



### VMV MISSION

- Committed to global energy saving and security
- Strive for the sustainable development of mankind



### VMV VISION

- To become a respected brand providing steam and thermal energy system solutions to realize everyone's dream.



### VMV VALUES

- Take responsibility
- Exert all one's energies
- Contribute to clients
- Walk the walk



### VMV SPIRIT

- Integrity
- Altruism
- Innovation
- Efficiency



Shanghai R&D  
(Brand Operation)Center



Since 1998

[WWW.VMVVALVE.COM](http://WWW.VMVVALVE.COM)

**350**

Employees

**75000m<sup>2</sup>**

Factory Plant Area

**37**

Engineers

**2000m<sup>2</sup>**

Laboratory Area

Committed To Global Energy Saving And Security  
Strive For The Sustainable Development Of Mankind

致力于全球能源节约与安全  
为人类可持续发展努力奋斗



VMV®



## ABOUT VMV

VMV Newton is the professional valve manufacturer, integrating valve casting, complete machine research and development, production and sales. We established in 1998, the headquarter covers 75000 square meters and realizes digital intelligence integration workshop.

Our products have applied to steam system, thermal oil system, hot and cold water system, petroleum industry, natural gas industry, chemical industry etc.

We have also qualified with CE, ISO, TS A1, API, DNV, EAC certificates etc.



TRUE EFFICIENCY  
USE VMV



Workshop2  
Bellows Sealed Valve Series



Workshop3  
Steam Trap Series



Workshop5  
General Valve &  
Customized Valve Series



Workshop3  
Control Valve Series



HONORARY  
CERTIFICATE

## PROFESSIONAL MANUFACTURER OF VALVES



### FORGED STEEL AUTOMATIC PRODUCTION LINE

This production line is operated by robots to turn, mill, drill, tap, and complete the whole processing at one time.



### INTELLIGENT THREE- DIMENSIONAL WAREHOUSE

Total 3000 storage spaces, with a height of 24 meters. It can accommodate 3,600 tons of materials, improving the utilization rate of the entire space and working efficiency.



### INTELLIGENT CNC MACHINE

It can process large size valve up to 40", the processing accuracy up to UM level, to ensure that each valve has high precision, to ensure zero leakage.



## VMV PRODUCTION MANAGEMENT

- Standardized production process
- High precision machining capability
- Accurate inventory data
- Strict quality control
- Protection of workers' health
- Environment and sustainable development



# HIGH QUALITY CONTROL OF VMV



## HIGH PRECISION GRINDING MACHINE

The grinding accuracy of the internal parts can be controlled within 3UM, and has excellent sealing performance.



## FULL PROCESS INSPECTION

Complete process inspection from incoming inspection, process inspection and finished product inspection.



## DUST-FREE WORKSHOP

Control dust, particles, bacteria and other pollutants in the production environment to ensure high-precision processing technology and high-clean product characteristics.



## VMV TESTING LABORATORY

Equipped with spectrometer, Rockwell hardness tester, tensile testing machine, impact testing machine, metallographic testing machine, helium mass spectrometry microleak detector, etc.



# HIGH PRECISION CONTROL OF VMV



# V8000 SERIES CONTROL VALVE



## CONTENTS

- V8000 SERIES CONTROL VALVE ..... 01-13
- V9000 SERIES BELLOWS CONTROL VALVE ..... 14-25
- V6000 SERIES THREE-WAY CONTROL VALVE ..... 26-34
- MT SERIES PNEUMATIC DIAPHRAGM ACTUATOR ..... 35-41



# V8000 SERIES CONTROL VALVE

## 1. Product Introduction

In the fields of heating, temperature control, refrigeration, and even the entire field of industrial fluid automation, GLOBE straight-Travel control valve is a common and indispensable fluid control component. The control valve achieves the regulation of steam and other fluids' pressure, flow rate, temperature and fluid level, which mainly through changing the throttling area between the valve plug and valve seat. Common issues with regular GLOBE straight-Travel control valves include difficulty in disassembling and replacing valve seats, packing wear and leakage, poor regulating accuracy, weak sealing, especially in high temperature conditions where it is prone to stick, excessive vibration and noise, stem breakage or detachment, and large leakage, which cannot meet operational requirements, lead to emergency shutdowns in severe cases, resulting in substantial losses for users.

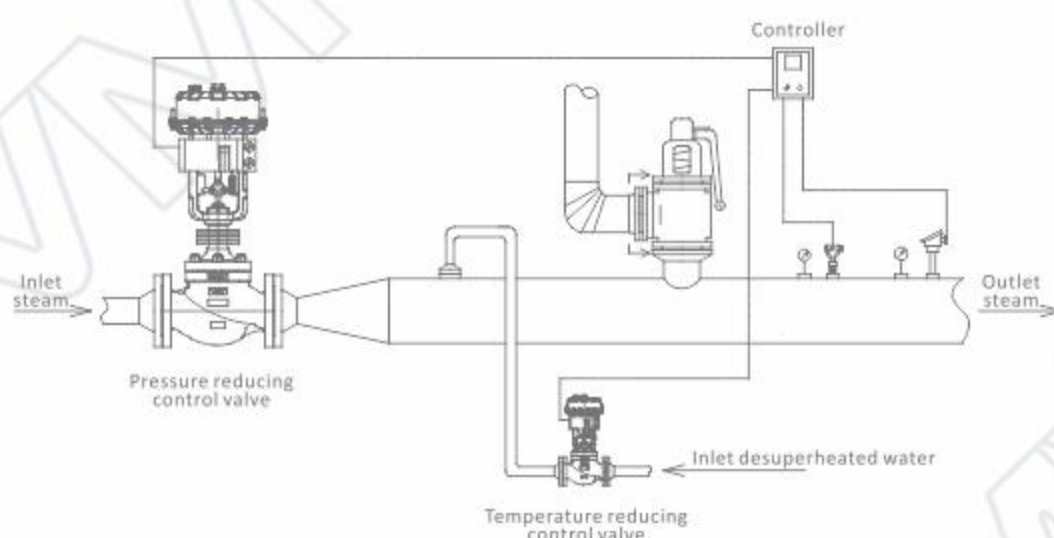
## 2. Product advantages

The V8000 model solves the above problems well and owns the following features:

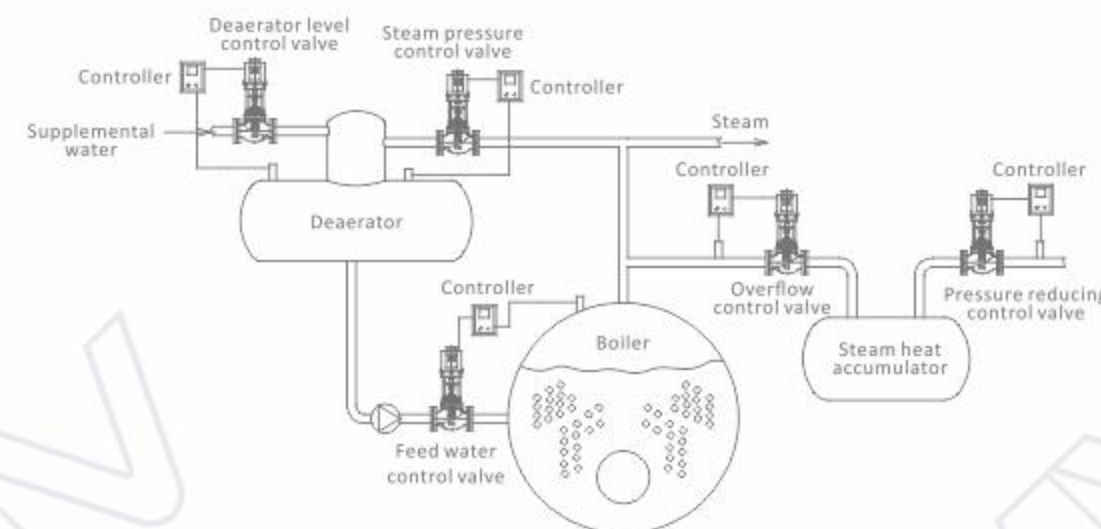
- Good stability against high differential pressure
  - Long-lasting seals in high-temperature operations
  - High regulation precision with low leakage
  - Long service life of packing
  - Convenient and quick on-site valve maintenance
  - Fast response speed
- VMV equipped with either pneumatic diaphragm actuator or electric actuator according to the user's on-site energy.

## 3. Typical Application Scenarios

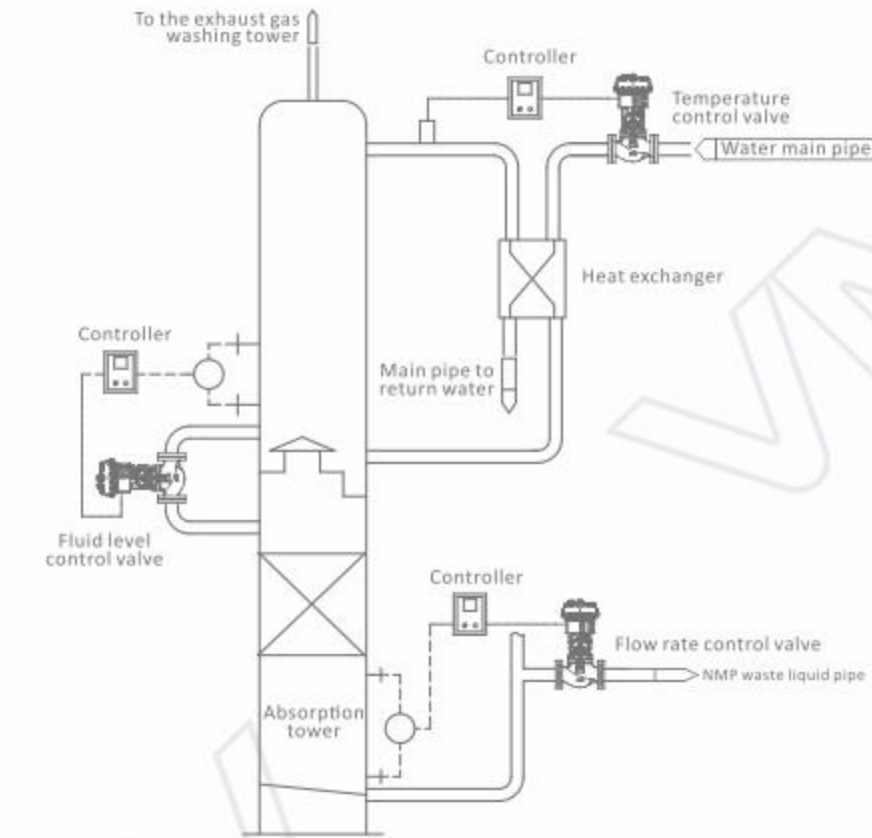
3.1 Control valve of steam pressure reducing and temperature reducing on steam pipelines.



3.2 Control valve of feed water, deaerator fluid level, steam pressure, steam overflow, and steam pressure reducing is used in conjunction with boiler.



3.3 Absorption tower in the NMP recovery system for control valve of fluid level, water-added temperature, NMP and water mixture outlet flow rate.



## 4. Technical Parameters

Nominal diameter	DN15(NPS1/2) ~ DN500
Pressure rating	PN16 ~ PN420、Class150 ~ Class2500
Operating voltage (electric actuator)	220VAC, 380VAC, 24VDC
Air supply pressure (pneumatic actuator)	0.4 ~ 0.6MPa
Operating temperature	-45 ~ 588 °C
Bonnet type	Standard type (-17 ~ 300°C) Radiator fin type(-45°C ~ -17°C, > 300°C)
Packing	V-type combination packing(≤200°C) Graphite combination packing(>200°C)

## 5. Performance

Rated Cv value	See table below
Flow characteristic	Equal percentage, linear, quick opening
Regulating	50:1
Leakage level	Level IV (metal hard seal) Level V (metal hard seal) Level VI (soft seal)
Hysteresis	<1%
Dead zone	<0.6%
Allowable differential pressure	See table below

# V8000 SERIES CONTROL VALVE

## 6. Structure and characteristics

### 6.1 Single-seat control valve

#### Valve stem double guided structure

Keeping the packing and valve stem coaxial at any times can prevent abnormal wear of the packing caused by eccentricity, greatly improving the service life of the packing.

#### Thread + pin connection structure

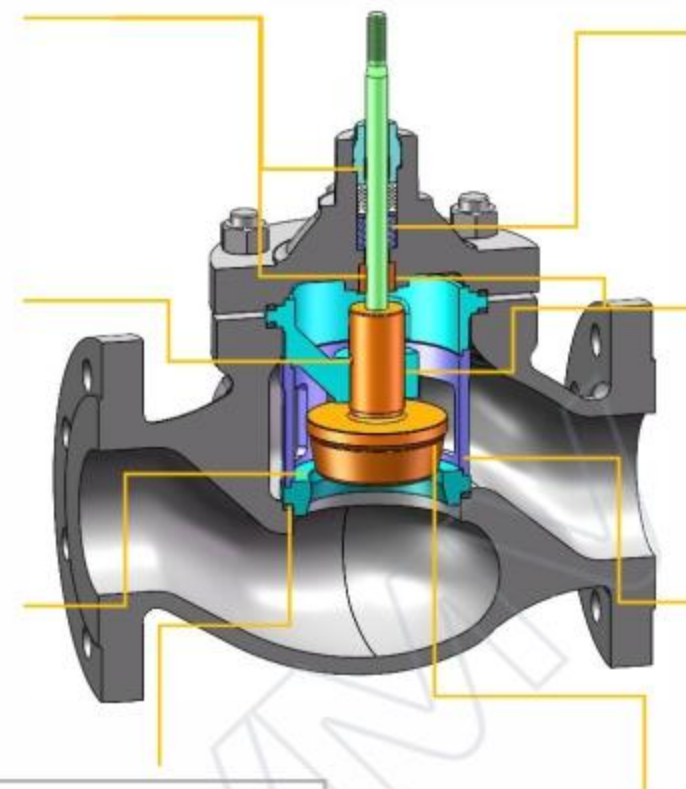
The valve plug and the valve stem is tightly connected by threads and pins, with no any relative movement gap, effectively prevent fatigue and fracture of the valve stem from relative swing of the valve plug and valve stem.

#### Up-pressure valve seat structure

By loosening the valve bonnet bolts, the internal components of the valve can be removed one by one, allowing for quick maintenance and components on-site, thus saving the user's replacement of the valve seat and internal maintenance time

#### Gasket quantitative compression structure

Prevent the gasket from being overly compressed to achieve durable sealing without external leakage.



#### Spring-loaded packing gland structure

Provide a continuous and stable compressive force for the packing, allowing the packing to automatically compensate for wear during use, achieving long-term stable sealing.

#### Valve plug double-guided structure

The valve plug operates smoothly, not prone to vibration and sticking, ensuring higher regulating precision.

#### Elastic pressure cage compensation structure

Under high-temperature conditions, the pressure cage can absorb the axial displacement caused by high temperatures and convert it into radial elastic deformation, prevent the gasket or valve internal components from failing due to thermal stress deformation.

#### Single seat sealing structure

Lower leakage and hard sealing can meet level V and above leakage requirements for a long time.

### 6.2 Balanced single-seat control valve

#### Wear-resistant piston ring seal structure

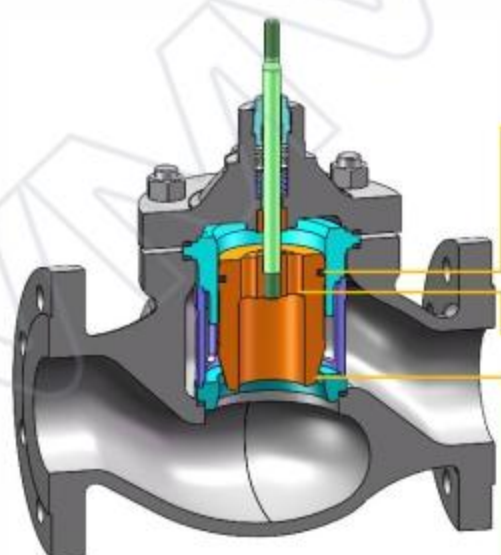
The wear-resistant piston ring still has self-lubricating at temperatures above 200°C, making the valve not easy to stretch and block during the long period regulating process, maintaining a seal grade above level IV.

#### Balanced single seat structure

Low thrust overcomes the large pressure difference, has better performance of overcoming differential pressure.

#### Spherical valve plug structure

The throttling orifice is uniformly distributed on the valve plug, allowing the medium to flow smoothly and stably, thus achieving higher regulating precision.



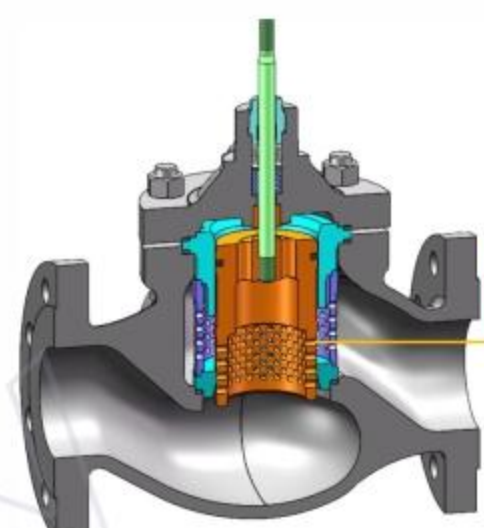
### 6.3 Low noise control valve

#### Low noise valve plug structure

This design reduces the flow speed of the medium, thus diminishing the erosion of the valve plug and seat caused by high flow speed, increasing its service life.

It also lowers noise, reducing environmental noise pollution.

Decreased vibrations, prevent damage to valve internal components from high-frequency vibrations, enhancing regulating precision and service life.



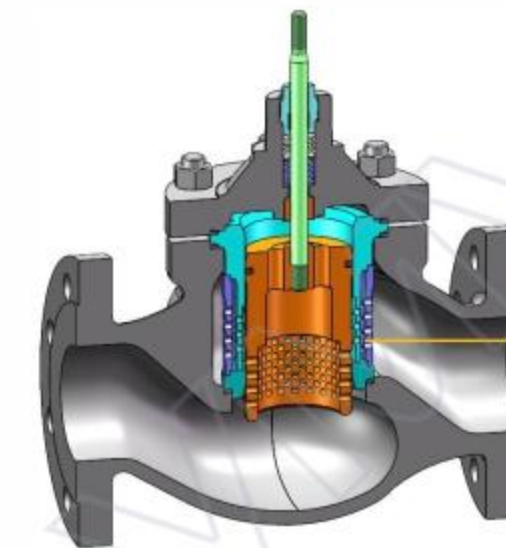
### 6.4 Multi-stage pressure reducing control valve

#### Multi-stage pressure +reducing valve plug structure

Used in conditions with high differential pressure to reduce medium flow speed and minimize the erosion to the valve plug and seat that occurs at high speed, thereby prolonging the valve's service life.

It also reduces noise, lessening noise pollution to the environment

The structure also diminishes vibrations, preventing damage to valve internal components due to high-frequency vibrations and improving the precision of regulation as well as service life.

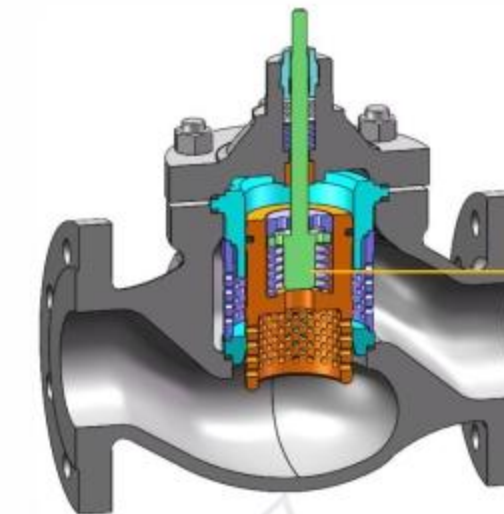


### 6.5 Pilot control Valve

#### Pilot operated valve plug structure

Equipped with regulating and shut-off function, it has excellent sealing performance under high temperature (>230 °C) working conditions and can ensure long-term operation with sealing above level V.

The structure also diminishes vibrations, preventing damage to valve components due to high-frequency vibrations and improving the precision of regulation as well as service life.



## 7. Common Material and Temperature Range of V8000 Series

### 7.1 Common valve trim materials

Body	Seat	Plug	Stem	Packing
JS1049	420+HT	420+HT	410	PTFE
WCB	304+STL	304+STL	630	Flexible graphite
LCB	304	304	XM-19	
WC6	316L+STL	316L+STL	304	
WC9	321+STL	321+STL	316L	
CF8	304+RPTFE	304+RPTFE		
CF3	316L+RPTFE	316L+RPTFE		
CF8M	F11+Q.STL	F11+Q.STL		
CF3M				

### 7.2 Temperature and pressure corresponding ranges of valve body material(MPa)

Temp°C	Class150					Class300					Class600				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.90	1.90	-	-	-	4.96	4.96	-	-	-	9.93	9.93
-29~38	1.96	1.98	1.98	1.90	1.90	5.11	5.17	5.17	4.96	4.96	10.21	10.34	10.34	9.93	9.93
50	1.92	1.95	1.95	1.83	1.84	5.01	5.17	5.17	4.81	4.81	10.2	10.34	10.34	9.56	9.62
100	1.77	1.77	1.77	1.57	1.62	4.66	5.15	5.15	4.22	4.22	9.32	10.3	10.3	8.17	8.44
150	1.58	1.58	1.58	1.42	1.48	4.51	4.97	5.03	3.85	3.85	9.02	9.95	10.03	7.4	7.7
200	1.38	1.38	1.38	1.32	1.37	4.38	4.80	4.86	3.57	3.57	8.76	9.59	9.72	6.9	7.13
250	1.21	1.21	1.21	1.21	1.21	4.19	4.63	4.63	3.34	3.34	8.39	9.27	9.27	6.5	6.68
300	1.02	1.02	1.02	1.02	1.02	3.98	4.29	4.29	3.16	3.16	7.96	8.57	8.57	6.18	6.32
325	0.93	0.93	0.93	0.93	0.93	3.87	4.14	4.14	3.09	3.09	7.74	8.26	8.26	6.04	6.18
350	0.84	0.84	0.84	0.84	0.84	3.76	4.03	4.03	3.03	3.03	7.51	8.04	8.04	5.93	6.07

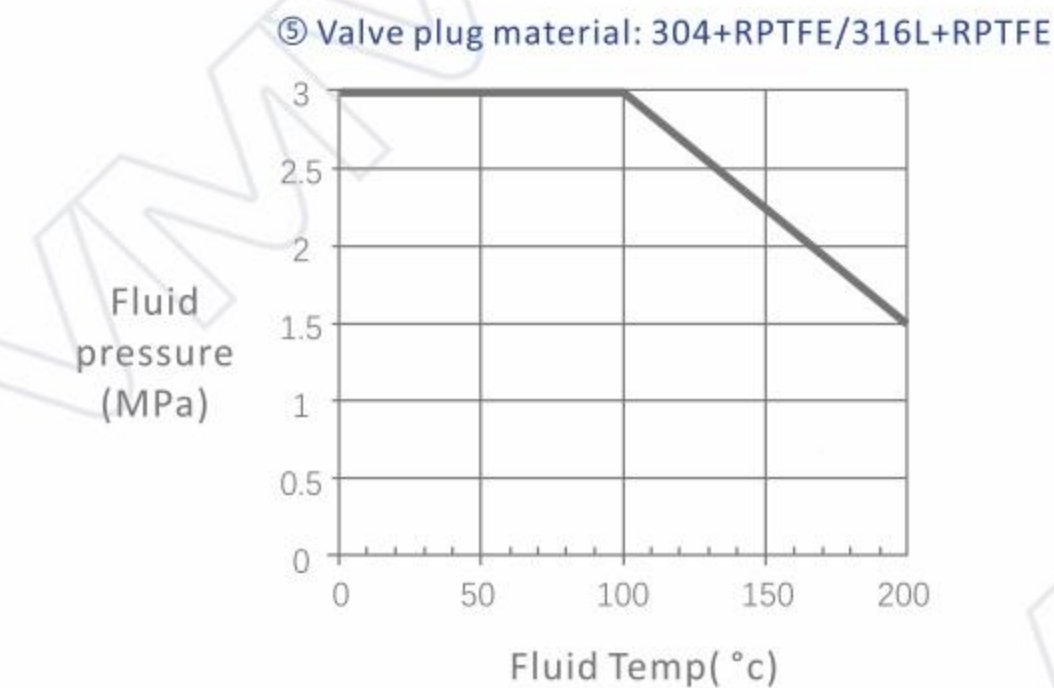
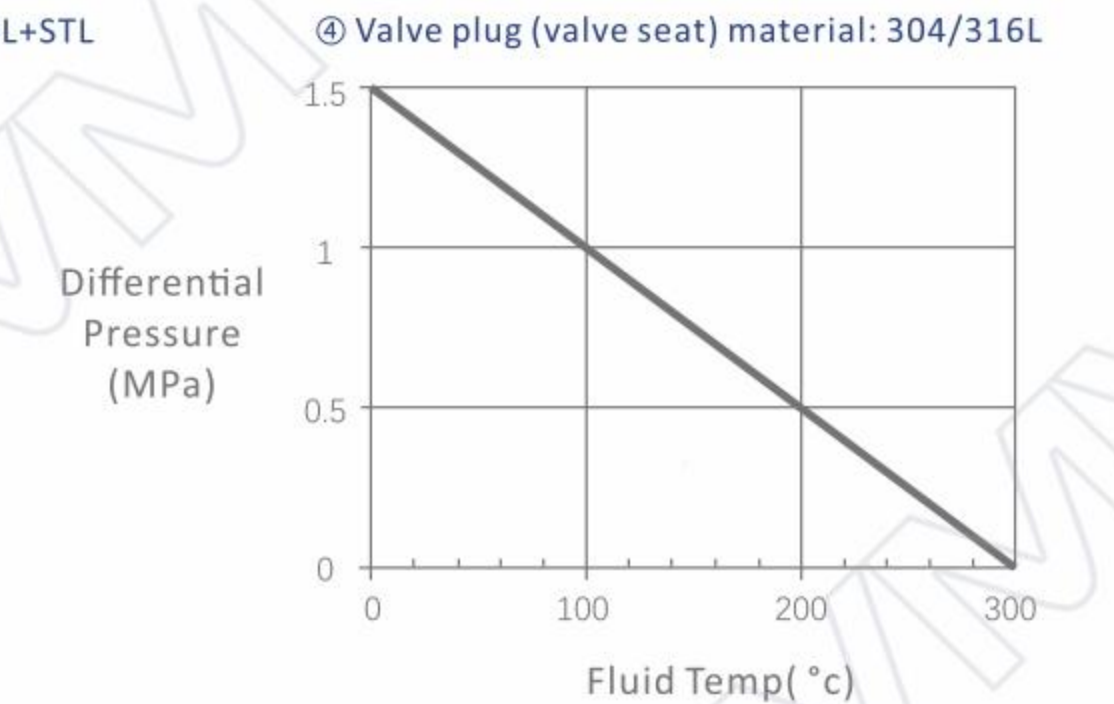
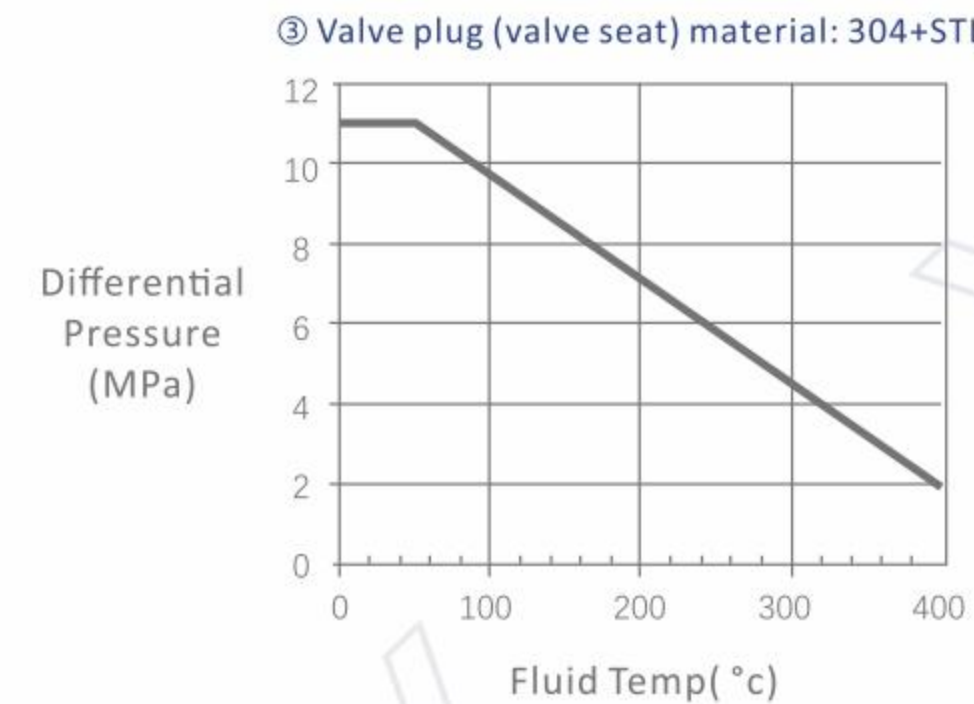
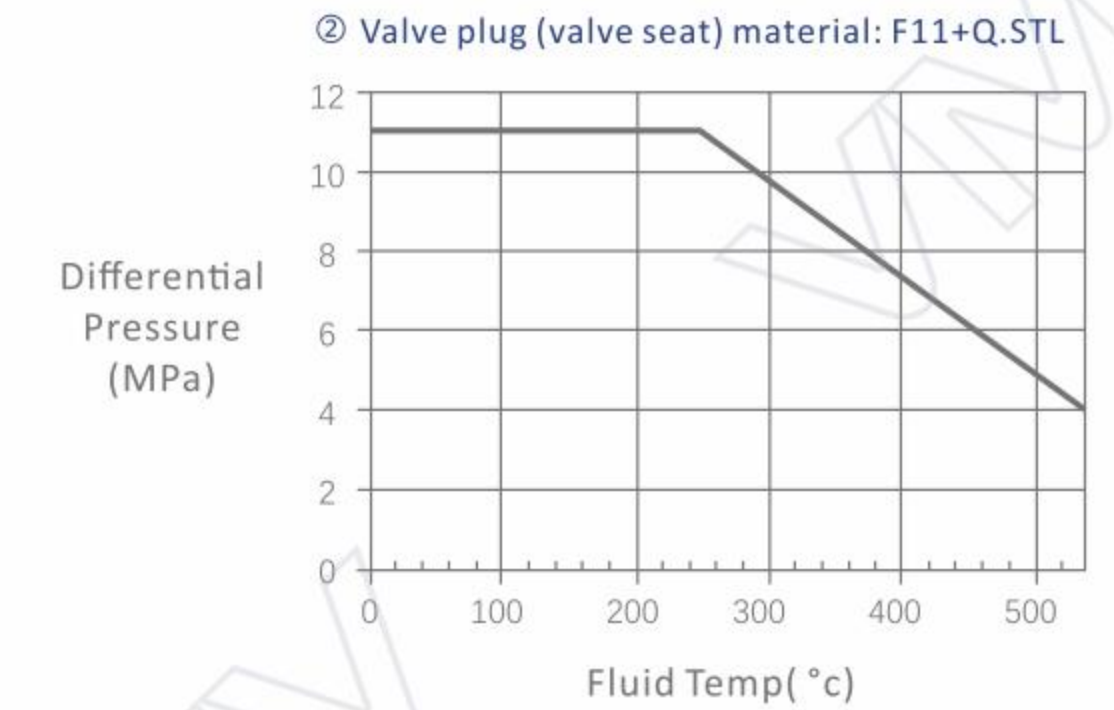
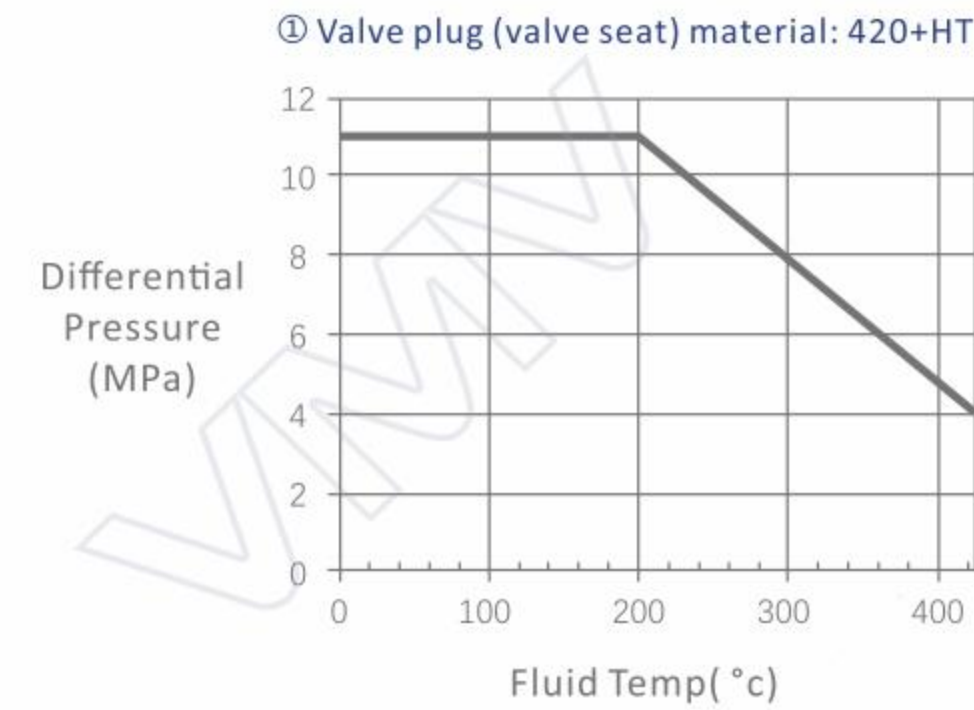
# V8000 SERIES CONTROL VALVE

375	0.74	0.74	0.74	0.74	0.74	3.64	3.89	3.89	2.99	2.99	7.27	7.26	7.76	5.81	5.98
400	0.65	0.65	0.65	0.65	0.65	3.47	3.65	3.65	2.94	2.94	6.94	7.33	7.33	5.69	5.89
425	0.55	0.55	0.55	0.55	0.55	2.88	3.52	3.52	2.91	2.91	5.75	7.00	7.00	5.6	5.83
450	-	0.46	0.46	0.46	0.46	-	3.37	3.37	2.88	2.88	-	6.77	6.77	5.48	5.77
475	-	0.37	0.37	0.37	0.37	-	3.17	3.17	2.87	2.87	-	6.34	6.34	5.39	5.73
500	-	0.28	0.28	0.28	0.28	-	2.57	2.82	2.82	2.82	-	5.15	5.65	5.3	5.65
538	-	0.14	0.14	0.14	0.14	-	1.49	1.84	2.52	2.52	-	2.98	3.69	4.89	5.00
550	-	-	-	-	-	-	1.27	1.56	-	-	-	2.54	3.13	-	-
575	-	-	-	-	-	-	0.88	1.05	-	-	-	1.76	2.11	-	-
600	-	-	-	-	-	-	0.61	0.69	-	-	-	1.22	1.38	-	-

Temp°C	PN16					PN25					PN40				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.57	1.57	-	-	-	2.45	2.45	-	-	-	3.92	3.92
-29~38	1.61	1.63	1.63	1.57	1.57	2.52	2.55	2.55	2.45	2.45	4.03	4.08	4.08	3.92	3.92
50	1.58	1.63	1.63	1.51	1.52	2.47	2.55	2.55	2.36	2.37	3.95	4.08	4.08	3.78	3.8
100	1.46	1.63	1.63	1.29	1.33	2.29	2.54	2.54	2.02	2.08	3.66	4.06	4.07	3.23	3.33
150	1.43	1.57	1.58	1.17	1.22	2.23	2.45	2.48	1.83	1.9	3.57	3.93	3.96	2.93	3.04
200	1.38	1.51	1.54	1.09	1.13	2.16	2.37	2.41	1.70	1.76	3.46	3.79	3.85	2.72	2.82
250	1.32	1.46	1.46	1.03	1.05	2.06	2.28	2.29	1.60	1.65	3.29	3.64	3.66	2.56	2.63
300	1.22	1.35	1.35	0.97	1.00	1.91	2.11	2.11	1.51	1.56	3.06	3.38	3.38	2.42	2.50
350	1.17	1.27	1.27	0.93	0.96	1.82	1.98	1.98	1.46	1.5	2.92	3.18	3.18	2.33	2.40
375	1.15	1.23	1.23	0.92	0.94	1.80	1.91	1.91	1.44	1.47	2.88	3.06	3.06	2.30	2.36
400	1.09	1.15	1.15	0.90	0.93	1.70	1.80	1.80	1.41	1.45	2.72	2.89	2.89	2.26	2.32
425	0.91	1.11	1.11	0.88	0.92	1.42	1.73	1.73	1.37	1.44	2.27	2.77	2.77	2.20	2.30
450	-	1.07	1.07	0.86	0.91	-	1.67	1.67	1.35	1.42	-	2.67	2.67	2.16	2.28
475	-	1.00	1.00	0.85	0.91	-	1.56	1.56	1.33	1.41	-	2.50	2.50	2.13	2.26
500	-	0.80	0.88	0.84	0.86	-	1.24	1.37	1.31	1.35	-	1.99	2.19	2.09	2.16
525	-	0.57	0.68	0.76	0.80	-	0.90	1.07	1.19	1.25	-	1.43	1.71	1.90	2.00
550	-	0.40	0.49	0.69	0.76	-	0.63	0.76	1.07	1.18	-	1.00	1.21	1.72	1.89
575	-	0.28	0.33	0.63	-	-	0.43	0.52	0.99	-	-	0.69	0.83	1.58	-
600	-	0.19	0.22	0.53	-	-	0.30	0.31	0.83	-	-	0.48	0.51	1.32	-

Temp°C	PN63					PN100				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	6.17	6.17	-	-	-	9.8	9.8
-29~38	6.35	6.43	6.43	6.17	6.17	10.08	10.21	10.21	9.8	9.8
50	6.22	6.43	6.43	5.95	5.98	9.88	10.21	10.21	9.44	9.5
100	5.77	6.4	6.41	5.08	5.25	9.15	10.16	10.17	8.07	8.33
150	5.62	6.19	6.24	4.62	4.79	8.92	9.82	9.9	7.34	7.6
200	5.45	5.96	6.06	4.29	4.43	8.65	9.47	9.63	6.81	7.04
250	5.19	5.74	5.76	4.04	4.15	8.23	9.11	9.14	6.41	6.59
300	4.81	5.33	5.33	3.81	39.3	7.64	8.46	8.16	6.05	6.24
350	4.59	5.00	5.00	3.67	3.79	7.29	7.94	7.94	5.83	6.01
375	4.53	4.82	4.82	3.63	3.72	7.2	7.66	7.66	5.76	5.90

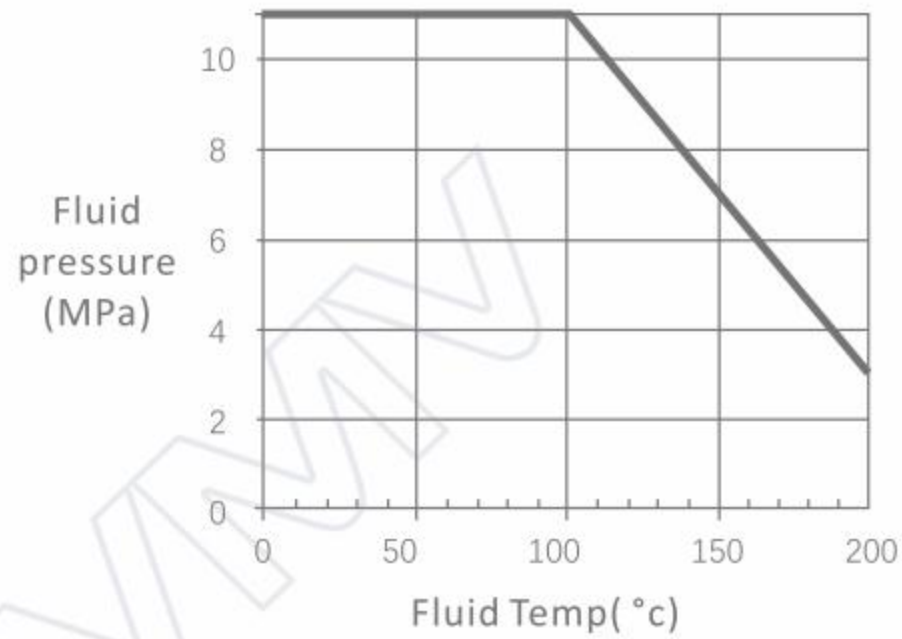
### 7.3 The valve trim material corresponds to the temperature and pressure range



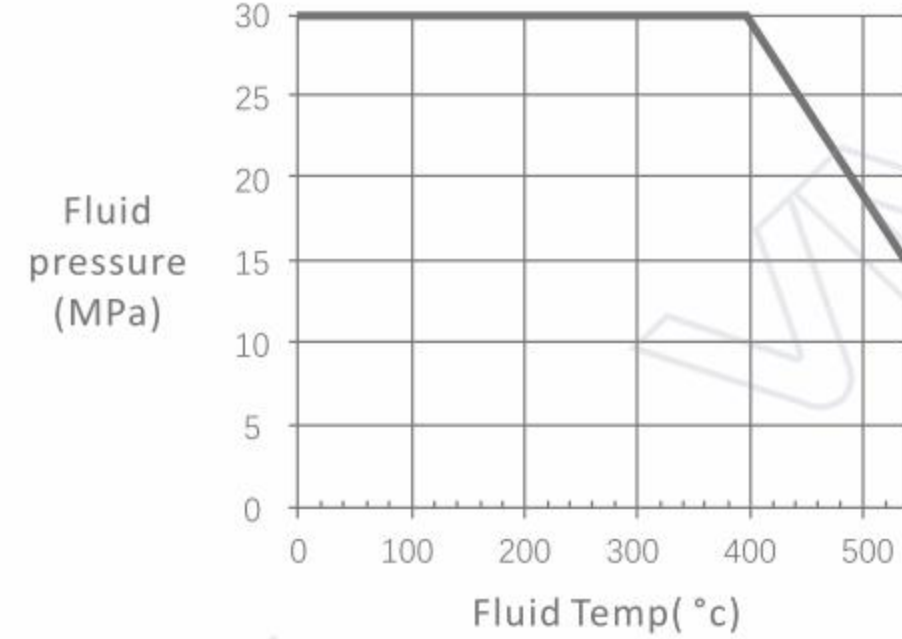


# V8000 SERIES CONTROL VALVE

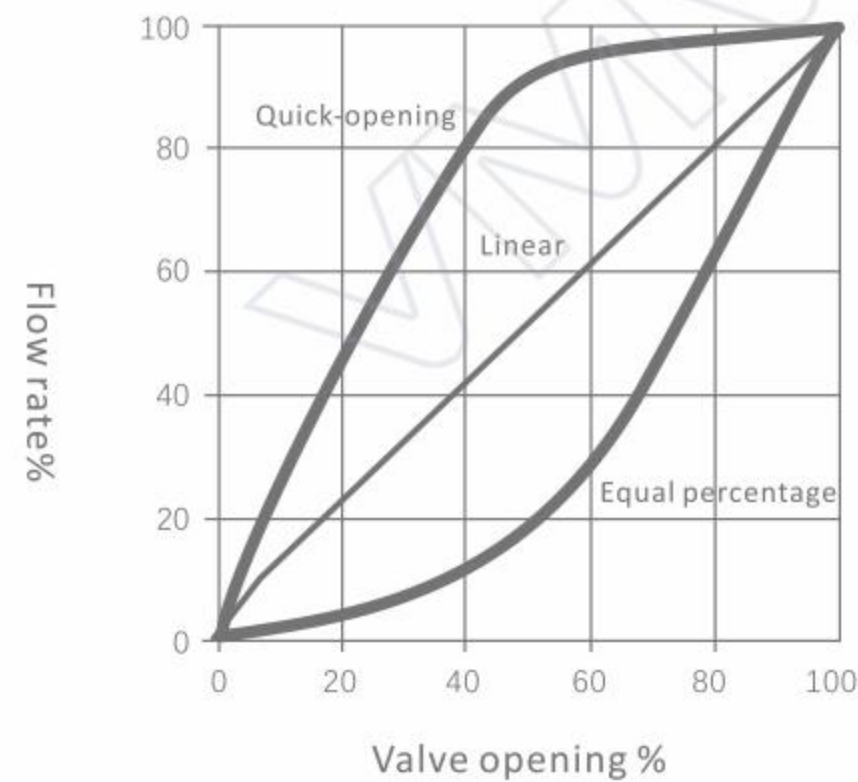
⑥ Packing material: PTFE



⑦ Packing material: graphite



## 8. Typical Flow Characteristic Curve



## 9. Rated Cv and Travel

Nominal diameter	Travel	Valve seat diameter code	Rated CV			
			Linear	Equal percentage	Low noise correction linearity	Low noise correction linearity equal percentage
-	16	6E	0.002	-	-	-
-	16	6D	0.005	-	-	-
-	16	6C	0.008	-	-	-
-	16	6B	0.01	-	-	-
-	16	6A	0.08	-	-	-
-	16	6	0.12	0.12	-	-
-	16	7	0.23	0.23	-	-
-	16	8	0.58	0.58	-	-

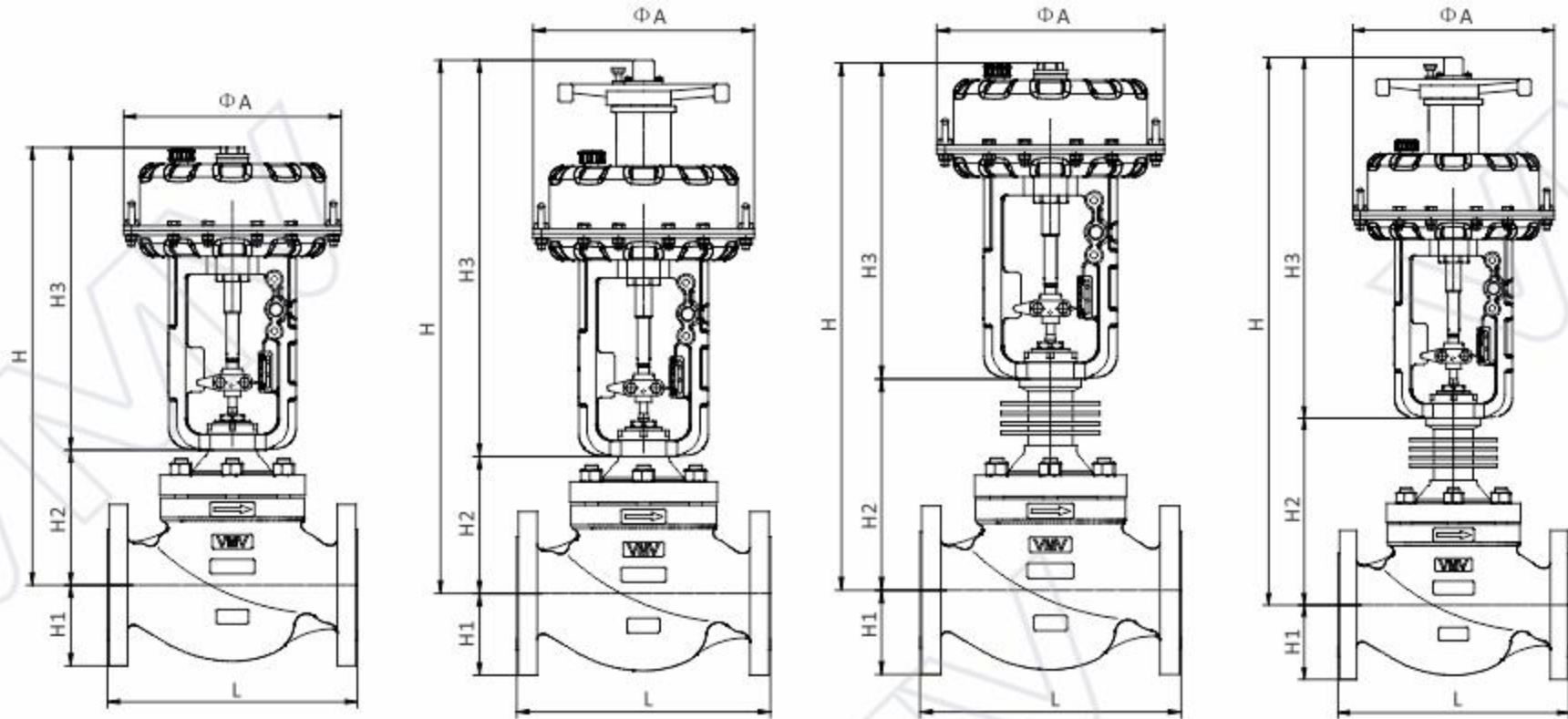
-	16	10	1.2	1.2	-	-
-	16	12	1.9	1.9	-	-
-	16	14	2.9	2.9	-	-
DN15	16	15	4.7	4.7	-	-
-	16	18	7.4	7.4	-	-
DN20	16	20	10	10	-	-
DN25	16	25	14	14	7	6
DN32	20	32	24	24	14	9
DN40	20	40	30	30	22	17
DN50	20	50	48	45	41	31
DN65	30	65	74	74	61	41
DN80	30	80	117	117	99	63
DN100	30	100	187	187	135	99
DN125	60	125	320	287	261	171
DN150	60	150	456	433	342	243
DN200	60	200	749	678	567	401
DN250	100	250	1100	950	842	639
DN300	100	300	1600	1400	1224	945
DN350	130	350	2100	1900	1607	1283
DN400	130	400	2800	2600	2142	1755

## 10. Maximum Closing Differential Pressure (MPa)

Nominal diameter	Actuator model	PN < 10MPa (metal seal level IV)			
		PTFE packing		Graphite packing	
		Unbalanced single seat structure	Balanced single seat structure	Unbalanced single seat structure	Balanced single seat structure
DN20	Mt1	4.3	-	1.9	-
DN25	MT1	3.6	-	1.6	-
DN32	MT1	1.9	6	0.9	2.2
DN40	MT1	1.3	6	0.7	2.2
DN50	MT1	0.8	6	0.4	2.2
DN65	MT2	1.2	8.7	1.1	5
DN80	MT2	0.8	8.7	0.7	6.5
DN100	MT2	0.5	6.8	0.4	5
DN125	MT3	0.7	10	0.2	9.2
DN150	MT3	0.5	9.8	-	7.7
DN200	MT3	-	6	-	4.6
DN250	MT4	-	7.2	-	5.6
DN300	Mt4	-	5.7	-	4.5

# V8000 SERIES CONTROL VALVE

## 11. Dimensions and Weight



### 11.1 Overall dimensions (mm)

Nominal diameter	Actuator model	L						H1	H2		H3		ΦA
		PN16	PN25	PN40	CLASS 150	CLASS 300	PN63 PN100 CLASS600		Standard type bonnet	Radiator fin type bonnet	Without handwheel	With handwheel	
DN15	MT1	130	130	130	-	-	-	75	130	285	300	450	180
DN20	MT1	150	150	150	184	194	206	75	130	285	300	450	180
DN25	MT1	160	160	160	184	197	210	75	130	285	300	450	180
DN32	MT1	180	180	180	180	222	251	90	140	290	300	450	180
DN40	MT1	200	200	200	222	235	251	90	140	290	300	450	180
DN50	MT1	230	230	230	254	267	286	105	180	330	300	450	180
DN65	MT2	290	290	290	276	292	311	115	196	346	398	651	270
DN80	MT2	310	310	310	298	318	337	120	196	346	398	651	270
DN100	MT2	350	350	350	352	368	394	145	221	371	398	651	270
DN125	MT3	400	400	400	403	425	457	189	260	460	610	950	400
DN150	MT3	480	480	480	451	473	508	189	260	460	610	950	400
DN200	MT3	600	600	568	600	568	610	239	292	492	610	950	400
DN250	MT4	730	730	708	730	708	752	305	357	607	1100	1700	620
DN300	MT4	850	850	775	850	775	819	335	394	644	1100	1700	620

### 11.2 Weight (kg)

Nominal Diameter	Actuator model	Weight			
		PN≤5MPa		PN≤10MPa	
		Without handwheel	With handwheel	Without handwheel	With handwheel
DN15	MT1	17	24	20	27
DN20	MT1	17	24	20	27
DN25	MT1	17	24	20	27
DN32	MT1	33	40	41	48
DN40	MT1	34	41	42	49
DN50	MT1	35	42	43	50
DN65	MT2	65	75	79	89
DN80	MT2	67	77	82	92
DN100	MT2	86	96	106	116
DN125	MT3	171	190	209	228
DN150	MT3	202	221	249	268
DN200	MT3	285	304	357	376
DN250	MT4	531	566	662	697
DN300	MT4	703	738	885	920

## 12. Valve Body Casting Material Comparison Table

ASTM	DIN	EN	JIS
A216 WCB	1.0619	GS-C25	G5151 SCPH2
A536 60-40-80	JS1049	GGG40	G5502 FCD400-15
A352 LCB	1.1131	G17Mn5	G5152 SCPL1
A217 WC6	1.7357	G17CrMo5-5	G5151 SCPH21
A217 WC9	1.7379	G17CrMo9-10	G5151 SCPH-32
A351 CF8	1.4308	GX5CrNi19-10	G5151 SCS13A
A351 CF3	1.4309	GX2CrNi19-11	G5151 SCS19A
A351 CF8M	1.4408	GX5CrNiMo19-11-2	G5151 SCS14A
A351 CF3M	1.4409	GX2CrNiMo19-11-2	G5151 SCS16A
A351 CF8C	1.4552	GX5CrNiNb19-11	G5151 SCS21

# V8000 SERIES CONTROL VALVE

## 13. Ordering information

Application type	Fluid regulation or on-off	
	Application	
	Pipe diameter	
	Pipe material	
Minimum ambient temperature on site over the years (°C)		
Fluid	Name	
	State (gas, liquid or vapor)	
	Density	
	Operating temperature	
Inlet pressure (Mpa)	Minimum value	
	Normal value	
	Maximum value	
Outlet pressure	Minimum value	
	Normal value	
	Maximum value	
Flow rate	Unit	
	Minimum value	
	Normal value	
	Maximum value	
Maximum closing differential pressure(MPa)		
Nominal diameter		
Nominal pressure		
Body and trim material		
Connection(RF/BW)		
Leakage level (IV, V or VI)		
Fault position(open,closed or hold)		

Equipped with pneumatic actuator	Positioner type (mechanical or intelligent)	
	Positioner explosion-proof grade	
	Positioner protection grade	
	HART protocol	
	Valve position transmitter	
	Handwheel mechanism	
Equipped with electric actuator	Other accessory requirements	
	Voltage (220V, 380V, or 24V)	
	Explosion-proof grade	
	Protection grade	
	HART protocol	
	Valve position transmitter	

# V9000 SERIES BELLOWS CONTROL VALVE



## V9000 SERIES BELLOWS CONTROL VALVE

### 1. Product Introduction

VMV V9000 series GLOBE straight-stroke bellows control valve is developed by Newton's professional R&D team. In view of the conventional control valve, packing is easy to wear, leak externally, poor adjustment regulating, bellows seal is not durable and other phenomena, VMV has collected much operational condition information and researched technically for the above phenomenon. Many tests have proved that the V9000 series can fully meet the users' needs, especially applied in the petrochemical industry and high requirements for fresh air and other special conditions.

### 2. Product advantage

- Long-term operation, maintenance-free to keep working
  - Zero leakage of valve stem during long operation cycles
  - Bellows' operational service life >500,000 times
  - High regulating precision
  - Fast response speed
  - Convenient and quick on-site valve maintenance
  - Wide temperature range(-196°C~588°C)
- VMV equipped with either pneumatic diaphragm actuator or electric actuator according to the user's on-site energy

### 3. Technical parameters

Nominal diameter	DN15(NPS1/2) ~ DN300
Pressure rating	PN16 ~ PN420、 Class150 ~ Class2500
Operating voltage (electric actuator)	220VAC, 380VAC, 24VDC
Air supply pressure (pneumatic actuator)	0.4 ~ 0.6MPa
Operating temperature	-45 ~ 588 °C
Packing	V-type combination packing(≤300°C) Graphite combination packing(>300°C)

### 4. Performance

Rated Cv value	See table below
Flow characteristic	Equal percentage, linear, quick opening
Regulating	50:1
Leakage level	IV (metal hard seal) V (metal hard seal) VI (soft seal)
Hysteresis	<1%
Dead zone	<0.8%
Allowable differential pressure	See table below

# V9000 SERIES BELLOWS CONTROL VALVE

## 5. Structure and Characteristics

### 5.1 Single-seat control valve

#### Bellows anti-rotation Structure

The keyway on the valve stem is matched with the pin of the bellows sleeve. Forcing the bellows to move along the axis to prevent damage and increase the service life of the bellows.

#### Bellows failure detection structure

A pressure gauge or pressure sensor can be connected to the detection port on the valve bonnet for real-time monitoring of bellows leakage.

#### Single bonnet structure

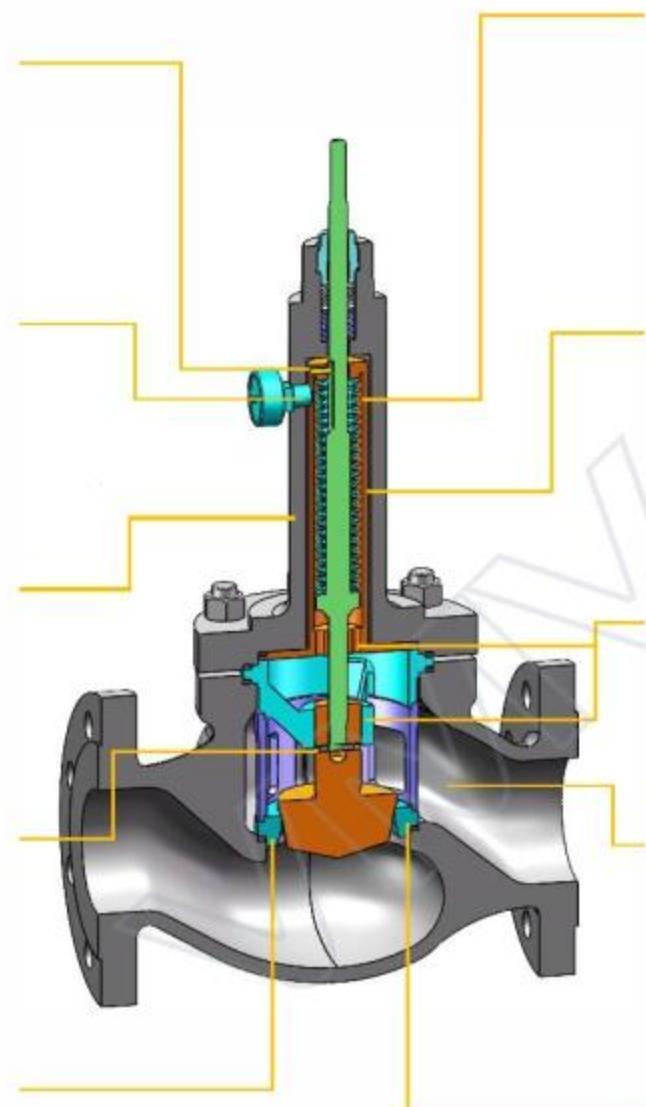
Lower external leakage risk.

#### Thread + Pin Connection Structure

The plug and stem are closely connected, and there is no relative moving gap. Effectively prevent stem fatigue and fracture caused by the relative swing of the plug and stem.

#### Sealing gasket quantitative compression structure

Prevent the gasket from being overly compressed to achieve durable sealing without leakage.



#### Bellows external pressure bearing structure

Provide stable pressure load for bellows, reduce movement and increase the maximum allowable stress, thus improving the bellows service life and valve operation accuracy.

#### Bellows structure with protective armor

Protects the bellows during handling, installation, and operation. Without bonnet parts, more convenient and fast to replace.

#### Double-guided valve plug structure

The valve core operates smoothly, not prone to vibration and sticking, ensuring higher regulating precision.

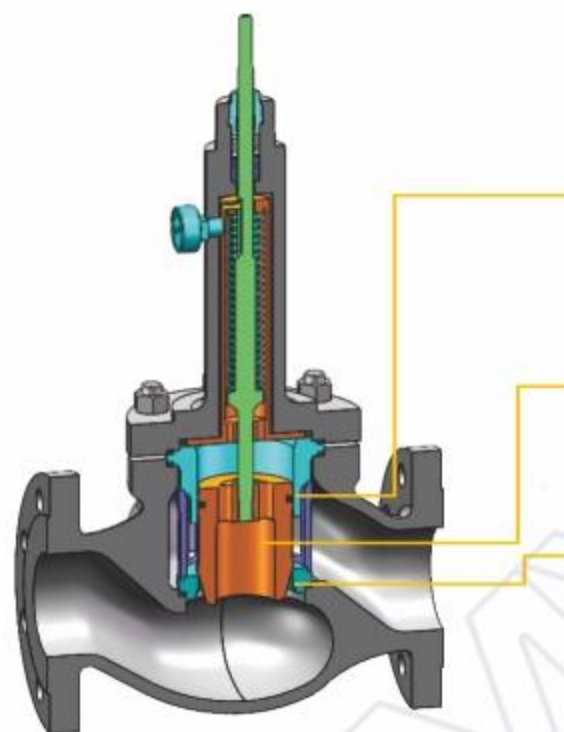
#### Bellows and flow channel separation structure

Prevent the medium from directly impacting the bellows, improve the service life of the bellows.

#### Up-pressure valve seat structure

By loosening the valve bonnet bolts, the internal components of the valve can be removed one by one, allowing for quick maintenance and replacement of the valve seat and internal components on-site, thus saving the user's maintenance time.

### 5.2 Balanced Single-Seat Bellows Control Valve



#### Wear-resistant piston ring seal structure

The wear-resistant piston ring still has self-lubricating at temperatures above 200°C, making the valve not easy to stretch and stick during the long period regulating process, maintaining a seal class above level IV.

#### Balanced single-seat structure

Low thrust overcomes the large pressure difference, has better performance of overcoming differential pressure.

#### Spherical valve plug structure

The throttling orifice is uniformly distributed on the surface of the valve core, allowing the medium to flow smoothly and stably, thus has higher regulating precision.

## 6. Common material and temperature range of V9000 Series

### 6.1 Common valve trim materials

Body	Seat	plug	Stem	Bellows	Packing
JS1249	420+HT	420+HT	410	304	PTFE
WCB	304+STL	304+STL	630	316	Flexible graphite
LCB	304	304	XM-19	HC276	
WC6	316L+STL	316L+STL	304	316Ti	
WC9	321+STL	321+STL	316L		
CF8	304+RPTFE	304+RPTFE	HC276		
CF3	316L+RPTFE	316L+RPTFE			
CF8M	F11+Q.STL	F11+Q.STL			
CF3M	HC276	HC276			
HC276					

### 6.2 Temperature and pressure corresponding range of valve body material(MPa)

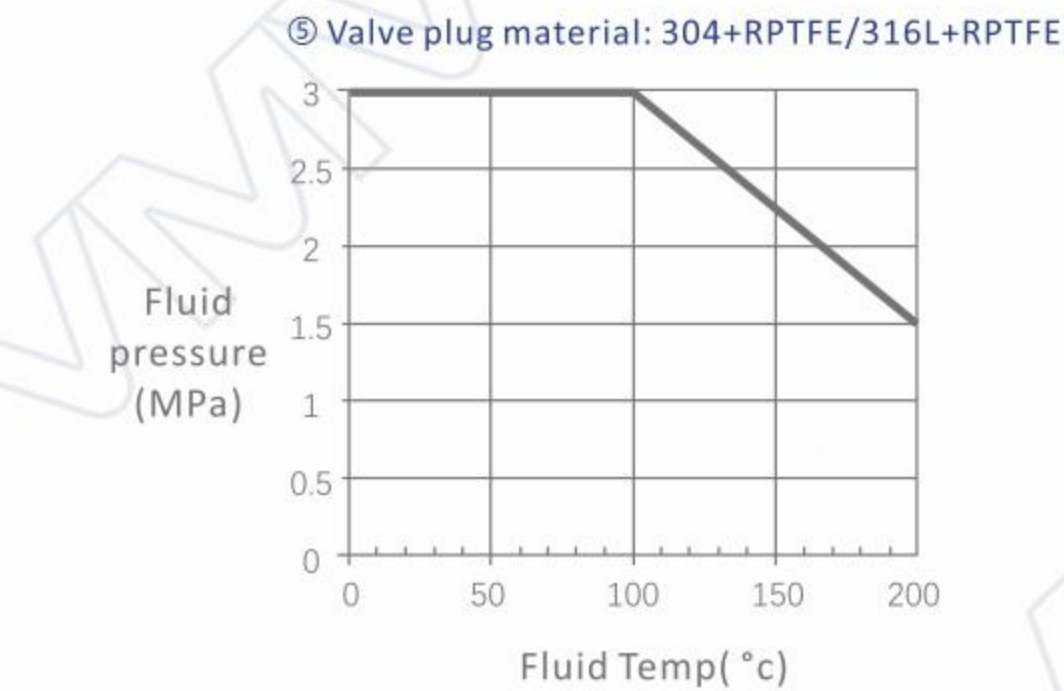
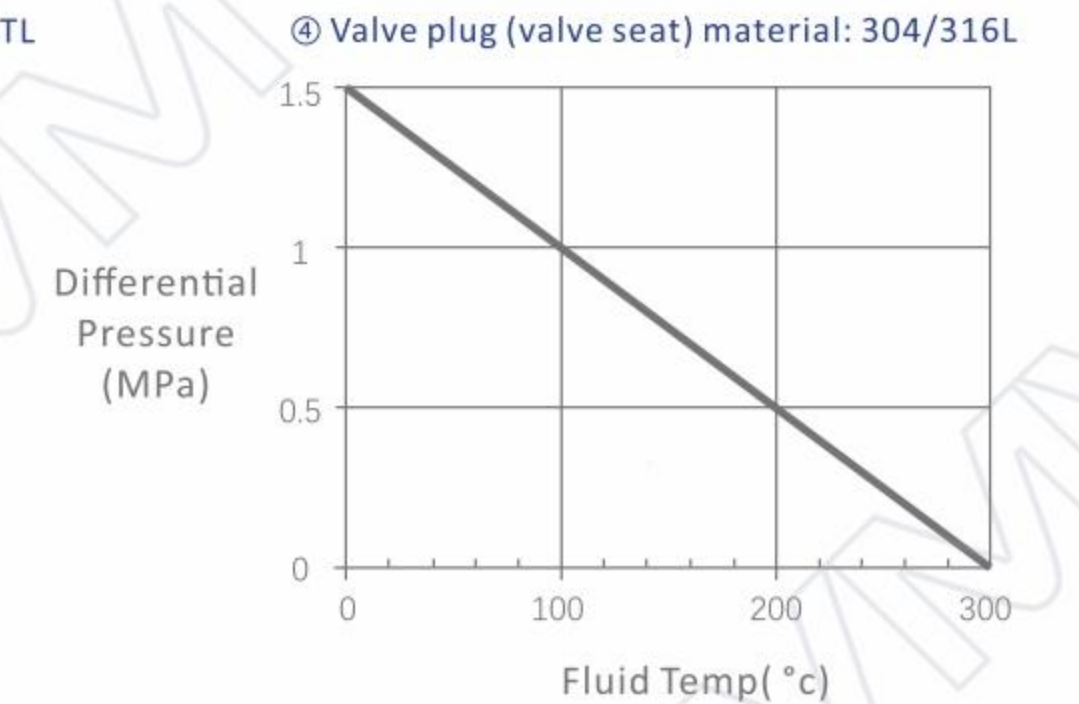
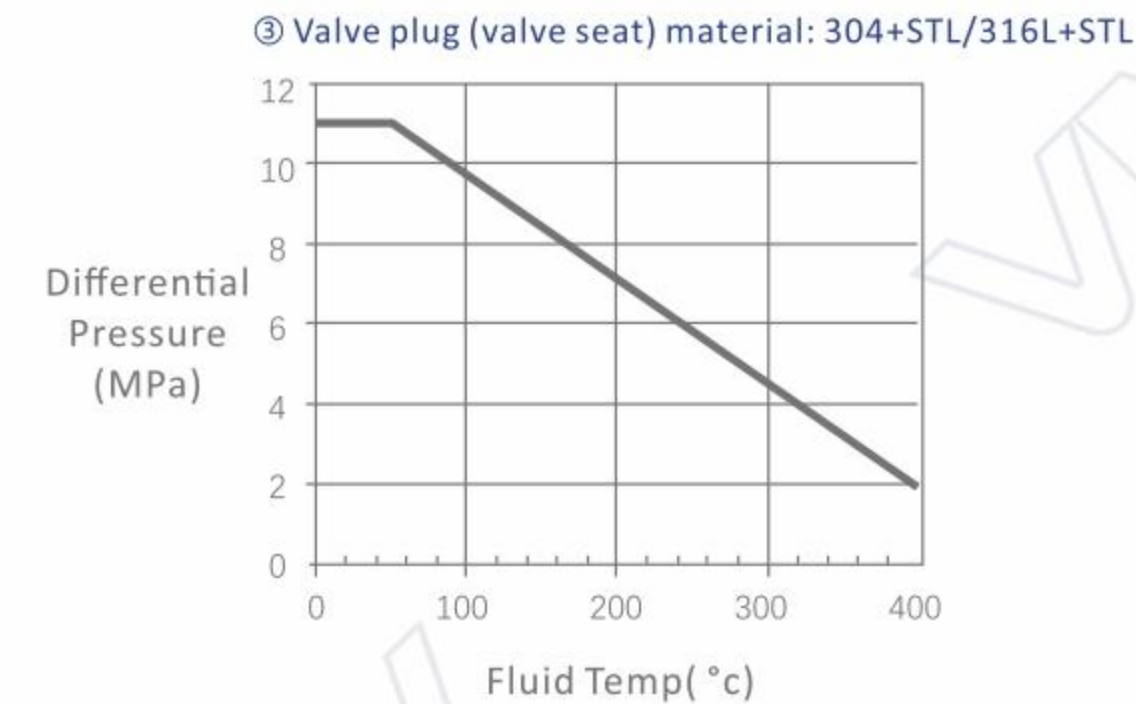
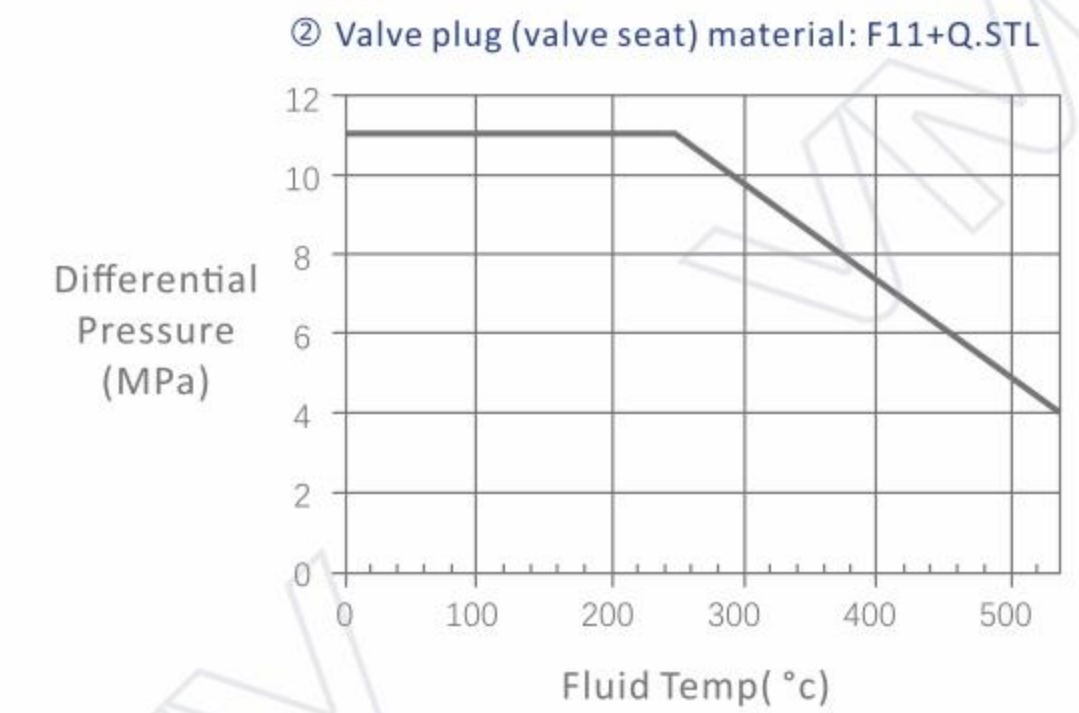
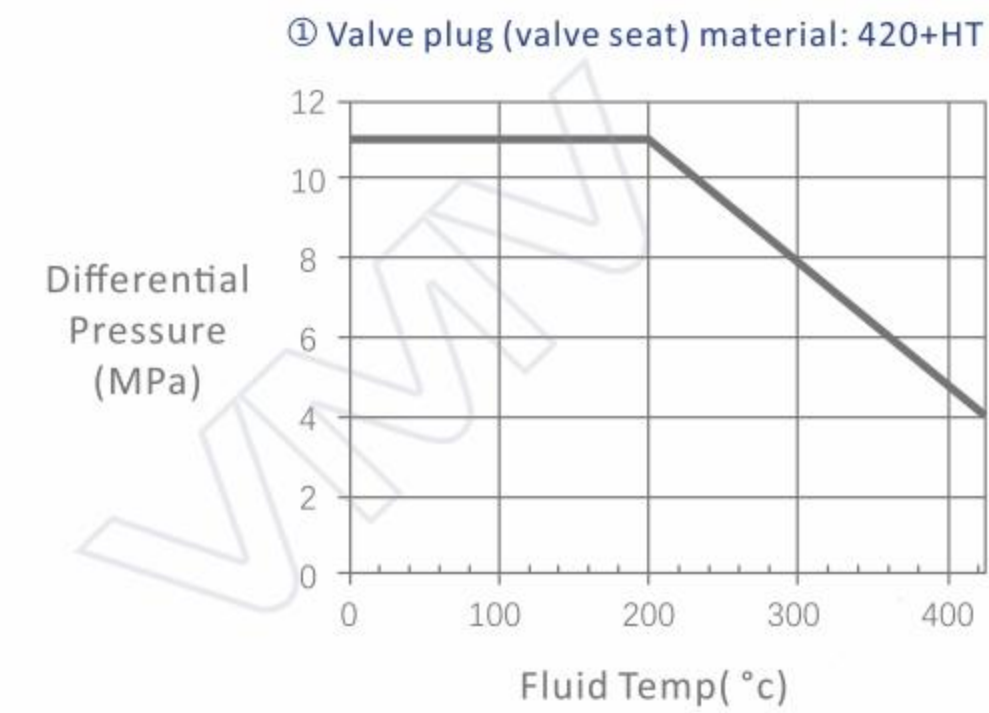
Temp°C	Class150					Class300					Class600				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.90	1.90	-	-	-	4.96	4.96	-	-	-	9.93	9.93
-29~38	1.96	1.98	1.98	1.90	1.90	5.11	5.17	5.17	4.96	4.96	10.21	10.34	10.34	9.93	9.93
50	1.92	1.95	1.95	1.83	1.84	5.01	5.17	5.17	4.78	4.81	10.2	10.34	10.34	9.56	9.62
100	1.77	1.77	1.77	1.57	1.62	4.66	5.15	5.15	4.09	4.22	9.32	10.3	10.3	8.17	8.44
150	1.58	1.58	1.58	1.42	1.48	4.51	4.97	5.03	3.7	3.85	9.02	9.95	10.03	7.4	7.7
200	1.38	1.38	1.38	1.32	1.37	4.38	4.80	4.86	3.45	3.57	8.76	9.59	9.72	6.9	7.13
250	1.21	1.21	1.21	1.21	1.21	4.19	4.63	4.63	3.25	3.34	8.39	9.27	9.27	6.5	6.68
300	1.02	1.02	1.02	1.02	1.02	3.98	4.29	4.29	3.09	3.16	7.96	8.57	8.57	6.18	6.32
325	0.93	0.93	0.93	0.93	0.93	3.87	4.14	4.14	3.02	3.09	7.74	8.26	8.26	6.04	6.18
350	0.84	0.84	0.84	0.84	0.84	3.76	4.03	4.03	2.96	3.03	7.51	8.04	8.04	5.93	6.07
375	0.74	0.74	0.74	0.74	0.74	3.64	3.89	3.89	2.9	2.99	7.27	7.76	7.76	5.81	5.98
400	0.65	0.65	0.65	0.65	0.65	3.47	3.65	3.65	2.84	2.94	6.94	7.33	7.33	5.69	5.89
425	0.55	0.55	0.55	0.55	0.55	2.88	3.52	3.52	2.8	2.91	5.75	7.00	7.00	5.6	5.83
450	-	0.46	0.46	0.46	0.46	-	3.37	3.37	2.74	2.88	-	6.77	6.77	5.48	5.77
475	-	0.37	0.37	0.37	0.37	-	3.17	3.17	2.69	2.87	-	6.34	6.34	5.39	5.73
500	-	0.28	0.28	0.28	0.28	-	2.57	2.82	2.65	2.82	-	5.15	5.65	5.3	5.65
538	-	0.14	0.14	0.14	0.14	-	1.49	1.84	2.44	2.52	-	2.98	3.69	4.89	5.00
550	-	-	-	-	-	-	1.27	1.56	-	-	-	2.54	3.13	-	-
575	-	-	-	-	-	-	0.88	1.05	-	-	-	1.76	2.11	-	-
600	-	-	-	-	-	-	0.61	0.69	-	-	-	1.22	1.38	-	-

# V9000 SERIES BELLOWS CONTROL VALVE

Temp°C	PN16					PN25					PN40				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.57	1.57	-	-	-	2.45	2.45	-	-	-	3.92	3.92
-29~38	1.61	1.63	1.63	1.57	1.57	2.52	2.55	2.55	2.45	2.45	4.03	4.08	4.08	3.92	3.92
50	1.58	1.63	1.63	1.51	1.52	2.47	2.55	2.55	2.36	2.37	3.95	4.08	4.08	3.78	3.8
100	1.46	1.63	1.63	1.29	1.33	2.29	2.54	2.54	2.02	2.08	3.66	4.06	4.07	3.23	3.33
150	1.43	1.57	1.58	1.17	1.22	2.23	2.45	2.48	1.83	1.90	3.57	3.93	3.96	2.93	3.04
200	1.38	1.51	1.54	1.09	1.13	2.16	2.37	2.41	1.70	1.76	3.46	3.79	3.85	2.72	2.82
250	1.32	1.46	1.46	1.03	1.05	2.06	2.28	2.29	1.60	1.65	3.29	3.64	3.66	2.56	2.63
300	1.22	1.35	1.35	0.97	1.00	1.91	2.11	2.11	1.51	1.56	3.06	3.38	3.38	2.42	2.50
350	1.17	1.27	1.27	0.93	0.96	1.82	1.98	1.98	1.46	1.5	2.90	3.18	3.18	2.33	2.40
375	1.15	1.23	1.23	0.92	0.94	1.80	1.91	1.91	1.44	1.47	2.88	3.06	3.06	2.30	2.36
400	1.09	1.15	1.15	0.90	0.93	1.70	1.80	1.80	1.41	1.45	2.72	2.89	2.89	2.26	2.32
425	0.91	1.11	1.11	0.88	0.92	1.42	1.73	1.73	1.37	1.44	2.27	2.77	2.77	2.20	2.30
450	-	1.07	1.07	0.86	0.91	-	1.67	1.67	1.35	1.42	-	2.67	2.67	2.16	2.28
475	-	1.00	1.00	0.85	0.91	-	1.56	1.56	1.33	1.41	-	2.50	2.50	2.13	2.26
500	-	0.80	0.88	0.84	0.86	-	1.24	1.37	1.31	1.35	-	1.99	2.19	2.09	2.16
525	-	0.57	0.68	0.76	0.80	-	0.90	1.07	1.19	1.25	-	1.43	1.71	1.90	2.00
550	-	0.40	0.49	0.69	0.76	-	0.63	0.76	1.07	1.18	-	1.00	1.21	1.72	1.89
575	-	0.28	0.33	0.63	-	-	0.43	0.52	0.99	-	-	0.69	0.83	1.58	-
600	-	0.19	0.22	0.53	-	-	0.30	0.31	0.83	-	-	0.48	0.51	1.32	-

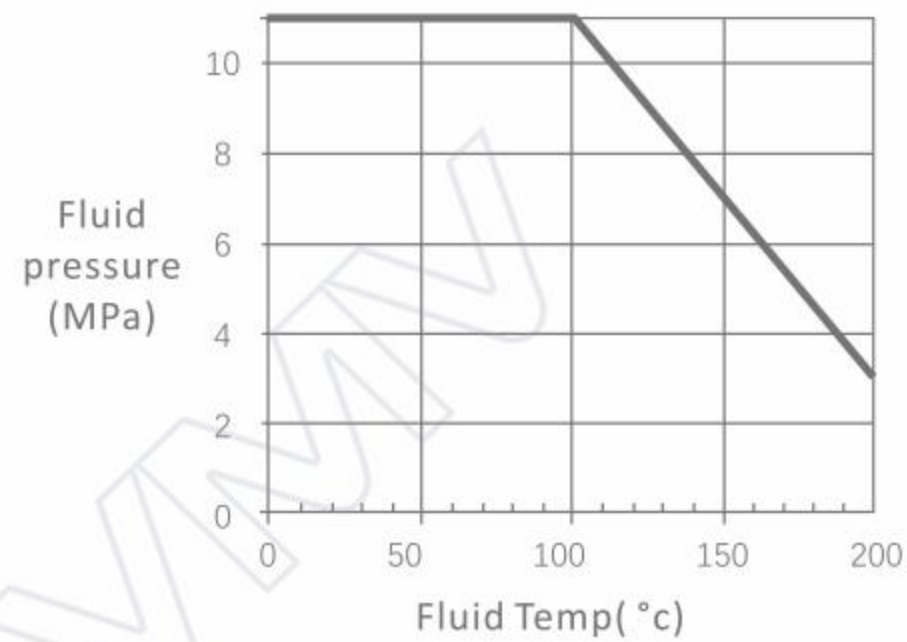
Temp°C	PN63					PN100				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	6.17	6.17	-	-	-	9.8	9.8
-29~38	6.35	6.43	6.43	6.17	6.17	10.08	10.21	10.21	9.8	9.8
50	6.22	6.43	6.43	5.95	5.98	9.88	10.21	10.21	9.44	9.5
100	5.77	6.4	6.41	5.08	5.25	9.15	10.16	10.17	8.07	8.33
150	5.62	6.19	6.24	4.62	4.79	8.92	9.82	9.9	7.34	7.6
200	5.45	5.96	6.06	4.29	4.43	8.65	9.47	9.63	6.81	7.04
250	5.19	5.74	5.76	4.04	4.15	8.23	9.11	9.14	6.41	6.59
300	4.81	5.33	5.33	3.81	3.93	7.64	8.46	8.16	6.05	6.24
350	4.59	5.00	5.00	3.67	3.79	7.29	7.94	7.94	5.83	6.01
375	4.53	4.82	4.82	3.63	3.72	7.2	7.66	7.66	5.76	5.90
400	4.29	4.55	4.55	3.56	3.66	6.81	7.22	7.22	5.64	5.81
425	3.57	4.36	4.36	3.46	3.62	5.67	6.92	6.92	5.50	5.75
450	-	4.20	4.20	3.40	3.59	-	6.67	6.67	5.40	5.69
475	-	3.94	3.94	3.35	3.56	-	6.25	6.25	5.32	5.66
500	-	3.14	3.46	3.29	3.40	-	4.98	5.49	5.23	5.40
525	-	2.26	2.69	2.99	3.14	-	3.58	4.28	4.75	4.99
550	-	1.58	1.91	2.70	2.97	-	2.51	3.03	4.29	4.72
575	-	1.09	1.31	2.50	-	-	1.74	2.08	3.96	-
600	-	0.75	0.86	2.08	-	-	1.19	1.36	3.31	-

### 6.3 The valve trim material corresponds to the temperature and pressure range

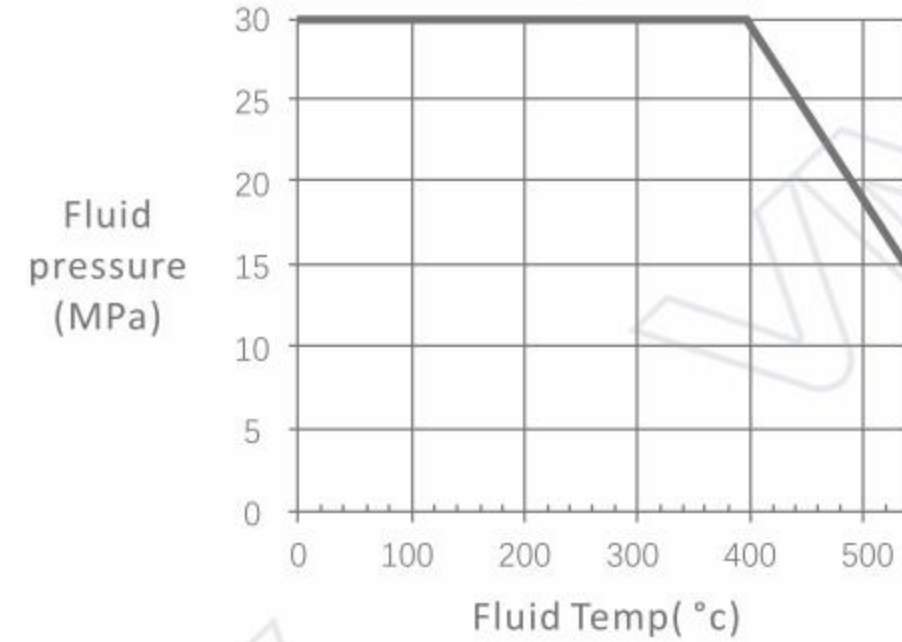


## V9000 SERIES BELLOWS CONTROL VALVE

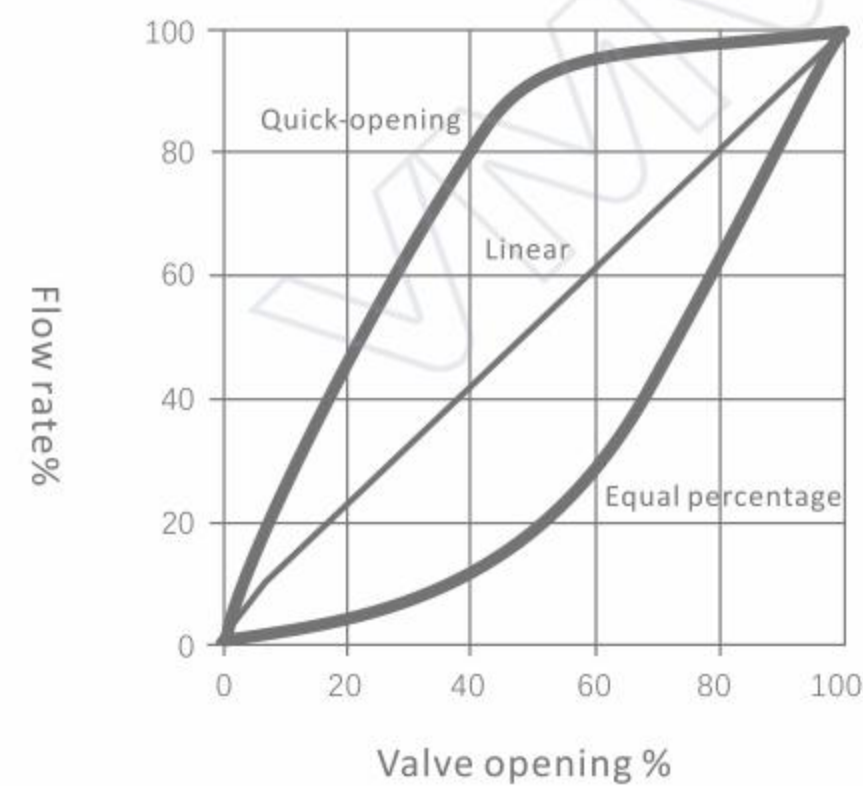
⑥ Packing material: PTFE



⑦ Packing material: graphite



### 7. Typical flow characteristic curve



### 8. Rated Cv and Travel

Nominal diameter	Travel	Valve seat diameter code	Rated CV	
			Linear	Equal percentage
-	16	6E	0.002	-
-	16	6D	0.005	-
-	16	6C	0.008	-
-	16	6B	0.01	-
-	16	6A	0.08	-
-	16	6	0.12	0.12

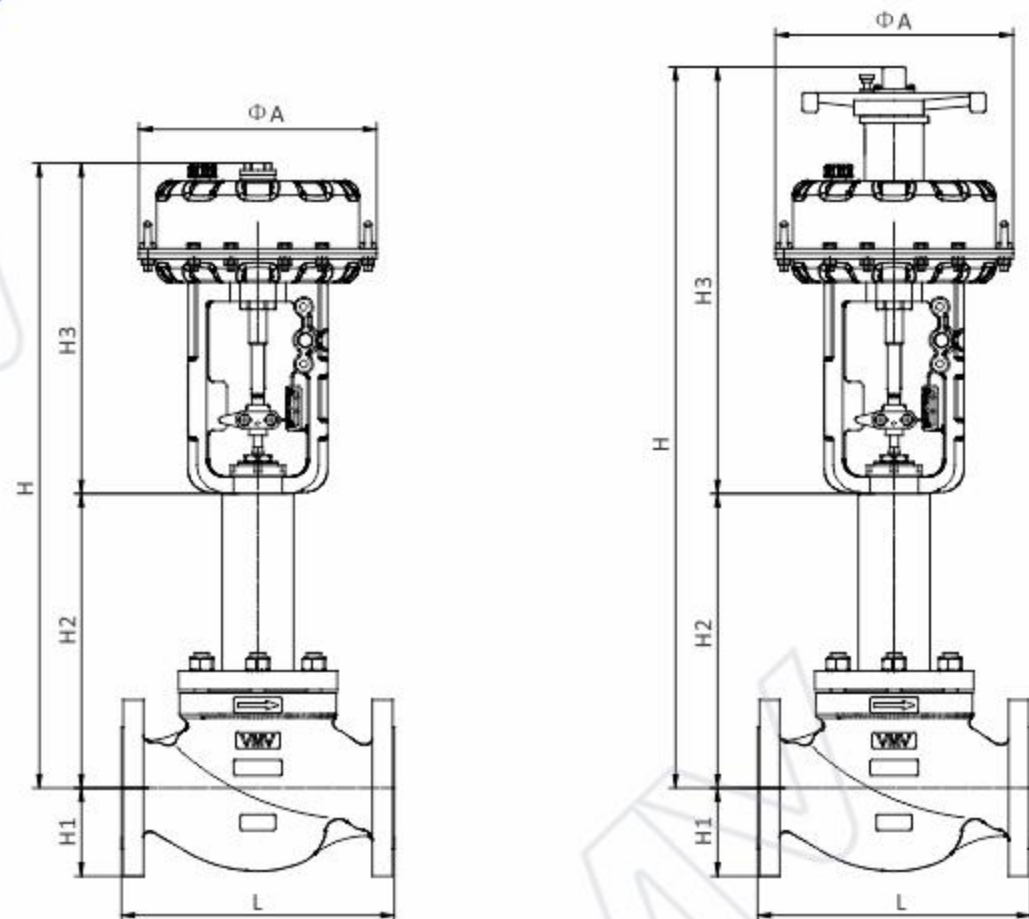
-	16	7	0.23	0.23
-	16	8	0.58	0.58
-	16	10	1.2	1.2
-	16	12	1.9	1.9
-	16	14	2.9	2.9
DN15	16	15	4.7	4.7
-	16	18	7.4	7.4
DN20	16	20	10	10
DN25	16	25	14	14
DN32	20	32	24	24
DN40	20	40	30	30
DN50	20	50	48	45
DN65	30	65	74	74
DN80	30	80	117	117
DN100	30	100	187	187
DN125	60	125	320	287
DN150	60	150	456	433
DN200	60	200	749	678
DN250	10	250	1100	950
DN300	10	300	1600	1400
DN350	130	350	2100	1900
DN400	130	400	2800	2600

### 9. Maximum Closing Differential Pressure (Mpa)

Nominal diameter	Actuator model	PN < 10MPa (metal seal level IV)			
		PTFE packing		Graphite packing	
		Unbalanced single seat structure	Balanced single seat structure	Unbalanced single seat structure	Balanced single seat structure
DN20	MT1	4.3	-	1.9	-
DN25	MT1	3.6	-	1.6	-
DN32	MT1	1.9	6	0.9	2.2
DN40	MT1	1.3	6	0.7	2.2
DN50	MT1	0.8	6	0.4	2.2
DN65	MT2	1.2	8.7	1.1	5
DN80	MT2	0.8	8.7	0.7	6.5
DN100	MT2	0.5	6.8	0.4	5
DN125	MT3	0.7	10	0.2	9.2
DN150	MT3	0.5	9.8	-	7.7
DN200	MT3	-	6	-	4.6
DN250	MT4	-	7.2	-	5.6
DN300	MT4	-	5.7	-	4.5

# V9000 SERIES BELLOWS CONTROL VALVE

## 10. Dimensions and Weight



### 10.1 Overall dimensions (mm)

Nominal diameter	Actuator model	L						H1	H2		H3		ΦA
		PN16	PN25	PN40	CLASS 150	CLASS 300	PN63 PN100 CLASS600		Standard type bonnet	Radiator fin type bonnet	Without handwheel	With handwheel	
DN15	MT1	130	130	130	-	-	-	75	310	425	300	450	180
DN20	MT1	150	150	150	184	194	206	75	310	425	300	450	180
DN25	MT1	160	160	160	184	197	210	75	310	425	300	450	180
DN32	MT1	180	180	180	180	222	251	90	335	455	300	450	180
DN40	MT1	200	200	200	222	235	251	90	335	455	300	450	180
DN50	MT1	230	230	230	254	267	286	105	375	495	300	450	180
DN65	MT2	290	290	290	276	292	311	115	454	654	398	651	270
DN80	MT2	310	310	310	298	318	337	120	454	654	398	651	270
DN100	MT2	350	350	350	352	368	394	145	479	689	398	651	270
DN125	MT3	400	400	400	403	425	457	189	780	1100	610	950	400
DN150	MT3	480	480	480	451	473	508	189	780	1100	610	950	400
DN200	MT3	600	600	568	600	568	610	239	801	1150	610	950	400
DN250	MT4	730	730	708	730	708	752	305	1129	1500	1100	1700	620
DN300	MT4	830	830	775	850	775	819	335	1294	1650	1100	1700	620

### 10.2 Weight (kg)

Nominal Diameter	Actuator model	Weight			
		PN≤5MPa		PN≤10MPa	
		Without handwheel	With handwheel	Without handwheel	With handwheel
DN15	MT1	17	24	20	27
DN20	MT1	17	24	20	27
DN25	MT1	17	24	20	27
DN32	MT1	33	40	41	48
DN40	MT1	34	41	42	49
DN50	MT1	35	42	43	50
DN65	MT2	65	75	79	89
DN80	MT2	67	77	82	92
DN100	MT2	86	96	106	116
DN125	MT3	171	190	209	228
DN150	MT3	202	221	249	268
DN200	MT3	285	304	357	376
DN250	MT4	531	566	662	697
DN300	MT4	703	738	885	920

## 11. Valve Body Casting Material Comparison Table

ASTM	DIN	EN	JIS
A216 WCB	1.0619	GS-C25	G5151 SCPH2
A536 60-40-80	JS1049	GGG40	G5502 FCD400-15
A352 LCB	1.1131	G17Mn5	G5152 SCPL1
A217 WC6	1.7357	G17CrMo5-5	G5151 SCPH21
A217 WC9	1.7379	G17CrMo9-10	G5151 SCPH-32
A351 CF8	1.4308	GX5CrNi19-10	G5151 SCS13A
A351 CF3	1.4309	GX2CrNi19-11	G5151 SCS19A
A351 CF8M	1.4408	GX5CrNiMo19-11-2	G5151 SCS14A
A351 CF3M	1.4409	GX2CrNiMo19-11-2	G5151 SCS16A
A351 CF8C	1.4552	GX5CrNiNb19-11	G5151 SCS21



# V9000 SERIES BELLOWS CONTROL VALVE

## 12. Ordering Information

Application Type	Fluid regulation or on-off	
	Application	
	Pipe diameter	
	Pipe material	
Minimum ambient temperature on site over the years (°C)		
Fluid	Name	
	State (gas, liquid or vapor)	
	Density	
	Operating temperature (°C)	
Inlet pressure (Mpa)	Minimum value	
	Normal value	
	Maximum value	
Outlet pressure	Minimum value	
	Normal value	
	Maximum value	
FLOW	Unit	
	Minimum value	
	Normal value	
	Maximum value	
Maximum closing differential pressure(MPa)		
Nominal diameter		
Nominal pressure		
Body and trim material		
Connection(RF/BW)		
Leakage level (IV, V or VI)		
Fault position(open,closed or hold)		

Equipped with pneumatic actuator	Positioner type (mechanical or intelligent)	
	Positioner explosion-proof grade	
	Positioner protection grade	
	HART protocol	
	Valve position transmitter	
	Handwheel mechanism	
Equipped with electric actuator	Other accessory requirements	
	Voltage (220V, 380V, or 24V)	
	Explosion-proof grade	
	Protection grade	
	HART protocol	
	Valve position transmitter	

# V6000 SERIES THREE-WAY CONTROL VALVE



## V6000 SERIES THREE-WAY CONTROL VALVE

### 1. Product Introduction

In the heating field, the three-way control valve is a common fluid control component that can replace two two-way control valves to regulate temperature and flow rate. These valves can be categorized as either combination flow and diversion type according to their functionality. Common issues with three-way control valves include difficulty in disassembling and replacing valve seats, packing wear and leakage, poor adjustment accuracy, stem breakage or detachment, and large leakage, which cannot meet operational requirements, lead to emergency in severe cases shutdowns, resulting in substantial losses for users.

Regarding above potential hazards, the Newton R&D team conducted in-depth users' sites and extensive information gathering regarding operational conditions, as well as technological breakthroughs and through extensive validated tests and experiments making the designs, manufacturing, and batch deliveries of the V6000 series three-way control valves fully meet users' requirements.

### 2. Product Advantages

The V6000 series control valves have the following features:

- High regulating precision with low leakage rates
- Long service life of the packing material
- Convenient and quick on-site valve maintenance
- Fast response speed
- Optional bellows seal to achieve zero external leakage
- Long-term operation, maintenance-free to keep working
- VMV equipped with either pneumatic diaphragm actuator or electric actuator according to the user's on-site energy

### 3. Technical Parameters

Nominal size	DN15(NPS1/2) ~ DN300
Pressure rating	PN16 ~ PN100、Class150 ~ Class600
Operating voltage (electric actuator)	220VAC, 380VAC, 24VDC
Air supply pressure (pneumatic actuator)	0.4 ~ 0.6MPa
Operating temperature	-17 ~ 350 °C
Bonnet type	Standard type (-17 ~ 300°C) Radiator fin type( > 300°C)
Packing	V-type combination packing(≤200°C) Graphite combination packing( > 200°C)

### 4. Performance

Rated Cv value	See table below
Flow characteristic	Equal percentage, linear, quick opening
Regulating ratio	50:1
Leakage level	Level IV (metal hard seal) Level V (metal hard seal) Level VI (soft seal)
Hysteresis	<1%
Dead zone	<0.6%
Allowable differential pressure	See table below

# V6000 SERIES THREE-WAY CONTROL VALVE

## 5. Structure and Characteristics

### 5.1 Three-way control valve

**Valve stem double-guided structure**  
Keeping the packing and valve stem coaxial at all times can prevent abnormal wear of the packing caused by eccentricity, greatly improving the service life of the packing.

**Spring-loaded packing gland structure**  
Provide a continuous and stable compressive force for the packing, allowing the packing to automatically compensate for wear during use, achieving long-term stable sealing.

**Up-pressure valve seat structure**  
By loosening the valve cover bolts, the internal components of the valve can be removed one by one, allowing for quick maintenance and replacement of the valve seats and internal components on-site, thus saving the user's maintenance time

**Valve plug double-guided structure**  
The valve plug operates smoothly, not prone to vibration and sticking, ensuring higher regulating precision.

**Sealing Gasket Quantitative Compression Structure**  
Prevent the gasket from being overly compressed to achieve durable sealing without leakage.

**Single seat sealing structure**  
Lower leakage and hard seling can meet level V and above leakage requirements for a long time

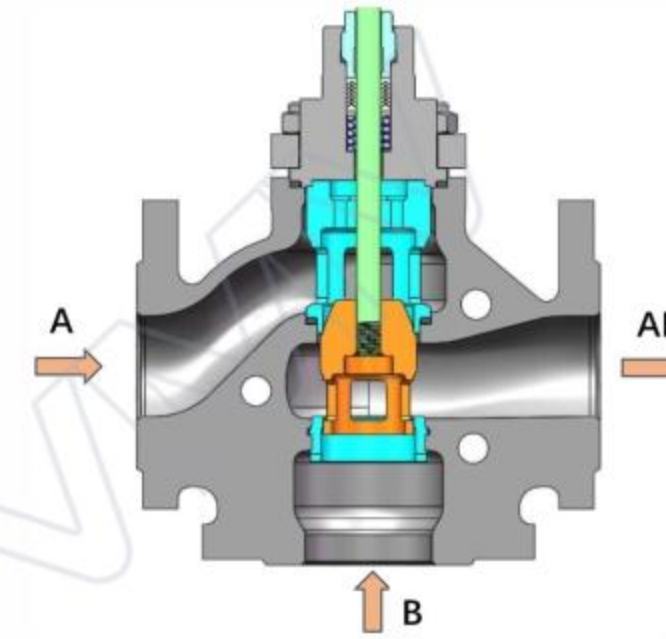
### 5.2 Three-way bellows control valve

**Bellows external pressure-bearing structure**  
Provides a stable pressure load for the bellows, reducing movement and improving both the bellows' lifespan and the valves' operational precision. Compared to an internal pressure-bearing structure, an external pressure-bearing structure increases the maximum allowable stress on the bellows, thereby enhancing its service life.

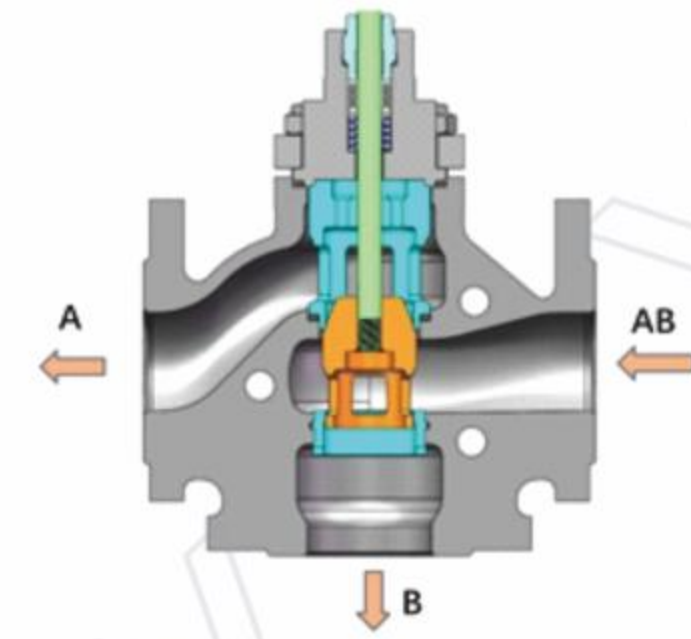
**Bellows and flow channel separation structure**  
Prevents the medium from directly impacting the bellows, thereby increasing the service life of the bellows.

## 6. Three-way Control Valve Flow Direction and Fault Location

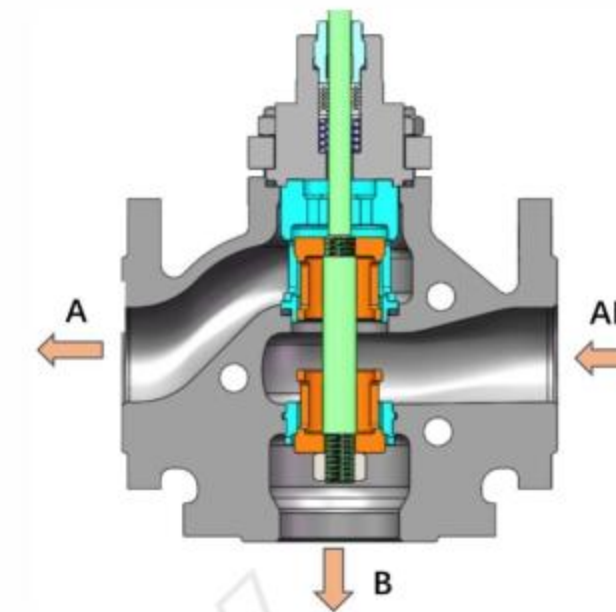
### 6.1 Three-way combined flow type



### 6.2 Three-way diversion type(DN≤65)



### 6.3 Three-way diversion type(DN > 65)



No	Type	Diameter range	Fault position		Actuator Acting type
			A-AB	B-AB	
1	Combined flow type	Unlimited	Close	Open	Direct action (D)
2			Open	Close	Reverse action (R)
3	Diversion	DN≤65	Close	Open	Direct action (D)
4			Open	Close	Reverse action (R)
5	Diversion	DN > 65	Close	Open	Direct action (D)
6			Open	Close	Reverse action (R)

## 7. Valve Body Main Parts Common Materials and Temperature Range

### 7.1 Common valve trim materials

Body	Seat	plug	Stem	Packing
WCB	420+HT	420+HT	410	PTEE
LCB	304+STL	304+STL	630	Flexible graphite
WC6	304	304	XM-19	
WC9	316L+STL	316L+STL	304	
CF8	321+STL	321+STL	316L	
CF3	304+RPTFE	304+RPTFE		
CF8M	316L+RPTFE	316L+RPTFE		
CF3M	F11+Q.STL	F11+Q.STL		

# V6000 SERIES THREE-WAY CONTROL VALVE

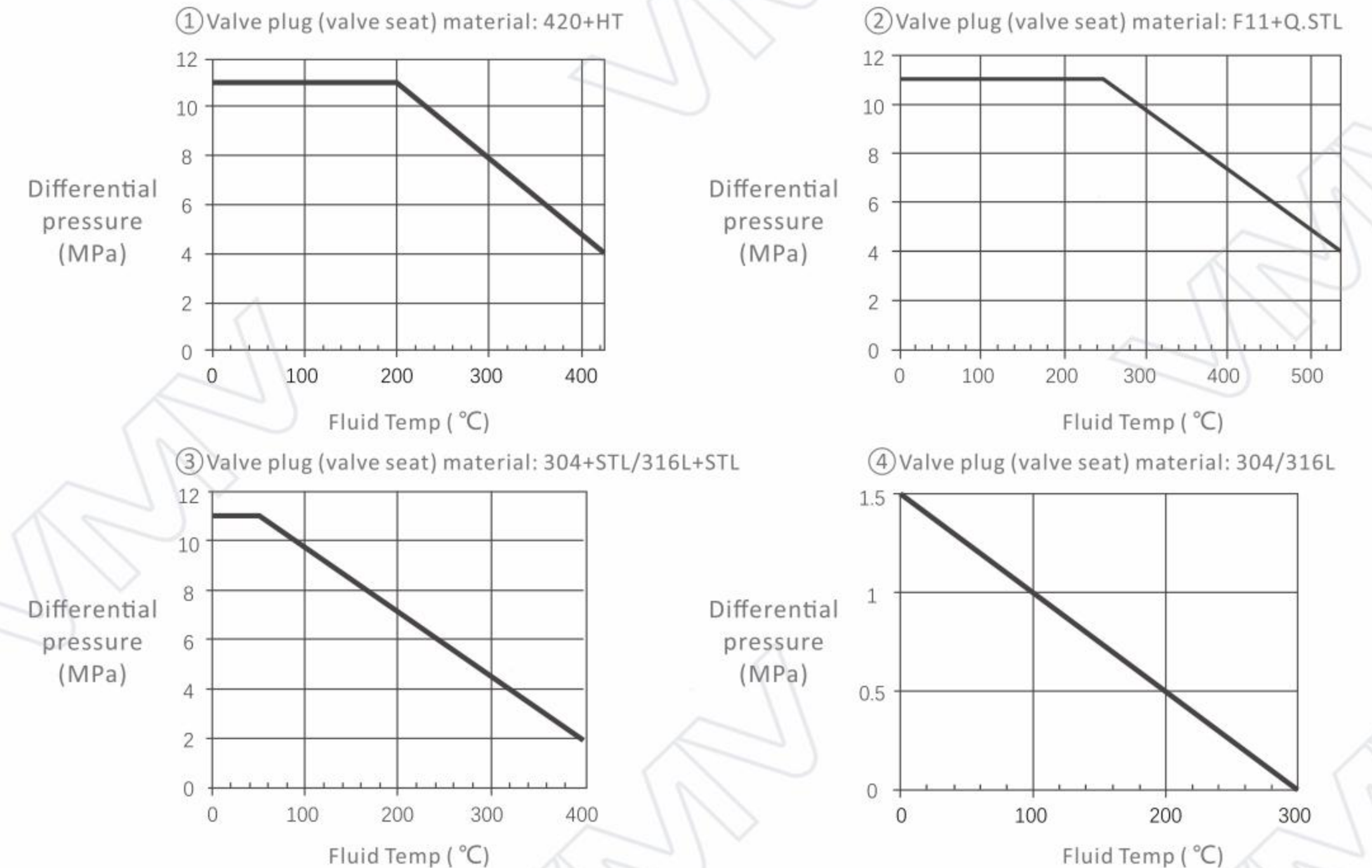
## 7.2 Temperature and pressure corresponding range of valve body material(MPa)

Temp°C	Class150					Class300					Class600				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.90	1.90	-	-	-	4.96	4.96	-	-	-	9.93	9.93
-29~38	1.96	1.98	1.98	1.90	1.90	5.11	5.17	5.17	4.96	4.96	10.21	10.34	10.34	9.93	9.93
50	1.92	1.95	1.95	1.83	1.84	5.01	5.17	5.17	4.81	4.81	10.02	10.34	10.34	9.56	9.62
100	1.77	1.77	1.77	1.57	1.62	4.66	5.15	5.15	4.22	4.22	9.32	10.3	10.3	8.17	8.44
150	1.58	1.58	1.58	1.42	1.48	4.51	4.97	5.03	3.85	3.85	9.02	9.95	10.03	7.4	7.7
200	1.38	1.38	1.38	1.32	1.37	4.38	4.80	4.86	3.57	3.57	8.76	9.59	9.72	6.9	7.13
250	1.21	1.21	1.21	1.21	1.21	4.19	4.63	4.63	3.34	3.34	8.39	9.27	9.27	6.5	6.68
300	1.02	1.02	1.02	1.02	1.02	3.98	4.29	4.29	3.16	3.16	7.96	8.57	8.57	6.18	6.32
325	0.93	0.93	0.93	0.93	0.93	3.87	4.14	4.14	3.09	3.09	7.74	8.26	8.26	6.04	6.18
350	0.84	0.84	0.84	0.84	0.84	3.76	4.03	4.03	3.03	3.03	7.51	8.04	8.04	5.93	6.07
375	0.74	0.74	0.74	0.74	0.74	3.64	3.89	3.89	2.99	2.99	7.27	7.76	7.76	5.81	5.98
400	0.65	0.65	0.65	0.65	0.65	3.47	3.65	3.65	2.94	2.94	6.94	7.33	7.33	5.69	5.89
425	0.55	0.55	0.55	0.55	0.55	2.88	3.52	3.52	2.91	2.91	5.75	7.00	7.00	5.6	5.83
450	-	0.46	0.46	0.46	0.46	-	3.37	3.37	2.88	2.88	-	6.77	6.77	5.48	5.77
475	-	0.37	0.37	0.37	0.37	-	3.17	3.17	2.87	2.87	-	6.34	6.34	5.39	5.73
500	-	0.28	0.28	0.28	0.28	-	2.57	2.82	2.82	2.82	-	5.15	5.65	5.3	5.65
538	-	0.14	0.14	0.14	0.14	-	1.49	1.84	2.52	2.52	-	2.98	3.69	4.89	5.00
550	-	-	-	-	-	-	1.27	1.56	-	-	-	2.54	3.13	-	-
575	-	-	-	-	-	-	0.88	1.05	-	-	-	1.76	2.11	-	-
600	-	-	-	-	-	-	0.61	0.69	-	-	-	1.22	1.38	-	-

Temp°C	PN16					PN25					PN40				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.57	1.57	-	-	-	2.45	2.45	-	-	-	3.92	3.92
-29~38	1.61	1.63	1.63	1.57	1.57	2.52	2.55	2.55	2.45	2.45	4.03	4.08	4.08	3.92	3.92
50	1.58	1.63	1.63	1.51	1.52	2.47	2.55	2.55	2.36	2.37	3.95	4.08	4.08	3.78	3.8
100	1.46	1.63	1.63	1.29	1.33	2.29	2.54	2.54	2.02	2.08	3.66	4.06	4.07	3.23	3.33
150	1.43	1.57	1.58	1.17	1.22	2.23	2.45	2.48	1.83	1.9	3.57	3.93	3.96	2.93	3.04
200	1.38	1.51	1.54	1.09	1.13	2.16	2.37	2.41	1.70	1.76	3.46	3.79	3.85	2.72	2.82
250	1.32	1.46	1.46	1.03	1.05	2.06	2.28	2.29	1.60	1.65	3.29	3.64	3.66	2.56	2.63
300	1.22	1.35	1.35	0.97	1.00	1.91	2.11	2.11	1.51	1.56	3.06	3.38	3.38	2.42	2.50
350	1.17	1.27	1.27	0.93	0.96	1.82	1.98	1.98	1.46	1.5	2.92	3.18	3.18	2.33	2.40
375	1.15	1.23	1.23	0.92	0.94	1.80	1.91	1.91	1.44	1.47	2.88	3.06	3.06	2.30	2.36
400	1.09	1.15	1.15	0.90	0.93	1.70	1.80	1.80	1.41	1.45	2.72	2.89	2.89	2.26	2.32
425	0.91	1.11	1.11	0.88	0.92	1.42	1.73	1.73	1.37	1.44	2.27	2.77	2.77	2.20	2.30
450	-	1.07	1.07	0.86	0.91	-	1.67	1.67	1.35	1.42	-	2.67	2.67	2.16	2.28
475	-	1.00	1.00	0.85	0.91	-	1.56	1.56	1.33	1.41	-	2.50	2.50	2.13	2.26
500	-	0.80	0.88	0.84	0.86	-	1.24	1.37	1.31	1.35	-	1.99	2.19	2.09	2.16
525	-	0.57	0.68	0.76	0.80	-	0.90	1.07	1.19	1.25	-	1.43	1.71	1.90	2.00
550	-	0.40	0.49	0.69	0.76	-	0.63	0.76	1.07	1.18	-	1.00	1.21	1.72	1.89
575	-	0.28	0.33	0.63	-	-	0.43	0.52	0.99	-	-	0.69	0.83	1.58	-
600	-	0.19	0.22	0.53	-	-	0.30	0.31	0.83	-	-	0.48	0.51	1.32	-

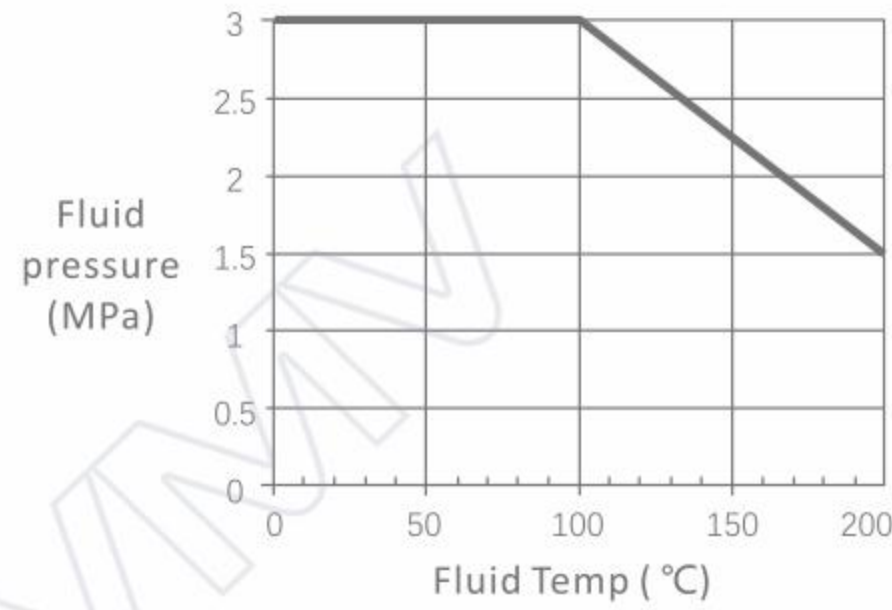
Temp°C	PN63					PN100				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	6.17	6.17	-	-	-	9.8	9.8
-29~38	6.35	6.43	6.43	6.17	6.17	10.08	10.21	10.21	9.8	9.8
50	6.22	6.43	6.43	5.95	5.98	9.88	10.21	10.21	9.44	9.5
100	5.77	6.4	6.41	5.08	5.25	9.15	10.16	10.17	8.07	8.33
150	5.62	6.19	6.24	4.62	4.79	8.92	9.82	9.9	7.34	7.6
200	5.45	5.96	6.06	4.29	4.43	8.65	9.47	9.63	6.81	7.04
250	5.19	5.74	5.74	4.04	4.15	8.23	9.11	9.14	6.41	6.59
300	4.81	5.33	5.33	3.81	3.93	7.64	8.46	8.16	6.05	6.24
350	4.59	5.00	5.00	3.67	3.79	7.29	7.94	7.94	5.83	6.01
375	4.53	4.82	4.82	3.63	3.72	7.20	7.66	7.66	5.76	5.90
400	4.29	4.55	4.55	3.56	3.66	6.81	7.22	7.22	5.64	5.81
425	3.57	4.36	4.36	3.46	3.62	5.67	6.92	6.92	5.50	5.75
450	-	4.20	4.20	3.40	3.59	-	6.67	6.67	5.40	5.69
475	-	3.94	3.94	3.35	3.56	-	6.25	6.25	5.32	5.66
500	-	3.14	3.46	3.29	3.40	-	4.98	5.49	5.23	5.40
525	-	2.26	2.69	2.99	3.14	-	3.58	4.28	4.75	4.99
550	-	1.58	1.91	2.70	2.97	-	2.51	3.03	4.29	4.72
575	-	1.09	1.31	2.50	-	-	1.74	2.08	3.96	-
600	-	0.75	0.86	2.08	-	-	1.19	1.36	3.31	-

## 7.3 The valve trim material corresponds to the temperature and pressure range

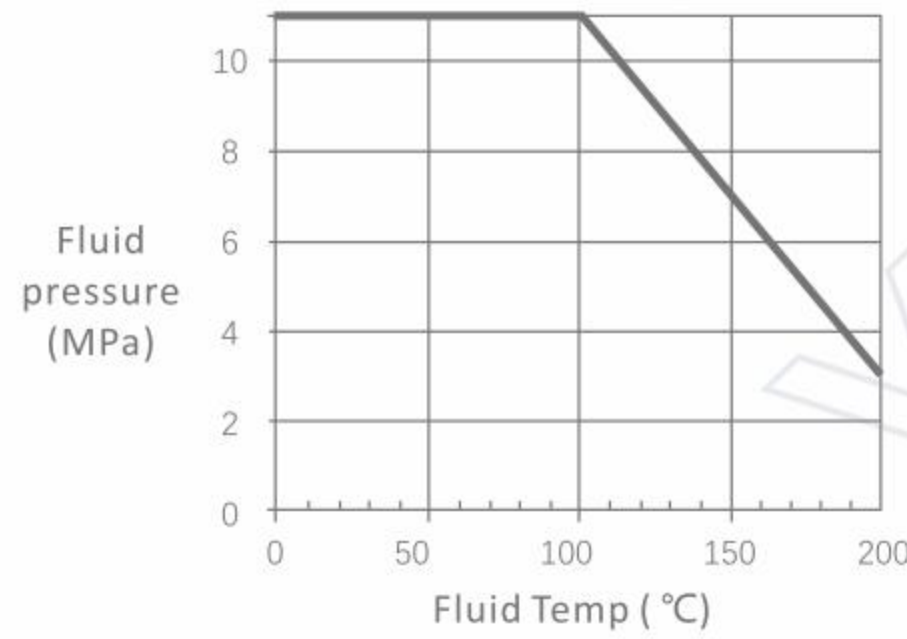


# V6000 SERIES THREE-WAY CONTROL VALVE

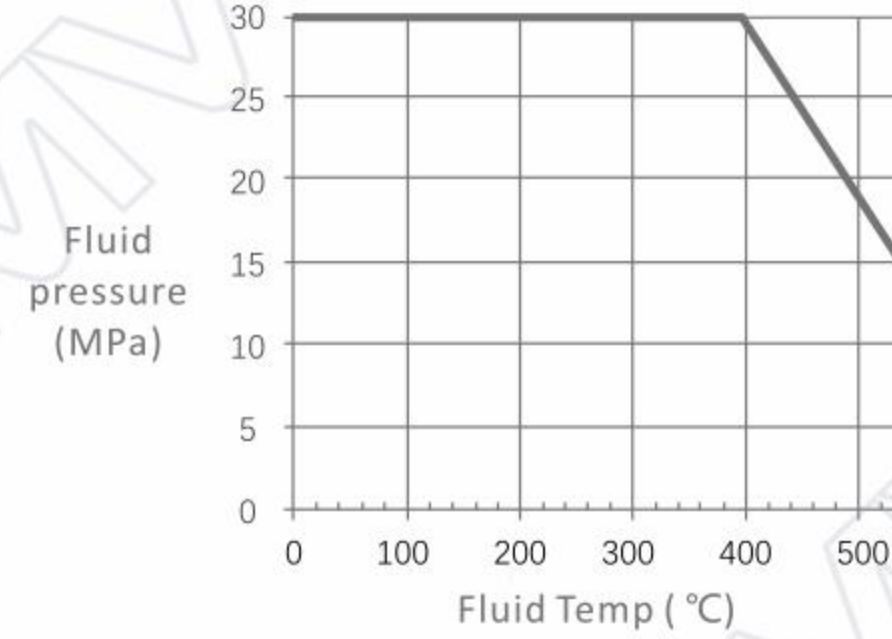
⑤ Valve plug material: .304+RPTFE/316L+RPTFE



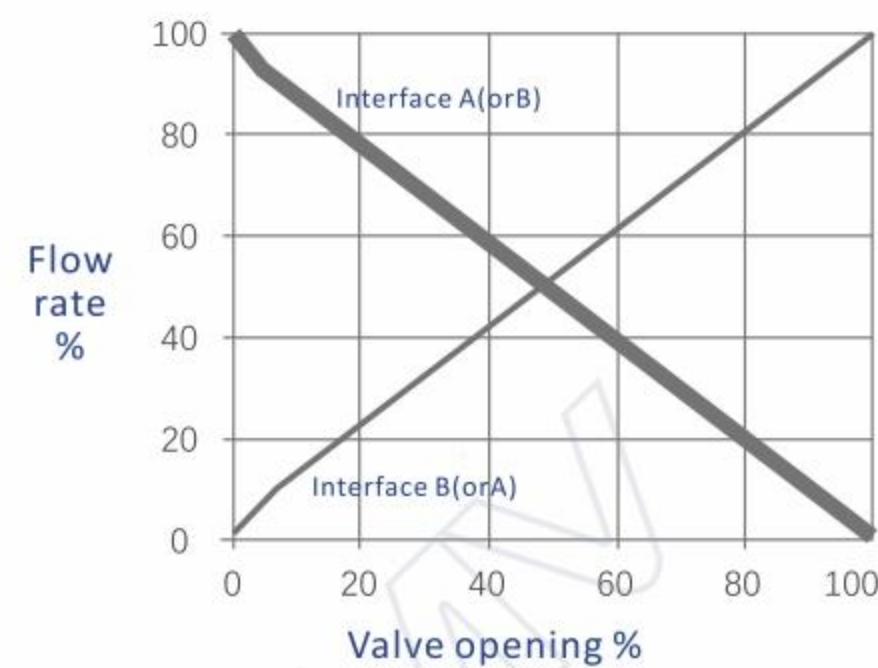
⑥ Packing material: PTFE



⑦ Packing material: graphite



## 8. Typical flow characteristic curve



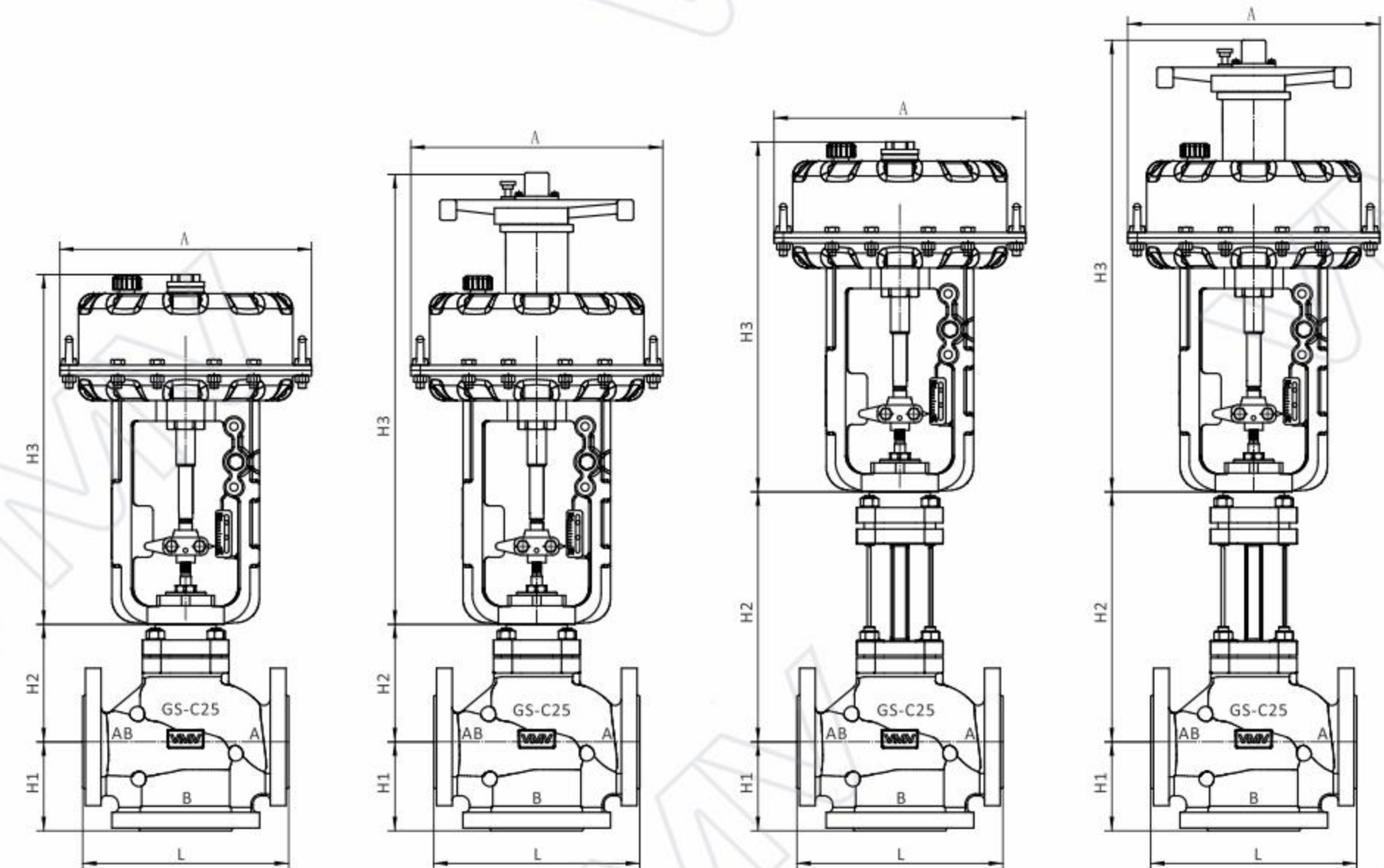
## 9. Rated cv and stroke

Nominal diameter	Stroke	Valve seat diameter code	Linear
DN15	16	15	4.7
DN20	16	18	7.4
DN25	16	25	11.7
DN32	20	32	19.8
DN40	20	40	29
DN50	20	50	42
DN65	30	65	74
DN80	30	80	117
DN100	30	100	151
DN125	60	125	226
DN150	60	150	360
DN200	60	200	522
DN250	100	250	750

## 10. Maximum closing differential pressure (MPa)

Nominal diameter	Actuator model	PTFE packing	Graphite packing
DN20	MT1	4.3	1.9
DN25	MT1	3.6	1.6
DN32	MT1	1.9	0.9
DN40	MT1	1.3	0.7
DN50	MT2	0.8	0.4
DN65	MT2	1.2	1.1
DN80	MT2	0.8	0.7
DN100	MT2	0.5	0.4
DN125	MT3	0.7	0.2
DN150	MT3	0.5	-

## 11. Dimensions and weight



# V6000 SERIES THREE-WAY CONTROL VALVE

## 11.1 Overall dimensions (mm)

Nominal diameter	L					H1	H2		H3		ΦA
	PN16	PN25	PN40	CLASS150	CLASS300		Standard type	Bellows type	Without Handwheel	With Handwheel	
DN15	130	130	130	130	194	65	115	240	300	450	180
DN20	150	150	150	150	194	70	115	240	300	450	180
DN25	160	160	160	160	197	75	115	240	300	450	180
DN32	180	180	180	180	222	80	140	300	300	450	180
DN40	200	200	200	200	235	90	140	300	300	450	180
DN50	230	230	230	230	267	100	180	300	300	450	180
DN65	290	290	290	290	292	120	210	410	398	651	270
DN80	310	310	310	310	318	130	210	410	398	651	270
DN100	350	350	350	350	368	150	221	421	398	651	270
DN125	400	400	400	400	425	200	260	623	610	890	400
DN150	480	480	480	480	473	210	260	633	610	890	400
DN200	600	600	600	600	568	275	330	712	610	890	400

## 11.2 Weight (kg)

Nominal diameter	Ordinary type		Bellows type	
	Without Handwheel	With Handwheel	Without Handwheel	With Handwheel
DN15	16	23	17	24
DN20	16	23	17	24
DN25	16	23	17	24
DN32	31	38	33	40
DN40	32	39	34	41
DN50	33	40	35	42
DN65	60	70	65	75
DN80	60	70	67	77
DN100	80	90	86	96
DN125	164	183	171	190
DN150	191	210	202	221
DN200	264	283	285	304

## 12. Valve Body Casting Material Comparison Table

ASTM	DIN	EN	JIS
A216 WCB	1.0619	GS-C25	G5151 SCPH2
A536 60-40-80	Js1049	GGG40	G5502 FCD400-15
A352 LCB	1.1131	G17Mn5	G5152 SCPL1
A217 WC6	1.7357	G17CrMo5-5	G5151 SCPH21
A217 WC9	1.7379	G17CrMo9-10	G5151 SCPH-32
A351 CF8	1.4308	GX5CrNi19-10	G5151 SCS13A
A351 CF3	1.4309	GX2CrNi19-11	G5151 SCS19A
A351 CF8M	1.4408	GX5CrNiMo19-11-2	G5151 SCS14A
A351 CF3M	1.4409	GX2CrNiMo19-11-2	G5151 SCS16A
A351 CF8C	1.4552	GX5CrNiNb19-11	G5151 SCS21

## 13. Ordering Information

Application Type	Fluid regulation or on-off	
	Application	
	Pipe diameter	
	Pipe material	
	Minimum ambient temperature on site over the the years (°C)	
Fluid	Name	
	State (gas, liquid or vapor)	
	Density	
Import pressure (MPa)	Operating temperature (°C)	
	Minimum value	
	Normal value	
Outlet pressure (Mpa)	Maximum value	
	Minimum value	
	Normal value	
	Maximum value	

## V6000 SERIES THREE-WAY CONTROL VALVE

Flow	Unit	
	Minimum value	
	Normal value	
	Maximum value	
Maximum closing differential pressure(MPa)		
Nominal diameter		
Nominal pressure		
Body and trim material		
Connection(RF/BW)		
Tee type(diversion, combined flow)		
Leakage level (IV, V or VI)		
Fault position(open,closed or hold)		
Equipped with pneumatic actuator	Positioner type (mechanical or intelligent)	
	Positioner explosion-proof grade	
	Positioner protection grade	
	HART protocol	
	Valve position transmitter	
	Handwheel mechanism	
	Other accessory requirements	
Equipped with electric actuator	Voltage (220V, 380V, or 24V)	
	Explosion-proof grade	
	Protection grade	
	HART protocol	
	Valve position transmitter	

## MT SERIES PNEUMATIC DIAPHRAGM ACTUATOR



# MT SERIES PNEUMATIC DIAPHRAGM ACTUATOR

## 1. Product Introduction

The MT series pneumatic diaphragm actuator is designed with a single-spring or multi-spring structure, providing an axial output thrust. It is compact in structure, light in weight, small in size, performs highly, has a long service life, and delivers a significant output thrust. It is used in conjunction with GLOBE control valves, globe valves, and other straight-stroke valves, facilitating a tight and easy valve closure.

Working principle: The electrical signal from the control instrument, after being converted into air pressure by the positioner or solenoid valve, is input into the diaphragm chamber. This pressure acts on the diaphragm to generate thrust, causing the output shaft to move.

MT actuator has excellent versatility and interchangeability. In the field, the action mode can easily be reversed by simply flipping the upper and lower diaphragm chambers. Its unique design, which requires no external air supply tubing, means air is supplied to the positioner and actuator through holes in the mounting bracket, eliminating the need for external tubing. Compared to traditional designs, this arrangement is more reliable and requires less space for control valves assembly. This method ensures a safe air supply to the actuator and significantly simplifies the assembly process of the positioner.

## 2. Specifications and Technical Data

Model specifications	MT1, MT2, MT3, MT4
Action type	Direct action (D): The air pressure increases and the output shaft drops. Reverse action (R): The air pressure increases and the output shaft rises.
Output force	See table below
Stroke	See table below
Air supply pressure	0.4~0.6MPa
Applicable media	Compressed air, nitrogen
Ambient temperature	Standard type: -20~70°C Low temperature type: -40~70°C
Optional accessories	Handwheel mechanism, positioner, air filter pressure reducing valve, solenoid valve, limit switch, etc.
Performance	Hysteresis: < 1%FS Linearity: < ±1%FS

## 3. Structure and Characteristics

### 3.1 MT1 actuator

**Anti-loosening nut structure**  
Prevent the push rod from loosening, and improve the stability of the connection

**Single spring structure**  
Compact structure, occupies small space, large output force.

**Ultra-high fatigue strength diaphragm material**  
Service life >200,000 cycles, ensuring long-term maintenance-free operation for customers.

**Ultra-long self-lubricating bearing guided structure**  
Smooth operation, without random movement, low friction and high operational precision

**Gating nut connection structure**  
Tightly connected without gaps, easy to disassemble, high regulating precision and stability.

**dust-proof sealing ring structure**  
Double sealing, long-lasting seal without external leakage

### 3.2 MT2 and MT3 actuators

**Anti-loosening nut structure**  
Prevents the push rod from loosening, enhancing connection stability

**Ultra-high fatigue strength diaphragm material**  
Operational life of over 200,000 cycles, ensuring long maintenance-free periods for customers.

**Embossed diaphragm cover structure**  
Enhances the pressure resistance of the diaphragm cover, and increases the output thrust of the actuator.

**Ultra-long self-lubricating bearing guide structure**  
Operates smoothly without creep, low friction, and high action type precision.

**Dustproof sealing ring structure**  
Double sealing, long-lasting and leak-proof.

**External threaded connection structure**  
Enables quick interchangeability between direct and reverse action, improving the efficiency of on-site changeovers of operational modes for users.

**Opening and closing nut connection structure**  
Closely connected with no gaps, easy to disassemble, high adjustment precision, and high stability.

**Built-in air intake hole structure**  
No external air source tubing required, reduces the space needed for positioner installation, and decreases the number of potential leak points, regulating more stable.

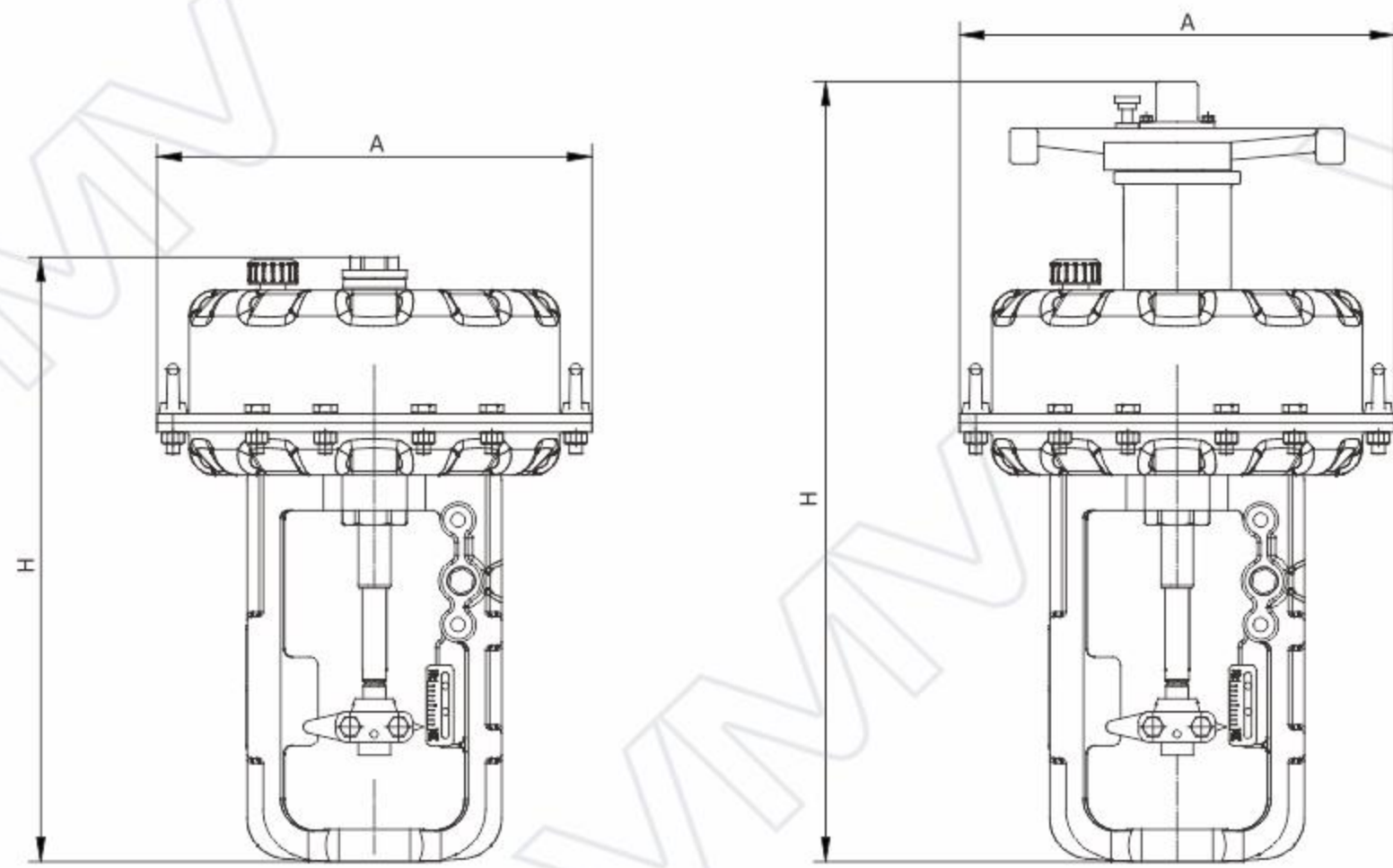
## 4. Output force of actuator

Model	Effective area of the diaphragm cm <sup>2</sup>	Stroke(mm)	Output force (N)	Weight	
				Without Hand wheel	With Hand wheel
MT1R	100	20	2000	8	15
MT1D	100	20	2000	8	15
MT2R	320	30	4800	18	28
MT2D	320	30	8000	18	28
MT3R	720	60	8500	46	65
MT3D	720	60	18000	46	65
MT4R	1500	100	13000	95	130
MT4D	1500	100	19500	95	130



# MT SERIES PNEUMATIC DIAPHRAGM ACTUATOR

## 5. Overall Dimensions



Model	A	H	
		Without handwheel	With Handwheel
MT1R	180	300	450
MT1D	180	300	450
MT2R	270	398	651
MT2D	270	398	651
MT3R	400	610	950
MT3D	400	610	950
MT4R	620	1100	1700
MT4D	620	1100	1700

## 6. Model selection

No	Item	Code	Detailed explanation of code	Sizing case
1	Series	MT	Pneumatic diaphragm actuator	MT
2	Model	1	Effective area of diaphragm: 100cm <sup>2</sup>	2
		2	Effective area of diaphragm: 320cm <sup>2</sup>	
		3	Effective area of diaphragm: 720cm <sup>2</sup>	
		4	Effective area of diaphragm: 1500cm <sup>2</sup>	
3	Action type	R	Reverse action	R
		D	Direct action	
4	-	-	-	-
5	Temperature code	None	Standard type -29~70 (°C)	L
		L	Low temperature type -40~70 (°C)	
6	+	+	+	+
7	Handwheel code	None	Without hand wheel	S
		S	With top handwheel	



**ZHEJIANG NEWTON FLUID CONTROL CO.,LTD.**

**Headquarters (Wenzhou)**

Zhiyi road,Lingxia industrial zone,Wuniu,Wenzhou,  
Zhejiang, China.  
Tel: 86-577-67978269  
Fax:86-577-67376711  
E-mail: vmv@vmv-valve.com

**Shanghai R&D Center**

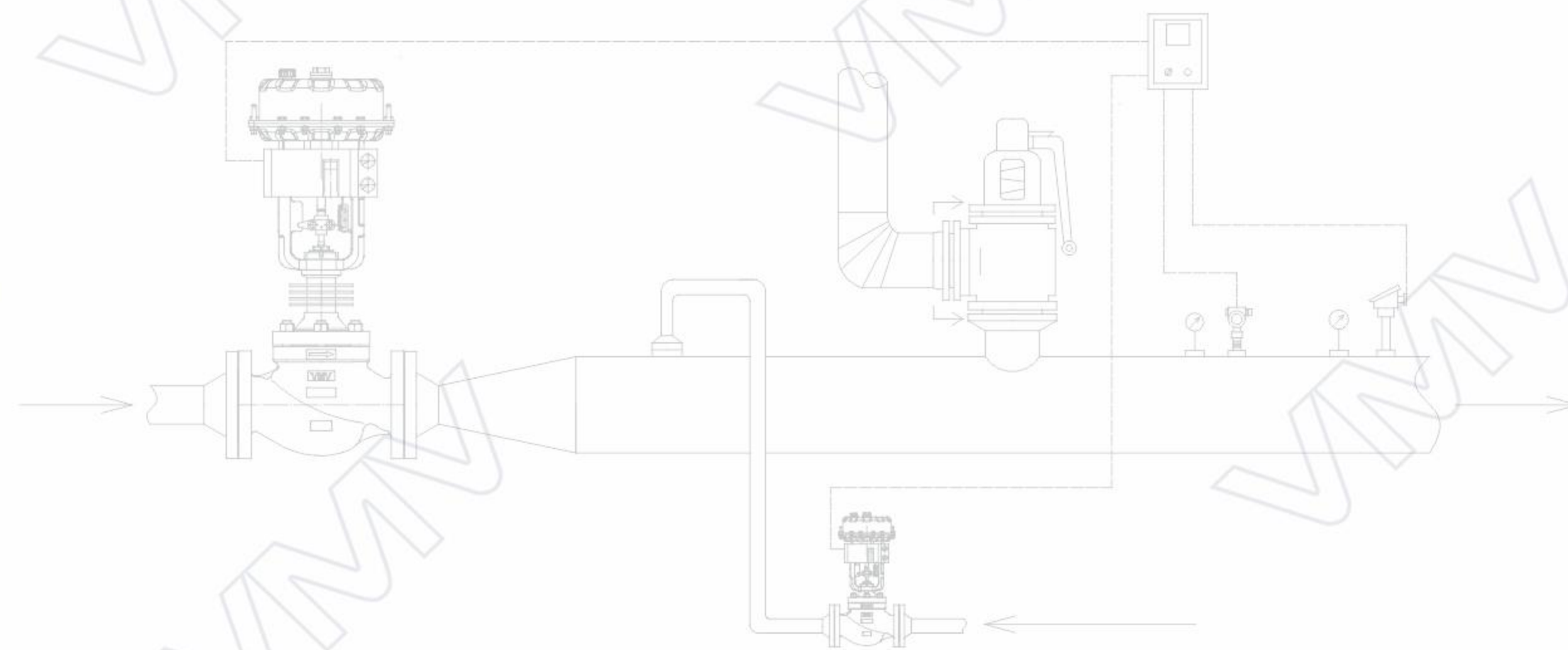
Jiading District, Shanghai  
Building 12A, No. 1818 Chengbei Road  
Tel: 86-18057752663  
E-mail: vmv8@vmv-valve.com

CE ISO TS EAC DNV  
www.vmvvalve.com

www.vmvvalve.com



2024 © Version and technical interpretation rights belong to Newton. Counterfeiting must be investigated!



**CONTROL VALVES SERIES**

- V8000 Series Control Valve
- V9000 Series Bellows Control Valve
- V6000 Series Three-way Control Valve
- MT Series Pneumatic Diaphragm Actuator

