

Series D3W, F Style 32-Design Directional Control Valves

Service Bulletin

Bulletin HY14-2543-M13/US

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS

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SAFETY GUIDE

For safety information, see Safety Guide SG HY14-1000 at www.parker.com/safety or call 1-800-CParker.

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D
 Directional Control Valve

3
 Basic Valve

NFPA D05,
 CETOP 5
 NG10

W
 Actuator

Wet
 armature
 solenoid

□
 Spool

F
 Style

Code Description
 N Nitrile
 V Fluorocarbon

□
 Seal

□
 Solenoid Voltage

Code Description
 E 24/60 - 24/50 VAC
 Y 120/60 - 110/50 VAC
 T 240/60 - 220/50 VAC
 K 12 VDC
 J 24 VDC
 D# 120 VDC
 U# 98 VDC
 Z# 250 VDC

High Watt Coil only.

□
 Solenoid Connection

Code Description
 C** Conduit Cavity
 K Conduit Box
 P Hirschmann w/Plug
 W* Hirschmann w/o Plug
 E* Explosion Proof

* Lights not available.
 ** No variations (See "K").

Code	Symbol	Code	Symbol
1		11	
2		12	
3		14	
4		15	
5		16	
6		21†	
7		22†	
8*		81†	
9**		††	

10†		82†	
		††	

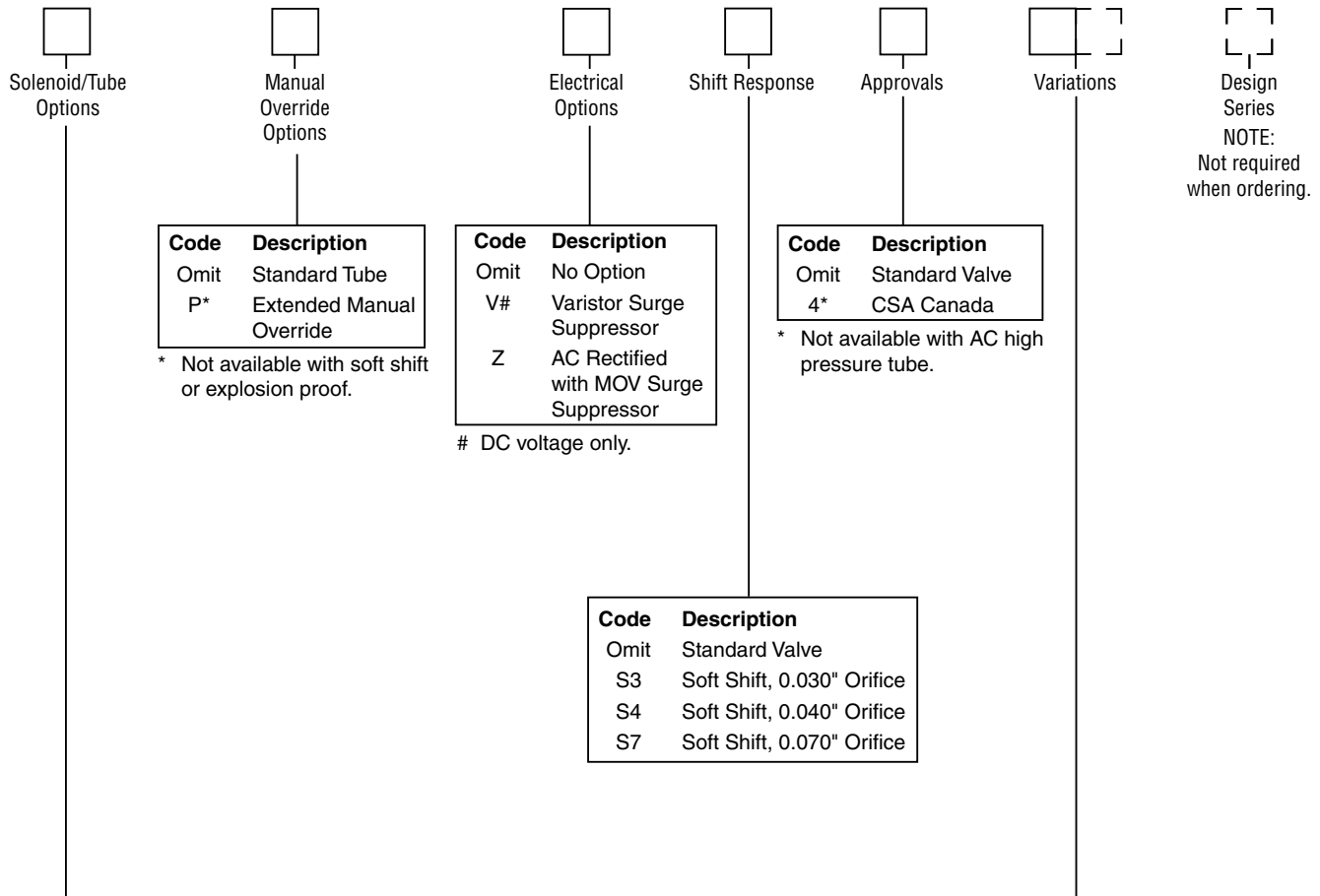
* 8 spool has closed crossover.
 ** 9 spool has open crossover.
 † Available only with high-watt rectified AC coils or high-watt DC coils.
 †† Spring centered versions C, E, F, K & M only.
 *** 81 and 82 spools not available with explosion proof.

Valve schematic symbols are per NFPA/ANSI standards, providing flow P to A when energizing solenoid A. Note operators reverse sides for #8 and #9 spools. See installation information for details.

Code Description
 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.



This condition varies with spool code



Code	Description
Omit	Standard Tube
P*	Extended Manual Override

* Not available with soft shift or explosion proof.

Code	Description
Omit	No Option
V#	Varistor Surge Suppressor
Z	AC Rectified with MOV Surge Suppressor

DC voltage only.

Code	Description
Omit	Standard Valve
4*	CSA Canada

* Not available with AC high pressure tube.

Code	Description
Omit	Standard Valve
S3	Soft Shift, 0.030" Orifice
S4	Soft Shift, 0.040" Orifice
S7	Soft Shift, 0.070" Orifice

Options	Coil	Tube Rating	
		AC	DC/AC Rectified
Omit	High Watt	103.5 Bar (1500 PSI)	207 Bar (3000 PSI)
F*#	Low Watt	n/a	207 Bar (3000 PSI)
H	High Watt	207 Bar (3000 PSI)	n/a
D†	Explosion Proof EEXD ATEX		
U†	Explosion Proof, UL/CSA		

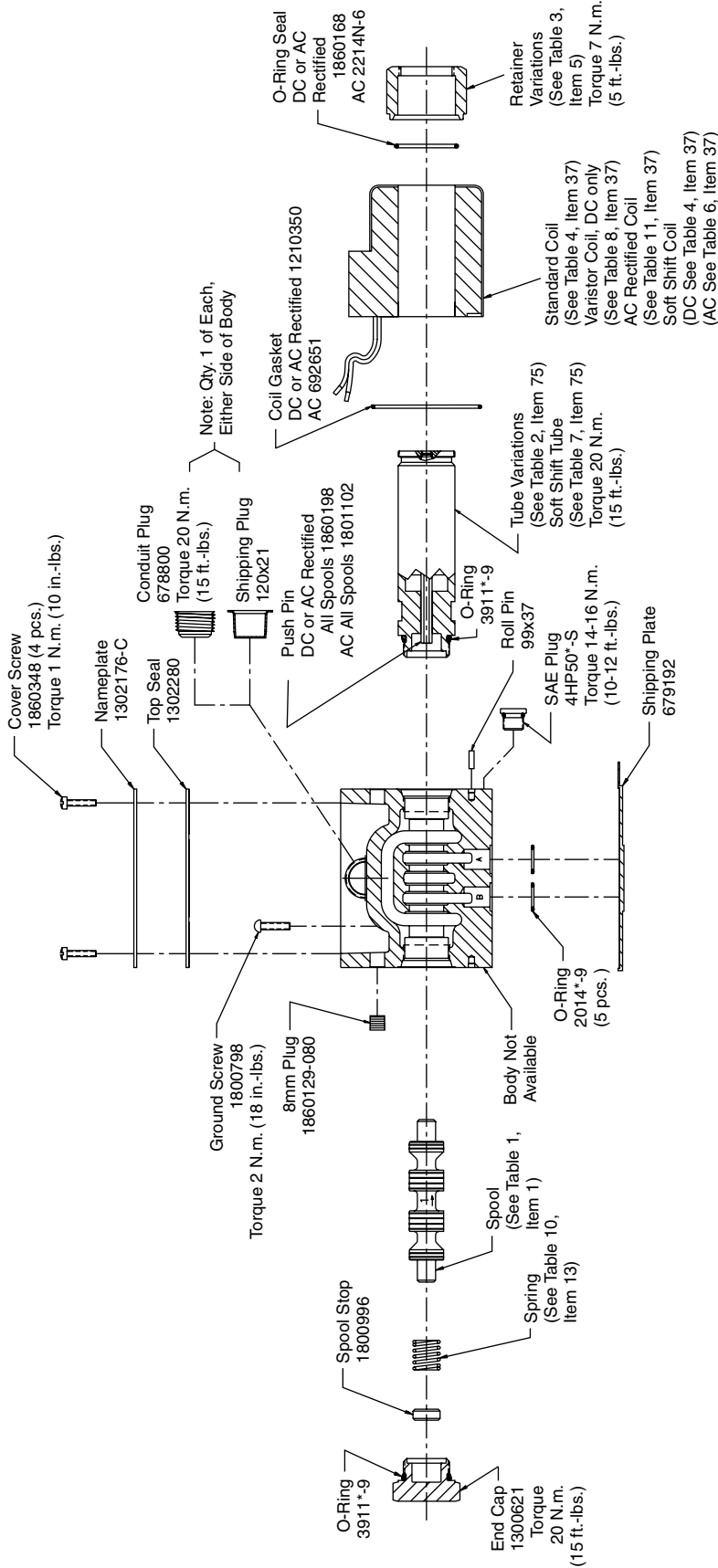
* Available only with J, K and Y (Rectified), T (Rectified) voltages.
 # Not available with soft shift valves or with F and M style valves.
 † Explosion proof coils are 60 Hz at standard voltage; dual rating not available.

Code	Description
Omit	Standard Valve
5	Signal Lights
6	Manaplug, Brad Harrison Mini
7	Manaplug, Brad Harrison Micro (M12x1)
56	Manaplug (Mini) with Lights
57	Manaplug (Micro) with Lights (M12x1)
1A	Manaplug (Mini) Single Sol. 5-Pin
1B	Manaplug (Micro) Single Sol. 5-Pin (M12x1)
1C	Manaplug (Mini) Single Sol. 5-Pin w/Lights
1D	Manaplug (Micro) Single Sol. 5-Pin w/Lights (M12x1)
1M	Manaplug Opposite Normal

Valve Weight:
 Single Solenoid:
 AC 4.3 kg (9.5 lbs.)
 DC 5.3 kg (11.6 lbs.)

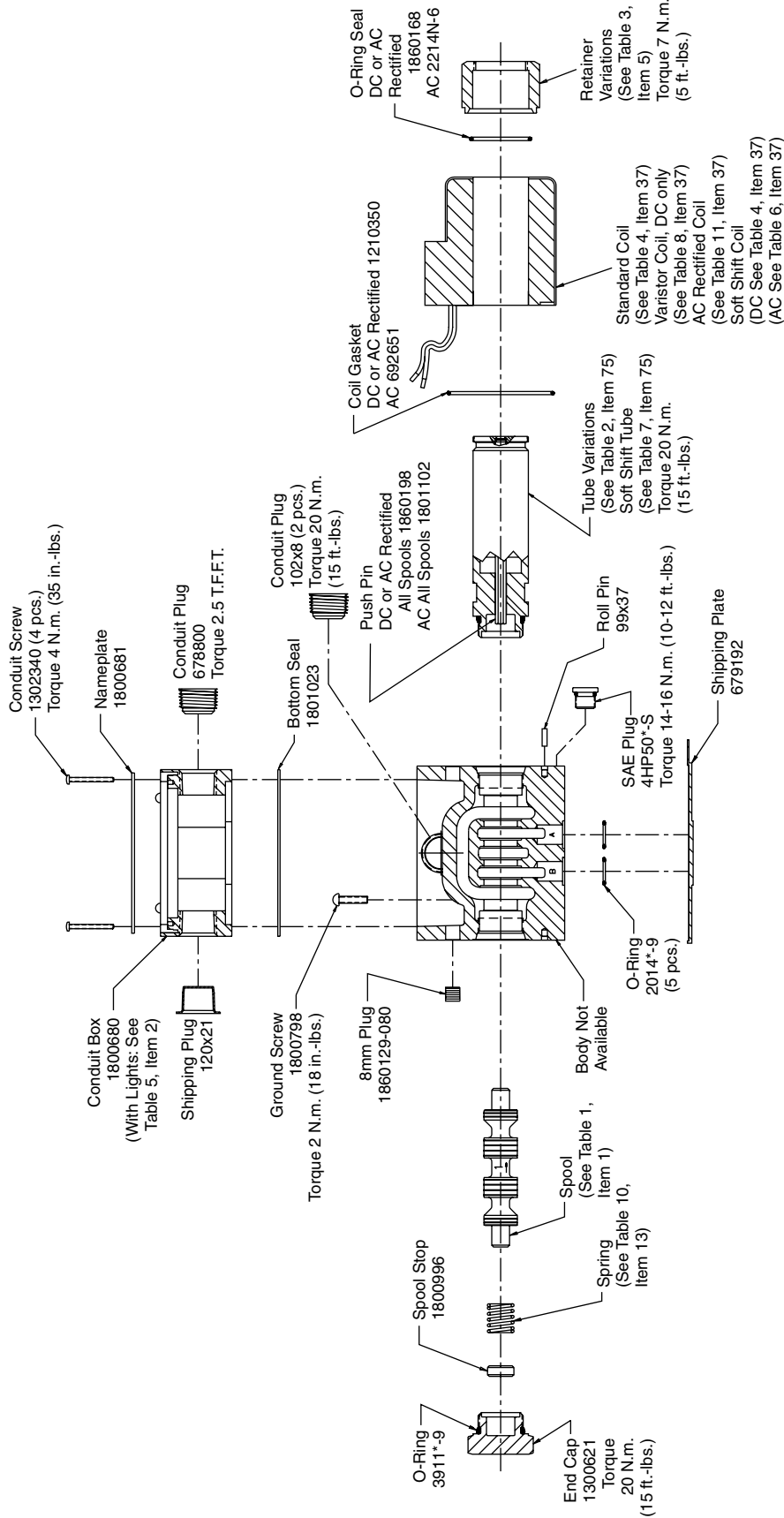
Standard Bolt Kit:
 BK98
Seal Kit:
 Nitrile SKD3W
 Fluorocarbon SKD3WV



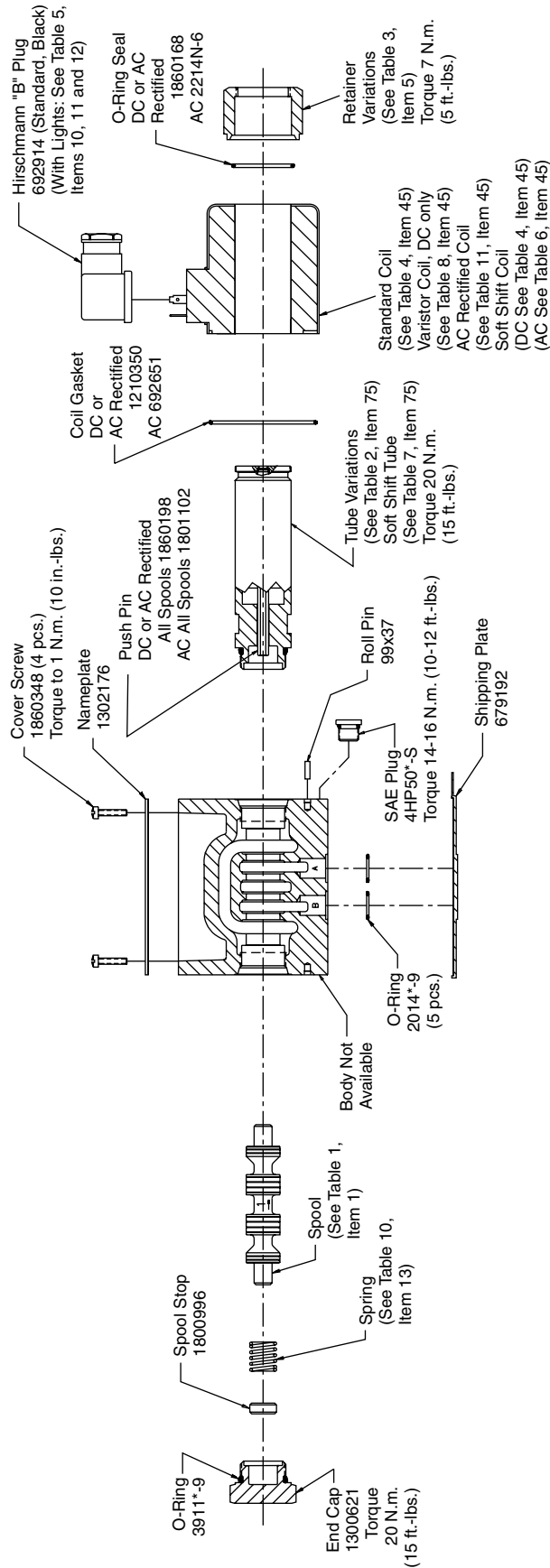


NOTES:
 1) DC Components Shown, See Tables for AC Components Where Applicable
 2) * Indicates Seal Compound: N-Nitrile, V-Fluorocarbon.
 3) Gasket 1300698 (Used on AC Only) Not Shown. Reference C-Style for Location.





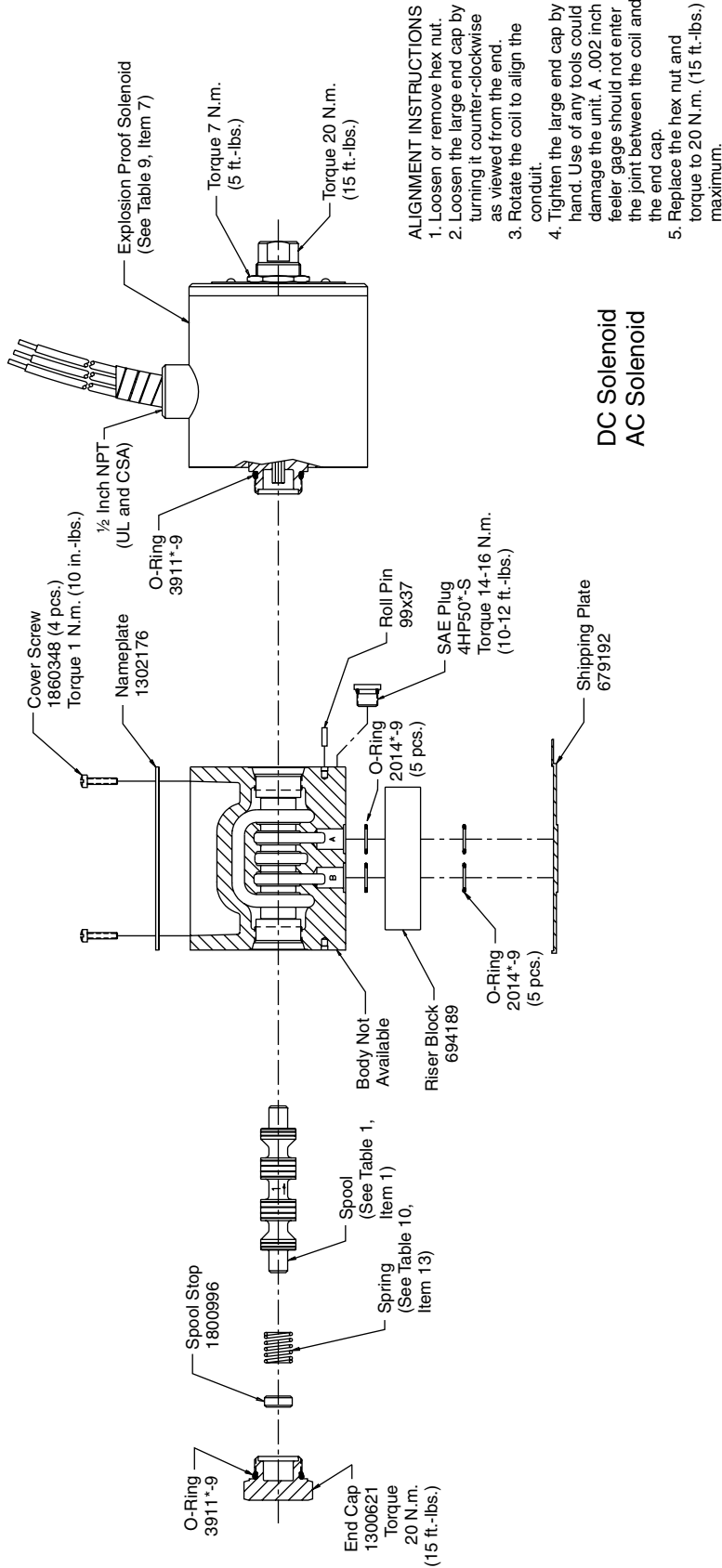
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 2) * Indicates Seal Compound: N-Nitrile, V-Fluorocarbon.
 3) Gasket 1300698 (Used on AC Only) Not Shown. Reference C-Style for Location.



**DC or AC Rectified Solenoid
 AC Solenoid**

**D3W Single AC Solenoid Model
 D3W Single DC Solenoid Model**

- NOTES:**
- 1) DC Components Shown. See Tables for AC Components Where Applicable
 - 2) * Indicates Seal Compound: N-Nitrile, V-Fluorocarbon.
 - 3) Gasket 1300698 (Used on AC Only) Not Shown. Reference C-Style for Location.



ALIGNMENT INSTRUCTIONS

1. Loosen or remove hex nut.
2. Loosen the large end cap by turning it counter-clockwise as viewed from the end.
3. Rotate the coil to align the conduit.
4. Tighten the large end cap by hand. Use of any tools could damage the unit. A .002 inch feeler gage should not enter the joint between the coil and the end cap.
5. Replace the hex nut and torque to 20 N.m. (15 ft.-lbs.) maximum.

DC Solenoid
AC Solenoid

D3W Single AC Solenoid Model
D3W Single DC Solenoid Model

NOTES:

- 1) DC Components Shown. See Tables for AC Components where Applicable.
- 2) * Indicates Seal Compound: N-Nitrile, V-Fluorocarbon.

Table 1 (Spools)					
	Code	Item	Part Number	Qty	Description
1	1	1	1300601	1	#1 Spool
	2	1	1300602	1	#2 Spool
4	3	1	1300603	1	#3 Spool
	4	1	1300604	1	#4 Spool
	5	1	1300605	1	#5 Spool
	6	1	1300606	1	#6 Spool
2	7	1	1300607	1	#7 Spool
	8	1	1300608	1	#8 Spool
	9	1	1300609	1	#9 Spool
	10	1	1300610	1	#10 Spool
	11	1	1300611	1	#11 Spool
	12	1	1300664	1	#12 Spool
	14	1	1300607	1	#7 Spool Reversed
	15	1	1300603	1	#3 Spool Reversed
	16	1	1300605	1	#5 Spool Reversed
	21	1	1301701	1	#21 Spool
3	22	1	1301701	1	#21 Spool Reversed
	81	1	1210161	1	#81 Spool
	82	1	1210162	1	#82 Spool

- Notes:
- 1 Arrow points toward A port end of body for all spools except 14, 15, 16 and 22.
 - 2 For F and M styles with 8 or 9 spools, solenoid is on opposite end of that shown in illustration.
 - 3 81 and 82 spools are not available with explosion proof.
 - 4 10, 21, 22, 81 and 82 spools only available in high watt rectified AC or high watt DC only.

Table 2 (Tube Variations)				
Code	Item	Part Number	Qty	Description
Omit or H	75	1300666	1	AC Tube 103.5 Bar (1500 PSI)
		1301710		AC Tube 207 Bar (3000 PSI)
		1860213		DC or AC Rectified Tube 207 Bar (3000 PSI)
P or HP	75	1860174	1	Extended AC Tube 103.5 Bar (1500 PSI)
		1860176		Extended AC Tube 207 Bar (3000 PSI)
		1860165		Extended DC or AC Rectified Tube 207 Bar (3000 PSI)

Table 3 (Retainer Variations)				
Code	Item	Part Number	Qty	Description
All except P, HP & T	5	693568	1	AC Standard Retainer
		1860167		DC Standard or AC Rectified Retainer
P or HP	5	1300128	1	AC Extended Override Retainer
		1860171		DC or AC Rectified Extended Override Retainer
		697161		Extended Override Boot

Table 4 (Standard Coils)				
Solenoid Connection			C/K (Conduit)	P/W (Hirschmann)
Item			37	45
Code	Description	Qty	Part Number	Part Number
E*	24/50 – 24/60 VAC, 32/36 Watt	1	691745-1	1300574
Y*	120/60 – 110/50 VAC, 32 Watt	1	691740-1	691750
T*	240/60 – 220/50 VAC, 32 Watt	1	691743-1	693987
K*	12 VDC, 36 Watt	1	1860156-K	1860152-K
J*	24 VDC, 36 Watt	1	1860156-J	1860152-J
D*	120 VDC	1	1860156-D	1860152-D
U*	98 VDC	1	1860156-U	1860152-U
Z*	250 VDC	1	1860156-Z	1860152-Z

Table 5 (Signal Lights)									
Code	Item	Part Number	Qty	Description	Code	Item	Part Number	Qty	Description
All Plugs (*P*5)	10	697047	A/R	Label – “A” Solenoid	YK*5	2	1800679-Y	1	Conduit Box Cover, 120 VAC
	11	697048	A/R	Label – “B” Solenoid	TK*5		1800679-T	1	Conduit Box Cover, 240 VAC
					EK*5		1800679-E	1	Conduit Box Cover, 24 VAC
YP*5		694936	1	Plug with Light, 100 – 120V	KK*5		1800679-K	1	Conduit Box Cover, 12 VAC
TP*5		694936	1	Plug with Light, 240V	JK*5		1800679-J	1	Conduit Box Cover, 24 VAC
KP*5	12	694935	1	Plug with Light, 12V	DK*5		1800679-D	1	Conduit Box Cover, 120 VAC
JP*5		694935	1	Plug with Light, 24V	ZK*5		1800679-Z	1	Conduit Box Cover, 250 VAC
DP*5		694936	1	Plug with Light, 100 – 120V			697799	1	Warning Label

Table 6 (Soft Shift Coils, AC Only)				
Solenoid Connection			C/K (Conduit)	P/W (Hirschmann)
Item			37	45
Code	Description	Qty	Part Number	Part Number
Y*S	120/60 – 110/50 VAC, 36 Watt	1	1860299-36-Y-Z	1860154-Y
T*S	240/60 – 220/50 VAC, 36 Watt	1	1860299-36-T-Z	1860154-T

Table 7 (Soft Shift Tubes)				
Code	Item	Part Number	Qty	Description
S3	75	1860172-3	1	207 Bar (3000 PSI) Soft Shift Tube
S4	75	1860172-4	1	207 Bar (3000 PSI) Soft Shift Tube
S7	75	1860172-7	1	207 Bar (3000 PSI) Soft Shift Tube

Table 8 (Varistor Coils, DC Only)				
Solenoid Connection			C/K (Conduit)	P/W (Hirschmann)
Item			37	45
Code	Description	Qty	Part Number	Part Number
K*	12 VDC	1	1860159-K	1860155-K
J*	24 VDC	1	1860159-J	1860155-J
D*	120 VDC	1	1860159-D	1860155-D
Z*	250 VDC	1	1860159-Z	1860155-Z

Table 9 (Explosion Proof Coils)				
Solenoid Connection			D (ATEX)	U (UL & CSA)
Item			7	7
Code	Description	Qty	Part Number	Part Number
YE*	120/60 VAC	1	1302310-Y	1302308-Y
TE*	240/60 VAC	1	1302310-T	1302308-T
PE*	110/50 VAC	1	1302310-P	1302308-P
NE*	220/50 VAC	1	1302310-N	1302308-N
KE*	12 VDC	1	1302310-K	1302308-K
JE*	24 VDC	1	1302310-J	1302308-J
DE*	120 VDC	1	1302310-D	1302308-D
ZE*	250 VDC	1	1302310-Z	1302308-Z

Table 10 (Springs)				
Code	Item	Part Number	Qty	Description
All	13	1301263	1	AC Spring for All Spools
All	13	1800684	1	DC or AC Rectified Spring for All Spools

Table 11 (Rectified Coils, AC Only)				
Solenoid Connection			C/K (Conduit)	P/W (Hirschmann)
Item			37	45
Code	Description	Qty	Part Number	Part Number
Y*Z	120/60 – 110/50 VAC, 36 Watt	1	1860299-36-YZ-6	1860154-Y
T*Z	240/60 – 220/50 VAC, 36 Watt	1	1860299-36-TZ-6	1860154-T

Spools

B-Solenoid		A-Solenoid		B-Solenoid		A-Solenoid	
*(A-Solenoid)	A PORT	B PORT	*(B-Solenoid)	*(A-Solenoid)	A PORT	B PORT	*(B-Solenoid)
		1				11	
1 Spool 1300601				11 Spool 1300611			
		2				12	
2 Spool 1300602				12 Spool 1300664			
		3				7	
3 Spool 1300603				14 Spool 1300607			
		4				3	
4 Spool 1300604				15 Spool 1300603			
		5				5	
5 Spool 1300605				16 Spool 1300605			
		6				21	
6 Spool 1300606				21 Spool 1301701			
		7				21	
7 Spool 1300607				22 Spool 1301701			
8 Spool 1300608				81 Spool 1210161			
	Note Reverse Operator Location						
9 Spool 1300609				82 Spool 1210162			
	Note Reverse Operator Location						
		10					
10 Spool 1300610							

* For 8 and 9 spools only.

Note: Arrow points to A port end on all spools except 14, 15, 16 and 22.

Solenoid Ratings**

Insulation	Class H
Allowable Deviation from rated voltage	DC, AC Rectified -10% to +15%
Armature	AC -5% to +5% Wet pin type

** DC Solenoids available with optional molded metal oxide varistor (MOV) for surge suppression.
 Leadwire length 6" from coil face.

D3W Solenoid Electrical Characteristics†

Solenoid Code	Nominal Volts/Hz	In Rush VA	Holding VA	Nominal Watts (Ref)
Y	120/60	298	95	32
	110/50	294	102	
T	240/60	288	96	32
	220/50	288	101	
E	24/60	290	77	32
	24/50	381	110	
K	12 VDC	—	3.00†	36
J	24 VDC	—	1.50†	36
D	120 VDC	—	0.30†	36
U	98 VDC	—	0.37†	36
Z	250 VDC	—	0.14†	36

† DC holding amps.

D3W Rectified AC Solenoid Electrical Characteristics‡

Solenoid Code	Nominal Volts/Hz	In Rush Amps	Holding Amps	Watts
Y	120/60	—	.37	36
	110/50	—	.37	
T	240/60	—	.18	36
	220/50	—	.18	

‡Based on nominal voltage @ 22°C (72°F)

Explosion Proof Solenoids

Explosion Proof Solenoid Ratings

U.L. / C.S.A. (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
ATEX (ED)	Complies with ATEX requirements for: Exd, Group IIB; EN50014: 1999+ Amds 1 & 2, EN50018: 200

Electrical Characteristics* ED and EU

Solenoid Code	Nominal Volts/Hz	In Rush VA	Holding VA	Nominal Watts (Ref)
Y	120/60	266	82	36
T	240/60	266	82	36
K	12 VDC	—	3.00†	36
J	24 VDC	—	1.50†	36
D	120 VDC	—	0.30†	36

*Dual frequency not available on explosion proof coils.

† DC holding amps.

Warning

Before any circuit connection is broken, be sure to turn off all power and relieve system pressure. Lower all vertical loads and cylinders, lock any load which could produce pressure and discharge any accumulators. Plug and cap all lines and openings to prevent contamination from entering the system.

Cleaning and Inspection

1. Proper cleaning is a critical part of preventive maintenance in the use of directional control valves. All parts should be cleaned with a solvent that is compatible with the system fluid. Compressed air may also work well when cleaning orifices and passage ways, but proper filtration must be employed to remove water and contamination.

NOTE: Always make sure all parts have been cleaned before reassembling.

2. Inspection

- a. Inspect all passage ways for obstructions.
- b. Inspect all washers, push pins, plungers and pole faces for signs of wear and/or mushrooming. Inspect all springs for signs of distortion. Replace parts as necessary.
- c. Look for nicks and burrs on the spool and bore lands. Nicks in these areas indicate likely contamination of the system fluid.

3. If there are no signs of nicks or burrs on the spool and bore, check the spool movement as follows:

- a. Lubricate the spool and bore with clean system fluid.
- b. Insert the spool back into the body and slowly move the spool back and forth. The spool should move freely. If there is any sticking between the spool and the bore, remove the spool and repeat 2a, 2c and 3a.
- c. The spool movement can also be checked by placing the valve body on end and inserting the spool. Gravity will pull the spool to the other end if there is no sticking.
- d. After several attempts have been made without resolution, replace the valve.

Continued on the next page

Problem: Valve spool fails to move

	Cause	Recommendation
Mechanical	Recommended flow exceeded	Check maximum flow rate for appropriate spool by spool function.
	Recommended pressure exceeded	Check maximum pressure rating for valve
	Improper installation connections	Check installation drawings
	Contamination in system	Disassemble, inspect, clean and flush
	Improper assembly	Check proper assembly. Refer to drawing for appropriate model.
	Valve has silted	Disassemble and clean valve.
Electrical	Power off	Turn power on
	Improper voltage	Check voltage requirements for valve model
	Faulty connection	Check connections
	Faulty coil	Check coil resistance

Problem: Valve produces undesirable response

	Cause	Recommendation
Mechanical	Recommended flow exceeded	Check maximum flow rate for appropriate spool by spool function.
	Recommended pressure exceeded	Check maximum pressure rating for valve.
	Improper installation connections	Check installation drawings.
	Contamination in system	Disassemble, inspect, clean and flush.
	Improper assembly	Check proper assembly. Refer to drawing for appropriate model.
	Improper fluid	Check fluid recommendations.
	Recommended temperature exceeded (indicated by fluid discoloration or spool tarnishing)	Check maximum temperature recommendations.
	Incorrect orifice size (soft shift only)	Check orifice size for desired response time.
Electrical	Improper voltage	Check voltage requirements for valve model.
	Faulty connection	Check connections.
	Faulty coil	Check coil resistance.

Offer of Sale with Warranty Limitations

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11. **Improper Use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright

infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. **Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.

13. **Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. **Force Majeure.** Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.

15. **Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. **Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appointments a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) dissolves or liquidates all or a majority of its assets.

17. **Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.

18. **Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

19. **Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.

20. **Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act.** Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.

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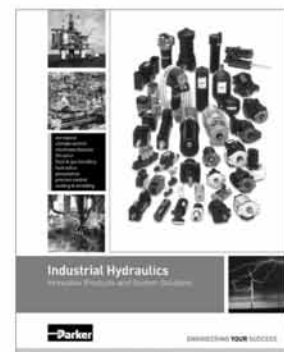
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