



Compact direct acting 2-port solenoid valve

USB2 Series

- NC
- Port size: M5



EXA

FWD

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
AD

APK/
ADK

DryAir

EX-
XPLNprf

XPLNprf

HVB/
HVL

SAB/
NAB

LAD/
NAD

Water-
Rela

NP/NAP/
NVP

SNP

CHB/G

MXB/G

Other
valves

SWD/
MWD

DustColl

CVE/
CVSE

CCH /
CPE/D

LifeSci

Gas-
Combus

Auto-
Water

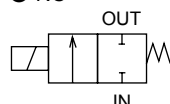
SpecFld

Custom

Ending

JIS symbol

- NC



Specifications

Descriptions	USB2-M5-1	USB2-M5-2
Working fluid	Air, water, dry air, low vacuum [1.33×10^2 Pa(abs)]	
Working pressure differential MPa	0 (≈ 0 psi, 0 bar) to 0.7 (≈ 100 psi, 7 bar)	0 (≈ 0 psi, 0 bar) to 0.3 (≈ 44 psi, 3 bar)
Proof pressure (water pressure) MPa	1.5 (≈ 220 psi, 15 bar)	
Fluid temperature °C	-10 (14°F) to 60 (140°F) (no freezing)	
Ambient temperature °C	-20 (-4°F) to 50 (122°F)	
Valve seat leakage cm ³ /min	0.2 or less (air)	
Mounting orientation	Unrestricted	
Weight kg	0.07	
Port size	M5	M5
Orifice size mm	1	1.5
Cv	0.03	0.06
C[dm ³ /(s·bar)]	0.13	0.28
b	0.57	0.46
Electrical specifications		
Rated voltage	12 VDC, 24 VDC (Option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Voltage fluctuation range	$\pm 10\%$	
Power	DC	3
consumption W	AC	4
Thermal class	Class 130 (B)	

*1 : If the solenoid valve will remain inactive for long periods when using water, the HB Series high corrosion proof solenoid valve (page 921) is recommended.

*2 : Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

*3 : When using at low vacuum, vacuum the OUT port side.

How to order

USB2 - M5 - 1 - 0 - DC24V

Model No.

Port size
M5

A Orifice

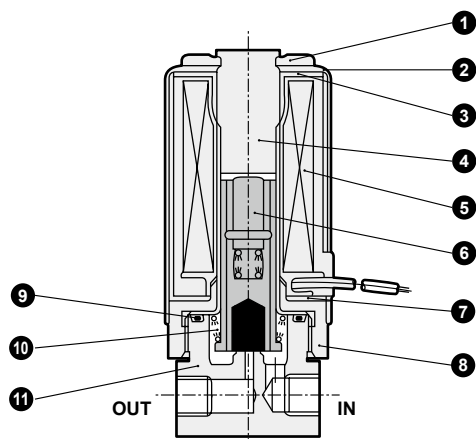
B Body/
sealant combination

C Voltage

Code	Content		
A Orifice			
1	φ1.0		
2	φ1.5		
B Body/sealant combination			
	Body	Seal	Treatment
Blank	Stainless steel	Nitrile rubber	-
L			Oil free
0	Copper alloy		-
C Voltage			
DC12V	Standard	12 VDC	
DC24V		24 VDC	
AC100V	Option	100 VAC 50/60 Hz	
AC200V		200 VAC 50/60 Hz	

Internal structure and parts list

● USB2-M5



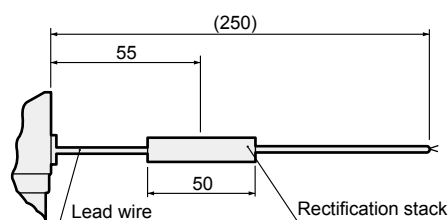
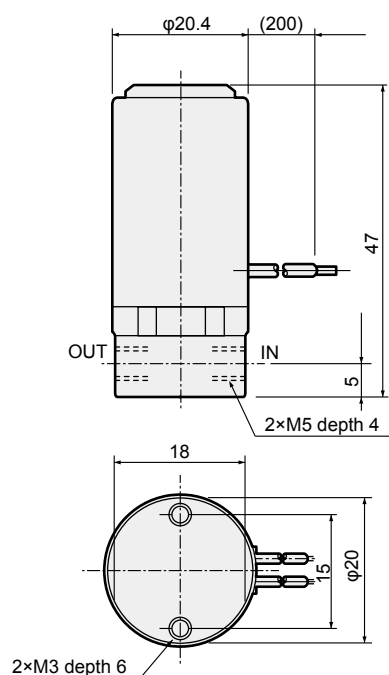
No.	Part name	Material	
1	Clip	PBT	Polybutylene terephthalate
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS405 or equiv., SUS316	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equiv., SUS303, NBR	Stainless steel, nitrile rubber
7	Wave washer	S65CM	Steel
8	Core B	SUM22	Free-cutting steel
9	O-ring	NBR	Nitrile rubber
10	Plunger spring	SUS304	Stainless steel
11	Body	SUS303(C3604)	Stainless steel (copper alloy)

() shows options.

Dimensions



● USB2-M5



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



Compact direct acting 2-port solenoid valve

USB3 Series

- NC
- Working fluids: Air, water, dry air, low vacuum
- Port size: Rc1/8



EXA
FWD
HNB/G
USB/G

FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK

DryAir
EX-
XPLNprf
XPLNprf
HVB/
HVL
SAB/
NAB
LAD/
NAD
Water-
Rela
NP/NAP/
NVP

SNP
CHB/G
MXB/G
Other
valves
SWD/
MWD
DustColl

CVE/
CVSE
CCH /
CPE/D
LifeSci

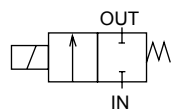
Gas-
Combus
Auto-
Water
SpecFld

Custom

Ending

JIS symbol

● NC



Specifications

1 MPa = 10 bar

Descriptions	USB3-6-1	USB3-6-2	USB3-6-3
Working fluid	Air, water, dry air, low vacuum [1.33×10^2 Pa(abs)]		
Working pressure differential MPa	0 (≈ 0 psi) to 0.9 (≈ 130 psi)	0 (≈ 0 psi) to 0.4 (≈ 58 psi)	0 (≈ 0 psi) to 0.1 (≈ 15 psi)
Proof pressure (water pressure) MPa	2 (≈ 290 psi, 20 bar)		
Fluid temperature °C	-10 (14°F) to 60 (140°F) (no freezing)		
Ambient temperature °C	-20 (-4°F) to 50 (122°F)		
Valve seat leakage cm ³ /min	0.2 or less (air)		
Mounting orientation	Unrestricted		
Weight kg	0.13		
Port size	Rc1/8	Rc1/8	Rc1/8
Orifice size mm	1.6	2.3	3.2
Cv	0.09	0.18	0.3
C[dm ³ /(s·bar)]	0.34	0.64	1.2
b	0.56	0.51	0.48

Electrical specifications

Rated voltage		12 VDC, 24 VDC (Option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Voltage fluctuation range		±10%	
Power	DC	4	
consumption W	AC	4	
Thermal class		Class 120 (E) (molded coil: class 130 (B))	

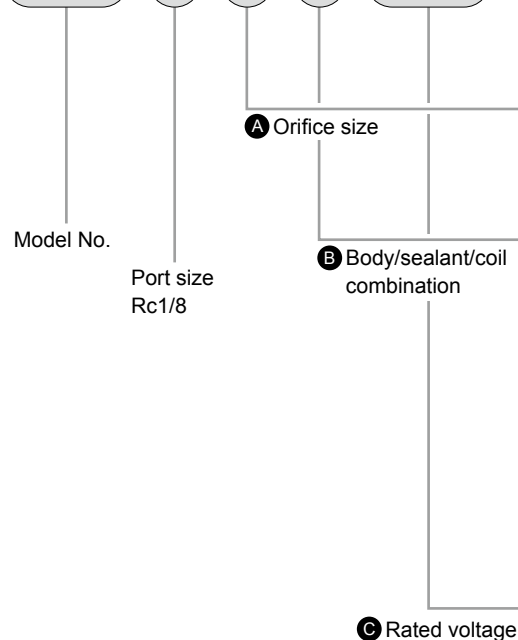
*1 : If the solenoid valve will remain inactive for long periods when using water, the HB Series high corrosion proof solenoid valve (page 921) is recommended.

*2 : Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

*3 : When using at low vacuum, vacuum the OUT port side.

How to order

USB3 - 6 - 1 - B - DC24V

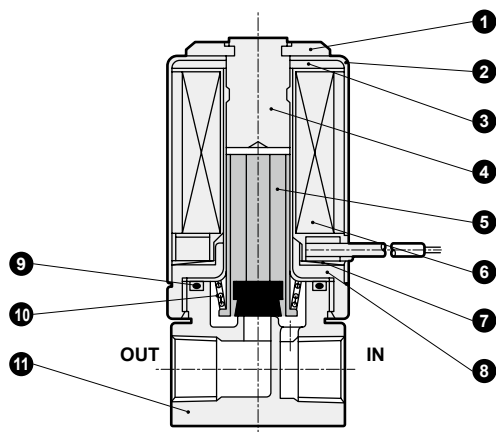


Code		Content			
A Orifice size					
1	φ1.6				
2	φ2.3				
3	φ3.2				
B Body/sealant/coil combination					
		Body	Seal	Coil	Treatment
Blank	Std.	Copper alloy	Nitrile rubber	Taped	-
B	Option		Fluoro rubber	Molded coil	Vacuum inspection (Note)
V					
D		Stainless steel	Nitrile rubber		-
E			Fluoro rubber	Vacuum inspection (Note)	
W		Copper alloy	Nitrile rubber	Taped	Oil free
H			Fluoro rubber	Molded coil	
J			Nitrile rubber		
L			Stainless steel		
M			Fluoro rubber		
C Rated voltage					
DC12V	Standard	12 VDC			
DC24V		24 VDC			
AC100V	Option	100 VAC 50/60 Hz			
AC200V		200 VAC 50/60 Hz			

(Note) For option codes "V" and "W", vacuum is inspected at "leakage rate: 1.33×10^{-6} Pa·m³/s or less".

Internal structure and parts list

● USB3-6



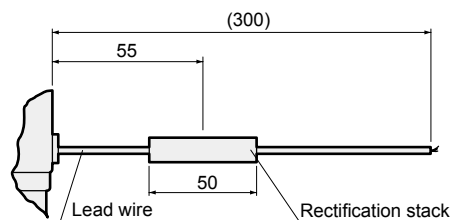
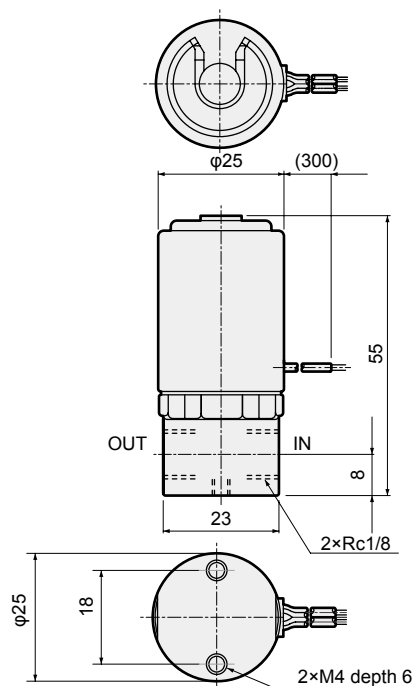
No.	Part name	Material	
1	Clip	PBT	Polybutylene terephthalate
2	Bonnet	SPC	Steel
3	Bonnet piece	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Plunger assembly	SUS405 or equivalent, NBR (FKM)	Stainless steel, nitrile rubber (fluoro rubber)
6	Coil assembly	-	-
7	Wave washer	S65CM	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)	Copper alloy (stainless steel)

() shows options.

Dimensions



● USB3-6



At AC, the alternating current (AC) has a rectification stack assembled into the lead wire.

EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S◇B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH / CPE/D
LifeSci
Gas- Combus
Auto- Water
SpecFld
Custom
Ending



Compact direct acting 3-port solenoid valve

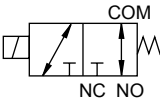
USG2 Series

- Universal
- Working fluids: Air, water, dry air, low vacuum
- Port size: M5



JIS symbol

- Universal



Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	USG2-M5-1	USG2-M5-2
Working fluid	Air, water, dry air, low vacuum [1.33 x 10 ² Pa(abs)]	
Working pressure differential MPa	0 to 0.7 (0 to 0.3 when NO pressurized)	0 to 0.3 (0 to 0.1 when NO pressurized)
Proof pressure MPa	1.5 (≈220 psi, 15 bar)	
Fluid temperature °C	-10 (14°F) to 60 (140°F) (no freezing)	
Ambient temperature °C	-20 (-4°F) to 50 (122°F)	
Valve seat leakage cm ³ /min	0.2 or less (pneumatic pressure)	
Mounting orientation	Unrestricted	
Weight kg	0.07	
Port size	M5	M5
Orifice size mm	1	1.5
Cv	0.03	0.06
C[dm ³ /(s·bar)]	0.13	0.28
b	0.57	0.46
Electrical specifications		
Rated voltage	12 VDC, 24 VDC (Option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Voltage fluctuation range	±10%	
Power consumption W	DC	3
	AC	4
Thermal class	Class 130 (B)	

- *1 : Contact CKD if the solenoid valve will remain inactive for long periods when using water.
 *2 : When using in a continuously energized state, contact CKD.
 *3 : Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

How to order

USG2 - M5 - 1 - 0 - DC24V

Model No.

Port size
M5

A Orifice size

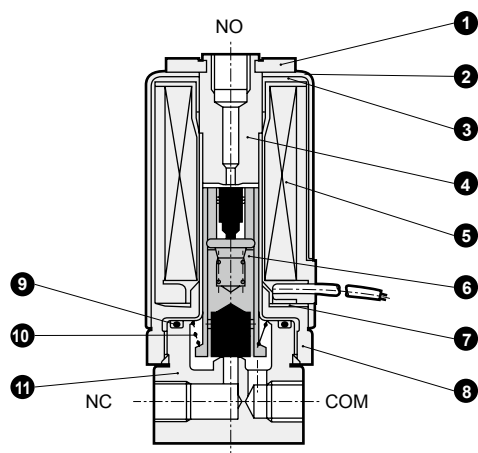
B Body/sealant combination

C Rated voltage

Code	Content	
A Orifice size		
1	φ1.0	
2	φ1.5	
B Body/sealant combination		
	Body	Seal
Blank	Stainless steel	Nitrile rubber
0	Copper alloy	Nitrile rubber
C Rated voltage		
DC12V	Standard	12 VDC
DC24V		24 VDC
AC100V	Option	100 VAC 50/60 Hz
AC200V		200 VAC 50/60 Hz

Internal structure and parts list

● USG2-M5

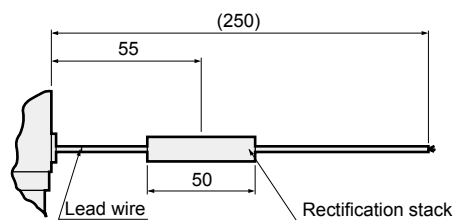
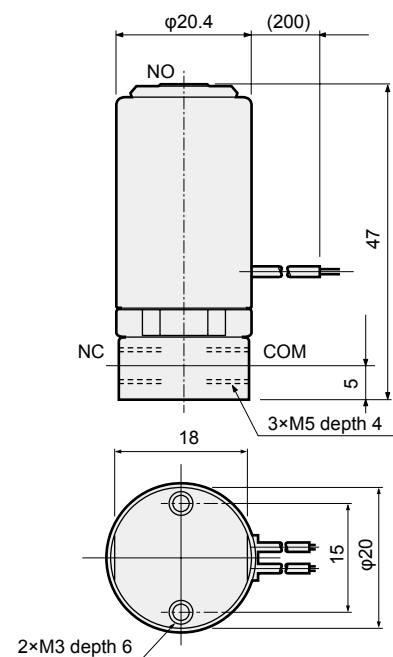


No.	Part name	Material	
1	Clip	PBT	Polybutylene terephthalate
2	Bonnet	SPC	Steel
3	Sub core	SPC	Steel
4	Core assembly	SUS316, SUS405 or equivalent	Stainless steel
5	Coil assembly	-	-
6	Plunger assembly	SUS405 or equivalent, NBR	Stainless steel, nitrile rubber
7	Wave washer	S65CM	Steel
8	Core B	SUM22	Free-cutting steel
9	O-ring	NBR	Nitrile rubber
10	Plunger spring	SUS304	Stainless steel
11	Body	SUS303(C3604)	Stainless steel (copper alloy)

() shows options.

Dimensions

● USG2-M5



At AC, the alternating current (AC) has a rectification stack assembled into the lead wire.

EXA

FWD

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
ADAPK/
ADK

DryAir

EX-
XPLNprf

XPLNprf

HVB/
HVLSAB/
NABLAD/
NADWater-
RelaNP/NAP/
NVP

SNP

CHB/G

MXB/G

Other
valvesSWD/
MWD

DustColl

CVE/
CVSECCH /
CPE/D

LifeSci

Gas-
CombusAuto-
Water

SpecFld

Custom

Ending



Compact direct acting 3-port solenoid valve

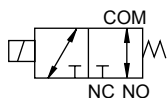
USG3 Series

- Universal
- Working fluids: Air, water, dry air, low vacuum
- Port size: Rc1/8



JIS symbol

- Universal



Specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	USG3-6-1	USG3-6-2
Working fluid	Air, water, dry air, low vacuum [1.33×10^2 Pa(abs)]	
Working pressure differential MPa	0 to 0.7 (0 to 0.3 when NO pressurized)	0 to 0.3 (0 to 0.1 when NO pressurized)
Proof pressure MPa	2 (≈290 psi, 20 bar)	
Fluid temperature °C	-10 (14°F) to 60 (140°F) (no freezing)	
Ambient temperature °C	-20 (-4°F) to 50 (122°F)	
Valve seat leakage cm ³ /min	0.2 or less (air)	
Mounting orientation	Unrestricted	
Weight kg	0.14	
Port size	Rc1/8	Rc1/8
Orifice size mm	1.2	1.8
Cv	0.05	0.1
C[dm ³ /(s·bar)]	0.19	0.42
b	0.57	0.5
Electrical specifications		
Rated voltage	12 VDC, 24 VDC (Option: 100 VAC 50/60 Hz, 200 VAC 50/60 Hz)	
Voltage fluctuation range	±10%	
Power consumption	DC	4
	W AC	4
Thermal class	Class 120 (E) (molded coil: class 130 (B))	

*1 : Contact CKD if the solenoid valve will remain inactive for long periods when using water.

*2 : When using in a continuously energized state, select FKM for the sealant material.

*3 : Effective cross-sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

How to order

USG3 - 6 - 1 - B - DC24V

Model No.

Port size
Rc1/8

A Orifice size

B Body/sealant/coil
combination

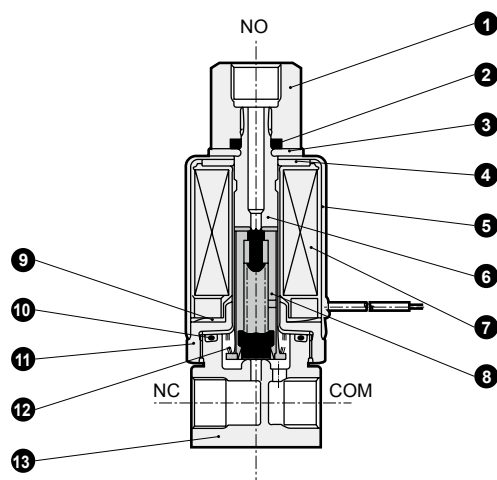
C Rated voltage

Code		Content			
A Orifice size					
1	φ1.2				
2	φ1.8				
B Body/sealant/coil combination					
		Body	Seal	Coil	Treatment
Blank	Std.	Copper	Nitrile rubber	Taped	-
B	Option	alloy	Fluoro rubber	Molded coil	Vacuum inspection(Notes)
V			Fluoro rubber		-
D		Stainless steel	Nitrile rubber	Molded coil	Vacuum inspection(Notes)
E			Fluoro rubber		-
W		Copper alloy	Nitrile rubber	Taped	Oil free
H			Fluoro rubber		
J			Nitrile rubber	Molded coil	
L			Fluoro rubber		
M		Stainless steel	Fluoro rubber		
C Rated voltage					
DC12V	Standard	12 VDC			
DC24V		24 VDC			
AC100V	Option	100 VAC 50/60 Hz			
AC200V		200 VAC 50/60 Hz			

(Note) : For option codes "V" and "W", vacuum is inspected at "leakage rate: 1.33×10^{-6} Pa·m³/s or less".

Internal structure and parts list

● USG3-6



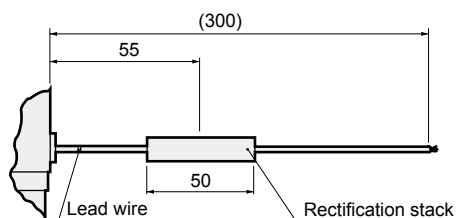
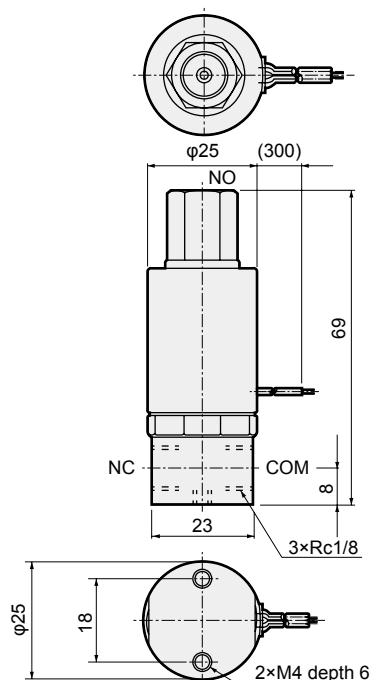
No.	Part name	Material
1	Socket	C3604(SUS303) : Copper alloy (stainless steel)
2	O-ring	NBR(FKM) : Nitrile rubber (fluoro rubber)
3	Washer	SPC : Steel
4	Bonnet piece	SPC : Steel
5	Bonnet	SPC : Steel
6	Core assembly	SUS316, SUS405 or equivalent : Stainless steel
7	Coil assembly	- : -
8	Plunger assembly	SUS405 or equivalent, NBR (FKM) : Stainless steel, nitrile rubber (fluoro rubber)
9	Wave washer	S65CM : Steel
10	O-ring	NBR(FKM) : Nitrile rubber (fluoro rubber)
11	Core B	SUM22 : Free-cutting steel
12	Plunger spring	SUS304 : Stainless steel
13	Body	C3604(SUS303) : Copper alloy (stainless steel)

() shows options.

Dimensions



● USG3-6



At AC, the alternating current (AC) has a rectification stack assembled into the lead wire.

EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
DryAir
EX-
XPLNprf
XPLNprf
HVB/
HVL
SAB/
NAB
LAD/
NAD
Water-
Rela
NP/NAP/
NVP
SNP
CHB/G
MXB/G
Other
valves
SWD/
MWD
DustColl
CVE/
CVSE
CCH /
CPE/D
LifeSci
Gas-
Combus
Auto-
Water
SpecFld
Custom
Ending



Compact direct acting 2, 3-port solenoid valve

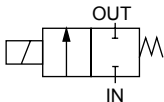
US (resin body) Series

- NC, universal
- Port size: M6, barbed fitting (compatible tube size φ6 x φ4)

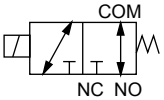


JIS symbol

- USB (2-port valve)
: NC



- USG (3-port valve)
: Universal



Common specifications

Descriptions	USB/USG
Working fluid	Refer to the working fluid in individual specifications.
Working pressure differential	0 (≈0 psi, 0 bar) to 0.7 (≈100 psi, 7 bar) (refer to max. working pressure differential in individual specifications.)
Proof pressure	MPa 1.5 (≈220 psi, 15 bar) (US*2), 2 (≈290 psi, 20 bar) (US*3) (water pressure)
Fluid temperature	°C 0 (32°F) to 60 (140°F) (no freezing)
Ambient temperature	°C 0 (32°F) to 50 (122°F)
Thermal class	Class 130 (B)
Atmosphere	No explosive or corrosive atmospheres
Valve seat leakage	cm ³ /min 0.2 or less
Port size	M6/barbed fitting (compatible tube size φ6 x φ4)
Mounting orientation	Unrestricted
Rated voltage	24 VDC/12 VDC
Treatment	Oil free

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Working fluid	Orifice size [mm]	Cv	C[dm³/(s·bar)]	b	Max. working press diff [MPa]	Power consumption [W]
Model No.							
2-port valve (Item ㊦ Wetted metal material: 2 (equivalent to SUS316))							
USB2- * -1	Water/pure water (*1)	1	0.03	0.13	0.36	0.6	3
		1.5	0.06	0.27	0.28	0.3	3
USB3- * -1		1.6	0.08	0.32	0.30	0.7	4
		-2	2.3	0.13	0.45	0.30	0.3
3-port valve (Item ㊦ Wetted metal material: 2 (equivalent to SUS316))							
USG2- * -1	Water/pure water (*1)	1	0.03	0.13	0.36	0.6 (NO press'ed 0.2)	3
		1.5	0.06	0.27	0.28	0.3 (NO press'ed 0.1)	3
USG3- * -1		1.6	0.08	0.32	0.30	0.2 (NO press'ed 0.08)	4
2-port valve (Item ㊦ Wetted metal material: 1 (equivalent to SUS405))							
USB2- * -1	Air/water/ dry air/low vacuum [1.33 x 10² Pa(abs)] (*1)	1	0.03	0.13	0.36	0.7	3
		1.5	0.06	0.27	0.28	0.3	3
USB3- * -1		1.6	0.08	0.32	0.30	0.9	4
		-2	2.3	0.13	0.45	0.30	0.3
3-port valve (Item ㊦ Wetted metal material: 1 (equivalent to SUS405))							
USG2- * -1	Air/water/ dry air/low vacuum [1.33 x 10² Pa(abs)] (*1)	1	0.03	0.13	0.36	0.7 (0.3 for NO)	3
		1.5	0.06	0.27	0.28	0.3 (NO press'ed 0.1)	3
USG3- * -1		1.6	0.08	0.32	0.30	0.3 (NO press'ed 0.1)	4

*1 : Check the compatibility between the wetted part material and working fluid before using chemical liquid for washing.
 *2 : When using a 3-port valve in a continuously energized state, select FKM for the sealant material.
 *3 : Effective cross-sectional area "S" and sonic conductance "C" are converted as S ≈ 5.0 x C.
 *4 : When using a 2-port valve at low vacuum, vacuum the NC port side.

How to order

USB2 - M6 - 1 - S 2 - DC24V

A Model No.

B Port size

C Orifice size

D Body/sealant

E Wetted metal material

(*2)

F Voltage

A Model No.

2-port valve

3-port valve

USB2

USB3

USG2

USG3

Code Content

B Port size

M6

M6

T6

Barbed fitting

C Orifice size

1

Refer to text at right

φ1

φ1.6

φ1

φ1.6

2

Refer to text at right

φ1.5

φ2.3

φ1.5

D Body/sealant

Body

Seal

G

PPS

NBR

S

PPS

FKM

E Wetted metal material

1

SUS405 or equiv.

2

SUS316 or equiv.

F Voltage

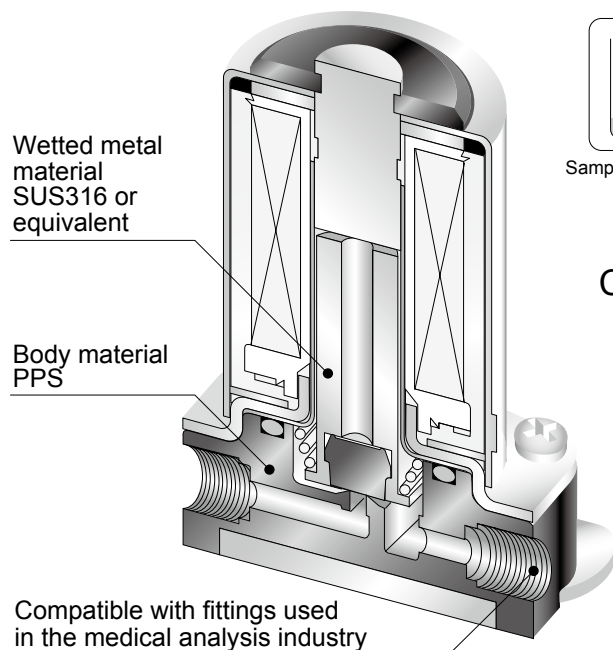
12 VDC

24 VDC

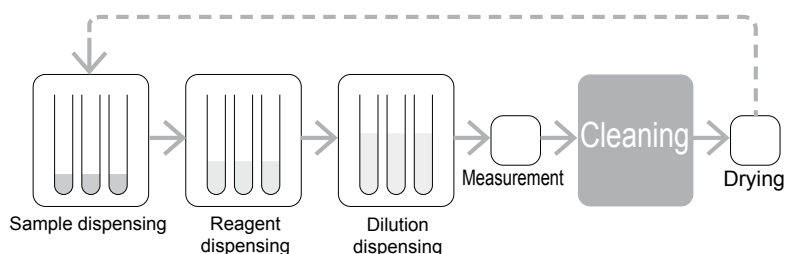
⚠ Precautions for model No. selection

*1 : NO port of USG2 is M5.

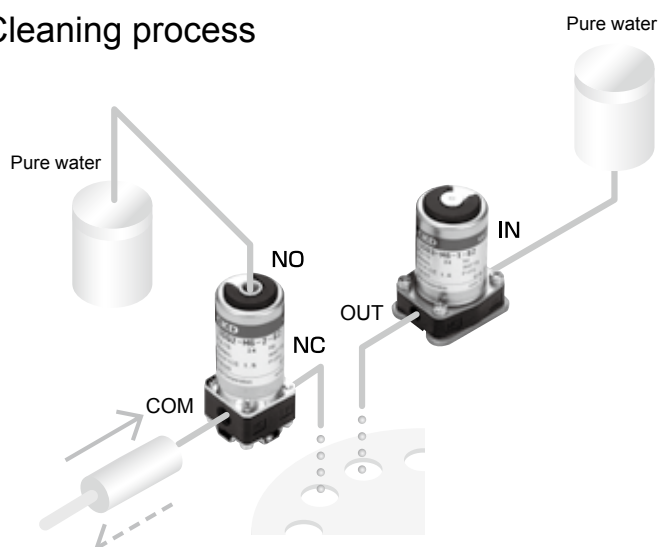
*2 : For voltages other than 12 or 24 VDC, contact CKD.



Applications



Cleaning process

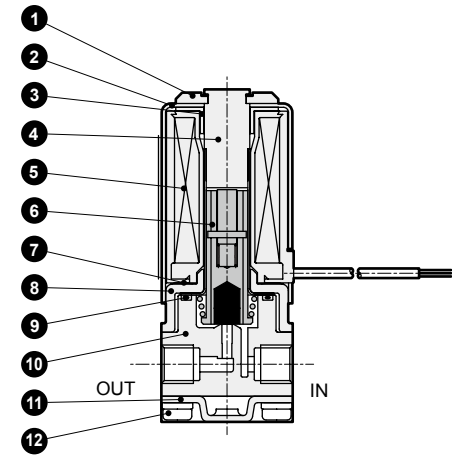


US^B_G2 (resin body) Series

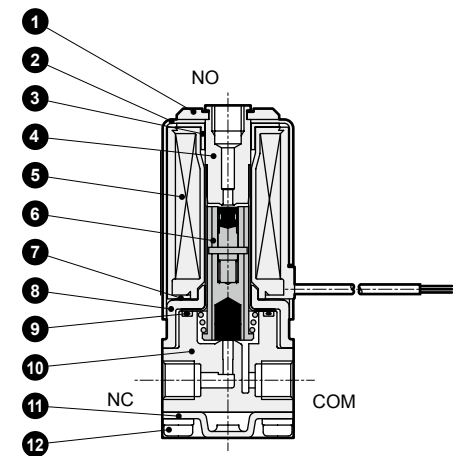
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
DryAir
EX-
XPLNprf
XPLNprf
HVB/
HVL
SAB/
NAB
LAD/
NAD
Water-
Rela
NP/NAP/
NVP
SNP
CHB/G
MXB/G
Other valves
SWD/
MWD
DustColl
CVE/
CVSE
CCH /
CPE/D
LifeSci
Gas-
Combus
Auto-
Water
SpecFld
Custom
Ending

Internal structure and parts list

● USB2



● USG2

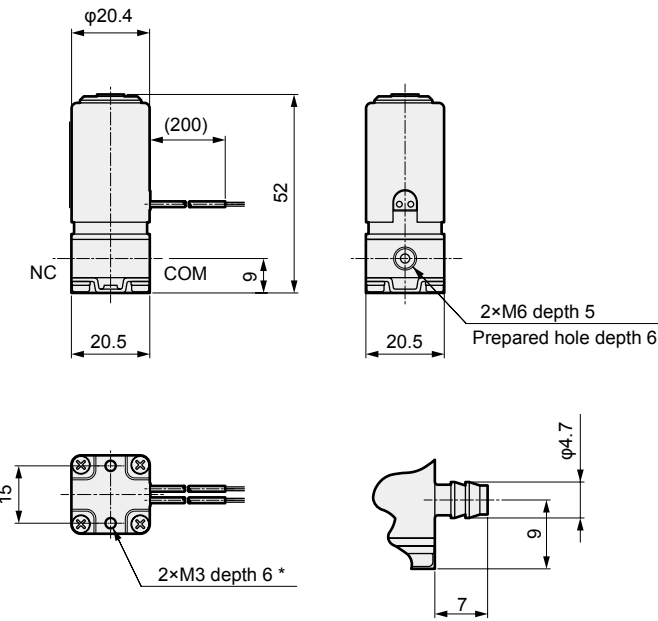


No.	Part name	Material	No.	Part name	Material
1	Clip	PBT	7	Wave washer	S65C
2	Bonnet	SPC	8	Core B	SPC
3	Sub core	SPC	9	O-ring	NBR(FKM)
4	Core assembly	SUS316 or equivalent (SUS405 or equivalent), SUS316	10	Body	PPS
5	Coil assembly	-	11	Retainer plate	SPC
6	Plunger assembly	SUS316 or equivalent (SUS405 or equivalent), NBR (FKM)	12	Pan head machine screw	SWRM

Materials in () are selectable based on options.

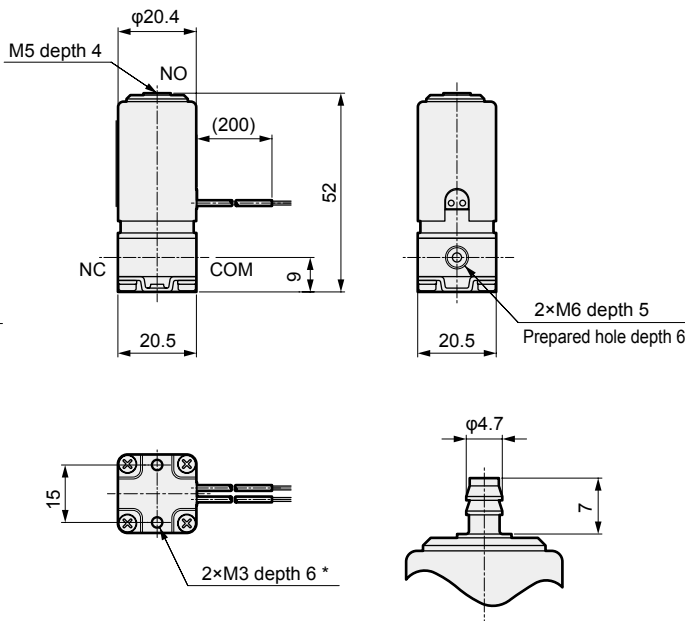
Dimensions

● USB2



[For option code "T6"]
Barbed fitting dimensions

● USG2

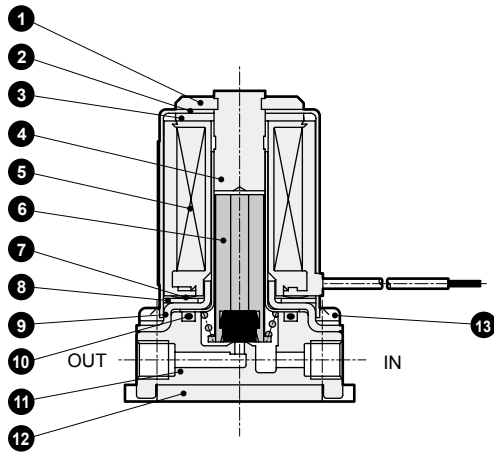


[For option code "T6"]
Barbed fitting dimensions of NO port
(COM, NC ports are the same as the 2-port valve)

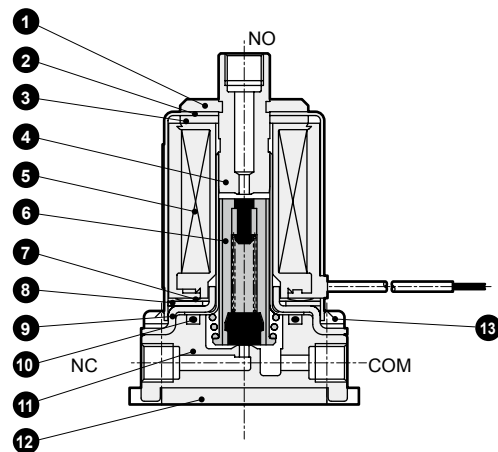
* Keep the product screw insertion depth to within 6 mm.

Internal structure and parts list

● USB3



● USG3

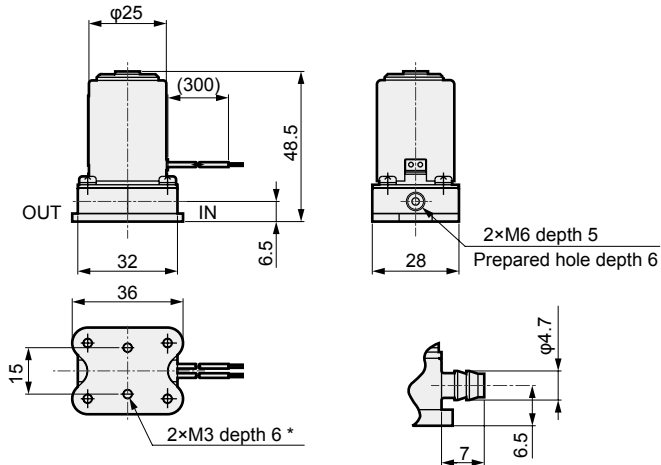


No.	Part name	Material	No.	Part name	Material
1	Clip	PBT	8	Sub core	SPC
2	Bonnet	SPC	9	Core B	SPC
3	Bonnet piece	SPC	10	O-ring	NBR(FKM)
4	Core assembly	SUS316 or equivalent (SUS405 or equivalent), SUS316	11	Body	PPS
5	Coil assembly	-	12	Retainer plate	SPC
6	Plunger assembly	SUS316 or equivalent (SUS405 or equivalent), NBR (FKM)	13	Pan head machine screw	SWRM
7	Wave washer	S65C			

Materials in () are selectable based on options.

Dimensions

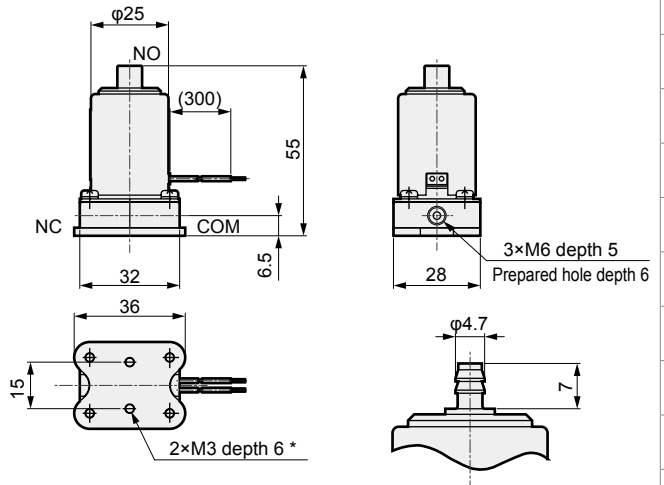
● USB3



[For option code "T6"]
Barbed fitting dimensions

* Keep the product screw insertion depth to within 6 mm.

● USG3



[For option code "T6"]
Barbed fitting dimensions of NO port
(COM, NC ports are the same as the 2-port valve)