HVB/HVL

Solenoid valve for high vacuum

■ For vacuum, inert gas, air, nitrogen

Overview

Advanced technology, such as stability in the leak amount (vacuum holding force) and increased seal life, is required when the degree of vacuum increases.

The HVB Series introduces special technology throughout for the valve seat shape, seal material and surface processing, etc. A stable performance is realized even at a high vacuum. Use this for various vacuum devices, including electronic beams, molecular accelerators and vacuum deposition.

The HVL Series is the conventional high vacuum solenoid valve to which a device is added to provide a several-second delay when opening the valve. This prevents various troubles in vacuum devices during power failures.

Use this to prevent release to atmospheric pressure at a power failure, or to prevent oil from entering the piping if the manual valve is not properly opened after the power stops.

Features

Special packing seal adopted
FKM with outstanding seal life.

High corrosion proof
Stainless steel is adopted for body.

High vacuum holding force
The low leakage provides a stable vacuum holding force.

Back pressure usable (reverse vacuum)
* Excluding some models

Easy maintenance
Simple structure facilitates maintenance.

CONTENTS

⚠ Always read the precautions in the Introduction and page 414 before starting use.

Safety precautions
Always read this section before starting use.

Solenoid valve for high vacuum (HVB/HVL)

Design & Selection

⚠ CAUTION

1 Working fluid

· The high vacuum device is designed for controlling fluids (inert gas, air, vacuum). If other fluids (active gas, fluids, solids, etc.) are passed, the product will not operate correctly, or its performance could drop markedly.

Installation & Adjustment

⚠ WARNING

1 Installation

· Incorrect mounting and piping will result in product trouble, may cause trouble in the user's system, and may result in death or serious injury. The user is responsible for making sure that the operator has read the instruction manual and fully comprehends the system.

After mounting, carry out an appropriate function test to confirm that the product is correctly mounted.

⚠ CAUTION

1 Direction when connecting pipes (some models)

· The vacuum valve is basically designed so that all connection ports can be connected to the vacuum pump. However, with some models (see below), the connection port to the vacuum pump is limited.

<Table 1> Vacuum pumps with limited connection ports

Model	Vacuum pump connection port
HVB612-12F-12B	Port A
HVB712-15F-15B	Port A

When using the models shown above and using a port other than the designated port when connecting to the vacuum pump, trouble such as a seal fault or operation fault could result.

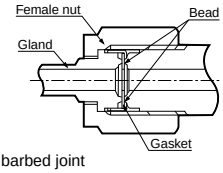
2 Tightening the joint

· Make sure that there is no dirt, scratches or burrs on the seal section before tightening the joint with the following procedures.

(1) Joint tightening method

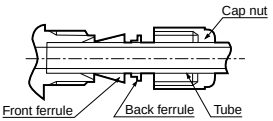
● JXR joint (when gasket material is nickel/SUS316)

Using fingers, tighten the nut until the gasket contacts the bead surface, and then tighten another 1/8 turn with a tool. (Consult with CKD for all other materials.)



● Double barbed joint

Confirm that the front ferrule, back ferrule and nut are properly attached, and then insert the tube until it contacts the back of the body. Tighten the nut as far as possible with fingers, and then tighten 1 1/4 turn with a tool.



(2) After tightening the joint, always carry out a leak test, and confirm that there are no leaks.

3 High temperature caution during solenoid valve coil energizing

· The coil section of the solenoid valve (HVB/HVL) will heat up when energized. Especially, the class H specification coil (some of the HVB coils) will become very hot when energized. There is a risk of burns if these coils are touched directly.

4 Cautions for wiring solenoid valve

(1) As a guide, use a wire with a nominal cross section of 0.5 mm^2 or more. Make sure that excessive force is not applied on the lead wire.

(2) Always use within the allowable voltage range. Use exceeding the allowable voltage range could result in operation faults or coil damage.

(3) Provide a breaker, such as a fuse, on the control circuit side to protect the electric equipment.

(4) Use of a switching circuit which does not generate contact chattering will increase the solenoid valve's durability.

(5) If the electric circuit system is susceptible to solenoid surging, provide measures such as inserting a surge absorber in parallel to the solenoid.

When Using

⚠ CAUTION

1 Electric shock risk: Solenoid valve electrical wiring connections (bare live parts)

· There is a risk of electric shock by touching the electrical wiring connections (bare live parts) of the solenoid valve (HVB/HVL).

Always disconnect the power supply before disassembly and inspection.

Never touch the live parts with wet hands.

New HVB Series high-vacuum solenoid valve maintaining

A new easier-to-use series has been added to the reliable, proven conventional series

HVB 312 Series

HVB 212 Series

HVB 512 Series

Durability 2,000,000 times (*CKD conditions)

This highly reliable high-quality valve provides superior performance even in continuous long-term use.

Power consumption reduced by 40% (CKD comparison)

Power consumption is greatly reduced.
This valve saves power even in long-term use with power on continuously.

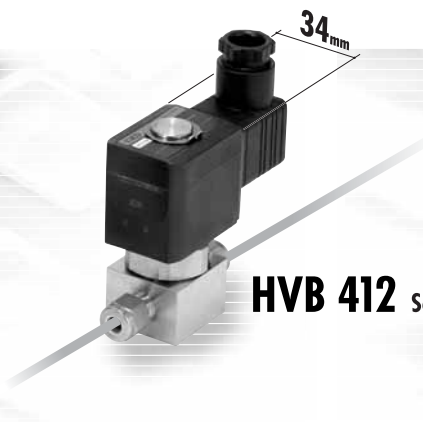
Vacuum leakage: 1 x 10^{-9} Pa・m^3/s or less

The high vacuum has a stable leakage range both inside and outside.

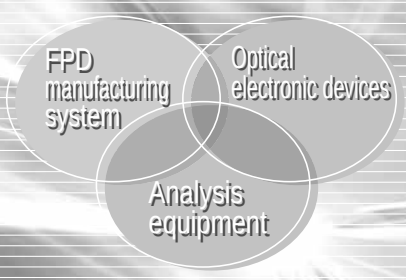
High vacuum solenoid valve

High Vacuum HVB Series

high vacuum degree and providing outstanding durability



HVB 412 Series



Lightweight and compact

This valve is lighter and smaller than the conventional type.

Coil width: 25% smaller

Weight : 23% lighter

Wide variations

Orifices are available in diameters of 1, 2, 3, 4.5,and 6. Coil widths are available at 22, 28, 34, and 40 mm.

Unlimited installation

This valve can be installed to match the installation site, thereby saving space.

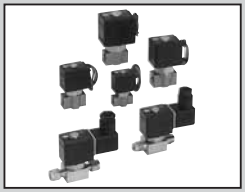
Three connection types

- JXR male threads
  Connectable to
  VCR female threads

- Double barbed joint
  Connectable to
  a swage joint

- NPT

Series variation	Coil width (mm)				Orifice (mm)					Connection		
	22	28	34	40	φ1	φ2	φ3	φ4.5	φ6	JXR	Double barbed joint	NPT
HVB 212 Series	●	●	●		●	●	●			1/4"	1/4"	1/8"
HVB 312 Series	●	●	●		●	●	●			1/4"	1/4"	1/8"・1/4"
HVB 412 Series			●	●			●	●	●	1/4"・3/8"	1/4"・3/8"	1/4"・3/8"
HVB 512 Series				●			●	●	●	1/4"・3/8"	1/4"・3/8"	1/4"・3/8"



Solenoid valve for high vacuum

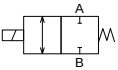
HVB$^{2}_{3}_{4}_{5}$12 Series

- Orifice: ø1, ø2, ø3, ø4.5, ø6
- NC (normally closed) type

CE

JIS symbol

- NC (normally closed) type



Common specifications

Item	HVB*12
Working fluid	Air, vacuum, inert gas (*1)
Withstanding pressure MPa	5.0
Fluid temperature ˚C	5 to 55
Ambient temperature ˚C	0 to 55 (no freezing)
Heat proof class	B
Allowable voltage fluctuation	Rated voltage ±10%
Atmosphere	Not in explosive or corrosive environment
Valve structure	Direct acting poppet structure
Valve seat leakage Pa·m^3/s He	1.0 x 10^{-9} or less (*2)
External leakage Pa·m^3/s He	1.0 x 10^{-9} or less
Mounting attitude	Free
Number of endurance times	2,000,000 times

Individual specifications

Item / Model no.	Port size (*3)	Orifice (mm)	Cv flow factor (*5)	Working pressure range Pa (abs) (*10)	Max. working pressure diff. (*6) (MPa)	Back pressure (*7) (MPa)	Rated voltage	Power consumption (W) AC	Power consumption (W) DC	Weight (*9) (kg)
NC (normally closed) type										
HVB212	1/4" JXR male joint 1/4" double barbed joint NPT 1/8, Rc 1/8	1	0.04	1.0 x 10^{-6} to 1.0 x 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 x 10^{-6} to 0.3 x 10^6	0.3	0.15				
HVB312	1/4" JXR male joint 1/4" double barbed joint NPT 1/8, 1/4, Rc 1/8, 1/4	2	0.17	1.0 x 10^{-6} to 0.8 x 10^6	0.8	0.5		6.5	6	0.29
		3	0.33	1.0 x 10^{-6} to 0.3 x 10^6	0.3	0.25				
HVB412	1/4" JXR male joint 1/4" double barbed joint NPT 1/4, Rc 1/4	3	0.33	1.0 x 10^{-6} to 1.0 x 10^6	1.0	0.4		8.3	8 (*8)	0.50
		4.5	0.6	1.0 x 10^{-6} to 0.3 x 10^6	0.3	0.2				
	3/8" JXR male joint 3/8" double barbed joint NPT 3/8, Rc 3/8	6	1.05	1.0 x 10^{-6} to 0.2 x 10^6	0.1	0.05				
HVB512	1/4" JXR male joint 1/4" double barbed joint NPT 1/4, Rc 1/4	4.5	0.6	1.0 x 10^{-6} to 0.8 x 10^6	0.8	0.2		11.8	11.5	0.69
	3/8"JXR male joint 3/8" double barbed joint NPT 3/8, Rc 3/8	6	1.05	1.0 x 10^{-6} to 0.3 x 10^6	0.3	0.15				

*1: The durability may drop considerably depending on the degree of dryness.
*2: This value applies when port A is the vacuum side.
*3: The JXR joint can be connected with the VCR joint.
*4: Keep the leakage current at the following value or less.
*5: The listed Cv flow factors are for the NPT connection.
*6: The maximum working pressure differential indicates the difference of pressures between port B (high pressure side) and port A (low pressure side).
*7: Pressure at which pressurizing from port A with port B released to atmospheric pressure is possible.
*8: 8.6 (W) at 12 VDC.
*9: The weights listed are for the grommet lead wire and 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 when using.

Leakage current: Voltage / Series	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

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

Symbol	Descriptions	HVB212	HVB312	HVB412	HVB512
Ⓐ Size variation					
2	22 mm	●			
3	28 mm		●		
4	34 mm			●	
5	40 mm				●
Ⓑ Connection (refer to Table 1)					
4RM	1/4" JXR male joint	●	●	●	●
6RM	3/8" JXR male joint			●	●
4S	1/4" double barbed joint	●	●	●	●
6S	3/8" double barbed joint			●	●
6N	NPT 1/8	●	●		
8N	NPT 1/4		●	●	●
10N	NPT 3/8			●	●
6	Rc 1/8	●	●		
8	Rc 1/4		●	●	●
10	Rc 3/8			●	●
Ⓒ Orifice (refer to Table 1)					
Z	ø1	●			
2	ø2	●	●		
3	ø3		●	●	
5	ø4.5			●	●
6	ø6			●	●
Ⓓ Coil option					
For AC					
2CR	Std. Grommet lead wire, All wave rectifier	●	●	●	●
For DC					
2C	Std. Grommet lead wire	●	●	●	●
2CS	Std. Grommet lead wire, Surge suppressor	●	●	●	●
2G	Option DIN terminal box (Pg11)	●	●	●	●
2HS	Option DIN terminal box + light, Surge suppressor (Pg11)	●	●	●	●
Ⓔ Other options					
Blank	Std. Blank	●	●	●	●
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: Joint type and orifice combinations

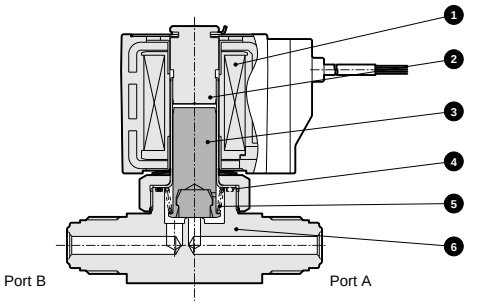
	Connection Ⓑ	Joint type	Size	Orifice Ⓒ Z ø1	2 ø2	3 ø3	5 ø4.5	6 ø6
HVB212	4RM	JXR male	1/4"	●	●			
	4S	Double barbed	1/4"	●	●			
	6N	NPT	1/8"	●	●			
	6	Rc	1/8"	●	●			
HVB312	4RM	JXR male	1/4"		●	●		
	4S	Double barbed	1/4"		●	●		
	6N	NPT	1/8"		●	●		
	8N	NPT	1/4"		●	●		
	6	Rc	1/8"		●	●		
	8	Rc	1/4"		●	●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

HVB212-4RM-2-2CB-DC24V
Series: HVB212
Ⓐ Size variation : 22 mm
Ⓑ Connection : 1/4" JXR male joint
Ⓒ Orifice : ø2
Ⓓ Coil option : Grommet lead wire
Ⓔ Other options : Mounting plate
Ⓕ Voltage : 24 VDC

*1: The surge suppressor is incorporated as standard in the model with full wave rectifier.
*2: A compact terminal box (Pg9) is used when Ⓓ 2G or 2HS is selected for HVB212.

Internal structure and parts list

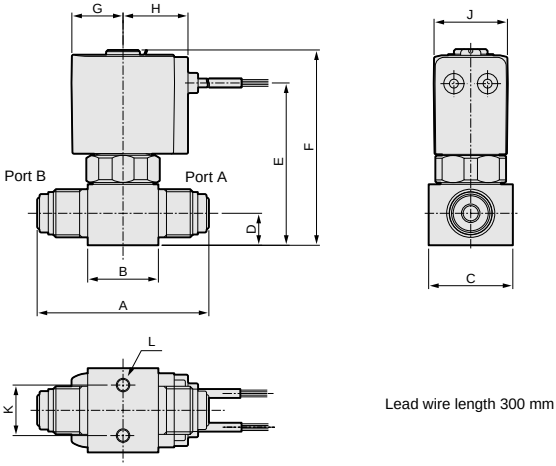


No.	Parts name	Material		No.	Parts name	Material	
1	Coil assembly	(Molded coil)		4	O ring	FKM	Fluoro rubber
2	Core assembly	SUS405, SUS316L	Stainless steel	5	Spring	SUS304	Stainless steel
3	Plunger assembly	SUS405, FKM	Stainless steel, fluoro rubber	6	Body	SUS304 or SCS13	Stainless steel

Dimensions

● Grommet lead wire (voltage: DC type) and JXR male joint type

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



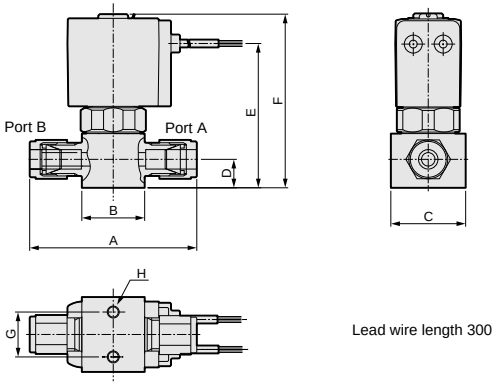
Lead wire length 300 mm

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

● Grommet lead wire (voltage: DC type) and double barbed joint type

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

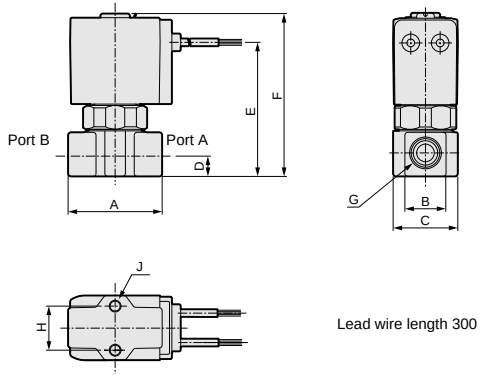


Lead wire length 300

Model no.	A	B	C	D	E	F	G	H
HVB212-4S	56	21	25	9.5	48	58	15	M4 x 0.7 depth 6
HVB312-4S	69	30	25	9.5	53.5	64.5	18	M5 x 0.8 depth 8
HVB412-4S	69	34	32	11.6	66	79.5	18	M5 x 0.8 depth 8
HVB412-6S	80	34	32	11.6	66	79.5	18	M5 x 0.8 depth 8
HVB512-4S	69	34	32	11.6	71.5	86.5	18	M5 x 0.8 depth 8
HVB512-6S	80	34	32	11.6	71.5	86.5	18	M5 x 0.8 depth 8

● Grommet lead wire (voltage: DC type) and NPT type

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



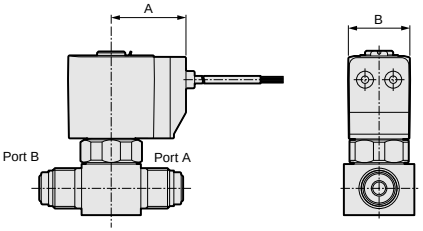
Lead wire length 300

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-$\frac{3}{8}$N/$\frac{3}{8}$	36	18	28	11	57.5	68.5	NPT1/8, NPT1/4	18	M5 x 0.8 depth 6
HVB412-$\frac{8}{10}$N/$\frac{8}{10}$	40	21	34	12	67	81	NPT1/4, NPT3/8	18	M5 x 0.8 depth 8
HVB412-$\frac{8}{10}$N/$\frac{8}{10}$	40	21	34	12	73.5	89	NPT1/4, NPT3/8	18	M5 x 0.8 depth 8

Optional dimensions

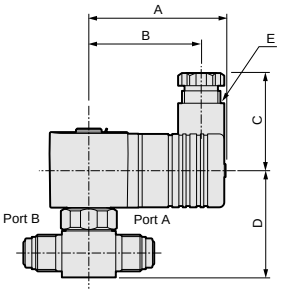
● Grommet lead wire (voltage: AC type) and all wave rectifier
HVB*12-*-*- 2CR

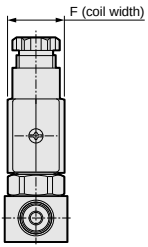
Refer to the grommet lead wire (DC type) dimensions on the previous page for common dimensions.



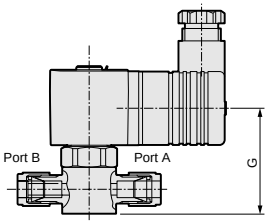
Model no.	A	B
HVB212	26.5	22
HVB312	29.5	28
HVB412	34	34
HVB512	37.5	40

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

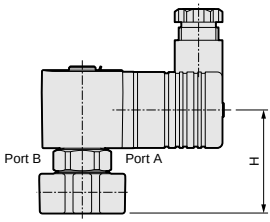




JXR male joint: 4RM, 6RM



Double barbed joint: 4S, 6S

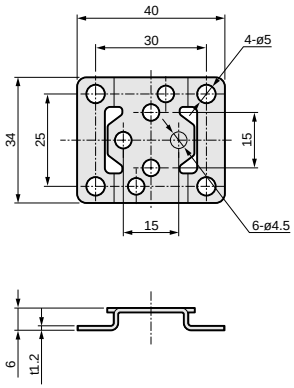


NPT joint: 6N, 8N, 10N

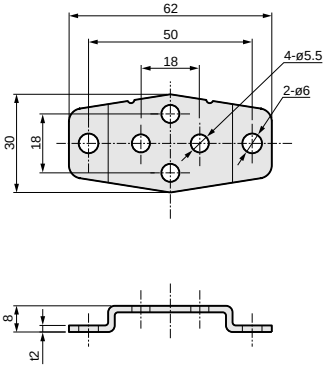
Model no.	A	B	C	D	E	F	G	H
HVB212	53	44	38	41.5	Pg9	22	41.5	39
HVB312	58.5	47	42	47.5	Pg11	28	47.5	51
HVB412	62	50.5	42	59.5	Pg11	34	59.5	61
HVB512	65.5	54	42	67	Pg11	40	67	69.5

Optional dimensions

● Mounting plate
HVB212-*-*-* B



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



Solenoid valve for high vacuum

HVB112 Series

- NC (normally closed) type
- Port size: NPT1/8

JIS symbol

- NC (normally closed) type

Specifications

Item	HVB112-6N-*	HVB112-8R-* (custom order)
Working fluid	Vacuum, inert gas (Note 1)	
Working pressure range Pa (abs)	1.3 x 10^{-6} to 3 x 10^{5} (Note 3)	
Max. working differential pressure MPa	0.3	
Valve seat leakage Pa·m³/s (He)	1.0 x 10^{-9} or less	
External leakage Pa·m³/s (He)	1.0 x 10^{-9} or less	
Withstanding pressure MPa	0.5	
Back pressure (Note 2) MPa	0.2	
Fluid temperature ˚C	5 to 55	
Ambient temperature ˚C	0 to 55	
Orifice mm	1.6	
Cv flow factor	0.09	
Frequency cycle/min. or less	60	
Port size	NPT1/8	1/4 inch VCR female
Mounting attitude	Vertical position with coil facing upward	
Weight kg	0.15	0.24
Electric specifications		
Rated voltage	100, 200 VAC (50/60 Hz), 24 VDC	
Allowable voltage fluctuation	Rated voltage ±10%	
Power consumption W	4.0	
Heat proof class	B	
Temperature rise K	70	

Note 1: The durability may drop considerably depending on the degree of dryness.
Note 2: Pressure at which pressurizing from port A with port B released to atmospheric pressure is possible.
Note 3: The working pressure range vacuum does not guarantee the vacuum attainment time or that the vacuum will not fluctuate.
Note 4: FKM is used for sealant material, so consider the generation of discharge gas when using.

How to order

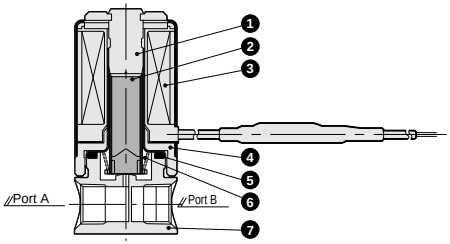
HVB 112 - **6N** - 5 - **AC100V**

- HVB: Model no.
- 6N: Ⓐ Port size
- 5: Orifice ø1.6
- AC100V: Ⓑ Voltage

Symbol	Descriptions
Ⓐ Port size	
6N	NPT1/8
8R	1/4" VCR female joint (custom order)
Ⓑ Voltage	
AC100V	100 VAC (50/60 Hz)
AC200V	200 VAC (50/60 Hz)
DC24V	24 VDC

Note: The older model HVB11-6N-5 is equivalent to the HVB112-6N-5.

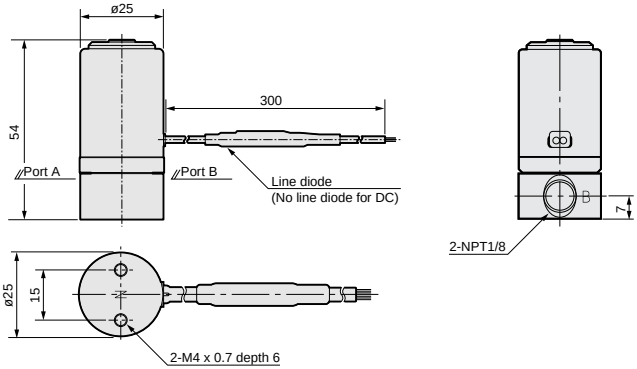
Internal structure and parts list



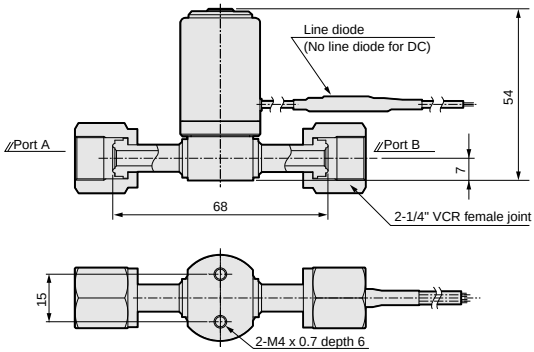
No.	Parts name	Material
1	Core assembly	SUS316 SUS405
2	Plunger assembly	SUS405 FKM
3	Coil assembly	
4	Core B	SUM22
5	O ring	FKM
6	Spring	SUS304
7	Body	SUS303

Dimensions and optional dimensions

● HVB112



● VCR joint (custom order)
HVB112- 8R



Note: The DC specifications are not provided with a line diode.

Solenoid valve for high vacuum

HVB41 Series

- NC (normally closed) type
- Port size: NPT1/4 (with O ring sheet)

JIS symbol

- NC (normally closed) type

Specifications

Item	HVB41-8N-*	HVB41-8R-* (custom order)
Working fluid	Vacuum, inert gas (Note 1)	
Working pressure range Pa (abs)	1.3 x 10^{-6} to 3 x 10^{5} (Note 3)	
Max. working differential pressure MPa	0.3	
Valve seat leakage Pa·m³/s (He)	1.0 x 10^{-9} or less	
External leakage Pa·m³/s (He)	1.0 x 10^{-9} or less	
Withstanding pressure MPa	0.5	
Back pressure (Note 2) MPa	0.2	
Fluid temperature ˚C	5 to 55	
Ambient temperature ˚C	0 to 55	
Orifice mm	5	
Cv flow factor	0.67	0.47
Frequency cycle/min. or less	30	
Port size	NPT1/4 (with O ring seat)	1/4 inch VCR female
Mounting attitude	Vertical position with coil facing upward	
Weight kg	0.79	0.86
Electric specifications		
Rated voltage	100, 200 VAC (50/60 Hz), 24 VDC	
Allowable voltage fluctuation	Rated voltage ±10%	
Power consumption W	14	
Heat proof class	B	
Temperature rise K	80	

Note 1: The durability may drop considerably depending on the degree of dryness.
Note 2: Pressure at which pressurizing from port A with port B released to atmospheric pressure is possible.
Note 3: The working pressure range vacuum does not guarantee the vacuum attainment time or that the vacuum will not fluctuate.
Note 4: FKM is used for sealant material, so consider the generation of discharge gas when using.

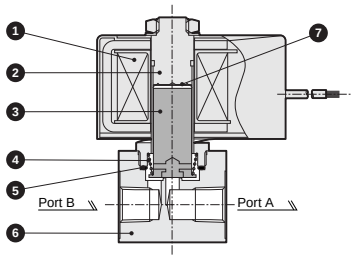
How to order

HVB 41 - 8N - 5 - 3M - AC100V

- HVB 41: Model no.
- 5: Orifice ø5
- A Connection: 8N
- B Option: 3M
- C Voltage: AC100V

Symbol	Descriptions
A Connection	
8N	NPT1/4 (with O ring sheet)
8R	1/4 " VCR female joint (custom order)
B Option	
Blank	Blank
3M	HP terminal box G1/2
3N	HP terminal box + light G1/2
B	Mounting plate
C Voltage	
AC100V	100 VAC (50/60 Hz)
AC200V	200 VAC (50/60 Hz)
DC24V	24 VDC

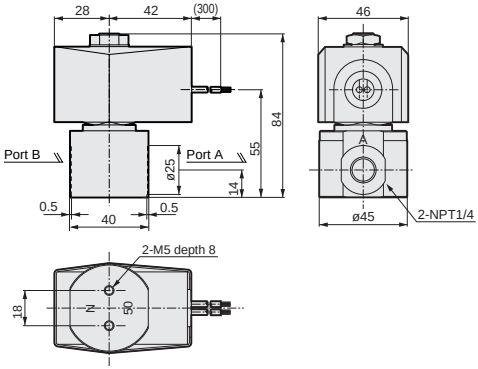
Internal structure and parts list



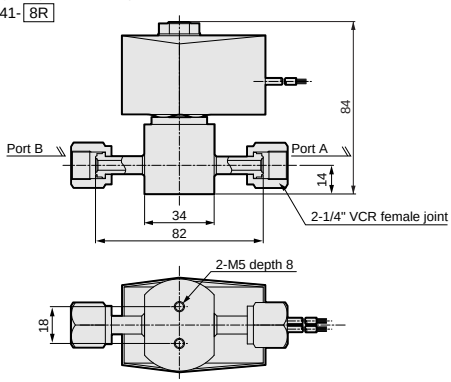
No.	Parts name	Material
1	Coil assembly	
2	Core assembly	SUS405 SUS403 SUS316L
3	Plunger assembly	SUS405 FKM PET
4	Spring	SUS304
5	O ring	FKM
6	Body	SUS303
7	Cushion plate	PET

Dimensions and optional dimensions

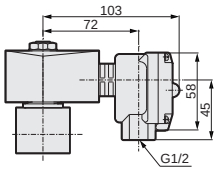
● HVB41-8N



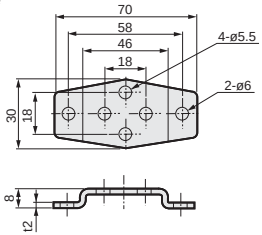
● VCR joint (custom order)
HVB41-[8R]

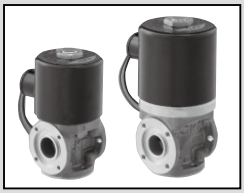


● Square terminal box
HVB41-*-*-[3M] [3N]



● Mounting plate
HVB41-*-*-[B]





Solenoid valve for high vacuum

HVB$^{6}_{7}$12 Series

- NC (normally closed) type
- Port size: ø48, ø52 flange

JIS symbol

- NC (normally closed) type

Specifications

Model no.		HVB612-12F			HVB712-15F			
Item		-8B	-8H	-12B	-12B	-12H	-15B	-15H
Working fluid		Vacuum, inert gas (Note 1)						
Working pressure range	Pa (abs)	1.3×10^{-6} to 2.0×10^{5}	1.3×10^{-6} to 3.0×10^{5}	1.3×10^{-6} to 1.0×10^{5}	1.3×10^{-6} to 1.5×10^{5}	1.3×10^{-6} to 3.0×10^{5}	1.3×10^{-6} to 1.0×10^{5}	1.3×10^{-6} to 1.0×10^{5}
Max. working differential pressure	MPa	0.2	0.3	0.1	0.15	0.3	0.1	0.1
Orifice	mm	8		12	12		15	
Cv flow factor	Axial	1.8		2.7	3.2		4.3	
	Radial	2.1		3.2	3.6		4.7	
Back pressure (Note 2)	MPa	0.1		0.02	0.1		0.02	0.1
Valve seat leakage	$Pa \cdot m^3/s$ (He)	1.0×10^{-9} or less						
External leakage	$Pa \cdot m^3/s$ (He)	1.0×10^{-9} or less						
Withstanding pressure	MPa	0.5						
Fluid temperature	°C	5 to 55						
Ambient temperature	°C	0 to 55						
Frequency	cycle/min. or less	10						
Mounting attitude		Free						
Port size		ø48 flange			ø52 flange			
Weight	kg	1.15			2.0			
Electric specifications								
Rated voltage		100, 200 VAC (50/60 Hz), 24 VDC						
Allowable voltage fluctuation		Rated voltage ±10%						
Power consumption	W	14.3	28	14.3	19	AC: 32.5 DC: 40	19	AC: 32.5 DC: 40
Heat proof class		B	H	B	B	H	B	H
Temperature rise	K	75	125	75	75	125	75	125

Note 1: The durability may drop considerably depending on the degree of dryness.
Note 2: Pressure at which pressurizing from port A with port B released to atmospheric pressure is possible.
(Note that the reverse vacuum is not available for HVB612-12F-12B and HVB712-15F-15B.)
Note 3: Grease for high vacuum is used on the wetted O ring.

How to order

HVB 6 12 - 12F - 8 B - 3N - AC100V

Model no.

Ⓐ Size variation

Ⓑ Size variation

Ⓒ Orifice

Ⓓ Heat proof class *1

Ⓔ Option *2

Ⓕ Voltage

Symbol	Descriptions	Model no. HVB712	Model no. HVB612
Ⓐ Size variation			
6	60 mm	●	
7	70 mm		●
Ⓑ Connection			
12F	ø48 flange	●	
15F	ø52 flange		●
Ⓒ Orifice			
8	ø8	●	
12	ø12	●	●
15	ø15		●
Ⓓ Heat proof class			
B	Class B	●	●
H	Class H	●	●
Ⓔ Option			
Blank	Blank	●	●
3M	HP terminal box G1/2	●	●
3N	HP terminal box + light G1/2	●	●
F	Companion flange	●	●
3MF	HP terminal box G1/2 + companion flange	●	●
3NF	HP terminal box + light G1/2 + companion flange	●	●
Ⓕ Voltage			
AC100V	100 VAC (50/60 Hz)	●	●
AC200V	200 VAC (50/60 Hz)	●	●
DC24V	24 VDC	●	●

<Example of model number>

HVB612-12F-8B-3N-AC100V

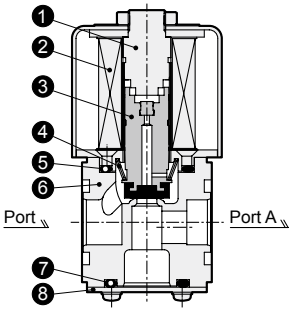
Series: HVB612

- Ⓐ Size variation : 60 mm
- Ⓑ Connection : ø48 flange
- Ⓒ Orifice : ø8
- Ⓓ Heat proof class : Class B
- Ⓔ Option : HP terminal box + light G1/2
- Ⓕ Voltage : 100 VAC (50/60 Hz)

⚠ Note on model no. selection

*1: Ⓓ H is not available for HVB612 orifice ø12.
*2: Ⓔ 3M/3N/3MF/3NF are not available for AC voltage specifications when H is selected for Ⓓ.
*3: Consult with CKD for details on joints (double barbed, JXR) other than listed above.

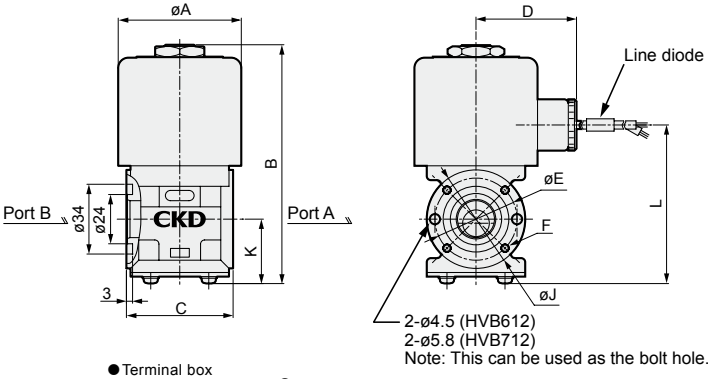
Internal structure and parts list



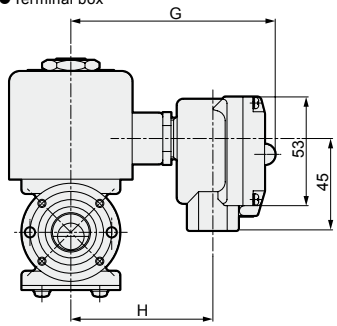
No.	Parts name	Material
1	Core assembly	SUS405, SUS316, SUS403
2	Coil assembly	
3	Plunger assembly	SUS405, FKM, PFA, PET
4	Spring	SUS304
5	O ring	FKM
6	Body	SCS13
7	O ring	FKM
8	Base cover	SUS304

Dimensions and optional dimensions

●HVB6712



●Terminal box

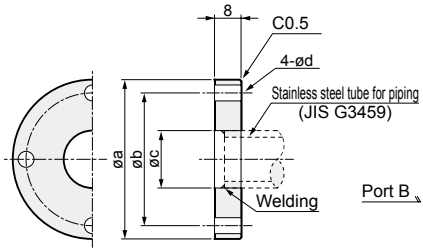


Model no.	Dimensions										
	A	B	C	D	E	F	G	H	J	K	L
HVB612	60	117	52	49	40	4-M4	101	70	48	32	77
HVB712	70	145	55	54	42.4	4-M5	106	75	52	33	107

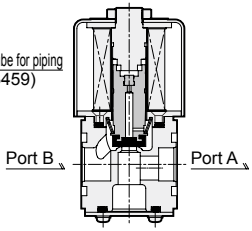
Note: The line diode is enclosed only with the heat proof class H AC specifications. Thus, the terminal box cannot be assembled with this series.
Note: The mounting bolts and applicable O-rings are enclosed when the companion flange is ordered.

Dimensions

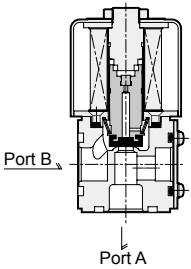
● Companion flange dimensions



● Axial piping



● Radial piping



Companion flange dimension

Model no.	Companion flange dimensions				Mounting bolt	O ring
	a	b	c	d		
HVB612	48	40±0.2	17.3 +0.5 0	4.8	M4-14	JIS B2401 V-24
HVB712	52	42.4±0.2	21.7 +0.5 0	5.8	M5-14	

*The mounting bolts and applicable O-rings are enclosed when the companion flange is ordered.