

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.

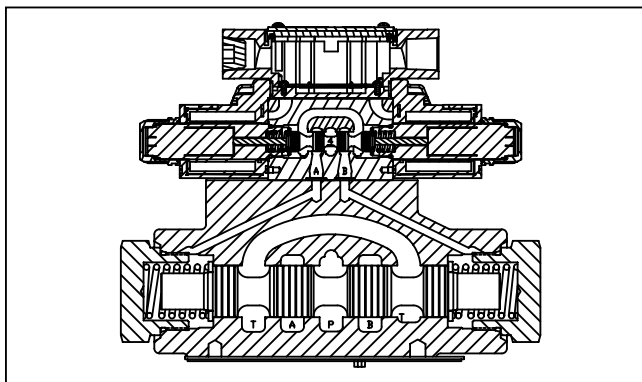
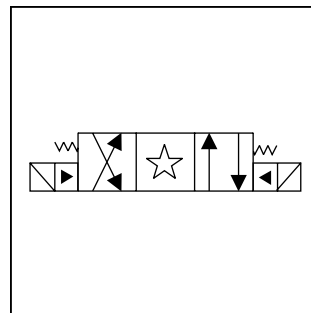
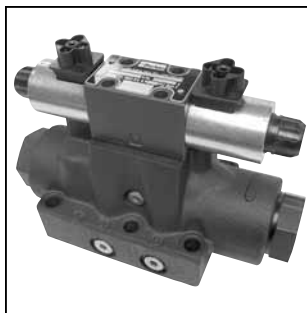
Features

- 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

| | |
|-----------------------------------|--|
| Mounting Pattern | NFPA D08 CETOP 8, NG25 |
| Maximum Operating Pressure | 205 Bar (3000 PSI) Standard CSA  205 Bar (3000 PSI) |
| Maximum Tank Line Pressure | 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) |
| Maximum Drain Pressure | 102 Bar (1500 PSI) AC Standard 205 Bar (3000 PSI) DC Standard/ AC Optional CSA  102 Bar (1500 PSI) |
| Minimum Pilot Pressure | 5.1 Bar* (75 PSI) |
| Maximum Pilot Pressure | 205 Bar (3000 PSI) Standard CSA  205 Bar (3000 PSI) |
| Nominal Flow | 189 LPM (50 GPM) |
| Maximum Flow | See Reference Data Chart |

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



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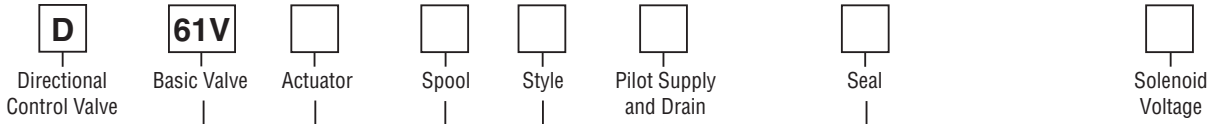
Response Time

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).

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

| Code | Description |
|------------|------------------------------------|
| W* | Solenoid, Wet Pin, Screw-in |
| HW* | Reversed Wiring |

* 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 |
|----------|---------------------|
| N | Nitrile |
| V | Fluorocarbon |

| Code | Description |
|------------|---|
| 1 | Internal Pilot, External Drain |
| 2 | External Pilot, External Drain |
| 3** | Internal Pilot w/Check, External Drain |
| 4* | Internal Pilot, Internal Drain |
| 5 | External Pilot, Internal Drain |
| 6** | Internal Pilot w/Check Internal Drain |

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

* 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** | | | |

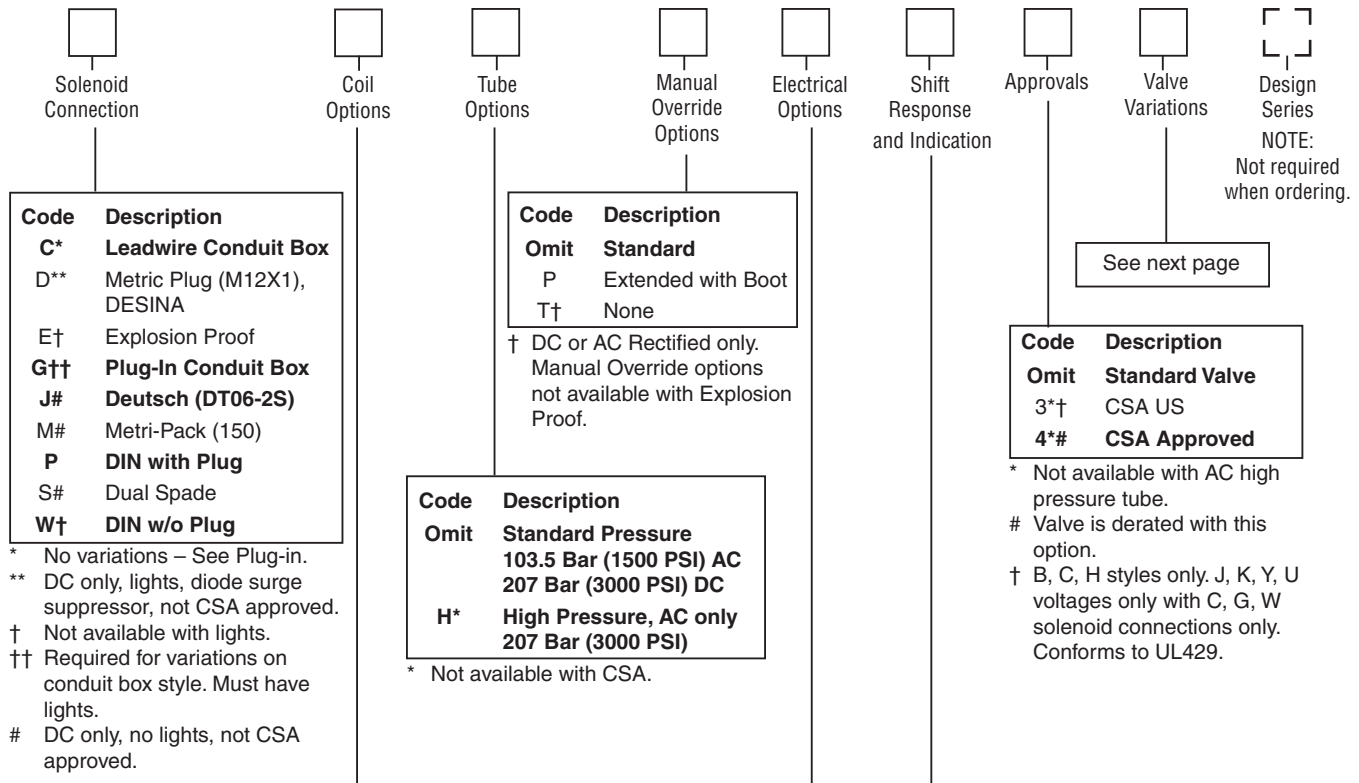
* 008 spool has closed crossover.
 ** 009 spool has open crossover.

| Code | Description | Symbol |
|------------|---|--------|
| B* | Single solenoid, 2 position, spring offset. P to A and B to T in offset position. | |
| C | Double solenoid, 3 position, spring centered. | |
| D* | Double solenoid, 2 position, detent. | |
| E | Single solenoid, 2 position, spring centered. P to B and A to T when energized. | |
| F** | 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. | |
| H* | Single solenoid, 2 position, spring offset. P to B and A to T in offset position. | |
| K | Single solenoid, 2 position, spring centered. P to A and B to T when energized. | |
| M** | 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. | |

* 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.



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

A

| Code | Description |
|------|--|
| 5* | Signal Lights – Standard |
| | Signal Lights – Hirsch. (DIN with plug) |
| 7B** | Manaplug – Brad Harrison (12x1) Micro with lights |
| 56** | Manaplug (Mini) with Lights |
| 20 | Fast Response |
| 1C** | Manaplug (Mini) Single Sol. 5-pin, with Lights |
| 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 | Pilot Choke Meter Out |
| 3B | Pilot Choke Meter In |
| 3C | Pilot Pressure Reducer |
| 3D | Stroke Adjust 'B' End |
| 3E | Stroke Adjust 'A' End |
| 3F | Stroke Adjust 'A' & 'B' End |
| 3G* | Pilot Choke Meter Out with Lights |
| 3H* | Pilot Choke Meter In with Lights |
| 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

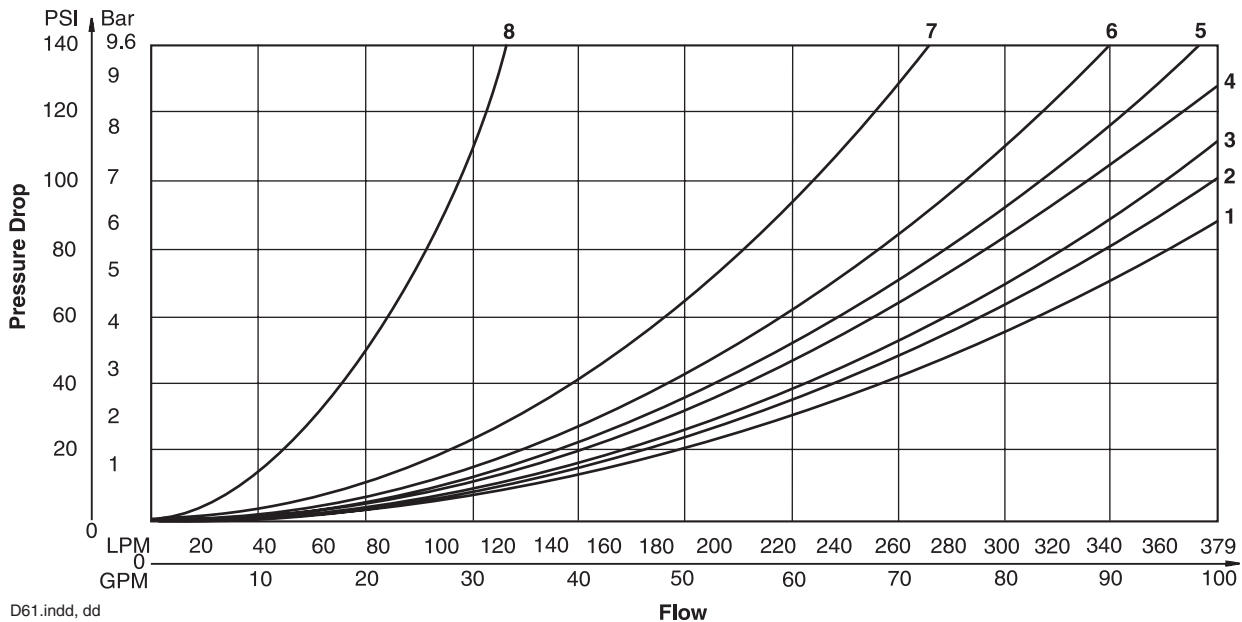
The following chart provides the flow vs. pressure drop curve reference for the Series D61V valves by spool type.

| 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

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

Explosion Proof Solenoid Ratings*

| | |
|-------------------------------|---|
| U.L. & CSA (EU) | Class I, Div 1 & 2, Groups C & D Class II, Div 1 & 2, Groups E, F & G As defined by the N.E.C. |
| MSHA (EO) | Complies with 30CFR, Part 18 |
| ATEX (ED) | Complies with ATEX requirements for: Exd, Group IIB; EN50014: 1999+ Amds. 1 & 2, EN50018: 2000 |
| ATEX & CSA/US (ET) | 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.

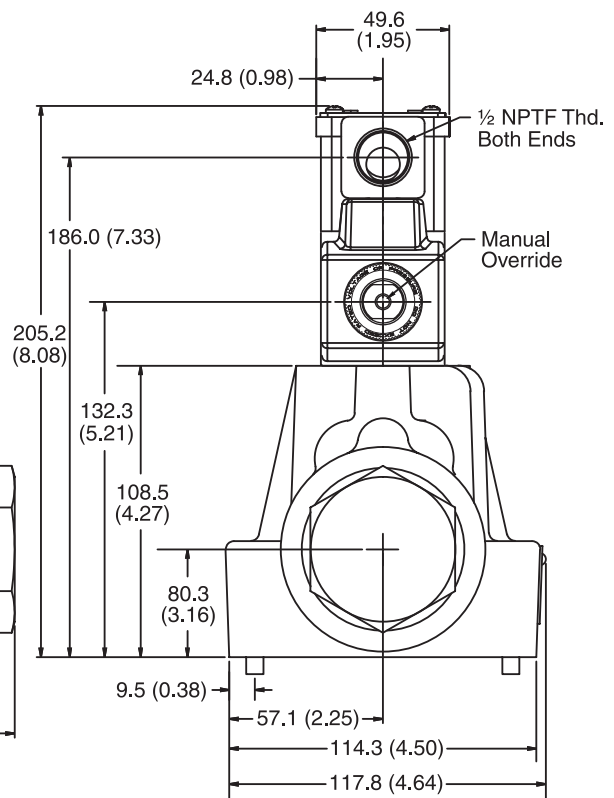
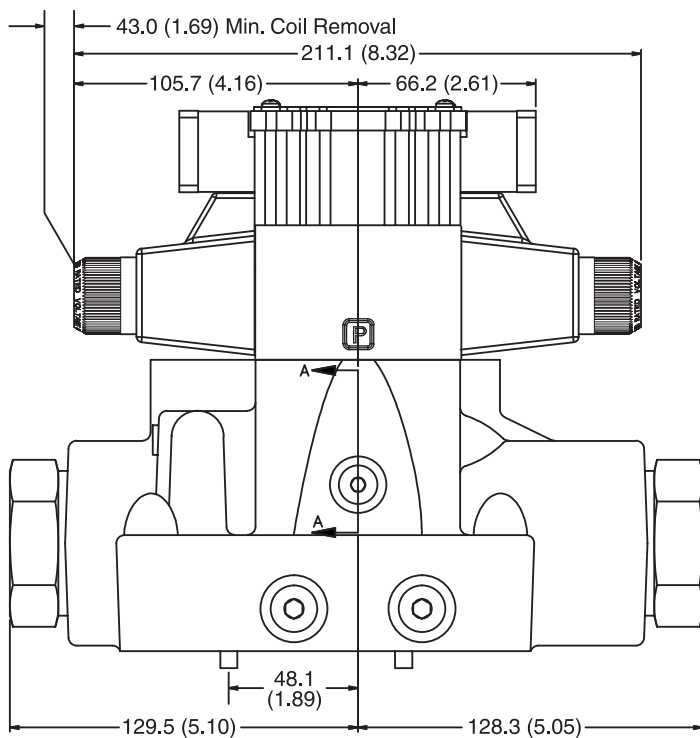
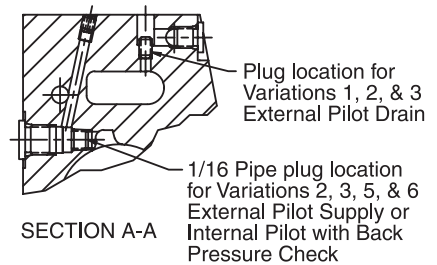
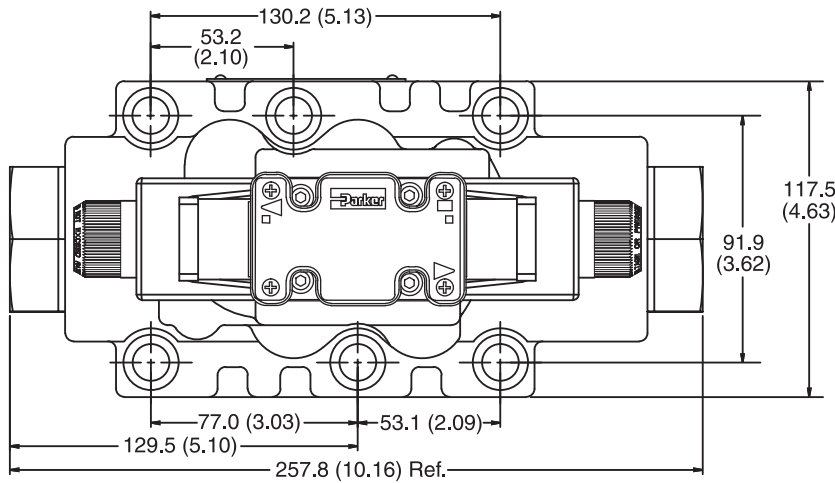
| Code | | Voltage | In Rush Amps Amperage | In Rush VA | Holding Amps @ 3MM | Watts | Resistance |
|---------------------------------------|------------|----------------------|-----------------------|------------|--------------------|-------|--------------|
| Voltage Code | Power Code | | | | | | |
| 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 |
| Explosion Proof Solenoids | | | | | | | |
| 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 |
| "ET" Explosion Proof Solenoids | | | | | | | |
| 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



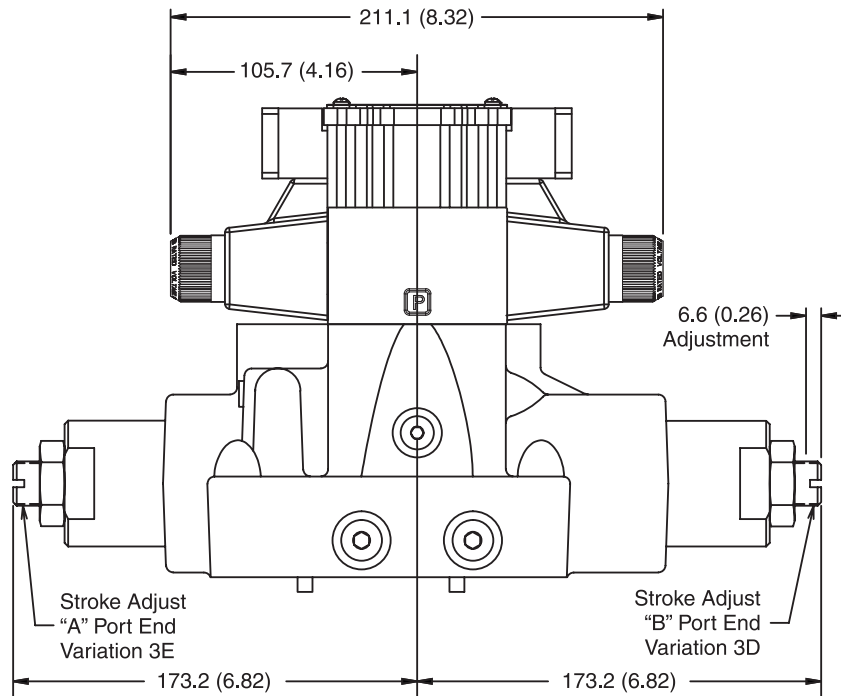
Note: 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.



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

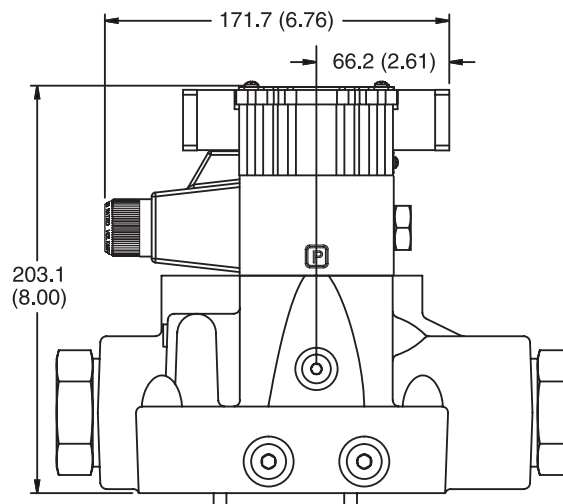
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Plug-in Conduit Box and Stroke Adjust, Double AC Solenoid



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

Plug-in Conduit Box, Single AC Solenoid

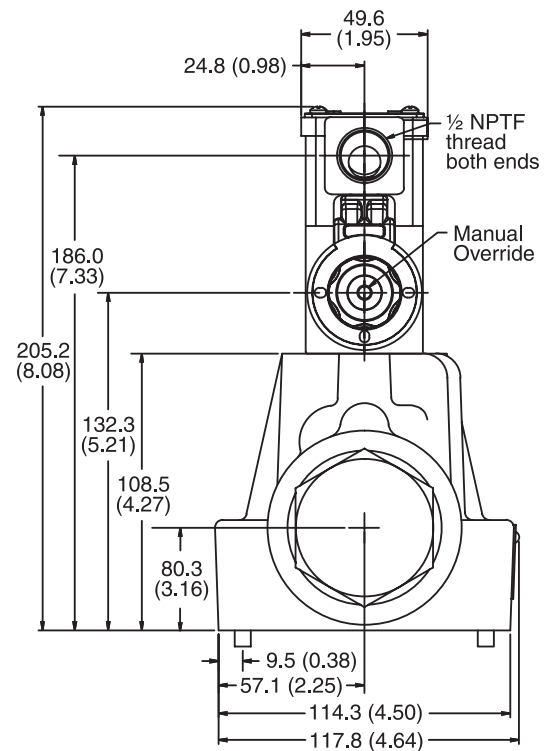
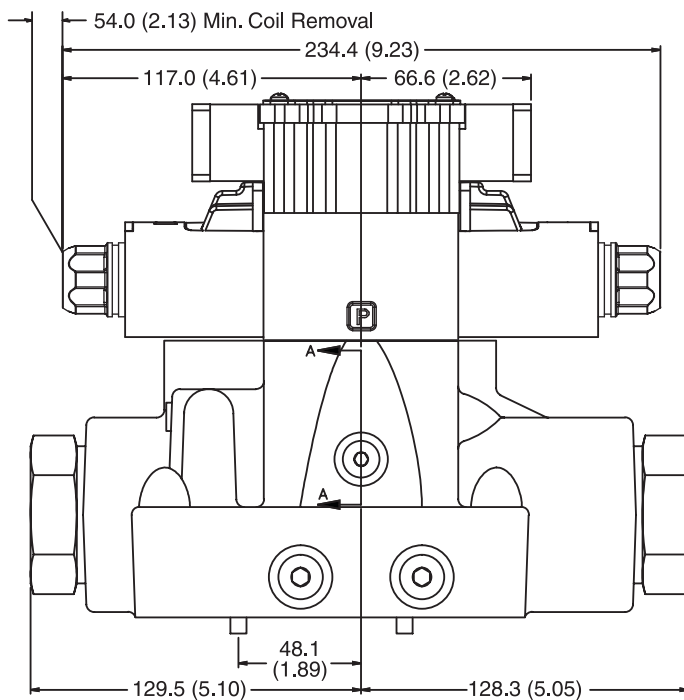
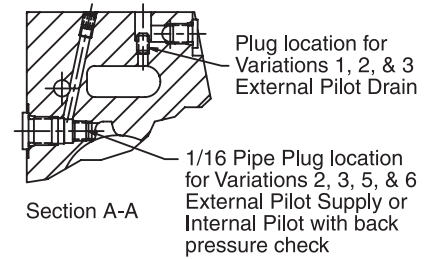
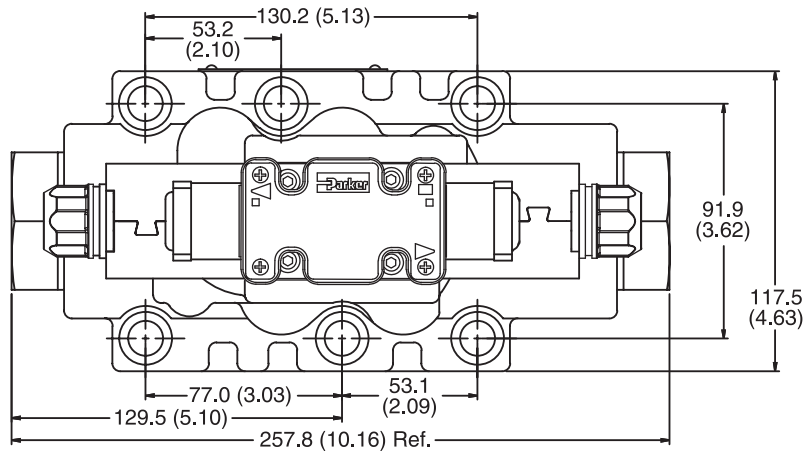


Note: 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.

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

Plug-in Conduit Box, Double DC Solenoid

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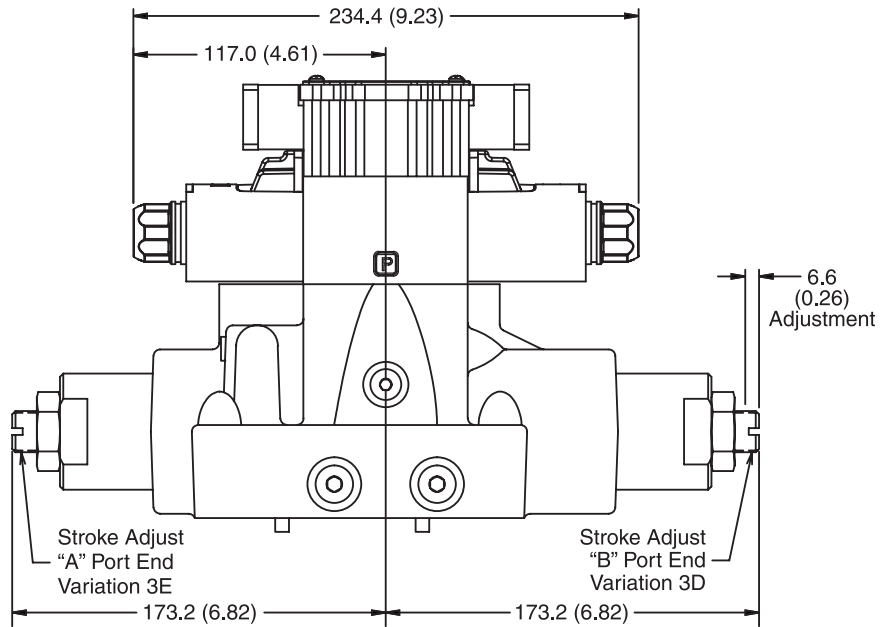
Note: 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.



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

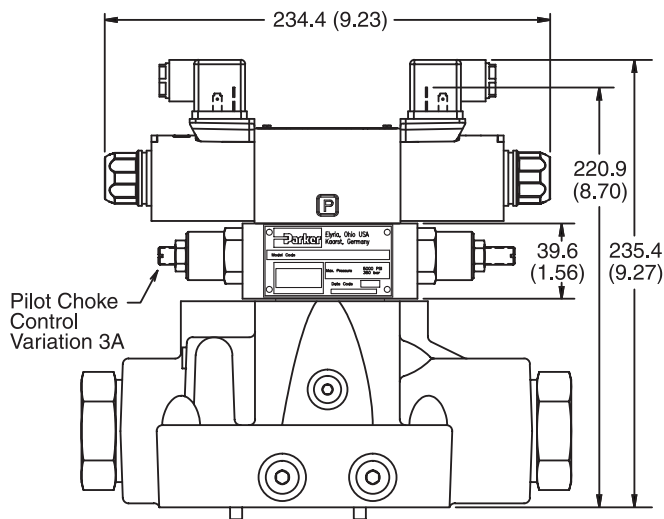
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Plug-in Conduit Box and Stroke Adjust, Double DC Solenoid

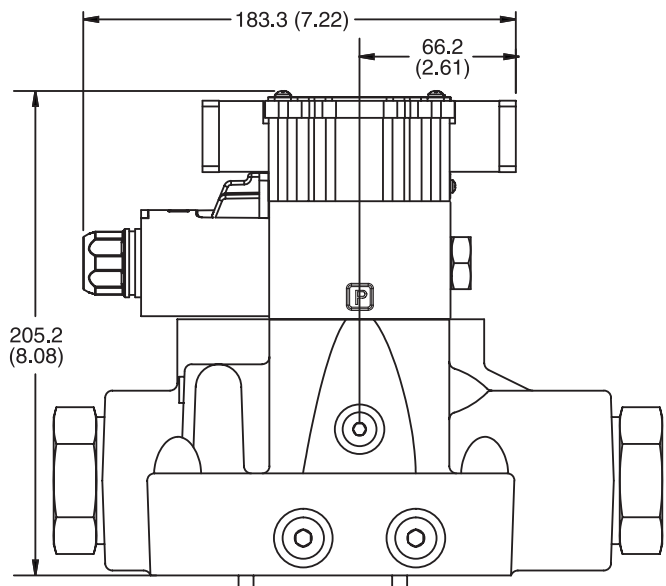


Note: 41.9mm (1.65") from bottom of bolt hole counterbore to bottom of valve.

Hirschmann and Pilot Choke Control, Double DC Solenoid

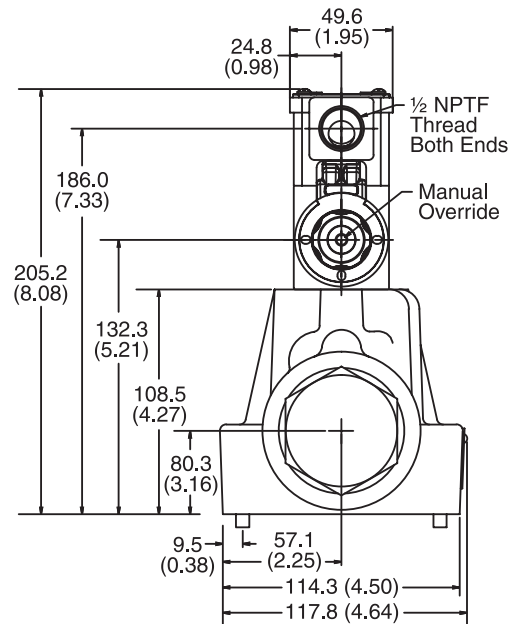
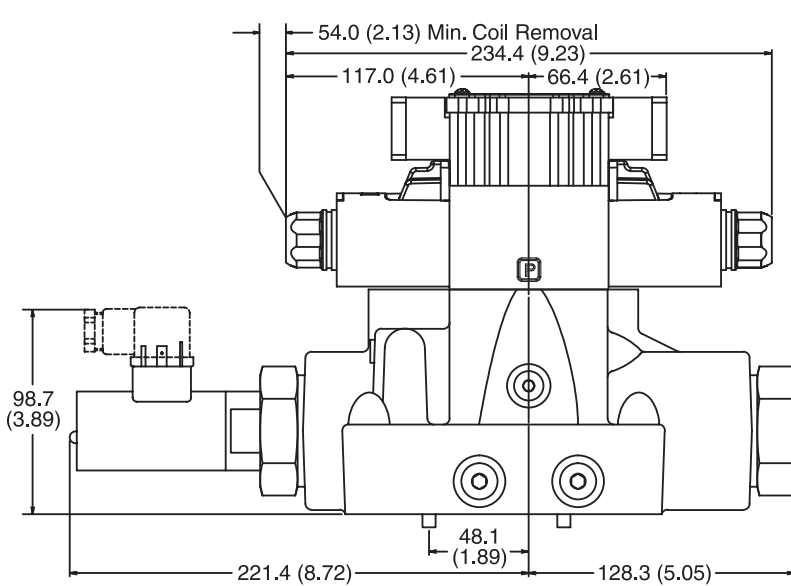
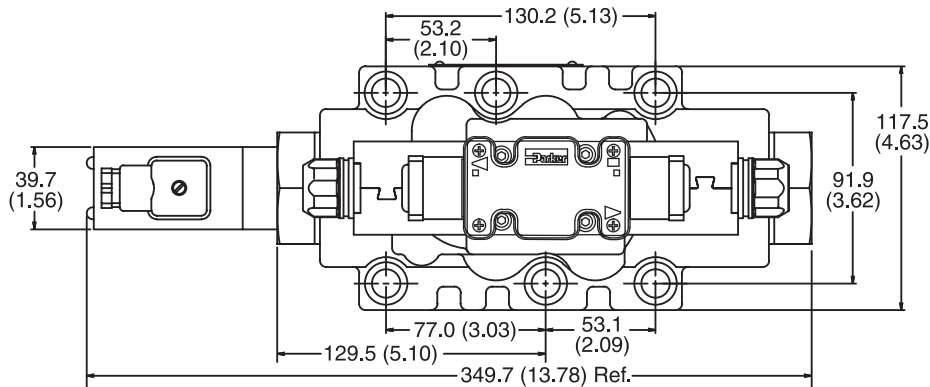


Plug-in Conduit Box, Single DC Solenoid



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

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

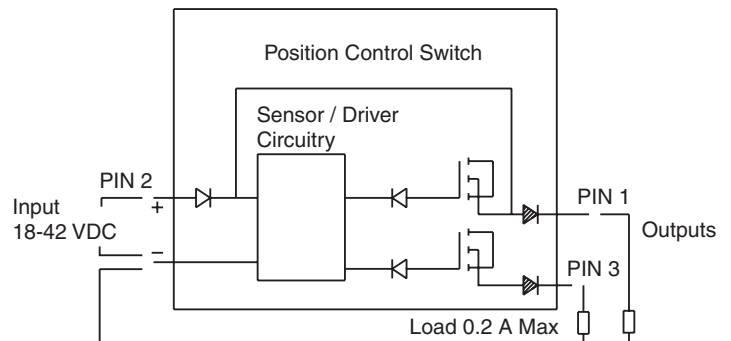


Monitor Switch (Variation I3 and I6)

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

Switch Data

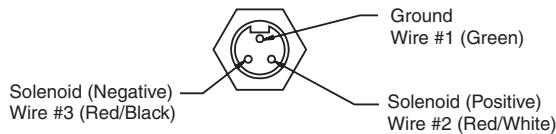
Pin 1 and Pin 3 have outputs equal to the input. When the monitor switch has the output to Pin 1, Pin 3 will have an output of zero, and vice-versa. When the valve is switched, Pin 1 and Pin 3 will switch outputs.





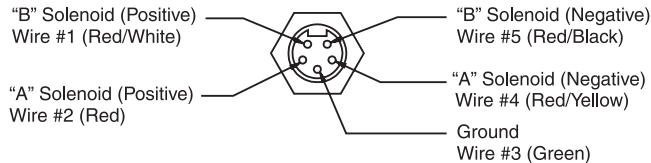
Manaplug (Options 6, 56, 1A & 1C)

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



3-Pin Manaplug (Mini) with Lights

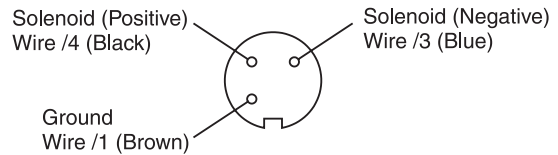
Single Solenoid Valves – Installed Opposite Side of Solenoid



5-Pin Manaplug (Mini) with Lights

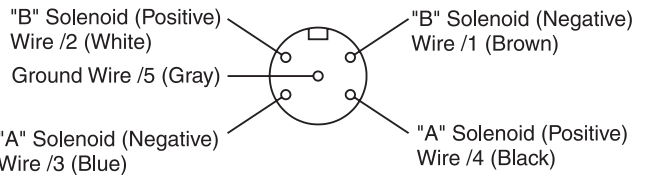
Single Solenoid Valves – Installed Opposite Side of Solenoid
 Double Solenoid Valves – Installed Over "A" Solenoid
 ("A" and "B" Solenoids Reversed for #8 and #9 Spools)

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

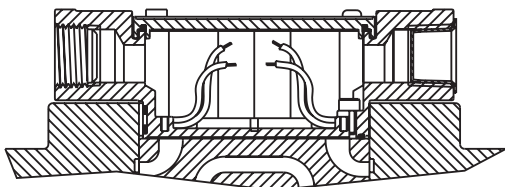
- EP336-30** 3 Pin Plug
- EP316-30** 5 Pin Plug (Double Solenoid)
- EP31A-30** 5 Pin Plug (Single Solenoid)

Manaplug – Electrical Micro Plug

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

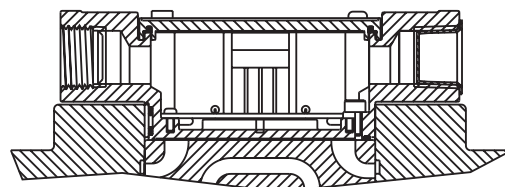
Conduit Box Option C

- No Wiring Options Available

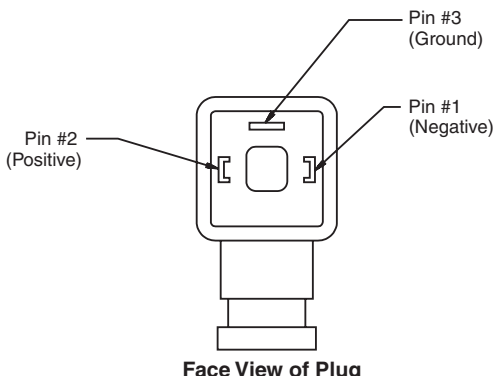


Signal Lights (Option 5) – Plug-in Only

- LED Interface
- Meets Nema 4/IP67



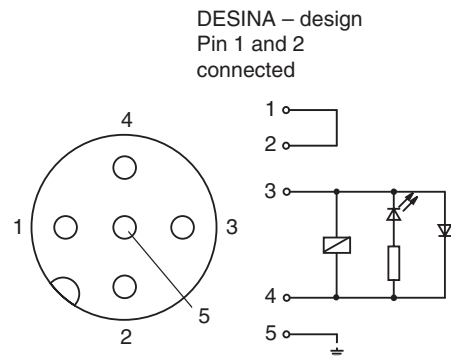
Hirschmann Plug with Lights (Option P5)
ISO 4400/DIN 43650 Form "A"



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)