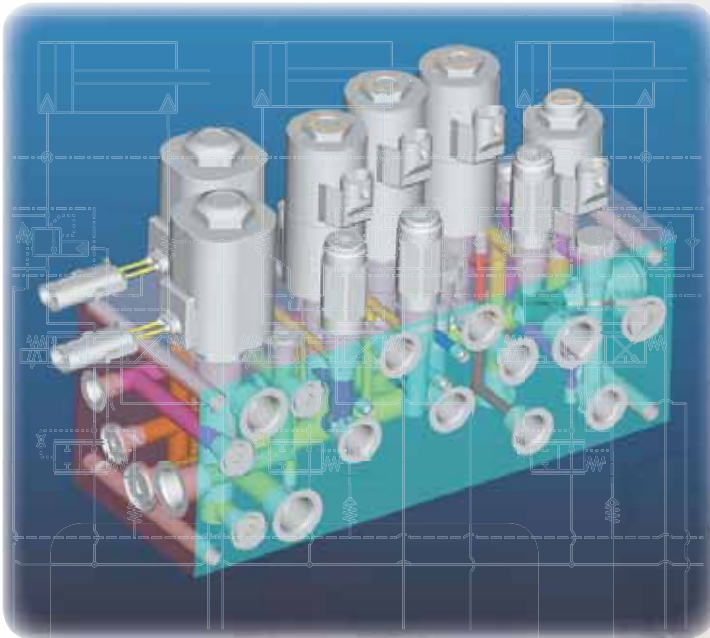




Product Guide

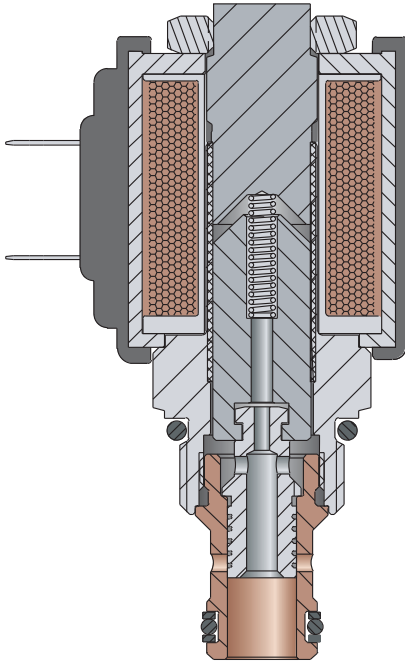
HYDRAFORCE



Hydraulic Cartridge Valves
Manifold Systems
Electronic Controls

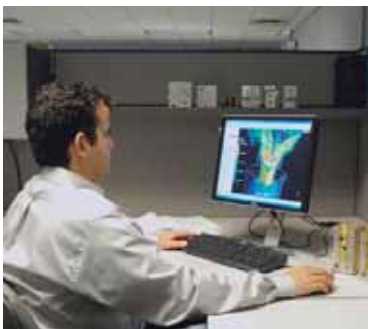
Complete Product Line

HydraForce offers the industry's widest range of high performance hydraulic cartridge valves, manifold assemblies, and electronic controls. Our standard product line includes a full range of directional, pressure and flow control valves for flow rates up to **379 lpm/ 100 gpm** and operating pressures up to **420 bar/6090 psi**.



Engineering Innovation

HydraForce continues to pioneer the development of proportional and electro-proportional hydraulic valves and controls, as well as a growing family of multi-function valves offering lower-cost, more compact hydraulic circuitry. Our engineers are highly recognized for their innovative, high quality, cost-effective valve designs and application solutions.



Latest Technology

HydraForce is now offering a full line of electronic vehicle control products that integrate various machine functions into a common J1939 or CAN Data Link control circuit.



Quality, Reliability

HydraForce products are endurance and performance qualified to ensure reliability in the harsh operating conditions of off-highway, material handling and mobile equipment applications. In addition, valves and manifold assemblies are 100% tested prior to shipment, assuring consistent and reliable performance. Valve components are machined within precise tolerances utilizing the most advanced CNC equipment. HydraForce is recognized and certified by many global equipment manufacturers for superior product quality and reliability, on-time delivery, and world-class technical standards.



Worldwide Support

HydraForce products are marketed and serviced worldwide by a highly qualified and experienced network of international distributors, supported by factory application engineers and customer support specialists.



Custom Manifolds, Accessories and Electronic Controls



System Application Expertise

Custom manifolds consolidate and optimize the many control functions of a machine's hydraulic circuitry. External connections are minimized. Installation time and maintenance are reduced. Valve replacement, when necessary, is fast and easy. All manifolds are 100% circuit logic and function tested. HydraForce produces a wide range of custom valves, manifolds and electro-hydraulic systems for customer-specific applications.

- Steel, aluminum, cast or ductile iron manifold blocks.
- Anodized or zinc plated for protection in severe environments.
- Industry-common valve cavities.
- Fittings, CETOP valves and accessory components can be included.
- "FastTrak" service for quick delivery of a working prototype.
- i-Design Hydraulic System design software available free of charge to qualified users.

Valve Housings

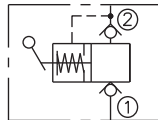
Single cavity housings are available in a wide variety of port sizes for industry-common valve cavity sizes. Anodized aluminum housings are rated up to 240 bar (3500 psi). Steel and ductile iron housings are available in select sizes for high-pressures up to 345 bar (5000 psi).

Custom Manifold Accessories

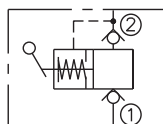
A full line of manifold accessories are available from stock including: cavity plugs, orifice discs, port plugs, orifice plugs, pilot pistons, screen cartridges, as well as cavity form tools and finishing tools.

Hand Pumps

Model HP10-20



Models HPxx-21



HydraForce Valve Size

04
07
08, 38, 58, 98
10, 50, 70
12, 52, 72
16, 76
20
42

Cavity Thread Size

7/16-20UNF-2B
5/8-18UNF-2B
3/4-16UNF-2B
7/8-14UNF-2B
1-1/16-12UN-2B
1-5/16-12UN-2B
1-5/8-12UN-2B
M42 x 2,0-6H

Heavy-Duty Electronic Controls and Complete Machine Control Systems

HydraForce offers a full line of vehicle controls, joysticks, shifters, sensors, monitors, displays and electrical connectors for integrated control applications in mobile, off-highway and material handling and industrial equipment.

- Rugged and reliable in the most demanding mobile equipment applications.
- Operating temperatures from -40 to 110°C.
- Chemical splash immunity.
- Moisture resistance to IP67 specifications.
- Fully resistant to EMI/RFI.
- Vibration resistant to 8 Grms (random) 24-200 Hz, 3-axis.
- CE rated for global application.

NEW HyPerformance™ High Pressure Cartridge Valves



FEATURES:

- 350 bar/5075 psi continuous operating pressure.
- 420 bar/6090 psi intermittent 10% duty cycle tested.
- Fatigue tested to 420 bar/6090 psi for 2 million cycles.
- Flows up to 379 lpm/100 gpm.
- 1000 hour salt spray tested.
- IP69K rated solenoid coils.
- Single-piece, high endurance PPDU Urethane seals rated to 135°C (275°F)
- Vibration tested (3-axis) to 20G RMS.

H-Series High Pressure Valves

rated for 350 bar/ 5075 psi continuous operating pressure

These valves are designed to offer the industry's highest level of valve performance, enabling the most reliable application of cartridge technology in high duty cycle, high horsepower and high-pressure machine applications.

BENEFITS:

High installation torque improves reliability under heavy duty cycle conditions.

Single-piece urethane seals eliminate back-up rings and improve ease-of-installation. Optional fluorocarbon seals with back-up rings.

Modified cavity with bottom shoulder, enhances strength and prevents twisting or binding during installation, assuring accurate and consistent performance.

All High Performance Products are tested to the rigorous NFPA T 2.6.1 standard of 900K cycles at 350 bar/5075 psi and 100K at 420 bar/6090 psi to ensure long-life and superior performance throughout the life of your machine.

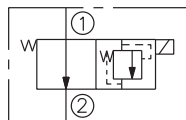
NEW Multi-Function Cartridge Valves

Multiple valve functions are combined in a single cartridge, eliminating some cavities and cross drills, and minimizing the overall size of the manifold envelope. Weight, materials, machining time and overall system costs can be reduced.



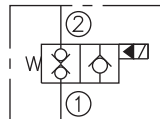
Spool-Type, 2-Way, with Internal Relief

Normally Open
Model SVRV10-26



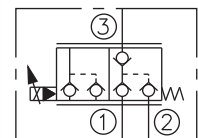
Poppet-Type, 2-Way Blocking w/Outlet Check

Normally Closed
Model SVCV08-20



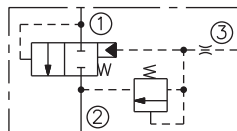
Proportional Directional w/Checks

N.C. w/Check-Isolated Load Sense
Model SPCL10-30



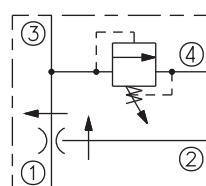
Pilot Logic with Pressure Relief

Model ECR16-S35



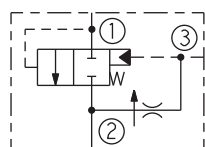
Flow Regulator with Pressure Relief

Priority Type
Models FRRVxx-41F



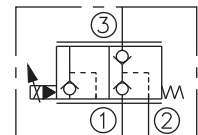
Pressure-Compensated Logic w/Flow Regulation

Models EPFRxx-(s)35



N.C. w/Non-Isolated Load Sense

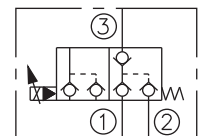
Model SPCL10-32



On/Off Directional w/Checks

N.C. w/Check-Isolated Load Sense

Model SVCL10-30



Solenoid-Operated On/Off Valves

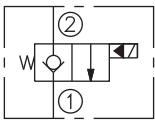


- Continuous-duty coils with a wide range of voltages, terminations and diode options.
- Designed for mobile operating environments including low-voltage, high and low temperatures, and exposed environmental conditions.
- Industry-common cavity sizes -07, -08, -10, -12, -16, -20, as well as drop-in-style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

Poppet-Type, 2-Way Valves

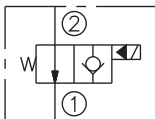
Normally Closed

Models SVxx-20, SF08-20



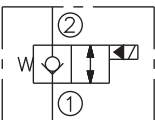
Normally Open

Models SVxx-21, SF08-21



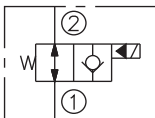
Normally Closed with Reverse Flow Energized

Models SVxx-22, SL08-22 and SFxx-22



Normally Open with Reverse Flow Energized

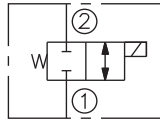
Models SVxx-23, SFxx-23



Spool-Type, 2-Way Valves

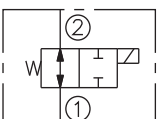
Normally Closed

Models SVxx-24



Normally Open

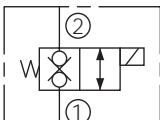
Models SVxx-25



Poppet-Type, 2-Way Blocking Valves

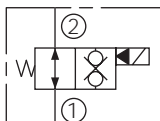
Normally Closed

Models SVxx-26, SVxx-28



Normally Open

Models SVxx-29

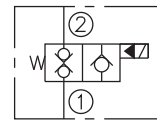


Poppet-Type, 2-Way Blocking Valves (cont'd.)

Normally Closed with Outlet Check

Model SVCV08-20

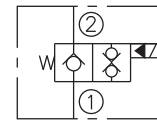
Multi-Function



Normally Open with Outlet Check

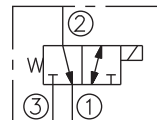
Model SVCV08-21

Multi-Function

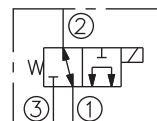


Spool-Type, 3-Way Valves

Model SVxx-30

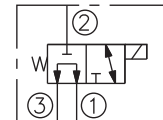


Models SVxx-31

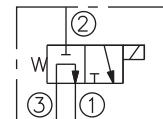


Spool-Type, 3-Way Valves (cont'd.)

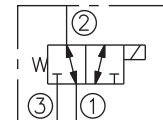
Models SV08-33, SV12-33



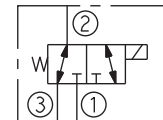
Model SV10-33



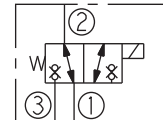
Models SVxx-34



Models SVxx-35



Model SV38-38



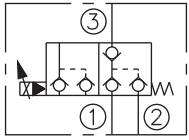
Solenoid-Operated On/Off Valves

Poppet-Type, 3-Port Blocking Valves

Normally Closed w/Check-Isolated Load Sense

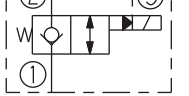
Model SVCL10-30

Multi-Function



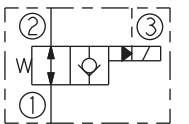
Normally Closed

Model SV20-S38



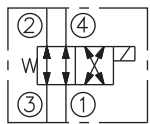
Normally Open

Model SV20-S39

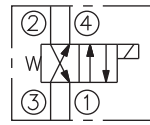


Spool-Type, 4-Way, 2-Position Valves

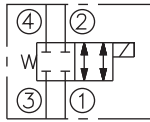
Model SVxx-40



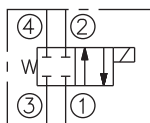
Model SV12-40R



Models SVxx-41

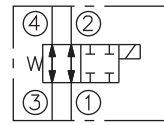


Model SV12-41

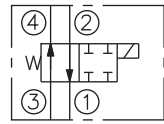


Spool-Type, 4-Way, 2-Position Valves (cont'd.)

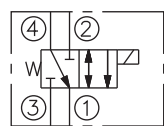
Models SV08-42, SV10-42



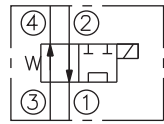
Model SV12-42



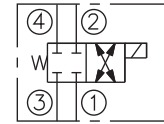
Models SVxx-43



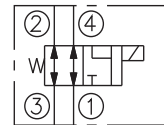
Models SVxx-44



Model SV08-45



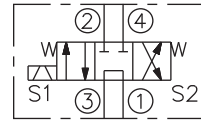
Model SV08-46



Spool-Type, 4-Way, 3-Position Valves

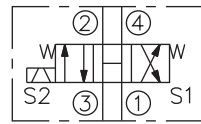
Tandem Center

Models SVxx-47A



Open Center

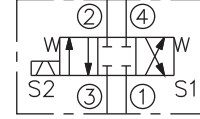
Models SVxx-47B



Spool-Type, 4-Way, 3-Position Valves (cont'd.)

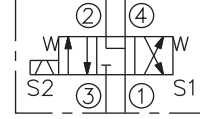
Closed Center

Models SVxx-47C

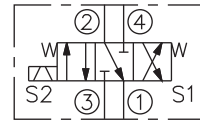


"Motor" Spool

Models SVxx-47D

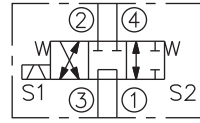


Model SV08-47E



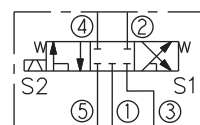
Modified Tandem Center

Model SV10-47F

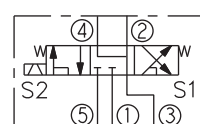


Spool-Type, 5-Way, 3-Position with Load Sense Port

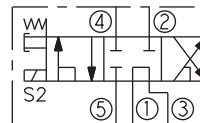
Model SV10-57C



Model SV10-57D

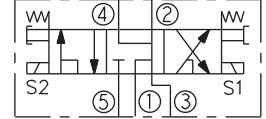


Model SVxx-58C



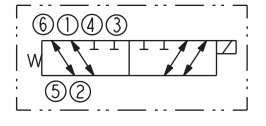
Spool-Type, 5-Way, 3-Position with Load Sense Port (cont'd.)

Model SVxx-58D



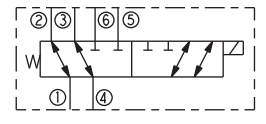
Spool-Type, 6-Way, 2-Position Valves

Model SV12-60



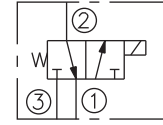
for Selector or Series/Parallel Drive Circuits

Model SV80-61

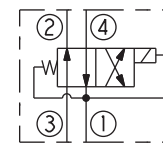


Spool-Type, 2-Position Drop-In Style Valves

3-Way: Model SV98-T39



4-Way: Model SV98-T40

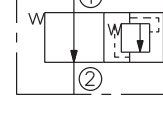


Spool-Type, 2-Way with Internal Relief

Normally Open

Model SVRV10-26

Multi-Function



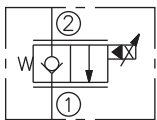
Electro-Proportional Valves



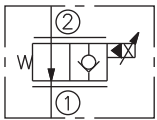
- Designed for reliability in mobile machinery applications and in exposed environmental conditions.
- Excellent linearity and low hysteresis.
- Hardened precision spools and cages for long life.
- Industry-common cavity sizes enable interchangeability with non-proportional valves.
- Drop-in-style, sealed,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

Proportional Directional Control, 2-Way

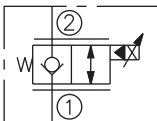
Normally Closed
Models SPxx-20



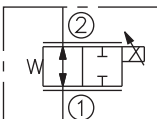
Normally Open
Models SPxx-21



Normally Closed, Bi-Directional
Model SP08-22

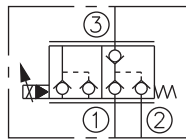


Normally Open, Bi-Directional
Model SP08-25

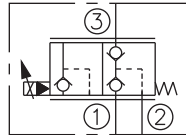


Proportional Directional 3-Port, Normally Closed

Check-Isolated Load Sense
Model SPCL10-30
Multi-Function

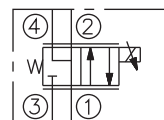


Non-Isolated Load Sense
Model SPCL10-32
Multi-Function

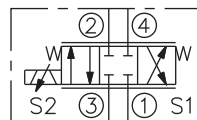


Proportional Directional Control, 4-Way

2-Position, Normally Closed
Models SPxx-46R

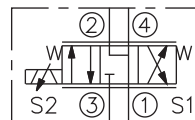


3-Position, Closed Center
Models SPxx-47C, SP08-47CL



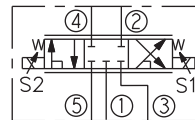
Proportional Directional Control, 4-Way (cont'd.)

3-Position, "Motor Spool"
Models SPxx-47D, SP08-47DL

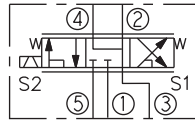


Proportional Directional Control, 5-Way

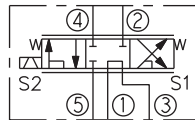
3-Position, Load Sense
Models SP10-57C



3-Position, Load Sense
Models SPxx-57D

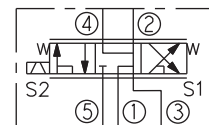


3-Position, Brake Release
Models SP10-58C



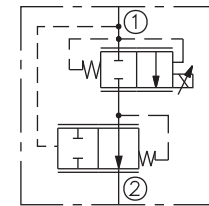
Proportional Directional Control, 5-Way (cont'd.)

3-Position, Brake Release
Models SPxx-58D

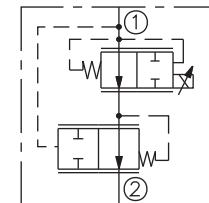


Proportional Flow Control 2-Way

Restrictive, Normally Closed
Model PV72-20



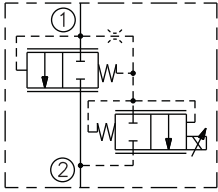
Restrictive, Normally Open
Model PV72-21



Electro-Proportional Valves

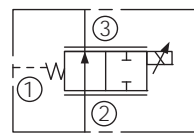
Proportional Flow Control 2-Way (cont'd.)

Normally Closed
Model PV16-23



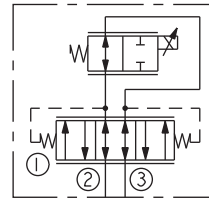
Proportional Flow Control 3-Way (cont'd.)

Normally Open
Models PV70-35, PV72-35



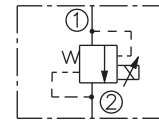
Proportional Flow Control Bi-Directional (cont'd.)

Normally Open
Models ZL70-31, ZL72-31



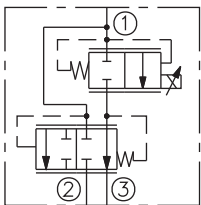
Proportional Pressure Control, Relief (cont'd.)

**Pilot-Operated Relief,
Decreasing Pressure
with Increasing Current**
Model TSxx-27



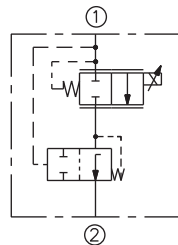
Proportional Flow Control 3-Way

Bypass, Normally Closed
Models PVxx30, PV76-30A

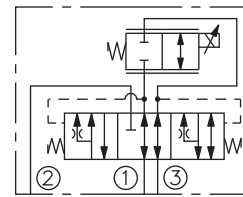


Proportional Flow Regulators, Pressure Compensated

2-Port, Normally Closed
Models PFR7x-33x

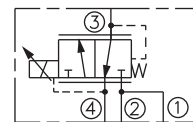


Normally Closed
Models ZL70-36, ZL72-36



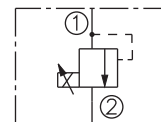
Proportional Pressure Control Valves, Reducing/Relieving

Internal Pilot Operated
Models TS98-30
and TS98-T34 (Drop-In Type)

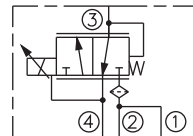


Proportional Pressure Control, Relief

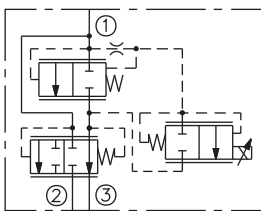
**Increasing Pressure
with Increasing Current**
Models TSxx-20



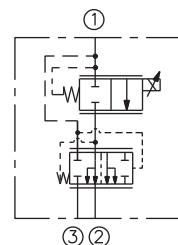
Internal Pilot Operated
Model TS90-31



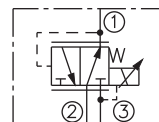
Bypass, Normally Closed
Model PV42-M30



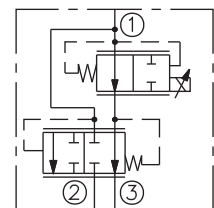
**3-Port, Normally Closed
Priority Bypass**
Models PFR7x-33x



Pilot Operated
Models TSxx-36

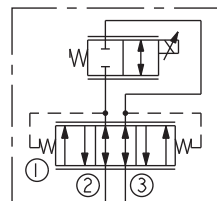


Bypass, Normally Open
Models PVxx-31, PV76-31A

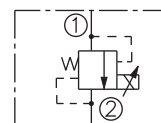


Proportional Flow Control Bi-Directional

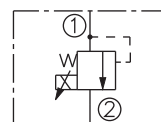
Normally Closed
Models ZL70-30, ZL72-30



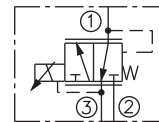
**Decreasing Pressure
with Increasing Current**
Model TS38-21



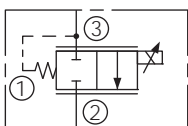
**Pilot-Operated Relief,
Increasing Pressure
with Increasing Current**
Models TSxx-26



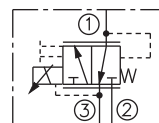
Direct Operated
Model EHPR08-33
and EHPR98-T33 (Drop-In Type)



Normally Closed
Models PV70-33, PV72-33



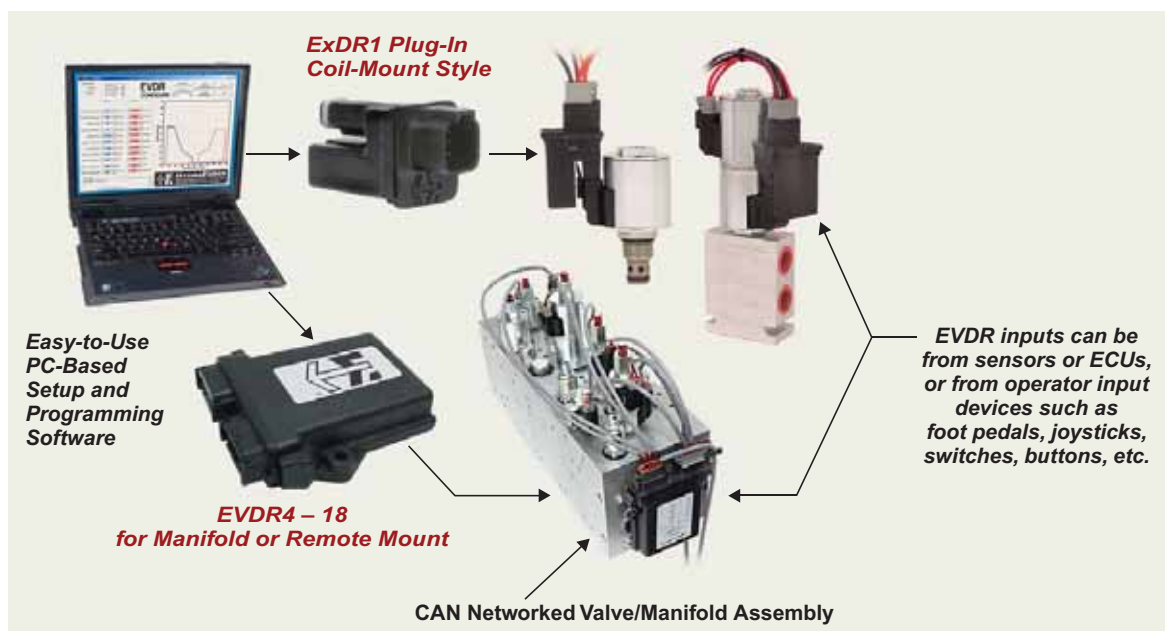
Direct Operated, Drop-In Type
Model EHPR98-T35
and EHPR98-T38



Heavy Duty Electronic Machine Control Systems

Rugged, Reliable Electro-Hydraulic Controllers and Systems

PC-Programmable EVDR controllers, heavy-duty ECU machine controllers, proportional fan controllers and proportional valve drivers, support a wide range of machine control installations.



EVDR1, EFDR1, ETDR1 Plug-In-Style Controllers for Valve Coil Mounting

The EVDR1 is a general-purpose PC-programmable controller for HydraForce proportional directional, flow or pressure control valves.

EFDR1 for proportional fan drive control, and ETDR1 for transmission control applications.

ExDR1-type controllers are designed for convenient plug-in coil mounting on valve coils with the Deutsch electrical connector.



EVDR4 and EVDR5 can drive four proportional and one on/off valve with customer-programmable interface. The EVDR4 is stand-alone. The EVDR5 uses a CAN communications interface.

EVDR6 Operates six on/off coils using J1939 CAN Communications port.

EVDR7 Operates two proportional or on/off valves and provides up to four 5V references.

EVDR9, EVDR10 and EVDR18 CAN expansion modules provide up to nine networked outputs and ten to eighteen inputs using a J1939 interface.



EFDR2 and EFDR3 Multi-Input Fan Drive Controllers provide full cooling system control for your hydrostatic fan drive.

The EFDR2 receives up to three temperature inputs and an on/off input via RS232 communications to provide optimal control of a proportional Fan Drive valve and a Solenoid reversing valve.

The EFDR3 receives up to three temperature inputs via CAN/J1939 communication and up to three analog inputs to provide optimal control of a proportional Fan Drive valve and a Solenoid reversing valve.



ECU Heavy-Duty Machine Controllers

Customer-programmable or HydraForce-programmable using an intuitive function-block-style software programming tool.

Rugged and reliable in the most demanding mobile equipment applications.

Environmentally-sealed with chemical splash immunity.

Vibration resistant to 8 Grms; Temperature range from -40°C to 100°C.

Tested for resistance to EMI/RFI.

Model ECU-MS: 25 inputs; 12 or 20 outputs.

Model ECU-MM: 44 inputs; 20 outputs.

Model ECU-ML: 72 inputs; 26 outputs.

Directional Valves

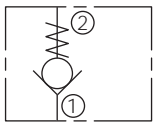


- Industry-common cavity sizes -04, -08, -10, -12, -16, -20 and -42.
- Hydraulically piloted or manually-operated directional and logic valves enable circuit flexibility and performance optimization.
- Proportional, piloted 3-position, 4-way directional valves for flow rates up to 170 lpm/45 gpm.
- Hardened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

Check Valves

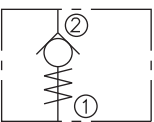
Check, Guided

Models CVxx-(B)20, CV42-M20, and HCVxx-(M)20



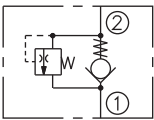
Guided, Reverse Flow Direction

Models CVxx-21, CV10-23, CV10-24



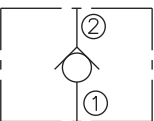
Guided, with Thermal Relief

Models CV10-28



Check Valve Discs

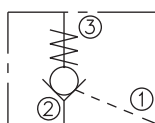
Models CVD08, CVD10



Pilot-Operated Check Valves, Lock Valves

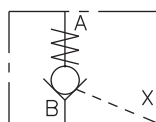
Check, Pilot-to-Open

Models PCxx-30, PC10-32



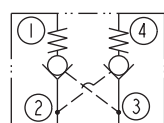
Check, Pilot-to-Open, In-Line Plumbed Valve

Models PCVxx



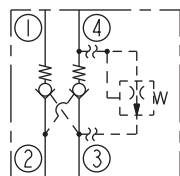
Check, Dual Pilot-to-Open

Model DC08-40



Check, Dual Pilot-to-Open with Optional Thermal Relief

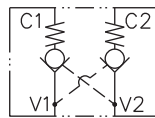
Model DC10-40



Pilot-Operated Check Valves, Lock Valves (cont'd.)

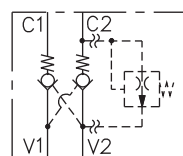
Check, Dual Pilot-to-Open, In-Line Plumbed

Models DCV08, DVC12



Lock Valve with Thermal Relief Option, In-Line Plumbed

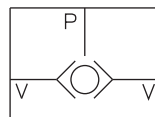
Model DCV10



Load Shuttle Valves

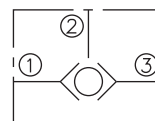
Ball-Type, In-Line Plumbed

Model LSV1



Ball-Type

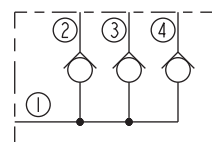
Models LSxx-(B)30



Load Shuttle Valves (cont'd.)

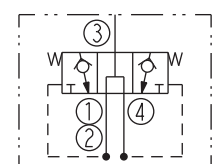
Network

Model LS10-40



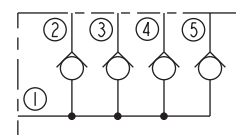
Inverted

Model LS10-41



Network

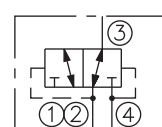
Model LS10-50



Low Side (Hot Oil) Shuttle Valves

Normally Closed, Springless

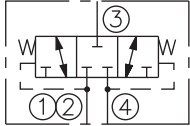
Models HSxx-42



Directional Valves

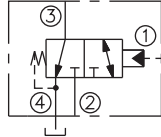
Low Side (Hot Oil) Shuttle Valves (cont'd.)

Spring Centered
Models HS5x-43



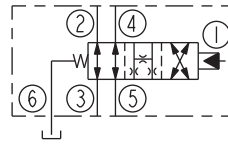
Piloted, 3-Way Spool, Vented (cont'd.)

Internal Vent
Models PDxx-(M)41



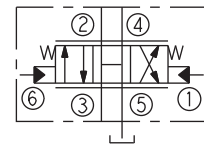
Piloted, 4-Way Spool, with Vented Spring

Model PD12-S60N



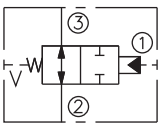
Piloted, 4-Way Spool Valves

Model PD42-S67B

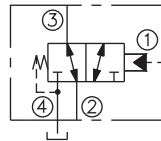


Piloted, 2-Way Spool, Vented

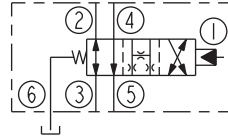
Normally Open, External Vent
Models PDxx-30



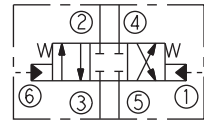
Internal Vent
Models PDxx-(M)42



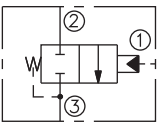
Models: PD16-S60N, PD42-S60N



Model PD16-S67C

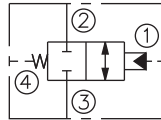


Normally Closed, Internal Vent
Models PDxx-32

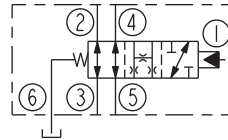


Piloted, 2-Way Spool, Ported Vent

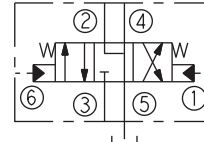
Models PDxx-44



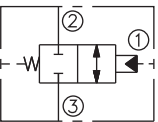
Model PD12-S61N



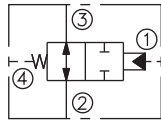
Model PD16-S67D



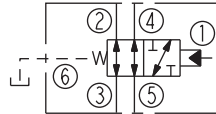
Normally Closed, External Vent
Models PDxx-34



Models PDxx-(M)45

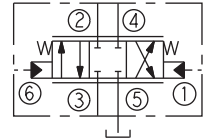


Model PD16-S61N

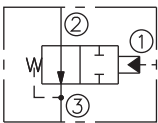


Pilot Operated, Proportional Valves

Models PExx-S67C

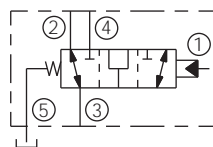


Normally Open, Internal Vent
Models PDxx-35

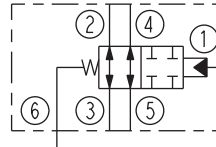


Piloted, 3-Way Spool, Ported Vent

Model PD10-50

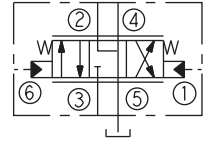


Model PD10-S62



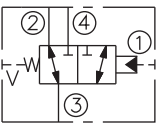
Meter-In and Meter-Out

Models PExx-S67D

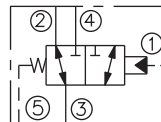


Piloted, 3-Way Spool, Vented

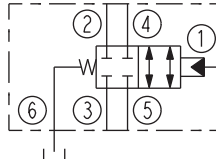
External Vent
Models PDxx-(M)40



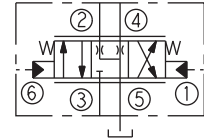
Model PDxx-S50



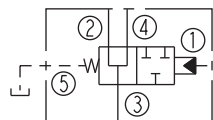
Model PD16-S63



Models PExx-S67H

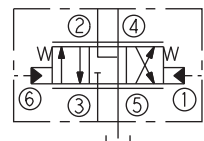


Model PD16-S51



Meter-In Only

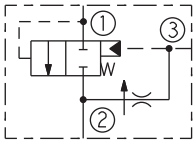
Models PExx-S67K



Directional Valves

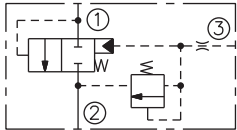
Pressure-Compensated Logic Elements

with Flow Regulator
Models EPFRxx-(S)35
Multi-Function

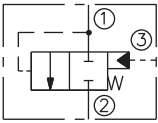


Piloted Logic Elements

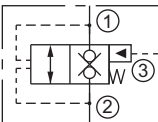
with Pressure Relief
Models ECR16-S35
Multi-Function



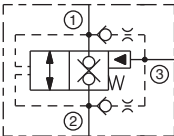
Spool-Type
Models EPxx-(S)35
and HEP42-S35



Poppet-Type
Models EPxx-S38

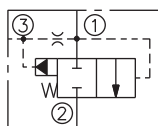


Poppet-Type, Vented, with Two Built-In Checks
Model EP20-S39



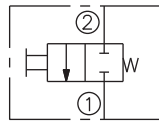
Vented, Spool-Type Logic Elements

Models EVxx-(S)34, HEV42-S34



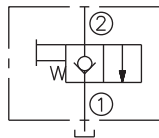
Manually-Operated, 2-Way Valves

Model MV08-22



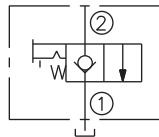
Spring Return, Pull-to-Open, Normally Closed

Models MP08-20, MP10-20
Lock Position Option on 10-size



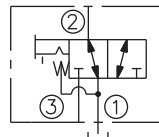
Spring Return, Pull-to-Open, Normally Closed

Models MP10-22
with Lock Position Option

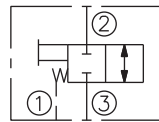


Manually-Operated, 3-Way Valves

Spring Return, Pull-to-Shift
Model MPxx-30
with Lock Position Option

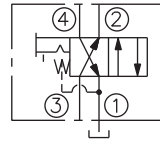


Spring Return, Pull-to-Shift
Model MP08-34

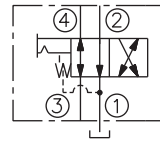


Manually-Operated, 4-Way Valves

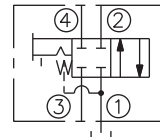
Spring Return, Pull-to-Shift
Model MPxx-40
with Lock Position Option



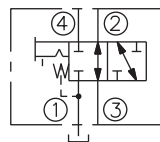
Spring Return, Push-to-Shift
Model MD10-40



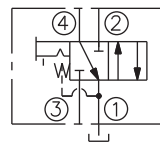
Spring Return, Pull-to-Shift
Model MPxx-41
with Lock Position Option



Spring Return, Pull-to-Shift
Model MP10-42
with Lock Position Option

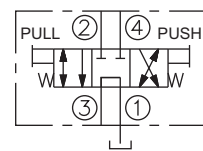


Spring Return, Pull-to-Shift
Model MP10-43
with Lock Position Option

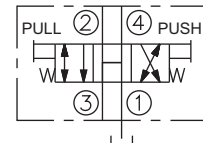


Manually-Operated, 3-Position, 4-Way Valves Pull/Shift

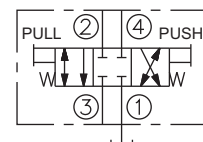
Tandem Center
Model MP10-47A



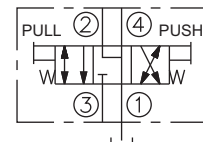
Open Center
Model MP10-47B



Closed Center
Model MP10-47C

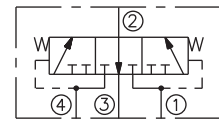


"Motor Spool"
Model MP10-47D

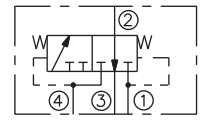


Brake Release Valves

Model BV10-40



Model BV10-42

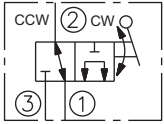


Directional Valves

Manual Rotary Valves, 3-Way

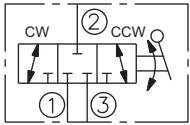
2-Position

Model MR10-31



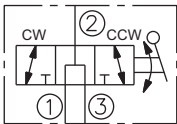
3-Position

Model MR10-37A
with Spring Center Option



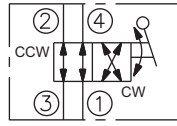
3-Position

Model MR10-37B
with Spring Center Option

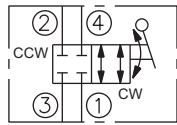


Manual Rotary Valves, 4-Way, 2-Position

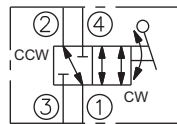
Model MR10-40



Model MR10-41



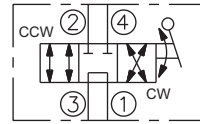
Model MR10-43



Manual Rotary Valves, 4-Way, 3-Position

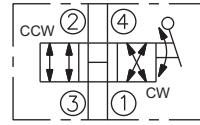
Tandem Center

Model MR10-47A
with Spring Center Option



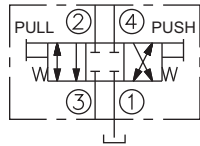
Open Center

Model MR10-47B
with Spring Center Option



Closed Center

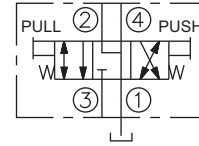
Model MR10-47C
with Spring Center Option



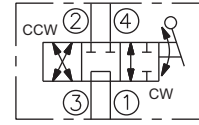
Manual Rotary Valves, 4-Way, 3-Position (cont'd.)

"Motor Spool"

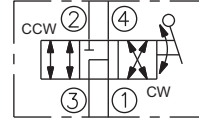
Model MR10-47D
with Spring Center Option



Model MR10-47F
with Spring Center Option



Model MR10-47G
with Spring Center Option



Flow Control Valves

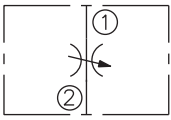


- Variable or fixed orifice restrictor valves.
- Pressure-compensated flow regulators.
- Pressure compensators for restrictive, bypass and priority circuits, with load-sensing system compatibility.
- Optional settings and adjustment styles available.
- Flow dividers/combiners for cylinder synchronizing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

Needle Valves and Rotary Flow Control

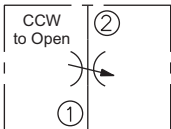
Needle Valves

Models NVxx-20, NV10-22



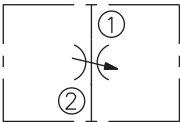
Rotary Flow Control

Model MR10-20



Needle Valves, Fine Adjustment

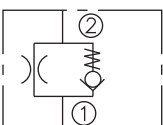
Model NVxx-21



Flow Control, Free Flow

Port 1 to Port 2

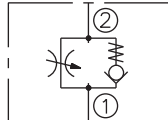
Model FC08-20F



Flow Control, Free Flow (cont'd.)

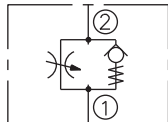
Port 1 to Port 2

Model FCxx-20



Port 2 to Port 1

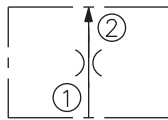
Model FC10-21



Flow Regulators, Pressure Compensated

Fixed Setting

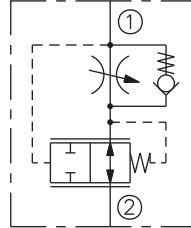
Model FRxx-20F



Flow Regulators, Restrictive, Adjustable

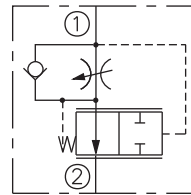
Pressure Compensated

Models FR50-23, FR50-28



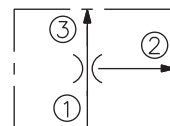
Adjustable Orifice

Model FR12-23



Flow Regulators, Priority Bypass, Pressure Compensated, Fixed Setting

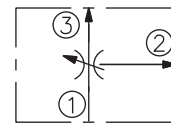
Models FRxx-30F



Flow Regulators, Pressure Compensated, Adjustable

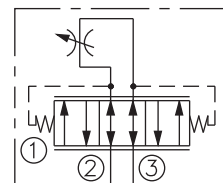
Priority Bypass, Limited Range Adjustable

Model FR10-30A



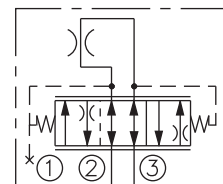
Bi-Directional

Model FRxx-32



Flow Regulator, Fixed Orifice, Bi-Directional

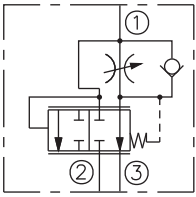
Model FR10-32F



Flow Control Valves

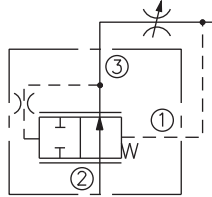
Bypass Flow Control, Adjustable Orifice

Models FRxx-33, FR10-39



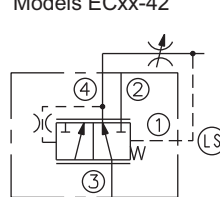
Pressure Compensators (cont'd.)

Model ECxx-32



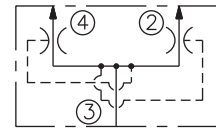
Pressure Compensators, Load Sensing

Priority Type
Models ECxx-42



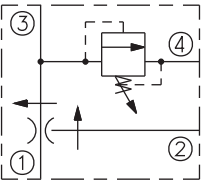
Flow Dividers, Combiners

Models FDxx-40

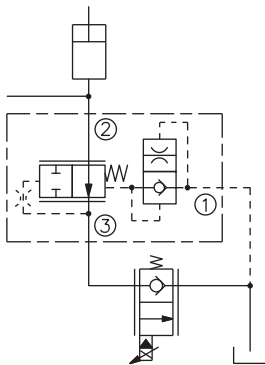


Flow Regulator with Pressure Relief

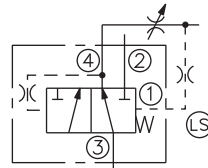
Priority-Type
Models FRRVxx-41F
Multi-Function



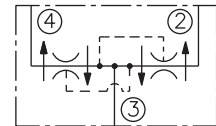
with Damping and Load-Holding
Model ECxx-34



Priority-on-Demand Static Load Sense
Model EC42-M42

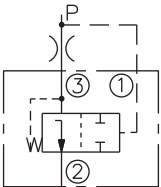


Cylinder Synchronizing
Models FDxx-41

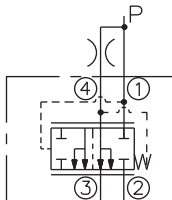


Pressure Compensators

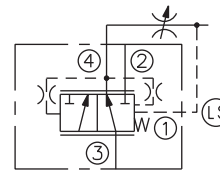
Spool Element
Models ECxx-30



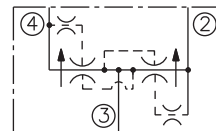
Priority Bypass Spool Element
Models ECxx-40, EC42-M40



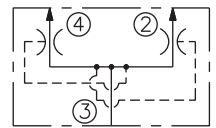
Dynamic Load Sense
Models ECxx-43



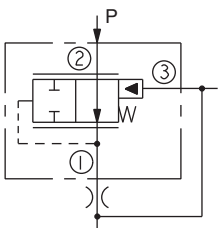
Anti-Stall
Models FDxx-42



Heavy Duty, High Pressure
Models FD50-44, FD5x-45



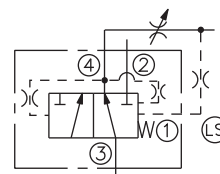
Model EC10-S31



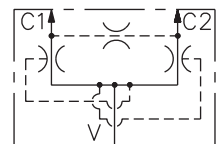
Priority Bypass Spool Element, Line Plumbed Body
Model ECV10-44



Dynamic Load Sense, Priority-On-Demand
Model EC42-M43



with Balance Orifice
Model FDC16



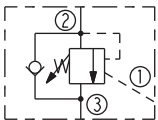
Pressure Control Valves



- 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.
- Operating pressures up to 350 bar/5075 psi.
- Optional spring ranges and adjustment styles.

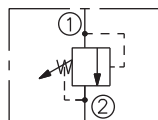
Motion Control Valve, Pilot-Operated

Model CB10-30



Relief Valves, Spool-Type Pilot-Operated

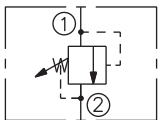
Models RVxx-26



Relief Valves, Poppet-Type

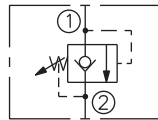
Direct-Acting

Models RVxx-20, RV08-29, and RVD50-20



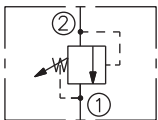
Pilot-Operated with Reverse Check

Model RV10-28



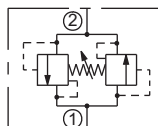
Differential Area Poppet, Port 2 to 1

Models RVxx-22



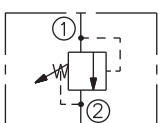
Relief Valves, Bi-Directional

Model CR10-28

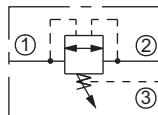


Differential Area Poppet, Port 1 to 2

Models RV10-23



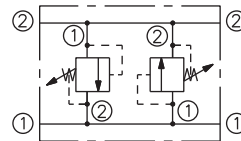
Model CR08-38



Cross-Over Relief Valves

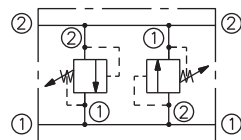
Direct-Acting Poppet

Models CRVxx-20



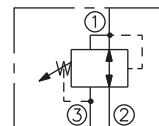
Differential Area Poppet

Models CRVxx-22



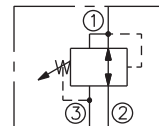
Pressure Reducing/Relieving Valves (cont'd.)

Models PRxx-32



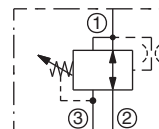
Pilot-Operated

Models PRxx-36



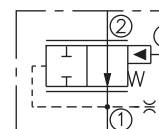
Spool-Type, Damped, Direct-Acting

Models PR5x-38



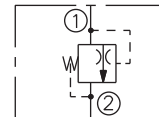
Pressure Reducing Logic Element

Models ERxx-S30



Thermal Relief Valve

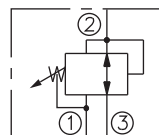
Model TR04-B20



Pressure Reducing/Relieving Valves

High Pressure

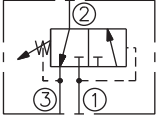
Models PRES50-30



Pressure Control Valves

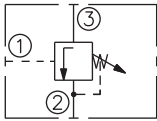
Sequence Valves with Pilot and Internal Vent

Internal Pilot and Vent
Models PSxx-30, PS10-31

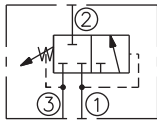


External Pilot and Internal Vent

Models PSxx-32, PS10-33

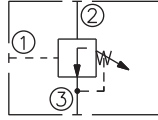


Internal Pilot and Vent
Model PS10-34



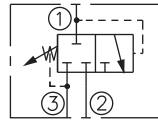
Sequence Valves with Pilot and Drain

External Pilot, Internal Drain
Models PSxx-35

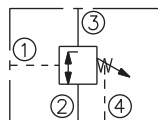


Internal Pilot-Operated, External Drain

Models PSxx-36

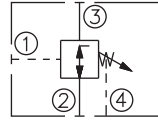


Normally-Closed, External Pilot and Drain
Models PSxx-40

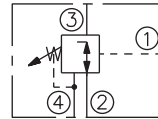


Sequence Valves with External Pilot

Normally-Open, External Pilot and Vent
Model PS10-41

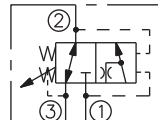


Model PS10-43

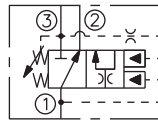


Sequence Valves, Kick Down

Model KS10-30

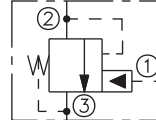


Internal Pilot
Model KS10-31

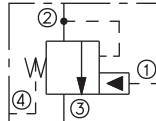


Unloading Pilot Valves

Internal Drain
Models UP10-31



Remote Sequence
Model UP10-40



HYDRAFORCE *Product Guide*

For twenty-five years, HydraForce has been producing high-performance hydraulic and electro-hydraulic control products for both in-plant equipment and for mobile machinery. Our products are designed to provide superior reliability and performance under the demanding duty-cycle requirements of the heavy-duty industrial equipment markets, as well as the severe environmental conditions of the off-highway and mobile equipment markets. Customer visits are always welcomed.

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- **Construction and Road-Building Equipment**
- **Material Handling and Man-Lift Equipment**
- **Transmission, Engine and Power Train Controls**
- **Forestry and Resource Management Equipment**
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- **Injection Molding and Press Machinery**
- **Other Specialized Mobile and Industrial Applications**



Main headquarters, engineering and manufacturing facility in Lincolnshire Illinois, just north of Chicago.



Precision machining facility in Lincolnshire, Illinois.



European headquarters, engineering and manufacturing facility in Birmingham, England.



Complete, up-to-date info. at www.hydraforce.com

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