Series 6 Mobile Motion Control Valves with Individual Pressure Compensation (MMV-IPC) B2

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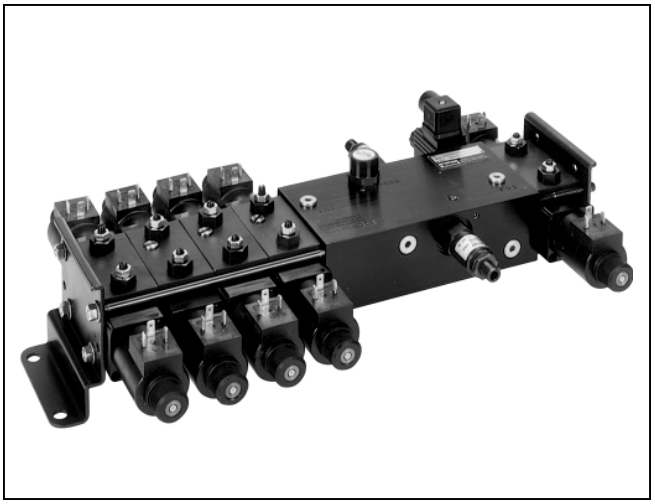
Introduction

MMV-IPC (Mobile Motion control Valves with Individual Pressure Compensation) systems are designed for use in applications requiring precise metering when 2 or more functions are operated simultaneously.

Standard MMV systems incorporate one inlet compensator per system to provide control of one function at a time. Additionally, *Series 6 MMV-IPC* systems provide individual pressure compensation to each 4-way section and have built-in shuttle systems that direct the pressure signal from the highest pressure function to the inlet. This guarantees that the system supply pressure will be greater than the highest load experienced up to highest pressure setting.

Series 6 valves provide precise metering characteristics, regardless of load variations.

Designs — The *stackable* design of the Series 6 valve allows the user to combine multiple functions into one compact design.



The modularity of this design allows the Series 6 to be combined with other MMV valve sizes or with *manifolds* (if used with cartridges). This allows the user to design part or all of the hydraulic system. (Please consult factory for further details).

General Description

Integrated System — MMV-IPC valves are more than a directional control valve . . . they also control pressure and flow in a single package.

Cost Reduction — MMV-IPC valves provide pressure compensation per directional control section (4-way); thus eliminating the need for external pressure compensated flow controls, pressure reducing valves, flow dividers, etc.

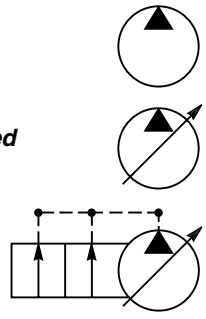
Also, built-in pump unloading valves provide high system efficiency while keeping heat generation to a minimum when fixed displacement pumps are used.

Pump Adaptability —

Fixed Volume

Pressure Compensated Variable Volume

Load Sensing



Flexibility — MMV-IPC valves are compatible with all pump types . . . fixed displacement, pressure compensated or load sense.

Modular construction simplifies field service by making valve sections easy to remove and replace . . . minimizing down-time and simplifying trouble-shooting.

Modular design also permits the designer to easily add functions (4-ways) to the hydraulic circuit as required.

Control — MMV-IPC valves provide output flow that is proportional to the input signal. These proportional valves provide precise metering from minimum to full speed. Furthermore, these directional control valve systems provide excellent pressure compensation for each 4-way.

Reliability — MMV-IPC valves contain no small orifices, thereby minimizing sensitivity to contamination and viscosity changes.

There are no internal screens or filters to clog or maintain.

MMV-IPC valves are tested 100%.

Adjustable Flow Controls — Separate adjustments for each work port allow variations to the output flow from the A and B work ports to be made independently. (Unless specified, work port maximum flows are factory set @ 7 GPM @ 100 psi bias).

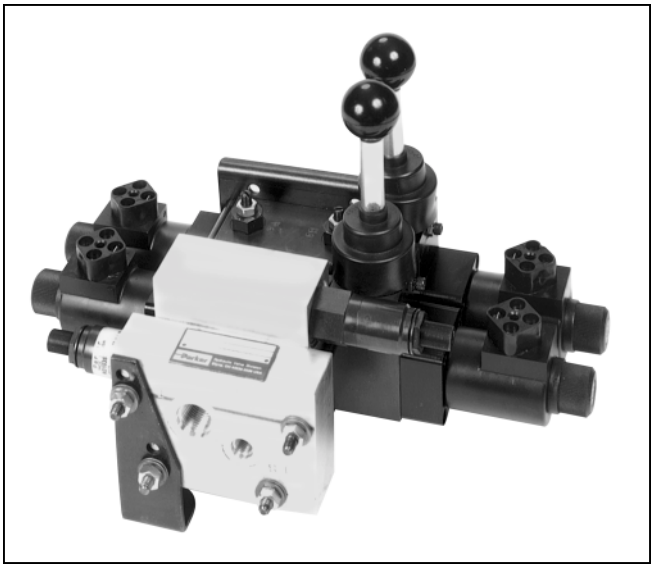
Direct Acting Solenoids — The solenoids respond to input commands predictably, accurately and promptly. Under metering conditions, function speed is precisely controlled.

Application

Series 6 MMV (Mobile Motion Control Valve) systems are ideal for applications that require precise control of load, speed and direction. They provide precise and variable speed control without lurching during start-up. Series 6 valves provide precise and predictable metering throughout the flow range, thus providing smooth acceleration and deceleration.

Features

- **Low cost**
- **Pressure compensation** - Per spool
- **Precise Metering** - Independent port flow adjustments from 2-30 LPM (0.5 to 8 GPM)
- **Compact and Lightweight** - Saves space
- **System Integration** - Adaptable to larger MMV proportional valves
- **Direct Acting**
- **No Null Adjustment**
- **Manual Override Levers Optional**
- **Low current demand**
- **Serviceable** - Easy to assemble and disassemble
- **Universal coil adaptation** - Common coils with new Series 10, 12, & 16 pilot valves
- **Low Hysteresis**



Operation

The Series 6, MMV-IPC (Individual Pressure Compensation) valves are controlled by proportional, push-type oil immersed solenoids, which provide precise metering characteristics. Each valve section is individually compensated by means of a return-line sensing orifice, which applies differential pressure to the ends of the main metering spool.

Specifications

Max. Operating Pressure	275 Bar (4000 PSI) Maximum with “AD” & “AN” inlet 204 Bar (3000 PSI) Maximum with “MUV” inlet
Max. Flow Settings *(For other input currents, please specify when ordering)*	Adjustable between: 2-30 LPM (0.5-8 GPM) 1900 mA - 12 VDC supply (A & C spool) 950 mA - 24 VDC supply (A & C spool)
Seals	Nitrile (Standard) Fluorocarbon (Optional)
Operating Temp. Range (Ambient)	-40°C to 82°C (-40°F to 180°F)
Viscosity Range	35 to 1750 SSU recommended
Filtration	ISO Code 21/18, SAE Class 4 or better
Fluids	Petroleum base (consult factory for other fluids)
Mounting	Valve will function in any position; however, it is recommended that the valve be mounted horizontally for optimum performance.

Electrical Specifications

Supply Voltages	12 VDC or 24 VDC
PWM Control Required	To obtain precise, proportional control, Pulse width modulation (PWM) is required: 200-250 Hz range 225 Hz optimum
Current Range	Cracking to full flow (Reference): 12 VDC supply: 800-1900 mA 24 VDC supply: 250-950 mA
Coil Resistance	Standard coils at 20°C (68°F): 12 VDC supply: 3.7 ohms 24 VDC supply: 14.7 ohms
Duty	Continuous duty rated
Grounding	No grounding is required
Connections	Standard: DIN 43650 connection
Optional	DIN 43650 appliance type plug with gasket for 6 mm to 8 mm cable diameter with one mounting screw. To order optional appliance plug separately, use P/N 15000-14.
Hysteresis	Approximately 4%

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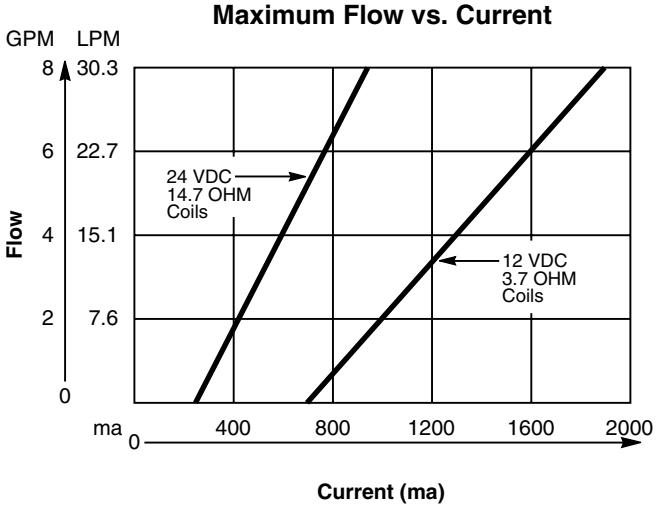
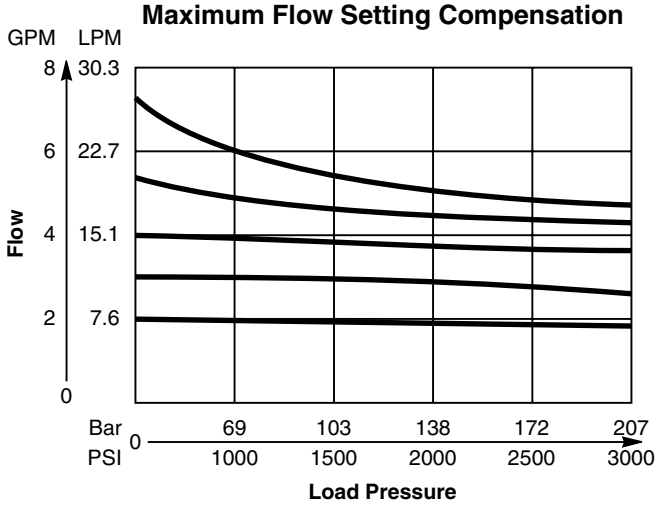
Performance Curves

Maximum Flow vs. Current



Maximum Flow Setting Compensation



Inlet Sections

Loadsense Inlet — The **"L"** inlet section is used with Loadsense pumps. It consists of a three ported body with pressure, tank and loadsense ports.

The loadsense port connects to a shuttle network within the Series 6 body which allows the pump to sense the assemblies highest load pressure and make pressure adjustments within the pump.

Pressure Compensated Inlet — The **"P"** inlet section is used with Pressure Compensated pumps. It consists of a body similar to the "L" body except the loadsense port is plugged. The pressure compensated pump will maintain its compensator pressure and will destroke until a valve spool is shifted causing a demand for flow.

Unloading Compensator Inlet — The **"U"** inlet section is used with fixed displacement pumps or when power beyond is required. The "U" unloading compensator consists of a modulating, infinitely variable, normally closed compensator cartridge and a relief cartridge.

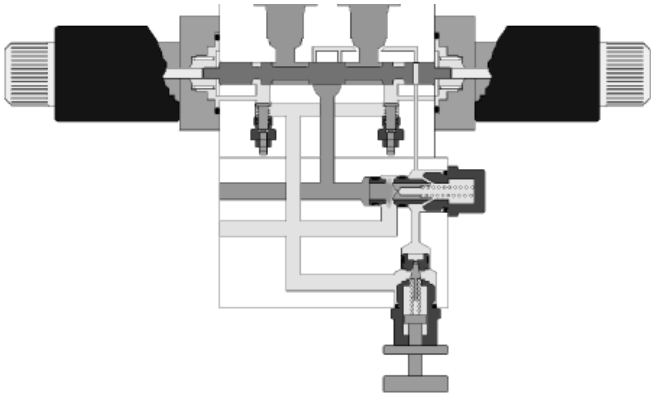
The "U" inlet performs three major functions:

1. To unload unused pump flow to tank . . .

With the 4-way in neutral, bias spring chamber is drained to tank. Therefore, any pump pressure above bias spring rate. . . 100 psi. . . will cause the compensator spool to shift upward dumping pump flow to tank at 100 psid.

2. Supply flow demand to valve sections . . .

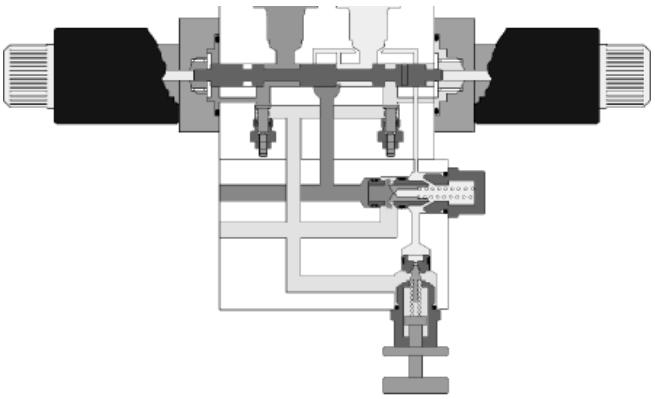
When the 4-way spool is shifted, the compensator cartridge will maintain a constant pressure drop across



Neutral Position

the 4-way spool while dumping any unused pump flow to tank.

With the 4-way shifted to some fixed flow rate (depending on degree of shift), load pressure is sensed at the bias spring chamber. (Load pressure plus bias spring rate are additive acting against the top side of



Shifted Position

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the compensator cartridge. Pump pressure is sensed on the bottom of the compensator cartridge).

Flow will pass from P to work port until pump pressure exceeds load pressure plus bias pressure. At that time, the higher pump pressure will cause the "U" spool to shift upward dumping excess pump flow to tank at a pressure drop equivalent to load psi plus bias pressure.

During valve operation, the "U" is always modulating to allow only enough flow to the function equivalent to degree of spool shift at a pressure drop equal to the bias pressure.

3. To limit maximum load pressure . . .

To control maximum load pressure, the "U" inlet incorporates a relief valve. The relief valve is in the form of a cartridge.

The relief valve senses load pressure. When load pressure exceeds relief valve setting, the relief opens, limiting maximum pressure in the bias spring chamber to relief valve setting. Therefore, any pump pressure above relief valve setting will cause the main "U" inlet to dump pump flow to tank at a pressure drop equivalent to relief valve setting plus bias spring rate.

Pressure Ranges

The "U" inlet has *three* pressure settings to choose from.

S option *(50 - 1000 PSI)*	Select for systems where pressure ranges from 50 to 1000 psi. (Pressure is usually set @ 1000 psi).
T option *(50 - 2000 PSI)*	Select for systems where pressure ranges from 50 to 2000 psi. (Pressure is usually set @ 2000 psi).
L option *(50 - 3000 PSI)*	Select for systems where pressure ranges from 50 to 3000 psi. (Pressure is usually set @ 3000 psi).

Options

R option - (Power Beyond) — This option should be called out when power beyond is needed in the application. Power beyond gives the customer access to another valve system, elsewhere on their application by diverting excess flow to that system. However, please keep in mind that priority flow will always go to the **"S6"** valves in the application first and return flow from the Series 6 valves will go directly to tank.

Directional Control Sections

The "S6" 4-way directional control valves are used to regulate actuator direction and speed.

Body Types

The "S6" valves come in 4 different body types. There are two types of end bodies and two types of middle bodies. An assembly will always consist of 1 end body with the balance of sections being middle bodies. Up to 6 valve sections can be put in one assembly.

B

End Bodies

A option
(End body no shuttle) — This body is a standard end body with no load shuttles nor any work port relief capability. This option *must be* included in any assembly requiring a Series 6 valve with no additional work port capabilities.

C option
(End body with overload relief capability) — This body is a standard end body that has no load sense shuttles, but has work port relief capabilities. That means that this body has the option of stacking functions such as overload relief & cross-over relief before the 4-way in the assembly. This option *must be* included in any assembly requiring a Series 6 valve with work port relief capabilities.

Middle Bodies

S option
(Standard body with load sense shuttles) — This body is a standard middle body with load sense shuttles and no work port relief capability. This option should be used with one end body for all assemblies with 2 or more 4-way sections.

B option
(Standard body with load sense shuttles and overload relief capability) — This body is standard middle body with load sense shuttles and work port relief capabilities.

That means that this body has the option of stacking functions such as overload relief & cross-over relief before the 4-way in the assembly. This option should be used with one end body for all assemblies with 2 or more 4-way sections.

Emergency Manual Overrides

The "S6" valve is an electrical valve that comes with push pin overrides or has the option of including a lever to act as an emergency manual override.

Levers on the "S6" valve are emergency manual overrides only. When actuated manually, the "S6" valve is not pressure compensated and the maximum flow limiters are not active.

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B

ST option
(Standard push pin override) — This option gives the customer a standard electrical body with push pin overrides on the ends of the solenoid tubes.

AF option
(Lever, flow control side, A side) — This option allows a lever to be mounted with the lever extending on the flow control side of the valve, on the "FA" end of the valve.

BF option
(Lever, flow control side, B side) — This option allows a lever to be mounted with the lever extending on the flow control side of the valve, on the "FB" end of the valve.

AP option
(Lever, work port side, A side) — This option allows a lever to be mounted with the lever extending on the work port side of the valve, on the "A" end of the valve.

BP option
(Lever, work port side, B side) — This option allows a lever to be mounted with the lever extending on the work port side of the valve, on the "B" end of the valve.

Spool Types

The "S6" valves offer five types of spools with their assemblies. These spools are: 1) cylinder, 2) motor, 3) bleeder, 4) low flow cylinder and 5) low flow motor.

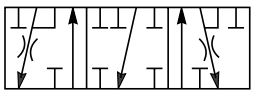
These are all meter-in type spools. For applications requiring counterbalancing, or where overcenter, or where braking conditions occur additional load control valves must be used.

Leakage rates are the following using 10W Oil @ 100°F & 1000 psi:

Work Port leakage: 13cc/min
Horse Power loss leakage: 13 cc/min

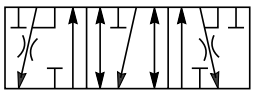
Note: These leakages are reference only.

C option
(Cylinder spool)



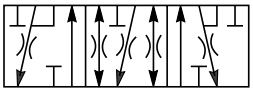
The 'C' option illustrates a cylinder spool where all ports are blocked in the center position.

M option
(Motor spool)



The 'M' option illustrates a motor spool. A and B work ports are open to tank and is used with applications that have motors or any actuator that is permissible to have free movement where there is no pressure build up in the actuator lines. This type of spool can be used with load holding valves.

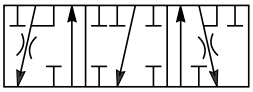
B option
(Bleeder spool)



The 'B' option illustrates a bleeder spool and is used with applications with motors or any actuator with free movement like the motor spool. In addition, this spool has restrictor orifices on the A and B lands that restricts flow in the center position acting as a safety valve.

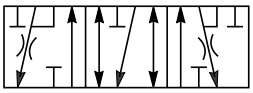
This type of spool can also be used with load holding valves.

L option
(Low flow cylinder spool)



The 'L' option illustrates a low flow cylinder spool where all ports are blocked in the center position. This spool provides precise metering of extremely low flows that range from 0 - 8 LPM (0 - 2.0 GPM).

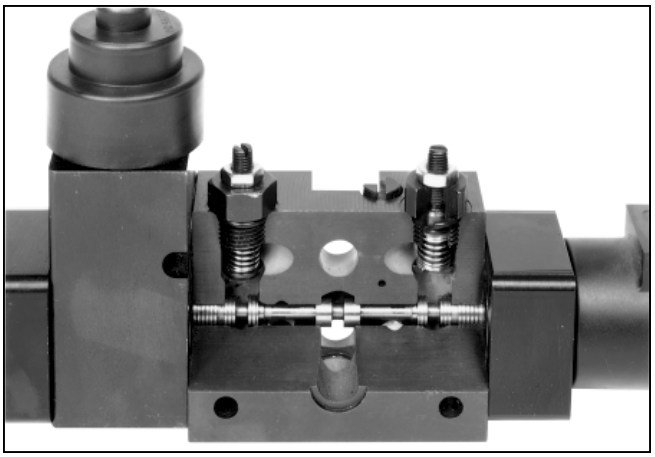
R option
(Low flow motor spool)



The 'R' option illustrates a low flow motor spool, where A and B work ports are open to tank, and is used with applications that have motors, or any actuator that is permissible to have free movement since there is no pressure build up in the actuator lines. This spool provides precise metering of extremely low flows that range from 0 - 8 LPM (0 - 2.0 GPM).

Standard A/B Port Output Flow

The "S6" valves have adjustable flow controls which allow the customer to vary the output flow from **2 - 30 LPM (0.5 - 8 GPM),** in increments of **0.1 GPM** for the C,M and B spool options and **0 - 8 LPM (0 - 2.0 GPM),** in increments of **0.1 GPM** for the L and R spool options. These valves have separate adjustments for each work port to allow the customer to set each output flow independently.



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Voltage (coils)

The “S6” valves offer two standard supply voltages of 12 VDC and 24 VDC. These are standard with all other MMV valve sizes as well.

These coils require low current demand. The 12 VDC supply requires 750 - 1900 mA using a 3.7 Ω coil and the 24 VDC supply requires 250 - 950 mA using a 14.7 Ω coil. As a result, this allows for greater flow capabilities at smaller current supplies.

For other voltage supply options, please consult the factory.

Seals

The “S6” series valves offer three types of seals to be used in their applications.

N option
(Nitrile seals) — Nitrile seals, **(N674)**, are standard when ordering these valves. They have a working temperature of **-35° to 121°C (-30° to 250°F).**

V option
(Fluorocarbon seals) — Fluorocarbon seals, **(V884),** are offered as an option with theses valves. They have a working temperature of **-25° to 205°C (-15° to 400°F)**.

K option
(Cold weather seals) — Cold Weather seals, **(N304),** are available as an option for the “S6” valve, as well. They have a working temperature of **-55° to 107°C (-65° to 225°F).**

Options

A option
(Spade terminals, work port side) — These are standard spade terminals and face toward the work port side.

B option
(Spade terminals, flow control side) — These are standard spade terminals and face toward the flow control side.

D option
(DIN 43650 connector, work port side) — These coils have DIN 43650 female appliance plugs included as a standard and they face the work port side.

E option
(DIN 43650 connector, flow control side) — These coils have DIN 43650 female appliance plugs included as a standard and they face the flow control side.

Optional Section

Overload Reliefs

The Overload Relief Valves limit cylinder port pressure by venting excess flow to the return line.

Single/Double

Cylinder work port reliefs are available for both A and B ports (double overload), or A or B port only (single overload).

1 option
(Single overload, A port) — This allows pressure to be vented on the A work port to the return line.

2 option
(Double overload) — This allows pressure to be vented on the A and B work ports to the return line.

3 option
(Single overload, B port) — This allows pressure to be vented on the B work port to the return line.

Cross-over Relief Section

The Cross-over Relief Valve relieves pressure from one side of the actuator to the other. This allows smooth deceleration of a load when the 4-way is returned to the neutral position. They also prevent cavitation.

Single/Double

Cross-over reliefs are available in a single (A or B port) or double (A and B ports) versions.

1 option
(Single cross-over, A port) — This allows pressure to be vented from the A port to the B port.

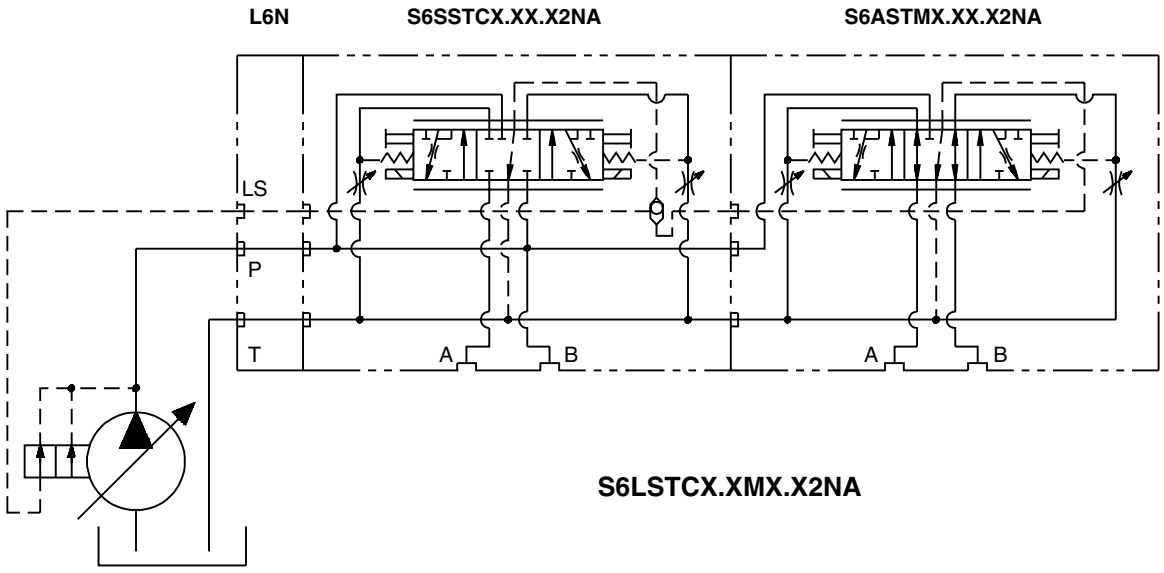
2 option
(Double cross-over) — This allows pressure to be vented from the A and B ports to their opposite ports.

3 option
(Single cross-over, B port) — This allows pressure to be vented from the B port to the A port.

B

Load Sense Application

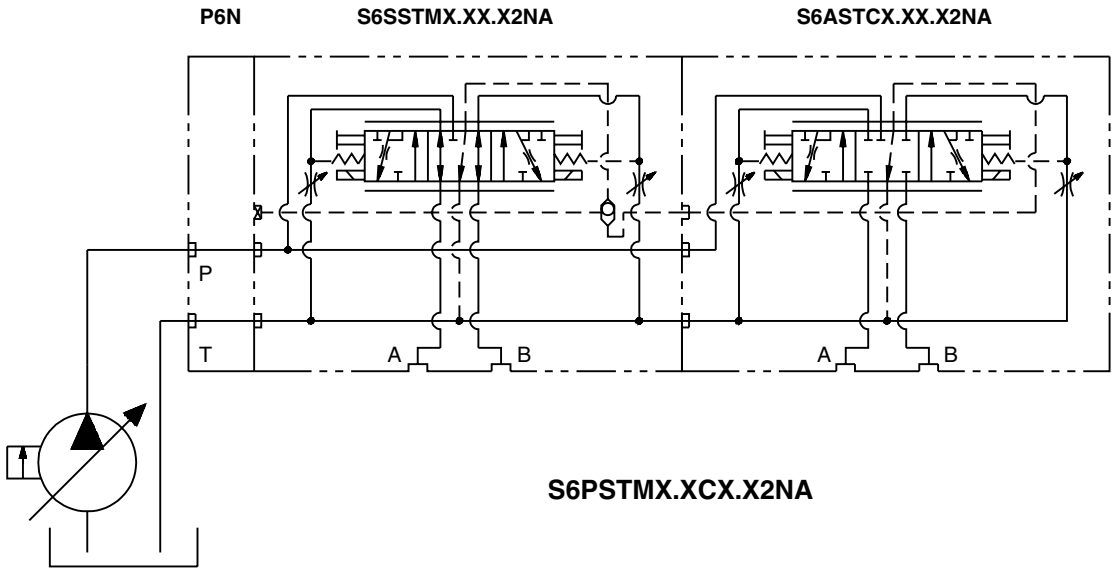
S6 Series Stack — 2 Function Series 6 with an "L" inlet for loadsensing.



S6LSTCX.XMX.X2NA

Pressure Compensation Application

S6 Series Stack — 2 Function Series 6 with a "P" inlet for pressure compensation.



S6PSTMX.XCX.X2NA

Note: The individual section call outs are listed at the top of each schematic, and the overall assembly code for each schematic is listed at the bottom.

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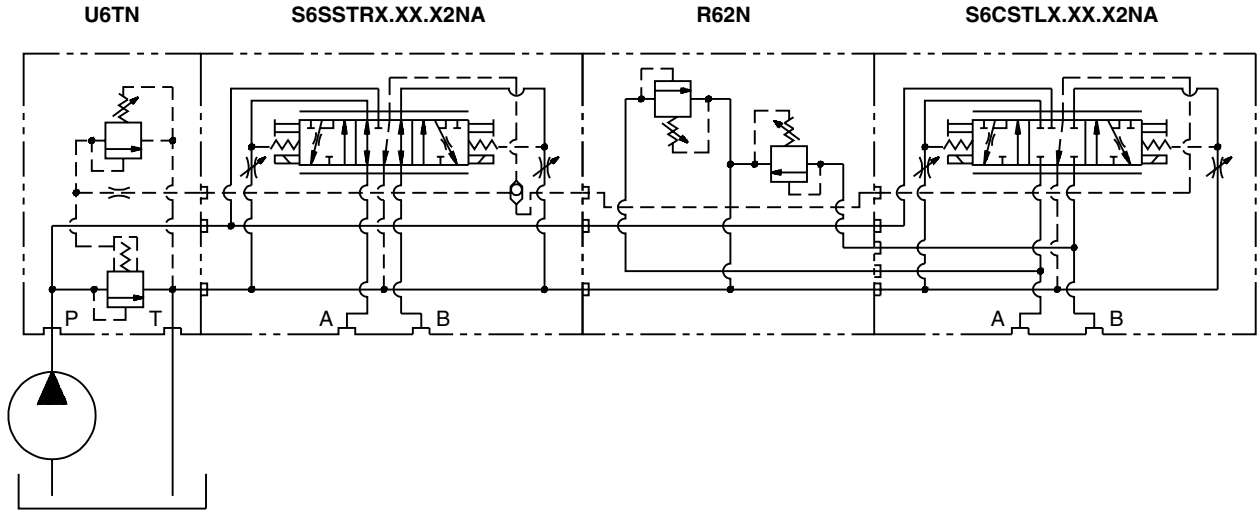
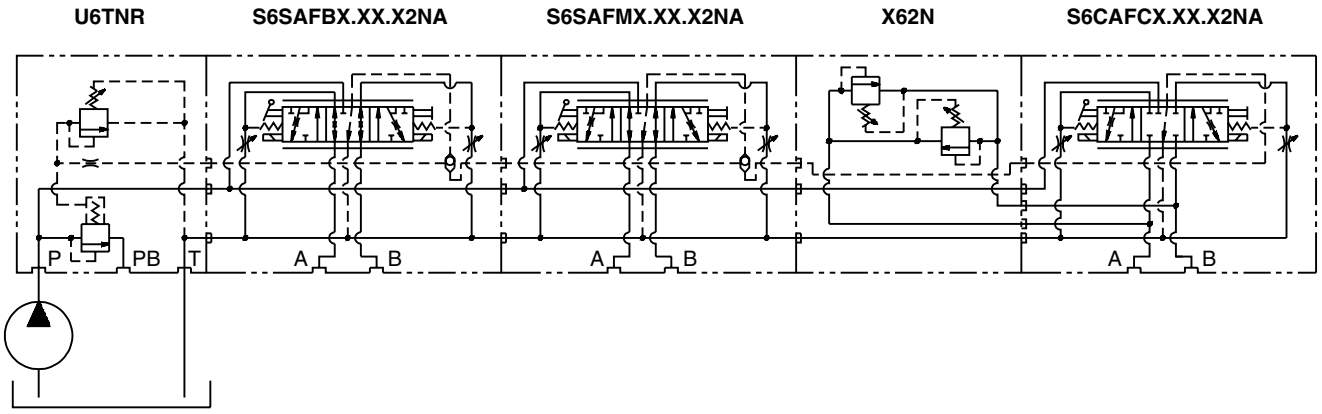
Fixed Displacement Application

S6 Series Stack — 2 Function Series 6 with an “U” inlet unloader and a dual overload relief block for use with fixed displacement pumps.



Power Beyond Application

S6 Series Stack — 3 Function Series 6 with an “U” inlet unloader with power beyond port added and a dual cross-over relief block for use with fixed displacement pumps.

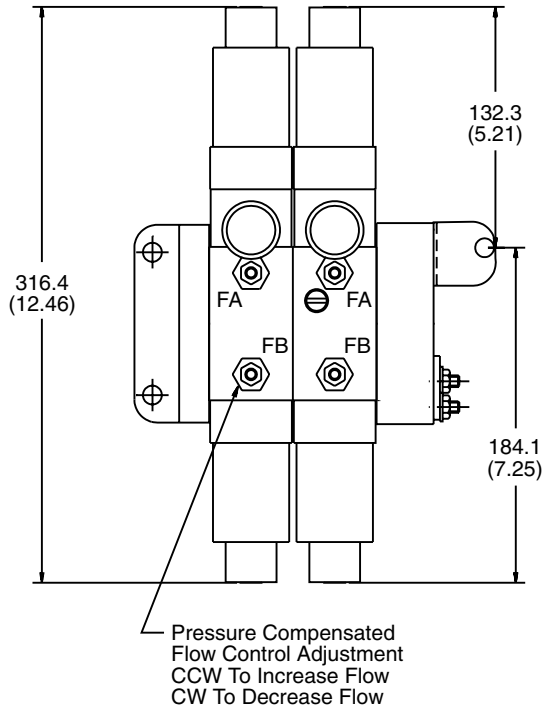


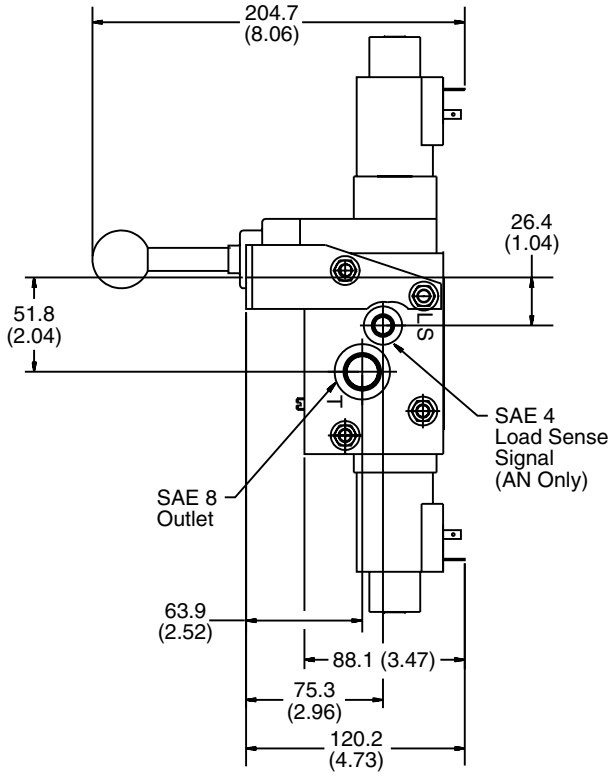
Note: The individual section call outs are listed at the top of each schematic, and the overall assembly code for each schematic is listed at the bottom.

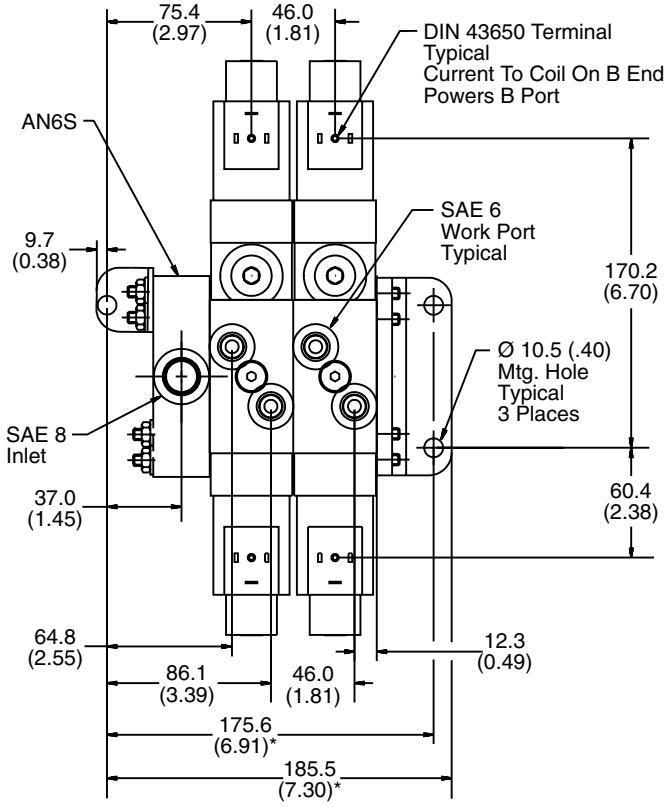
B

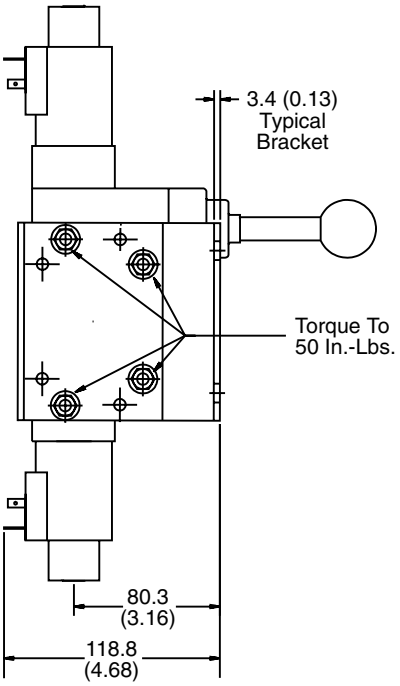
*Inch equivalents for millimeter dimensions are shown in (**)

These drawings show a typical two function electrohydraulic proportional valve assembly. Mounting brackets can be reversed 180°.









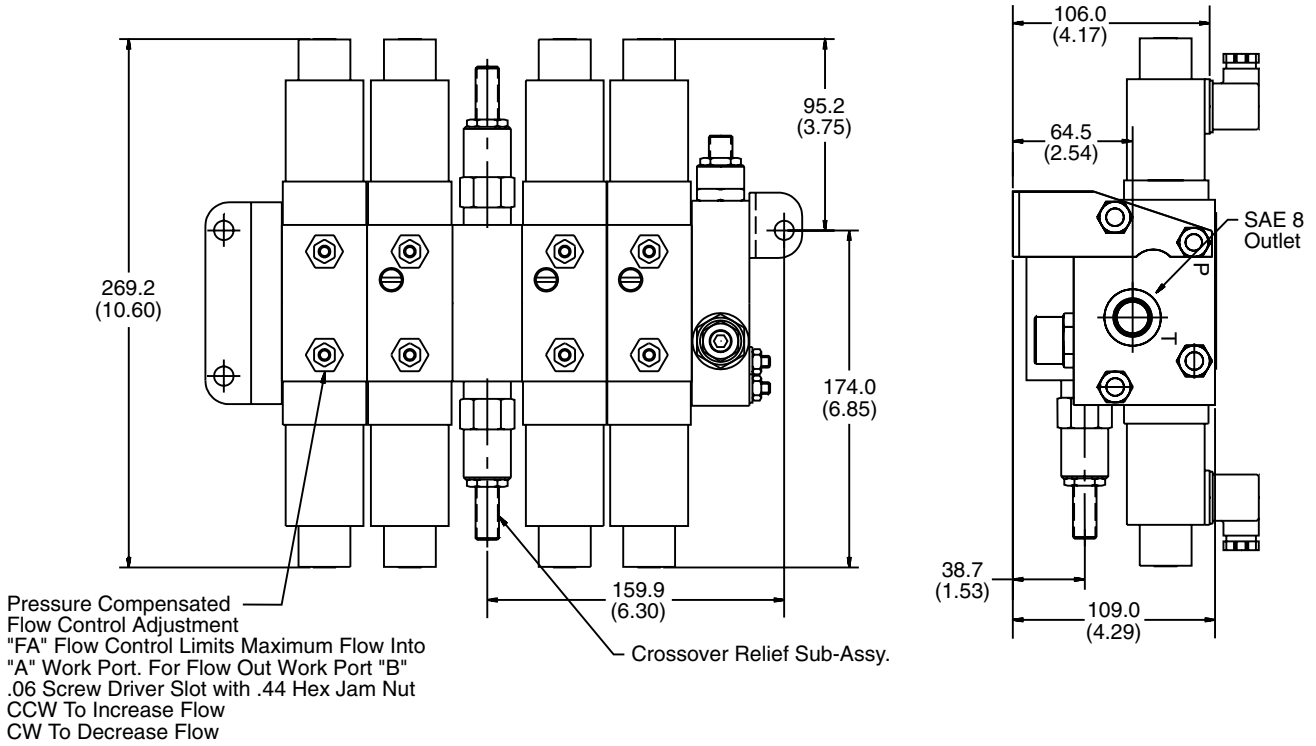
THIRD-ANGLE PROJECTION

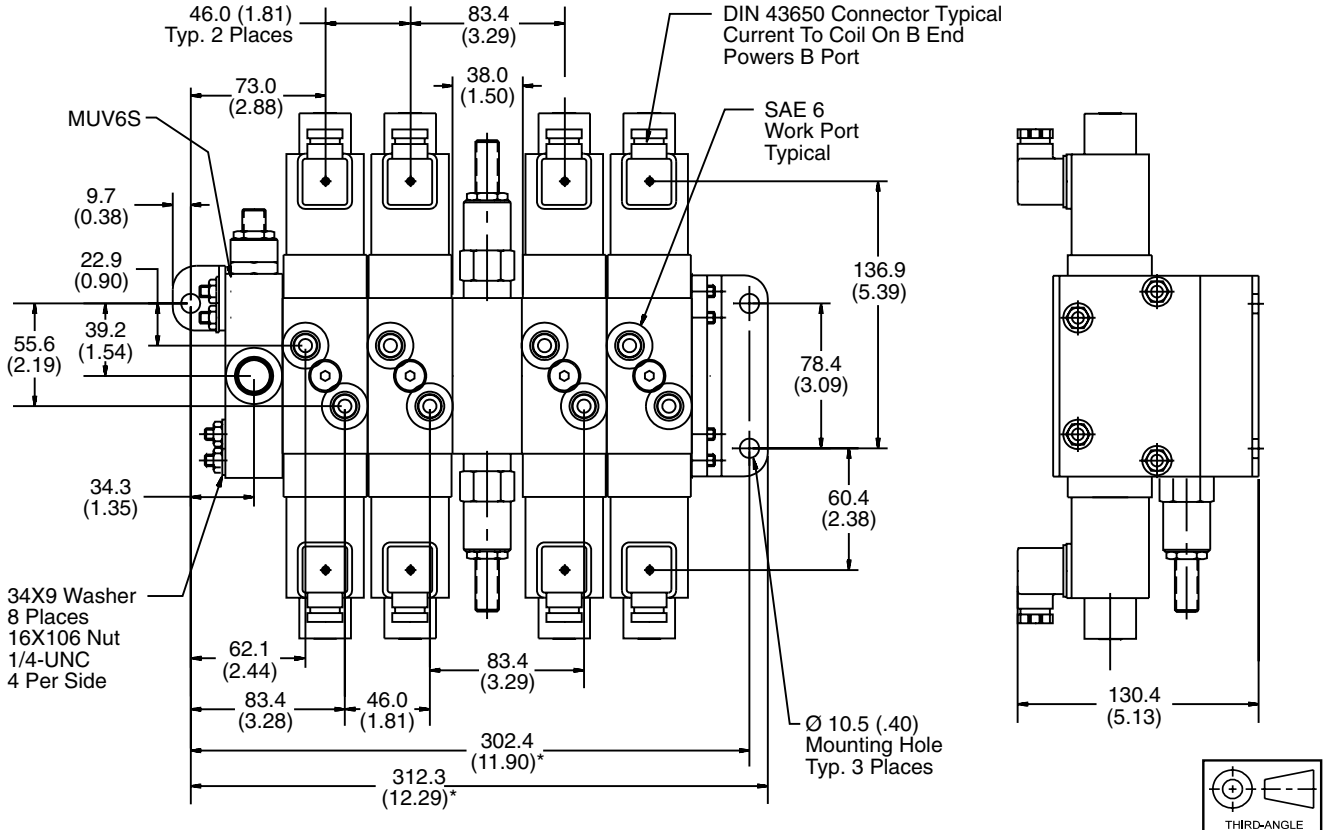
*Add 46.4 (1.81) for each additional section.

B

*Inch equivalents for millimeter dimensions are shown in (**)

These drawings illustrate a typical four function electrohydraulic proportional valve assembly with dual cross reliefs and Hirschmann connectors, which is used with load sense pumps.





*Add 46.4 (1.81) for each additional section.

B

Series 6 — Inlet Section

	6			
Inlet Type	Size	Pressure Range	Seals	Options

Code	Size
6	3/8”

Code	Inlet Type
K	With Load Sense Relief
L	Load Sense
P	Pressure Compensation
U	Unloading Compensator

Code	Seals
N	Nitrile
V	Fluorocarbon
K	Cold Weather

Code	Pressure	Std. Setting
Omit	“L” Inlet	—
Omit	“P” Inlet	—
Omit	w/o Relief	—
S	50 - 1000 PSI	1000 PSI
T	50 - 2000 PSI	2000 PSI
L	50 - 3000 PSI	3000 PSI

Code	Options
Omit	None
R	Power Beyond*
Z	Aux. “Z” Port w/shuttle

* “U” Inlet Only

Series 6 — Directional Control Section

S6				X.X	X.X			
Series	Body Type	Manual Override	Spool Type	A Port Output Flow	B Port Output Flow	Voltage	Seals	Options

Code	Operator Type
S6	Series 6 (3/8" Spool)

Flow Rate (GPM)**	
**	A Port

Flow Rate (GPM)**	
**	B Port

**Note: Maximum flow settings available in increments of 0.1 GPM (0.5 - 8.0 GPM) with Standard spool and increments of 0.1 GPM (0 - 2.0 GPM) with low flow spools.

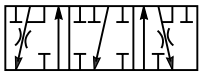
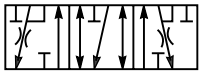
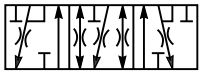
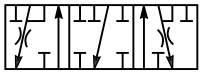
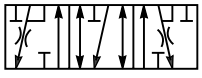
Code	Voltage
2	12 VDC
4	24 VDC

Code	Seals
N	Nitrile
V	Fluorocarbon
K	Cold Weather

Code	Body Type
A	End Body (No Shuttle)
B	Standard Body w/ L/S Shuttle & O/L Relief Capability
C	End Body w/ O/L Relief Capability
S	Standard Body (Includes Load Sense Shuttle)

Code	Options
A	Hirschmann w/o plug, Work Port Side
B	Hirschmann w/o plug, Flow Control Side
D	Hirschmann w/plug, Work Port Side
E	Hirschmann w/plug, Flow Control Side

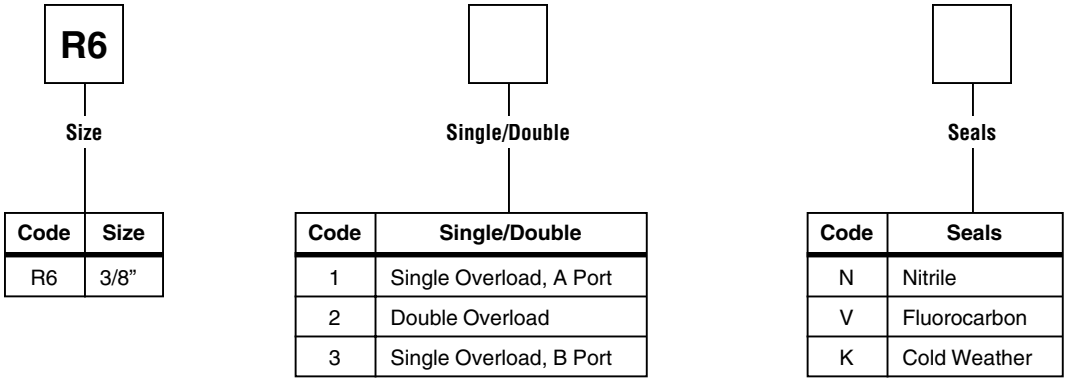
Code	Manual Override
ST	Standard Push Pin Override
AF	Lever, Flow Control Side, A Side
BF	Lever, Flow Control Side, B Side
AP	Lever, Work Port Side, A Side
BP	Lever, Work Port Side, B Side

Code	Options	
C	Cylinder	
M	Motor	
B	Bleeder Spool	
L	Low Flow Cylinder	
R	Low Flow Motor*	

***Note:** Output flow of the "L" and "R" spools are limited to 2.0 GPM.

B

Series 6 — Overload Relief Valve Section (Optional)



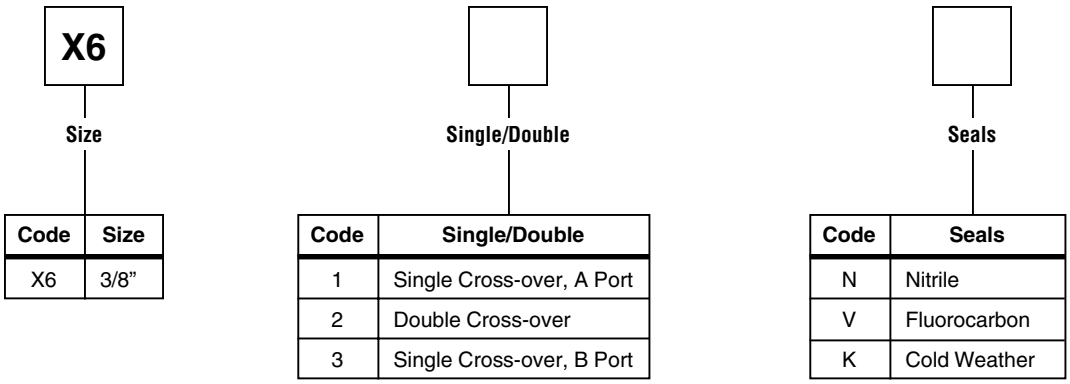
Code	Size
R6	3/8”

Code	Single/Double
1	Single Overload, A Port
2	Double Overload
3	Single Overload, B Port

Code	Seals
N	Nitrile
V	Fluorocarbon
K	Cold Weather

Note: Overload reliefs must be set higher than the main relief valve pressure setting. (Standard setting is usually 3000 PSI)

Series 6 — Cross-Over Relief Valve Section (Optional)



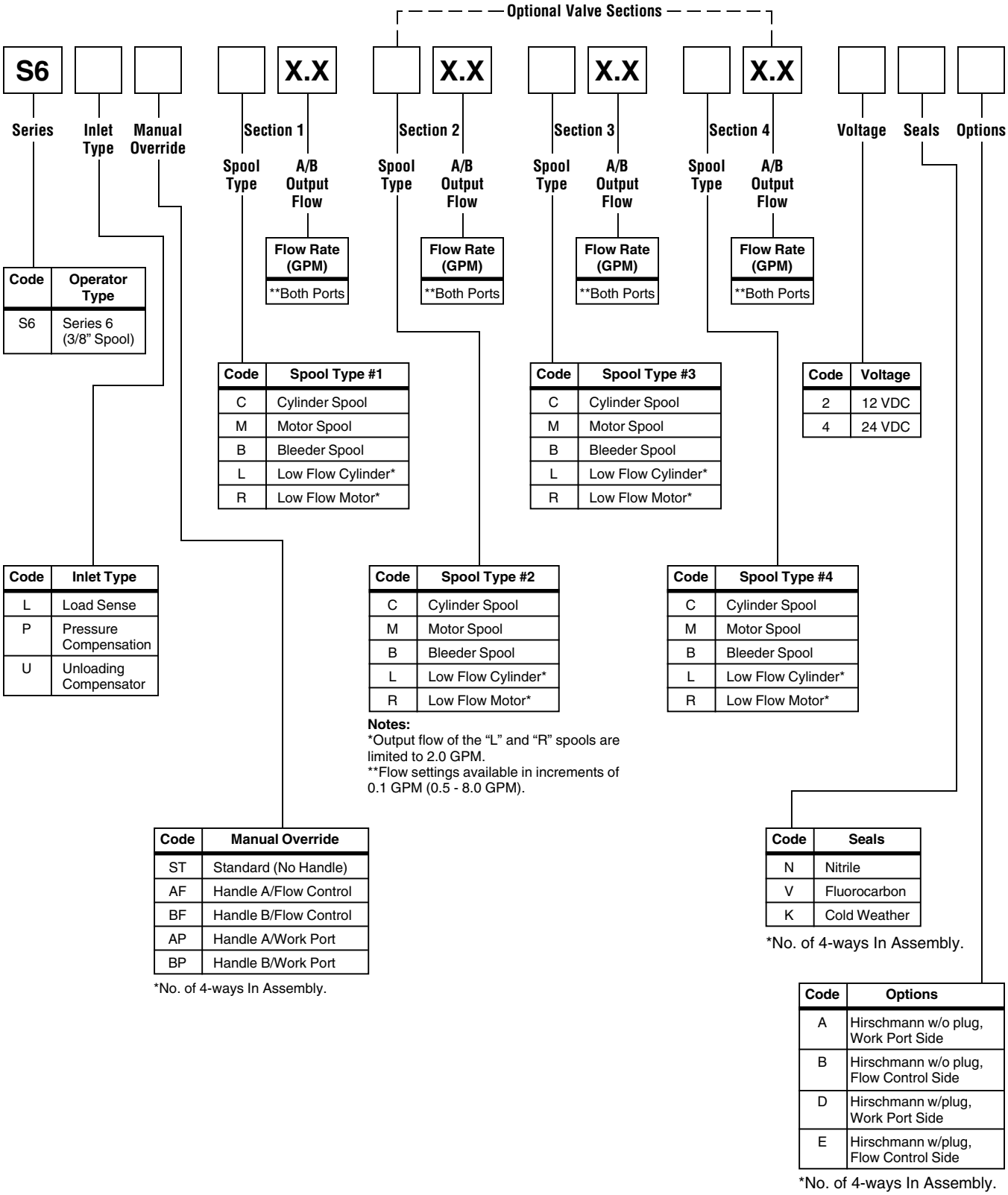
Code	Size
X6	3/8”

Code	Single/Double
1	Single Cross-over, A Port
2	Double Cross-over
3	Single Cross-over, B Port

Code	Seals
N	Nitrile
V	Fluorocarbon
K	Cold Weather

Note: Standard setting for Cross-over relief valves is 3000 PSI.

Series 6 — Assembly Model Codes (Order Up to 4 Valve Sections with this Model Code)



Code	Operator Type
S6	Series 6 (3/8" Spool)

Code	Spool Type #1
C	Cylinder Spool
M	Motor Spool
B	Bleeder Spool
L	Low Flow Cylinder*
R	Low Flow Motor*

Code	Spool Type #3
C	Cylinder Spool
M	Motor Spool
B	Bleeder Spool
L	Low Flow Cylinder*
R	Low Flow Motor*

Code	Voltage
2	12 VDC
4	24 VDC

Code	Inlet Type
L	Load Sense
P	Pressure Compensation
U	Unloading Compensator

Code	Spool Type #2
C	Cylinder Spool
M	Motor Spool
B	Bleeder Spool
L	Low Flow Cylinder*
R	Low Flow Motor*

Code	Spool Type #4
C	Cylinder Spool
M	Motor Spool
B	Bleeder Spool
L	Low Flow Cylinder*
R	Low Flow Motor*

Notes:
*Output flow of the "L" and "R" spools are limited to 2.0 GPM.
**Flow settings available in increments of 0.1 GPM (0.5 - 8.0 GPM).

Code	Manual Override
ST	Standard (No Handle)
AF	Handle A/Flow Control
BF	Handle B/Flow Control
AP	Handle A/Work Port
BP	Handle B/Work Port

*No. of 4-ways In Assembly.

Code	Seals
N	Nitrile
V	Fluorocarbon
K	Cold Weather

*No. of 4-ways In Assembly.

Code	Options
A	Hirschmann w/o plug, Work Port Side
B	Hirschmann w/o plug, Flow Control Side
D	Hirschmann w/plug, Work Port Side
E	Hirschmann w/plug, Flow Control Side

*No. of 4-ways In Assembly.

B

General Description

Series 6 Mobile Motion Control Valve (MMV) systems are ideal for applications that require precise control of load, speed and direction. They provide precise and variable speed control without lurching during start-up. These valves provide smooth acceleration and deceleration, providing precise and predicatable metering throughout the flow range. Series 6 valves are meter-in style valves and each section is return flow pressure compensated.

Now, the Series 6 is offered in a manifold mount configuration to allow easier application in systems using cartidge valves or other manifold mounted MMV and industrial valves to complete a circuit.

Features

- **Flexibility** — All ports can be located to customer specification in the manifold. Easily combined in one assembly with other MMV, Parker Threaded Cartridge or Industrial Valves.
- **Serviceability** — The manifold mounted design makes each valve section much easier to service.
- **Interchangeability** — All service parts are interchangeable with Series 6 stack valves.
- **Cost Savings** — The Series 6 MMV-IPC valve provides pressure compensation per directional control spool (4-way section). This eliminates the need for external pressure compensated flow controls, pressure reducing valves, flow dividers, etc.
- **Direct Acting Solenoids** — The solenoids respond to input commands predictably, accurately and promptly. Under metering conditions, funcion speed is precisely controlled.
- **Control** — Series 6 MMV-IPC valves provide output flow that is proportional to the input signal. These proportional valves provide precise metering from minimum to full speed.
- **Adjustable Flow Controls** — Separate adjustments for each work port allows variations to the output flow from the A and B work ports to be made independently. Unless specified, work port maximum flows are factory set to 7 GPM @ 100 PSI bias. Low flow spools are set to 2 GPM @ 100 PSI bias.

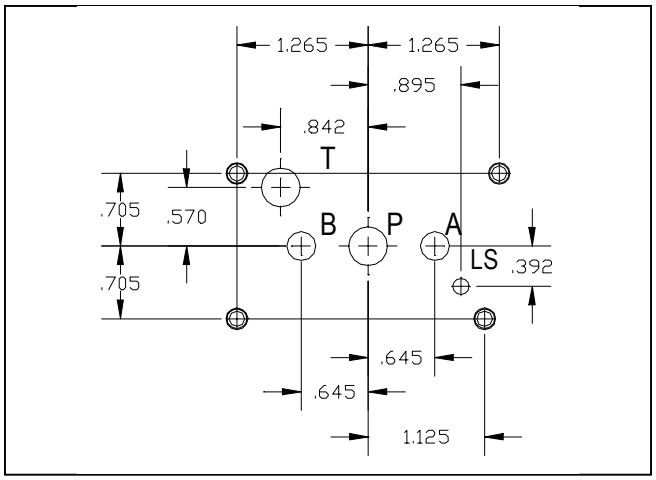
Operating Specifications

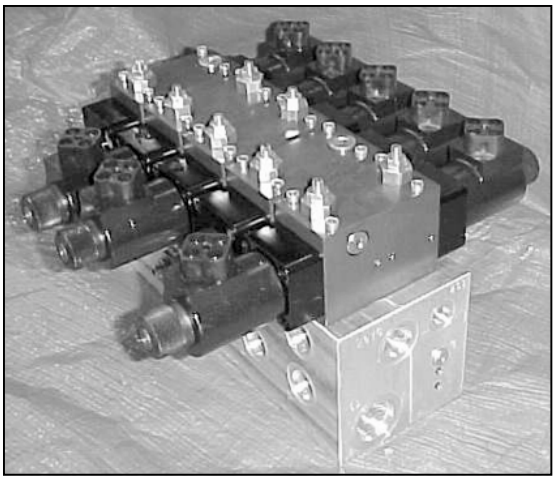
Max. Pressure	275 Bar (4000 PSI) max.*
Max. Flow Setttings For other input currents, please specify when ordering	Adjustable between: 2-26 LPM (0.5-7 GPM) 1900 mA - 12 VDC supply (C & M spool) 950 mA - 24 VDC supply (C & M spool)
Seals	Nitrile (Std.), Fluorocarbon (optional)
Temp. Range	-40°C to +82°C (-40°F to +180°F)
Fluid Viscosity	35 to 1750 SSU recommended
Filtration	ISO Code 21/18, SAE Class 4 or better
Fluids	Petroleum base (consult factory for other fluids)
Mounting	Valve will function in any position; however, it is recommended that the spool be oriented horizontally for optimum performance.

* 200 Bar (3000 PSI) max. with Aluminum Manifold

Electrical Specifications

Supply Voltages	12 VDC or 24 VDC
PWM Control Required	To obtain precise, proportional pulse width modulation (PWM) is required: 200 - 250 Hz range 225 Hz optimum
Current Range	Cracking to full flow: 12 VDC supply: 800 - 1900 mA 24 VDC supply: 250 - 950 mA
Coil Resistance	Standard coils at 20°C (68°F): 12 VDC supply 3.7 ohms 24 VDC supply 14.7 ohms
Duty	Continuous duty rated
Grounding	No grounding is required
Connections	Standard: DIN 43650 connection
Optional Connector	DIN 43650 appliance type plug with gasket for 6mm to 8mm cable diameter with one mounting screw. To order optional appliance plug separately, use P/N 15000-14.
Hysteresis	Approximately 4%.





B

Ordering Information

S6 | ☐ | ☐ | ☐ | **X.X** | **X.X** | ☐ | ☐ | ☐

Series | Body Type | Manual Override | Spool Type | A Port Output Flow | B Port Output Flow | Voltage | Seals | Options

Code	Operator Type
S6	Series 6 (3/8" Spool)

Code	Body Type
M	Manifold Style Body

Code	Manual Override
ST	Standard Push Pin Override
AF	Lever, Flow Control Side, A Side
BF	Lever, Flow Control Side, B Side

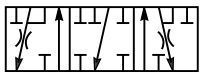
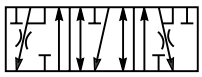
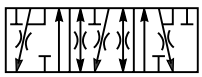
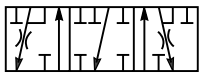
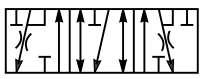
Flow Rate (GPM)**	
**	A Port

Flow Rate (GPM)**	
**	B Port

Note: Flow settings available in increments of 0.1 GPM (0.5 - 7.0 GPM) with standard spools and increments of 0.1 GPM (0 - 2.0 GPM) with low flow spools (Type L & R).

Code	Voltage
2	12 VDC
4	24 VDC

Code	Seals
N	Nitrile
V	Fluorocarbon
K	Cold Weather

Code	Options	
C	Cylinder	
M	Motor	
B	Bleeder Spool	
L*	Low Flow Cylinder	
R*	Low Flow Motor	

Note: Output flow of the "L" and "R" spools are limited to 2.0 GPM.

Code	Options
B	Spade Terminals, Flow Control Side
C	Spade Terminals, Single Solenoid, A port
E	DIN 43650 Conn., Flow Control Side
F	DIN 43650 Conn., Single Solenoid, A port

B

General Description

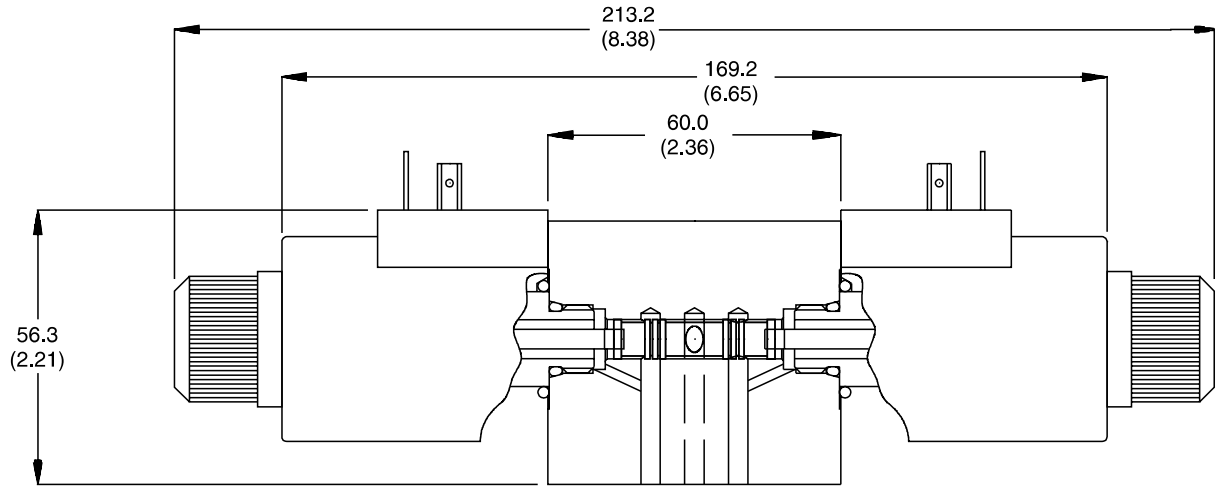
The MMV pilot valve has been redesigned with new solenoid coils and tubes. This new design improves the performance of the pilot valve and makes it easier to service the solenoid/coils.

Features

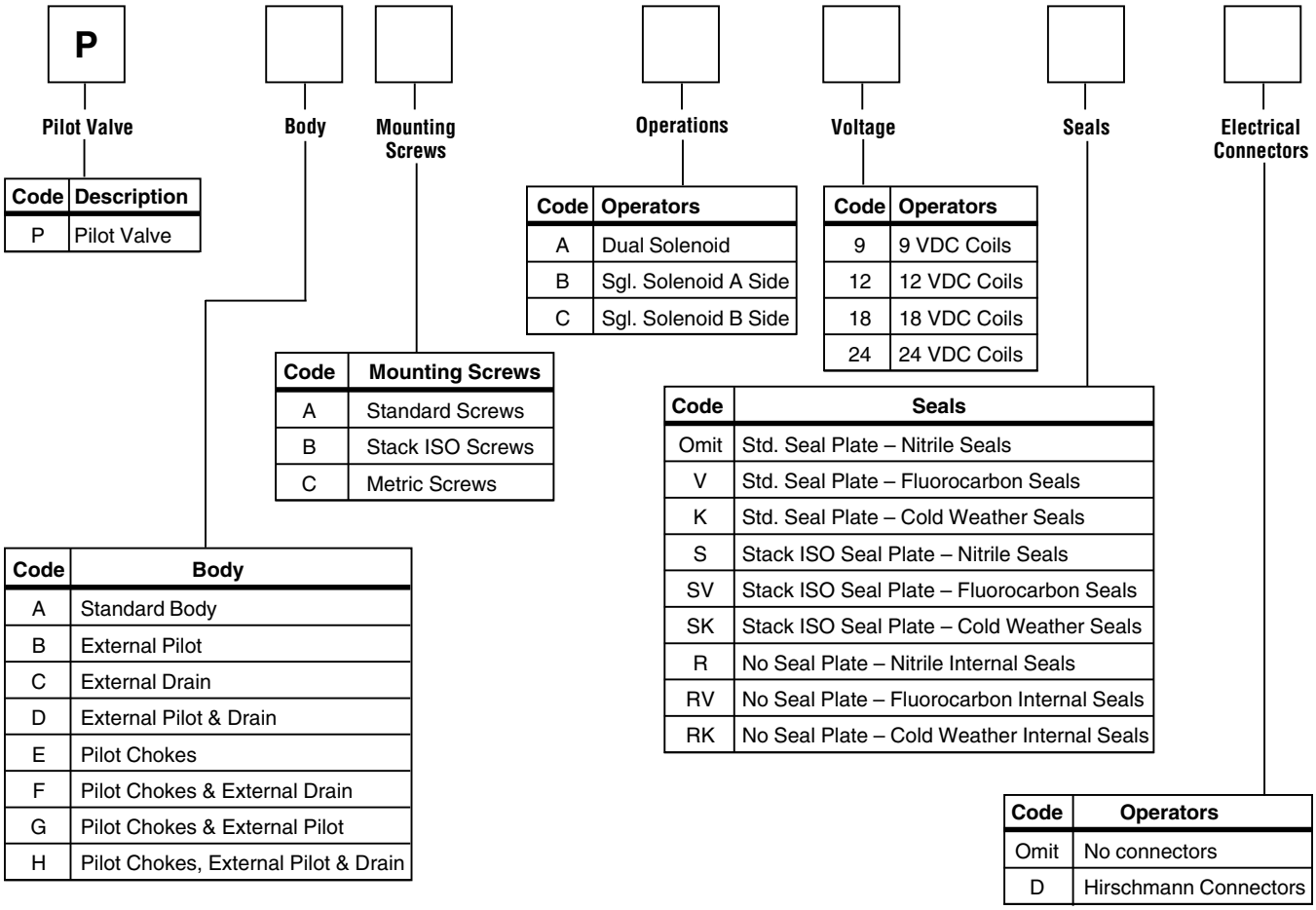
- **Better Performance** — The new pilot solenoid design requires lower amperage input for increased pilot pressure output. The new design also offers a more stable pilot output pressure through the entire operating range.
- **Serviceability** — The screw-in tube and slip-on coil design make the valve tube and coil much easier to service.
- **Contamination Tolerance** — Because the new tubes provide more force, they are less susceptible to silting.
- **Corrosion Resistance** — The new coils are completely encapsulated and will not rust. The tubes are O-ring sealed to prevent corrosion.
- **Interchangeability** — The new pilot valves fit the same mounting pattern as the previous design and can be mounted on existing valves.
- **Appearance** — The encapsulated coil and screw-in tube give the new pilot a cleaner, modern appearance.

Specifications

Voltages	Standard coils: 12 VDC or 24 VDC Low ohm coils: 9 VDC or 18 VDC
Coil Resistance	Standard coils: 20°C (68°F) 6.5 Ω (12 VDC) 20°C (68°F) 26 Ω (24 VDC) 60°C (140°F) 7.5 Ω (12 VDC) 60°C (140°F) 30 Ω (24 VDC) Low ohm coils: 20°C (68°F) 3.9 Ω (9 VDC) 20°C (68°F) 13.7 Ω (18 VDC) 60°C (140°F) 4.5 Ω (9 VDC) 60°C (140°F) 13.8 Ω (18 VDC)
Current Range (approx.)	Standard coils: (without lever) 500-1250 mA (12 VDC) 250-620 mA (24 VDC) (with lever 'L' option) 750-1450 mA (12 VDC) 370-720 mA (24 VDC) Low ohm coils: (without lever) 590-1420 mA (9 VDC) 310-780 mA (18 VDC) (with lever 'L' option) 890-1710 mA (9 VDC) 470-900 mA (18 VDC)
PWM Control Required	To obtain precise, proportional control, pulse width modulation (PWM) is required: 65-70 Hz
Grounding	A grounding terminal is supplied, but its use is not required.
Connections	Standard: DIN 43650 terminals
Optional	DIN 43650 appliance type plug with gasket for 6 mm to 8mm cable diameter with one mounting screw. To order optional appliance plug separately, use P/N 15000-14.
Duty	Continuous duty rated



Individual Pilot Valves (for 10, 12 and 16 Series)



Code	Description
P	Pilot Valve

Code	Operators
A	Dual Solenoid
B	Sgl. Solenoid A Side
C	Sgl. Solenoid B Side

Code	Operators
9	9 VDC Coils
12	12 VDC Coils
18	18 VDC Coils
24	24 VDC Coils

Code	Mounting Screws
A	Standard Screws
B	Stack ISO Screws
C	Metric Screws

Code	Seals
Omit	Std. Seal Plate – Nitrile Seals
V	Std. Seal Plate – Fluorocarbon Seals
K	Std. Seal Plate – Cold Weather Seals
S	Stack ISO Seal Plate – Nitrile Seals
SV	Stack ISO Seal Plate – Fluorocarbon Seals
SK	Stack ISO Seal Plate – Cold Weather Seals
R	No Seal Plate – Nitrile Internal Seals
RV	No Seal Plate – Fluorocarbon Internal Seals
RK	No Seal Plate – Cold Weather Internal Seals

Code	Body
A	Standard Body
B	External Pilot
C	External Drain
D	External Pilot & Drain
E	Pilot Chokes
F	Pilot Chokes & External Drain
G	Pilot Chokes & External Pilot
H	Pilot Chokes, External Pilot & Drain

Code	Operators
Omit	No connectors
D	Hirschmann Connectors

Service Parts

Bodies

Part Number	Description
75345-01	Standard Body
75345-02	Body w/ Pilot Choke Adjustments
75345-03	Body w/ External Drain Port
75345-04	Body w/ External Supply Port
75345-05	Body w/ External Supply & External Drain Port
75345-06	Body w/ Pilot Choke Adjustments & External Supply Port
75345-07	Body w/ Pilot Choke Adjustments & External Supply Port
75345-08	Body w/ Pilot Choke Adjustments & External Supply & External Drain

Tube

Part Number	Description
25226-20	Screw-In Solenoid Tube

Coil Retaining Nut

Part Number	Description
25226-21	Cap

Coil Seals

Part Number	Description
25231-01	O-Ring

Adapter Plug (used on single solenoid versions)

Part Number	Description
25226-21	Plug

Coils

Part Number	Description
25226-50	9 VDC
25226-51	12 VDC
25226-52	18 VDC
25226-53	24 VDC

Although the new style Pilot Valve is interchangeable with the existing valves, parts are not interchangeable.