CLA VAL RP

SIZE
2", 2 1/2", 3", 4", 6", 8", 10"

DESCRIPTION
This valve is a reduced pressure assembly. The model RP is no longer in production and was produced from approximately 1958 to 1978. The 2 1/2"-10" size consists of two fused epoxy coated cast iron body check valves and a bronze body pressure differential relief valve. The 2" size had a bronze bodied check valve assembly. The model CDHS 14 relief valve section is the one used in the RP series. This relief valve can be detached from the check body. The relief valve utilizes two external sensing lines. The relief valve spring was not contained when the RV cover was removed. The relief valve rubber repair parts were discontinued in 1993. Check and relief valve seats are replaceable and a seat removal tool is needed to change the seats. Most internal check and relief hardware parts are made of bronze. The RP series utilizes the 3081 toggle lever check design for the check valves. Check springs were not contained when the cover was removed.

BASIC REPAIR KIT
The repair kit contains all rubber discs, rolling diaphragm, gaskets, relief valve spacer, O-rings, washers and cover seals.

SIZE	KIT NO
2"	RPO200 * ◆
2 1/2"	RPO250 * ◆
3"	RPO300 * ◆
4"	RPO400 * ◆
6"	RPO600 * ◆
8"	RPO800 * ◆
10"	RPO001 * ◆

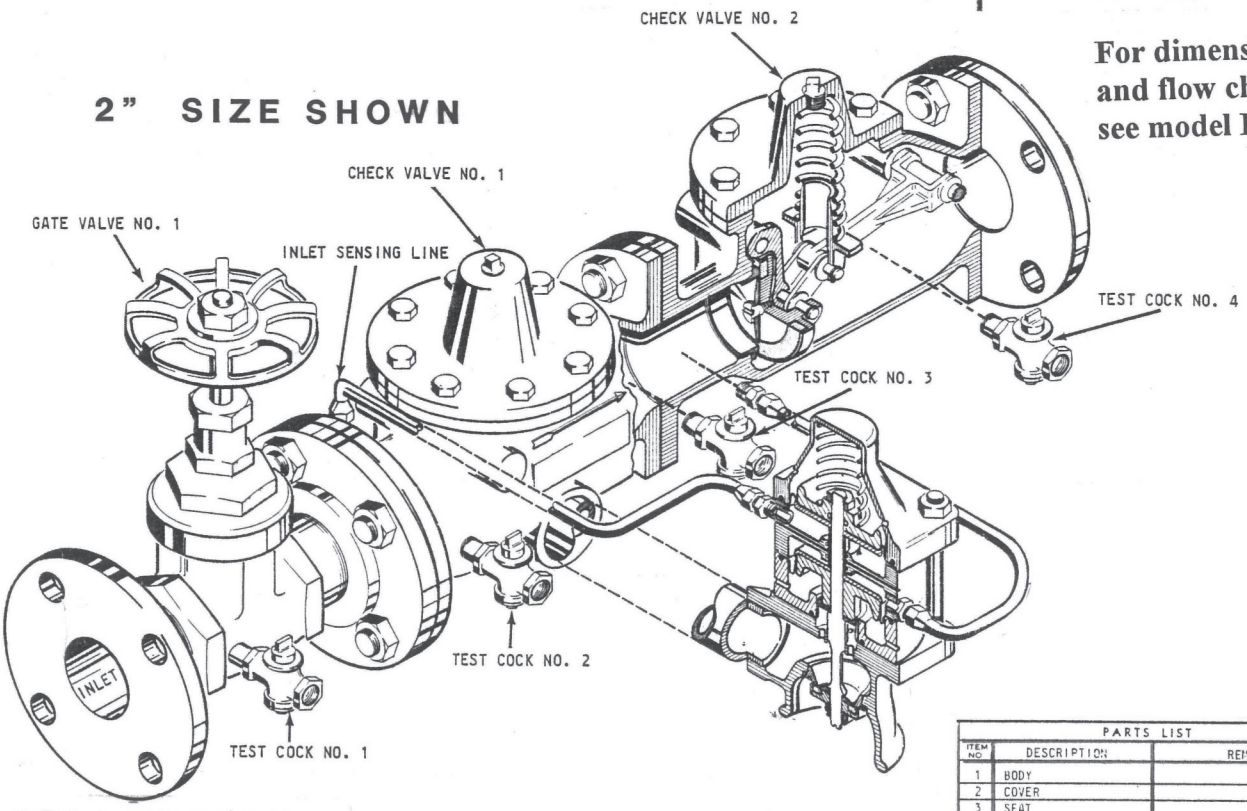
IMPORTANT FEATURES
~2" has a bronze body
~2 1/2"-10" has a fused epoxy coated check body
~All seats are replaceable
~Springs are not contained
~Double external R.V. sensing lines
~Detachable R.V. assembly
~Factory repair information enclosed

BACKFLOW PREVENTER

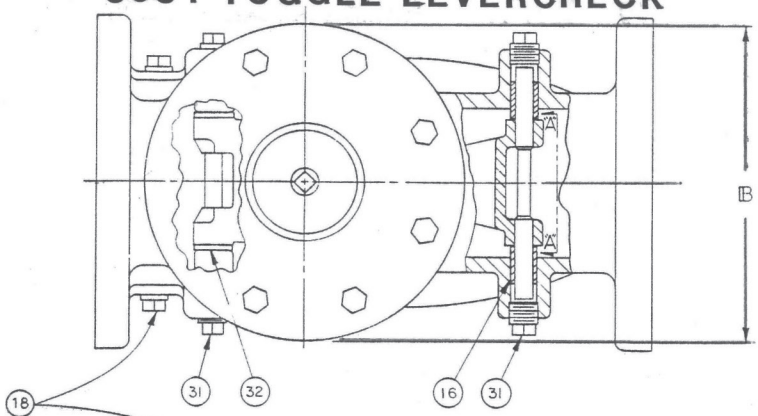
Clayton **RP**

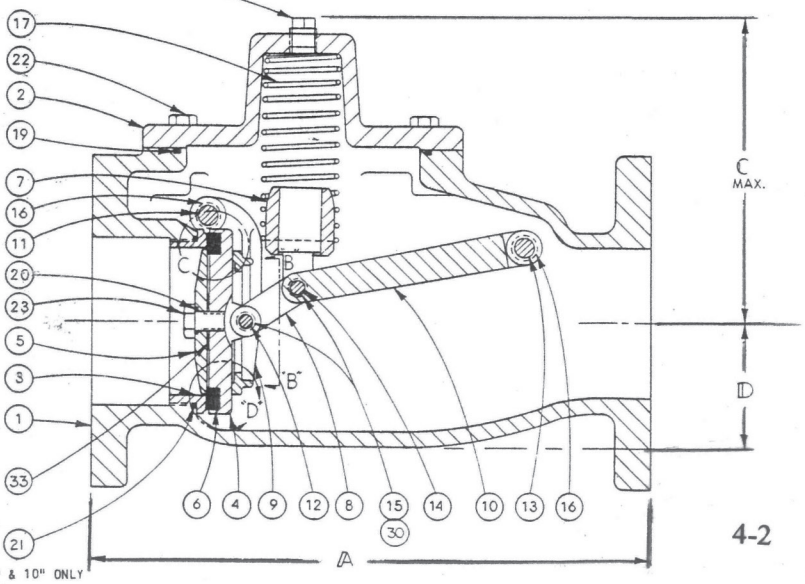
For dimensions and flow charts see model RP-1

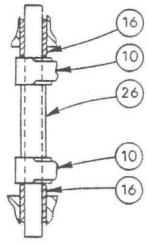
2" SIZE SHOWN



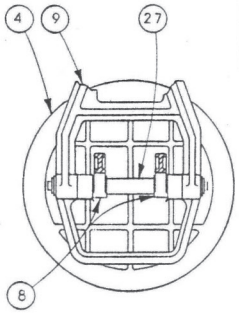
3081 TOGGLE LEVERCHECK



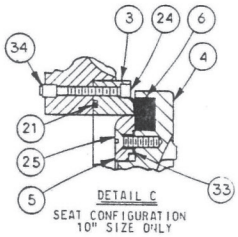




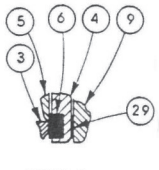
VIEW A-A
LEVER ARM SPACER
8" & 10" SIZE ONLY



VIEW B-B
LINK SPACER
10" SIZE ONLY



DETAIL C
SEAT CONFIGURATION
10" SIZE ONLY

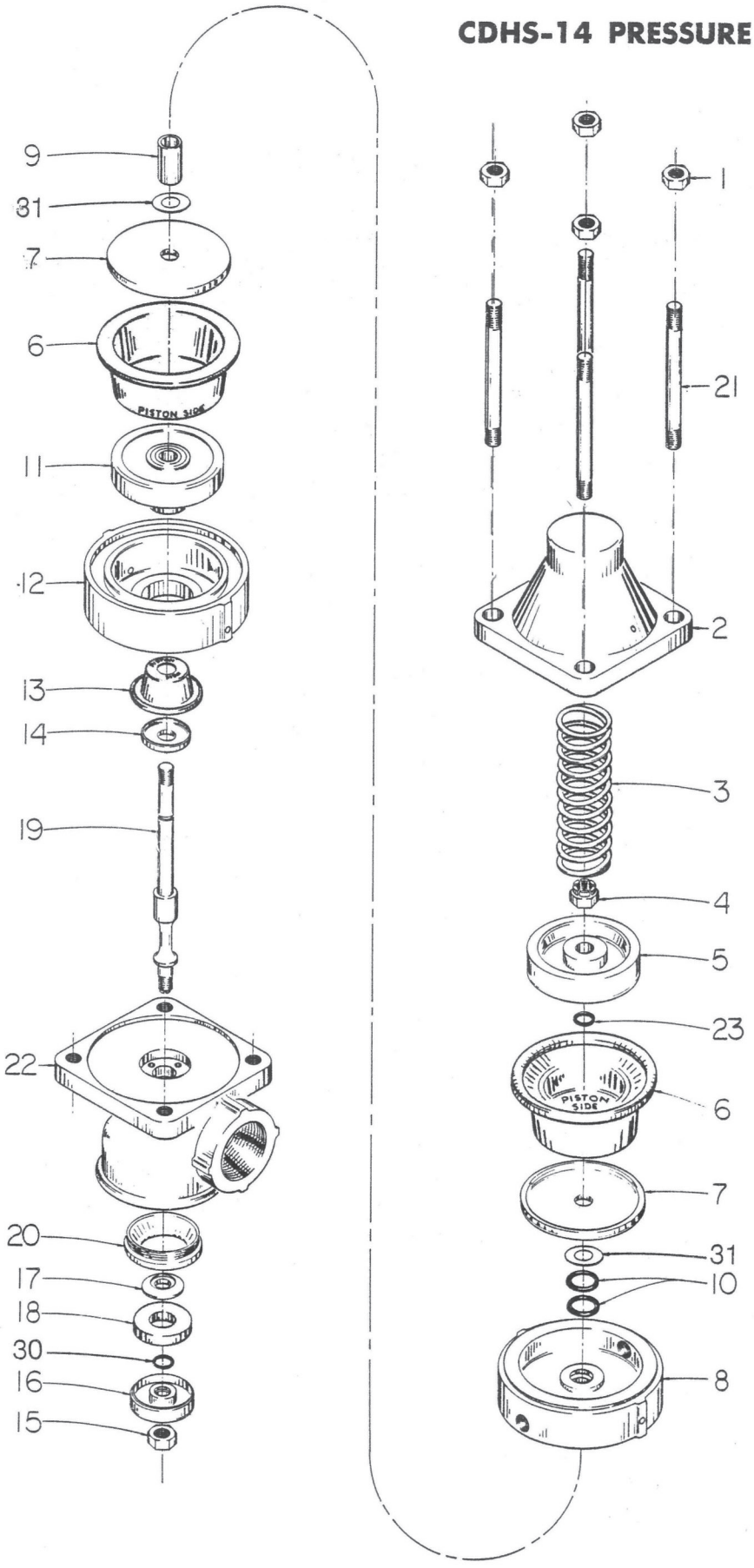


DETAIL D
HINGE BUMPER
2", 2-1/2", & 3" SIZE ONLY

PARTS LIST		
ITEM NO.	DESCRIPTION	REMARKS
1	BODY	
2	COVER	
3	SEAT	
4	DISC RETAINER	
5	DISC GUIDE	
6	DISC	
7	YOKE	
8	LINK	
9	HINGE	
10	LEVER ARM	
11	HINGE PIN	
12	DISC RETAINER PIN	
13	LEVER ARM PIN	
14	LINK PIN	
15	PIN RETAINER RING	
16	BUSHING	2-1/2" THRU 10" ONLY
17	SPRING	
18	PLUG	
19	COVER SEAL	
20	DISC GUIDE "O" RING	4" THRU 8" ONLY
21	SEAT "O" RING	8" THRU 10" ONLY
22	CAP SCREWS	
23	DISC GUIDE BOLT	2"-8" ONLY(2" USES SEELSCREW
24	SEAT SCREW	10" ONLY
25	DISC GUIDE SCREW	10" ONLY
26	LEVER ARM SPACER	8" THRU 10" ONLY
27	LINK SPACER	10" ONLY
29	HINGE BUMPER	2" THRU 3" ONLY
30	WASHER	
31	PIPE PLUG	
32	SPACER WASHER	1" & 2" ONLY
33	FIBER SPACER	
34	LEEPLUG	10" ONLY

	2	2-1/2	3	4	6	8	10
A	10	13-1/2	13	15	20	25-3/8	29-3/4
B	5-1/2	6-1/2	6-1/2	8-5/8	9-3/4	12-1/8	15-1/8
C	5-1/4	7-1/4	7-1/4	8-5/16	11	13	15-3/4
D	1-7/8	3-5/16	3-5/16	3-3/8	4-9/16	5-11/16	8
FLANGED CONNECTIONS	150 ASA B16.24 (BRONZE)	125 ASA B16.1 (CAST IRON)					

CDHS-14 PRESSURE DIFFERENTIAL RELIEF VALVE



1″ and 1 1/4″ SHOWN BELOW

PARTS LIST

ITEM NO.	DESCRIPTION
1	STUD NUTS
2	VALVE COVER
3	SPRING
4	STEM NUT
5	UPPER PISTON
6	LARGE DIAPHRAGM
7	LARGE DIAPHRAGM RETAINER
8	INTERMEDIATE PLATE
9	SPACER
10	"O" RING
11	LOWER PISTON
12	CYLINDER
13	SMALL DIAPHRAGM
14	SMALL DIAPHRAGM RETAINER
15	STEM NUT
16	DISC RETAINER
17	DISC GUIDE
18	DISC
19	STEM
20	SEAT
21	STUDS
22	BODY
23	"O" RING
30	"O" RING
31	GASKET

CLA VAL
RP I/ RPI-EX

SIZE
2”, 2 1/2”, 3”, 4”, 6”, 8”, 10”

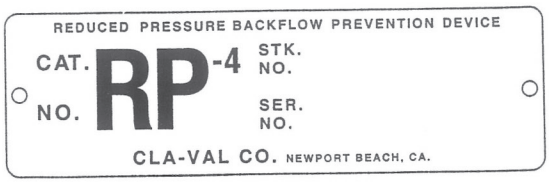
DESCRIPTION
This is a reduced pressure assembly. The assembly was produced from approximately 1978 to 1990. The 2 1/2”-10” valve consists of two fused epoxy coated cast iron body toggle lever check valves and a bronze body differential relief valve. The 2” size has a bronze body check valve. There are two styles of check rubber discs and the serial numbers are needed to order the correct parts. Assemblies produced after 1986 are the RP1-EX design. The repair parts are the same as the RP1 series. The difference in the two models was the repositioning of the relief valve section below the first check body in the RP1-EX version. The RP1-EX was discontinued in 1990. The RP1 and RP1-EX series used the CDHS 20 relief valve section which can be detached from the check body. The relief valve spring was not contained when the relief valve body was disassembled. Most internal hardware parts in the R.V. are made of stainless steel. The R.V. utilizes a single external sensing line. Check and relief seats are replaceable on the assembly. A seat removal tool is needed to replace the check seats. The RP1 and RP1-EX models utilize the 3081 toggle lever check design. Check springs are not contained when the cover is removed. Most internal check hardware parts are made of bronze.

BASIC REPAIR KIT
The repair kit contains all rubber discs, rolling diaphragm, diaphragm, gaskets, O-rings, washers, and cover seals.

SIZE	KIT NO
2”	RP1200 *
2 1/2”	RP1250 *
3”	RP1300 * ◆
4”	RP1400 *
6”	RP1600 *
8”	RP1800 *
10”	RP1001 *

IMPORTANT FEATURES
~2” has a bronze body
~2 1/2”-10” has a fused epoxy coated cast iron body
~All seats are replaceable
~Springs are not contained
~Detachable relief valve assembly
~Serial numbers are needed to order some parts
~Factory repair information enclosed

BAVCO
BACKFLOW APPARATUS & VALVE CO.

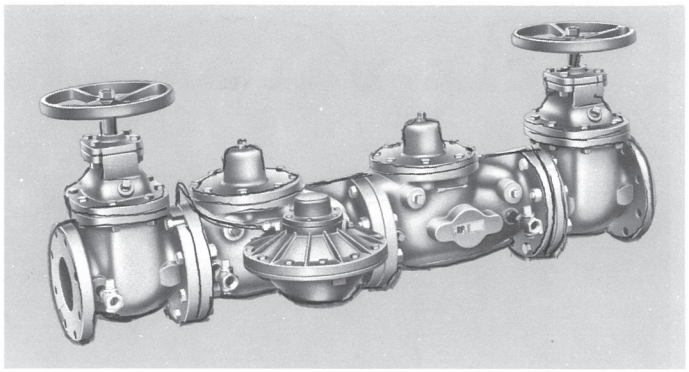


This brass plate is on our backflow prevention assemblies and is found on the side of the number two check. The serial number of the assembly is also stamped on the top of the inlet flange of the number one check.

MODEL RPI

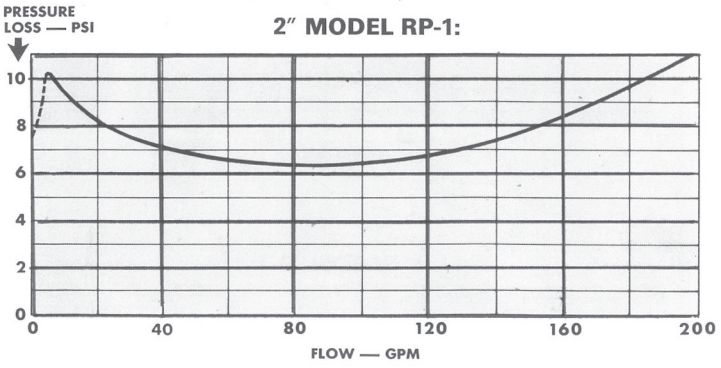
REDUCED PRESSURE PRINCIPLE

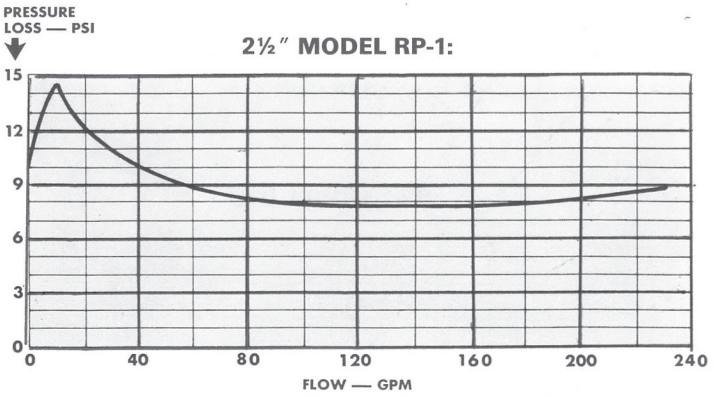
Sizes 2" through 10"

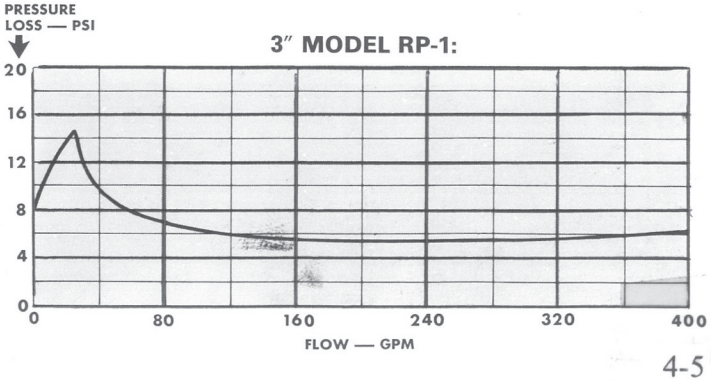


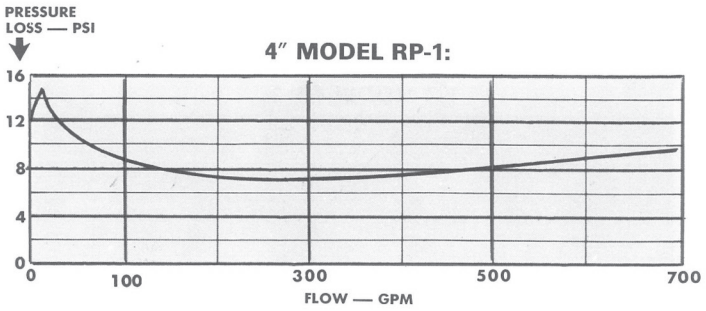
4" size illustrated

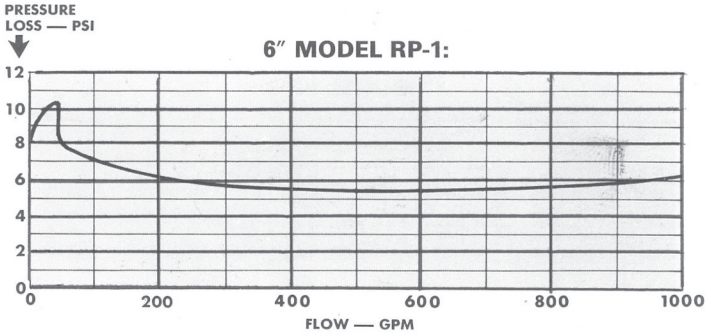
FLOW CURVES

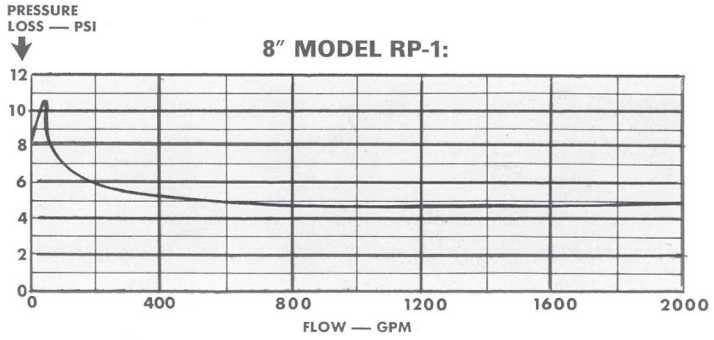


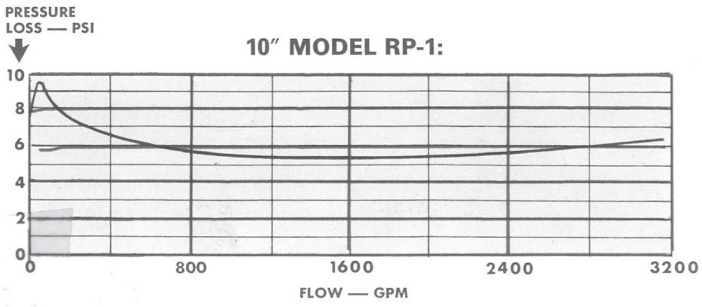




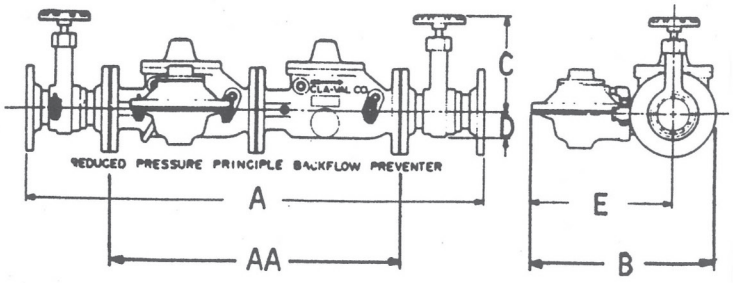








DIMENSIONS



SPECIFICATIONS

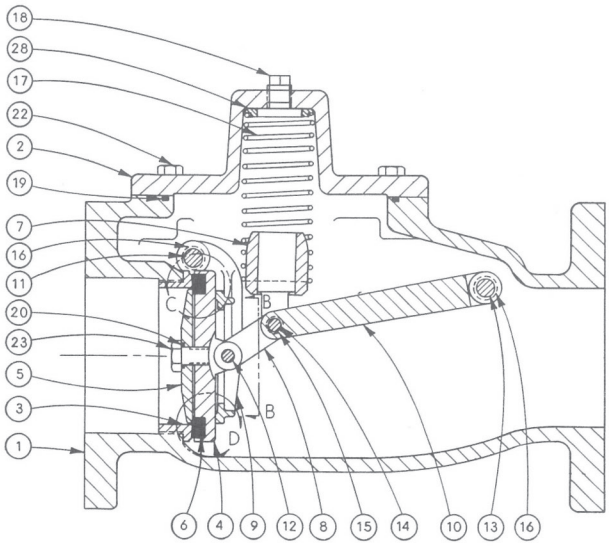
SIZES	2"- 10"
END DETAIL	125 ANSI
MAXIMUM WORKING PRESSURE	150 PSI
HYDROSTATIC TEST PRESSURE	300 PSI
TEMPERATURE RANGE	to 110°F.
FLUID	Water
MATERIAL	*2" main valve body and cover:* Bronze ASTM B-61 *2½" and larger main valve body and cover:* Cast Iron ASTM A-126 interior epoxy coated *Main valve trim:* Bronze ASTM B-61 *Differential relief valve:* Bronze ASTM B-61 with Stainless Steel 316 Trim

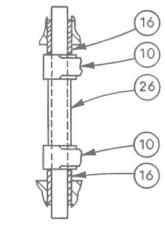
DIMENSION TABLE

SIZE	2" SCR	2" FLG	2½	3	4	6	8	10
A END TO END	29¼	33	42 3/16	42 3/16	48¼	61¼	74	86
AA LESS G.V.	22 3/16	20⅛	27 1/16	27 1/16	30⅛	40⅛	50¾	59½
B OVERALL WIDTH	12¾	12¾	15½	15 7/16	20 5/16	22½	26¾	30⅛
C CENTER TO TOP	8½	8½	13⅛	15	17½	20¾	25	29½
D CENTER TO BOTTOM	2	2	3	3	3½	4½	5¾	8
E CENTER TO OUTSIDE	9¾	9¾	11 11/16	11 11/16	14 13/16	16	17	19⅜
TEST COCKS	¼	¼	½	½	½	¾	¾	¾

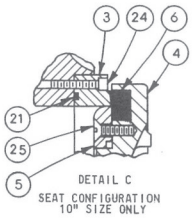
SHUT-OFF VALVES ON 2" ARE RISING STEM.
SHUT-OFF VALVES ON 2½" & LARGER ARE NON-RISING STEM STANDARD

3081 TOGGLE LEVER CHECK VALVE

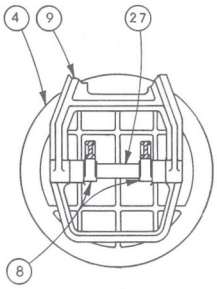




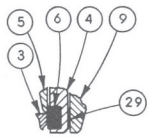
VIEW A-A
LEVER ARM SPACER
8" & 10" SIZE ONLY



DETAIL C
SEAT CONFIGURATION
10" SIZE ONLY



VIEW B-B
LINK SPACER
10" SIZE ONLY



DETAIL D
HINGE BUMPER
2", 2-1/2",
& 3" SIZE ONLY

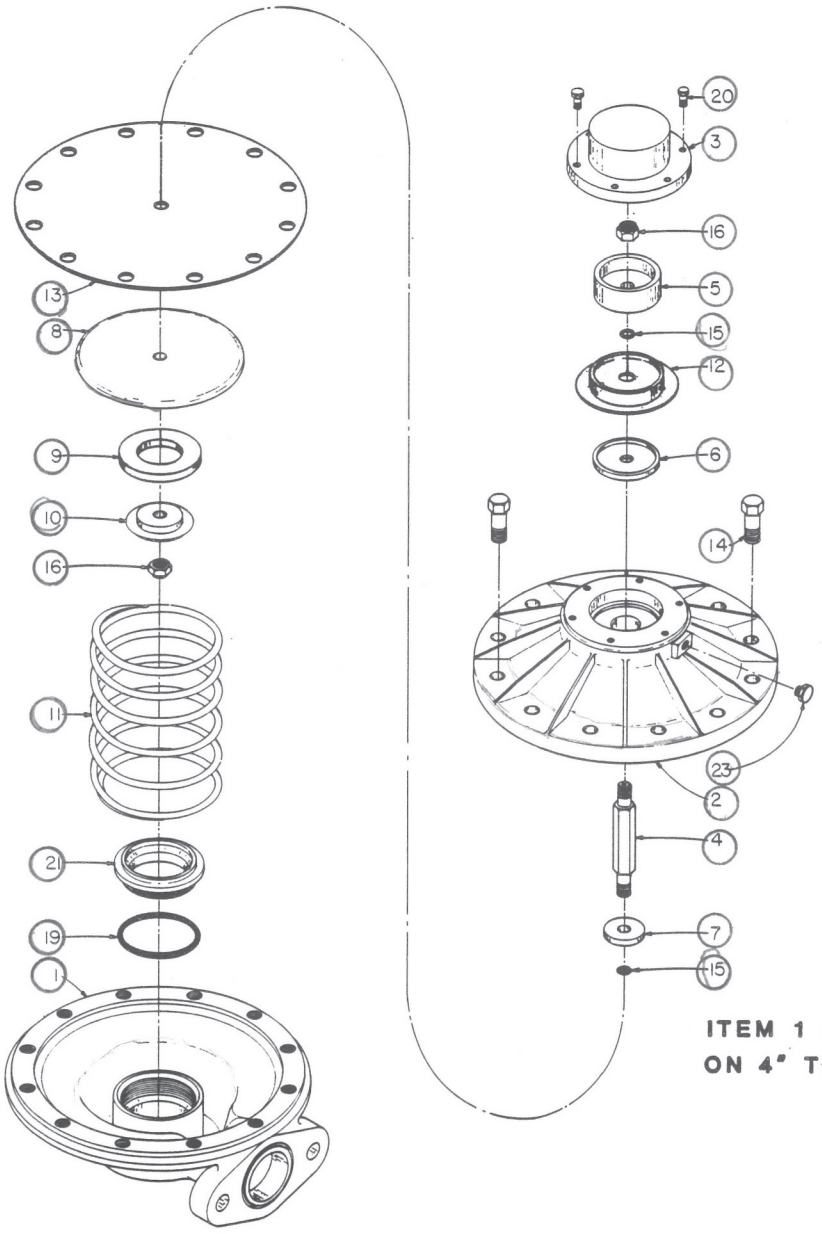
PARTS LIST
When ordering parts specify item No., Description, all name Plate data, and valve size

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	BODY	13	LEVER ARM PIN	22	CAP SCREWS
2	COVER	14	LINK PIN	23	DISC GUIDE BOLT (1" THRU 8")
3	SEAT	15	PIN RETAINER	24	SEAT SCREW (10" ONLY)
4	DISC RETAINER	16	BUSHING	25	DISC GUIDE SCREW (10" ONLY)
5	DISC GUIDE	17	SPRING	26	LEVER ARM SPACER (8" & 10" ONLY)
6	DISC	18	PLUG	27	LINK SPACER (10" ONLY)
7	YOKE	19	COVER SEAL	28	SPRING WASHER (2" ONLY)
8	LINK	20	DISC GUIDE "O" RING (4", 6", 8" ONLY)	29	HINGE BUMPER (2", 2½" & 3" ONLY)
9	HINGE	21	SEAT "O" RING (10" ONLY)		
10	LEVER ARM				
11	HINGE PIN				
12	DISC RETAINER PIN				

CDHS 20

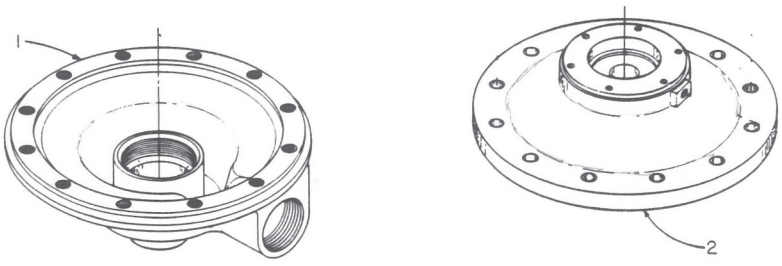
PRESSURE DIFFERENTIAL RELIEF VALVES FOR RP-1 BACKFLOW PREVENTER

ALL PARTS TYPICAL EXCEPT AS NOTED



ITEM NO.	DESCRIPTION
1	Body
2	Intermediate Body
3	Cover
4	Stem
5	Piston
6	Retainer Plate
7	Diaphram Washer
8	Disc Retainer
*9	Disc
10	Disc Guide
11	Spring
*12	Bellofram
*13	Diaphragm
14	Hex Head Screw
*15	Stem O-Ring
*16	Self Locking Nut
19	Seat-O-Ring
20	Fil Head Screw
21	Seat
*23	Pipe Plug

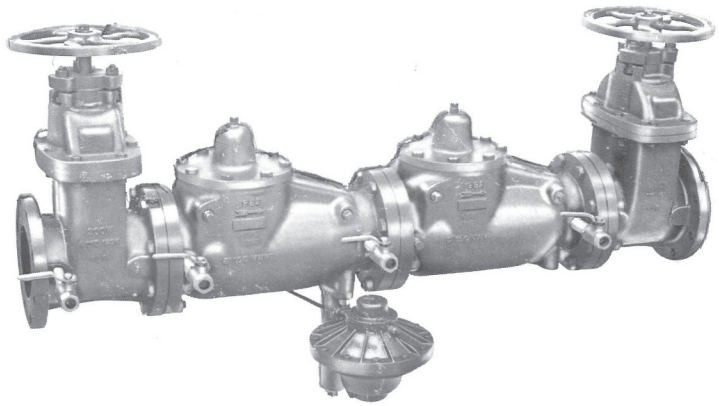
ITEM 1 & 2 SHOWN FOR USE ON 4" THRU 10" MODEL RP-1

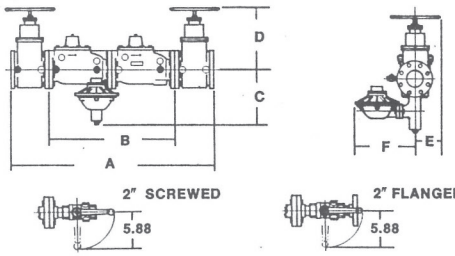


ITEM 1 & 2 SHOWN FOR USE ON 2" THRU 3" MODEL RP-1

CLA-VAL CO

MODEL RP-1EX
Backflow Preventer





Dimensions (IN INCHES)

Size	2" screwed	2" flanged	2½"	3"	4"	6"	8"	10"
A	33.66	37.16	42.19	42.19	48.19	61.19	73.94	85.69
B	20.06	20.06	27.06	27.06	30.06	40.06	50.81	59.56
C	7.94	7.94	9.44	9.44	12.56	13.56	14.75	17.06
D Max	5.25	5.25	19.00	19.00	24.75	31.25	40.25	48.50
E	5.88	5.88	4.50	4.50	5.00	6.00	8.00	10.00
F	9.25	9.25	9.25	9.25	14.25	14.25	14.25	14.25
End Details	2-11½" NPT screwed	150 Lb ANSI B 16.24	125 Lb ANSI B 16.21					

Specifications

Sizes
2", 2½", 3", 4", 6", 8", 10"

End Detail
125 ANSI B16.1

Maximum Working Pressure
175 PSI

Hydrostatic Test Pressure
350 PSI

Temperature Range
to 110° F

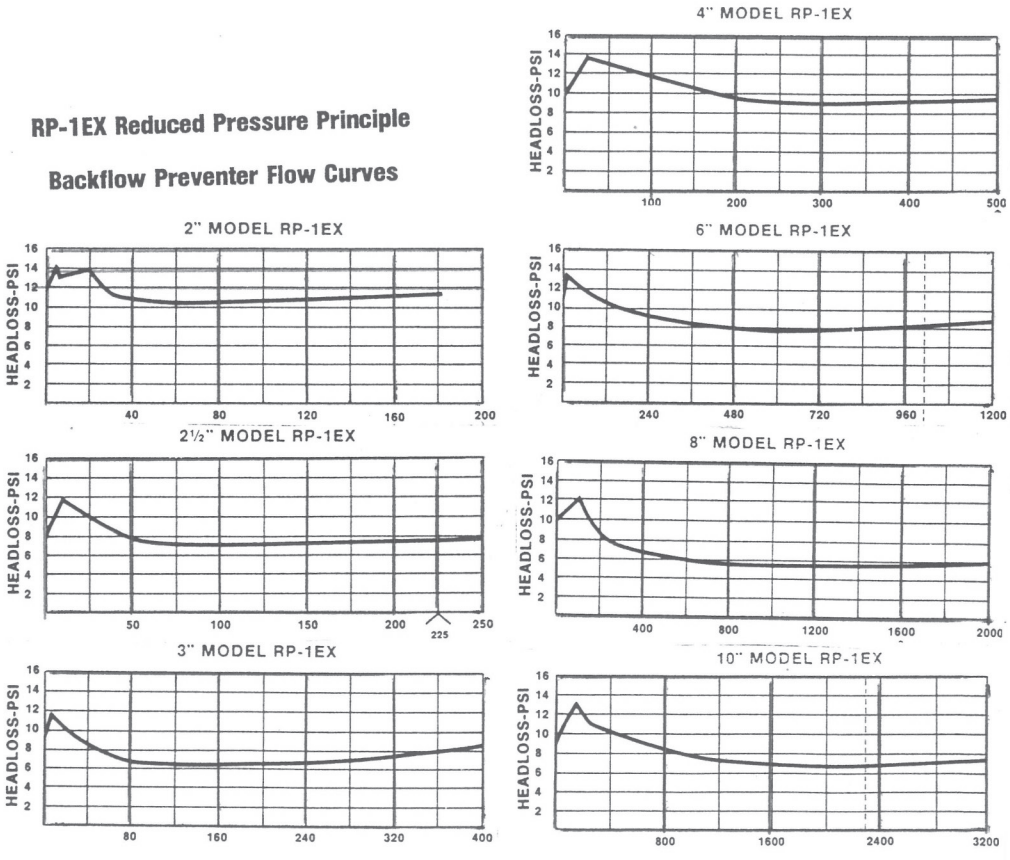
Fluid
Water

Material
2" main valve body and cover:
Bronze ASTM B-61

2½" and larger main valve body and cover:
Cast Iron ASTM A-126 interior epoxy coated
main valve trim:
Bronze ASTM B-61
Differential relief valve:
Bronze ASTM B-61 with Stainless Steel 316 Trim

RP-1EX Reduced Pressure Principle

Backflow Preventer Flow Curves



CLA VAL RP2

SIZE
3/4", 1", 1 1/4", 1 1/2"

DESCRIPTION
This is a reduced pressure assembly. Production began approximately 1978 and was discontinued in 2003. The assembly is of bronze construction and consists of two poppet type check valves with a pressure differential relief valve. Check and relief valve seats are replaceable. A seat removal tool is needed to change the check seat. The relief valve uses the CDHS 20 design which can be detached from the check body. Most internal RV hardware parts are made of stainless steel. This relief valve can also be mounted on either side of the check body. Check springs are not contained when the cover is removed. The check poppets will be made of either stainless steel or delrin plastic. This model utilizes an internal relief valve sensing line. The relief valve spring was not contained when the relief valve body was disassembled.

BASIC REPAIR KIT
The repair kit contains all rubber discs, diaphragm, rolling diaphragm, gaskets, washers, and O-rings.

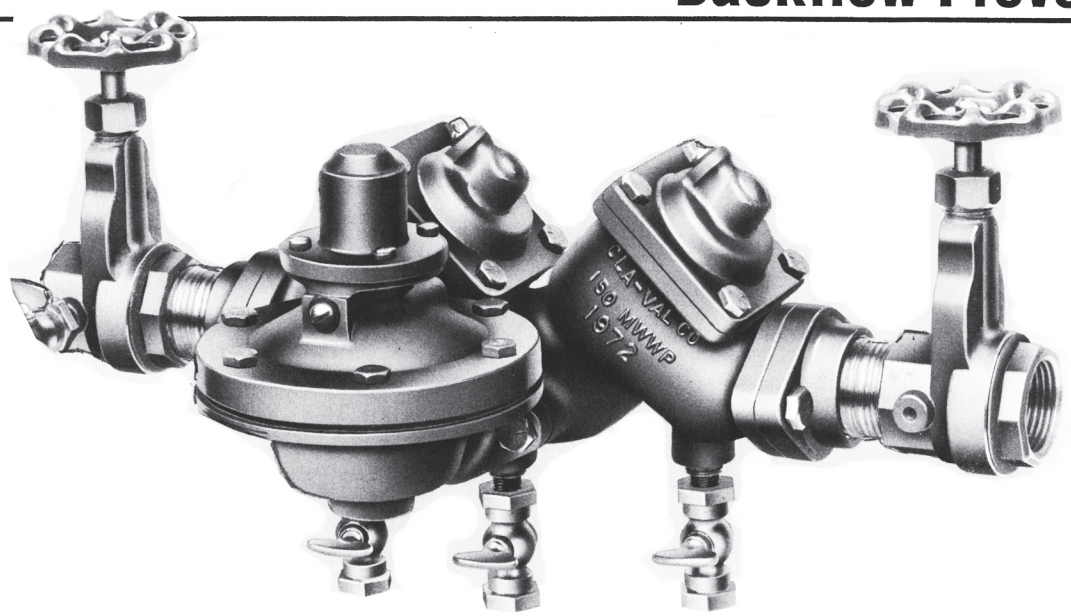
SIZE	KIT NO
3/4"-1"	RP2100 *
1 1/4"-1 1/2"	RP2150 *

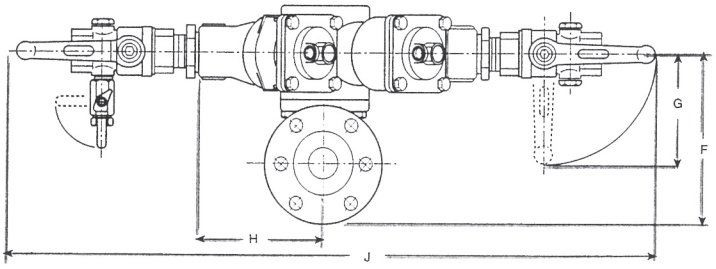
IMPORTANT FEATURES
~Bronze body
~Replaceable seats
~Springs are not contained
~Detachable RV assembly
~Internal RV sensing line
~Factory repair information enclosed

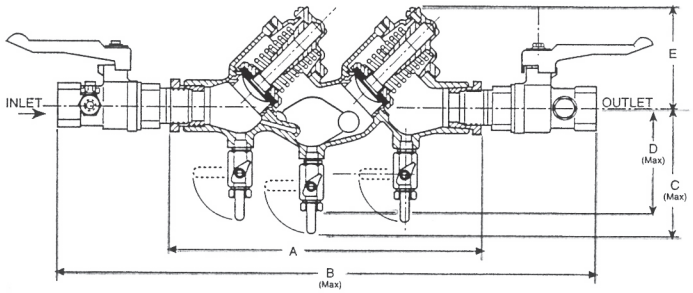
CLA-VAL™

—MODEL— **RP-2**

Reduced Pressure Principle Backflow Preventer



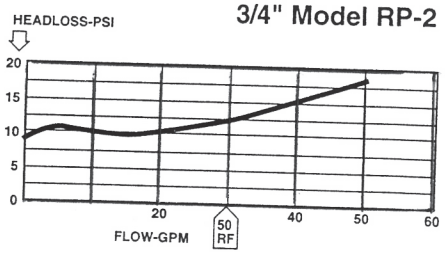




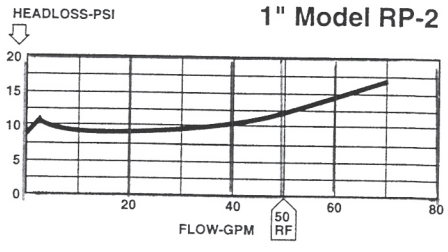
DIMENSION TABLE									
VALVE SIZE	A	B	C (MAX)	D (MAX)	E (MAX)	F	G	H (TYP)	J (MAX)
3/4"	10.12	17.06	4.06	3.31	3.00	6.00	3.62	4.09	20.62
1"	9.00	16.81	4.06	3.31	3.00	6.00	4.62	4.09	21.75
11/4"	13.25	21.25	4.50	3.75	4.00	6.12	4.44	4.81	26.00
11/2"	11.75	21.62	4.50	3.75	4.00	6.12	6.00	4.81	28.38

Flow Curves

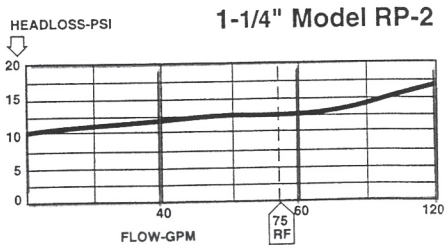
3/4" Model RP-2



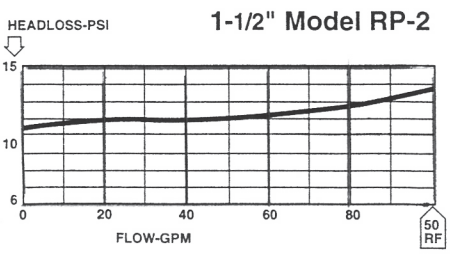
1" Model RP-2



1-1/4" Model RP-2



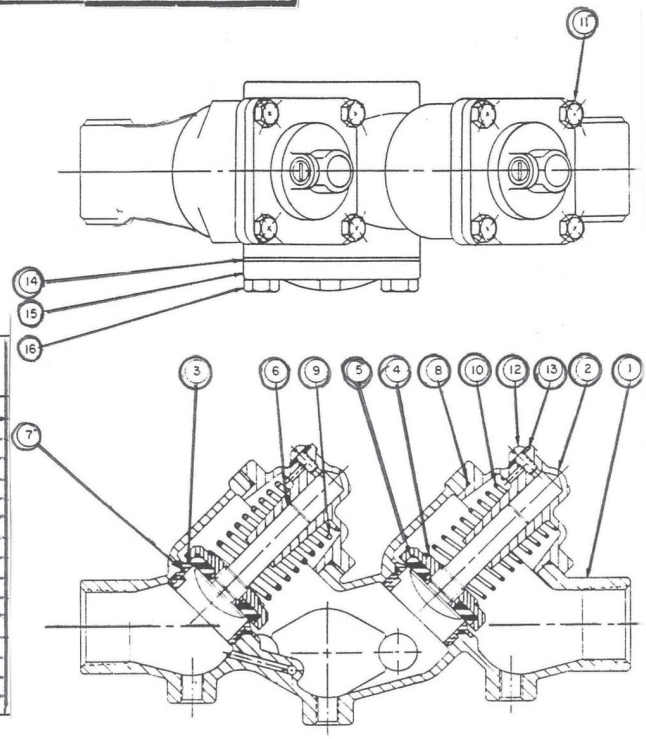
1-1/2" Model RP-2



Model RP-2
Sizes ¾" thru 1½"

POPPET STYLE CHECK

DELRIN CHECK ASSEMBLY

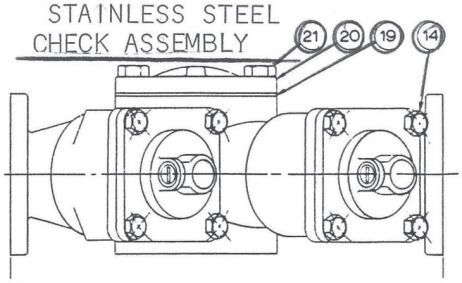


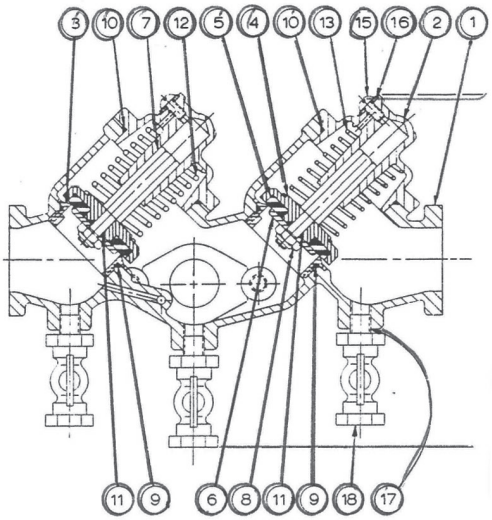
PARTS LIST

ITEM NO	DESCRIPTION
1	Body
2	Cover Assembly
3	Seat
4	Disc Retainer
*5	Disc
6	Stem
7	O-Ring, Seat
*8	O-Ring, Cover
9	Spring, #1 Check
10	Spring, #2 Check
11	Bolt, Hex Head
12	Screw, Round Head
*13	Washer
*14	Gasket
15	Cover, Flange
16	Bolt, Hex Head

*Recommended Spare Parts

STAINLESS STEEL CHECK ASSEMBLY



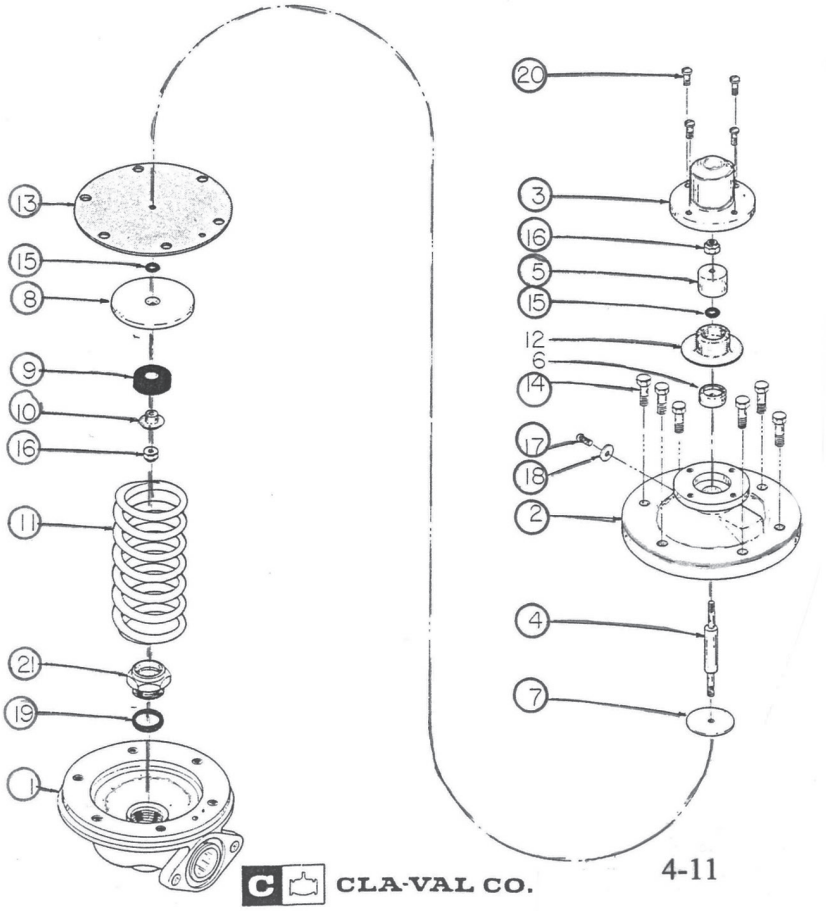


PARTS LIST

ITEM NO.	PART DESCRIPTION
1	Body
2	Cover Assembly
3	Seat
4	Disc Retainer
* 5	Disc
6	Disc Guide
7	Stem
* 8	Nut, Self-locking
9	O-Ring, Seat
*10	O-Ring, Cover
*11	O-Ring, Stem
12	Spring, #1 Check
13	Spring, #2 Check
14	Bolt, Hex Head
15	Screw, Round Head
*16	Washer
17	Nipple, Close
18	Cock, Plug Type
*19	Gasket
20	Cover, Flange
21	Bolt, Hex Head

*Recommended Spare Parts

EXPLODED VIEW **CDHS 20**



Clayton ¾" CDHS-20

PRESSURE DIFFERENTIAL RELIEF VALVE

For Model RP-2 Backflow Preventers in Sizes ¾" thru 1½"

ITEM NO.	PART DESCRIPTION
1	Body
2	Body Assembly, Intermediate
3	Cover
4	Stem
5	Piston
6	Plate, Retainer
7	Washer, Diaphragm
8	Retainer, Disc
* 9	Disc
10	Guide, Disc
11	Spring
*12	Bellofram
*13	Diaphragm
14	Screw, Hex Head
*15	O-Ring, Stem
*16	Nut, Self-locking
17	Screw, Round Head
*18	Washer
19	O-Ring, Seat
20	Screw, Fil. Head
21	Seat

*Recommended Spare Parts

CLA VAL RP4

SIZE
2", 2 1/2", 3", 4", 6", 8", 10"

DESCRIPTION
This is a reduced pressure assembly. Production began in 1991. The 2" size was discontinued in 2003. The 2 1/2"-4" sizes were discontinued in 2005. The 6"-10" were discontinued in 2012. The RP4 was a redesign of the RP1-EX. Slight changes in design of the internal parts of the check and relief valve were implemented. The 2 1/2"-10" check bodies are cast iron with a fused epoxy coating. The 2" design is a bronze check body. The toggle lever check design used is the 3084. The workings of the 3084 are very similar to the 3081 check design as used in the RP1 series. Changes in the disc, disc retainer, and disc guide were implemented. Most internal check hardware parts are made of bronze. The relief valve used on the RP4 series is the CDHS 24. The CDHS 24 is similar to the CDHS 20 used in the RP1 series. The body is made of bronze. Changes in the stem, disc holder, and disc retainer were implemented. Most internal RV hardware parts are made of plastic. All seats are replaceable and check springs are not contained when the cover is removed. A seat removal tool is needed to change the check seats. This unit utilizes a single external relief valve sensing line. The relief valve spring is not contained when the relief valve body is disassembled. The relief valve can be removed from the check body and can be mounted on either side of the check body.

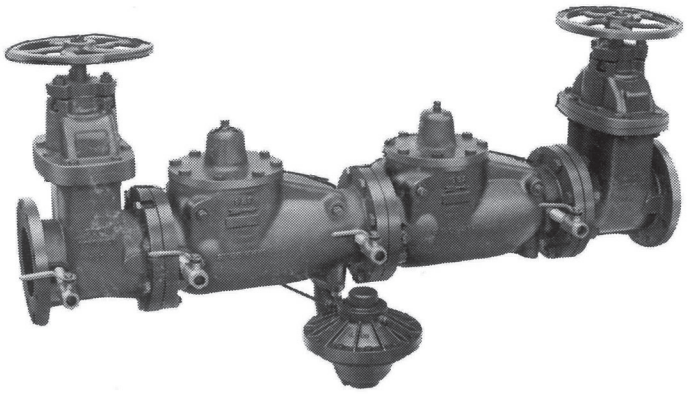
BASIC REPAIR KIT
The repair kit contains all rubber discs, diaphragm, rolling diaphragm, O-rings, washers, and cover seals.

SIZE	KIT NO
2"	RP4200 *
2 1/2"	RP4250 *
3"	RP4250 *
4"	RP4400 *
6"	RP4600 *
8"	RP4800 *
10"	RP4001 *

IMPORTANT FEATURES
~2" has a bronze check body
~2 1/2"-10" has a cast iron fused epoxy coated check body
~Springs are not contained
~Seats are replaceable
~RV is detachable
~External RV sensing line

CLA-VAL CO

MODEL RP-4 Backflow Preventer



Classified by Underwriters Laboratories, Inc. ®
as to Friction Loss and Body Strength Only

Reduced Pressure Principle

The Cla-Val Co. Model RP-4 Backflow Preventer protects potable water lines against contamination. This device combines protection against backflow with exceptionally low head loss characteristics. It operates on the reduced pressure principle, which is an accepted method of safeguarding potable water supplies against the hazards of cross-connections. The Model RP-4 is approved by the Foundation for Cross Connection Control and Hydraulic Research of the University of Southern California and complies with the AWWA Standard C51189, the ASSE Standard 1013, and the CSA Standard B64.4.

The Model RP-4 is carefully constructed of corrosion resisting materials. It consists of two independently acting Toggle Lever Check Valves, an automatic Pressure Differential Relief Valve located between the two check valves, two shutoff valves and four test cocks. The levers, links and pins are rugged, simple and direct with ample clearances to insure long, trouble free operation, even in very hard water and over prolonged periods of time. All internal parts are readily accessible without removing the device from the line. Field testing is easily performed by means of the test cocks.

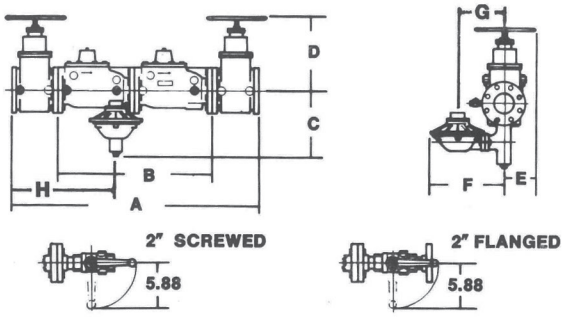
Operation

Under a normal flow condition, both Check Valves are open and the Pressure Differential Relief Valve is closed. During normal flow and at the cessation of flow, the pressure in the zone between the two Check Valves is maintained at least 2 PSI less than the supply pressure by action of the Pressure Differential Relief Valve.

Under a no flow condition, both Check Valves are closed. When supply pressure drops **to** 2 PSI above the "zone" pressure, then the Relief Valve discharges as necessary to maintain the "zone" pressure at 2 PSI below supply pressure. When supply pressure drops **below** 2 PSI above the "zone" pressure, then the Relief Valve opens fully.

The Model RP-4 operates efficiently at either high or low pressures. There are no pressure adjustments. The flow curves show the slight pressure drop at rated flow.

It is recommended that this unit be installed in a horizontal position and that provisions for adequate drainage be made. Right hand mount of Relief Valve is standard. Left hand mount is optional. Shut-off valves on 2" are resilient seat ball valves. Standard Shut-off valves on 2½"and larger are a resilient seat non-rising stem design. When used in fire service, OS&Y Shut-off Valves must be used, which are available at extra cost.



Dimensions (in inches)

Size	2" Screwed	2" Flanged	2½"	3"	4"	6"	8"	10"
A	33.66	37.16	42.19	42.19	48.19	61.19	73.94	85.69
B	20.06	20.06	27.06	27.06	30.06	40.06	50.81	59.56
C	7.94	7.94	9.44	9.44	12.56	13.56	14.75	17.06
D Max	5.25	5.25	19.00	19.00	24.75	31.25	40.25	48.50
E	5.88	5.88	4.50	4.50	5.00	6.00	8.00	10.00
F	9.25	9.25	9.25	9.25	14.25	14.25	14.25	14.25
G	7.70	7.70	7.70	7.70	9.00	9.00	9.00	9.00
H	14.74	16.49	18.56	18.56	20.56	26.81	32.94	38.31
End Details	2-11½ NPT screwed B	150 Lb ANSI 16.24	125 Lb ANSI B 16.21					

Specifications

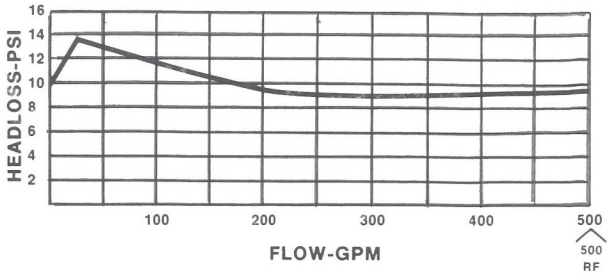
Sizes
2", 2½", 3", 4", 6", 8", 10"
End Detail
125 ANSI B16.1
Maximum Working Pressure
175 PSI
Hydrostatic Test Pressure
350 PSI
Temperature Range
to 110° F
Fluid
Water
Material
2" main valve body and cover:
Bronze ASTM B-61
2½" and larger
main valve body and cover:
Cast Iron ASTM A-126
interior epoxy coated
main valve trim:
Bronze ASTM B-61
Differential relief valve:
Bronze ASTM B-61 with
Stainless Steel 316 Trim

E-RP4 (6/90)

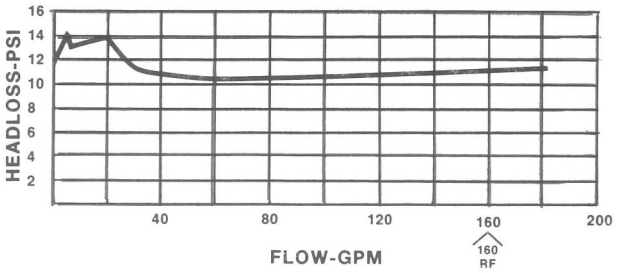
RP-4 Reduced Pressure Principle

Backflow Preventer Flow Curves

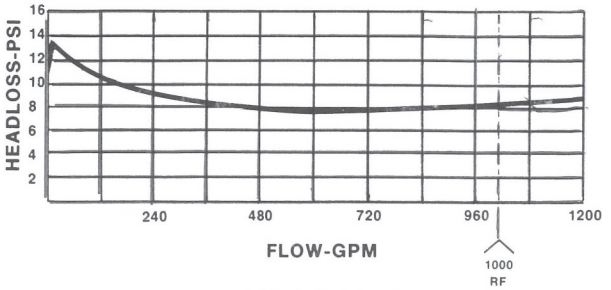
4" MODEL RP-4



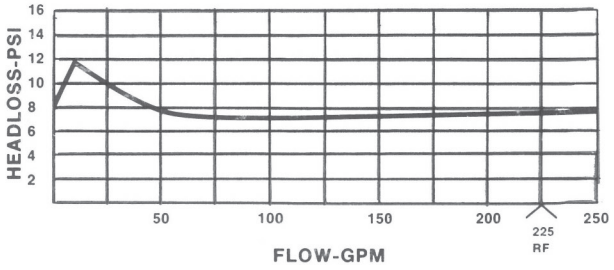
2" MODEL RP-4



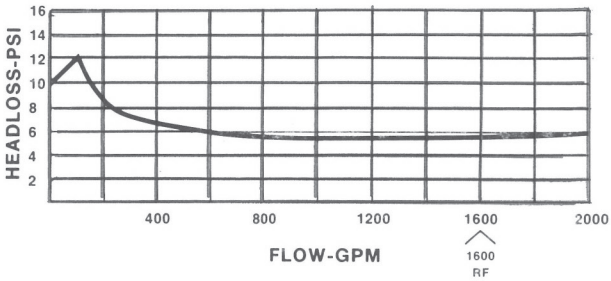
6" MODEL RP-4



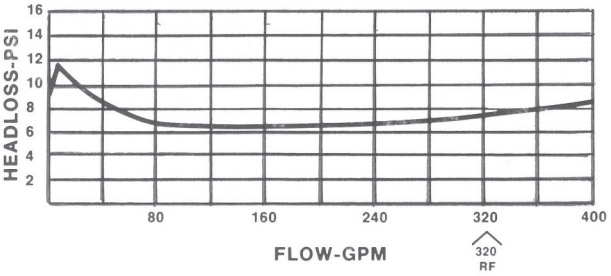
2½" MODEL RP-4



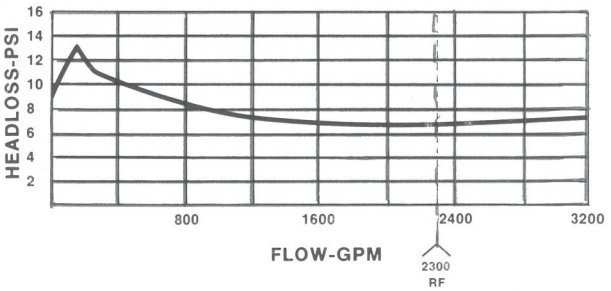
8" MODEL RP-4



3" MODEL RP-4



10" MODEL RP-4



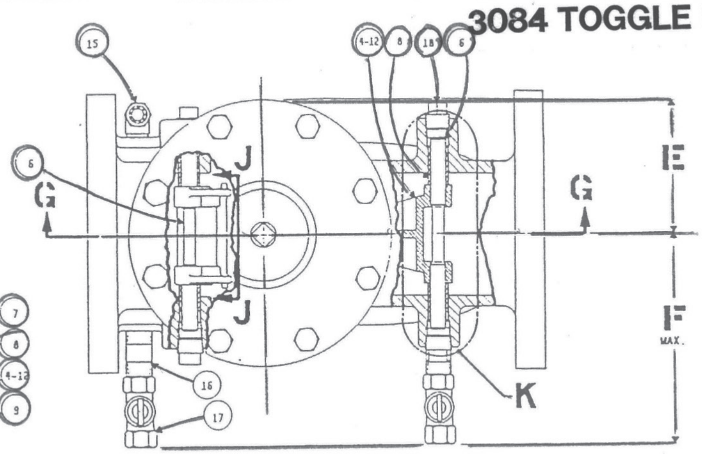
*"Rated Flow" Values adopted by the American Water Works Association and the New England Water Works Association.

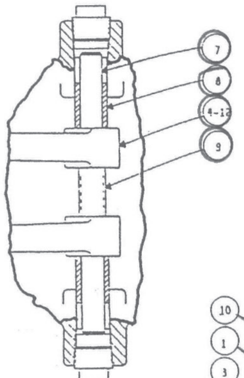
Purchase Specifications

The reduced pressure principle backflow preventer shall be a complete assembly consisting of two independently acting spring-loaded toggle lever check valves together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve shall reduce the supply pressure a predetermined amount so that during normal flow and at the cessation of normal flow, the pressure between the checks is less than the supply pressure. In the case of leakage of either check valve, the differential relief valve shall discharge to atmosphere to maintain the pressure between the checks at least 2 PSI less than the supply pressure.

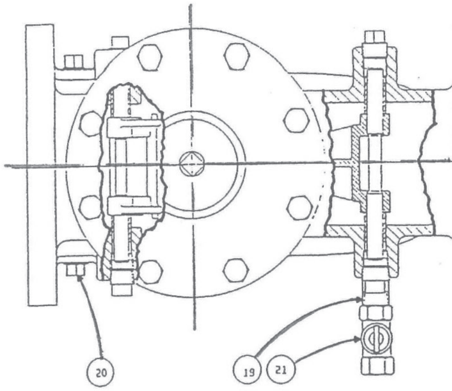
The unit shall include tightly closing shut-off valves located at each end of the device, and shall be fitted with properly located test cocks. Operation shall be completely automatic. All internal parts of the toggle lever check valves and the pressure differential relief valve must be removable or replacable without removal of the unit from the line. The total head loss through the complete backflow device shall not exceed 10 PSI at the "rated flow".* The reduced pressure principle Backflow Preventer shall be the Model RP-4 BACKFLOW PREVENTER as manufactured by Cla-Val Co., Newport Beach, California.

3084 TOGGLE LEVER CHECK

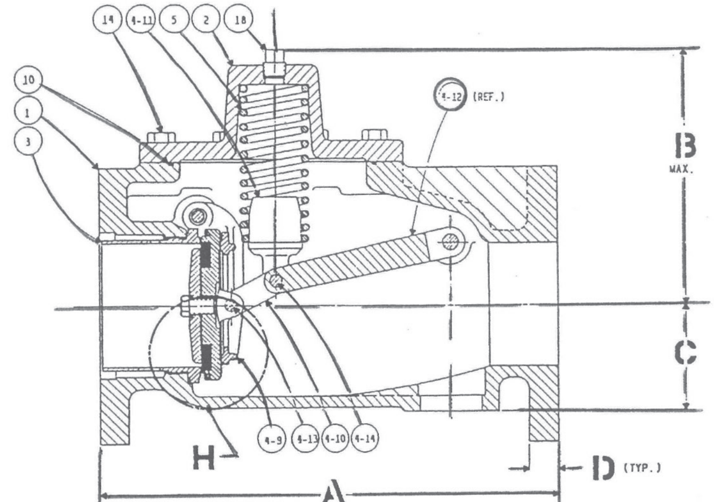




DETAIL K
8" & 10" ONLY

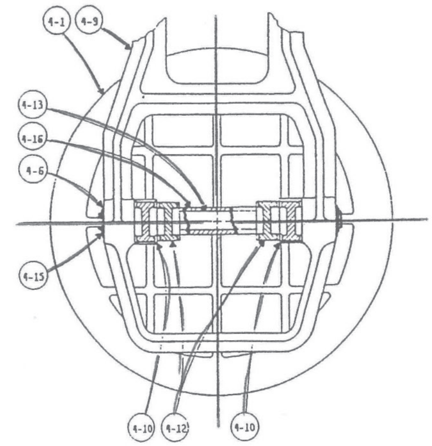


4" #2 3084 CHECK VALVE SHOWN
(TOP VIEW)

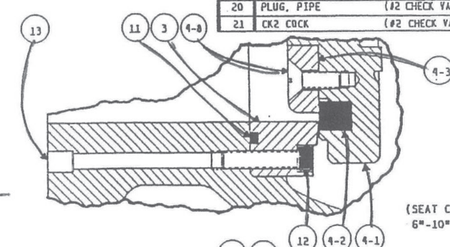


4" #1 3084 CHECK VALVE SHOWN

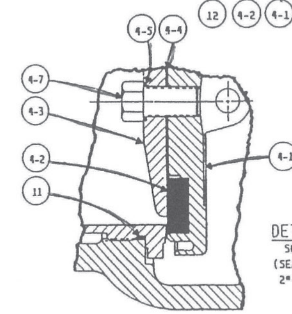
SECTION G-G



VIEW J-J
10" CLAPPER ASSEMBLY SHOWN)



(SEAT CONFIGURATION FOR 6"-10" ONLY.)



DETAIL H
SCALE=1:1
(SEAT CONFIGURATION FOR 2"-4" ONLY)

SIZE	2"	2-1/2"	3"	4"	6"	8"	10"
A DIM.	10.00	13.50	13.00	15.00	20.00	25.38	29.75
B MAX.	5.25	7.25	7.25	8.31	11.00	13.00	15.75
C DIM.	2.38	3.88	3.88	3.50	4.50	5.69	8.00
D MIN.	.50	.69	.75	.94	1.00	1.12	1.19
E DIM.	2.75	3.25	3.25	4.31	4.88	6.06	7.56
F MAX.	5.00	6.50	6.50	7.62	9.50	10.25	11.38
FLANGE END DETAIL	150 LB. PER ANSI B16.24			125 LB. PER ANSI B16.1			

16028 A

PARTS LIST

ITEM NO.	DESCRIPTION		QTY.
1	BODY		1
2	COVER		1
3	SEAT		1
4	CLAPPER ASSEMBLY		1
4-1	RETAINER, DISC		1
4-2	DISC		1
4-3	GUIDE, DISC		1
4-4	SPACER, FIBER	(2"-4" ONLY)	A/R
4-5	O-RING, DISC GUIDE	(2"-4" ONLY)	1
4-6	WASHER, FLAT		4
4-7	BOLT HEX HD.	(2"-4" ONLY)	1
4-8	SCREW, FLAT HD.	(6"-10" ONLY)	A/R
4-9	HINGE		1
4-10	LINK		2
4-11	YOKE		1
4-12	ARM, LEVER		A/R
4-13	PIN, DISC RETAINER		1
4-14	PIN, LINK		1
4-15	RING, RETAINING		4
4-16	SPACER, LINK	(10" ONLY)	1
5	SPRING		1
6	PIN, HINGE		1
7	PIN, LEVER ARM	(8" & 10" ONLY)	1
8	BUSHING		4
9	SPACER, LEVER ARM	(8" & 10" ONLY)	1
10	O-RING, COVER		1
11	O-RING, SEAT		1
12	SCREW, CAP, SOCKET HD.	(6"-10" ONLY)	A/R
13	LEEPLUG	(10" #1 CHECK VALVE ONLY)	A/R
14	BOLT HEX HD.		A/R
15	ELBOW, TUBE	(#1 CHECK VALVE ONLY)	1
16	NIPPLE, PIPE	(#1 CHECK VALVE ONLY)	3
17	CK2 COCK	(#1 CHECK VALVE ONLY)	2
18	PLUG, PIPE		A/R
19	NIPPLE, PIPE	(#2 CHECK VALVE ONLY)	1
20	PLUG, PIPE	(#2 CHECK VALVE ONLY)	A/R
21	CK2 COCK	(#2 CHECK VALVE ONLY)	1

LTR	DESCRIPTION	BY	DATE
A	VALVE ONLY WAS 6"-10" ONLY (ECO 8681) ITEM 16 QTY 3 WAS 2, ITEM 19-10" ...	DF	6-12-87
—	RELEASED FOR PRODUCTION (MED 30682)	B.W.	5-24-85

REVISION RECORD

DO NOT SCALE PRINT

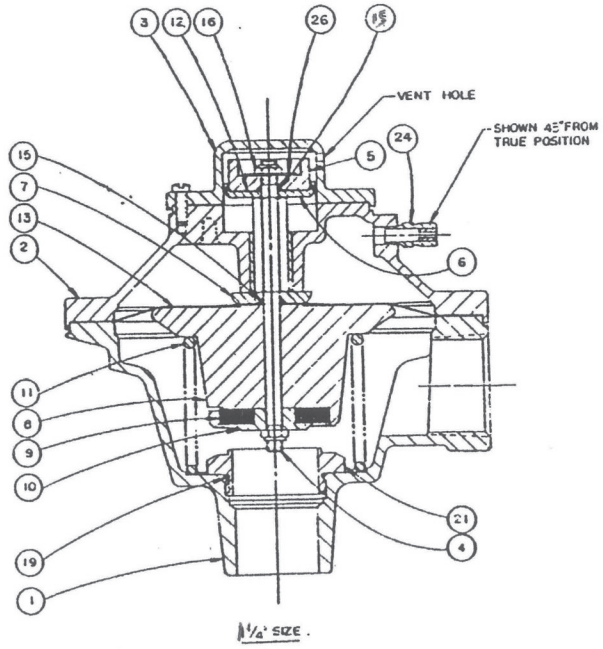
2"-10" 3084 CHECK VALVE
125/150 LB. FLANGES

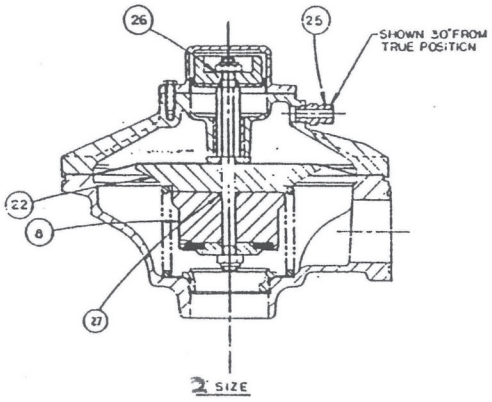
DRAWN 5-24-85 B.W.
CHECKED 10-17-85 J.C.
APPROVED 10-18-85 WEP
SCALE 1:2 & NOTED

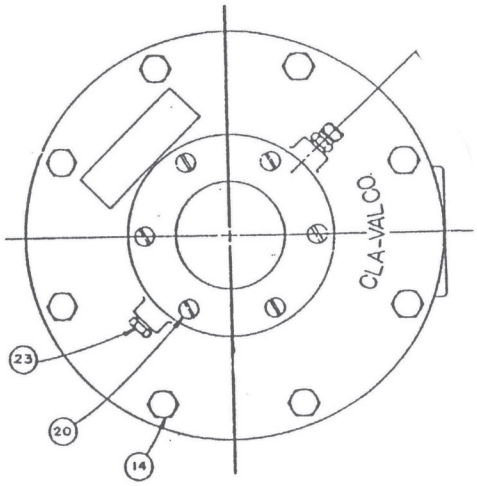
CLA-VAL CO.

16028 A

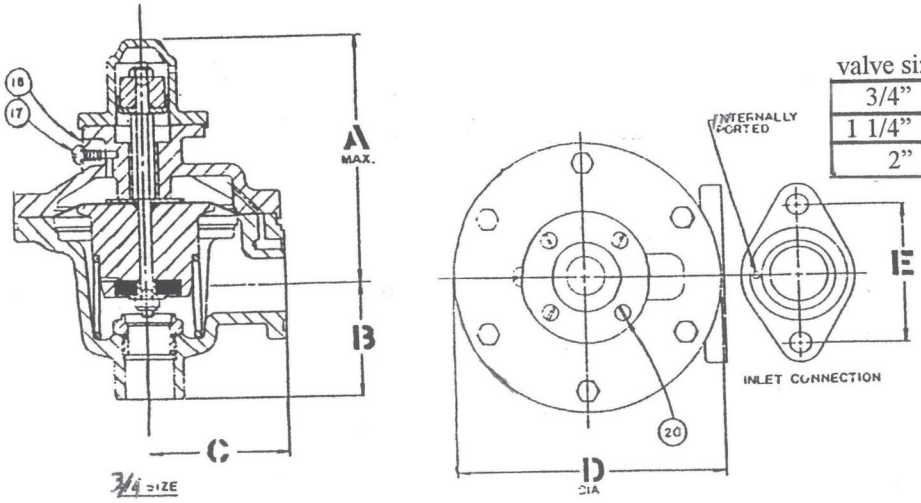
CDHS 24 RELIEF VALVE







1 body
2 body assy inter.
3 cover
4 stem
5 piston
6 plate retainer
7 washer diaph
8 retainer, disc
9 disc
10 guide disc
11 spring
12 bellofram
13 diaphragm
14 bolt
15 o'ring
16 nut self locking
17 screw
18 washer (3/4" only)
19 O'ring seat
20 screw/ bolt
21 seat
22 washer diaph (2" only)
23 plug (1 1/4-2" only)
24 X58C restrrictor (1 1/4" only)
25 connector
26 washer (1 1/4-2" only)
27 o'ring (2" only)



valve size	A	B	C	D	E
3/4"	4.10	1.84	2.25	4.38	2.25
1 1/4"	4.09	3.03	3.38	6.81	-
2"	4.03	2.85	5.25	10.38	4.5

CLA VAL RP4V

SIZE
4", 6", 8"

DESCRIPTION
This model is a reduced pressure assembly. Production began approximately 1990 and was discontinued around 2005. It utilizes the same components as the RP4. The RP4V is a vertical oriented assembly. It splits the check bodies and with the specially located elbows it allows the piping in and out of the assembly to facilitate a vertical orientation.

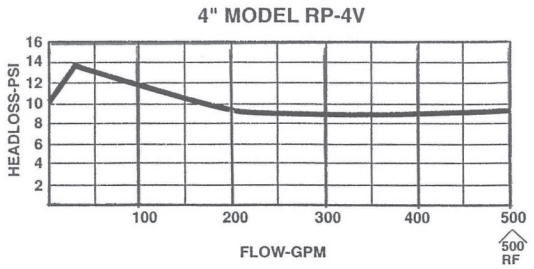
BASIC REPAIR KIT
The repair kit contains all rubber discs, diaphragm, rolling diaphragm, cover seals, O-rings, and washers.

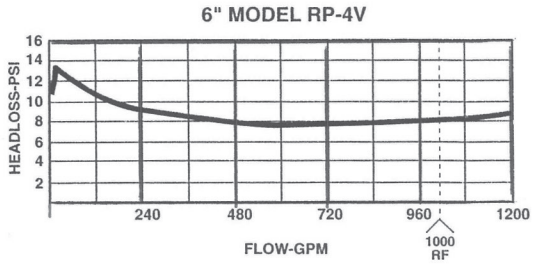
SIZE	KIT NO
4"	RP4400 *
6"	RP4600 *
8"	RP4800 *

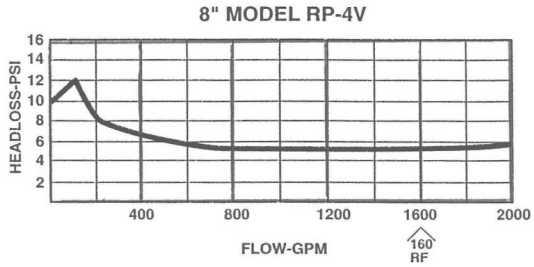
IMPORTANT FEATURES
~See Model RP4

~Vertical orientation for installation

RP-4V
Reduced Pressure Principle Backflow Preventer Flow Curves

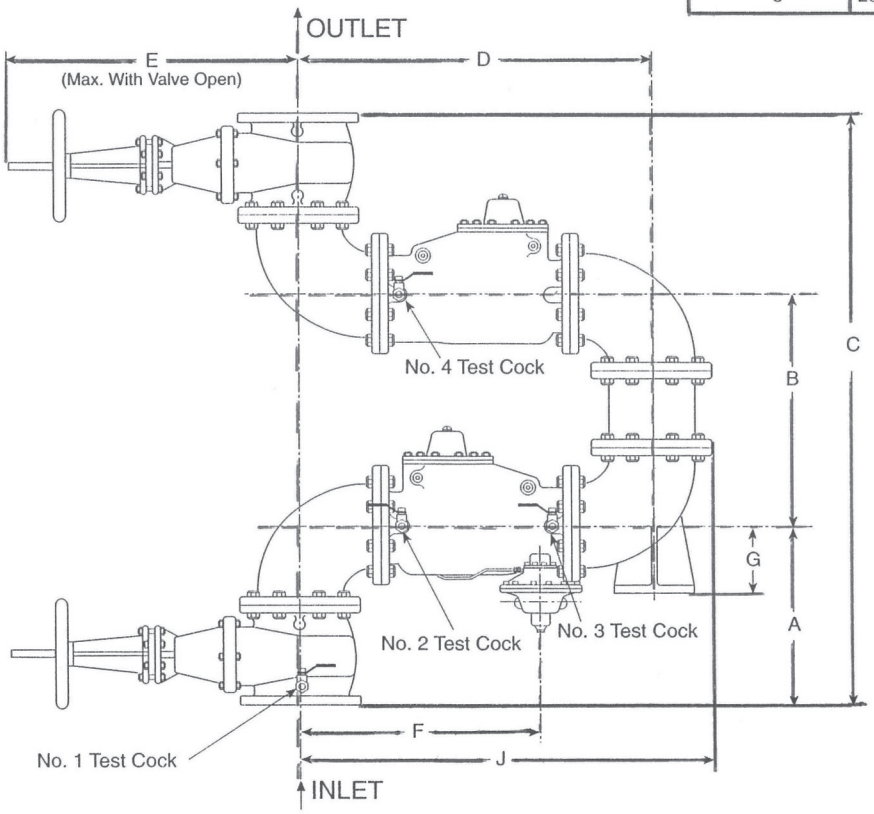


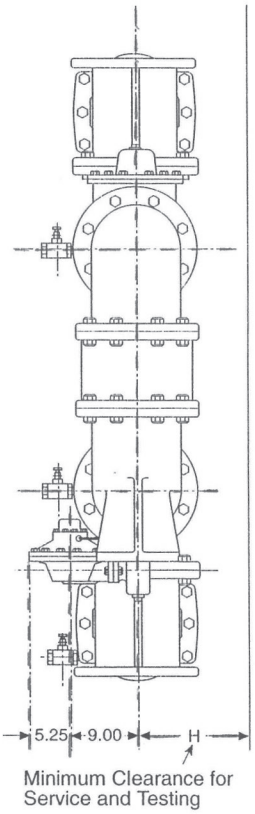




Dimensions (In Inches)

DIMENSION TABLE									
DIM / Valve Size	A	B	C	D	E	F	G	H	J
4"	15.56	23.13	54.25	28.13	22.75	18.16	5.50	16.50	32.63
6"	18.56	26.13	63.25	36.13	30.13	23.63	7.00	17.50	41.63
8"	20.56	28.13	69.25	43.50	37.75	28.69	8.75	18.75	50.25





Specifications

Sizes:
4", 6", 8"

End Detail:
125 ANSI B16.1

Maximum Working Pressure:
175 psi

Hydrostatic Test Pressure:
350 psi

Max. Temperature:
to 110° F

Fluid:
Water

Material:
Main Valve Body and Cover:
Cast Iron ASTM A-126 interior epoxy coated

Main Valve Trim:
Bronze ASTM B-61

Differential Relief Valve:
Bronze ASTM B-61 with Stainless Steel 316 Trim

Shut-off Valves:
Resilient Seat Outside Stem and Yoke Type, Epoxy Coated Interior and Exterior AWWA C550

CLA-VAL

CLA VAL D
CLA VAL D-EX

SIZE
2”, 2 1/2”, 3”, 4”, 6”, 8”, 10”

DESCRIPTION
These models are both double check assemblies. The valve was produced from approximately 1958-1990. The 2” valve is of bronze body construction. The 2 1/2”-10” size is a cast iron body with a fused epoxy coating. The checks are the 3081 toggle lever type as used in the RP1 series. The model D and D-EX use the same internal parts. Check seats are replaceable. A seat removal tool is needed to change the seats. Check springs are not contained when the cover is removed. The serial number is needed to order some repair parts. Most internal hardware parts are made of bronze.

BASIC REPAIR KIT
The repair kit contains all rubber discs, cover seals, O-rings, and washers.

SIZE	KIT NO
2”	D00200 *
2 1/2”	D00250 *
3”	D00300 * ◆
4”	D00400 *
6”	D00600 *
8”	D00800 *
10”	D00001 *

IMPORTANT FEATURES
~2” bronze body

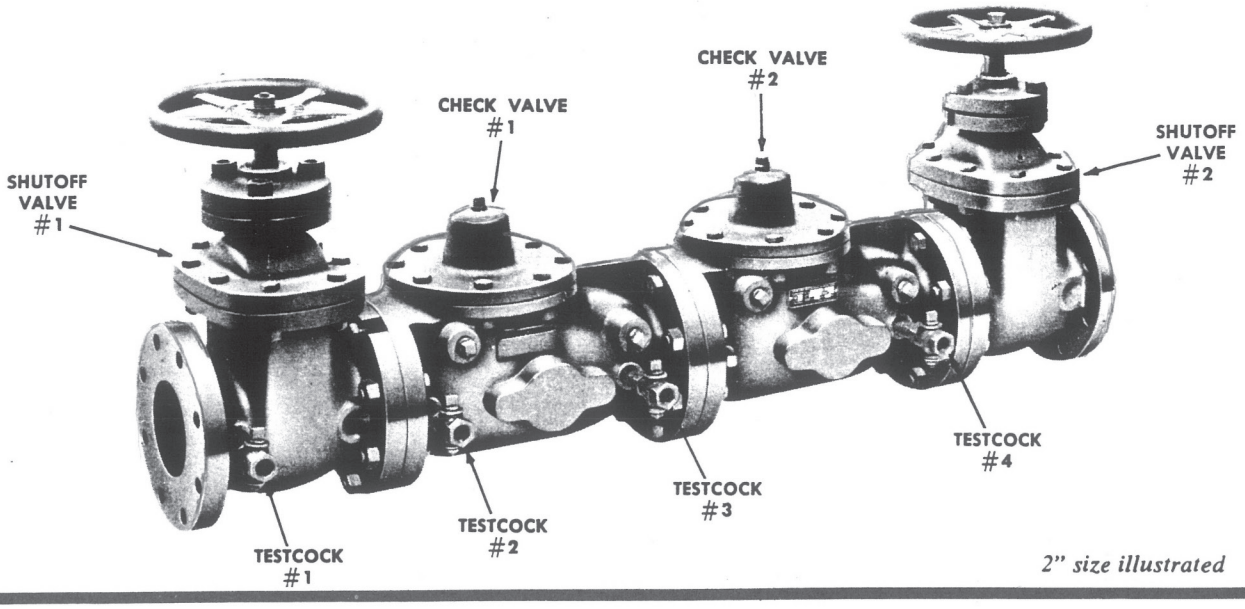
~2 1/2”-10” has a cast iron fused epoxy coating

~Replaceable check seats

~Springs are not contained

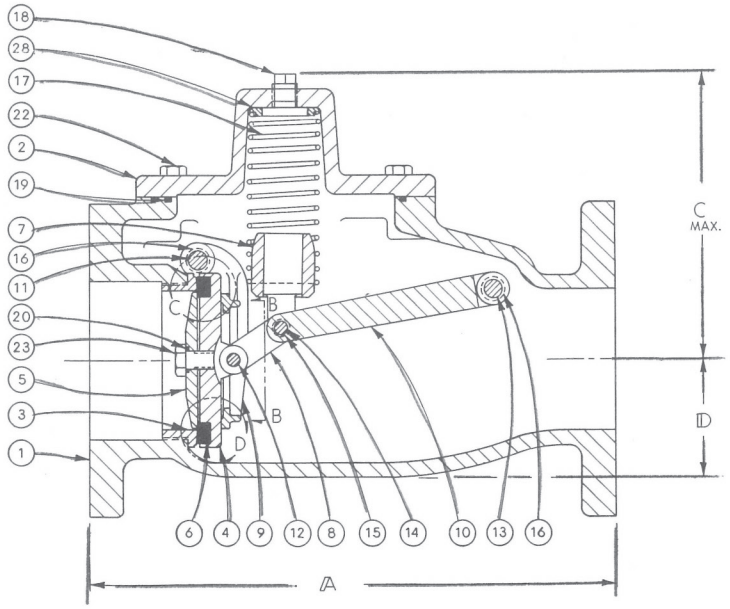
~Serial number is needed to order some parts

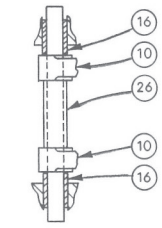
~Factory repair information enclosed



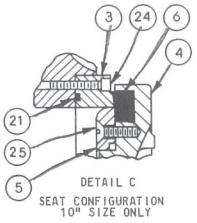
2" size illustrated

3081 TOGGLE LEVER CHECK VALVE

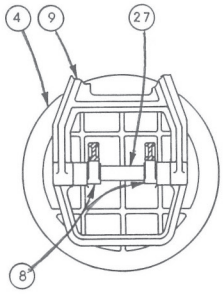




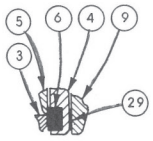
VIEW A-A
LEVER ARM SPACER
8" & 10" SIZE ONLY



DETAIL C
SEAT CONFIGURATION
10" SIZE ONLY



VIEW B-B
LINK SPACER
10" SIZE ONLY



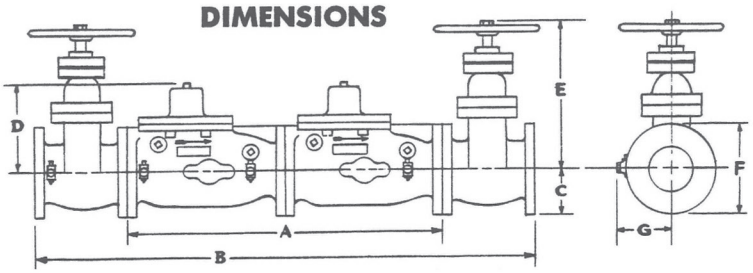
DETAIL D
HINGE BUMPER
2", 2-1/2",
& 3" SIZE ONLY

PARTS LIST

When ordering parts specify Item No., Description and all Name Plate data.

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	BODY	13	LEVER ARM PIN	22	CAP SCREWS
2	COVER	14	LINK PIN	23	DISC GUIDE BOLT (1" THRU 8")
3	SEAT	15	PIN RETAINER	24	SEAT SCREW (10" ONLY)
4	DISC RETAINER	16	BUSHING	25	DISC GUIDE SCREW (10" ONLY)
5	DISC GUIDE	17	SPRING	26	LEVER ARM SPACER (8" & 10" ONLY)
6	DISC	18	PLUG	27	LINK SPACER (10" ONLY)
7	YOKE	19	COVER SEAL	28	SPRING WASHER (2" ONLY)
8	LINK	20	DISC GUIDE "O" RING (4", 6", 8" ONLY)	29	HINGE BUMPER (2", 2½" & 3" ONLY)
9	HINGE	21	SEAT "O" RING (10" ONLY)		
10	LEVER ARM				
11	HINGE PIN				
12	DISC RETAINER PIN				

DIMENSIONS



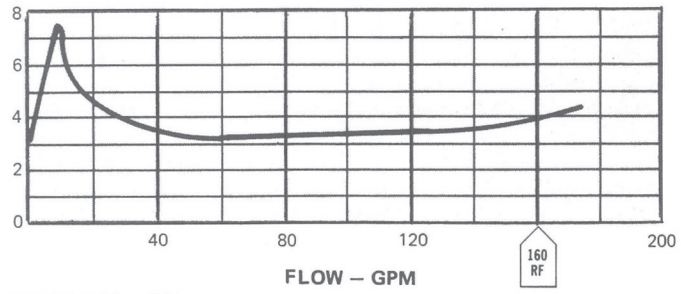
	Valve Size →	SCREWED 2"	FLANGED 2"	2½"	3"	4"	6"	8"	10"
	A	22 5/16	20 1/8	27 1/16	26 1/16	30 1/8	40 1/8	50 3/4	59 1/2
*	B	28 11/16	31 13/16	42 3/16	42 3/16	48 1/4	61 1/4	74	86
	C	3	3	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4	8
*	D	5 1/4	5 1/4	7 1/4	7 1/4	8 5/16	11	13	15 3/4
*	E	8 1/2	8 1/2	13 1/8	15	17 1/2	20 3/4	25	29 1/2
	F	6	6	7	7 1/2	9 1/4	11 1/2	13 1/2	16 1/4
*	G	4 1/4	4 1/4	6 1/2	6 1/2	6	8 1/2	9 1/2	10 1/4

** Maximum Dimensions*

FLOW CURVES

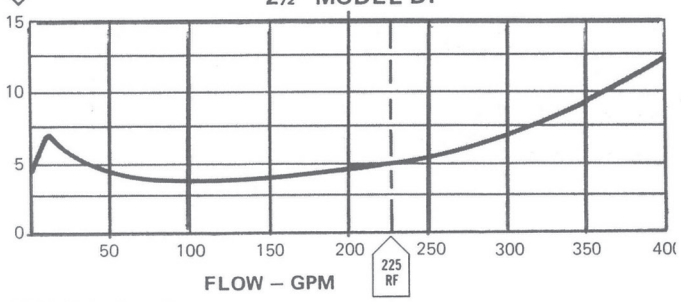
HEADLOSS – PSI

2" MODEL D:



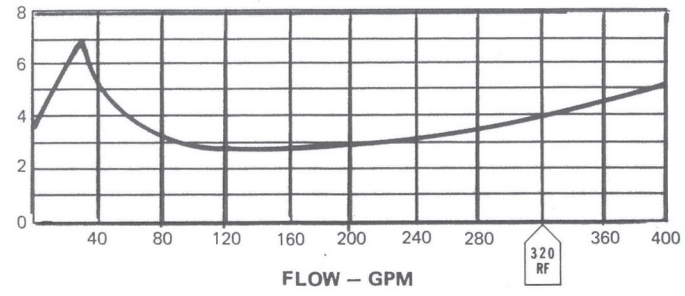
HEADLOSS – PSI

2½" MODEL D:



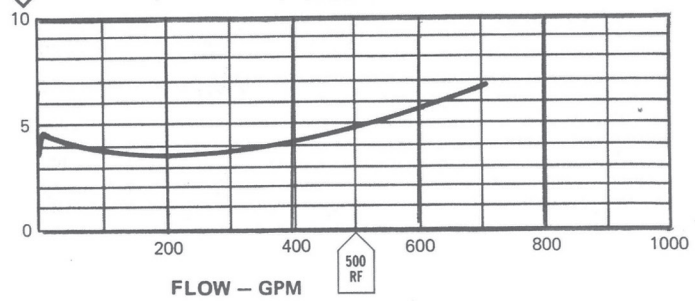
HEADLOSS – PSI

3" MODEL D:



HEADLOSS – PSI

4" MODEL D:

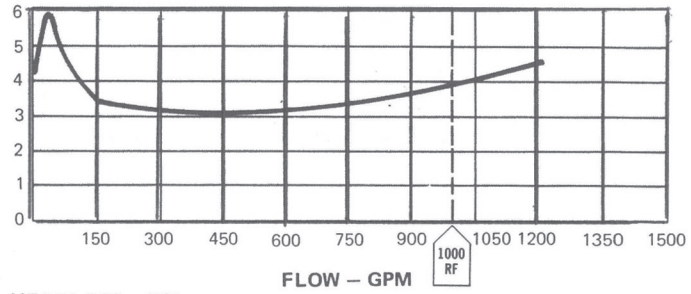


SPECIFICATIONS

WORKING PRESSURE	*Maximum:* 150 psi
HYDROSTATIC TEST	*Pressure:* 300 psi
TEMPERATURE RANGE	to 110°F
FLUID	Water
MATERIALS	*Check valve body and cover:* *2":* Bronze ASTM B-61 *2½" and larger:* Cast Iron Epoxy Coated *Check valve trim:* Bronze ASTM B-61

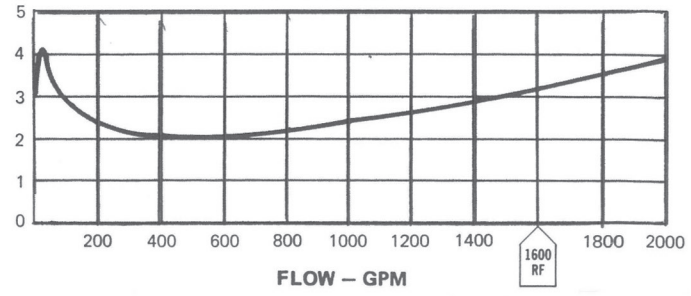
HEADLOSS – PSI

6" MODEL D:



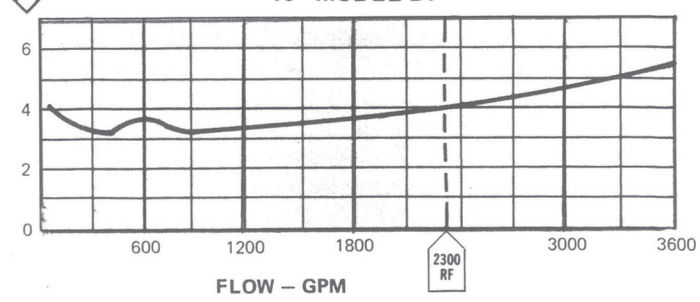
HEADLOSS – PSI

8" MODEL D:



HEADLOSS – PSI

10" MODEL D:



CLA VAL D2

SIZE
3/4", 1", 1 1/4", 1 1/2"

DESCRIPTION
The Model D-2 is a double check assembly. Production began approximately 1978 and was discontinued in 2003. The valve is a bronze body with poppet type check valves. The check poppets are either stainless steel or delrin plastic. Check seats are replaceable. A seat removal tool is needed to change the check seats. Check springs are not contained when the covers are removed. The valve uses the check design as used in the RP2 series.

BASIC REPAIR KIT
The repair kit contains all rubber discs, O-rings, gasket, and washers.

SIZE	KIT NO
3/4"-1"	D20100 *
1 1/4"-1 1/2"	D20150 *

IMPORTANT FEATURES
~Bronze body
~Replaceable seats
~Springs are not contained
~Factory repair information enclosed

BAVCO
BACKFLOW APPARATUS & VALVE CO.

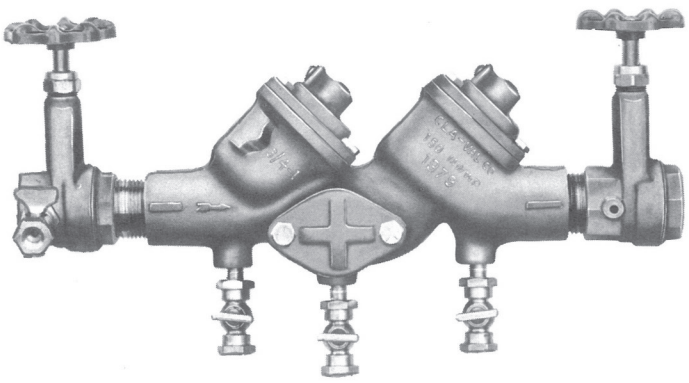
CLA-VAL CO. | BACKFLOW PREVENTER | MODEL D-2

The Cla-Val Model D-2 Double Check Valve Assembly is a reliable means of backflow protection for intermediate degrees of hazard. The assembly is carefully constructed of corrosion resisting materials. It consists of one body containing two independently acting spring-loaded poppet check valves, two shut-off valves and four test cocks. Field testing is easily performed by means of the test cocks provided for this purpose.

The poppet check valves are uniquely designed to provide drip-tight closure against reverse flow, and low pressure drop at maximum capacity. The spring-loaded poppet causes the valve to seal against an inlet pressure higher than the outlet pressure when there is no flow.

It is recommended that this unit be installed in a horizontal position. All internal parts are readily accessible without removing valves from the line.

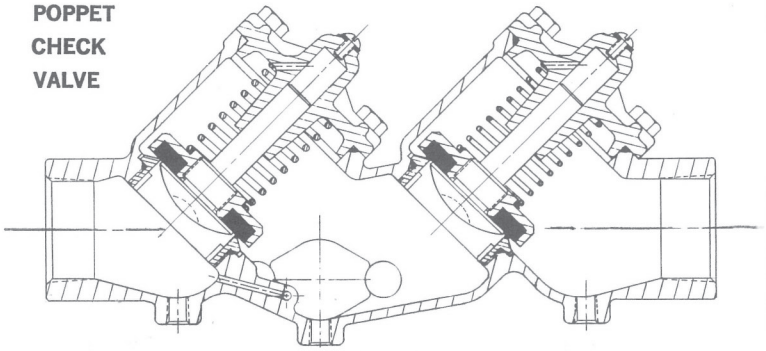
DOUBLE CHECK VALVE ASSEMBLY



FEATURES

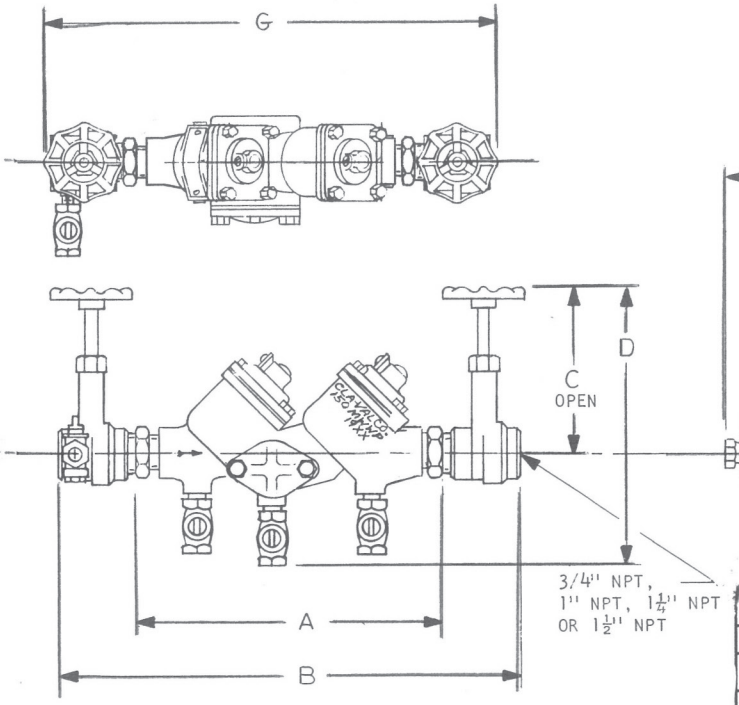
- Low head loss
- No internal or external weights
- All parts are corrosion resistant
- Positive operation without chattering

POPPET CHECK VALVE



for repair parts breakdown see
Cla Val model RP2 ck assy

DIMENSIONS



Size	B
3/4"	17.06
1"	16.81
1 1/4"	21.25
1 1/2"	21.62

Dimension with ball valves

DIMENSIONS IN INCHES

Valve Size	A	B	C	D	E	F	G	Test Cocks
¾"	10.12	15.00	4.06	7.50	1.50	4.22	15.38	⅛
1"	9.00	14.38	5.19	8.62	1.50	4.44	14.56	⅛
1¼"	13.25	18.62	6.06	10.06	1.69	4.78	18.88	⅛
1½"	11.75	18.12	7.06	11.06	1.69	4.94	18.88	⅛

Gate Valves are rising stem

SPECIFICATIONS

VALVE SIZES	¾", 1", 1¼" & 1½"
END DETAILS	*Screwed:* ANSI B 16.15
WORKING PRESSURE	*Maximum:* 150 psi
HYDROSTATIC TEST	*Pressure:* 300 psi
TEMPERATURE RANGE	to 110°F
FLUID	Water
MATERIALS	*Check valve body and cover:* Bronze ASTM B-61 *Check valve trim:* Bronze ASTM B-61

CLA-VAL CO.
Newport Beach, California

CLA VAL D4

SIZE
2", 2 1/2", 3", 4", 6", 8", 10"

DESCRIPTION
The Model D-4 is a double check assembly. Production began in 1991. The 2" size was discontinued in 2003. The 2 1/2"-4" sizes were discontinued in 2005. The 6"-10" sizes were discontinue in 2012. The assembly utilizes the 3084 toggle lever checks as used in the RP4 series. The workings of the 3084 check mechanism are similar to the 3081 design as used in the RP1 series. Changes in the disc, disc retainer, and disc guide were implemented. Most internal hardware parts are made of bronze.

BASIC REPAIR KIT
The repair kit contains all rubber discs, O-rings, washers, and gaskets

SIZE	KIT NO
2"	D40200 *
2 1/2"	D40250 *
3"	D40250 *
4"	D40400 *
6"	D40600 *
8"	D40800 *
10"	D40001 *

IMPORTANT FEATURES
~2" size has a bronze body

~2 1/2"-10" have a cast iron fused epoxy coated body

~Springs are not contained

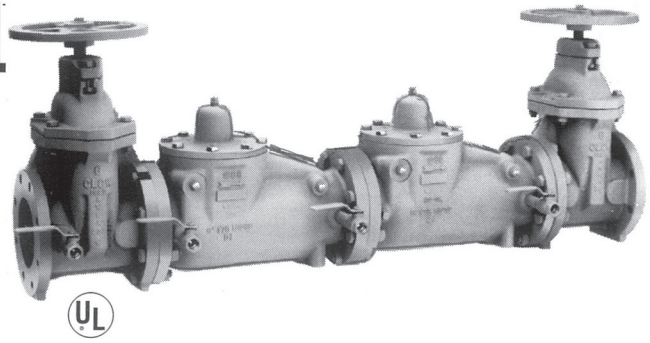
~Seats are replaceable

CLA-VAL®

—MODEL— **D-4**

for repair parts breakdown see
Cla Val model RP4 ck assy

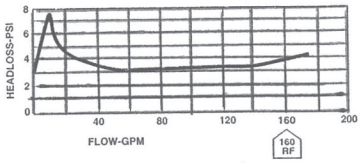
Double Check Backflow Preventer



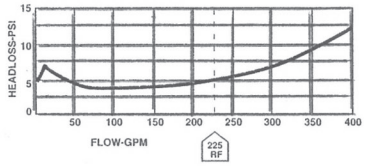
Classified By Underwriters' Laboratories Inc.® as to Friction Loss and Body Strength Only.

Model D-4 Double Check Backflow Preventer Flow Curves

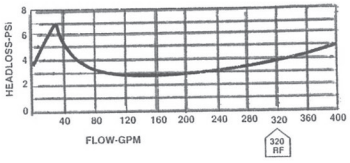
2" Model D-4



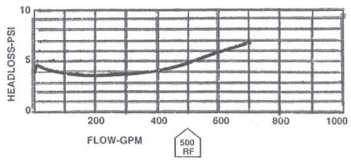
2½" Model D-4



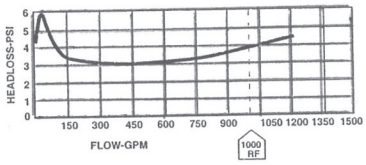
3" Model D-4



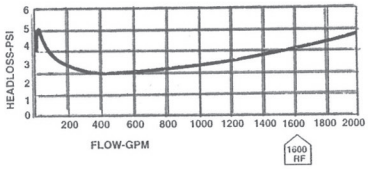
4" Model D-4



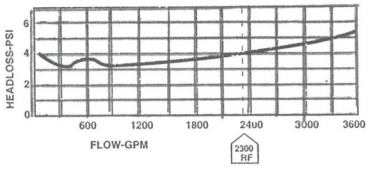
6" Model D-4



8" Model D-4

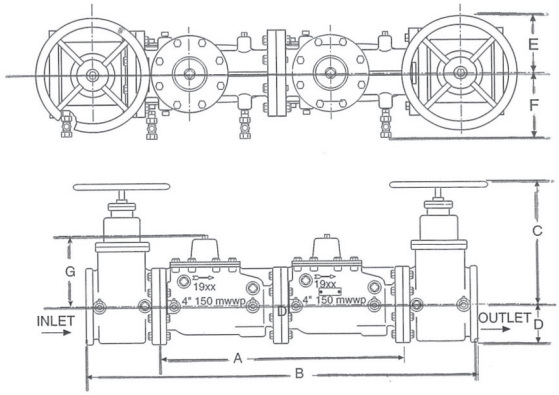


10" Model D-4



Dimensions (In Inches)

Valve Size	2" Screwed	2" Flanged	2½"	3"	4"	6"	8"	10"
A	20.06	20.06	26.06	26.06	30.06	40.06	50.81	59.56
B	33.16	37.16	42.19	42.19	48.19	61.19	73.94	85.69
C	5.25	5.25	13.12	15.25	17.50	21.00	24.85	29.38
D	—	3.00	3.50	3.75	4.50	5.50	6.75	8.00
E	4.00	4.00	4.00	4.50	5.00	6.00	8.00	10.00
F	5.00	5.00	6.50	6.50	7.62	9.50	10.25	11.38
G	5.25	5.25	7.25	7.25	8.31	11.00	13.00	15.75



It is recommended that this unit be installed in a horizontal position and that adequate space is allowed for maintenance work and testing.

Specifications

Valve Sizes:
2", 2½", 3", 4", 6", 8",10"

End Details:
2" Screwed:
2–11½ NPT
2" Flanged:
150 lb. ANSI B 16.24
2½"-10" Flanged:
125 lb ANSI B 16.1

Maximum Working Pressure:
Maximum: 175 psi

Hydrostatic Test:
Pressure: 350 psi

Max. Temperature:
to 110° F

Fluid:
Water

Materials:
Check Valve Body and Cover
2" Bronze ASTM B-61
2½" and Larger: Main Valve Body and Cover
Cast iron ASTM A-126 interior epoxy coated*
Check Valve Trim:
Bronze ASTM B-61
Shut-off Valves:
Resilient Seat Non-Rising
Stem Type, Epoxy Coated
Interior & Exterior AWWA C560

*Exterior may be epoxy coated at extra cost.

CLA-VAL™

CLA VAL 16
CLA VAL 16-4

SIZE
3”, 4”, 6”, 8”, 10”

DESCRIPTION
Both models are double check detector assemblies. Production of the Model 16 was from approximately 1980-1990. The Model 16-4 began in 1991 and was discontinued in 2003. In the Model 16 the main valve utilizes an assembly similar to the Model D/DEX. The bypass valve on both models utilizes the 3/4” D2 or Wilkins 950 XL. The serial number of the main valve unit is needed to order some repair parts. The Model 16-4 main valve utilizes the D-4 design.

BASIC REPAIR KIT
Main valve repair kit contains all rubber discs, cover gaskets, and washers

	MODEL 16	MODEL 16-4
SIZE	KIT NO	KIT NO
3”	D00300 * ◆	D40250 *
4”	D00400 *	D40400 *
6”	D00600 *	D40600 *
8”	D00800 *	D40800 *
10”	D00001 *	D40001 *

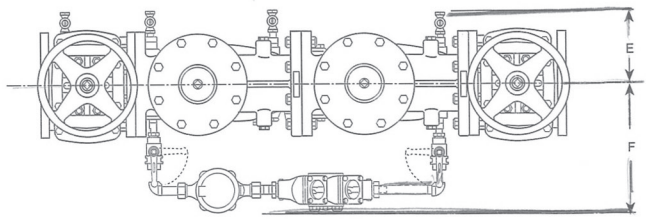
Bypass repair kit contains all rubber discs, O-rings, washers, and gasket

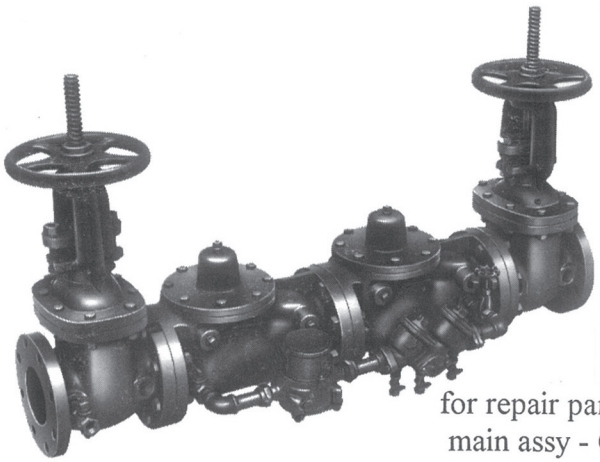
SIZE	KIT NO
Cla Val D2 3/4”	D20100 *
Wilkins 950 XL 3/4”	RK34-950XLR

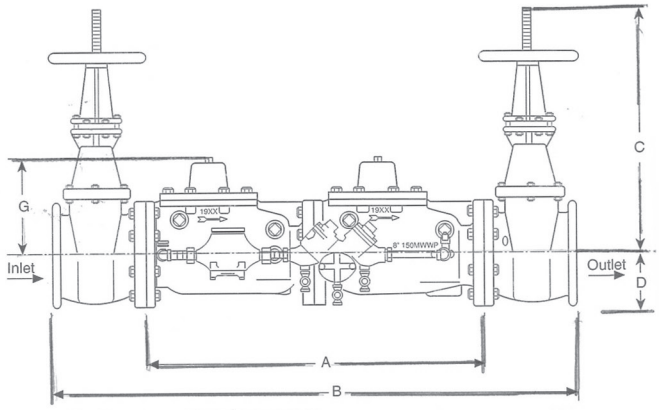
IMPORTANT FEATURES
~Mainline assembly see Cla Val D/DEX
~Bypass assembly see Cla Val D2 3/4”
~Factory repair information enclosed

—— MODEL — 16-4

Double Check Detector Check Backflow Preventer





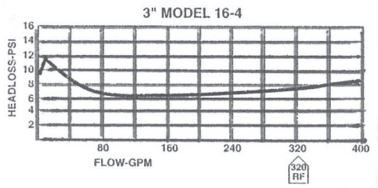


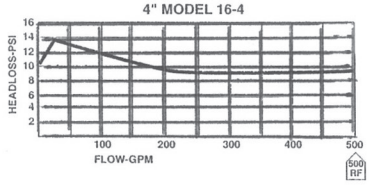
for repair parts breakdown see
main assy - Cla Val RP4 ck Assy
bypass assy - Cla Val RP2 ck assy

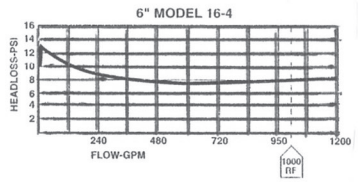
Dimensions (In Inches)

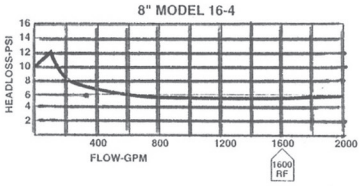
Valve Size	3"	4"	6"	8"	10"
A	26.06	30.06	40.06	50.81	59.56
B	42.19	48.19	61.19	73.94	85.69
C Max	18.87	22.75	30.13	37.75	45.75
D	3.75	4.50	5.50	6.75	8.00
E	4.50	5.00	6.00	8.00	10.00
F	11.00	11.63	13.00	14.50	18.50
G	7.25	8.31	11.00	13.00	15.75

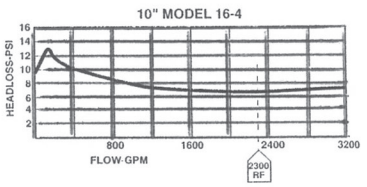
It is recommended that this unit be installed in a horizontal position and that provisions for adequate drainage be made. Right hand mount of bypass assembly is standard. Left hand mount is optional. Adequate space around assembly for maintenance work and testing is recommended.











Specifications

Sizes:

Main-Line: 3", 4", 6", 8", 10"

By-Pass Line ¾"

Material:

Main-Line Check valve & Body cover:

Cast Iron, epoxy coated internally*

By-Pass Line Check Valve Body & Cover:

Bronze ASTM B-61

Check Valve Trim (all):

Bronze ASTM B-61

End Detail:

125 ANSI B16.1

Working Pressure:

150 psi Maximum

Hydrostatic Test Pressure:

300 psi

Max. Temperature:

to 110° F

Fluid:

Water

Meter:

Magnetic Drive Type:

⅝" x ¾" size for low flow registration ¼ GPM to 20 GPM

Material: Bronze

(To comply with latest AWWA standards)

Shut-off Valves:

Main-Line:

Resilient Seat Outside Stem and Yoke Type

Interior and Exterior AWWA C550

By-pass line:

Resilient Seat Ball Type

*Exterior may be epoxy coated at extra cost

CLA VAL 18
CLA VAL 18-4

SIZE
3”, 4”, 6”, 8”, 10”

DESCRIPTION
This model is a reduced pressure detector assembly. The Model 18 was produced from 1989-1990. The Model 18-4 began production in 1991 and was discontinued in 2003. The Model 18 utilized a mainline assembly similar to the RP1EX. The Model 18-4 utilized an assembly similar to the RP4. The serial number of the main assembly is needed to order certain repair parts. The bypass assembly was either the Cla Val RP2 or the Wilkins 975 XL.

BASIC REPAIR KIT
Mainline unit repair kit contains all rubber discs, diaphragm, bellofram, cover seals, O-rings, and washers.

	18	18-4
SIZE	KIT NO	KIT NO
3”	RP1300* ◆	RP4250 *
4”	RP1400*	RP4400 *
6”	RP1600*	RP4600 *
8”	RP1800*	RP4800 *
10”	RP1001*	RP4001 *

Bypass repair kit contains all rubber discs, O-rings, washers, gasket, diaphragm, and bellofram.

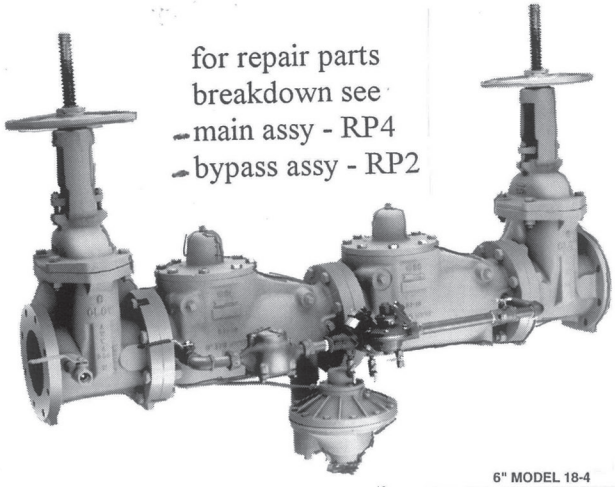
SIZE	KIT NO
Cla Val 3/4” RP2	RP2100 *
Wilkins 975 XL 3/4”	RK34-975XLR

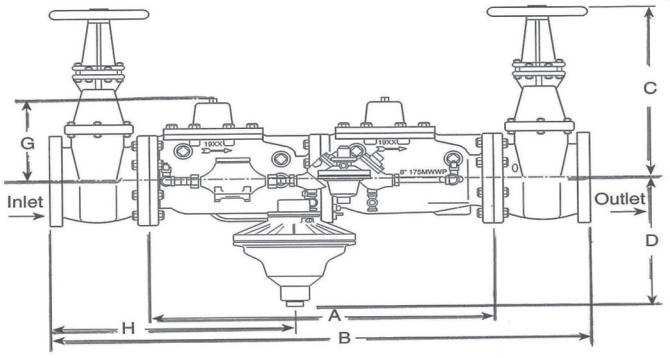
IMPORTANT FEATURES
~Main line assembly see RP4
~Bypass assembly see RP2 3/4”
~Factory repair information enclosed

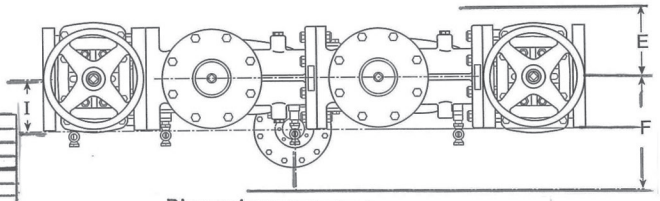
CLA-VAL™

—MODEL—**18-4**

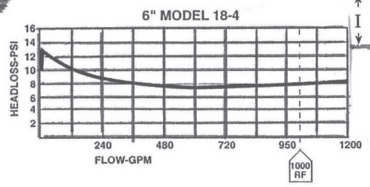
Reduced Pressure Principle Detector Check Backflow Preventer

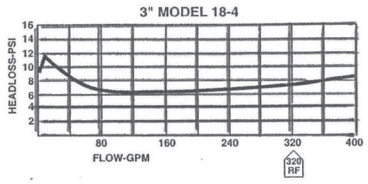


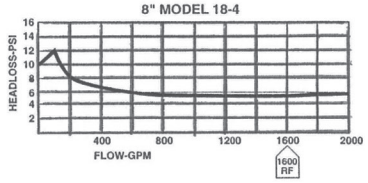


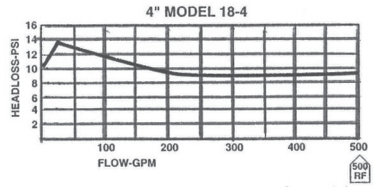


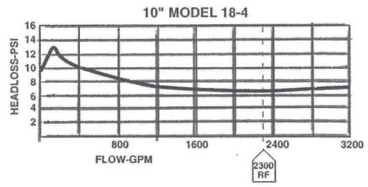
Model 18-4
Reduced Pressure Principle
Detector Check
Backflow Preventer











Dimensions (In Inches)

Valve Size	3"	4"	6"	8"	10"
A	26.06	30.06	40.06	50.81	59.56
B	42.19	48.19	61.19	73.94	85.69
C Max.	15.25	17.50	21.00	24.85	29.38
D	9.44	12.56	13.56	14.75	17.06
E	4.50	5.00	6.00	8.00	10.00
F	14.75	15.38	16.94	18.44	22.44
G	7.25	8.31	11.00	13.00	15.75
H	18.56	20.56	26.81	32.94	38.31
I	7.70	9.00	9.00	9.00	9.00

It is recommended that this unit be installed in a horizontal position and that provisions for adequate drainage be made. Right hand mount of bypass assembly and relief valve is standard. Left hand mount is optional. Adequate space around assembly for maintenance work and testing is recommended.

Specifications

Sizes:

3", 4", 6", 8", 10"

End Detail:

125 lb. ANSI B16.1

Maximum Working Pressure:

175 psi

Hydrostatic Test Pressure:

350 psi

Max. Temperature:

to 110° F

Fluid:

Water

Material:

3" and larger Main Valve Body and Cover:
Cast Iron ASTM A-126 interior epoxy coated*

Main Valve Trim:
Bronze ASTM B-61

Differential Relief Valve:
Bronze ASTM B-61 with Stainless Steel 316 Trim

Meter:
Magnetic Drive Type, ⅝" x ¾" size for low flow registration ¼ GPM to 20 GPM

Material:
Bronze
(To comply with latest AWWA standards)

Shut-off Valves:
Main-Line:
Resilient Seat Outside Stem and Yoke Type
Epoxy Coated Interior and Exterior
AWWA C550
By-pass line:
Resilient seat ball type

CLA VAL 27
CLA VAL 27-4

SIZE
2 1/2", 3", 4", 6", 8", 10"

DESCRIPTION
Both models are a two check pressure vacuum breaker. Production of the Model 27 was from approximately 1975-1990. The Model 27-4 began in 1991 and was discontinued in 2001. The Model 27 consists of a Model D or the DEX double check assembly with a spring loaded air inlet installed on the downside of the #2 check. The serial number is needed to order some repair parts. The Model 27-4 consists of a Model D-4 double check assembly with a spring loaded air inlet installed on the downside of the #2 check.

BASIC REPAIR KIT
The check repair kit contains all rubber discs, cover gaskets, O-rings, and washers

SIZE	MODEL 27 KIT NO	MODEL 27-4 KIT NO
2 1/2"	D00250 *	D40250 *
3"	D00300 *◆	D40250 *
4"	D00400 *	D40400 *
6"	D00600 *	D40600 *
8"	D00800 *	D40800 *
10"	D00001 *	D40001 *

If the air inlet needs repair, parts are available as follows:

	KIT NO
float assembly	76546B ◆
float spring	76549F ◆
float disc	76547K◆

IMPORTANT FEATURES
~See Model D/DEX
~Factory repair information enclosed

PRESSURE-TYPE VACUUM BREAKER

BACKFLOW PREVENTER

Clayton MODEL 27

The Clayton Model 27 Pressure-Type Vacuum Breaker assembly is a reliable means of backflow protection for intermediate degrees of hazard.

The assembly is carefully constructed of corrosion resisting materials. It consists of two independently acting spring-loaded toggle lever check valves, an air inlet valve, two gate valves and three test cocks.

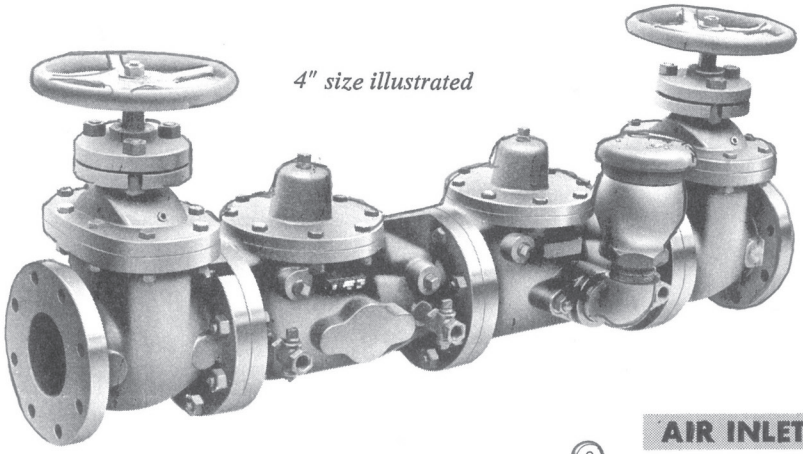
Field testing is easily performed by means of the test cocks provided for this purpose.

The toggle lever check valves are uniquely designed to provide drip tight closure against reverse flow, low pressure drop at maximum capacity. The spring-loaded toggle causes the valve to seal against a higher inlet pressure than outlet pressure when there is no flow.

The toggle lever system is designed so the mechanical advantage of the toggle is maximum in the closed position. Spring force required is relatively low in this position. As the valve opens to permit flow, the mechanical advantage reduces rapidly so a very low pressure drop is incurred at high flow rates.

The levers, links, and pins are rugged, simple, and direct, with ample clearances to insure long trouble-free operation, even in very hard water and over prolonged periods of time. All internal parts are readily accessible without removing valves from the line.

It is recommended that this unit be installed in a horizontal position.

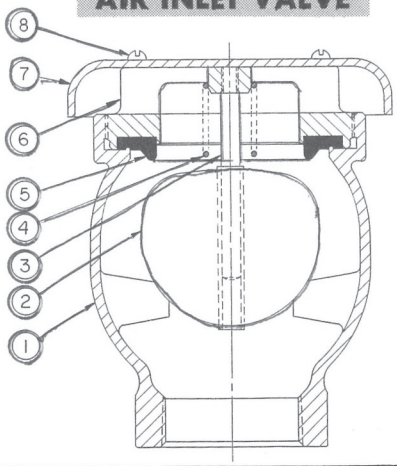


4" size illustrated

SPECIFICATIONS

VALVE SIZES	2½", 3", 4", 6", 8"
WORKING PRESSURE	*Maximum:* 150 psi
HYDROSTATIC TEST	*Pressure:* 300 psi
TEMPERATURE RANGE	+32° to 110°F
FLUID	Water
MATERIALS	*Check valve body & cover:* Cast iron ASTM A-48 Epoxy coated *Check valve trim:* Bronze ASTM B-61 *Air inlet valve:* Bronze ASTM B-61

AIR INLET VALVE

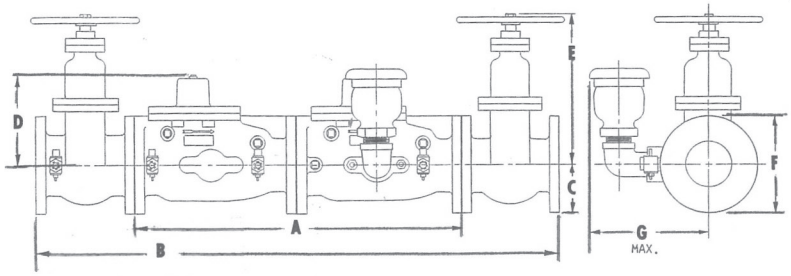


NO. ITEM	DESCRIPTION	ITEM NO.	DESCRIPTION
1	BODY	5	DISC
2	FLOAT	6	DISC RETAINER
3	STEM	7	CANOPY
4	SPRING	8	SCREW

DIMENSIONS

Valve Size →	2½"	3"	4"	6"	8"
A	27 1/16	26 1/16	30 1/8	40 1/8	50 3/4
* B	42 3/16	42 3/16	48 1/4	61 1/4	74
C	3 1/2	3 3/4	4 1/2	5 1/2	6 3/4
* D	7 1/4	7 1/4	8 5/16	11	13
* E	13 1/8	15	17 1/2	20 3/4	25
F	7	7 1/2	9 1/4	11 1/2	13 1/2
* G	8 3/4	9 1/2	10 1/2	12	13 1/4

**Maximum Dimensions*

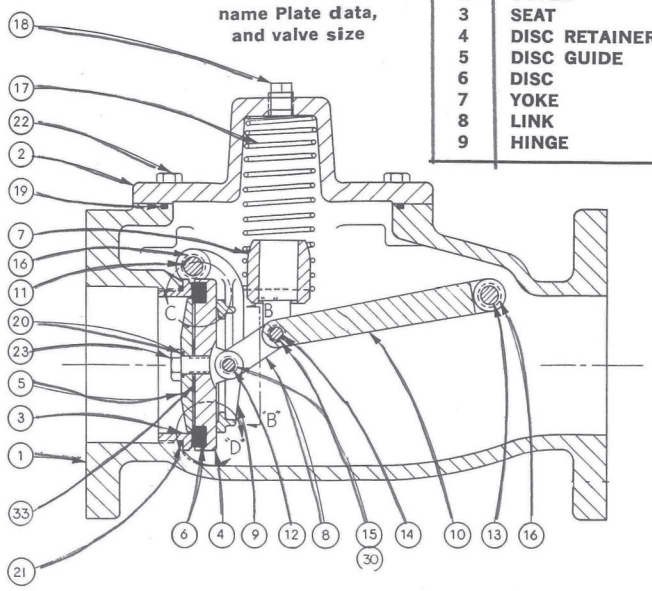


Gate Valves are non-rising stem

3081 TOGGLE LEVER CHECK VALVE

PARTS LIST
When ordering parts specify item No., Description, all name Plate data, and valve size

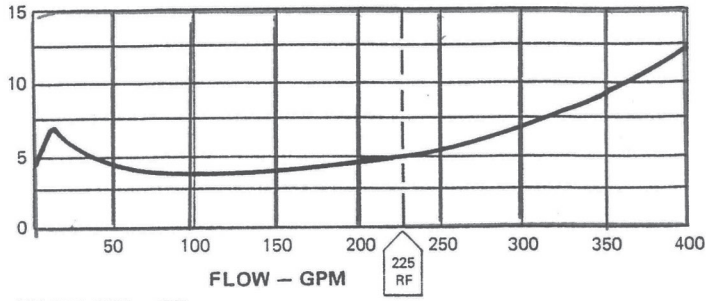
ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	BODY	10	LEVER ARM	19	COVER SEAL
2	COVER	11	HINGE PIN	20	DISC GUIDE "O" RING
3	SEAT	12	DISC RETAINER PIN	21	SEAT "O" RING
4	DISC RETAINER	13	LEVER ARM PIN	22	CAP SCREWS
5	DISC GUIDE	14	LINK PIN	23	DISC GUIDE BOLT (2½" THRU 8")
6	DISC	15	PIN RETAINER	29	HINGE BUMPER (2½" & 3" ONLY)
7	YOKE	16	BUSHING	33	FIBER SPACER
8	LINK	17	SPRING		
9	HINGE	18	PLUG		



FLOW CURVES

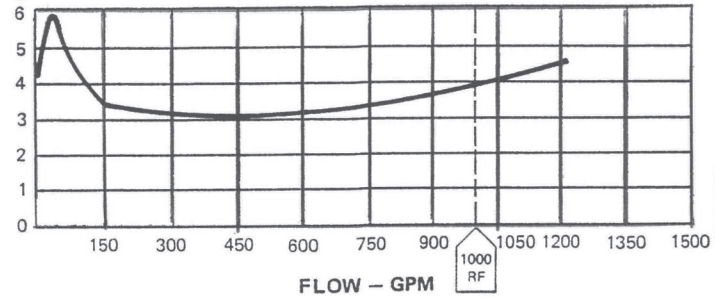
HEADLOSS – PSI

2½" MODEL 27



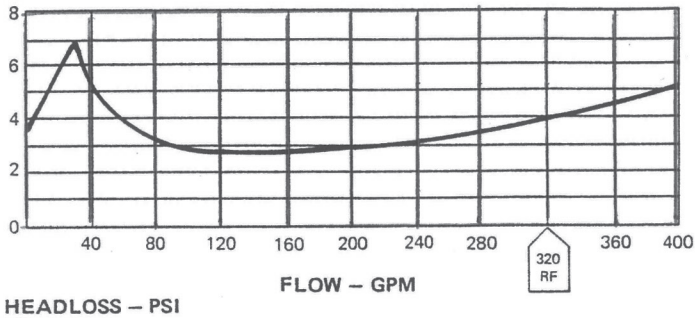
HEADLOSS – PSI

6" MODEL 27



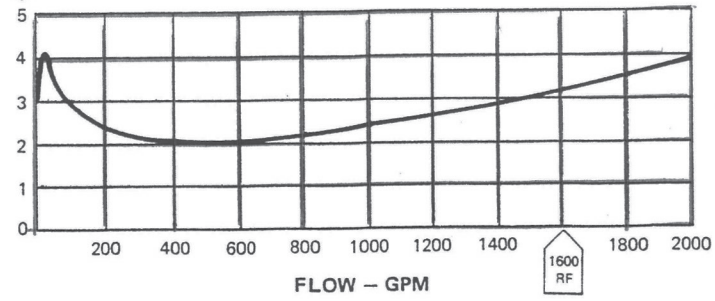
HEADLOSS – PSI

3" MODEL 27



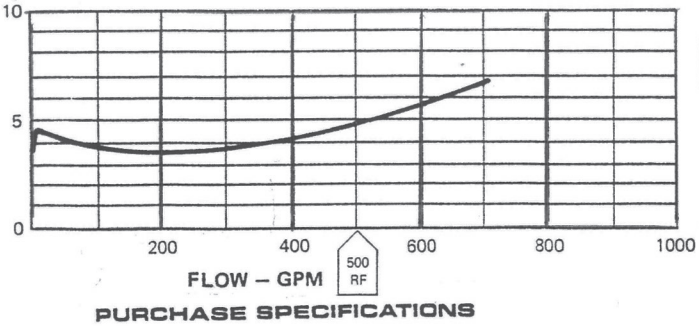
HEADLOSS – PSI

8" MODEL 27



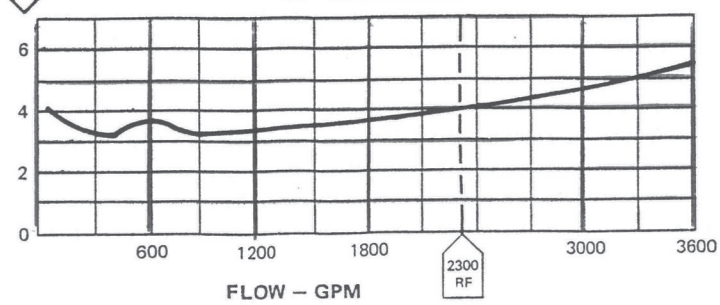
HEADLOSS – PSI

4" MODEL 27



HEADLOSS – PSI

10" MODEL 27



PURCHASE SPECIFICATIONS

The Pressure-Type Vacuum Breaker Assembly shall be a complete unit consisting of two independently acting spring loaded toggle lever check valves, an opening to atmosphere on the discharge side of the second check valve, two shut-off valves and four test cocks arranged so that a test of each check valve can be made. The spring loading of the check valves shall be sufficient to hold at least 1 PSI in the direction of flow. The head loss across the entire unit shall not exceed 10 PSI at the rated flow.

The opening to atmosphere shall be arranged so that it begins to open at no less than 1 PSI and is fully open at atmospheric pressure. All internal parts of the toggle lever check valves and the air inlet valve must be removable or replaceable without removal of the unit from the line. All materials shall be corrosion resistant. Where ferrous metals are used they shall be protected against corrosion. The Assembly shall be similar in all respects to the Model 27 Pressure-Type Vacuum Breaker Assembly as manufactured by Cla-Val Co., Newport Beach, California 92663, or approved equal.

CLA VAL

DOUBLE CHECK ASSY

DC6L
DC7L
DC8L
DC8N
DC8V
DD7L
DD8L
DD8N
DD8V

REDUCED PRESSURE ASSY

RP6L
RP7L
RP8L
RP8N
RP8V
RD7L

DESCRIPTION

Cla Val entered into a private labeling agreement with Febco and received permission to put their name on certain Febco Models. Cla Val sold these assemblies from 1995-2001. The only change was in the color of epoxy utilized. Febco used a grey fused epoxy. The Cla Val models were delivered with a blue fused epoxy. From 1998 -2001 production was changed and only grey epoxy was provided.

For specifications and parts see the following Febco breakdowns:

DOUBLE CHECK ASSY

Cla Val	Febco
DC6L	805Y
DC7L	805YD
DC8L	850
DC8N	870
DC8V	870V
DD7L	806YD
DD8L	856
DD8N	876
DD8V	876V

REDUCED PRESSURE ASSY

Cla Val	Febco
RD7L	826YD
RP6L	825Y
RP7L	825YD
RP8L	860
RP8N	880
RP8V	880V

CLA VAL FACTORY REPAIR INFORMATION

The following pages are excerpts from literature the manufacturers print to help repair their assemblies. This information is provided to assist in repairing their assemblies but should not be considered all the information needed to repair all situations.

MODELS FOR WHICH FACTORY REPAIR INFORMATION IS PROVIDED

MODEL D pg 4-62

MODEL D EX pg 4-62

MODEL D2 pg 4-61

MODEL 16 pg 4-62

MODEL RP1 pg 4-62

MODEL 27 pg 4-62

MODEL RP1-EX pg 4-62

MODEL RP2 pg 4-61

For repair information on Febco private label series please see the corresponding Febco Model.

PAGES 4-34 THROUGH 4-59 HAVE INTENTIONALLY BEEN OMITTED

DISASSEMBLY - POPPET CHECK VALVE #1 AND #2

3/4-1 1/2"

Removing four cap screws releases the cover assembly. Spring tension should force the cover out of the recess in the upper portion of the check valve housing. Inspect the cover o-ring for evidence of pinching or other damage. Replace if necessary.

Lift out the spring (green for #1 check valve, orange for #2 check valve). Lift out the poppet assembly.

Inspect all parts for wear or scale buildup, and clean or replace as necessary. Inspect the disc for distortion, cleanliness and evidence of excessive imbedding of the seat.

TO DISASSEMBLE THE POPPET ASSEMBLY

With the delrin stem and disc retainer:

Hold the disc retainer in one hand, and with an allen wrench of the proper size, remove the stem from the disc retainer. Replace the disc as necessary.

When changing discs in the RP-2/D-2 poppet check valves, lubricating BOTH sides of the disc that contact the delrin disc retainer and disc guide permits easier assembly (less torque to tighten the disc retainer on disc guide); ensures a smoother interface between the disc and the seat (eliminates wrinkles in disc caused by friction between disc guide and disc), which produces more favorable head loss characteristics.

Inspect the seat for nicks and cleanliness. In the event the seat is nicked, very fine wet-or-dry sandpaper may be used to "polish out" the blemish.

CAUTION: Use a very fine grade of sandpaper, that will retain the abrasive properties when wet. Polish the inside diameter of the throat and the beveled area of the seat. Polish in as wide an arc as possible, to ensure a proper and continuous match between the seat and disc.

The seat and the seat o-ring should be replaced if a dent/nick in the seat cannot be removed by "polishing". Reassembly of the poppet check valve is reverse of disassembly. Ensure that the HEAVY (green) spring is placed in the first check valve of the reduced pressure principle device.

Follow instructions, "To place in service" and "Testing", set forth in the appropriate technical manual EACH AND EVERY TIME the backflow preventer is disassembled.

DISASSEMBLY OF 3081 CHECK VALVES

2 1/2—10"

CHECK VALVE COVER REMOVAL

It is suggested that jack screws be used when removing or replacing the covers (item 2) of 8" and 10" check valves. 8" check valves use two 5/8-11 althread approximately 8" long, with one wing nut or lever nut on each length of althread. 10" check valves use two 3/4-10 althread approximately 8" long.

Remove two cover bolts (item 22) on opposite side of the bolt circle, and install althread (jack screws) and nuts. Remove remaining cover bolts. Simultaneously, back the wing nut or lever nut off until the spring tension is released. Remove the cover.

NOTE: Carefully examine interior of check valve. Note position of clapper assembly, knee, freedom of movement; and remove all foreign material therein.

TOGGLE-LEVER (CLAPPER) ASSEMBLY REMOVAL

Remove the two pipe plugs (item 31) on each side of the check valve body above the centerline, to expose the lever arm pin (item 13) and the hinge pin (item 11). Using a brass rod (smaller in diameter than the pins), gently tap out the rear (lever arm) pin first.

CAUTION: Support the lever arm (item 10) while completely removing the lever arm pin. Let the lever arm rest gently in the bottom of the check valve.

NOTE: On 8" and 10" sizes, a lever arm spacer (item 26) is installed between the two lever arms to maintain proper distance between them, and prevent binding.

Grasp the yoke (item 7) with one hand, while removing the front (hinge) pin (item 11). Lift out the toggle-lever (clapper) assembly, being careful that the brass seat (item 3) is not dented.

Prior to disassembly of the clapper assembly, thoroughly and closely examine the area of the disc (item 6) that meets the seat. Pay particular attention to the indentation in the disc made by the seat. Ensure that equal distances between all sides of the disc guide (item 5) and the indentations are present, indicating proper alignment. Inspect for indentations caused by foreign materials between the seat and the disc.

CAUTION: If indentations are discovered on the disc, examine this same relative area of the seat for dents/nicks.

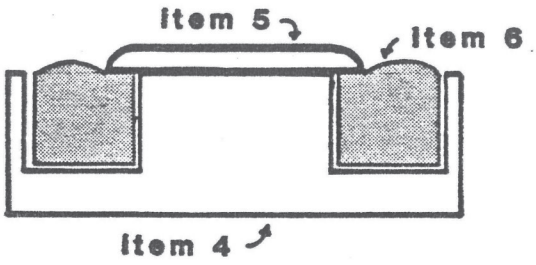
TOGGLE-LEVER (CLAPPER) DISASSEMBLY

Removing the disc guide bolt (item 23) from the center of the disc guide (for 2" through 8"), or sixteen disc guide screws (item 25) from the periphery of the disc guide (item 5) (for 10" only); permits separation of the disc guide from the disc retainer (item 4), and provides access to the disc (item 6).

NOTE: An O-Ring (item 20) is installed on the disc guide bolts in sizes 2½", 3", 4", 6" & 8"

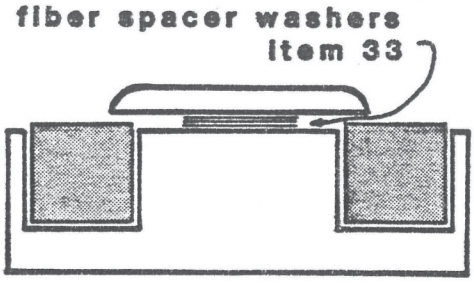
When installing a new disc, fiber spacer washers between the disc retainer and the disc guide MAY or MAY NOT be required. The fiber spacer washers (item 33) are installed, IF REQUIRED, to ensure that the proper "squeeze" on the disc (item 6) is obtained by the disc guide and the disc retainer. Too many fiber spacer washers between the disc guide and disc retainer will not generate sufficient squeeze on the disc (not a water-tight seal), permitting water to get between the disc and disc retainer; pushing the disc out of the disc retainer, giving the disc a "swollen" appearance and resulting in insufficient pressure drop (too little head loss) across that particular check valve.

Not enough fiber spacer washers between the disc guide and disc retainer can generate TOO MUCH squeeze on the disc, causing it to "round off" around the disc guide, resulting again in insufficient pressure drop (too little head loss) across that particular check valve.



NOT ENOUGH

fig.1



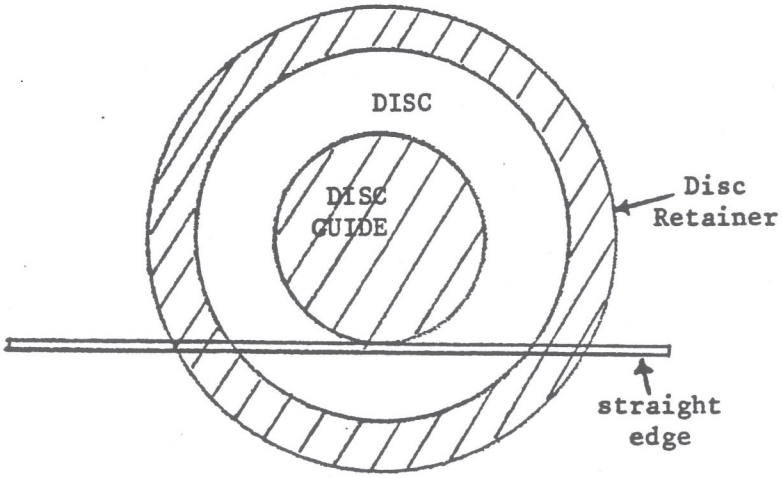
TOO MANY

fig.2

In Fig 1 above, ADD fiber spacer washers (item 33) between the disc guide (item 5) and disc retainer (item 4), until bulge disappears, but disc cannot be rotated.

In Fig 2 above, REMOVE fiber spacer washers between disc guide and disc retainer, until disc cannot be rotated and no bulge appears.

A straight edge just touching the disc guide, the disc and the disc retainer will indicate proper squeeze on the disc WHEN NO LIGHT CAN BE SEEN BETWEEN THE BOTTOM OF THE STRAIGHT EDGE AND THE DISC.



Two grey (thin) and one red (thick) spacer washers with each kit.

Inspect all internal parts for wear, corrosion, erosion or mineral buildup. Thoroughly clean all parts and bearing surfaces; replace any damaged parts.

TOGGLE-LEVER (CLAPPER) REASSEMBLY

Insert disc in disc retainer. Install fiber spacer washers as required, to give the correct amount of squeeze. Insert and tighten the disc guide bolt or disc guide screws as required. Lay the toggle-lever (clapper) assembly aside.

Inspect the seat (item 3) for nicks and cleanliness. In the event the seat is nicked or dented, very fine wet-or-dry sandpaper may be used to "polish out" the blemish. Remove the seat only if damage cannot be polished out.

CAUTION: Use a very fine grade of sandpaper that will retain the abrasive properties when wet.

Polish the inside diameter of the throat and the beveled area of the seat.

Polish in as wide an arc as possible, to ensure a proper and continuous match between the seat and the disc.

ALIGNMENT OF THE CLAPPER ASSEMBLY

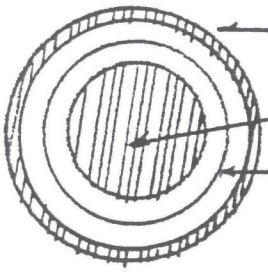
Re-install clapper assembly. Do not permit disc guide to come in contact with the seat. Damage to seat may occur.

Support clapper assembly in one hand, insert through cover cavity and install hinge pin.

With clapper assembly supported by hinge pin only, exert pressure to force disc against the seat, and leave an imprint of the seat in the disc. Remove clapper assembly. Inspect disc to ascertain that alignment is correct.

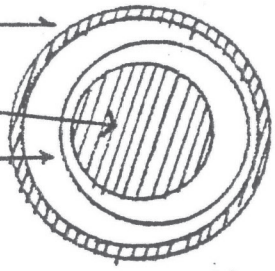
NOTE: Alignment is correct if seat leaves imprint on disc equidistant on all sides of disc guide, as indicated by FIG. 1.

FIG 1



Correct Alignment

FIG 2



Incorrect Alignment

In the event the seat imprint resembles FIG. 2, adjust hinge pin bushing OUT, on side corresponding to least distance between seat imprint and disc guide. In FIG 2 above, adjust hinge pin bushing on your RIGHT out. (For proper perspective, assume that you are looking into the inlet check valve).

REASSEMBLY

To reassemble, reverse the order of disassembly. When installing the toggle-lever (clapper) assembly in the valve body, use care that the valve seat is not nicked or otherwise damaged. When the two pins that hold the toggle-lever (clapper) assembly are installed, be sure to note that the knee (yoke, item 7) of the toggle-lever (clapper) assembly pivots upward freely into the opening.

NOTE: If the toggle-lever (clapper) assembly is installed with the knee pivoting downward, the valve will fail to function.

If both check valve #1 and #2 are disassembled simultaneously, be sure that the HEAVY spring is installed in the #1 check valve cover cavity; and in sizes 2½", 3", 4", 6" & 8", ensure that the finned clapper assembly is installed in the #1 check valve body.

Follow instructions, "To place in service" and "Testing", as set forth in the appropriate technical manual.

Flat in shape. Manufactured in three sizes, for use on different size reduced pressure principle backflow prevention devices, as follows:

CDHS-20	RP-2/RP-1 Size
3/4"	3/4", 1", 1¼" & 1½" RP-2
1¼"	2", 2½" & 3" RP-1
2"	4", 6", 8" & 10" RP-1

Supply (inlet) pressure is transmitted through the high pressure sensing line, and introduced into the intermediate body through the high pressure sensing port. It is directed against the top of the diaphragm, overcomes the spring tension and pushes the disc down against the seat, closing the discharge port.

Pressure from the zone between the two check valves is transmitted through the opening connecting the CDHS-20 to the body of the first check valve, and is directed against the bottom of the diaphragm. This pressure combines with the spring action to push the diaphragm up. This carries the disc away from the seat, and opens the discharge port.

The area of the piston (exposed to atmospheric pressure through the vent in the cover) essentially equlas the area of the disc (that is exposed to atmospheric pressure through the discharge port). The pressures exerted on these areas tend to cancel each other, thereby balancing the relief valve.

Disassembly of the CDHS-20

To remove cover (item 3), remove cover screws (item 20). Four used on 3/4", six on 1¼" and 2" sizes. Remove cover.

To remove intermediate body (item 2), remove all intermediate body cap screws (6 on 3/4", 8 on 1¼" & 12 on 2"), except two, Leave these two on opposite sides of bolt circle.

While exerting pressure downward on the intermediate body to prevent the forcible ejection of the intermediate body by the spring, remove the two remaining intermediate body cap screws. Remove the intermediate body.

Examine the intermediate body assembly closely. Pay particular attention to the condition of the bellofram and diaphragm. Inspect for small pinholes, tears, cleanliness.

Examine the areas near the stem nuts for cleanliness.

To Remove Stem Assembly from the Intermediate Body

With wrenches or sockets of the proper size, on both upper and lower stem nuts (item 16), remove the upper stem nut.

Lift off the piston (item 5), the upper stem o-ring (item 15), the bellofram (item 12) and the retainer plate (item 6). Notice the machined recess in the bottom of the piston that accommodates the upper stem o-ring.

The stem (item 4) may be removed from the intermediate body.

Clean and replace all parts as necessary.

To Remove Diaphragm Assembly from Stem

Using a vice with brass jaws, or two pieces of wood between the jaws of a regular vice, or a wrench; Grasp the stem as near the diaphragm washer (item 7) as possible. With a wrench or socket of the proper size, remove the lower stem nut.

The disc guide (item 10), the disc (item 9) and the disc retainer (item 8) are removed as an assembly. Remove the diaphragm (item 13), the lower stem o-ring (item 15) and the diaphragm washer (item 7) from the stem.

Notice that the diaphragm washer in the 3/4" CDHS-20 is flat, and DOES NOT have a machined recess to accommodate the lower stem o-ring, while the diaphragm washer on the 1½" and 2" CDHS-20 DOES have a machined recess to accommodate the lower stem o-ring.

To Remove Disc from Disc Retainer

Remove the disc guide. It should fall out. Insert a flat, blunt tool through the hole in the disc, between the disc and disc retainer, and pry the disc out.

Reassembly of the CDHS-20

Reassembly is the reverse of disassembly.

Ensure that the disc is completely and firmly under the machined lip of the disc retainer on all sides.

With the stem (long end up) held in a vice with brass jaws, etc., install the diaphragm washer, lower stem o-ring, diaphragm, disc retainer assembly, disc guide and lower stem nut (1½" and 2" CDHS-20).

For 3/4" CDHS-20 - With the stem (either end up), install the diaphragm washer, diaphragm, lower stem o-ring, disc retainer assembly, disc guide and lower stem nut.

Note that the serrated area of the disc retainer is placed against the diaphragm.

Make certain the stem is free of nicks and burrs.

Insert stem, with diaphragm and disc retainer intact, through the delrin bushing in the intermediate body.

Install the retainer plate, bellofram (with GLOSSY surface out; side with printing inside, next to piston), upper stem o-ring, piston and upper stem nut.

Do not over-tighten upper and lower stem nuts. Ensure that they are both snug.

On older 1½" CDHS-20 only: Ensure that the gasket is between the diaphragm and intermediate body. Gasket not required on newer versions.

Insert all but two intermediate body cap screws; through the intermediate body and diaphragm. Leave these two out on opposite side of the bolt circle.

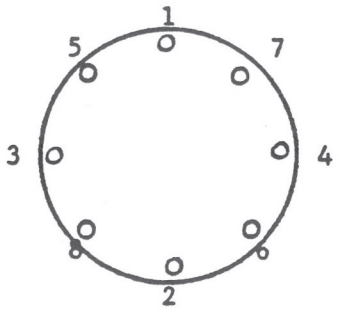
On 3/4" CDHS-20 only: Ensure that the internal sensing port in the cover, the diaphragm and body are properly aligned, and that the diaphragm does not "fold over" and block the sensing port.

Position the the spring over the seat in the main body. Position the body of the CDHS-20, so that the opening to the check valve body (low pressure sensing) is pointing away from you.

On 1½" and 2" CDHS-20: The sensing line will be properly positioned if the sensing port of the intermediate body is positioned between the first and second bolt hole (to your left) of the low pressure sensing opening.

Press the intermediate body down on the body, and hold until two bolts on opposite sides of the bolt circle have been started. Start, and finger-tighten all remaining bolts.

Final tightening of the body bolts should follow the sequence below:



Position the bellofram flat against the upper portion of the intermediate body. Position the cover so that the vent hole is on the opposite side of the sensing line & port. Insert, and tighten the cover retaining screws.

Follow instructions, "To place in Service" and "Testing", set forth in the appropriate technical manual each and every time the pressure differential relief valve is repaired.

CLA-VAL

— MODEL — CDHS-20/24

Supplemental Instructions

Proper installation of the upper rolling diaphragm ("Bellofram") is important on all sizes of the CDHS-20 and CDHS-24 Pressure Differential Relief Valves. These valves are used on CLA-VAL backflow preventers Model RP-1, RP-2, RP-1EX and RP-4. After a repair kit has been installed, the symptom of the relief valve leaking out of the weep hole in the cover often occurs very soon (e.g. - "I think that the diaphragm is defective. The relief valve cycled only a very few times after I installed the repair kit and then it started leaking"). This problem is due to improper re-assembly of the relief valve and not the rolling diaphragm. Please note the following tips:

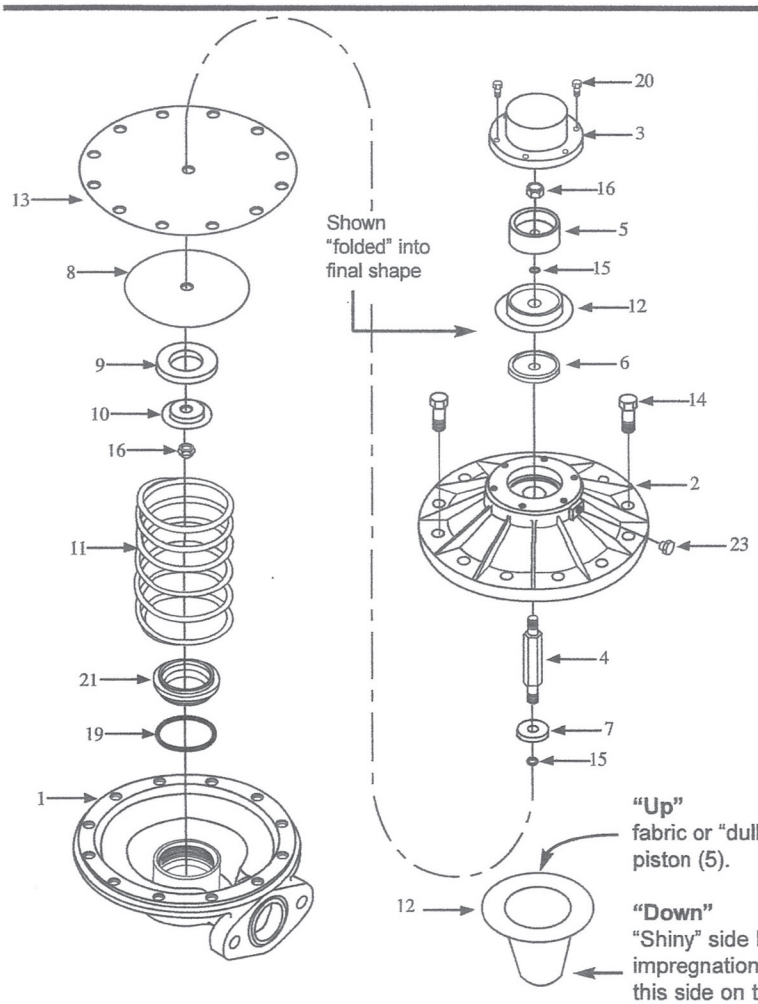
1.) Be sure that the stainless steel retainer plate (6) goes down against the shoulder of the stem (4) (upper end) with its outer lip facing up (or 'concave' side up).

2.) The rolling diaphragm (12) has a 'top hat' shape and is installed next on the stem upside down with the top of the 'hat' down onto the retainer plate. (6) The rolling diaphragm is made with a rubber coating or impregnation on one side only of a fine nylon fabric as it is molded into its shape. It is this rubber coating which must be against the water pressure coming up from the intermediate body of the relief valve, otherwise, the rubber coat will be pushed away from the nylon fabric and fail. Be sure that the "shiny" side or coated side of the rolling diaphragm is down on top of the retainer plate and facing outward (OR the fabric or "dull" side is to be against the piston or inside the 'top hat'). You may have to turn the rolling diaphragm inside out to install it.

3.) Next, Install the O-ring on (15) the stem. Install the piston (5) with the recess around the stem hole facing down towards the O-ring. Install self-locking nut (16) and tighten after installing parts on lower end of stem.

4.) After tightening stem nut, carefully push rolling diaphragm "brim" straight down over itself, so that the "brim" is flat and smooth against the intermediate body (2). Be sure that the rolling diaphragm is not twisted or wrinkled.

5.) Install cover (3) so that weep hole faces out and away from backflow assembly. When installing cover screws (20), alignment of cover screw holes is critical. Do not rotate cover after placing over rolling diaphragm "brim", this will twist the rolling diaphragm and cause it to fail quickly after cover screws are tightened.



For proper installation of rolling diaphragm (12), be sure that:

- After tightening stem nut (16) carefully fold rolling diaphragm "brim" down to shape shown.
- Do not twist cover (3) when installing it.
- Inspect to be sure rolling diaphragm (12) is not twisted or wrinkled. It must be smooth as shown.

Item No.	Description
1	Body
2	Intermediate
3	Cover
4	Stem
5	Piston
6	Retainer
7	Diaphragm Washer
8	Disc Retainer
9	Disc
10	Disc Guide
11	Spring
12	Rolling Diaphragm
13	Diaphragm
14	Hex Head Screw
15	Stem O-Ring
16	Self Locking Nut
19	Seat O-Ring
20	Fill Head Screw
23	Pipe Plug