

LPH13/LPG13 Cage Guided Control Valve



Code	Actuator	Action	Air Fail Position Control	Structure	Body Material	Sealing Material	Core Material	Connection DN	PN	
LPH13– LPG13–	1 Pneumatic 2 Pneumatic & Handwheel 4 AC220V 5 AC380V 0 Others	S Single-acting D Double-acting 0 Others	1 Normally Open 2 Normally Closed 4 Held 0 Others	B Control C Intelligent 0 Others	4 Low temperature type 5 Bellows type 6 High temperature type 7 Normal 0 Others	A CF3M B CF8M C CF8 D WCB I CF3 L CE3MN 2 Ti 5 WCC 0 Others	P PTFE Y FEP(F46) R BODY S Stellite 3 Gr 4 WC 0 Others	A CF3M B CF8M C CF8 I CF3 L CE3MN 2 Ti 0 Others	1 Flange 5 Weld 0 Others	0 Others

LPH13–Pneumatic diaphragm cage guided control valve
LPG13–Electric cage guided control valve



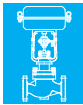
Overview

LPH13 Cage Guided Control Valve is designed for heavy duty services. The compact valve body, having a S–shape flow passage that features low pressure loss and a stabilizer that regulates turbulent flow around the cage, allows a large flow capacity, rangeability, and high accuracy flow characteristics. The valve plug is structured in a pressure–balanced type that permits flow control of a high differential pressure with a small actuating force. The actuator integrated with simplest mechanisms utilizes a compact yet powerful diaphragm actuator loaded with multiple springs.

LPH13 is widely applicable for reliable control of high or low temperature, high pressure or high differential pressure process lines where dynamic stability, low noise, and cavitation/ flashing resistance are required.

Specifications

Nominal size	20,25,40,50,65,80,100,150,200mm 3/4,1,1 1/2, 2, 2 1/2, 3, 4, 6, 8 inch
Pressure rating	JIS 10K, 16K, 20K, 30K, 40K ANSI Class 125, 150, 300, 600 PN1.6,4.0,6.4MPa
Pressure rating	Flange:FF, RF, RJ, LG, MF Tongue and groove (groove), TG Male and female(female) Flanged end:JIS B2201–1984, ANSI B16.5–1981, GB/T 9112–9124–2000 Weld:SW (from 40–50mm) , BW (from 65–200mm)
Body material	CF3M,CF8M,CF8,WCB,CF3,CE3MN,WCC,TI
Core material	304,316,304L,316L,CE3MN



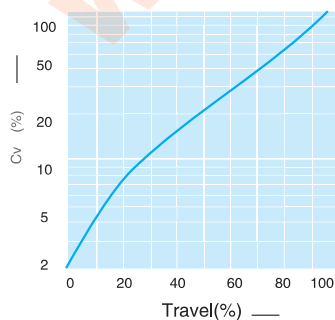
LPH13/LPG13

Cage Guided Control Valve

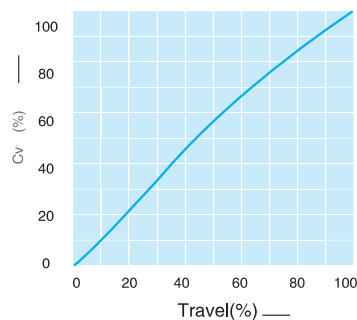


Bonnet	Plain bonnet (-17~230°C) Extension bonnet Type 1 (-45~-17°C和230~566°C) Extension bonnet Type 2 (-100~-45°C) Extension bonnet Type 3 (-196 ~-100°C)
Packing / Grease	Grease not provided: When V shaped PTFE packing or PTFE yarn packing is used. Grease provided: When graphite packing is used.
Gasket	Type: Flat type, serrated type Material: Carbon steel (S15C), stainless steel (SUS316, SUS316L, SUS329J1), copper, aluminum, titanium, ASTM B574 (Hastelloy C-276 equivalent), or Alloy 20
Actuator	Pneumatic, electric: refer to the attachment.
Flow characteristics	Equal percentage (%VF), Linear (LVF) Equal percentage (%TF), Linear (LTF)
Performance	Inherent range ability 50 : 1 Leakage class: Metal seat: ANSI B16.104-1976 II , Leakage less than 0.5% of maximum valve capacity. Soft seat: ANSI B16.104-1976 VI , Leakage less than 0.00001% of maximum valve capacity. Hysteresis error Without positioner: Within 3% F.S. With positioner: Within 1% F.S. Linearity Without positioner: Within ± 5% F.S. With positioner: Within ± 1% F.S.

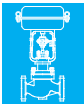
Characteristics



Equal percentage characteristics (%VF: Metal seat)



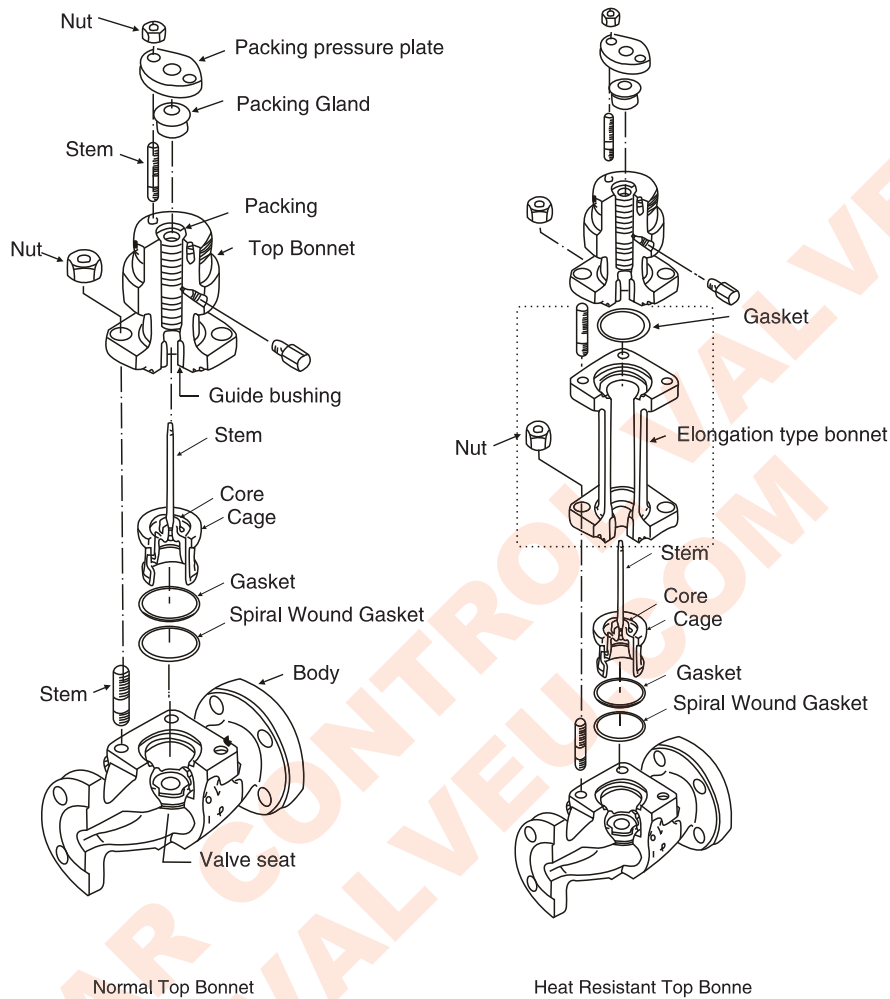
Linear characteristics (LVF: Metal seat)



LPH13/LPG13 Cage Guided Control Valve



Exploded View



Cage Guided Control Valve(DN20–25)

Cv Value and Travel

DN20–25

mm

CV		0.01	0.04	0.1	0.16	0.25	0.4	0.63	1.0	1.6	2.5	4.0
Flow characteristics	Metal seat											
	Equal percentage	—	—	—	—	○	○	○	○	○	○	○
	Linear	○	○	○	○	○	○	○	○	○	○	○
Rated travel		14.3										
DN		20, 25										

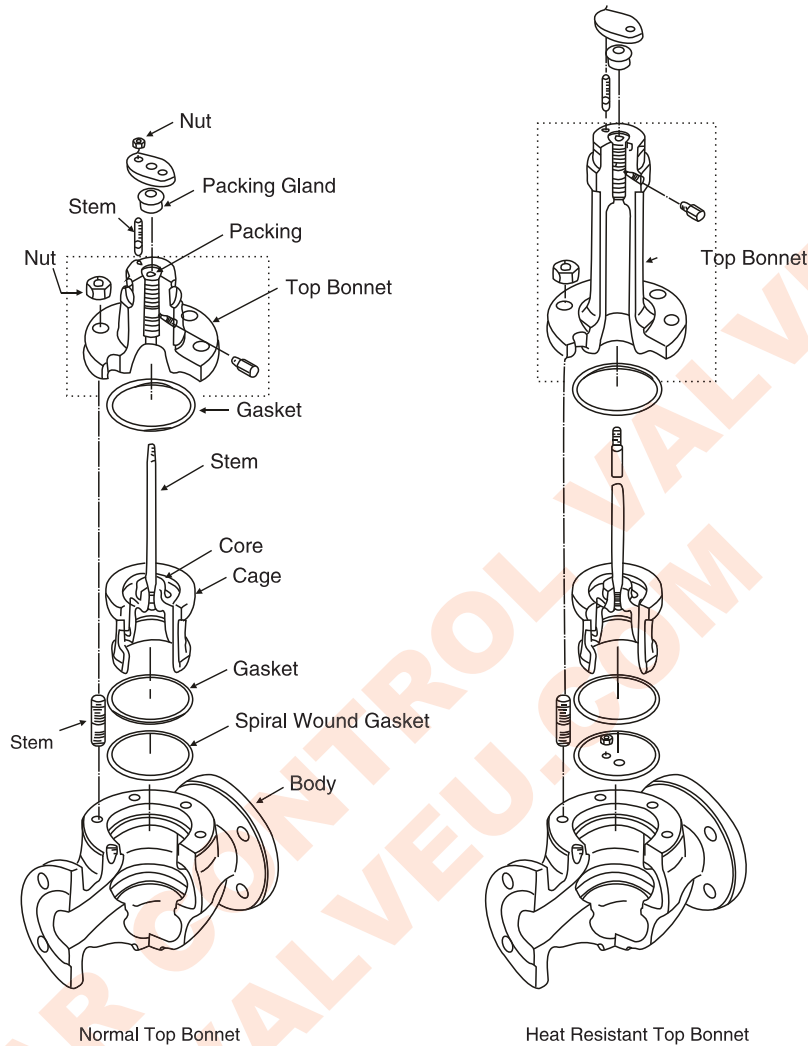
○ represent valve specifications.



LPH13/LPG13 Cage Guided Control Valve



Exploded View



Cage Guided Control Valve(DN40–200)

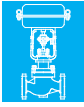
Cv Value and Travel

DN40–200

mm

DN	40			50			65			80			100			150			200			
Diameter	25	32	40	32	40	50	40	50	65	50	65	80	65	80	100	100	125	150	125	150	200	
CV	11	17	24	17	24	44	24	44	68	44	68	99	68	99	175	175	275	360	275	360	650	
Equal percentage or linear	Metal seat	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
	Soft seat	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Travel	25						38						50			75						

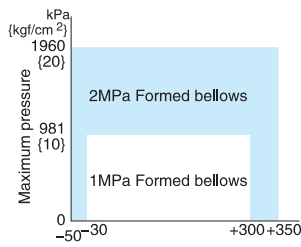
○ and △ represent valve specifications.
△ represents that valve flow characteristics conform to IEC534–1–1976.



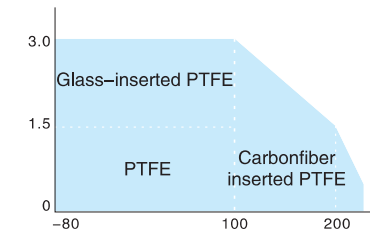
LPH13/LPG13 Cage Guided Control Valve



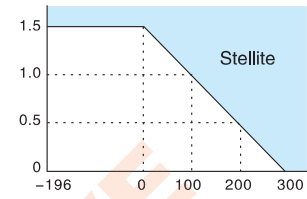
Temperature And Pressure Ranges



Fluid temperature (°C)
Bellows Type by
Temperature and Pressure Ranges



Fluid temperature (°C)
Temperature and maximum
differential pressure range of soft-seat type



Fluid temperature (°C)
Temperature/normal differential
pressureranges requiring Stellite

When cavitation/flushing service, oil prohibitive service, or retention of valve-close performance is required, use of Stellite is recommended regardless of temperature or differential pressure.

Allowable Differential Pressure

Air-to-close(DN20-25)

100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN20-25)						
				CV						
				≤ 0.25	0.4	0.63	1.0	1.6	2.5	4.0
ZHA1D	1.4	0.2 ~ 1.0		40	31	31	16	16	10	10
				56						
	1.6	0.2 ~ 1.0	With	40	40	40	40	40	40	40
				100	100	100	84	84	52	52
4.0	0.8 ~ 2.4	With	—	—	—	40	40	40	40	
			—	—	—	100	100	100	100	
ZHA2D	1.4	0.2 ~ 1.0		40	40	40	32.6	32.6	20	20
				100	62	62				
	1.6	0.2 ~ 1.0	With	—	40	40	40	40	40	40
				—	100	100	100	100	100	100

Air-to-open(DN20-25)

100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN20-25)						
				CV						
				≤ 0.25	0.4	0.63	1.0	1.6	2.5	4.0
ZHA1R	1.4	0.2 ~ 1.0		40	31	31	16	16	10	10
				56						
	2.8	0.8 ~ 2.4	With	40	40	40	40	40	40	40
				100	100	100	100	100	72	72
ZHA2R	1.4	0.2 ~ 1.0		40	40	40	32.6	32.6	20	20
				100	62	62				
	2.8	0.8 ~ 2.4	With	—	40	40	40	40	40	40
				—	100	100	100	100	100	100

Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34-1981 or JIS B2201-1984.

The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

Column bordered with bold lines denote types provided with standard-type actuator



LPH13/LPG13 Cage Guided Control Valve



Air-to-close(DN40-200)

100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN40-200)						
				DN						
				40	50	65	80	100	150	200
ZHA1D	1.4	0.2 ~ 1.0		5.1	4.0	—	—	—	—	—
	1.6	0.2 ~ 1.0	With	25	19	—	—	—	—	—
	4.0	0.8 ~ 2.4	With	40 76	40 59	—	—	—	—	—
ZHA2D	1.4	0.2 ~ 1.0		9.9	7.7	6.6	5.4	4.2	—	—
	1.6	0.2 ~ 1.0	With	40 49.2	38	32.9	27.4	20.8	—	—
	4.0	0.8 ~ 2.4	With	40 100	40 100	40 98.7	40 82.3	40 62.8	—	—
ZHA3D	1.4	0.2 ~ 1.0		17.5	13.7	11.7	9.7	7.4	5.2	—
	1.6	0.2 ~ 1.0	With	40 87	40 67	40 58	40 48.7	37	26.1	—
	4.0	0.8 ~ 2.4	With	40 100	40 100	40 100	40 100	40 100	40 78.6	—
ZHA4D	1.4	0.2 ~ 1.0		—	—	20.2	16.7	12.8	9.0	7.4
	1.6	0.2 ~ 1.0	With	—	—	40 100	40 83.9	40 63.6	40 45	37
	4.0	0.8 ~ 2.4	With	—	—	40 100	40 100	40 100	40 100	40 100

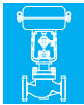
Air-to-open(DN40-200)

100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN40-200)						
				DN						
				40	50	65	80	100	150	200
ZHA1R	1.4	0.2 ~ 1.0		5.1	4.0			—	—	—
	2.8	0.8 ~ 2.4	With	36	27			—	—	—
ZHA2R	1.4	0.2 ~ 1.0		9.9	7.7	6.6	5.4	4.2	—	—
	2.8	0.8 ~ 2.4	With	40 68.1	40 53.9	40 46	38.4	29.3	—	—
ZHA3R	1.4	0.2 ~ 1.0		17.5	13.7	11.7	9.7	7.4	5.2	—
	2.8	0.8 ~ 2.4	With	40 100	40 95.7	40 81.7	40 68	40 51.8	36.7	—
ZHA4R	1.4	0.2 ~ 1.0				20.2	16.7	12.8	9.0	7.4
	2.8	0.8 ~ 2.4	With			40 100	40 100	40 89.7	40 63	40 51
ZVA5R	1.4	0.2 ~ 1.0				—	—	17.5	12.3	10.2
	1.4	0.4 ~ 1.2				—	—	40 52	37	30.7
	2.8	0.8 ~ 2.4	With			—	—	40 100	40 80	40 70

Continue in the following table





LPH13/LPG13 Cage Guided Control Valve



100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN40–200)						
				DN						
				40	50	65	80	100	150	200
ZVA6R	4.0	1.9 ~ 3.5	With	—	—	—	—	40 100	—	—
	5.0	1.9 ~ 4.0	With	—	—	—	—	—	40 100	—

Bellows Type , Air-to-close (DN40–200)

100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN40–200)						
				DN						
				40	50	65	80	100	150	200
ZHA2D	1.4	0.2 ~ 1.0		3.95	3.85	3.3	2.7	2.1	—	—
	1.6	0.2 ~ 1.0	With	20	19	16.45	13.7	10.4	—	—
				24.6						
4.0	0.8 ~ 2.4	With	20	20	20	20	20	—	—	
ZHA3D	1.4	0.2 ~ 1.0		8.77	6.85	5.85	4.85	3.7	2.6	—
	1.6	0.2 ~ 1.0	With	20	20	20	20	18.5	13.05	—
				43.5						
4.0	0.8 ~ 2.4	With	20	20	20	20	20	20	—	
ZHA4D	1.4	0.2 ~ 1.0		—	—	10.1	8.35	6.4	4.5	3.7
	1.6	0.2 ~ 1.0	With	—	—	20	20	20	20	18.5
				—	—	50	42	32	22.5	
4.0	0.8 ~ 2.4	With	—	—	20	20	20	20	20	
						50	50	50	50	50

Bellows Type , Air-to-open (DN40–200)

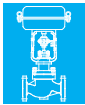
100KPa

Actuator	Supply pressure	Spring range	Positioner	Allowable differential pressure (DN40–200)						
				DN						
				40	50	65	80	100	150	200
ZHA2R	1.4	0.2 ~ 1.0		4.95	3.85	3.3	2.7	2.1	—	—
	2.8	0.8 ~ 2.4	With	20	20	20	19.2	14.65	—	—
ZHA3R	1.4	0.2 ~ 1.0		8.75	6.86	5.85	4.85	3.7	2.6	—
	2.8	0.8 ~ 2.4	With	20	20	20	20	20	18.35	—
ZHA4R	1.4	0.2 ~ 1.0		—	—	10.1	8.35	6.4	4.5	3.7
	2.8	0.8 ~ 2.4	With	—	—	20	20	20	20	20
						50	50	44.85	31.5	25.5

Take care not to cause the maximum allowable differential pressure to exceed the maximum operating pressure designated by ANSI B 16. 34–1981 or JIS B2201–1984.

The upper figures denote the operating allowable differential pressure. The lower denote allowed differential pressure at full closure.

Column bordered with bold lines denote types provided with standard-type actuator



LPH13/LPG13 Cage Guided Control Valve

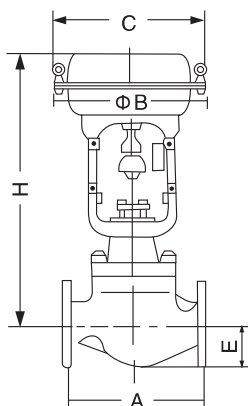


Allowable Differential Pressure for Electric Control Valve

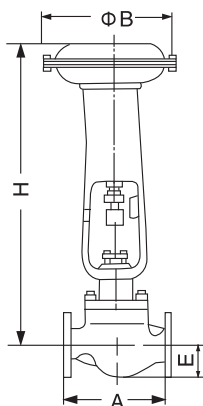
100KPa

DN(mm)	25	40	50	65	80	100	150	200	250	300		
Diameter(mm)	25	32	40	50	65	80	100	125	150	200	250	300
Allowable differential pressure(MPa)	6.4				5.9		4.1	3.7	3.7	2.8	2.2	

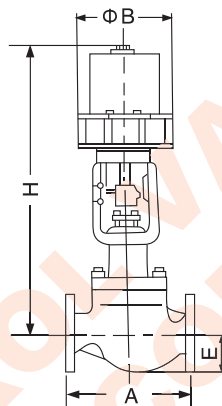
Dimensions



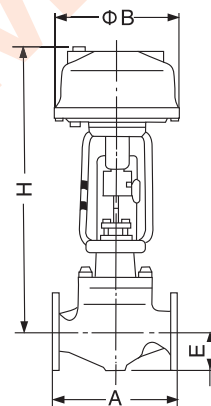
ZHA actuator



ZVA5 actuator



ZVA6 actuator



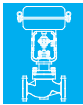
ZVP actuator

mm

DN	A										
	ANSI 125RF ANSI 150RF JIS 10K FFRF PN1.6	JIS 16K RF	ANSI 300RF JIS 20KRF JIS 30KRF PN4.0	ANSI 600RF JIS 40KRF PN6.4	ANSI 150 RJ	ANSI 300 RJ	ANSI 600 RJ	JIS 20K MF TG	JIS 30K MF TG	ANSI 300 LG	ANSI 600 SW, BW
20	184	190	194	206	—	206	206	198	208	203	206
25	184	193	197	210	197	210	210	198	212	206	210

mm

DN	A							
	ANSI 125FF, PN1.6 ANSI 150RF JIS 10K FF RF	JIS 16K RF	ANSI 300 RF JIS 20, 30K RF JIS 30K RF	ANSI 600 RF JIS 40K RF PN6.4	JIS 16K MF TG	JIS 20K MF TG	JIS 30K MF TG	JIS 40K MF TG
40	222	231	235	251	235	236	248	251
50	254	263	267	286	265	267	276	286
65	276	288	292	311	290	292	303	311
80	298	313	317	337	310	317	326	337
100	352	364	368	394	360	368	379	394
150	451	465	473	508	475	473	486	508
200	543	560	568	610	570	568	580	610



LPH13/LPG13

Cage Guided Control Valve



mm

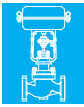
DN	A						
	ANSI 150 RJ	ANSI 300 RJ	ANSI 600 RJ	ANSI 300 LG	ANSI 600 LG	ANSI 150 SW、BW	ANSI 150、600 SW、BW
40	235	248	251	244	248	251	251
50	267	283	289	276	283	286	286
65	289	308	314	302	308	311	311
80	311	333	340	327	333	337	337
100	365	384	397	378	391	394	394
150	464	489	511	483	505	473	508
200	556	584	613	578	606	568	610

mm

DN	Actuator	H				C	φ B	E
		Normal	Extension bonnet 1	Extension bonnet 2	Extension bonnet 3			
	ZHA1D、R	375	525	685	900	230	218	40
	ZHA2D、R	450	600	760	975	281	267	
40	ZHA1D、R	425	590	705	945	230	218	70
	ZHA2D、R	500	665	780	1020	281	267	
	ZHA3D、R	590	760	875	1140	363	350	
50	ZHA1D、R	425	595	710	950	230	218	80
	ZHA2D、R	500	670	785	1025	281	267	
	ZHA3D、R	595	765	875	1140	363	350	
65	ZHA2D、R	575	745/755	880	1130	281	267	88
	ZHA3D、R	630	800/810	930	1180	363	350	
	ZHA4D、R	865	1035/1045	1165	1495	520	470	
80	ZHA2D、R	580	755/765	900	1135	281	267	98
	ZHA3D、R	635	810/820	955	1190	363	350	
	ZHA4D、R	870	1045/1055	1190	1505	520	470	
100	ZHA2D、R	610	810/870	915	1150	281	267	113
	ZHA3D、R	660	860/870	1020	1205	363	350	
	ZHA4D、R	890	1100/1110	1255	1520	520	470	
	ZVA5D	1300	1515	1710	1940	-	620	
	ZVA5R	1420	1635	1820	2050	-	620	
	ZVA6R	1160	1375	1560	1790	-	445	
150	ZVP5	940	1155	1340	1570	-	345	170
	ZHA3D、R	785	1020/1045	1250	1385	363	350	
	ZHA4D、R	955	1190/1215	1425	1570	520	470	
	ZVA5D	1360	1620	1870	2000	-	620	
	ZVA5R	1480	1740	1980	2110	-	620	
	ZVA6R	1220	1480	1720	1850	-	445	
	ZVP5	1000	1260	1500	1630	-	345	
200	ZVP6	1210	1470	1710	1840	-	445	220
	ZVP7	1290	1550	1790	1920	-	545	
	ZHA4D、R	1090	1350	1580	1710	520	470	
	ZVA5D	1475	1740	2025	2155	-	620	
	ZVA5R	1585	1850	2145	2275	-	620	
	ZVP5	1165	1425	1665	1795	-	345	
200	ZVP6	1375	1635	1875	2005	-	445	220
	ZVP7	1455	1715	1955	2085	-	545	

"H" dimensions are applicable when a hand wheel is not provided. When top-mounted hand wheel actuators or side-mounted hand wheel are used, add the hand wheel dimensions.

"H" dimensions of Extended bonnet Type are as follows: The left side for JIS 10K and ANSI 150, and the right side for JIS 16K and ANSI 300 or over.



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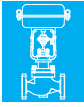


Weight

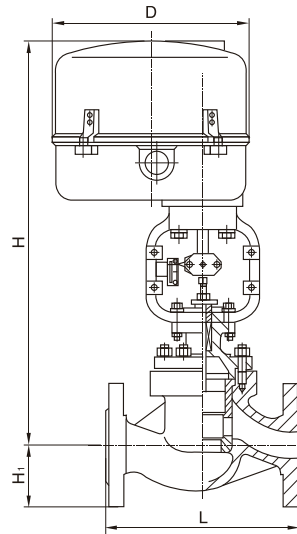
kg

DN	Actuator	Flange												Weld			
		ANSI 125、150 JIS 10K				ANSI 300 JIS 16、20、30K				ANSI 600 JIS 40K				ANSI 150、300、600 JIS 10、16、20、30K			
		P	E I	E II	E III	P	E I	E II	E III	P	E I	E II	E III	P	E I	E II	E III
40	ZHA1D、R	24	27	30	32	29	32	35	37	37	40	43	45	29	32	35	37
	ZHA2D、R	31	34	37	39	36	39	42	44	44	47	50	52	36	39	42	44
	ZHA3D、R	43	46	49	51	48	51	54	56	56	59	62	64	48	51	54	56
50	ZHA1D、R	30	33	36	38	35	38	41	43	40	43	46	48	35	38	41	43
	ZHA2D、R	37	40	43	45	42	45	48	50	47	50	53	55	42	45	48	50
	ZHA3D、R	49	52	55	57	54	57	60	62	59	62	65	67	54	57	60	62
65	ZHA2D、R	43	47	51	53	48	52	56	58	65	69	73	75	48	52	56	58
	ZHA3D、R	55	59	63	65	60	64	68	70	77	81	85	87	60	64	68	70
	ZHA4D、R	86	90	94	96	91	95	99	101	108	112	116	118	91	95	99	101
80	ZHA2D、R	53	59	65	68	63	69	75	78	85	91	97	100	63	69	75	78
	ZHA3D、R	65	71	77	80	75	81	87	90	97	103	109	112	75	81	87	90
	ZHA4D、R	96	102	108	111	106	112	118	121	128	134	140	143	106	112	118	121
100	ZHA2D、R	63	73	78	81	78	88	93	96	113	123	128	131	75	85	90	93
	ZHA3D、R	75	85	90	93	90	100	105	108	125	135	140	143	87	97	102	105
	ZHA4D、R	106	116	121	124	121	131	136	139	156	166	171	174	118	128	133	136
	ZVA5D	208	218	223	226	223	233	238	241	258	268	273	276	220	230	235	238
	ZVA5R	233	243	248	251	248	258	263	266	283	293	298	301	245	255	260	263
	ZVA6R	248	258	263	266	263	273	278	281	298	308	313	316	260	270	275	278
150	ZVP5	123	133	138	141	138	148	153	156	173	183	188	191	135	145	150	153
	ZHA3D、R	157	172	179	182	187	202	209	212	237	252	259	262	177	192	199	202
	ZHA4D、R	188	203	210	213	218	233	240	243	268	283	290	293	208	223	230	233
	ZVA5D	290	305	312	315	320	335	342	345	370	385	392	395	310	325	332	335
	ZVA5R	315	330	337	340	345	360	367	370	395	410	417	420	335	350	357	360
	ZVA6R	330	345	352	355	360	375	382	385	410	425	432	435	350	365	372	375
	ZVP5	205	220	227	230	235	250	257	260	285	300	307	310	225	240	247	250
200	ZVP6	280	295	302	305	310	325	332	335	360	375	382	385	300	315	322	325
	ZVP7	390	405	412	415	420	435	442	445	470	485	492	495	410	425	432	435
	ZHA4D、R	268	288	298	303	318	338	348	353	438	458	468	473	308	328	338	343
	ZVA5D	370	390	400	405	420	440	450	455	540	560	570	575	410	430	440	445
	ZVA5R	395	415	425	430	445	465	475	480	565	585	595	600	435	455	465	470
	ZVP5	285	305	315	320	335	355	365	370	455	475	485	490	325	345	355	360
200	ZVP6	360	380	390	395	410	430	440	445	530	550	560	565	400	420	430	435
	ZVP7	470	490	500	505	520	540	550	555	640	660	670	675	510	530	540	545





LPH13/LPG13 Cage Guided Control Valve



Dimensions and Weight of Electric Control Valve

mm

DN	L			H		H1			D Ordinary/ flame-proof	Weight (kg)	
	PN1.6	PN4.0	PN6.4	Normal temperature	High temperate	PN1.6	PN4.0	PN6.4		PN1.6	PN4.0 PN6.4
25	185	197	210	503	653	57	57	70	260/280	15	21
40	222	235	251	648	815	75	75	85		26	36
50	254	267	286	650	820	82	82	90		32	43
65	276	292	311	752	932	92	92	102		34	58
80	298	317	337	766	949	100	100	107	290//310	45	66
100	352	368	394	785	992	110	117	125		55	88
150	451	473	508	1060	1339	142	150	172	360	158	206
200	600	600	650	1098	1359	170	187	207		222	282
250	730	730	775	1245	1560	202	225	235		428	470
300	850	850	900	1276	1592	230	257	265		668	736