WIKA TÜREN

SERIES K
CONTROL VALVE

WIKATÜREN

CONTROL VALVE

Series K

INTRODUCTION

Series K pneumatic diaphragm control valve, as one new high-performance industrial fluid control valve, is independently developed and integrated with international advanced design concept by WIKATUREN GmbH & CO., KG currently WIKATUREN has obtained certifications of TS manufacturing license for special equipments and S1L3.

The valve, provided with multi-spring diaphragm actuator, applies modular structure, in which different trim parts can be freely mounted and replaced, and offers different accessories.

Like: electropneumatic valve positioned, electromagnetic valve, selflocking valve, amplifier, limit switch and pressure-reducing valve, which are convenient for the full combination of control valve and DCS or PLC control system, receive 4-20mA DC control signal to carry out the wholetravel automatic regulation of the valve.

PERFORMANCE SPECIFICATIONS OF CONTROL VALVE

MANUFACTURING STANDARD		
FLANGE STANDARD	ASME	JIS DIN
NOMINAL DIAMETER	DN15-400	
NOMINAL PRESSURE	PN1.6-32; CLASS150-2500	
OPERATING TEMP.	-196～570°C	

FEATURES

1. The valve body applies S-shaped design, the S-shaped passageway in the valve has small resistance and no dead corner during the controlling.

2. According to specific work conditions, various structures are provided for selection, the trim parts with throttle are wholly interchangeable, the unbalanced and balanced with same diameter is only available with different structures of guide sleeve, spool, sealing-function trimming module, in such a way, the valve type can be changed between regulating, cut-off, low-noise, multi-step pressure-reducing or labyrinth, the flow characteristic has quick-closing, linear, equal percentage and so on.

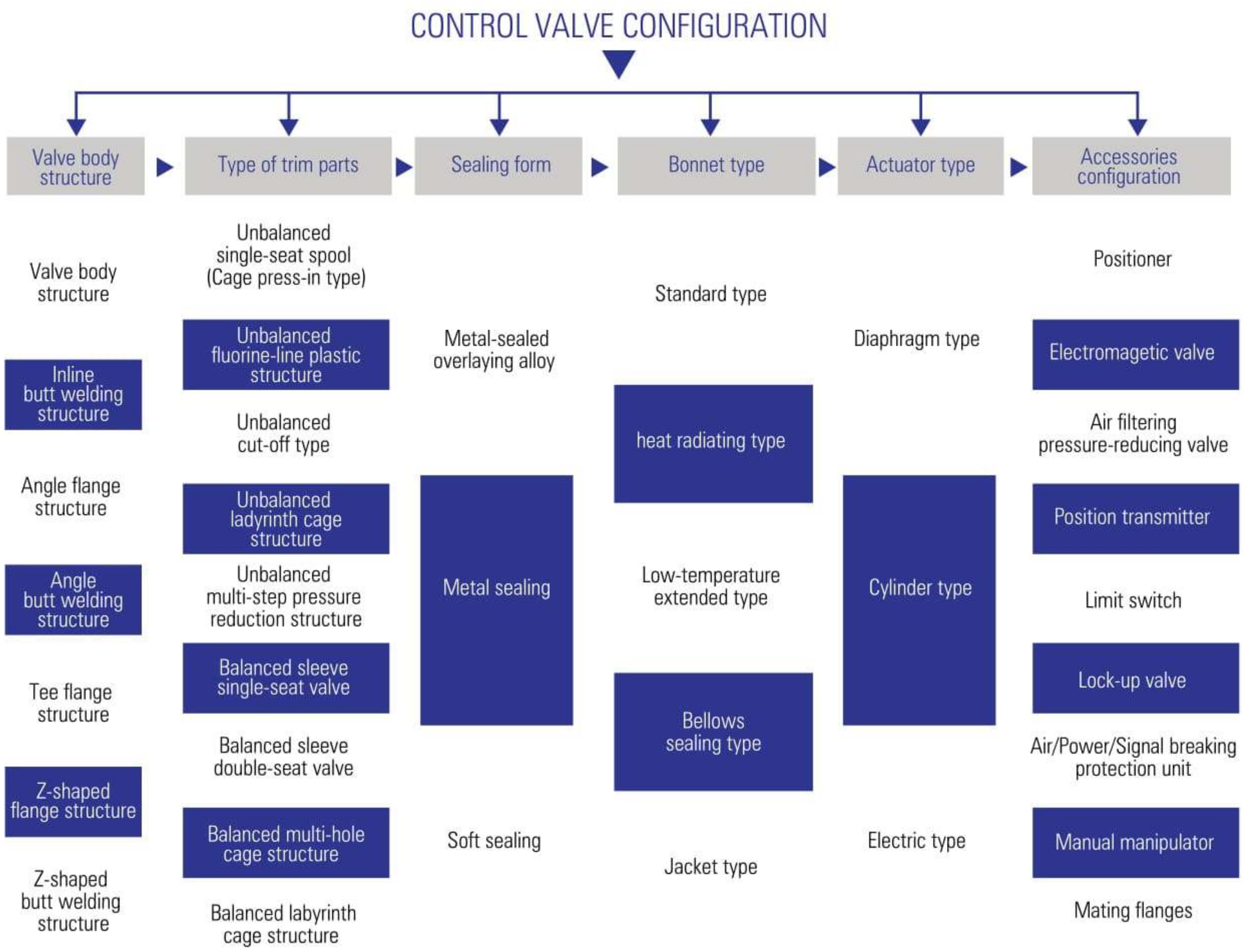
3. The control valve applies top-guided structure. The guide sleeve in the valve controls the spool to stably guide and operate, quicklydisassembled valve seat and cage ensure the sealing performance of the valve and easy maintenance.

4. The bonnet is selectable with various sealing form to meet the control requirements of work conditions, such as, standard type, regulating cut-off type, high-temperature heat-radiating type, low-temperature extended type, Bellows type and insulated type.

5. Furthermore, provides various types of electric actuators, i.e. electric control valve, to suit the needs of customers.

COMPONENTS OF CONTROL VALVE

CONTROL VALVE CONFIGURATION



NOTE:

- The above list view is the deployment guide diagram of linear motion control valve, you can select most suitable control valve structure to meet the requirements of technical parameters as per indicated by arrow direction.
- The above guide diagram in the document is only relating to the portion of important contents.
- Please find detailed parameters to engineers for any information not specified in the documents like electric actuator, pneumatic actuator and other relating accessories.
- The document does not specify maximum allowable pressure difference value of control valve and act uator, the Cv value of valve opening and other more specific performance data, please consult engineers for further information.

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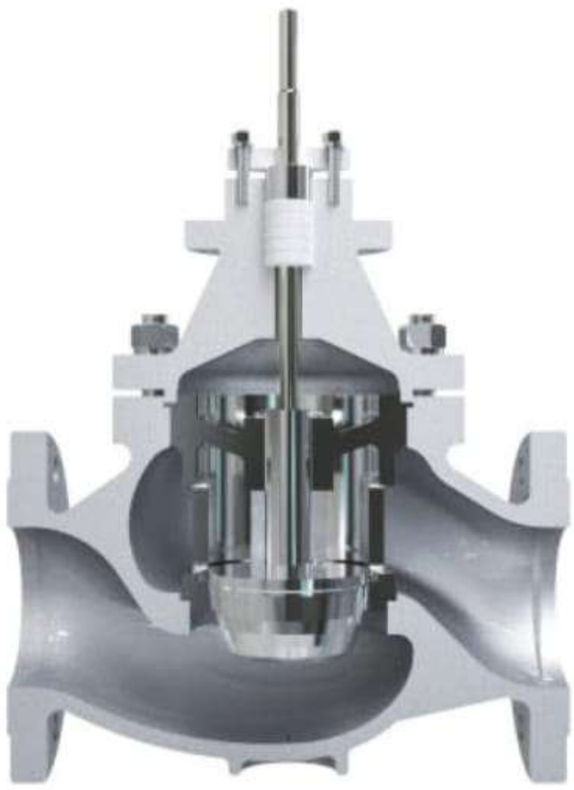
TYPE OF VALVE BODY

INLINE VALVE BODY



The inline body provides S-streamline passageway, with smooth inner wall and equal sections, has the merits of small pressure drop loss, big flowage, stable flowing etc..

ANGLE VALVE BODY

The angle body has a generally universal with inline valve body except for perpendicular shape.
It has the merits of compact structure, simple flowage, small resistance, especially suitable for the work conditions like easily-coked, easily-jammed and high-viscosity.

TEE VALVE BODY

The tee body is divided into interflow and diversion types, mainly used for proportional control or bypass control, small occupancy and low cost.

Z-SHAPED VALVE BODY

Z-shaped body is mainly applicable for high-pressure work conditions, integrally forged, has a nice pressure resistance and simple internal passageway, which may not arise easily vortex, reflux, and reduces the possibility of flash evaporation and cavitation erosion under high pressure difference condition.

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CONTROL VALVE | Series K

BONNET TYPE

STANDARD BONNET

The standard bonnet is a normal-temperature unit, its materials are fully similar to those of the body, which can provide functions of sealing the valve body and actuator. Operating temperature:-30°C～260°C

HIGH-TEMPERATURE BONNET

The bonnet is specially designed for high-temperature conditions, which can offer heat radiation function by enlarging the contact area between the bonnet and surrounding air through radiating fin, and can effectively protect the stuffing and actuator.
Operating temperature:+ 230°C～530°C

LOW-TEMPERATURE EXTENDED BONNET

The low-temperature extended bonnet is suitable for medium under low temperature, like liquid oxygen, liquid nitrogen. The bonnet can effectively safeguard the stuffing and actuator, the standard materials are 304 or 316, or other materials with different expansion coefficient to suit different work conditions.
Operating temperature:-196°C～45°C

METAL BELLOWS SEALED BONNET

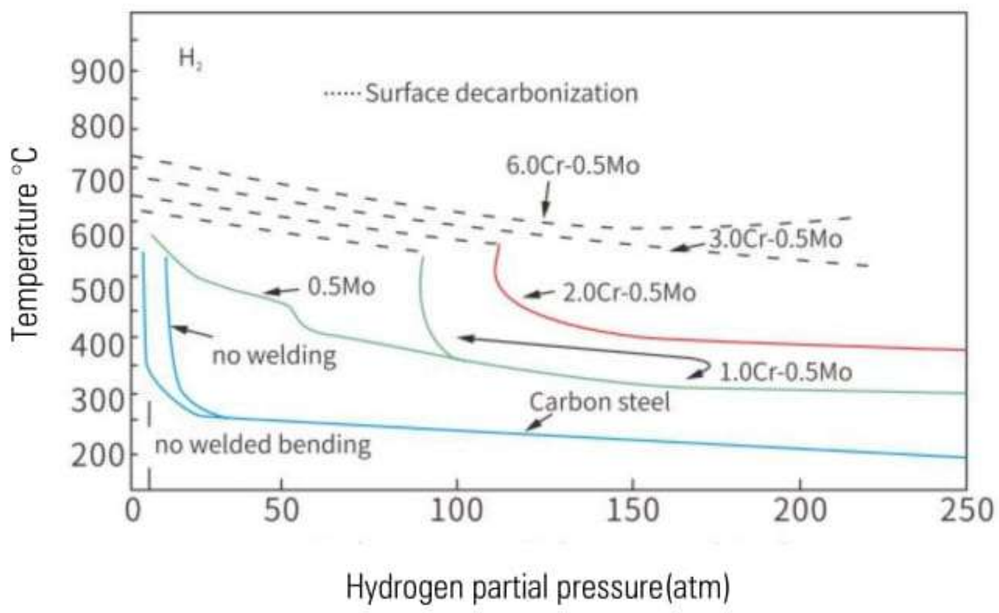
The metal bellows sealed bonnet, armed with stainless steel bellows unit to separate the medium from outside, which can ensure the stem to make vertical movement. Besides, the standard stuffing box provided in the bonnet ensures no waste or accidents or environmental pollution caused by the medium leakage.
Operating temperature:-60°C～530°C

SELECTION FO VALVE BODY MATERIALS

BASIC RULE OF MATERIALS SELECTION

HIGH-TEMPERATURE MATERIALS

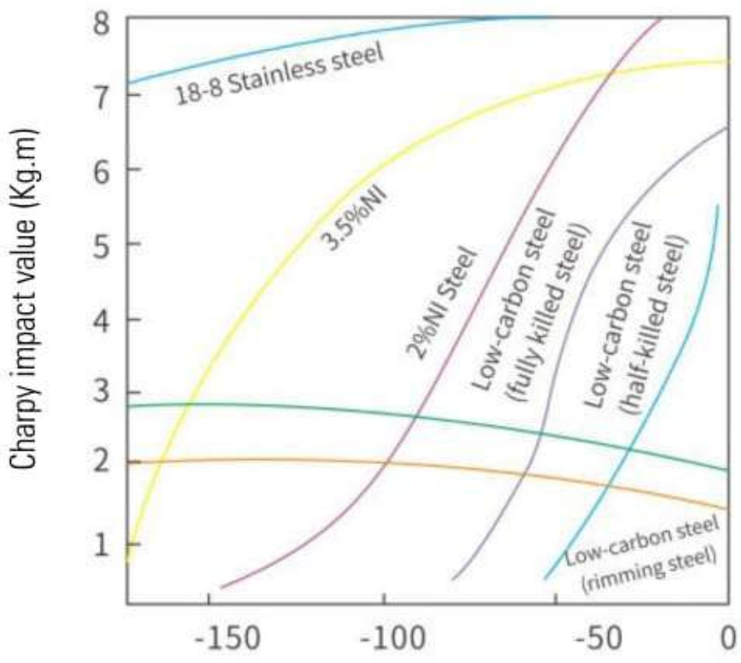
The high-temperature materials must consider completely the change of metallographic structure and corrosion resistance. In general, alloy steel materials con tain chromium, nickel and molybdenum. Besides, under high-temperature condition, the steel is eroded by hydrogen, which may result in decarbonization generally and embrittlement. The metal elements like chromium, nickel and molybdenum are added into the steel and combine with carbon element to increase the hydrogen-attack resistance of the steel.



LOW-TEMPERATURE MATERIALS

As selects low-temperature materials, the lowtemperature impact value of the materials must be completely considered, as well as the embrittlement problem of the materials arisen by toughness decrease under low temperature. Henceforth, under low-temperature work conditions, the applicable materials must be enough toughness under low temperature, the steel materials applicable for valve under different temperatures is safe and reliable when it attains standard impact power for suitable temperature.

The low-temperature mechanical performance of austenite stainless steel is relatively stable, so the austenite is often applied.



Low-temperature impact value
(5mm U-shaped notch of various materials

ANTI-CAVITATION MATERIALS

When the fluid is liquid, especially there is flash evaporation and cavitation, the anti-cavitation of materials shall be fully considered. Anti-cavitation includes two types as follows:

a. High-hardness materials (The heat-treatment mode increases the hardness);

b. Jhe materials with high toughness and big fatigue strength and solid oxide layer. (The surface heat treatment increases the surface hardness of the materials);

c. Local hardening materials (overlaying treatment);

ANTI-CORROSION MATERIALS

The corrosion amount of metal materials is generally divided into fully corrosion, crevice corrosion, intercrystalline corrosion, pitting corrosion, stress corrosion and so on. No materials can resist to various corrosion. Actually, the corrosion of the materials relates to type of fluid, concentration and temperature, and also the factors including the fluid containing or not containing oxidant and flow rate, which caused the complicated selection of the materials.

The corrosion-resistant materials commonly used for control valves mainly consist of lined materials like PTFE, F46 or austenite stainless steel, 20# alloy steel, Hastelloy alloy B, Hastelloy alloy C, titanium or other special metals with high cost.

MATERIALS OF TRIM PARTS

MAIN METHODS OF HARDENING

Common materials of trim parts involve SUS304, SUS3I6, SUS316L, SUS410, SUS420 etc., are relatively treated according to different fluids, the hardening treatment must be done for the occasions like controlling cavitation fluid, containing-solid-particle fluid or high temperature high-pressure so as to prolong the service life of valves.

1. HEAT TREATMENT

A. 304/316 Solution heat treatment

The materials of austenite stainless steel are mainly applied for corrosive-medium work conditions, or low-temperature occasions. When the medium contains strong corrosion, the solution heat treatment shall be performed. The purpose of the treatment is to increase the hardness of the materials and corrosion-resistance.
Operating temperature range :-196～530°C

B. 410/420 Thermal refining (quenching ° and tempering)

The material of martensitic stainless steel is a superior anti-cavitation material, shall be quenched and tempered under hightemperature high-pressure occasions. The purpose of thermal refining is to greatly increase the hardness of the materials and prolong the service life under rigorous work conditions.
Operating temperature range: -45～425°C

C. 17-4PH Precipitation hardening treatment

Adds different types and amount of strengthening elements into basic composition of stainless steel, by which different types and amount of carbide, nitride, carbide-metal compound will be separated out during precipitation hardening, in such as way, for the purpose of enhancing the strength of the steel and maintaining enough toughness.
Operating temperature range: -45-425°C

2. SURFACE HARDENING TREATMENT

Surface treatment involves surface hardening and surface chemical heat treatment.
A. Surface hardening by flame heating, electro-contact surface hardening, induced heat surface hardening.
B. Carburizing, nitriding, carbonitriding, boronizing, chromizing, copperizing and so on.

3. OVERLAYING TREATMENT

Stellite overlaying (main composition) is a common hardening treatment with excellent corrosion resistance. Stellite overlaying includes fully and local overlaying, there is no specific standard stipulation for the application of the overlaying mode, which is determined by different pressure, temperature of the fluid and the fluid containing or not containing particles.
The types of overlaying include as follows:

Overlaying treatment of spool (overlaid by stellite alloy)

Sealing face overlaying | Full-profile overlaying | Guide surface overlaying

Overlaying types of valve seat (overlayed by stellite alloy)

Sealing face overaying

Full-profile overaying

MATERIALS OF TRIM PARTS

COMMON MATERIALS FOR MAIN COMPONENTS

PART NAME	MATERIAL
Valve body, Bonnet	WCB,WC6,WC9,CF8,CF8M,CF3,CF3M,Alloy steel
Spool, Valve seat	304,316,316l,410,420,17-4PH,Monel alloy,Hastelloy alloy
Cage	CF8,CF8M,Alloy steel
Valve stem	304,316,316L,420,17-4PH,Alloy steel

Note: can customize special materials

OPERATING TEMP. OF BODY MATERIALS PRESSURE RANGE

Valve body and bonnet is the main bearing component of the valve, once failed, the medium contained will be released to the air. Henceforth, the materials applicable shall attain relative mechanical performance under stipulated medium temperature and pressure action.

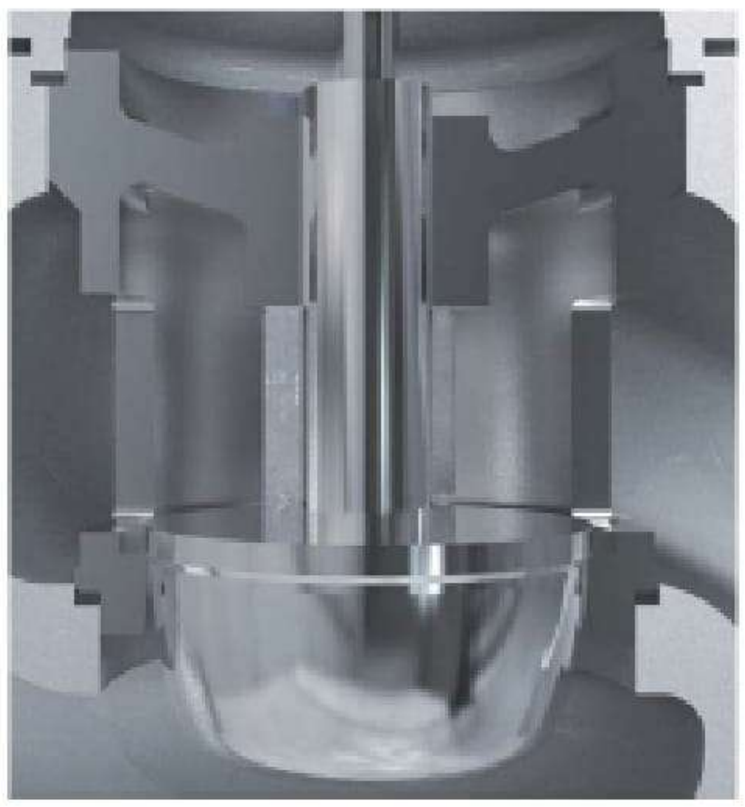
TEMPERATURE °C	150#			300#			600#		
	WCB	CF8	CF8M	WCB	CF8	CF8M	WCB	CF8	CF8M
-196～38	-	1.90	1.90	-	4.95	4.95	-	9.91	9.92
-45～38	-	1.90	1.90	-	4.95	4.95	-	9.91	9.92
-5～38	1.96	1.90	1.90	5.10	4.95	4.95	10.20	9.91	9.92
50	1.92	1.84	1.84	5.00	4.77	4.80	10.01	9.56	9.62
100	1.76	1.61	1.61	4.63	4.08	4.21	9.27	8.17	8.43
150	1.57	1.47	1.47	4.51	3.62	3.85	9.04	7.26	7.69
200	1.40	1.37	1.37	4.38	3.27	3.56	8.75	6.54	7.12
250	1.20	1.20	1.20	4.16	3.04	3.34	8.33	6.10	6.67
300	1.01	1.01	1.01	3.87	2.91	3.15	7.74	5.80	6.32
350	0.84	0.84	0.84	3.69	2.81	3.03	7.38	5.60	6.07
375	0.73	0.73	0.73	3.64	2.77	2.96	7.28	5.54	5.93
400	0.64	0.64	0.64	3.44	2.74	2.91	6.89	5.48	5.81
425	0.55	0.55	0.55	2.88	2.71	2.87	5.74	5.42	5.72
450	0.47	0.47	0.47	1.99	2.68	2.81	4.00	5.37	5.61
475	0.37	0.37	0.37	1.35	2.65	2.73	2.70	5.30	5.46
500	0.28	0.28	0.28	0.88	2.60	2.67	1.75	5.20	5.37
525	0.18	0.18	0.18	0.51	2.19	2.57	1.03	4.77	5.15
538	0.13	0.15	0.15	0.34	2.18	2.53	0.72	4.55	5.06

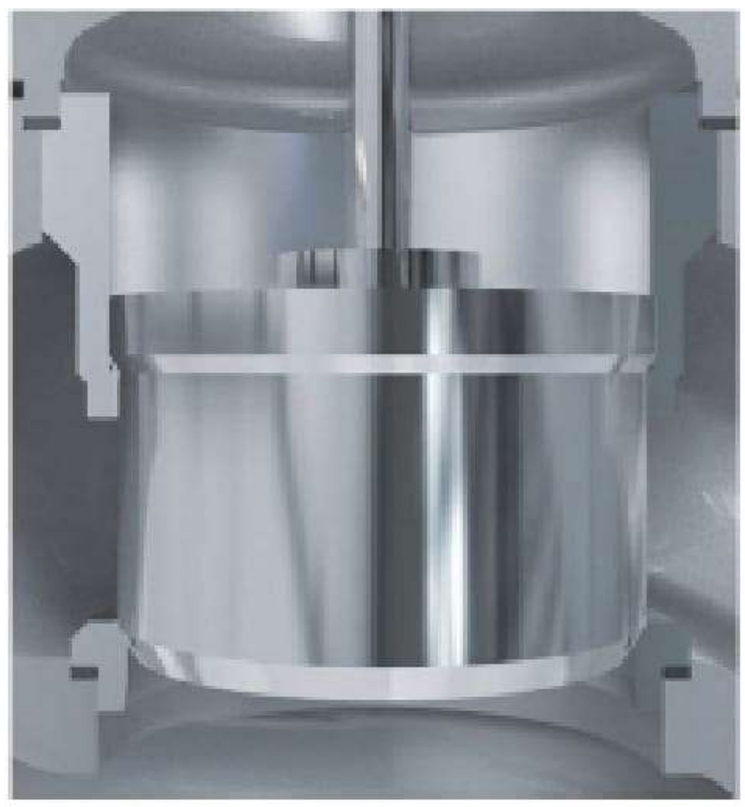
TEMPERATURE °C	PN1.6	PN4.0	PN6.3	PN10	TEMPERATURE °C	PN1.6	PN4.0	PN6.3	PN10
	XXXXXX					XXXXXX			
-5～200	1.60	4.00	6.30	10.00	-45～200	1.60	4.00	6.30	10.00
～250	1.40	3.50	5.40	9.00	～300	1.40	3.50	5.40	9.00
～300	1.20	3.00	4.00	7.50	～400	1.20	3.00	4.00	7.50
～350	1.10	2.60	4.00	6.60	～480	1.10	2.60	4.00	6.60
～400	0.90	2.30	3.70	5.80	～520	0.90	2.30	3.70	5.80
～425	0.80	2.00	3.20	5.00	～560	0.80	2.00	3.20	5.00
～435	0.70	1.80	2.80	4.50					
～445	0.62	1.60	2.50	4.20					
～455	0.57	1.40	2.30	3.60					

STRUCTURE OF GASKET

Series K is a new high-performance control valve by applying auto-centering snap-on non-threaded valve seat. It is axial fixed by bonnet and cage. The gap between bonnet and body, or between valve seat and body, metal contacted, are filled with sealing gasket to ensure its sealing. The compression degree of bonnet sealing gasket is determined by the bolt preload on the bonnet, the insurance of coaxiality between bonnet and body can ensure the vertical centering of spool and valve seat to attain strict sealing needs.

When the bonnet is well installed, its force will be transmitted to the valve seat by cage or sleeve. When the height tolerance of valve seat, cage or sleeve is very approximately, the sealing gasket of the valve seat will be properly compressed to ensure its sealing needs, and will not cause the leakage arisen from overpressure of sealing gasket of the valve seat. If the valve is exactly mounted, auto-centered and top-guided valve seat will be fit with spool and need no polishing.





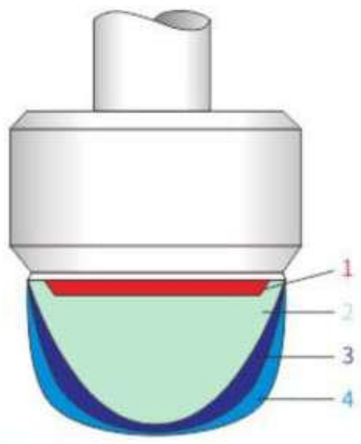
MATERIALS AND OPERATING TEMP. RANGE OF VARIOUS GASKETS

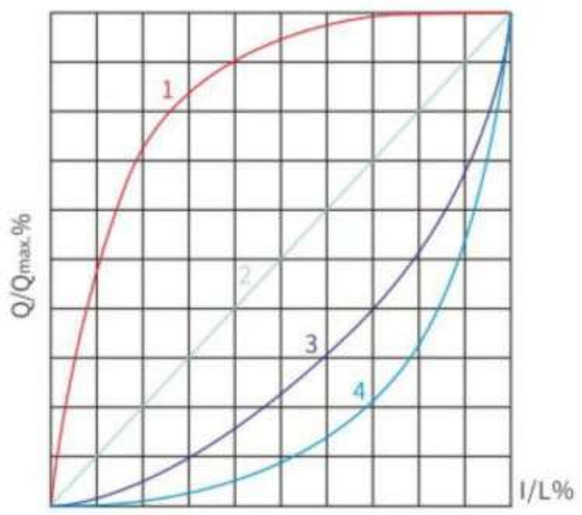
TYPE	MATERIAL	TEMPERATURE RANGE
Plane gasket (generally used)	PTFE	-130°C~230°C
Serrated gasket (applies for high temperature high pressure)	304/316	-196°C~500°C
Spira I wound gasket (applies for high-temperature corrosion)	304/316+Flexible graphite	-196°C~500°C

The sealing gasket designed by special materials can apply for higher temperature

FLOW CHARACTERISTIC

The flow characteristic of control valve is the relationship between flow capacity and opening of incompressible fluid in the control valve under constant pressure difference between both ends of the valve, it is a kind of inherent flow characteristic. The typical inherent flow characteristic is divided into linear and equal percentage characteristic. In fact, when the control valve controls the processing medium, the change of opening will arise the change of pressure difference of the valve. In such condition, the characteristic curve between the opening and flow capacity of the control valve will deviate from inherent flow characteristic curve, i.e., the actual flow characteristic.





1 Quick-opening feature
2 Linear characteristic
3. Parabola characteristic
4. Equal percentage characteristic

LINEAR FLOW CHARACTERISTIC

Linear characteristic

It means that the flow capacity and opening of control valve is a linear ratios relations. It is usually used for small pressure difference change, almost constant, or the pressure drop in the valve becomes the main pressure drop of the system.

EQUAL PARCENTAGE FLOW CHARACTERISTIC

Equal percentage characteristic

It means that the flow change rate arisen by the stroke change is directly proportional to the original flow capacity. It is generally used for larger adjustable range, or the pressure drop of the whole system is higher than the power loss of the valve, or the opening change and in-valve pressure difference change is relatively big.

QUICK OPENING

Quick-opening feature

It is mainly applied to switch control system, it requires large flow capacity by small opening, the flow capacity reaches its maximum value along the increase of the opening, afterwards, the opening increases, the flow change is small.

STRUCTURE OF STEM STUFFING BOX

The stuffing, as the sealing of stem, enables the sealing function of vertical movement of the stem. The traditional solution is clamptype stuffing box structure, which can finish the sealing, however, the friction of the stem is big resulting in the dead zone of the whole valve is big and may not respond to small signal.
In order to solve the problem, Series K Control Valve ensures the effective sealing of the stem, and also improves the structure to reduce the friction of the stem. The new stuffing box is re-designed. The feature of the structure is that integral stuffing box is convenient for replacement and repair, multiple U-shaped seal-compensation sealing- ring replaces the traditional PTFE V-shaped stuffing.

STRUFFING

Standard type stuffing

Integral stuffing box is standard configuration of stuffing. Its modular design is convenient for replacement and repair.

Operati ng te m peratu re:-30°C～260°C

The stuffing is made up from several Ushaped sealing rings, which carries sealcompensation function.

STRUCTURE OF HIGH-TEMP. STRUFFING BOX

High-temperature stuffing

Applies V-shaped flexible graphite as high-temperature stuffing.

Operating temperature:-45°C～530°C

The high-temperature stuffing is made up from several V-shaped graphite with different conicity.

STRUCTURE OF BELLOWS STUFFING BOX

The bellows stem sealing structure generally applies bellows, the standard stuffing box is dual sealing, which is absolutely insulated to strong poison or cryogenic medium.

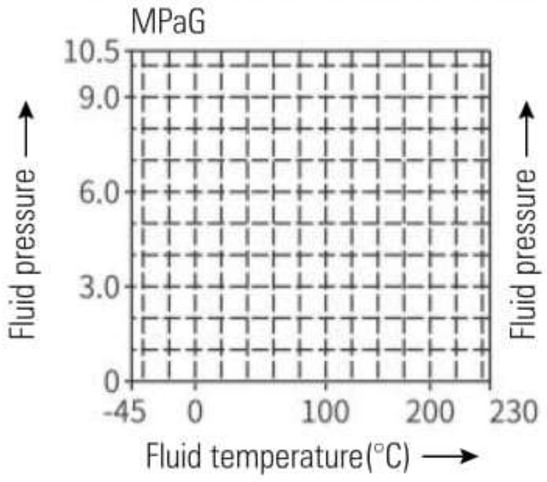
Operating temperature:-60°C～530°C

The metal bellows separates the medium from outside, which can ensure the vertical movement of the stem.

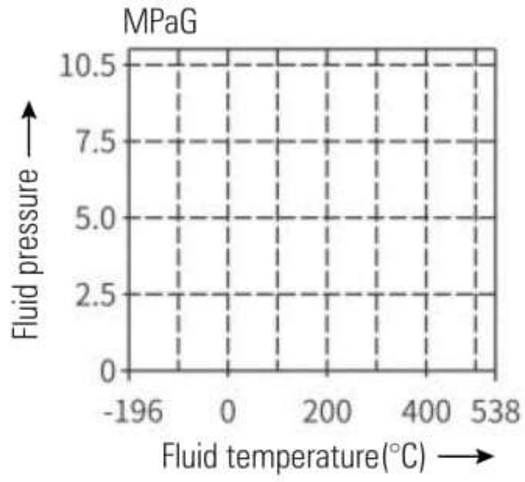
PRESSURE, OPERATING TEMP. RANGE OF SEALING MATERIAL

TYPE, MATERIAL, TEMPERATURE RANGE	MATERIAL	TEMPERATURE RANGE
Standard type	PPL	-30°C～260°C
	PTFE	-30°C～230°C
High-temperature type	V-shaped flexible graphite	-30°C～540°C
	RTFE	-50°C～250°C
Bellows pipe sealing	304/316	-196°C～400°C
	Hastelloy C/MOENEL	-250°C～530°C

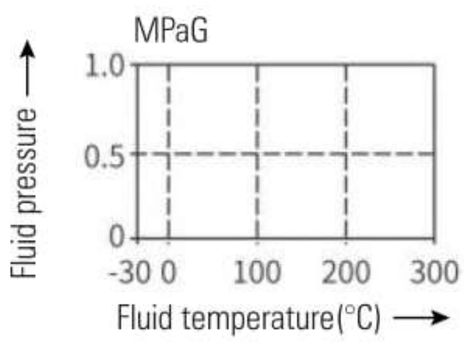
Strengthened PTFE V-shaped stuffing



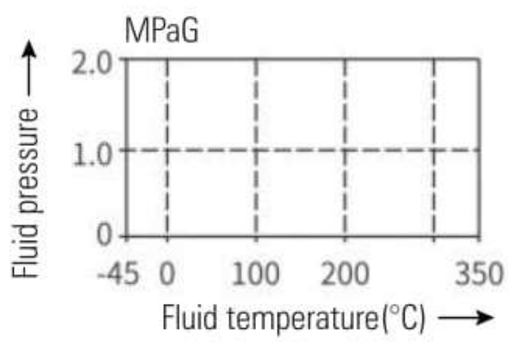
Flexible graphite



Formed bellows sealing(SUS316)



Welded bellows sealing(SUS316)



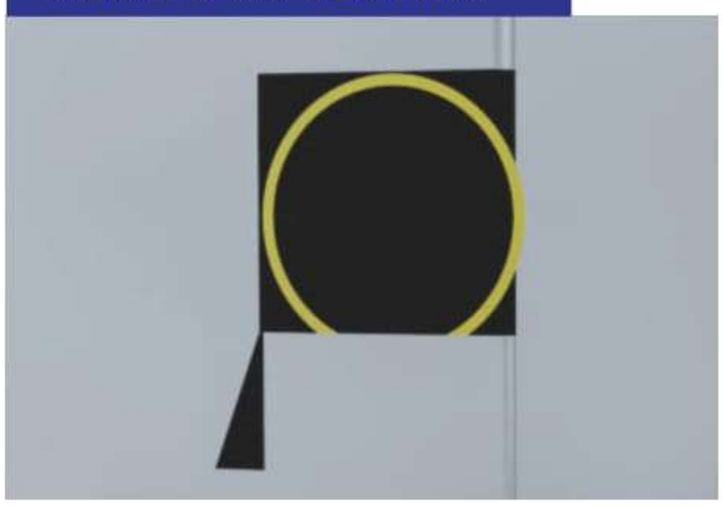
SOLUTION OF THE SEALING RING IN BALANCED VALVE TRIM

The balanced sealing ring is acting the locking of upper seal in the balanced trim, is the core technical part in the sleeve control valve.
The balanced control valve produced in the company provides customers with three solution for sealing ring.

BALANCED SEALING RING

Sealing mode: Pressurized self-sealing
Grade of leakage:ASME 816.104-1998
Temperature range:-30°C～260°C

METAL C-SHAPED RING



Sealing mode: Crush seal/Pressurized self-sealing
Grade of leakage:ASME 816.104-1998
Temperature range:-196°C～650°C

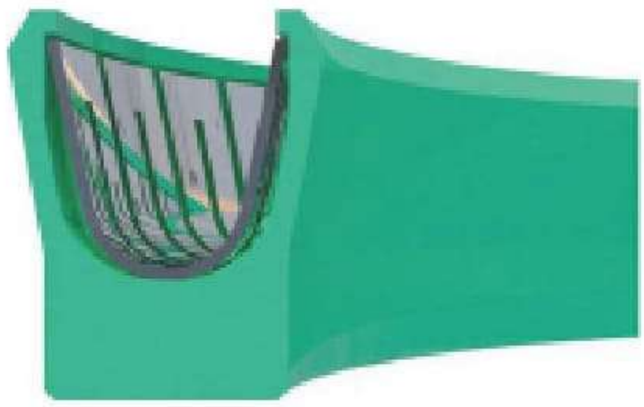
COMPOSITE GRAPHITE SEALING RING

Sealing mode: Crush seal
Grade of leakage:ASME 816.104-1998
Temperature range:-196°C～560°C

INTRODUCTION TO BALANCED SEALING RING

The spring-driven PTFE sealing element is a high performance element with U-shaped PTFE built-in special spring.
The suitable spring force and flow pressure in the system enables the sealing lip to eject and slightly press the sealed face to produce very outstanding sealing effect.
The sealing lip with best short and dense features reduces the friction and prolongs the service life.

FEATURES OF BALANCED SEALING RING



1. Available for reciprocating and rotating movement
2. Can be applicable for most of fluids and chemicals
3. Small friction coefficient
4. No creeping under precise control to reduce the dead zone of the valve
5. Excellent anti-abrasion performance and dimensional stability
6. Can adapt to steep temperature change
7. No pollution

SELECTION OF SEALING MATERIALS

S.N.	TYPE OF SEALING	MATERIAL	TEMPERATURE RANGE
1	Balanced sealing ring	PPL	-30°C～260°C
2	Stone sealing ring	Flexible graphite	-196°C～560°C
3	Metal sealing ring	INCONEL 718	-196°C～650°C

MODE OF CONNECTION

The end connection mode of the control valve produced in our company includes flange connection, overlaying connection, the small diameter can also be designed into socket weld connection and threaded connection, or designed according to the requirements of customers.

THE FLANGED CONNECTION END

MODE OF SEALING FACE

MFM Male and female face

TG Tongue & groove face

RJ Connection face

RF Convex surface

BUZZ WELDED CONNECTION END

The buzz welded end of the control valve is processed as per the groove stipulated in ASME B16.25, or produced according to the requirements of customers.

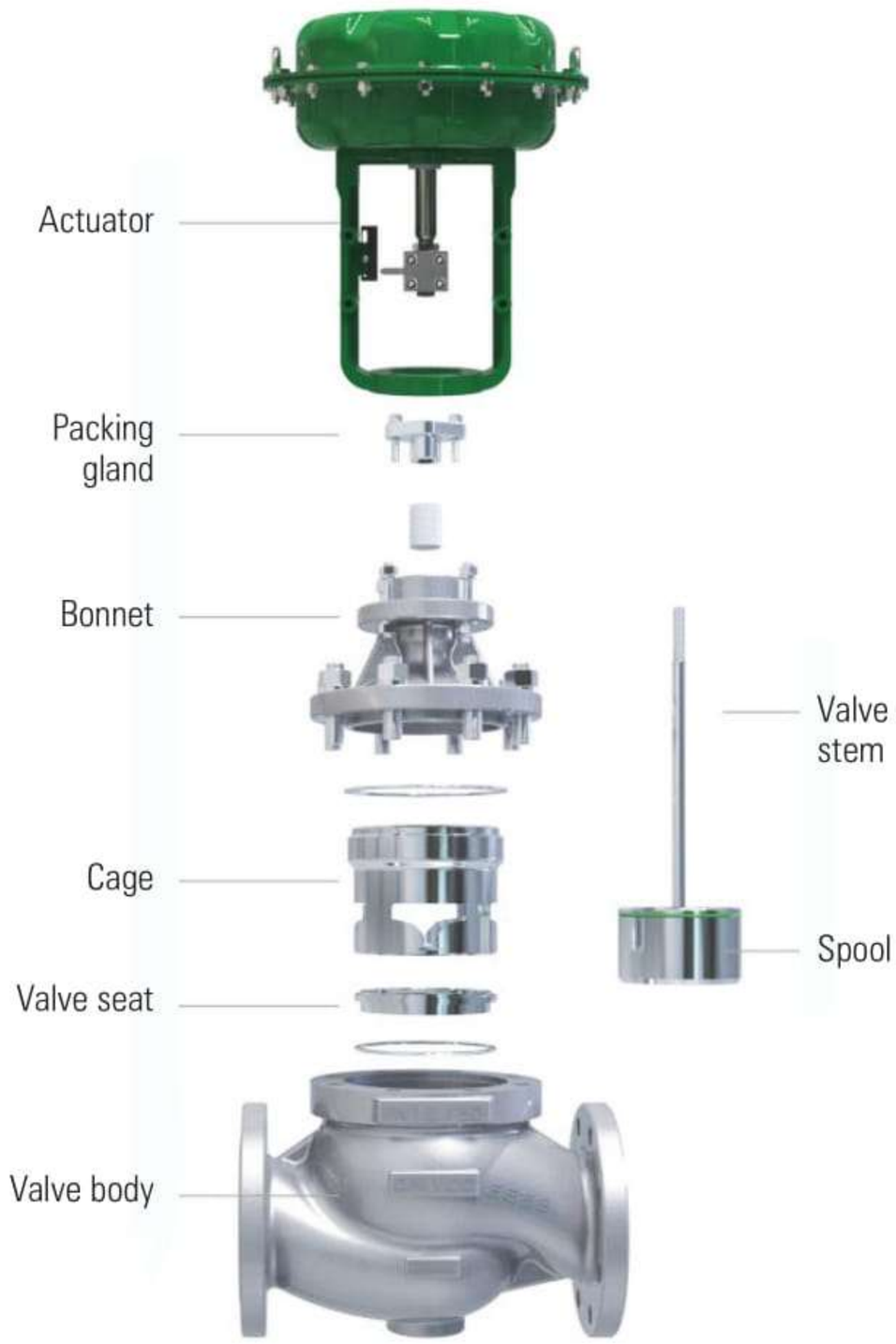
SOCKET WELDED CONNECTION END

The socket weld end of the control valve is processed as per the groove stipulated in ASME B16.ll, or produced according to the requirements of customers.

WIKA TÜREN

2 WAYS CONTROL VALVE

Series K



INTRODUCTION

Series K 2 Ways Control Valve applies sleeve-guided, pressure-balanced spool to suit the occasions with large pressure difference. By replacing upper valve seat with balanced sealing ring, the traditional sleeve double-seat valve structure is changed into sleeve single-seat structure, which greatly improves the leakage grade of the sleeve valve. By applying pressure-balanced structure of the spool, the small starting/closing force can control the work condition with high pressure difference by small push force of actuator. It is widely used for the fluid control in middle/low temperature middle/low pressure pipeline with sound dynamic stability.

It has the features of nice sealing performance, big pressure difference allowance, sleeve guide, large guiding area, sound stability, compact structure, replacing quickly trim parts in the pipeline and high repair efficiency. The balanced spool structure ensures the required push force of actuators to be least.

SPECIFICATIONS

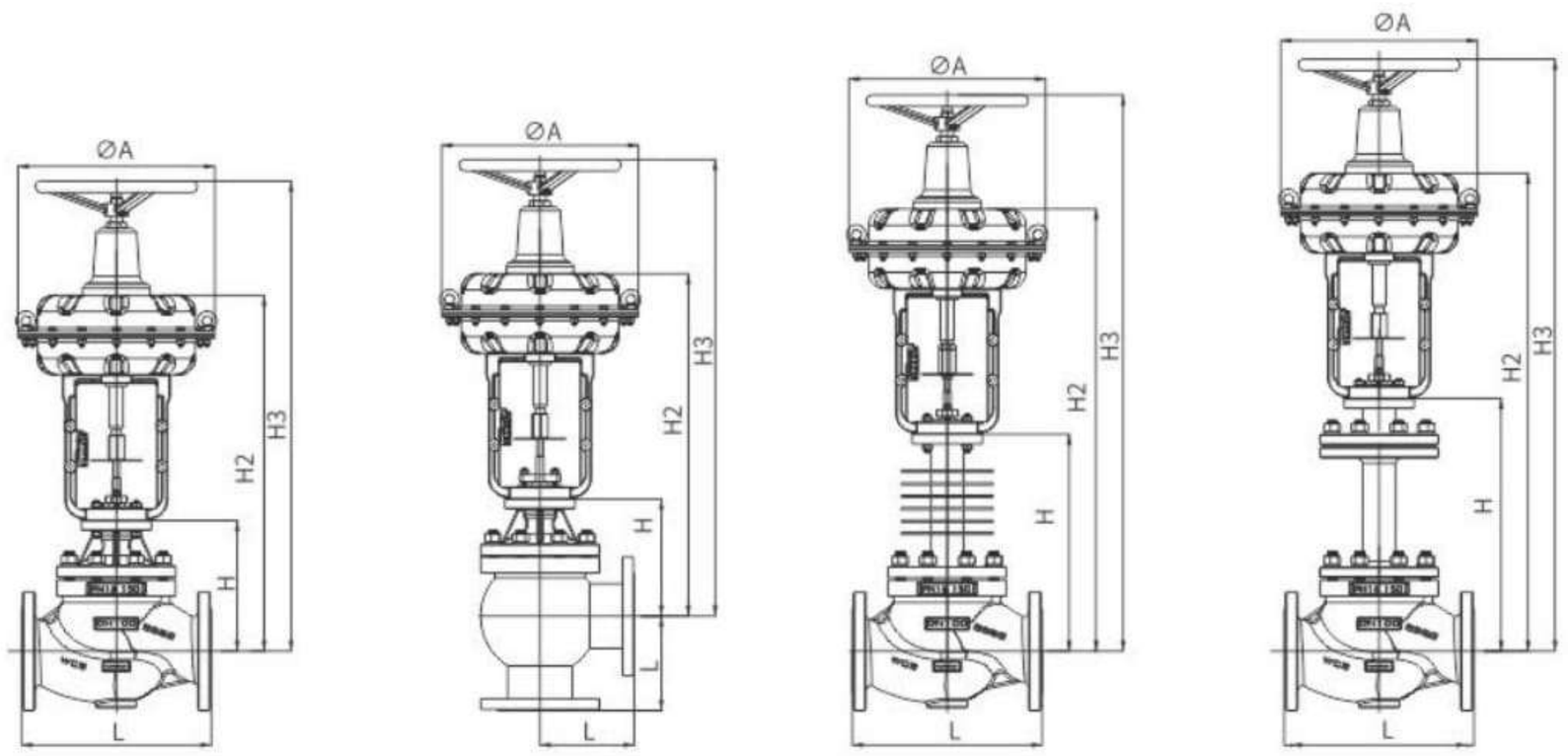
- Features of trim part: Sleeve guided type, balanced trim structure, balanced sealing ring structure
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows.
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
  ASME B16.104-1998 (Cutoff soft valve seat)
- Mode of pipeline connection: Flanged, butt welded.
- Temperature range: -30°C～260°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

RATED Cv VALUE AND STROKE (mm)

VALVE SIZE (DN)	PLUG SIZE	RATED Cv	STORKE
40	32	17	25
	40	24	25
50	50	44	25
65	65	68	40
80	80	99	40
100	100	175	40
125	125	275	60
150	150	360	60
200	200	640	60
250	250	900	100
300	300	1440	100

WIKA TÜREN

2 WAYS CONTROL VALVE | Series K



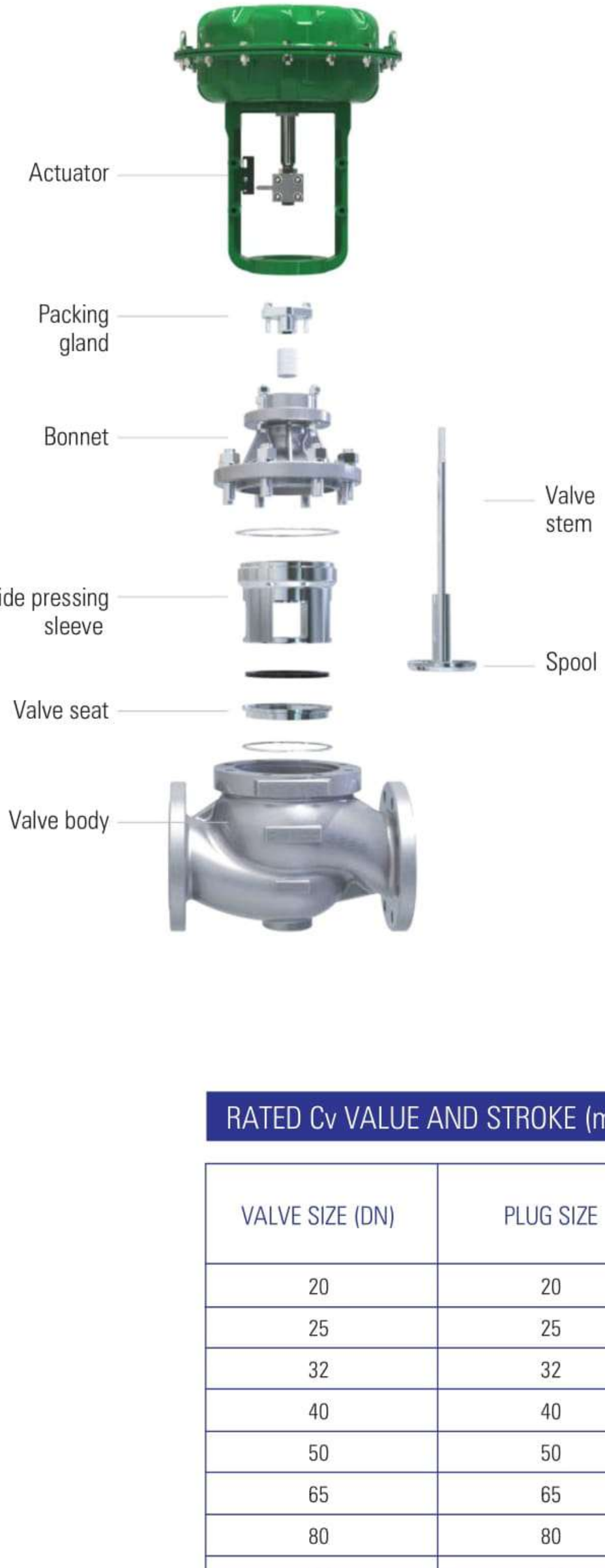
STRUCTURAL DIMENSION OF VALVE

DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

DIMENSION OF VALVE (DN)	RIGHT-ANGLE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	95	95	115	150	447	632	275	572	757	260	557	742	290
25	100	100	115	150	447	632	275	572	757	260	557	742	
32	105	105	130	160	486	671	285	611	796	270	596	781	290
40	115	115	130	165	491	676	290	616	801	275	601	786	
50	125	125	150	190	516	701	315	641	826	300	626	811	
65	145	145	170	285	702	937	370	787	1022	400	817	1052	365
80	155	155	190	285	702	937	370	787	1022	400	817	1052	
100	175	175	215	295	712	947	380	797	1032	410	827	1062	
125	200	200	250	370	895	1217	500	1025	1347	490	1015	1337	470
150	225	225	275	390	915	1237	520	1045	1367	520	1045	1367	
200	275	275	325	430	955	1277	560	1085	1407	530	1055	1377	
250	-	-	-	-	-	-	-	-	-	-	-	-	597
300	-	-	-	-	-	-	-	-	-	-	-	-	

WIKA TÜREN

UNBALANCED SHUT OFF VALVE Series K



INTRODUCTION

Series K unbalanced shut off valve applies top-guided, pressure unbalanced single-seat spool structure, applies to the occasions with narrow pressure difference. The surface of spool and valve seat is overlaid by hard alloy to ensure the long-term stable operation of the valve. Double-spool pressure-relief shut off valve is especially designed for the cutting-off under the conditions with high temperature, large pressure difference of the medium.

The type of trim parts applies double spool structure, flow-to-close design. When the valve opens, please firstly open the small spool, the opening is narrow because of small treatment area of small spool, after the opening of the small spool, the downstream pressure is released, the acting on the pressure difference of large spool is greatly reduced, in such a way, only a small actuator can open large spool. The trim parts of the structure can greatly meet the cutting off under high-pressure-difference occasion.

SPECIFICATIONS

- Features of trim part: Cage guided, unbalanced trim parts, quick-dismantling cage structure,single-spool & double-spool pressure-relief device
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows.
- Flow characteristic: Quick-open characteristic
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
- Mode of pipeline connection: Flanged, butt welded.
- Temperature range: -196°C～570°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

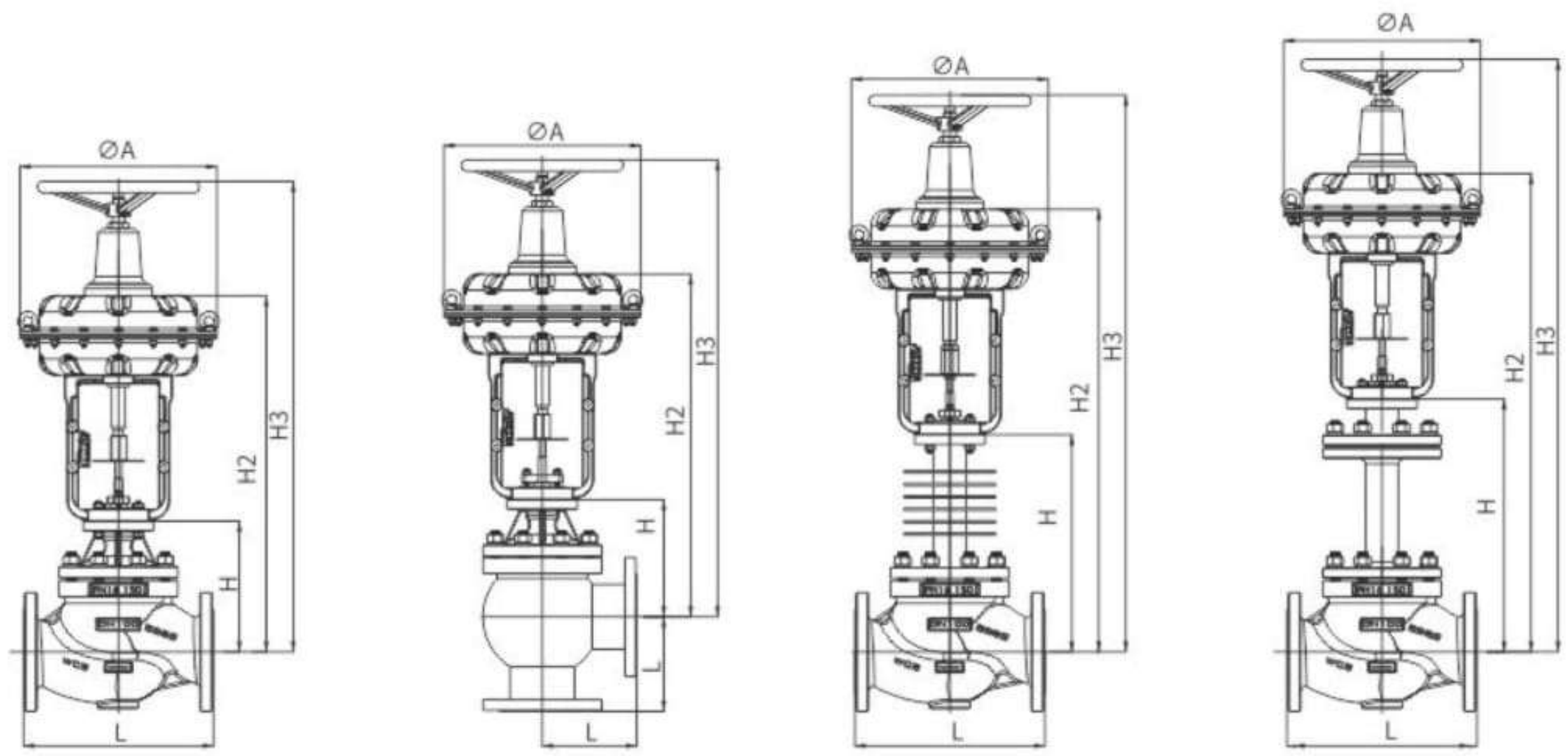
RATED Cv VALUE AND STROKE (mm)

VALVE SIZE (DN)	PLUG SIZE	RATED Cv	STORKE
20	20	8	16
25	25	14	16
32	32	21	16
40	40	45	25
50	50	69	25
65	65	118	40
80	80	125	40
100	100	232	40

WIKA TÜREN

UNBALANCED SHUT OFF VALVE

Series K



STRUCTURAL DIMENSION OF VALVE

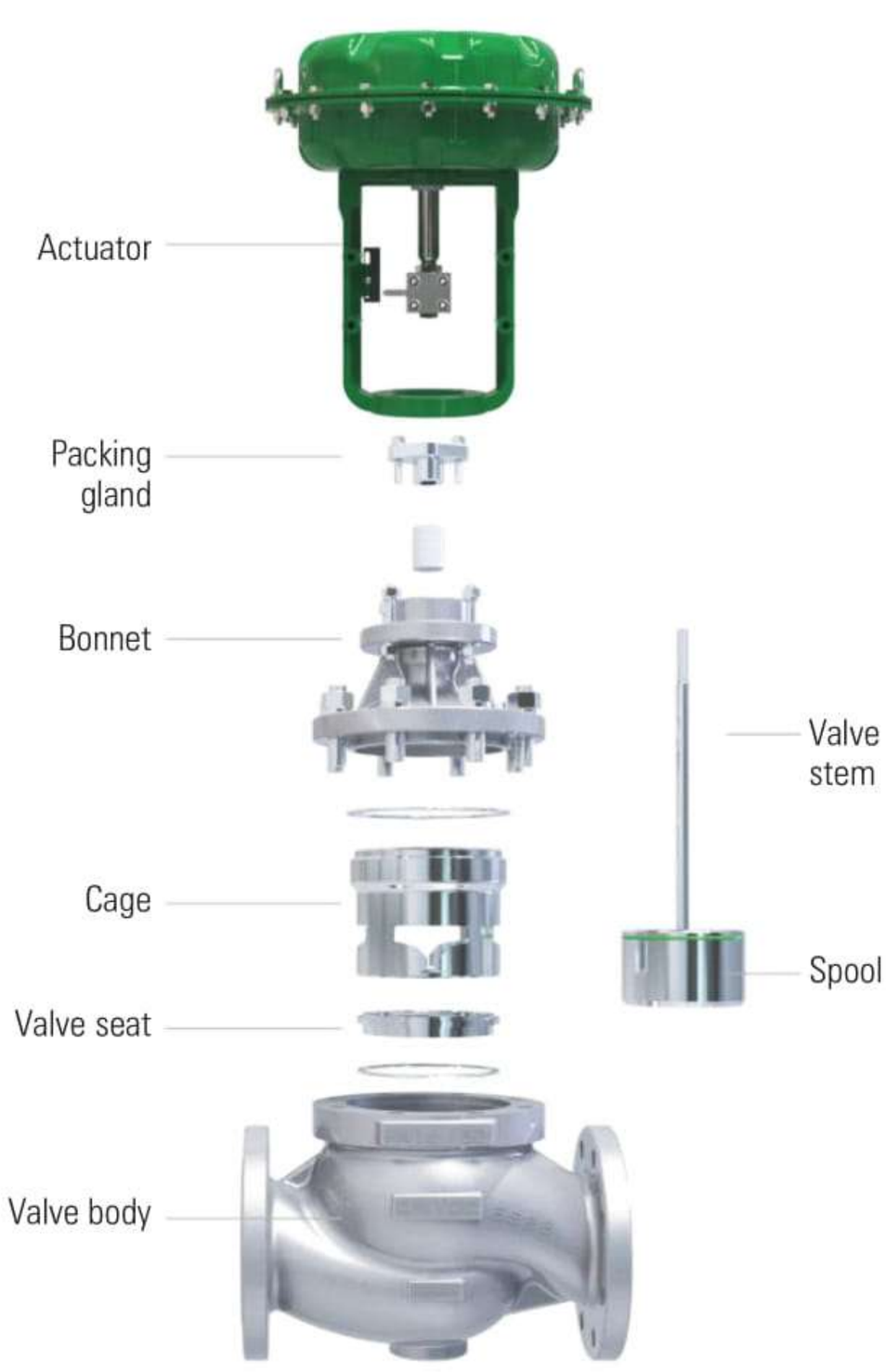
DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

DIMENSION OF VALVE (DN)	RIGHT-ANGLE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	95	95	115	150	447	632	275	572	757	260	557	742	290
25	100	100	115	150	447	632	275	572	757	260	557	742	
32	105	105	130	160	486	671	285	611	796	270	596	781	290
40	115	115	130	165	491	676	290	616	801	275	601	786	
50	125	125	150	190	516	701	315	641	826	300	626	811	
65	145	145	170	285	702	937	370	787	1022	400	817	1052	365
80	155	155	190	285	702	937	370	787	1022	400	817	1052	
100	175	175	215	295	712	947	380	797	1032	410	827	1062	
125	200	200	250	370	895	1217	500	1025	1347	490	1015	1337	470
150	225	225	275	390	915	1237	520	1045	1367	520	1045	1367	
200	275	275	325	430	955	1277	560	1085	1407	530	1055	1377	
250	-	-	-	-	-	-	-	-	-	-	-	-	597
300	-	-	-	-	-	-	-	-	-	-	-	-	

WIKA TÜREN

2 WAYS CONTROL VALVE

Series K



INTRODUCTION

Series K 2 ways control valve applies sleeve-guided, pressure-balanced spool to suit the occasions with large pressure difference. By replacing upper valve seat with balanced sealing ring, the traditional sleeve double-seat valve structure is changed into sleeve single-seat structure, which greatly improves the leakage grade of the sleeve valve. By applying pressure-balanced structure of the spool, the small starting/closing force can control the work condition with high pressure difference by small push force of actuator. It is widely used for the fluid control in middle/low temperature middle/low pressure pipeline with sound dynamic stability.

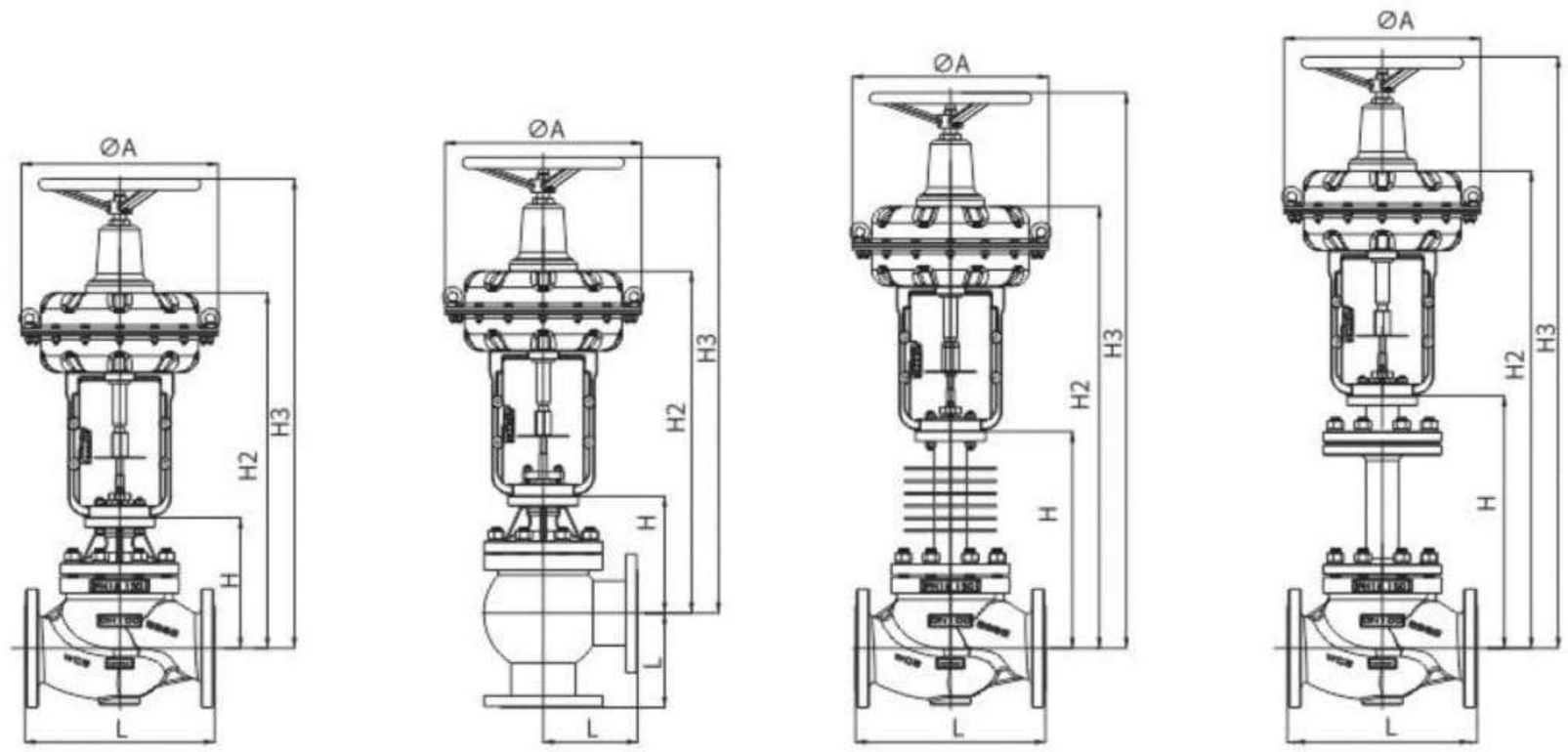
It has the features of nice sealing performance, big pressure difference allowance, sleeve guide, large guiding area, sound stability, compact structure, replacing quickly trim parts in the pipeline and high repair efficiency. The balanced spool structure ensures the required push force of actuators to be least.

SPECIFICATIONS

- Features of trim part: Sleeve guided type, balanced trim structure, balanced sealing ring structure
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows.
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
  ASME B16.104-1998 (Cutoff soft valve seat)
- Mode of pipeline connection: Flanged, butt welded.
- Temperature range: -30°C～260°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

RATED Cv VALUE AND STROKE (mm)

VALVE SIZE (DN)	PLUG SIZE	RATED Cv	STORKE
40	32	17	25
	40	24	25
50	50	44	25
65	65	68	40
80	80	99	40
100	100	175	40
125	125	275	60
150	150	360	60
200	200	640	60
250	250	900	100
300	300	1440	100



STRUCTURAL DIMENSION OF VALVE

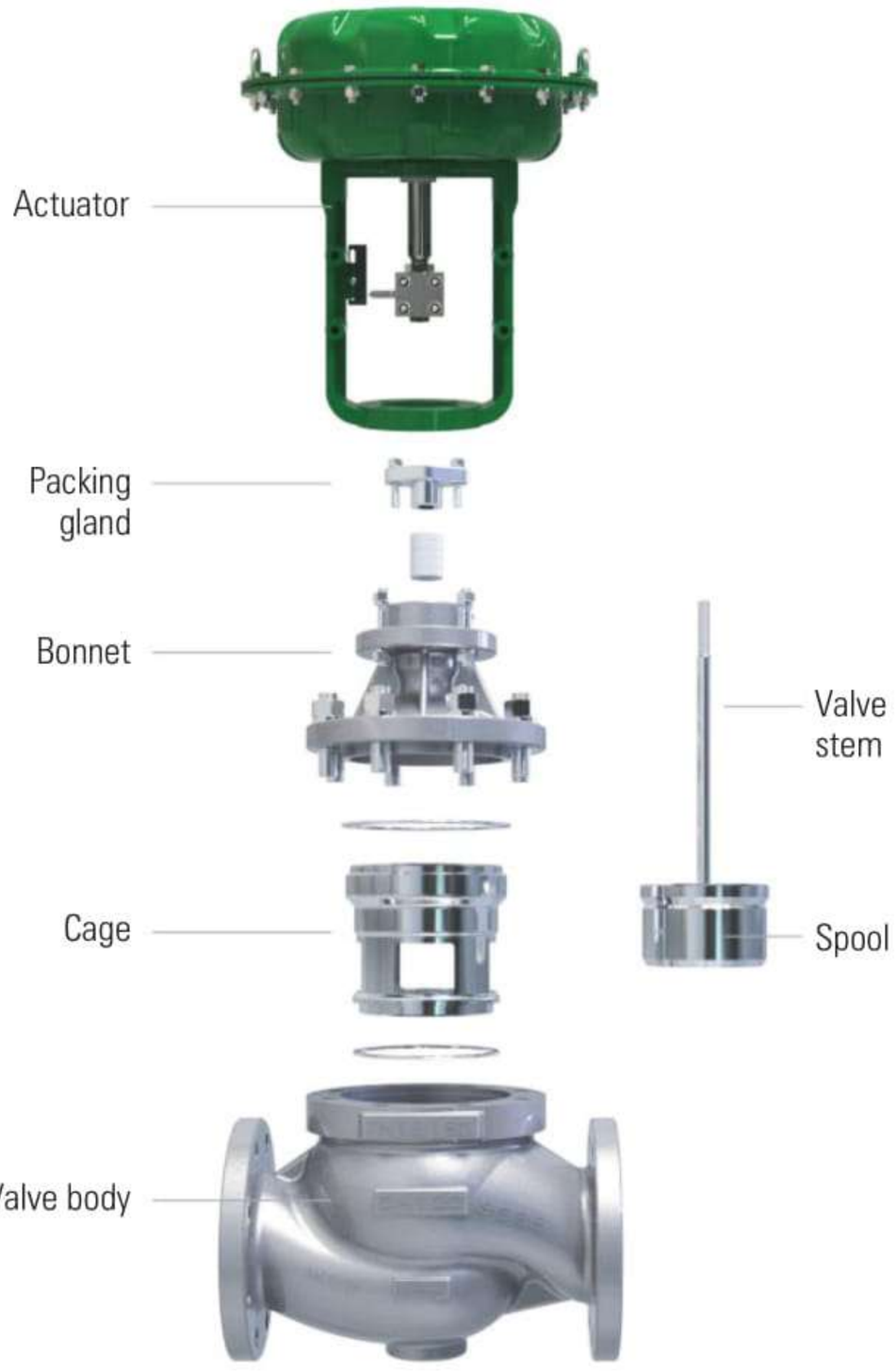
DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

DIMENSION OF VALVE (DN)	RIGHT-ANGLE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	95	95	115	150	447	632	275	572	757	260	557	742	290
25	100	100	115	150	447	632	275	572	757	260	557	742	
32	105	105	130	160	486	671	285	611	796	270	596	781	290
40	115	115	130	165	491	676	290	616	801	275	601	786	
50	125	125	150	190	516	701	315	641	826	300	626	811	
65	145	145	170	285	702	937	370	787	1022	400	817	1052	365
80	155	155	190	285	702	937	370	787	1022	400	817	1052	
100	175	175	215	295	712	947	380	797	1032	410	827	1062	
125	200	200	250	370	895	1217	500	1025	1347	490	1015	1337	470
150	225	225	275	390	915	1237	520	1045	1367	520	1045	1367	
200	275	275	325	430	955	1277	560	1085	1407	530	1055	1377	
250	-	-	-	-	-	-	-	-	-	-	-	-	597
300	-	-	-	-	-	-	-	-	-	-	-	-	

WIKA TÜREN

BALANCED DOUBLE-SEAT SLEEVE CONTROL VALVE

Series K



INTRODUCTION

Series K control valve applies sleeve guided pressure-balanced spool. Compared with Series K is a sleeved double-seat structure and mainly applies for the occasions where has low requirement on the leakage. Because the sealing face of double-seat structure is metalsealed, the operating temperature range is wider.

By applying pressure-balanced structure of the spool, the small starting/closing force can control the work condition with high pressure difference by small push force of actuator. It is widely used for the fluid control in middle/low temperature middle/low pressure pipeline with sound dynamic stability. The direction of the medium is high-in and low-out.

It has the features of nice sealing performance, big pressure difference allowance, sleeve guide, large guiding area, sound stability, compact structure, replacing quickly trim parts in the pipeline and high repair efficiency. The balanced spool structure ensures the required push force of actuators to be least.

SPECIFICATIONS

- Features of trim part: Sleeve guided type, balanced trim structure
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
  ASME B16.104-1998 (Cutoff soft valve seat)
- Mode of pipeline connection: Flanged, butt welded
- Temperature range: -196°C～570°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

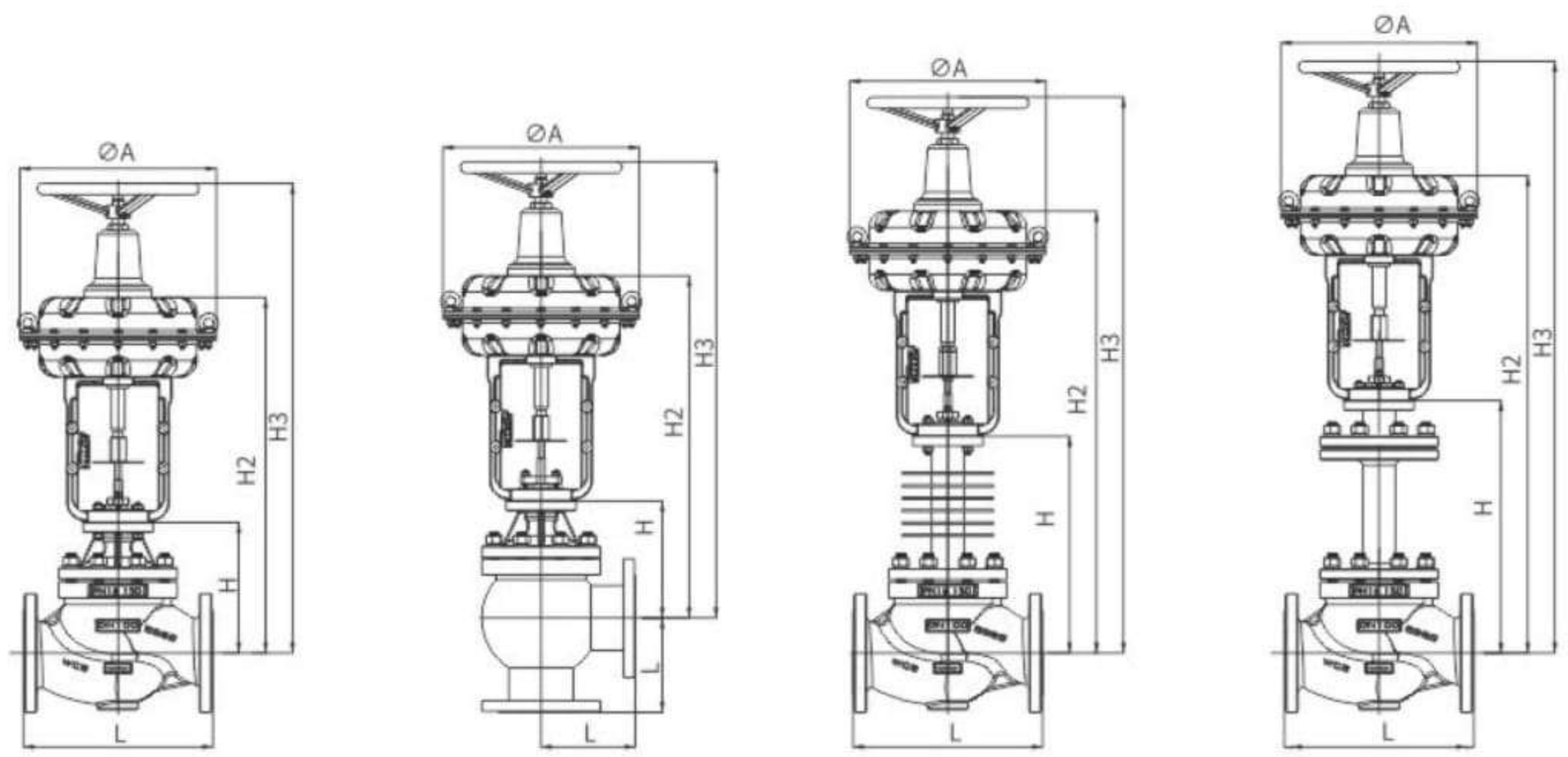
RATED Cv VALUE AND STROKE (mm)

VALVE SIZE (DN)	PLUG SIZE	RATED Cv	STORKE
40	32	17	25
	40	24	25
50	50	44	25
65	65	68	40
80	80	99	40
100	100	175	40
125	125	275	60
150	150	360	60
200	200	640	60
250	250	900	100
300	300	1440	100

WIKA TÜREN

BALANCED DOUBLE-SEAT SLEEVE CONTROL VALVE

Series K



STRUCTURAL DIMENSION OF VALVE

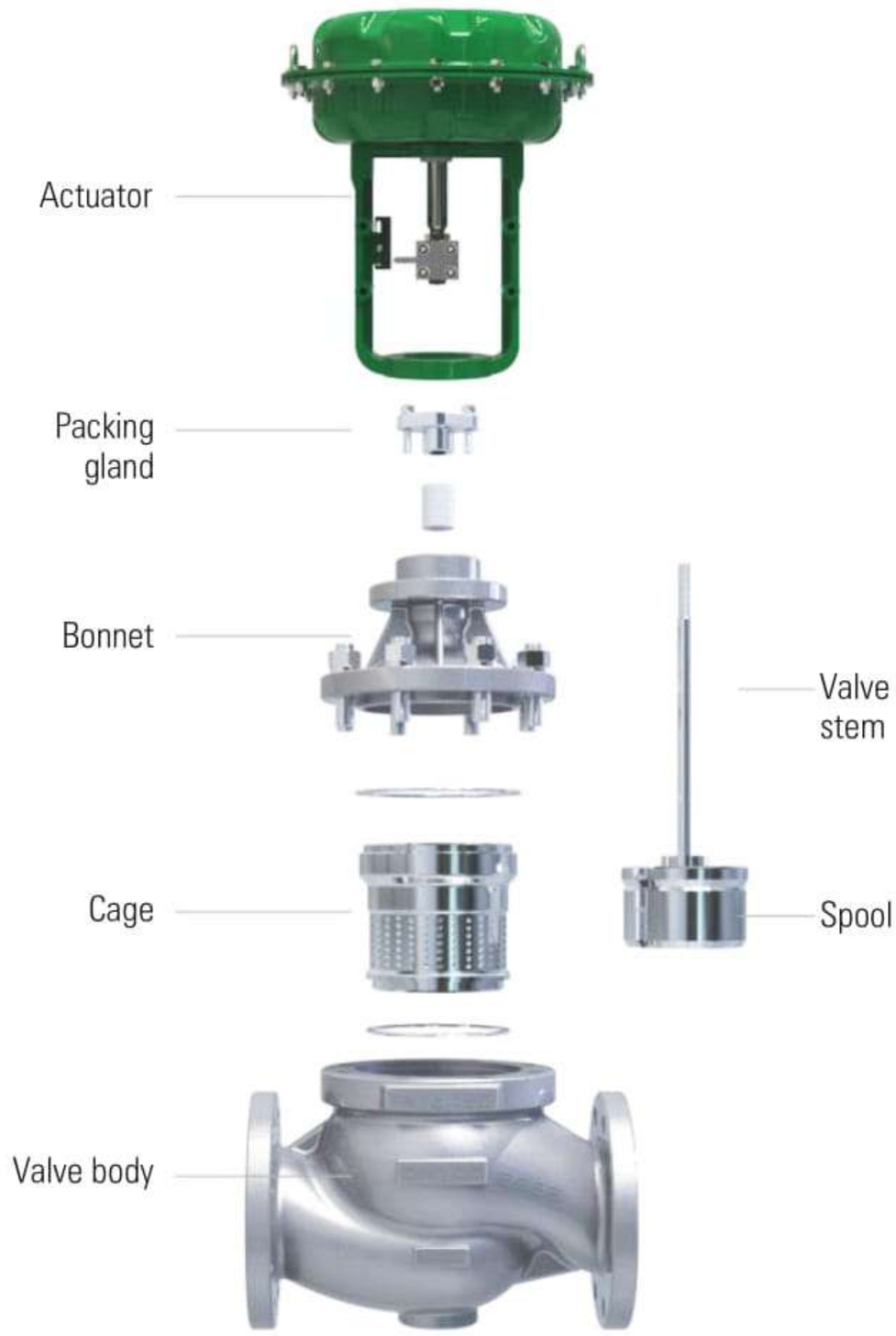
DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

DIMENSION OF VALVE (DN)	RIGHT-ANGLE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	95	95	115	150	447	632	275	572	757	260	557	742	290
25	100	100	115	150	447	632	275	572	757	260	557	742	
32	105	105	130	160	486	671	285	611	796	270	596	781	290
40	115	115	130	165	491	676	290	616	801	275	601	786	
50	125	125	150	190	516	701	315	641	826	300	626	811	
65	145	145	170	285	702	937	370	787	1022	400	817	1052	365
80	155	155	190	285	702	937	370	787	1022	400	817	1052	
100	175	175	215	295	712	947	380	797	1032	410	827	1062	
125	200	200	250	370	895	1217	500	1025	1347	490	1015	1337	470
150	225	225	275	390	915	1237	520	1045	1367	520	1045	1367	
200	275	275	325	430	955	1277	560	1085	1407	530	1055	1377	
250	-	-	-	-	-	-	-	-	-	-	-	-	597
300	-	-	-	-	-	-	-	-	-	-	-	-	

WIKA TÜREN

BALANCED MULTI-HOLE LOW-NOISE CONTROL VALVE

Series K



INTRODUCTION

Series K is a high performance control valve with sound dynamic stability and applicable for severe work conditions by applying sleeve guided, pressure-balanced spool.

The medium with large pressure difference and high flow rate causes the serious erosion attack and makes very big noise. Therefore, we change the window-type standard sleeve into multi-hole one, liquid is generally flowed from the high to the low of the valve, the multi-hole throttle enables the medium to be collided in the sleeve to consume its inner energy and reduce the flow rate. However, the gas medium is generally moved from lower to higher, the gas medium offers a volume expansion at the back of valve seat after the throttling of multi-hole sleeve, then the pressure of the medium is reduced and the flow rate is slowed down.

Compared with Series K has multi-hole sleeve, but other components can be replaceable with those of Series K.

SPECIFICATIONS

- Features of trim part: Sleeve guided type, balanced trim structure, the structure with balanced sealing ring
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
  ASME B16.104-1998 (Cutoff soft valve seat)
- Mode of connection: Flanged, butt welded
- Temperature range: -30°C～260°C
  -196°C～570°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

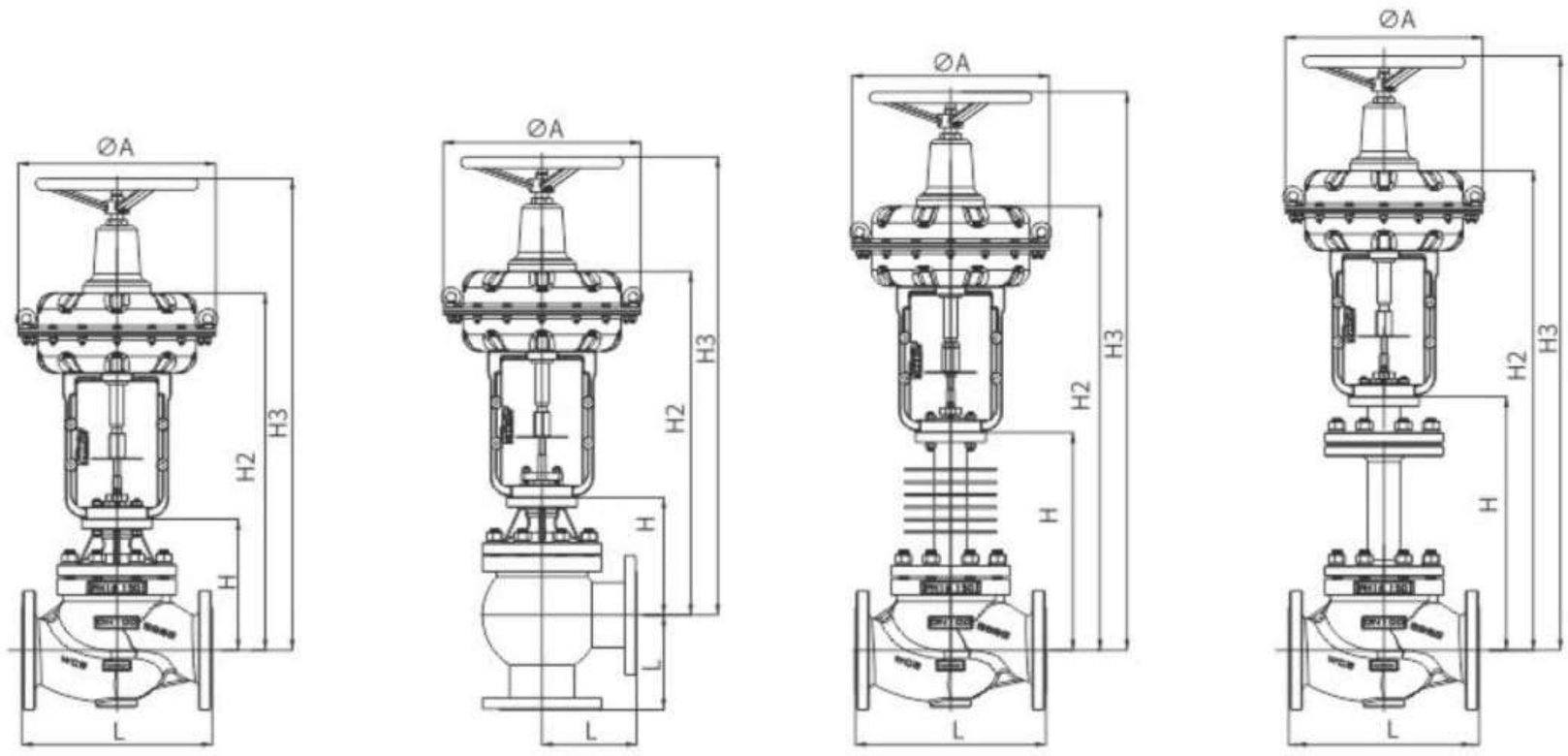
RATED Cv VALUE AND STROKE (mm)

VALVE SIZE (DN)	PLUG SIZE	RATED Cv	STORKE
32	32	17	25
40	40	24	25
50	50	44	25
65	65	68	40
80	80	99	40
100	100	175	40
125	125	275	60
150	150	360	60
200	200	640	60

WIKA TÜREN

BALANCED MULTI-HOLE LOW-NOISE CONTROL VALVE

Series K



STRUCTURAL DIMENSION OF VALVE

DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

DIMENSION OF VALVE (DN)	RIGHT-ANGLE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	95	95	115	150	447	632	275	572	757	260	557	742	290
25	100	100	115	150	447	632	275	572	757	260	557	742	
32	105	105	130	160	486	671	285	611	796	270	596	781	290
40	115	115	130	165	491	676	290	616	801	275	601	786	
50	125	125	150	190	516	701	315	641	826	300	626	811	
65	145	145	170	285	702	937	370	787	1022	400	817	1052	365
80	155	155	190	285	702	937	370	787	1022	400	817	1052	
100	175	175	215	295	712	947	380	797	1032	410	827	1062	
125	200	200	250	370	895	1217	500	1025	1347	490	1015	1337	470
150	225	225	275	390	915	1237	520	1045	1367	520	1045	1367	
200	275	275	325	430	955	1277	560	1085	1407	530	1055	1377	
250	-	-	-	-	-	-	-	-	-	-	-	-	597
300	-	-	-	-	-	-	-	-	-	-	-	-	

WIKA TÜREN

MULTI STAGE DISC STACKS CONTROL VALVE

Series K

INTRODUCTION

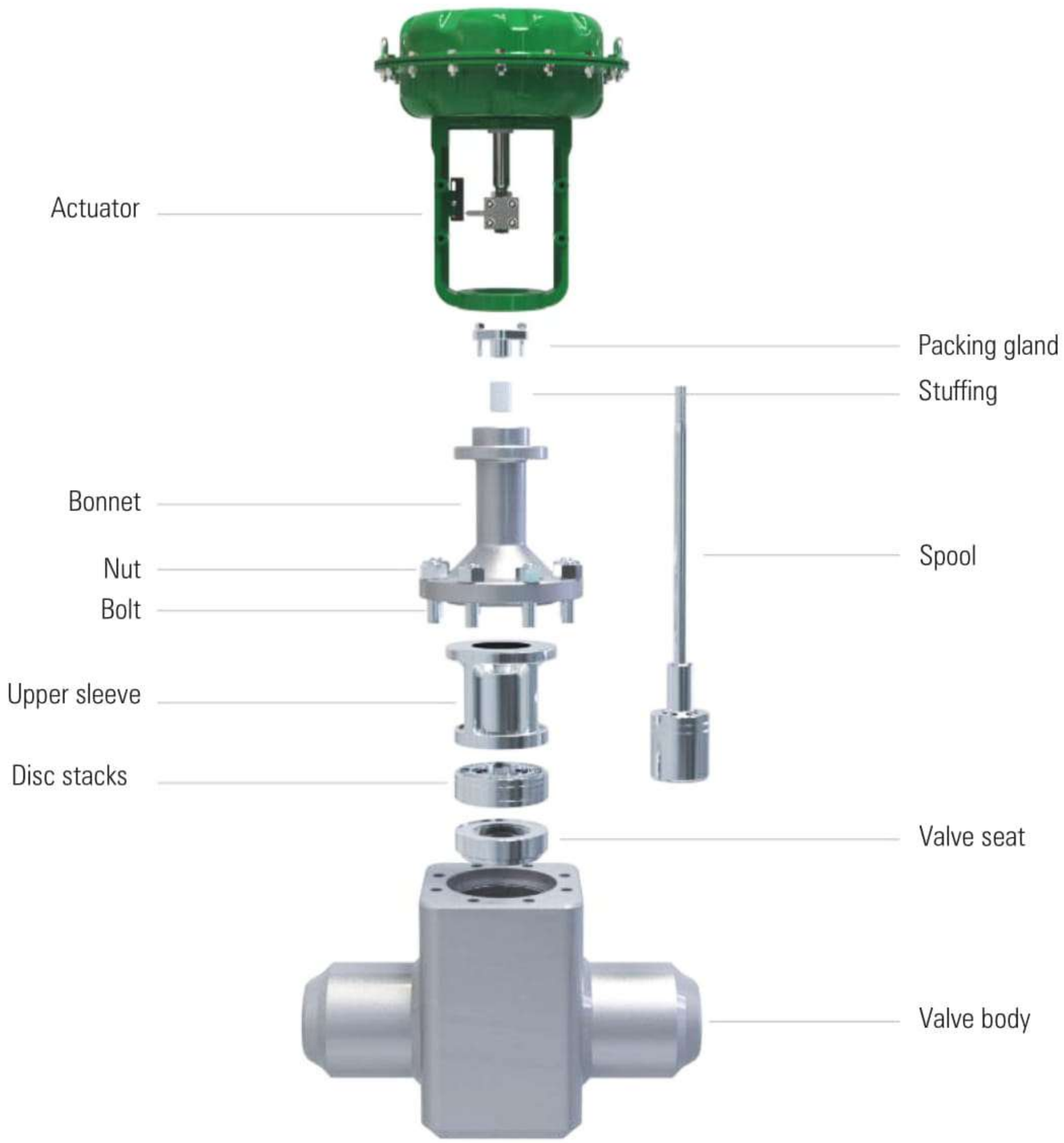
Series K Multi stage disc stacks control valve, applies the structure of disc stacks with unbalanced trim parts. Disc stacks are made from several cylinder discs where distributed with disc stacks on the coaxial surface.

According to different technical parameter of the medium, the cage, composed of different maze specifications and coincided into several layers, is designed, and divides the overall passageway into tiny roundabout or sidestep distributed throttle passageway, forces the fluid continuously to change the flow direction and flow area and to gradually reduce the pressure of fluid, and then to prevent from the arising of flash evaporation and cavitation, and to prolong the service life of trim parts.

The trim parts are suitable for easily-blocked and cavitation-erosion work conditions. The unbalanced trim specification suits to the small-diameter and high-temperature occasion.

SPECIFICATIONS

- Features of trim part: Sleeve guided type, unbalanced trim structure, disc stacks & cage assembly
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
  ASME B16.104-1998 (Cutoff soft valve seat)
- Mode of connection: Flanged, butt welded
- Temperature range: -196°C～570°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator



FLOW RATE CONTROL PRINCIPLE OF DISC STACKS TYPE CONTROL VALVE

The valve damages caused by cavitation erosion, flash evaporation brushing, vibration and noise arisen from high-flow rate medium passed through the valve is the main source of system control failure.

Even if the undamaged valve, the inferior process control arisen from overlarge noise and intense vibration will reduce the performance of the product and destroy the capacity of the device under high-volume operation.

The disc stacks control valve adopts and applies the technology on the basis of flow rate control principle and fluid mechanics, to eliminate the problems of cavitation erosion, flash evaporation brushing, vibration and noise resulted from multi-step pressure reduction, provides a whole system control solution for various different applications.

Under severe work conditions, the bad performance of the valve is mainly caused by high flow rate. The maximum flow rate of the fluid in the valve frequently occurs in the throttling surface (See Diagram. 1) at the downstream of restricted pin-hole of the spool. Even if the materials with high hardness is used in the valve to control the destroying of cavitation erosion, it can only eliminate slightly the failures caused by high flow rate, all valves maintain its performance and reliability by limiting the flow rate of the medium.

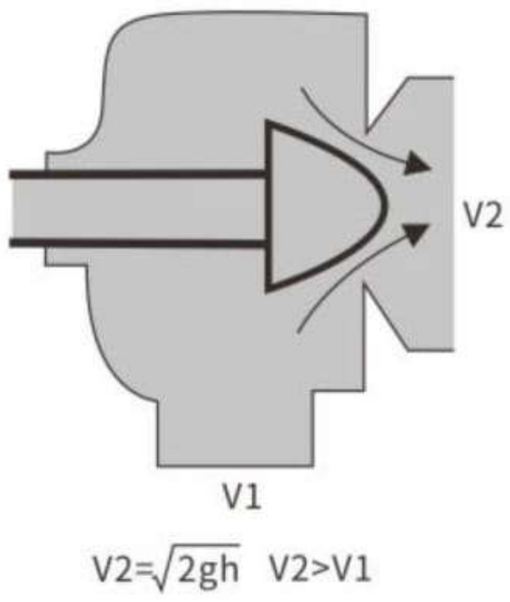


Diagram 1: Single-step pressure reduction

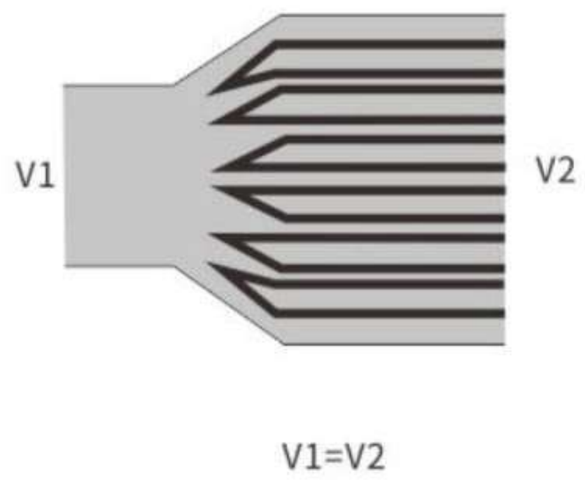


Diagram 2: Militia-stream pressure reduction

CONTROL OF FLOW VELOCITY IN DISC STACKS CHANNE

Disc stacks control valve avoids the high flow rate of the spool and ensures the final control effects: during the whole process of the valve, the pressure and flow rate of the medium can be effectively controlled. Disc stacks divides the fluid into several sub-passage to reduce the flow rate as much as possible (Diagram 2).

Each fluid passage is made of a certain amount of quarter turn, and forms a disc stacks passageway (Diagram 3), during the process, every turn will reduce a certain flow rate of the flowing medium.

The number of turns N, the number used to disperse maximum pressure difference of the spool, (Diagram 4), by transforming the formula: $V2(Hole)=\sqrt{2gh}$ Get a new formula: $V2(10M)=\sqrt{2gh/N}$

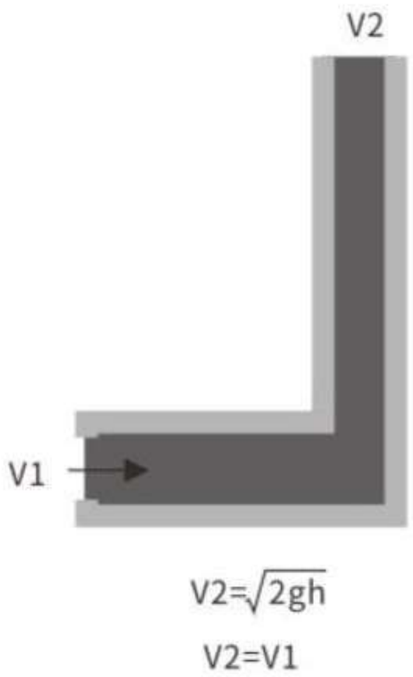


Diagram 3: Disc stacks track

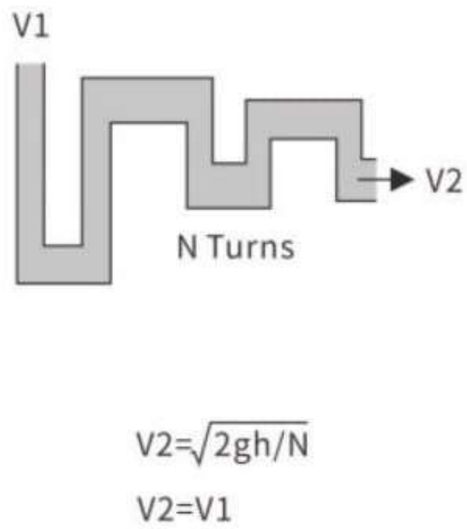


Diagram 4: Disc stacks multi-step pressure reduction

THE CAUSE OF CAVITATION EROSION

When the pressure of the fluid is reduced to saturated vapor pressure or lower, the flash evaporation or bubble will be arisen. In the most of control valves (Diagram 5), the inflow pressure of fluid is P1, the flow rate is V1, when the fluid passes through necking section of the spool, accelerated to flow rate Vvc, according to conservation-of-energy principle, the pressure of the fluid is suddenly reduced to Pvc, where Pvc is equal to or lower than the saturated vapor pressure of the liquid Pv, the liquid will be gasified to produce bubbles and result in flash evaporation.

When the fluid passes through the spool, the pressure is restored, changes the kinetic energy into potential energy. When restoring to downstream pressure, the pressure is P2, the flow rate is V2. As the restored pressure exceeds the saturated vapor pressure Pv of the fluid, the newly-formed bubbles will break up and result in cavitation erosion. Such energy release will cause local stress up to above 200000PSI (1400MPa), the stress will quickly destroy the hard spool.

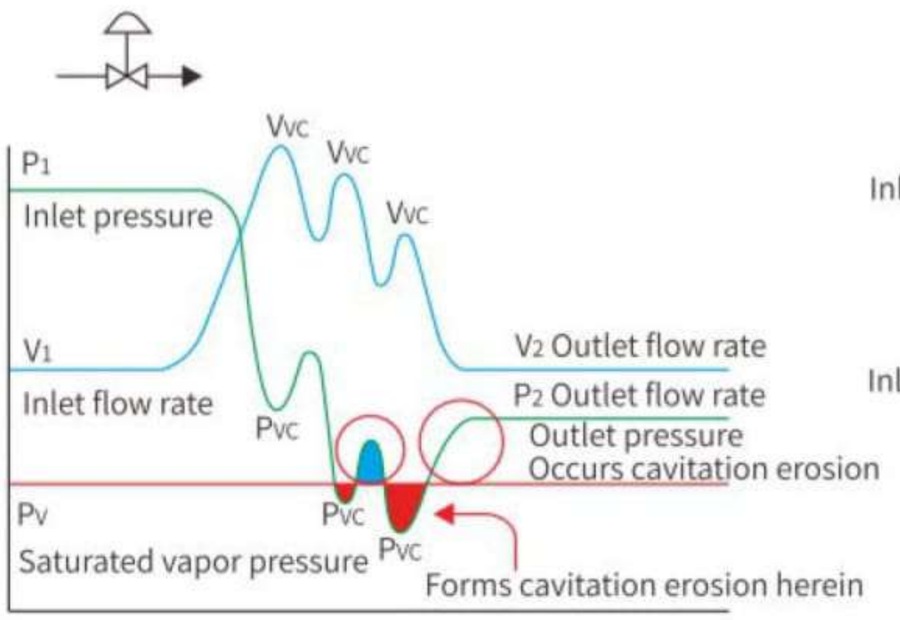


Diagram 5: The cause of cavitation erosion

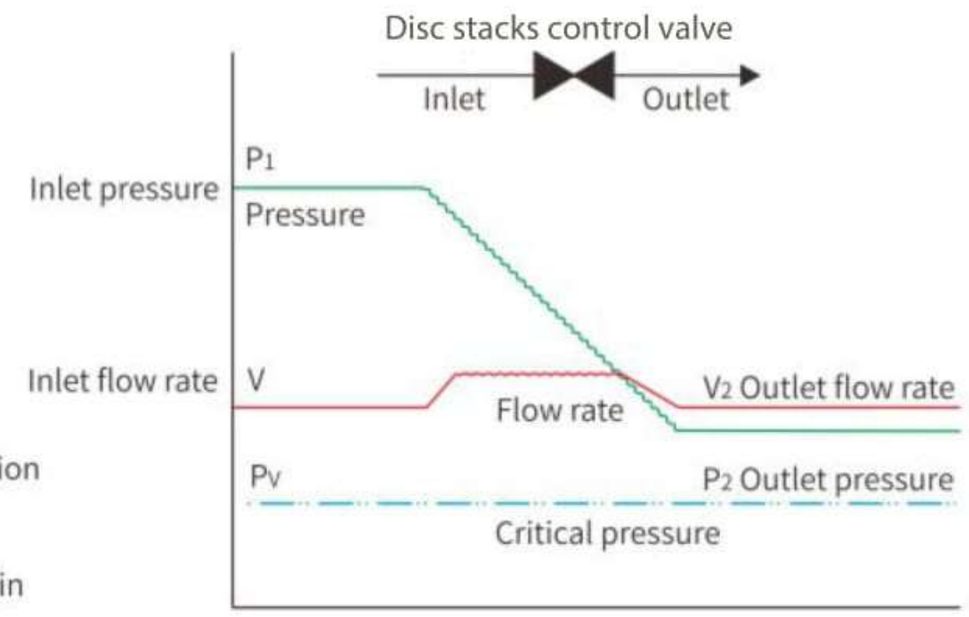


Diagram 6: Disc stacks effectively solves the cavitation erosion

THE SOLUTION OF CAVITATION EROSION

Disc stacks control valve can effectively eliminate destructive effect arisen from flow rate runaway of the fluid.

Firstly disperse the fluid into small passages to attain the purpose, even if there is bubble produced, its volume is very small, and its energy is insufficient to produce the stress resulted in the destroying of materials. Secondly, the flow rate maintains the minimum level, the local pressure will not reduce below the gasifying pressure of the fluid. Therefore, cavitation erosion will not occur.

The destructive result of the cavitation erosion is the typical signal of flow rate runaway. As previously stated, the hardness materials, insulating lining or down stream orifice can only eliminate little the failure arisen from cavitation erosion. The high flow rate causes the cavitation erosion attack of the spool, henceforth, the solution of cavitation erosion is the applying of disc stacks as indicated in Diagram 8.

According to the vapor pressure of fluid, the flow rate can be calculated as per the following formula: $V=\sqrt{4637(P2-Pv)/P}$ or $v=\sqrt{1000(P2-Pv)/P}$

Metric system British system

THE DESIGN OF THE DISC STACKS USED IN CONTROL VALVE

Defines number of turns N, selects the number to ensure the flow rate as the fluid flows out the passageway, each cage applies special process to form multilayer disc stacks group (Diagram 7). Each disc stacks is specially formed and processed into several channel like disc stacks (Diagram 8). Each channel provides a stable flow rate reduction under the acting of medium resistance by designing a certain amount of square turns according to different work conditions through precise calculation and combining CFD flowfield analysis, the technology completely controls the flow rate of the medium in each channel made of disc stacks, which enables the medium to be flowed within controllable flow rate in the whole range.

In order to attain the flow characteristic required for the system, a disc stacks group consists of 3 disc stacks. At the lowest disc, in order to meet the requirements of high pressure difference and large flow capacity, the passage number shall be less and the turns shall be more; the middle disc stacks is moderate amount of channel; at the top disc stacks of the group, to suit the needs of accidental flow capacity (i.e. low pressure difference, large flow capacity), the passage number required is more and the turns is less. The resistance, amount and area in each fluid passageway of disc stacks control valve can be customized according to your specific applications so as to control the flow rate, eliminate the cavitation erosion and flash evaporation, vibration and noise etc. arisen from using of fluid.

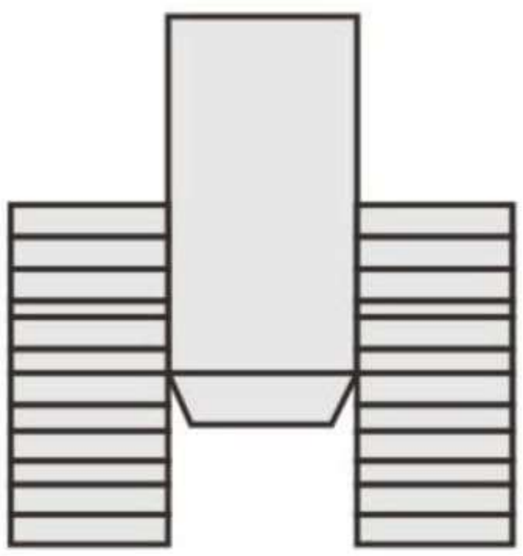


Diagram 7: Multi-layer disc stacks group

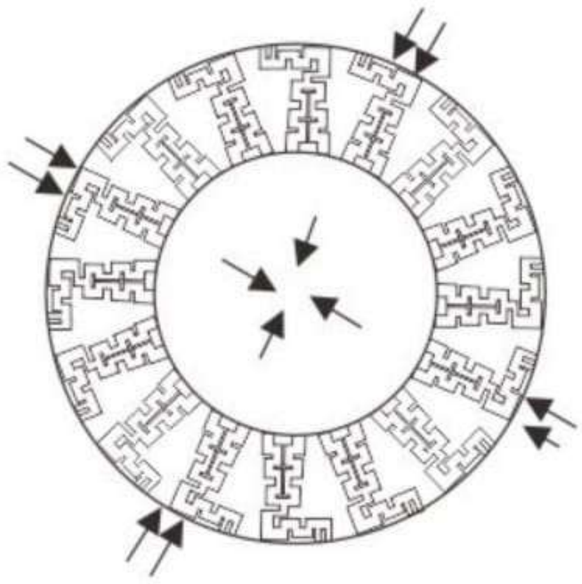


Diagram 8: Disc stacks

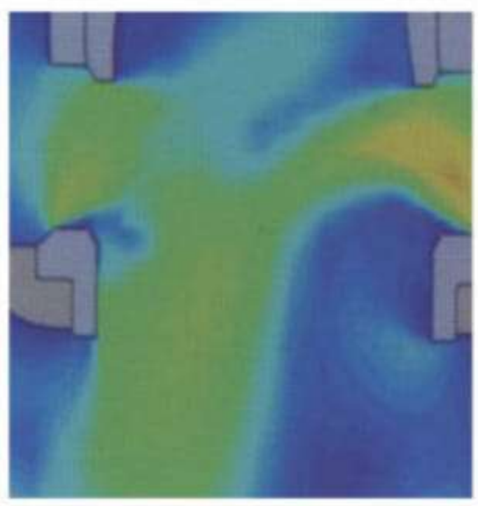
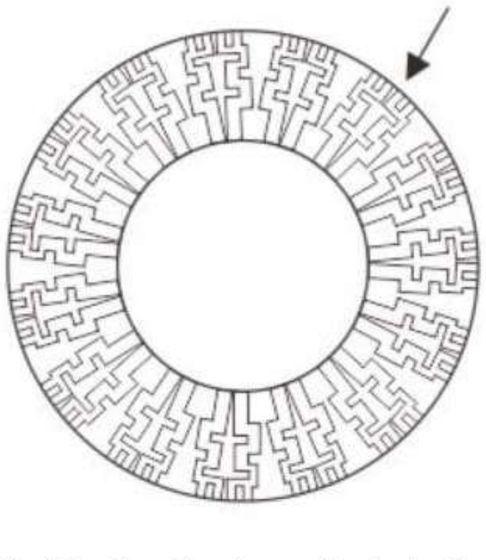


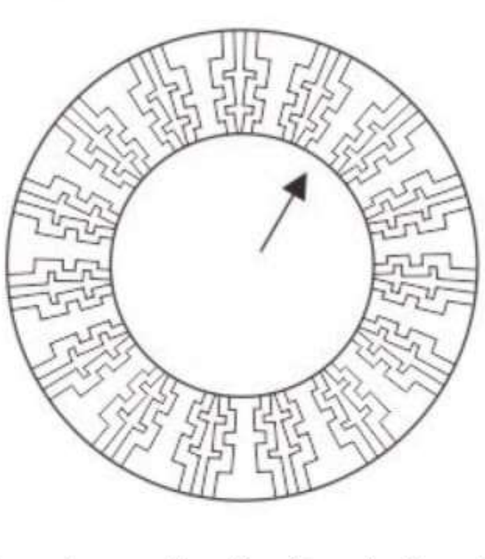
Diagram 6: CFD Fluid analysis

SELECTION OF FLOW CAPACITY IN DISC STACKS CONTROL VALVE

When the medium is liquid that inflows from side and outflows from bottom, the gas and steam is bottom in and side out. This is because the liquid is uncom pressed fluid, applies side-in and bottom-out can enable high-flow-rate liquid at the outlet of each channel can be mutually collided on the central axle of disc stacks to offset mutual energy and build a cushion and to further slow down the flow rate, and to reduce the impact of high-rate liquid on the valve body and trim parts. The high-pressure-difference gas and steam is compressible fluid, through the pressure reduction of disc stacks, the volume is quickly expanded, this requires the section area of outlet passageway shall be larger than that of inlet, the bottom-in and side-out is applies, otherwise, the pressure reduction effect will be influenced.



(A)Liquid - direction from side to bottom

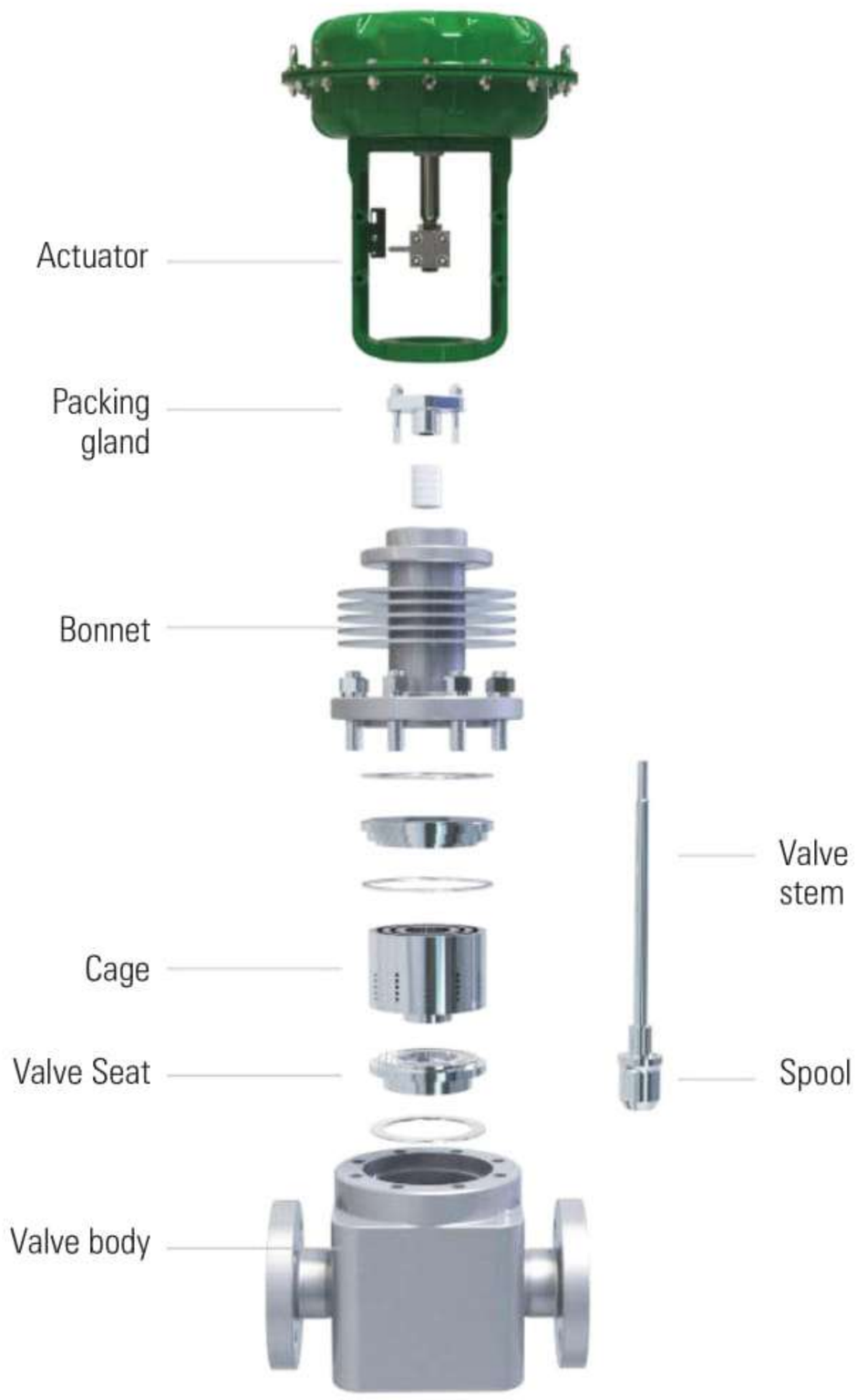


(B)Gas, steam - direction from bottom to side

WIKA TÜREN

BALANCED MULTI STAGE PRESSURE REDUCTION CONTROL VALVE

Series K



INTRODUCTION

Series K multi stage pressure reduction control valve applies sleeveguided and pressure-balanced spool. The valve is mainly applicable for the occasions with high pressure difference and where occurs flash evaporation and cavitation work conditions.

According to the different design of specifications, several different pressure reduction cages to be assembled into a multi-step pressurereduction trim parts, the cages designed for different work conditions ensure to remove the flash evaporation and cavitation of the valve. The medium is throttled starting from the contact of first cage, the inlet high pressure difference is gradually decreased after several throttling, which can effectively ensure to enable the pressure to be always above the saturated vapor pressure when the medium is flowing in the valve, and also to eliminate the possibility of flash evaporation and cavitation, so as to prolong the service life of the control valve in severe work conditions.

SPECIFICATIONS

- Features of trim part: Sleeve guided type, balanced trim parts structure, the structure with balanced sealing ring
- Valve body type: Inline type, angle type
- Bonnet type: Standard, heat radiating, low temperature, bellows
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
  ASME B16.104-1998 (Cutoff soft valve seat)
- Mode of connection: Flanged, butt welded
- Temperature range: -30°C～260°C
  -196°C～570°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

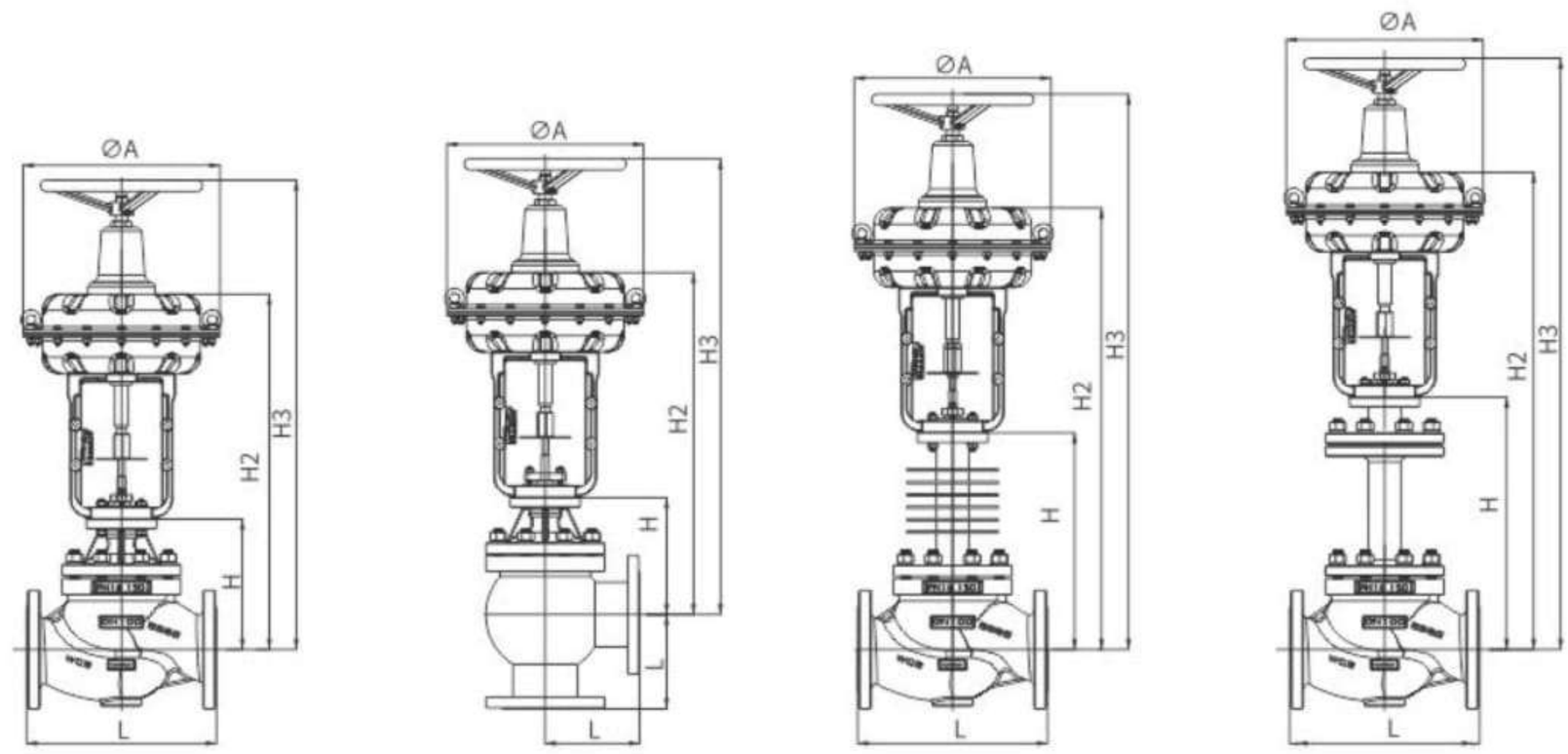
RATED Cv VALUE AND STROKE (mm)

VALVE SIZE (DN)	PLUG SIZE	RATED Cv	STORKE
40	25	10	25
50	32	17	25
65	40	24	40
80	50	44	40
100	65	68	40
125	80	99	60
150	100	175	60
200	125	275	60
250	150	360	100
300	200	630	100

WIKA TÜREN

BALANCED MULTI STAGE PRESSURE REDUCTION CONTROL VALVE

Series K



STRUCTURAL DIMENSION OF VALVE

DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

DIMENSION OF VALVE (DN)	RIGHT-ANGLE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	95	95	115	150	447	632	275	572	757	260	557	742	290
25	100	100	115	150	447	632	275	572	757	260	557	742	
32	105	105	130	160	486	671	285	611	796	270	596	781	290
40	115	115	130	165	491	676	290	616	801	275	601	786	
50	125	125	150	190	516	701	315	641	826	300	626	811	
65	145	145	170	285	702	937	370	787	1022	400	817	1052	365
80	155	155	190	285	702	937	370	787	1022	400	817	1052	
100	175	175	215	295	712	947	380	797	1032	410	827	1062	
125	200	200	250	370	895	1217	500	1025	1347	490	1015	1337	470
150	225	225	275	390	915	1237	520	1045	1367	520	1045	1367	
200	275	275	325	430	955	1277	560	1085	1407	530	1055	1377	
250	-	-	-	-	-	-	-	-	-	-	-	-	597
300	-	-	-	-	-	-	-	-	-	-	-	-	

WIKA TÜREN

3 WAYS CONTROL VALVE

Series K

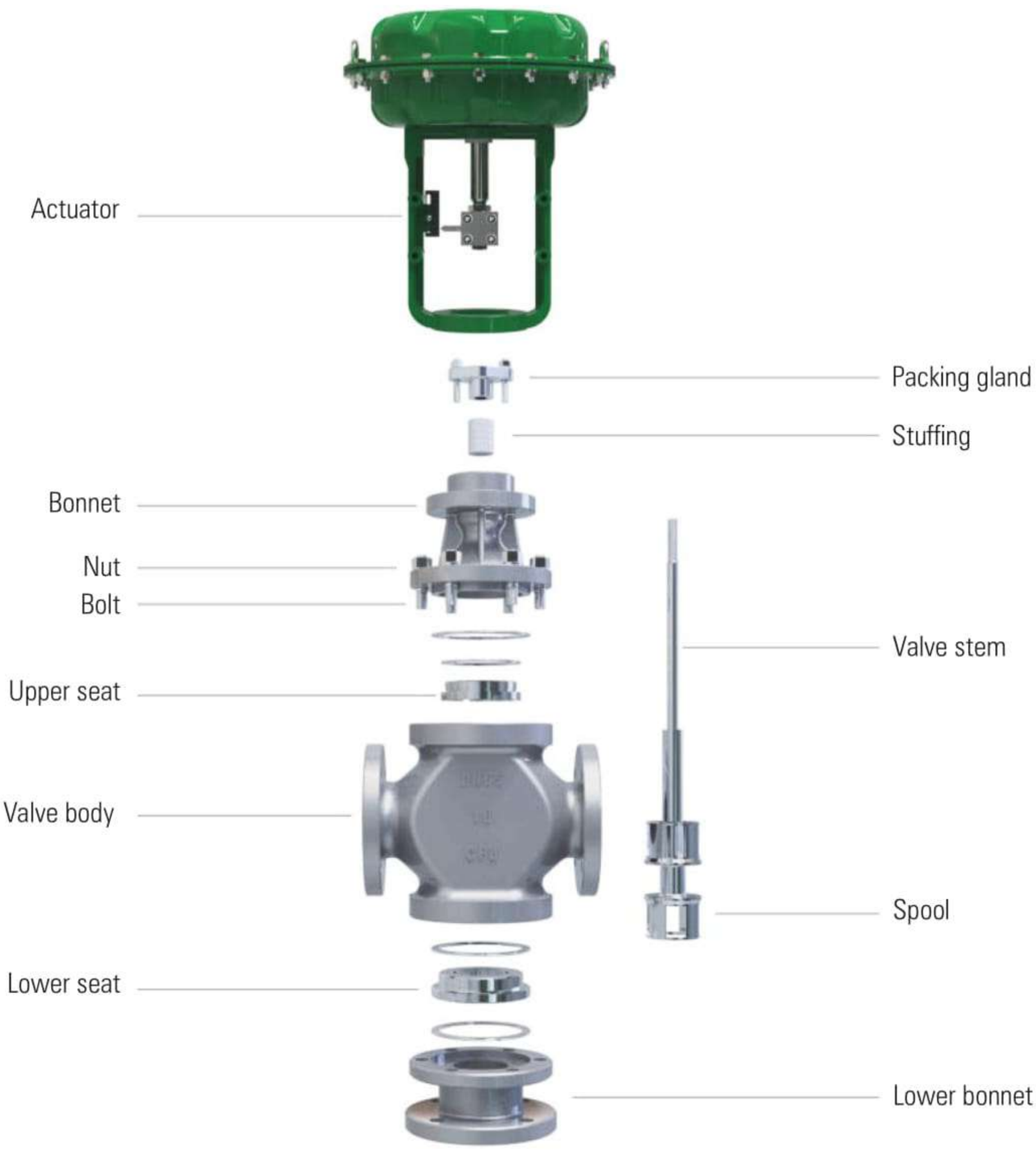
INTRODUCTION

Series K 3 ways control valve applies sleeve guided and pressure-unbalanced spool. The valve are mainly applied for the control of the gathering or diversion of the medium in several channels, two passageways in and one passageway out becomes three-way interflowing, in reverse, one passage in and two passages out is diversion.

Tee valve is also can be acted as cutoff and starting function of pipeline. The standard interflow/diversion design is unbalanced double-seat trim parts structure. Moreover, a special cage structure like noise reduction or anti-cavitation can be designed for work conditions.

SPECIFICATIONS

- Features of trim part: Double-seat sleeve-guided
- Valve body type: Tee-type
- Bonnet type: Standard, heat radiating, low-temperature, bellows
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998 (Standard metal valve seat)
- Mode of connection: Flanged, butt welded
- Temperature range: -196°C～560°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator



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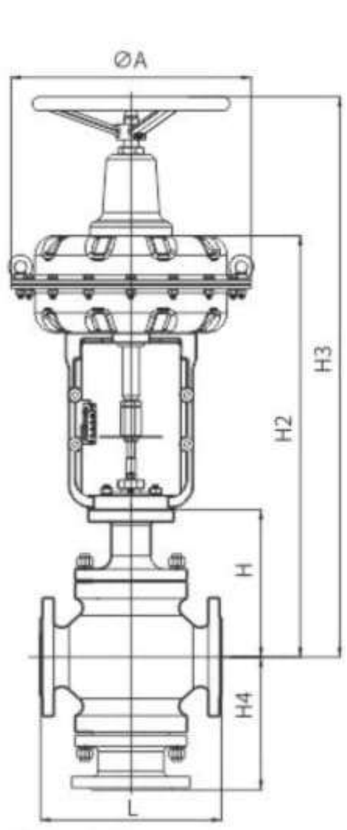
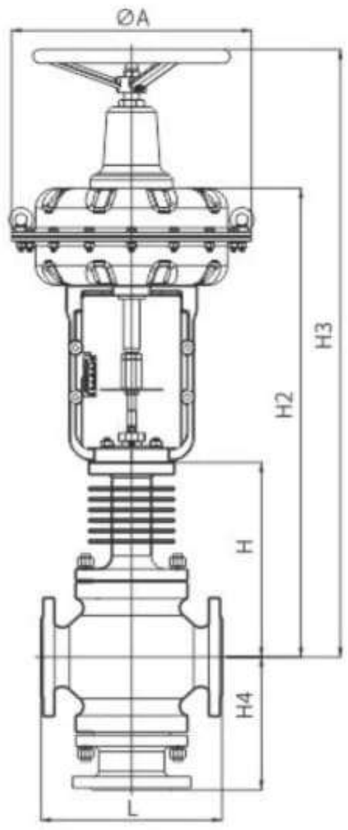
3 WAYS CONTROL VALVE | Series K





STRUCTURAL DIMENSION OF VALVE

DIMENSION OF VALVE (DN)	INLINE VALVE BODY STRUCTURE												OUTER DIAMETER OF ACTUATOR ØA
	L			STANDARD TYPE			HEAT RADIATING TYPE			BELLOWS TYPE			
	ANSI150# PN1.6 JIS10K	ANSI300# PN4.0 JIS30K	ANSI600# PN6.3 JIS40K	H	H2	H3	H	H2	H3	H	H2	H3	
20	184	197	206	139	436	621	202	499	684	275	572	757	290
25	184	197	210	139	436	621	202	499	684	275	572	757	
32	205	210	220	150	476	661	231	557	742	303	629	814	290
40	222	235	251	155	481	666	236	562	747	308	634	819	
50	254	267	286	161	487	672	251	577	762	314	640	825	
65	276	292	311	220	637	872	293	710	945	440	857	1092	365
80	298	317	337	234	651	886	294	711	946	454	871	1106	
100	352	368	394	242	659	894	324	819	1054	462	879	1114	
125	400	425	457	286	811	1133	417	920	1242	495	1020	1342	470
150	451	473	508	345	870	1192	437	962	1284	536	1061	1383	
200	600	620	650	355	880	1202	447	972	1294	550	1075	1397	
250	650	660	670	447	1178	1608	547	1278	1708	600	1331	1761	597
300	737	775	800	504	1238	1668	607	1338	1768	650	1381	1811	

RATED Cv VALUE AND STROKE (mm)

VALVE SIZE(DN)	PLUG SIZE	RATED Cv	STORKE
20	20	6.3	10
25	25	8.5	16
32	32	13	16
40	40	21	25
50	50	34	25
65	65	52	40
80	80	85	40
100	100	135	40

VALVE SIZE(DN)	PLUG SIZE	RATED Cv	STORKE
125	125	210	60
150	150	340	60
200	200	535	60
250	250	800	100
300	300	1260	100

WIKA TÜREN

UNBALANCED FLUORINE-LINED CONTROL VALVE

Series K

INTRODUCTION

Series K Linear unbalanced single-seat fluorine-lined control valve applies wholly-fluorine-lined body and trim structure, which can effectively resist the corrosion of corrosive medium on the metal materials of the valve.

The cavity of metal body provides tooth treatment, which enables the lining materials to be fully bonded with metal, so as to prolong the service life and performance of lined materials. The stem sealing is the combination of bellows pipe and V-shaped PTFE stuffing sealing, which completely eliminates the leakage of the medium via stem. Unbalanced fully-lined control valve especially adapts to extremely corrosive and toxic medium under low-pressure normaltemperature work conditions.

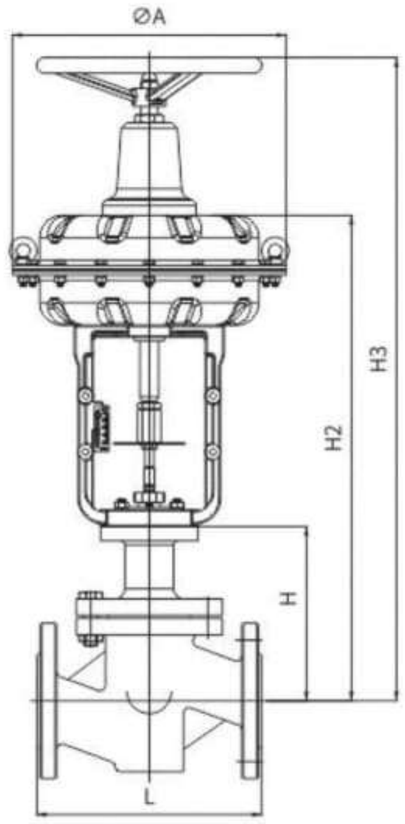
SPECIFICATIONS

- Features of trim part: Unbalanced spool, lined valve seat, sealing of bellows valve stem
- Valve body type: Inline type, angle type
- Bonnet type: Standard, bellows
- Flow characteristic: Equal percentage, linear, quick-open
- Grade of leakage: ASME B16.104-1998
- Mode of pipeline connection: Flanged
- Temperature range: -45°C～150°C
- Type of mechanism: Pneumatic diaphragm actuator
  Pneumatic piston-type actuator
  Electric actuator

WIKA TÜREN

UNBALANCED FLUORINE-LINED CONTROL VALVE

Series K



STRUCTURAL DIMENSION OF VALVE

VALVE SIZE (DN)	L	STANDARD TYPE			BELLOWS TYPE			OUTER DIAMETER OF ACTUATOR ØA
		H	H2	H3	H	H2	H3	
20	150	190	487	672	290	587	772	290
25	160	190	487	672	290	587	772	
32	180	200	526	711	300	626	811	290
40	200	205	531	716	305	631	816	
50	230	230	556	741	320	646	831	
65	290	310	727	962	420	837	1072	365
80	310	320	737	972	420	837	1072	
100	350	340	757	992	430	847	1082	
125	400	380	905	1227	495	1020	1342	470
150	480	400	925	1247	520	1045	1367	
200	600	430	955	1277	560	1085	1407	
250	730	-	-	-	-	-	-	-
300	850	-	-	-	-	-	-	

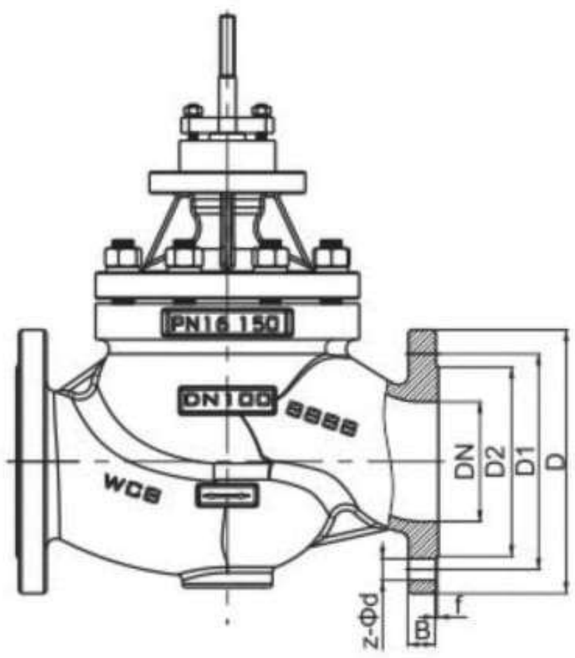
RATED Cv VALUE AND STROKE (mm)

VALVE SIZE(DN)	PLUG SIZE	RATED Cv	STORKE
20	6	0.4	10
	8	1	
	10	1.6	
	12	2.5	
	15	4	
	20	6.3	
25	6	0.4	16
	8	1	
	10	1.6	
	12	2.5	
	15	4	
	20	6.3	
	25	10	

VALVE SIZE(DN)	PLUG SIZE	RATED Cv	STORKE
32	32	17	16
40	40	24	25
50	50	44	25
65	65	68	40
80	80	99	40
100	100	175	40
125	125	275	60
150	150	360	60
200	200	630	60
250	250	900	100
300	300	1440	100

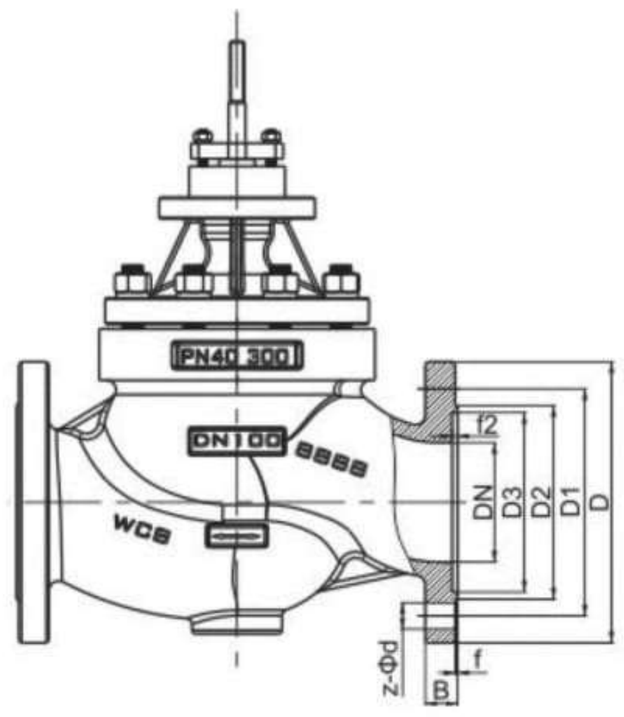
FLANGE CONNECTION DIMENSION

Department of chemical
Standard connection dimension of flanged end face



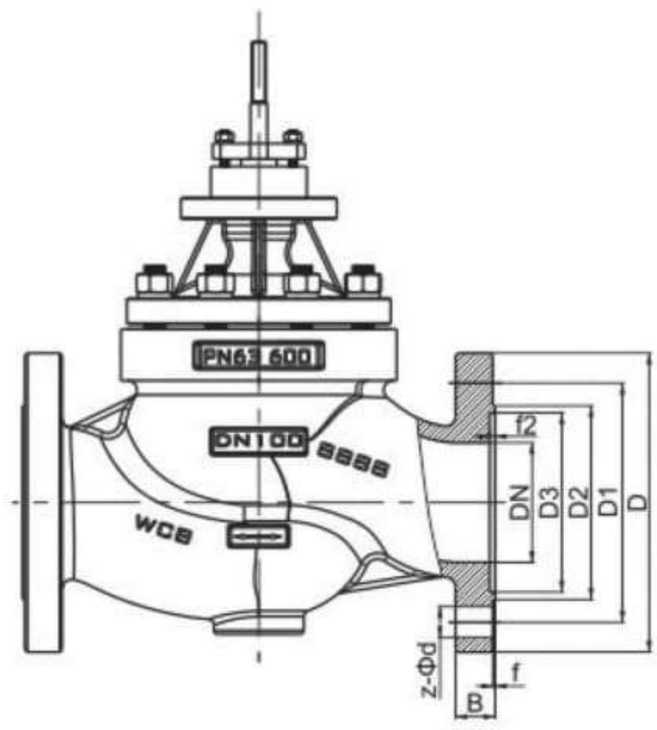
PN16 RF FACE

NOMINAL DIAMETER (DN)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15	95	65	45	16	2	4-14
20	105	75	58	18	2	4-14
25	115	85	68	18	2	4-14
32	140	100	78	18	2	4-18
40	150	110	88	18	2	4-18
50	165	125	102	18	2	4-18
65	185	145	122	18	2	8-18
80	200	160	138	20	2	8-18
100	220	180	158	20	2	8-18
125	250	210	188	22	2	8-18
150	285	240	212	22	2	8-22
200	340	295	268	24	2	12-22
250	405	355	320	26	2	12-26
300	460	410	378	28	2	12-26



PN40 FM FACE

NOMINAL DIAMETER (DN)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	D3	f	f2	z-Ød
15	95	65	45	16	40	4	2	4-14
20	105	75	58	18	51	4	2	4-14
25	115	85	68	18	58	4	2	4-14
32	140	100	78	18	66	4	2	4-18
40	150	110	88	18	75	4	2	4-18
50	165	125	102	20	88	4	2	4-18
65	185	145	122	22	110	4	2	8-18
80	200	160	138	24	121	4	2	8-18
100	230	190	162	24	150	4.5	2	8-22
125	270	220	188	26	176	4.5	2	8-26
150	300	250	218	28	204	4.5	2	8-26
200	375	320	285	34	260	4.5	2	12-30
250	450	385	345	38	313	4.5	2	12-33
300	515	450	410	42	364	4.5	2	16-33



PN63 FM FACE

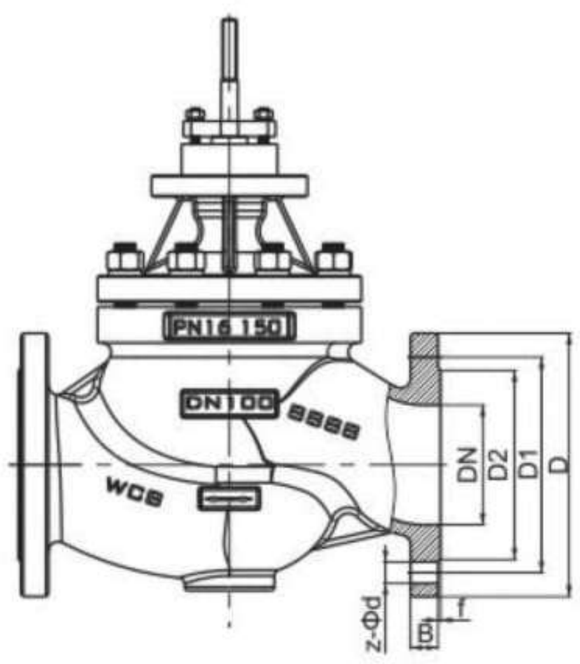
NOMINAL DIAMETER (DN)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	D3	f	f2	z-Ød
15	105	75	45	20	40	4	2	4-14
20	130	90	58	22	51	4	2	4-18
25	140	100	68	24	58	4	2	4-18
32	155	110	78	26	66	4	2	4-22
40	170	125	88	26	75	4	2	4-22
50	180	135	102	26	88	4	2	4-22
65	205	160	122	26	110	4	2	8-22
80	215	170	138	28	121	4	2	8-22
100	250	200	162	30	150	4.5	2	8-26
125	295	240	188	34	176	4.5	2	8-30
150	345	280	218	36	204	4.5	2	8-33
200	415	345	285	42	260	4.5	2	12-36
250	470	400	345	46	313	4.5	2	12-36
300	530	460	410	52	364	4.5	2	16-36

WIKA TÜREN

CONTROL VALVE | Series K

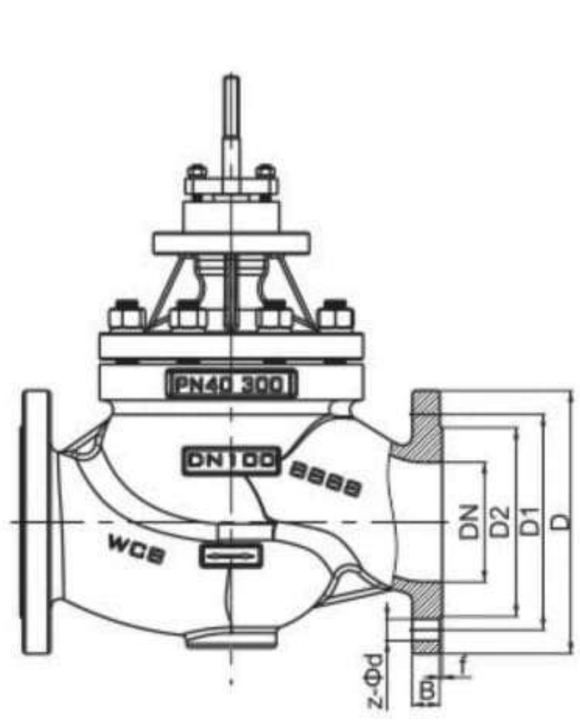
FLANGE CONNECTION DIMENSION

ASME B16.5-2013
Connection dimension of flanged end face



ASME 150LB

NOMINAL DIAMETER (DN)/(NPS)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15 (1/2")	90	60.3	34.9	9.6	2	4-16
20 (3/4")	100	69.9	42.9	11.2	2	4-16
25 (1")	110	79.4	50.8	12.7	2	4-16
32 (1 1/4")	115	88.9	63.5	14.3	2	4-16
40 (1 1/2")	125	98.4	73.0	15.9	2	4-16
50 (2")	150	120.7	92.1	17.5	2	4-18
65 (2 1/2")	180	139.7	104.8	20.7	2	4-18
80 (3")	190	152.4	127.0	22.33	2	4-18
100 (4")	230	190.5	157.2	22.3	2	8-18
125 (5")	255	215.9	185.7	22.3	2	8-22
150 (6")	280	241.3	215.9	23.9	2	8-22
200 (8")	345	298.5	269.9	27.0	2	8-22
250 (10")	405	362.0	323.8	28.6	2	12-26
300 (12")	485	431.8	381.0	30.2	2	12-26



ASME 300LB

NOMINAL DIAMETER (DN)/(NPS)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15 (1/2")	95	66.7	34.9	12.7	2	4-16
20 (3/4")	115	82.6	42.9	14.3	2	4-18
25 (1")	125	88.9	50.8	15.9	2	4-18
32 (1 1/4")	135	98.4	63.5	17.5	2	4-18
40 (1 1/2")	155	114.3	73.0	19.1	2	4-22
50 (2")	165	127.0	92.1	20.7	2	8-18
65 (2 1/2")	190	149.2	104.8	23.9	2	8-22
80 (3")	210	168.3	127.0	27.0	2	8-22
100 (4")	255	200.0	157.2	30.2	2	8-22
125 (5")	280	235.0	185.7	33.4	2	8-22
150 (6")	320	269.9	215.9	35.0	2	12-22
200 (8")	380	330.2	269.9	39.7	2	12-26
250 (10")	445	387.4	323.8	46.1	2	16-30
300 (12")	520	450.8	381.0	49.3	2	16-33

ASME 600LB

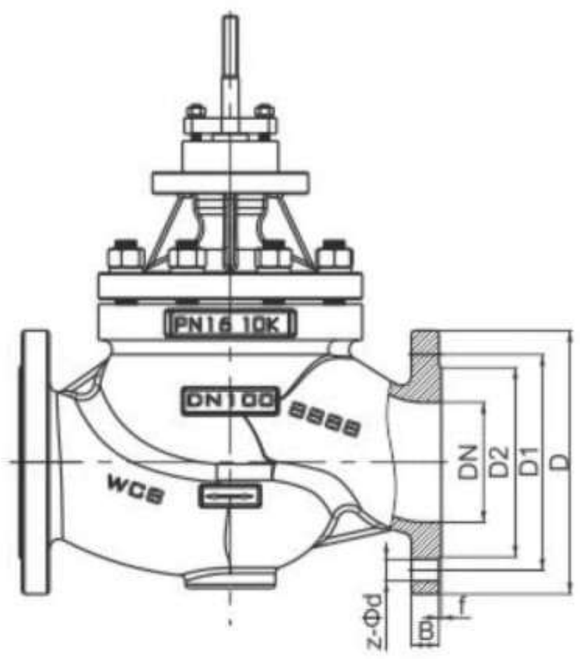
NOMINAL DIAMETER (DN)/(NPS)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15 (1/2")	95	66.7	34.9	14.3	7	4-16
20 (3/4")	115	82.6	42.9	15.9	7	4-18
25 (1")	125	88.9	50.8	17.5	7	4-18
32 (1 1/4")	135	98.4	63.5	20.7	7	4-18
40 (1 1/2")	155	114.3	73.0	22.3	7	4-22
50 (2")	165	127.0	92.1	25.4	7	8-18
65 (2 1/2")	190	149.2	104.8	28.6	7	8-22
80 (3")	210	168.3	127.0	31.8	7	8-22
100 (4")	275	215.9	157.2	38.1	7	8-26
125 (5")	330	266.7	185.7	44.5	7	8-30
150 (6")	355	292.1	215.9	47.7	7	12-30
200 (8")	420	349.2	269.9	55.6	7	12-33
250 (10")	510	431.8	323.8	63.5	7	16-36
300 (12")	560	489.0	381.0	66.7	7	20-36

WIKA TÜREN

CONTROL VALVE | Series K

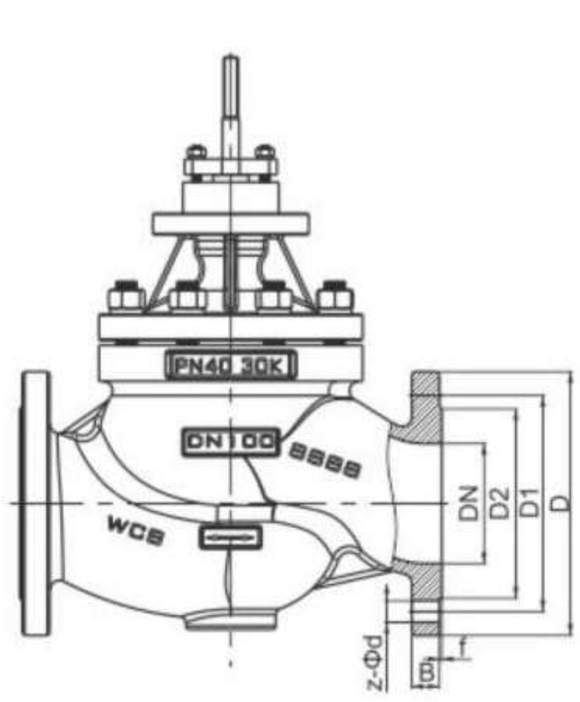
FLANGE CONNECTION DIMENSION

JIS 82220-2012
Standard connection dimension of flanged end face



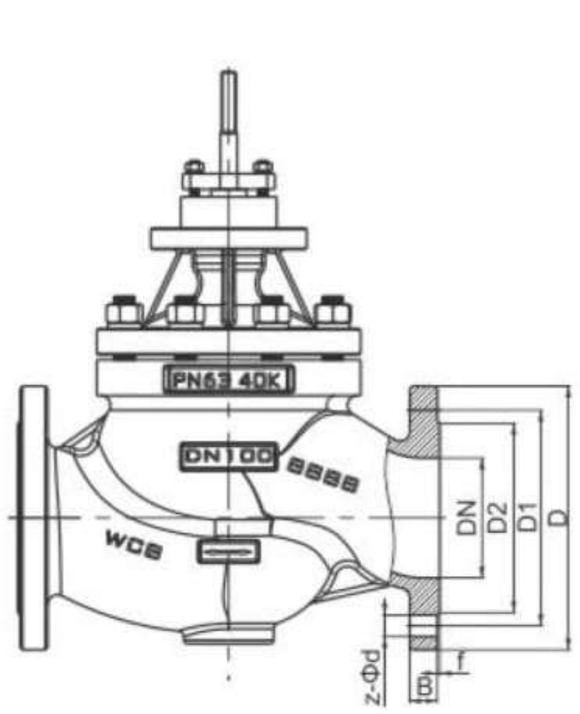
JIS 10K

NOMINAL DIAMETER (DN)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15A	95	70	51	12	1	4-15
20A	100	75	56	14	1	4-15
25A	125	90	67	14	1	4-19
32A	135	100	76	16	2	4-19
40A	140	105	81	16	2	4-19
50A	155	120	96	16	2	4-19
65A	175	140	116	18	2	4-19
80A	185	150	126	18	2	8-19
100A	210	175	151	18	2	8-19
125A	250	210	182	20	2	8-23
150A	280	240	212	22	2	8-23
200A	330	290	262	22	2	12-23
250A	400	355	324	24	2	12-25
300A	445	400	368	24	3	16-25



JIS 30K

NOMINAL DIAMETER (DN)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15A	115	80	55	18	1	4-19
20A	120	85	60	18	1	4-19
25A	130	95	70	20	1	4-19
32A	140	105	80	22	2	4-19
40A	160	120	90	22	2	4-23
50A	165	130	105	22	2	8-19
65A	200	160	130	26	2	8-23
80A	210	170	140	28	2	8-23
100A	240	195	160	32	2	8-25
125A	275	230	195	36	2	8-25
150A	325	275	235	38	2	12-27
200A	370	320	280	42	2	12-27
250A	450	390	345	48	2	12-33
300A	515	450	405	52	3	16-33



JIS 40K

NOMINAL DIAMETER (DN)	OUTLET DIAMETER OF FLANGE (D)	CENTER DIAMETER OF SCREW HOLE (D1)	DIAMETER OF SEALING FACE (D2)	FLANGE THICKNESS (B)	f	z-Ød
15A	115	80	55	20	1	4-19
20A	120	85	60	20	1	4-19
25A	130	95	70	22	1	4-19
32A	140	105	80	24	2	4-19
40A	160	120	90	24	2	4-23
50A	165	130	105	26	2	8-19
65A	200	160	130	30	2	8-23
80A	210	170	140	32	2	8-23
100A	250	205	165	36	2	8-25
125A	300	250	200	40	2	8-28
150A	355	295	240	44	2	12-33
200A	405	345	290	50	2	12-33
250A	475	410	355	56	2	12-33
300A	540	470	410	60	3	16-39

DESCRIPTION AND DIMENSION LIST OF PNEUMATIC DIAPHRAGM ACTUATOR

Series K is provided with multi-spring diaphragm actuator, it has the features of less weight, small volume and stable output force. The air source is acting on the diaphragm in the inner of actuator, which overcomes the reacting force of spring to make vertical linear movement. Under zero air source pressure, the compressed spring releases the pressure to push the shaft of the actuator to make vertical movement. The actuator has two types, i.e. positive action and reaction, according to the mode of acting.

According to the effective area of the diaphragm, the different actuators in the stroke include the following 5 specifications:

EFFECTIVE AREA OF DIAPHRAGM	STORKE	REACTION	POSITIVE ACTION
360	16	XXXX	XXXX
360	25	XXXX	XXXX
560	40	XXXX	XXXX
900	60	XXXX	XXXX
1400	100	XXXX	XXXX

Series K Side-mounted Manual Lever applies screw lever and nut in its inside designed as per crank principle. It has exquisite appearance and small operating force. When there is no air source on the site, the user can rotate the manual lever to enable the valve to open or close. Compared with top-mounted lever, side-mounted one has smaller operating force, we highly recommend to use sidemounted lever.

According to the different stroke, we provide 5 specifications of side-mounted manual levers for choice.

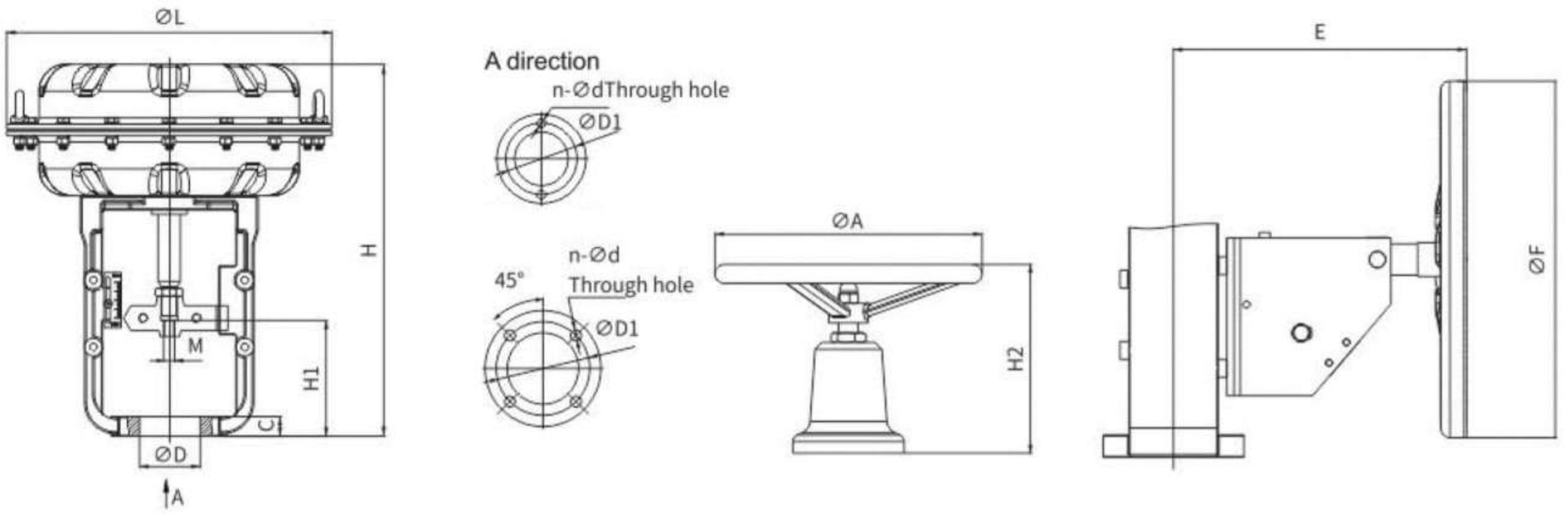
SERIES K	STORKE	MATCHING ACTUATOR
XXXX	16	XXXX
XXXX	25	XXXX
XXXX	40	XXXX
XXXX	60	XXXX
XXXX	100	XXXX

Series K Top-mounted Lever applies T-shaped screw in its inner to transmit axial movement. When there is no air source on the site, the user can rotate the lever to enable the valve to open or close. Compared with side-mounted lever, top-mounted one has smaller volume, the operating force requires bigger.

According to the different stroke, we provide 5 specifications of top-mounted manual levers for choice.

SERIES K	STORKE	MATCHING ACTUATOR
XXXX	16	XXXX
XXXX	25	XXXX
XXXX	40	XXXX
XXXX	60	XXXX
XXXX	100	XXXX

APPEARANCE CONNECTION DIMENSION LIST



CONNECTION DIMENSION & OUTPUT FORCE

SERIES K	ØL	H	H1		C	ØD	M	ØD1	n-Ød	OUTPUT FORCE(N)		
			AIR TO OPEN	AIR TO CLOSE						20-100KPa	40-200KPa	80-240KPa
XXXX	290	297	90	106	20	60	M8	Ø80	2-Ø10	640	1286	2512
XXXX	290	326	90	115	20	60	M8	Ø80	2-Ø10	640	1286	2512
XXXX	365	417	130	170	22	80	M12X1.25	Ø105	4-Ø12	980	1963	3925
XXXX	470	525	135	195	25	95	M16X1.5	Ø118	4-Ø14	1700	3419	6839
XXXX	597	731	170	270	35	100	M20X1.5	Ø130	4-Ø18	2500	5024	10048

OVERALL DIMENSIONS OF MANUAL LEVER

SERIES K	TOP-MOUNTED LEVER		SIDE-MOUNTED LEVER	
	ØA	H2	E	ØF
XXXXX	250	185	210	250
XXXXX	300	235	240	300
XXXXX	400	322	330	400
XXXXX	500	430	375	500

COMMON BRANDS FOR ACCESSORIES APPLICABLE

The purpose of accessories selection is to fulfill the whole regulation and cutoff performance and control features of control valve, the common accessories involve electropneumatic valve positioner, filter pressure-relief valve, self-locking valve, amplifier, valve position transmitter (signal feedback), pneumatic valve, limit switch and electromagnetic valve etc .. The different accessory offers different purpose, please select proper accessories according to different work conditions, flow characteristic and precision, or customized brands.

Common international brands of electropneumatic valve positioner

SIEMENS AG

FISHER

METSO

Korea YTC

TISSIN Korea

Japan SMC

ABB

azbil

Common international brands of electropneumatic valve

ASCO

SMC

FESTO

NOGUEN

Common international brands of limit switch

I_Tork

HKC

azbil

YTC

Common international brands of filter pressure-relief valve

NOGUEN

SMC

FISTO

ATTACHMENT1 VALVE LEAKAGE GRADE STANDART

PNEUMATIC CONTROL VALVE			
SHUT-OFF CLASS	TESTING MEDIUM	TESTING PRESSURE	MAXIMUM SEAT LEAKAGE L/h
I	Agreed by the user and manufacturer		
II	Water, air or nitrogen	A	5×10^{-3} x valve rated capacity
III			10^{-3} x valve rated capacity
IV	Water, air or nitrogen	A or BA	10^{-4} x valve rated capacity
IV-S1	Water, air or nitrogen	A or BA	5×10^{-6} x valve rated capacity
IV-S2	Air or nitrogen	A	$20 \times 10^{-4} \times \Delta P \times D$
V	Water	B	$1.8 \times 10^{-7} \times \Delta P \times D$
VI	Air or nitrogen	A	$3 \times 10^{-3} \times \Delta P$ x (leakage in the continued table)

CONTINUED TABLE

SEAT SIZE		20	25	40	50	65	80	100	150	200	250	300	350	400
LEAKAGE	ml/min	0.1	0.15	0.3	0.45	0.6	0.9	1.7	4	6.75	11.1	16	21.6	26.4
	BUBBLES/min		1	2	3	4	6	11	27	45	-	-	-	-

ANSI B16.104-1998			
SHUT-OFF CLASS	MAXIMUM ALLOWALBLE LEAKAGE	TESTING MEDIUM	TESTING PRESSURE
II	0.5%CV	Air or water at 10-52°C	Maximum working differential pressureΔP or 50lb/in² (3.5bar) differentialpressure, whichever is lower.
III	0.1%CV	Air or water at 10-52°C	Maximum working differential pressureΔP or 50lb/in² (3.5bar) differentialpressure, whichever is lower.
IV	0.01%CV	Air or water at 10-52°C	Maximum working differential pressureΔP or 50lb/in² (3.5bar) differentialpressure, whichever is lower.
V	0.0005ml/min of water leakage per inch of nominal diameter per psi differential pressure is allowed	Water at 10-52°C	Maximum working differential pressureΔP
VI	VALVE SIZE in / mm; ml/min; BUBBLES /min (see below)	Air or water at 10-52°C	Maximum working differential pressureΔP or 50lb/in² (3.5bar) differentialpressure, whichever is lower.

VALVE SIZE in	VALVE SIZE mm	ml/min	BUBBLES /min
1	25	0.15	1
1 1/2	38	0.30	2
2	51	0.45	3
2 1/2	64	0.60	4
3	76	0.90	6
4	102	1.70	11
6	152	4.00	27
8	203	6.75	45
10	250	11.1	
12	300	16.0	
14	350	21.6	
16	400	28.4	

ATTACHMENT2 STEEL GRADE CONTRAST TABLE OF COMMONLY USED MATERIALS OF CONTROL VALVES

STEEL GRADE CONTRAST TABLE OF COMMONLY USED MATERIALS OF CONTROL VALVE				
MATERIAL NAME	ASTM	JIS	DIN	MAIN CHEMICAL COMPONENT
Carbon steel (cast)	WCA WCB WCC	SCPH2	1.0619	C:≤0.30
Cr-Mo steel (cast)	WC6 WC9	SCPH21 SCPH32	1.7357 1.7379	C:≤0.20 C:≤0.18
Stainless steel (cast)	CF8	SCS13 SCS13A	1.4308	C:≤0.08 Cr:18.0-21.0
	CF8M	SCS14 SCS14A	1.4580 1.4581	C:≤0.08 Cr:18.0-21.0 Mo:2.0-3.0
	CF3	-	1.4306	C:≤0.03 Cr:17.0-21.0
	CF3M	-	1.4435	C:≤0.03 Cr:17.0-21.0 Mo:2.0-3.0
Stainless steel (rod)	304	SUS304	1.4301	C:≤0.08 Cr:17.0-20.0
	316	SUS316	1.4401 1.4436	C:≤0.08 Cr:16.0-18.0 Mo:2.0-3.0
	304L	SUS304L	1.4036	C:≤0.03 Cr:18.0-20.0
	316L	SUS316L	1.4435 1.4404	C:≤0.03 Cr:2.0-3.0
	410	SUS410	1.4006	C:≤0.15 Cr:11.5-13.0
	416	SUS416	1.4005	C:≤0.15 Cr:12.0-14.0
	420	SUS420	1.4021	C:0.16-0.25 Cr:16.0-18.0
	440B	SUS440B	1.4112	C:0.75-0.95 Cr:16.0-18.0
	440C	SUS440C	1.4125	C:0.75-0.95 Cr:16.0-18.0
	630	SUS630 SUS24(Cast)	1.4542	Cr:16.5 Ni:4.0 Cu:3.5

ATTACHMENT3 SELECTION TABLE OF ANTICORROSIVE MATERIALS OF CONTROL VALVES

SELECTION TABLE OF ANTICORROSIVE MATERIALS OF CONTROL VALVE														
FLUID	CARBON STEEL	CAST IRON	302 OR 304SS	316SS	BRONZE	MONEL	HASTELLOY B	HASTELLOY C	SS#20	TITANIUM	Co-Cr ALLOY#6	416 SS	440C SS	17-4PH SS
Acetaldehyde	A	A	A	A	A	A	I.L	A	A	I.L	I.L	A	A	A
Acetic acid (air free)	C	C	B	B	B	B	A	A	A	A	A	C	C	B
Acetic acid (aerated)	C	C	A	A	A	A	A	A	A	A	A	C	C	B
Acetic acid vapor	C	C	A	A	B	B	I.L	A	A	A	A	C	C	B
Acetone	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetylene	A	A	A	A	I.L	A	A	A	A	I.L	A	A	A	A
Alcohols	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Aluminum sulfate	C	C	A	A	A	A	A	A	A	A	I.L	C	C	I.L
Ammonia	A	A	A	A	A	A	A	A	A	A	A	A	A	I.L
Ammonium chloride	C	C	B	B	A	A	A	A	A	A	A	C	C	I.L
Ammonium nitrate	A	A	A	A	C	C	A	A	A	A	A	C	C	I.L
Ammonium phosphate (unvalent)	C	C	A	A	B	B	A	A	A	A	A	B	B	I.L
Ammonium sulfate	C	C	B	A	B	B	A	A	A	A	A	C	C	I.L
Ammonium sulfite	C	C	A	A	C	C	I.L	A	A	A	A	C	C	I.L
Aniline	A	A	A	A	A	A	A	A	A	A	A	C	C	I.L
Asphalt	A	A	A	A	C	C	A	A	A	I.L	A	A	A	A
Beer	B	B	A	A	B	B	A	A	A	A	A	B	B	A
Benzene	A	A	A	A	A	A	B	A	A	A	A	A	A	A
Benzoic acid	C	C	A	A	A	A	I.L	A	A	A	I.L	A	A	A
Boric acid	C	C	A	A	A	A	B	A	A	A	A	B	B	I.L
Butane	A	A	A	A	A	A	A	A	A	I.L	A	A	A	A
Calcium chloride (akaline)	B	B	C	B	C	A	A	A	A	A	I.L	C	C	I.L
Calcium hypochlorite	C	C	B	B	B	B	C	A	A	A	I.L	C	C	I.L
Carbolic acid	B	B	A	A	A	A	A	A	A	A	A	I.L	I.L	I.L
Carbon dioxide (dry)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon dioxide (wet)	C	C	A	A	A	A	A	A	A	A	A	A	A	I.L
Carbon disulfide	A	A	A	A	C	B	A	A	A	A	A	B	B	A
carbon tetrachloride	B	B	B	B	A	A	B	A	A	A	I.L	C	C	C
Carbonic acid	C	C	B	B	B	A	A	A	A	I.L	I.L	A	A	I.L
Chlorine, gas (dry)	A	A	B	B	B	A	A	A	A	C	B	C	C	A
Chlorine, gas (wet)	C	C	C	C	C	C	C	B	C	A	B	C	C	C
Liquid chlorine	C	C	C	C	B	C	A	A	B	C	B	C	C	C
Chromic acid	C	C	C	C	C	A	C	A	C	A	B	C	C	C
Citric acid	I.L	C	B	B	A	B	A	A	A	A	I.L	B	B	B
Coke oven gas	A	A	A	A	B	B	A	A	A	A	A	A	A	A
Copper sulfate	C	C	B	B	B	C	I.L	A	A	A	I.L	A	A	A
Cottonseed oil	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Creosote	A	A	A	A	A	A	A	A	A	I.L	A	A	A	A
Ethane	A	A	A	A	A	B	A	A	A	A	A	A	A	A
Ether	B	B	A	A	B	A	A	A	A	I.L	A	A	A	A
Ethyl chloride	C	C	A	A	A	A	A	A	A	A	A	B	B	I.L
Ethylene	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ethylene glycol	A	A	A	A	A	A	I.L	I.L	A	I.L	A	A	A	A
Ferric chloride	C	C	C	C	C	C	C	B	A	A	B	C	C	A
Formaldehyde	B	B	A	A	A	A	A	A	C	A	A	A	A	I.L
Formic acid	I.L	C	B	B	A	A	A	A	A	C	B	C	C	B
Freon (wet)	B	B	B	B	A	A	A	A	A	A	A	I.L	I.L	I.L
Freon (dry)	B	B	A	A	A	A	A	A	A	A	A	I.L	I.L	I.L
Furfural	A	A	A	A	A	A	A	A	A	A	A	B	B	I.L
Gasoline (refined)	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glucose	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Symbols:A- normally sutable; B- use with caution; C - unsatisfactory, I.L.- lack of information.
Abstract from (Handbook of Control Valves) Second Editon, Instrument Society o Amarica, J.W. Hutchiscn Editor in Chief, Lin Oiuhong and Other.
Translators December 12,1984
This table is intended to give only a genoral indcaston of how various metals wil react when in contact with certan fluids.The recorrmendations camnot be absolute because concentration, temperature, pressure and other condtions may alter the suitability of a particular metal.Therefore.use this table as a guide only.

ATTACHMENT3 SELECTION TABLE OF ANTICORROSIVE MATERIALS OF CONTROL VALVES

SELECTION TABLE OF ANTICORROSIVE MATERIALS OF CONTROL VALVE														
FLUID	CARBON STEEL	CAST IRON	302 OR 304SS	316SS	BRONZE	MONEL	HASTELLOY B	HASTELLOY C	SS#20	TITANIUM	Co-Cr ALLOY#6	416 SS	440C SS	17-4PH SS
Hydrochloric acid (aerated)	C	C	C	C	C	C	A	B	C	C	B	C	C	C
Hydrochloric acid (air free)	C	C	C	C	C	C	A	B	C	C	B	C	C	C
Hydrofluoric acid (aerated)	B	C	C	B	C	C	A	A	B	C	B	C	C	C
Hydrofluoric acid (air free)	A	C	C	B	C	A	A	A	B	A	I.L	C	C	I.L
Hydrogen	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrogen peroxide	I.L	I.L	A	A	C	A	B	B	B	B	I.L	B	B	I.L
Hydrogen sulfide (liquid)	C	C	A	A	C	C	A	A	A	A	A	C	C	I.L
Magnesium hydroxide	A	A	A	A	B	A	A	A	A	A	A	A	A	I.L
Mercury	A	A	A	A	C	B	A	A	A	A	A	A	A	B
Methanol	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl ethyl ketone	A	A	A	A	A	A	A	A	A	I.L	A	A	A	A
Milk	C	C	A	A	A	A	A	A	A	C	A	C	C	C
Natural gas	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Nitric acid	C	C	A	A	C	C	C	A	B	A	C	C	C	C
Oleic acid	C	C	A	A	B	A	A	A	A	A	A	A	B	I.L
Oxalic acid	C	C	B	B	B	B	A	A	A	B	B	B	B	I.L
Oxygen	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Petroleum oils (refined)	A	C	A	B	A	A	A	A	A	A	A	A	A	A
Phosphoric acid (aerated)	C	C	A	A	C	C	B	B	B	B	A	C	C	I.L
Phosphoric acid (air free)	C	C	A	A	C	B	A	A	A	B	A	C	A	I.L
Phosphoric acid vapor	C	C	A	A	C	C	A	I.L	A	B	C	C	A	I.L
Picric acid	C	C	A	A	C	C	A	A	A	I.L	I.L	B	A	I.L
Potassium chloride	B	B	B	B	B	B	A	A	A	A	I.L	C	A	I.L
Potassium hydroxide	B	B	A	A	B	A	A	A	A	A	I.L	B	C	I.L
Propane	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Rosin	B	B	A	A	A	A	A	A	A	I.L	A	A	A	A
Silver nitrate	C	C	A	A	C	C	A	A	A	A	B	B	B	I.L
Sodium acetate	A	A	B	A	A	A	A	A	A	A	A	A	A	A
Sodium carbonate	A	A	A	A	A	A	A	A	A	A	A	B	B	A
Sodium chloride	C	C	B	B	A	A	A	A	A	A	A	B	B	B
Sodium chromate	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Sodium hydroxide	A	A	A	A	A	A	A	A	A	A	A	B	B	A
Sodium hypochlorite	C	C	C	C	B-C	B-C	C	A	B	A	I.L	C	C	I.L
Sodium thiosulfate	C	C	A	A	C	C	A	A	A	A	I.L	B	B	I.L
Stannous chloride	B	B	C	A	C	B	A	A	A	A	I.L	C	C	I.L
Stearic acid	A	C	A	A	B	B	A	A	A	A	A	B	B	I.L
Sulfate liquor (black)	A	A	A	A	C	A	A	A	A	A	A	I.L	I.L	I.L
Sulfur	A	A	A	A	C	A	A	A	A	A	A	A	A	A
Sulfur dioxide (dry)	A	A	A	A	A	A	B	A	A	A	A	B	B	I.L
Sulfur trioxide (dry)	A	A	A	A	A	A	B	A	A	A	A	B	B	I.L
Sulfuric acid (aerated)	C	C	C	C	C	C	A	A	A	B	B	C	C	C
Sulfuric acid (air free)	C	C	C	C	B	B	A	A	A	B	B	C	C	C
Sulfurous acid	C	C	B	B	B	B	A	A	A	A	A	C	C	I.L
Tar	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Trichloroethylene	B	B	B	A	A	A	A	A	A	A	A	B	B	I.L
Turpentine	B	B	A	A	A	B	A	A	A	A	A	A	A	A
Vinegar	C	C	A	A	C	A	A	A	A	I.L	A	C	C	A
Water (water feed)	B	C	A	A	A	A	A	A	A	A	A	B	A	A
Water (distilled)	A	A	A	A	B	A	A	A	A	A	A	B	B	I.L
Sea water	B	B	B	B	B	A	A	A	A	A	A	C	C	I.L
Whiskey and wines	C	C	A	A	A	B	A	A	A	A	A	C	C	I.L
Zinc chloride	C	C	C	C	C	C	A	A	A	A	B	C	C	I.L
Zinc sulfate	C	C	A	A	B	A	A	A	A	A	A	B	B	I.L

Symbols:A- normally sutable; B- use with caution; C - unsatisfactory, I.L.- lack of information.
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WIKA TÜREN

CONTROL VALVE | Series K

SERIES K	1	2	3	4	5	6	7	8	9	10	11	12	13

VALVE BODY PART

1 Code — Category of control valves
- P Linear unbalanced trim parts
- M Linear balanced trim parts

2 Code — Valve Body Structure
1. Inline structure
2. Right-angle structure
3. Tee structure
4. Z-shaped structure

3 Code — Model of trim parts
1. Series K 2 ways structure
2. Series K unbalanced shut off structure
3. Series K 2 ways structure
4. Series K balanced double-seat sleeved structure
5. Series K balanced multi-hole cage structure
6. Series K multi stage disc stacks cage structure
7. Series K balanced multi-stage pressure reduction structure
8. Series K 3 ways structure
9. Series K unbalanced fluorine-lined structure

4 Code — Bonnet type
1. Standard type
2. Heat radiating type
3. Extended type
4. Low-temperature type
5. Bellows sealing type
6. Jacket insulation type

5 Code — Mode of connection
1. Flanged
2. Wafer type
3. Butt welded
4. Screw type

6 Code — Sealing type
- Y Metal sealing overlaying alloy
- H Metal sealing
- R Soft sealing

7 Code — Nominal pressure

8 Code — Mode of action
- K Air to open
- B Air to close
- F Lock-up

9 Code — Materials of valve body
- C Carbon steel
- P CF8/304
- R CF8M/316
- RL CF3M/316L

10 Code — Nominal diameter

ACTUATORS

11 Code — Type of actuator
- F Diaphragm pneumatic actuator
- P Piston type pneumatic actuator
- E Electric actuator

12 Code — Mode of manual mechanism
- T Top-mounted
- L Side-mounted

13 Code — Special requirements

WIKATÜREN

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