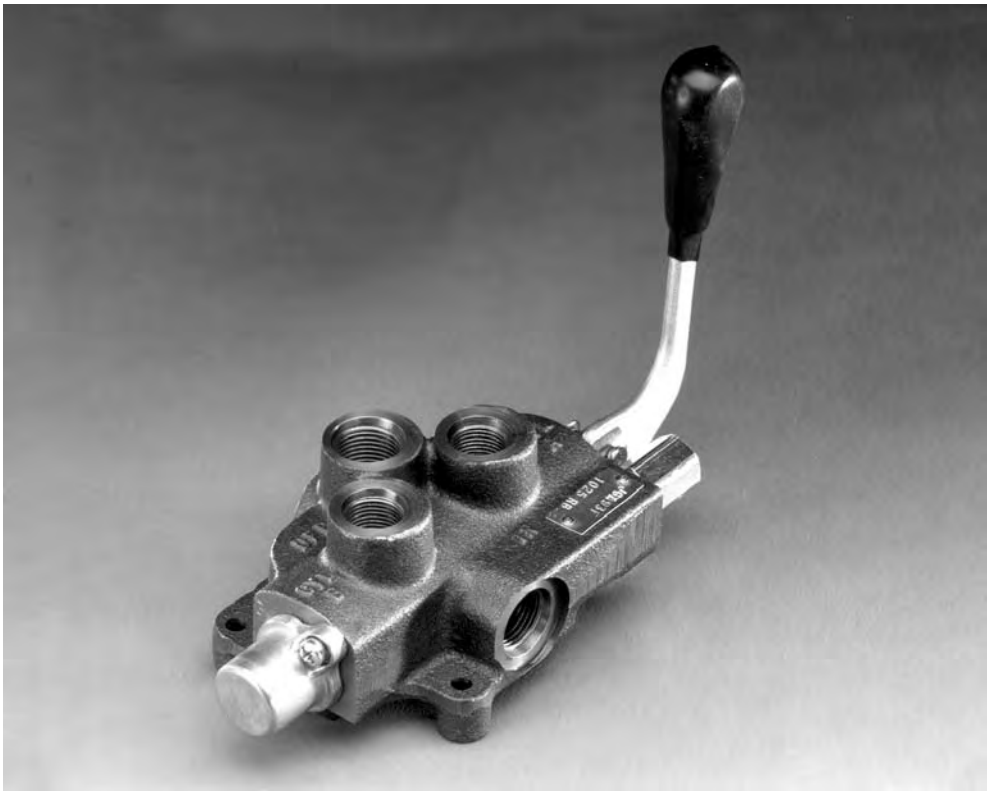
Relief valve

Code	Description
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 210 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

DIMENSIONS


OPTIONAL
PILOT OPERATED
RELIEF VALVE
1 1/16-12 SAE
INLET PORT
10.82 [0.426]
10.57 [0.416]
IN
23.9
[0.94]
26.7
[1.05]
A
B
95.3
[3.75]
44.5
[1.75]
1 1/16-12 SAE
WORK PORTS
OUT
25.4
[1.00]
6.4
[0.25]
22.4
[0.88]
88.9
[3.50]
111.3
[4.38]
74.2
[2.92]
Ø10.31
[0.406]
(2 PLACES)
79.2
[3.12]
108.0
[4.25]
157.2
[6.19]
54.9
[2.16]
52.3
[2.06]
Ø 6.50 [0.256]
6.35 [0.250]
171.2
[6.74]
157.5
[6.20]
8.6
[0.34]
OPTIONAL
HANDLE
38.1
[1.50]
6.4
[0.25]
6.4
[0.25]
NEUTRAL
1 1/16-12 SAE
OUTLET PORT
mm [in]

Directional Control Valves
Technical Information
Model 1025



DESCRIPTION

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

TYPICAL APPLICATIONS

Sweepers, loaders, 3-point hitch control, fork lifts, and agricultural equipment

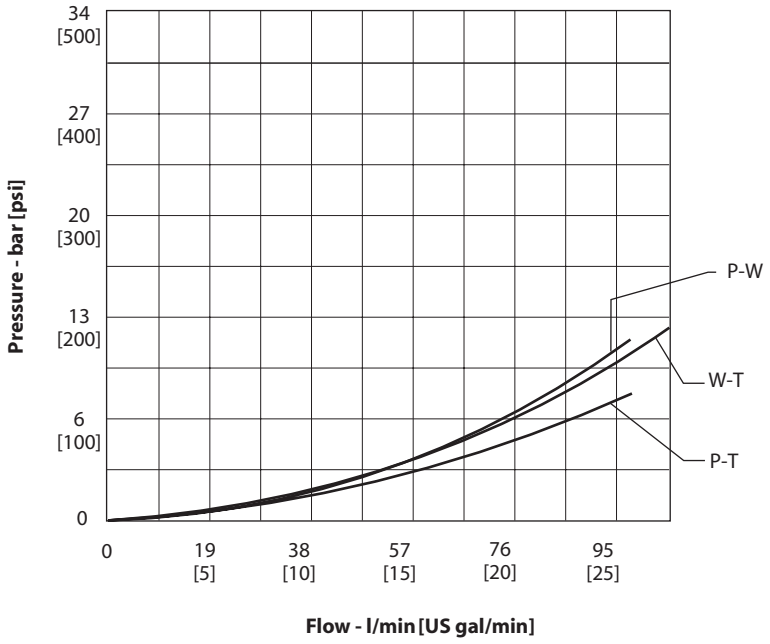
STANDARD FEATURES

- 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
- Closed transition spool timing prevents load-drop before raise
- All porting options machined and plugged
- Individually boxed and labeled

OTHER FEATURES AVAILABLE

- Custom metering
- A range of port sizes

PRESSURE DROP



PORTING

Inlet/outlet	7/8-14, SAE 10
Locations available	inlet-side outlet-top
Work ports	3/4-16, SAE 8

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

BSP and other port configurations available upon request.

HANDLES

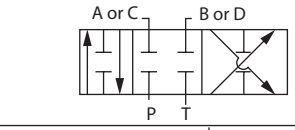
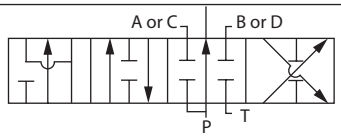
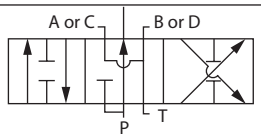
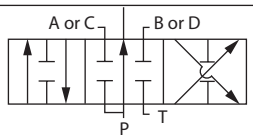
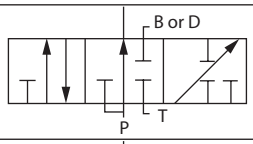
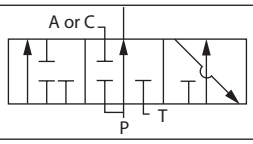
Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
P	Pivot-block handle kit

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	6.4 mm	[0.25 in]
Spool travel to position from neutral	12.7 mm	[0.50 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	24 cm³/min	1.46 in³/min
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature range	-29° C to 60° C	[-20° F to 140° F]
Minimum viscosity	6 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort - dry, full stroke	200 N	[53 lbf]

OPTIONS

Spool types

Code	Symbol	Description
C		4-way, 3-position Closed center Work ports blocked to tank in neutral position
F		4-way, 4-position Open center Work ports blocked to tank in neutral open to tank in fourth position float
O		4-way, 3-position Open center motor Work ports open to tank in neutral position
T		4-way, 3-position Open center Work ports blocked to tank in neutral position
V		3-way, 3-position Open center Work port blocked to tank in neutral: B or D port
X		3-way, 3-position Open center Work port blocked to tank in neutral: A or C port

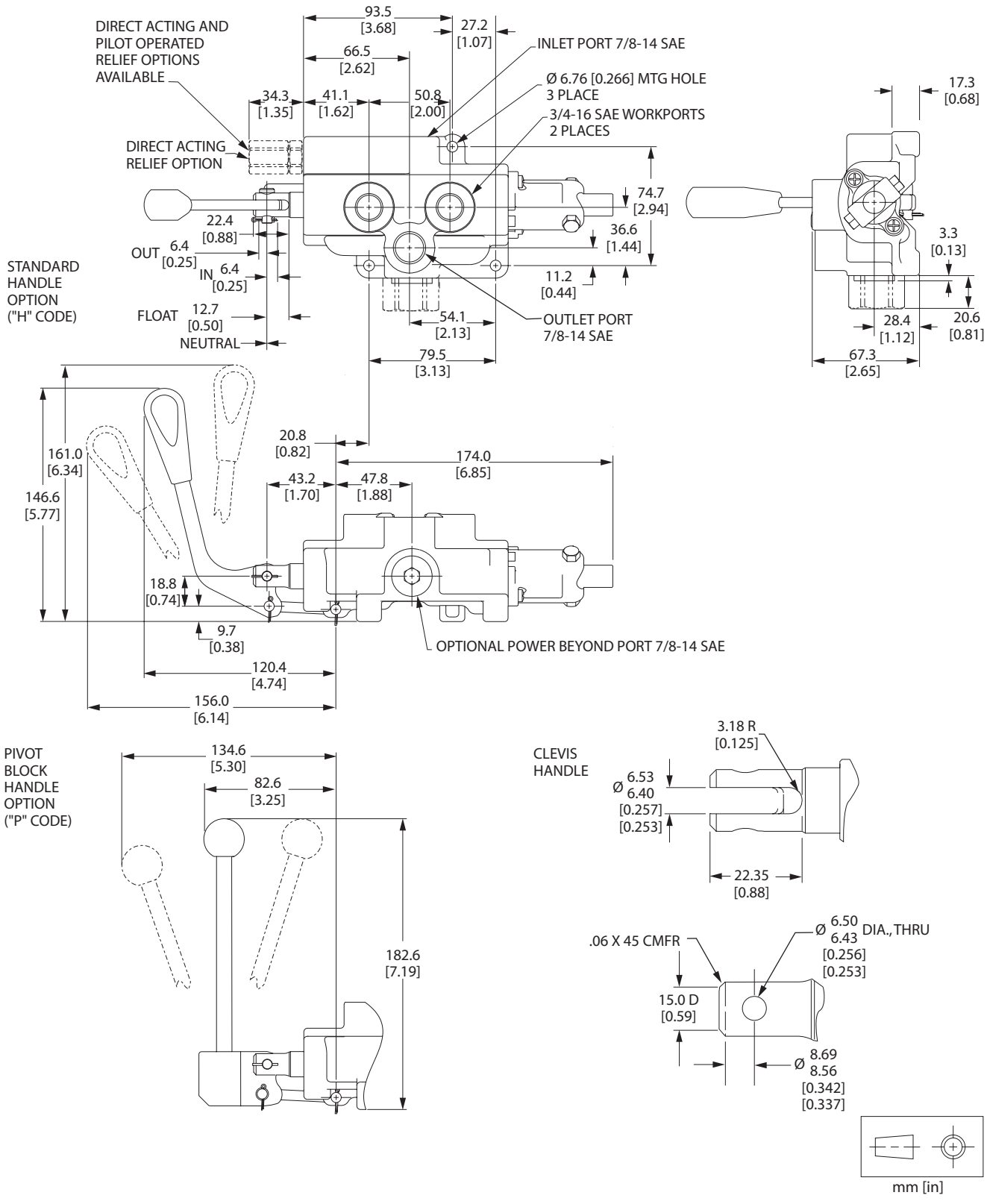
Spool actions

Code	Description	Code	Description
A	Spring centered, detent in float	M	Motor start switch in and out
D	3-position detent	N	Spring centered, detent in
K	Spring centered, detent in and out	S	Spring centered
L	Spring centered, detent out		

Relief valve

Code	Description
2	Direct-acting ball and spring • 1 bar/l [50 psi/gal] rise • Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min] • Not for use on setting over 30 l/min [8 US gal/min] • Full flow setting at 138 bar [2000 psi]
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 210 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

DIMENSIONS


DIRECT ACTING AND PILOT OPERATED RELIEF OPTIONS AVAILABLE
DIRECT ACTING RELIEF OPTION
93.5 [3.68]
66.5 [2.62]
34.3 [1.35]
41.1 [1.62]
50.8 [2.00]
27.2 [1.07]
INLET PORT 7/8-14 SAE
Ø 6.76 [0.266] MTG HOLE 3 PLACE
3/4-16 SAE WORKPORTS 2 PLACES
74.7 [2.94]
36.6 [1.44]
11.2 [0.44]
22.4 [0.88]
OUT 6.4 [0.25]
IN 6.4 [0.25]
FLOAT 12.7 [0.50]
NEUTRAL
STANDARD HANDLE OPTION ("H" CODE)
54.1 [2.13]
79.5 [3.13]
OUTLET PORT 7/8-14 SAE
17.3 [0.68]
3.3 [0.13]
28.4 [1.12]
20.6 [0.81]
67.3 [2.65]
161.0 [6.34]
146.6 [5.77]
20.8 [0.82]
174.0 [6.85]
43.2 [1.70]
47.8 [1.88]
18.8 [0.74]
9.7 [0.38]
120.4 [4.74]
156.0 [6.14]
OPTIONAL POWER BEYOND PORT 7/8-14 SAE
PIVOT BLOCK HANDLE OPTION ("P" CODE)
134.6 [5.30]
82.6 [3.25]
182.6 [7.19]
CLEVIS HANDLE
3.18 R [0.125]
Ø 6.53 6.40 [0.257] [0.253]
22.35 [0.88]
.06 X 45 CMFR
Ø 6.50 6.43 DIA., THRU [0.256] [0.253]
15.0 D [0.59]
Ø 8.69 8.56 [0.342] [0.337]
mm [in]

Directional Control Valves
Technical Information
Model 1225

DESCRIPTION

Two-spool directional control valve. 76 l/min [20 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure. This two-spool valve has tandem circuitry that always provides flow to the first spool, which has priority over the second spool.

TYPICAL APPLICATIONS

Sweepers, loaders, 3-point hitch control, fork lifts, and agricultural equipment

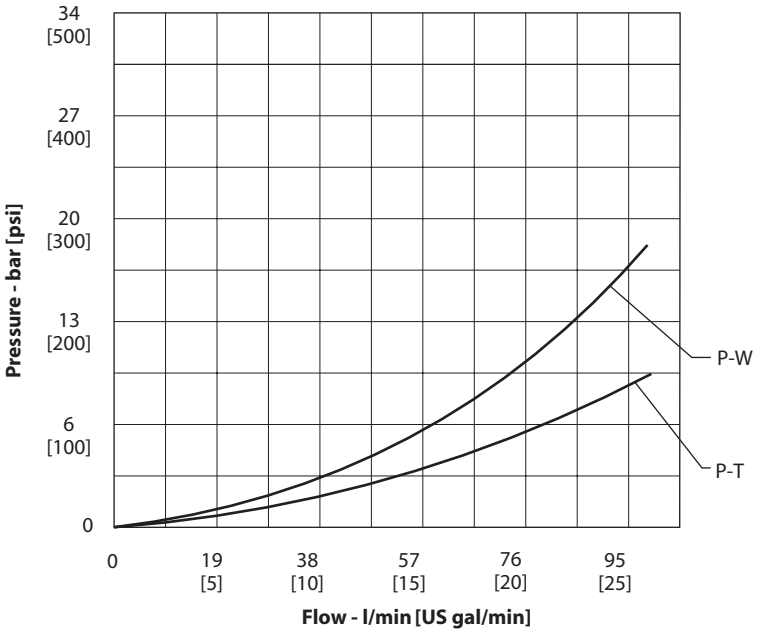
STANDARD FEATURES

- 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
- Closed transition spool timing prevents load-drop before raise
- All porting options machined and plugged
- Individually boxed and labeled

OTHER FEATURES AVAILABLE

- Custom metering
- A range of port sizes

PRESSURE DROP



PORTING

Inlet/outlet	7/8-14, SAE 10
Locations available	inlet-side outlet-top
Work ports	3/4-16, SAE 8

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

BSP and other port configurations available upon request.

HANDLES

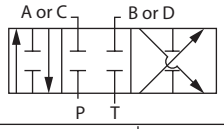
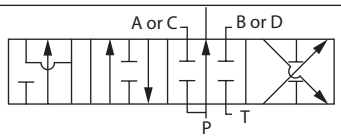
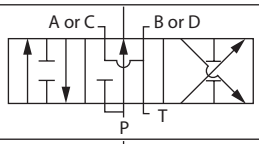
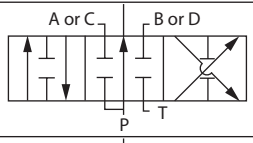
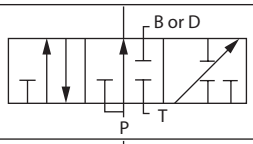
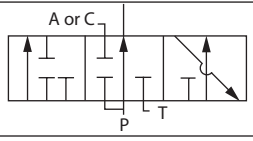
Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
P	Pivot-block handle kit

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	6.4 mm	[0.25 in]
Spool travel to position from neutral	12.7 mm	[0.50 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	24 cm³/min	[1.46 in³/min]
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature range	-29° C to 60° C	[-20° F to 140° F]
Minimum viscosity	6 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	200 N	[53 lbf]

OPTIONS

Spool types

Code	Symbol	Description
C		4-way, 3-position Closed center Work ports blocked to tank in neutral position
F		4-way, 4-position Open center Work ports blocked to tank in neutral open to tank in fourth position float
O		4-way, 3-position Open center motor Work ports open to tank in neutral position
T		4-way, 3-position Open center Work ports blocked to tank in neutral position
V		3-way, 3-position Open center Work port blocked to tank in neutral: B or D port
X		3-way, 3-position Open center Work port blocked to tank in neutral: A or C port

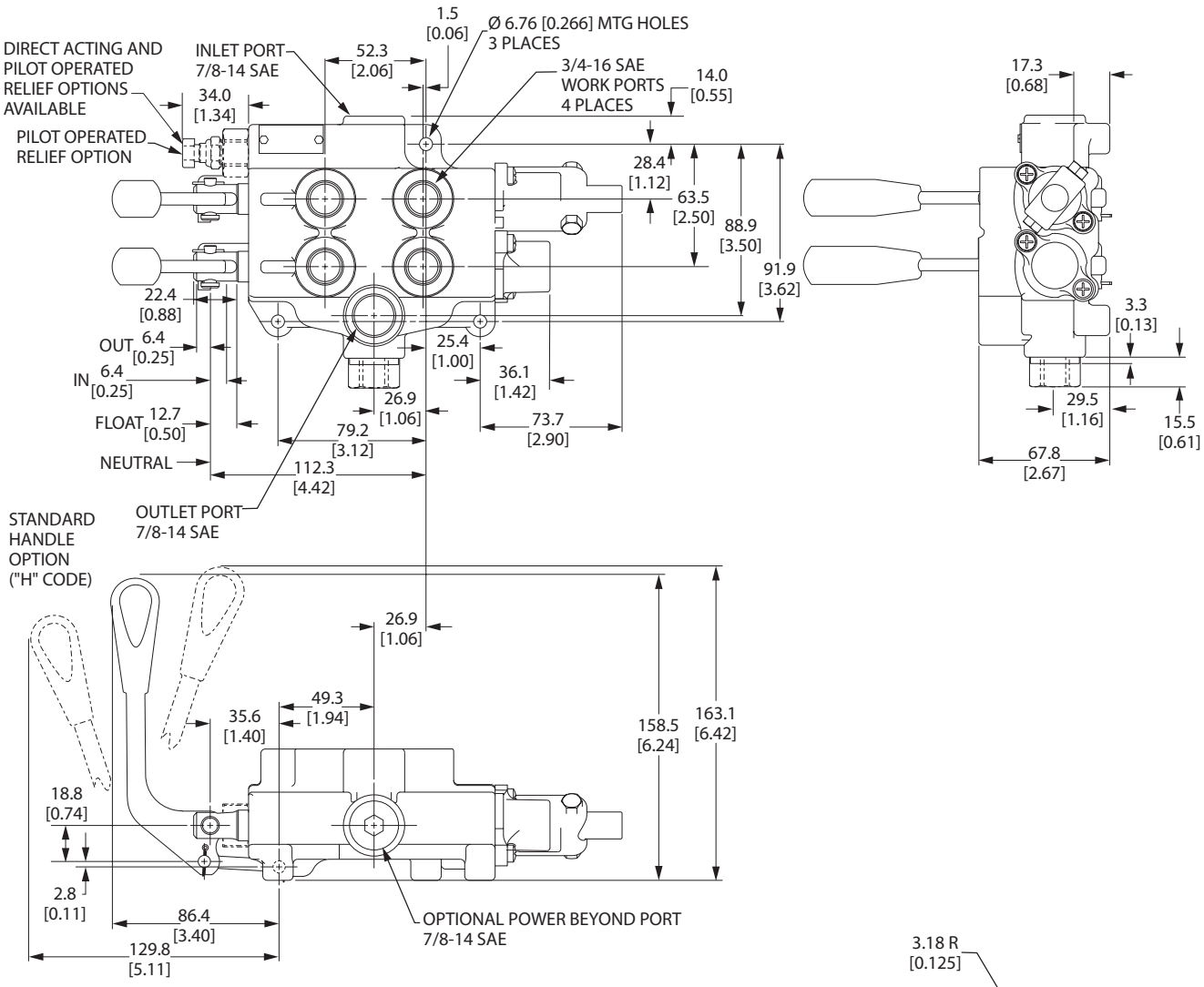
Spool action

A	Spring centered, detent in float	M	Motor start switch in and out
D	3-position detent	N	Spring centered, detent in
K	Spring centered, detent in and out	S	Spring centered
L	Spring centered, detent out		

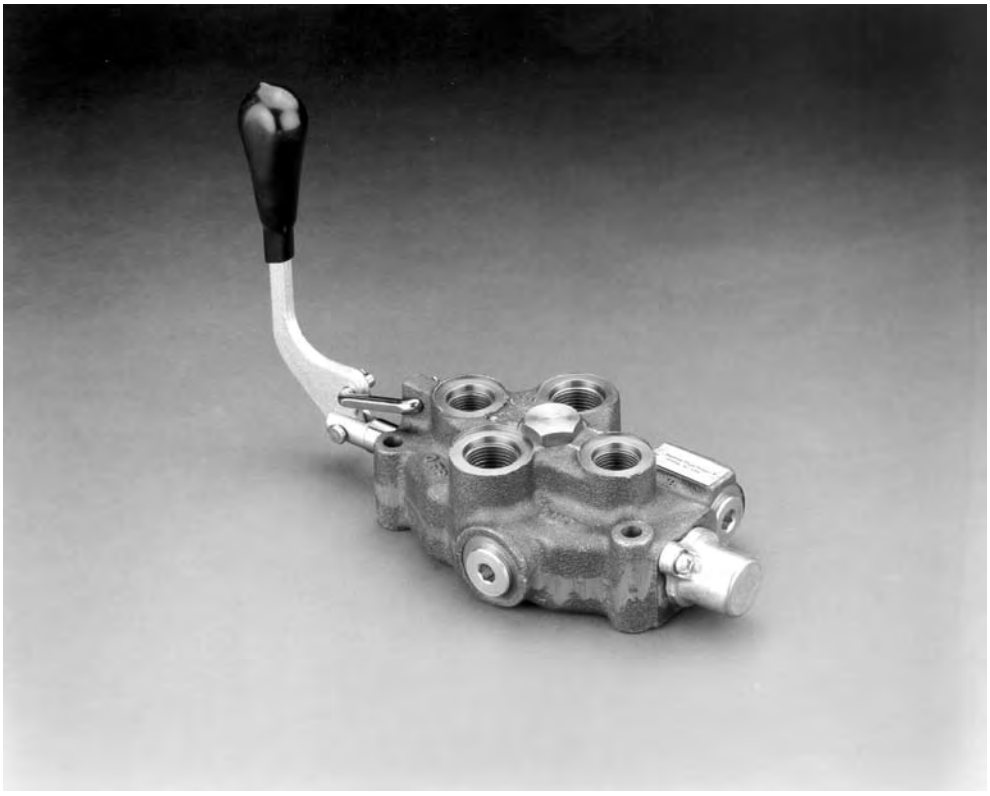
Relief valve

Code	Description
2	Direct-acting ball and spring • 1 bar/l [50 psi/gal] rise • Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min] • Not for use on setting over 30 l/min [8 US gal/min] • Full flow setting at 138 bar [2000 psi]
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 210 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

DIMENSIONS


DIRECT ACTING AND PILOT OPERATED RELIEF OPTIONS AVAILABLE
PILOT OPERATED RELIEF OPTION
INLET PORT 7/8-14 SAE
1.5 [0.06]
Ø 6.76 [0.266] MTG HOLES 3 PLACES
52.3 [2.06]
3/4-16 SAE WORK PORTS 4 PLACES
14.0 [0.55]
34.0 [1.34]
28.4 [1.12]
63.5 [2.50]
88.9 [3.50]
91.9 [3.62]
17.3 [0.68]
22.4 [0.88]
OUT 6.4 [0.25]
IN 6.4 [0.25]
FLOAT 12.7 [0.50]
NEUTRAL
25.4 [1.00]
36.1 [1.42]
26.9 [1.06]
79.2 [3.12]
112.3 [4.42]
73.7 [2.90]
3.3 [0.13]
29.5 [1.16]
15.5 [0.61]
67.8 [2.67]
OUTLET PORT 7/8-14 SAE
STANDARD HANDLE OPTION ("H" CODE)
26.9 [1.06]
49.3 [1.94]
35.6 [1.40]
158.5 [6.24]
163.1 [6.42]
18.8 [0.74]
2.8 [0.11]
86.4 [3.40]
129.8 [5.11]
OPTIONAL POWER BEYOND PORT 7/8-14 SAE
126.0 [4.96]
73.9 [2.91]
176.5 [6.95]
PIVOT BLOCK HANDLE OPTION ("P" CODE)
3.18 R [0.125]
CLEVIS HANDLE
Ø 6.40 6.53 [0.257] [0.253]
22.35 [0.88]
.06 X 45 CMFR
Ø 6.35 6.43 DIA., THRU [0.250] [0.253]
15.0 D [0.59]
Ø 8.69 8.56 [0.342] [0.337]
mm [in]

Directional Control Valves
Technical Information
Model 1612



DESCRIPTION

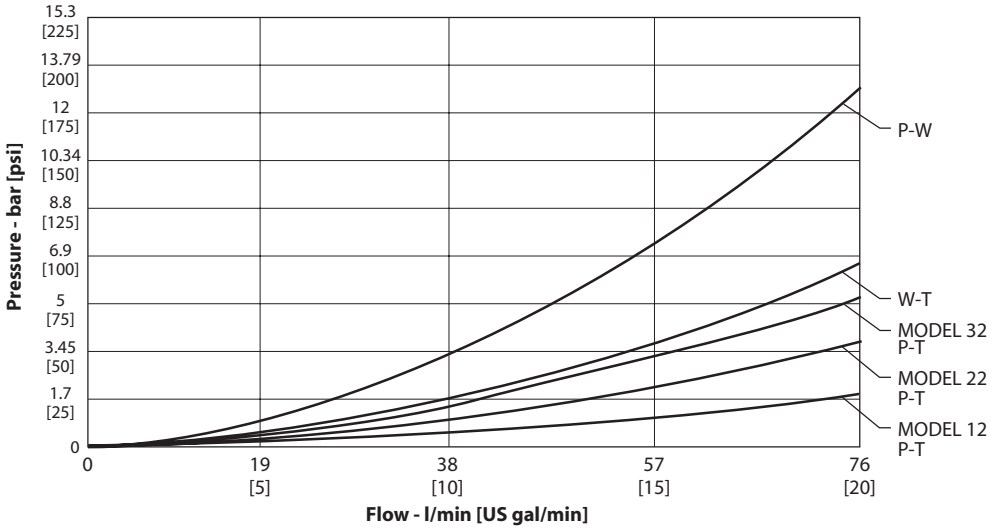
Single spool monoblock valve. 76 l/min [20 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

TYPICAL APPLICATIONS

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

- 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
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

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

HANDLES

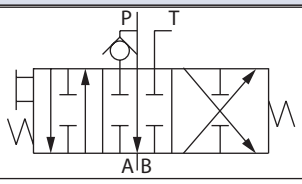
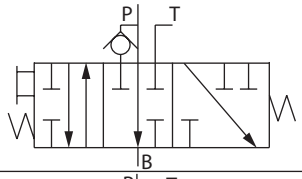
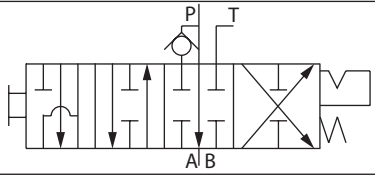
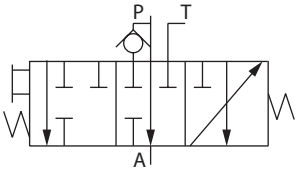
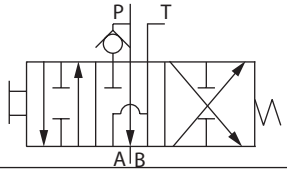
- C-hook kit
- Standard handle with C-hook kit
- Pivot-block handle kit

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 mm²/sec (cSt) [102 SUS]	24 cm³/min	[1.46 in³/min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm³/min	[82 cm³/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
typical spool effort: dry, full stroke	231 N	[53 lbf]

OPTIONS

Spool types

Symbol	Description
	4-way open center
	4-way open center
	4-way float open center
	3-way port A open center
	4-way motor open center

Spool action

- Spring center
- Detent in, detent out, and three position detent
- Detent in float
- Motor start switches

Relief valve

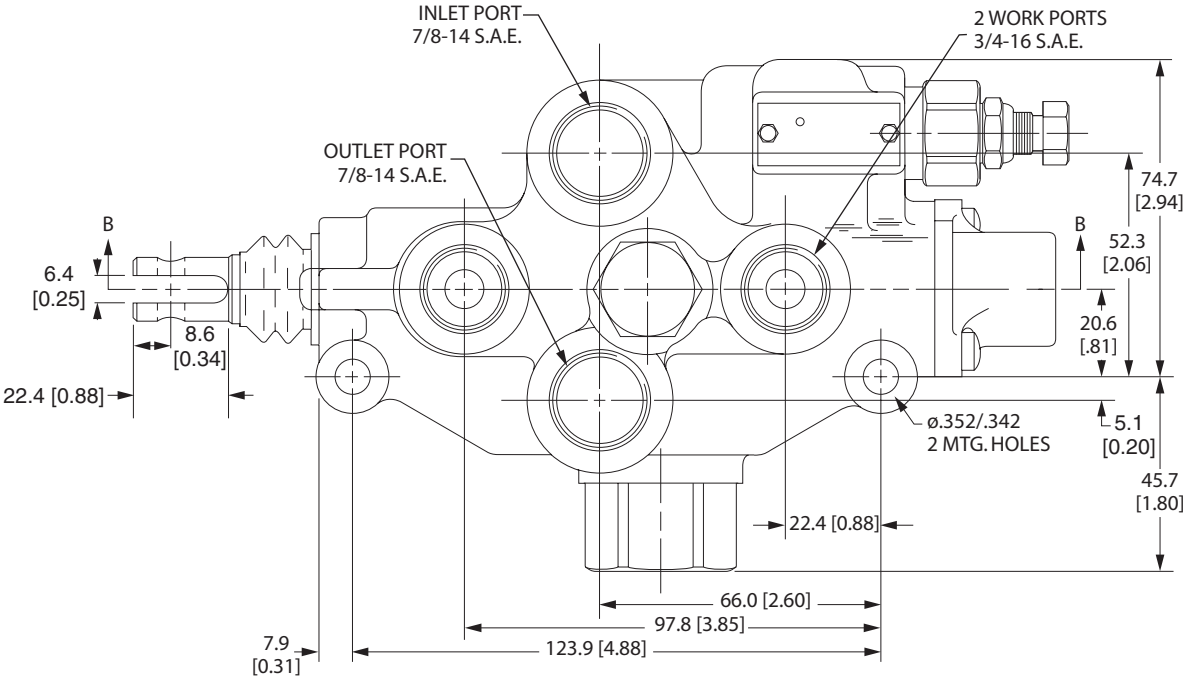
Direct acting ball and spring

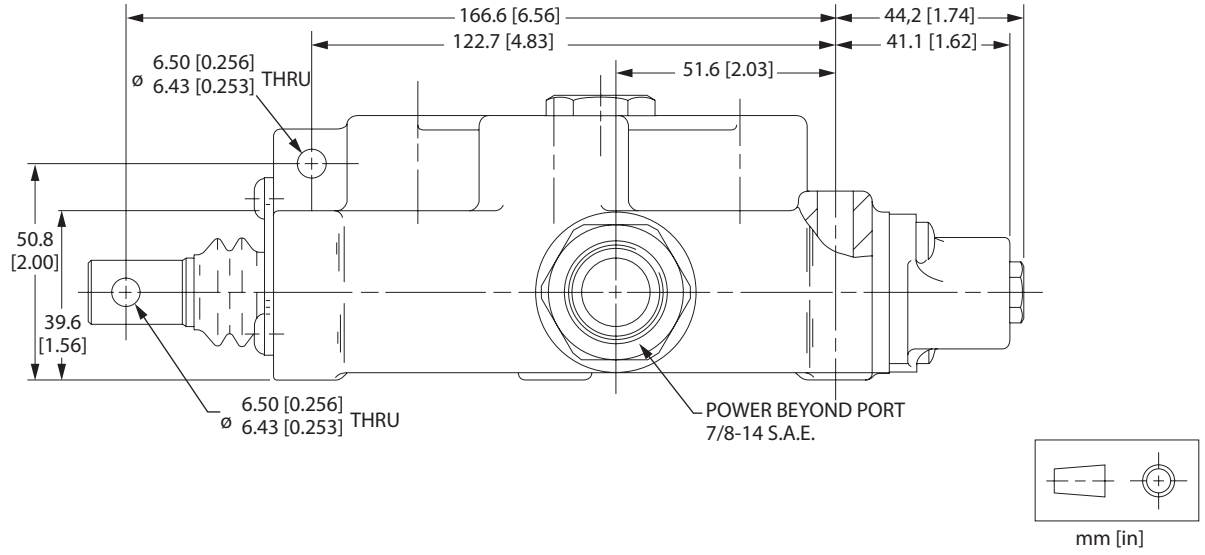
- 0.9 bar per liter [50 psi per gallon] rise
- Not for use on settings over 30 l/min [8 US gal/min]. Full flow setting at 138 bar [2000 psi]
- Adjustable is standard, tamper-proof cap is optional.

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, tamper-proof is optional.

DIMENSIONS





mm [in]

Directional Control Valves
Technical Information
Model 1622

DESCRIPTION

Two-spool series circuit monoblock valve. 66 l/min [17 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

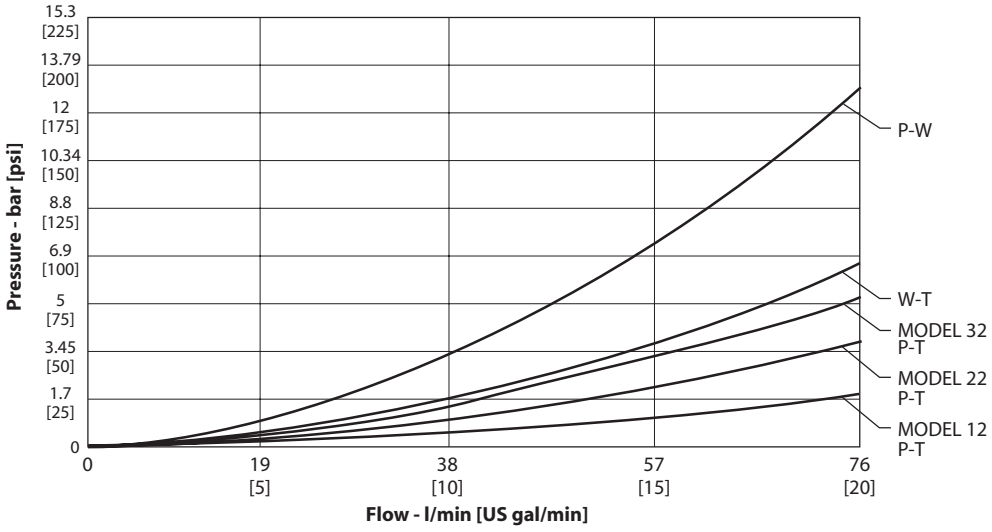
TYPICAL APPLICATIONS

Tractor loaders, skid steer loaders, sweepers, mowers, trenchers, agricultural equipment, tree removal equipment, forklifts

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
- Closed-transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

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

HANDLES

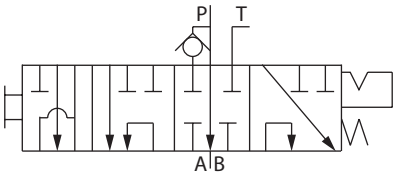
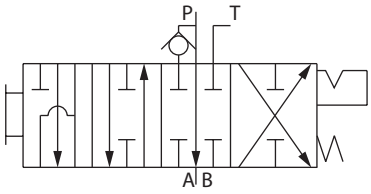
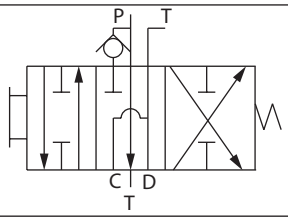
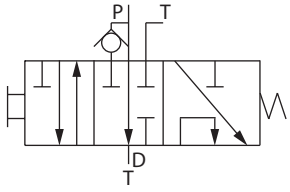
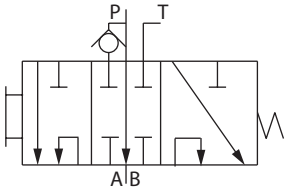
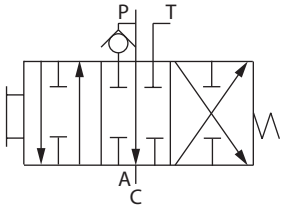
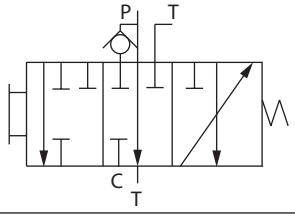
- C-hook kit
- Standard handle with C-hook kit
- Pivot-block handle kit

TECHNICAL DATA

Maximum pressure	207 bar	[3000 psi]
Maximum tank line pressure	69 bar	[1000 psi]
Maximum oil flow	66 l/min	[17 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 mm²/sec (cSt) [102 SUS]	24 cm^3/min	[1.46 in^3/min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm^3/min	[82 cm^3/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^2/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm^2/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

OPTIONS

Spool types

Symbol	Description
	Series float
	Tandem center float (spool next to outlet)
	Tandem center motor (spool next to outlet only)
	3-way tandem center (spool next to outlet)
	4-way series
	4-way tandem (spool next to outlet)
	3-way tandem center (spool next to outlet)

OPTIONS

Spool action

- Spring center
- Detent in, detent out, and three position detent
- Detent in float
- Motor start switches

Relief valve

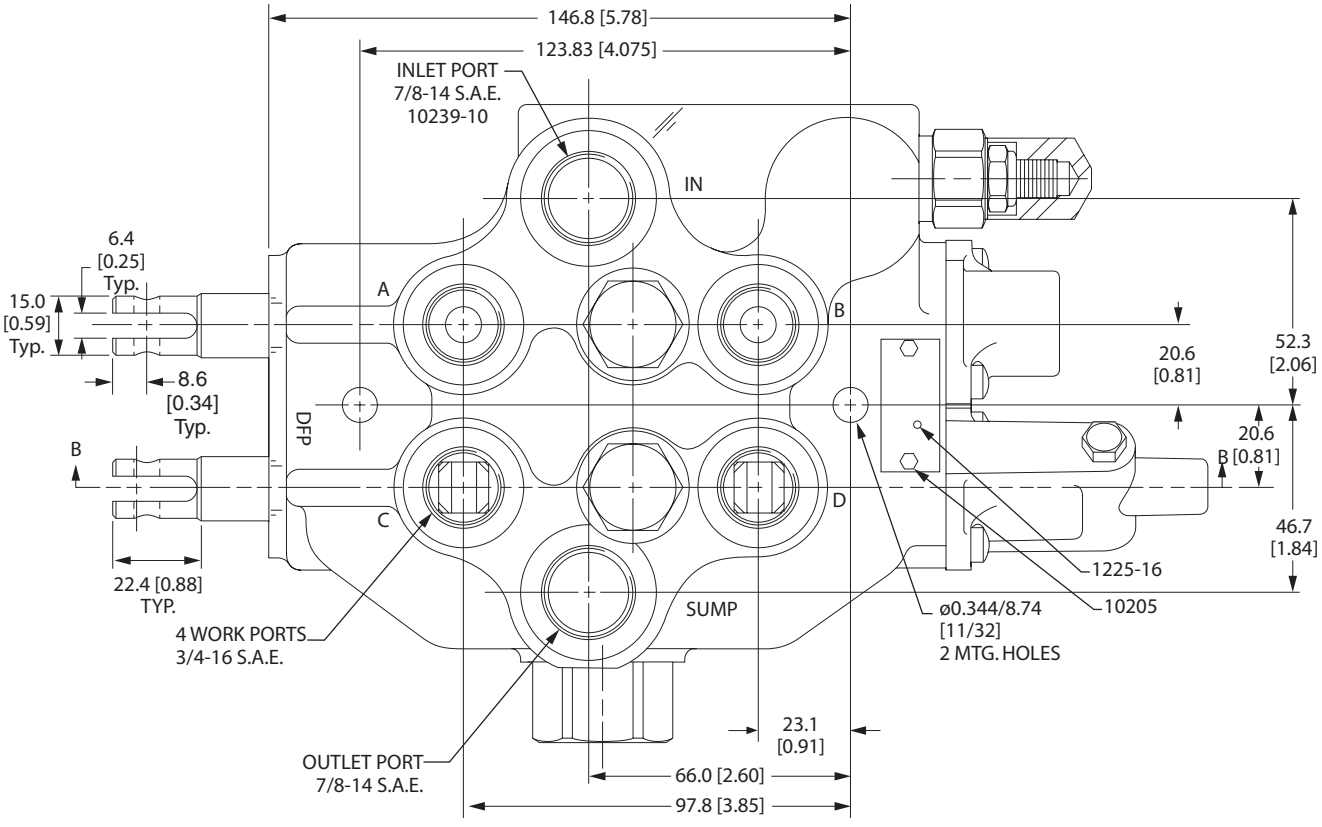
Direct acting ball and spring

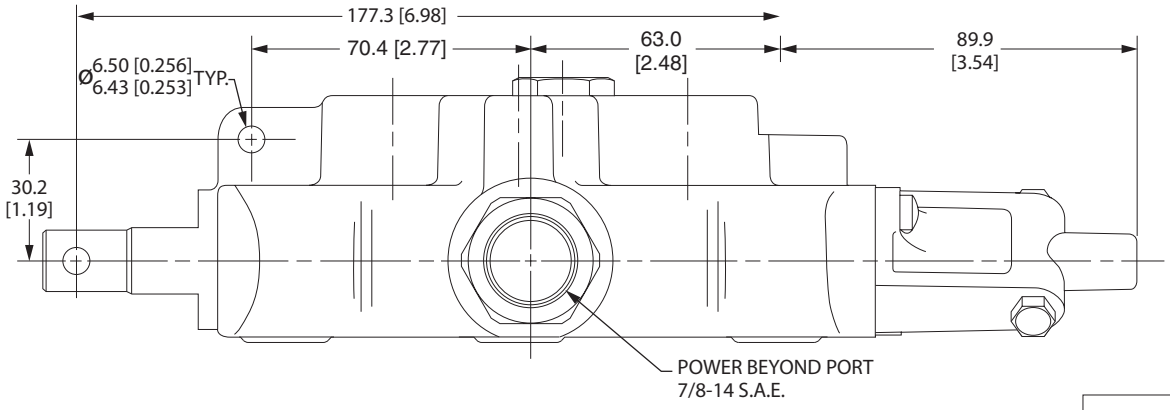
- 0.9 bar per liter [50 psi per gallon] rise
- Not for use on settings over 30 l/min [8 US gal/min]. Full flow setting at 138 bar [2000 psi]
- Adjustable is standard, tamper-proof cap is optional.

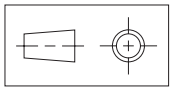
Pilot operated relief valve

- 0.4 bar per liter [20 psi per gallon] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard, tamper-proof is optional.

DIMENSIONS







mm [in]

Directional Control Valves
Technical Information
Model 1632

DESCRIPTION

Three-spool series circuit monoblock valve. 66 l/min [17 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

TYPICAL APPLICATIONS

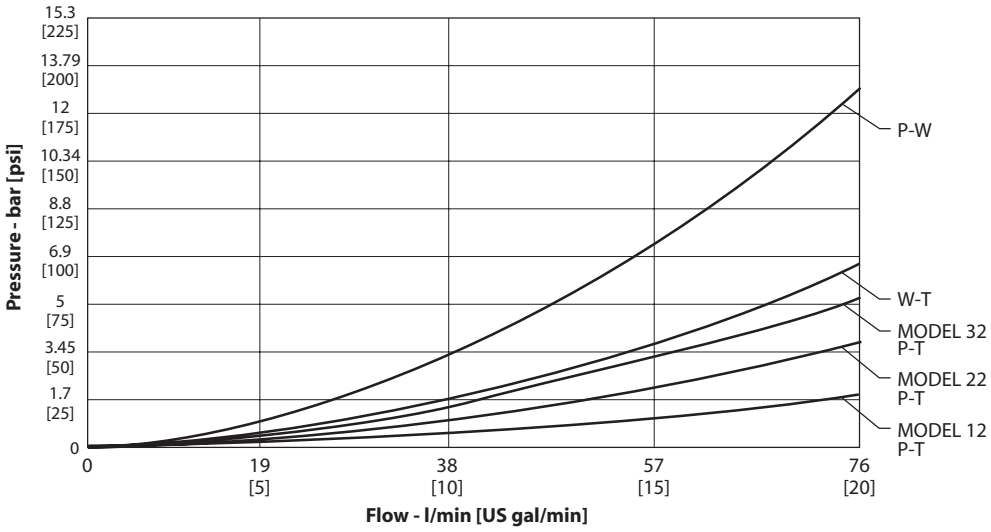
Tractor loaders, skid steer loaders, sweepers, mowers, trenchers, agricultural equipment, tree removal equipment, fork lifts

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
- Closed-transition spool timing prevents load drop before raise
- Individually boxed and labeled

Model 1632

PRESSURE DROP



PORTING

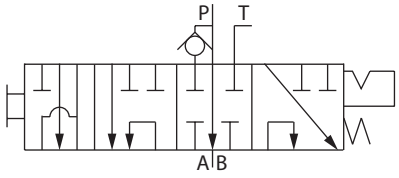
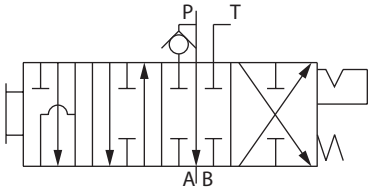
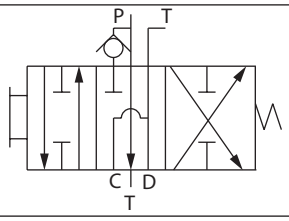
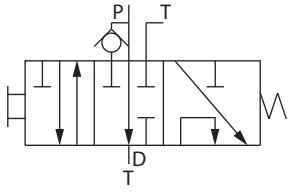
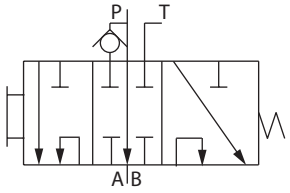
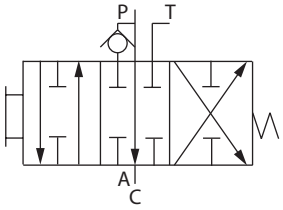
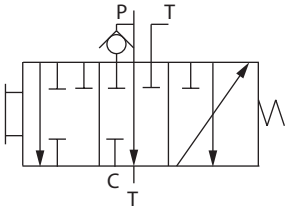
Inlet/outlet	7/8-14, SAE (standard) 3/4-16 SAE
Locations available	top and side
Work ports	3/4-16, SAE (standard)

HANDLES

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

Maximum pressure	207 bar	[3000 psi]
Maximum tank line pressure	69 bar	[1000 psi]
Maximum oil flow	66 l/min	[17 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 mm²/sec (cSt) [102 SUS]	24 cm^3/min	[1.46 in^3/min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm^3/min	[5 in^3/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

Spool types

Symbol	Description
	Series float
	Tandem center float (spool next to outlet)
	Tandem center motor (spool next to outlet, only)
	3-way tandem center (spool next to outlet)
	4-way series
	4-way tandem (spool next to outlet)
	3-way tandem center (spool next to outlet)

OPTIONS

Spool action

- Spring center
- Detent in, detent out, and three position detent
- Detent in float
- Motor start switches

Relief valve

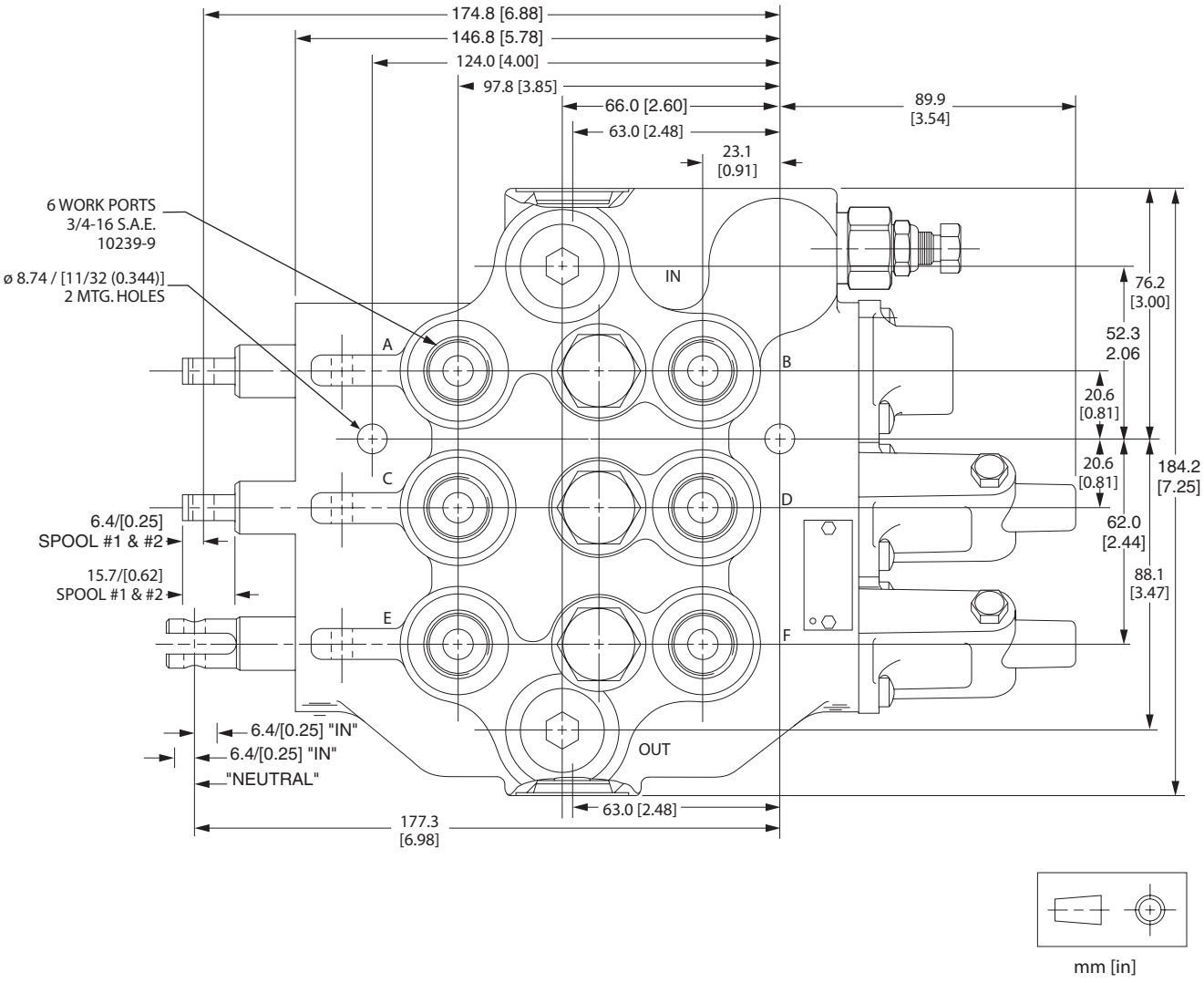
Direct acting ball and spring

- 0.9 bar per liter [50 psi per gallon] rise
- Not for use on settings over 30 l/min [8 US gal/min]. Full flow setting at 138 bar [2000 psi]
- Adjustable is standard, tamper-proof cap is optional.

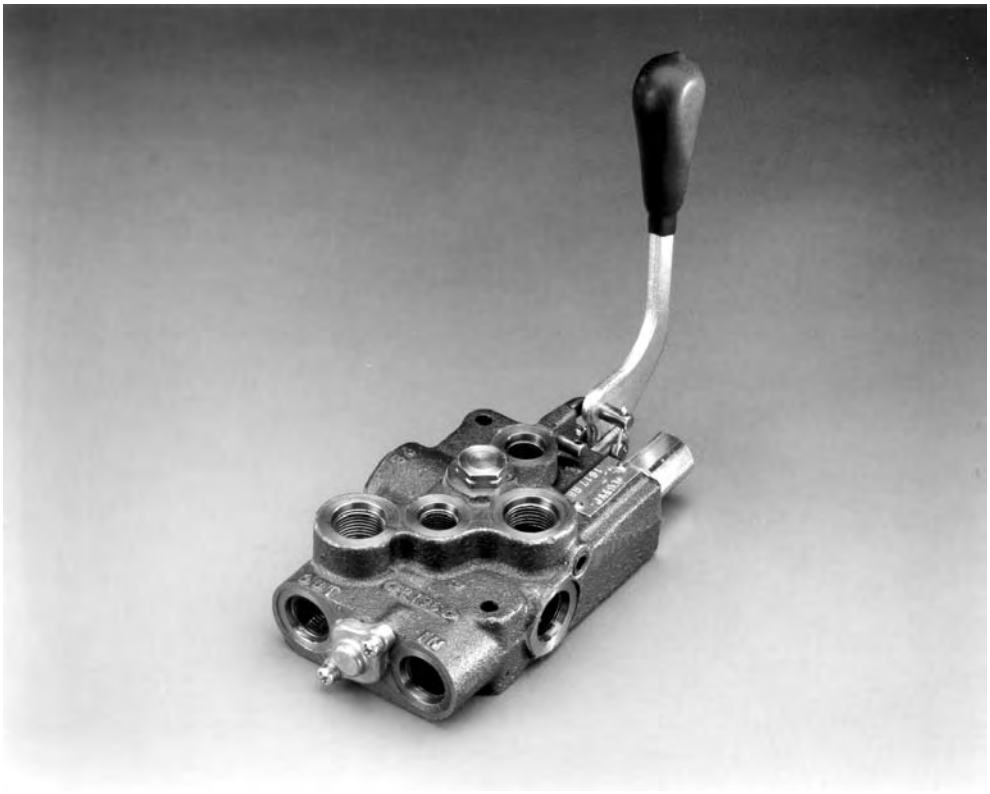
Pilot operated relief valve

- 0.4 bar per liter [20 psi per gallon] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard, tamper-proof is optional.

DIMENSIONS


174.8 [6.88]
146.8 [5.78]
124.0 [4.00]
97.8 [3.85]
66.0 [2.60]
63.0 [2.48]
89.9
[3.54]
23.1
[0.91]
6 WORK PORTS
3/4-16 S.A.E.
10239-9
ø 8.74 / [11/32 (0.344)]
2 MTG. HOLES
IN
A
B
C
D
E
F
OUT
76.2
[3.00]
52.3
2.06
20.6
[0.81]
20.6
[0.81]
184.2
[7.25]
62.0
[2.44]
88.1
[3.47]
6.4/[0.25]
SPOOL #1 & #2
15.7/[0.62]
SPOOL #1 & #2
6.4/[0.25] "IN"
6.4/[0.25] "IN"
"NEUTRAL"
63.0 [2.48]
177.3
[6.98]
mm [in]

Directional Control Valves
Technical Information
Model 1617



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

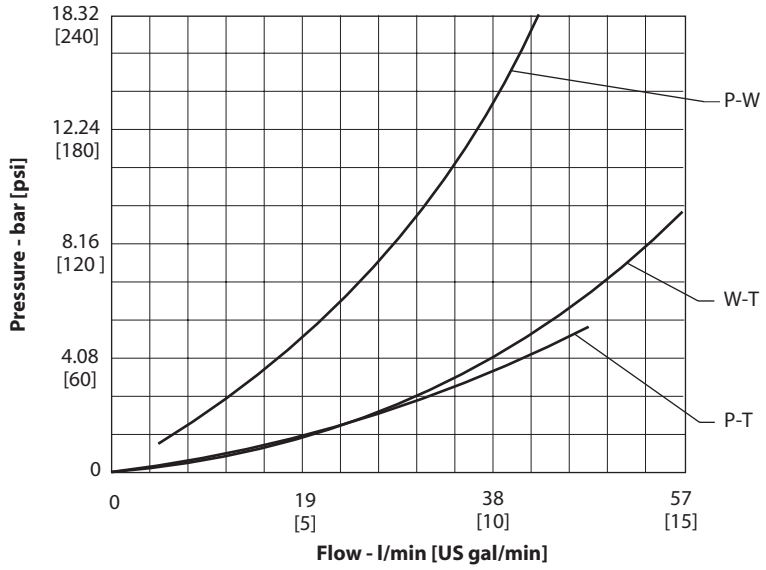
STANDARD FEATURES

- 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)
- Individually boxed and labeled

OTHER FEATURES AVAILABLE

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

PRESSURE DROP



PORTING

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

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

HANDLES

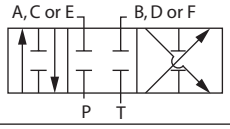
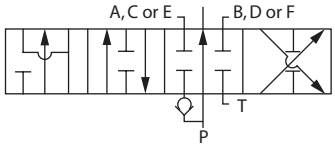
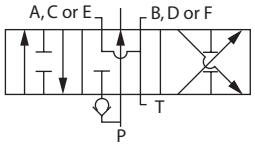
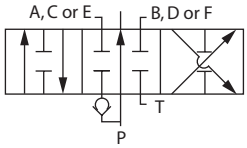
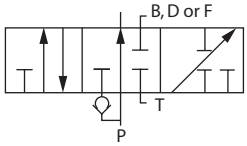
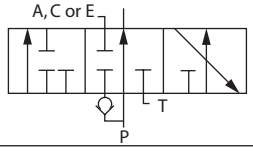
Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
P	Pivot-block handle kit

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 mm²/sec (cSt) [102 SUS]	16 cm³/min	[1 in³/min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm³/min	[5 in³/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

OPTIONS

Spool types

Code	Symbol	Description
C		4-way, 3-position Closed center Work ports blocked to tank in neutral position
F		4-way, 4-position Open center Work ports blocked to tank in neutral, open to tank in fourth position float
O		4-way, 3-position Open center motor Work ports open to tank in neutral position
T		4-way, 3-position Open center Work ports blocked to tank in neutral position
V		3-way, 3-position Open center Work port blocked to tank in neutral: B, D or F port
X		3-way, 3-position Open center Work port blocked to tank in neutral: A, C or E port

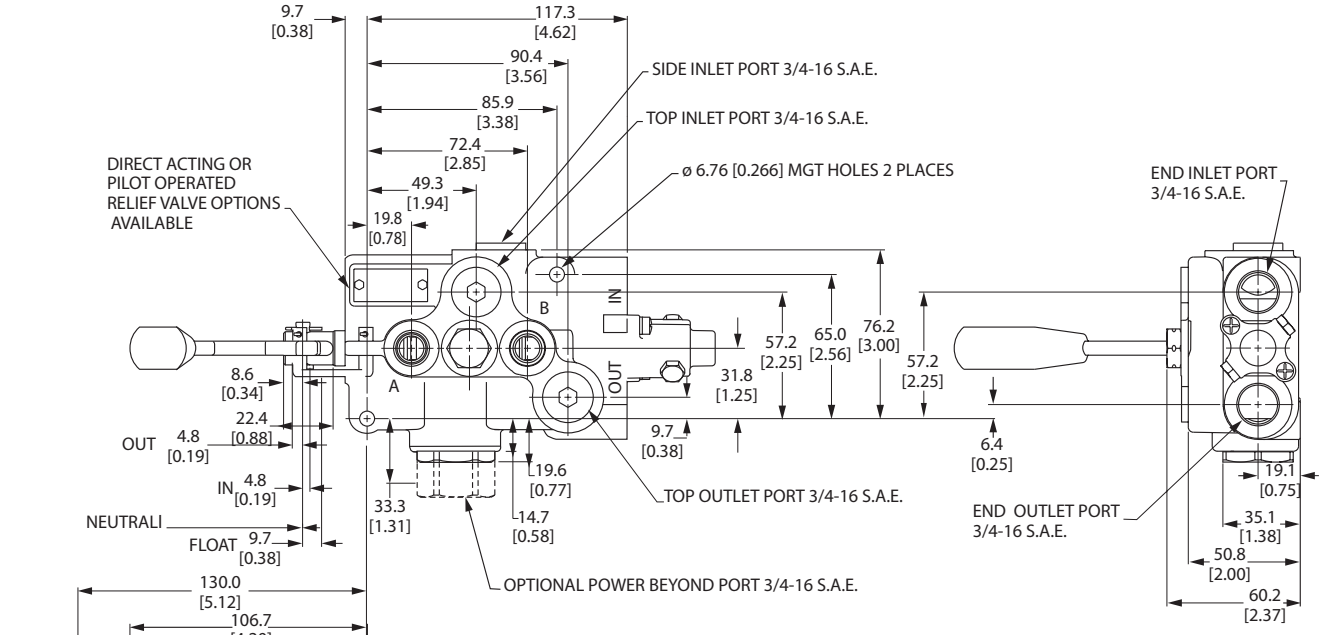
Spool action

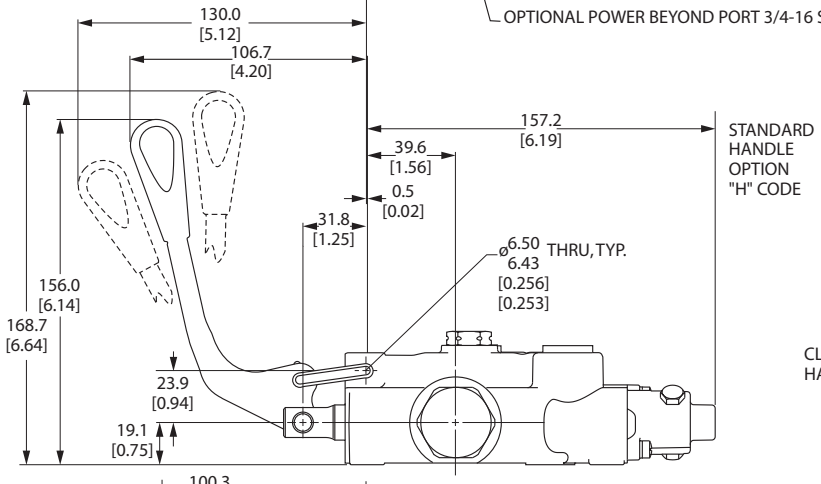
Code	Description	Code	Description
A	Spring centered, detent in float	N	Spring centered, detent in
D	3-position detent	S	Spring centered
L	Spring centered, detent out		

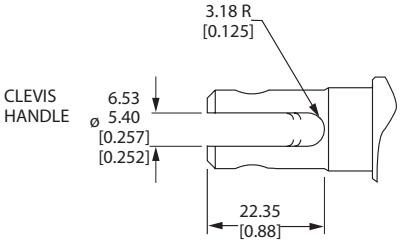
Relief valve

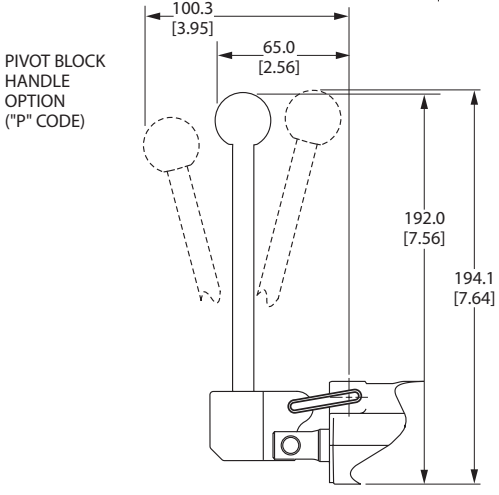
Code	Description
2	Direct-acting ball and spring • 1 bar/l [50 psi/gal] rise • Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min] • Not for use on setting over 30 l/min [8 US gal/min] • Full flow setting at 138 bar [2000 psi]
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 210 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

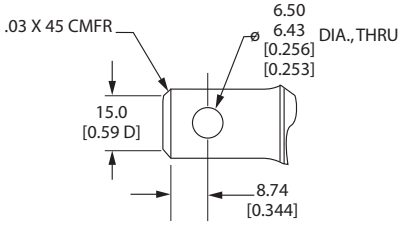
DIMENSIONS

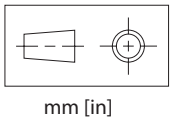






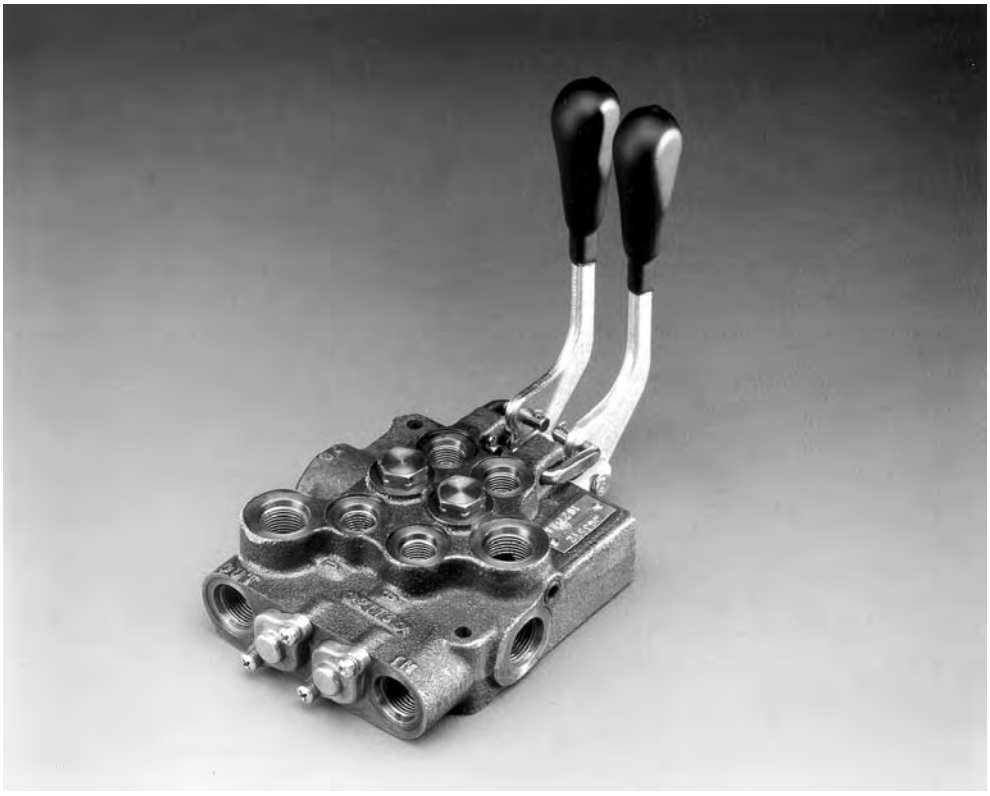






mm [in]

Directional Control Valves
Technical Information
Model 1627



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

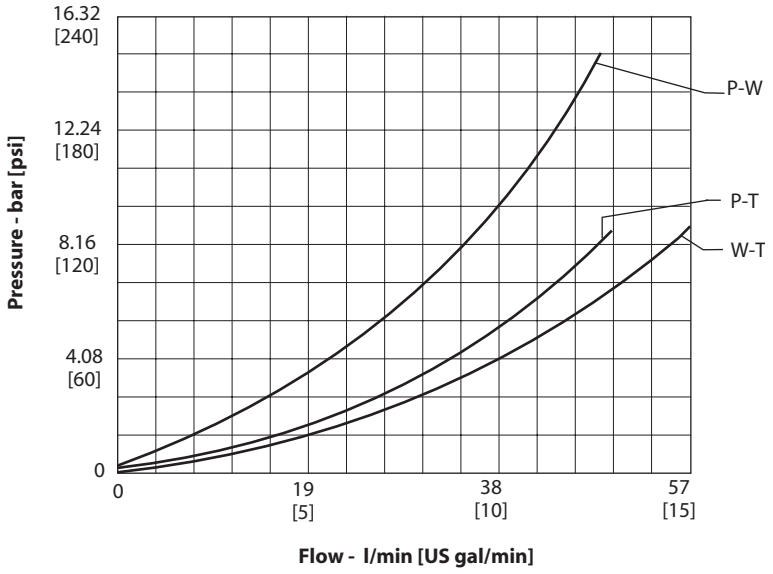
STANDARD FEATURES

- 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)
- 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
- Cam operation
- Custom metering

PRESSURE DROP



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

HANDLES

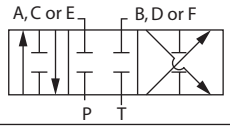
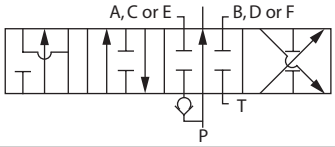
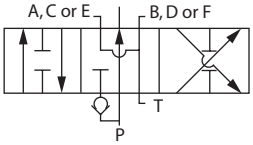
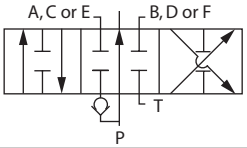
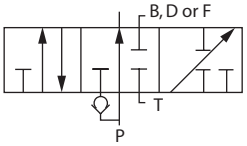
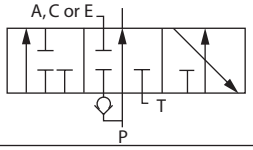
Code	Description
C	C-hook kit
F	Joystick (option)
H	Standard handle with C-hook kit
P	Pivot-block handle kit

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 mm²/sec (cSt) [102 SUS]	16 cm³/min	[1 in³/min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm³/min	[5 in³/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

OPTIONS

Spool types

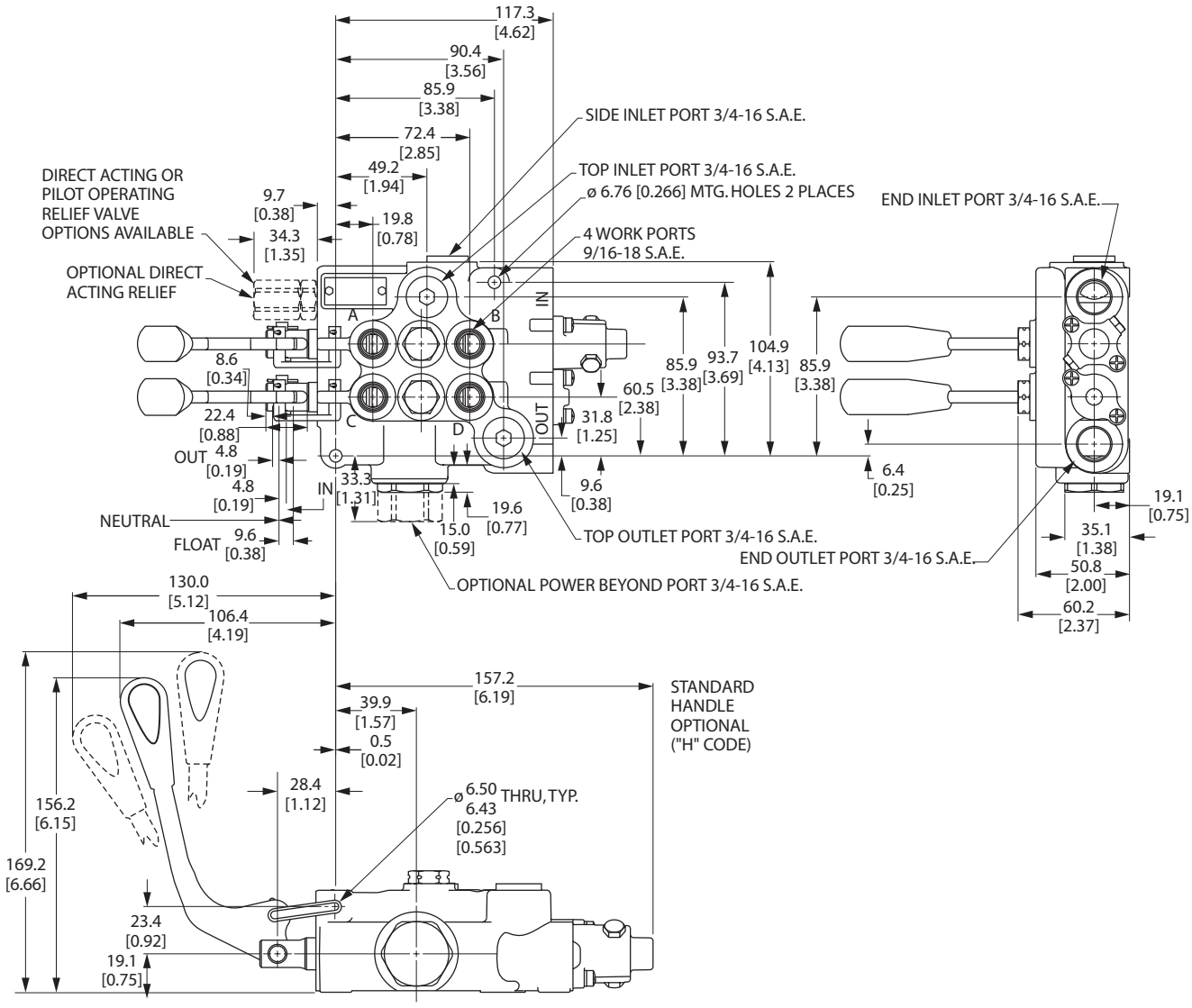
Code	Symbol	Description
C		4-way, 3-position Closed center Work ports blocked to tank in neutral position
F		4-way, 4-position Open center Work ports blocked to tank in neutral, open to tank in fourth position float
O		4-way, 3-position Open center motor Work ports open to tank in neutral position
T		4-way, 3-position Open center Work ports blocked to tank in neutral position
V		3-way, 3-position Open center Work port blocked to tank in neutral: B, D or F port
X		3-way, 3-position Open center Work port blocked to tank in neutral: A, C or E port

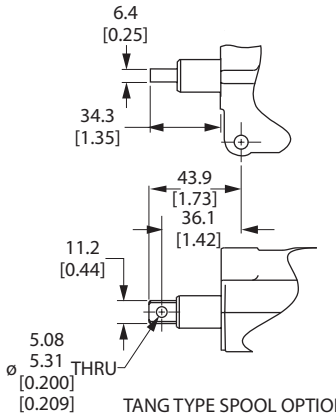
Spool action

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		

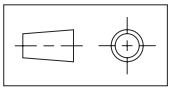
Relief valve

Code	Description
2	Direct-acting ball and spring • 1 bar/l [50 psi/gal] rise • Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min] • Not for use on setting over 30 l/min [8 US gal/min] • Full flow setting at 138 bar [2000 psi]
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 210 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]





TANG TYPE SPOOL OPTION



mm [in]

Directional Control Valves
Technical Information
Model 1637

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

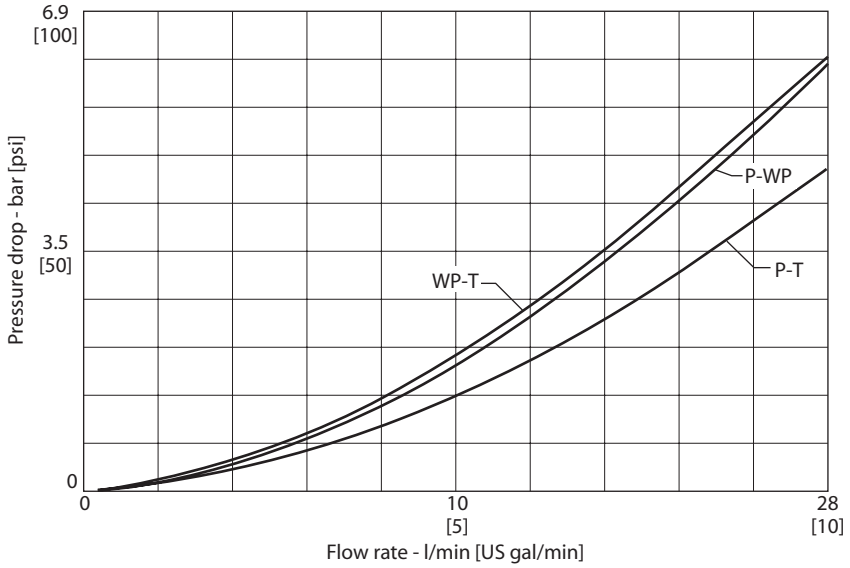
STANDARD FEATURES

- 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)
- Individually boxed and labeled

OTHER FEATURES AVAILABLE

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

PRESSURE DROP



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

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

BSP and other port configurations available upon request.

HANDLES

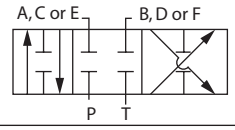
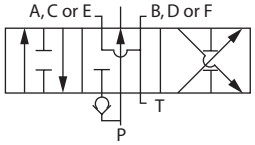
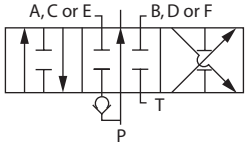
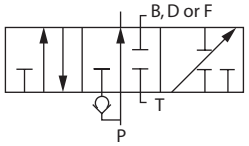
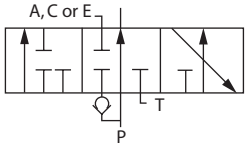
Code	Description
C	C-hook kit
F	Joystick (option)
H	Standard handle with C-hook kit
P	Pivot-block handle kit

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 mm²/sec (cSt) [102 SUS]	16 cm³/min	[1 in³/min]
Maximum lift check leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm³/min	[5 in³/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

OPTIONS

Spool types

Code	Symbol	Description
C		4-way, 3-position Closed center Work ports blocked to tank in neutral position
O		4-way, 3-position Open center motor Work ports open to tank in neutral position
T		4-way, 3-position Open center Work ports blocked to tank in neutral position
V		3-way, 3-position Open center Work port blocked to tank in neutral: B, D or F port
X		3-way, 3-position Open center Work port blocked to tank in neutral: A, C or E port

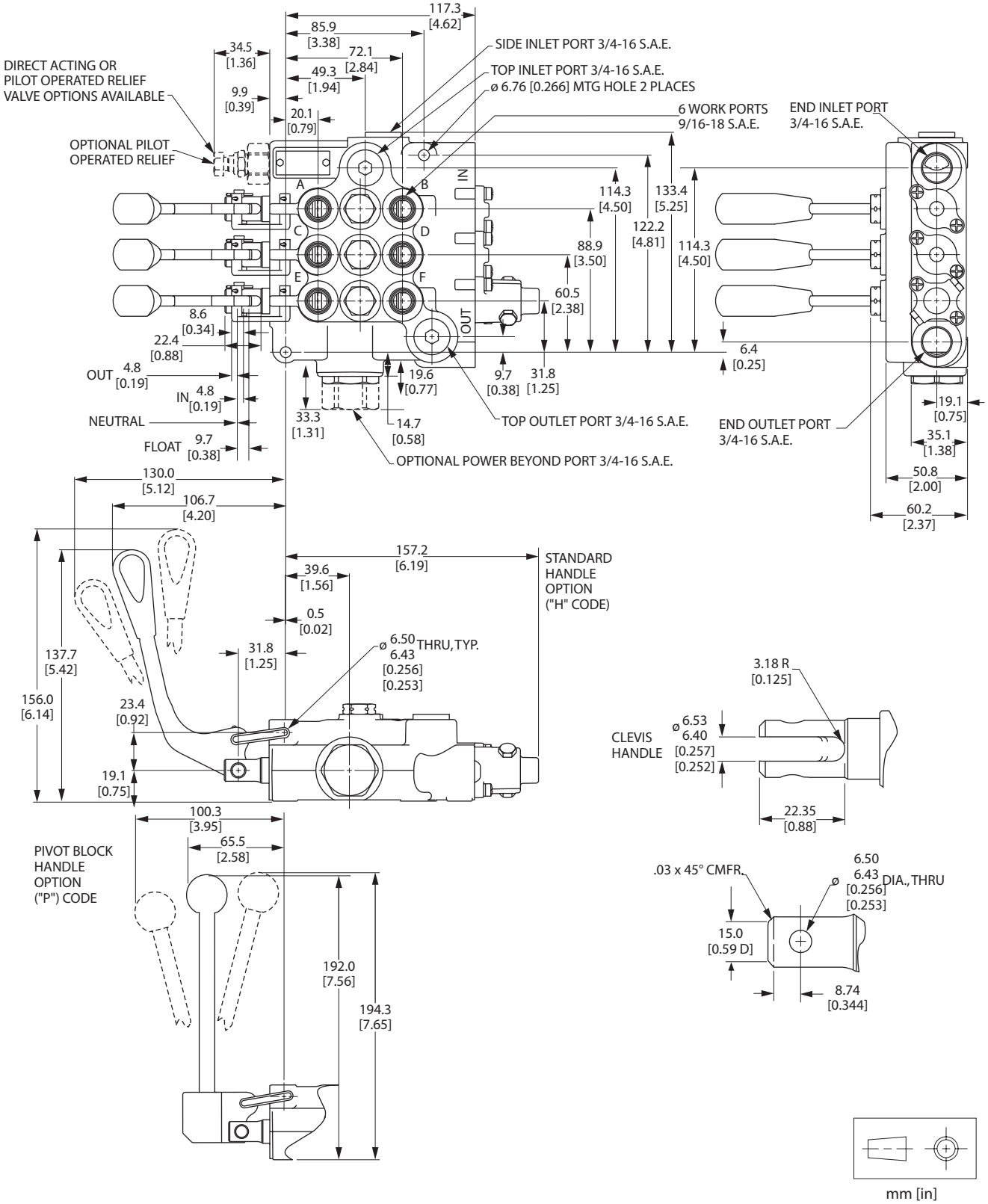
Spool action

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		

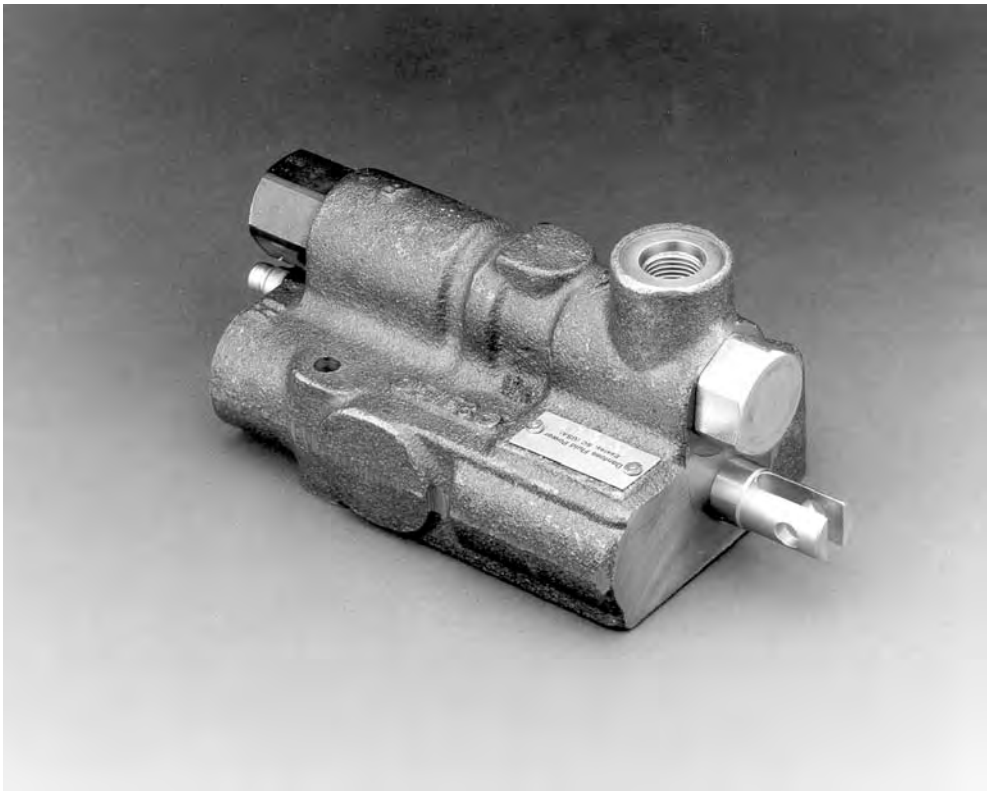
Relief valve

Code	Description
2	Direct-acting ball and spring • 1 bar/l [50 psi/gal] rise • Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min] • Not for use on setting over 30 l/min [8 US gal/min] • Full flow setting at 138 bar [2000 psi]
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 210 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

DIMENSIONS


117.3 [4.62]
85.9 [3.38]
72.1 [2.84]
49.3 [1.94]
34.5 [1.36]
9.9 [0.39]
20.1 [0.79]
DIRECT ACTING OR PILOT OPERATED RELIEF VALVE OPTIONS AVAILABLE
OPTIONAL PILOT OPERATED RELIEF
SIDE INLET PORT 3/4-16 S.A.E.
TOP INLET PORT 3/4-16 S.A.E.
ø 6.76 [0.266] MTG HOLE 2 PLACES
6 WORK PORTS 9/16-18 S.A.E.
END INLET PORT 3/4-16 S.A.E.
A
B
C
D
E
F
IN
OUT
114.3 [4.50]
133.4 [5.25]
122.2 [4.81]
88.9 [3.50]
114.3 [4.50]
60.5 [2.38]
8.6 [0.34]
22.4 [0.88]
OUT 4.8 [0.19]
IN 4.8 [0.19]
NEUTRAL
FLOAT 9.7 [0.38]
19.6 [0.77]
9.7 [0.38]
31.8 [1.25]
6.4 [0.25]
33.3 [1.31]
14.7 [0.58]
TOP OUTLET PORT 3/4-16 S.A.E.
OPTIONAL POWER BEYOND PORT 3/4-16 S.A.E.
END OUTLET PORT 3/4-16 S.A.E.
19.1 [0.75]
35.1 [1.38]
50.8 [2.00]
60.2 [2.37]
130.0 [5.12]
106.7 [4.20]
157.2 [6.19]
39.6 [1.56]
0.5 [0.02]
31.8 [1.25]
ø 6.50 6.43 [0.256] [0.253] THRU, TYP.
STANDARD HANDLE OPTION ("H" CODE)
137.7 [5.42]
156.0 [6.14]
23.4 [0.92]
19.1 [0.75]
100.3 [3.95]
65.5 [2.58]
PIVOT BLOCK HANDLE OPTION ("P") CODE
192.0 [7.56]
194.3 [7.65]
3.18 R [0.125]
CLEVIS HANDLE
ø 6.53 6.40 [0.257] [0.252]
22.35 [0.88]
.03 x 45° CMFR.
ø 6.50 6.43 [0.256] [0.253] DIA., THRU
15.0 [0.59 D]
8.74 [0.344]
mm [in]

Directional Control Valves
Technical Information
Model 1618



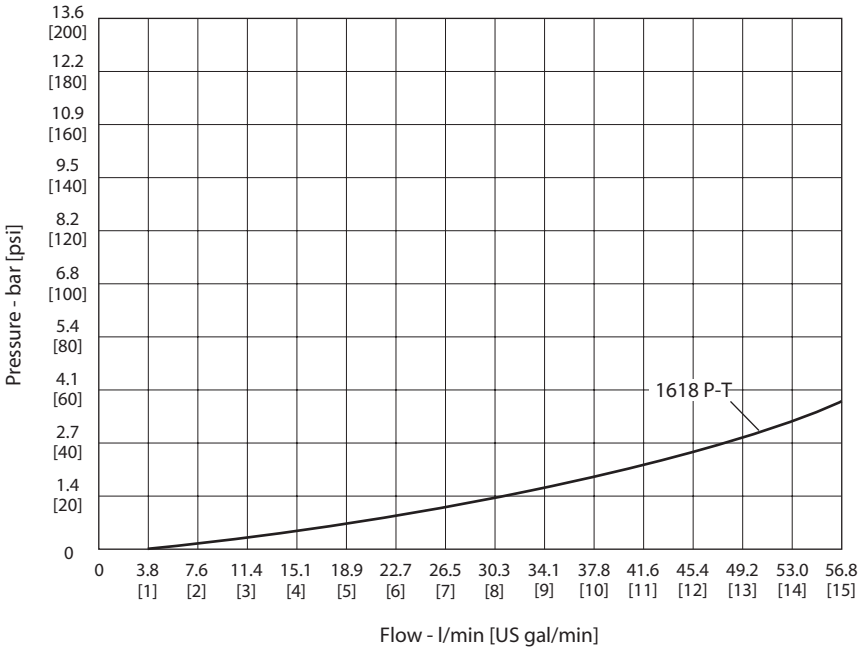
Single spool monoblock valve. 38 l/min [10 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

TYPICAL APPLICATIONS

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

- 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
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

Inlet/outlet	9/16 -18 SAE, 3/4 - 6 SAE
Locations available	side, end B/D ports - end A/C ports - top,end
Work ports	9/16 -18 SAE, 1/2 -20 SAE , 7/16 -20 SAE

HANDLES

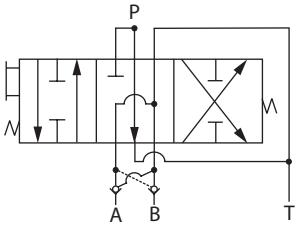
None Available

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]
Maximum standby leakage @ 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	300 cm^3/min	[18 in^3/min]
Standard pilot check leakage@ 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	0.5 cm^3/min	[0.03 in^3/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

OPTIONS

Spool types

Code	Symbol	Description
		3-position, 4-way

Spool action

- Spring center
- Detent in, detent out, and three position detent

Relief valve

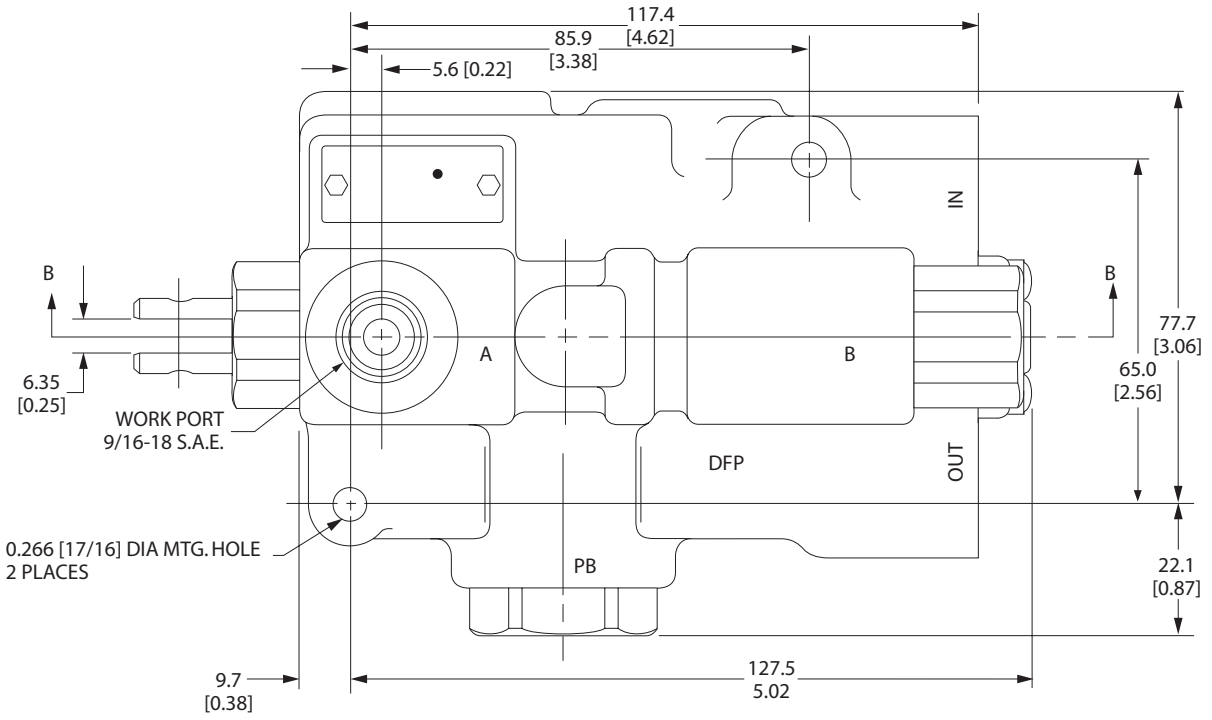
Direct acting ball and spring

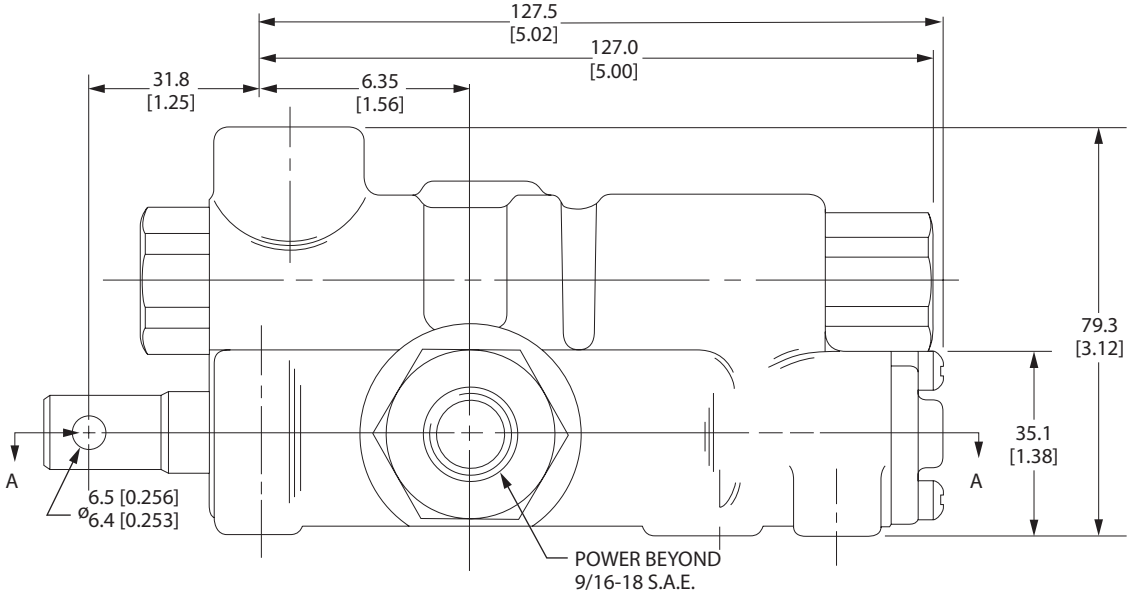
- 0.9 bar per liter [50 psi per gallon] rise
- Not for use on settings over 30 l/min [8 US gal/min]. Full flow setting at 138 bar [2000 psi]
- Adjustable is standard, tamper-proof cap is optional.

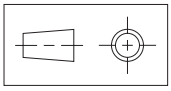
Pilot operated relief valve

- 0.4 bar per liter [20 psi per gallon] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard, tamper-proof is optional.

DIMENSIONS

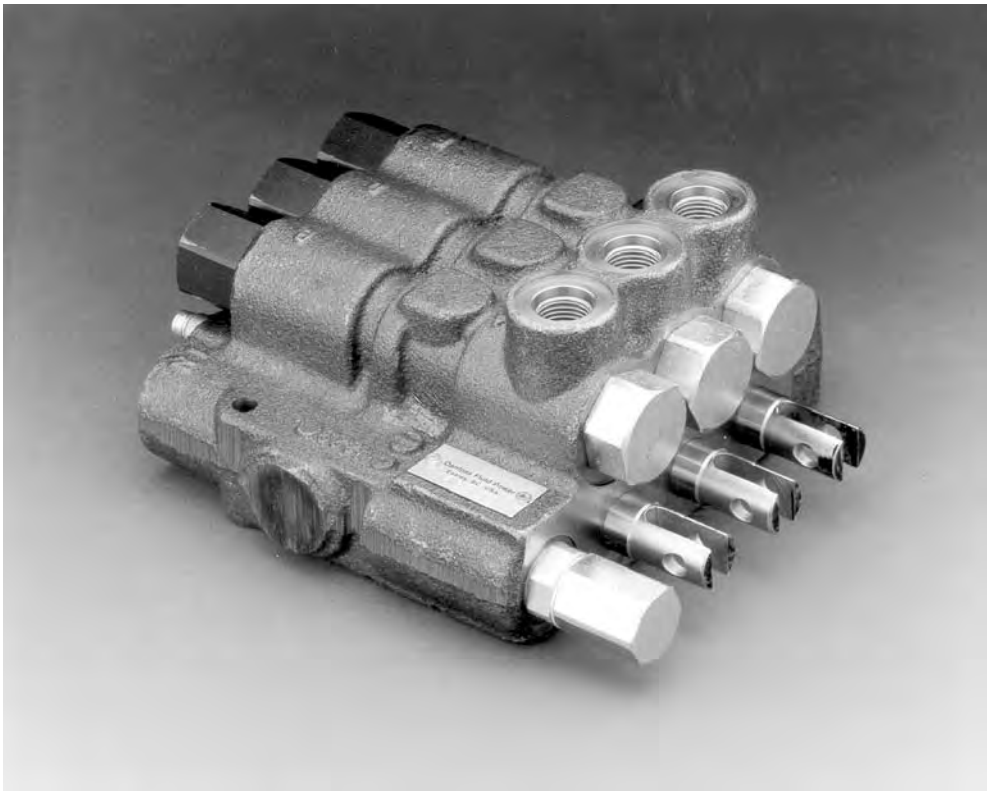






mm [in]

Directional Control Valves
Technical Information
Model 1638



DESCRIPTION

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

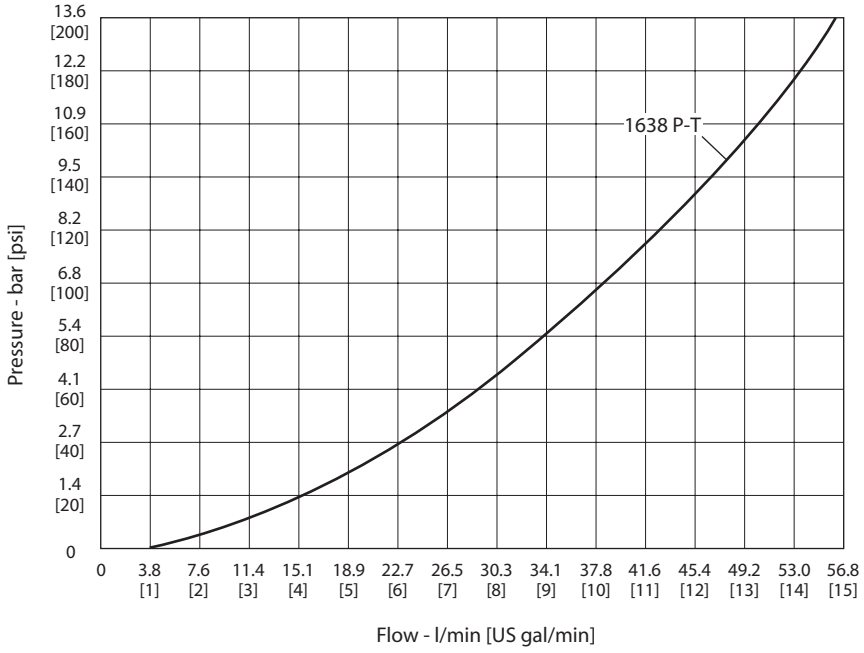
TYPICAL APPLICATIONS

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
- Paint color: black primer
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

Inlet/outlet	9/16 -18 SAE, 3/4 - 6 SAE
Locations available	side, end B/D ports - end A/C ports - top,end
Work ports	9/16 -18 SAE, 1/2 -20 SAE , 7/16 -20 SAE

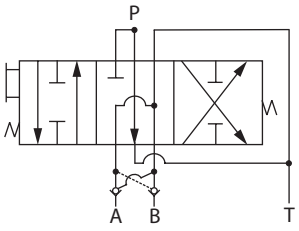
HANDLES

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]
Maximum standby leakage @ 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	300 cm^3/min	[18 in^3/min]
Standard pilot check leakage@ 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	0.5 cm^3/min	[0.03 in^3/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

OPTIONS

Spool types

Code	Symbol	Description
		3-position, 4-way

Spool action

- Spring center
- Detent in, detent out, and three position detent

Relief valve

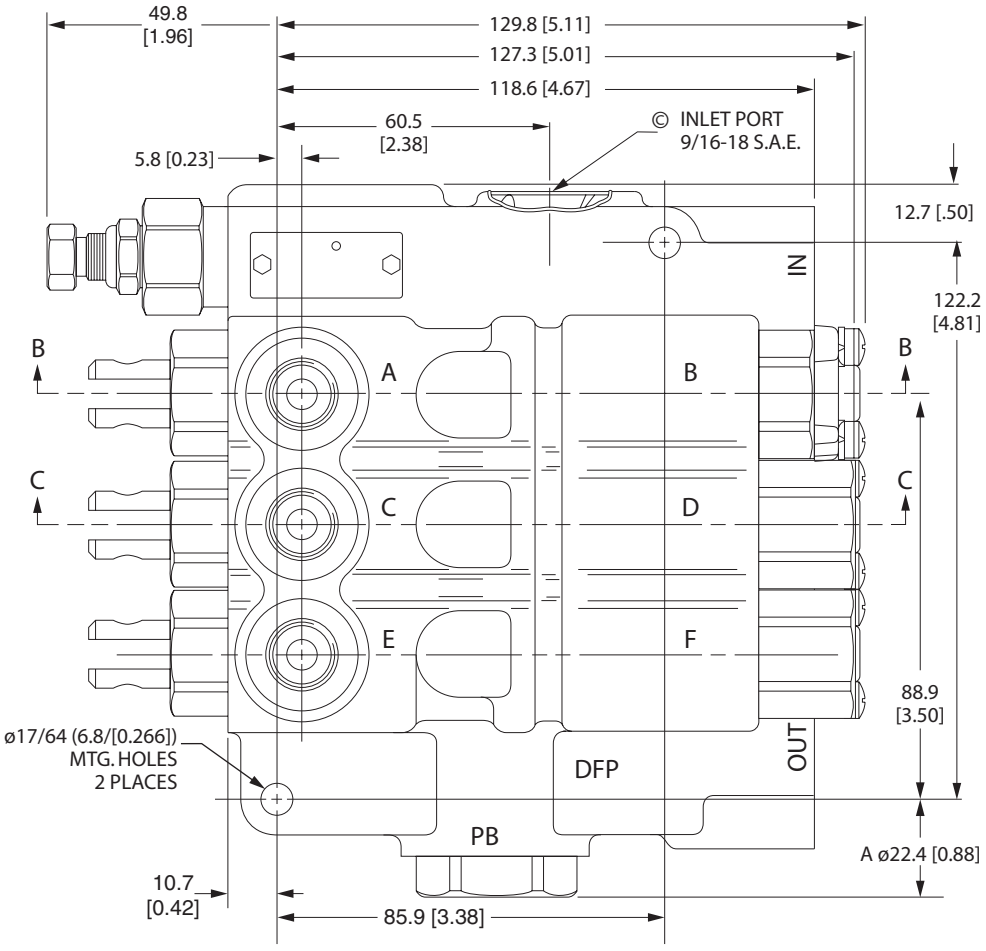
Direct acting ball and spring

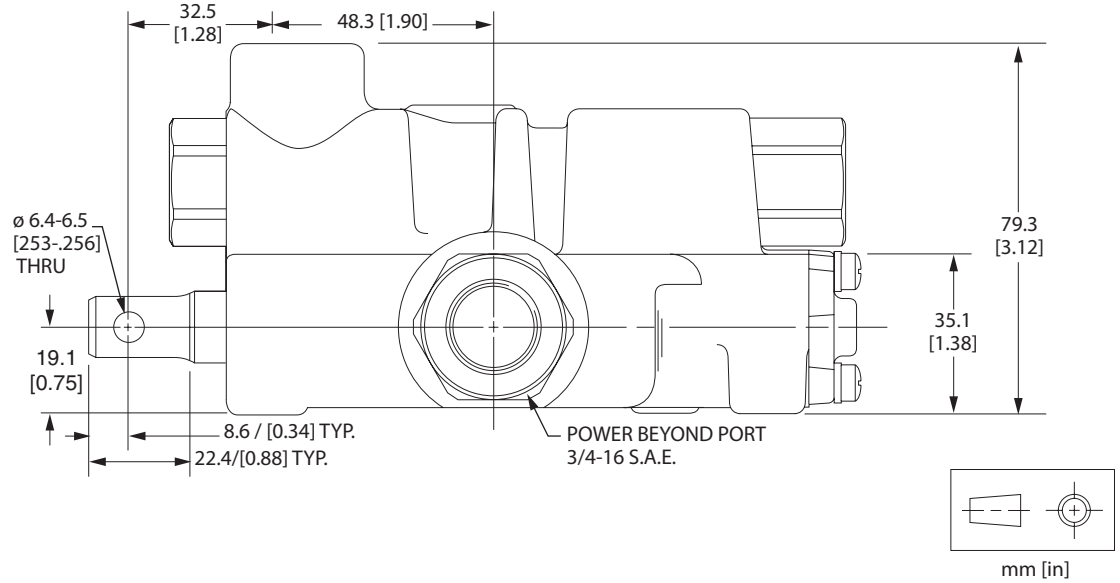
- 0.9 bar per liter [50 psi per gallon] rise
- Not for use on settings over 30 l/min [8 US gal/min]. Full flow setting at 138 bar [2000 psi]
- Adjustable is standard, tamper-proof cap is optional.

Pilot operated relief valve

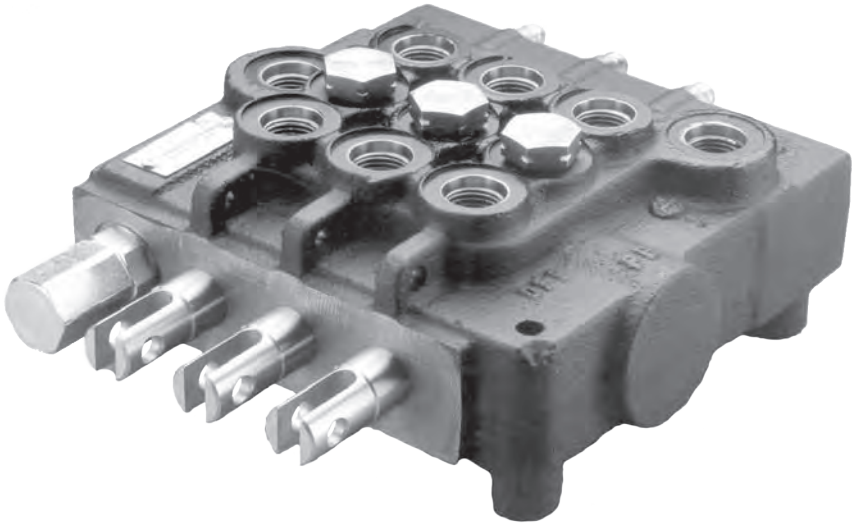
- 0.4 bar per liter [20 psi per gallon] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard, tamper-proof is optional.

DIMENSIONS


49.8
[1.96]
129.8 [5.11]
127.3 [5.01]
118.6 [4.67]
60.5
[2.38]
5.8 [0.23]
© INLET PORT
9/16-18 S.A.E.
12.7 [.50]
IN
122.2
[4.81]
B
A
B
B
C
C
C
D
E
F
88.9
[3.50]
ø17/64 (6.8/[0.266])
MTG. HOLES
2 PLACES
DFP
OUT
PB
A ø22.4 [0.88]
10.7
[0.42]
85.9 [3.38]


32.5
[1.28]
48.3 [1.90]
ø 6.4-6.5
[253-.256]
THRU
79.3
[3.12]
35.1
[1.38]
19.1
[0.75]
8.6 / [0.34] TYP.
22.4/[0.88] TYP.
POWER BEYOND PORT
3/4-16 S.A.E.
mm [in]

Directional Control Valves
Technical Information
Model 1635



DESCRIPTION

Three-spool series circuit monoblock valve. 26.4 l/min [7 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure.

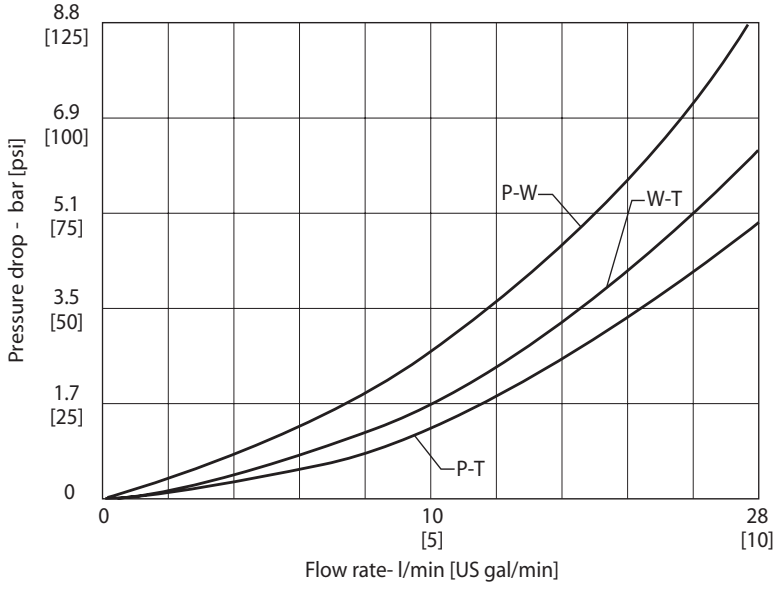
TYPICAL APPLICATIONS

Small tractor loaders, skid steer loaders, small sweepers, snow blades, agricultural equipment, 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
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

Inlet/outlet	9/16 -18 SAE (standard), 3/4 - 6 SAE
Locations available	top, side, end
Work ports	9/16 -18 SAE (Standard), 1/2 -20 SAE , 7/16 -20 SAE

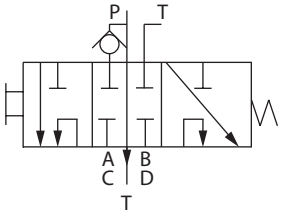
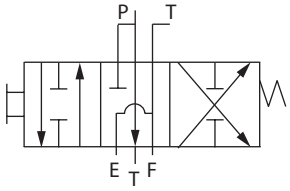
HANDLES

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

TECHNICAL DATA

Maximum pressure	207 bar	[3000 psi]
Maximum tank line pressure	69 bar	[1000 psi]
Maximum oil flow	26.4 l/min	[7 US gal/min]
Spool travel in and out from neutral	4.8 mm	[0.19 in.]
Spool travel to float position from neutral	9.6 mm	[0.38 in.]
Maximum port leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	24 cm^3/min	[1.46 in^3/min]
Maximum lift check leakage@ 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm^3/min	[5 in^3/min]
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature	-29° to 60° C	[-20° to 140° F]
Minimum viscosity	6 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	231 N	[52 lbf]

Spool types

Symbol	Description
	4-way series spools 1 & 2
	Tandem center motor Not recommended for spool 1 or 2

Spool action

- Spring center
- Detent in, detent out, and three position detent
- Detent in float

Relief valve

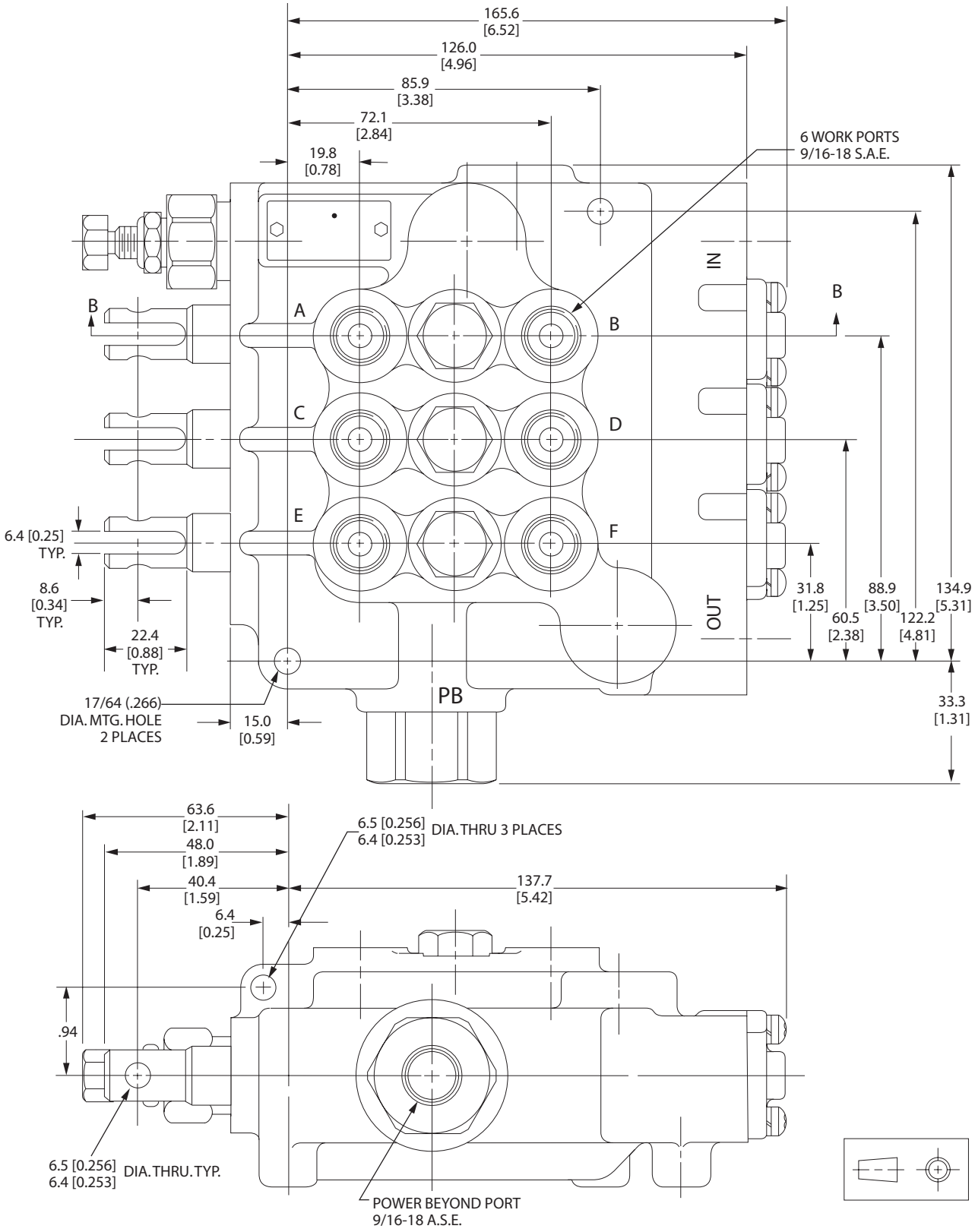
Direct acting ball and spring

- 0.9 bar per liter [50 psi per gallon] rise
- Not for use on settings over 30 l/min [8 US gal/min]. Full flow setting at 138 bar [2000 psi]
- Adjustable is standard, tamper-proof cap is optional.

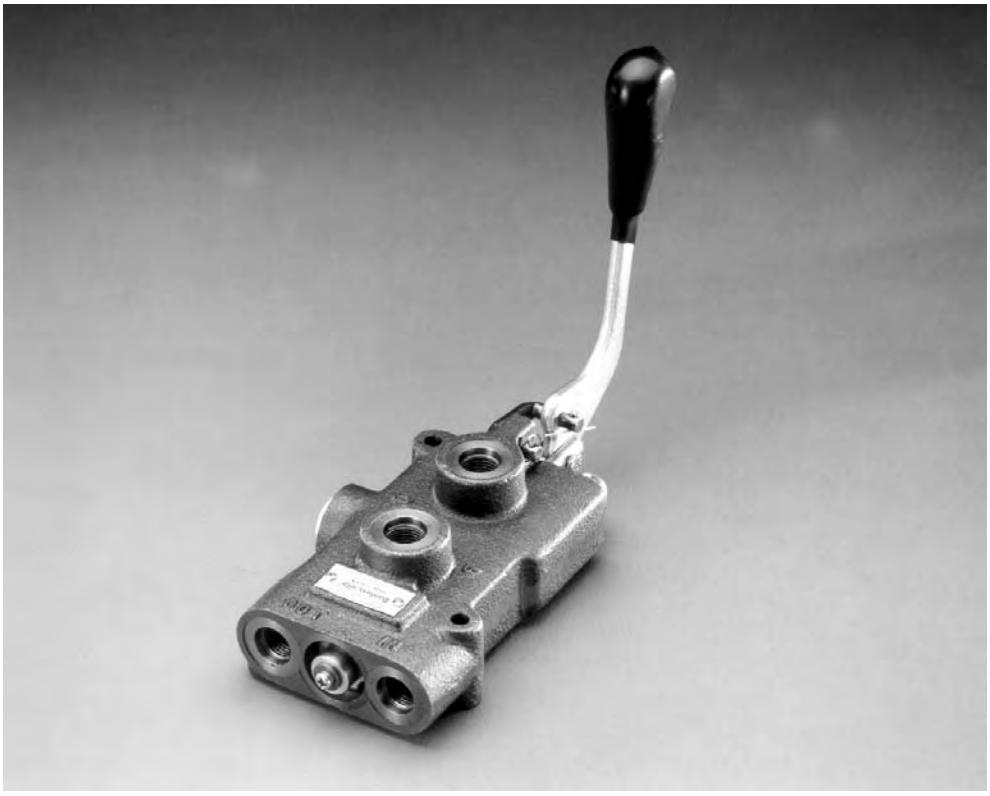
Pilot operated relief valve

- 0.4 bar per liter [20 psi per gallon] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard, tamper-proof is optional.

DIMENSIONS


165.6
[6.52]
126.0
[4.96]
85.9
[3.38]
72.1
[2.84]
19.8
[0.78]
6 WORK PORTS
9/16-18 S.A.E.
IN
OUT
A
B
C
D
E
F
B
6.4 [0.25]
TYP.
8.6
[0.34]
TYP.
22.4
[0.88]
TYP.
17/64 (.266)
DIA. MTG. HOLE
2 PLACES
15.0
[0.59]
PB
31.8
[1.25]
60.5
[2.38]
88.9
[3.50]
122.2
[4.81]
134.9
[5.31]
33.3
[1.31]
63.6
[2.11]
48.0
[1.89]
40.4
[1.59]
6.4
[0.25]
6.5 [0.256]
6.4 [0.253]
DIA. THRU 3 PLACES
137.7
[5.42]
.94
6.5 [0.256]
6.4 [0.253]
DIA. THRU. TYP.
POWER BEYOND PORT
9/16-18 A.S.E.

Directional Control Valves
Technical Information
Model 1500



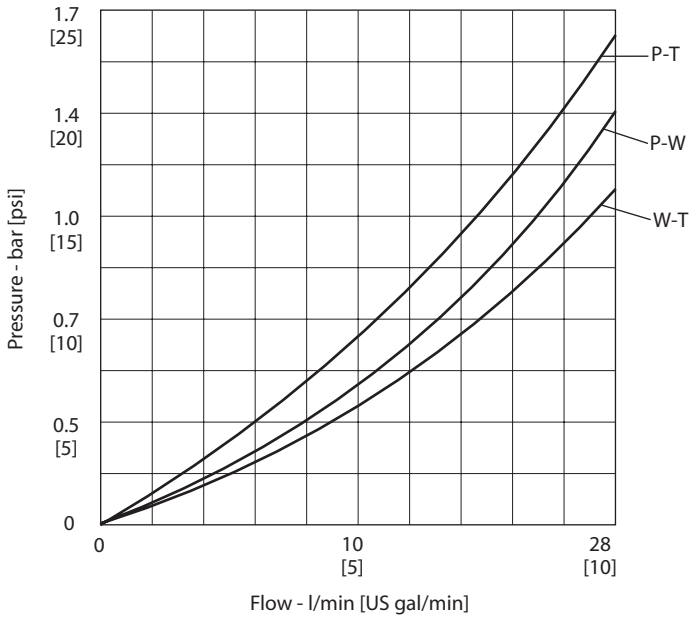
Single spool monoblock valve. 26.4 l/min [7 US gal/min] maximum flow. 138 bar [2000 psi] maximum pressure with relief. 207 bar [3000 psi] maximum pressure without relief.

Garden tractors, mowers, utility equipment, fire fighting equipment, 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
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

Inlet/outlet	9/16-18 SAE 6
Work ports	9/16-18 , SAE 6

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

BSP and other port configurations available upon request.

HANDLES

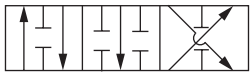
Code	Description
C	C-hook kit
H	Standard handle with C-hook kit
P	Pivot-block handle kit

TECHNICAL DATA

Maximum pressure with relief valve	138 bar	[2000 psi]
Maximum pressure without relief valve	207 bar	[3000 psi]
Maximum tank line pressure	70 bar	[1000 psi]
Maximum oil flow	26.4 l/min	[7 US gal/min]
Spool travel in and out from neutral	4.8 mm	[0.19 in.]
Maximum port leakage at 69 bar [1000 psi] 21 mm^2/sec (cSt) [102 SUS]	24 cm^3/min	[1.46 in^3/min]
Minimum oil temperature	-29° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature	-29° C to 60° C	[-20° F to 140° F]
Minimum viscosity	6 mm^2/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm^2/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Typical spool effort: dry, full stroke	187 N	[42 lbf]

OPTIONS

Spool types

Code	Symbol	Description
T		4-way, 3-position Open center Work ports blocked to tank in neutral position

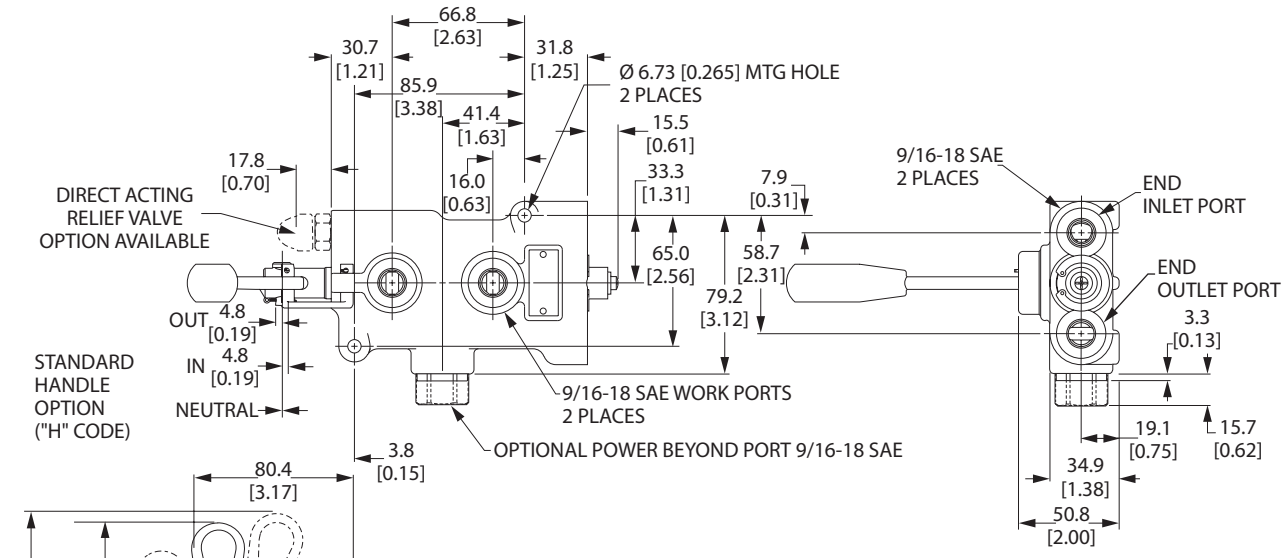
Spool action

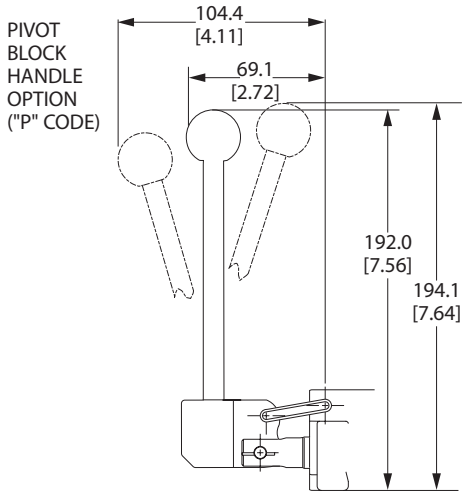
Code	Description
S	Spring centered

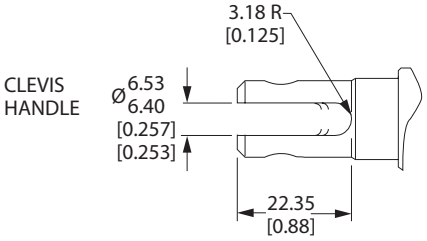
Relief valve

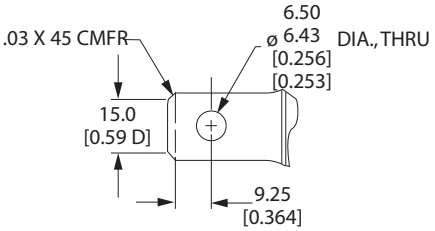
Code	Description
2	Direct-acting ball and spring • 1 bar/l [50 psi/gal] rise • Standard setting 83 bar [1200 psi] crack pressure at 2.9 l/min [0.75 US gal/min] • Not for use on setting over 30 l/min [8 US gal/min] • Full flow setting at 138 bar [2000 psi]

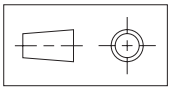
DIMENSIONS





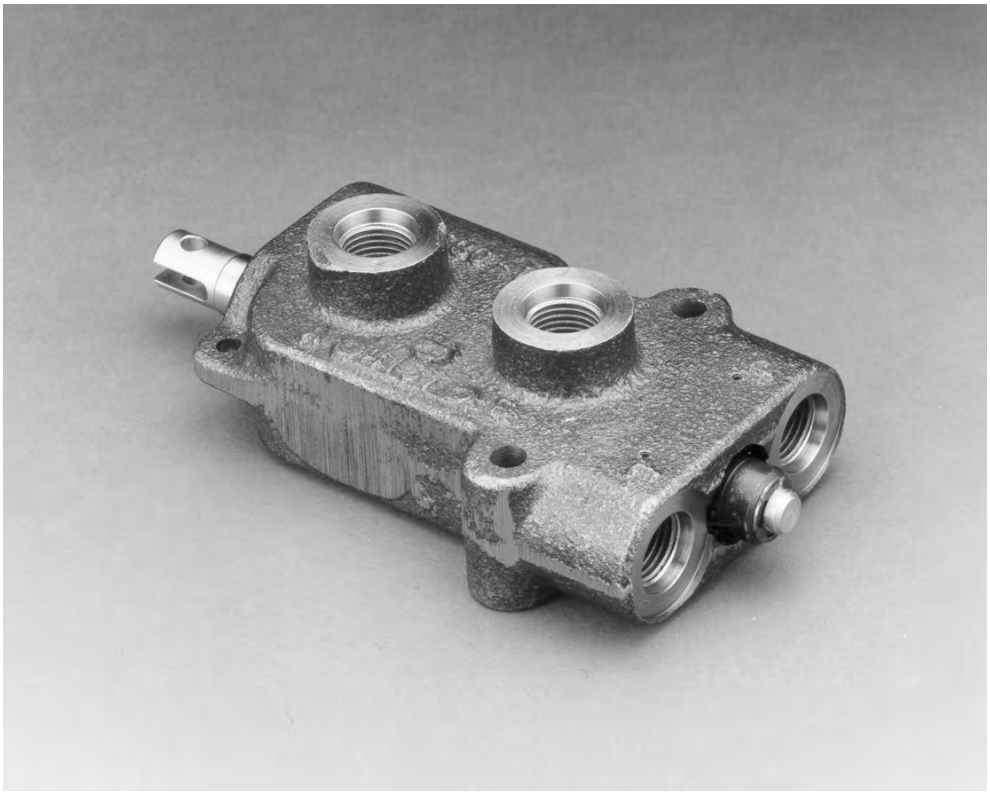






mm [in]

Directional Control Valves
Technical Information
Model 1530



DESCRIPTION

Single spool, low cost valve assembly. 23 l/min [6 US gal/min] maximum flow. 103 bar [1500 psi] maximum pressure.

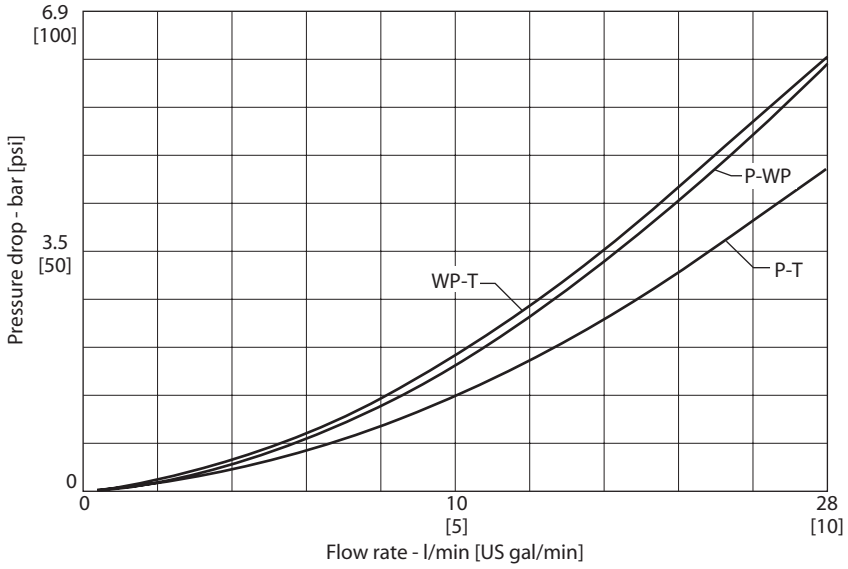
TYPICAL APPLICATIONS

Lawn and garden tractors

STANDARD FEATURES

- All valves supplied with clevis end spools
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Paint color: black primer
- Closed transition spool timing prevents load drop before raise
- Individually boxed and labeled

PRESSURE DROP



PORTING

Inlet/outlet	9/16-18 SAE 6
Work ports	9/16-18 , SAE 6

HANDLES

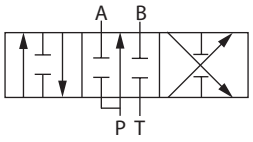
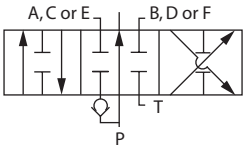
None available

TECHNICAL DATA

Maximum pressure	103 bar	[1500 psi]
Maximum tank line pressure	14 bar	[200 psi]
Maximum oil flow	23 l/min	[6 US gal/min]
Spool travel in and out from neutral	4.1 mm	[0.16 in]
Maximum port leakage at 69 bar [1000 psi] 21 mm^2/sec (cSt) [102 SUS]	24 cm^3/min	[1.46 in^3/min]
Minimum oil temperature	-29 ° C	[-20° F]
Maximum oil temperature	82° C	[180° F]
Ambient temperature range	-29° C to 60° C	[-20° F to 140° F]
Minimum viscosity	6 mm^2/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm^2/sec (cSt)	[2000 SUS]
Filtration (maximum contamination) per ISO 4406	19/16	
Typical spool effort: dry, full stroke	98 N	[22 lbf]

OPTIONS

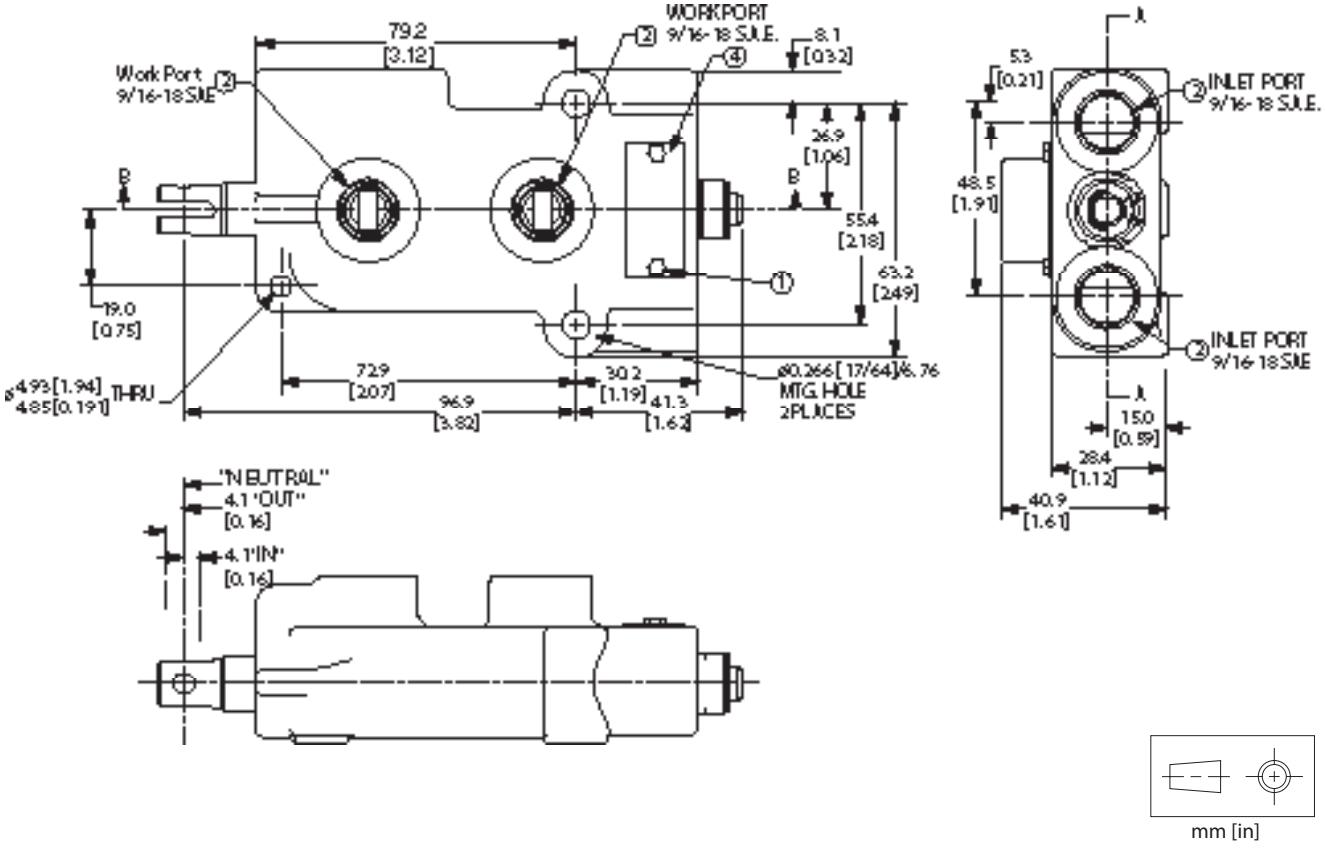
Spool types

Code	Symbol	Description
		4-way, 3-position Open center Work ports blocked to tank in neutral position
T		4-way, 3-position Open center Work ports blocked to tank in neutral position

Spool action

Code	Description
S	Spring centered

DIMENSIONS



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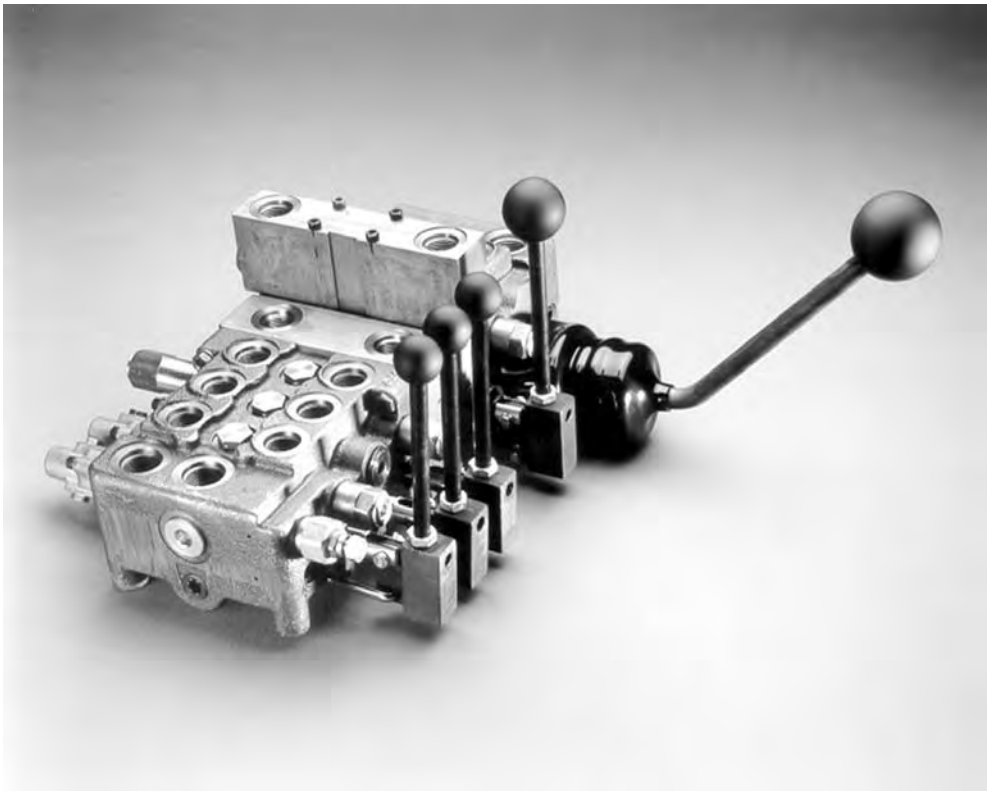
Directional Control Valves
Technical Information
Model 1681



DESCRIPTION

1681-2: Two-Spool
1681-3: Three-Spool
1681-4: Four-Spool
1681-5: Five-Spool
1681-6: Six-Spool

57 l/min [15 US gal/min] maximum flow. 207 bar [3000 psi] maximum pressure. Up to two add-on sections available per valve for 7 and 8 spool units or for adding on in the field.

TYPICAL APPLICATIONS

This valve combines the lower manufacturing costs of a monoblock with the versatility of a stack valve. The design eliminates between section leakage and spool bind. Exceptionally fine metering can be obtained in this unit. It is available from two to eight spools.

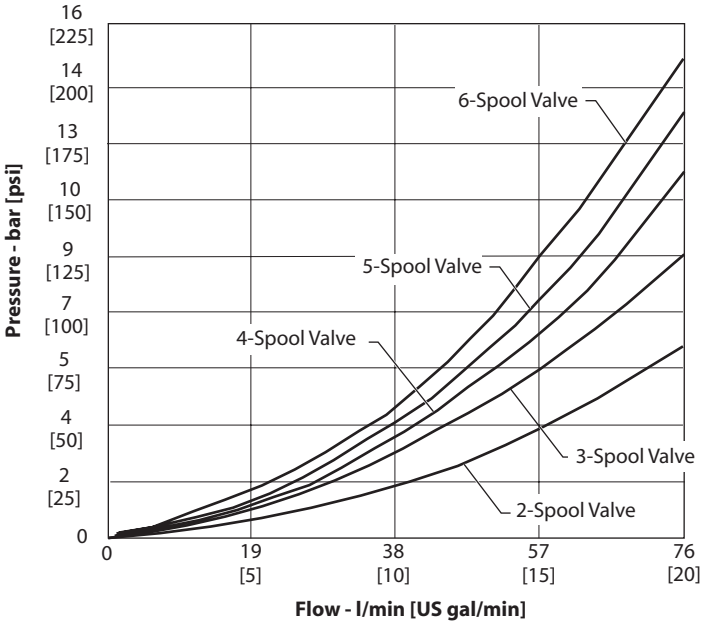
STANDARD FEATURES

- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Lift check for each spool to prevent load drop before raise
- Leak-free feed tubes for between section connection
- Priority circuit for #1 spool of valve, optional
- One-valve mating face versus one per section with conventional stack valves
- Paint color: black primer
- Symmetrical design allows spools to be switched to either side of body. This allows access from either end of valve

STANDARD FEATURES AND SPECIFICATIONS

- All spool supplied with clevis ends.
- Maximum spool leakage: 16 cm^3/mim at 69 bar [1000 psi] and 110°F oil.
- All valves painted black and bulk-packed.
- All available ports machined and plugged with shipping plugs. Distributors should provide solid plugs for unused options. (QCC will provide any non-standard plugs such as optional power beyond ports).
- Nameplates are installed on all assembled valves and two / three spool outlet sections. No part numbers are stamped on standard valves and outlets. Nameplates contain an eight-digit manufacturing date code.
- All accessories (such as handles, spool action option kits) are sold separately as kits. With these kits distributors can customize standard valves from their inventory.
- All standard valves are shipped from QCC with 4-way, 3 position (T) spool and standard spring center mechanisms installed. Specify exceptions, such as motors spools (O), when ordering.

PRESSURE DROP



PORTING

Inlet/outlet	7/8-14 SAE (standard), 3/4-16 SAE
Locations available	Opposite end-porting standard Same end porting, left or right inlet porting, top and side locations available
Work ports	3/4-16 SAE (standard) top only 9/16-18 SAE, top only
Power beyond	7/8-14 SAE (standard), must be opposite inlet Top and side locations only

HANDLES

- Standard Kit, multi-position, two handle lengths. Also available with angled handles.
- Joystick, two-spool control with one handle (tang-spools must be used)
- S-hook only

TECHNICAL DATA

Maximum pressure	205 bar	[3000 psi]
Maximum tank line pressure	70 bar	[1000 psi]
Maximum oil flow	57 l/min	[15 US gal/min]
Spool travel in and out from neutral	5.6 mm	[0.22 in]
Spool travel to float position from neutral	10.6 mm	[0.42 in]
Maximum port leakage at 69 bar [1000 psi]	16 cm^3/min	[1 in^3/min]
Maximum lift check leakage at 69 bar [1000 psi]	82 cm^3/min	[5 in^3/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^2/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm^2/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Standard spool forces - dry	231 N	[52 lbf]

OPTIONS

Work port orifice options

Orifice port standard: Drop in orifices can be purchased separately.

Unidirectional: Restricts flow in one direction and has free flow in opposite direction. With feet installed in the up position, the orifice restricts flow returning from actuator. With feet installed down, the orifice restricts flow to the actuator.

Bidirectional: Restricts flow both to and from actuator. This can be the same, or different size orifice for each position.

Spool types

- Tandem-center - 4-way, 3-position
- Motor-spool - 4-way, 3-position
- Float-spool - 4-way, 3-position
- Regenerative - 4-way, 3-position
- Single-acting A - 3-way, 3-position
- Single-acting B - 3-way, 3-position
- Closed-center - 4-way, 3-position

Spool action

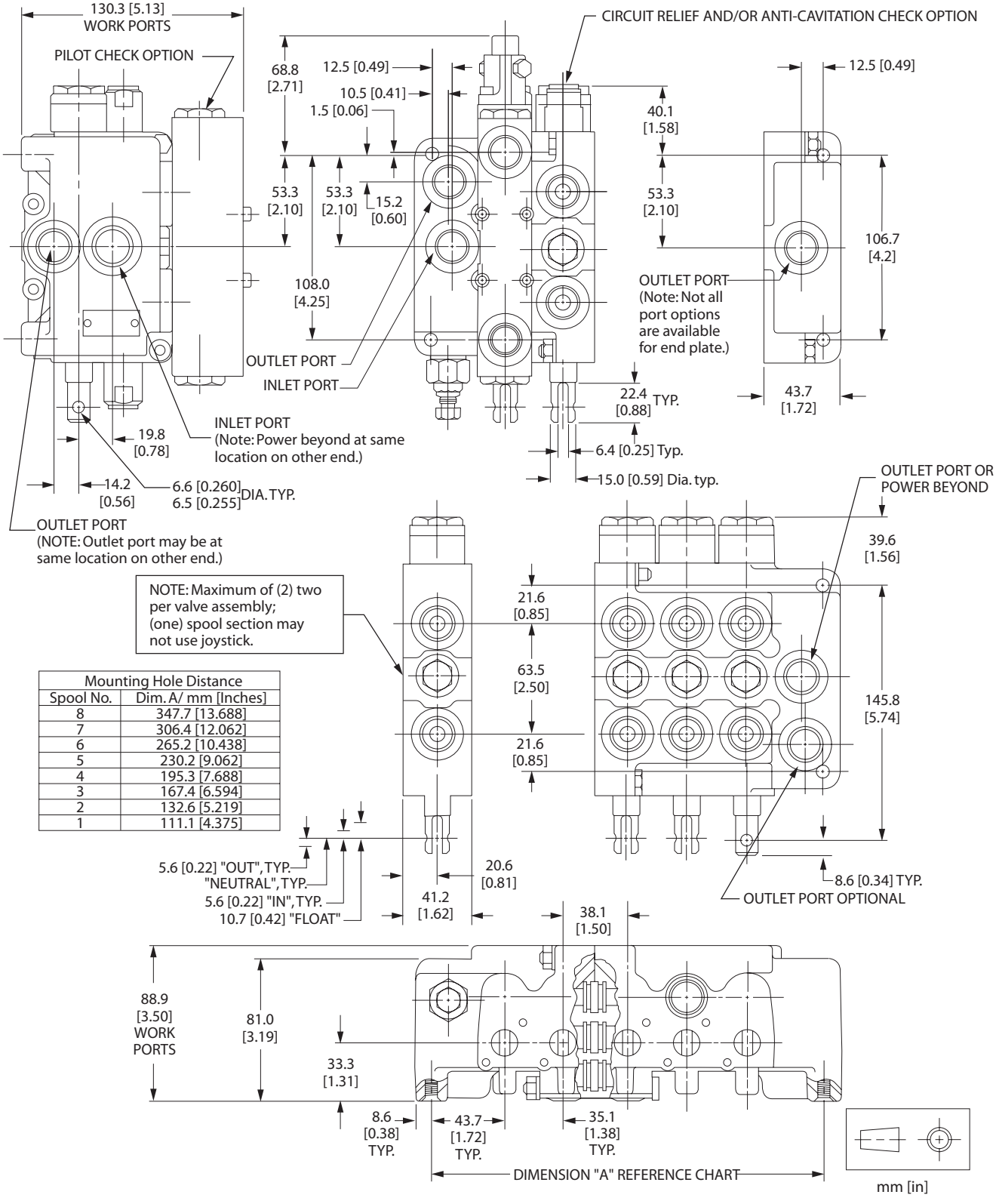
- Spring-center
- Spring-center, detent-in
- Spring-center, detent-out
- Spring-center, detent in float
- Spring-center, detent out float (Requires additional O-ring groove machining)
- Three position detent
- Friction-detent

Relief valve (port options available per spool)

Pilot operate relief valve

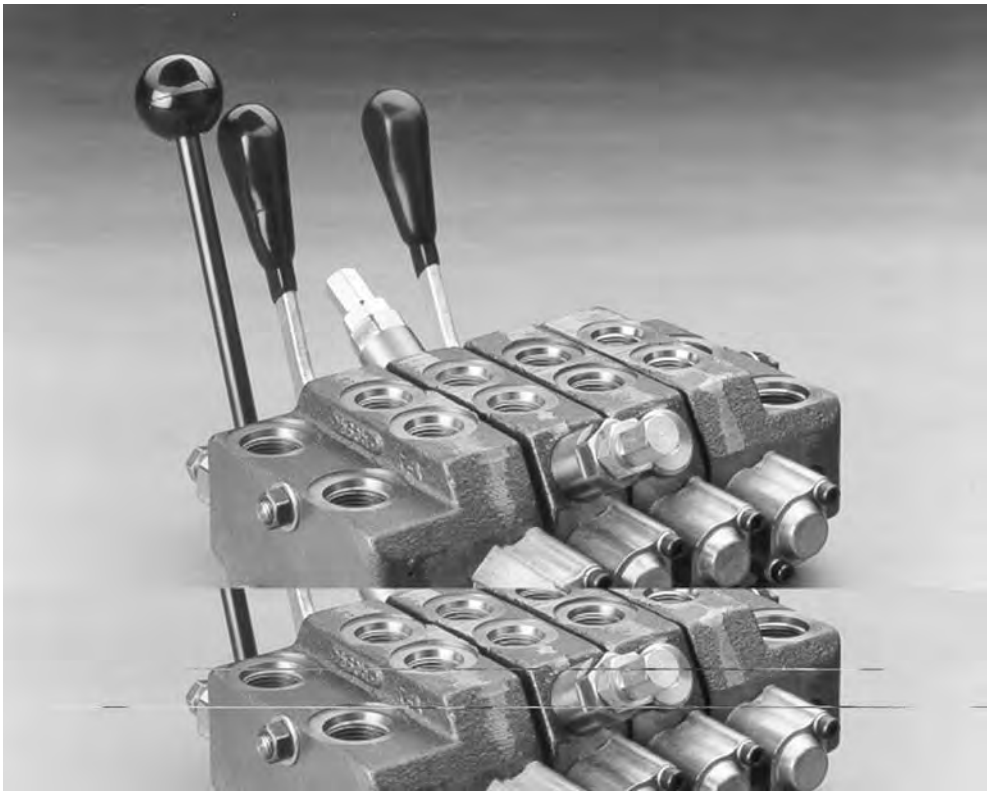
- 1.38 bar/l [20 psi/gal] rise
- No restrictions on setting up to 207 bar [3000 psi]
- Adjustable standard, tamper-proof cap optional

DIMENSIONS



Mounting Hole Distance	
Spool No.	Dim. A/ mm [Inches]
8	347.7 [13.688]
7	306.4 [12.062]
6	265.2 [10.438]
5	230.2 [9.062]
4	195.3 [7.688]
3	167.4 [6.594]
2	132.6 [5.219]
1	111.1 [4.375]

Directional Control Valves
Technical Information
Model 1125



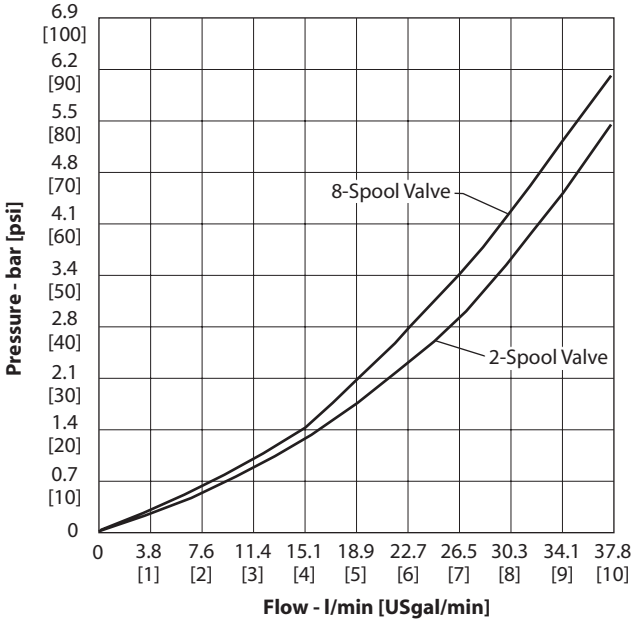
TYPICAL APPLICATIONS Car transport haulers, small backhoes, utility trucks, and mini-excavators

STANDARD FEATURES

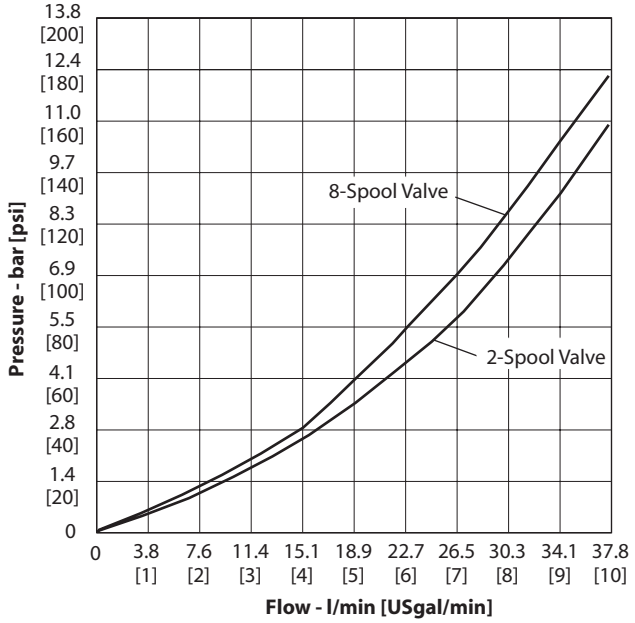
- All valves supplied with clevis end spools
- Power-beyond port machined and plugged (use whenever a downstream valve is required)
- Cast-iron body
- Chrome plated spools select fit to body for leakage control
- Load-check for each spool to prevent load drop before raise
- All porting options machined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

PRESSURE DROP CURVES

Pressure vs. flow P→T

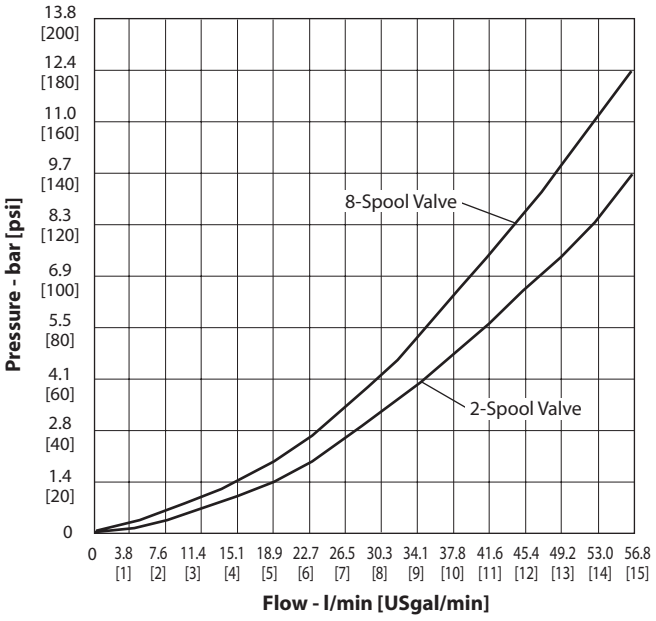


Pressure vs. flow P→A/B



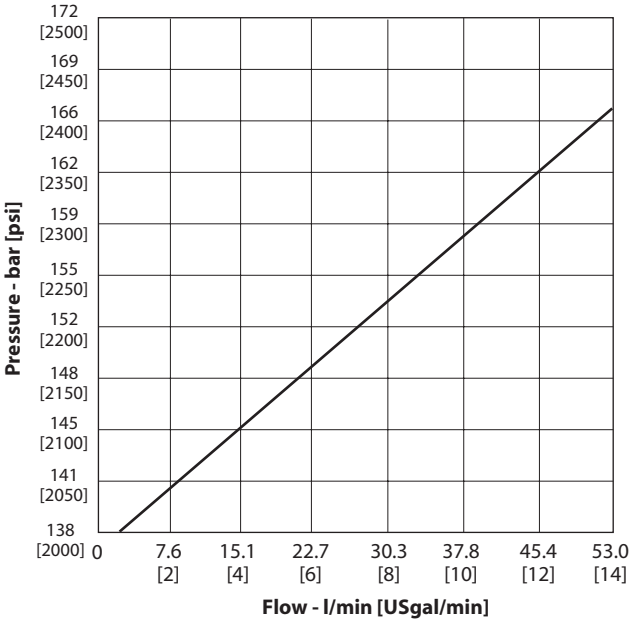
PRESSURE DROP CURVES (continued)

Pressure vs. flow A/B→T



PRESSURE RISE CURVES (SYSTEM RELIEF VALVE SVPR)

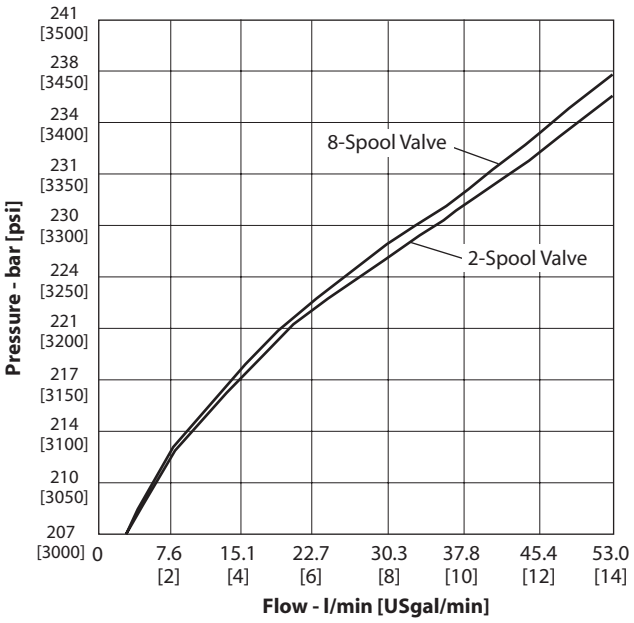
Pressure vs. flow P→T



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

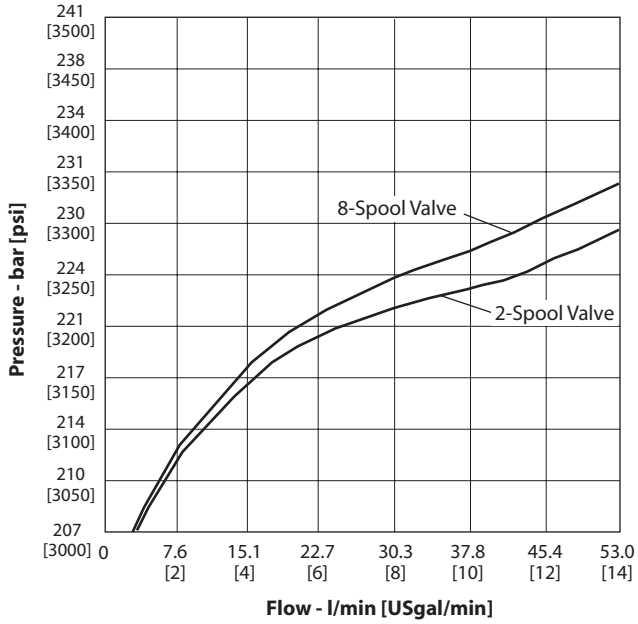
PRESSURE RISE CURVES (WORK PORT RELIEF VALVE SVLP)

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

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

HANDLES SVM

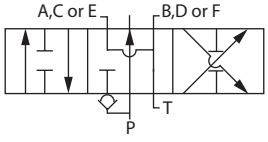
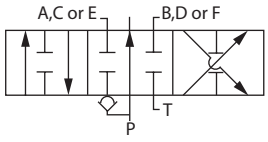
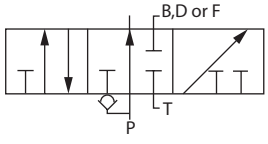
Code	Description
H	Standard handle with C-hook kit (156B8587)
P	Pivot-block handle kit (156B8302)

TECHNICAL DATA

Maximum pressure	205 bar	[3000 psi]
Maximum tank line pressure	70 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]
Maximum port leakage at 69 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	16 cm^3/min	[1 in^3/min]
Maximum lift check leakage at 70 bar [1000 psi] 21 mm²/sec (cSt) [102 SUS]	82 cm^3/min	[5 in^3/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 mm²/sec (cSt)	[45 SUS]
Maximum viscosity	440 mm²/sec (cSt)	[2000 SUS]
Fluid cleanliness per ISO 4406	19/16	
Standard spool forces: Dry	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 (156B8315)
S	Spring centered (156B8399)

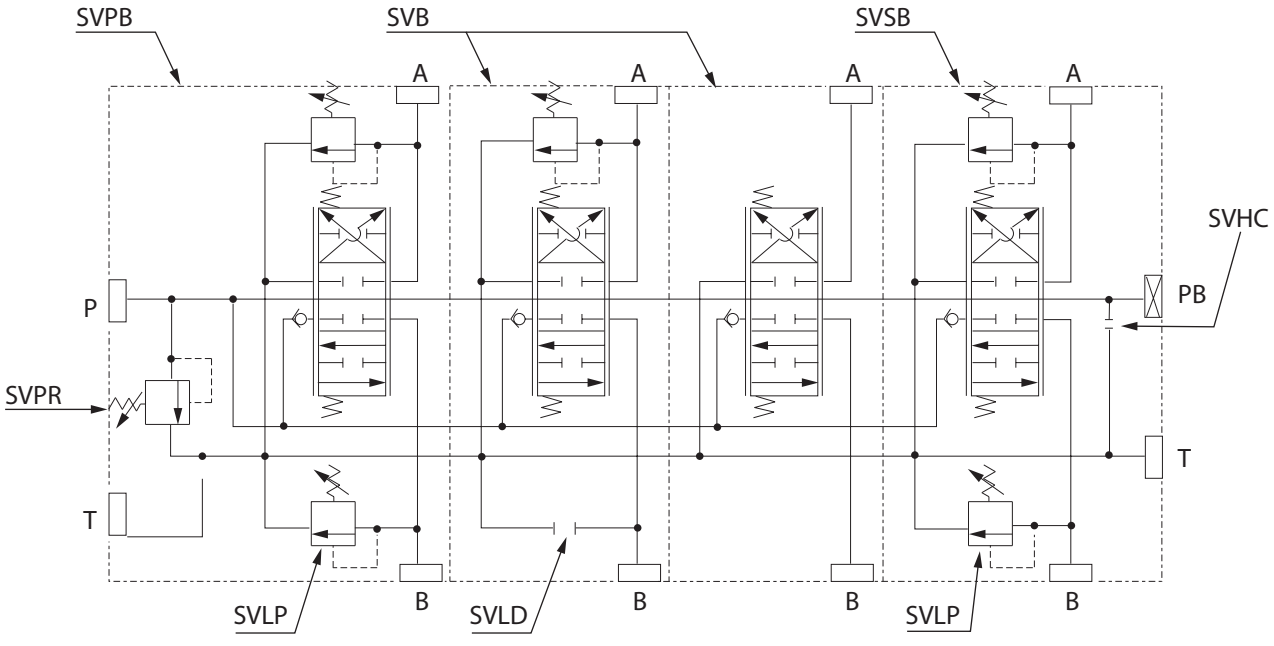
Relief valve SVLP

Code	Description
3	Pilot operated relief valve • 0.4 bar/l [20 psi/gal] rise • No restrictions on setting up to 207 bar [3000 psi] • Standard setting 138 bar [2000 psi] crack pressure at 2.9 l/min [0.75 US gal/min]

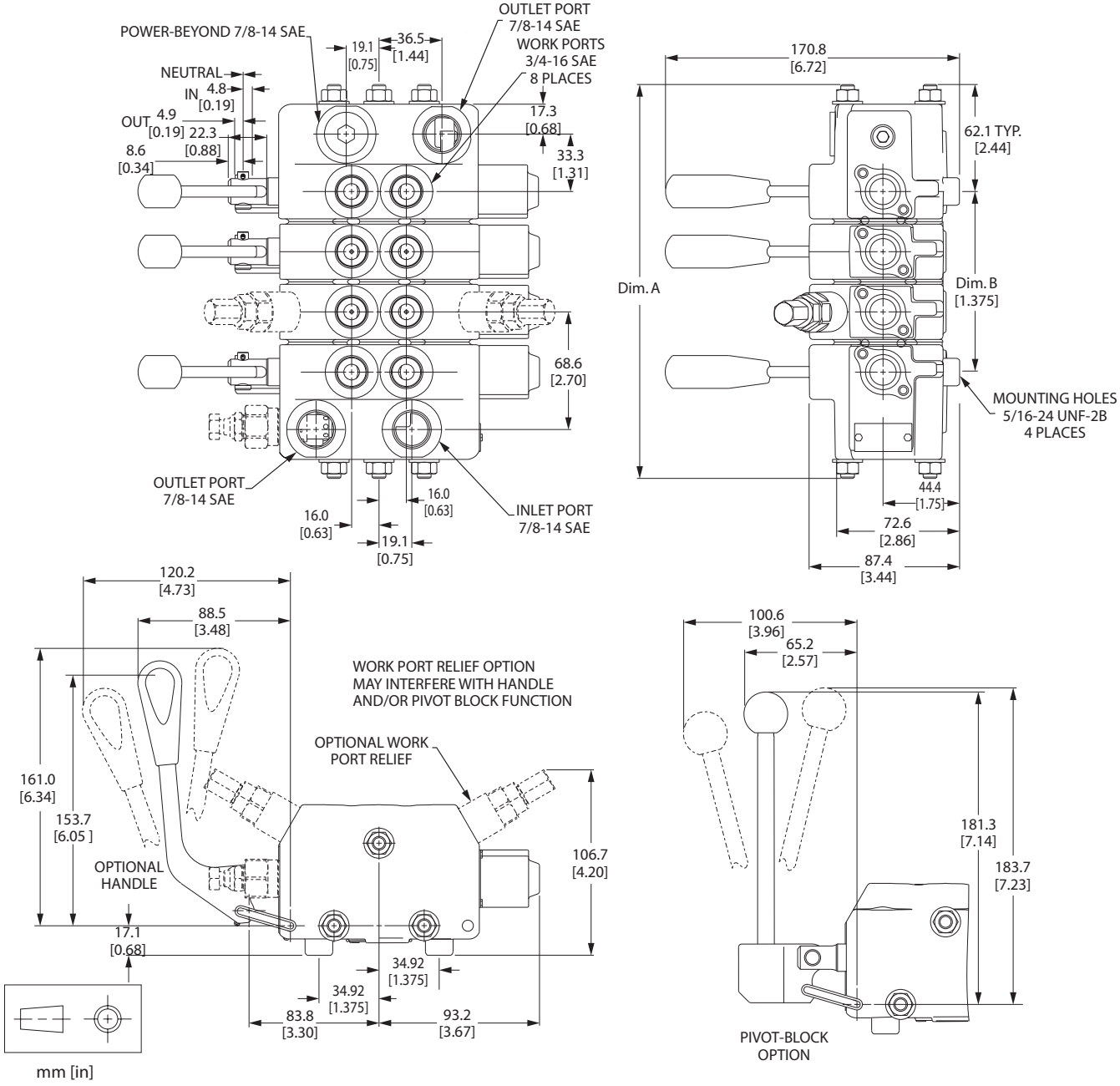
Work port relief valve SVLP

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

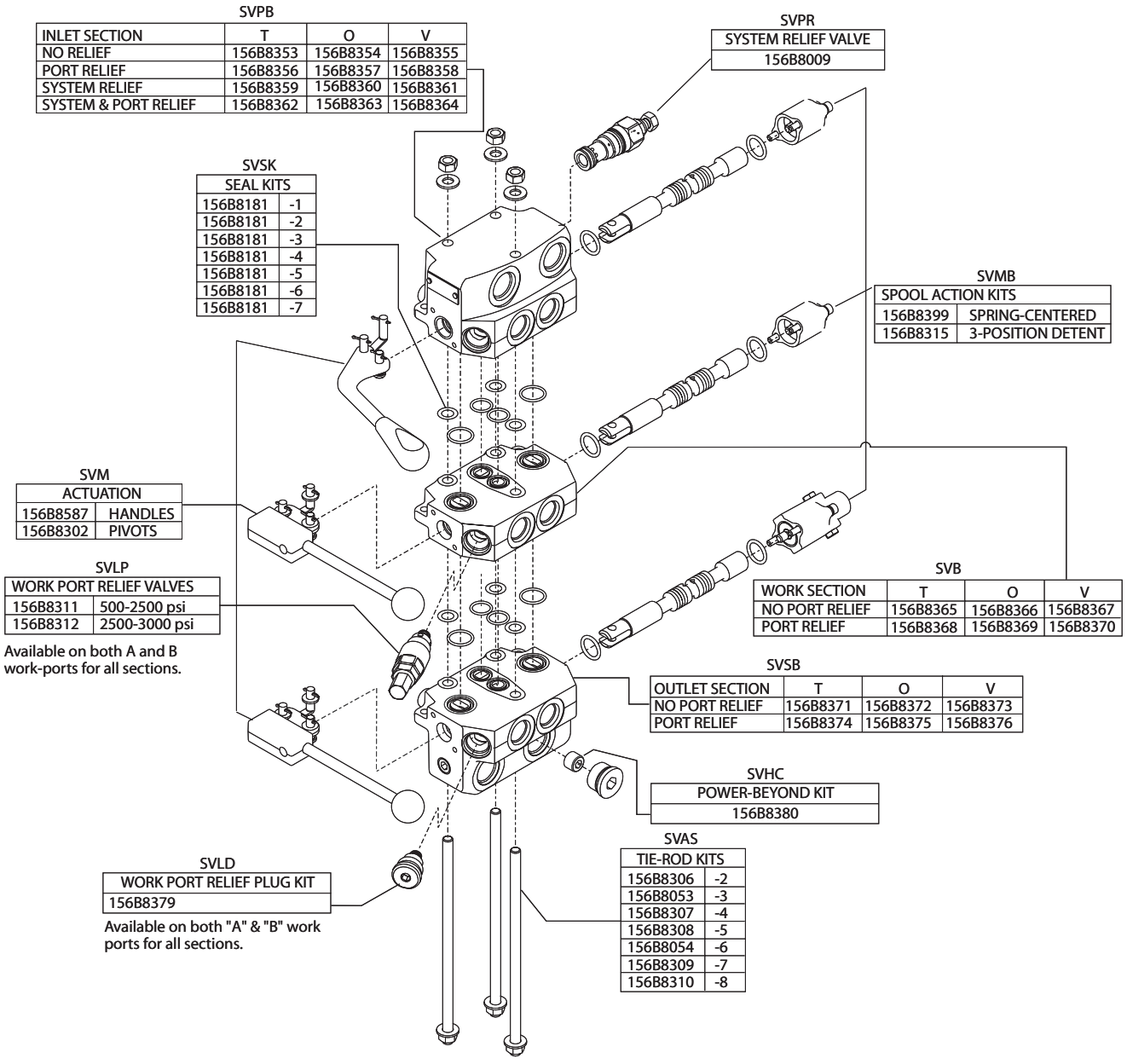


DIMENSIONS



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



SVPB

INLET SECTION	T	O	V
NO RELIEF	156B8353	156B8354	156B8355
PORT RELIEF	156B8356	156B8357	156B8358
SYSTEM RELIEF	156B8359	156B8360	156B8361
SYSTEM & PORT RELIEF	156B8362	156B8363	156B8364

SVPR

SYSTEM RELIEF VALVE
156B8009

SVSK

SEAL KITS	
156B8181	-1
156B8181	-2
156B8181	-3
156B8181	-4
156B8181	-5
156B8181	-6
156B8181	-7

SVMB

SPOOL ACTION KITS	
156B8399	SPRING-CENTERED
156B8315	3-POSITION DETENT

SVM

ACTUATION	
156B8587	HANDLES
156B8302	PIVOTS

SVLP

WORK PORT RELIEF VALVES	
156B8311	500-2500 psi
156B8312	2500-3000 psi

Available on both A and B work-ports for all sections.

SVB

WORK SECTION	T	O	V
NO PORT RELIEF	156B8365	156B8366	156B8367
PORT RELIEF	156B8368	156B8369	156B8370

SVSB

OUTLET SECTION	T	O	V
NO PORT RELIEF	156B8371	156B8372	156B8373
PORT RELIEF	156B8374	156B8375	156B8376

SVHC

POWER-BEYOND KIT
156B8380

SVAS

TIE-ROD KITS	
156B8306	-2
156B8053	-3
156B8307	-4
156B8308	-5
156B8054	-6
156B8309	-7
156B8310	-8

SVLD

WORK PORT RELIEF PLUG KIT
156B8379

Available on both "A" & "B" work ports for all sections.

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