

# INSTALLATION, OPERATION, & MAINTENANCE **MANUAL**

BFMM DC4A SBF 1-2012



**1/2" - 2"**  
**Double Check Valve (DC) Backflow Preventer**

**Model DC4A**  
**Model DCLF4A**





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# DOUBLE CHECK VALVE BACKFLOW PREVENTER 1/2" – 2"

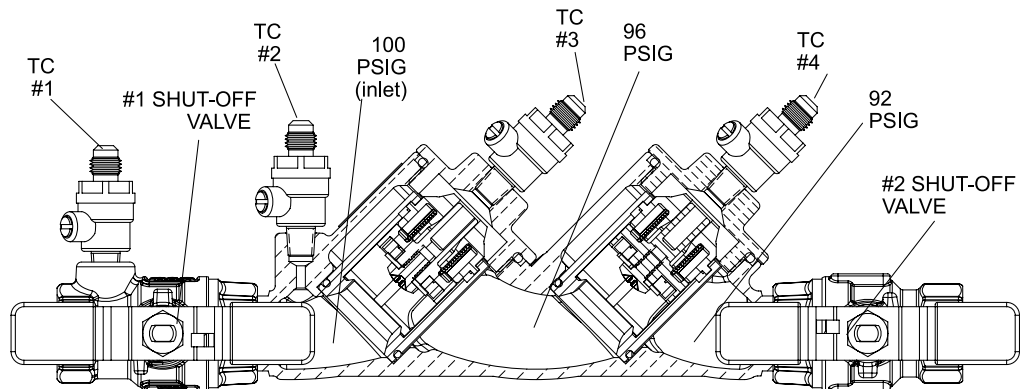
## I. DESCRIPTION AND OPERATION

The Double Check Valve (DC) device consists of two independently-acting, spring-loaded check valves. Two resilient seated shut-off valves and four test cocks complete the assembly. Each check is designed to maintain a minimum of 1 psi across the valve during normal operation. If at any time the pressure downstream of the device increases above the supply pressure, both check valves will close to prevent any backflow from occurring. The flowing and no flow conditions are illustrated in figures 1 and 2. To initiate flow, supply pressure must be sufficient to open both checks and overcome friction, normally a minimum of 3 to 5 psi above the downstream pressure.

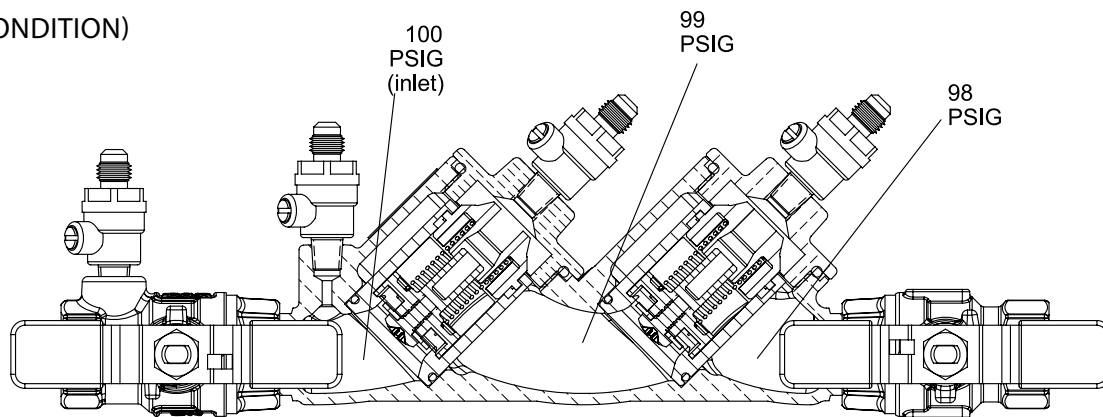
## II. INSTALLATION

- A. The DC must be installed in an accessible location to facilitate periodic field testing and maintenance.
- B. Flush all upstream piping thoroughly to remove foreign matter prior to installing the device.
- C. The device should be installed either horizontally or vertical up for ease of maintenance and testing. A clearance between the lower most portion of the device and flood grade or floor should be provided for ease of maintenance.
- D. When shut-off valves are provided separately, they should be installed with a test cock on the upstream side of the inlet shut-off valve.
- E. After installing the assembly and with downstream or #2 shut-off valve closed, pressurize the device and bleed ALL air through test cock #4. Then open #2 shut-off valve.

**Figure 1**  
 (FLOWING CONDITION)



**Figure 2**  
 (NO FLOW CONDITION)



**NOTE:** Pressures shown are for illustrative purposes only and are not necessarily indicative of any actual valve.

### III. TROUBLE SHOOTING

SYMPTOM	CAUSE	CORRECTIVE ACTION
1. Check valve fails to hold 1 psid.	a. Shut-off valve not closed completely. b. Check valve fouled with debris. c. Check poppet stem not moving freely in guide.	a. Close #2 shut-off valve or inspect for possible leakage through leakage. b. Inspect and clean seat disc and seat. c. Inspect for debris or deposit on poppet stem or guide.

### IV. MAINTENANCE INSTRUCTIONS 1/2" – 2"

#### A. Disassembly - Check Valves

1. Close #2 shut-off valve, then close #1 shut-off valve.
2. Bleed pressure from the assembly by opening #2, #3, and #4 test cocks.
3. Unscrew cap using hex head provided.
4. Push down and turn the spring retainer 90 degrees to remove. Remove the spring. Remove the poppet from the check seat.
5. Normally, the check seat need not be removed. If removal is required, rock it back and forth while pulling outward.

#### B. Disassembly - Check Valve Poppet

**CAUTION: Do not use pliers or other tools, which may damage or scratch the plastic stem.**

1. Holding the poppet assembly in one hand, remove screw and retaining washer.
2. Remove the seat disc.
3. All parts should be carefully inspected for any damage or excessive wear and thoroughly rinsed in clean water prior to reassembly. Replace worn parts as necessary.

#### C. Assembly - Check Valve Poppet

1. Install new disc in poppet and secure with washer and screw.

#### D. Assembly - Check Valve

1. If the check seat was removed, install the new o-ring and lubricate with a thin coat of Apollo supplied lubricant, DOW 111 or equal. Line up the seat with the bore and push it firmly into place.
2. Place and center the poppet assembly in the check seat.
3. Install the spring onto the poppet.
4. Install the spring retainer onto the spring by pushing down into the grooves of the check seat and turning 90 degrees. Ensure spring retainer pops up about .1" and locks into the lugs. **CAUTION: Ensure the spring retainer orientation matches that in the parts list drawing or the device's flow will be significantly restricted.**
5. Apply a thin coat of Apollo supplied lubricant, DOW 111 or equal on cap o-ring.
6. Install cap.

## V. TESTING PROCEDURES

This test is performed with the Differential Pressure Gauge Test Kit. The Differential Pressure Gauge simply measures the pressure drop across the check valve. This pressure drop is normally the same as the strength of the check valve spring. In using the Differential Pressure Gauge to test the Double Check assembly, a minimum of 1.0 psid is required for each check valve in order for that check valve to pass the test. Such a small reading is often difficult to read on most test kits. This is one of the drawbacks of this test. However, since the first shut-off valve is left in the open position for this test, it is possible to use this test when the first shut-off valve is leaking badly.

***NOTE: This is a three-valve test kit procedure and may or may not be approved in all jurisdictions. Consult your local water purveyor for acceptable test procedures.***

### Test Setup

1. Notify customer that the water service will be off. Identify the make, model, and serial number on the backflow device. Inspect that this is an approved assembly - two check valves, two shut-off valves and four test cocks. Observe the area to make sure there are no leaks.
2. Flush test cocks (1, 2, 3 & 4), then close all test cocks.
3. Install appropriate adapters (if necessary).
4. Close shut-off valve #2.

#### TEST NO. 1

**PURPOSE:** To test check valve #1

1. Close all valves on test kit.
2. Connect the high side hose to test cock #2 and the low side hose to test cock #3. Open test cock #2 and test cock #3.
3. Open vent valve "C" and high "A" on the test kit to bleed air from the high side of the kit. Close high "A" valve and then open low "B" valve to bleed the low side. Close low "B" valve.
4. Record the gauge reading. It must be a minimum of 1.0 psid in order to pass. Close test cock #2 and test cock #3.

#### TEST NO. 2

**PURPOSE:** To test check valve #2

1. Move the high side hose to test cock #3 and the low side hose to test cock #4. Open test cock #3 and test cock #4.
2. Open vent "C" valve. Then open high "A" and bleed air from the high side of the kit. Close high "A" valve, and then open low "B" valve and bleed the low side of the kit. Close low "B" valve.
3. Record the gauge reading. It must be a minimum of 1.0 psid in order to pass. Close test cock #3 and test cock #4. Remove hoses and test kit. Slowly open shut-off valve #2 in order to restore water flow to the facility, placing the DC back into service.

**TEST NO. 3**

**PURPOSE:** To test leaking #2 shut-off valve

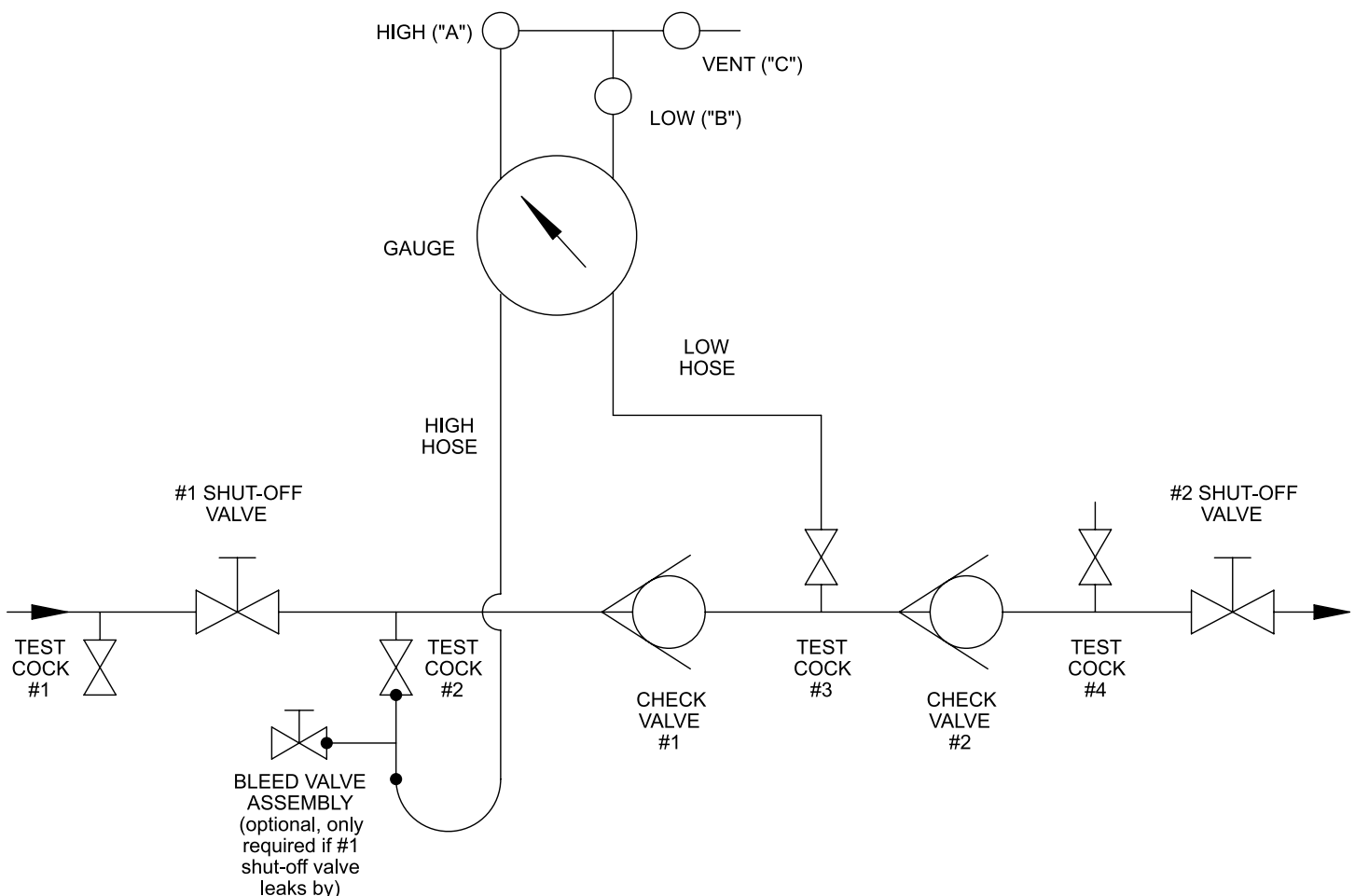
As previously mentioned, the above test is not accurate when the second shut-off valve is leaking. The following test will expose a leaking shut-off valve.

1. Both shut-off valves should be open. Make sure all valves on test kit are closed. Connect the high "A" hose to test cock #2 and the low "B" hose to test cock #3. Open test cock #2 and test cock #3.
2. Open the high "A" valve and vent "C" valve to bleed air from high side of gauge. Open low "B" valve to bleed air from low side of gauge. Close valves "A", "B" and "C" on test kit.
3. Connect the vent hose to test cock #4. Open test cock #4.
4. Close shut-off valve #2. The differential gauge needle should read at least 1.0 psid in order to pass.
5. Open the high "A" valve and vent "C" valve. This will put back pressure on check valve #2.
6. Close test cock #2.

*NOTE: If gauge is steady, then shut-off valve #2 is holding tight. However, if gauge drops to zero psid, then shut-off valve #2 is leaking.*

*NOTE: If the gauge rises then the #2 shut-off valve is still leaking, but is under backpressure from the facility.*

### 3-Valve Test Kit



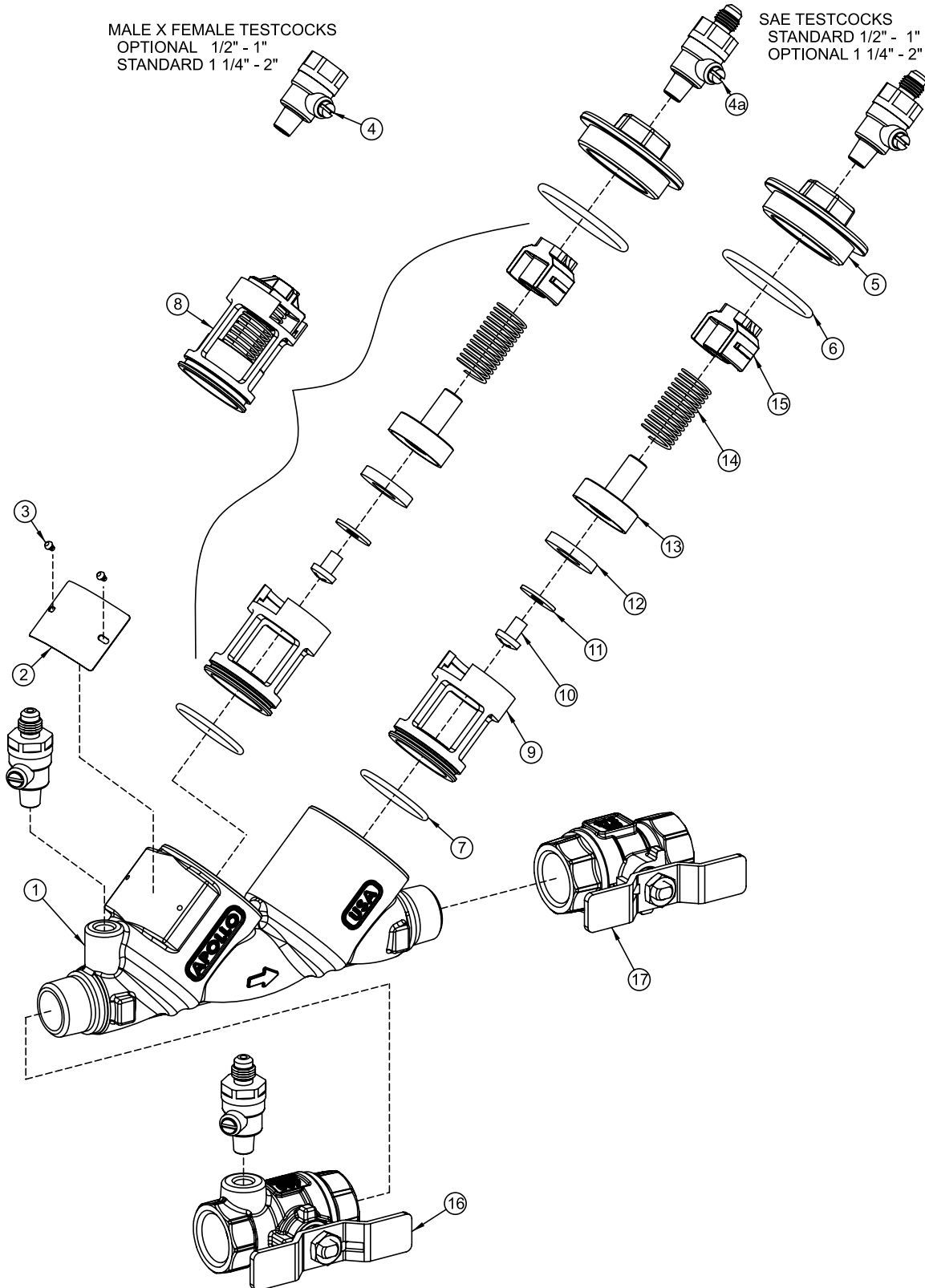
**Figure 3**

**PARTS LIST 1/2" - 2"**

MALE X FEMALE TESTCOCKS  
 OPTIONAL 1/2" - 1"  
 STANDARD 1 1/4" - 2"

SAE TESTCOCKS  
 STANDARD 1/2" - 1"  
 OPTIONAL 1 1/4" - 2"

**Figure 4**





**DC4A and DCLF4A Parts List**

Item #	Description	Std. or LF	Qty.	Part Number					
				1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
1	Body	All	1	Consult Factory					
2	Label Plate	All	1	Consult Factory					
3	Label Plate Tacks	All	2	I-2614-00					
4	Test Cock M x F (81 metal)	Std	4	78-290-01 (Optional)			78-291-01 (Standard)		
	Test Cock M x F (Lead Free)	LF		78LF-290-01 (Optional)			78LF-291-01 (Standard)		
4a	Test Cock SAE (81 metal)	Std		78-292-01 (Standard)			78-293-01 (Optional)		
	Test Cock SAE (Lead Free)	LF		78LF-292-01 (Standard)			78LF-293-01 (Optional)		
5	Cap (81 metal)	Std	2	F-3846-05	F-3822-05	F-3848-05	F-3850-05	F-3854-05	
	Cap (Lead Free)	LF		F-3847-05	F-3823-05	F-3849-05	F-3851-05	F-3855-05	
6	Cap O-Ring	All	2	D-4881-00	D-4812-00	D-4884-00	D-4885-00	D-4888-00	
7	Check Module O-Ring	All	2	D-4880-00	D-4744-00	D-4882-00	D-4884-00	D-4885-00	
8	Check S-Assy (see below)	All	2	W-9075-05	W-9003-05	W-9074-05	W-9159-05	W-9204-05	

**Individual parts are only available for bulk sales. Please refer to the appropriate repair kits on pages 11.**

**Check Module Sub-Assembly Parts List**

Item #	Description	Std. or LF	Qty.	Part Number					
				1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
9	Check Seat	All	1	L-7815-00	L-7727-00	L-7813-00	L-7979-00	L-7983-00	
10	Screw	All	1	B-3279-00	B-1750-00				
11	Disc Retaining Washer	All	1	E-2372-00	E-2841-00	E-2933-00	E-2860-00	E-2876-00	
12	Seat Disc	All	1	D-4771-00	D-4743-00	D-4770-00	D-4853-00	D-4873-00	
13	Poppet	All	1	K-4491-00	K-4471-00	K-4483-00	K-4511-00	K-4512-00	
14	Spring	All	1	A-2505-00	A-2503-00	A-2510-00	A-2511-00	A-2512-00	
15	Spring Retainer	All	1	L-7814-00	L-7726-00	L-7812-00	L-7980-00	L-7984-00	

**Individual parts are only available for bulk sales. Please refer to the appropriate repair kits on pages 11.**

## Inlet and Outlet Shut-Off Valves

Item #	Description	Std. or LF	Qty.	Part Number					
				1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
16	T2 Inlet NPT Ball Valve w/"T" Handle (Standard)	81 Mtl	1	77B-103-85	77B-104-83	77B-105-83	Not Available		
		LF		77BLF-103-85	77BLF-104-83	77BLF-105-83			
	T4 Inlet Union Ball Valve w/"T" Handle (Option)	81 Mtl		77B-303-85	77B-304-83	77B-305-83	Not Available		
		LF		77BLF-303-85	77BLF-304-83	77BLF-305-83			
	T2 Inlet NPT Ball Valve w/ Lever Handle (Standard)	81 Mtl		Not Available			77B-106-84	77B-107-84	77B-108-84
		LF					77BLF-106-84	77BLF-107-84	77BLF-108-84
	T4 Inlet Union Ball Valve with Lever Handle (Option)	81 Mtl		Not Available			77B-306-84	77B-307-84	77B-308-84
		LF					77BLF-306-84	77BLF-307-84	77BLF-308-84
	T2 Inlet NPT Ball Valve with Locking "T" Handle (Option)	81 Mtl		Not Available	77B-104-91	77B-105-91	Not Available		
		LF			77BLF-104-91	77BLF-105-91			
	T4 Inlet Union Ball Valve with Locking "T" Handle (Option)	81 Mtl		Not Available	77B-304-91	77B-305-91	Not Available		
		LF			77BLF-304-91	77BLF-305-91			
T2 Inlet NPT Ball Valve with Locking Lever Handle (Option)	81 Mtl	Not Available			77B-106-86	77B-107-86	77B-108-86		
	LF				77BLF-106-86	77BLF-107-86	77BLF-108-86		
T4 Inlet Union Ball Valve with Locking Lever Handle (Option)	81 Mtl	Not Available			77B-306-86	77B-307-86	77B-308-86		
	LF				77BLF-306-86	77BLF-307-86	77BLF-308-86		
17	T2 Outlet NPT Ball Valve with "T" Handle (Standard)	81 Mtl	1	77C-103-A4	77C-104-83	77C-105-83	Not Available		
		LF		77CLF-103-85	77CLF-104-83	77CLF-105-83			
	T4 Outlet Union Ball Valve with "T" Handle (Option)	81 Mtl		77C-303-85	77C-304-83	77C-305-83	Not Available		
		LF		77CLF-303-85	77CLF-304-83	77C-305-83			
	T2 Outlet NPT Ball Valve with Lever Handle (Standard)	81 Mtl		Not Available			77C-106-84	77C-107-84	77C-108-84
		LF					77CLF-106-84	77CLF-107-84	77CLF-108-84
	T4 Outlet Union Ball Valve with Lever Handle (Option)	81 Mtl		Not Available			77C-306-84	77C-307-84	77C-308-84
		LF					77CLF-306-84	77CLF-307-84	77CLF-308-84
	T2 Outlet NPT Ball Valve with Locking "T" Handle (Option)	81 Mtl		Not Available	77C-104-91	77C-105-91	Not Available		
		LF			77CLF-104-91	77CLF-105-91			
	T4 Outlet Union Ball Valve with Locking "T" Handle (Option)	81 Mtl		Not Available	77C-304-91	77C-305-91	Not Available		
		LF			77CLF-304-91	77CLF-305-91			
T2 Outlet NPT Ball Valve with Locking Lever Handle (Option)	81 Mtl	Not Available			77C-106-86	77C-107-86	77C-108-86		
	LF				77CLF-106-86	77CLF-107-86	77CLF-108-86		
T4 Outlet Union Ball Valve with Locking Lever Handle (Option)	81 Mtl	Not Available			77C-306-86	77C-307-86	77C-308-86		
	LF				77CLF-306-86	77CLF-307-86	77CLF-308-86		

### Replacement Handles for Ball Valve Shut-Off Valves (T2 & T4 options)

"T" Handle	All	W-9732-00	W-9864-00	W-9734-00
Lever Handle		Not Available		W-9366-00
Locking "T"		Not Available	W-2394-00	Not Available
Locking Lever		Not Available		W-9686-00

***Stainless steel handles are standard on all Apollo® backflow devices.***

**REPAIR KITS DC4A & DCLF4A 1/2" – 2"**

Check Module Rubber Kit (One kit repairs one check) (Universal, for standard & lead free valves)			Size				
			1/2"	3/4"	1"	1-1/4" – 1-1/2"	2"
	Repair Kit Model Number		<b>RK4A12CMR</b>	<b>RK4A34CMR</b>	<b>RK4A1CMR</b>	<b>RK4A112CMR</b>	<b>RK4A2CMR</b>
<b>Item #</b>	Ordering Number		4A-003-01	4A-004-01	4A-005-01	4A-007-01	4A-008-01
not Shown	O-Ring Lubricant		I-9016-00				
11	Check Module Seat Disc	1	D-4771-00	D-4743-00	D-4770-00	D-4853-00	D-4873-00
7	Check Module O-Ring	1	D-4880-00	D-4744-00	D-4882-00	D-4884-00	D-4885-00
6	Cap O-Ring	1	D-4881-00	D-4812-00	D-4884-00	D-4885-00	D-4888-00

DC Checks Complete Kit (One kit repairs one check) (Universal, for standard & lead free valves)			Size				
			1/2"	3/4"	1"	1-1/4" – 1-1/2"	2"
	Repair Kit Model Number		<b>RK4A12CMC</b>	<b>RK4A34CMC</b>	<b>RK4A1CMC</b>	<b>RK4A112CMC</b>	<b>RK4A2CMC</b>
<b>Item #</b>	Ordering Number		4A-003-02	4A-004-02	4A-005-02	4A-007-02	4A-008-02
not Shown	O-Ring Lubricant		I-9016-00				
8	Check Module S-Assy	1	W-9075-05	W-9003-05	W-9074-05	W-9159-05	W-9204-05
7	Check Module O-Ring	1	D-4880-00	D-4744-00	D-4882-00	D-4884-00	D-4885-00
6	Cap O-Ring (for DC/RP)	1	D-4881-00	D-4812-00	D-4884-00	D-4885-00	D-4888-00
extra part(s)	Bonnet O-Ring (for PVB)	1	D-4812-00	D-4883-00	D-4887-00	D-4858-00	

DC Complete Internals Kit (One kit repairs ONE DC valve) (Universal, for standard & lead free valves)			Size				
			1/2"	3/4"	1"	1-1/4" – 1-1/2"	2"
	Repair Kit Model Number		<b>RK4A12TDC</b>	<b>RK4A34TDC</b>	<b>RK4A1TDC</b>	<b>RK4A112TDC</b>	<b>RK4A2TDC</b>
<b>Item #</b>	Ordering Number		4A-003-08	4A-004-08	4A-005-08	4A-007-08	4A-008-08
not Shown	O-Ring Lubricant		I-9016-00				
8	Check Module S-Assy	2	W-9075-05	W-9003-05	W-9074-05	W-9159-05	W-9204-05
7	Check Module O-Ring	2	D-4880-00	D-4744-00	D-4882-00	D-4884-00	D-4885-00
6	Cap O-Ring	2	D-4881-00	D-4812-00	D-4884-00	D-4885-00	D-4888-00



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	Pro Marketing, Inc.	NC/SC/TN-East	sales@promarketinginc.net	864-578-4334	864-578-4889
	Spirit Group	FL (except Panhandle)	info@spiritgroupinc.com	407-291-6035	407-299-0378
	Tim Morales & Associates, Inc.	AL/FL Panhandle	sales@timmorales.com	251-602-8333	251-602-8339
	White Wolf Group	GA	info@whitewolfgroupinc.com	800-401-4870	888-908-9372
<b>SOUTHERN REGION</b>	BWC Inc.	LA (Commercial Products)	chuck@bwcassoc.com	504-734-0229	504-734-3711
	Marathon Flow Control	TX, OK, KS except Northeast, LA (Industrial)	sales@marathonflowcontrol.com	214-201-0100	214-201-0104
	Southern Marketing Group	MS/TN-West/AR/Bowie Cty.-TX	SMG49@bellsouth.net	901-547-0042	901-547-0035
<b>MIDWESTERN REGION</b>	FourMation Sales	MN/ND/SD/WI-West	ryan@fourmationsales.com	763-420-6900	763-420-6993
	Marshall-Rodeno Heartland	NE/IA (Except River Counties)	trodeno@marshallrodeno.com	303-575-6701	303-575-6706
	Midwest Spec	KY/OH/PA-West/WV-West	glsales@mwspec.com	330-538-0406	330-538-0410
	New Tech Marketing	Northern-IL/WI-East/IN/MI-UP/IA-River Counties	sales@new-techmarketing.com	630-378-4300	630-378-0343
	New Tech Marketing	MO/Southern IL/Northeast Kansas	ntm112@aol.com	618-394-0329	618-394-0427
	V.E. Sales Co., Inc.	MI (Except Upper Peninsula)	tomv@vesalesinc.com	586-774-7760	586-774-1490
<b>WESTERN REGION</b>	Elmco Duddy	CA - South	tduddy@elmcoduddy.com	626-333-9942	626-855-4811
	Gordon & Associates	WA, OR, AK, Northern counties ID	laura@gordonandassoc.com	360-566-1470	360-566-1478
	HC Fletcher	CA - North (AB 1953 compliant product)	apollosales@hcfletcher.com	800-432-7047	949-660-9072
	Marshall-Rodeno Associated	CO/WY/MT/ID-SE/UT/NV-NE/NM/El Paso-TX	trodeno@marshallrodeno.com	303-575-6701	303-575-6706
	Romatec	CA - North PVF (non AB 1953)	apollo@romatec.com	877-530-3530	661-588-3534
	Southwest Valves	CA (Waterworks and Fire Protection)	d.burell@southwestvalve.com	559-261-2703	559-261-2711
	Southwestern Industrial Sales Co.	AZ/Nevada-SW	eduardop@sw-ind.com	480-458-5838	480-458-5843
	Spec Management Group	HI	msmarch4@cox.net	949-481-4225	949-487-0990
<b>NORTHEAST REGION</b>	Conroy & Griese Sales, Inc.	NY-East/NJ-North	iezzi52@aol.com	856-663-4440	856-663-6644
	Keith Engle & Associates	OEM accounts	keith.enge@verizon.net	610-827-9560	610-827-9561
	Layden Company	NY-Upstate/PA-East/DE/NJ-South	joejr@laydencompany.com	610-363-6657	877-529-3361
	Urell, Inc.	MA/New England States	conbraco@urell.com	617-923-9500	617-926-9414
<b>IRRIGATION ONLY REPS</b>	Active Sales Northwest, Inc.	OR, WA, Western ID	skactive@aol.com	541-726-0320	541-726-1148
	Biz Sales Company	OH, KY, MI, IN, parts of PA, WV, WI	dzavelson@bizpvf.com	216-595-2888	216-595-2899
	Fourmation Sales	MN/ND/SD/WI-West	dean@fourmationsales.com	763-262-4700	763-262-4740
	Hall Marketing	AL, LA	hallmarketing@bellsouth.net	228-547-4637	228-832-6666
	J&J Midwest Sales	NE, IA, MO, KS	john@jandjmidwestsales.com	314-422-8419	
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	John Hart	FL	jhart@lascofittings.com	772-595-7773	772-489-4305
	Larry Perkins	TX - Southern	lperkins@lascofittings.com	936-443-1096	
	Marel Enterprises	New England, NY, DE, MD, VA, DC, parts of PA & WV	marelenterprise@gmail.com	631-271-1718	631-427-8558
	Marshall-Rodeno Associated	CO/WY/MT/ID-SE/UT/NV-NE	trodeno@marshallrodeno.com	303-575-6701	303-575-6706
	NSC Marketing Group Inc.	OK	nsc_tulsa@sbcglobal.net	918-627-5340	918-664-1408
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	Southern Marketing Group	MS/TN-West/AR/Bowie Cty.-TX	SMG49@bellsouth.net	901-547-0042	901-547-0035
	Spec Management Group	CA-South	msmarch4@cox.net	949-481-4225	949-487-0990
	VPC Sales	AZ	chudson@vpcsales.com	661-257-3923	661-257-3928
	<b>CANADA</b>	Agences J. Pierre Sylvain, Inc.	Quebec	agencespsylvain@golden.net	450-655-9588
Barclay Sales Ltd.		British Columbia	bbarclay@barclaysales.com	604-945-1010	604-945-3030
Conbraco Industries, Canada		178 Pennsylvania Ave., Unit 1, Concord, Ontario L4K 4B1	conbraco.canada@conbraco.com	905-761-6161	905-761-6666
D & M Mechanical Sales		Ontario/East	don@dandmsales.ca	613-384-7084	613-384-3407
Dynamic Agencies, Ltd.		Saskatchewan	doug.dynamicage@sasktel.net	306-343-1901	306-343-1901
J. Levandier Sales, Inc.		Nova Scotia, New Brunswick, Prince Edward Island & Newfoundland	service@jlevandiersales	506-858-1615	506-858-1084
Kern Industries, Ltd.		Alberta-North	kernind@telusplanet.net	780-451-2056	780-454-6687
Kern Industries Calgary, Ltd.		Alberta-South	marty.yucytus@kernindustries.ca	403-730-7791	403-239-8179
Key to the North Sales Agency, Inc.		Ontario-North	hmehes@keytothenorth.ca	705-524-6714	705-566-0148
Task Controls, Inc.		Ontario	infotoronto@taskcontrols.com	416-291-3004	416-754-3481
Tom Beggs Agencies Ltd.		Manitoba/NW Ontario	tba@mts.net	204-953-1900	204-774-6915

