

HNB^B_G1/USB^B_G2/USB^B_G3

Compact direct acting 2, 3 port solenoid valve

■ For air, water, dry air, low vacuum (1.33 x 10² Pa (abs))



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▲ Always read the precautions in the Introduction and page 2 before starting use.

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
AD

APK/
ADK

For
dry air

Explosion
proof

HVB/
HVL

SAB/
SVB

NP/NAP/
NVP

CHB/G

MXB/G

Other G.P.
systems

PD/FAD/
PJ

CVE/
CVSE

CPE/
CPD

Medical
analysis

Custom
order

Compact direct acting 2, 3 port solenoid valve



Safety precautions

Always read this section before starting use.

Compact direct acting 2, 3 port solenoid valve

Design & Selection

WARNING

1 Working fluid

- (1) When using this valve for dry air, the life can be shortened considerably due to wear. Use a valve for dry air.
- (2) This valve cannot be used for maintaining the vacuum. Consult with CKD when the vacuum needs to be maintained.

CAUTION

1 Continuous energizing

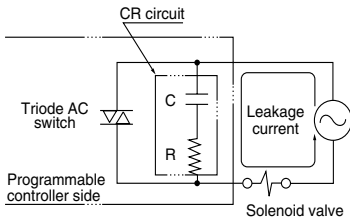
Consult with CKD when using the 3 port valve in a continuously energized state.

2 Fluid viscosity

The fluid viscosity must be 50 mm²/s or less. Malfunctions could occur if the viscosity is higher than 50 mm²/s.

3 Leakage current from other fluid control components

When operating the solenoid valve with a programmable controller, etc., check that the output leakage current from the programmable controller is within the following specifications. Failure to observe this could lead to malfunctions.



Model no.	Voltage		AC		AC diode		DC	
	100 V	200 V	100 V	200 V	12 V	24 V	12 V	24 V
USB, USG	—	—	0.2 mA or less	0.1 mA or less	2 mA or less	1 mA or less	1 mA or less	1 mA or less
HNB, HNG	—	—	—	—	1 mA or less	1 mA or less	1 mA or less	1 mA or less

Installation, Piping & Wiring

CAUTION

1 Piping

Always hold the socket with a spanner, etc., if the NO side is a socket.

Maintenance

CAUTION

1 For USB/USG

When disassembling or assembling, tighten the core assembly and socket with the following tightening torques.

Model no.	Core assembly tightening torque	Socket tightening torque
USB2	10 to 22 N·m	-
USG2	10 to 22 N·m	-
USB3	18 to 32 N·m	-
USG3	18 to 32 N·m	4 to 8 N·m

<<Precautions for each model>>

USB/USG (resin body type)

CAUTION

1 Metal is wetted. (This is not a metal free valve.)

Do not use a metal (M6) joint because it could damage the port.

2 Use a PP or fluorine resin joint. Refer to the recommended torque below.

Recommended tightening torque: 0.1 to 0.15 N·m

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order

Compact direct acting 2, 3 port solenoid valve



Compact direct acting 2 port solenoid valve



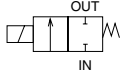
HNB1 Series

- NC (normally closed) type
- Port size: M5



JIS symbol

- NC (normally closed) type



Specifications

Item	HNB1-M5
Working fluid	Air, water, dry air, low vacuum (1.33 x 10 ² Pa (abs))
Working pressure differential range MPa	0 to 0.7
Withstanding pressure (water) MPa	1.0
Fluid temperature °C	-10 to 40 (no freezing)
Ambient temperature °C	-20 to 40 (no freezing)
Valve seat leakage cm ³ /min.	0 (water pressure)
Mounting attitude	Free
Weight g	43
Port size	M5
Orifice mm	1.0
Cv flow factor	0.03
C [dm ³ /(s·bar)]	0.11
b	0.34
Electric specifications	
Rated voltage	24 VDC (option: 12 VDC)
Allowable voltage fluctuation	±10%
Power consumption W	2.5
Leakage current mA	1 or less
Heat proof class	B

*1: Effective sectional area S and sonic conductance C are converted as S = 5.0 x C.

How to order



Model no.

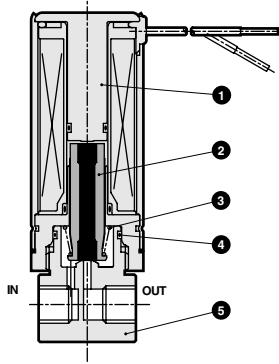
Port size
M5

Rated voltage

Symbol	Descriptions
A Rated voltage	
DC24V	24 VDC
DC12V	12 VDC

Internal structure and parts list

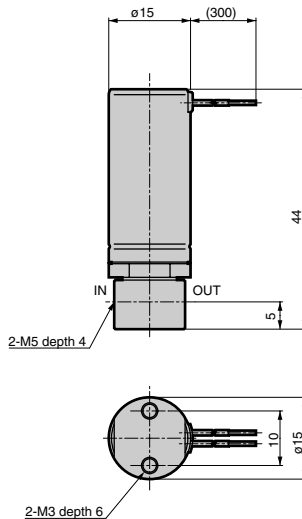
● HNB1



No.	Parts name	Material	
1	Core assembly	PPS, STKM, SUS	Resin, stainless steel
2	Plunger assembly	SUS, NBR	Stainless steel, nitrile rubber
3	Spring	SUS304	Stainless steel
4	O ring	NBR	Nitrile rubber
5	Body	SUS303	Stainless steel

Dimensions (Page 20)

● HNB1



HNB/G
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FWB/G
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AP/ AD
APK/ ADK
For dry air
Explosion proof
HVB/ HVL
SAB/ SVB
NP/NAP/ NVP
CHB/G
MXB/G
Other G.P. systems
PD/FAD/ PJ
CVB/ CVSE
CPE/ CPD
Medical analysis
Custom order

Compact direct acting 2 port solenoid valve



Compact direct acting 3 port solenoid valve



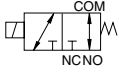
HNG1 Series

- Universal type
- Port size: M5



JIS symbol

- Universal type



Specifications

Item	HNG1-M5
Working fluid	Air, water, dry air, low vacuum (1.33×10^2 Pa (abs))
Working pressure differential range: MPa	0 to 0.7 (NO pressurization: 0 to 0.3)
Withstanding pressure (water) MPa	1.0
Fluid temperature °C	-10 to 40 (no freezing)
Ambient temperature °C	-20 to 40 (no freezing)
Valve seat leakage cm ³ /min.	0 (water pressure)
Mounting attitude	Free
Weight g	46
Port size	M5
Orifice mm	1.0
Cv flow factor	0.03
C [dm ³ /(s·bar)]	0.11
b	0.34
Electric specifications	
Rated voltage	24 VDC (option: 12 VDC)
Allowable voltage fluctuation	±10%
Power consumption W	2.5
Leakage current mA	1 or less
Heat proof class	B

*1: Effective sectional area S and sonic conductance C are converted as $S = 5.0 \times C$.

How to order



Model no.

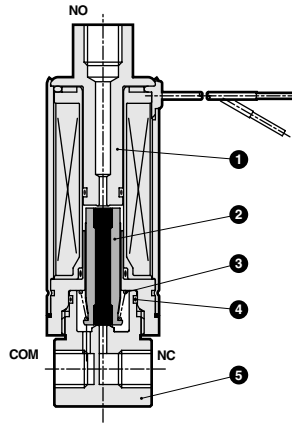
Port size
M5

Rated voltage

Symbol	Descriptions
A Rated voltage	
DC24V	24 VDC
DC12V	12 VDC

Internal structure and parts list

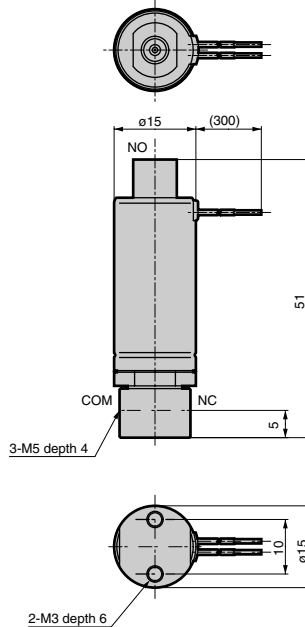
● HNG1



No.	Parts name	Material	
1	Core assembly	PPS, STKM, SUS	Resin, stainless steel
2	Plunger assembly	SUS, NBR	Stainless steel, nitrile rubber
3	Spring	SUS304	Stainless steel
4	O ring	NBR	Nitrile rubber
5	Body	SUS303	Stainless steel

Dimensions  (Page 20)

● HNG1



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Medical
analysis

Custom
order

Custom
order

Compact direct acting 3 port solenoid valve



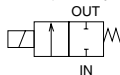
USB2 Series

- NC (normally closed) type
- Port size: M5



JIS symbol

- NC (normally closed) type



Specifications

Item	USB2-M5-1	USB2-M5-2
Working fluid	Air, water, dry air, low vacuum (1.33 x 10 ² Pa (abs))	
Working pressure differential range MPa	0 to 0.7	0 to 0.3
Withstanding pressure (water) MPa	1.5	
Fluid temperature °C	-10 to 60 (no freezing)	
Ambient temperature °C	-20 to 50	
Valve seat leakage cm ³ /min.	0.2 or less (pneumatic pressure)	
Mounting attitude	Free	
Weight kg	0.07	
Port size	M5	M5
Orifice mm	1	1.5
Cv flow factor	0.03	0.06
C [dm ³ /(s·bar)]	0.13	0.28
b	0.57	0.46
Electric specifications		
Rated voltage	12 VDC, 24 VDC (option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Allowable voltage fluctuation	±10%	
Power consumption W	DC	3
	AC	4
Heat proof class	B	

*1: For use with water when the solenoid valve is not used for a long time, the high corrosion resistant solenoid valve HB Series (page 807) is recommended.

*2: Effective sectional area S and sonic conductance C are converted as S = 5.0 x C.

How to order



Model no.

Port size
M5

A Orifice

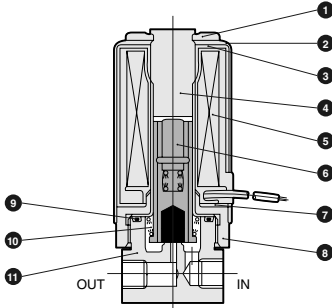
B Body/
sealant
combination

C Voltage

Symbol	Descriptions		
A Orifice			
1	ø1.0		
2	ø1.5		
B Body/sealant combination			
	Body	Sealant	Treatment
Blank	Stainless steel	Nitrile rubber	-
L			-
0	Brass	-	-
C Voltage			
DC12V	Option \$/ct.	12 VDC	
DC24V		24 VDC	
AC100V		100 VAC 50/60 Hz	
AC200V		200 VAC 50/60 Hz	

Internal structure and parts list

● USB2-M5

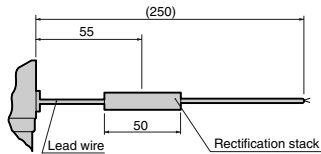
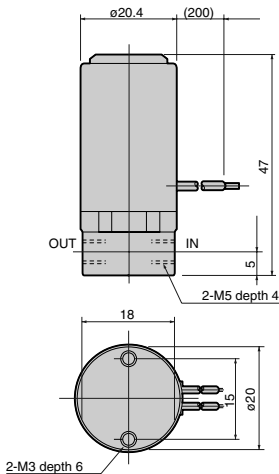


No.	Parts name	Material	
1	Clip	PBT	PBT
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS405 or equivalent, SUS316L	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equivalent, SUS303, NBR	Stainless steel, nitrile rubber
7	Waving washer	S65CM	Steel
8	Core B	SUM22	Free cutting steel
9	O ring	NBR	Nitrile rubber
10	Plunger spring	SUS304	Stainless steel
11	Body	SUS303 (C3604)	Stainless steel (brass)

() shows option.

Dimensions (Page 20)

● USB2-M5



The alternating current (AC) type has a rectification stack assembled into the lead wire.

HNB/G
 USB/G
 FAB/G
 FGB/G
 FVB
 FWB/G
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 SVB
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 CHB/G
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 Other G.P.
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 CVE/
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 CPE/
 CPD
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 analysis
 Custom
 order

Compact direct acting 2 port solenoid valve



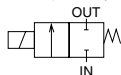
USB3 Series

- NC (normally closed) type
- Port size: Rc1/8



JIS symbol

- NC (normally closed) type



Specifications

Item	USB3-6-1	USB3-6-2	USB3-6-3
Working fluid	Air, water, dry air, low vacuum (1.33 x 10 ² Pa (abs))		
Working pressure differential range MPa	0 to 0.9	0 to 0.4	0 to 0.1
Withstanding pressure (water) MPa	2		
Fluid temperature °C	-10 to 60 (no freezing)		
Ambient temperature °C	-20 to 50		
Valve seat leakage cm ³ /min.	0.2 or less (pneumatic pressure)		
Mounting attitude	Free		
Weight kg	0.13		
Port size	Rc1/8	Rc1/8	Rc1/8
Orifice mm	1.6	2.3	3.2
Cv flow factor	0.09	0.18	0.3
C [dm ³ /(s·bar)]	0.34	0.64	1.2
b	0.56	0.51	0.48

Electric specifications

Rated voltage	12 VDC, 24 VDC (option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)		
Allowable voltage fluctuation	±10%		
Power consumption W	DC	4	
	AC	4	
Heat proof class	E (molded coil: B)		

*1: For use with water when the solenoid valve is not used for a long time, the high corrosion resistant solenoid valve HB Series (page 807) is recommended.

*2: Effective sectional area S and sonic conductance C are converted as S = 5.0 x C.

How to order



Model no.

Port size
Rc1/8

A Orifice

B Body/sealant/coil combination

Symbol	Descriptions
A Orifice	
1	ø1.6
2	ø2.3
3	ø3.2

B Body/sealant/coil combination					
	Body	Sealant	Coil	Treatment	
Blank	Std.	Brass	Nitrile rubber	Taped	-
B	Option	Stainless steel	Fluoro rubber	Molded coil	Vacuum inspection *3
V			Nitrile rubber		
D			Fluoro rubber		
E			Fluoro rubber	Taped	Oil free
W			Nitrile rubber		
H	Brass	Nitrile rubber	Molded coil	Oil free	
J	Stainless steel	Fluoro rubber			
L		Nitrile rubber			
M	Fluoro rubber				

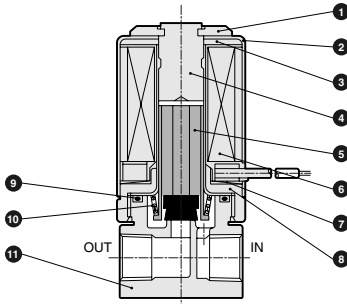
C Voltage

C Voltage	
DC12V	Std. 12 VDC
DC24V	24 VDC
AC100V	Option 100 VAC 50/60 Hz
AC200V	200 VAC 50/60 Hz

*3: For option symbols V and W, vacuum is inspected at "leakage amount: 1.33 x 10⁻⁶ Pa·m³/s or less".

Internal structure and parts list

● USB3-6

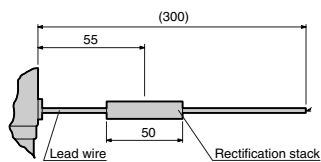
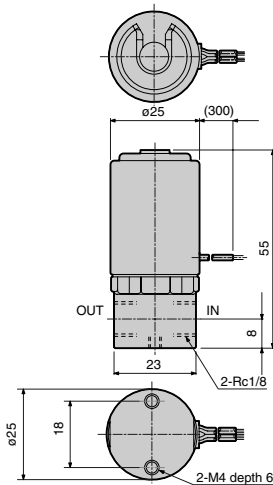


No.	Parts name	Material	
1	Clip	PBT	PBT
2	Bonnet	SPC	Steel
3	Bonnet piece	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Plunger assembly	SUS405 or equivalent, NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
6	Coil assembly	-	-
7	Waving washer	S65CM	Steel
8	Core B	SUM22	Free cutting steel
9	O ring	NBR (FKM)	Nitrile rubber (fluoro rubber)
10	Plunger spring	SUS304	Stainless steel
11	Body	C3604 (SUS303)	Brass (stainless steel)

() shows option.

Dimensions (Page 20)

● USB3-6



The alternating current (AC) type has a rectification stack assembled into the lead wire.

HNB/G

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FAB/G

FGB/G

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Compact direct acting 2 port solenoid valve