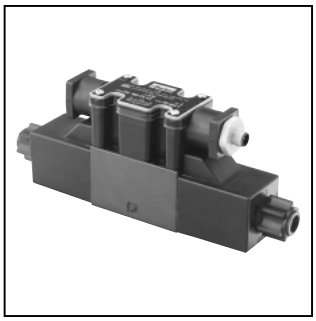
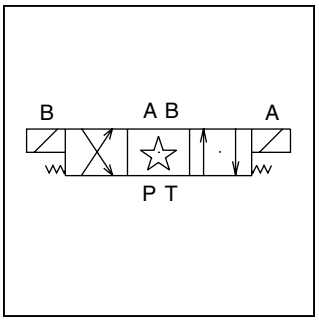
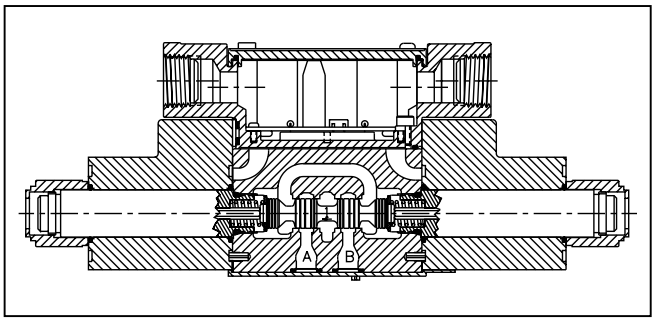
A

General Description

The D1VW Series 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

- Mechanically tunable soft shift
- Proportional spools, 21 standard spool styles available
- Repairable override
- DC surge suppression
- Nine electrical connection options
- AC & DC lights available (CSA approval for solenoids and lights)
- Internally ground
- Easy access mounting bolts
- Waterproof (NEMA 4 rated)
- Explosion proof
- CSA approved and U.L. recognized available
- No tools required for coil removal
- AC rectified coils

Response Time*

Nominal response time (milliseconds) at 345 Bar (5000 PSI) is 32 L/M (8.5 GPM).

Solenoid Type	Pull-In	Drop-Out
AC	13	20
DC 8 Watt or 10 Watt	61	22
DC 30 Watt	51	21

* For soft shift, see ordering code X-number.

Specifications

Mounting Pattern	NFPA D03, CETOP 3; NG 6
Mounting Interface	DIN 24340-A6 ISO 4401-AB-03-4-A CETOP R35H 4.2-4-03, NFPA D03
Maximum Pressure	P, A, B 345 Bar (5000 PSI) Standard CSA 276 Bar (4000 PSI) Tank: 103 Bar (1500 PSI) Standard 207 Bar (3000 PSI) Optional with H, FH, G, LG CSA 103 Bar (1500 PSI)

Standard Valves

A

D — Directional Control Valve

1V — Basic Valve

2MD
NFPA D03
CETOP 3
DIN NG6

Actuator#

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

Spool

Style

Seal

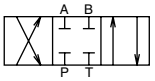
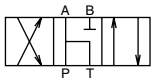
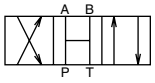
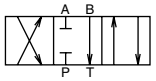
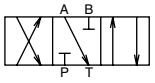
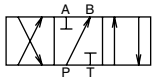
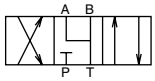
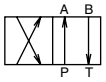
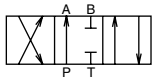
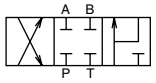
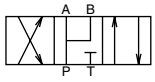
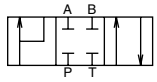
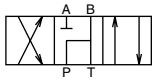
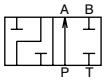
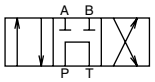
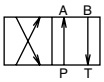
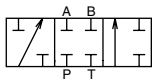
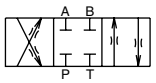
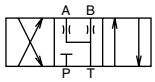
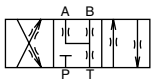
Code	Description
N	Nitrile
V	Fluorocarbon
E *	EPR

* Contact HVD for availability.

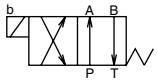
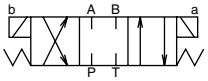
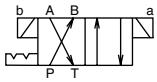
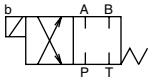
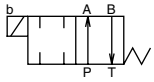
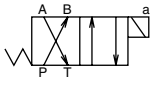
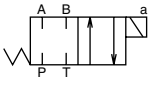
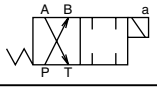
Solenoid Voltage

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
Q	100/60 VAC
R	24/60 VAC
T	240/60 - 220/50 VAC
U	98 VDC
Y	120/60 - 110/50 VAC
Z	250 VDC

\# 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		014	
002		015	
003		016	
004		020*	
005		021	
006		022	
007		026*	
008*, 009**		030**	
010		081	
011		082	

* 008, 020 & 026 spools have closed crossover.
** 009 & 030 spool have open crossover.
See Universal Spool Chart for other spool options.

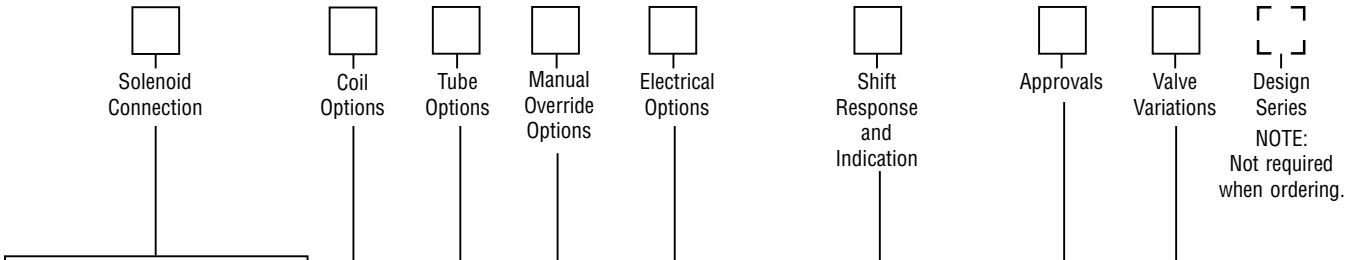
Code	Description	Symbol
B*	2 position, spring offset P to A	
C	3 position, spring centered	
D†	2 position, detent, P to A and B to T	
E	2 position, spring centered and P to B	
F	2 position, spring offset P to A and centered	
H*	2 position, spring offset P to B	
K	2 position, spring centered and P to A	
M	2 position, spring offset P to B and centered	

* 020, 026 and 030 spools only.
† 020 and 030 spools only.

2502-A1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

Standard Valves



Code	Description
C	Conduit Box
D	Metric Plug (M12X1), DESINA
E	Explosion Proof
G	Plug-In
H*†	Single Spade
J**†	Deutsch (DT06-25)
L	Dual Screw Lug
M**†	Metri-Pack (150)
P	DIN with Plug
S	Double Spade
W*	DIN w/o Plug

* Not available with lights.
** See valve variations for others.
† DC only.

Code	Description
Omit	Standard Response
S2*	Soft Shift, 0.020" Orifice
S3*	Soft Shift, 0.030" Orifice
S4*	Soft Shift, 0.040" Orifice
S5*	Soft Shift, 0.050" Orifice
S6*	Soft Shift, 0.060" Orifice
SN*	Soft Shift, No Orifice
I7	Monitor Switch Direct Op. End Stroke
I8	Monitor Switch Direct Op. Start Stroke

* Not available with 8 watt.

Code	Description
Omit	Standard Valve
4*	C.S.A. Approved
K	UL Recognition

* Not available with high pressure tube.

Code	Description
Omit	High Watt
D	Explosion Proof, EEXD ATEX
E	Explosion Proof, EEXME ATEX
F**	Low Watt
C†	CSA Hazardous Location
L***	8 Watt
O	Explosion Proof, MSHA
U	Explosion Proof, UL/CSA
X*	No Coils

* See solenoid voltage code to specify proper tube.
** AC only.
*** DC/AC Rectified only.
† Applicable to conduit box and plug-in style only.

Code	Description
Omit	No Options
J	Diode Surge Suppressor
B	Rectified Coil

Code	Description
Omit	Standard
P	Extended with Boot
T	None
R	Repairable
W	Waterproof Override Protection

Code	Description
Omit	Low Pressure, AC only
H	High Pressure, AC only
M	Low Pressure, DC-WI only
G	High Pressure, DC-WI only

Code	Description
5	Signal Lights
6	Manaplug - Brad Harrison Mini
7A	Manaplug - Brad Harrison (12x1) Micro
56	Manaplug (Mini) with Lights
7B	Manaplug (Micro) with Lights (D1 only)
1A	Manaplug (Mini) Single Sol. 5-pin
1B	Manaplug (Micro) Single Sol. 5-pin
1C	Manaplug (Mini) Single Sol. 5-pin, with Lights
1D	Manaplug (Micro) Single Sol. 5-pin, with Lights
4D	Twist & Lock Override (Old 5426)
4E	Push Manual Override (Old x5450)

Valve Weight:

Single Solenoid	1.36 kg (3.0 lbs.)
Double Solenoid	1.6 kg (3.5 lbs.)
Standard Bolt Kit:	BK209
Metric Bolt Kit:	BKM209

2502-A1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

A

Solenoid Ratings

Insulation System	Class F
Allowable Deviation from rated voltage	-10% to +15% for DC and AC rectified coils -5% to +5% for AC Coils
Armature	Wet pin type
CSA File Number	LR60407
Environmental Capability	DC Solenoids are rated at NEMA 4 (IP67) or better 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 NEC
M.S.H.A. (EO)	Complies with 30CFR, Part 18
ATEX (ED)	Complies with ATEX requirements for: Exd, Group IIB; EN50014: 1999+ Amds. 1 & 2, EN50018: 2000
CSA Hazardous Location	Class II, Groups E, F & G

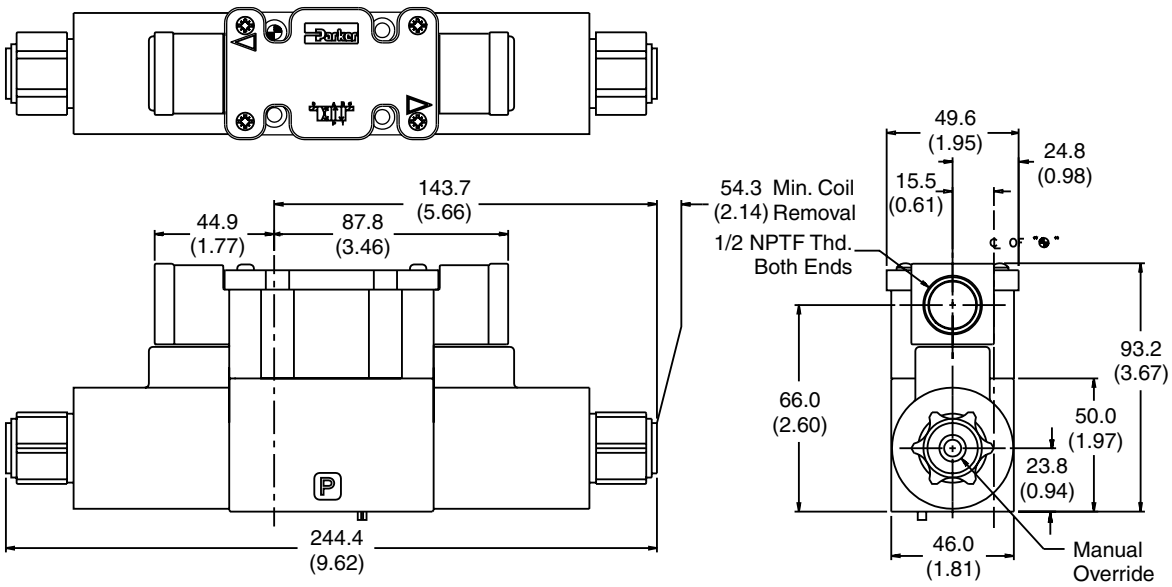
* Allowable Voltage Deviation +/- 10%
Note that AC coils are single frequency only.

Code		Voltage	In Rush Amps	In Rush Amps	Holding Amps	Watts	Resistance
Voltage Code	Power Code		Amperage	D1VW VA @ 3MM	D1VW	D1VW	D1VW
A		24/50 VAC, High Watt	7.00 Amps	168 VA	2.65 Amps	28 W	1.67 ohm(s)
D	L	120 VDC	N/A	N/A	0.09 Amps	10 W	1584.00 ohm(s)
			N/A	N/A	0.26 Amps	30 W	528.00 ohm(s)
E		24/60 VAC, High Watt	6.00 Amps	144 VA	1.85 Amps	20 W	1.67 ohm(s)
		24/50 VAC, High Watt	7.00 Amps	168 VA	2.65 Amps	28 W	1.67 ohm(s)
G	L	198 VDC	N/A	N/A	0.05 Amps	10 W	3920.40 ohm(s)
			N/A	N/A	0.15 Amps	30 W	1306.80 ohm(s)
J	L	24 VDC	N/A	N/A	0.44 Amps	10 W	51.89 ohm(s)
			N/A	N/A	1.32 Amps	30 W	17.27 ohm(s)
K	L	12 VDC	N/A	N/A	0.88 Amps	10 W	12.97 ohm(s)
			N/A	N/A	2.64 Amps	30 W	4.32 ohm(s)
L	L	6 VDC	N/A	N/A	1.67 Amps	10 W	3.59 ohm(s)
			N/A	N/A	5.00 Amps	30 W	1.20 ohm(s)
M	L	9 VDC	N/A	N/A	1.11 Amps	10 W	8.12 ohm(s)
			N/A	N/A	3.35 Amps	30 W	2.67 ohm(s)
P		110/50 VAC			0.38 Amps	19 W	135.00 ohm(s)
R		24/60 VAC, High Watt	8.00 Amps	192 VA	2.70 Amps	27 W	1.40 ohm(s)
	F	24/60 VAC, Low Watt	6.67 Amps	160 VA	2.20 Amps	23 W	1.52 ohm(s)
S	***Specials***	SEE BELOW					
T		240/60 VAC, High Watt	0.77 Amps	185 VA	0.26 Amps	25 W	134.50 ohm(s)
		220/50 VAC, High Watt	0.82 Amps	180 VA	0.31 Amps	27 W	134.50 ohm(s)
	F	240/60 VAC, Low Watt	0.70 Amps	168 VA	0.22 Amps	21 W	145.00 ohm(s)
	F	220/50 VAC, Low Watt	0.75 Amps	165 VA	0.26 Amps	23 W	145.00 ohm(s)
U	L	98 VDC	N/A	N/A	0.10 Amps	10 W	960.00 ohm(s)
X	L	16 VDC	N/A	N/A	0.63 Amps	10 W	25.60 ohm(s)
Y		120/60 VAC, High Watt	1.55 Amps	186 VA	0.49 Amps	25 W	33.70 ohm(s)
		110/50 VAC, High Watt	1.65 Amps	182 VA	0.58 Amps	27 W	33.70 ohm(s)
	F	120/60 VAC, Low Watt	1.40 Amps	168 VA	0.42 Amps	21 W	36.50 ohm(s)
	F	110/50 VAC, Low Watt	1.50 Amps	165 VA	0.50 Amps	23 W	36.50 ohm(s)
	L*B	120/60 VAC, 10 Watt	0.63 Amps	83 VA	0.18 Amps	10 W	75.00 ohm(s)
	L*B	110/50 VAC, 10 Watt	0.73 Amps	79 VA	0.20 Amps	10 W	75.00 ohm(s)
	*H	120/60 VAC, High Pressure	1.40 Amps	168 VA	0.50 Amps	26 W	36.50 ohm(s)
	*H	110/50 VAC, High Pressure	1.48 Amps	163 VA	0.60 Amps	28 W	36.50 ohm(s)
Z	L	250 VDC	N/A	N/A	0.04 Amps	10 W	6875.00 ohm(s)
			N/A	N/A	0.13 Amps	30 W	1889.64 ohm(s)
Specials	**S**	Other voltages/frequencies may be available Contact HVD for more information					
Explosion Proof Solenoids							
R		24/60 VAC	7.63 Amps	183 VA	2.85 Amps	27 W	1.99 ohm(s)
T		240/60 VAC	0.76 Amps	183 VA	0.29 Amps	27 W	1.34 ohm(s)
N		220/50 VAC	0.77 Amps	169 VA	0.31 Amps	27 W	1.38 ohm(s)
Y		120/60 VAC	1.60 Amps	192 VA	0.58 Amps	27 W	33.50 ohm(s)
P		110/50 VAC	1.47 Amps	162 VA	0.57 Amps	27 W	34.70 ohm(s)
Q		100/60 VAC	1.90 Amps	192 VA	0.70 Amps	27 W	38.60 ohm(s)
K		12 VDC	N/A	N/A	2.75 Amps	33 W	4.36 ohm(s)
J		24 VDC	N/A	N/A	1.38 Amps	33 W	17.33 ohm(s)
D		120 VDC	N/A	N/A	0.28 Amps	33 W	420.92 ohm(s)
Z		250 VDC	N/A	N/A	0.13 Amps	33 W	1952.66 ohm(s)

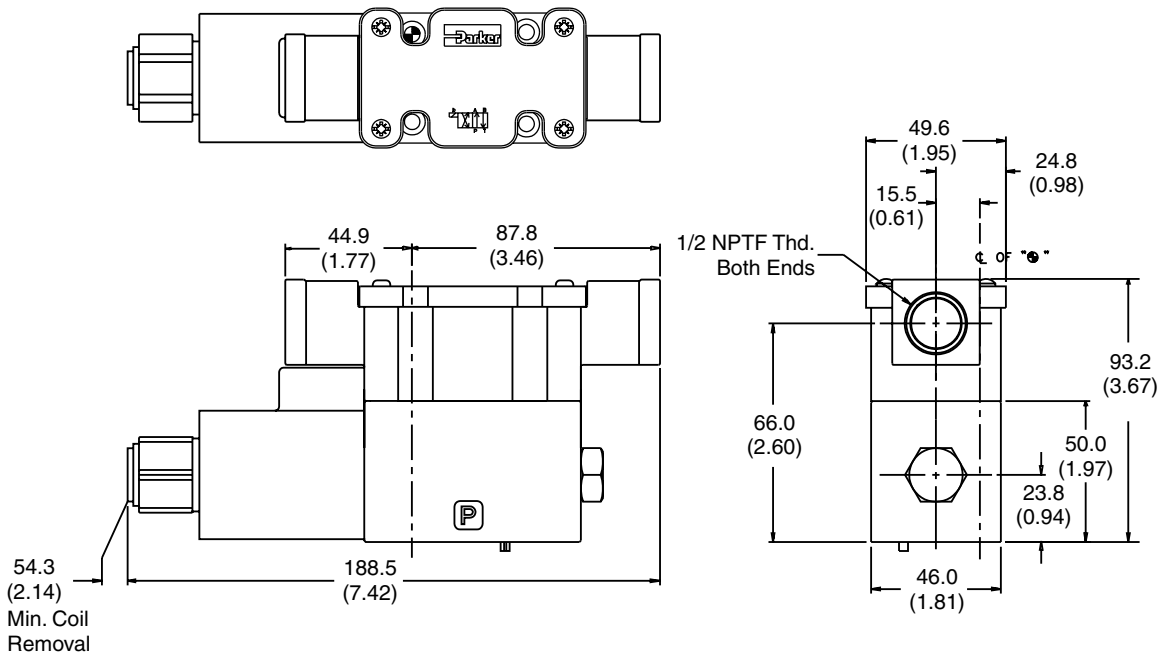
Inch equivalents for millimeter dimensions are shown in (**)

A

Plug-In Box, Double DC Solenoid



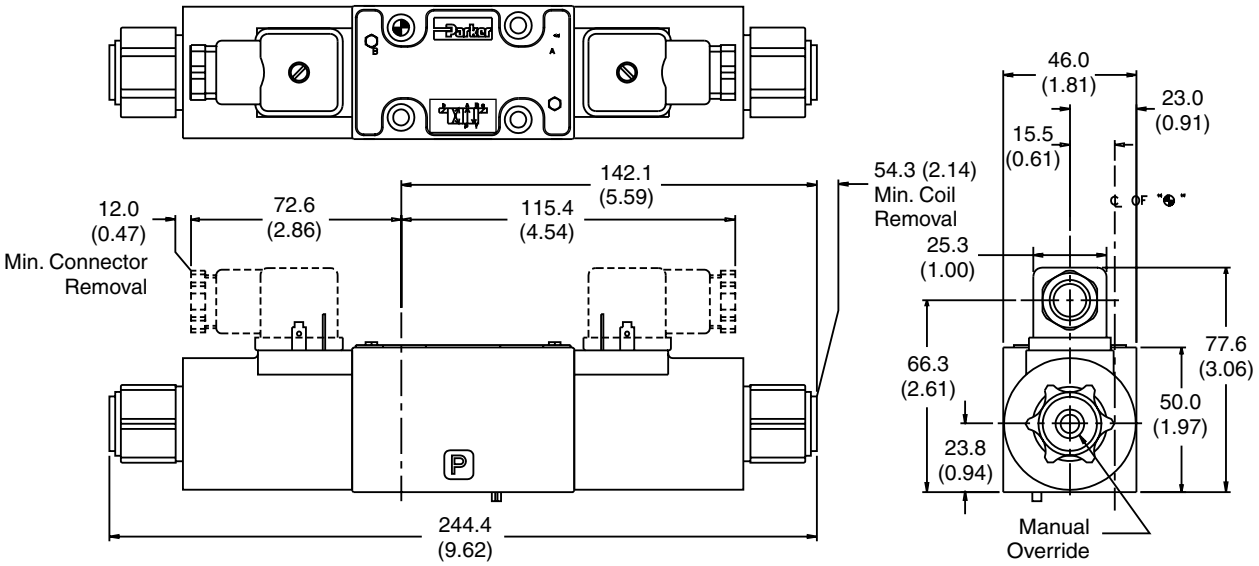
Plug-In Box, Single DC Solenoid



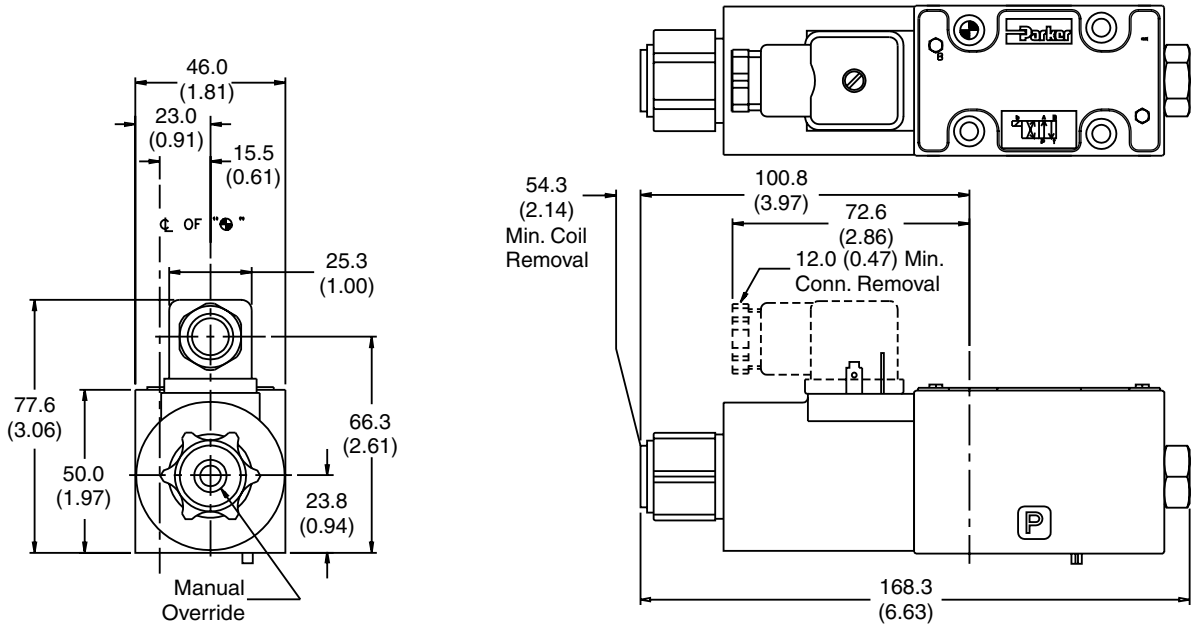
Inch equivalents for millimeter dimensions are shown in (**)

A

Hirschmann, Double DC Solenoid



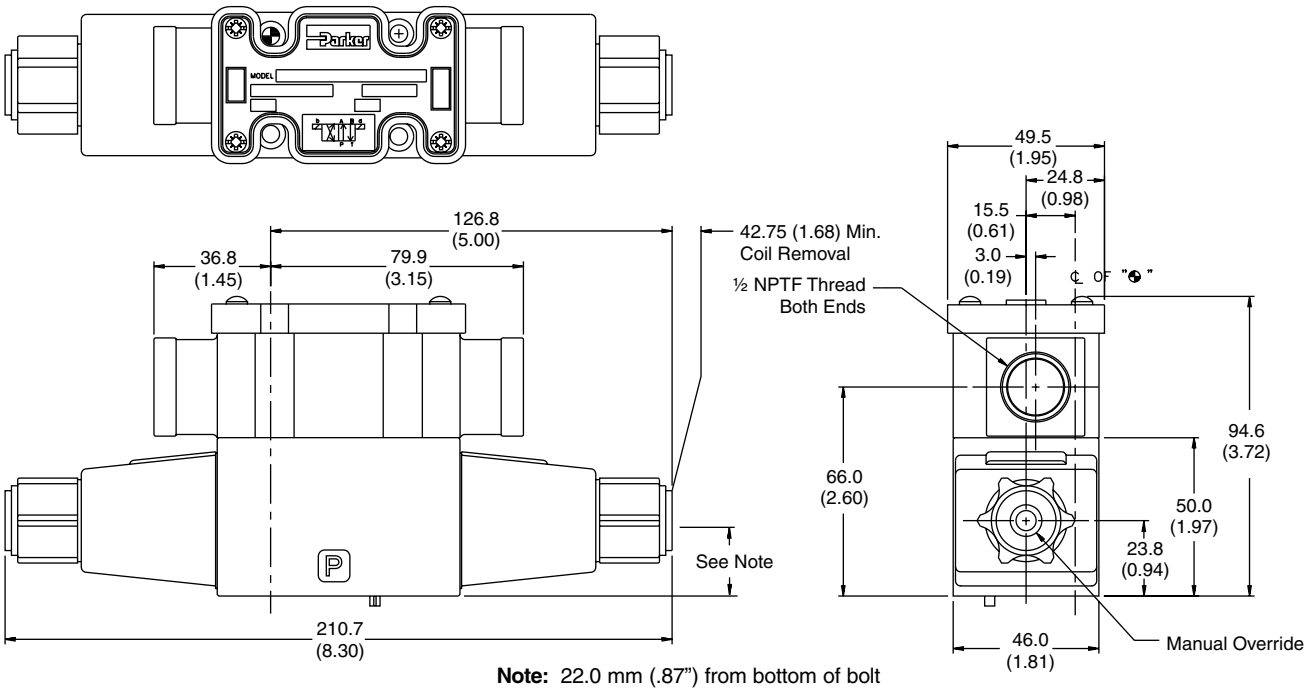
Hirschmann, Single DC Solenoid



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

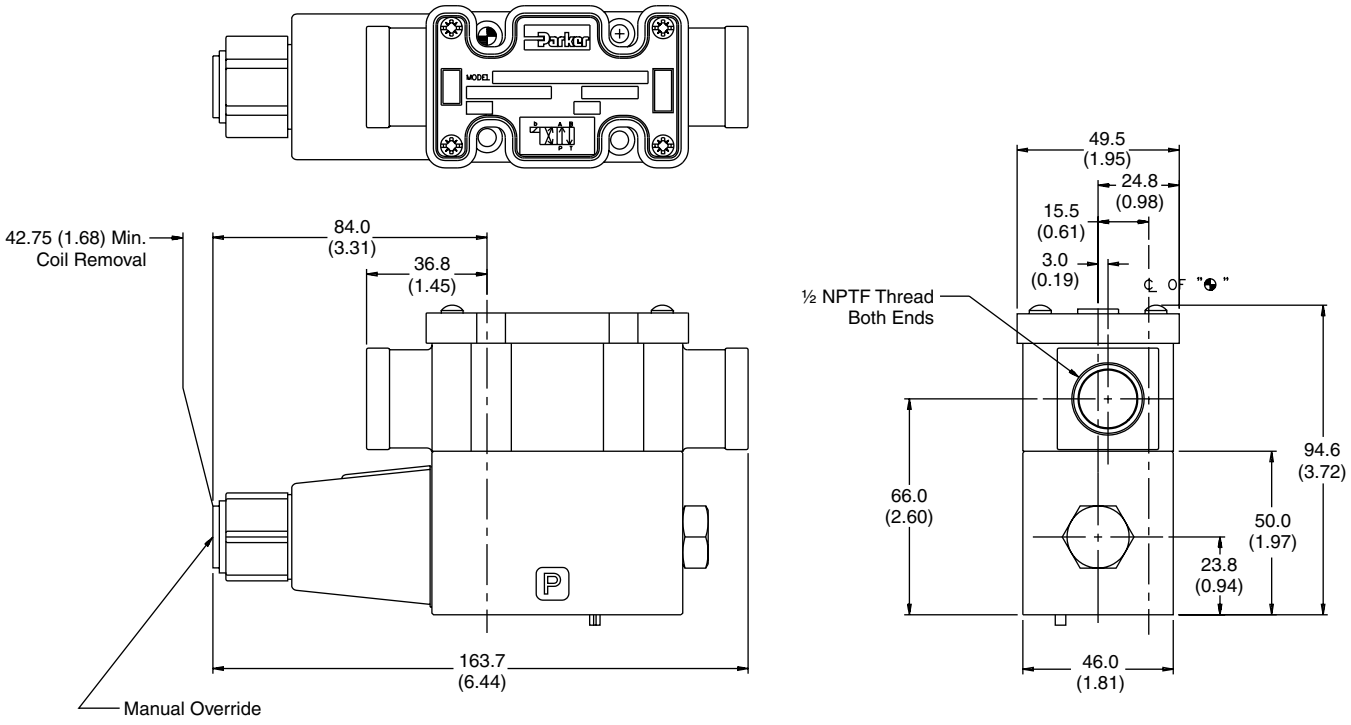
A

Conduit Box, Double AC Solenoid



Note: 22.0 mm (.87") from bottom of bolt hole counterbore to bottom of valve.

Conduit Box, Single AC Solenoid

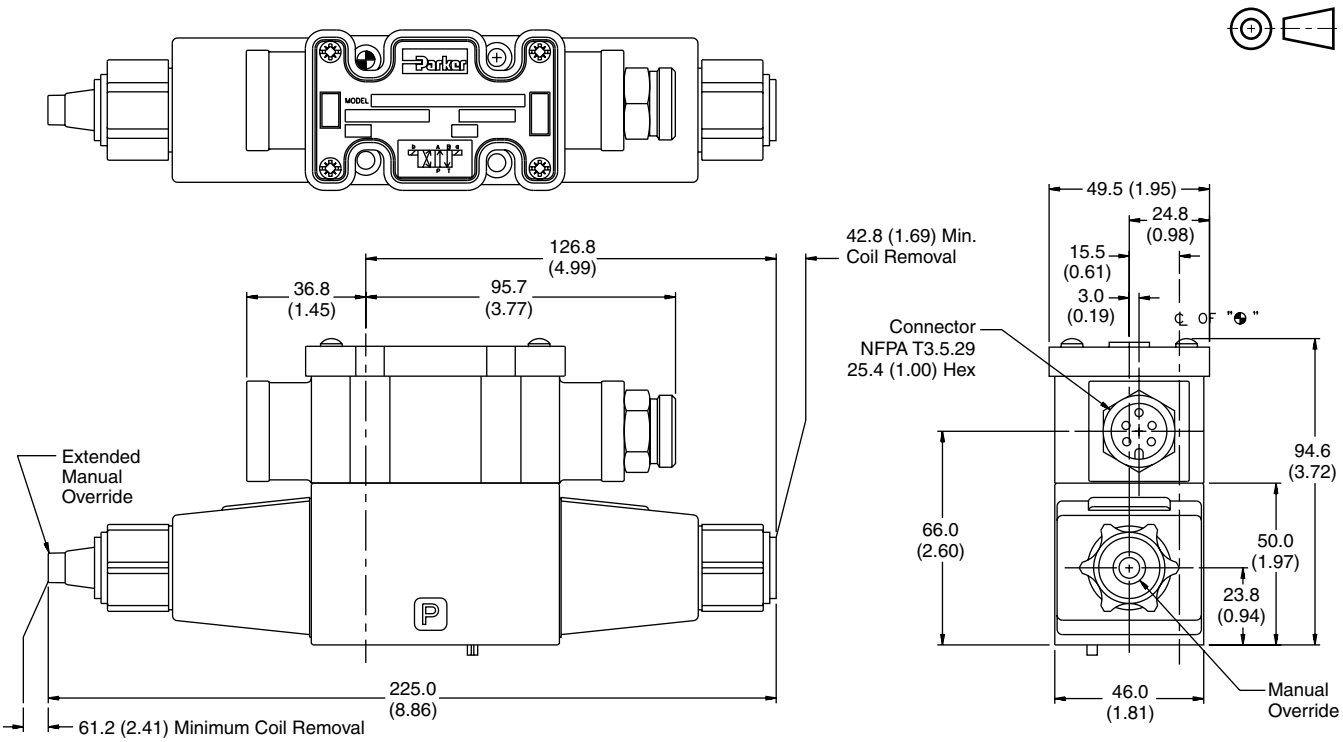


Inch equivalents for millimeter dimensions are shown in (**)

A

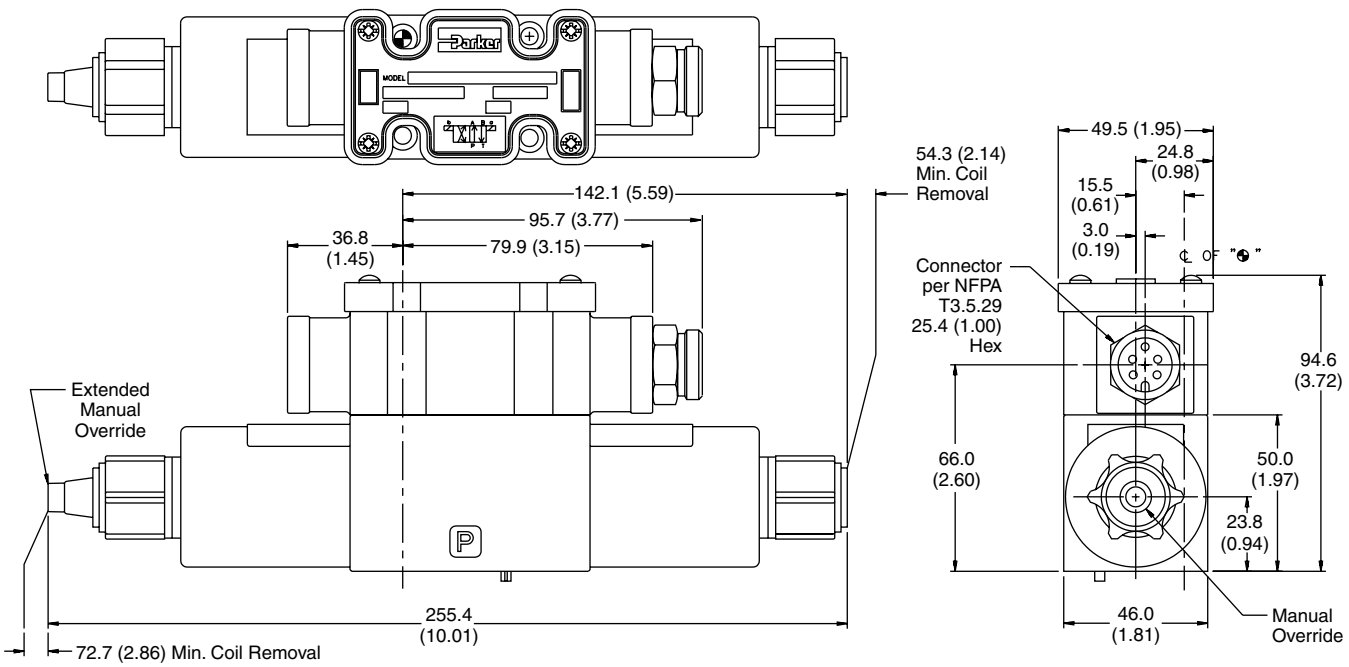
Conduit Box, Double AC Solenoid

with Variation 6 (Manaplug) & Variation P (Extended Manual Override)



Conduit Box, Double DC & AC Rectified Solenoids

with Variation 6 (Manaplug) & Variation P (Extended Manual Override)



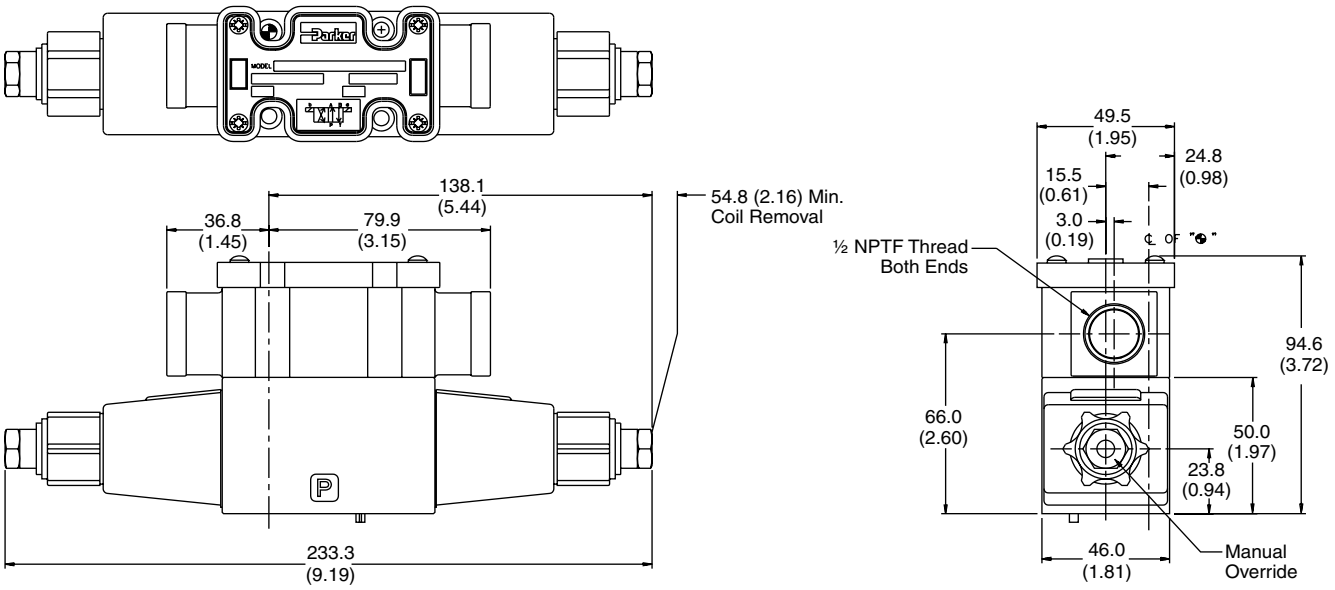
2502-A1.p65, dd

Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

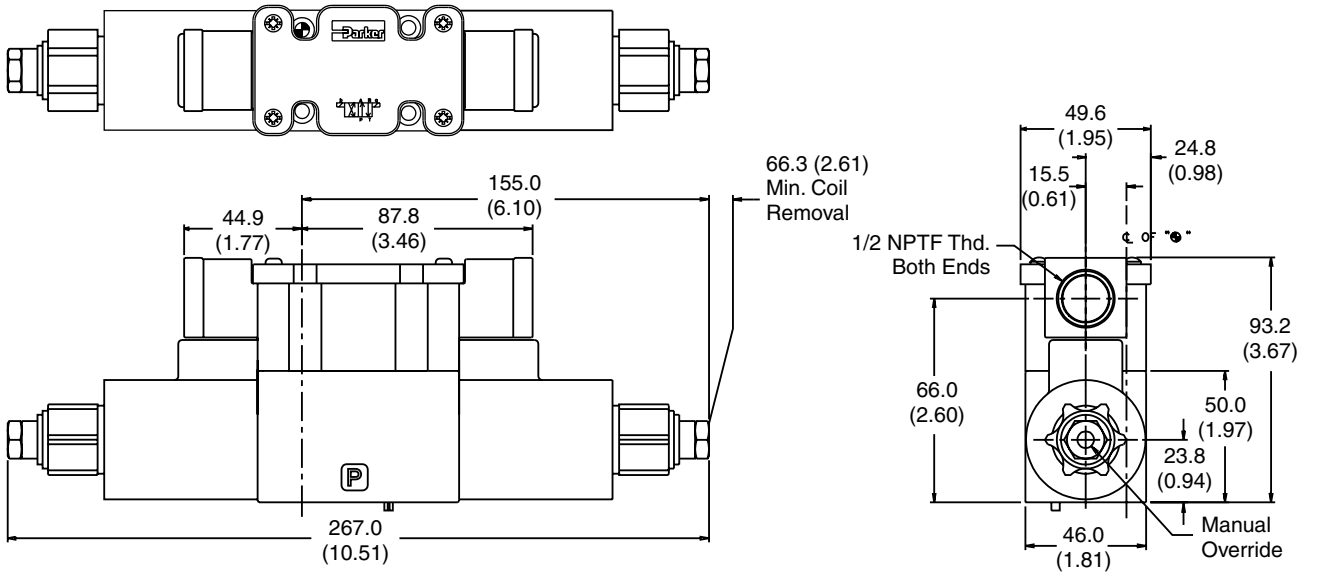
Inch equivalents for millimeter dimensions are shown in (**)

A

Conduit Box, Double AC Solenoid
with Variation R (Repairable Override)



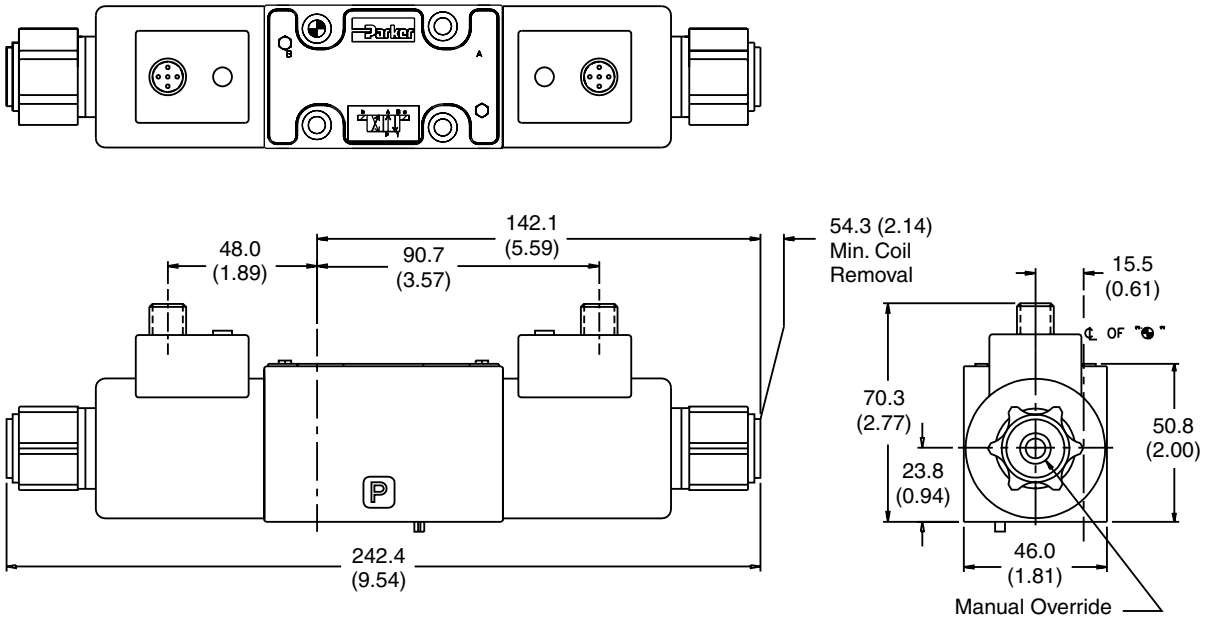
Conduit Box, Double DC Solenoid
with Variation R (Repairable Override)



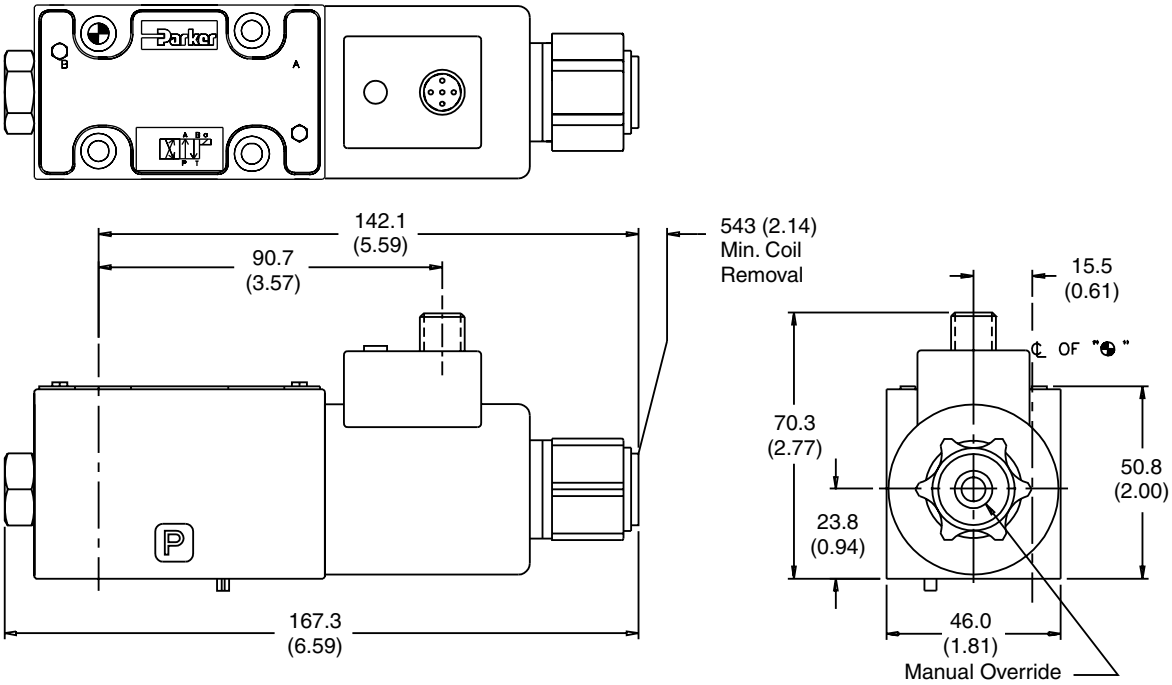
Inch equivalents for millimeter dimensions are shown in (**)

A

DESINA, Double DC Solenoid



DESINA, Single DC Solenoid

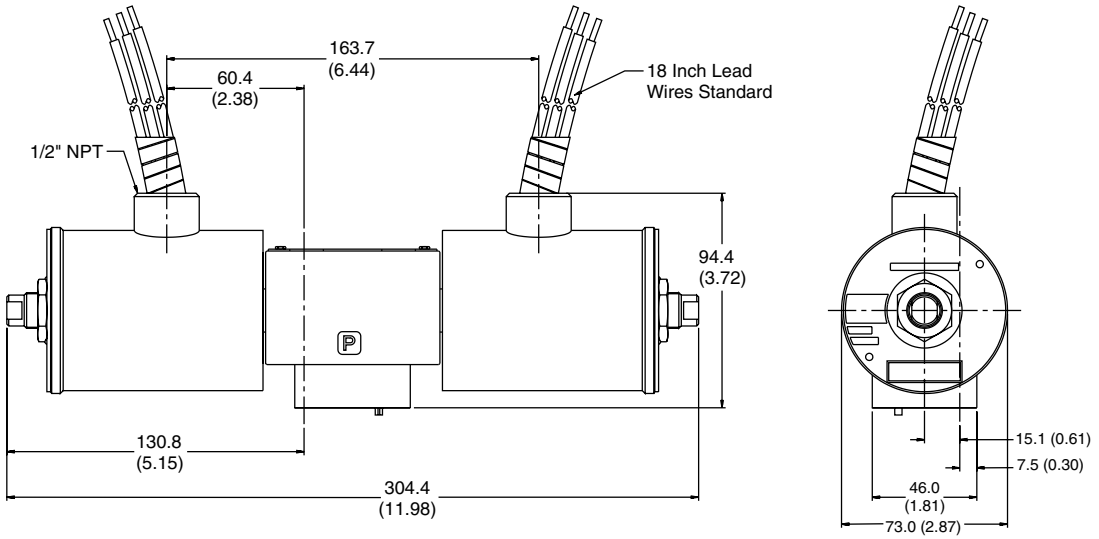


2502-A1.p65, dd

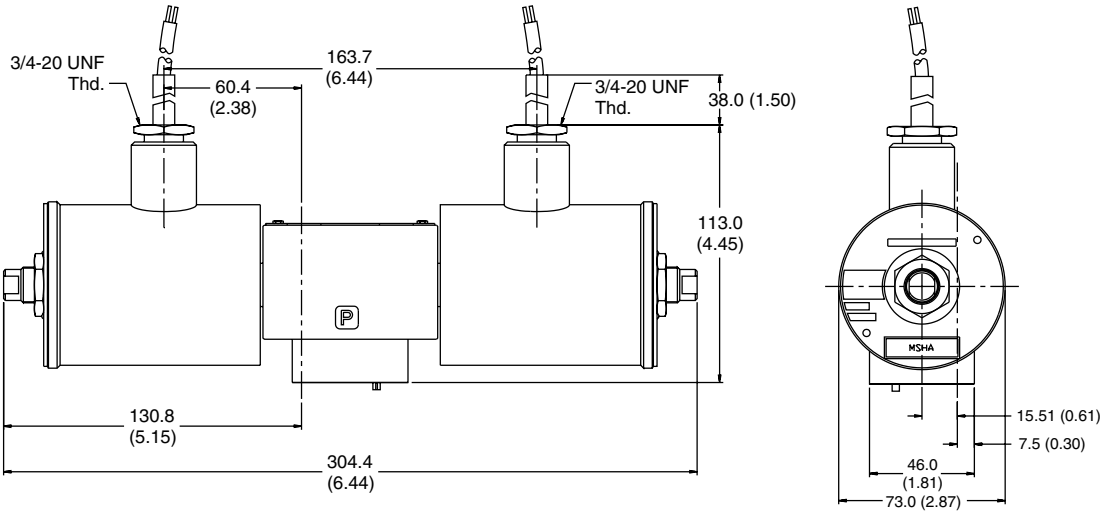
Inch equivalents for millimeter dimensions are shown in (**)

A

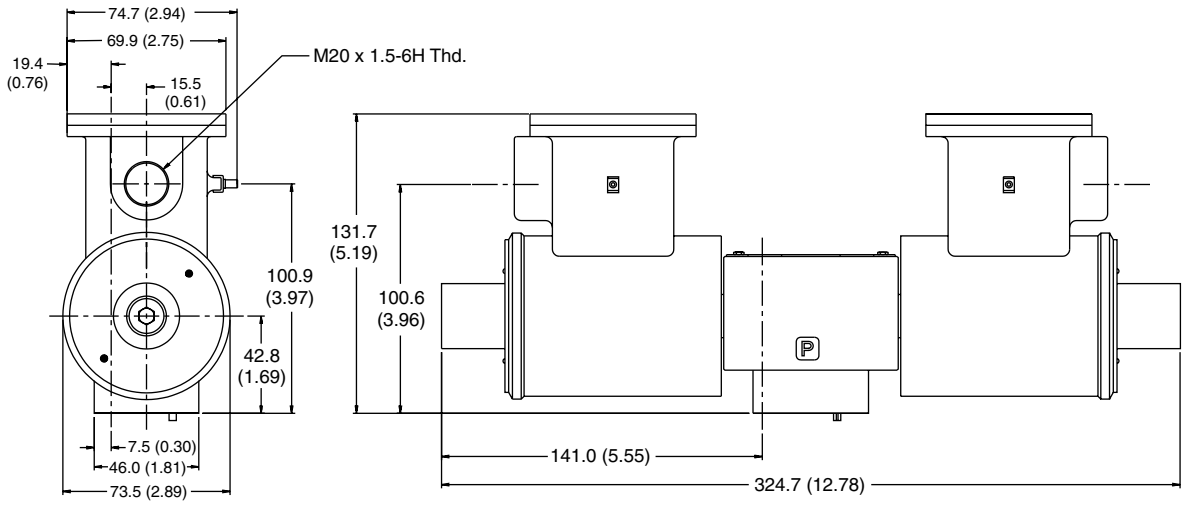
Explosion Proof U.L. & C.S.A., Double Solenoid



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



Explosion Proof ATEX, Double Solenoid



2502-A1.p65, dd

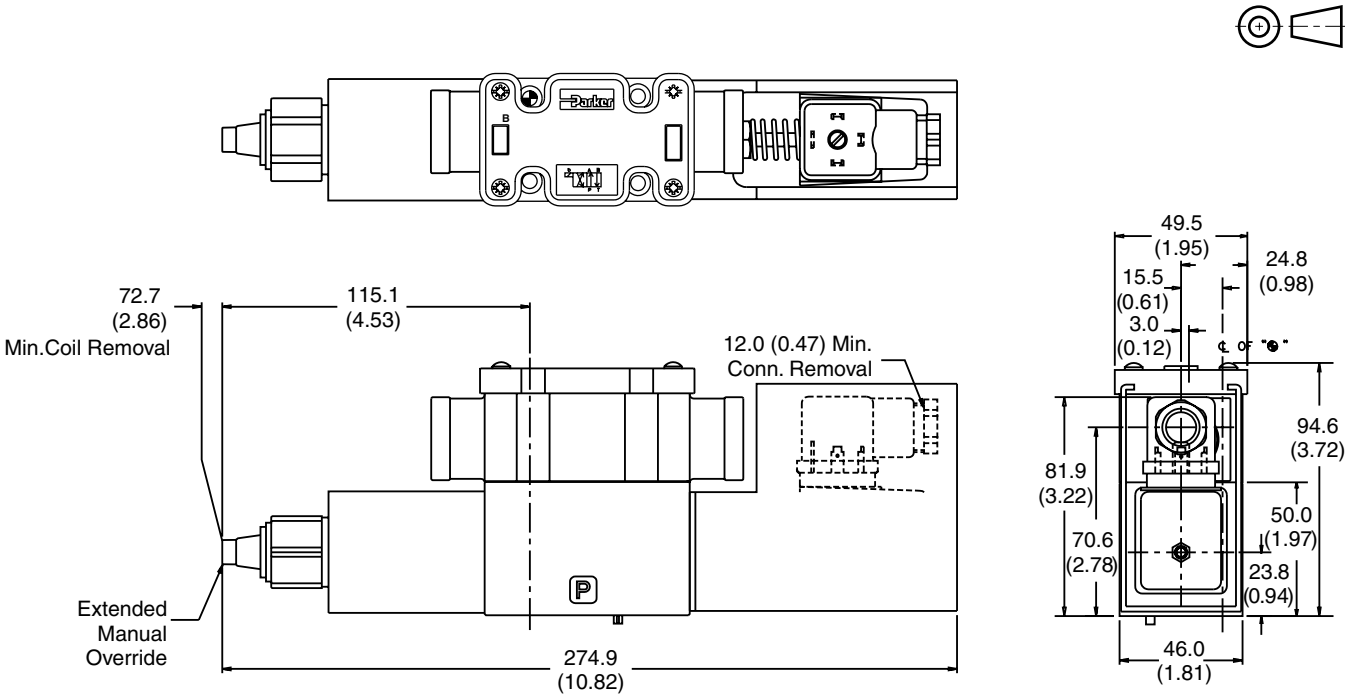
Parker Hannifin Corporation
Hydraulic Valve Division
Elyria, Ohio, USA

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

A

Conduit Box, Single DC Solenoid

with Variation I7 (Monitor Switch) & Variation P (Extended Manual Override)

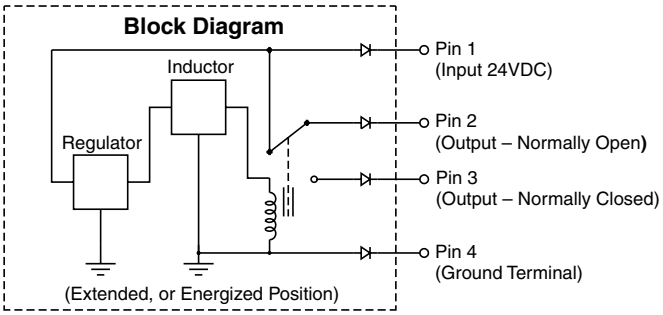


Monitor Switch
(valve variation I7)

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.

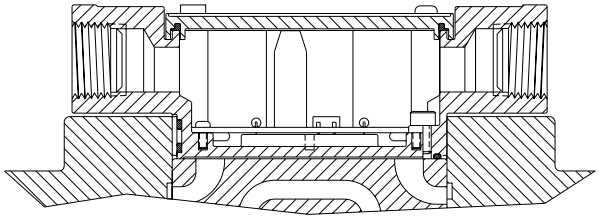
Conduit Box
(connection option G & C)

Interface – 152.4 cm (6.0 inch) lead wires, 18 awg.
– Waterproof

Plug-In Conduit Box
– NEMA 4 rated
– Phoenix connector
– Lights, Manaplug available

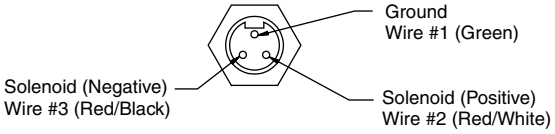
Signal Lights
(valve variation 5)

Interface – LED

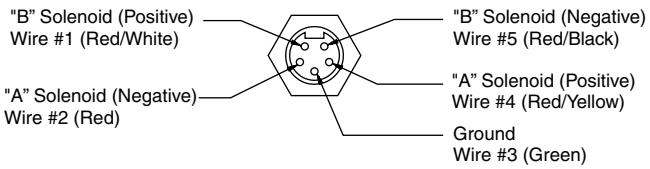


Manaplug
(valve variations 6, 56, 630)

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

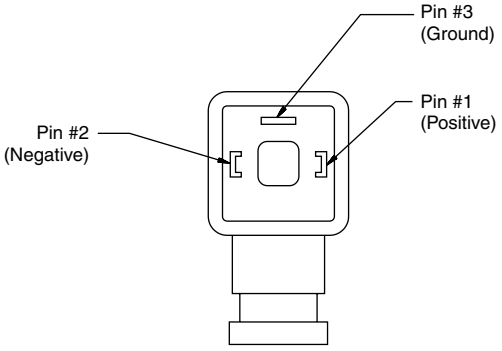


3-Pin Manaplug (Mini) with Lights
Single Solenoid Valves



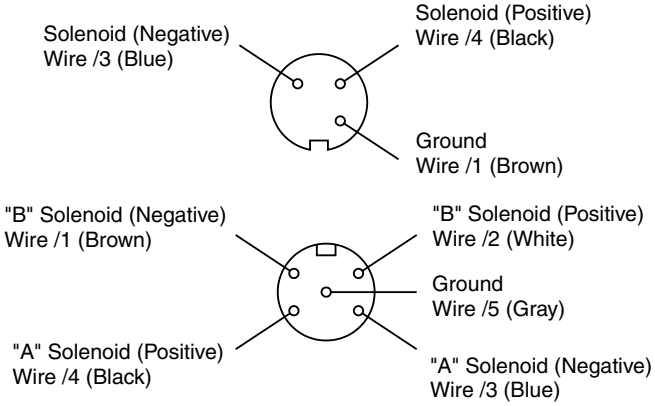
5-Pin Manaplug (Mini) with Lights
Single and Double Solenoid Valves
("A" and "B" Solenoids Reversed for #8 and #9 Spools)

Hirschmann Plug with Lights
ISO 4400/DIN 43650 Form "A"



Face View of Plug

Micro Connector
valve variations 7A, 7B



DESINA Connector
M12 pin assignment
Standard

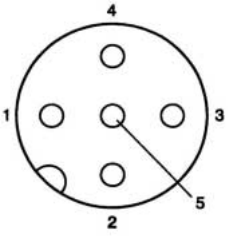
1 = Not used

2 = Not used

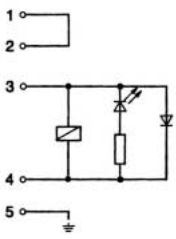
3 = 0V

4 = Signal (24 V)

5 = Earth Ground



DESINA – design
Pin 1 and 2
connected



Mounting Bolt Kits

A

Bolt Kits for use with D1V Directional Control Valves & Manapaks (D1V*-82 & 70/75 Design, Solenoid Operated & D1V*-60 Design, Non-Solenoid Operated)

Number of Manapaks at 44.5mm (1.75") Thickness	Number of Manapaks/Cartpaks @40mm (1.58") thickness									
	0		1		2		3		4	
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.		
	BKM209	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.						
	BKM253	165 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 & Manapaks (D1V*-82 & 70/75 Design)

Number of Manapaks at 44.5mm (1.75") Thickness	Number of Manapaks/Cartpaks @40mm (1.58") thickness									
	0		1		2		3		4	
0	BK50	2.00 in.	BK211	3.63 in.	BK101	5.12 in.	BK102	6.75 in.	BK103	8.25 in.
	BKM51	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.		
	BKM209	95 mm			BKM105	175 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 Manapak valves (starting with 31 Series) including CM2, CPOM2, FM2, PRDM2 and RM2 measure 40mm (1.58") thickness.

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

A

Fluid Recommendations

Premium quality hydraulic oil with a viscosity range between 150-250 SSU (32 -54 cst) at 38°C (100°F) is recommended. The absolute operation viscosity range is from 80-1000 SSU (16-220 cst). Oil should have maximum anti-wear properties and rust and oxidation treatments.

Fluids and Seals

Valves using synthetic, fire-resistant fluids require special seals. When phosphate ester or its blends are used, FLUOROCARBON seals are required. Water-glycol, water-in-oil emulsions, and petroleum oil may be used with NITRILE seals.

Temperature Recommendation

Recommended oil temperature:
-7° to +71°C (-20 to +160°F)

Filtration

For maximum valve and system component life, the system should be protected at a contamination level not to exceed 125 particles greater than 10 microns per milliliter of fluid. (SAE Class 4 or better, ISO Code 16/13).

Tank Line Surges

If several valves are piped with a common tank line, flow surges in the line may cause unexpected spool shift. Detent style valves are most susceptible to this. Separate tank lines should be used when line surges are expected in an application.

Recommended Mounting Position

Valve Type	Recommended Mounting Position
Detent (Solenoid)	Horizontal
Spring Centered	Unrestricted
Spring Offset	Unrestricted

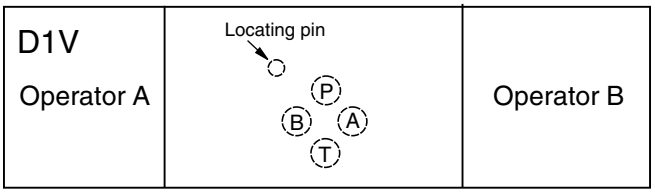
Silting

Silting can cause any sliding spool valve to stick and not spring return, if held shifted under pressure for long periods of time. The valve should be cycled periodically to prevent sticking.

Single Pass Operation

Valve flow ratings are for double pass operation (with equal flow in both paths). When using these components in single pass applications, flow capabilities may be reduced. Consult your local Parker representative for details.

Flow Path Data



*Note: On valves with 008 or 009 spool, A and/or B operators reverse sides. Flow paths remain the same as viewed from top of valve.

Double Solenoid. With solenoid "A" energized, flow path is P→A and B→T. When solenoid "B" is energized, flow path is P→B and A→T. The center condition on a spring-centered valve exists when both coils are de-energized, or during a complete shift, as the spool passes through center.

Detent and Spring Offset. The center condition exists on detent and spring offset valves only during spool crossover. To shift and hold a detented spool, only a momentary energizing of the solenoid is necessary. The minimum duration of the signal is approximately 0.1 seconds for DC voltages. This position will be held provided the spool center line is in a horizontal plane, and no shock or vibration is present to displace the spool.

Single Solenoid. Spring offset valves can be ordered in styles B, E, F, H, K and M. Flow path data for the various styles are described in the order chart.

Electrical Failure

Should electric power fail, spring offset and spring centered valves will shift to the spring held position. Detented valves will stay in the last position held before power failure. If main flow does not fail or stop simultaneously, machine actuators may continue to function in an undesirable manner or sequence.

Torque Specifications

Torque values recommended for the bolts which mount the valve to the manifold or subplate are as follows:

#10-24 thread (M5-0.8) torque 5.6 Nm (50 in-lbs).