

KEYSTONE

VALVE USA, INC.

999/992-0
REV. 0 5/93

999 (1"–20") & 992 (2"–20") INSTALLATION AND MAINTENANCE MANUAL

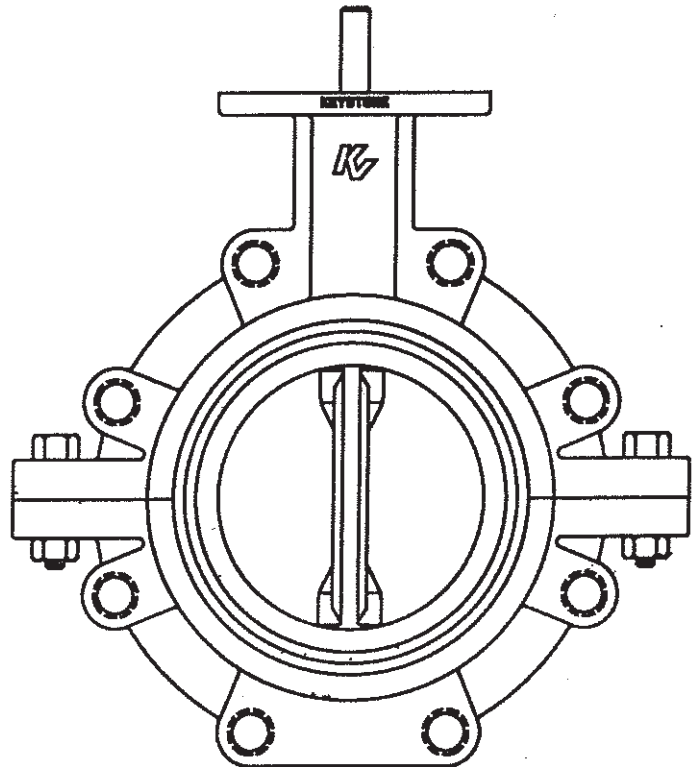
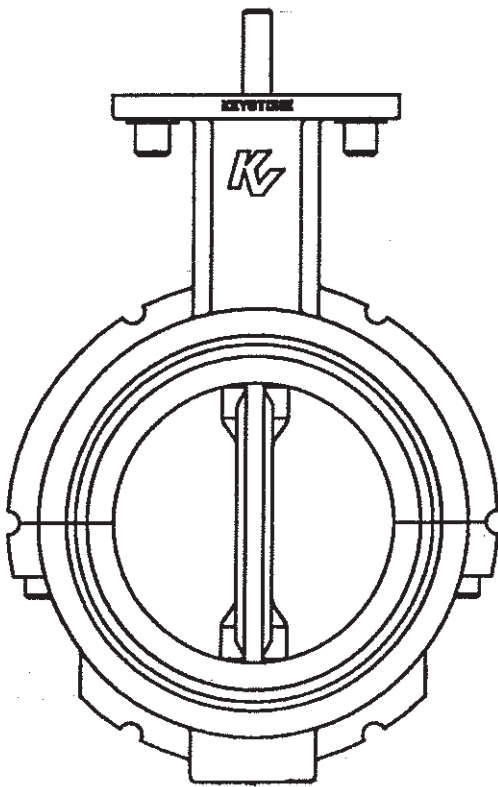


TABLE OF CONTENTS
999/992 VALVES
INSTALLATION AND MAINTENANCE MANUAL

TITLE	PAGE
<i>Flange Requirements</i>	1
<i>Storage</i>	1
<i>Service Locations</i>	1
<i>Installation Instructions</i>	1
<i>Installation Between Pre-Existing Flanges</i>	2
<i>Installation In New Construction Using ANSI Type Flanges</i>	3
<i>Maintenance</i>	3
<i>Valve Disassembly</i>	3
<i>Valve Assembly</i>	6
<i>Troubleshooting</i>	7
<i>SM0826 Drawing/Parts List for 1"-8" 999</i>	9
<i>SM0827 Drawing/Parts List for 10"-20" 999</i>	10
<i>SM0823 Drawing/Parts List for 2"-8" 992</i>	11
<i>SM0824 Drawing/Parts List for 10"-20" 992</i>	12

999/992 INSTALLATION AND MAINTENANCE MANUAL
1" – 20"

FLANGE REQUIREMENTS:

The 999/992 valves are designed for installation between ANSI Class 125/150 flat or raised faced flanges. Gaskets are not required. Lined pipe, heavy wall pipe or flanges must have a minimum allowable inside diameter (See appropriate SM0 drawing at back of manual for the specific valve's "Q" dimension) at the centered body face to clear the disc sealing edge when opening the valve.

STORAGE:

The valves should be stored on a pallet or "skid" in a clean, dry warehouse. If the valves must be stored outside, the following applies:

1. Valves must be kept off the ground and high enough to avoid standing water.
2. Cover the valves with a water repellant cover (not supplied by Keystone).

SERVICE LOCATIONS:

For service or technical information, contact your factory representative;

Keystone Valve U.S.A., Inc.
P.O. Box 40010, Houston TX 77240
Phone (713) 466-1176
Fax (713) 937-5402
Telex 166-038/755-265

INSTALLATION INSTRUCTIONS:

The 999/992 valves are bi-directional and will control flow equally well in either direction. For the best results in slurry service regarding sedimentation, position the valve assembly so that the valve stem is in the horizontal position and the lower disc edge opens downstream. This will create a self-flushing effect, thereby extending the service life of the valve.

Consideration should be given to the location of the valves in the piping system. The valve should not be placed too close to other valves, elbows, etc. as its performance may be affected. It is recommended the valve have a minimum of six pipe diameters upstream (see Illus. 1) and four pipe diameters downstream between it and other valves, elbows, etc. in the piping system. If the valve must be installed less than six pipe diameters of a piping disturbance, the preferred orientation is mounting with the stem parallel to the inlet pipe axis.

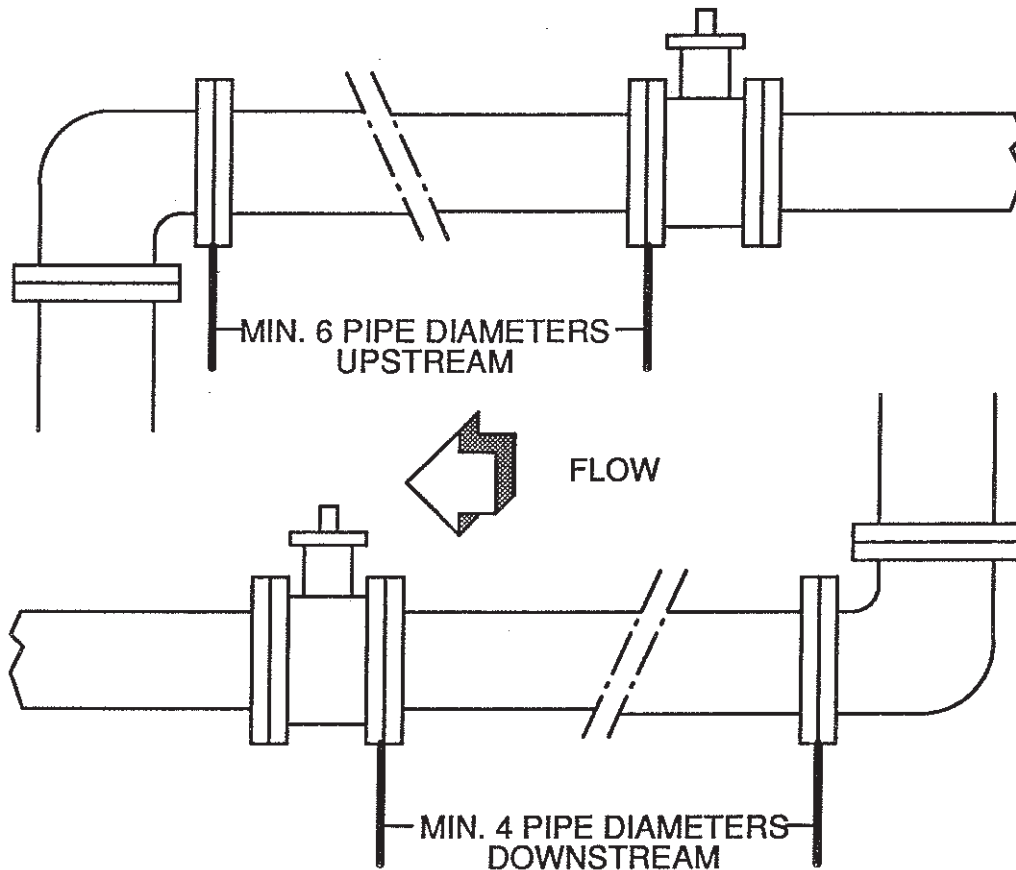


ILLUSTRATION 1

INSTALLATION BETWEEN PRE-EXISTING ANSI FLANGES:

1. Spread the flanges to exceed the valves face-to-face dimension by 3/16" before placing the valve in position to prevent distortion and/or damage to the sealing face of the seat. Remove protective covers from valve prior to installation.
2. Open the valve (counterclockwise) so that the disc is at least 3/8" away from the body face. With the flanges spread, center the valve body between the flanges and span the valve body with all flange bolts possible.
3. Turn the disc to the fully open position and tighten the bolting hand tight. Slowly close the valve clockwise to check for adequate disc clearance.

4. Return the disc to the fully open position and cross-tighten all bolting to the proper torque specification.
5. Again, check for adequate disc clearance. If the installation is satisfactory, the valve is ready for service and/or installing the valve actuator.

INSTALLATION IN NEW CONSTRUCTION USING ANSI WELDING TYPE FLANGES:

1. With the disc in the nearly closed position (ten degrees or less), align and center the companion flange bolt holes to the body scallops (if present) or body lugs.
2. Assemble the body and flanges with the flange bolting and make-up the bolting.
3. Use the flange-body-flange assembly for fit-up and centering to the pipe.
4. Tack weld the flanges to the pipe.
5. Remove the flange bolting and valve assembly from between the flanges.

CAUTION:

Do not finish weld the flanges to the pipe with the valve bolted between the flanges as this will result in serious heat damage to the valve seat.

6. Finish welding the flanges to the pipe and allow the flanges to cool completely before proceeding. Remove and clean weld spatter from pipe I.D.
7. Follow steps 2 thru 5 of "INSTALLATION BETWEEN PRE-EXISTING ANSI FLANGES."

MAINTENANCE:

Routine maintenance or lubrication is not required.

VALVE DISASSEMBLY:

CAUTION:

Do not attempt to remove an actuator from a valve that is under pressure. Doing so may cause the actuator to swing violently. Isolate the valve by closing the valves that are just upstream and then downstream (in that order) of the valve before attempting to remove the actuator or close upstream valves and assure line is vented.

1. Turn the disc to the nearly closed position (ten degrees or less), loosen and remove all flange bolting. Spread the flanges if necessary and remove the valve from the pipeline.

2. Turn the disc to where it is almost out of the seat. Remove the actuator if still mounted.

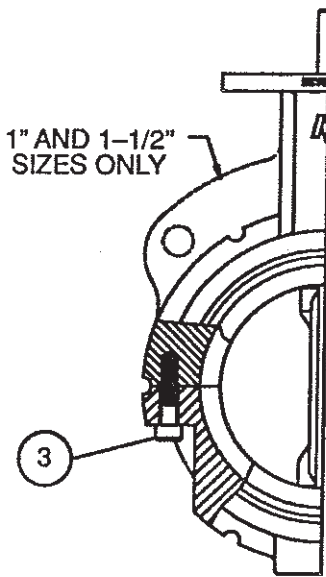


FIGURE 999
1"-8"

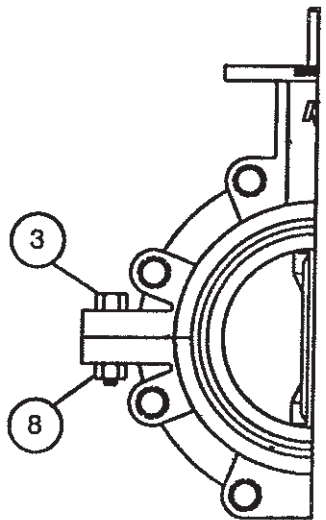


FIGURE 992
2"-8"

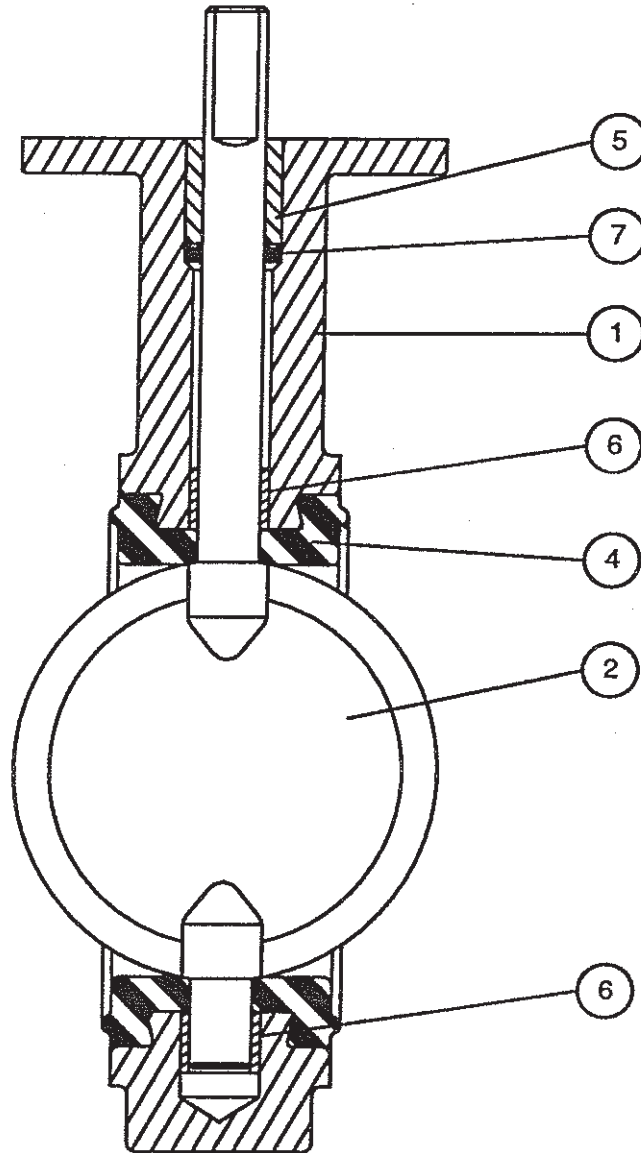


FIGURE 999
LEGEND

- 1. BODY
- 2. DISC-STEM
- 3. SCREW
- 4. SEAT
- 5. BUSHING
- 6. BEARING
- 7. PACKING

FIGURE 992
LEGEND

- 1. BODY
- 2. DISC-STEM
- 3. SCREW
- 4. SEAT
- 5. BUSHING
- 6. BEARING
- 7. PACKING
- 8. NUT

999 (1"-8") & 992 (2"-8")
VALVE PARTS

ILLUSTRATION 2

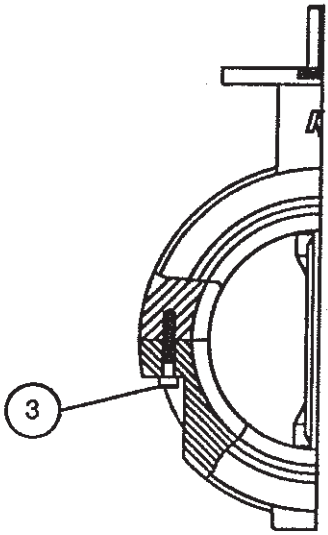


FIGURE 999
10"-20"

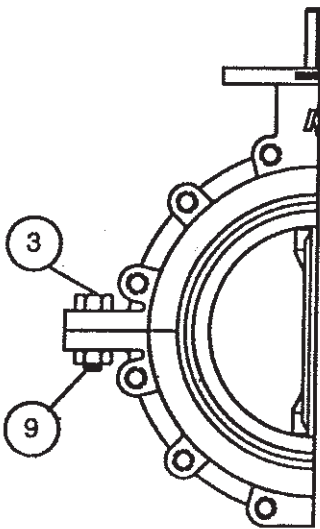


FIGURE 992
10"-20"

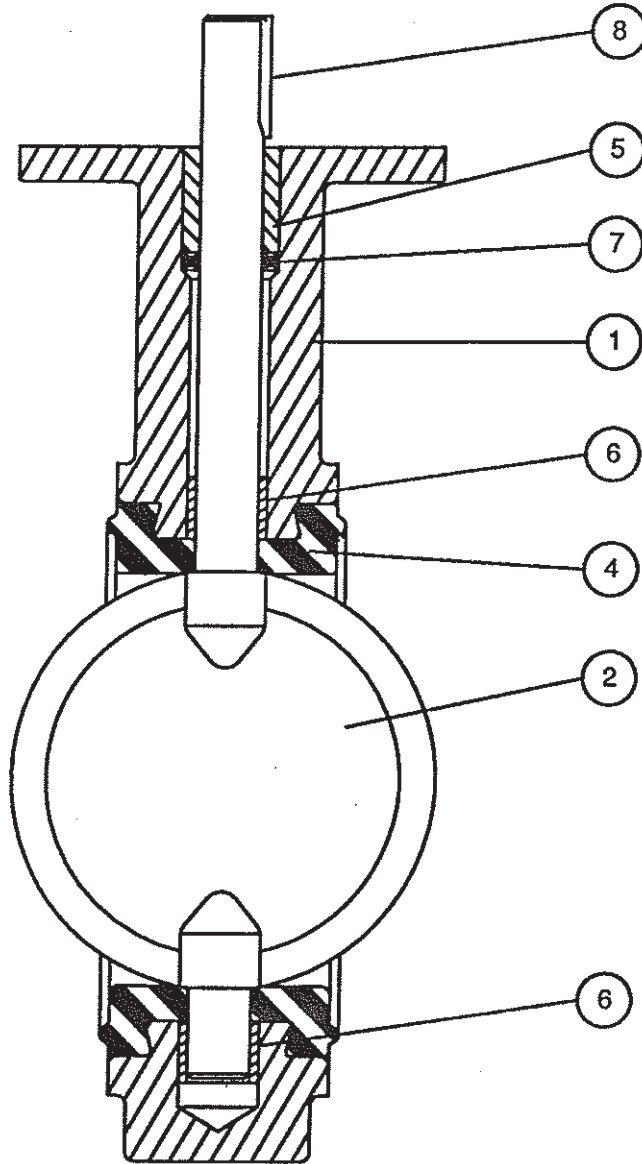


FIGURE 999
LEGEND

- 1. BODY
- 2. DISC-STEM
- 3. SCREW
- 4. SEAT
- 5. BUSHING
- 6. BEARING
- 7. PACKING
- 8. KEY

FIGURE 992
LEGEND

- 1. BODY
- 2. DISC-STEM
- 3. SCREW
- 4. SEAT
- 5. BUSHING
- 6. BEARING
- 7. PACKING
- 8. KEY
- 9. NUT

999 (10"-20") & 992 (10"-20")
VALVE PARTS

ILLUSTRATION 3

3. Remove body screws for a 1"–8" valve (see illus. 2, pc. 3), or the body screws for 10"–20" valves (see illus. 2, pc. 3) and separate the body halves
4. Remove the upper and lower body halves from the seat (illus. 2 & 3, pc. 4) and the stem shafts.
5. Remove the seat (Illus. 2 & 3, pc. 4) from the disc–stem (illus. 2 & 3, pc. 2) by elongating the seat (oval shape) in the direction of the stem shaft and remove the lower stem from the seat. The entire disc–stem (illus. 2 & 3, pc. 2) may then be removed from the seat (illus. 2 & 3, pc. 4).
6. If needed, remove the upper and lower bearings (illus. 2 & 3, pc. 6) and inspect for excessive wear. Replace if needed.
7. If needed, remove the upper bushing (Illus. 2 & 3, pc. 5) and inspect for damage. Replace if needed.
8. If needed, remove the stem packing (Illus. 2 & 3, pc. 7) after bushing removal and inspect for tears or deterioration. Replace if removed from stem bore.

VALVE ASSEMBLY:

1. Clean all reusable parts. If possible use silicone base oil or lubricant to facilitate assembly. (Hydrocarbon base lubricants may damage some elastomer seat materials).
2. Install the bearings (illus. 2 & 3, pc. 6) if removed.
3. Assemble the disc–stem (illus. 2 & 3, pc. 2) into the new seat in reverse order of disassembly.
4. Install body halves on upper and lower stem shafts in the same orientation as they were prior to disassembly.
5. Seat body halves into the dove tail of the seat such that upper and lower body halves meet at the splits.
6. Install body screws (illus. 2 & 3, pc. 3) and tighten snugly. 10"–20" 992 valves will have nuts (illus. 2, pc. 8/Illus. 3 pc. 9) that are used to tighten the screws snugly.
7. Cycle the valve to check operability and proper disc closure.
8. Install the packing (Illus. 2 & 3., pc. 7).
9. Install the upper stem bushing (Illus. 2 & 3, pc. 5).

TROUBLESHOOTING		
SYMPTOM	PROBABLE CAUSE	SOLUTION
VALVE OPENS ONLY A FEW DEGREES AND STOPS (IT WILL NOT OPEN TO THE FULL ANGLE DESIRED).	IMPROPER INSTALLATION. THE VALVE IS IMPROPERLY ALIGNED.	LOOSEN THE FLANGE BOLTS, REALIGN THE VALVE WITH FLANGES, AND RETIGHTEN THE FLANGE BOLTS TO CORRECT TORQUE PER ANSI REQUIREMENTS.
LEAKAGE PAST THE FLANGE FACE.	1. FLANGE BOLTS ARE NOT EVENLY TORQUED.	1. LOOSEN THE FLANGE BOLTS AND TIGHTEN THE FLANGE BOLTS TO CORRECT TORQUE PER ANSI REQUIREMENTS.
	2. IMPROPER FLANGES.	2. REFER TO "FLANGE REQUIREMENTS" ON PAGE 1.
LEAKAGE IN THE CLOSED POSITION (LEAKAGE IN THE PIPELINE).	THE DISC IS NOT CLOSING FULLY: 1. ACTUATOR IS NOT PROPERLY ADJUSTED OR SEATING TORQUE EXCEEDS ACTUATOR OUTPUT CAPACITY.	1. REFER TO ACTUATOR ADJUSTMENT PROCEDURES OR CONSULT THE FACTORY (OR LOCAL REP.).
	2. DAMAGED SEAT.	2. REPLACE SEAT.
	3. LINE PRESSURE EXCEEDS VALVE'S WORKING PRESSURE.	3. REDUCE LINE PRESSURE TO VALVE WORKING PRESSURE.
	4. DAMAGED VALVE DISC.	4. REPLACE DISC.
LEAKAGE AT THE VALVE STEM.	PACKING/BUSHING FAILURE.	1. REFER TO "VALVE DISASSEMBLY PROCEDURES."
LEAKAGE AT BODY SPLIT CONNECTION.	STEM HOLE IN SEAT (SECONDARY SEAL) DAMAGED DURING ASSEMBLY.	1. REPLACE SEAT.

TROUBLESHOOTING (CONT.)		
SYMPTOM	PROBABLE CAUSE	SOLUTION
WATER HAMMER	THE VALVE IS CLOSING TOO QUICKLY.	ADJUST THE ACTUATOR.
EXCESSIVELY HIGH TORQUE.	1. OBSTRUCTION IN THE PIPELINE.	1. REMOVE VALVE FROM PIPELINE AND REMOVE OBSTRUCTION.
	2. VALVE STEM OR DISC BENT.	2. RETURN VALVE TO FACTORY FOR DISC/STEM REPLACEMENT (CHECK FOR WATER HAMMER OR FREEZING OF LINE MATERIAL).
	3. SCALE BUILD-UP ON DISC OR SEAT.	3. OPEN AND CLOSE THE VALVE SEVERAL TIMES. OPERATE THE VALVE AT LEAST ONCE A MONTH. CHECK THE VALVE SEAT FOR DETERIORATION.
	4. SEAT DAMAGE.	4. CHECK SEAT FOR DAMAGE AND REPLACE IF NECESSARY.
	5. VALVE IMPROPERLY INSTALLED.	5. DISASSEMBLY VALVE AND RE-ASSEMBLY PER INSTRUCTIONS.

VALVE DIMENSIONS

SIZE	TOP PLATE DRILLING											ADAPT. CODE		
	A	B	C	D	Q	WEIGHT (LBS.)	E	F	G	H	BOLT CIRCLE		NO. HOLES	HOLE DIA.
1	1 3/16	2 7/16	3 1/8	1 1/8	5/8	1 1/2	2 1/4	3/4	3/8	1/4	1 3/4	4	1/4	AAA
1 1/2	1 3/4	3 7/32	3 1/16	1 3/16	1 7/16	2 1/4	2 1/4	3/4	3/8	1/4	1 3/4	4	1/4	AAA
2	2	4 1/8	3 5/16	1 5/8	1 3/8	6	4	1 1/4	9/16	3/8	3 1/4	4	7/16	BAB
2 1/2	2 1/2	4 7/8	4 1/2	1 3/4	2 1/16	8	4	1 1/4	9/16	3/8	3 1/4	4	7/16	BAB
3	3	5 3/8	4 7/8	1 3/4	2 9/16	9	4	1 1/4	9/16	3/8	3 1/4	4	7/16	BAB
4	4	6 7/8	6	2	3 5/8	11	4	1 1/4	5/8	7/16	3 1/4	4	7/16	BAC
5	5	7 3/4	6	2 1/8	4 3/4	15	4	1 1/4	3/4	1/2	3 1/4	4	7/16	BAD
6	5 3/4	8 3/4	6 1/2	2 1/8	5 1/2	17	4	1 1/4	3/4	1/2	3 1/4	4	7/16	BAD
8	7 3/4	11	8 5/16	2 1/2	7 1/2	29	6	1 1/4	7/8	5/8	5	4	9/16	CAE

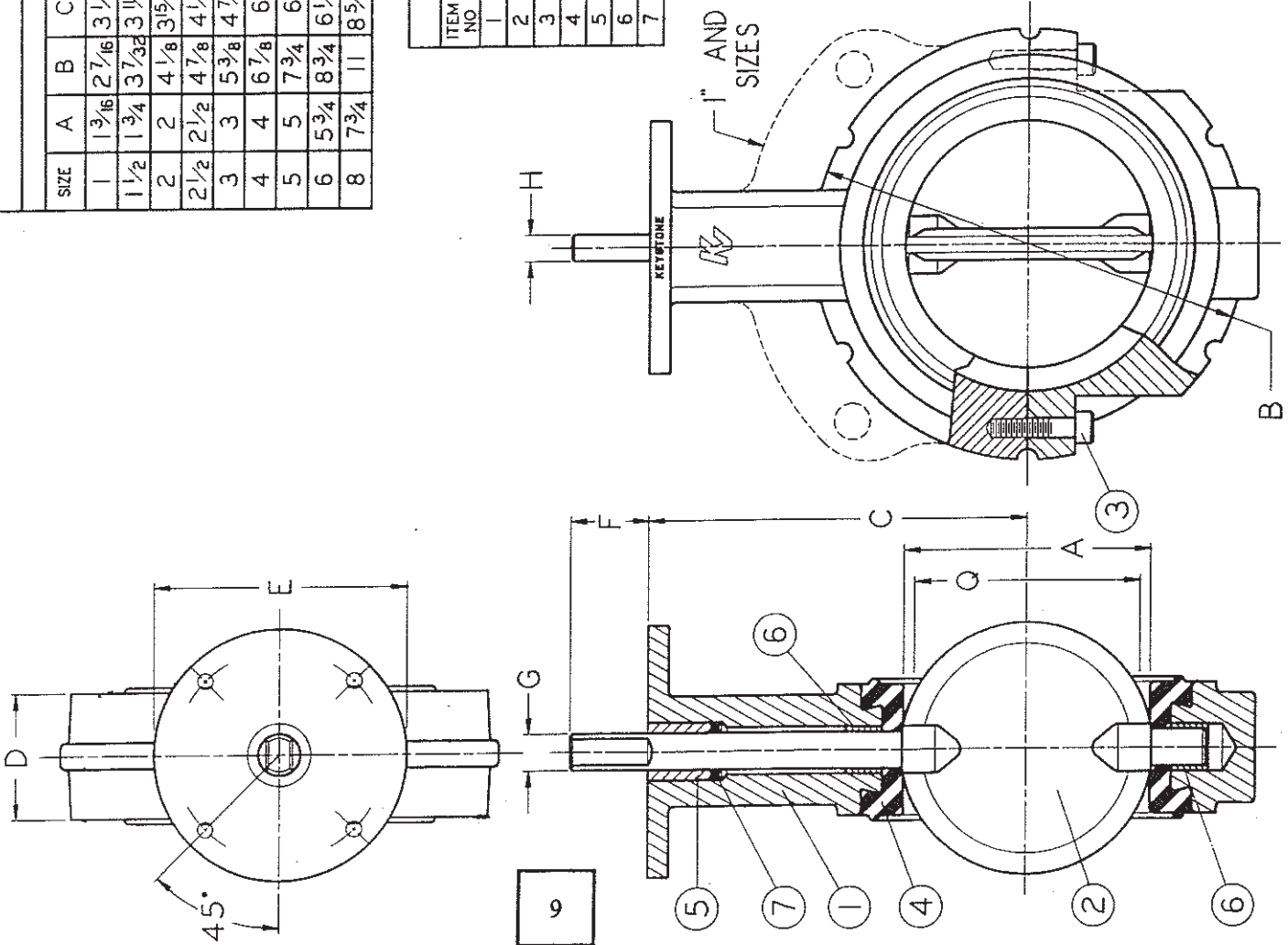
PARTS LIST

ITEM NO	NAME	NO. REQ'D.	PART NO. & FIG. NO.	REMARKS
1	BODY	1	203-999	203-999 FOR 3" AND 5" VALVES
2	DISC-STEM	1	234-999	234-999 FOR 1" AND 1-1/2" VALVES
3	SCREW	2	905-735	
4	SEAT	1	206-999	206-999 FOR 1" AND 1-1/2" VALVES
5	BUSHING	1	207-100	207-099 FOR 1" AND 1-1/2" VALVES
6	BEARING	2	930-001	2" - 8" ONLY
7	PACKING	1	928-100	927-130 FOR 1" AND 1-1/2" VALVES (O-RING)

1" AND 1-1/2" SIZES ONLY

NOTES:

- THE VALVE IS RATED AT 100 PSI PRESSURE DIFFERENTIAL IN THE CLOSED POSITION WITH A TEFLON DISC AND 150 PSI PRESSURE DIFFERENTIAL WITH A METAL DISC.
- BODY O.D. WHEN BODY PLACED BETWEEN ANSI CLASS 125/150 FLANGES, TO BE CENTERED AND SPANNED BY THE FLANGE BOLTING. SEE "B" DIMENSION.
- "Q" DIMENSION IS THE MINIMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISC SEALING EDGE AGAINST DAMAGE WHEN OPENING THE VALVE.



KEYSTONE
VALVE USA, INC.

VALVE ASSY
FIG 999
1 - 8

SMO826

012509 ERW 470 BB 470
NOTE: DRAWN DATE CHECK DATE

SHEET 1 OF 1

VALVE DIMENSIONS

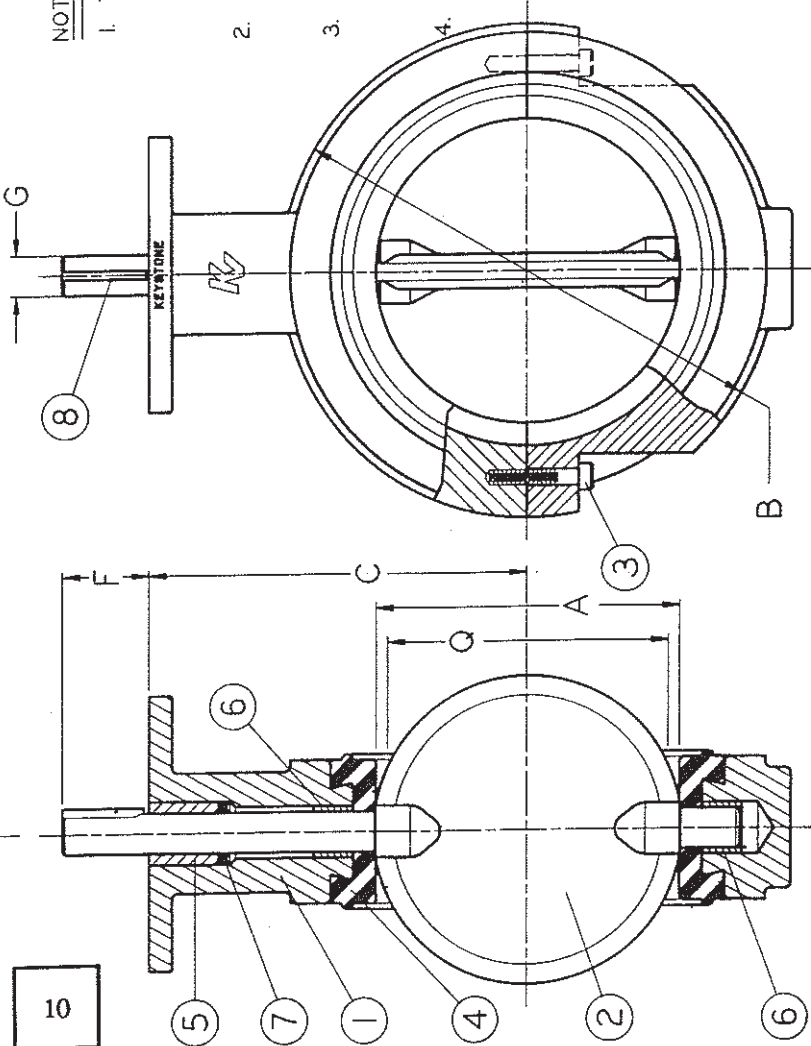
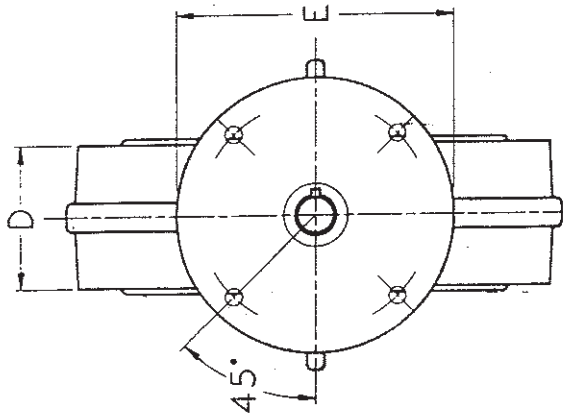
SIZE	A	B	C	D	Q	WEIGHT (LBS.)	E	F	G	KEY	TOP PLATE DRILLING			
											BOLT NO. CIRCLE HOLES	HOLE DIA.	ADAPT. CODE	
10	9 3/4	13 1/4	9	2 1/2	9 19/32	44	6	2	1 1/8	1/4 x 1/4	5	4	9/16	CAF
12	11 3/4	16 1/8	10 5/8	3	11 9/16	85	6	2	1 1/8	1/4 x 1/4	5	4	9/16	CAF
14	13 1/4	16 7/8	12	3	13 1/8	105	6	3	1 3/8	5/16 x 5/16	5	4	9/16	CAG
16	15 1/4	19 1/4	12 5/64	4	15	180	6	3	1 5/8	3/8 x 3/8	5	4	9/16	CAH
18	17 3/8	21 1/2	14 1/2	4 1/4	17	222	8	4 1/4	1 7/8	1/2 x 3/8	6 1/2	4	13/16	DAJ
20	19 3/8	23 3/4	15 7/8	5	18 7/8	315	8	4 1/4	1 7/8	1/2 x 3/8	6 1/2	4	13/16	DAJ

PARTS LIST

ITEM NO.	NAME	NO. REQD.	PART NO. & FIG. NO.	REMARKS
1	BODY	1	203-999	203-999 FOR 12" VALVE
2	DISC-STEM	1	234-099	234-099 FOR 14" AND 16" (W/TEFLON COVERED DISC)
3	SCREW	2	905-735	
4	SEAT	1	206-999	206-100 FOR 14" AND 16" VALVES
5	BUSHING	1	207-100	
6	BEARING	2	930-001	10" AND 12" ONLY
7	PACKING	1	928-100	
8	KEY	1	913-735	

NOTES:

1. THE VALVE RATED PRESSURE DIFFERENTIAL IN THE CLOSED POSITION: 10" AND 12" - 150 PSI W/316 SS DISC. 10" AND 12" - 100 PSI W/TEFLON COVERED DISC. 14" AND 20" - 75 PSI (ALL CONST.)
2. BODY O.D., WHEN BODY PLACED BETWEEN ANSI CLASS 125/150 FLANGES, TO BE CENTERED AND SPANNED BY THE FLANGE BOLTING. SEE "B" DIMENSION.
3. "Q" DIMENSION IS THE MINIMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISC SEALING EDGE AGAINST DAMAGE WHEN OPENING THE VALVE.
4. CAUTION: SIZES 14" - 20" CANNOT BE USED WITH LINED SCHEDULE 40 PIPE.



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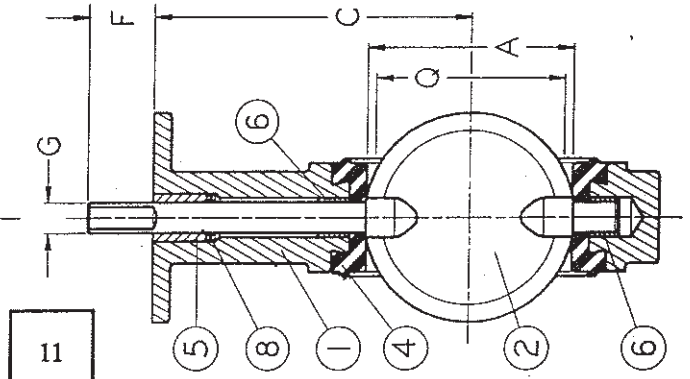
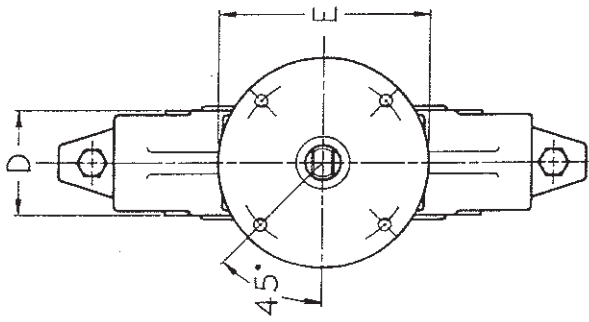
VALVE ASSY
FIG 999
10" - 20"

SM0827

0.12502	ERW	470	B.B.	470
NO. ECN	DRAWN	DATE	CHECK	DATE

VALVE DIMENSIONS

SIZE	TOP PLATE DRILLING								TAPPED LUG DATA		ADAPT. CODE					
	A	B	C	D	Q	WEIGHT (LBS.)	E	F	G	H		BOLT CIRCLE	HOLE DIA.	BOLT CIRCLE	NO. HOLES	TAP
2	4 3/4	3 15/16	1 5/8	1 3/8	1 3/8	7 1/2	4	1 1/4	9/16	3/8	3 1/4	7/16	4 3/4	4	5/8-11UNC	BAB
2 1/2	4 1/2	4 1/2	1 3/4	2 1/16	2 1/16	8	4	1 1/4	9/16	3/8	3 1/4	7/16	5 1/2	4	5/8-11UNC	BAB
3	6	4 7/8	1 3/4	2 9/16	2 9/16	11	4	1 1/4	9/16	3/8	3 1/4	7/16	6	4	5/8-11UNC	BAB
4	7 1/2	6	2	3 5/8	3 5/8	17	4	1 1/4	5/8	7/16	3 1/4	7/16	7 1/2	8	5/8-11UNC	BAC
5	8 1/2	6	2 1/8	4 3/4	4 3/4	21	4	1 1/4	3/4	1/2	3 1/4	7/16	8 1/2	8	3/4-10UNC	BAD
6	9 1/2	6 1/2	2 1/8	5 1/2	5 1/2	26	4	1 1/4	3/4	1/2	3 1/4	7/16	9 1/2	8	3/4-10UNC	BAD
8	11 3/4	8 5/16	2 1/2	7 1/2	7 1/2	42	6	1 1/4	7/8	5/8	5	9/16	11 3/4	8	3/4-10UNC	CAE



PARTS LIST

ITEM NO	NAME	NO. REQD.	PART NO. REQD. & FIG. NO.	REMARKS
1	BODY	1	203-992	
2	DISC-STEM	1	234-999	
3	SCREW	2	905-735	
4	SEAT	1	206-999	
5	BUSHING	1	207-100	
6	BEARING	2	930-001	
7	NUT	2	903-735	
8	PACKING	1	928-100	

NOTES:

1. THE VALVE BETWEEN FLANGES IS RATED AT 100 PSI PRESSURE DIFFERENTIAL IN THE CLOSED POSITION WITH A TEFLON COVERED DISC, AND 150 PSI PRESSURE DIFFERENTIAL WITH A METAL DISC.
2. BODY IS WAFER LUG TYPE WITH DRILLED AND TAPPED LUGS TO ANSI CLASS 125/150 FLANGE STANDARDS. (NOT FOR ANSI CLASS 250/300 FLANGES).
3. "Q" DIMENSION IS THE MINIMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISC SEALING EDGE AGAINST DAMAGE WHEN OPENING THE VALVE.

KEYSTONE
VALVE USA, INC.

VALVE ASSY
FIG 992
2-8"

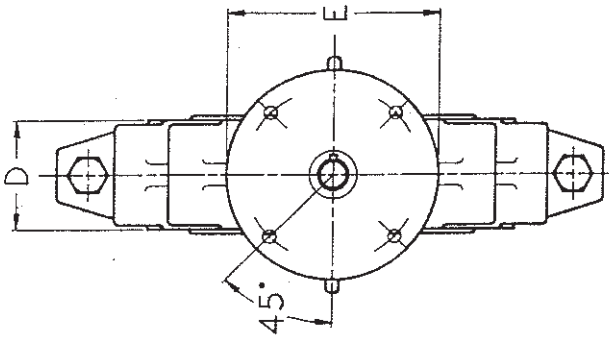
SM0823

012560 IRW 4/90 B.B. 4/90
NO. ECN DRAWN DATE CHECK DATE

SHEET 1 OF 1

VALVE DIMENSIONS

SIZE	TOP PLATE DRILLING										TAPPED LUG DATA		ADAPT. CODE				
	A	B	C	D	Q	WEIGHT (LBS.)	E	F	G	KEY	BOLT CIRCLE DIA.	HOLE DIA.		NO. HOLES	BOLT NO.	CIRCLE HOLES	TAP
10	9 3/4	4 1/4	9	2 1/2	9 19/32	65	6	2	1 1/8	1/4 x 1/4	5	4	9/16	14 1/4	12	7/8-9UNC	CAF
12	11 3/4	17	10 5/8	3	11 9/16	108	6	2	1 1/8	1/4 x 1/4	5	4	9/16	17	12	7/8-9UNC	CAF
14	13 1/4	18 3/4	12	3	13 1/8	127	6	3	1 3/8	1/4 x 1/4	5	4	9/16	18 3/4	12	1-8UNC	CAG
16	15 1/4	20 3/8	12 5/8	4	15	144	6	3	1 5/8	3/8 x 3/8	5	4	9/16	21 1/4	16	1-8UNC	CAH
18	17 3/8	22 3/8	14 1/2	4 1/4	17	165	8	4 1/4	1 7/8	1/2 x 3/8	6 1/2	4	13/16	22 3/4	16	1 1/8-7UNC	DAJ
20	19 3/8	24 1/2	15 7/8	5	18 7/8	218	8	4 1/4	1 7/8	1/2 x 3/8	6 1/2	4	13/16	25	20	1 1/8-7UNC	DAJ

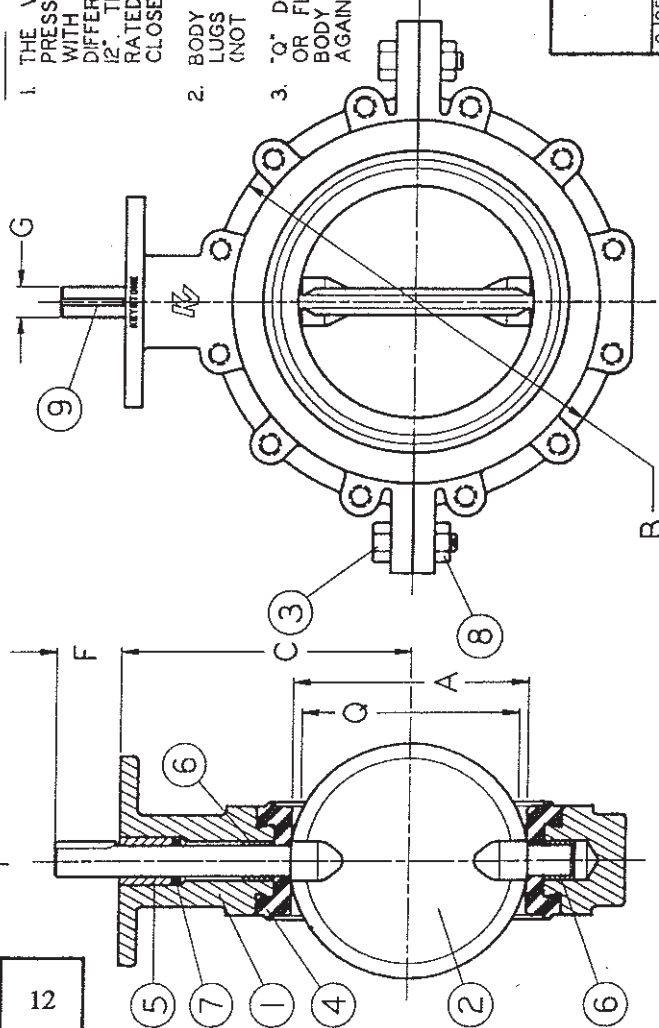


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ITEM NO.	NAME	NO. REQD.	PART NO. & FIG. NO.	REMARKS
1	BODY	1	203-992	
2	DISC-STEM	1	234-999	
3	SCREW	2	905-735	
4	SEAT	1	206-999	
5	BUSHING	1	207-100	
6	BEARING	2	930-001	10" AND 12" ONLY
7	PACKING	1	928-100	
8	NUT	2	903-735	
9	KEY	1	913-735	

NOTES:

1. THE VALVE BETWEEN FLANGES IS RATED AT 100 PSI PRESSURE DIFFERENTIAL IN THE CLOSED POSITION. WITH A TEFLON COVERED DISC, AND 150 PSI PRESSURE DIFFERENTIAL WITH A METAL DISC FOR SIZES 10" AND 12". THE 14" THRU 20" VALVE BETWEEN FLANGES IS RATED AT 75 PSI PRESSURE DIFFERENTIAL IN THE CLOSED POSITION WITH A TEFLON OR METAL DISC.
2. BODY IS WAFER LUG TYPE WITH DRILLED AND TAPPED LUGS TO ANSI CLASS 125/150 FLANGE STANDARDS. (NOT FOR ANSI CLASS 250/300 FLANGES).
3. "Q" DIMENSION IS THE MINIMUM ALLOWABLE PIPE OR FLANGE INSIDE DIAMETER AT THE CENTERED BODY FACE TO PROTECT THE DISC SEALING EDGE AGAINST DAMAGE WHEN OPENING THE VALVE.



KEYSTONE
VALVE USA, INC.

VALVE ASSY
FIG 992
10-20

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Q12560 ERW 490 RB 40M
NO. ECN DRAWN DATE CHECK DATE

SHEET 1 OF 1