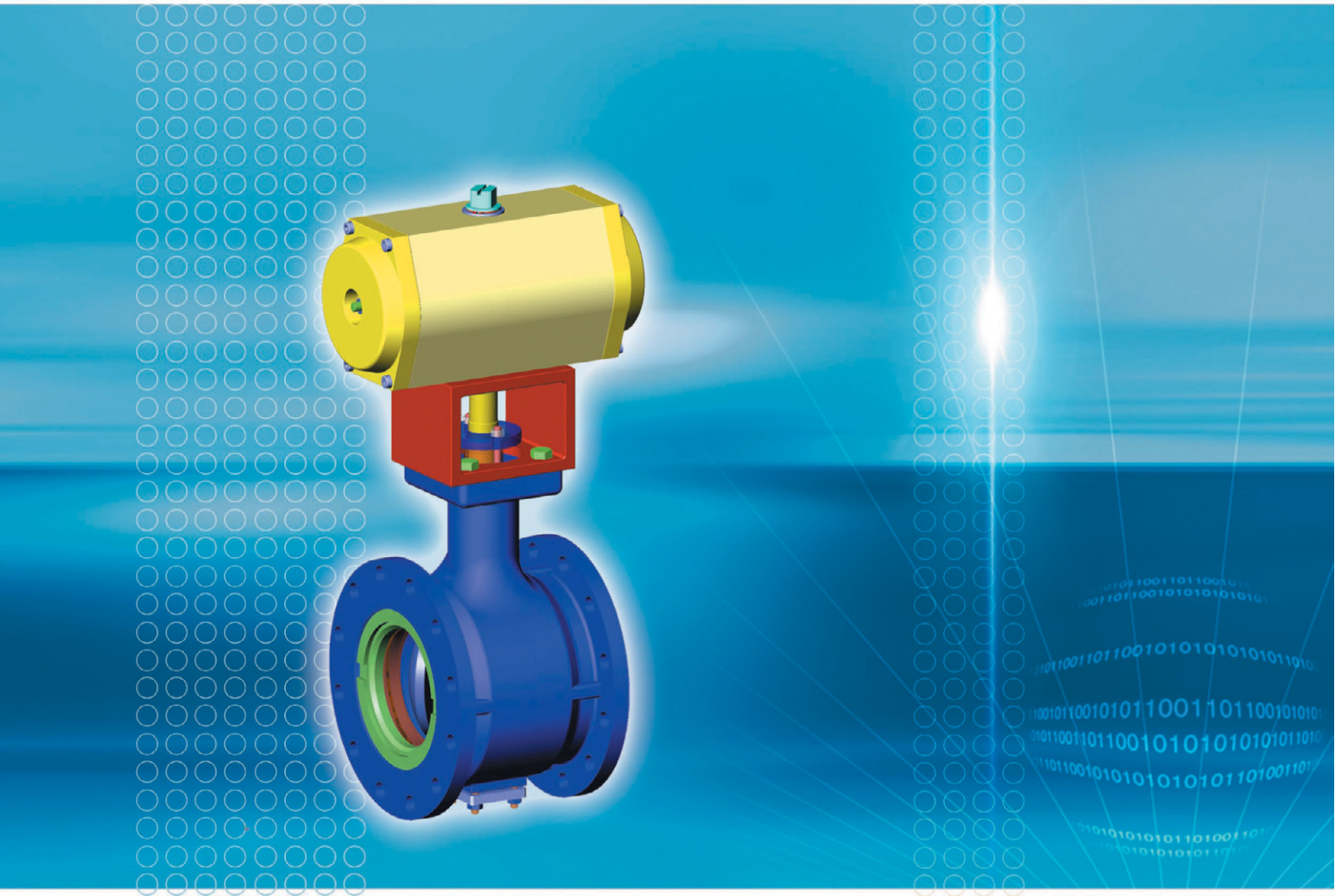
ER / VR Series

Eccentric Plug & V-Nocth Plug Rotating Control Valve



bFS

ER series / Eccentric Rotating Plug Valve

The ER's series is a heavy-duty automatic throttling control valve which incorporates into it's design the following

- Heavy-duty guide lugs assure quick positive alignment during installation.
- Large capacity ; Because of stream lined body no bottleneck inside, ER's has a large capacity approximately same as conventional butterfly valve.
- ER's operated very smoothly even at alow opening because of the unique eccentrically rotating mechanism so that control capability is widened remarkably through wide range of flow road.
- ER's has good dynamic stability due to the unique plug design and cross.
- Sectional view of body which are developed under the long time hydrodynamic investigation.
- Flange of Flangeless type connection.

VR series / V-Nocth Rotating Plug Valve

The VR-series is a combines globe valve. A shearing action between the V-nocth plug and the plug seal promotes smooth. nonclogging operation. The unlesstricted stright-through flow design provides high capacity for gas, steam, liquids, and fibers slurries. The design VR mate with a variety of ANSI raised face flanges, as well as with DIN & KS(JIS) flanges.

- One piece body ; Body design is robust and the body is not operationally affected by pipeline forces, flange gasket contact surfaces are continuous to accept all type of standard flange gasket, one-piece body avoids body leak paths.
- High rangeability : VR's have a rangeability of 150:1(standard) which ensures controllability of high turn down processes, high rangeability compensates for changes in process conditions.
- Low torque requirement : As opposed to many constructions, VR's are trunnion mounted with both shafts supported by low friction bearings.
- Excellent tightness with metal seats : VR's are metal seated and feature bidirectional tightness, in flow direction tightness is better than 0.0000002 x rates Cv value.

CONTENTS

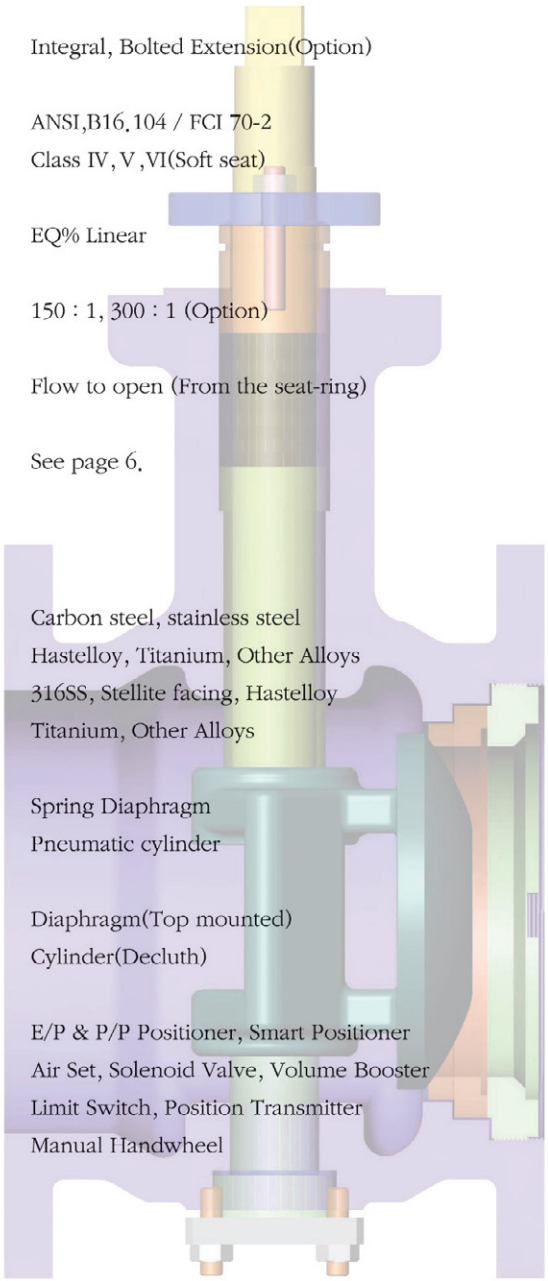
General Information & Model Numbering System ---------- 2
Valve Specification (ER's & VR's) ---------- 3
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Cv. FL Travel chart ---------- 5
Dimension of Valve Body ---------- 6
Dimension of Actuator ---------- 7

Model Numbering System

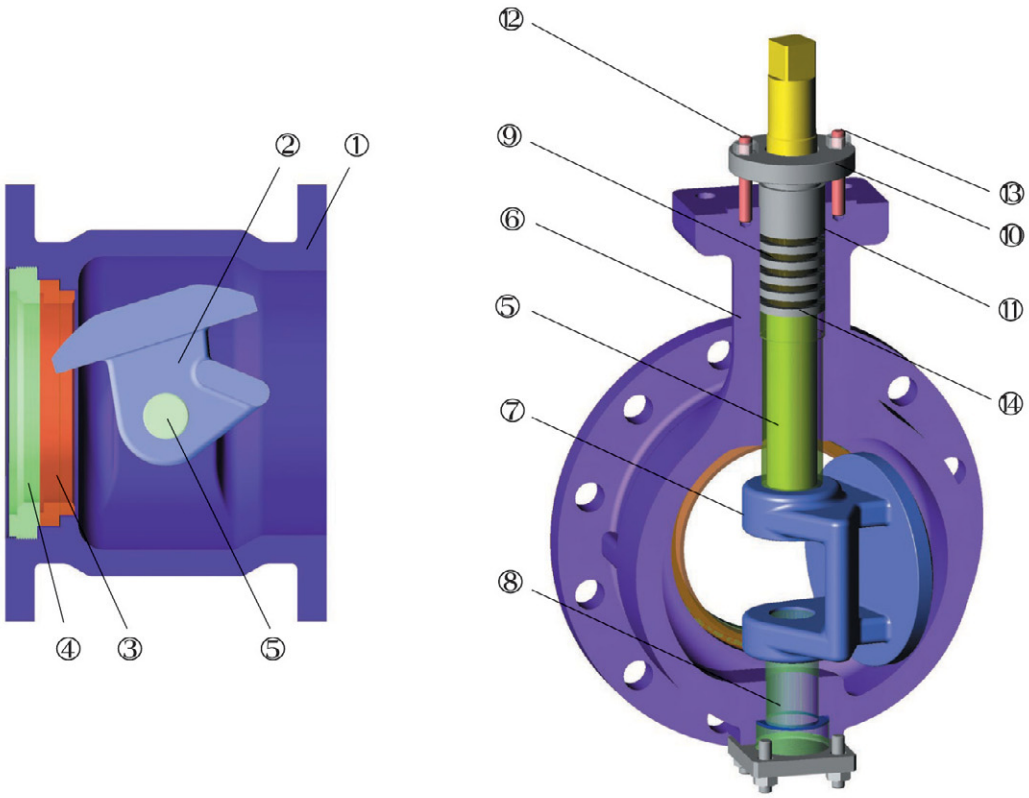
1	2	3	4	5
1. Body Series	**2. Seat Type**	**3. Pres. Rating**	**4. Body Option**	**5. Actuator Type**
ER / Eccentric	**SS** / Soft seat	**A1** / 150#	**00 /** Nobody Option	**CD** / Double cylinder
VR / V-nocth	**MS** / Metal-seat	**A2** / 300#	**RF /** RF Flange	**CS** / Spring cylinder
		A3 / 600#	**FL** / Wafer	**EM** / Electric motor
		K1 / 10K	**JK /** Jacket Body	**HS** / Hydraulic
		K2 / 20K	**CS** / Cryogenic	**LH** / Lever handle
		K3 / 40K	**VD /** C.V.D Treat.	**GH** / Gear box
			LL / Live Loading	**XX** / others option
			LB/ Lining Body	
			XX / Others Option	

Specification

ER Series Eccentric Plug		VR Series V-Nocth Plug
1" through 14"	Body Size	1" tough 14"
ANSI150# through 1500#	Pressure Rating	ANSI150# through 1500#
Threaded Flanged Flangeless	End Connection	Flanged, Flangeless, Threaded
Internal, Bolted Extension(Option)	Bonnet Type	Integral, Bolted Extension(Option)
ANSI,B16.104 / FCI 70-2 Class IV, V ,VI(Soft seat)	Seat leakage	ANSI,B16.104 / FCI 70-2 Class IV, V ,VI(Soft seat)
EQ% Linear	Characteristic	EQ% Linear
(Cv Ratio) 100 : 1	Rangeability	150 : 1, 300 : 1 (Option)
Flow to open (From the seat-ring)	Flow direction	Flow to open (From the seat-ring)
See page 6.	Flow coefficients	See page 6.
	Materials	
Carbon steel, stainless steel Hastelloy, Titanium, Other Alloys	Body	Carbon steel, stainless steel Hastelloy, Titanium, Other Alloys
316SS Stellite Facing, Hastelloy Titanium, Other Alloys	Trim	316SS, Stellite facing, Hastelloy Titanium, Other Alloys
Spring Diaphragm Pneumatic cylinder	Actuator	Spring Diaphragm Pneumatic cylinder
Diaphragm(Top mounted) Cylinder(Decluth)	Handwheel	Diaphragm(Top mounted) Cylinder(Decluth)
E/P & P/P Positioner, Smart Positioner Air Set. Solenoid Valve, Volume Booster Limit Switch, Position Transmitter Manual Handwheel	Accessories	E/P & P/P Positioner, Smart Positioner Air Set, Solenoid Valve, Volume Booster Limit Switch, Position Transmitter Manual Handwheel



Body Materials



[Eccentric Rotating Plug]

No.	Temperature Range	-198℃ ~ -50℃	~ +205℃	~ +232℃	~ +423℃
	Parts Name	Materials			
1	Body	A216-WCB			
		A351-CF8 / 304SS, A351-CF8M / 316SS, A351-CF3M / 316LS			
		Hastelloy-C			
2	Plug	Solid Stellite, 316SS+Stellite Hard Facing			
		Hastelloy-C			
3	Seat-Ring	316SS Stellite Hard Facing			
		316SS+PTFE			
		Hastelloy-C			
4	Seat-Ring Retainer	A351-CF8M / 316SS, Hastelloy-C			
5	Steam	316SS, Hastelloy-C			
6	Spacer	316SS, Hastelloy-C			
7	Upper Guide	440C or Stellite 6			
8	Lower Guide	440C or Stellite 6			
9	Gland Packing	PTFE, PTFE+Free Asbestos.			Graphite
10	Packing Flange	304SS			
11	Packing Follower	304SS			
12	Packing Stud	304SS A193 Gr.B8			
13	Packing Stud Nut	304SS A193 Gr.8			
14	Packing Box Ring	316SS			
15	Seat-Ring spring	316SS			

◆ Titanium, Zirconium, Monel, Other Alloys : Option.

ER's Cv. FL Travel Chart

unit / inch

Percent of Plug Rotation		10	20	30	40	50	60	70	80	90	100
FL	Flow to Open	0.96	0.93	0.91	0.89	0.88	0.87	0.87	0.86	0.86	0.85
	Flow to Close	0.94	0.91	0.88	0.83	0.80	0.77	0.74	0.72	0.70	0.68
Valve Size	Orifice dia	Rated Cv									
1	Reduced	0.4	0.9	1.4	2.0	2.7	3.5	4.2	4.8	5.3	5.6
	Full	0.8	2.1	3.6	5.8	7.7	9.5	11.0	12.0	13.0	14
1.5	Reduced	0.7	1.4	2.1	3.2	4.3	5.8	7.2	8.2	8.8	9.0
	Full	1.6	3.2	5.8	8.2	12.0	15.0	17.0	20.0	22.0	24
2	Reduced	1.0	1.9	3.0	4.3	5.9	7.6	9.0	10.0	11.0	12
	Full	1.8	4.5	7.8	12.0	17.0	20.0	24.0	26.0	29.0	30
3	Reduced	1.6	3.2	5.0	7.2	9.8	13	15	17	19	20
	Full	3.0	7.5	13.0	21	28	34	40	44	48	50
4	Reduced	4.9	9.2	14.0	20	26	33	40	45	50	54
	Full	8.2	18	31	45	61	78	96	113	126	135
5	Reduced	8.4	17	25	35	46	58	69	78	87	93
	Full	15	31	54	77	105	134	164	193	215	231
6	Reduced	19	35	53	75	99	125	148	169	187	200
	Full	31	66	116	166	226	291	356	419	466	500
8	Reduced	25	45	72	108	149	198	242	280	317	341
	Full	44	112	201	320	435	545	639	724	796	852
10	Reduced	37	69	110	165	227	303	340	427	481	521
	Full	73	170	307	489	664	833	976	1111	1221	1300
12	Reduced	50	91	148	222	306	407	498	575	649	703
	Full	100	229	412	657	894	1121	1311	1491	1641	1751
14	Reduced	68	123	198	298	411	546	668	772	871	941
	Full	133	305	551	880	1198	1503	1758	2000	2201	2349
16	Reduced	103	191	308	462	637	848	1038	1197	1352	1460
	Full	209	477	858	1368	1864	2337	2733	3109	3422	3650

◆ Flow Characteristic : The essentially linear flow characteristics of ER's are fixed by the basic design of the spherically shaped, eccentric rotating plug.

VR's Cv Table

Valve Size	Inch/mm	1/(25)	1/(25)	1/(25)	1.5/(40)	2/(50)	3/(80)	4/(100)	6/(150)	8/(200)	10/(250)
Cv	90%	3.76	10	18.6	53.7	82.9	192	308	564	915	1440
	100%	5	15	28	81	125	290	465	850	1380	2170
FL		-	-	0.42	0.99	0.80	0.50	0.60	0.91	1.2	1.2

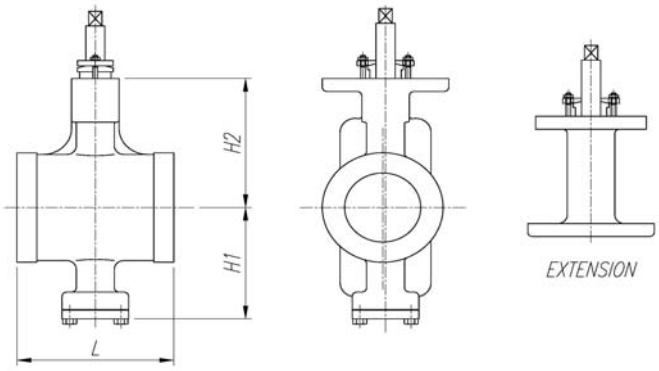
■ **Maximum flow capacity**
BFS's VR-Series valves have a rangeability of 150:1(standard), which ensures controllability of high turn-down-ratio processes.
High rangeability compensates for changes in process conditions.

■ **Linear system control / equal percent inherent characteristic**
VR-Series valves have on equal percent flow characteristic which is optimal for linearization of overall system control under variable pressure drop service. Even at small opening angles the control behaviour of VR's valve is extremely accurate.

■ **BFS's VR-series** valves feature equal percentage flow characteristics in a carefully engineerd, compact quarter-turn construction. Available in a number of special constructions and complete with BFS actuators, positioners and accessories, VR-series valves have been designed for long maintenance free service life giving you the real state-of-the art in costent-effici process control.

ER/VR-series

Wafer Type Dimension (ANSI 150#, 300#)

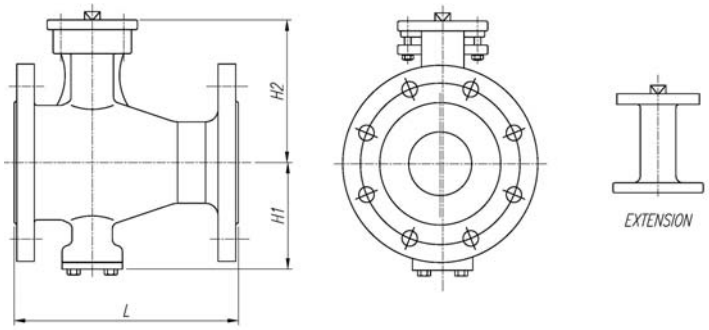


Size		1"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
		25A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A	350A	400A
L	150/300	102	114	124	143	165	194	213	229	243	297	338	400	400
H1		104	112	119	127	150	166	201	234	291	320	366	408	477
H2		254	262	269	277	300	316	351	384	441	470	516	558	627

* Same Face to Face dimension./ 150# 10K, 300# 20K.

* Option / Others size valve & Pressure Rating. Cryogenic Bonnet.

Flange Type Dimension (ANSI 150#, 300#, 600#)

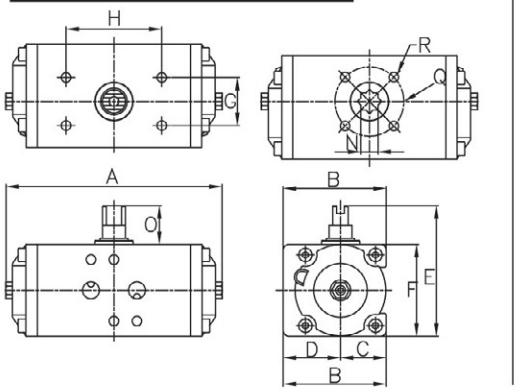


Size		1"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"	14"	16"
		25A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A	350A	400A
L	150#	127	165	178	190	203	229	356	394	457	533	610	686	762
	300#	165	190	216	241	283	305	381	403	502	568	648	762	838
	600#	216	241	292	330	356	432	508	559	660	787	838	889	991
H1		104	112	119	127	150	166	201	234	291	320	366	408	477
H2		254	262	269	277	300	316	351	384	441	470	516	558	627

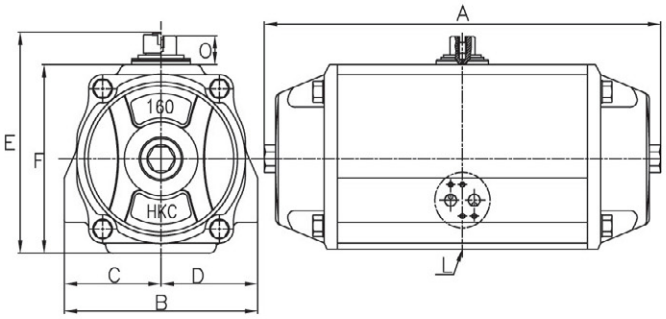
* Same Face to Face dimension./ 150# 10K, 300# 20K, 600# 40K.

* Option / Others size valve & Pressure Rating. Cryogenic Bonnet.

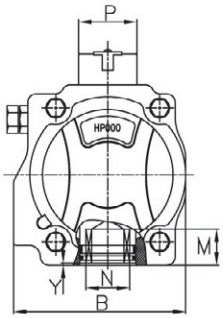
HP035

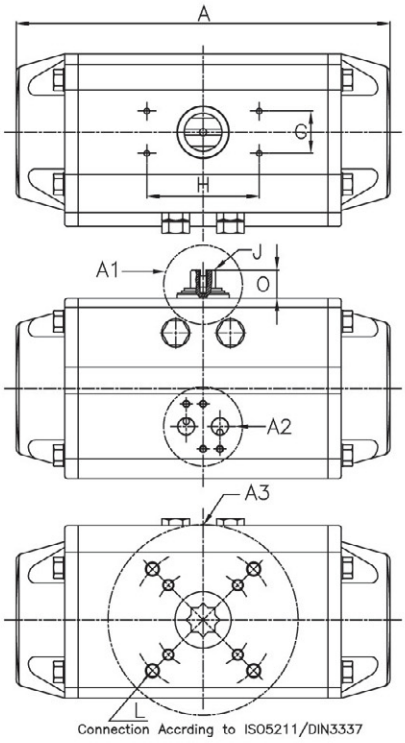


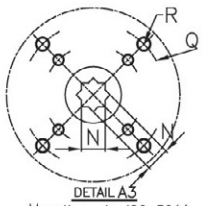
HP160, HP200

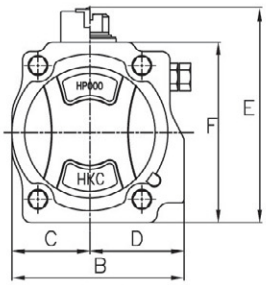


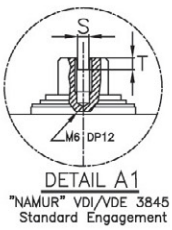
HP050, HP063, HP075, HP088, HP100, HP125

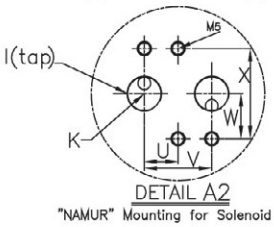












Guide Bearing

unit(mm)

Model	FLANGE (ISO 5211) L / Q	R / M (min) / N	A	B	C	D	E	F	G	H	I	J	K	O	P	S	T	U	V	W	X
HP35	F03/F05	M5/M6	108	54	24	30	68	48	25	50	PF	M6	1/8"	20	41.5	4	4	12	24	16	32
	ø36/ø50	9/10																			
HP50	F03/F05	M5/M6	140	72	30	42	92	72	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32
	ø36/ø50	9/10																			
HP63	F05	M6	162	84	37	47	105	85	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32
	ø50	11																			
HP75	F05/F07	M6/M8	208	96	42.5	53.5	123	103	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32
	ø50/ø70	12/14																			
HP88	F05/F07	M6/M8	243	108	49.5	58.5	136	116	30	80	PF	M6	1/8"	20	41.5	4	4	12	24	16	32
	ø50/ø70	12/14																			
HP100	F05/F07/F10	M6/M8/M10	268	123	56	67	148	128	30	80	PF	M6	1/4"	20	41.5	4	4	12	24	16	32
	ø50/ø70/ø102	12/14/18																			
HP125	F7/F10	M8/M10	349	151	69	82	189	159	30	80	PF	M6	1/4"	30	41.5	4	4	12	24	16	32
	ø70/ø102	14/18																			
HP160	F10/F12	M10/M12	450	202	101	101	226	197	30	80	PF	M6	1/4"	30	41.5	4	4	12	24	16	32
	ø102/ø125	18/23																			
HQ200	F14	M16	554	232	116	116	276	246	30	130	PF	M6	1/4"	30		4	4	12	24	16	32
	ø140	36																			

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