

# Parker D61VW Series Pilot Operated Directional Control Valve Service Manual

## General Description

Series D61VW directional control valves are 5-chamber, pilot operated, solenoid controlled valves. They are available in 2 or 3-position styles. These valves are manifold or subplate mounted, and conform to NFPA's D08, CETOP 8 mounting patterns.





## Operation

Series D61VW pilot operated valves are standard with low shock spools and pilot orifice. The orifice can be removed if a faster shift is required. It is recommended, however, that all systems operating above 138 Bar (2000 PSI) use the standard valve to avoid severe shock.

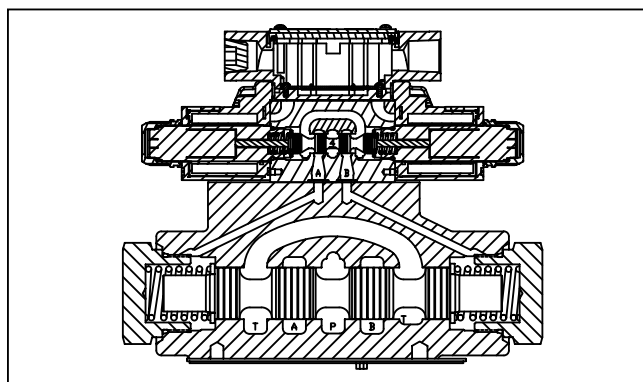
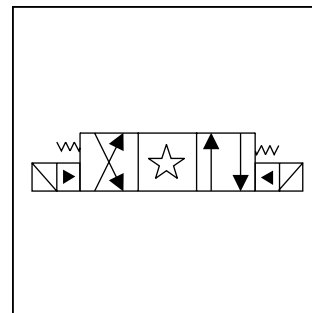
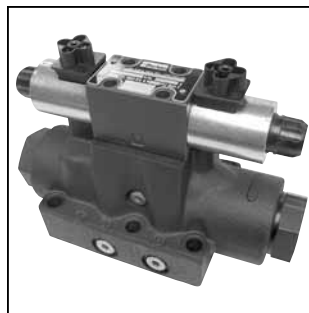
## Features

- Low pressure drop design.
- Hardened spools provide long life.
- Fast response option available.
- Explosion proof availability.
- Wide variety of voltages and electrical connection options.
- No tools required for coil removal.

## Specifications

<b>Mounting Pattern</b>	NFPA D08 CETOP 8, NG25
<b>Maximum Operating Pressure</b>	205 Bar (3000 PSI) Standard CSA  205 Bar (3000 PSI)
<b>Maximum Tank Line Pressure</b>	Internal Drain Model: 102 Bar (1500 PSI) AC Only 205 Bar (3000 PSI) DC Std./ AC Optional External Drain Model: 205 Bar (3000 PSI) CSA  102 Bar (1500 PSI)
<b>Maximum Drain Pressure</b>	102 Bar (1500 PSI) AC Standard 205 Bar (3000 PSI) DC Standard/ AC Optional CSA  102 Bar (1500 PSI)
<b>Minimum Pilot Pressure</b>	5.1 Bar* (75 PSI)
<b>Maximum Pilot Pressure</b>	205 Bar (3000 PSI) Standard CSA  205 Bar (3000 PSI)
<b>Nominal Flow</b>	189 LPM (50 GPM)
<b>Maximum Flow</b>	See Reference Data Chart

\* 6.9 Bar (100 PSI) for spool configurations 002, 007, 008, 009 & 014.



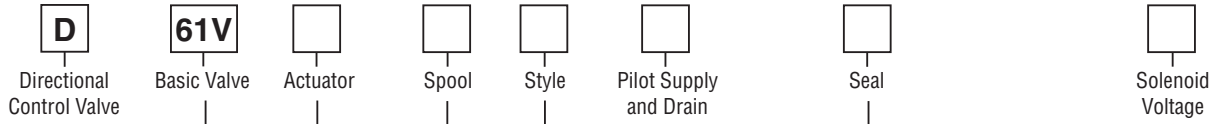
## Response Time

Response times (milliseconds) are measured at 205 Bar (3000 PSI) and 195 LPM (50 GPM) with various pilot pressures as indicated.

Solenoid Type	Pilot Pressure	Pull-In		Drop-Out	
		Std	Fast	Std	Fast
DC	500	130	100	80	80
	1000	90	90	80	80
	2000	80	80	80	80
AC	500	80	40	72	72
	1000	40	40	72	72
	2000	30	30	72	72

Because of the high drain line pressure transients generated during shifting, use of the fast response option is not recommended for pilot pressures exceeding 138 Bar (2000 PSI).

**A**



**NFPA D08, CETOP 8,  
 DIN NG25  
 Low Flow, D03 Pilot**

Code	Description
<b>W*</b>	<b>Solenoid, Wet Pin, Screw-in</b>
<b>HW*</b>	<b>Reversed Wiring</b>

\* Valve schematic symbols are per NFPA/ANSI standards, providing flow P to A when energizing solenoid A. Note operators reverse sides for #008 and #009 spools. See installation information for details. To configure per DIN standards (A coil over A port, B coil over B port) code valves as D61VHW\*\*\*.

Code	Description
<b>N</b>	<b>Nitrile</b>
<b>V</b>	<b>Fluorocarbon</b>

Code	Description
<b>1</b>	<b>Internal Pilot, External Drain</b>
<b>2</b>	<b>External Pilot, External Drain</b>
<b>3**</b>	<b>Internal Pilot w/Check, External Drain</b>
<b>4*</b>	<b>Internal Pilot, Internal Drain</b>
<b>5</b>	<b>External Pilot, Internal Drain</b>
<b>6**</b>	<b>Internal Pilot w/Check Internal Drain</b>

\* Not available with 002, 007, 008, 009 & 014 spools.  
 \*\* #3 and #6 bodies cannot be converted to other styles. Other pilot versions cannot be converted to styles 3 and 6.

Code	Description
<b>A*</b>	<b>24/50 VAC</b>
<b>D</b>	<b>120 VDC</b>
<b>G</b>	<b>198 VDC</b>
<b>J</b>	<b>24 VDC</b>
<b>K</b>	<b>12 VDC</b>
<b>N**</b>	<b>220/50 VAC</b>
<b>Q*</b>	<b>100/60 VAC</b>
<b>QD†</b>	<b>100 VAC/60 HZ 100 VAC/50 HZ</b>
<b>R</b>	<b>24/60 VAC</b>
<b>T</b>	<b>240/60 - 220/50 VAC</b>
<b>U</b>	<b>98 VDC</b>
<b>Y</b>	<b>120/60 - 110/50 VAC</b>
<b>Z</b>	<b>250 VDC</b>

\* High Watt only.  
 \*\* Explosion Proof only.  
 † Available in DIN only.

Code	Symbol	Code	Symbol
001		011	
002		012	
003		014	
004		015	
005		016	
006		021	
007		022	
008*			
009**			

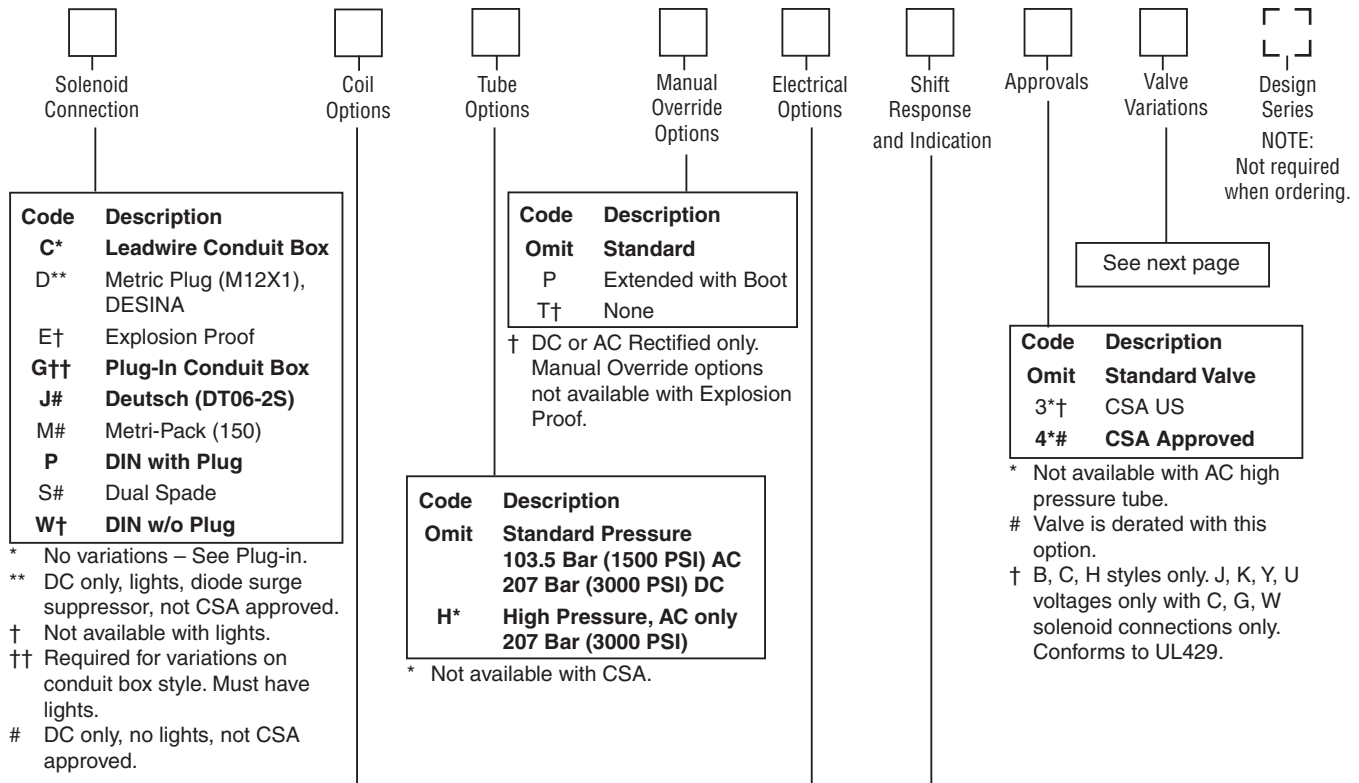
\* 008 spool has closed crossover.  
 \*\* 009 spool has open crossover.

Code	Description	Symbol
<b>B*</b>	<b>Single solenoid, 2 position, spring offset. P to A and B to T in offset position.</b>	
<b>C</b>	<b>Double solenoid, 3 position, spring centered.</b>	
<b>D*</b>	<b>Double solenoid, 2 position, detent.</b>	
<b>E</b>	<b>Single solenoid, 2 position, spring centered. P to B and A to T when energized.</b>	
<b>F**</b>	<b>Single solenoid, 2 position, spring offset, energized to center. Position spool spacer on A side. P to A and B to T in spring offset position.</b>	
<b>H*</b>	<b>Single solenoid, 2 position, spring offset. P to B and A to T in offset position.</b>	
<b>K</b>	<b>Single solenoid, 2 position, spring centered. P to A and B to T when energized.</b>	
<b>M**</b>	<b>Single solenoid, 2 position, spring offset, energized to center position. Spool spacer on B side. P to B and A to T in spring offset position.</b>	

\* Available with 001, 002, 004, 011 and 014 spools only.  
 \*\* High watt coil only.

**Bold: Designates Tier I products and options.**

**Non-bold: Designates Tier II products and options. These products will have longer lead times.**



Code	Description
<b>C*</b>	<b>Leadwire Conduit Box</b>
D**	Metric Plug (M12X1), DESINA
E†	Explosion Proof
<b>G††</b>	<b>Plug-In Conduit Box</b>
<b>J#</b>	<b>Deutsch (DT06-2S)</b>
M#	Metri-Pack (150)
<b>P</b>	<b>DIN with Plug</b>
S#	Dual Spade
<b>W†</b>	<b>DIN w/o Plug</b>

\* No variations – See Plug-in.  
 \*\* DC only, lights, diode surge suppressor, not CSA approved.  
 † Not available with lights.  
 †† Required for variations on conduit box style. Must have lights.  
 # DC only, no lights, not CSA approved.

Code	Description
<b>Omit</b>	<b>Standard</b>
P	Extended with Boot
T†	None

† DC or AC Rectified only. Manual Override options not available with Explosion Proof.

Code	Description
<b>Omit</b>	<b>Standard Pressure</b>
	<b>103.5 Bar (1500 PSI) AC</b>
	<b>207 Bar (3000 PSI) DC</b>
<b>H*</b>	<b>High Pressure, AC only</b>
	<b>207 Bar (3000 PSI)</b>

\* Not available with CSA.

Code	Description
<b>Omit*</b>	<b>High Watt</b>
D**	Explosion Proof, EEXD ATEX
E**	Explosion Proof, EEXME ATEX
F†	Low Watt
L††	10 Watt
O**	Explosion Proof, MSHA
T#	Explosion Proof, Ex d IIC ATEX/CSA
U**	Explosion Proof, UL/CSA

\* AC ambient temperature must not exceed 60°C (140°F).  
 \*\* 60 Hz only on AC, no options.  
 † AC only.  
 †† DC and AC rectified only.  
 # J, K and Y voltages only. Dual frequency on AC, no options.

**Valve Weight:**  
 Double Solenoid 12.1 kg (26.6 lbs.)  
**Seal Kit:**  
 Nitrile SKD61VWN91  
 Fluorocarbon SKD61VWV91

Code	Description
<b>Omit</b>	<b>No Options</b>
J*	Diode Surge Suppressor
Z†	Rectified Coil

\* DC only. DIN coil must include plug with lights.  
 † DC tube standard.

Code	Description
<b>Omit</b>	<b>Standard Response, No Switch</b>
I3	Monitor Switch, 'A' & 'B' Port End
I6	Monitor Switch, 'A' & 'B' Port Start

Note: Not CE or CSA approved. Not available with "F" or "M" styles.

Code	Description
<b>Omit</b>	<b>Standard Valve</b>
3*†	CSA US
<b>4*#</b>	<b>CSA Approved</b>

\* Not available with AC high pressure tube.  
 # Valve is derated with this option.  
 † B, C, H styles only. J, K, Y, U voltages only with C, G, W solenoid connections only. Conforms to UL429.

**Mounting Bolt Kits**

UNC Bolt Kits for use with D6 and D8 Directional Control Valves & Sandwich Valves				
	Number of Sandwich Valves @ 2.75" (70mm) thickness			
	0	1	2	3
D6	BK227 2.50"	BK121 5.25"	BK122 8.00"	BK123 10.75"
D6 plus tapping plate	BK161 3.50"	BK170 6.25"	BK171 9.00"	BK172 11.75"
D8	BK228 3.00"	BK131 5.75"	BK132 8.50"	BK133 11.25"
D8 plus tapping plate	BK173 4.00"	BK174 6.75"	BK175 9.50"	BK114 12.125"

Note: All bolts are SAE grade 8, 1/2-13 UNC-3A thread, torque to 133 N.m. (100 ft.-lbs.)

**Bold: Designates Tier I products and options.**

**Non-bold: Designates Tier II products and options. These products will have longer lead times.**



**Valve Variations**

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Code	Description
5*	<b>Signal Lights – Standard</b>
	<b>Signal Lights – Hirsch. (DIN with plug)</b>
7B**	Manaplug – Brad Harrison (12x1) Micro with lights
56**	<b>Manaplug (Mini) with Lights</b>
20	<b>Fast Response</b>
1C**	<b>Manaplug (Mini) Single Sol. 5-pin, with Lights</b>
1D**	Manaplug (Micro) Single Sol. 5-pin, with Lights
1G**	Manaplug (Mini) Single Sol. 5-pin, with Stroke Adjust 'A' & 'B' End and Lights
1H**	Manaplug (Micro) Single Sol. 5-pin, with Stroke Adjust 'A' & 'B' End and Lights
1M**	Manaplug Opposite Normal
1P	Painted Body
1R	Stroke Adjust 'A' & 'B' End with Pilot Choke Meter In
3A	<b>Pilot Choke Meter Out</b>
3B	<b>Pilot Choke Meter In</b>
3C	<b>Pilot Pressure Reducer</b>
3D	Stroke Adjust 'B' End
3E	Stroke Adjust 'A' End
3F	Stroke Adjust 'A' & 'B' End
3G*	<b>Pilot Choke Meter Out with Lights</b>
3H*	<b>Pilot Choke Meter In with Lights</b>
3J*	Pilot Pressure Reducer with Lights
3K	Pilot Choke Meter Out with Stroke Adjust 'A' & 'B' End
3L**	Pilot Choke Meter Out, Stroke Adjust 'A' & 'B' End with Lights and Manaplug — Brad Harrison Mini
3M	Pilot Choke Meter Out, Pilot Pressure Reducer, Stroke Adjust 'A' & 'B' End
3R	Pilot Choke Meter Out & Pilot Pressure Reducer
3S**	Lights, Mini Manaplug, Pilot Choke Meter Out
7Y**	M12x1 Manaplug (4-pin), Special Wiring, and Lights

\* DESINA, plug-in conduit box, and DIN with plug styles only.

\*\* Must have plug-in style conduit box.



**Reference Data**

Model	Spool Symbol	Maximum Flow, LPM (GPM) 207 Bar (3000 PSI) w/o Malfunction	Model	Spool Symbol	Maximum Flow, LPM (GPM) 207 Bar (3000 PSI) w/o Malfunction
D61V*001		390 (100)	D61V*008		312 (80)
D61V*002		312 (80)	D61V*009		312 (80)
D61V*003		390 (100)	D61V*011		390 (100)
D61V*004		390 (100)	D61V*012		137 (35)
D61V*005		390 (100)	D61V*014		195 (50)
D61V*006		390 (100)	D61V*015		390 (100)
D61V*007		195 (50)	D61V*016		390 (100)

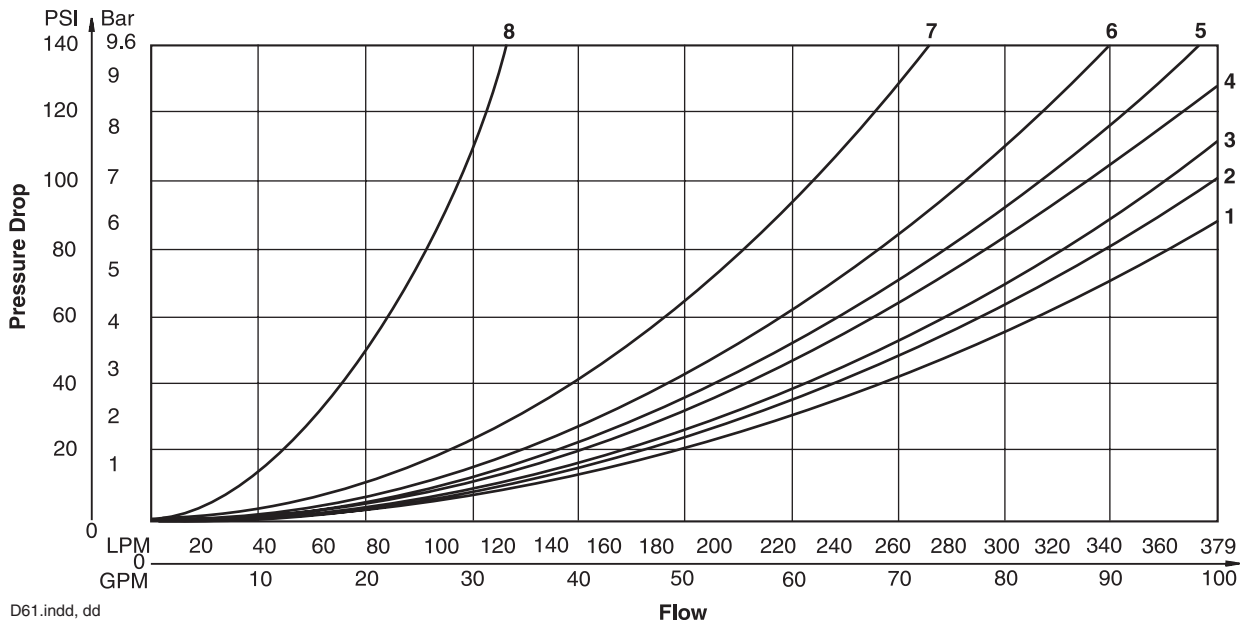
**D61V\* Series Pressure Drop Chart**

The following chart provides the flow vs. pressure drop curve reference for the Series D61V valves by spool type.

VISCOSITY CORRECTION FACTOR							
Viscosity (SSU)	75	150	200	250	300	350	400
% of ΔP (Approx.)	93	111	119	126	132	137	141
Curves were generated using 100 SSU hydraulic oil. For any other viscosity, pressure drop will change as per chart.							

D61VW Pressure Drop Reference Chart -- Curve Number					
Spool No.	P-A	P-B	P-T	A-T	B-T
001	3	3	—	1	2
002	4	4	5	4	5
003	3	3	—	4	2
004	3	3	—	4	5
005	3	4	—	1	2
006	4	4	—	1	2
007	4	4	7	1	5
008/009	3	3	7	4	6
011	3	3	—	1	2
012	3	3	8	4	5
014	4	4	—	2	1
015	3	3	—	2	4
016	4	3	—	2	1

**Performance Curves**



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**Solenoid Ratings**

<b>Insulation System</b>	Class F
<b>Allowable Deviation from rated voltage</b>	-15% to +10% for DC and AC rectified coils -5% to +5% for AC Coils
<b>Armature</b>	Wet pin type
<b>CSA File Number</b>	LR60407
<b>Environmental Capability</b>	DC Solenoids meet NEMA 4 and IP67 when properly wired and installed. Contact HVD for AC coil applications.

**Explosion Proof Solenoid Ratings\***

<b>U.L. &amp; CSA (EU)</b>	Class I, Div 1 & 2, Groups C & D Class II, Div 1 & 2, Groups E, F & G As defined by the N.E.C.
<b>MSHA (EO)</b>	Complies with 30CFR, Part 18
<b>ATEX (ED)</b>	Complies with ATEX requirements for: Exd, Group IIB; EN50014: 1999+ Amds. 1 & 2, EN50018: 2000
<b>ATEX &amp; CSA/US (ET)</b>	Complies with ATEX EN60079-0, EN60079-1 Ex d IIC; CSA/US Ex d IIC, AEx d IIC for Class I, Zone 1, UL1203, UL1604, CSA E61241,1 Class II, Div 1

\* Allowable Voltage Deviation ±10%.  
 Note that Explosion Proof AC coils are single frequency only.

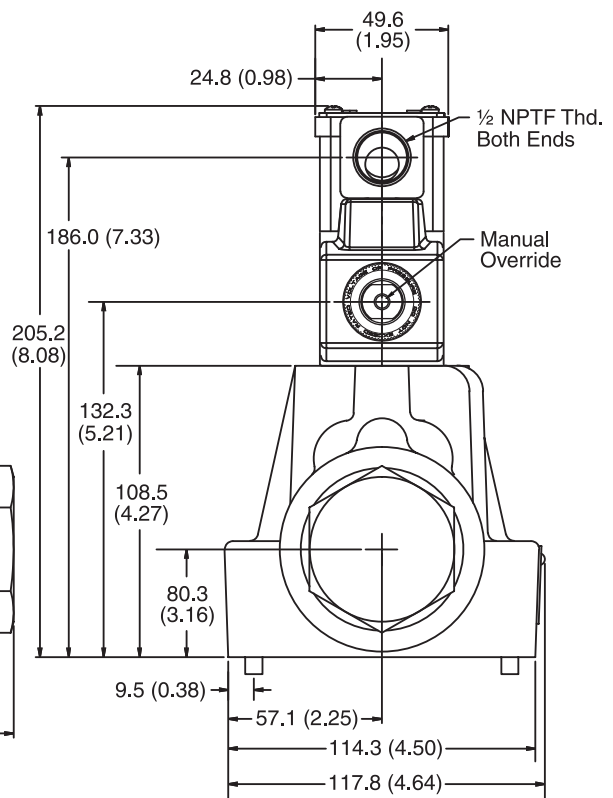
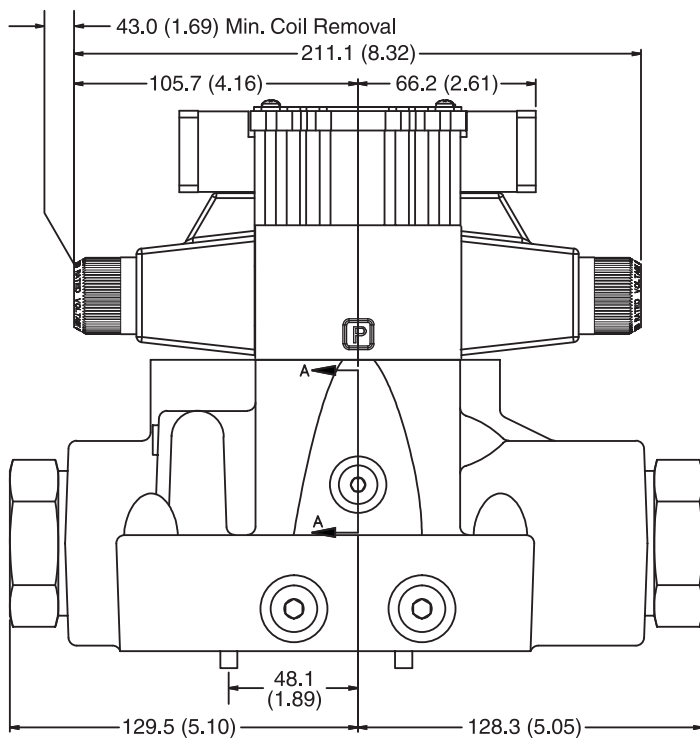
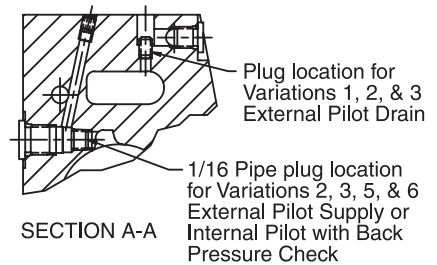
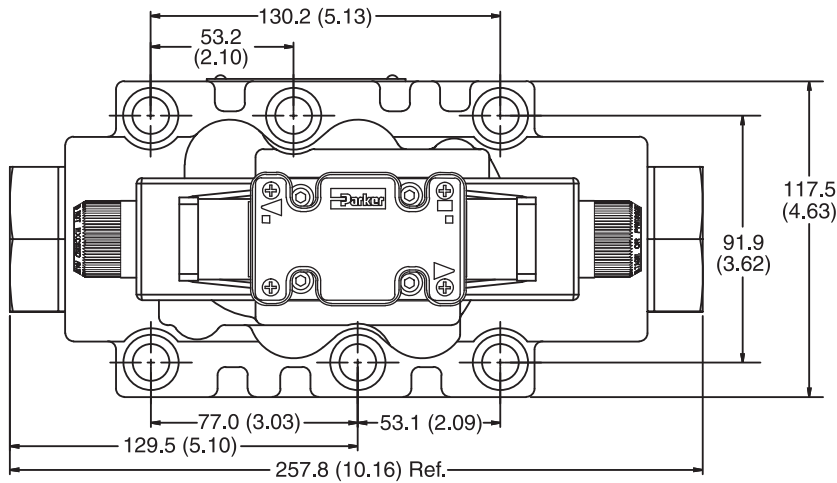
Code		Voltage	In Rush Amps Amperage	In Rush VA	Holding Amps @ 3MM	Watts	Resistance
Voltage Code	Power Code						
D	L	120 VDC	N/A	N/A	0.09 Amps	10 W	1584.00 ohms
D	Omit	120 VDC	N/A	N/A	0.26 Amps	30 W	528.00 ohms
G	Omit	198 VDC	N/A	N/A	0.15 Amps	30 W	1306.80 ohms
J	L	24 VDC	N/A	N/A	0.44 Amps	10 W	51.89 ohms
J	Omit	24 VDC	N/A	N/A	1.32 Amps	30 W	17.27 ohms
K	L	12 VDC	N/A	N/A	0.88 Amps	10 W	12.97 ohms
K	Omit	12 VDC	N/A	N/A	2.64 Amps	30 W	4.32 ohms
L	L	6 VDC	N/A	N/A	1.67 Amps	10 W	3.59 ohms
L	Omit	6 VDC	N/A	N/A	5.00 Amps	30 W	1.20 ohms
Q	Omit	100 VAC / 60 Hz	2.05 Amps	170 VA	0.77 Amps	30 W	19.24 ohms
QD	F	100 VAC / 60 Hz	1.35 Amps	135 VA	0.41 Amps	18 W	31.20 ohms
QD	F	100 VAC / 50 Hz	1.50 Amps	150 VA	0.57 Amps	24 W	31.20 ohms
R	F	24/60 VAC, Low Watt	6.67 Amps	160 VA	2.20 Amps	23 W	1.52 ohms
T	Omit	240/60 VAC	0.83 Amps	199 VA	0.30 Amps	30 W	120.40 ohms
T	Omit	220/50 VAC	0.87 Amps	191 VA	0.34 Amps	30 W	120.40 ohms
T	F	240/60 VAC, Low Watt	0.70 Amps	168 VA	0.22 Amps	21 W	145.00 ohms
T	F	220/50 VAC, Low Watt	0.75 Amps	165 VA	0.26 Amps	23 W	145.00 ohms
U	L	98 VDC	N/A	N/A	0.10 Amps	10 W	960.00 ohms
U	Omit	98 VDC	N/A	N/A	0.31 Amps	30W	288.00 ohms
Y	Omit	120/60 VAC	1.7 Amps	204 VA	0.60 Amps	30 W	28.20 ohms
Y	Omit	110/50 VAC	1.7 Amps	187 VA	0.68 Amps	30 W	28.20 ohms
Y	F	120/60 VAC, Low Watt	1.40 Amps	168 VA	0.42 Amps	21 W	36.50 ohms
Y	F	110/50 VAC, Low Watt	1.50 Amps	165 VA	0.50 Amps	23 W	36.50 ohms
Z	L	250 VDC	N/A	N/A	0.04 Amps	10 W	6875.00 ohms
Z	Omit	250 VDC	N/A	N/A	0.13 Amps	30 W	1889.64 ohms
<b>Explosion Proof Solenoids</b>							
R		24/60 VAC	7.63 Amps	183 VA	2.85 Amps	27 W	1.99 ohms
T		240/60 VAC	0.76 Amps	183 VA	0.29 Amps	27 W	1.34 ohms
N		220/50 VAC	0.77 Amps	169 VA	0.31 Amps	27 W	1.38 ohms
Y		120/60 VAC	1.60 Amps	192 VA	0.58 Amps	27 W	33.50 ohms
P		110/50 VAC	1.47 Amps	162 VA	0.57 Amps	27 W	34.70 ohms
K		12 VDC	N/A	N/A	2.75 Amps	33 W	4.36 ohms
J		24 VDC	N/A	N/A	1.38 Amps	33 W	17.33 ohms
<b>"ET" Explosion Proof Solenoids</b>							
K		12 VDC	N/A	N/A	1.00 Amps	12 W	12.00 ohms
J		24 VDC	N/A	N/A	1.00 Amps	13 W	44.30 ohms
Y		120/60-50 VAC	N/A	N/A	0.16 Amps	17 W	667.00 ohms

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

**Plug-in Conduit Box, Double AC Solenoid**



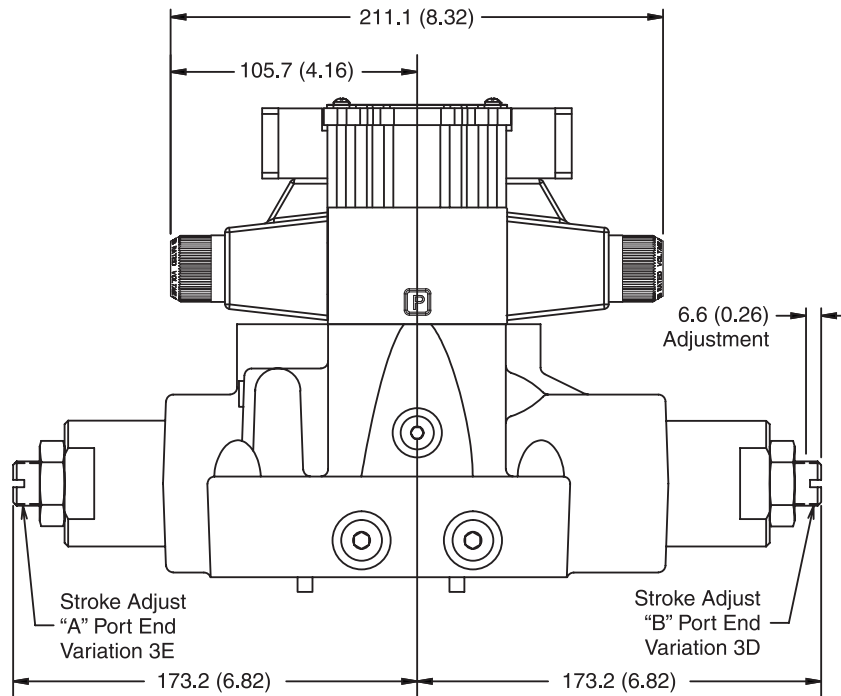
**Note:** 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.



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

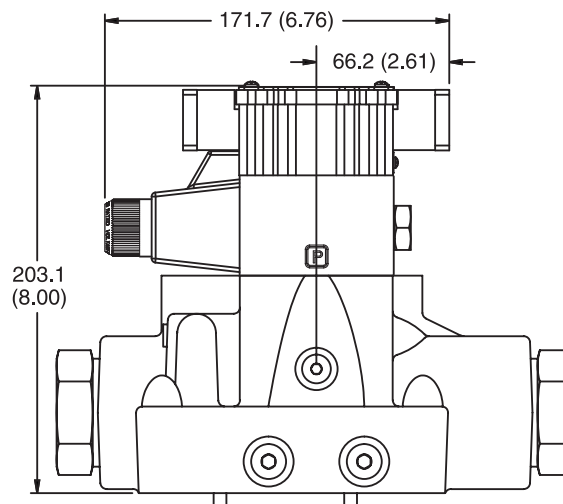
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**Plug-in Conduit Box and Stroke Adjust, Double AC Solenoid**



**Note:** 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.

**Plug-in Conduit Box, Single AC Solenoid**



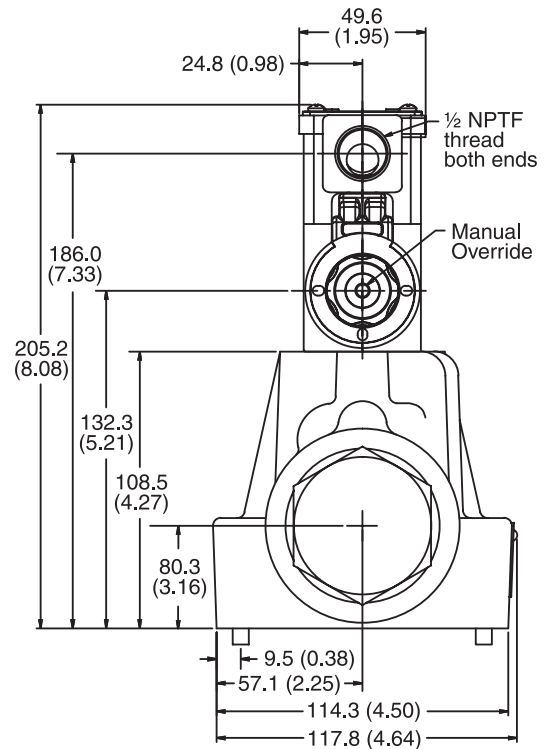
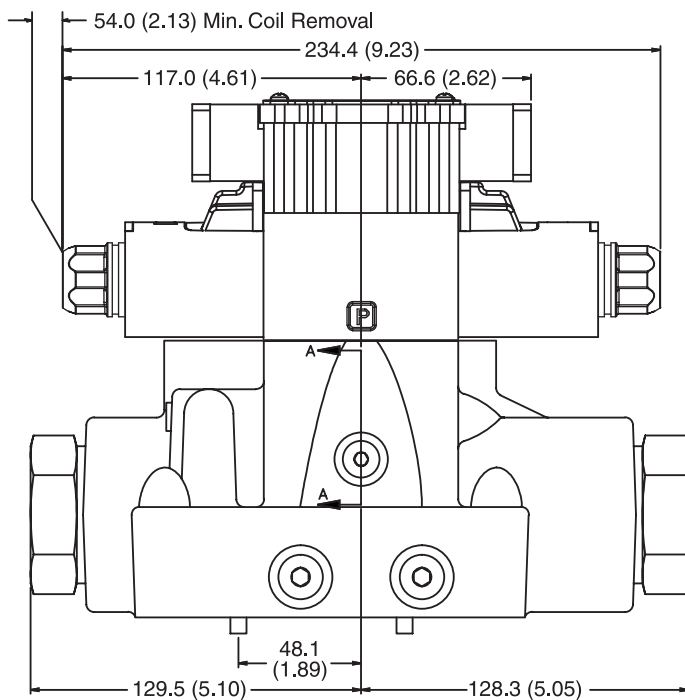
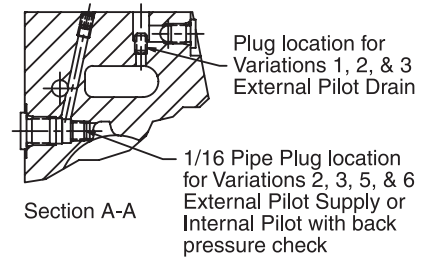
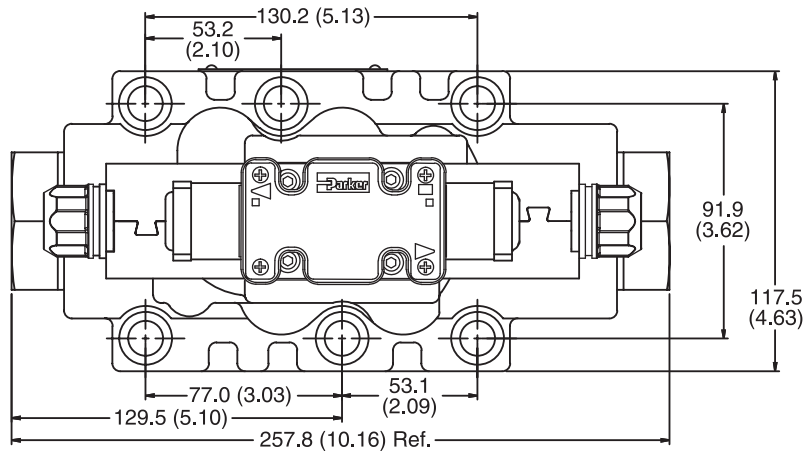
**Note:** 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.



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

**Plug-in Conduit Box, Double DC Solenoid**

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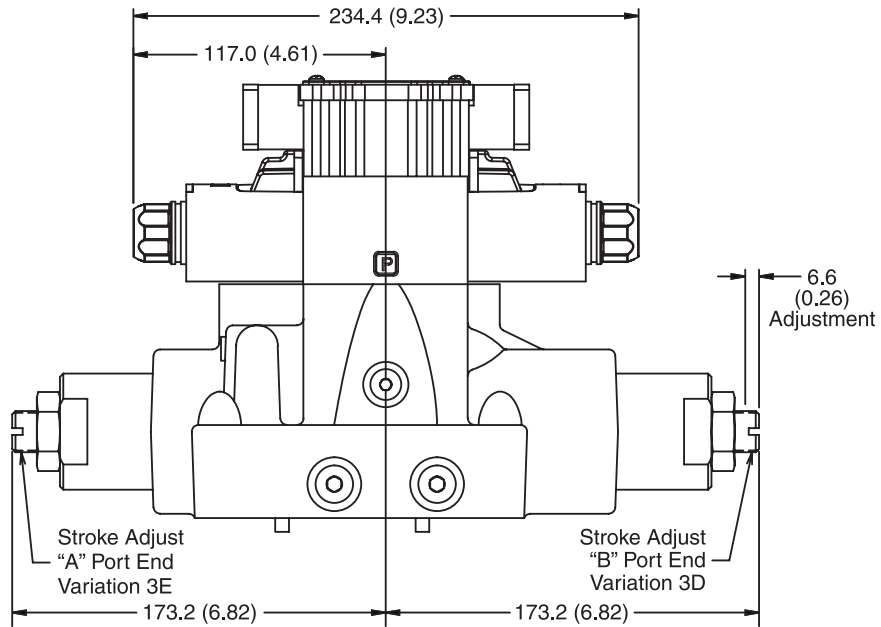
**Note:** 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.



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

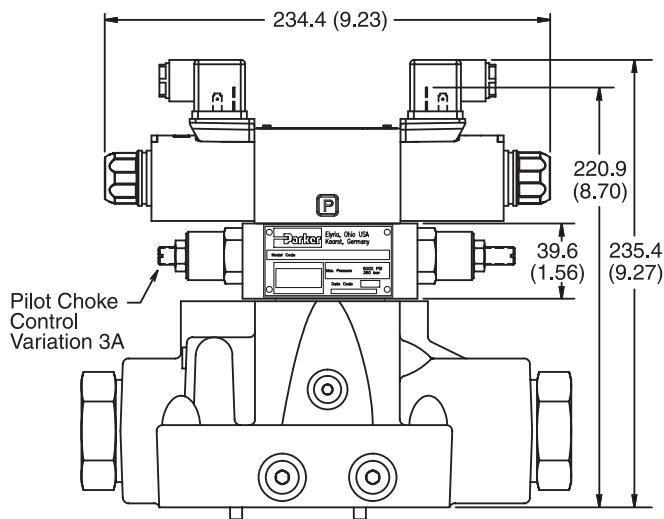
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**Plug-in Conduit Box and Stroke Adjust, Double DC Solenoid**

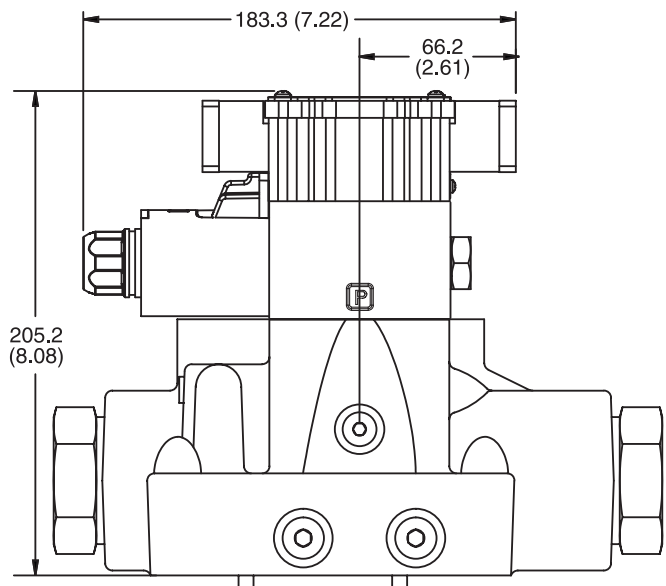


**Note:** 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.

**Hirschmann and Pilot Choke Control, Double DC Solenoid**

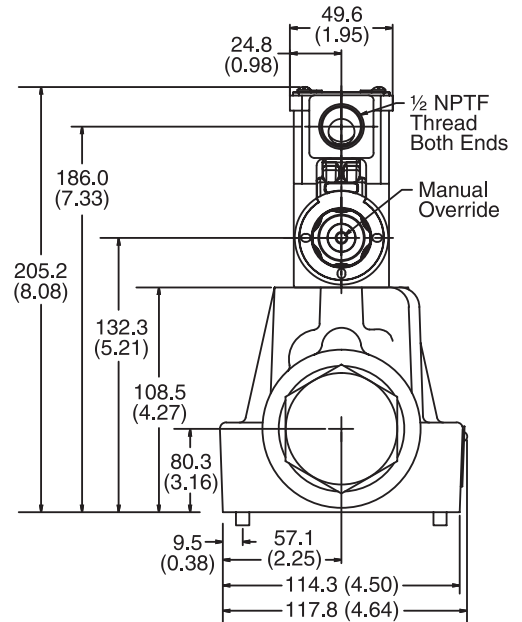
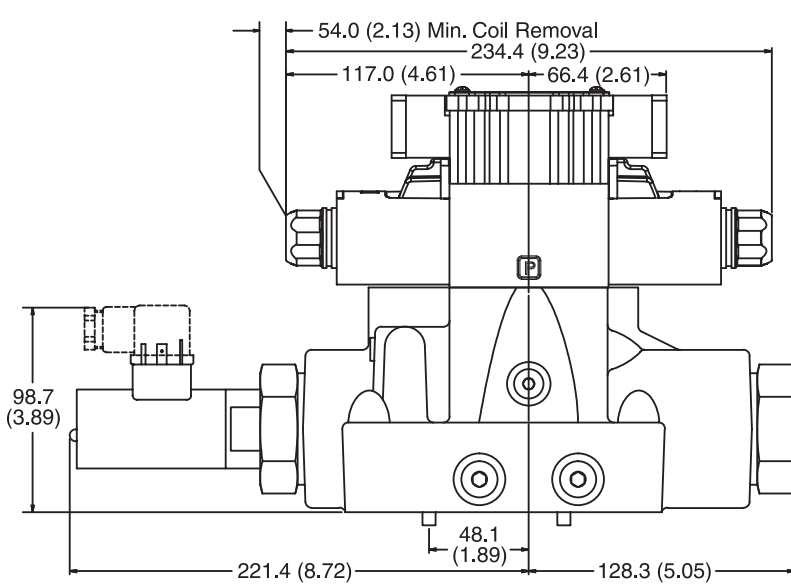
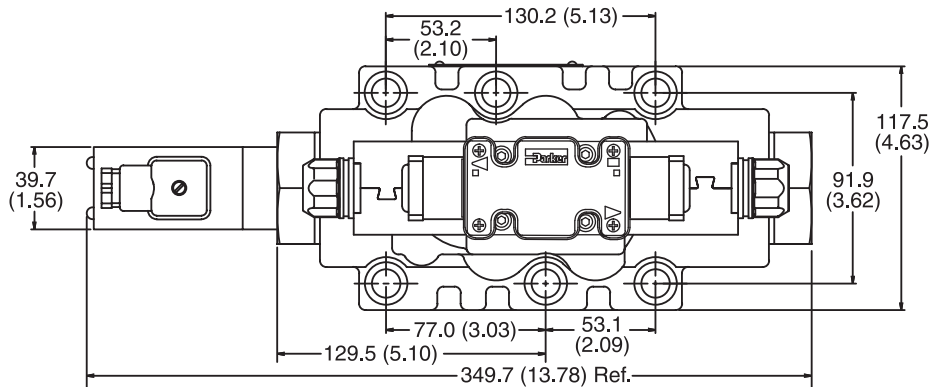


**Plug-in Conduit Box, Single DC Solenoid**



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

**Plug-in Conduit Box, Double DC Solenoid with Variation I3 (Monitor Switch)**

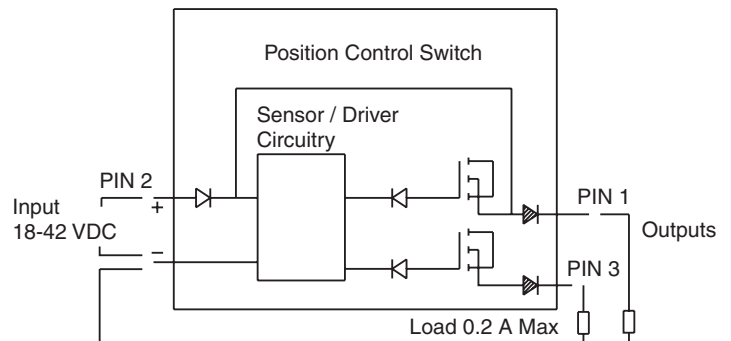


**Monitor Switch (Variation I3 and I6)**

This feature provides for electrical confirmation of the spool shift. This can be used in safety circuits, to assure proper sequencing, etc.

**Switch Data**

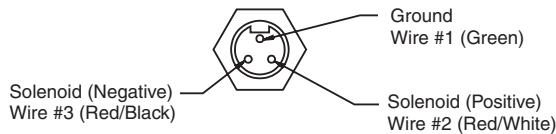
Pin 1 and Pin 3 have outputs equal to the input. When the monitor switch has the output to Pin 1, Pin 3 will have an output of zero, and vice-versa. When the valve is switched, Pin 1 and Pin 3 will switch outputs.





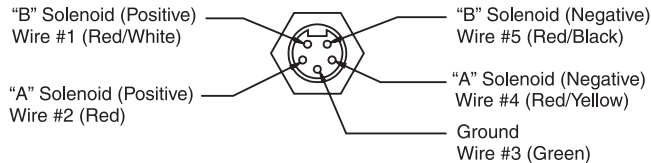
**Manaplug (Options 6, 56, 1A & 1C)**

- Interface – Brad Harrison Plug
- 3-Pin for Single Solenoid
- 5-Pin for Double Solenoid



**3-Pin Manaplug (Mini) with Lights**

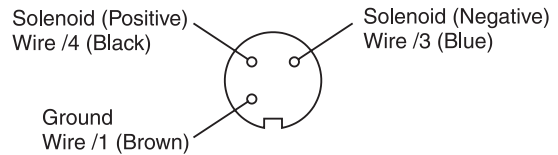
Single Solenoid Valves – Installed Opposite Side of Solenoid



**5-Pin Manaplug (Mini) with Lights**

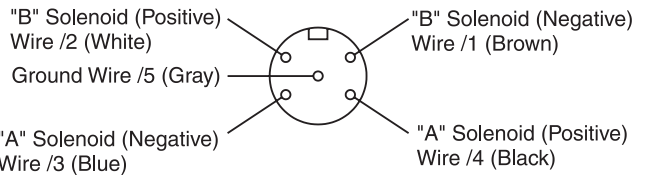
Single Solenoid Valves – Installed Opposite Side of Solenoid  
 Double Solenoid Valves – Installed Over "A" Solenoid  
 ("A" and "B" Solenoids Reversed for #8 and #9 Spools)

**Micro Connector Options (7A, 7B, 1B & 1D)**



**3-Pin Manaplug (Micro) with Lights**

Single Solenoid Valves – Installed Opposite Side of Solenoid



**5-Pin Manaplug (Micro) with Lights**

Single Solenoid Valves – Installed Opposite Side of Solenoid  
 Double Solenoid Valves – Installed Over "A" Solenoid  
 ("A" and "B" Solenoids Reversed for #8 and #9 Spools)

**Pins are as seen on valve (male pin connectors)**

**Manaplug – Electrical Mini Plug**

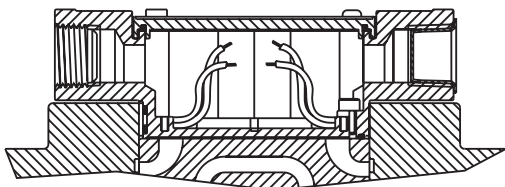
- EP336-30 3 Pin Plug
- EP316-30 5 Pin Plug (Double Solenoid)
- EP31A-30 5 Pin Plug (Single Solenoid)

**Manaplug – Electrical Micro Plug**

- EP337-30 3 Pin Plug
- EP317-30 5 Pin Plug (Double Solenoid)
- EP31B-30 5 Pin Plug (Single Solenoid)

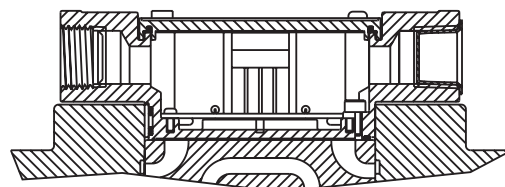
**Conduit Box Option C**

- No Wiring Options Available

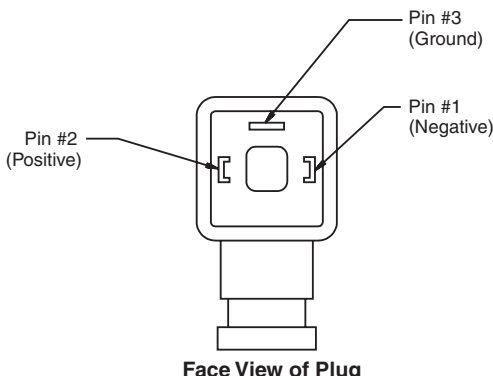


**Signal Lights (Option 5) — Plug-in Only**

- LED Interface
- Meets Nema 4/IP67



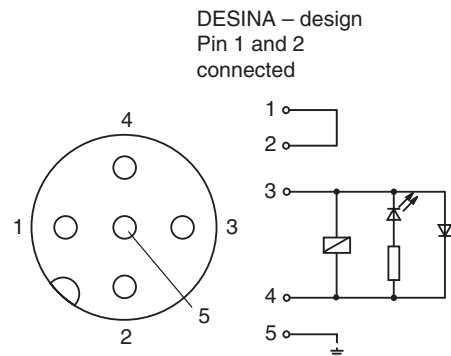
**Hirschmann Plug with Lights (Option P5)  
 ISO 4400/DIN 43650 Form "A"**



Face View of Plug

**DESINA Connector (Option D)  
 M12 pin assignment  
 Standard**

- 1 = Not used
- 2 = Not used
- 3 = 0V
- 4 = Signal (24 V)
- 5 = Earth Ground



DESINA – design  
 Pin 1 and 2  
 connected

**Pins are as seen on valve (male pin connectors)**