



# KVN piston valves. The security lies in the principle.

Technical Data – ANSI Standard



**Quality Assurance**  
according to **ISO 9001!**

Our production is quality-approved by TÜV,  
Lloyd's Reg. of Shipping, Germanischer Lloyd,  
American Bureau of Shipping, Det Norske Veritas.

Specific approvals for various products!



# The best solution for steam application, hot water and heat transfer media

## **Klinger: A success story**

In 1893, Richard Klinger founded the parent plant of the Klinger group near Vienna, Austria. Klinger's early inventions included the reflex level gauge and compressed sheet gaskets.

In 1922, Richard Klinger invented the piston valve by replacing the disk and seat of a conventional globe valve with a cylindrical piston and two resilient, replaceable sealing rings. Constant research and development have resulted in sealing rings that provide the piston valve with an extraordinary ability to seal line pressure and prevent leakage to the atmosphere.

Independent testing laboratories have subjected Klinger piston valves to API fire test and Helium leak tests. The Klinger piston valve has outperformed other generic valve types in these tests and these results have been consistently confirmed by extraordinary performance in customer installations.

Over 60 million Klinger piston valves are in service worldwide.

### **An extraordinary sealing system: Amazingly simple and reliably tight.**

A stainless steel piston enclosed by two valve rings makes up the sealing element. The upper valve ring provides the outer seal, while the lower valve ring seals the passage. The large sealing surface on the piston skirt provides an optimal seal.

When locked, the piston simultaneously pushes any impurities which

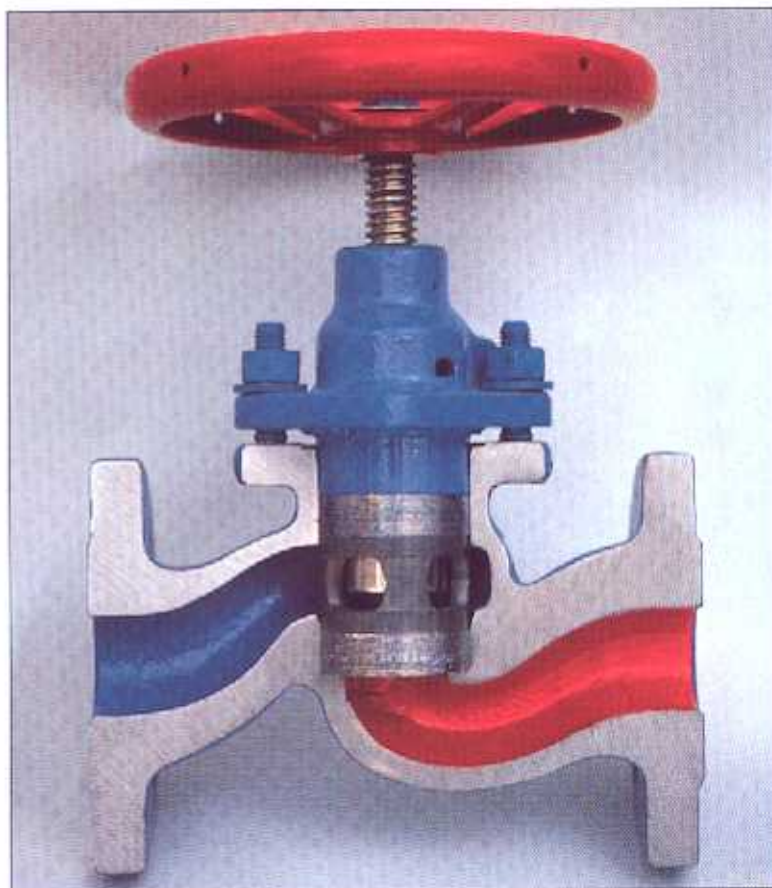
might be present in the medium ahead of itself. Therefore, media with fibrous or contaminated constituents are reliably checked as well.

In principle, damage to the sealing surfaces is excluded. Function is always kept fully intact.

### **Excellent control characteristics.**

The double guidance of the piston in closed position prevents fluttering and vibration in the control setting, and oscillations in the tube.

The KVN is ideal for the bypass around a modulating control valve.



### **The valve stays in the line while changing the valve-ring.**

time.

After the first commissioning the valve is absolutely maintenance free for a long

In case used-up valve rings have to be changed – this is very easily done: The valve does not have to be dismantled.



# KVN piston valves. High-tech shut-off valves. Environmentally safe and energy efficient.

## **The heart of the piston valve: The KX-module**

The valve rings (KX-GT) are made of specially treated graphite. They have no asbestos – containing materials and make the valve maintenance-free. "Install and forget" is the motto. The coupling pressure on the piston is so high that media are reliably checked up to 900 psi in any aggregate condition and at temperatures ranging from -50° F to +800° F. The various expansion coefficients of the valve components which arise during alternating thermal loads are fully compensated by the KX-GT. Reliably tight in all operating states.



The bonnet (1) presses against the lower component with the sealing element. The two rings (2) and (3) are pre-sealed and increase their coupling pressure on the casing and piston.



## **The benefits:**

- Reliably tight in the line seal
- Reliably tight to the atmosphere
- Meets EPA requirements
- Environmentally safe
- Asbestos-free
- Energy efficient
- No erosion on the sealing surfaces
- Easy to service and economical
- Retightened in the line
- Maintenance-free
- Exceed requirements of API-6 FA fire test
- Excellent control characteristics

## **The know-how**

- CAD, CAM technology
- Production to AD WO, TRD 100 HPO\*)
- Quality assurance according to ISO 9001

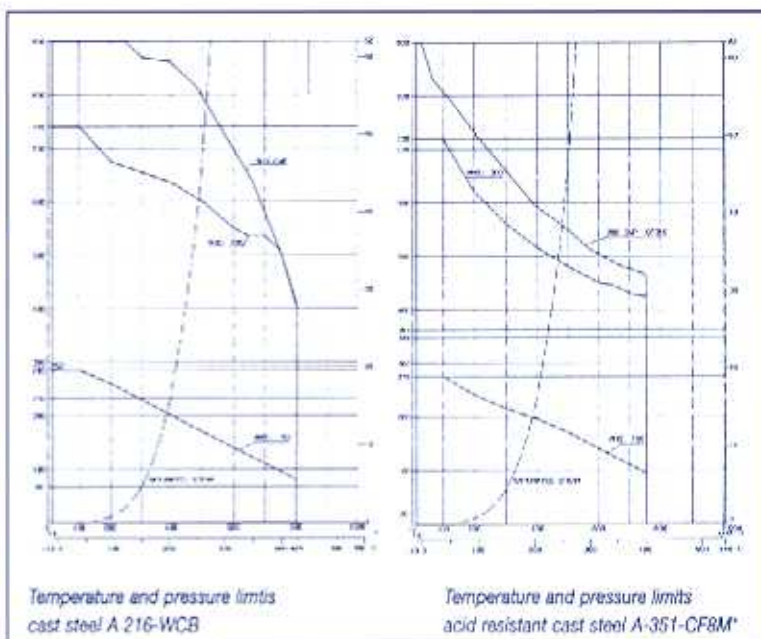
\*) Manufacturer approval to German AD-Merkblatt WO, TRD 100 and HPO for fluid control products by TÜV-Saarland (Germany)

**Reliable according to all standards and tests.**

The Klinger piston valve passed the fire-safe test according to API 6 FA.

## Design Benefits

- **Maximum compression transmitted to lower ring**
- **Elimination of leakage due to shaft runout**
- **Elimination of seal exposed to atmosphere**
- **Elimination of wire draw**
- **Live loading extends cycle life**



### Flow coefficients

Size	ANSI 150	ANSI 300
	C <sub>v</sub>	C <sub>v</sub>
1/2"	4.9	5.3
3/4"	8.4	9.4
1"	12.5	14.5
1 1/2"	33.5	37.4
2"	55.8	58.5
2 1/2"	75.8	80.7
3"	119	122
4"	185	191
6"	373	392
8"	670.2	681

C<sub>v</sub>: Valve parameter (gal/min)

### Material Codes

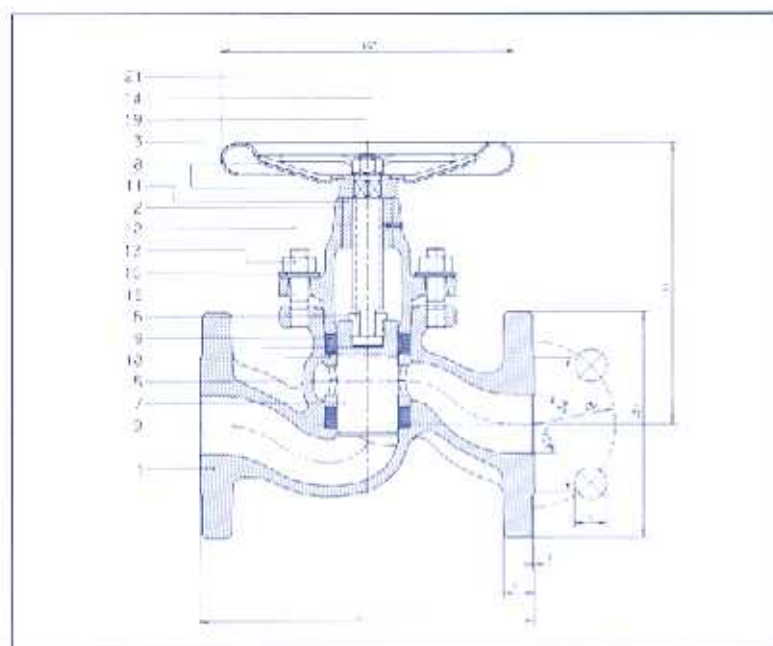
Type	Casting	Upper part	Inner parts	Color of valve
VIII	Cast steel	Cast steel	No copper alloy parts	Blue
Xc	Acid resistant steel	Acid resistant steel	Acid resistant steel	unpainted, pickled

### Thrust loads (lbs.)

Valve size (in.)	Line pressure (psi)								
	100	200	300	400	500	600	700	800	900
1/2"	163	190	218	245	272	300	327	355	382
3/4"	259	308	356	405	453	502	551	599	648
1"	375	452	528	604	680	756	832	908	984
1 1/2"	855	1049	1244	1439	1633	1828	2022	2217	2412
2"	1129	1433	1737	2041	2346	2650	2954	3258	3562
2 1/2"	1297	1367	1437	1507	1578	1648	1718	-	-
3"	1550	1620	1691	1761	1831	1901	1971	-	-
4"	2103	2212	2322	2431	2541	2650	2760	-	-
6"	3159	3269	3378	3488	3597	3707	3816	-	-
8"	4191	4301	4410	4520	4629	4739	4848	-	-



# Specifications



**Piston valve**  
**KVN 1/2" - 2"**  
**ANSI 150/300**  
**flanged**

**Overall length**  
 ANSI 150: ANSI B 16.10 Class 150  
 ANSI 300: ANSI B 16.10 Class 300

**Connection**  
 ANSI 150: Flange according to  
 ANSI B 16.5-Class 150 RF  
 ANSI 300: Flange according to  
 ANSI B 16.5-Class 300 RF

**Material**  
 Carbon steel – Klinger mat. code VIII  
 Acid resistant steel –  
 Klinger mat. code Xc

Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF8M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
5 Lantern bush	Sintered steel	A-351-CF8M
6 Split nut	AISI 1213	AISI 316-Ti
7 Piston	A-276-430F	AISI 316L
8 Spindle	A-276-430F	AISI 316L
9 Valve ring	KX-GT	KX-GT
11 Threaded bush	Sintered steel	AISI 316

Parts	Steel (VIII)	Stainless (Xc)
12 Tension pin	Spring steel	Stainless Steel
13 Hex. nuts	A-194 2H	A-193 B8
14 Hex. nuts	A-194 2H	A-193 B8
15 Stud bolts	A-193 B7	A-193 B8
16 Belleville washer	AISI 6150	AISI 1070
18 Disc	AISI 02	AISI 316 Ti
19 Disc	Steel	Stainless steel
21 Type plate	Al	Al

## Dimensions (in.)

Dimensions (in.)						L		D		e		Wt (lb.)		Drilling 150			Drilling 300		
Size	A	H	g	f	Stroke	150	300	150	300	150	300	150	300	No	r	ok	No	r	ok
1/2"	5	4.2	1.36	0.06	0.8	4.25	6	3.50	3.75	0.5	0.61	5.4	7.5	4	0.62	2.38	4	0.62	2.62
3/4"	5	4.8	1.63	0.06	1.1	4.62	7	3.88	4.62	0.53	0.7	7.9	11.2	4	0.62	2.75	4	0.75	3.25
1"	6.3	5.6	2	0.06	1.3	5	8	4.25	4.88	0.61	0.75	11	15.4	4	0.62	3.12	4	0.75	3.50
1 1/2"	8	7.6	2.88	0.06	1.7	6.5	9	5	6.12	0.75	0.87	23.4	30.5	4	0.62	3.88	4	0.88	4.50
2"	9.8	8.6	3.62	0.06	2	8	10.5	6	6.50	0.8	0.96	36	44.6	4	0.75	4.75	8	0.75	5

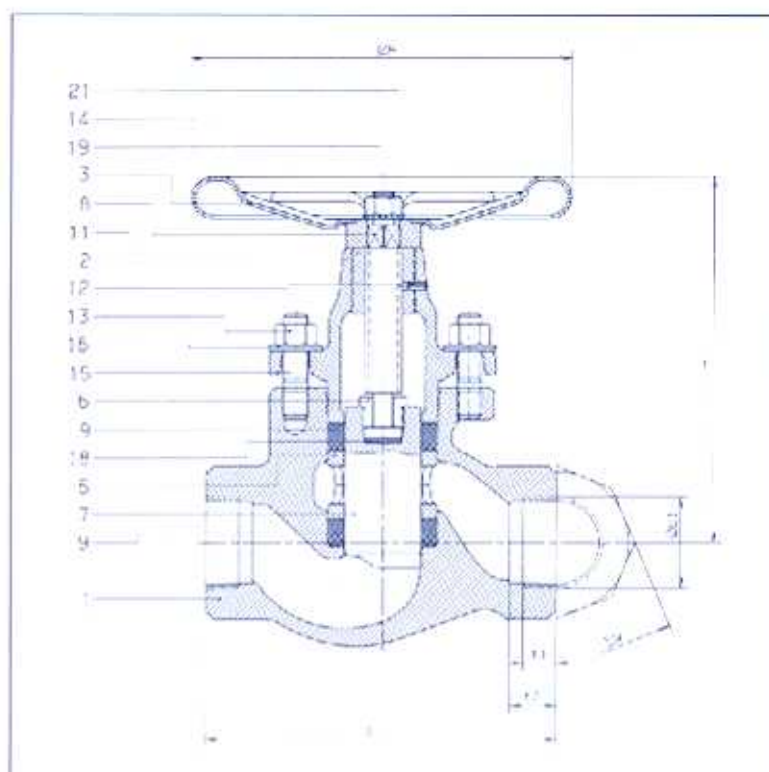
Part 11 Threaded bush } only for DN 1 1/4"  
 Part 12 Tension pin } and DN 2"

**Piston valve**  
**KVMN 1/2" - 2" NPT**  
**900 CWP\*)**  
**Female screwed ends**

**Connection**  
 NPT thread to ANSI B2.1

**Material**  
 Carbon steel – Klinger mat. code VIII  
 Acid resistant steel –  
 Klinger mat. code Xc

\*) Temperature/Pressure limits see  
 Page 4.



Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF3M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
5 Lantern bush	Sintered steel	A-351-CF8M
6 Split nut	AISI 1213	AISI 316-Ti
7 Piston	A-216-430F	AISI 316L
8 Spindle	A-276-430F	AISI 316L
9 Valve ring	KX-GT	KX-GT
11 Threaded bush	Sintered steel	AISI 316

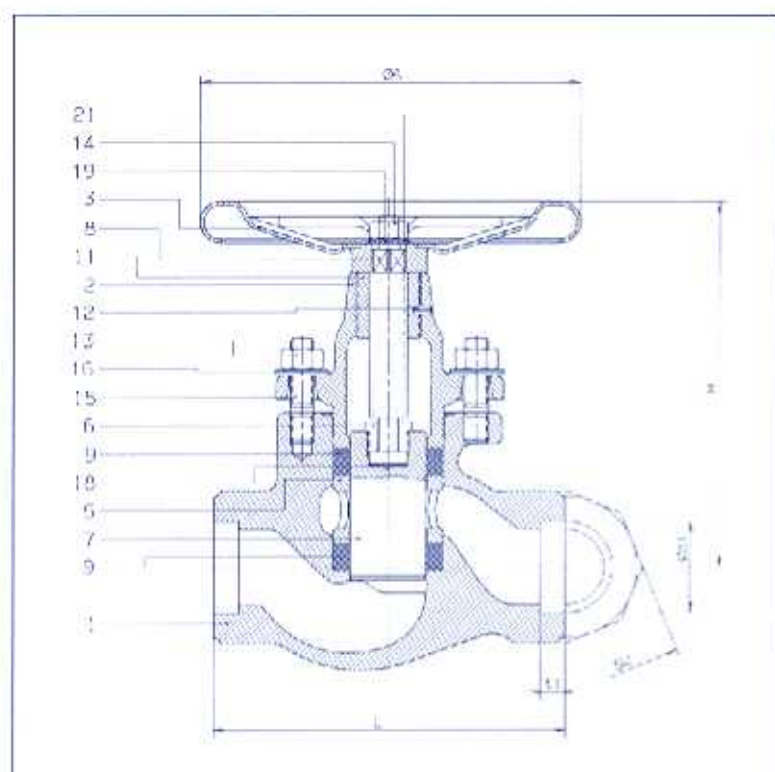
Parts	Steel (VIII)	Stainless (Xc)
12 Tension pin	Spring steel	Stainless Steel
13 Hex. nuts	A-194 2H	A-193 B8
14 Hex. nuts	A-194 2H	A-193 B8
15 Stud bolts	A-193 B7	A-193 B8
16 Belleville washer	AISI 6150	AISI 1070
18 Disc	AISI 62	AISI 316 Ti
19 Disc	Steel	Stainless steel
21 Type plate	Al	Al

#### Dimensions (In.)

Size	L	H	Stroke	A	d1	t1	t2	Wt (lb)	SW
1/2"	4	4.2	0.9	5	1/2" - 14 NPT	0.53	0.76	3.9	1.41
3/4"	4.75	4.9	1.1	5	3/4" - 14 NPT	0.55	0.78	6.3	1.61
1"	5.3	5.5	1.3	6.3	1" - 11.5 NPT	0.66	0.94	8.9	1.96
1 1/2"	7.3	7.5	1.7	8	1 1/2" - 11.5 NPT	0.66	0.96	21.6	2.95
2"	8.7	8.8	2	9	2" - 11.5 NPT	0.70	0.98	34.8	3.54

Part 11 Threaded bush } only for DN 1 1/2"  
 Part 12 Tension pin } and DN 2"

# Specifications



**Piston valve**  
**KVSN 1/2" - 2" sw**  
**900 CWP\*)**  
**Socket weld ends**

**Connection**  
 Socket weld ends to  
 ANSI B 16.11-1966

**Material**  
 Carbon steel – Klinger mat. code VIII  
 Acid resistant steel –  
 Klinger mat. code Xc

\*) Temperature/Pressure limits see  
 Page 4.

Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF8M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
4 Lantern bush	Sintered steel	A-351-CF8M
5 Split nut	AISI 1213	AISI 316-Ti
6 Piston	A-276-430F	AISI 316L
7 Spindle	A-276-430F	AISI 316L
8 Valve ring	KX-GT	KX-GT
11 Threaded bush	Sintered steel	AISI 316

Parts	Steel (VIII)	Stainless (Xc)
12 Tension pin	Spring steel	Stainless Steel
13 Hex. nuts	A-194 2H	A-193 B8
14 Hex. nuts	A-194 2H	A-193 B8
15 Stud bolts	A-193 B7	A-193 B8
16 Belleville washer	AISI 6150	AISI 1070
18 Disc	AISI 62	AISI 316 Ti
19 Disc	Steel	Stainless steel
21 Type plate	Al	Al

## Dimensions (in.)

Size	L	H	Stroke	A	d1	d2	Wt (lb)	SW
1/2"	4	4.2	0.9	5	0.86	0.4	8.9	1.41
3/4"	4.75	4.8	1.1	5	1.07	0.51	6.3	1.61
1"	5.3	5.6	1.3	6.3	1.33	0.51	8.9	1.96
1 1/2"	7.3	7.6	1.7	8	1.92	0.51	21.6	2.95
2"	8.7	8.6	2	9	2.41	0.63	34.6	3.54

Part 11 Threaded bush } only for DN 1 1/2"  
 Part 12 Tension pin } and DN 2"



**Piston valve**  
**KVSN 1/2" - 2" bw**  
**900 CWP\*)**  
**Butt weld ends**

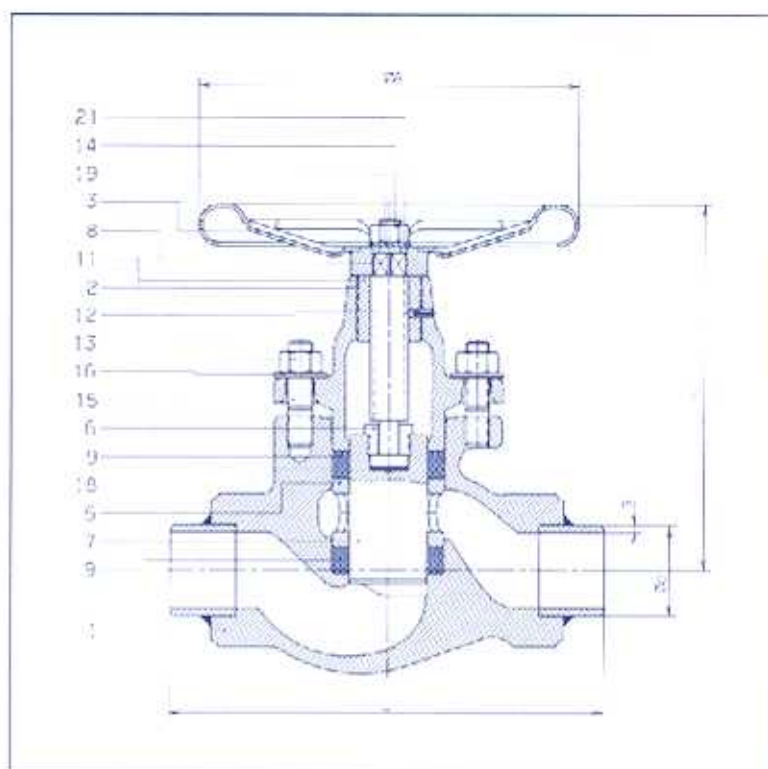
#### Connection

Butt weld ends to  
 ANSI Class 300

#### Material

Carbon steel - Klinger mat. code VIII  
 Acid resistant steel -  
 Klinger mat. code Xc

\*) Temperature/Pressure limits see  
 Page 4.



Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF3M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Hand/wheel	Steel	Steel
5 Lantern bush	Sintered steel	A-351-CF8M
6 Split nut	AISI 1213	AISI 316-L
7 Piston	A-276-430F	AISI 316L
8 Spindle	A-276-430F	AISI 316L
9 Valve ring	KX-GT	KX-GT
11 Threaded bush	Sintered steel	AISI 316

Parts	Steel (VIII)	Stainless (Xc)
12 Tension pin	Spring steel	Stainless Steel
13 Hex. nuts	A-194 2H	A 193 B8
14 Hex. nuts	A-194 2H	A 193 B8
15 Stud bolts	A-193 B7	A 193 B8
16 Belleville washer	AISI 6150	AISI 1070
18 Disc	AISI 02	AISI 316 Ti
19 Disc	Steel	Stainless steel
21 Type plate	Al	Al

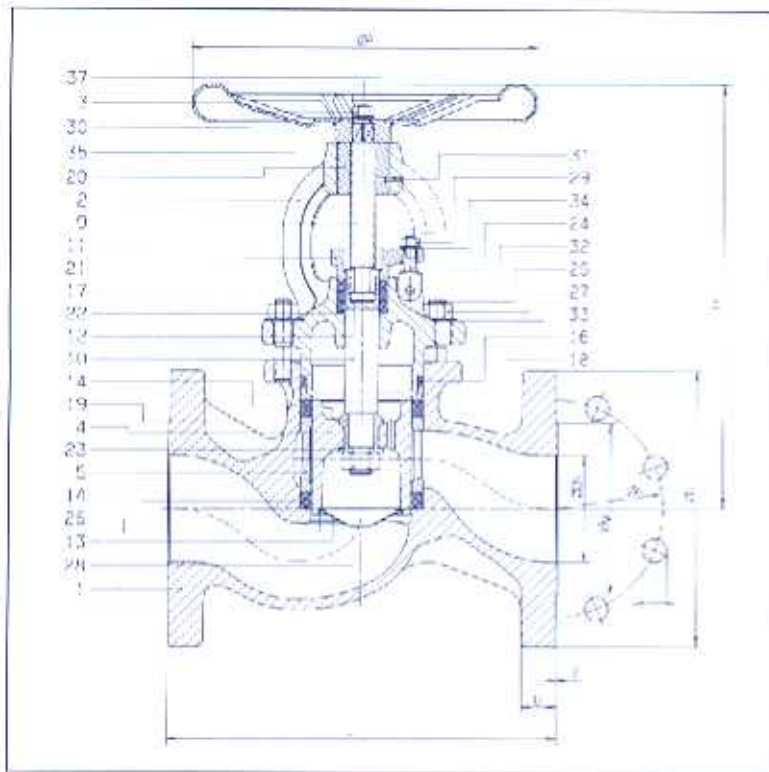
#### Dimensions (In.)

Size	L	H	Stroke	A	d	s	Wt (lb.)
1/2"	6	4.2	0.9	5	0.84	0.11	4.13
3/4"	7	4.8	1.1	5	1.06	0.11	6.65
1"	8	5.6	1.3	6.3	1.32	0.14	9.45
1 1/2"	9	7.6	1.7	8	1.90	0.16	22.38
2"	10.5	8.6	2	9	2.37	0.16	35.78

Part 11 Threaded bush } only for DN 1 1/2"  
 Part 12 Tension pin } and DN 2"



# Specifications



**Piston valve**  
**KVN 2 1/2" - 8"**  
**ANSI 150/300**

## Overall length

ANSI 150: ANSI B 16.10 Class 150  
 ANSI 300: ANSI B 16.10 Class 300

## Connection

ANSI 150: Flange according to  
 ANSI B 16.5-Class 150 RF  
 ANSI 300: Flange according to  
 ANSI B 16.5-Class 300 RF

## Material

Carbon steel – Klinger mat. code VIII  
 Acid resistant steel –  
 Klinger mat. code Xc

Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351 CF8M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
4 Piston	A-276-430F	A-351 CF8M
5 Lantern bush	AISI A48-30B	A-351 CF8M
9 Spindle	A-276-430F	AISI 316L
10 Piston shaft	A-276-430F	AISI 316L
11 Gland retainer	AISI 60-40-18	A-351 CF8M
12 Disc	AISI 02	AISI 316Ti
13 Piston nose cone	AISI 316	AISI 316
14 Valve ring	KX-GT	KX-GT
16 O1 valve ring	KX-L	KX-L
17 Stuffing-box ring	KX-GT	KX-GT
18 Thrust piece	Sintered steel	AISI 316
19 Back seat	A-276-430F	AISI 316
20 Threaded bush	Sintered steel	AISI 316

Parts	Steel (VIII)	Stainless (Xc)
21 Split nut	AISI 1050	AISI 316
22 Washer	AISI 1009	AISI 316
23 Disc	AISI 316Ti	AISI 316Ti
24 Swing bolt	A-193 B7	A-193 B8
25 Stud bolt	A-193 B7	A-193 B8
26 Securing ring	AISI 301	AISI 301
27 Hex. nuts	A-194 2H	A-193 B8
28 Hex. nuts	A-194 2H	A-193 B8
29 Hex. nuts	A-194 2H	A-193 B8
30 Hex. nuts	A-194 2H	A-193 B8
31 Tension pin	Spring steel	Stainless steel
32 Notched pin	Stainless steel	Stainless steel
33 Belleville washer	AISI 6150	AISI 440C
34 Belleville washer	AISI 1070	AISI 440C
36 Disc	Steel	Stainless steel
37 Typeplate	Al	Al

## Dimensions (In.)

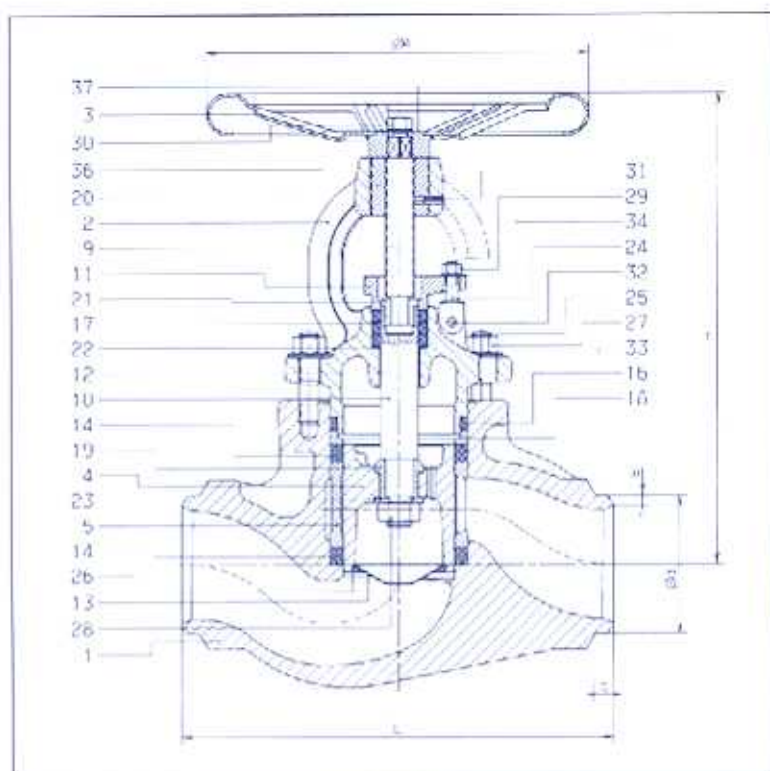
Size	A	H	g	f	Stroke	L		D		c		Wt (lb.)		Drilling 150			Drilling 300		
						150	300	150	300	150	300	150	300	No	1	pk	No	1	pk
2 1/2"	9.85	12.4	4.12	0.06	1.92	8.50	11.50	7	7.50	0.86	1	55.4	67.6	4	0.75	5.50	8	0.88	5.88
3"	9.85	13.25	5	0.06	2.24	9.50	12.50	7.50	8.25	0.94	1.12	77	85.8	4	0.75	6	8	0.88	8.62
4"	12.40	15.35	6.19	0.06	2.48	11.50	14.00	9	10	0.94	1.25	117	133.3	8	0.75	7.50	8	0.88	7.88
6"	15.75	19.60	8.50	0.06	3.66	16.0	17.50	11	12.50	1	1.44	237	256	8	0.88	9.50	12	0.88	10.62
8"	15.75	22.80	10.62	0.06	4.64	19.50	22	13.50	15	1.12	1.62	432	480	8	0.88	11.75	12	1	13

**Piston valve**  
**KVSN 2 1/2" - 8"**  
**ANSI 300**  
**Butt weld ends**

**Overall length**  
 ANSI 300: ANSI B 16.10 Class 300

**Connection**  
 Butt weld ends to  
 ANSI Class 300 Sched. 80

**Material**  
 Carbon steel - Klinger mat. code VIII  
 Acid resistant steel -  
 Klinger mat. code Xc



Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF3M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
4 Piston	A-276-430F	A-351 CF8M
5 Lantern bush	AISI 448-30H	A-351 CF8M
9 Spindle	A-276-430F	AISI 316L
10 Piston shaft	A-276-430F	AISI 316L
11 Gland retainer	AISI 60-40-18	A-351 CF8M
12 Disc	AISI 02	AISI 316Ti
13 Piston nose cone	AISI 316	AISI 316
14 Valve ring	KX-GT	KX-GT
15 O1 valve ring	KX-L	KX-L
17 Stuffing-box ring	KX-GT	KX-GT
18 Thrust piece	Sintered steel	AISI 316
19 Rack seat	A-276-430F	AISI 316
20 Thru-bush	Sintered steel	AISI 316

Parts	Steel (VIII)	Stainless (Xc)
21 Split nut	AISI 1050	AISI 316
22 Washer	AISI 1008	AISI 316
23 Disc	AISI 316Ti	AISI 316Ti
24 Swing bolt	A-193 B7	A-193 B8
25 Stud bolt	A-193 B7	A-193 B8
26 Securing ring	AISI 301	AISI 301
27 Hex. nuts	A-194 2H	A-193 B8
28 Hex. nuts	A-194 2H	A-193 B8
29 Hex. nuts	A-194 2H	A-193 B8
30 Hex. nuts	A-194 2H	A-193 B8
31 Tension pin	Spring steel	Stainless steel
32 Notched pin	Stainless steel	Stainless steel
33 Belleville washer	AISI 6150	AISI 440C
34 Belleville washer	AISI 1070	AISI 440C
36 Disc	Steel	Stainless steel
37 Typeplate	Al	Al

**Dimensions (In.)**

Size	A	H	Stroke	L	d	s	t	WT (lb.)
2 1/2"	9.85	12.4	1.92	11.50	2.88	0.276	0.60	49
3"	9.85	13.25	2.24	12.50	3.5	0.300	0.60	62
4"	12.40	15.35	2.48	14	4.5	0.337	0.60	100
6"	15.75	19.60	3.66	17.50	6.63	0.432	0.60	191
8"	15.75	22.80	4.64	22	8.63	0.500	0.60	358



# Specifications

## Seal rings

Type	Description	Service	Temperature
KX-GT	graphite/metal laminate	high pressure	800 °F
KX 1	graphite/PTFE	EPA/TA-Luft	572 °F

## Valve rings and stuffing box rings dimensions

DN 1/2"-2" – cast steel, acid resistant steel					DN 2 1/2"-6" – cast steel, acid resistant steel				
Model	Item	Outside dia. (mm)	Inside dia. (mm)	Height	Model	Item	Outside dia. (mm)	Inside dia. (mm)	Height
KVN KX-GT 1/2"	2 valve rings	23,5	15	8.0	KVN KX-GT 2 1/2"	2 valve rings	82	60	13.3
	1 bonnet valve ring					1 bonnet valve ring	82	69	10.0
	3 stuffing box rings					3 stuffing box rings	36	24	8.0
KVN KX-GT 3/4"	2 valve rings	30	20	9.3	KVN KX-GT 3"	2 valve rings	94	70	14.6
	1 bonnet valve ring					1 bonnet valve ring	94	80	10.0
	3 stuffing box rings					3 stuffing box rings	36	24	8.0
KVN KX-GT 1"	2 valve rings	38	25	10.6	KVN KX-GT 4"	2 valve rings	112	90	14.6
	1 bonnet valve ring					1 bonnet valve ring	112	100	11.0
	3 stuffing box rings					3 stuffing box rings	46	30	10.0
KVN KX-GT 1 1/2"	2 valve rings	58	40	14.6	KVN KX-GT 6"	2 valve rings	155	130	17.3
	1 bonnet valve ring					1 bonnet valve ring	155	141	13.0
	3 stuffing box rings					3 stuffing box rings	46	30	10.0
KVN KX-GT 2"	2 valve rings	70	50	16	KVN KX-GT 8"	2 valve rings	200	170	18.6
	1 bonnet valve ring					1 bonnet valve ring	200	184	15.0
	3 stuffing box rings					3 stuffing box rings	46	30	10.0

## Summary of types

DN	PN	Connection	Overall length	Material
1/2"-6"	ANSI 150/300	Flanges	ANSI B16.10 Class 150/300	cast steel, acid resistant steel
1/2"-2" NPT	900 CWP	Female screwed ends		cast steel, acid resistant steel
1/2"-2"	900 WCP	Butt weld ends		cast steel, acid resistant steel
2 1/2"-6"	ANSI 300	Butt weld ends	ANSI B16.10 Class 300	cast steel, acid resistant steel
1/2"-2"	900 CWP	Socket weld ends		cast steel, acid resistant steel

## Klinger piston valves for special applications

### KVN for heat transfer

are equipped to meet the most stringent requirements imposed on valves in this type of service.

### KVN for steam

are designed for use with steam and are the world's most leak resistant valve on this service.

### KVN for liquid gas

are invariably made of materials free from non-ferrous metals. They are therefore suitable also for ammonia without additional changes.

### Klingermatic actuators

Klinger piston valves of all nominal sizes may be equipped with pneumatic or electromechanical actuators.

## ***Product range***

**Ballostar® ball valves**  
in cast iron, cast steel and  
acid-resistant steel

**KLINGER® Monoball**  
one-piece ball valves in steel

**Piston valves**  
in cast iron, cast steel and  
acid-resistant steel

**KLINGERMATIC®**  
Actuators for piston valves  
and ball valves

**Sleeve-packed cocks**  
**pressure gauge cocks**  
in steel and  
acid-resistant steel

**KLINGER Ball-o-top**  
Brass ball valves

*\*for KLINGER registered trademarks*

*Your KLINGER Representative*

KLINGER Fluid Control GmbH & Co KG  
P.O.B. 19, Am Kanal 8-10  
A-2352 Gumpoldskirchen, Austria  
Tel. Int. +43 (2252) 600-0  
Telex: 14 430 kltg a  
Fax: Int. +43 (2252) 63 336 Export