Product Guide

Hydraulic Cartridge Valves
Manifold Systems
Electronic Controls

HydraForce
POWER FORWARD

www.hydraforce.com

HydraForce®

POWER FORWARD

With a unique blend of customized design solutions and superior product performance, HydraForce is leading the way in manufacturing the highest quality hydraulic cartridge valves, manifolds and electro-hydraulic controls.

Our Vision
To be an independent provider of innovative technical solutions that can change the world

Our Mission
To create world wide customer delight by providing the highest quality products and the most responsive customer support in the world at a globally competitive cost

While custom design solutions are our specialty, HydraForce also provides many standard products. This Product Guide is a quick reference to the products available from HydraForce and its 120 stocking distributors. If you don't see what you need, contact HydraForce or your distributor for application support.

Hydraulic Cartridge Valves
HydraForce is the largest manufacturer of cartridge-style hydraulic valves in the world with a range of products that encompasses flow, directional and pressure controls, solenoid and electro-proportional options. Standard valves are grouped by category, with ISO graphic symbols, flow, and pressure ratings.

Multifunction Valves
HydraForce multifunction valves incorporate two or more hydraulic functions in a single valve, allowing the design of a lighter, more compact valve package.

HyPerformance™ Valves
Designed for pressures up to 350 bar (5075 psi), HyPerformance or H-series valves meet more rigorous performance testing standards than standard models.

High Quality, Precision Manufacturing
HydraForce uses the most advanced equipment and processes for machining, assembly, and product testing. By maintaining precise control of the fit and clearances in critical valve subassemblies, HydraForce is able to create high quality products that perform consistently. Precise procedures and state-of-the-art assembly equipment enable HydraForce to meet critical tolerances for more efficient hydraulic circuits.

Our equipment includes the following:

- Automated honing/bore-sizing equipment to 0.00005 tolerances
- Automated parts cleaning and assembly equipment

Product Qualification
HydraForce's product qualification policy includes fatigue and pressure testing to NFPA T2.6.1. Standard products are tested for at least one-million cycle capability. Other qualification testing can be done to meet specific customer requirements.

Manifold Systems
Optimizing the performance of your machine starts with creative hydraulic integrated circuits. Our design staff will collaborate with you and verify your design prior to manufacturing a prototype. Then we'll make any necessary refinements and engineer your product to meet your exact specifications. With proprietary innovations like our i-Design manifold tool, designing your hydraulic control schematic is easier than ever. The result is a performance- and configuration-optimized hydraulic solution that is designed exclusively for you.

Every HydraForce manifold is hydraulic function tested to a documented customer or product-specific test procedure. Manifolds produced at our U.S., U.K., and China facilities conform to the requirements of the ISO 9001 Certified Standard. HydraForce will mount customer specified fittings or other components not of our manufacture on request.

HydraForce can provide the following options for your custom hydraulic control system manifold:

- Steel, aluminum, cast or ductile iron manifold blocks
- Anodized or zinc plating for protection in severe environments
- Industry-common valve cavities
- Fittings, CETOP valves, and accessory components available
- “FastTrak” service for quick delivery of a working prototype
- i-Design hydraulic system design software available free of charge to qualified users

info.hydraforce.com/downloadi-design

Electronic Controls
HydraForce is pleased to offer a full line of electronic vehicle control products integrating engine, transmission, and other machine functions into a common J1939 or ISO 11783 CAN data link control circuit.

These systems consist of rugged, field-proven components suitable for heavy-duty operating conditions. PWM digital signal logic maximizes efficiency, response, and signal integrity under harsh environmental conditions. Reliability has been proven through extensive testing, as well as years of real-world application experience.

This is a complete line of the most rugged, heavy-duty vehicle machine controllers, monitors, displays, and electrical connectors for motion control and integrated machine control applications in mobile, off-highway and material handling equipment.

www.hydraforce.com/electronics

- Reliable operation in the most demanding mobile equipment applications
- Operating temperatures from -40 to 85 °C (-40 to 185 °F)
- Chemical splash immunity
- Moisture resistance to IP67 specifications
- Fully resistant to EMI/RFI
- Vibration resistant to 8 G_{rms} (random) 24–200 Hz, 3-axis

INTEGR8
ENGINEERED HYDRAULIC CONTROL SOLUTIONS

INTEGR8
As an industry leader, HydraForce offers a unique series of innovative engineered hydraulic control solutions called INTEGR8. These solutions are designed to save engineering time and maximize efficiency. Specifically, they take the guesswork out for the most common hydraulic functions by providing engineered circuits featuring the best valve configurations. Now i-Design features a built-in library of INTEGR8 circuits to accelerate the design process.

All INTEGR8 circuits are 100% logic and function tested.

At HydraForce we believe that better performance comes from working together.

Our engineers and field representatives work with you to design your hydraulic control system. When you work with HydraForce, you can select from the broadest product range in the industry.

All HydraForce products meet global quality standards including ISO 9001, QS 9000. Every cartridge valve, manifold, and electrohydraulic control goes through rigorous testing and inspection to perform beyond industry standards.

Contact us for additional product information:

US: +1-847-793-2000
UK: +44-121-333-1800
China: +86-519-6988-1200

HydraForce Electronic Control Units
HydraForce offers a line of general-purpose CoDeSys™ programmable controllers that work well as stand-alone controllers or integrate with other CAN networked devices. These controllers are designed to withstand the environmental demands of mobile off-highway equipment applications. They feature flexible input and output configuration.

HydraForce Electronic Valve Drivers
HydraForce electronic valve drivers are available for a variety of electrohydraulic machine control functions. Whether you need simple closed-loop speed control, a fan control, or lift/lower, extend/retract, and dump controls, there is a HydraForce ExDR valve driver for your application. Vigorously tested and durable enough for mobile applications, and with SAE J1939 and CAN Open networking, these drivers fit into any system architecture.

Firmware Personalities
The ExDR drivers are available in multiple specialized personalities. These preprogrammed firmware choices are fully configurable using HF-Impulse, a free utility available for download from the HydraForce electronics portal.

- EVDR — General 1 or 2 coil proportional valve driver
- ETDR — Time-based driver useful for shift/clutch controls
- EFDR — Fan speed control with reversing feature
- ECDR — Fully configurable with user-developed function diagram built from preprogrammed and tested function blocks

ExDR-0101A
This single I/O driver features on-coil mounting, flexible input choices, and is configurable with the easy-to-use HF-Impulse software available for free download. It supports serial communication for configuration only. Personalities include EVDR/ETDR.

ExDR-0201A
With SAE J1939 and CAN Open networking capabilities, this proportional hydraulic valve driver accepts inputs from virtually any analog or CAN-capable input device. It provides closed-loop control of one or two proportional solenoids, and mounts on the coil with an integrated DT06-2S Deutsch™ connector. Personalities include EVDR/EFDR/ECDR.

ECDR-0203A
The ECDR-0203A features SAE J1939 and CAN Open networking capabilities, closed-loop control of one or two proportional solenoids, and three configurable analog or digital inputs. The ECDR firmware personality allows the user to build complex control schemes using preprogrammed and tested function blocks in a simple logic diagram.

ECDR-0506A
Like the ECDR-0203A, the ECDR-0506A also features SAE J1939 and CAN Open networking capabilities, and the ECDR firmware personality. The I/O includes four closed-loop and one open-loop solenoid control, and up to six configurable analog or digital inputs.

Displays
HydraForce offers operator display/input devices. These rugged units are programmable operator panels specifically designed for use with hydraulically powered mobile equipment. They offer the operator convenient and state-of-the-art control of hydraulic functions. The 4.3 or 7 inch (109/177 mm) displays feature 8 or 12 programmable soft keys, three hard keys, video input, programming tool, and CAN communications.

ECBP Electronic CAN Button Panels
HydraForce ECBP panels are CAN capable input devices that really simplify your vehicle control wiring. A handsome addition to any cab or control panel, these units feature 16 color LED lighting, momentary/on-off/on-off-on cam configurable action, and available custom etching. Banks of four through eight buttons are possible. HF-Impulse supports operation and configuration of the ECBP panels.

Sensors and Accessories
HydraForce extends machine system integration with pressure and temperature sensors, and all connectors and accessories necessary build complete machine control systems. HydraForce sensors allow machines to respond optimally to changing operating conditions of the system.

HF-Impulse Software
Available for free download from the HydraForce electronics portal, HF-Impulse is a complete support and configuration tool for HydraForce electronic products. Using this custom software, you can set operating parameters, update firmware, service deployed equipment, or build complex logic schemes without writing a single line of code. HF-Impulse is continually updated to support the growing line of HydraForce electronics.

Electronics

HydraForce electronic control units

Item no.	Model	Input/Output	CAN
4000350	ECU-0809	8/9	Yes
4000352	ECU-2415	24/15	Yes
4000356	ECU-2820	28/20	Yes
4000343	ECU-3233A (1 MB RAM)	32/33	Yes
4000344	ECU-3233B (3 MB RAM)	32/33	Yes

Drivers and controllers

Item no.	Model	Input/Output	CAN
4204800	EVDR-0101A	1/1	No
4204810	ETDR-0101A	1/1	No
4204700	EVDR-0201A	2/1	Yes
4204710	EFDR-0201A	2/1	Yes
4204740	ECDR-0201A	2/1	Yes
4208230	ECDR-0203A	2/3	Yes
4208560	ECDR-0506A	5/6	Yes

Display/operator input devices

Item no.	Model	Display size	Inputs	Outputs
4000401	A3F - Touch screen	109 mm (4.3 in)	4 analog/digital 1 video	3 digital
4000400	A3S	109 mm (4.3 in)	None	None
4000408	A6F - Touch screen	177 mm (7 in)	4 analog/digital 3 video	3 digital
4000407	A6S	177 mm (7 in)	1 video	None

ECBP electronic CAN button panels

Item no.	Description
4000384	ECBP-4, 4-Button CAN Rocker Switch Panel
4000385	ECBP-5, 5-Button CAN Rocker Switch Panel
4000386	ECBP-6, 6-Button CAN Rocker Switch Panel
4000387	ECBP-7, 7-Button CAN Rocker Switch Panel
4000388	ECBP-8, 8-Button CAN Rocker Switch Panel

Heavy-duty pressure sensors

Item no.	Voltage	Pressure rating
4000650	5 Vdc	0 to 34 bar (500 psi)
4000651	5 Vdc	0 to 103 bar (1500 psi)
4000652	5 Vdc	0 to 207 bar (3000 psi)
4000653	5 Vdc	0 to 345 bar (5000 psi)
4000654	5 Vdc	0 to 414 bar (6000 psi)
4000655	9 to 36 Vdc	0 to 34 bar (500 psi)
4000656	9 to 36 Vdc	0 to 103 bar (1500 psi)
4000657	9 to 36 Vdc	0 to 207 bar (3000 psi)
4000658	9 to 36 Vdc	0 to 345 bar (5000 psi)
4000659	9 to 36 Vdc	0 to 414 bar (6000 psi)

Thermistor temperature sensors

Item no.	Model	Temp range	Output signal
4206200	ERT-120	-40 to 150 °C (-40 to 300 °F)	436 to 5428 Ω

Refer to the HydraForce catalog for additional information and specifications. Complete technical information, including user manuals, are available on the HydraForce electronics portal at www.hydraforce.com/electronics.

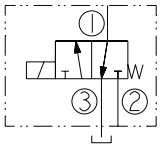
Next Generation (G3) Cartridge Valves

HydraForce has a complete range of control solutions for pilot control, diesel engine and powertrain systems, and transmissions. Fuel efficiency and emissions standards continue to drive the demand for more efficient, reliable powertrain systems. HydraForce meets the demand by providing the next generation of precise, customizable controls.

- Optimized actuator magnetic force
- Low current draw
- Zinc-nickel plated
- Maximized flow capacity
- IP69K ingress protection
- Low hysteresis
- Top-mounted connectors

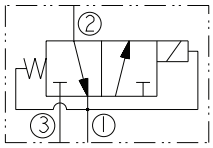
G3 Valves

Solenoid valve, 2-position, 3-way, drop-in



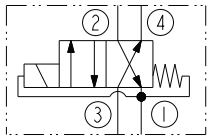
Model	Pressure bar (psi)	Flow lpm (gpm)
SV98-G38	45 (650)	30 (8)

Solenoid valve, 2-position, 3-way, drop-in



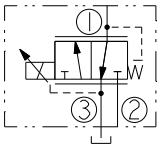
Model	Pressure bar (psi)	Flow lpm (gpm)
SV90-G39	45 (650)	30 (8)

Solenoid valve, 2-position, 4-way, drop-in



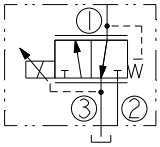
Model	Pressure bar (psi)	Flow lpm (gpm)
SV90-G40R	45 (650)	30 (8)

Proportional pressure reducing/relieving valve, drop-in



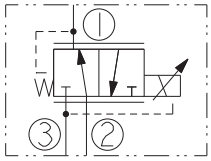
Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR98-G33	45 (650)	4 (1)

Proportional pressure reducing/relieving valve, drop-in



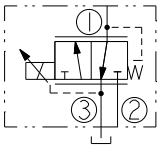
Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR98-G35	45 (650)	6 (2)

Proportional pressure reducing/relieving valve, drop-in



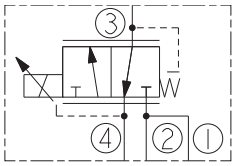
Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR98-G37	45 (650)	18 (5)

Proportional pressure reducing/relieving valve, drop-in



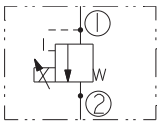
Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR98-G38	35 (500)	30 (8)

Proportional pressure reducing/relieving valve, drop-in



Model	Pressure bar (psi)	Flow lpm (gpm)
TS90-G34	35 (500)	34 (9)
TS92-G34	35 (500)	60 (16)

Proportional pressure relief valve, drop-in



Model	Pressure bar (psi)	Flow lpm (gpm)
TS98-G21	83 (1200)	6 (1.5)

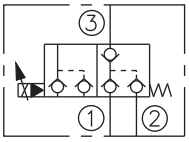
HydraForce multifunction valves incorporate two or more functions into a single valve, allowing for the design of a lighter, more compact valve package. Multifunction valves reduce manifold size, number of ports, and machining costs, while increasing flow passage efficiency. The result is more responsive machine performance and efficient use of available horsepower.

- Directional valves with isolated load-sense checks
- Solenoid valves with internal flow checks
- Solenoid valves with Integrated pressure relief
- Proportional flow controls with integrated pressure compensation
- Logic elements with built-in relief
- Logic elements with flow regulation
- Flow controls with adjustable pressure relief

Multifunction Valves

Solenoid valve, poppet type, normally closed, load sense port

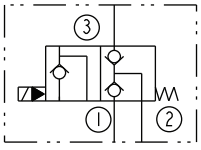
US Pat. 7,921,880



Model	Pressure bar (psi)	Flow lpm (gpm)
SVCL10-30	240 (3500)	57 (15)

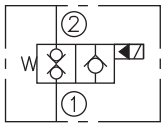
Solenoid valve, poppet type, normally open, load sense port

US Pat. 7,921,880



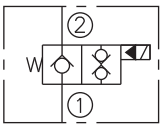
Model	Pressure bar (psi)	Flow lpm (gpm)
SVCL10-32	250 (3625)	57 (15)

Solenoid valve, poppet type, normally closed, internal outlet flow check



Model	Pressure bar (psi)	Flow lpm (gpm)
SVCV08-20	207 (3000)	23 (6)

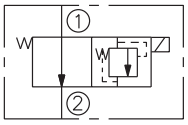
Solenoid valve, poppet type, normally open, internal outlet flow check



Model	Pressure bar (psi)	Flow lpm (gpm)
SVCV08-21	207 (3000)	23 (6)

Solenoid valve, normally open, integral pressure relief

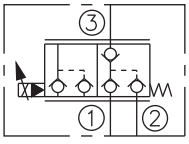
US Pat. 7,137,406



Model	Pressure bar (psi)	Flow lpm (gpm)
SVRV10-26	297 (4300)	76 (20)
SVRV12-26F	297 (4300)	189 (50)

Proportional flow control, normally closed, isolated load sense port

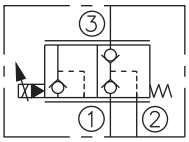
US Pat. 7,921,880



Model	Pressure bar (psi)	Flow lpm (gpm)
SPCL10-30	250 (3625)	57 (15)
SPCL16-30	250 (3625)	152 (40)

Proportional flow control, normally closed, load sense port

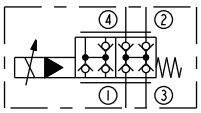
US Pat. 7,921,880



Model	Pressure bar (psi)	Flow lpm (gpm)
SPCL10-32	250 (3625)	57 (15)
SPCL16-32	250 (3625)	152 (40)

Proportional directional valve, 2-position, 4-way, normally closed, isolated load sense port

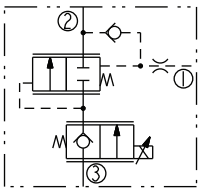
US Pat. 7,921,880



Model	Pressure bar (psi)	Flow lpm (gpm)
SPCL10-40	250 (3625)	132 (35)
SPCL16-40	250 (3625)	152 (40)

Proportional flow control valve with integral compensator

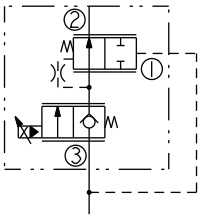
US Pat. 7,261,030



Model	Pressure bar (psi)	Flow lpm (gpm)
HSPEC10-30A	350 (5075)	35 (9)
HSPEC12-30A	350 (5075)	70 (18)
HSPEC16-30	350 (5075)	132 (35)

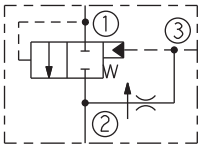
Proportional flow control valve with integral compensator

US Pat. 7,261,030



Model	Pressure bar (psi)	Flow lpm (gpm)
HSPEC10-34	350 (5075)	34 (9)
HSPEC12-34	350 (5075)	61 (16)

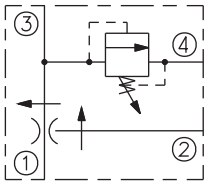
Logic element with flow regulator



Model	Pressure bar (psi)	Flow lpm (gpm)
EPFR58-35	345 (5000)	38 (10)
EPFR50-S35	345 (5000)	76 (20)
EPFR52-S35	345 (5000)	151 (40)
EPFR16-S35	240 (3500)	189 (50)

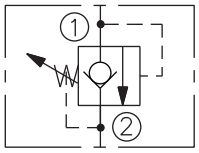
Flow control with adjustable pressure relief

US Pat. 7,063,100



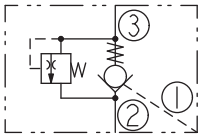
Model	Pressure bar (psi)	Flow lpm (gpm)
FRRV10-41F	207 (3000)	38 (10)
FRRV12-41F	207 (3000)	76 (20)

Relief valve, direct acting with anti-cavitation check



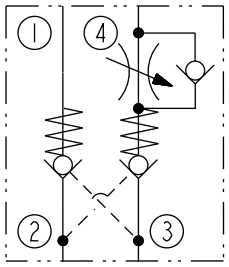
Model	Pressure bar (psi)	Flow lpm (gpm)
RVCV56-20	420 (6100)	175 (46)

Check, pilot to open, integrated thermal relief



Model	Pressure bar (psi)	Flow lpm (gpm)
PC10-38	240 (3500)	45 (12)

Dual PO check with adjustable flow control

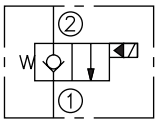


Model	Pressure bar (psi)	Flow lpm (gpm)
DCFC08-40	207 (3000)	19 (5)

- Continuous-duty coils with a wide range of voltages, terminations, and diode options
- Designed for mobile operating environments including low voltage, high and low temperatures, and exposed environmental conditions
- Industry common cavity sizes -07, -08, -10, -12, -16, -20, as well as drop-in-style construction
- Series E water/weather-resistant coils with integral connectors rated up to IP69K
- Manual override option on most models
- Integral position sensors available on some models

Solenoid Valves

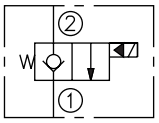
Solenoid valve, piloted poppet type, normally closed



Model	Pressure bar (psi)	Flow lpm (gpm)
SF08-20	345 (5000)	19 (5)

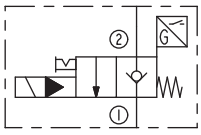
Solenoid valve, poppet type, normally closed

*** available with position sensor**



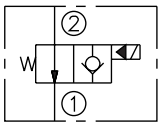
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-20	207 (3000)	23 (6)
SV08-20J	207 (3000)	23 (6)
HSV10-20	350 (5075)	76 (20)
SV10-20, SV10-P20A*	240 (3500)	57 (15)
HSV12-20	350 (5075)	114 (30)
SV12-20, SV12-P20A*	240 (3500)	114 (30)
SV16-20	240 (3500)	95 (25)

Solenoid valve, poppet type, normally closed, integral position sensor



Model	Pressure bar (psi)	Flow lpm (gpm)
SV58-P20A	345 (5000)	19 (5)

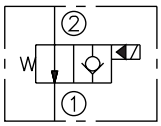
Solenoid valve, piloted poppet type, normally open



Model	Pressure bar (psi)	Flow lpm (gpm)
SF08-21	345 (5000)	30 (8)

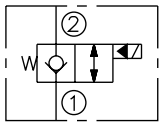
Solenoid valve, poppet type, normally open

*** available with position sensor**



Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-21	207 (3000)	30 (8)
HSV10-21	350 (5075)	76 (20)
SV10-21, SV10-P21A*	207 (3000)	68 (18)
SV12-21, SV12-P21A*	240 (3500)	114 (30)
HSV12-21	350 (5075)	114 (30)
SV16-21	207 (3000)	132 (35)

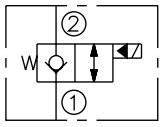
Solenoid valve, piloted poppet type, normally closed, bidirectional



Model	Pressure bar (psi)	Flow lpm (gpm)
SF08-22	345 (5000)	23 (6)
SF20-22	345 (5000)	303 (80)

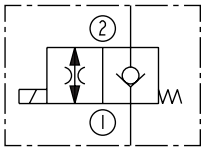
Solenoid valve, poppet type, normally closed, bidirectional

*** available with position sensor**



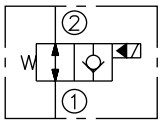
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-22	207 (3000)	27 (7)
HSV10-22	350 (5075)	76 (20)
SV10-22, SV10-P22A*	240 (3500)	57 (15)
HSV12-22	350 (5075)	114 (30)
SV12-22, SV12-P22A*	240 (3500)	114 (30)
SV16-22, SV16-P22A*	240 (3500)	151 (40)

Solenoid valve, needle type, normally closed



Model	Pressure bar (psi)	Flow lpm (gpm)
SL08-22	207 (3000)	1.5 (0.4)

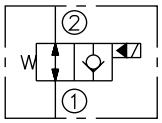
Solenoid valve, piloted poppet type, normally open, bidirectional



Model	Pressure bar (psi)	Flow lpm (gpm)
SF08-23	345 (5000)	30 (8)
SF20-23	345 (5000)	303 (80)

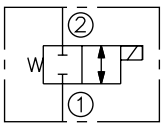
Solenoid valve, poppet type, normally open, bidirectional

*** available with position sensor**



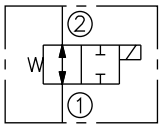
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-23	207 (3000)	30 (8)
HSV10-23	350 (5075)	76 (20)
SV10-23, SV10-P23A*	207 (3000)	68 (18)
HSV12-23	350 (5075)	114 (30)
SV12-23, SV12-P23A*	240 (3500)	114 (30)
SV16-23	207 (3000)	132 (35)

Solenoid valve, spool type, normally closed, bidirectional



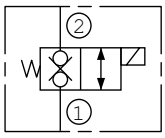
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-24	207 (3000)	17 (4)
HSV10-24	350 (5075)	30 (8)
SV10-24	207 (3000)	38 (10)
SV12-24	240 (3500)	76 (20)

Solenoid valve, spool type, normally open, bidirectional



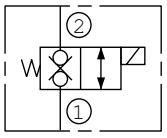
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-25	207 (3000)	10 (3)
HSV10-25	350 (5075)	30 (8)
SV10-25	207 (3000)	22 (6)
SV12-25	240 (3500)	76 (20)

Solenoid valve, blocking, normally closed, low flow



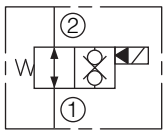
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-26	207 (3000)	1.9 (0.5)
SV38-26	207 (3000)	3.4 (0.9)

Solenoid valve, blocking, normally closed, bidirectional



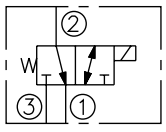
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-28	207 (3000)	11 (3)
HSV10-28	350 (5075)	76 (20)
SV10-28	240 (3500)	76 (20)
HSV12-28	350 (5075)	114 (30)
SV12-28	240 (3500)	114 (30)
SV38-28	207 (3000)	19 (5)

Solenoid valve, poppet type, normally open



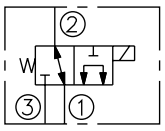
Model	Pressure bar (psi)	Flow lpm (gpm)
HSV10-29	350 (5075)	76 (20)
SV10-29	240 (3500)	76 (20)
HSV12-29	350 (5075)	114 (30)
SV12-29	240 (3500)	114 (30)

Solenoid valve, 2-position, 3-way



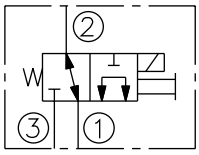
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-30	207 (3000)	15 (4)
SV38-30	207 (3000)	18 (5)
SV58-30	345 (5000)	15 (4)

Solenoid valve, 2-position, 3-way



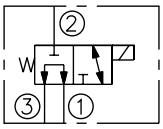
Model	Pressure bar (psi)	Flow lpm (gpm)
SV07-31	207 (3000)	6 (2)
SV08-31	207 (3000)	11 (3)
SV10-31	207 (3000)	22 (6)
SV12-31	240 (3500)	60 (16)

Solenoid valve, 2-position, 3-way



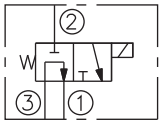
Model	Pressure bar (psi)	Flow lpm (gpm)
SV38-31J	207 (3000)	11 (3)

Solenoid valve, 2-position, 3-way



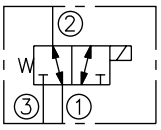
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-33	207 (3000)	11 (3)
SV12-33	240 (3500)	60 (16)

Solenoid valve, 2-position, 3-way



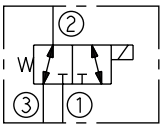
Model	Pressure bar (psi)	Flow lpm (gpm)
SV10-33	207 (3000)	19 (5)

Solenoid valve, 2-position, 3-way



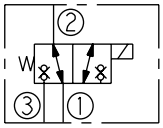
Model	Pressure bar (psi)	Flow lpm (gpm)
SV07-34	207 (3000)	13 (3)
SV10-34	207 (3000)	23 (6)
SV12-34	240 (3500)	60 (16)

Solenoid valve, 2-position, 3-way



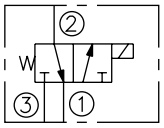
Model	Pressure bar (psi)	Flow lpm (gpm)
SV07-35	207 (3000)	11 (3)
SV08-35	207 (3000)	11 (3)

Solenoid valve, poppet type, normally closed, internally piloted, high flow



Model	Pressure bar (psi)	Flow lpm (gpm)
SV38-38	207 (3000)	11 (3)

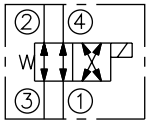
Solenoid valve, 2-position, 3-way, drop-in



Model	Pressure bar (psi)	Flow lpm (gpm)
SV98-T39	45 (650)	30 (8)

Solenoid directional valve, 2-position, 4-way, open transition

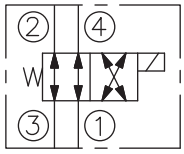
*** available with position sensor**



Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-40	207 (3000)	11 (3)
SV10-40, SV10-P40*	207 (3000)	23 (6)
SV58-40	345 (5000)	11 (3)

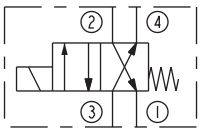
Solenoid directional valve, 2-position, 4-way, closed transition

*** available with position sensor**



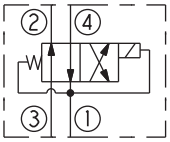
Model	Pressure bar (psi)	Flow lpm (gpm)
SV10-40A, SV10-P40A*	207 (3000)	38 (10)

Solenoid directional valve, 2-position, 4-way, open transition



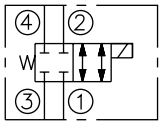
Model	Pressure bar (psi)	Flow lpm (gpm)
HSV10-40R	350 (5075)	23 (6)
SV12-40R	240 (3500)	60 (16)

Solenoid directional valve, 2-position, 4-way, drop-in



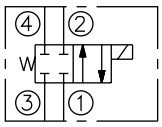
Model	Pressure bar (psi)	Flow lpm (gpm)
SV98-T40	30 (435)	30 (8)

Solenoid directional valve, 2-position, 4-way, normally closed



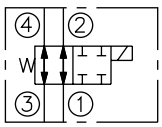
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-41	207 (3000)	13 (3)
SV10-41	207 (3000)	26 (7)
SV58-41	345 (5000)	26 (7)

Solenoid directional valve, 2-position, 4-way, normally closed



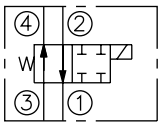
Model	Pressure bar (psi)	Flow lpm (gpm)
SV12-41	240 (3500)	60 (16)

Solenoid directional valve, 2-position, 4-way



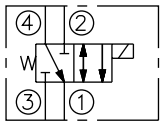
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-42	207 (3000)	11 (3)
SV10-42	207 (3000)	23 (6)

Solenoid directional valve, 2-position, 4-way



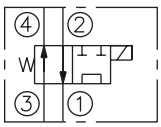
Model	Pressure bar (psi)	Flow lpm (gpm)
SV12-42	240 (3500)	60 (16)

Solenoid directional valve, 2-position, 4-way



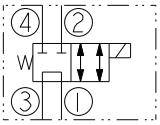
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-43	207 (3000)	11 (3)
SV10-43	207 (3000)	22 (6)

Solenoid directional valve, 2-position, 4-way



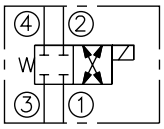
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-44	207 (3000)	11 (3)
SV10-44	207 (3000)	22 (6)

Solenoid valve, 4-way, 2-position, spool type



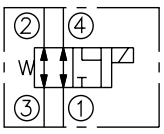
Model	Pressure bar (psi)	Flow lpm (gpm)
HSV10-44R	350 (5075)	23 (6)

Solenoid directional valve, 2-position, 4-way



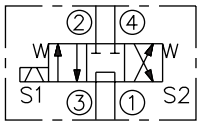
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-45	207 (3000)	11 (3)

Solenoid directional valve, 2-position, 4-way



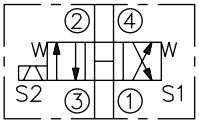
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-46	207 (3000)	11 (3)

Solenoid directional valve, 3-position, 4-way, tandem center



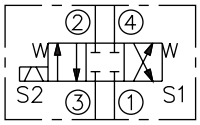
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-47A	207 (3000)	11 (3)
SV10-47A	240 (3500)	19 (5)

Solenoid directional valve, 3-position, 4-way, open center



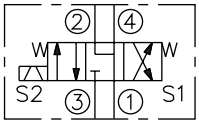
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-47B	207 (3000)	11 (3)
SV10-47B	240 (3500)	23 (6)

Solenoid directional valve, 3-position, 4-way, closed center



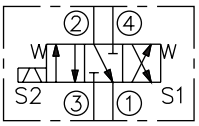
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-47C	207 (3000)	11 (3)
HSV10-47C	350 (5075)	38 (10)
SV10-47C	240 (3500)	23 (6)
HSV12-47C	350 (5075)	57 (15)

Solenoid directional valve, 3-position, 4-way, motor center



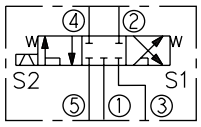
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-47D	207 (3000)	11 (3)
HSV10-47D	350 (5075)	34 (9)
SV10-47D	240 (3500)	23 (6)

Solenoid directional valve, 3-position, 4-way



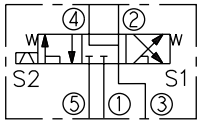
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-47E	207 (3000)	11 (3)
SV10-47E	250 (3625)	30 (8)

Solenoid directional valve, 3-position, 5-way, closed center, load sense port



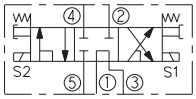
Model	Pressure bar (psi)	Flow lpm (gpm)
SV10-57C	250 (3625)	20 (5)

Solenoid directional valve, 3-position, 5-way, motor center, load sense port



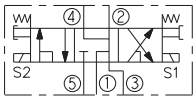
Model	Pressure bar (psi)	Flow lpm (gpm)
SV10-57D	250 (3625)	20 (5)

Solenoid directional valve, 3-position, 5-way, closed center, brake release port



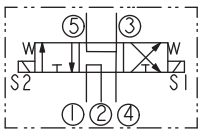
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-58C	207 (3000)	13 (3)
SV10-58C	250 (3625)	30 (8)

Solenoid directional valve, 3-position, 5-way, motor center, brake release port



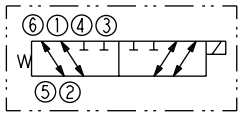
Model	Pressure bar (psi)	Flow lpm (gpm)
SV08-58D	240 (3500)	13 (4)
SV10-58D	250 (3625)	30 (8)

Solenoid directional valve, 3-position, 5-way, motor center, power beyond port



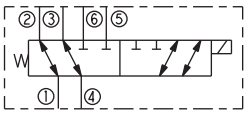
Model	Pressure bar (psi)	Flow lpm (gpm)
SV10-59D	207 (3000)	15 (4)

Solenoid selector valve, 2-position, 6-way



Model	Pressure bar (psi)	Flow lpm (gpm)
SV12-60	240 (3500)	45 (12)

Solenoid selector valve, 2-position, 6-way

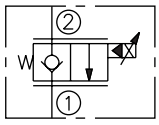


Model	Pressure bar (psi)	Flow lpm (gpm)
SV80-61	207 (3000)	8 (2)

- Designed for reliability in mobile machinery applications and exposed environmental conditions
- Excellent linearity and low hysteresis
- Hardened precision spools and cages for long life
- Industry common cavity sizes enable interchangeability with non-proportional valves
- Drop-in style, sealed, proportional clutch actuation, and piloting valves
- Series E water/weather-resistant coils with integral connectors rated up to IP69K
- Patented high strength solenoid tube for all 3-position HSP valves

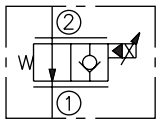
Electro-proportional Valves

Proportional flow control, poppet type, normally closed



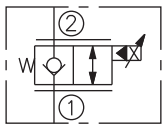
Model	Pressure bar (psi)	Flow lpm (gpm)
SP08-20	207 (3000)	22 (6)
SP08-20A	207 (3000)	30 (8)
HSP10-20	350 (5075)	53 (14)
SP10-20	250 (3625)	68 (18)
HSP12-20	350 (5075)	84 (22)
SP12-20	250 (3625)	100 (26)
HSP16-20	350 (5075)	265 (70)
SP16-20	250 (3625)	265 (70)

Proportional flow control, poppet type, normally open



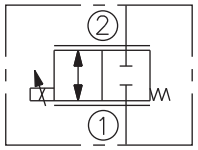
Model	Pressure bar (psi)	Flow lpm (gpm)
SP08-21	207 (3000)	23 (6)
HSP10-21	350 (5075)	53 (14)
SP10-21	250 (3625)	61 (16)
SP12-21	250 (3625)	200 (53)
HSP16-21	350 (5075)	95 (25)
SP16-21	250 (3625)	265 (70)

Proportional flow control, poppet type, normally closed, bidirectional



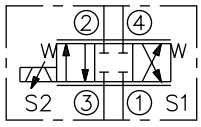
Model	Pressure bar (psi)	Flow lpm (gpm)
SP08-22	207 (3000)	30 (8)

Proportional flow control, spool type, normally closed, bidirectional



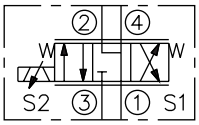
Model	Pressure bar (psi)	Flow lpm (gpm)
HSP08-24	350 (5075)	19 (5)
SP08-24	207 (3000)	11 (3)
SP10-24	207 (3000)	27 (7)

Proportional directional control, 3-position, 4-way, closed center



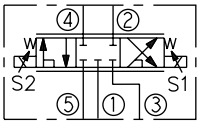
Model	Pressure bar (psi)	Flow lpm (gpm)
SP08-47C	240 (3500)	11 (3)
*HSP10-47C	350 (5075)	33 (9)
SP10-47C	248 (3600)	22 (6)
*HSP12-47C	350 (5075)	56 (15)
SP08-47CL	240 (3500)	8 (2)

Proportional directional control, 3-position, 4-way, motor center



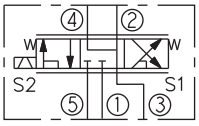
Model	Pressure bar (psi)	Flow lpm (gpm)
SP08-47D	240 (3500)	11 (3)
*HSP10-47D	350 (5075)	35 (9)
SP10-47D	207 (3000)	22 (6)
*HSP12-47D	350 (5075)	56 (15)
SP08-47DL	240 (3500)	8 (2)

Proportional directional valve, 3-position, 5-way, closed center, load sense port



Model	Pressure bar (psi)	Flow lpm (gpm)
SP10-57C	250 (3625)	23 (6)

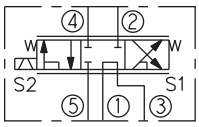
Proportional directional valve, 3-position, 5-way, motor center, load sense port



Model	Pressure bar (psi)	Flow lpm (gpm)
SP10-57D	250 (3625)	23 (6)
SP08-57D	240 (3500)	10 (3)

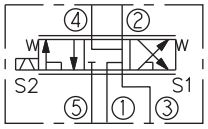
* US Pat. 8,253,063

Proportional directional valve, 3-position, 5-way, closed center, brake release port



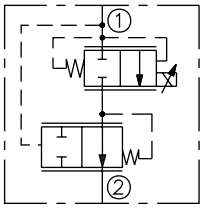
Model	Pressure bar (psi)	Flow lpm (gpm)
SP10-58C	250 (3625)	23 (6)

Proportional directional valve, 3-position, 5-way, motor center, load sense port, brake release



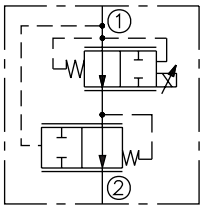
Model	Pressure bar (psi)	Flow lpm (gpm)
SP10-58D	250 (3625)	23 (6)
SP08-58D	240 (3500)	15 (4)

Pressure-compensated proportional flow control valve, normally closed



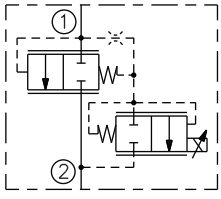
Model	Pressure bar (psi)	Flow lpm (gpm)
HPV12-20	350 (5075)	68 (18)
PV72-20	240 (3500)	64 (17)

Pressure-compensated proportional flow control valve, normally open



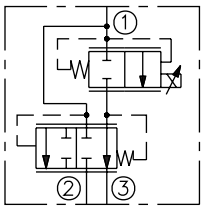
Model	Pressure bar (psi)	Flow lpm (gpm)
HPV12-21	350 (5075)	61 (16)
PV72-21	240 (3500)	56 (15)

Proportional flow control, normally closed



Model	Pressure bar (psi)	Flow lpm (gpm)
PV16-23	240 (3500)	170 (45)

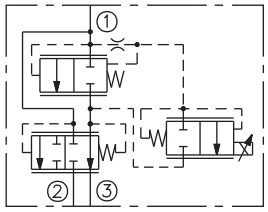
Proportional flow control, normally closed, priority bypass



Model	Pressure bar (psi)	Flow lpm (gpm)
PV08-30	240 (3500)	23 (6)
HPV12-30	350 (5075)	76 (20)
HPV16-30	350 (5075)	151 (40)
PV70-30	240 (3500)	30 (8)
PV72-30	240 (3500)	114 (30)
PV76-30A	240 (3500)	95 (25)

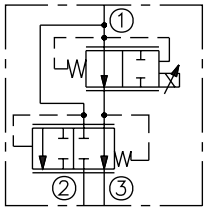
Proportional flow control, 2-stage, normally closed, priority bypass

US Pat. 6,966,329



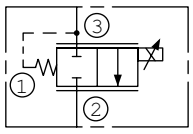
Model	Pressure bar (psi)	Flow lpm (gpm)
PV42-M30	240 (3500)	190 (50)

Proportional flow control, normally open, priority bypass



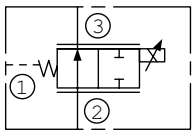
Model	Pressure bar (psi)	Flow lpm (gpm)
HPV12-31	350 (5075)	76 (20)
HPV16-31	350 (5075)	151 (40)
PV70-31	240 (3500)	50 (13)
PV72-31	240 (3500)	114 (30)

Proportional flow control, normally closed



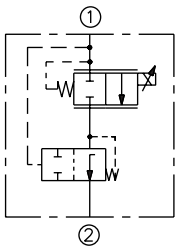
Model	Pressure bar (psi)	Flow lpm (gpm)
PV70-33	207 (3000)	30 (8)
PV72-33	240 (3500)	75 (20)

Proportional flow control, normally open



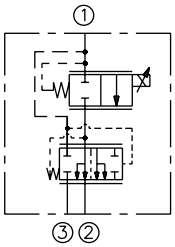
Model	Pressure bar (psi)	Flow lpm (gpm)
PV70-35	207 (3000)	30 (8)
PV72-35	207 (3000)	75 (20)

Proportional flow regulator, normally closed



Model	Pressure bar (psi)	Flow lpm (gpm)
PFR70-33x-E	207 (3000)	30 (8)
PFR72-33x-L	207 (3000)	60 (16)

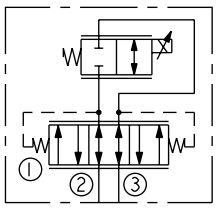
Proportional flow regulator, normally closed, priority bypass



Model	Pressure bar (psi)	Flow lpm (gpm)
PFR70-33x-F	207 (3000)	30 (8)
PFR70-33x-J	207 (3000)	30 (8)
PFR72-33x-J	207 (3000)	60 (16)

Pressure compensated proportional flow control, normally closed

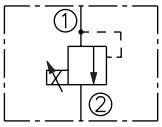
US Pat. 6,167,906



Model	Pressure bar (psi)	Flow lpm (gpm)
ZL70-30	240 (3500)	20 (5)

* US Pat. 8,253,063

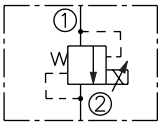
Proportional pressure control valve, relief, increasing pressure with current



Model	Pressure bar (psi)	Flow lpm (gpm)
TS08-20	35 (500)	4 (1)
TS38-20	248 (3600)	11 (3)
TS58-20	345 (5000)	8 (2)

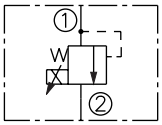
Proportional pressure control valve, relief, decreasing pressure with current

US Pat. 6,267,350



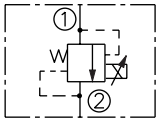
Model	Pressure bar (psi)	Flow lpm (gpm)
TS38-21	240 (3500)	1.1 (0.3)
TS58-21F	393 (5700)	1.9 (0.5)

Proportional pressure control valve, pilot operated, relief, increasing pressure with current



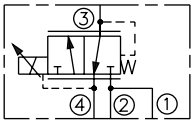
Model	Pressure bar (psi)	Flow lpm (gpm)
TS10-26	240 (3500)	95 (25)
TS12-26	240 (3500)	189 (50)

Proportional pressure control valve, pilot operated, relief, decreasing pressure with current



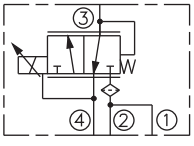
Model	Pressure bar (psi)	Flow lpm (gpm)
TS08-27	240 (3500)	25 (6)
TS10-27	275 (4000)	76 (20)
TS12-27	240 (3500)	186 (49)

Proportional pressure reducing/relieving valve, pilot operated



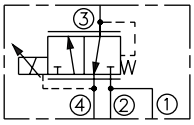
Model	Pressure bar (psi)	Flow lpm (gpm)
TS98-30	24 (350)	30 (8)

Proportional pressure reducing/relieving valve, pilot operated



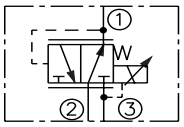
Model	Pressure bar (psi)	Flow lpm (gpm)
TS90-31	207 (3000)	38 (10)

Proportional pressure reducing/relieving valve, pilot operated, drop-in



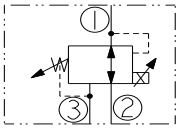
Model	Pressure bar (psi)	Flow lpm (gpm)
TS98-T34	30 (435)	30 (8)

Proportional pressure reducing/relieving valve, pilot operated



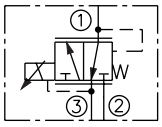
Model	Pressure bar (psi)	Flow lpm (gpm)
TS10-36	240 (3500)	57 (15)
TS12-36	275 (4000)	189 (50)

Proportional pressure reducing/relieving valve, pilot operated, decreasing pressure with current



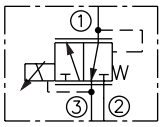
Model	Pressure bar (psi)	Flow lpm (gpm)
TS12-37F	276 (4000)	190 (50)

Proportional pressure reducing/relieving valve



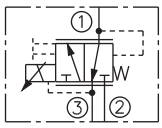
Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR08-33	207 (3000)	4 (1)

Proportional pressure reducing/relieving valve, drop-in



Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR98-T33	240 (3500)	4 (1)

Proportional pressure reducing/relieving valve, drop-in

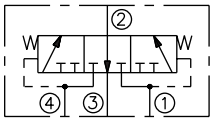


Model	Pressure bar (psi)	Flow lpm (gpm)
EHPR98-T35	103 (1500)	6 (2)
EHPR98-T38	240 (3500)	19 (5)
EHPR98-T38B	240 (3500)	19 (5)

- Industry-common cavity sizes -04, -08, -10, -12, -16, -20 and -42
- Hydraulically piloted or manually-operated directional and logic valves enable circuit flexibility and performance optimization
- Proportional, piloted 3-position, 4-way directional valves for flow rates up to 170 lpm (45 gpm)
- Hardened precision seats, spools and cages for long life and low leakage

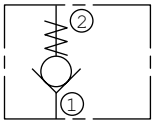
Directional Valves

Brake shuttle



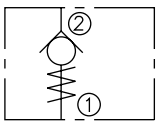
Model	Pressure bar (psi)	Flow lpm (gpm)
BV10-40	240 (3500)	8 (2)
HBV10-40	345 (5000)	8 (2)

Check valve



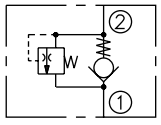
Model	Pressure bar (psi)	Flow lpm (gpm)
CV04-20	240 (3500)	5 (1.5)
CV04-B20	240 (3500)	5 (1.3)
HCV06-20	350 (5075)	19 (5)
CV08-20	240 (3500)	30 (8)
HCV08-20	350 (5075)	30 (8)
CV10-20	240 (3500)	75 (20)
HCV10-20	350 (5075)	76 (20)
CV50-20	345 (5000)	57 (15)
CV12-20	240 (3500)	95 (25)
HCV12-20	350 (5075)	95 (25)
CV16-20	240 (3500)	151 (40)
HCV16-20	350 (5075)	151 (40)
CV42-M20	240 (3500)	378 (100)
HCV42-M20	350 (5075)	303 (80)

Check valve



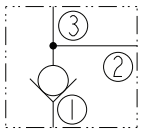
Model	Pressure bar (psi)	Flow lpm (gpm)
CV08-21	240 (3500)	30 (8)
CV12-21	240 (3500)	114 (30)
CV10-24	240 (3500)	57 (15)

Check valve



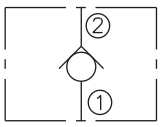
Model	Pressure bar (psi)	Flow lpm (gpm)
CV10-28	240 (3500)	45 (12)

Check valve



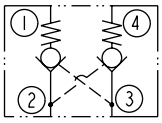
Model	Pressure bar (psi)	Flow lpm (gpm)
HCV16-30	350 (5075)	151 (40)

Check valve disk



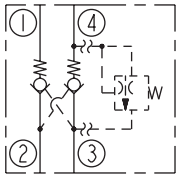
Model	Pressure bar (psi)	Flow lpm (gpm)
CVD08	250 (3625)	1.9 (0.5)
CVD10	250 (3625)	1.9 (0.5)

Pilot operated check valve, dual



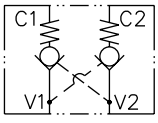
Model	Pressure bar (psi)	Flow lpm (gpm)
DC08-40	240 (3500)	19 (5)

Pilot operated check valve, dual, optional thermal relief



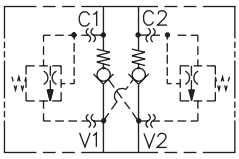
Model	Pressure bar (psi)	Flow lpm (gpm)
DC10-40	240 (3500)	30 (8)

Pilot operated check valve, dual cartridges in manifold



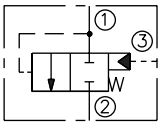
Model	Pressure bar (psi)	Flow lpm (gpm)
DCV08	240 (3500)	30 (8)
HDCV16	350 (5075)	151 (40)

Pilot operated check valve with thermal relief, dual cartridges in manifold



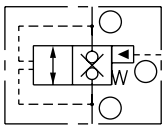
Model	Pressure bar (psi)	Flow lpm (gpm)
DCV10	240 (3500)	76 (20)

Logic element, spool type, 2-position, 2-way, externally piloted



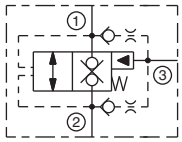
Model	Pressure bar (psi)	Flow lpm (gpm)
EP08-35	345 (5000)	38 (10)
EP10-S35	345 (5000)	76 (20)
EP12-S35	345 (5000)	151 (40)
EP16-S35	240 (3500)	189 (50)
HEP16-S35	350 (5075)	190 (50)
EP20-S35	345 (5000)	379 (100)
HEP42-S35	350 (5075)	379 (100)

Logic element, poppet type, 2-position, 2-way, externally piloted



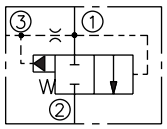
Model	Pressure bar (psi)	Flow lpm (gpm)
EP10-S38	350 (5075)	114 (30)
EP20-S38	240 (3500)	303 (80)
HEP42-S38	350 (5075)	284 (75)

Logic element, poppet type, 2-position, 2-way, externally piloted



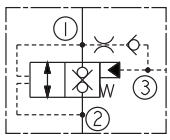
Model	Pressure bar (psi)	Flow lpm (gpm)
HEP16-S39	350 (5075)	190 (50)
EP20-S39	240 (3500)	285 (75)
HEP42-S39	350 (5075)	284 (75)

Logic element, spool type, vented



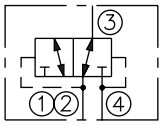
Model	Pressure bar (psi)	Flow lpm (gpm)
EV58-34	345 (5000)	38 (10)
EV10-S34	345 (5000)	76 (20)
EV12-S34	345 (5000)	151 (40)
EV16-S34	240 (3500)	189 (50)
HEV16-S34	350 (5075)	190 (50)
EV20-S34	345 (5000)	379 (100)
HEV42-S34	350 (5075)	379 (100)

Logic element, poppet type, vent to open



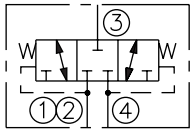
Model	Pressure bar (psi)	Flow lpm (gpm)
HEV12-S38	350 (5075)	114 (30)

Low side (hot oil) shuttle valve, springless



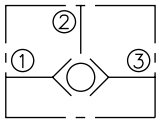
Model	Pressure bar (psi)	Flow lpm (gpm)
HS10-42	207 (3000)	38 (10)
HS50-42	207 (3000)	38 (10)
HS52-42	345 (5000)	45 (12)

Low side (hot oil) shuttle valve



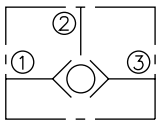
Model	Pressure bar (psi)	Flow lpm (gpm)
HS50-43	345 (5000)	132 (35)
HS52-43	345 (5000)	113 (30)

Load shuttle, ball type, down-hole mount



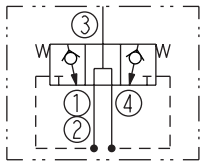
Model	Pressure bar (psi)	Flow lpm (gpm)
LS04-B30	240 (3500)	5 (1.3)
HLS06-B30	350 (5075)	8 (2)

Load shuttle, ball type



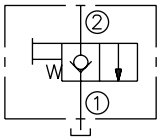
Model	Pressure bar (psi)	Flow lpm (gpm)
HLS06-30	350 (5075)	8 (2)
LS08-30	240 (3500)	19 (5)
LS10-30	240 (3500)	30 (8)
LS50-30	345 (5000)	30 (8)

Load shuttle, inverted



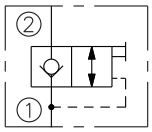
Model	Pressure bar (psi)	Flow lpm (gpm)
LS10-41	240 (3500)	15 (4)

Manual 2-position, 2-way valve, pull to open, spring return



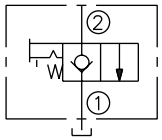
Model	Pressure bar (psi)	Flow lpm (gpm)
MP08-20	207 (3000)	53 (14)
MP10-20	207 (3000)	57 (15)

Manual 2-position, 2-way valve, pull to open, push to close



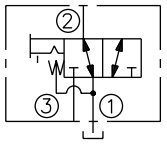
Model	Pressure bar (psi)	Flow lpm (gpm)
MP10-21	207 (3000)	57 (15)

Manual 2-position, 2-way valve, pull to open, with lock



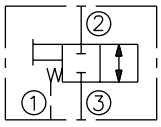
Model	Pressure bar (psi)	Flow lpm (gpm)
MP10-22	207 (3000)	57 (15)

Manual 2-position, 3-way valve, pull to shift, blocked transition



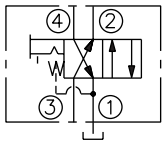
Model	Pressure bar (psi)	Flow lpm (gpm)
MP08-30	240 (3500)	25 (7)
MP58-30	345 (5000)	25 (7)

Manual 2-position, 2-way valve, pull to open, spring return, vented spring



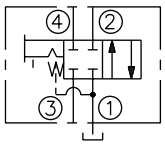
Model	Pressure bar (psi)	Flow lpm (gpm)
MP08-34	240 (3500)	38 (10)

Manual 2-position, 4-way valve, pull to shift, spring return, open transition



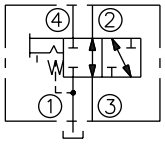
Model	Pressure bar (psi)	Flow lpm (gpm)
MP08-40	240 (3500)	12 (3)
MP10-40	207 (3000)	22 (6)

Manual 2-position, 4-way valve, pull to shift, spring return, closed transition



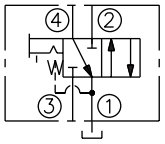
Model	Pressure bar (psi)	Flow lpm (gpm)
MP08-41	240 (3500)	12 (3)
MP10-41	207 (3000)	12 (3)

Manual 2-position, 4-way valve, pull to shift, spring return, closed transition



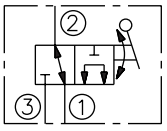
Model	Pressure bar (psi)	Flow lpm (gpm)
MP10-42	207 (3000)	12 (3)

Manual 2-position, 4-way valve, pull to shift, spring return, open transition



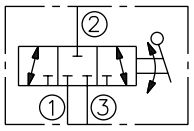
Model	Pressure bar (psi)	Flow lpm (gpm)
MP10-43	207 (3000)	12 (3)

Manual rotary, 2-position, 3-way valve, blocked transition



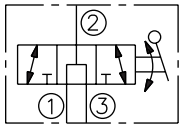
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-31	240 (3500)	38 (10)

Manual rotary, 3-position, 3-way valve, closed center



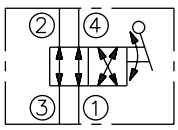
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-37A	240 (3500)	38 (10)

Manual rotary, 3-position, 3-way valve, open center



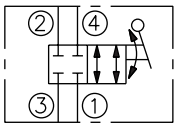
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-37B	240 (3500)	38 (10)

Manual rotary, 2-position, 4-way valve, blocked transition



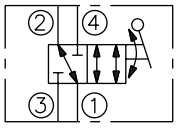
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-40	240 (3500)	11 (3)

Manual rotary, 2-position, 4-way valve, blocked transition



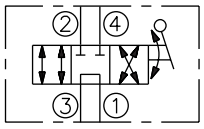
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-41	240 (3500)	11 (3)

Manual rotary, 2-position, 4-way valve, open transition, port 4 blocked



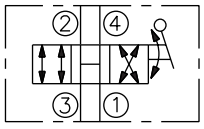
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-43	240 (3500)	11 (3)

Manual rotary, 3-position, 4-way valve, tandem center



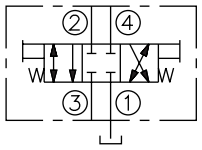
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-47A	240 (3500)	11 (3)

Manual rotary, 3-position, 4-way valve, open center



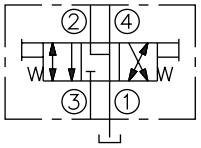
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-47B	240 (3500)	11 (3)

Manual rotary, 3-position, 4-way valve, closed center



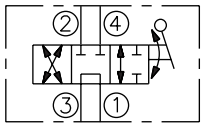
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-47C	240 (3500)	11 (3)

Manual rotary, 3-position, 4-way valve, motor center



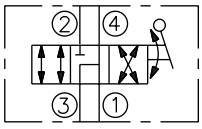
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-47D	240 (3500)	11 (3)

Manual rotary, 3-position, 4-way valve, tandem center



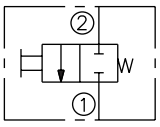
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-47F	240 (3500)	11 (3)

Manual rotary, 3-position, 4-way valve, motor center



Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-47G	240 (3500)	11 (3)

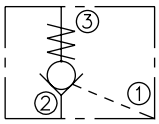
Manual valve, push to open



Model	Pressure bar (psi)	Flow lpm (gpm)
MV06-20	240 (3500)	115 (30)
MV08-22	207 (3000)	38 (10)

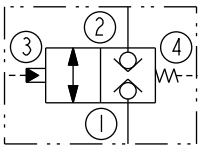
Check, pilot to open

see catalog for pilot ratio



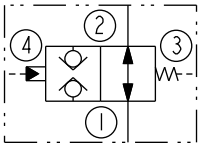
Model	Pressure bar (psi)	Flow lpm (gpm)
PC08-30	240 (3500)	26 (7)
HPC08-30	350 (5075)	30 (8)
PC10-30	240 (3500)	26 (7)
PC10-32	240 (3500)	30 (8)

Piloted directional element, balanced poppet, bidirectional, normally closed



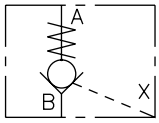
Model	Pressure bar (psi)	Flow lpm (gpm)
HPC42-J48	350 (5075)	380 (100)

Piloted directional element, balanced poppet, bidirectional, normally open



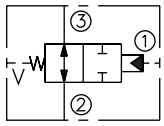
Model	Pressure bar (psi)	Flow lpm (gpm)
HPC42-J49	350 (5075)	380 (100)

Check, pilot to open



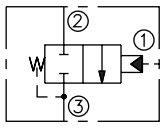
Model	Pressure bar (psi)	Flow lpm (gpm)
PCV10	240 (3500)	60 (16)
HPCV16	350 (5075)	151 (40)
PCV16	240 (3500)	151 (40)

Spool valve, piloted, 2-position, 2-way, normally open, external vent



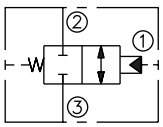
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-30	240 (3500)	38 (10)
PD12-30	240 (3500)	113 (30)

Spool valve, piloted, 2-position, 2-way, normally closed, internal vent



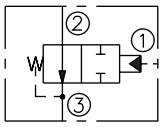
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-32	240 (3500)	38 (10)
PD12-32	240 (3500)	113 (30)

Spool valve, piloted, 2-position, 2-way, normally closed, external vent



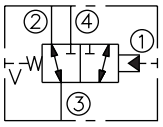
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-34	240 (3500)	38 (10)
PD12-34	240 (3500)	113 (30)

Spool valve, piloted, 2-position, 2-way, normally closed, internal vent



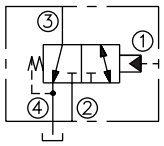
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-35	240 (3500)	38 (10)
PD12-35	240 (3500)	113 (30)

Spool valve, piloted, 2-position, 3-way, external vent



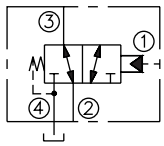
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-40	240 (3500)	38 (10)
PD12-40	240 (3500)	113 (30)
PD16-40	240 (3500)	170 (45)
PD42-M40	345 (5000)	265 (70)

Spool valve, piloted, 2-position, 3-way, internal vent, open transition



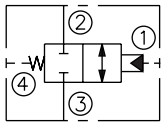
Model	Pressure bar (psi)	Flow lpm (gpm)
PD08-41	241 (3500)	8 (2)
PD10-41	240 (3500)	45 (12)
PD12-41	240 (3500)	113 (30)
PD16-41	240 (3500)	189 (50)
PD42-M41	345 (5000)	265 (70)

Spool valve, piloted, 2-position, 3-way, internal vent, open transition



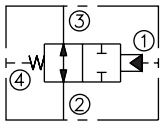
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-42	240 (3500)	38 (10)
PD12-42	240 (3500)	113 (30)
PD16-42	240 (3500)	189 (50)
PD42-M42	345 (5000)	265 (70)

Spool valve, piloted, 2-position, normally closed



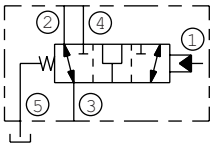
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-44	240 (3500)	32 (8)
PD12-44	240 (3500)	113 (30)
PD16-44	240 (3500)	189 (50)
HPD16-44	350 (5075)	170 (45)
HPD42-M44	350 (5075)	265 (70)

Spool valve, piloted, 2-position, normally open



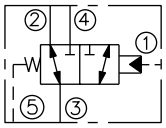
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-45	240 (3500)	45 (12)
PD12-45	240 (3500)	113 (30)
PD16-45	240 (3500)	189 (50)
HPD16-45	350 (5075)	170 (45)
PD42-M45	345 (5000)	265 (70)
HPD42-M45	350 (5075)	265 (70)

Spool valve, piloted, 2-position, 3-way, open transition



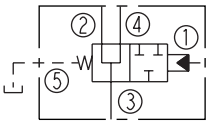
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-50	240 (3500)	38 (10)

Spool valve, piloted, 2-position, 3-way, open transition



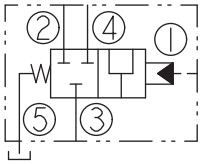
Model	Pressure bar (psi)	Flow lpm (gpm)
PD12-S50	240 (3500)	95 (25)
HPD16-S50	350 (5075)	151 (40)
PD16-S50	240 (3500)	170 (45)
PD42-S50	345 (5000)	265 (70)
HPD42-S50	350 (5075)	265 (70)

Spool valve, piloted, 2-position, 3-way



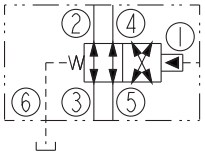
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-51	240 (3500)	45 (12)
HPD16-S51	350 (5075)	151 (40)
PD16-S51	240 (3500)	151 (40)
HPD42-S51	240 (3500)	246 (65)

Spool valve, piloted, 2-position, 3-way



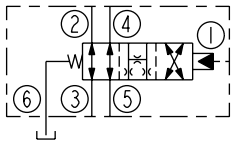
Model	Pressure bar (psi)	Flow lpm (gpm)
HPD16-S52	350 (5075)	151 (40)
HPD42-S52	350 (5075)	265 (70)

Spool valve, piloted, 2-poition, 4-way



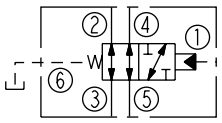
Model	Pressure bar (psi)	Flow lpm (gpm)
HPD16-S60	350 (5075)	95 (25)
HPD42-S60	350 (5075)	189 (50)

Spool valve, piloted, 2-position, 4-way, open transition



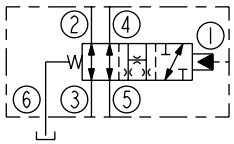
Model	Pressure bar (psi)	Flow lpm (gpm)
PD12-S60N	345 (5000)	56 (15)
PD16-S60N	240 (3500)	95 (25)
PD42-S60N	324 (4700)	189 (50)

Spool valve, piloted, 2-position, 4-way



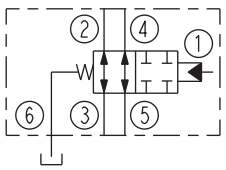
Model	Pressure bar (psi)	Flow lpm (gpm)
HPD42-S61	350 (5075)	189 (50)
HPD16-S61	350 (5075)	152 (40)

Spool valve, piloted, 2-position, 4-way, open transition



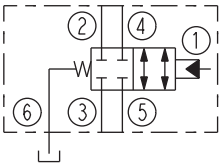
Model	Pressure bar (psi)	Flow lpm (gpm)
PD12-S61N	240 (3500)	56 (15)
PD16-S61N	240 (3500)	151 (40)

Spool valve, piloted, 2-position, 4-way



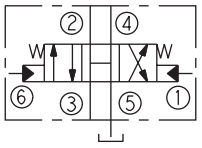
Model	Pressure bar (psi)	Flow lpm (gpm)
PD10-S62	250 (3625)	53 (14)
HPD42-S62	350 (5075)	189 (50)
HPD16-S62	350 (5075)	152 (40)

Spool valve, piloted, 2-position, 4-way



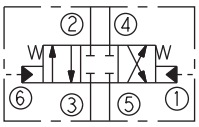
Model	Pressure bar (psi)	Flow lpm (gpm)
PD16-S63	240 (3500)	151 (40)
HPD42-S63	350 (5075)	189 (50)
HPD16-S63	350 (5075)	152 (40)

Spool valve, piloted, 3-position, 4-way, open center



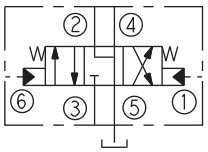
Model	Pressure bar (psi)	Flow lpm (gpm)
PD42-S67B	324 (3625)	189 (50)

Spool valve, piloted, 3-position, 4-way, closed center



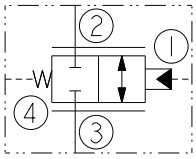
Model	Pressure bar (psi)	Flow lpm (gpm)
HPD12-S67C	350 (5075)	57 (15)
PD16-S67C	240 (3500)	95 (25)
HPD16-S67C	350 (5075)	95 (25)
HPD42-S67C	350 (5075)	189 (50)

Spool valve, piloted, 3-position, 4-way, motor center



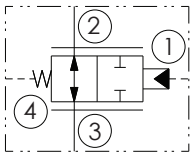
Model	Pressure bar (psi)	Flow lpm (gpm)
HPD12-S67D	350 (5075)	57 (15)
PD16-S67D	240 (3500)	95 (25)
HPD16-S67D	350 (5075)	95 (25)
HPD42-S67D	350 (5075)	189 (50)

Piloted proportional spool valve, normally closed



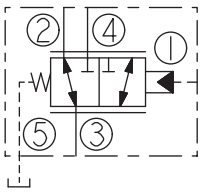
Model	Pressure bar (psi)	Flow lpm (gpm)
HPE16-44	350 (5075)	95 (25)
HPE42-M44	350 (5075)	170 (45)

Piloted proportional spool valve, normally open



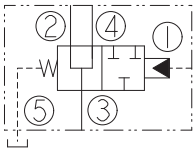
Model	Pressure bar (psi)	Flow lpm (gpm)
HPE16-45	350 (5075)	95 (25)
HPE42-M45	350 (5075)	170 (45)

Spool valve, piloted, proportional, 3-way



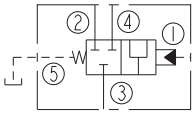
Model	Pressure bar (psi)	Flow lpm (gpm)
HPE42-S50	350 (5075)	170 (45)

Spool valve, piloted, proportional, 3-way



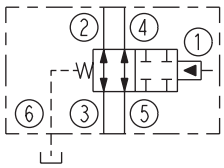
Model	Pressure bar (psi)	Flow lpm (gpm)
HPE42-S51	350 (5075)	170 (45)

Spool valve, piloted, proportional, 3-way



Model	Pressure bar (psi)	Flow lpm (gpm)
HPE42-S52	350 (5075)	170 (45)

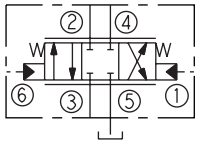
Spool valve, piloted, proportional, 4-way



Model	Pressure bar (psi)	Flow lpm (gpm)
HPE42-S62	350 (5075)	170 (45)

Spool valve, piloted, proportional, 3-position, 4-way, closed center

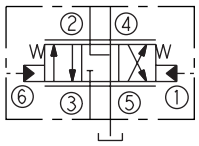
US Pat. 6,554,014



Model	Pressure bar (psi)	Flow lpm (gpm)
PE12-S67C	345 (5000)	45 (12)
HPE16-S67C	350 (5075)	95 (25)
PE16-S67C	345 (5000)	90 (24)
HPE42-S67C	350 (5075)	170 (45)
PE42-S67C	345 (5000)	170 (45)

Spool valve, piloted, proportional, 3-position, 4-way, motor center

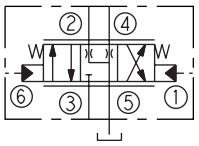
US Pat. 6,554,014



Model	Pressure bar (psi)	Flow lpm (gpm)
PE12-S67D	345 (5000)	45 (12)
HPE16-S67D	350 (5075)	95 (25)
PE16-S67D	345 (5000)	90 (24)
PE42-S67D	345 (5000)	170 (45)
HPE42-S67D	350 (5075)	170 (45)

Spool valve, piloted, proportional, 3-position, 4-way, motor center

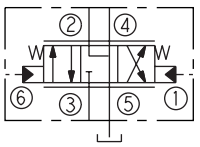
US Pat. 6,554,014



Model	Pressure bar (psi)	Flow lpm (gpm)
PE12-S67H	345 (5000)	45 (12)
HPE16-S67H	350 (5075)	95 (25)
PE16-S67H	345 (5000)	90 (24)
PE42-S67H	345 (5000)	170 (45)
HPE42-S67H	350 (5075)	170 (45)

Spool valve, piloted, proportional, 3-position, 4-way, motor center

US Pat. 6,554,014

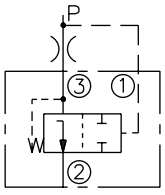


Model	Pressure bar (psi)	Flow lpm (gpm)
PE12-S67K	345 (5000)	45 (12)
HPE16-S67K	350 (5075)	95 (25)
PE16-S67K	345 (5000)	90 (24)
PE42-S67K	345 (5000)	170 (45)
HPE42-S67K	345 (5000)	170 (45)

- Variable or fixed orifice restrictor valves
- Pressure compensated flow regulators
- Pressure compensators for restrictive, bypass and priority circuits, with load-sensing system compatibility
- Optional settings and adjustment styles available
- Flow dividers/combiners for cylinder synchronizing and anti-stall applications
- Industry common cavity sizes

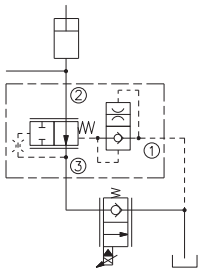
Flow Control Valves

Pressure compensator



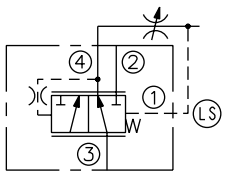
Model	Pressure bar (psi)	Flow lpm (gpm)
EC10-30	207 (3000)	30 (8)
EC12-30	240 (3500)	58 (15)
EC50-30	345 (5000)	30 (8)

Pressure compensator



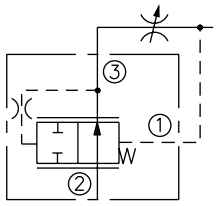
Model	Pressure bar (psi)	Flow lpm (gpm)
EC12-34	240 (3500)	83 (22)
HEC12-34	350 (5075)	83 (22)
EC16-34	240 (3500)	170 (45)

Pressure compensator with static load sense



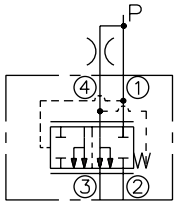
Model	Pressure bar (psi)	Flow lpm (gpm)
EC10-42	240 (3500)	38 (10)
EC50-42	345 (5000)	38 (10)
EC12-42	345 (5000)	76 (20)
HEC12-42	350 (5075)	95 (25)
EC42-M42	240 (3500)	303 (80)
EC16-42	240 (3500)	190 (50)
EC56-42	345 (5000)	150 (40)

Pressure compensator



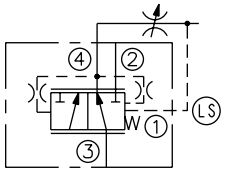
Model	Pressure bar (psi)	Flow lpm (gpm)
EC08-32	240 (3500)	11 (3)
EC10-32	207 (3000)	38 (10)
EC12-32	240 (3500)	57 (15)
HEC12-32	350 (5075)	83 (22)
EC16-32	240 (3500)	152 (40)
HEC16-32	350 (5075)	151 (40)

Pressure compensator, bypass type



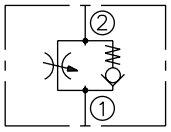
Model	Pressure bar (psi)	Flow lpm (gpm)
EC10-40	207 (3000)	38 (10)
EC12-40	240 (3500)	80 (21)
EC16-40	240 (3500)	180 (48)

Pressure compensator with dynamic load sense



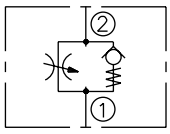
Model	Pressure bar (psi)	Flow lpm (gpm)
EC10-43	240 (3500)	34 (9)
EC50-43	345 (5000)	45 (12)
EC12-43	345 (5000)	95 (25)
HEC12-43	350 (5075)	95 (25)
EC16-43	240 (3500)	190 (50)
HEC32-43	350 (5075)	530 (140)
EC42-M43	240 (3500)	303 (80)

Flow control with reverse flow check



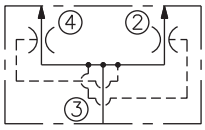
Model	Pressure bar (psi)	Flow lpm (gpm)
FC10-20	240 (3500)	45 (12)
FC12-20	240 (3500)	129 (34)
FC08-20F	240 (3500)	45 (12)

Flow control with reverse flow check



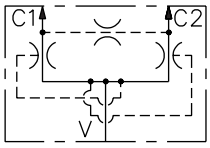
Model	Pressure bar (psi)	Flow lpm (gpm)
FC10-21	240 (3500)	57 (15)

Flow divider/combiner



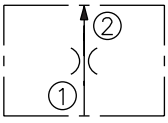
Model	Pressure bar (psi)	Flow lpm (gpm)
FD50-45	345 (5000)	57 (15)
FD52-45	345 (5000)	106 (28)
FD56-45	345 (5000)	197 (52)

Flow divider/combiner, cartridge in manifold



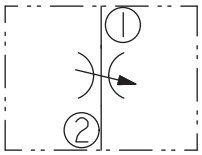
Model	Pressure bar (psi)	Flow lpm (gpm)
FDC16	207 (3000)	151 (40)

Flow regulator, pressure compensated



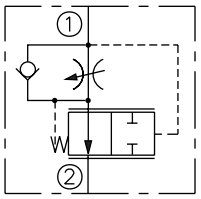
Model	Pressure bar (psi)	Flow lpm (gpm)
FR04-20F	240 (3500)	3 (0.8)
FR08-20F	240 (3500)	8 (2)
FR10-20F	240 (3500)	23 (6)
FR50-20F	345 (5000)	23 (6)
FR12-20F	345 (5000)	55 (15)
FR16-20F	240 (3500)	113 (30)

Manual rotary flow control



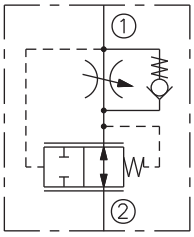
Model	Pressure bar (psi)	Flow lpm (gpm)
MR10-20	240 (3500)	53 (14)

Flow regulator, pressure compensated



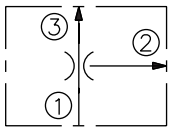
Model	Pressure bar (psi)	Flow lpm (gpm)
FR12-23	240 (3500)	77 (20)

Flow regulator, pressure compensated



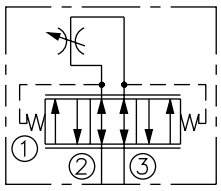
Model	Pressure bar (psi)	Flow lpm (gpm)
FR50-23	345 (5000)	12 (3)
FR50-28	345 (5000)	34 (9)

Flow regulator, pressure compensated, priority bypass type



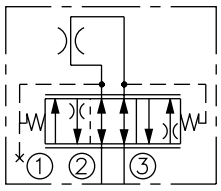
Model	Pressure bar (psi)	Flow lpm (gpm)
FR08-30F	207 (3000)	11 (3)
FR10-30F	207 (3000)	38 (10)
FR12-30F	240 (3500)	95 (25)
FR16-30F	240 (3500)	113 (30)

Flow regulator, pressure compensated, with adjustable orifice



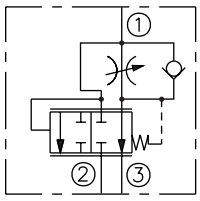
Model	Pressure bar (psi)	Flow lpm (gpm)
FR10-32	240 (3500)	19 (5)
HFR10-32	350 (5075)	19 (5)

Flow regulator, pressure compensated, fixed orifice



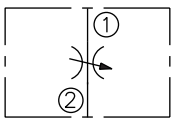
Model	Pressure bar (psi)	Flow lpm (gpm)
FR10-32F	240 (3500)	19 (5)
HFR10-32F	350 (5075)	19 (5)

Flow regulator, pressure compensated, bypass type, with adjustable orifice



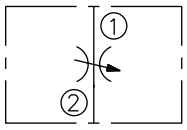
Model	Pressure bar (psi)	Flow lpm (gpm)
FR10-33	240 (3500)	26 (7)
FR12-33	240 (3500)	114 (30)
FR10-39	240 (3500)	57 (15)

Needle valve



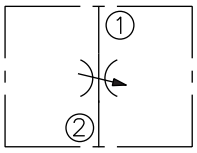
Model	Pressure bar (psi)	Flow lpm (gpm)
NV08-20	240 (3500)	42 (11)
NV10-20	240 (3500)	45 (12)
NV12-20	240 (3500)	114 (30)
NV10-22	240 (3500)	57 (15)

Needle valve, positive shut-off



Model	Pressure bar (psi)	Flow lpm (gpm)
NV08-21	240 (3500)	38 (10)
NV10-21	240 (3500)	57 (15)

Needle valve, fine adjustment

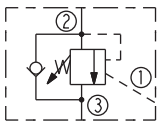


Model	Pressure bar (psi)	Flow lpm (gpm)
NV08-23	240 (3500)	38 (10)

- Pressure relief, reducing/relieving, unloading and sequencing operations
- Industry common cavity sizes up to -16 303 lpm (80 gpm)
- Pilot-operated, direct-acting, and differential-area pressure regulators for all application conditions
- RVD valve offers fast response with low pressure rise, low hysteresis, and low internal leakage
- Operating pressures up to 350 bar (5075 psi)
- Optional spring ranges and adjustment styles
- Externally plumbed pressure reducing options

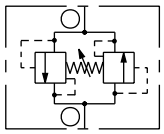
Pressure Control Valves

Counterbalance valve



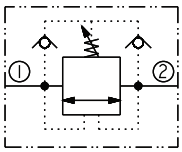
Model	Pressure bar (psi)	Flow lpm (gpm)
CB10-30	207 (3000)	19 (5)

Relief valve, bidirectional



Model	Pressure bar (psi)	Flow lpm (gpm)
CR10-28	240 (3500)	60 (16)

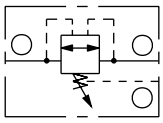
Relief valve, bidirectional



Model	Pressure bar (psi)	Flow lpm (gpm)
CR08-28H	276 (4000)	38 (10)

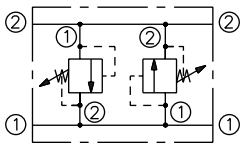
Relief valve, bidirectional, vented

US Pat. 7,069,945



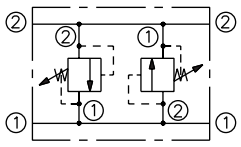
Model	Pressure bar (psi)	Flow lpm (gpm)
CR08-38	207 (3000)	30 (8)

Crossover relief valve, direct acting, dual cartridges in manifold



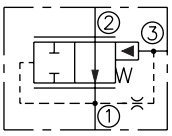
Model	Pressure bar (psi)	Flow lpm (gpm)
CRV08-20	228 (3300)	22 (6)
CRV10-20	240 (3500)	38 (10)

Crossover relief valve, differential area, dual cartridges in manifold



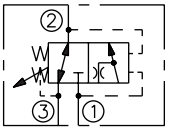
Model	Pressure bar (psi)	Flow lpm (gpm)
CRV08-22	180 (2600)	30 (8)
CRV10-22	240 (3500)	113 (30)

Logic element, spool type, pressure reducing



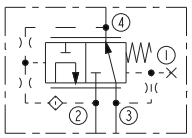
Model	Pressure bar (psi)	Flow lpm (gpm)
ER10-S30	345 (5000)	68 (18)
ER12-S30	345 (5000)	114 (30)

Kickdown sequence valve, internal pilot/ drain



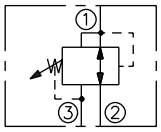
Model	Pressure bar (psi)	Flow lpm (gpm)
KS10-30	207 (3000)	11 (3)

Torque divider



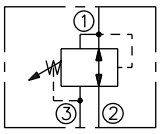
Model	Pressure bar (psi)	Flow lpm (gpm)
HTD10-40	350 (5075)	57 (15)

Pressure reducing/ relieving valve



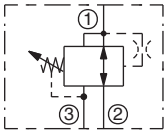
Model	Pressure bar (psi)	Flow lpm (gpm)
PR08-32	240 (3500)	11 (3)
PR10-32	207 (3000)	30 (8)

Pressure reducing/ relieving valve, pilot operated



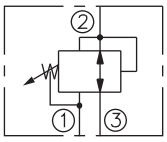
Model	Pressure bar (psi)	Flow lpm (gpm)
PR10-36	240 (3500)	56 (15)
PR50-36	345 (5000)	56 (15)
PR12-36	275 (4000)	189 (50)

Pressure reducing/ relieving valve, direct acting



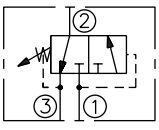
Model	Pressure bar (psi)	Flow lpm (gpm)
PR58-38	345 (5000)	19 (5)
PR50-38	345 (5000)	72 (19)

Pressure reducing/ relieving valve



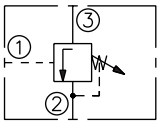
Model	Pressure bar (psi)	Flow lpm (gpm)
PRES50-30	345 (5000)	11 (3)

Sequence valve with internal pilot and drain



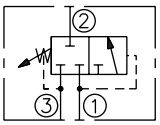
Model	Pressure bar (psi)	Flow lpm (gpm)
PS08-30	240 (3500)	22 (6)
PS10-30	207 (3000)	38 (10)
PS10-31	240 (3500)	22 (6)

Sequence valve with external pilot, internal drain



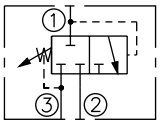
Model	Pressure bar (psi)	Flow lpm (gpm)
PS08-32	240 (3500)	19 (5)
PS10-32	207 (3000)	38 (10)
PS10-33	240 (3500)	23 (6)

Sequence valve with internal pilot and drain



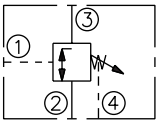
Model	Pressure bar (psi)	Flow lpm (gpm)
PS10-34	207 (3000)	117 (31)

Sequence valve with internal pilot, external drain



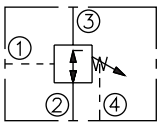
Model	Pressure bar (psi)	Flow lpm (gpm)
PS10-36	240 (3500)	56 (15)
PS50-36	331 (4800)	56 (15)

Sequence valve, normally closed with external pilot and drain



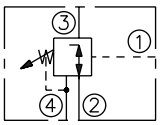
Model	Pressure bar (psi)	Flow lpm (gpm)
PS10-40	240 (3500)	38 (10)
PS50-40	345 (5000)	38 (10)

Sequence valve, normally open with external pilot and drain



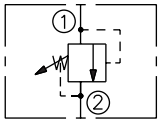
Model	Pressure bar (psi)	Flow lpm (gpm)
PS10-41	240 (3500)	38 (10)

Sequence valve, 3-way, external pilot and drain



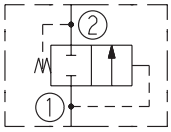
Model	Pressure bar (psi)	Flow lpm (gpm)
PS10-43	240 (3500)	38 (10)
PS50-43	414 (6000)	38 (10)

Relief valve, direct acting, poppet type



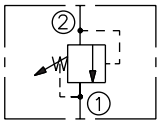
Model	Pressure bar (psi)	Flow lpm (gpm)
RV08-20	275 (4000)	23 (6)
RV58-20	345 (5000)	22 (6)
RV10-20	228 (3300)	38 (10)

Relief valve, pressure regulating, spool type



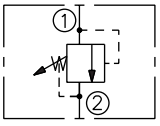
Model	Pressure bar (psi)	Flow lpm (gpm)
RV10-21F	228 (3300)	25 (7)

Relief valve, differential area, poppet type



Model	Pressure bar (psi)	Flow lpm (gpm)
RV08-22	248 (3600)	30 (8)
RV10-22	240 (3500)	114 (30)
RV50-22	345 (5000)	76 (20)

Relief valve, pilot operated, spool type



Model	Pressure bar (psi)	Flow lpm (gpm)
RV10-26	240 (3500)	114 (30)
RV50-26	345 (5000)	114 (30)
RV12-26	240 (3500)	170 (45)
RV16-26	275 (4000)	303 (80)
RV52-26	345 (5000)	170 (45)
RV56-26	345 (5000)	379 (100)

Relief valve, pilot operated with reverse-flow check

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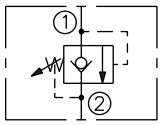
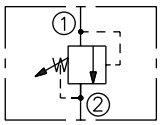
7,069,945



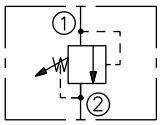
Model	Pressure bar (psi)	Flow lpm (gpm)
RV10-28	289 (4200)	114 (30)
RV50-28	345 (5000)	114 (30)

Relief valve, direct acting, poppet type, low flow



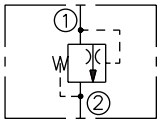
Model	Pressure bar (psi)	Flow lpm (gpm)
RV08-29	240 (3500)	1.9 (0.5)

Relief valve, direct acting, poppet type



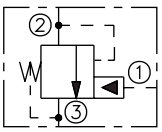
Model	Pressure bar (psi)	Flow lpm (gpm)
HRVD08-20	240 (3500)	53 (14)
RVD50-20	350 (5075)	114 (30)
RVD50-20P	385 (5575)	114 (30)

Thermal relief valve, poppet type



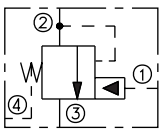
Model	Pressure bar (psi)	Flow lpm (gpm)
TR04-B20	414 (6000)	no rating

Unloading pilot, internal drain



Model	Pressure bar (psi)	Flow lpm (gpm)
UP10-31	207 (3000)	4 (1)

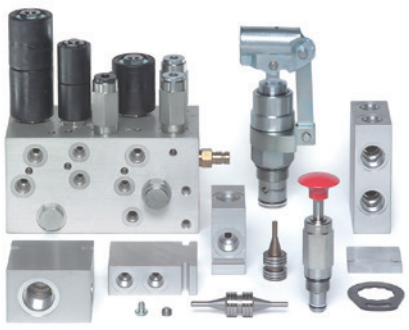
Remote sequence valve, unloading pilot



Model	Pressure bar (psi)	Flow lpm (gpm)
UP10-40	207 (3000)	4 (1)

Accessories

HydraForce Valve Size	Cavity Thread Size
04	7/16–20UNF–2B
07	5/8–18UNF–2B
08, 38, 58, 98	3/4–16UNF–2B
10, 50, 70	7/8–14UNF–2B
12, 52, 72	1-1/16–12UN–2B
16, 76	1-5/16–12UN–2B
20	1-5/8–12UN–2B
42	M42 x 2,0–6H



Valve Housings

Single cavity housings are available in a wide variety of port sizes for industry-common valve cavity sizes. Anodized aluminum housings are rated up to 240 bar (3500 psi). Steel and ductile iron housings are available in select sizes for high-pressures up to 350 bar (5075 psi).

Custom Manifold Accessories

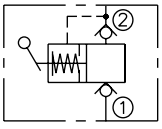
A full line of manifold accessories are available from stock including: cavity plugs, orifice discs, port plugs, orifice plugs, pilot pistons, screen cartridges, as well as cavity form tools and finishing tools.

Hand Pumps

Three versions of hand operated piston and check valve pumps are available for manual operation of piloted features like brake release or emergency lowering of power-down functions.

Hand Pumps

Hand pump
see catalog for operating force requirements



Model	Pressure bar (psi)	Disp. cm^3 (in^3)
HP10-20	207 (3000)	1.36 (0.083)
HP10-21	207 (3000)	10.6 (0.65)
HP16-21	207 (3000)	21.3 (1.3)

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RoHS COMPLIANT HydraForce valve and manifold products comply with the European Council and Parliament RoHS directive 2002/95/EC limiting the use of hazardous substances. For all other products, consult factory.

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