ECCENTRIC PLUG VALVES

KENNEDY VALVE

Size Range	3"-24"	
	Water Working	Hydrostatic
Size Range	Pressure psi	Test psi
3"-12"	175	350
14"-24"	150	300

Available End Connections & Size Range

		Figure No.
Flanged	3"-24"	F-5412
M.J.	3"-24"	F-5413
Grooved	3"-16"	F-5414
Flanged-Full Port	3"-12"	2725

Accessories

Floorstands
Extension Stems
Extended Bonnets
2" Sq. Operating Nuts
Handwheels
Lever Wrench Head (3"-8")
Chainwheels
Worm Gear Actuators
Electric Motor Actuators
Cylinder Actuators
Limit Switches
Stem Guides
Floor Boxes
“T” Handles
Chainlevers (3"-8")

***Note: Call Factory For Special Applications**

Valves 3" through 8" are available with lever actuators. Geared actuators are recommended on 6" and larger valves. It is also recommended that valves installed in pipelines with high velocity or where water hammer conditions can be caused by sudden valve shut-off that geared actuators be installed. Lever actuators can only be used for pressure ratings of 100 psi maximum and 25 psi in the reverse flow condition.

KENNEDY VALVE
Plant and Industrial Group

1021 East Water Street
Elmira, New York 14901
Telephone (607) 734-2211
Fax (607) 734-3288

Eccentric Plug Valves
Style 5412A: 3"- 24" Flanged Ends
Style 5413A: 3"- 24" Mechanical Joint Ends

1. Manufacturers:

    A. Kennedy Valve

2. Eccentric Plug valves shall be of the tight closing, resilient faced, non-lubricating variety and shall be of eccentric design such that the valves pressure member (plug) rises off the body seat contact area immediately upon shaft rotation during the opening movement. Valves shall be drip-tight at the rated pressure (175 psi through 12", 150 psi 14" and above) and shall be satisfactory for applications involving throttling service as well as frequent or infrequent on-off service. The valve closing member should rotate approximately 90 degrees from the full-open to full-close position and vice-versa

3. Materials:

    A. All cast iron shall conform to ASTM A 126 Class B, and all ductile iron to ASTM A 536 65-45-12. Casting shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed.

    B. Bolts shall be ASTM A 276 Type 304 stainless steel.

4. Valve Construction and Design:

    A. Both ends shall be ANSI A21.11 mechanical joint or flanged per ANSI B16.1 (or as otherwise noted on plans and specs).

    B. The valve body and cover shall be constructed of cast iron (semi-steel) conforming to ASTM A126, Class B.

    C. Eccentric Plug Valves shall have a rectangular shaped port. Port areas for 3"-20" valves shall be a minimum 80% of full pipe area. Port area for 24" valves shall be a minimum 70% of full pipe area.

    D. Valve seat surface shall be welded-in overlay, cylindrically shaped of not less than 99% pure nickel. Seat area shall be raised, with raised area completely

covered with weld to insure proper seat contact. The machined seat area shall be a minimum of .125" thick and .500" wide.

E. The valve plug shall be constructed of ductile iron conforming to ASTM A 536 65-45-12. The plug shall have a cylindrical seating surface that is offset from the center of the plug shafts. The plug shafts shall be integral. The entire plug shall be 100% encapsulated with Buna-N rubber in all valve sizes. The rubber compound shall be approximately 70 (Shore A) durometer hardness. The rubber to metal bond must withstand 75 lbs. pull under test procedure ASTM D-429-73 Method B.

F. Shaft bearing, upper and lower, shall be sleeve type metal bearings, sintered, oil impregnated, and permanently lubricated Type 316 stainless steel conforming to ASTM A743 Grade CF-8M. Thrust washers shall be PTFE.

G. Grit seals shall be provided at the upper and lower plug journals to prevent the entry of grit and/or other foreign solids into the bearing areas.

H. Plug valve shaft seals shall be on the multiple V-ring type (Chevron) and shall be adjustable. All packing shall be replaceable without removing the bonnet or actuator and while the valve is in service. Shaft seals shall be made of Buna N.

I. Each valve shall be given a test against the seat at the full rated working pressure and a hydrostatic shell test at 1.5 times the rated working pressure. Certified copies of individual test shall be submitted when requested. Certified copies of proof-of-design tests shall be submitted upon request.

J. Manual valves shall have lever or worm gear type actuators with hand wheels, 2" square nuts, or chain wheels attached. Lever actuators shall be furnished on valves 8" and smaller where the maximum unseating pressure is 25 psig or less. Worm gear type actuators shall be furnished on all 4" or larger valves where the maximum unseating pressure is 25 psig or more.

5. Coating:

A. The valve interior and exterior surfaces shall be coated in accordance with the latest revisions of AWWA C504 and must be NSF 61 Certified.

MATERIAL SPECIFICATIONS

CAST IRON Specification ASTM A-126 Class B

Physical Properties

Minimum tensile strength	31,000 psi
Minimum transverse strength	3,300 psi
Minimum deflection (12" centers)	.12 in.

Chemical Analysis (percent)

Phosphorus (maximum)	.75
Sulfur (maximum)	.12

STAINLESS STEEL – 316 – ASTM A743 Grade CF-8M

Physical Properties

Ultimate tensile strength	70,000 psi
Yield strength	30,000 psi
Elongation	30%
Rockwell hardness	B50

Chemical Analysis (percent)

Chromium	19
Nickel	9.0-12.0
Molybdenum	2.0-3.0
Silicon	2.0

BUNA-N RUBBER (Acrylonitrile-Butadiene)

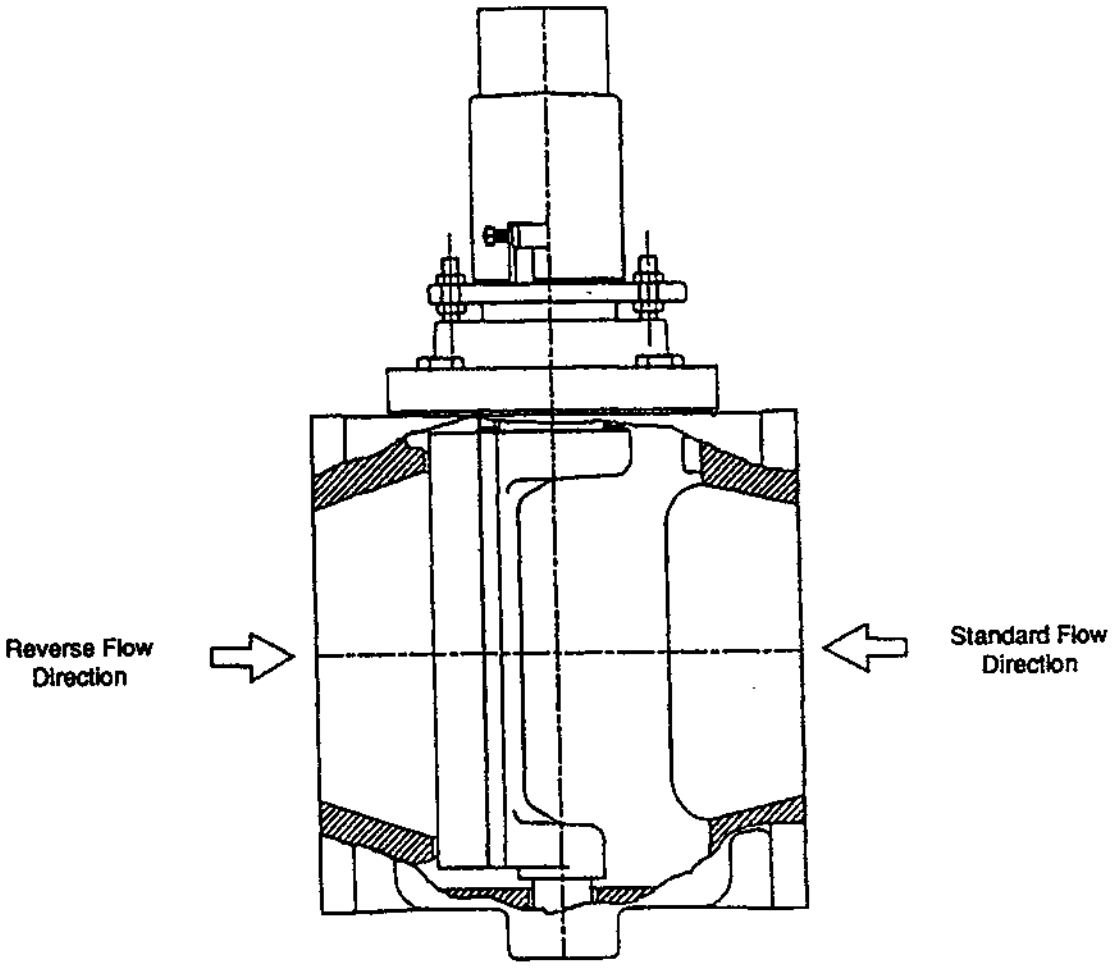
Physical and Mechanical Properties

Tensile strength	1,475 psi
Elongation	238%
Hardness (Shore A)	70
Compression set (Method B, 22 hrs. @ 150 F.)	18.7%
Specific Gravity	1.24

ECCENTRIC PLUG VALVE
FEATURES AND BENEFITS

KENNEDY VALVE

1. **Stem Packing Seals** – Kennedy utilizes Buna-N multiple “V” ring stem packing seals. This sealing system conforms to AWWA C504 and AWWA C507 standards. The Kennedy valve is repackable while under pressure without removing the actuation. The packing seal is held in place with an adjustable gland follower to provide many years of reliable service.
2. **Bolted Bonnet** – Valve bonnets are fully sealed and securely bolted to the valve body for easy removal of the plug should maintenance be required.
3. **Shaft Bearings** – Sintered 316 stainless steel shaft bearings are used in the upper and lower tunnions. These bearings are permanently lubricated for ease of operation even after long periods of inactivity.
4. **Valve Body** – The body and cover of the Kennedy valve is cast iron (Semi-Steel) conforming to ASTM A126 Class B. Flanged valves are in full compliance with ANSI B16.1 Class 125 standards including flange thickness. Mechanical Joint valves are in compliance with AWWA C111/ANSI 21.11. Grooved End valves are in compliance with AWWA C606.
5. **Welded Nickel Seat** – Kennedy welds a corrosion resistant nickel seat to a raised area in the body. The weld is of 90% pure nickel, at least 1/8" thick after it is machined. The nickel covers the entire seat surface so that there is no possibility of corrosion that could damage the plug face.
6. **Plug** – The valve plug is cast iron ASTM A126, Class B. The portion of the plug in the valve body cavity is coated with Buna-N rubber using an injection molding process. This allows for the entire surface to be covered, not just the plug face. With this injection molding process, you do not have to worry about the rubber dis-bonding from the iron.
7. **O-Ring Bonnet Seal** – The seal between the body and bonnet is an O-Ring allowing for easier maintenance, and since O-Rings seal better than flat gaskets, the number of bonnet bolts is reduced.



FLOW DIRECTION DESIGNATION

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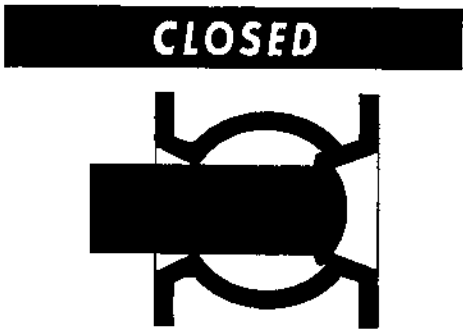
Valves 3" through 8" are available with lever actuators. Geared actuators are recommended on 6" and larger valves. It is also recommended that valves installed in pipelines with high velocity or where water hammer conditions can be caused by sudden valve shut-off that geared actuators be installed. Lever actuators can only be used for pressure ratings of 100 psi maximum and 25 psi in the reverse flow conditions.

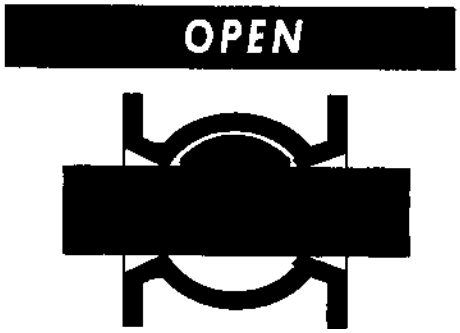
ECCENTRIC PLUG VALVE
FLOW DESIGNATED

KENNEDY VALVE



As the plug component is rotated to valve closure, the offset condition of the plug causes the seating surface to move axially downstream into the nickel. The results in a high seating force thereby crushing trapped solids and resulting in a bubble-tight seal. The upstream pressure acting on the convex side of the plug furthur improves the bubble-tight seal.

Upon opening the valve, the initial rotation of the plug causes the resilient seating surface to move axially away from the nickel seat in the body. This action minimizes wear and scraping of the resilient seat, thereby improving the life of the valve. The plug can be positioned at any position between open and closed for throttling applications.



In the full-open position, the plug is rotated out of the main fluid stream as shown. This allows for high capacity flow through the valve.

ECCENTRIC PLUG VALVE
C_V VALUES

KENNEDY VALVE

VALVE SIZE	PORT AREA %	C_V
3"	85	335
4"	88	565
6"	87	1210
8"	89	2050
10"	81	3100
12"	84	4170
14"	84	5460
16"	84	7420
18"	83	9675
20"	89	12920
24"	71	17670

Flow in GPM (gallons per minute) to equal a 1 psi pressure drop

Sizing Formula

(1) $Cv = \frac{Q}{\sqrt{\Delta}}$

(2) $Q = C\sqrt{\Delta}$

(3) $\Delta = \left(\frac{Q}{Cv}\right)^2$

Symbol Definitions

Cv = Valve Sizing Coefficient

ΔP = Pressure drop, pounds per square inch (psi)

Q = Flow, gallons per minute (gpm)

Gear operators with 2" sq. operating nuts, 150 ft. – lb. max. input torque
Consult factory for Reverse Flows above 50 psig.

VALVE SIZE	50 psig	75 psig	100 psig	125 psig	150 psig	175 psig
4"	U10N	U10N	U10N	U10N	U10N	U10N
6"	U10N	U10N	U10N	U10N	U10N	U10N
8"	U10N	U10N	U10N	U10N	U10N	U10N
10"	U10N	U10N	U10N	U10N	U10N	U10N
12"	U10N	U10N	U10N	U10N	U10N	U10N
14"	U90N	U90N	U90N	U90N	U90N	—
16"	U90N	U90N	U90N	U90N	U100N	—
18"	U100N	U100N	U100N	U100N	U100N	—
20"	U100N	U100N	U100N	U100N	U100N	—
24"	U100N	U100N	U100N	U160N	U160N	—

U10N = 1KE/OP Nut Buried Service
U90N = 9KE/OP Nut Buried Service
U100N = 10KE 2.5/OP Nut Buried Service
U160 = 16KE/OP Nut Buried Service

Gear operators with Handwheels & 80 lb. max, rim pull
Consult factory for Reverse Flows above 50 psig.

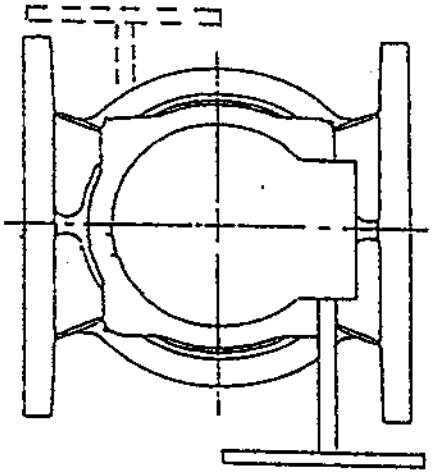
VALVE SIZE	50 psig	75 psig	100 psig	125 psig	150 psig	175 psig
4"	A110	A110	A110	A110	A110	A110
6"	A110	A110	A110	A110	A110	A110
8"	A110	A110	A110	A110	A110	A110
10"	A118	A118	A118	A118	A118	A118
12"	A118	A118	A118	A118	A118	A118
14"	A924	A924	A924	A924	A930	—
16"	A1024	A1024	A1024	A1024	A1624	—
18"	A1024	A1024	A1024	A1030	A1624	—
20"	A1024	A1024	A1030	A1624	A1624	—
24"	A1024	A1030	A1624	A1630	A1630	—

A110 = 1KE/10" Handwheel
A118 = 1KE/18" Handwheel
A924 = 9KE/24" Handwheel
A930 = 9KE/30" Handwheel
A1024 = 10KE 2.5/24" Handwheel
A1030 = 10KE 2.5/30" Handwheel
A1624 = 10KE 6/24" Handwheel
A1630 = 16KE/30" Handwheel

4"-24" ECCENTRIC PLUG VALVE OPERATION ORIENTATION OPTION

KENNEDY VALVE

OPTIONAL MOUNTING POSITION

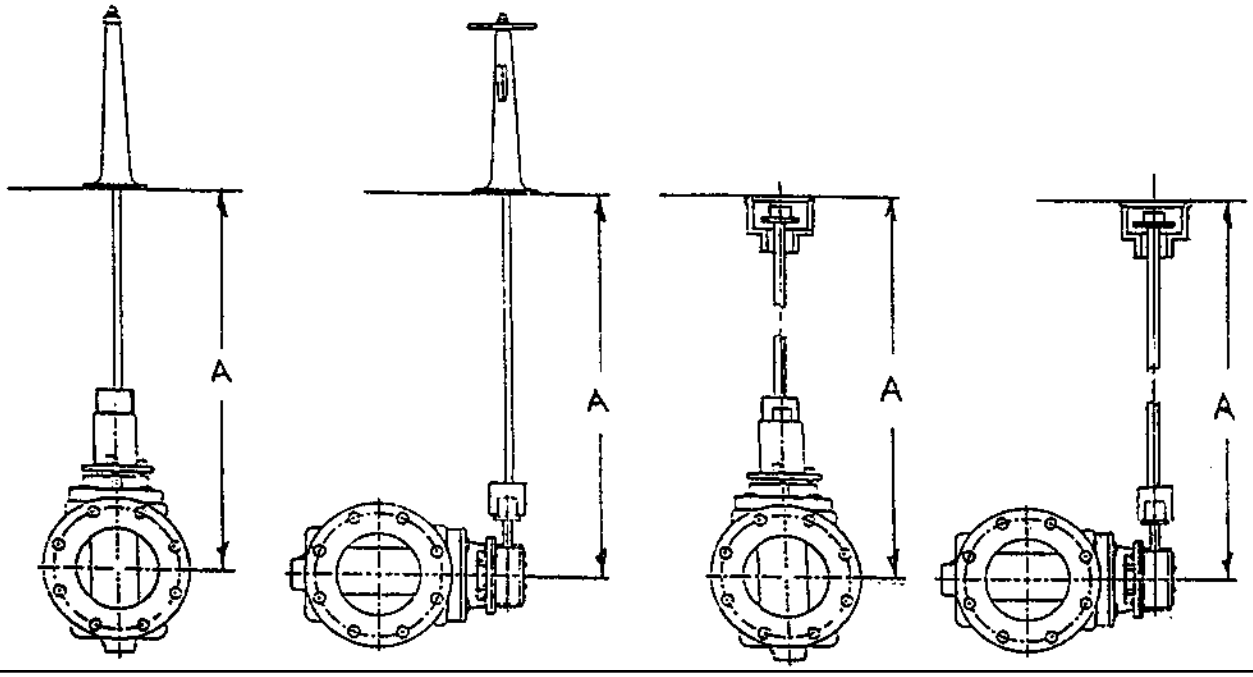


STANDARD MOUNTING POSITION

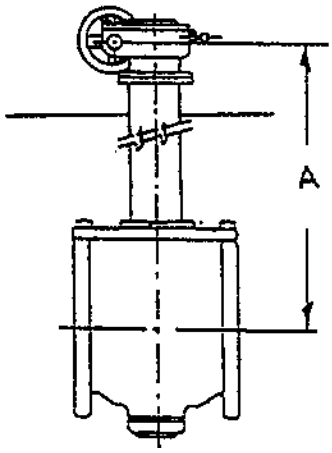
ACTUATOR MOUNTING POSITION AS VIEWED
FROM THE TOP OF THE VALVE

3"-24" ECCENTRIC PLUG VALVE ACCESSORIES – REMOTE EQUIPMENT

KENNEDY VALVE



FLOORSTAND INSTALLATION WRENCH OPERATED VALVE	INDICATING FLOORSTAND INSTALLATION - GEAR ACTUATED VALVE	FLOORBOX INSTALLATION WRENCH OPERATED VALVE	FLOORBOX INSTALLATION GEAR ACTUATED VALVE



EXTENDED BONNET ASSEMBLY VALVES FOR BURIED OR SUBMERGED SERVICE. CAN BE FURNISHED WITH HANDWHEEL/GEAR, CYLINDER OR ELECTRICAL ACTUATOR.

"A" TO BE SPECIFIED BY THE CONTRACTOR FOR PROPER SIZING OF EXTENSION ASSEMBLY.

Kennedy Valve

A DIVISION OF McWANE, INC.

www.kennedyvalve.com

1021 E. Water Street • Elmira, New York 14901
P.O. Box 981
PHONE: (607) 734-2211 • FAX: 1-800-952-4771

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