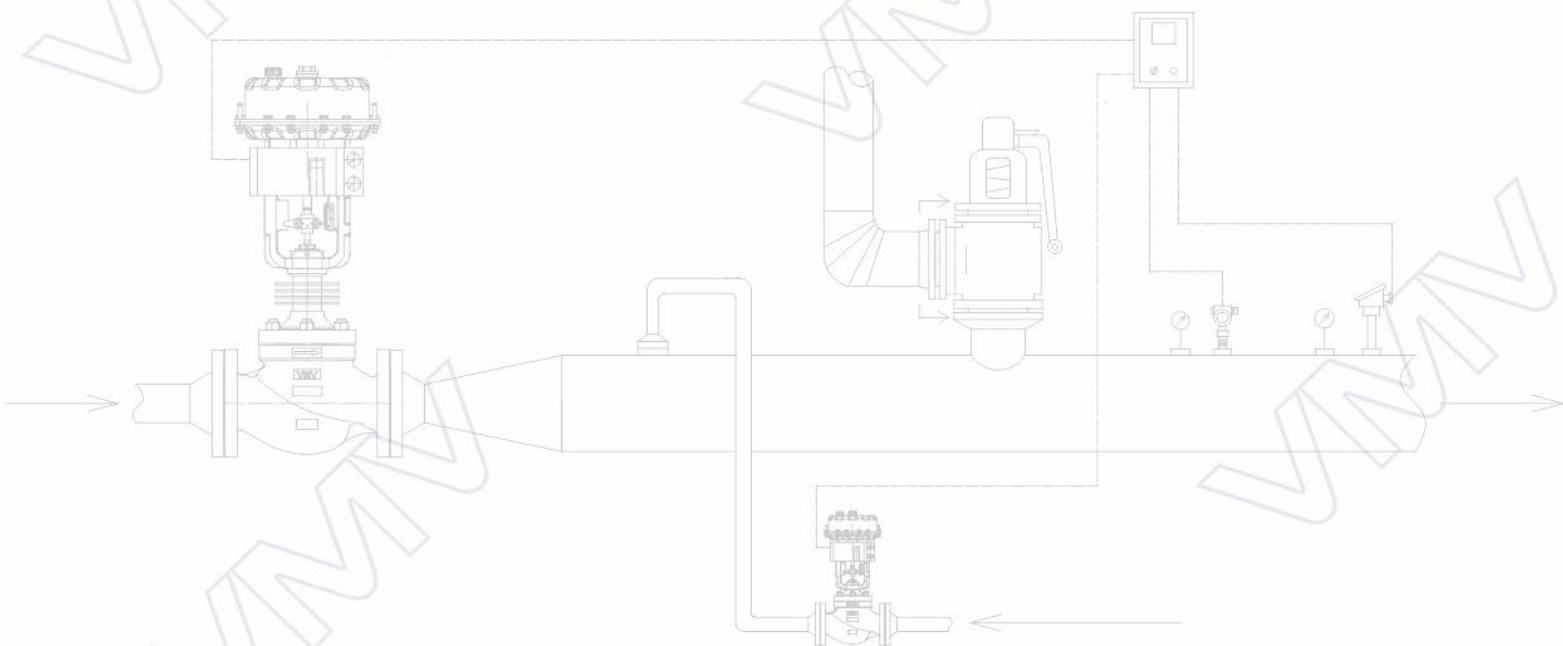




CONTROL VALVES SERIES

V6000 Series Three-way Control Valve



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

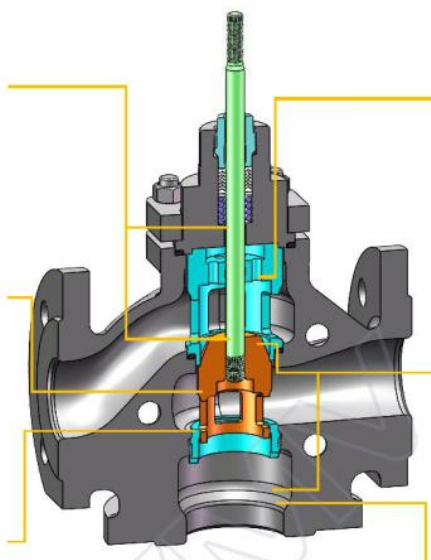
Keeping the packing and valve stem coaxial at all times can prevent abnormal wear of the packing caused by eccentricity, greatly improving the service life of the packing.

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

Sealing Gasket Quantitative Compression Structure

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

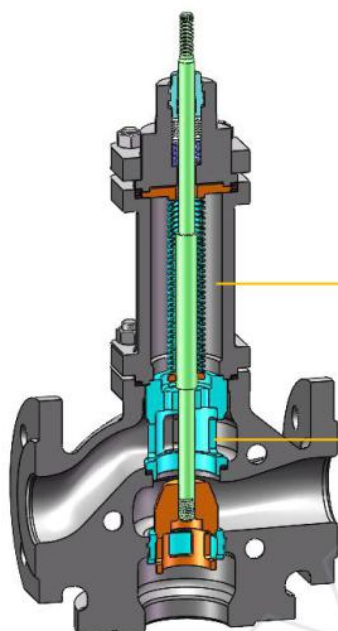
Valve plug double-guided structure

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

Single seat sealing structure

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

5.2 Three-way bellows control valve



Bellows external pressure-bearing structure

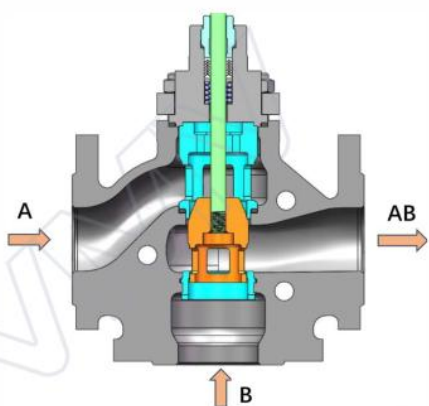
Provides a stable pressure load for the bellows, reducing movement and improving both the bellows' lifespan and the valves' operational precision. Compared to an internal pressure-bearing structure, an external pressure-bearing structure increases the maximum allowable stress on the bellows, thereby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

Bellows and flow channel separation structure

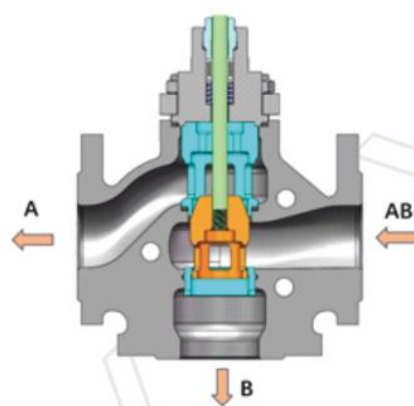
Prevents the medium from directly impacting the bellows, thereby increasing the service life of the bellows.

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

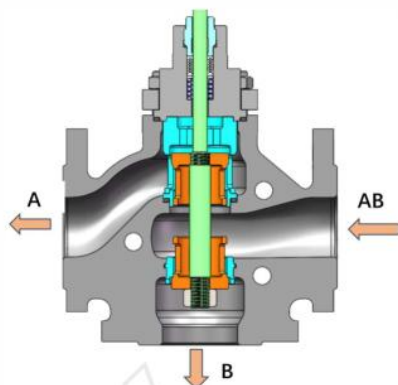
6.1 Three-way combined flow type



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		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)

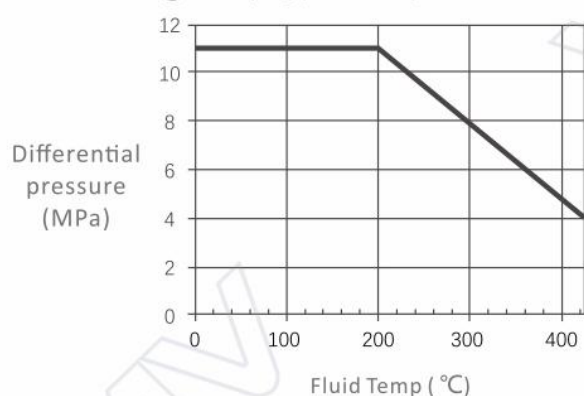
Temp°C	Class150					Class300					Class600				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	1.90	1.90	-	-	-	4.96	4.96	-	-	-	9.93	9.93
-29~38	1.96	1.98	1.98	1.90	1.90	5.11	5.17	5.17	4.96	4.96	10.21	10.34	10.34	9.93	9.93
50	1.92	1.95	1.95	1.83	1.84	5.01	5.17	5.17	4.81	4.81	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	-

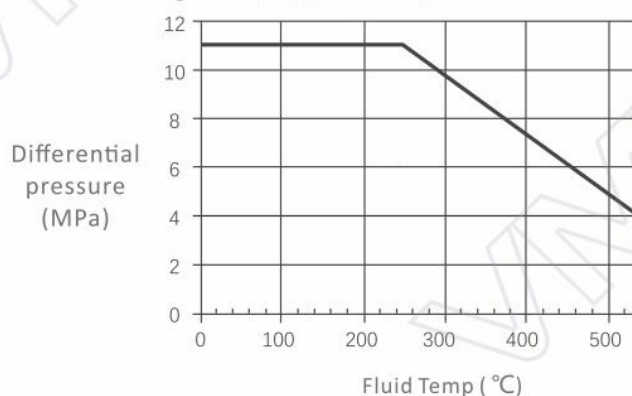
Temp°C	PN63					PN100				
	WCB	WC6	WC9	CF8	CF8M	WCB	WC6	WC9	CF8	CF8M
-196~-30	-	-	-	6.17	6.17	-	-	-	9.8	9.8
-29~38	6.35	6.43	6.43	6.17	6.17	10.08	10.21	10.21	9.8	9.8
50	6.22	6.43	6.43	5.95	5.98	9.88	10.21	10.21	9.44	9.5
100	5.77	6.4	6.41	5.08	5.25	9.15	10.16	10.17	8.07	8.33
150	5.62	6.19	6.24	4.62	4.79	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

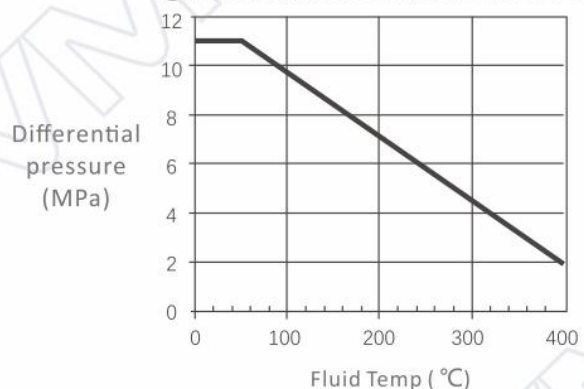
① Valve plug (valve seat) material: 420+HT



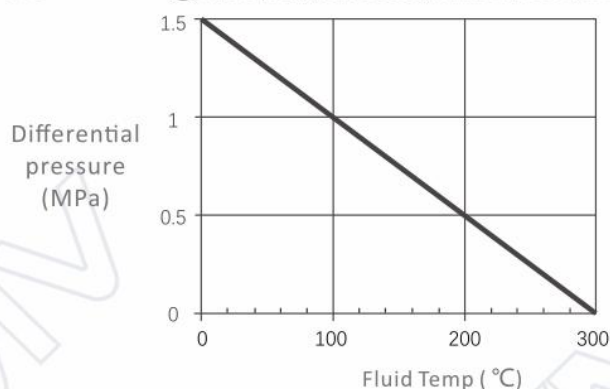
② Valve plug (valve seat) material: F11+Q.STL



③ Valve plug (valve seat) material: 304+STL/316L+STL

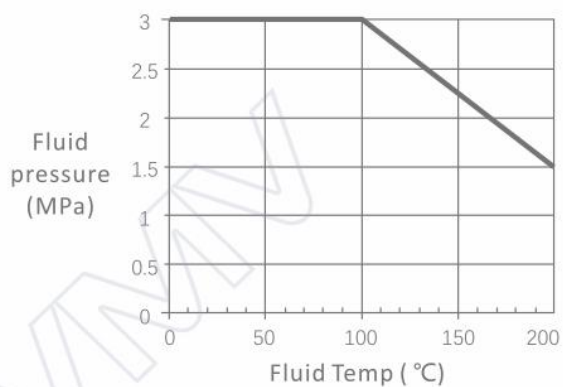


④ Valve plug (valve seat) material: 304/316L

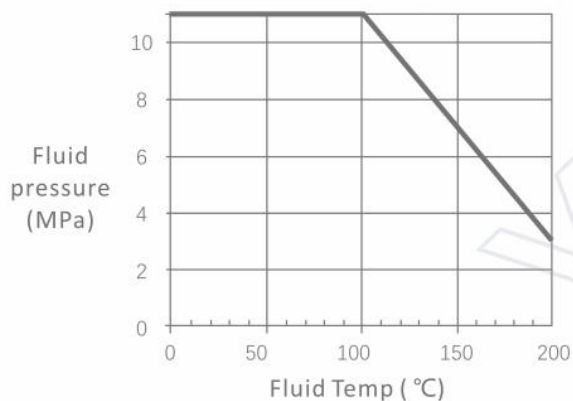


V6000 SERIES THREE-WAY CONTROL VALVE

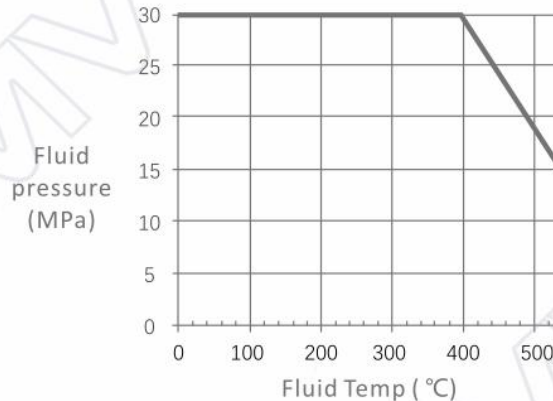
⑤ Valve plug material: .304+RPTFE/316L+RPTFE



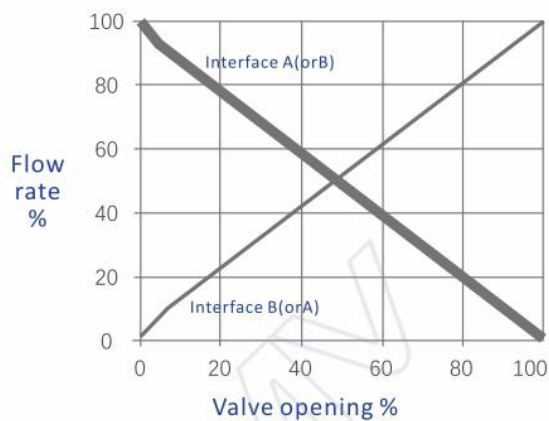
⑥ Packing material: PTFE



⑦ Packing material: graphite



8. Typical flow characteristic curve



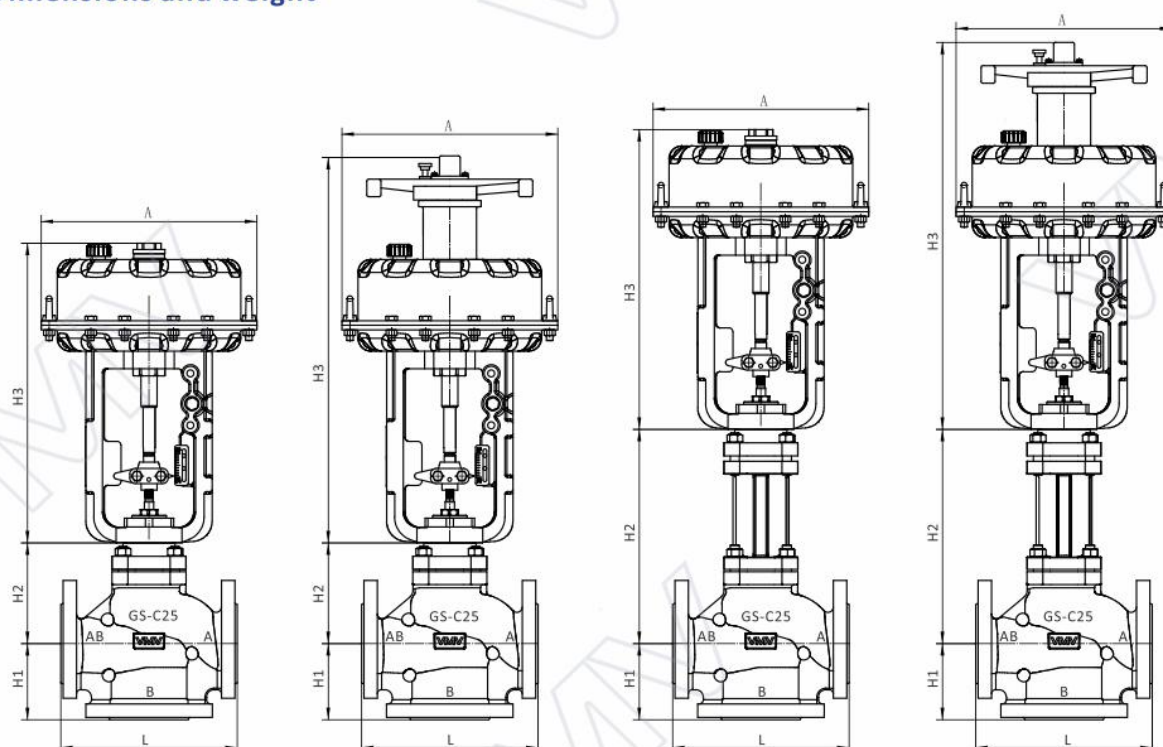
9. Rated cv and stroke

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	
	Operating temperature (°C)	
Import pressure (MPa)	Minimum value	
	Normal value	
	Maximum value	
Outlet pressure (Mpa)	Minimum value	
	Normal value	
	Maximum value	



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