KLINGER®

KVN Piston Valves

Sealing reliability for steam, hot water and heat transfer media

Technical Data – ANSI Standard

KLINGER **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

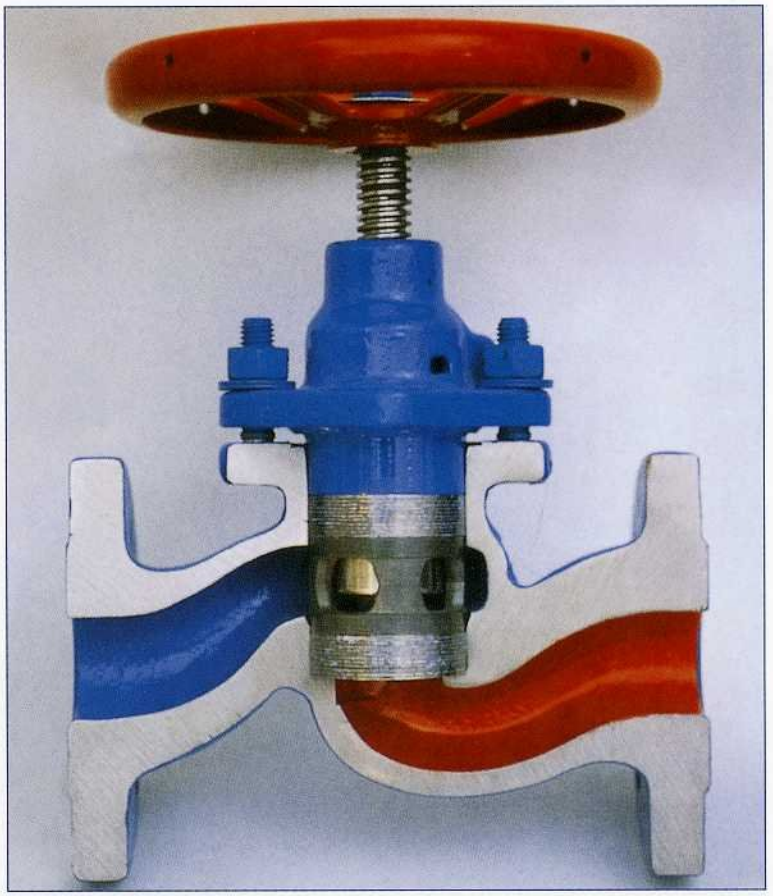
Klinger: A Success Story

In 1893, Richard Klinger founded the Klinger group and opened its first manufacturing plant near Vienna, Austria. Klinger's early inventions included the reflex level gauge and compressed sheet gasket materials.

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 tests and Helium leak tests. The Klinger piston valve has out-performed 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 stem seal, while the lower valve ring seals the passage. The large sealing surface on the piston and rings provides an optimal seal.

When closing the valve, the piston pushes and wipes away any impurities, which might be present in the fluid, ahead of itself. Therefore, media with fibrous or contaminated constituents are reliably sealed.

Damage to the sealing surfaces is eliminated and the valve remains fully functional longer.

Excellent control characteristics

The double guidance of the piston in the closed position prevents fluttering and vibration in the throttled position and is better able to handle turbulence in the pipeline.

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

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

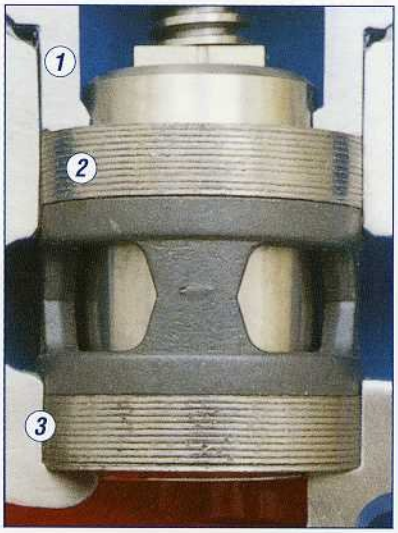
Once installed, the valve is absolutely maintenance free for a long time.

In case worn valve rings have to be changed, this is very easily done with the valve in the line.

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. Simply "Install and forget." The coupling pressure on the piston is so high that media are reliably checked 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 valve rings. They are reliably tight in all operating states.



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

Threaded cast iron piston valves for isolation and bypass lines

The benefits

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

The Know-how

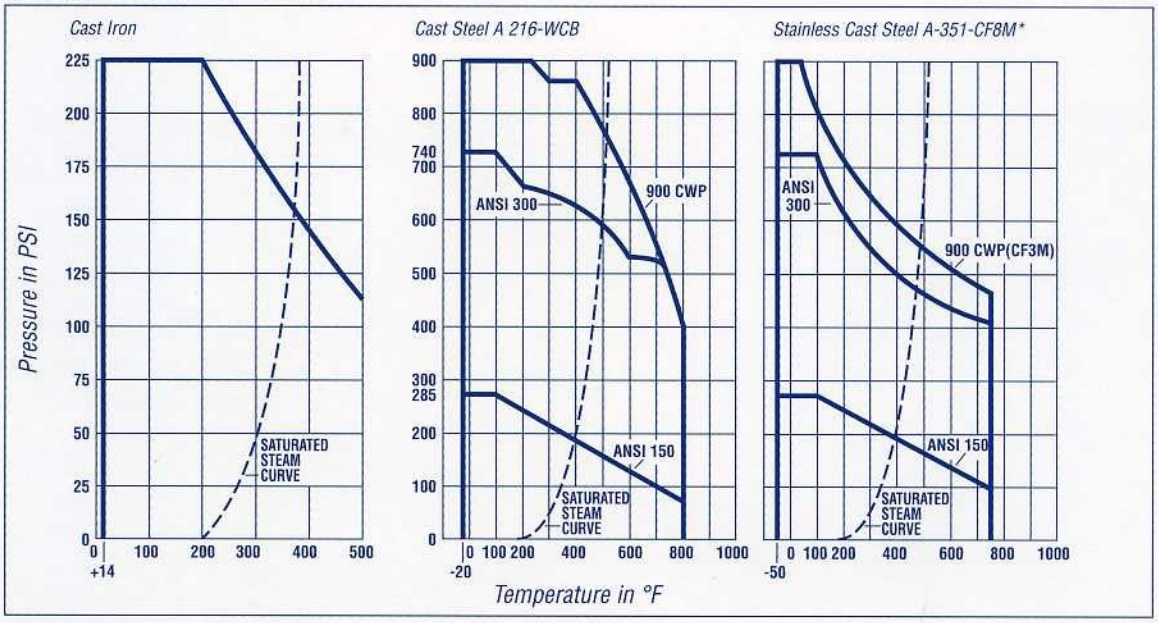
- CAD, CAM technology
- Production to AD WO, TRD 100 HPO*
- Quality assurance according to ISO 9001

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

Reliable According to All Standards and Tests

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

Temperature and Pressure Limits



Material Codes

Type	Body	Bonnet	Inner Parts	Color of Valve
III	Cast iron	Cast iron	No copper alloy parts	Grey
VIII	Cast steel	Cast steel	No copper alloy parts	Blue
Xc	Stainless steel	Stainless steel	Stainless 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	–	–

Design benefits

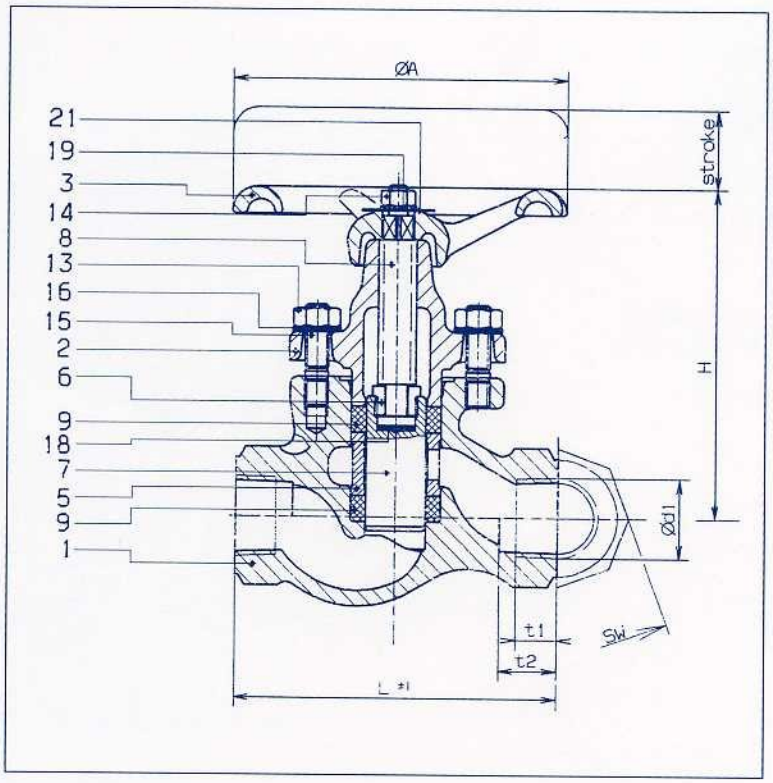
- Maximum compression transmitted to lower ring
- Elimination of leakage due to shaft runout
- Elimination of seal exposed to atmosphere
- Elimination of wire draw
- Live loading extends cycle life

Flow Coefficients

	ANSI 150	ANSI 300
Size (in)	C_v	C_v
1/2	4.9	5.3
3/4	8.4	9.4
1	12.5	14.6
1 1/2	33.5	37.4
2	55.8	58.6
2 1/2	75.8	80.7
3	119	122
4	185	191
6	373	392
8	670.3	681

C_v: Valve parameter (gal/min)

Specifications



Piston Valve
KVMN 1/2 in - 2 in NPT
225 CWP*
Female Screwed Ends

Connection
NPT thread to ANSI B2.1

Material
Cast iron – Klinger code III

* *Temperature/Pressure limits see Page 4.*

Parts	Cast Iron (III)
1 Body	A-126 Class B
2 Bonnet	A-126 Class B
3 Handwheel	A-126 Class A
5 Lantern bush	Sintered steel
6 Split nut	AISI 1213
7 Piston	A-276-430F
8 Spindle	A-276-430F
9 Valve ring	KX-GT
11 Threaded bush	Sintered steel

Parts	Cast Iron (III)
12 Tension pin	Spring steel
13 Hex nuts	A-194 2H
14 Hex nuts	A-194 2H
15 Stud bolts	AISI C-1035
16 Belleville washer	AISI 6150
18 Disc	AISI 316
19 Disc	Steel
21 Type plate	AL

Dimensions (in)

Size	L	H	Stroke	A	d1	t1	t2	Wt (lb)	SW
1/2	4	4.2	0.9	4.1	14 NPT	0.53	0.76	3.9	1.41
3/4	4.75	4.8	1.1	4.7	14 NPT	0.55	0.78	6.3	1.61
1	5.3	5.6	1.3	5.5	11.5 NPT	0.66	0.94	8.9	1.96
1 1/2	7.3	7.6	1.7	7.0	11.5 NPT	0.68	0.96	21.6	2.95
2	8.7	8.6	2	7.8	11.5 NPT	0.70	0.98	34.8	3.54

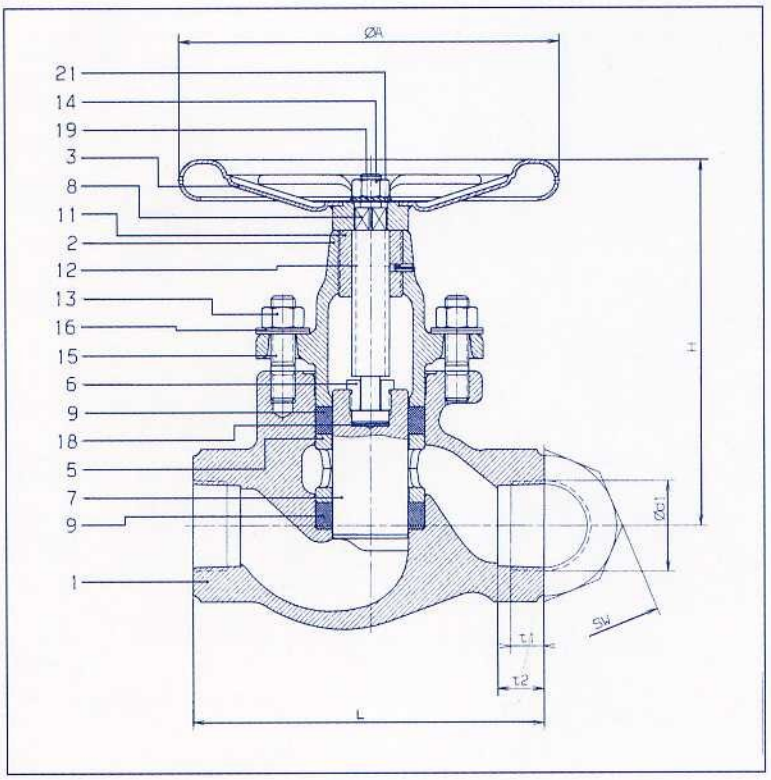
**** Part 11 Threaded Bush and Part 12 Tension Pin are for sizes 1 1/2 in and 2 in only.***

Piston Valve
KVMN 1/2 in -2 in NPT
900 CWP*
Female Screwed Ends

Connection
NPT thread to ANSI B2.1

Material
Carbon steel – Klinger mat. code VIII
Stainless steel – Klinger mat. code Xc

* Temperature/Pressure limits see Page 4.



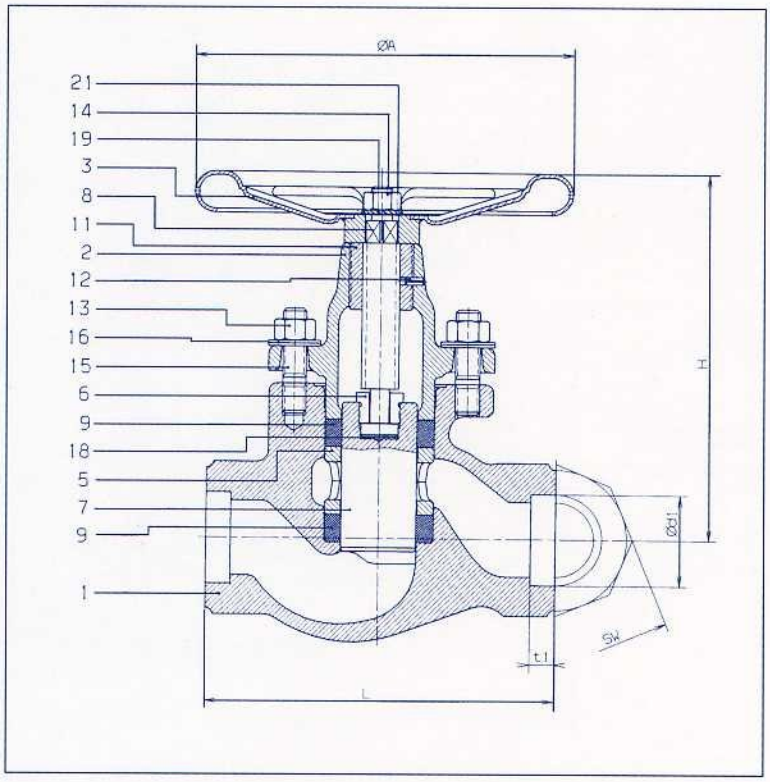
Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF3M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
5 Lantern bush	Sintered steel	A-351-CF8M
6 Split nut	AISI 1213	AISI 316-Ti
7 Piston	A-276-430F	AISI 316L
8 Spindle	A-276-430F	AISI 316L
9 Valve ring	KX-GT	KX-GT
11 Threaded 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	d1	t1	t2	Wt (lb)	SW
1/2	4	4.2	0.9	5	14 NPT	0.53	0.76	3.9	1.41
3/4	4.75	4.8	1.1	5	14 NPT	0.55	0.78	6.3	1.61
1	5.3	5.6	1.3	6.3	11.5 NPT	0.66	0.94	8.9	1.96
1 1/2	7.3	7.6	1.7	8	11.5 NPT	0.68	0.96	21.6	2.95
2	8.7	8.6	2	9	11.5 NPT	0.70	0.98	34.8	3.54

**** Part 11 Threaded Bush and Part 12 Tension Pin are for sizes 1 1/2 in and 2 in only.***



Piston Valve
KVSN 1/2 in- 2 in sw
900 CWP*
Socket Weld Ends

Connection
Socket weld ends to
ANSI B 16.11-1966

Material
Carbon steel – Klinger mat. code VIII
Stainless 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-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	d1	t1	Wt (lb)	SW
1/2	4	4.2	0.9	5	0.86	0.4	3.9	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	34.8	3.54

**** Part 11 Threaded Bush and Part 12 Tension Pin are for sizes 1 1/2 in and 2 in only.***

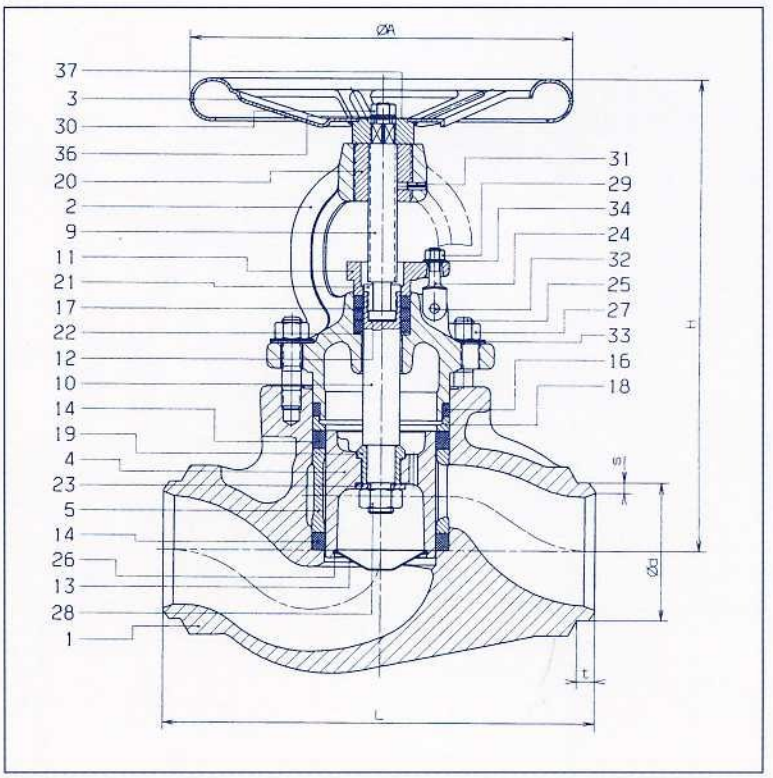
In the interest of technical progress, design and dimensions are subject to modification

Piston Valve
KVSN 2 1/2 in - 8 in
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
Stainless steel – Klinger mat. code Xc



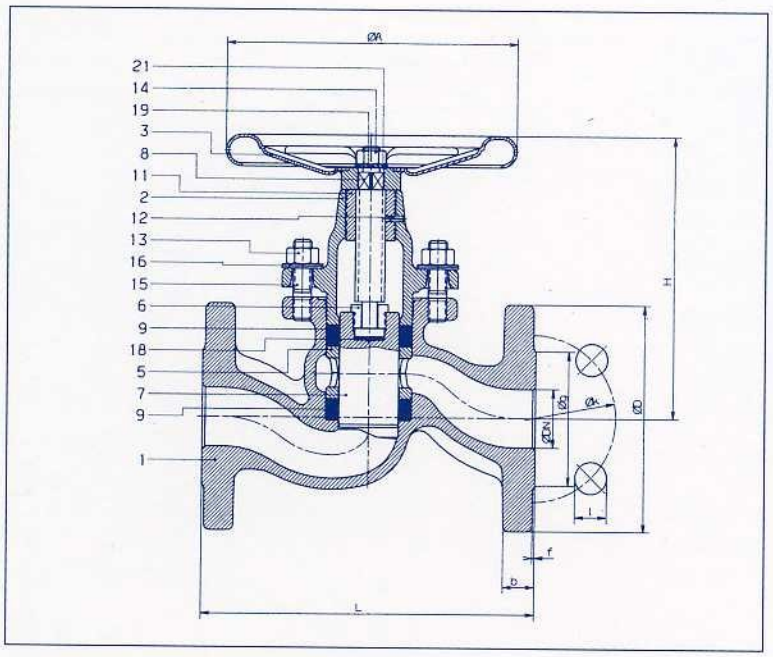
Parts	Steel (VIII)	Stainless (Xc)
1 Body	A-216 Grade WCB	A-351-CF3M
2 Bonnet	A-216 Grade WCB	A-351-CF8M
3 Handwheel	Steel	Steel
4 Piston	A-276-430F	A-351-CF8M
5 Lantern bush	AISI A48-30B	A-351 CF8M
9 Spindle	A-276-430F	AISI 316L
10 Piston shaft	A-276-430F	AISI 316L
11 Gland retainer	AISI 60-40-18	A-351 CF8M
12 Disc	AISI 02	AISI 316Ti
13 Piston nose cone	AISI 316	AISI 316
14 Valve ring	KX-GT	KX-GT
16 OT 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 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 par. 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

In the interest of technical progress, design and dimensions are subject to modification



Piston Valve
KVN 1/2 in - 2 in
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
Stainless 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)

						L		D		b		Wt (lb)		Drilling 150			Drilling 300		
Size	A	H	g	f	Stroke	150	300	150	300	150	300	150	300	No	l	øk	No	l	øk
1/2	5	4.2	1.38	0.06	0.9	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	1.69	0.06	1.1	4.62	7	3.88	4.62	0.53	0.7	7.8	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 and Part 12 Tension Pin are for sizes 1 1/2 in and 2 in only.***

Piston Valve
KVN 2 1/2 in - 8 in
ANSI 150/300

Overall Length

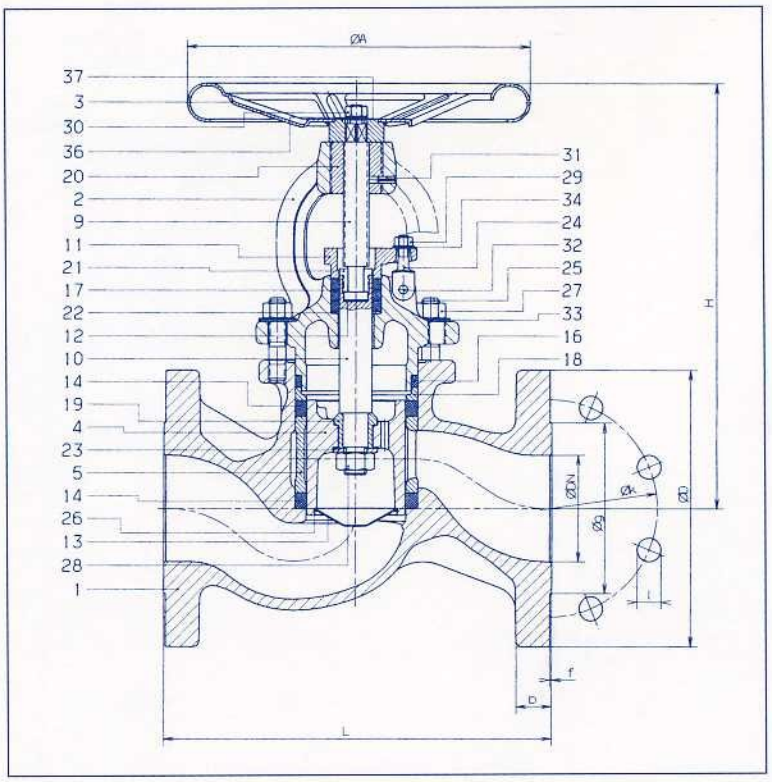
ANSI 150: ANSI B 16.10, Class 150
ANSI 300: ANSI B 16.10, Class 300

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
Stainless 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 OT 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 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 par. 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)

						L		D		b		Wt (lb)		Drilling 150			Drilling 300		
Size	A	H	g	f	Stroke	150	300	150	300	150	300	150	300	No	l	øk	No	l	øk
2 1/2	9.85	12.4	4.12	0.06	1.92	8.50	11.50	7	7.50	0.88	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	6.62
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	259	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

In the interest of technical progress, design and dimensions are subject to modification

Seal Rings

Type	Description	Service	Temperature
KX-GT (KXM)	Graphite/metal laminate	High pressure	800° F
KX 1	Graphite/PTFE	EPA-TA-Luft	572° F
TFE	PTFE	Special	158° F

Valve Rings and Stuffing Box Rings Dimensions

Size 1/2 in - 2 in — Cast iron, Cast steel, Stainless steel

Model	Item	Outside dia (mm)	Inside dia (mm)	Height
KVN KX-GT 1/2 in	2 valve rings	23.5	15	8.0
KVN KX-GT 3/4 in	2 valve rings	30	20	9.3
KVN KX-GT 1 in	2 valve rings	38	25	10.6
KVN KX-GT 1 1/2 in	2 valve rings	58	40	14.6
KVN KX-GT 2 in	2 valve rings	70	50	16

Size 2 1/2 in - 8 in — Cast steel, Stainless steel

Model	Item	Outside dia (mm)	Inside dia (mm)	Height
KVN KX-GT 2 1/2 in	2 valve rings	82	60	13.3
	1 bonnet valve ring	82	69	10.0
	3 stuffing box rings	36	24	8.0
KVN KX-GT 3 in	2 valve rings	94	70	14.6
	1 bonnet valve ring	94	80	10.0
	3 stuffing box rings	36	24	8.0
KVN KX-GT 4 in	2 valve rings	112	90	14.6
	1 bonnet valve ring	112	100	11.0
	3 stuffing box rings	46	30	10.0
KVN KX-GT 6 in	2 valve rings	155	130	17.3
	1 bonnet valve ring	155	141	13.0
	3 stuffing box rings	46	30	10.0
KVN KX-GT 8 in	2 valve rings	200	170	18.6
	1 bonnet valve ring	200	184	15.0
	3 stuffing box rings	46	30	10.0

Summary of Types

Size (in)	Class	Connection	Overall Length	Material
1/2-8	ANSI 150/300	Flanges	ANSI B16.10, Class 150/300	cast steel, stainless steel
1/2 - 2 NPT	900 CWP	Female screwed ends		cast steel, stainless steel
1/2 - 2	900 CWP	Socket weld ends		cast steel, stainless steel
2 1/2 - 8	ANSI 300	Butt weld ends	ANSI B16.10, Class 300	cast steel, stainless steel
1/2 - 2 NPT	250 CWP	Female screwed ends		cast iron

Klinger Piston Valves for Special Applications

KVN for Heat Transfer

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

KVN for Steam

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

KVN for Liquid Gas

Made of ferrous metals (no copper nor aluminum). They are, therefore, suitable for ammonia without additional changes.

Klingermatic Actuators

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

Klinger piston valves *are available with pneumatic actuators in all sizes, as follows:*
Spring Return, Fail Close (as shown)
Spring Return, Fail Open
Double Acting
Required Air Pressure 60-100 psi

Options:
Solenoid Valves
Limit Switches
Pneumatic Positioners
Electro-Pneumatic Positioners

For further details, contact your Klinger Distributor/Representative.

3" Klinger with #2A-HRT Fail Close Actuator

Your KLINGER Distributor/Representative

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