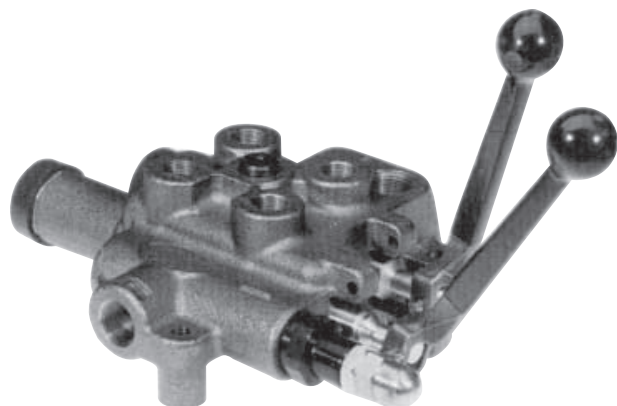




Series SSK

Bulletin HY14-2715-B1/US

Series SP, SPK and SSK Monoblock Control Valves

Effective: February 1, 2004
Supersedes: Cat. No. GPD-1051 dated 5/98

Features

- Monoblock body design
- Available in parallel (SP & SPK) or series (SSK) configurations
- Available in 1-, 2-, or 3-spool versions (model SSK available in 2-spool only)
- Adjustable or non-adjustable ball/spring type relief valve. Optional differential poppet, main relief valve available.
- Built-in, reverse flow check — one check for 'A' port circuit and one for 'B' port circuit in series SP and SPK (one for each spool in series SSK)
- Control handles may be mounted in 'up' or 'down' position
- Numerous spool positioner options available
- (Optional) power-beyond conversion, port outlet available

Specifications

Nominal Flow RatingUp to 20 GPM (76 lpm)

Operating Pressure (maximum)
Continuous Operating2000 PSI (138 bar)
Exhaust Core500 PSI (34,5 bar)

Operating Temperature-40°F (-40°C) to +176° (+80°C)

Available Port Sizes
Inlet & OutletSAE 12, 3/4" NPT
Work PortsSAE 10, 1/2" NPT
Power BeyondSAE 10, SAE 12, 3/4" NPT

FluidPetroleum Based, 60-1000 SSU (10-216 cSt)

Filtration Required (minimum)33 micrometer nominal

Number of SpoolsSP and SPK (1-, 2-, or 3-Spool)
.....SSK (2-Spool only)

Shipping Weight (approx.)
1-spoolSP Approx. 15.5 lbs. (7,03 kgs)
1-spoolSPK Approx. 17.5 lbs (7,94 kgs)
2-spoolAll Models Approx. 24 lbs. (10,89 kgs)
3-spoolSP Approx. 32.5 lbs. (14,74 kgs)
3-spoolSPK Approx. 29.5 lbs. (13,38 kgs)

Seals(Standard) Buna-N (Optional) Viton

Mounting PositionNot Restricted

DESCRIPTION

Model SP

Model SP Monoblock Type Directional Control Valve is manufactured to give outstanding, long-lasting performance. Spools are hone-fitted for above average 'load-hold' characteristics.

Model SP Valves are available either 3-way (single-acting), 4-way (double-acting) 4-way free flow (motor) or with combinations of each.

Monoblock valve housings are available in 1-, 2-, or 3-spool configurations. Optional spools, bonnet assemblies and ports are available on special order.

Model SPK

Model SPK Monoblock Type Directional Control Valve is available in 1-, 2-, or 3-spool configurations. The No. 1 spool is always a 4-way float spool. Spools No. 2 and No. 3 are either 3-way or 4-way, the same as in the SP valve.

The float spool is the same as the 4-way, 3-position spool, with the addition of a fourth 'Float' position. When in 'Float' position, the pump flow is directed to the tank through the open center core. Both work ports are open to the tank.

The float spool is spring-centered to Neutral in three positions. The fourth position is a detented 'Float' position which allows a cylinder to 'Float' or a motor to 'Free Wheel'.

Applications for valves with 'Float' positions include bulldozers, loaders, snow plows and other types of equipment that require a combination of both 'Float' and 'Hold' operations.

Model SSK

Model SSK Monoblock Type Directional Control Valve is designed for Series Circuit Operation, which allows simultaneous operation of two cylinders or motors by directing the discharge oil from the cylinder or motor controlled by the No. 1 spool to the cylinder or motor controlled by the No. 2 spool.

The No. 1 spool of the Model SSK valve is a 4-way, 4-position float spool as described in the Model SPK. The No. 2 spool is a 4-way, 3-position spool with spring return to neutral from power positions.

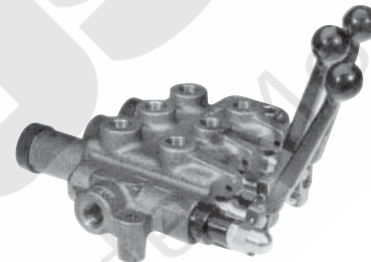
In the SSK valve, pressure is additive. The sum of the pressures required by both sections cannot exceed the main relief valve setting or pump pressure capability. If the cylinder controlled by spool No. 1 is fully retracted or extended, pump flow will go over the main relief and will not be available to spool No. 2.

The Model SSK may be used in any Open Center circuit where it is necessary to actuate two different functions simultaneously.

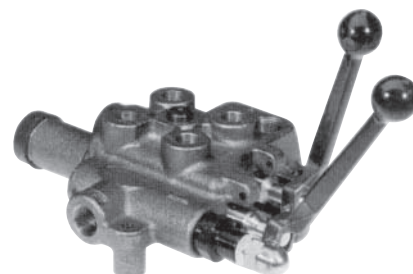
Note: The Model SSK CANNOT BE USED in 'Closed Center' hydraulic circuits.



Model SP (2-Spool)

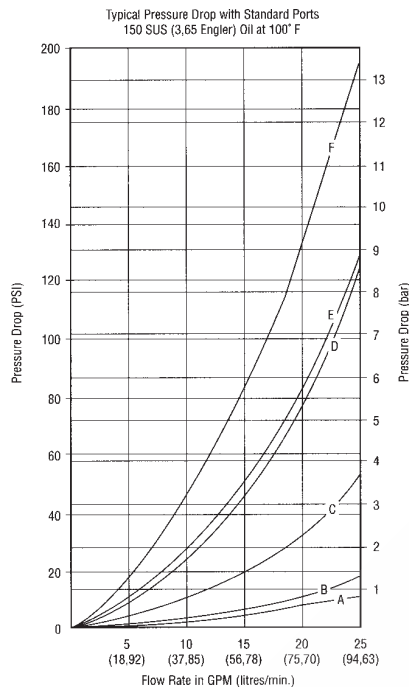


Model SPK (2-Spool)



Model SSK

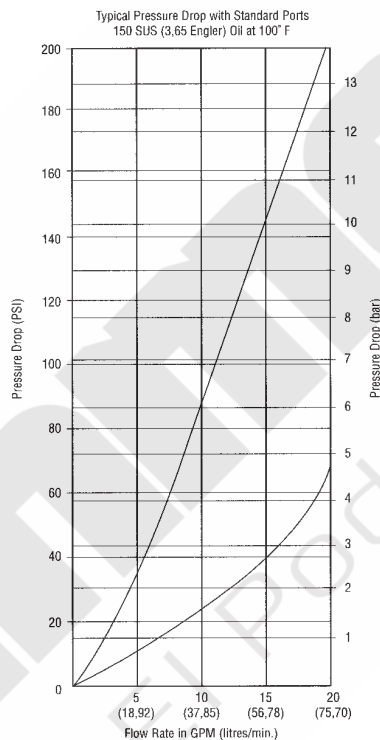
PERFORMANCE CURVES



Model SPK

PRESSURE DROP THRU OPEN CENTER	
A	1-Spool Valve
B	2-Spool Valve
C	3-Spool Valve

MAXIMUM PRESSURE DROP THRU VALVE (One spool in "Power Position")	
A	1-Spool Valve
B	2-Spool Valve
C	3-Spool Valve



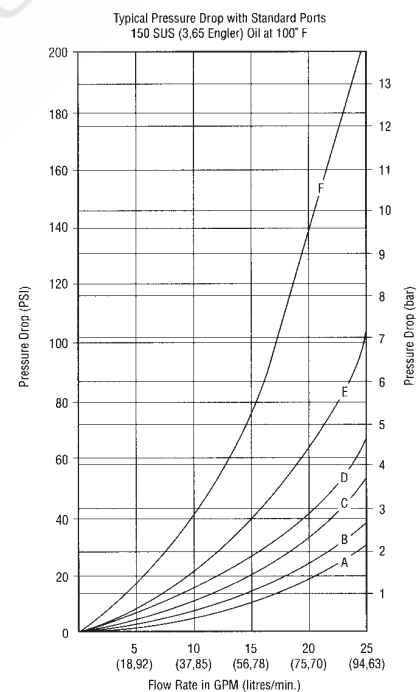
Model SSK

A PRESSURE DROP THRU OPEN CENTER	
B MAXIMUM PRESSURE DROP THRU VALVE (One Spool in "Power Position")	

Model SP

PRESSURE DROP THRU OPEN CENTER	
A	1-Spool Valve
B	2-Spool Valve
C	3-Spool Valve

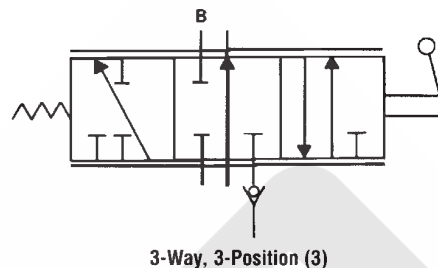
MAXIMUM PRESSURE DROP THRU VALVE (One spool in "Power Position")	
A	1-Spool Valve
B	2-Spool Valve
C	3-Spool Valve



SPOOL OPTIONS

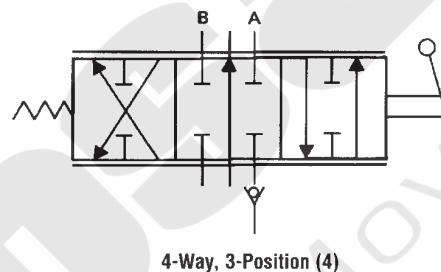
3-Way (Spool Code '3')

For control of single acting cylinders or starting and stopping non-reversible hydraulic motors where free-wheeling is not required. The work port is blocked in the neutral position.



4-Way (Spool Code '4')

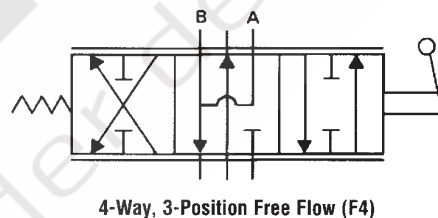
For control of double acting cylinders or reversible hydraulic motors where floating a cylinder or motor free-wheeling is not required. Both work ports are blocked in the neutral position.



4-Way Free Flow (Spool Code 'F4')

For control of double acting cylinders or reversible hydraulic motors. Because both work ports are open to tank in the neutral position, free flow spools will allow a motor to coast.

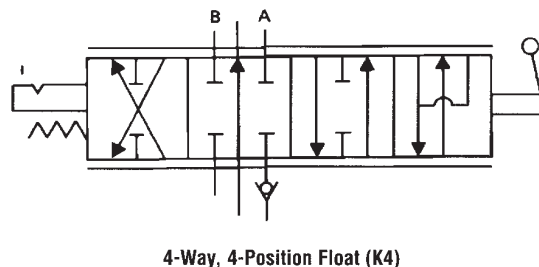
Warning: If you are using the free flow 'F4' spool configuration when installing a Model SP, SPK, or SSK directional control valve in a cylinder lift application, it must be used in conjunction with a load holding device. A load holding device will prevent the load from free falling when the spool is in the neutral position. A free falling load could cause serious bodily injury or property damage if the holding device is not installed. Be sure to clear the work area prior to testing the cylinder lift application to avoid a potential dangerous situation.



4-Way Float (Spool Code 'K4')

This spool is the same as the 4-Way spool with the addition of a fourth "Float" position. It is spring-centered to neutral from the "A" and "B" power positions. The fourth position is the detented "Float" position which allows a cylinder to float or a hydraulic motor to free wheel.

The "float" option is available for the No. 1 spool of Models SPK and SSK directional control the valves only.



SPOOL POSITIONER OPTIONS

Spring-Centering Positioner (No Code)

Furnished as standard, unless otherwise specified. This option spring returns the valve spool to neutral from the "A" and "B" power positions when the handle is released.

Spool Travel Limiter (Code 'L')

This option may be used to limit the spool travel 'In' to a very fine degree, allowing a restricted amount of pressurized oil to pass through 'A' port of the control valve to the cylinder or motor. This makes possible a regulated speed of operation. Used with the standard Spring Centering or Spring Extended Spool options.

If used in conjunction with a 3-way spool (for single-acting operation), the 'A' port is plugged and 'B' port only is used. Therefore, the Spool Travel Limiter would restrict exhausting oil from work port 'B' to tank.

3-Position Detent Positioner (Code 'D')

This option 'detents' the valve spool in neutral and the 'A' and 'B' power positions. There is no spring to return the valve spool to neutral. The valve spool will remain in the position in which it was manually placed when the handle is released.

This option is NOT intended for use as a positive spool locking device against excessive external forces or machine vibration.

(Optional) Detent Stops are available to limit spool travel to two detented positions, either Neutral and Spool In or Neutral and Spool Out.

4-Position Float Positioner (Code 'K4')

This option is the same as Spring-Centering Positioner with an addition of a fourth 'float' position.

In the float position (handle pushed in as far as it will go), the work ports are open to tank, allowing a cylinder to 'float' or a hydraulic motor to 'free wheel'.

1-Position Detented Positioner (Code 'R')

This feature allows spring-centering to neutral with a Detent for the spool 'IN' position only.

Work Port 'B' will remain open to tank when in the detented position, thereby allowing a single-acting cylinder to 'float'.

Rotary Spool Positioner (Code 'W')

With this option, the spool is positioned/moved by a rotary movement of the spool. Allows for 90° rotation of the spool each direction from the center, making a 180° total spool rotation with detent position in neutral.

There is no spring-centering, therefore the spool will stay in any position placed.

Note: No handle is supplied - the customer must furnish his own handle mechanism.

Spring Extended Positioner (Code 'A')

This option eliminates Spring-Centering to Neutral, and spring loads the spool to the 'OUT' position only. This option is usually used for 'Cam-Operation' of spool. Customer must supply cam-follower mechanism.

A handle assembly is NOT furnished with this option.

MAIN RELIEF VALVE OPTIONS

Main Relief Valves

The primary function of the main relief valve is to prevent excessive pressure spikes. When a main relief valve is not required, a no relief valve 'NR' plug must be installed in the relief valve cavity.

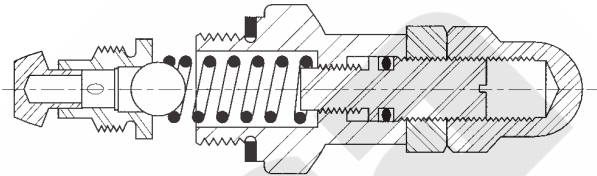
Ball and Spring Type Relief Valves

Ball and spring type relief valves are available in low pressure and high pressure models. They are available in externally-adjustable (Models 'J' and 'J-HP') and non-adjustable, tamper resistant versions (Models 'J-NJ' and 'J-NJ-HP'). Specific pressure ranges are given in the Ordering Instructions.

Differential Poppet Type Relief Valves

Differential poppet type relief valves are also available for use in the Model SP, SPK and SSK valves. Since they do not fit the same machining as the Ball and Spring type relief valves it is important to make the relief valve selection prior to ordering the valve.

The Model 'WS' is an internal shim-adjustable relief while the Model 'WSA' offers an external adjustment option. Both of these are used in the Model SP valve. The Model 'WK' and 'WKA' relief valves are used in the Model SPK and SSK valves. Specific pressure ranges are given in the Ordering Instructions.



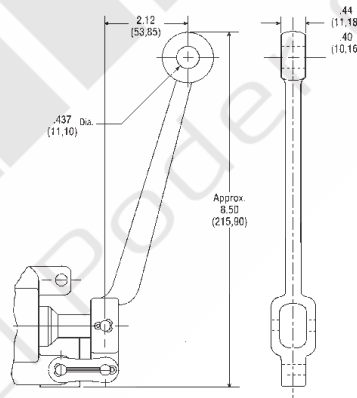
Model 'J'
(Adjustable 'J' Version Shown Here)

HANDLE OPTIONS

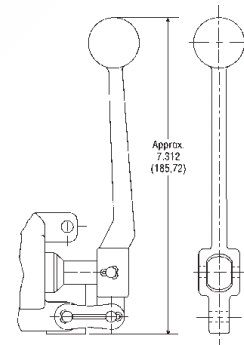
Four handle types are available for Model SP, SPK, and SSK directional valves.

The standard vertical, and offset handles are available with or without black plastic coating. The optional vertical handle with hole is only available in the non-coated version.

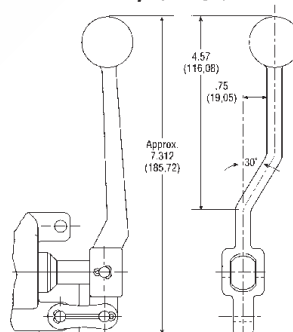
NOTE: Handles are not supplied with valves having rotary 'W4' and 'WF4' spool positioners.



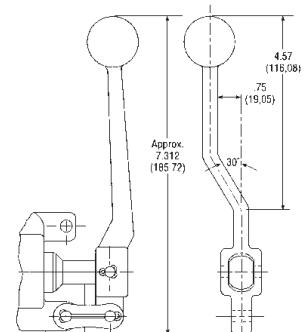
**Optional Vertical Handle
with 7/16" hole**



**Standard Vertical
Handle**

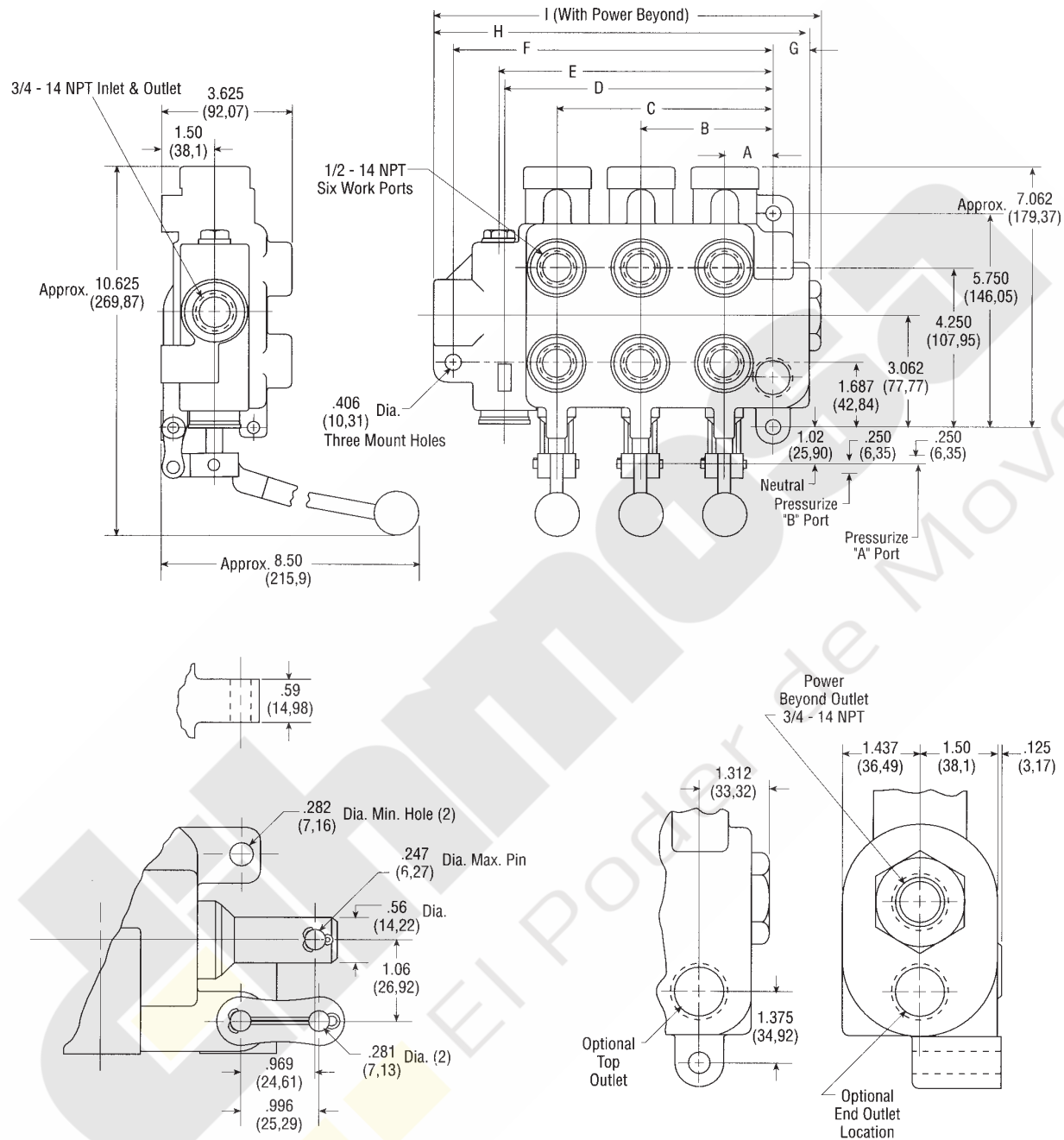


**Optional Handle
with offset to right**



**Optional Handle
with offset to left**

DIMENSIONS - Series SP

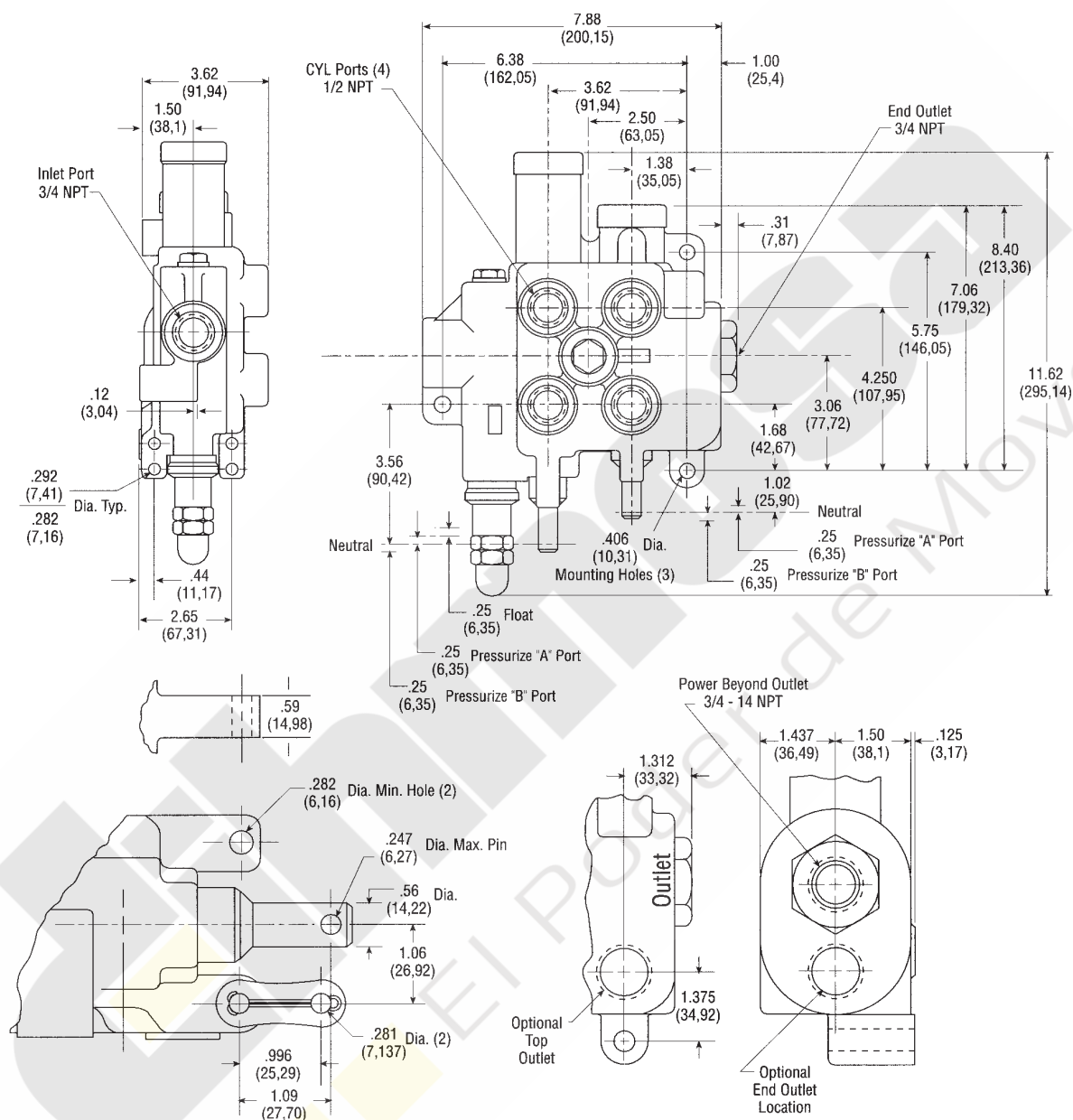


DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	I
1 SPOOL	1.375 in. (34,925mm)			2.750 in. (69,850mm)	2.875 in. (73,025mm)	4.125 in. (104,775mm)	1.000 in. (25,400mm)	5.625 in. (142,875mm)	5.937 in. (150,800mm)
2 SPOOL	1.375 in. (34,925mm)	3.625 in. (92,075mm)		5.000 in. (127,000mm)	5.125 in. (130,175mm)	6.375 in. (161,925mm)	1.000 in. (25,400mm)	7.875 in. (200,025mm)	8.187 in. (207,950mm)
3 SPOOL	1.375 in. (34,925mm)	3.625 in. (92,075mm)	5.875 in. (149,225mm)	7.250 in. (184,150mm)	7.375 in. (187,375mm)	8.625 in. (219,075mm)	1.000 in. (25,400mm)	10.125 in. (257,175mm)	10.437 in. (265,100mm)

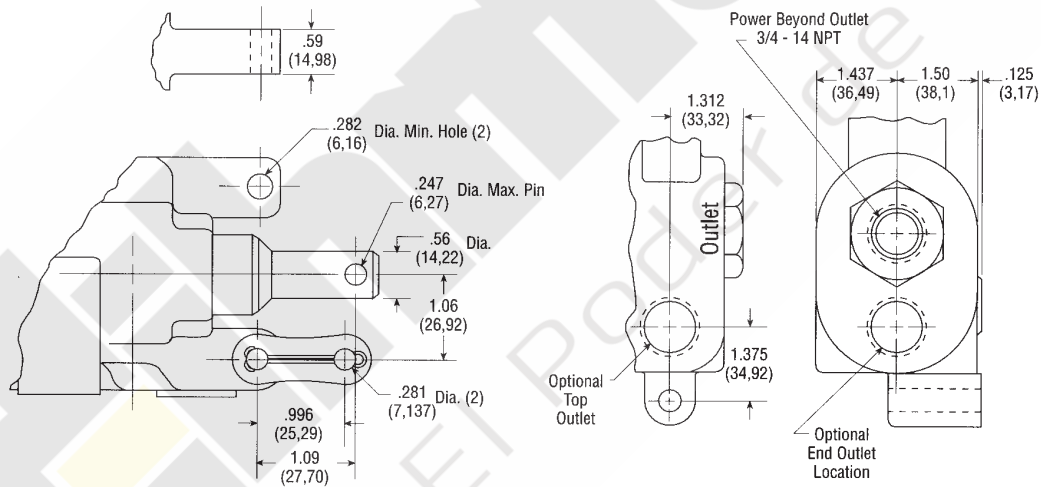
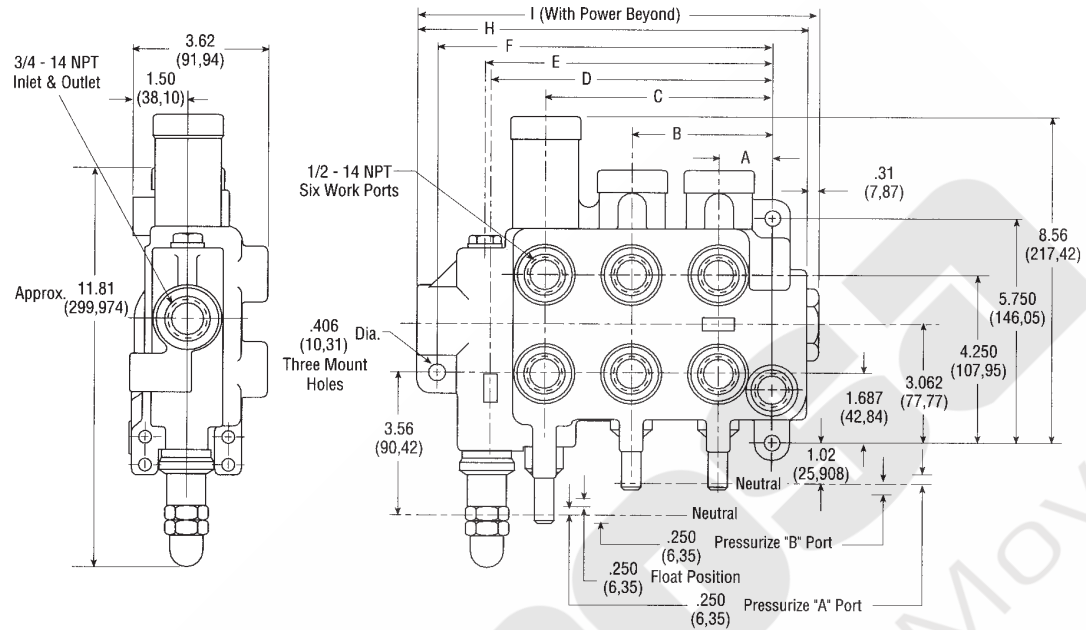
DIMENSIONS ARE IN INCHES (MILLIMETERS) AND ARE FOR REFERENCE ONLY.

DIMENSIONS - Series SSK



DIMENSIONS ARE IN INCHES (MILLIMETERS) AND ARE FOR REFERENCE ONLY.

DIMENSIONS - Series SPK



DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	I
1 SPOOL	1.375 in. (34,925mm)			2.750 in. (69,850mm)	2.875 in. (73,025mm)	4.125 in. (104,775mm)	.94 (23,876mm)	5.625 in. (142,875mm)	5.937 in. (150,800mm)
2 SPOOL	1.375 in. (34,925mm)	3.625 in. (92,075mm)		5.000 in. (127,000mm)	5.125 in. (130,175mm)	6.375 in. (161,925mm)	.94 (23,876mm)	7.875 in. (200,025mm)	8.187 in. (207,950mm)
3 SPOOL	1.375 in. (34,925mm)	3.625 in. (92,075mm)	5.875 in. (149,225mm)	7.250 in. (184,150mm)	7.375 in. (187,375mm)	8.625 in. (219,075mm)	.94 (23,876mm)	10.125 in. (257,175mm)	10.437 in. (265,100mm)

DIMENSIONS ARE IN INCHES (MILLIMETERS) AND ARE FOR REFERENCE ONLY.

ORDER CODE - Series SP and SPK

SPXTE - DF4 - DF4 - 3 - HP - LHO

Basic Model

- [SP] Model 'SP'
- [SPK] Model 'SPK' (Float)

Machining Options

- [-] Conversion Port Not Machined
- [C] Closed Center Plug Installed
- [X] Conversion Plug Installed
- [Y] Power Beyond Sleeve Installed

Outlet Port Location(s)

- [-] Standard End Outlet
- [T] Optional Top Outlet
- [E] Optional End Outlet Location
- [TE] Optional Top and End Locations

Positioner Options

Model 'SP' (All spools)

- [-] Standard Spring-Centering
 - [A] Spring Extended Spool
 - [D] 3-Position Detent (See Note 1)
 - [L] Spool Travel Limiter
 - [R] 1-Position Detent (Spool IN Only)
 - [W] Rotary Spool Positioner
- #### Model 'SPK' (Spool No. 1 only)
- [-] 4-Position Float Only (No Options)

Handle Information

- [-] Standard, Complete Handle Ass'y
- [LHO] Less Handle Only
- [LCHA] Less Complete Handle Ass'y

Main Relief Option (See Notes 2 & 3)

- [-] Standard 'J' Relief (300-1500 PSI) (bar)
- [HP] High Pressure 'J' Relief (1501 - 2000 PSI) (bar)
- [NJ] Non-Adjustable, 'J' Relief (400 - 1500 PSI) (bar)
- [NJ-HP] Non-Adj. High Pressure 'J' Relief (1501 - 2000 PSI) (bar)
- [WS] & [WK]* Differential Poppet-Types, Non-Adjustable (500-2000 PSI) (bar)
- [WSA] & [WKA]* Differential Poppet-Types, adjustable within the spring range installed:
No. 1864-001 Spring; (1351-1750 PSI)
No. 1451-001 Spring; (1751-2000 PSI)
- [NR] No Relief Plug Installed

All Model SP and SPK housings are machined for the Model J Ball/Spring - Type Relief Valve unless the Model WK Differential Poppet - Type Relief is specified. If relief valve is not required, the relief port will be plugged "NR".

*Machining for Model J is not the same as that required for the Model WS, therefore these relief valves are not interchangeable.

Positioner and Spool Options - Spool No. 3

Same Options as Spool No. 1 (Excluding Float)

Positioner and Spool Options - Spool No. 2

Same Options as Spool No. 1 (Excluding Float)

Spool Options

Model 'SP' (All Spools)

Model 'SPK' (Spools 2 & 3 only)

- [4] 4-Way
- [3] 3-Way
- [F4] 4-Way Free Flow

Model 'SPK' (Spool No. 1 only)

- [-] 4-Way, 4-Position Float

Note 1: An (Optional) Detent Stop is available for use with the 'D' Positioner Option
Specify: Neutral and Spool 'OUT' Positions only OR Neutral and Spool 'IN' positions only.

Note 2: Adjustable within the spring range installed;
No. 01864001 Spring 1351 - 1750 PSI (93-120 bar)
No. 02562002 Spring 1751 - 2000 PSI (121-138 bar)

Note 3: Specify relief setting when ordering. If not specified, Relief Valves will be set at 1000 PSI (79 bar) at 7.6 (28.7 litres/min) GPM. Pressure settings must be specified on all non-adjustable models.

ORDER CODE - Series SSK

SSKXE - 4 - DF4 - HP - LHO

Basic Model

[SSK] Model 'SSK' (Series)

Machining Options

[-] Conversion Port Not Machined
[X] Conversion Plug Installed
[Y] Power Beyond Sleeve Installed

Outlet Port Location

[-] Standard End Outlet
[T] Optional Top Outlet
[E] Optional End Outlet Location

Spool No. 1

[-] 4-Way, 4-Position Float Only (No Options)

Handle Information

[-] Standard, Complete Handle Ass'y
[LHO] Less Handle Only
[LCHA] Less Complete Handle Ass'y

Main Relief Option (See Notes 2 & 3)

[-] Standard 'J' Type Relief (300 - 1500 PSI) (bar)
[HP] High Pressure 'J' Type Relief
(1501-2000 PSI) (bar)
[NJ] Non-Adjustable, 'J' Type Relief
(400 - 1500 PSI) (bar)
[NJ-HP] Non-Adj. High Pressure 'J' Type Relief
(1501-2000 PSI) (bar)
[WK]* Differential Poppet-Type, Non-Adjustable
(500-2000 PSI)
[WKA]* Differential Poppet-Type, adjustable within
the spring range installed:
No. 1864-001 Spring; 1351-1750 PSI
No. 1451-001 Spring; 1751-2000 PSI
[NR] No Relief Plug Installed

All Model SSK housings are machined for the Model J
Ball/ Spring - Type Relief Valve unless the Model WK
Differential Poppet - Type Relief Valve is specified. If relief
valve is not required, the relief port will be plugged "NR".

** Machining for the Model J is not the same as that required
for the Model WK, therefore these relief valves are not
interchangeable.*

Spool No. 2 Options

[4] 4-Way, 3-Position
[3] 3-Way, 3-Position
[F4] 4-Way 3-Position, Free Flow

Spool No. 2 Positioner Options

[-] Standard Spring-Centering
[A] Spring Extended Spool
[D] 3-Position Detent (See Note 1)
[L] Spool Travel Limiter
[R] 1-Position Detent (Spool IN Only)
[W] Rotary Spool Position

Note 1: An (Optional) Detent Stop is available for use with the 'D' Positioner Option
Specify: Neutral and Spool 'OUT' Positions only OR Neutral and Spool 'IN' positions only.

Note 2: Adjustable within the spring range installed;
No. 01864001 Spring 1351 - 1750 PSI (93-120 bar)
No. 02562002 Spring 1751 - 2000 PSI (121-138 bar)

Note 3: Specify relief setting when ordering. If not specified, Relief Valves will be set at
1000 PSI (79 bar) at 7.6 (28.7 litres/min) GPM. Pressure settings must be specified
on all non-adjustable models.



WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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3C, 2/04, PHD