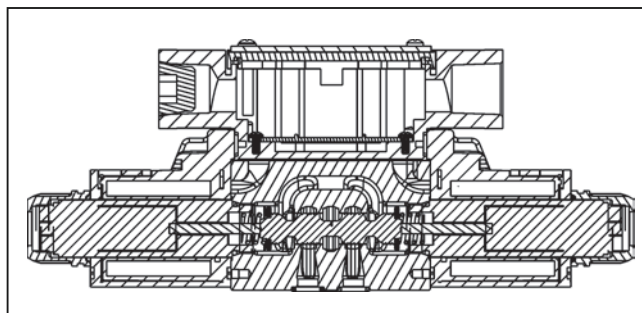
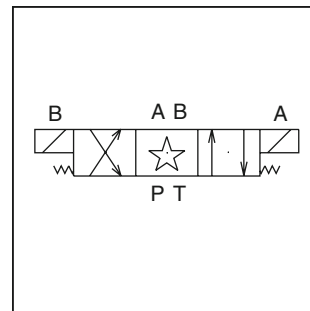
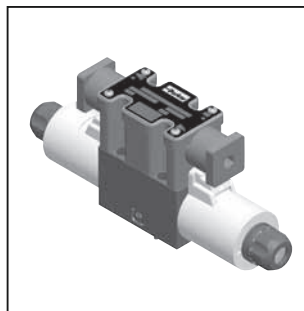


General Description

Series D1VW directional control valves are high performance, 4-chamber, direct operated, wet armature solenoid controlled, 3 or 4-way valves. They are available in 2 or 3-position and conform to NFPA's D03, CETOP 3 mounting patterns.

Features

- Soft shift available.
- 19 standard spool styles available (for other spools – Consult Factory).
- Proportional spools.
- DC surge suppression.
- Eight electrical connection options.
- AC & DC lights available (CSA approval for solenoids and lights).
- Internally ground.
- Easy access mounting bolts.
- Waterproof (meets NEMA 4, up to IP67 on some models).
- Explosion proof.
- CSA approvals.



- U.L. recognized available - Contact the division.
- No tools required for coil removal.
- AC rectified coils.

Specifications

| | | | |
|---------------------------|---|--|---|
| Mounting Pattern | NFPA D03, CETOP 3, NG 6 | Leakage Rates* | Maximum Allowable: |
| Mounting Interface | DIN 24340-A6 ISO 4401-AB-03-4-A CETOP R35H 4.2-4-03, NFPA D03 | 100 SSU @ 49°C (120°F) | 19.7 cc (1.2 Cu. in.) per Minute/Land @ 69 Bar (1000 PSI)* |
| Maximum Pressure | P, A, B 345 Bar (5000 PSI) Standard 207 Bar (3000 PSI) 10 Watt CSA 276 Bar (3750 PSI) Tank: 103 Bar (1500 PSI) AC only 207 Bar (3000 PSI) DC/AC Rectified Standard 207 Bar (3000 PSI) AC Optional CSA 103 Bar (1500 PSI) | *#008 and #009 Spools may exceed these rates. Consult Factory | 73.8 cc (4.5 Cu. in.) per Minute/Land @ 207 Bar (3000 PSI)* Typical: 4.9 cc (0.3 Cu. in.) per Minute/Land @ 69 Bar (1000 PSI)* 26.2 cc (1.6 Cu. in.) per Minute/Land @ 345 Bar (5000 PSI) |

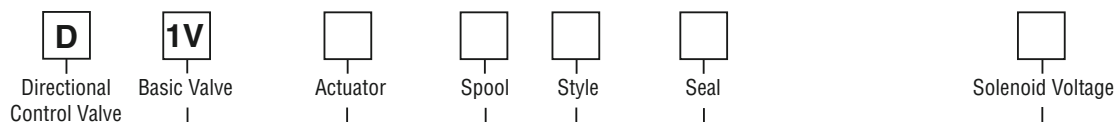
Response Time

Response time (milliseconds) at 345 Bar (5000 PSI) is 32 LPM (8.5 GPM).

| Solenoid Type | Pull-In | Drop-Out |
|---------------|---------|----------|
| AC | 13 | 20 |
| DC 10 Watt | 61 | 22 |
| DC 30 Watt | 51 | 21 |

| | Orifice Size | Spool Center Condition | | | | | |
|------------|-----------------|------------------------|-------------|----------|-------------|------------|-------------|
| | | Closed | | Open | | 2-Position | |
| Soft Shift | | Energize | De-Energize | Energize | De-Energize | Energize | De-Energize |
| S2 | 0.020 | 125 ms | 920 ms | 200 ms | 275 ms | 51 ms | 100 ms |
| S5 | 0.050 | 51 ms | 675 ms | 50 ms | 27 ms | 51 ms | 21 ms |

A



NFPA D03
 CETOP 3
 DIN NG6

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

Code Description
N Nitrile
V Fluorocarbon
E* EPR

* Contact HVD for
 availability.

Code Description
A** 24/50 VAC
D 120 VDC
G 198 VDC
J **24 VDC**
K **12 VDC**
L 6 VDC
N*** 220/50 VAC
P*** 110/50 VAC

Code Description
Q** 100/60 VAC
QD† 100/60 - 100/50 VAC
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.

* 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 D1VHW***.

| Code | Symbol | Code | Symbol |
|----------------|--------|-------|--------|
| 001 | | 011 | |
| 002 | | 014 | |
| 003 | | 015 | |
| 004 | | 016 | |
| 005 | | 020* | |
| 006 | | 026* | |
| 007 | | 030** | |
| 008*, 009** | | 081 | |
| 010 | | 082 | |

* 008, 020 & 026 spools have closed crossover.

** 009 & 030 spools have 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. | |

* 020, 026 and 030 spools only.

† 020 and 030 spools only.

‡ High Watt only.

Bold: Designates Tier I products and options.

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

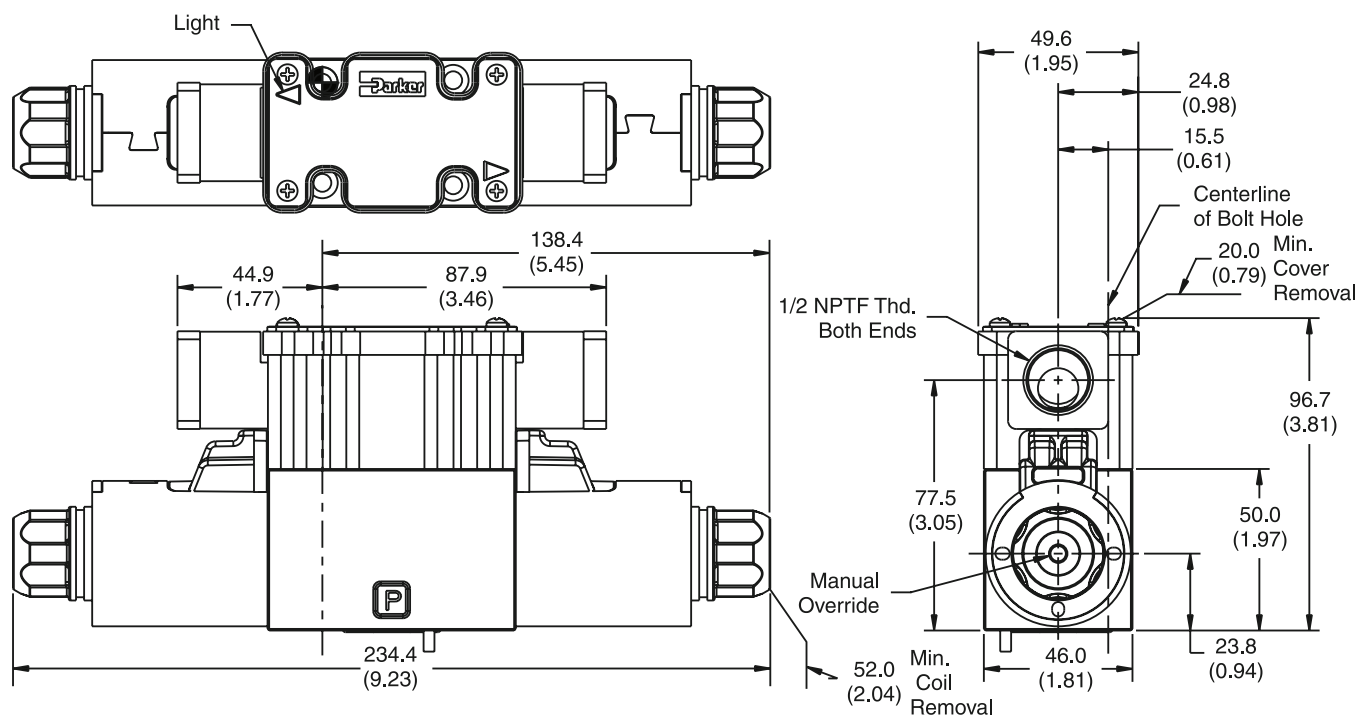
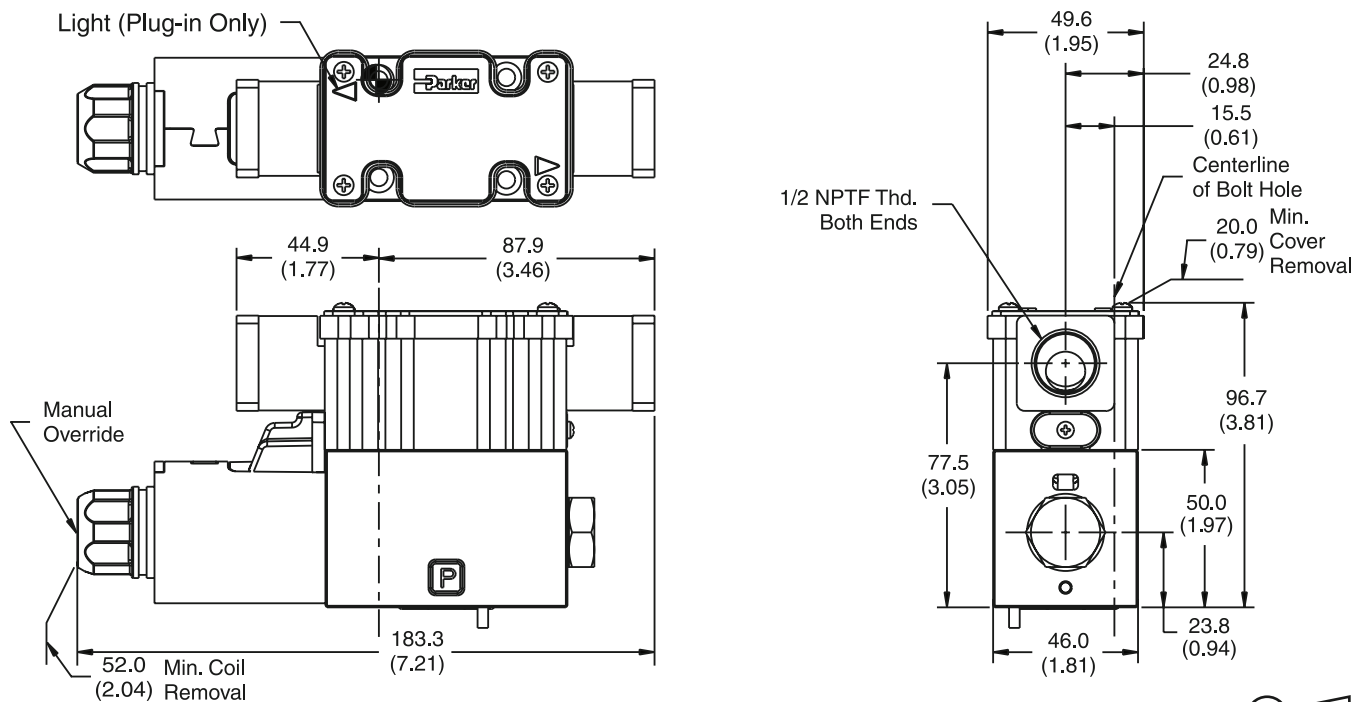
| Solenoid Connection | | Coil Options | | Tube Options | | Manual Override Options | | Electrical Options | | Shift Response and Indication | | Approvals | | Valve Variations | | Design Series | |
|---|---|--------------|--|--------------|--|-------------------------|--|--------------------|--|-------------------------------|--|-----------|--|------------------|--|---------------|--|
| Code | Description | | | | | | | | | | | | | | | | |
| C* | Leadwire Conduit Box | | | | | | | | | | | | | | | | |
| D** | Metric Plug (M12X1), DESINA | | | | | | | | | | | | | | | | |
| E† | Explosion Proof | | | | | | | | | | | | | | | | |
| G†† | Plug-In Conduit Box | | | | | | | | | | | | | | | | |
| J# | Deutsch (DT06-2S) | | | | | | | | | | | | | | | | |
| M# | Metri-Pack (150) | | | | | | | | | | | | | | | | |
| P | DIN with Plug | | | | | | | | | | | | | | | | |
| S# | Dual Spade | | | | | | | | | | | | | | | | |
| W† | DIN w/o Plug | | | | | | | | | | | | | | | | |
| * 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 | | | | | | | | | | | | | | | | |
| Omit* | High Watt | | | | | | | | | | | | | | | | |
| 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. | | | | | | | | | | | | | | | | | |
| Code | Description | | | | | | | | | | | | | | | | |
| Omit | No Options | | | | | | | | | | | | | | | | |
| J** | Diode Surge Suppressor | | | | | | | | | | | | | | | | |
| Z† | Rectified Coil | | | | | | | | | | | | | | | | |
| † DC tube standard. | | | | | | | | | | | | | | | | | |
| ** DC only. DIN coil must have plug with lights. | | | | | | | | | | | | | | | | | |
| Code | Description | | | | | | | | | | | | | | | | |
| Omit | Standard | | | | | | | | | | | | | | | | |
| T*† | No Override | | | | | | | | | | | | | | | | |
| P* | Extended Manual Override w/Boot | | | | | | | | | | | | | | | | |
| * Manual override options not available on explosion proof or soft shift. | | | | | | | | | | | | | | | | | |
| † DC/AC rectified only. | | | | | | | | | | | | | | | | | |
| Code | Description | | | | | | | | | | | | | | | | |
| Omit | Standard Pressure | | | | | | | | | | | | | | | | |
| | 103.5 Bar (1500 PSI) AC | | | | | | | | | | | | | | | | |
| | 207 Bar (3000 PSI) DC | | | | | | | | | | | | | | | | |
| H* | High Pressure, AC only | | | | | | | | | | | | | | | | |
| | 207 Bar (3000 PSI) | | | | | | | | | | | | | | | | |
| * Not available with CSA. | | | | | | | | | | | | | | | | | |
| Code | Description | | | | | | | | | | | | | | | | |
| Omit | Standard Valve | | | | | | | | | | | | | | | | |
| 3*† | CSA US | | | | | | | | | | | | | | | | |
| 4*# | CSA Canada | | | | | | | | | | | | | | | | |
| * Not available with AC high pressure tube. | | | | | | | | | | | | | | | | | |
| † B, C, H styles only. | | | | | | | | | | | | | | | | | |
| J, K, Y, U voltages only. | | | | | | | | | | | | | | | | | |
| C, G, W sol. connections only. Conforms to UL429. | | | | | | | | | | | | | | | | | |
| # Valve is derated. | | | | | | | | | | | | | | | | | |
| Code | Description | | | | | | | | | | | | | | | | |
| Omit | No Variations | | | | | | | | | | | | | | | | |
| 5** | Signal Lights | | | | | | | | | | | | | | | | |
| 56* | Manaplug (Mini) with Lights | | | | | | | | | | | | | | | | |
| 7B* | Manaplug (Micro) with Lights | | | | | | | | | | | | | | | | |
| 1C* | Manaplug (Mini) Single Sol. 5-pin, with Lights | | | | | | | | | | | | | | | | |
| 1D* | Manaplug (Micro) Single Sol. 5-pin, with Lights | | | | | | | | | | | | | | | | |
| 1M* | Manaplug Opposite of Normal | | | | | | | | | | | | | | | | |
| 4D† | Twist & Lock Override (Old 5426, 33 Ford wiring) | | | | | | | | | | | | | | | | |
| 4E† | Push Manual Override (Old x5450) | | | | | | | | | | | | | | | | |
| 4F | Heavy Duty Detent | | | | | | | | | | | | | | | | |
| 1P | Painted Body | | | | | | | | | | | | | | | | |
| 7Y* | 4-pin M12x1 Manaplug, special wiring with lights (Old B755) | | | | | | | | | | | | | | | | |
| * Plug-in Conduit Box | | | | | | | | | | | | | | | | | |
| ** Plug-in, DIN, or DESINA only | | | | | | | | | | | | | | | | | |
| † DC/AC Rectified only. | | | | | | | | | | | | | | | | | |
| Not available with soft shift. | | | | | | | | | | | | | | | | | |

Bold: Designates Tier I products and options.

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

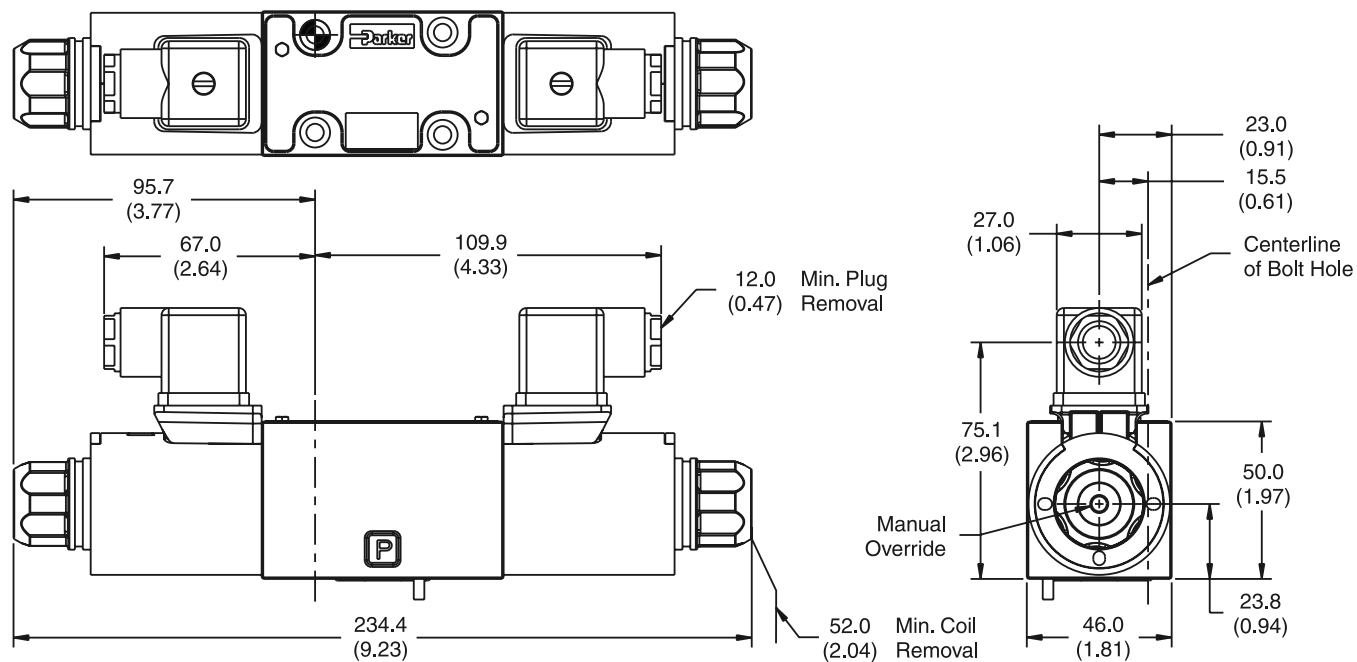
D1.indd, dd

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

A**DC Plug-In Conduit Box Connector, with Lights, Double Solenoid****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.**DC Plug-In or Leadwire Conduit Box Connector, with or without Lights, Single Solenoid****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

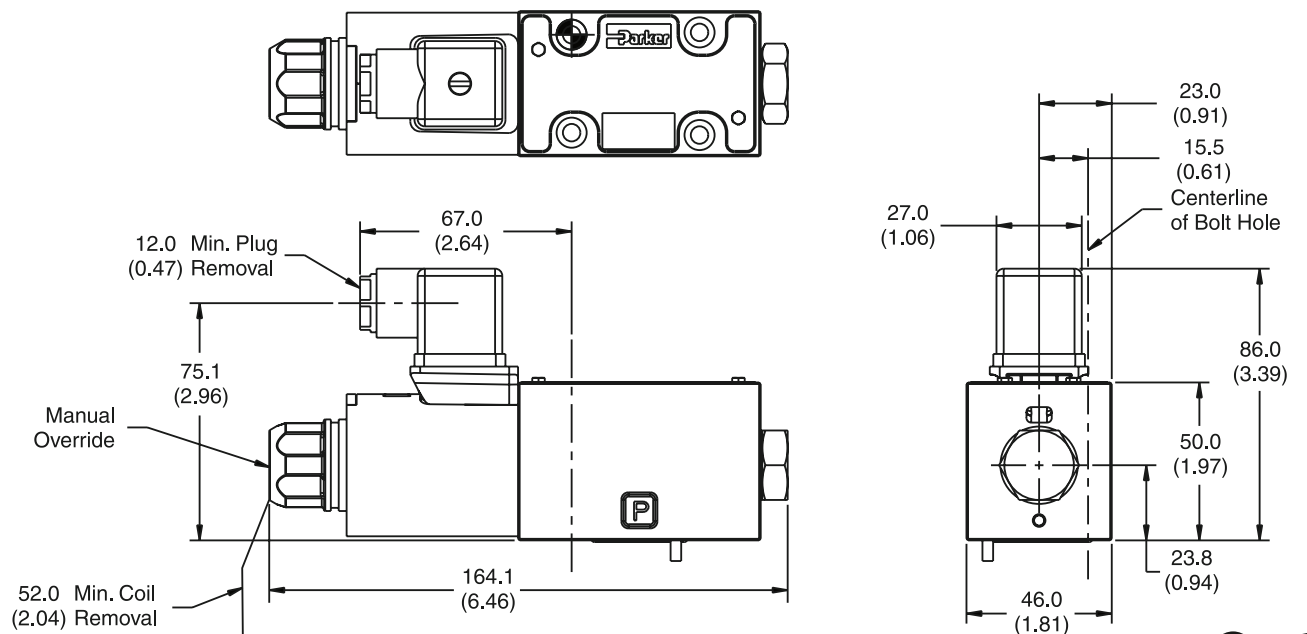
Inch equivalents for millimeter dimensions are shown in (**)

DC DIN with Plug Connector, Double Solenoid “P” Option Shown

A


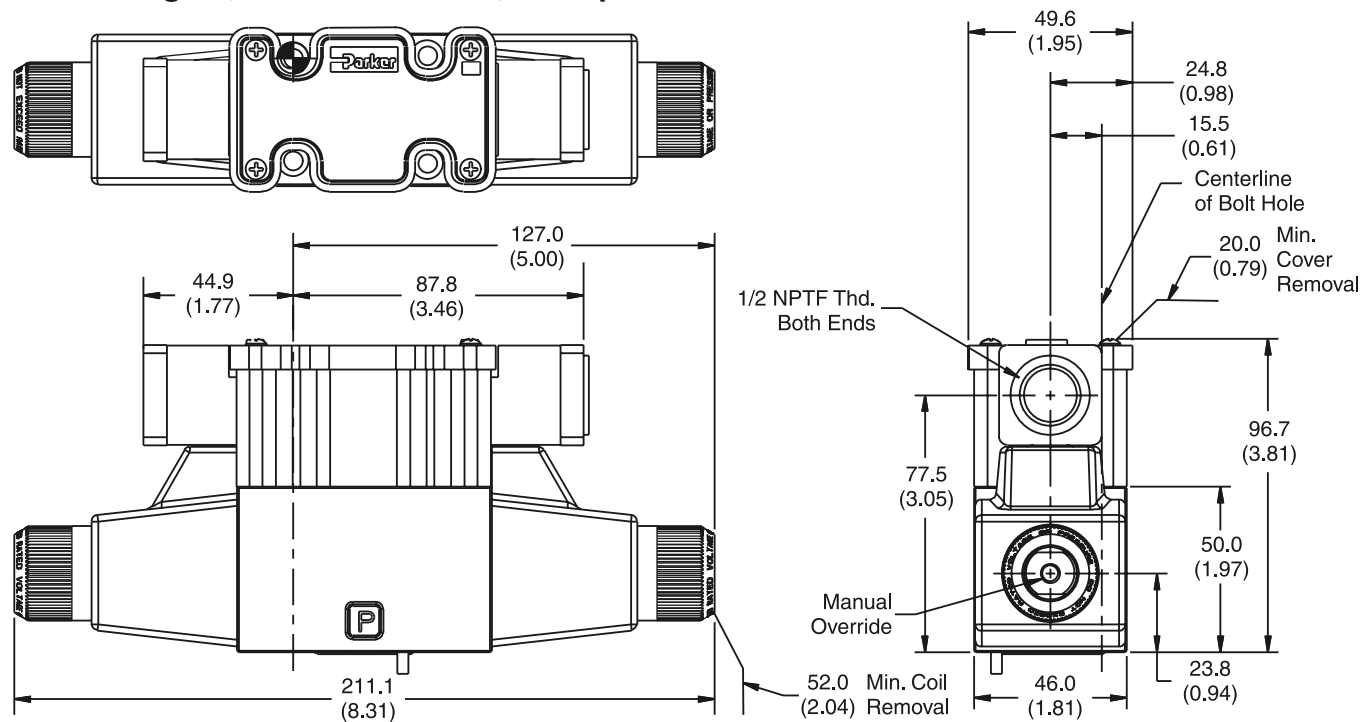
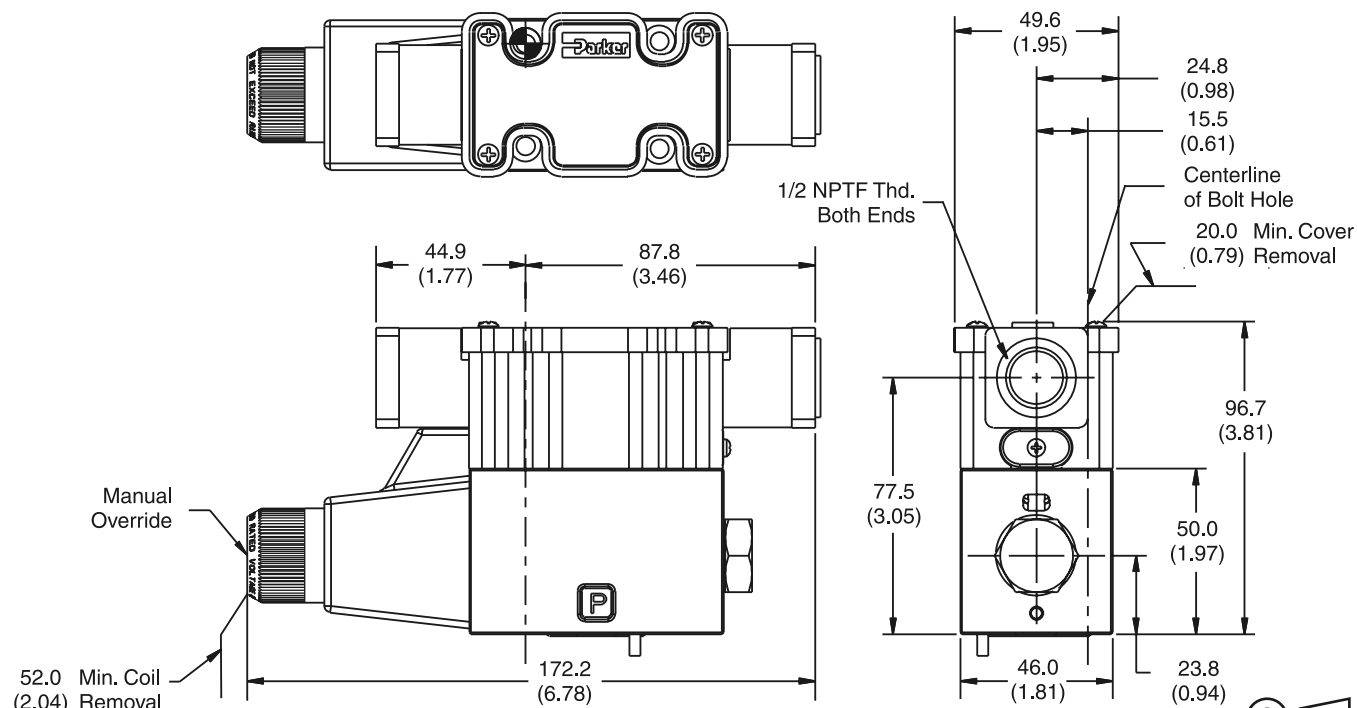
Note: 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

DC DIN Connector, Single Solenoid “P” Option Shown



Note: 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

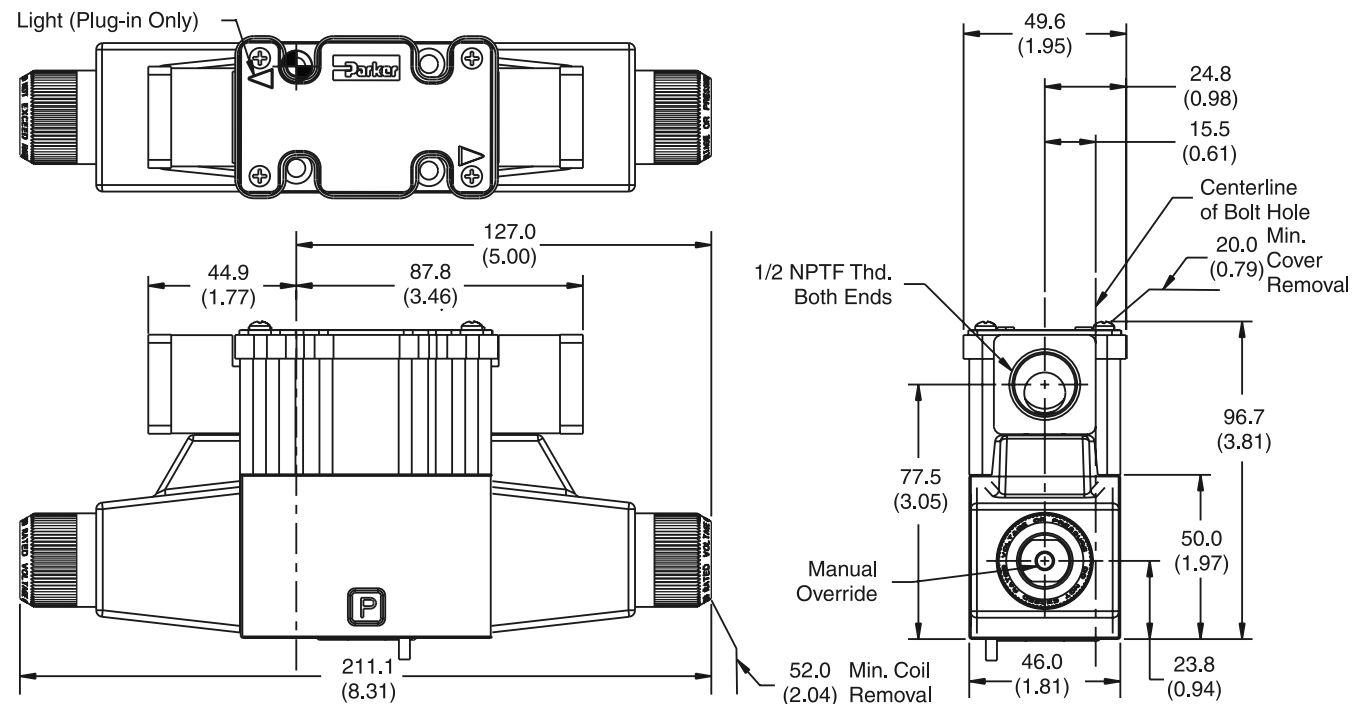
Inch equivalents for millimeter dimensions are shown in (**)

A**AC Leadwire Conduit Box Connector, without Lights, Double Solenoid, "C" Option****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.**AC Leadwire Conduit Box Connector, without Lights, Single Solenoid, "C" Option****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

D1.indd, dd

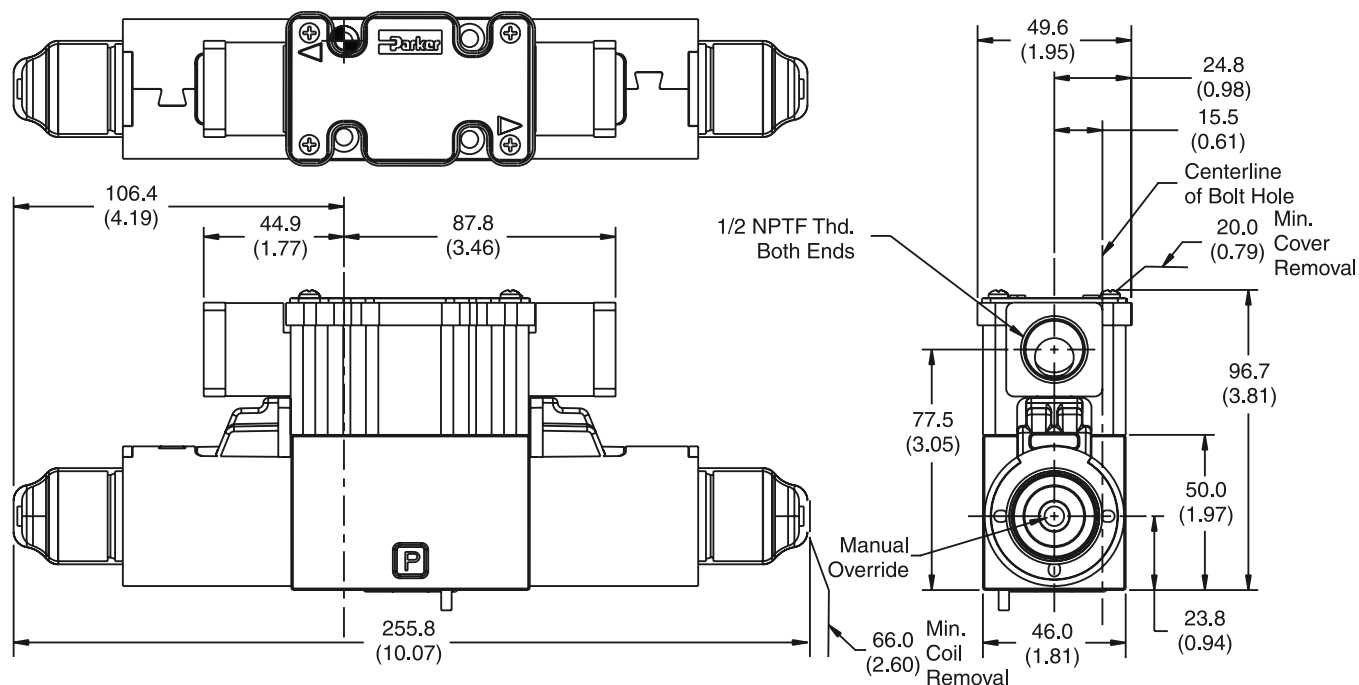
Inch equivalents for millimeter dimensions are shown in (**)

AC Plug-in Conduit Box Connector, with Lights, Double Solenoid, "G" Option

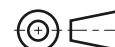


Note: 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

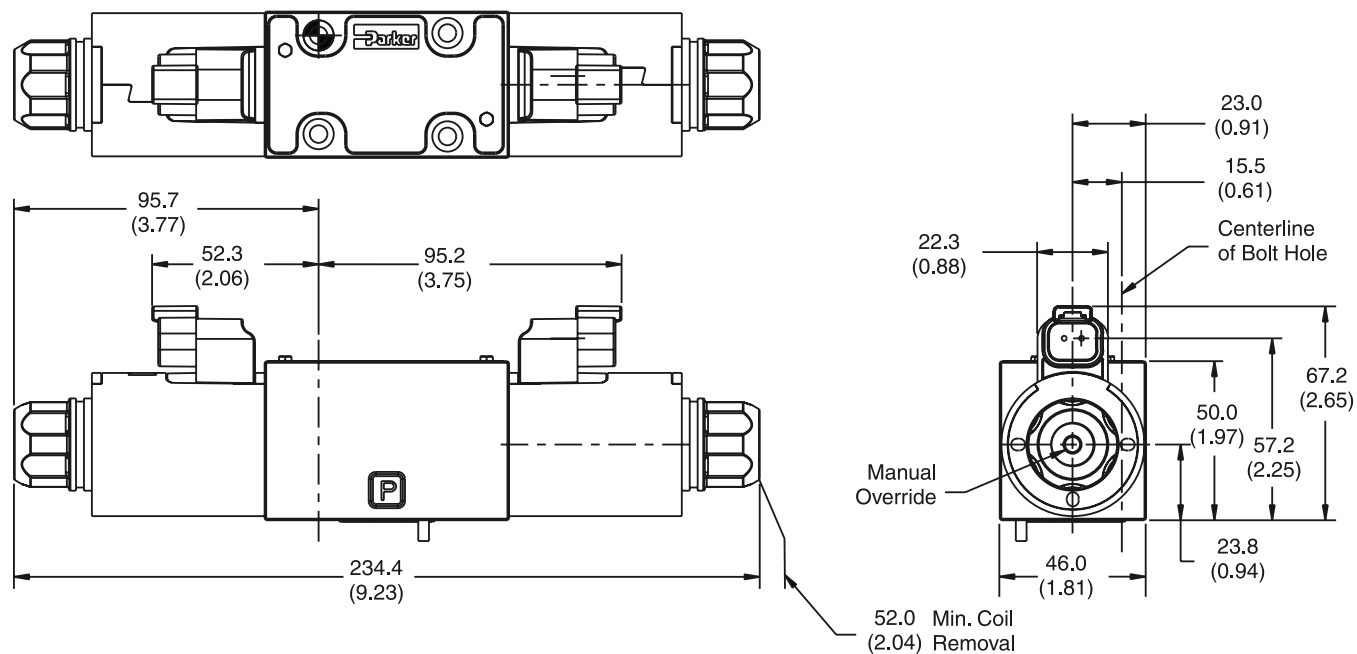
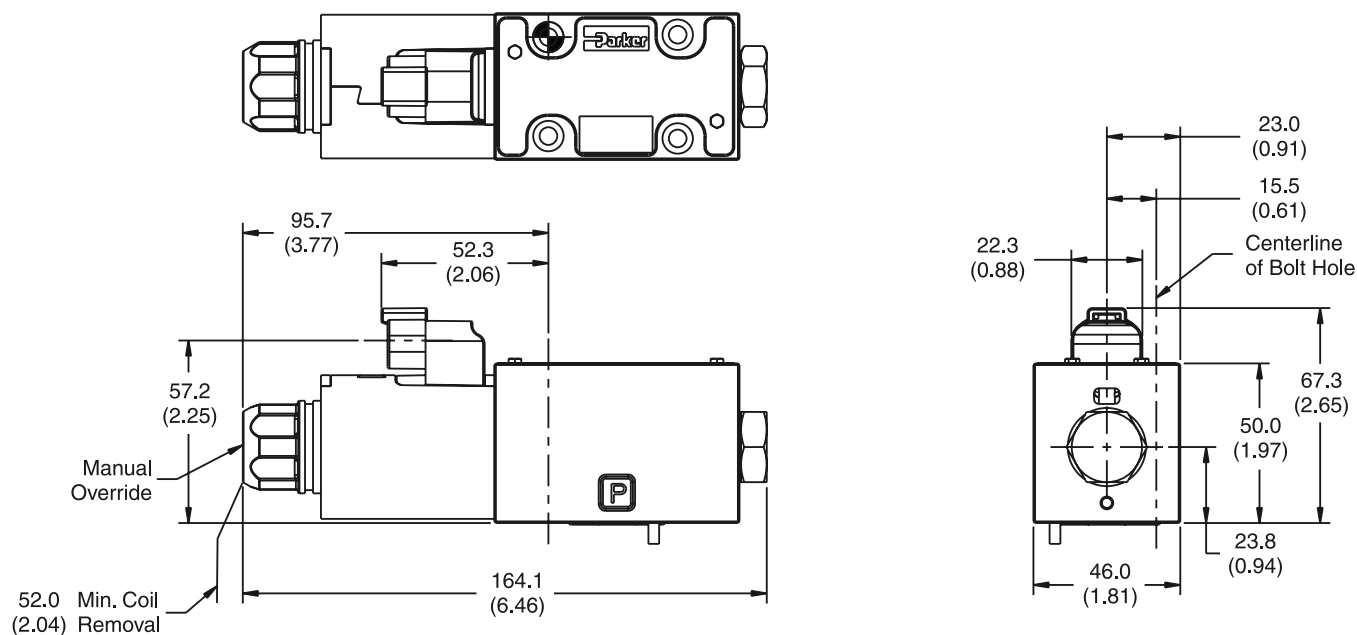
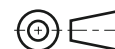
DC Plug-in or Leadwire Conduit Box Connector, with or without Lights and Extended Override Tubes, Double Solenoid



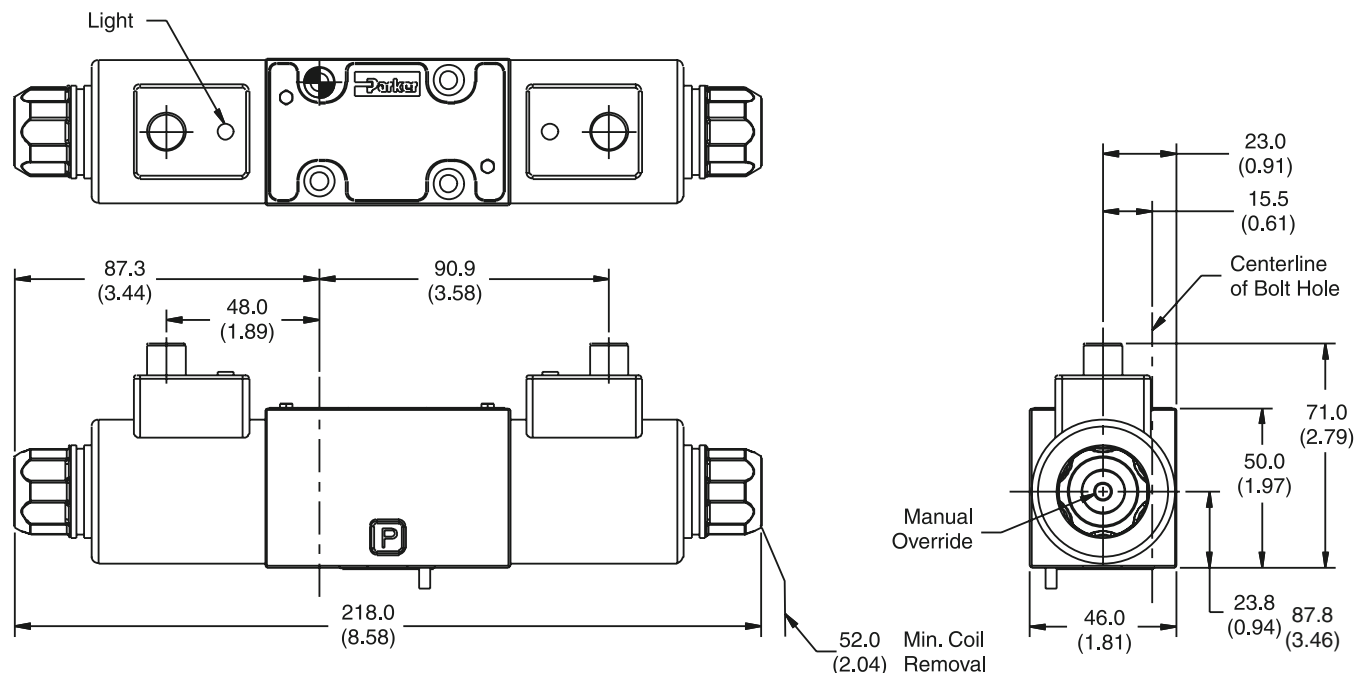
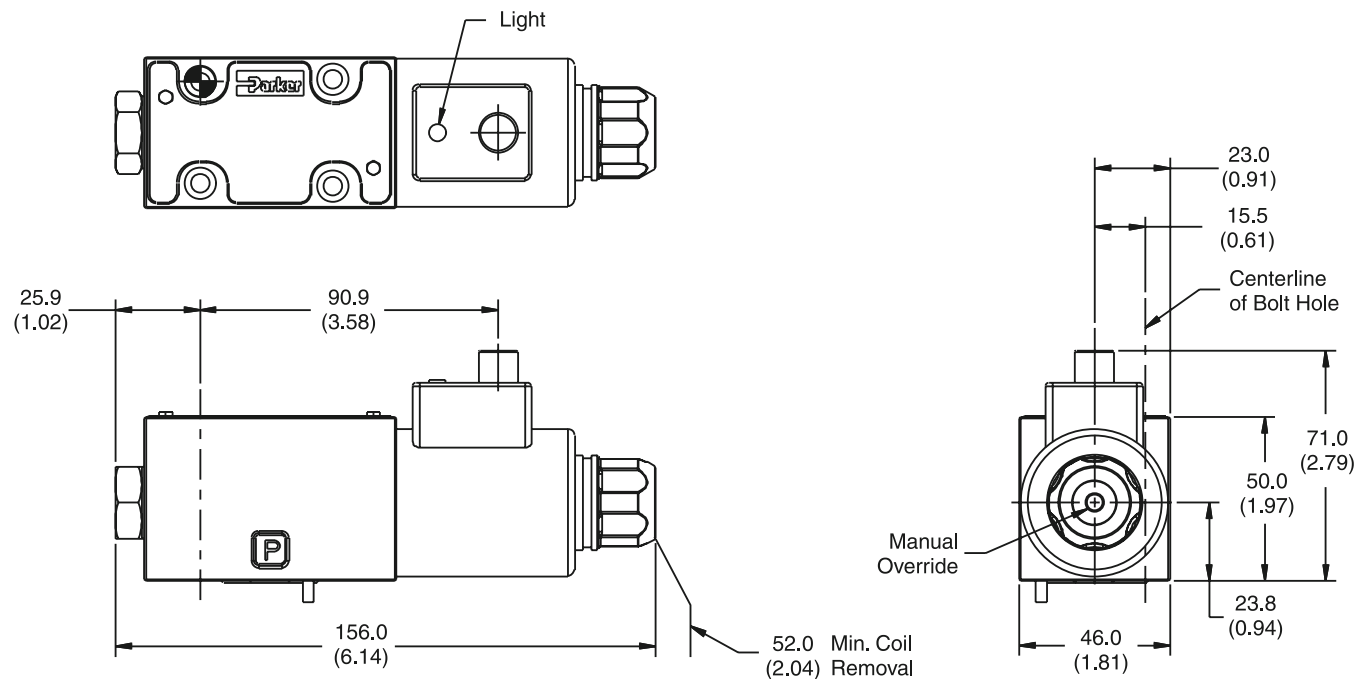
Note: 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.



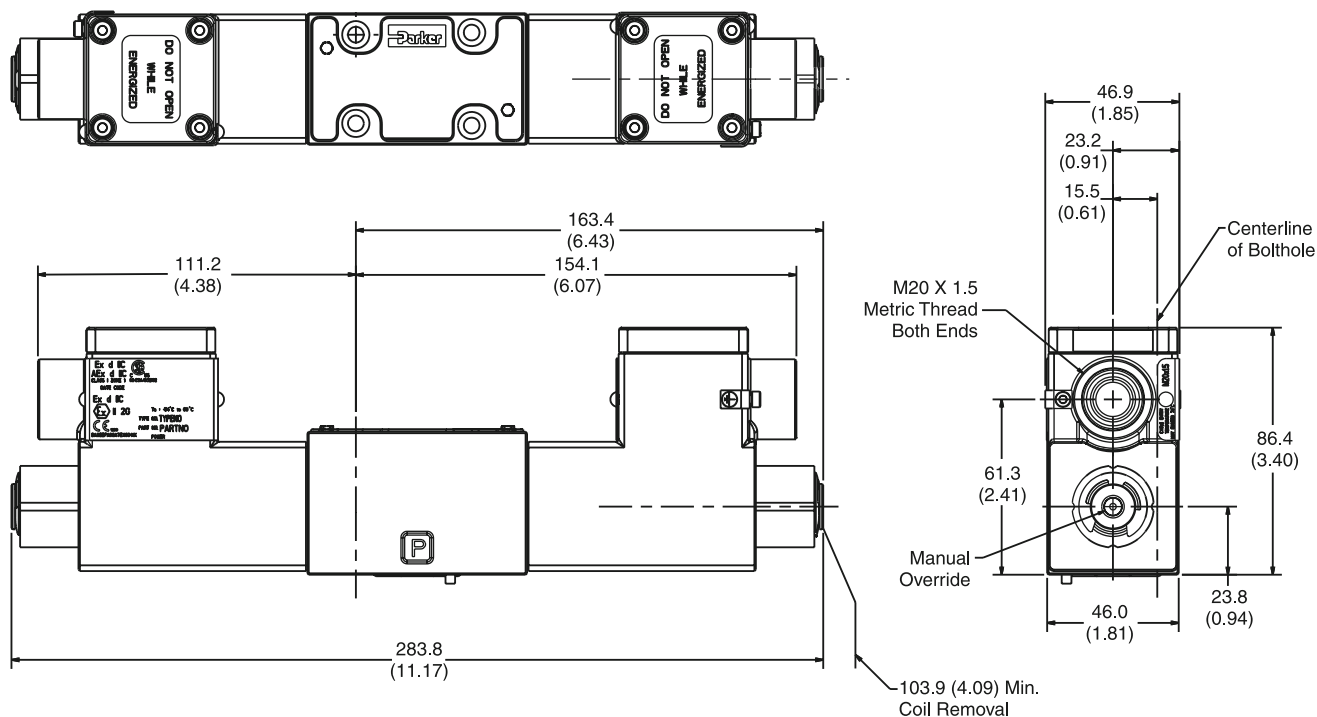
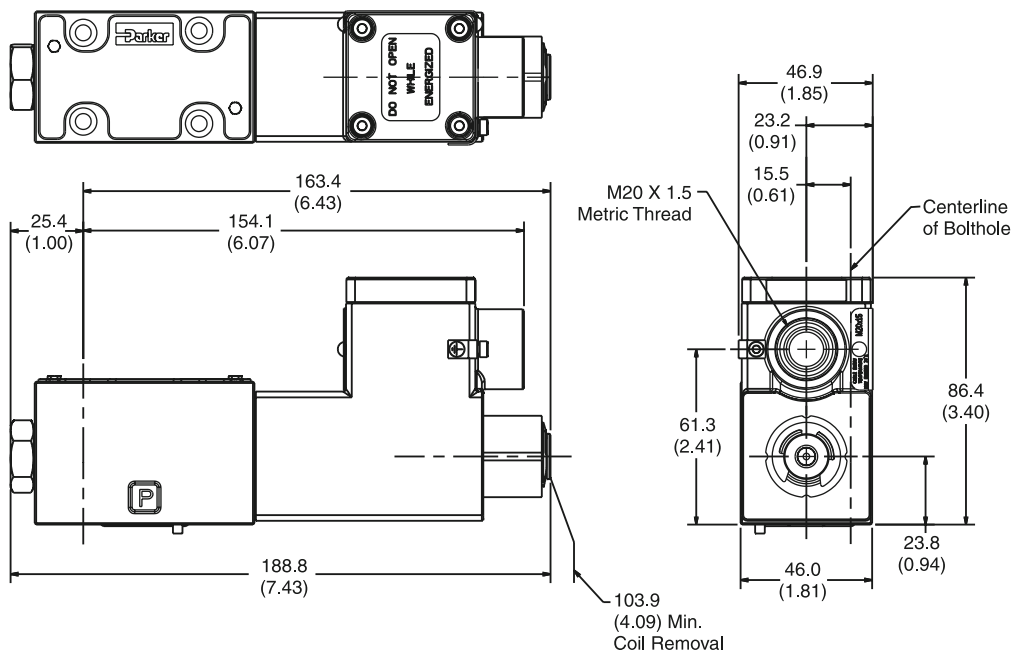
Inch equivalents for millimeter dimensions are shown in (**)

A**DC Deutsch Connector, Double Solenoid****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.**DC Deutsch Connector, Single Solenoid****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

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

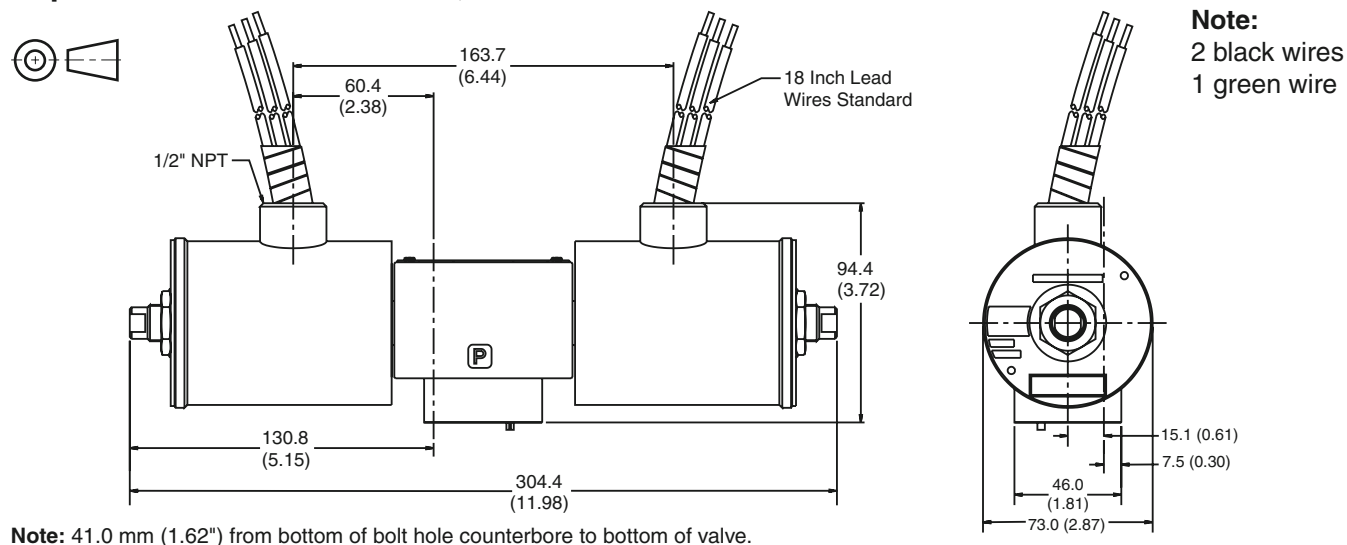
DC Desina Connector, Double Solenoid**A****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.**DC Desina Connector, Single Solenoid****Note:** 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.

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

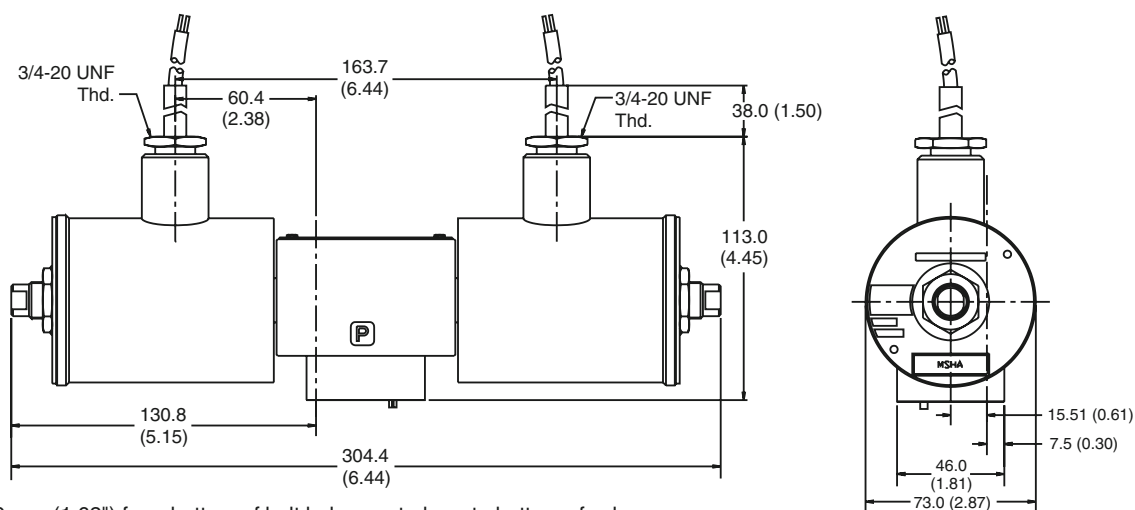
A**Explosion Proof, Ex d IIC ATEX/CSA, Double Solenoid****Explosion Proof, Ex d IIC ATEX/CSA, Single Solenoid**

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

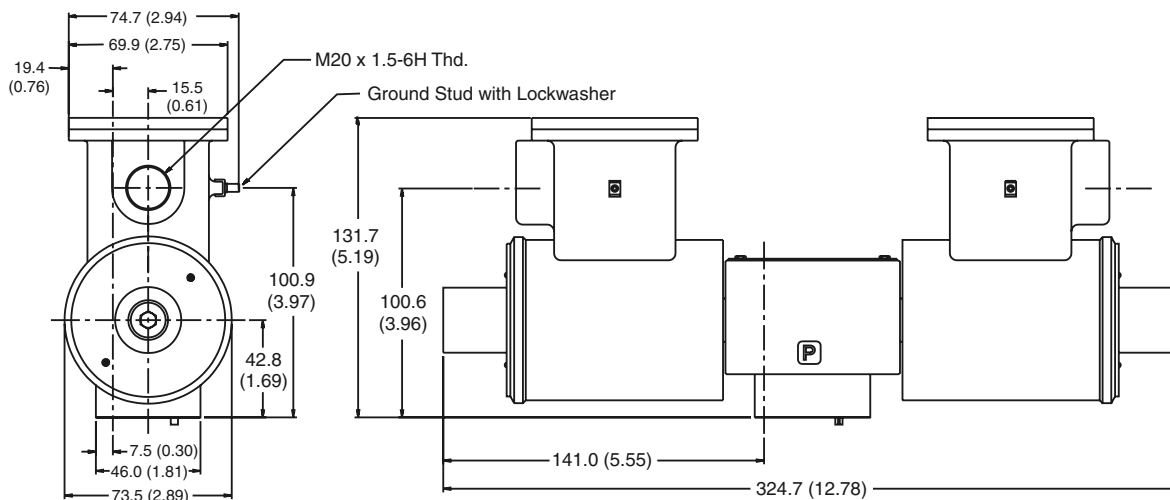
Explosion Proof U.L. & C.S.A., Double Solenoid



Explosion Proof M.S.H.A., Double Solenoid



Explosion Proof, EEXD ATEX, Double Solenoid

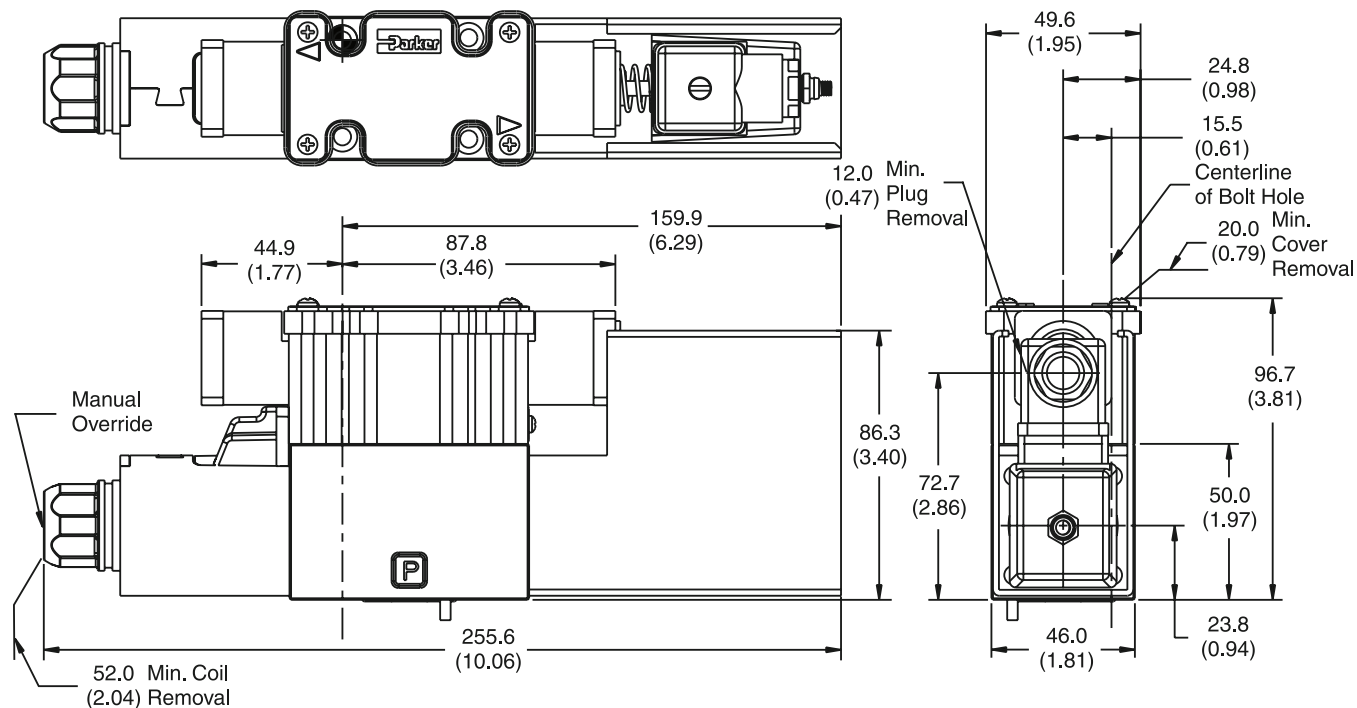


D1.indd, dd

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

A

DC Plug-in or Leadwire Conduit Box with Monitor Switch, with or without Lights, Single Solenoid



Note: 22.0 mm (0.87") from bottom of bolt hole counterbore to bottom of valve.



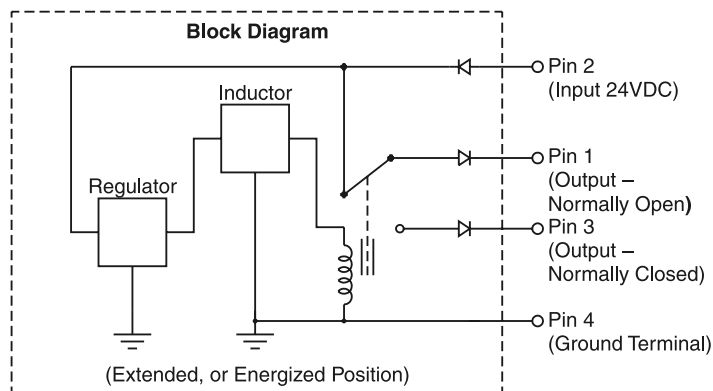
Monitor Switch

(Variation I7 and I8)

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

Switch Data

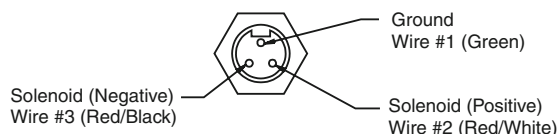
Inductive switch requiring +18-42 volt input. Outputs "A" and "B" are opposite; one at "0" voltage, the other at input voltage. During switching, "A" and "B" outputs reverse. Provides 0.4A switching current.



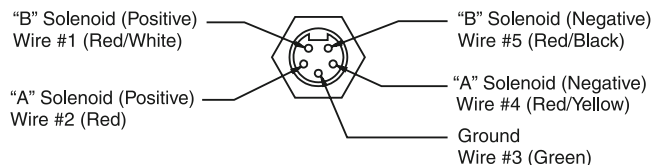
For repetitive switch power-up conditions, please consult factory.

Manaplug (Options 56 & 1C)

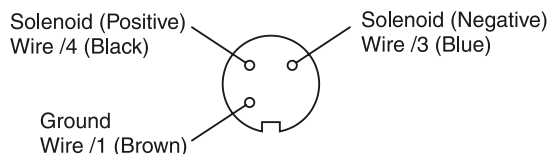
- Interface – Brad Harrison Plug
- 3-Pin for Single Solenoid
 - 5-Pin for Double Solenoid

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

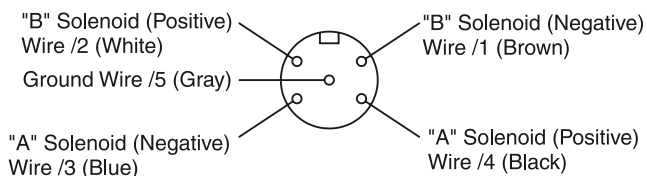
Single Solenoid Valves – Installed Opposite Side of Solenoid

**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 (7B & 1D)**3-Pin Manaplug (Micro) with Lights**

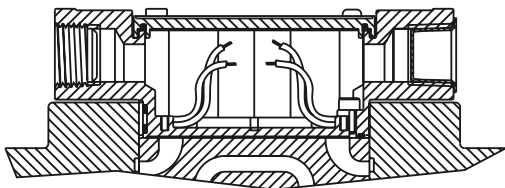
Single Solenoid Valves – Installed Opposite Side of Solenoid

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

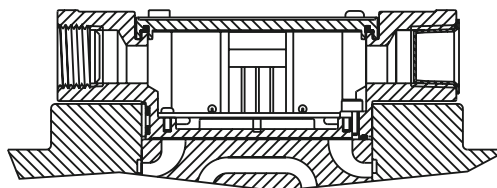
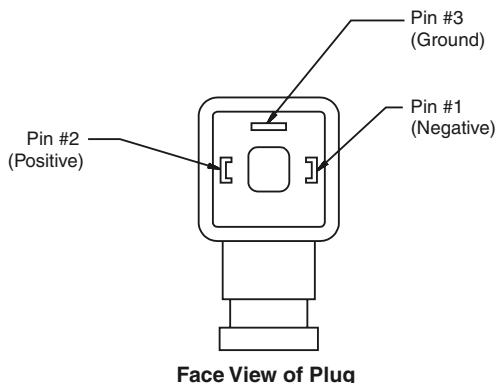
Single Solenoid Valves – Installed Opposite Side of Solenoid
 Double Solenoid Valves – Installed Over "A" Solenoid
 ("A" and "B" Solenoids Reversed for #8 and #9 Spools)

Pins are as seen on valve (male pin connectors)**Conduit Box Option C**

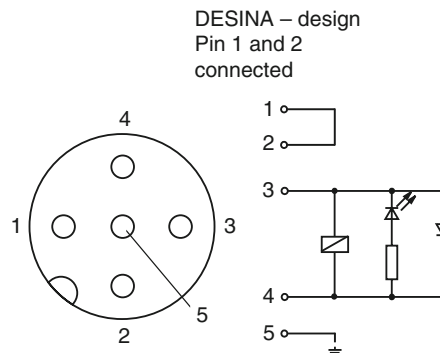
- No Wiring Options Available

**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"****Pins are as seen on valve (male pin connectors)****DESINA Connector (Option D)****M12 pin assignment
Standard**

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



Mounting Bolt Kits

A

Bolt Kits for use with D1V Directional Control Valves, "ET" Explosion Proof & Sandwich Valves (D1V*-91, 82 & 70/75 Design, Solenoid Operated & D1V*-72 Design, Non-Solenoid Operated)

| | | Number of Sandwich Valves @40mm (1.58") thickness | | | | | | | | | |
|---|---|---|----------|--------|----------|--------|----------|--------|----------|--------|----------|
| | | 0 | | 1 | | 2 | | 3 | | 4 | |
| Number of Sandwich Valves at 44.5mm (1.75") Thickness | 0 | BK209 | 1.25 in. | BK243 | 2.88 in. | BK225 | 4.38 in. | BK244 | 6.00 in. | BK245 | 7.50 in. |
| | | BKM209 | 30 mm | BKM243 | 70 mm | BKM225 | 110 mm | BKM244 | 150 mm | BKM245 | 190 mm |
| | 1 | BK246 | 3.00 in. | BK247 | 4.62 in. | BK248 | 6.12 in. | BK249 | 7.75 in. | | |
| | | BKM246 | 75 mm | BKM247 | 115 mm | BKM248 | 155 mm | BKM249 | 195 mm | | |
| | 2 | BK250 | 4.75 in. | BK251 | 6.38 in. | BK252 | 7.88 in. | | | | |
| | | BKM250 | 120 mm | BKM251 | 160 mm | BKM252 | 200 mm | | | | |
| | 3 | BK253 | 6.50 in. | BK254 | 8.12 in. | | | | | | |
| | | BKM102 | 170 mm | BKM254 | 205 mm | | | | | | |
| | 4 | BK103 | 8.25 in. | | | | | | | | |
| | | BKM103 | 210 mm | | | | | | | | |

Note: All bolts are SAE Grade 8, 10-24 UNC 2A thread (Metric-M5-0.8)

Torque to 5.6 Nm (50 in-Lb).

Bolt Kits for use with D1V Directional Control Valves with Explosion Proof Coils & Sandwich Valves (D1V*-91, 82 & 70/75 Design) Except "ET" Coil

| | | Number of Sandwich Valves @40mm (1.58") thickness | | | | | | | | | | |
|---|---|---|----------|-------|----------|--------|----------|--------|----------|--------|----------|--|
| | | 0 | | 1 | | 2 | | 3 | | 4 | | |
| Number of Sandwich Valves at 44.5mm (1.75") Thickness | 0 | BK50 | 2.00 in. | BK211 | 3.63 in. | BK101 | 5.12 in. | BK102 | 6.75 in. | BK103 | 8.25 in. | |
| | | BKM50 | 50 mm | — | | BKM101 | 130 mm | BKM102 | 170 mm | BKM103 | 210 mm | |
| | 1 | BK51 | 3.75 in. | BK212 | 5.37 in. | BK105 | 6.87 in. | BK106 | 7.75 in. | | | |
| | | BKM51 | 95 mm | — | | BKM105 | 180 mm | BKM106 | 195 mm | | | |
| | 2 | BK52 | 5.50 in. | BK213 | 7.13 in. | BK108 | 8.62 in. | | | | | |
| | | BKM52 | 140 mm | — | | BKM108 | 220 mm | | | | | |
| | 3 | BK53 | 7.25 in. | BK214 | 8.87 in. | | | | | | | |
| | | BKM53 | 185 mm | — | | | | | | | | |
| | 4 | BK54 | 9.00 in. | | | | | | | | | |
| | | BKM54 | 230 mm | | | | | | | | | |

Note: All bolts are SAE Grade 8, 10-24 UNC 2A thread (Metric-M5-0.8)

Torque to 5.6 Nm (50 in-Lb).

Sandwich Valve Dimensional Data

All D03 Sandwich valves (starting with 31 Series) including CM2, CPOM2, FM2, PRDM2 and RM2 measure 40mm (1.58") thickness.

For additional technical information about Sandwich valves, refer to the Sandwich Valve Section of this Catalog.

