

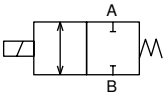
Solenoid valve for high vacuum

HVB$^{2}_{3}_{4}_{5}$12 Series

- Orifice: ø1, ø2, ø3, ø4.5, ø6
- NC (open when energized)

JIS symbol

- NC (open when energized)



Common specifications

Item	HVB*12
Working fluid	Air/vacuum/inert gas (*1)
Proof pressure MPa	5.0 (≈730 psi, 50 bar)
Fluid temperature °C	5 (41°F) to 55 (131°F)
Ambient temperature °C	0 (32°F) to 55 (131°F) (no freezing)
Thermal class	Class 130 (B)
Voltage fluctuation range	Rated voltage ±10%
Atmosphere	No explosive or corrosive atmospheres
Valve structure	Direct acting poppet structure
Valve seat leakage Pa·m³/sHe	1.0×10^{-9} or less (*2)
External leakage Pa·m³/sHe	1.0×10^{-9} or less
Mounting orientation	Unrestricted
Durability	2 million times

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item / Model No.	Port size (*3)	Orifice size (mm)	Cv (*5)	Working pressure Pa(abs)(*10)	Max. working pressure differential (*6)(MPa)	Back pressure (*7)(MPa)	Rated voltage	Power consump (W) AC	Power consump (W) DC	Weight (*9)(kg)
NC (open when energized)										
HVB212	1/4" JXR male fitting 1/4" double barbed fitting NPT1/8, Rc1/8	1	0.04	1.0×10^{-6} to 1.0×10^{6}	1.0	0.6	100 VAC 50/60 Hz 200 VAC 50/60 Hz 24 VDC 12 VDC	4.3	4	0.16
		2	0.17	1.0×10^{-6} to 0.3×10^{6}	0.3	0.15				
HVB312	1/4" JXR male fitting 1/4" double barbed fitting NPT1/8, 1/4, Rc1/8, 1/4	2	0.17	1.0×10^{-6} to 0.8×10^{6}	0.8	0.5		6.5	6	0.29
		3	0.33	1.0×10^{-6} to 0.3×10^{6}	0.3	0.25				
HVB412	1/4" JXR male fitting 1/4" double barbed fitting NPT1/4, Rc1/4	3	0.33	1.0×10^{-6} to 1.0×10^{6}	1.0	0.4		8.3	8 (*8)	0.50
		4.5	0.6	1.0×10^{-6} to 0.3×10^{6}	0.3	0.2				
	3/8" JXR male fitting 3/8" double barbed fitting NPT3/8, Rc3/8	6	1.05	1.0×10^{-6} to 0.2×10^{6}	0.1	0.05				
HVB512	1/4" JXR male fitting 1/4" double barbed fitting NPT1/4, Rc1/4	4.5	0.6	1.0×10^{-6} to 0.8×10^{6}	0.8	0.2		11.8	11.5	0.69
	3/8" JXR male fitting 3/8" double barbed fitting NPT3/8, Rc3/8	6	1.05	1.0×10^{-6} to 0.3×10^{6}	0.3	0.15				

*1 : The number of durability times may become much lower depending on the degree of dryness.
*2 : When port A is on the vacuum side.
*3 : JXR fitting can be connected to VCR fitting.
*4 : The leakage current must be less than the values shown below.
*5 : Cv shown in the table are values for NPT connection.
*6 : The max. working pressure differential is the difference between port B (high-pressure side) and port A (low-pressure side).
7 : Atmospheric pressure at port B that can be applied from port A. (B port vacuum is unusable for HVB412--6)
*8 : 8.6 (W) for 12 VDC.
*9 : Weights shown in the table are for grommet lead wire/NPT connection.
*10 : The working pressure range vacuum does not guarantee the vacuum attainment time or that the vacuum will not change.
*11 : FKM is used for sealant material, so consider the generation of discharge gas during use.
*12 : Grease for high vacuum is used on the O-rings of gas contacting parts.

Leakage current: Voltage / Model No.	100 VAC	200 VAC	24 VDC	12 VDC
HVB*12	2 mA or less	1 mA or less	1 mA or less	2 mA or less

How to order

HVB 2 12 - 4RM - 2 - 2C B - DC24V

- Ⓐ Series size (coil width)
- Ⓑ Connection
- Ⓒ Orifice size
- Ⓓ Coil option *1 *2
- Ⓔ Other options
- Ⓕ Voltage

Code	Description	Model No. HVB212	HVB312	HVB412	HVB512
Ⓐ Series size					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
Ⓑ Connection (refer to Table 1)					
4RM	1/4" JXR male fitting	●	●	●	●
6RM	3/8" JXR male fitting			●	●
4S	1/4" double barbed fitting	●	●	●	●
6S	3/8" double barbed fitting			●	●
6N	NPT1/8	●	●		
8N	NPT1/4		●	●	●
10N	NPT3/8			●	●
6	Rc1/8	●	●		
8	Rc1/4		●	●	●
10	Rc3/8			●	●
Ⓒ Orifice size (refer to Table 1)					
Z	ø1	●			
2	ø2	●	●		
3	ø3		●	●	
5	ø4.5			●	●
6	ø6			●	●
Ⓓ Coil option					
For AC					
2CR	Standard: Grommet lead wire/with full-wave rectifier	●	●	●	●
For DC					
2C	Std.: Grommet lead wire	●	●	●	●
2CS	Option: Grommet lead wire with surge suppressor	●	●	●	●
2G	Option: With DIN terminal box (Pg11)	●	●	●	●
2HS	Option: With DIN terminal box with lamp/surge suppressor (Pg11)	●	●	●	●
Ⓔ Other options					
Blank	Std.: None	●	●	●	●
B	Option: Mounting plate	●	●	●	●
Ⓕ Voltage					
AC100V	100 VAC 50/60 Hz	●	●	●	●
AC200V	200 VAC 50/60 Hz	●	●	●	●
DC24V	24 VDC	●	●	●	●
DC12V	12 VDC	●	●	●	●

Select from the combinations indicated with ● above.

Table 1: Table of fitting and orifice size combination

	Ⓑ Connection			Ⓒ Orifice Z	2	3	5	6
		Fitting	Size	ø1	ø2	ø3	ø4.5	ø6
HVB212	4RM	JXR male	1/4"	●	●			
	4S	Double barbed	1/4"	●	●			
	6N	NPT	1/8"	●	●			
	6	Rc	1/8"	●	●			
HVB312	4RM	JXR male	1/4"		●	●		
	4S	Double barbed	1/4"		●	●		
	6N	NPT	1/8"		●	●		
	8N	NPT	1/4"		●	●		
	6	Rc	1/8"		●	●		
	8	Rc	1/4"		●	●		
HVB412	4RM	JXR male	1/4"			●	●	
	6RM	JXR male	3/8"					●
	4S	Double barbed	1/4"			●	●	
	6S	Double barbed	3/8"					●
	8N	NPT	1/4"			●	●	
	10N	NPT	3/8"					●
	8	Rc	1/4"			●	●	
	10	Rc	3/8"					●
HVB512	4RM	JXR male	1/4"				●	
	6RM	JXR male	3/8"					●
	4S	Double barbed	1/4"				●	
	6S	Double barbed	3/8"					●
	8N	NPT	1/4"				●	
	10N	NPT	3/8"					●
	8	Rc	1/4"				●	
	10	Rc	3/8"					●

[Example of model No.]

HVB212-4RM-2-2CB-DC24V

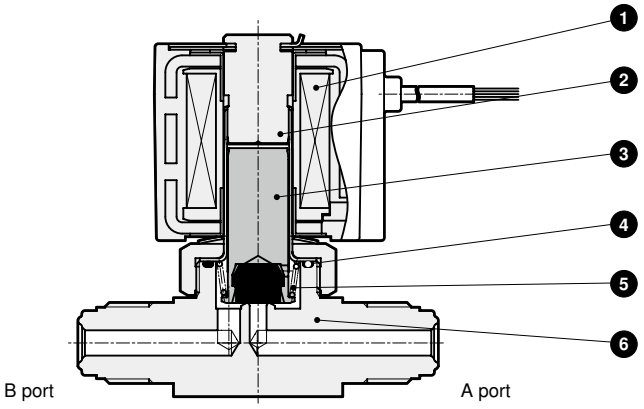
Model: HVB212

- Ⓐ Series size : 22 mm
- Ⓑ Connection : 1/4" JXR male fitting
- Ⓒ Orifice size : ø2
- Ⓓ Coil option : Grommet lead wire
- Ⓔ Other options : Mounting plate
- Ⓕ Voltage : 24 VDC

*1 : Surge suppressor is included as standard in the models with full-wave rectifier.

*2 : For HVB212 Item Ⓓ 2G/2HS, the compact terminal box (Pg9) is used.

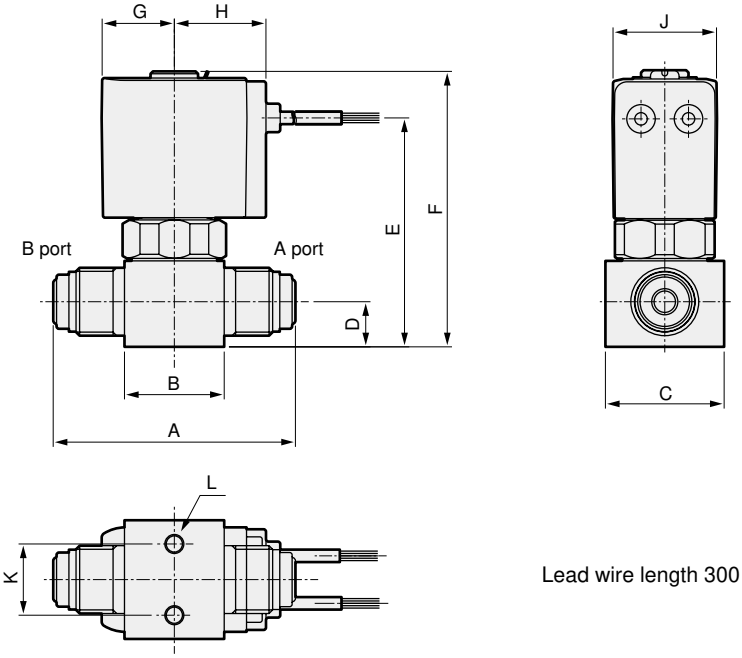
Internal structure and parts list



No.	Part name	Material		No.	Part name	Material	
1	Coil assembly	(Molded coil)		4	O-ring	FKM	Fluoro rubber
2	Core assembly	SUS405, SUS316L	Stainless steel	5	Spring	SUS304	Stainless steel
3	Plunger assembly	SUS405, FKM	Stainless steel, fluoro rubber	6	Body	SUS304 or SCS13	Stainless steel

Dimensions CAD

● Grommet lead wire (voltage: DC type)/JXR male fitting
HVB*12-[4RM / 6RM]-*-[2C]



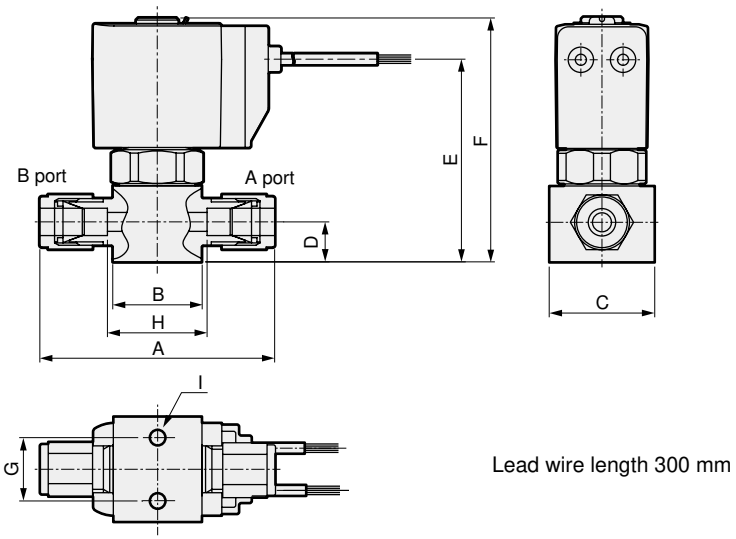
Lead wire length 300 mm

Model No.	A	B	C	D	E	F	G	H	J	K	L
HVB212-4RM	51	21	25	9.5	48	58	15.5	19.5	22	15	M4 x 0.7 depth 6
HVB312-4RM	64	30	25	9.5	53.5	64.5	18.5	22.5	28	18	M5 x 0.8 depth 8
HVB412-4RM	64	34	32	11.6	66	79.5	22.5	26	34	18	M5 x 0.8 depth 8
HVB412-6RM	75	34	32	11.6	66	79.5	22.5	26	34	18	M5 x 0.8 depth 8
HVB512-4RM	64	34	32	11.6	71.5	86.5	26	29.5	40	18	M5 x 0.8 depth 8
HVB512-6RM	75	34	32	11.6	71.5	86.5	26	29.5	40	18	M5 x 0.8 depth 8

Dimensions CAD

● Grommet lead wire (voltage: DC type)/double barbed fitting

HVB*12-[4S / 6S] -*- [2C]

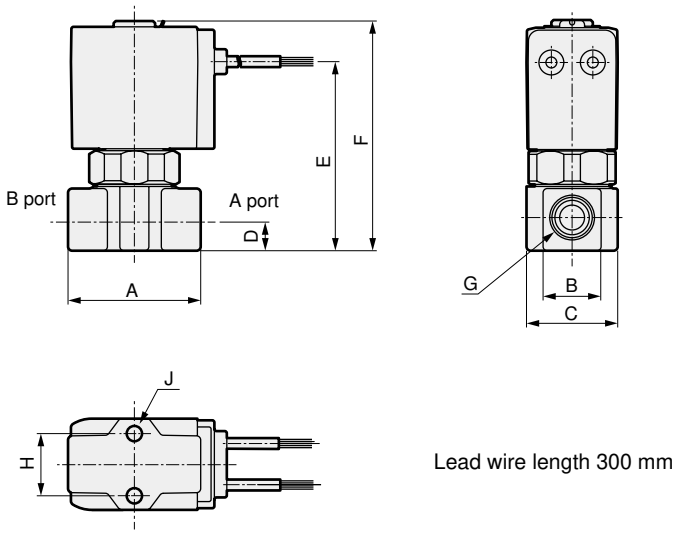


Lead wire length 300 mm

Model No.	A	B	C	D	E	F	G	H	I
HVB212-4S	(56)	21	25	9.5	48	58	15	22	M4 x 0.7 depth 6
HVB312-4S	(69)	30	25	9.5	53.5	64.5	18	35	M5 x 0.8 depth 8
HVB412-4S	(69)	34	32	11.6	66	79.5	18	35	M5 x 0.8 depth 8
HVB412-6S	(78)	34	32	11.6	66	79.5	18	43.5	M5 x 0.8 depth 8
HVB512-4S	(69)	34	32	11.6	71.5	86.5	18	35	M5 x 0.8 depth 8
HVB512-6S	(78)	34	32	11.6	71.5	86.5	18	43.5	M5 x 0.8 depth 8

● Grommet lead wire (voltage: DC type)/NPT type Rc screw-in

HVB*12-[6N / 8N / 10N / 6 / 8 / 10] -*- [2C]



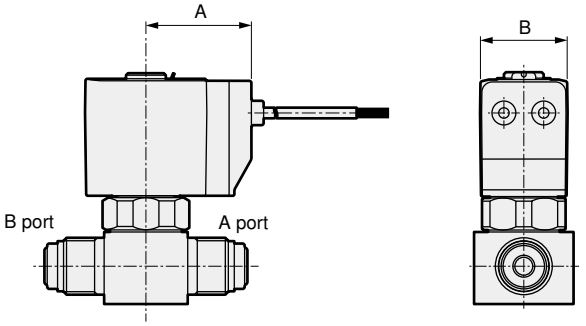
Lead wire length 300 mm

Model No.	A	B	C	D	E	F	G	H	J
HVB212-6N/6	32	14	22	8	45.5	56	NPT1/8	15	M4 x 0.7 depth 6
HVB312-$^{6}_{8}$N/$^{6}_{8}$	36	18	28	11	57.5	68.5	NPT1/8, NPT1/4	18	M5 x 0.8 depth 6
HVB412-$^{8}_{10}$N/$^{8}_{10}$	40	21	34	12	67	81	NPT1/4, NPT3/8	18	M5 x 0.8 depth 8
HVB512-$^{8}_{10}$N/$^{8}_{10}$	40	21	34	12	73.5	89	NPT1/4, NPT3/8	18	M5 x 0.8 depth 8

Optional dimensions

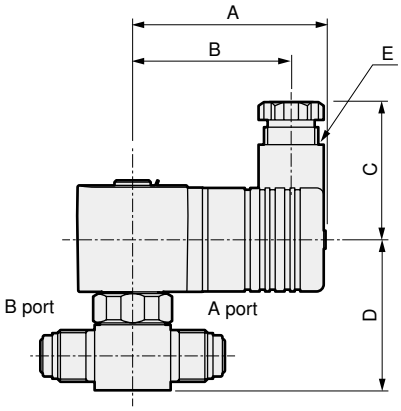
● Grommet lead wire (voltage: AC)/full-wave rectifier HVB*12-*-*- 2CR

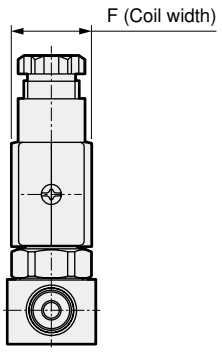
Refer to the dimensions of grommet lead wire (DC type) on pages 486 and 487 for common dimensions.



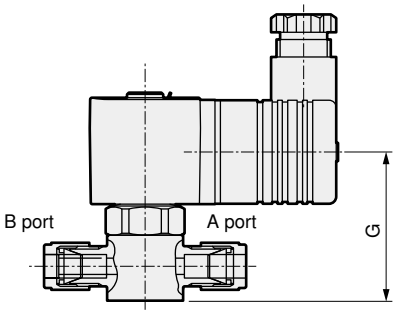
Model No.	A	B
HVB212	26.5	22
HVB312	29.5	28
HVB412	34	34
HVB512	37.5	40

● DIN terminal box (with lamp/surge suppressor)
HVB*12-*-*- 2G 2HS

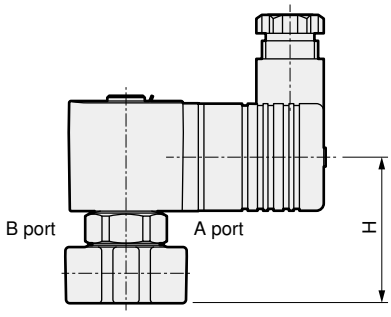




JXR male fitting: 4RM, 6RM



Double barbed fitting: 4S, 6S



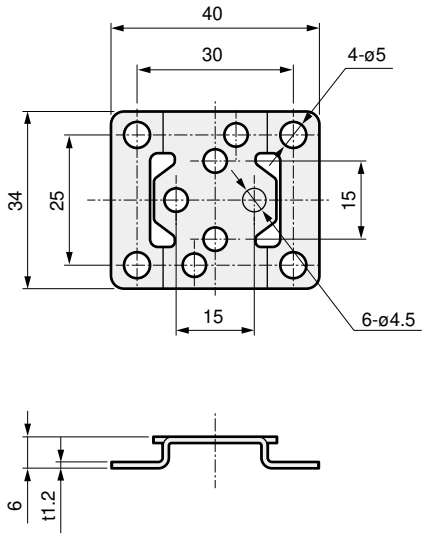
NPT:6N, 8N, 10N
Rc thread: 6, 8, 10

Model No.	A	B	C	D	E	F	G	H
HVB212	53	44	38	41.5	Pg9	22	41.5	39
HVB312	58.5	47	42	47.5	Pg11	28	47.5	51
HVB412	62	50.5	42	59.5	Pg11	34	59.5	61
HVB512	65.5	54	42	67	Pg11	40	67	69.5

Optional dimensions

● Mounting plate
HVB212-*-*-* B

Material: Steel
Nickel plating treatment



● Mounting plate
HVB$^{3}_{4}_{5}$12-*-*-* B

Material: Steel
Nickel plating treatment

