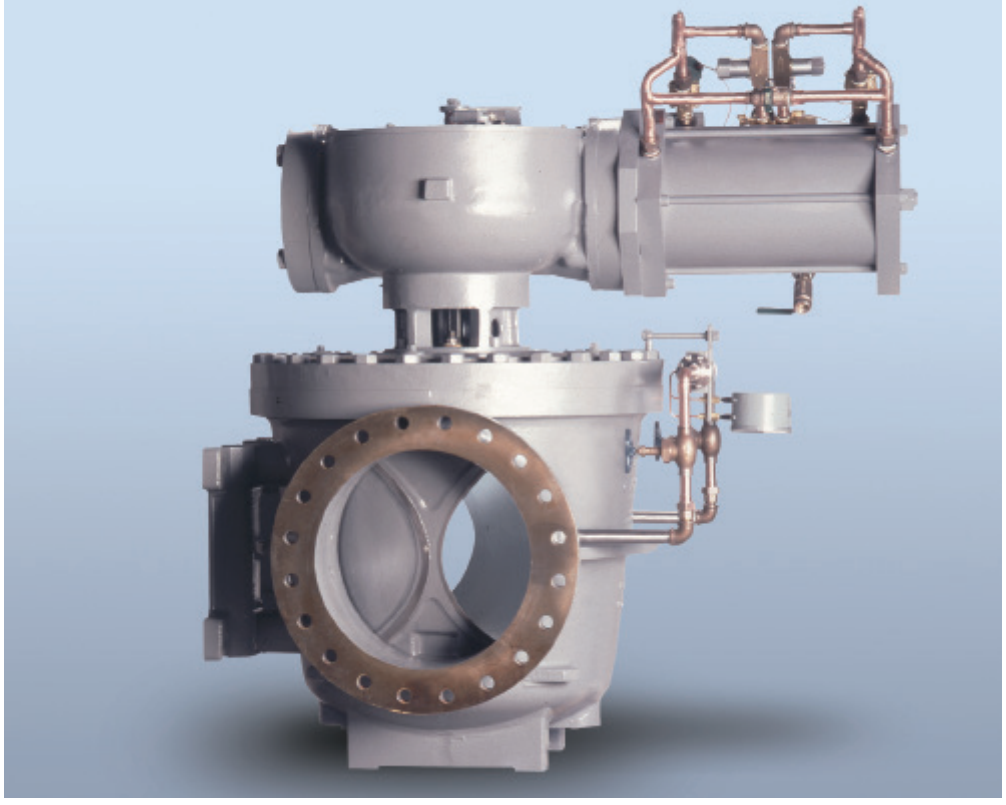
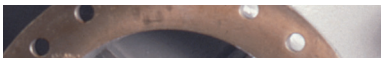
VAG ROTOVALVE Cone Valve

Precise Flow Control in Severe Service





A Century of Experience

VAG valves are known for long term reliability in the most demanding water and wastewater applications. Whether a simple check valve or a complex automatic control valve, each VAG valve is built on over 100 years of design, manufacturing and application experience to ensure its dependability and superior performance.

Outstanding Technical Support

From the factory to the field, VAG provides responsive and knowledgeable technical assistance and support. VAG application engineers, and our team of trained and experienced sales representatives, work closely with designers to select the right valve from our broad product range to ensure the valve meets the system requirements. VAG is committed to serving our customers in all phases of the project.

Superior Quality

VAG valves are designed in accordance with applicable AWWA and other industry standards and precision manufactured from the highest grade materials. Every valve is tested to ensure it meets our high standards and the latest industry requirements so you can be sure it will operate as expected from the minute it is put in service.

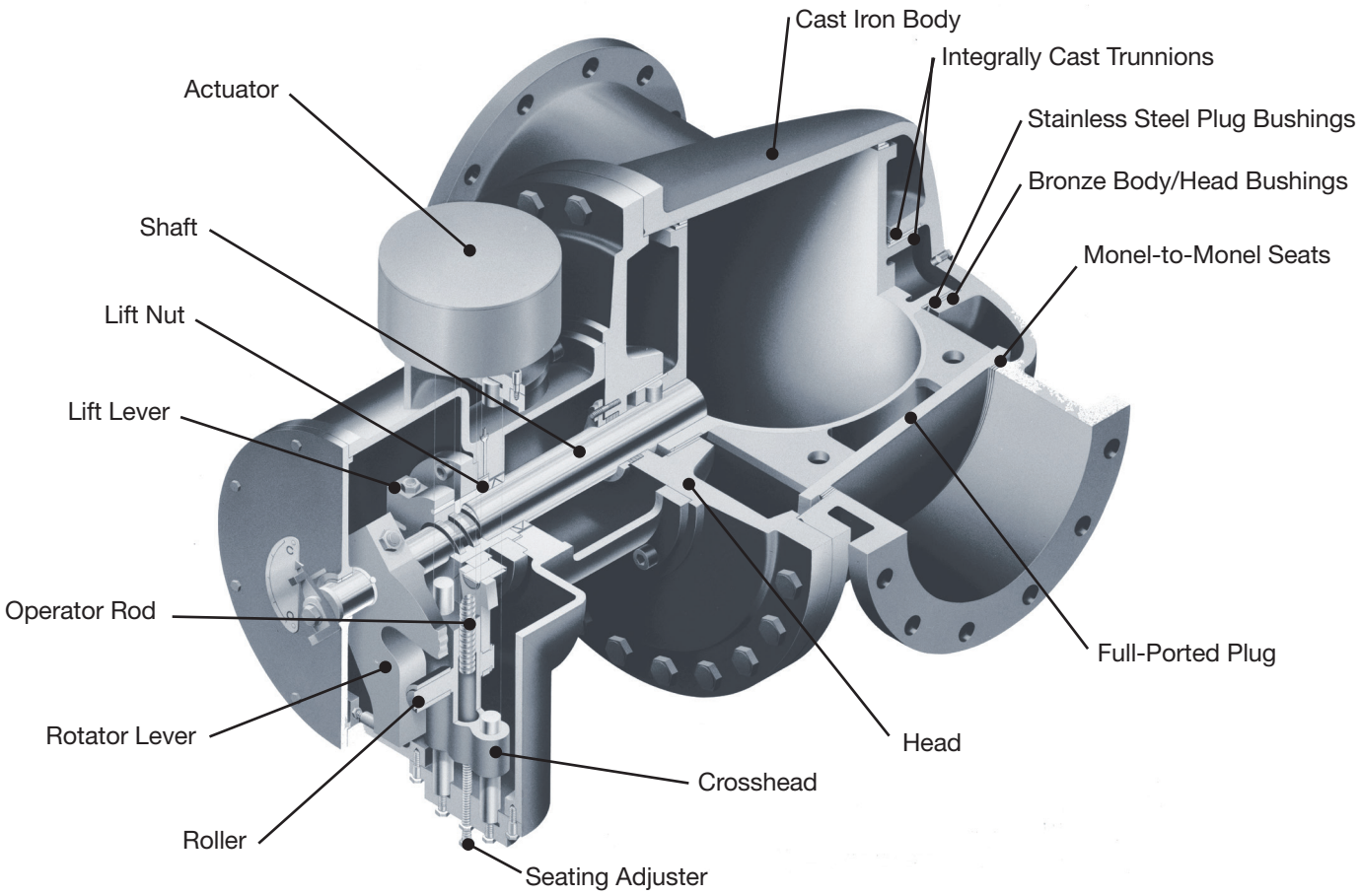
Comprehensive Product Range

We are continuously expanding and improving our product line to meet the ever-changing needs of the waterworks industry. From off-the-shelf standard butterfly and plug valves to sophisticated, highly engineered pump control, check and surge control valves, VAG offers one of the broadest ranges of valves specifically suited to the demanding needs of municipal waterworks.

VAG ROTOVALVE Cone Valve

Precise Flow Control in Severe Service

The VAG ROTOVALVE Cone Valve is a rugged and highly dependable liquid control valve that can accurately modulate flows under extreme velocities, pressures, and temperatures. The Rotovalve enjoys a worldwide reputation for service in a variety of applications.



Rugged Construction

Integrally cast trunnions and mounting pads assure proper alignment between body, plug, and mechanism. Electrically fused Monel metal-to-metal seats handle sludge and grit. Moving parts totally enclosed in a lubricated cast iron housing.

Unique Seating

Low torque, lift and turn operation means no seat wear. Precisely machined Monel-to-Monel seats assure tight closure.

Excellent Hydraulics

Straight line flow modulation and drip tight shutoff against pressure or vacuum. Two-stage pressure reduction minimizes vibration and cavitation.

Low Headloss

The VAG ROTOVALVE Cone Valve is full-ported for low headloss, precise flow control and lower pumping costs.

Water Hammer Control

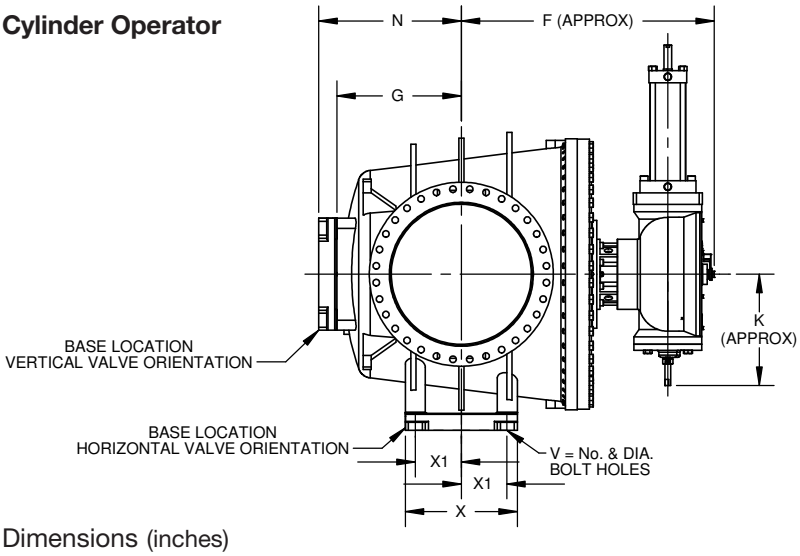
Smooth and linear operating cycle is highly effective in controlling surge and water hammer while providing precise flow regulation.

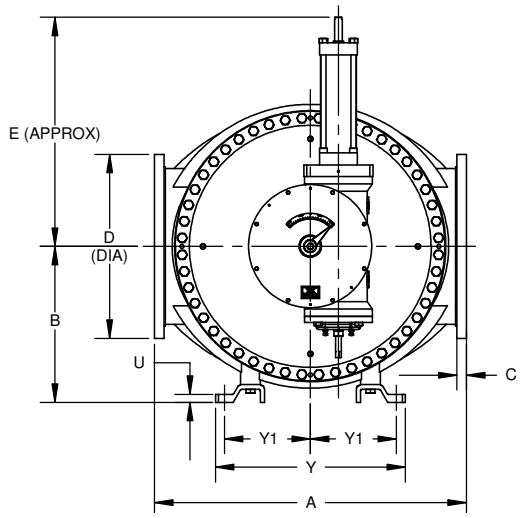
Long Life, Low Maintenance

The VAG ROTOVALVE Cone Valve tolerates the most severe service conditions, and the “lift and turn” operation eliminates seat wear. Many original Rotovalves are still operational after seventy-five years of dependable service.

Certified to
ISO 9001:2008

Cylinder Operator



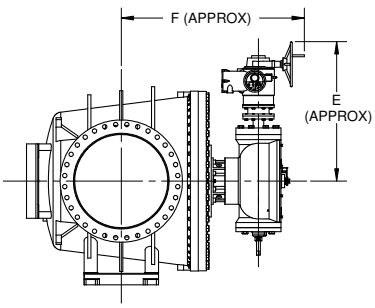


Dimensions (inches)

Size	A 125 lbs.	A 250 lbs.	B	E	F	G	K	N	U	V	X	X1	Y	Y1	Approx. Wt. (lbs.)
6	23 1/8	24	8 1/2	27	26 1/2	6 3/4	10	9 3/8	1 3/8	(4)-1	10	3 3/4	15 1/4	6 5/8	730
8	23 1/2	24 1/2	10	27	27 1/2	8 1/4	10	10 3/4	1 3/8	(4)-1	10	3 3/4	15 1/4	6 5/8	890
10	28 1/8	29 1/2	12	27	28 1/2	9 3/4	10	12 3/8	1 3/8	(4)-1	10	3 3/4	15 1/4	6 5/8	1,235
12	31	32 1/2	14	37	34 1/2	13 3/4	15 1/2	15 3/4	1 1/2	(4)-1 3/8	14	5	22	9 1/2	2,260
14	35 1/2	37	15 1/2	37	35 1/2	14 1/4	15 1/2	16 3/4	1 1/2	(4)-1 3/8	14	5	22	9 1/2	2,520
16	39	40 5/8	17 1/8	37	36 1/2	16 1/2	15 1/2	19	1 1/2	(4)-1 3/8	14	5	22	9 1/2	3,170
18	41 3/4	43 3/8	19 1/4	37	37 1/2	18 3/8	15 1/2	20 7/8	1 1/2	(4)-1 3/8	14	5	22	9 1/2	3,515
20	47	48 5/8	22 1/4	49	47 3/4	20 3/4	21	24 3/4	1 3/4	(4)-1 3/4	20	8	31 1/2	14	5,840
24	56	57 3/4	26 1/4	49	50 1/2	22 7/8	21	26 7/8	1 3/4	(4)-1 3/4	20	8	31 1/2	14	8,320
30	64	65 3/4	31 1/2	56 1/2	58 3/4	29 1/2	29 3/4	34	1 3/4	(4)-2 1/4	28	11 1/2	40 1/2	18	13,520
36	78	80	38 1/2	56 1/2	61 3/4	31	29 3/4	35 1/2	1 3/4	(4)-2 1/4	28	11 1/2	40 1/2	18	19,400
42	83 1/4	90	45 3/4	67 1/4	70	38	40 1/2	40 1/4	2 1/4	(4)-2 5/8	42	15 1/2	42	18	34,700
48	93	99 1/2	48 1/4	67 1/4	92	46 1/2	40 1/2	48 1/4	2 1/2	(4)-3	48	21	46	21	43,900
54	101	N/A	54	N/A	95	51 1/4	45	54	2 3/4	(4)-3	48	21	46	21	63,200
60	119 1/2	N/A	61	N/A	102	56	45	58 3/4	2 3/4	(4)-3	48	21	46	21	80,600

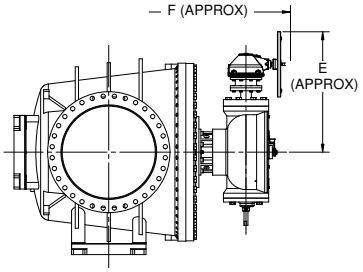
Notes: 1. 125 lb. and 250 lb. flanges fully conform to ANSI B16.1 latest edition both dimensionally and for bolting pattern. All flanges are full flat faced.
2. Dimensions for all three methods of operation are identical, except for E and F, as shown in the drawings below.
3. Valve can be mounted in a horizontal or vertical line. Shaft can be horizontal or vertical. Actuator can be oriented in any direction relative to the shaft.

Motor Operator



Size	E	F	Approx. Wt. (lbs.)
6	24 1/8	34	680
8	24 1/8	35	820
10	24 1/8	36	1,100
12	27 7/8	41	2,050
14	27 7/8	42	2,550
16	27 7/8	43	2,910
18	27 7/8	44	3,430
20	32	49	5,300
24	32	52	7,700
30	36	70	13,000
36	36	73	17,750
42	48	80	31,570
48	48	96	40,100
54	63	99	57,500
60	63	102	73,500

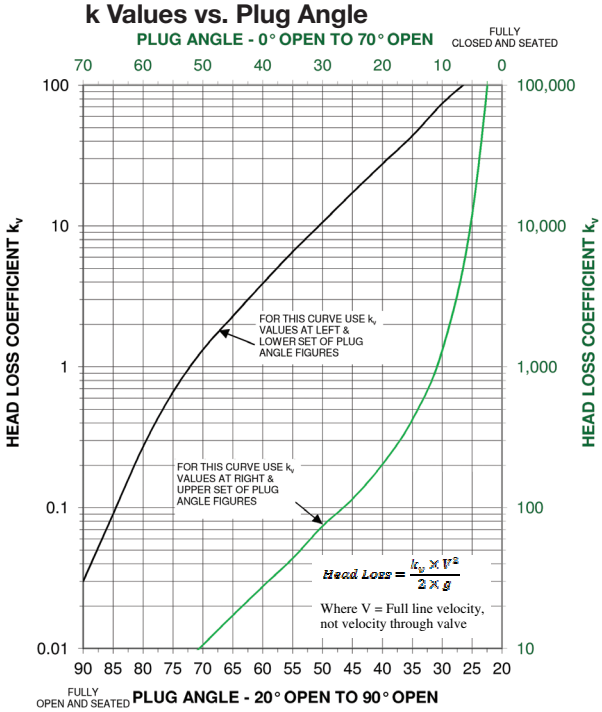
Manual Operator



Size	E	F	Approx. Wt. (lbs.)
6	25 1/2	28 1/2	610
8	25 1/2	29 1/2	750
10	25 1/2	30 1/2	1,030
12	30 1/8	36 3/16	1,830
14	30 1/8	37 3/16	2,330
16	30 1/8	38 3/16	2,690
18	30 1/8	39 3/16	3,200
20	34 5/8	49 3/16	5,080
24	34 5/8	51 15/16	7,480
30	41 1/8	68 5/8	12,600
36	41 1/8	71 5/8	17,350
42	48	74 1/2	31,100
48	48	77 1/2	39,600
54	63	85	57,000
60	63	93	72,800

Characteristics

k Values vs. Plug Angle



VAG ROTOVALVE Cv Values for Closed Systems

Valve Size	Plug Angle in Degrees from Closed								
	90	80	70	60	50	40	30	20	10
Headloss Coefficient K_v	0.27	1.32	3.9	10.6	27.6	74.0	203	1303	
6	3658	2067	935	544	330	205	125	75	30
8	7705	3674	1662	967	586	364	222	134	53
10	12708	5741	2596	1511	916	568	347	209	83
12	19446	8267	3739	2175	1319	818	499	302	119
14	27232	11252	5089	2961	1796	1114	680	410	162
16	36828	14697	6647	3867	2346	1454	888	536	212
18	48447	18601	8412	4894	2969	1841	1124	678	268
20	60038	22964	10386	6042	3665	2273	1387	838	331
24	88731	33068	14956	8701	5278	3272	1998	1206	476
30	148242	51559	23368	13595	8246	5113	3121	1885	744
36	227417	74403	33650	19577	11875	7363	4495	2714	1071
42	335504	101271	45801	26646	16163	10022	6118	3694	1458
48	447397	132273	59822	34803	21110	13090	7991	4825	1904

VAG ROTOVALVE Cone Valve Full Open Headloss=k(V²/2g)			
Size	k	Size	k
6	0.0862	24	0.0375
8	0.0614	30	0.0328
10	0.0551	36	0.0289
12	0.0488	42	0.0246
14	0.0461	48	0.0236
16	0.0430	54	0.0230
18	0.0398	60	0.0228
20	0.0395		

How does the VAG ROTOVALVE Cone Valve operate?

The VAG ROTOVALVE Cone Valve is different from other full-ported valves, like the ball valve, because of its unique seating/unseating operation.

The plug is raised along the axis of the shaft to initiate the opening of the valve. This action permits the plug to rotate freely on trunnion bushings during the entire opening/closing sequence, which reduces torque and eliminates seat wear.

Standard Materials

Part	Material	Part	Material
Body, Plug, and Head Castings	ASTM A536 Grade 65-45-12 Ductile Iron or Cast or Fabricated Steel for Higher Pressure or Larger Size Applications	Roller	Steel
		Guide Rods	Stainless Steel
		Seat Rings	Monel
Head and Body Bushing	Bronze	Trunnion Bearings	Bronze and Stainless Steel
Mechanism Housing	Cast Iron	Flanges	ANSI Class 125, 250, 300 or metric
Cover	Cast Iron	Valve Shaft	Stainless Steel ASTM Type 630
Lift Nut	Bronze	O-Ring	Buna-N
Crosshead	Bronze	Packing	Fiber and Graphite
Thrust Ring	Steel	Packing Gland	Bronze

Actuation

VAG is your single-source for design, construction, actuation, and start-up. We will assist you in selecting the right actuation system for your needs, whether it's manual, electric, or hydraulic.

Chilibre Water Plant, Panama City, Panama — One 24" Rotovalve with hydraulic cylinder and hydraulic power unit

Hydraulic Actuation Systems

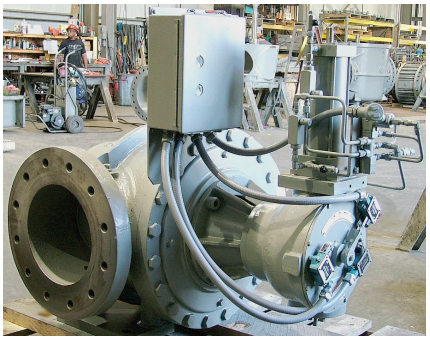
- Central or dedicated hydraulic power units
- Operate multiple gates or valves from a single system
- Linear operation of cylinders matches the linear operation of the gates
- Less wear, ideal for frequent cycling
- Precise positioning
- Ease of speed control, fully field-adjustable
- Operation during power failure

Projects

The VAG ROTOVALVE Cone Valve has a worldwide reputation for dependable service in a variety of water, wastewater, and hydropower applications.

The photos below show a few recent Rotovalve projects.

City of Detroit Water, Michigan, USA — Remanufactured 36" Allis Chalmers Rotovalve with electric motor actuator



Lake Chelan, Washington, USA — Remanufactured 12" Allis Chalmers Rotovalve with hydraulic cylinder actuator

East Delaware Tunnel Aqueduct, New York, USA — Six 48 " and two 36" Rotovalve cone valves with electric motor actuators

Specifications

VAG ROTOVALVE Cone Valve

General: The cone valve shall be the Rotovalve as manufactured by VAG Company. It shall be a full-ported valve and shall be complete with actuator and accessories as specified herein.

Operation: Operation of the cone valve shall employ an axial motion to lift the valve plug from its seat followed by a 90 degree rotary motion of the plug to open the valve and axial motion to reseat it in the open position. Closing movement of the valve plug shall be in reverse order. It shall be designed to operate satisfactorily at the flow conditions specified.

Valve Construction: The valve body shall be provided with seat rings of Monel metal electrically fused to the body waterway and sufficiently raised above the internal surface of the body to assure free operation. The valve shall be complete with ANSI Class flanges to mate with adjacent equipment.

The valve plug shall be fully skirted with integrally cast Trunnions. It shall have a set of Monel seat rings electrically fused to the waterway and sufficiently raised above the extended surface of the plug to assure free operation. If sealing in the open position is required to prevent flow around the plug, a second set of the seats shall be furnished. Trunnion bearings on the plug shall be bronze or stainless steel and shall mate with bronze or stainless steel bearings in the body and head.

The head shall make a registered connection with the valve body to assure proper bearing alignment. It shall be designed to support the cone valve mechanism and operating forces.

Unless otherwise specified, all valve castings shall be ASTM A536 Grade 65-45-12 ductile iron.

The valve shaft shall be stainless steel Type 630 with 125,000 psi minimum yield strength, and shall be pinned to the plug. The packing shall be fiber and graphite with a bronze adjustable packing gland.

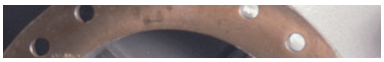
Mechanism Construction: The operating mechanism shall be totally enclosed in a cast iron housing with an integrally cast mounting bracket to assure proper alignment. The housing shall be designed for either right of left hand actuator mounting. The mechanism cover shall be cast iron and make a registered connection to the mechanism housing. The cover shall be bronze bushed where the valve shaft extends through it. The bronze lift nut shall be contained completely within the mechanism housing with provision for external lubrication. The crosshead shall be of bronze B584 C86200 and shall travel on stainless steel guide rods. Two covered access holes shall be provided for access to the lube fittings on the crosshead. An indicator shall be mounted on the end of the valve shaft for the local position indication.

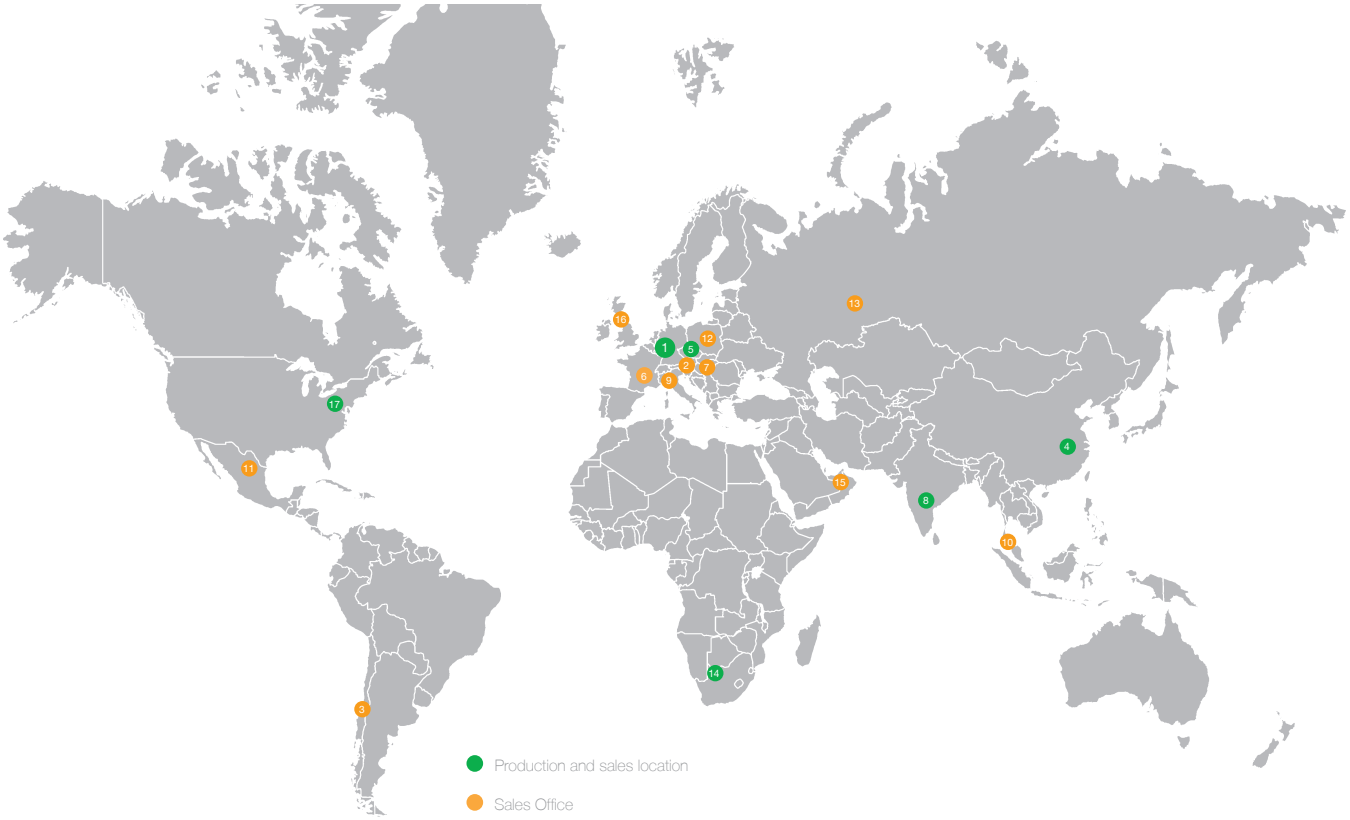
Actuator: Actuator will be sized to operate the valve from full open to full closed at rated pressure with a maximum of 80 ft./lb of input torque on a manual actuator. The valve manufacturer shall be responsible for sizing electrical or cylinder actuators based on the flow conditions.

Testing: Cone valve body and head shall be hydrostatically tested for 10 minutes at a test pressure of one and one-half times maximum working pressure for which the valve is intended. Under test, parts shall show no evidence of distress and shall be free from any leaks.

When fully shop assembled, each cone valve shall be leak tested at the rated pressure. Leakage shall not exceed 0.4 oz/min/inch of diameter.

Pump Check Control: The pump check controls shall be supplied, mounted and tested by the valve manufacturer. They shall consist of a 4-way solenoid valve with manual override speed control valves, open/close limit switches, pump shutdown limit switch and a pressure switch positioned on the upstream side of the valve. When the pump reaches the designated pressure, the pressure switch is activated, energizing the solenoid control valve causing the cone valve to open at a predetermined rate. To shut down pump operation, the solenoid control valve is de-energized causing the cone valve to close. When the cone valve is approximately 95% closed, the pump shutdown limit switch shall be activated shutting down the pump. The opening and closing speeds shall be independently adjusted from ___ seconds to ___ seconds.





Locations

1	**GERMANY**	**MANNHEIM**
2	AUSTRIA	VIENNA
3	CHILE	SANTIAGO DE CHILE
4	CHINA	TAICANG
5	CZECH REPUBLIC (JMA)	HODONIN
6	FRANCE	CHASSIEU
7	HUNGARY	BUDAPEST
8	INDIA	HYDERABAD
9	ITALY	SAN GIULIANO
10	MALAYSIA	PETALING JAYA
11	MEXICO	MONTERREY
12	POLAND	WARSAW
13	RUSSIA	SAMARA
14	SOUTH AFRICA (VAG/KLAMFLEX)	KRUGERSDORP
15	UAE	DUBAI
16	UK	BIRMINGHAM
17	VAG USA, LLC	CRANBERRY TWP, PA

The VAG USA, LLC is part of a global network with our partner company, VAG-Armaturen GmbH, headquartered in Mannheim, Germany. Together, we have a highly qualified team of service specialists around the world. Our capabilities include:

- **Engineering & technical design**
- **Production**
- **Fabrication**
- **Sales & distribution**
- **Installation & start-up**
- **Aftermarket service**

VAG

VAG USA, LLC
9025 Marshall Road
Cranberry Twp., PA 16066

Phone: 724-776-1020
info-ga@vag-group.com
www.vag-usa.com

For international sales, please contact our partner company, VAG-Armaturen GmbH, headquartered in Mannheim, Germany.

www.vag-group.com