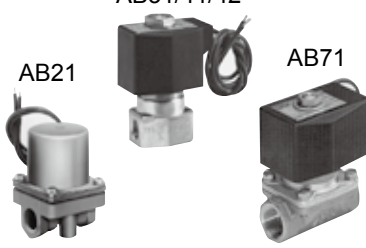
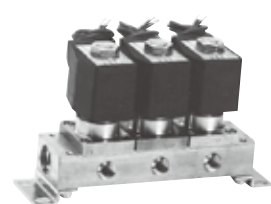

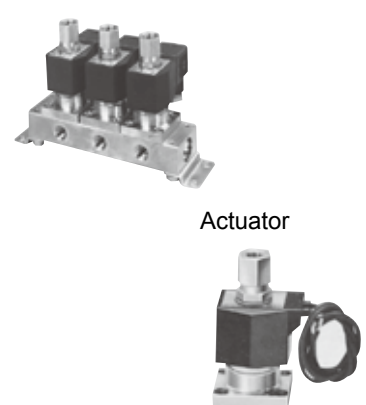


Series variation

Multi-fluid control direct acting 2, 3-port solenoid valve

* Refer to page 328 for dry air (-Z).

- 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

No. of ports	Model	Configuration	Actuation		Air	Low vacuum [1.33 x 10 ² Pa (abs)]				
2-port		AB21	Single unit	NC		●				
		AB31				●	●			
		AB41				●	●			
		AB42		NO		●	●			
		AB71		NC		●				
						●				
		GAB312	Manifold	NC	Common supply	●	●			
		GAB352			Individual supply	●	●			
		GAB412			Common supply	●	●			
		GAB452			Individual supply	●	●			
		GAB422		NO	Common supply	●	●			
						●	●			
3-port		AG31	Single unit	Universal		●	●			
		AG41				●	●			
		AG33		NC pressurization		●	●			
		AG43				●	●			
		AG34		NO pressurization		●	●			
		AG44				●	●			
				GAG31	Manifold	Universal	Common supply/ individual exhaust	●	●	
				GAG35			Common supply separate flow	●	●	
				GAG41			Common supply/ individual exhaust	●	●	
	GAG45		Common supply separate flow	●			●			
	GAG33		Actuator	NC pressurization		Common supply/individual exhaust	●	●		
	GAG43						●	●		
	GAG34				NO pressurization		●	●		
	GAG44						●	●		

Working fluid					Port size						Page
Water	Kerosene	Oil [50 mm ² /s or less]	Hot water	Steam	Rc1/8	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1	
●		●			●	●					150
●	●	●	●	●	● ^{*4}	● ^{*4}					154
●	●	●	●	●		● ^{*4}	● ^{*4}	● ^{*4}			154
●	●	●	●	●		● ^{*4}	● ^{*4}				154
●	●	● ^{*1}						●	●	●	168
●	●	●	●	●		● ^{*2}	● ^{*2}				172
●	●	●	●	●		● ^{*2}	● ^{*2}				172
●	●	●	●	●		● ^{*2}	● ^{*2}				172
●	●	●	●	●		● ^{*2}	● ^{*2}				172
●	●	●	●	●		● ^{*2}	● ^{*2}				182
●	●	●	●	●	● ^{*4}	● ^{*4}					190
●	●	●	●	●		● ^{*4}	● ^{*4}				190
●	●	●	●	●	● ^{*4}	● ^{*4}					208
●	●	●	●	●		● ^{*4}	● ^{*4}				208
●	●	●	●		● ^{*4}	● ^{*4}					226
●	●	●	●			● ^{*4}	● ^{*4}				226
●	●	●	●	●	● ^{*2} _{*3}	● ^{*2} _{*3}					198
●	●	●	●	●	● ^{*2} _{*3}	● ^{*2} _{*3}					198
●	●	●	●	●		● ^{*2} _{*3}	● ^{*2} _{*3}				198
●	●	●	●	●		● ^{*2} _{*3}	● ^{*2} _{*3}				198
●	●	●	●	●	● ^{*2} _{*3}	● ^{*2} _{*3}					216
●	●	●	●	●		● ^{*2} _{*3}	● ^{*2} _{*3}				216
●	●	●	●		● ^{*2} _{*3}	● ^{*2} _{*3}					234
●	●	●	●			● ^{*2} _{*3}	● ^{*2} _{*3}				234

Refer to page 148 for details on the coil system.

*1 : 20 mm²/s for AB71 Series.

*2 : Port A: Rc1/4, port C: Rc3/8

*3 : ● indicates NO port.

*4 : Refer to each How to order column for the thread.

- 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












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-
Combust
Auto-
Water
SpecFld
Custom
Ending

Coil selection guide

● Coil housing types and selection guide

Various types are available for general purpose valve according to the application. Refer to the structure and features to select the optimum model.

For direct acting 2, 3-port solenoid valve (AB/GAB/AG/GAG)

Coil system		Open frame		Appearance	
Thermal class B mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP61 or equivalent ● Cannot be used outdoors 	Grommet lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm 		Blank 6C
Thermal class B mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP61 or equivalent ● Cannot be used outdoors 	DIN terminal box	<ul style="list-style-type: none"> ● Easy wiring and maintenance ● Enhanced electrical safety (by grounding the ground terminal) ● Light available (Optional - 100 VAC, 200 VAC and 24 VDC) 		2E 2G 2H 6E 6G 6H
Thermal class B mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	Lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached 		3A
Thermal class B mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC) 		3M 3N
Thermal class B mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC) 		3I 3J
Thermal class H taped	<ul style="list-style-type: none"> ● AC dedicated (50/60 Hz common) ● High temperature fluids and high ambient temperatures usable ● Degree of protection: IP00 ● Cannot be used outdoors 	Lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 		4A
Thermal class B mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● Perfect for places where whirring noise should be prevented. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (optional -100 VAC, 200 VAC) 		4M 4N
Thermal class B mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● Perfect for places where whirring noise should be prevented. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	Lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 		5A
Thermal class B mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● Perfect for places where whirring noise should be prevented. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100/200 VAC) 		5M 5N
Thermal class B mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● Perfect for places where whirring noise should be prevented. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100/200 VAC) 		5I 5J
		Conduit	<ul style="list-style-type: none"> ● Use a conduit (CTC19 or G1/2) when using direct conduit wiring for the open frame lead wire. 		G H

● Repair parts compatibility table by coil option

Coil option code	Supported voltage	Repair parts			
		Plunger assembly	Core assembly	Coil assembly	Actuator assembly *1
0 or blank	AC	○	○	○	-
6C *2, *3	DC	-	-	-	○
2E 2G 2H	AC	○	○	○	-
2E 2G 2H	DC	○	○	○	-
6E 6G 6H *2, *3	DC	-	-	-	○
3A	AC	○	○	○	-
	DC		○	○	-
3M 3N	AC	○	○	○	-
	DC		○	○	-
3I 3J	AC	○	○	○	-
	DC		○	○	-
4A	AC	○	○	○	-
4M 4N	AC	○	○	○	-
5A	AC	○	○	○	-
5M 5N	AC	○	○	○	-
5I 5J	AC	○	○	○	-

*1 : The actuator assembly includes the coil assembly, core assembly and plunger assembly.

*2 : As 6C, 6E, 6G and 6H are dedicated parts, they are provided as part of the actuator assembly.

*3 : AB41 only.

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 \diamond 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



Direct acting 2-port solenoid valve
(General purpose valve)

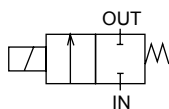
AB21 Series

- NC
- Port size: Rc1/8, Rc1/4



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/INP/
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



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	AB21
Working fluid	Air/water/kerosene/oil (50 mm ² /s or less)
Working pressure differential MPa	0 to 1.5 (refer to max. working pressure differential in individual specifications)
Max. working pressure MPa	1.5 (≈220 psi, 15 bar)
Proof pressure (water pressure) MPa	3 (≈440 psi, 30 bar)
Fluid temperature °C	-10 (14°F) to 40 (104°F) (no freezing)
Ambient temperature °C	-20 (-4°F) to 50 (122°F)
Thermal class	Class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm ³ /min(ANR)	0.2 or less
Mounting orientation	Unrestricted

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions Model No.	Port size	Orifice size (mm)	Max. working pressure differential (MPa)						Rated voltage	Apparent power (VA)				Power consumption (W)		Weight (kg)
			Air		Water/kerosene		Oil (50 mm ² /s)			When holding		When starting		AC 50/60 Hz	DC	
			AC	DC	AC	DC	AC	DC		50 Hz	60 Hz	50 Hz	60 Hz			
AB21-01-1	Rc1/8	1.5	1.5	1.0	1.5	1.0	0.9	1.0	100 VAC 50/60 Hz *2	11	9	15.4	12.6	5.5/4.2	7	0.23 (Aluminum)
AB21-01-2		2.0	1.0	0.6	1.0	0.6	0.5	0.6								
AB21-01-3		3.0	0.7	0.2	0.4	0.2	0.25	0.2								
AB21-01-5		4.0	0.4	0.1	0.2	0.1	0.1	0.1								
AB21-02-1	Rc1/4	1.5	1.5	1.0	1.5	1.0	0.9	1.0	200 VAC 50/60 Hz *2	11	9	15.4	12.6	5.5/4.2	7	0.36 (Copper alloy)
AB21-02-2		2.0	1.0	0.6	1.0	0.6	0.5	0.6								
AB21-02-3		3.0	0.7	0.2	0.4	0.2	0.25	0.2								
AB21-02-5		4.0	0.4	0.1	0.2	0.1	0.1	0.1								

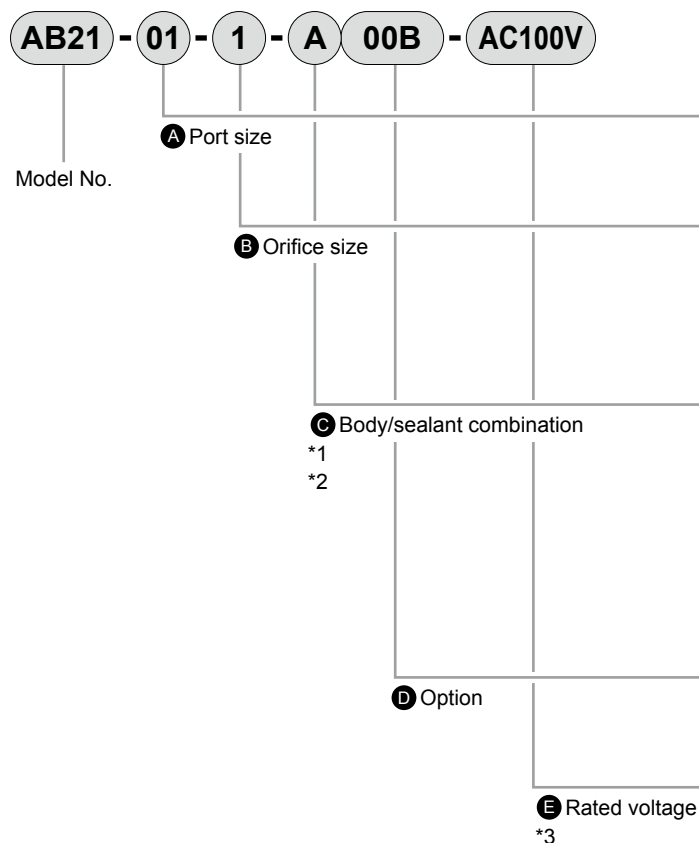
Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics		
			C[dm ³ /(s·bar)]	b	Cv
NC					
AB21-01-1	Rc1/8	1.5	0.29	0.51	0.1
AB21-01-2		2.0	0.53	0.55	0.15
AB21-01-3		3.0	1.1	0.52	0.3
AB21-01-5		4.0	1.8	0.35	0.4
AB21-02-1	Rc1/4	1.5	0.29	0.51	0.1
AB21-02-2		2.0	0.53	0.55	0.15
AB21-02-3		3.0	1.1	0.52	0.3
AB21-02-5		4.0	1.8	0.35	0.4

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

*2 : The 100 VAC (50/60 Hz) can be used with 110 VAC (60 Hz). The 200 VAC (50/60 Hz) can be used with 220 VAC (60 Hz).

How to order



Code	Content		
A Port size			
01	Rc1/8		
02	Rc1/4		
B Orifice size			
1	φ1.5		
2	φ2		
3	φ3		
5	φ4		
C Body/sealant combination			
	Body	Seal	Remarks
Blank	Aluminum	Nitrile rubber	Air/kerosene/oil
2		Fluoro rubber	Air/kerosene/oil
A	Copper alloy	Nitrile rubber	Air/water/kerosene/oil
B		Fluoro rubber	Air/water/kerosene/oil
Refer to Intro Page 39 for reference on material combinations.			
D Option			
Blank	None		
00B	With mounting plate		
E Rated voltage			
AC100V	100 VAC 50/60 Hz, 110 VAC 60 Hz	For other voltages, contact CKD.	
AC200V	200 VAC 50/60 Hz, 220 VAC 60 Hz		
DC24V	24 VDC		

[Example of model No.]

AB21-01-1-A00B-AC100V

Model: AB21

- A** Port size : Rc1/8
- B** Orifice size : φ1.5
- C** Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- D** Option : Mounting plate
- E** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

⚠ Precautions for model No. selection

- *1 : For **B** 1 (φ1.5 orifice), only Item **C** A/B are available.
- *2 : When the fluid is water, select the copper alloy (option code: A or B) body.
- *3 : The voltage fluctuation range must be within ±10% of the rated voltage.
- *4 : Leave Item **C** blank for standard. However, to select 00B for Item **D**, indicate 0 for Item **C**.

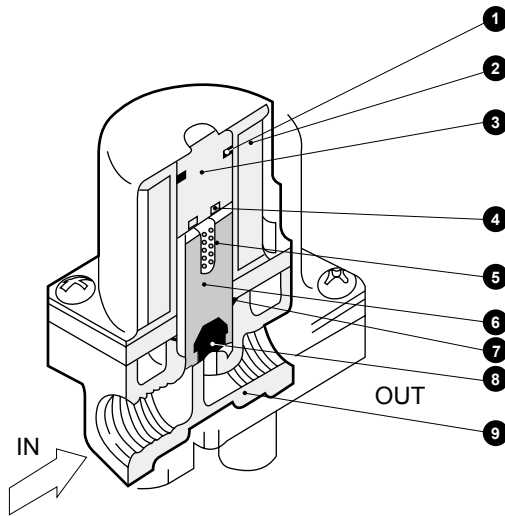
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/AD
APK/ADK
DryAir
EX-XPLNprf
XPLNprf
HVB/HVL
S [◇] B/NAB
LAD/NAD
Water-Rela
NP/NAP/NVP
SNP
CHB/G
MXB/G
Other valves
SWD/MWD
DustColl
CVE/CVSE
CCH / CPE/D
LifeSci
Gas-Combus
Auto-Water
SpecFld
Custom
Ending

AB21 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

● AB21 Series

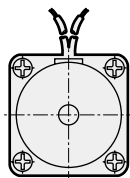


No.	Part name	Material
1	O-ring	Fluoro rubber
2	Coil	-
3	Core assembly	Stainless steel
4	Shading coil	Copper
5	Plunger spring	Stainless steel
6	Plunger	Stainless steel
7	O-ring	Nitrile or fluoro rubber
8	Seal	Nitrile or fluoro rubber
9	Body	Aluminum or copper alloy

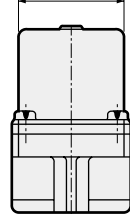
Dimensions



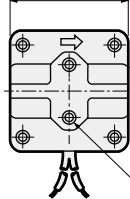
● AB21-01/02-1 to 5-*



φ35.5

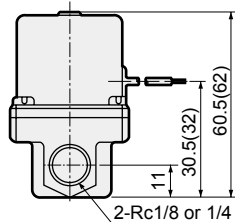


40



2-M5 depth 8

* Lead wire length
250 mm

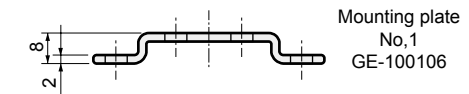
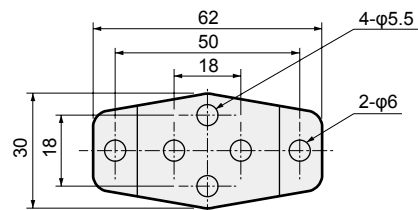


2-Rc1/8 or 1/4

Dimensions shown in () are for copper alloy body.

● With mounting plate

AB21-01/02-1 to 5-*00B



Mounting plate
No.1
GE-100106

MEMO

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



Direct acting 2-port solenoid valve, single unit
(General purpose valve)

AB31/AB41 Series ● NC

AB42 Series ● NO

● Port size: Rc1/8 to Rc1/2



Refer to the Ending for details.



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-Combust

Auto-Water

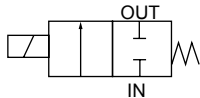
SpecFld

Custom

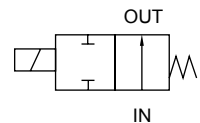
Ending

JIS symbol

● AB31/41: NC



● AB42: NO



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Standard specifications		Optional specifications	
Working fluid	Air/low vacuum [1.33 x 10 ² Pa (abs)]/water/kerosene/oil (50 mm ² /s or less)		Hot water	Steam
Working pressure differential MPa	0 to 5 (refer to max. working pressure differential in individual specifications.)			
Proof pressure (water pressure) MPa	25 (≈3600 psi, 250 bar)			
Fluid temperature (*1) °C	-10 (14°F) to 60 (140°F)	-10 (14°F) to 90 (194°F)	-10 (14°F) to 184 (363.2°F)	
Ambient temperature °C	-20 (-4°F) to 60 (140°F)		-20 (-4°F) to 100 (212°F)	
Thermal class	Class 130 (B)		Class 180 (H)	
Atmosphere	Place free of corrosive gas and explosive gas			
Valve structure	Direct acting poppet structure			
Valve seat leakage cm ³ /min(ANR)	0.2 or less (air)		300 or less (air)	
Mounting orientation	Unrestricted			
Body/seal material	Copper alloy/nitrile rubber		Copper alloy/EPM rubber	Copper alloy/PTFE

*1: No freezing.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Port size	Orifice size (mm)	Max. working pressure differential (MPa)								Max. working pressure (MPa)	Rated voltage	Apparent power (VA)				Power consump (W)		Weight (kg)
			Air		Water/hot water/kerosene		Oil (50 mm ² /s)		Steam				Holding	Starting	AC	DC			
			AC	DC	AC	DC	AC	DC	AC	50/60 Hz							DC		
NC																			
AB31- ⁰¹ / ₀₂ -1	Rc1/8	1.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	1.0	5 (≈730 psi, 50 bar) Fluid: Steam For 1	100 VAC 50/60 Hz *9	12	10	17	14	5.2/3.8	11 (8.1)*5	0.35
		2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.0									
		3.0	1.0	0.5	0.7	0.5	0.5	0.5	0.5	0.7									
		4.0	0.4	0.25	0.3	0.25	0.25	0.25	0.25	0.3									
		5.0	0.2	0.15	0.15	0.15	0.15	0.15	0.15	0.15									
		6.0	0.2	0.15	0.15	0.15	0.15	0.15	0.15	0.15									
AB41- ⁰² / ₀₃ -1	Rc1/4	1.5	5.0	4.0	4.5	4.0	4.0	4.0	4.0	1.0	5 (≈730 psi, 50 bar) Fluid: Steam For 1	100 VAC 50/60 Hz *9	18	15	29	24	6.7/5.7	11 (10.4)*5 (7)*7	0.43 (Rc1/4) 0.45 (Rc3/8)
		2.0	3.0	2.5	2.7	2.5	2.5	2.5	2.5	1.0									
		3.0	1.5	0.9	1.3	0.9	0.9	0.9	0.9	1.0									
		3.5	1.2	0.6	0.9	0.6	0.6	0.6	0.6	0.9									
		4.0	1.0	0.5	0.7	0.5	0.5	0.5	0.5	0.7									
		5.0	0.6	0.25	0.4	0.25	0.25	0.25	0.25	0.4									
		7.0	0.25	0.1	0.2	0.1	0.15	0.1	0.2										
AB41- ⁰³ / ₀₄ -8	Rc3/8	10.0	0.1	0.05 (0.03)*8	0.1	0.05 (0.03)*8	0.05	0.05 (0.03)*8			12 VDC 24 VDC 48 VDC								0.54
	Rc1/2																		
NO																			
AB42- ⁰² / ₀₃ -1	Rc1/4	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2 (≈290 psi, 20 bar) Fluid: Steam For 1	100 VDC	22	18	35	29	8.7/6.7	15.5 (14)*5	0.50 (Rc1/4) 0.52 (Rc3/8)
		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0									
		3.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7									
		3.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5									
		4.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4									
		5.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25									
		7.0	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15									

*1 : The model numbers above are for the basic port size (Rc) and orifice size. Refer to How to order for other combinations (e.g., for steam).

*2 : The port size model No. is 01 for Rc1/8 (6A), 02 for Rc1/4 (8A), 03 for Rc3/8 (10A) and 04 for Rc1/2 (15A).

*3 : Refer to DC column for the max. working pressure differential of coil with diode.

*4 : The voltage fluctuation range must be within ±10% of the rated voltage.

*5 : Power consumption of coil housings 2E/2G/2H.

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

*7 : Power consumption of coil housings 6C/6E/6G/6H.

*8 : DC voltage of coil housings 2E/2G/2H, and max. working pressure differential of coil housings 6C/6E/6G/6H.

*9 : The 100 VAC (50/60 Hz) can be used with 110 VAC (60 Hz). The 200 VAC (50/60 Hz) can be used with 220 VAC (60 Hz). However, this does not apply to coil housings 5A/5M/5N/5I/5J.

Optional specifications (fluid temperature, ambient temperature, valve seat leakage)

Sealant	Fluoro rubber		Ethylene propylene rubber		PTFE	
Coil (thermal class)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)
Fluid temperature (*1) °C	-10 to 60	-10 to 90	0 to 60 (*3)	0 to 90 (*3)	-10 to 60	-10 to 184
Ambient temperature °C	-20 to 60	-20 to 100 (*2)	-20 to 60	-20 to 100 (*2)	-20 to 60	-20 to 100 (*2)
Valve seat leakage cm ³ /min(ANR)	0.2 or less (air)				300 or less (air)	

*1 : No freezing.

*2 : -20 to 80°C when coil housing is HP terminal box with light.

*3 : The lowest temperature is 0°C since the fluid is water.

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics		
			C[dm ³ /(s·bar)]	b	Cv
NC					
AB31- ⁰¹ ₀₂ -1	Rc1/8 Rc1/4	1.5	0.29	0.53	0.1
-2		2.0	0.53	0.52	0.15
-3		3.0	1.1	0.52	0.31
-4		3.5	1.7	0.49	0.42
-5		4.0	2.1	0.48	0.54
-6		5.0	3.0	0.42	0.8
-7		7.0	4.8	0.29	1.0
AB41- ⁰² ₀₃ -1	Rc1/4 Rc3/8	1.5	0.29	0.53	0.1
-2		2.0	0.53	0.52	0.15
-3		3.0	1.1	0.52	0.31
-4		3.5	1.7	0.49	0.42
-5		4.0	2.1	0.48	0.54
-6		5.0	3.0	0.42	0.8
-7		7.0	4.8	0.29	1.0
AB41- ⁰³ ₀₄ -8	Rc3/8 Rc1/2	10.0	9.3	0.36	1.88
			[8.1]	[0.31]	[1.5]
NO					
AB42- ⁰² ₀₃ -1	Rc1/4 Rc3/8	1.5	0.29	0.53	0.1
-2		2.0	0.53	0.52	0.15
-3		3.0	1.1	0.52	0.31
-4		3.5	1.7	0.49	0.42
-5		4.0	2.1	0.48	0.54
-6		5.0	3.0	0.42	0.8
-7		7.0	4.8	0.29	1.0
			[4.6]	[0.37]	[0.82]

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

*2 : Dimensions shown in [] are for stainless steel body.

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

AB31/41/42 Series

How to order

● NC

AB31 - **02** - **3** - **0** **3A** **A** **B** **G** **S** - **AC100V**

AB41

Model No.

D Coil housing **G** Other options **I** Rated voltage

E Manual override (locking) **H** With surge suppressor

F Mounting plate

A Port size

B Orifice size

C Body/sealant combination

*1
*2
*3
*4
*5
*6
*7

[Example of model No. 1]

AB41-02-3-000AS-AC100V

Model: AB41

A Port size : Rc1/4

B Orifice size : φ3

C Body/sealant combination : Body - copper alloy, sealant - nitrile rubber

D Coil housing : Grommet lead wire

E Manual override (locking) : With

F / **G** / **H** : None

H Surge suppressor : With surge suppressor

I Rated voltage : 100 VAC 50/60 Hz,
110 VAC 60 Hz

⚠ Precautions for model No. selection

Notes for **C**

- *1 : Leave blank for standard. However, to select options in **D**, **E**, **F**, **G** or **H**, indicate 0 for Item **C**.
- *2 : When Item **D** 4A/4M/4N is selected.
- *3 : The body for low pressure large flow rate AB41-⁰⁰-8 is bronze (standard) or stainless steel (optional).
- *4 : For option codes V and W, vacuum is inspected at "leakage rate: 1.33 x 10⁻⁶ Pa·m³/s or less".
- *5 : When using low pressure large flow rate AB41-⁰⁰-8 with Item **C** VW, DC voltage type and Item **D** 5A/5M/5N/5I/5J are not available.
- *6 : The ethylene propylene rubber seal combination (Item **C** P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene rubber is not oil-resistant.)
- *7 : When Item **C** is C, F, K, P, N or R, the Item **D** coil housings 6C, 6E, 6G and 6H cannot be selected.

Notes for **D**

- *8 : Leave blank for the standard coil housing. However, to select options in **E**, **F**, **G** or **H**, indicate 00 for Item **D**.
- *9 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.
- *10 : A DC coil for steam is available for AB41. Contact CKD for more information.
- *11 : For 6C/6E/6G/6H, only AB41 is available.
- *12 : The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Model No.		
AB31	AB41	AB41 Low pressure large flow

Code	Content	Code	Content	Code	Content			
A Port size								
01	Rc1/8	1G	G1/8	1N	1/8NPT	●		
02	Rc1/4	2G	G1/4	2N	1/4NPT	●	●	
03	Rc3/8	3G	G3/8	3N	3/8NPT		●	●
04	Rc1/2	4G	G1/2	4N	1/2NPT			●

B Orifice size								
1	φ 1.5					●	●	
2	φ 2					●	●	
3	φ 3					●	●	
4	φ 3.5					●	●	
5	φ 4					●	●	
6	φ 5					●	●	
7	φ 7						●	
8	φ10							●

C Body/sealant combination								
Blank	Std.	Body	Seal	Treatment	Remarks			
		Copper alloy or bronze	Nitrile rubber	-	Air/water/low vacuum/kerosene (up to 60°C)	●	●	●
B			Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)	●	●	●
C			PTFE		Steam (up to 184°C *2)	●	●	
V			Fluoro rubber		Vacuum inspection	Low vacuum	●	●
		Stainless steel	Nitrile rubber	-	Air/water/low vacuum/kerosene (up to 60°C)	●	●	●
E			Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)	●	●	●
F			PTFE		Steam (up to 184°C *2)	●	●	
W			Fluoro rubber		Vacuum inspection	Low vacuum	●	●
		Copper alloy	Nitrile rubber	Oil free	Air/water/low vacuum/kerosene (up to 60°C)	●	●	●
H			Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)	●	●	●
J			PTFE		Steam (up to 184°C *2)	●	●	
K			Ethylene propylene rubber		Hot water (up to 90°C *2)	●	●	●
		Stainless steel	Nitrile rubber	Oil free	Air/water/low vacuum/kerosene (up to 60°C)	●	●	●
L			Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)	●	●	●
M			PTFE		Steam (up to 184°C *2)	●	●	
R			Ethylene propylene rubber		Hot water (up to 90°C *2)	●	●	●

Refer to Intro Page 39 for reference on material combinations.

D Coil housing								
Blank	Std.	Content						
		Grommet lead wire				●	●	●
2E		With DIN terminal box (G1/2)				●	●	●
2G		With DIN terminal box (Pg11)				●	●	●
2H		DIN terminal box with small lamp (Pg11)				●	●	●
3A	Option	Lead wire				●	●	●
3M		With HP terminal box (G1/2)				●	●	●
3N		HP terminal box with lamp (G1/2)				●	●	●
3I		HP terminal box (IP65 or equivalent) (G1/2)				●	●	●
3J		HP terminal box with lamp (IP65 or equivalent) (G1/2)				●	●	●
4A	Option	Lead wire				●	●	●
4M		With HP terminal box (G1/2)				●	●	●
4N		HP terminal box with lamp (G1/2)				●	●	●
5A		Lead wire					●	●
5M		With HP terminal box (G1/2)				●	●	●
5N		HP terminal box with lamp (G1/2)				●	●	●
5I		HP terminal box (IP65 or equivalent) (G1/2)				●	●	●
5J		HP terminal box with lamp (IP65 or equivalent) (G1/2)				●	●	●
6C		Grommet lead wire 7W					●	
6E		With DIN terminal box (G1/2) 7W					●	
6G		With DIN terminal box (Pg11) 7W					●	
6H		DIN terminal box with small lamp (Pg11) 7W					●	

The combinations indicated with ● in the above table are available.

		Model No.		
		AB31	AB41	AB41 Low pressure large flow
Code	Content			
E Manual override (locking)				
Blank	None	●	●	●
A	With manual override	●	●	
F Mounting plate				
Blank	None	●	●	●
B	With mounting plate	●	●	●
G For cable gland and conduit combinations, refer to the compatible coil housings below.				
Blank	None	●	●	●
D	A-15a Marine cable gland	●	●	●
E	A-15b Marine cable gland	●	●	●
F	A-15c Marine cable gland	●	●	●
G	CTC19 Conduit piping	●	●	●
H	G1/2 Conduit piping	●	●	●
H For surge suppressor combinations, refer to the compatible coil housings below.				
Blank	Without surge suppressor	●	●	●
S	With surge suppressor	●	●	●
I Rated voltage				
Refer to the table on the right for the voltage.				

● Compatible coil housing

		Blank	2E	2G	2H	3A	3M	3N	3I	3J	4A	4M	4N	5A	5M	5N	5I	5J	6C	6E	6G	6H	
G Cable gland/conduit																							
D	A-15a						●	●	●	●		●	●		●	●	●	●					
E	A-15b						●	●	●	●		●	●		●	●	●	●					
F	A-15c						●	●	●	●		●	●		●	●	●	●					
G	CTC19					●					●			●									
H	G1/2				●	●					●			●									●
H For surge suppressor compatible coil housings, refer to page 156.																							
S	With surge suppressor	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

⚠ Precautions for model No. selection







Notes for E to H

- *13: Manual override (Item E A) cannot be mounted on the low pressure large flow rate AB41-03-8.
- *14: When Item C is C, F, K, N, V or W, the manual override (Item E A) is not available.
- *15: For G, select an option from D, E, F, G and H.
- *16: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- *17: As standard, the surge suppressor is built into the the coil with diode and the 24 VDC coil (Item D 2H/6H), so the surge suppressor code S cannot be selected.
- *18: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that tropicalization is not available when the manual override option (A) and the coil option 6C/6E/6G/6H are selected.

Notes for I

- *20: 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item D 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *21: For voltages other than above, contact CKD.
- *22: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

I Rated voltage	
Blank	100 VAC, 200 VAC
2E	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
2H	100 VAC, 200 VAC, 24 VDC
3A	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3M	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 101 VDC
3N	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 101 VDC
3J	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A	100 VAC, 200 VAC
4M	100 VAC, 200 VAC
4N	100 VAC, 200 VAC
5A	100 VAC, 200 VAC
5M	100 VAC, 200 VAC
5N	100 VAC, 200 VAC
5I	100 VAC, 200 VAC
5J	100 VAC, 200 VAC
6C	12 VDC, 24 VDC
6E	12 VDC, 24 VDC
6G	12 VDC, 24 VDC
6H	24 VDC

Blank 6C		● Grommet lead wire 300 mm
2E 2G 2H 6E 6G 6H		● DIN terminal box
3A 4A 5A		● Open frame lead wire 300 mm ● 4A (Thermal class 180 (H)) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (Thermal class 180 (H)) ● 5M, 5N (diode integrated)
3I 3J 5I 5J		● Open frame HP terminal box (IP65 or equivalent) ● 5I, 5J (diode integrated)
G H		● Conduit ● G(CTC19) ● H(G1/2)

Refer to page 148 for coil selection.

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
DustCoil
CVE/CVSE
CCH/CPE/D
LifeSci
Gas-Combus
Auto-Water
SpecFld
Custom
Ending

AB31/41/42 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
- S Δ 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

How to order

● NO

AB42 - **02** - **4** - **L** **3A** **A** **B** - **AC100V**

Model No.

A Port size

B Orifice size

C Body/sealant combination

*1
*2
*3
*4

- D** Coil housing
- E** Manual override (locking)
- F** Mounting plate
- G** Other options
- H** With surge suppressor
- I** Rated voltage

Code	Content	Code	Content	Code	Content
A Port size					
02	Rc1/4	2G	G1/4	2N	1/4NPT
03	Rc3/8	3G	G3/8	3N	3/8NPT

B Orifice size	
1	φ1.5
2	φ2
3	φ3
4	φ3.5
5	φ4
6	φ5
7	φ7

C Body/sealant combination				
	Body	Seal	Treatment	Remarks
Blank	Std. Copper alloy	Nitrile rubber	-	Air/water/low vacuum/kerosene (up to 60°C)
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)
		PTFE		Steam (up to 184°C *2)
		V	Fluoro rubber	Vacuum inspection
D	Std. Stainless steel	Nitrile rubber	-	Air/water/low vacuum/kerosene (up to 60°C)
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)
		PTFE		Steam (up to 184°C *2)
		W	Fluoro rubber	Vacuum inspection
H	Option Copper alloy	Nitrile rubber	Oil free	Air/water/low vacuum/kerosene (up to 60°C)
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)
		PTFE		Steam (up to 184°C *2)
		Ethylene propylene rubber		Hot water (up to 90°C *2)
	Std. Stainless steel	Nitrile rubber		Air/water/low vacuum/kerosene (up to 60°C)
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *2)
		PTFE		Steam (up to 184°C *2)
		Ethylene propylene rubber		Hot water (up to 90°C *2)

Refer to Intro Page 39 for reference on material combinations.

D to I

Refer to the following page for details on the coil housing, other options and voltage, etc.

[Example of model No. 1]

AB42-02-1-AC100V

Model: AB42

- A** Port size : Rc1/4
- B** Orifice size : φ1.5
- C** Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- D** Coil housing : Grommet lead wire
- E** to **H** : None
- I** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

[Example of model No. 2]

AB42-03-6-000AS-AC100V

Model: AB42

- A** Port size : Rc3/8
- B** Orifice size : φ5
- C** Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- D** Coil housing : Grommet lead wire
- E** Manual override (locking) : Selected
- F** / **G** : None
- H** Surge suppressor : With surge suppressor
- I** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

⚠ Precautions for model No. selection






Notes for **C**

- *1 : Leave blank for standard. However, to select options in **D**, **E**, **F**, **G** or **H**, indicate 0 for Item **C**.
- *2 : When Item **D** 4A/4M/4N is selected.
- *3 : For option codes V and W, vacuum is inspected at "leakage rate: 1.33 x 10⁻⁶ Pa·m³/s or less".
- *4 : The ethylene propylene rubber seal combination (Item **C** P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene rubber is not oil-resistant.)


For Items (D) to (I), the combinations indicated with codes are available.
 Note that if options for Items (E) to (H) are not required, they should be left blank.

(D) Coil housing		(E)	(F)	(G) Other options			(H)	(I) Rated voltage			
Content		Manual override (Locking)	Mounting plate	Cable gland			Conduit		With surge suppressor	Content	
				(marine cable gland)			(conduit piping)				
				A-15a	A-15b	A-15c	CTC19	G1/2			
Blank	Grommet lead wire	A	B				G	H	S	100 VAC, 200 VAC	
2E	With DIN terminal box (G1/2)									100 VAC, 200 VAC	
2G	With DIN terminal box (Pg11)									12 VDC, 24 VDC, 48 VDC, 100 VDC	
2H	DIN terminal box with small lamp (Pg11)									100 VAC, 200 VAC, 24 VDC	
3A	Open frame	A	B	D E F			G	H	S	100 VAC, 200 VAC	
3M										Lead wire (IP65 or equivalent)	12 VDC, 24 VDC, 48 VDC, 100 VDC
3N										With HP terminal box (G1/2)	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I										HP terminal box with lamp (G1/2)	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J										HP terminal box (IP65 or equivalent) (G1/2)	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3J	HP term box, lamp (IP65, equiv) (G1/2)	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC									
4A	Open frame (Thermal class 180 (H))	A	B	D E F			G	H	S	100 VAC, 200 VAC	
4M										Lead wire	100 VAC, 200 VAC
4N										With HP terminal box (G1/2)	100 VAC, 200 VAC
4N	HP terminal box with lamp (G1/2)	100 VAC, 200 VAC									
5A	Open frame (diode integrated)	A	B	D E F			G	H	S	100 VAC, 200 VAC	
5M										Lead wire (IP65 or equivalent)	100 VAC, 200 VAC
5N										With HP terminal box (G1/2)	100 VAC, 200 VAC
5I										HP terminal box with lamp (G1/2)	100 VAC, 200 VAC
5J										HP terminal box (IP65 or equivalent) (G1/2)	100 VAC, 200 VAC
5J	HP term box, lamp (IP65, equiv) (G1/2)	100 VAC, 200 VAC									

⚠ Refer to the following cautions for Items (D) to (I).

Blank		● Grommet lead wire 300 mm
2E 2G 2H		● DIN terminal box
3A 4A 5A		● Open frame lead wire 300 mm ● 4A (Thermal class 180 (H)) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (Thermal class 180 (H)) ● 5M, 5N (diode integrated)
3I 3J 5I 5J		● Open frame HP terminal box (IP65 or equivalent) ● 5I, 5J (diode integrated)

Refer to page 148 for coil selection.

G H		● Conduit ● G(CTC19) ● H(G1/2)
--------	--	--------------------------------------

⚠ Precautions for model No. selection

Notes for (D)

- *5 : Leave blank for the standard coil housing. However, to select options in (E), (F), (G) or (H), indicate 00 for Item (D).
- *6 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.

Notes for (E) to (H)

- *7 : When Item (C) is C, F, K, N, V or W, the manual override (Item (E) A) is not available.
- *8 : For Item (G), select an option from D, E, F, G and H.
- *9 : The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- *10 : As standard, the surge suppressor is built into the coil with diode and the 24 VDC coil (Item (D) 2H), so the surge suppressor S cannot be selected.
- *11 : Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information. Note that tropicalization is not available when the manual override option (A) is selected.

Notes for (I)

- *13 : 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item (D) 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *14 : For voltages other than above, contact CKD.
- *15 : The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

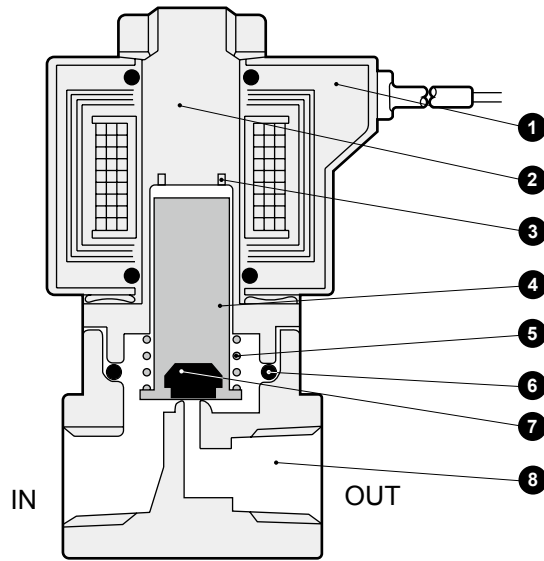
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/AD
APK/ADK
DryAir
EX-XPLNprf
XPLNprf
HVB/HVL
SΔB/NAB
LAD/NAD
Water-Rela
NP/NAP/NVP
SNP
CHB/G
MXB/G
Other valves
SWD/MWD
DustCoil
CVE/CVSE
CCH/CPE/D
LifeSci
Gas-Combust
Auto-Water
SpecFld
Custom
Ending

AB31/41/42 Series

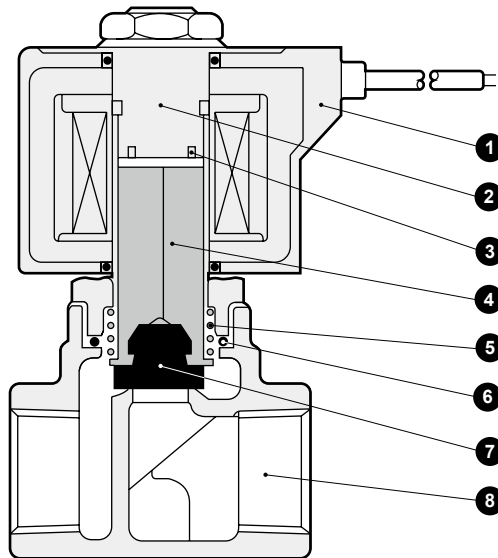
- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB**
- AG
- AP/
AD
- APK/
ADK
- DryAir
- EX-
XPLNprf
- XPLNprf
- HVB/
HVL
- S \diamond B/
NAB
- LAD/
NAD
- Water-
Rela
- NP/NAP/
NVP
- SNP
- CHB/G
- MXB/G
- Other
valves
- SWD/
MWD
- DustColl
- CVE/
CVSE
- CCH /
CPE/D
- LifeSci
-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

Internal structure and parts list

- AB31 Series
- AB41-02/03-1 to 7



- AB41-03/04-8



No.	Part name	Material	No.	Part name	Material
1	Coil	-	5	Plunger spring	SUS304
2	Core assembly	SUS405 or equivalent/316L/403 *1	6	O-ring	NBR (FKM/EPDM/PTFE) (Size: AS568-019)
3	Shading coil	Cu (Ag for stainless steel body) / Copper (silver for stainless steel body)	7	Seal	NBR (FKM/EPDM/PTFE)
4	Plunger	SUS405 or equiv.	8	Body	C3771 or CAC408*3 (SUS303)

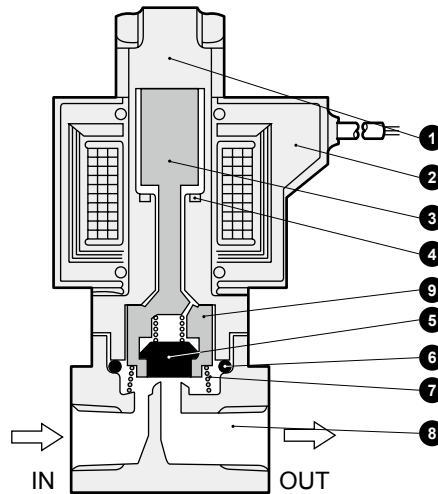
*1 : When the body/sealant combination code is other than blank and H, or the coil housing code is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent/ SUS316L/SUS430.

*2 : () shows options. However, AB41-⁰³/₀₄-8 PTFE is not available.

*3 : CAC408 for AB41-⁰³/₀₄-8 (bronze)

Internal structure and parts list

● AB42



No.	Part name	Material	No.	Part name	Material	
1	Core assembly	SUS405 or equiv./316L/304	Stainless steel	6	O-ring	NBR (FKM/EPDM/PTFE) (Size: AS568-019)
2	Coil	-	-	7	Spring	SUS304
3	Plunger	SUS405 or equiv.	Stainless steel	8	Body	C3771(SUS303)
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)	9	NO Valve	POM (SUS303/PFA)
5	Seal	NBR (FKM/EPDM/PTFE)	NBR: nitrile rubber (EPDM: ethylene propylene rubber) (FKM: fluoro rubber) (PTFE: tetrafluoroethylene resin)			Option code : Blank/O/D/H/L/V/W: POM resin : Others: Stainless steel/PFA resin

() shows options.

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

AB31/41/42 Series

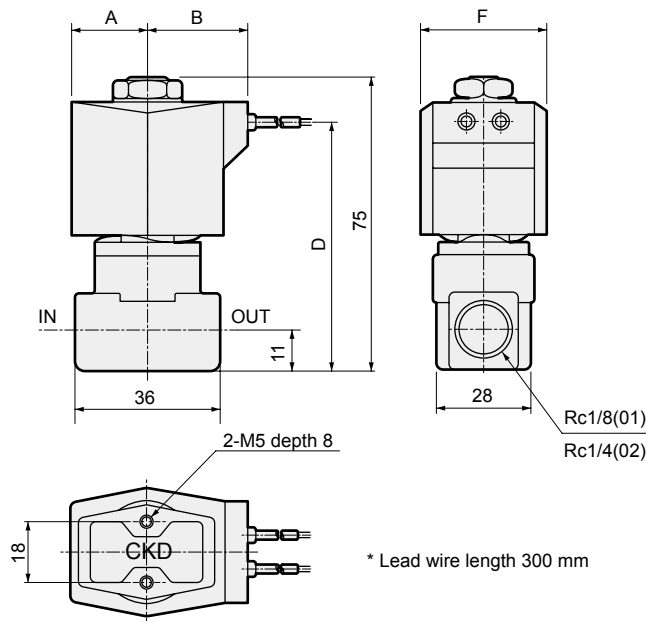


Dimensions: AB31 Series

● Grommet lead wire
AB31-01/02-1 to 6-* Blank

*1 : The AB31 Series is an NC 2-port solenoid valve. The body and sealant materials are combined according to the working fluid, and the orifice and pressure are selected according to the relation of the required flow rate and pressure. The coil specifications are determined according to the fluid temperature and ambient conditions, allowing the optimum valve to be selected.

*2 : The dimensions are the same for port sizes of G and NPT threads.



* Lead wire length 300 mm

Model No.	A	B	D	F
AB31-01-1 to 6-AC -02-1 to 6-AC	20	27	63	34

- 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 $\hat{\Delta}$ 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

Optional dimensions: AB31 Series

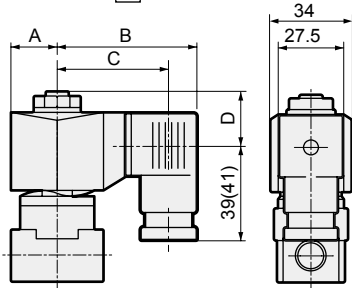


* Refer to the dimensions of grommet lead wire on the left page for common dimensions.

● With DIN terminal box

AB31-01/02-1 to 6-*

2	E
	G
	H



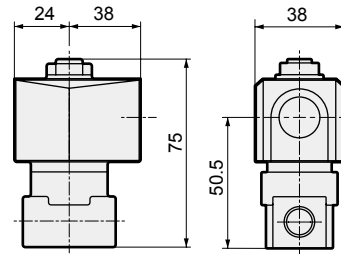
Dimensions shown in () are for G1/2.

Voltage	A	B	C	D
AC (2E/2G/2H)	20	62	50.5(50)	20.5
DC (2E/2G/2H)	21	63.5	52(51.5)	20.5

● Open frame lead wire

AB31-01/02-1 to 6-*

3A
4A
5A



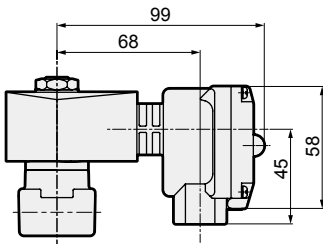
● Open frame + HP terminal box

AB31-01/02-1 to 6-*

3	M
5	N
	I
	J

 /

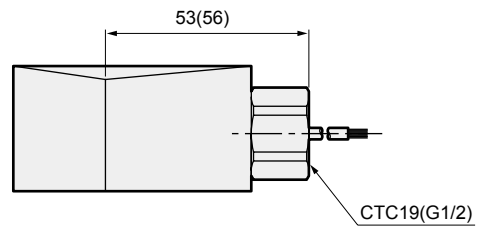
4M
4N



● Open frame + conduit

AB31-01/02-1 to 6-*

3A	G
4A	H
5A	

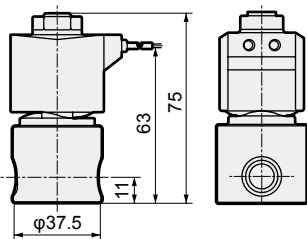


Dimensions shown in () are for G1/2.

● Stainless steel body + grommet lead wire

AB31-01/02-1 to 6-

D/E/F/R/W/L/M/N

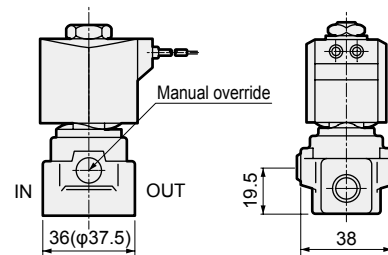


● Manual override (locking)

AB31-01/02-1 to 6-***

A

The figure shows copper alloy body.



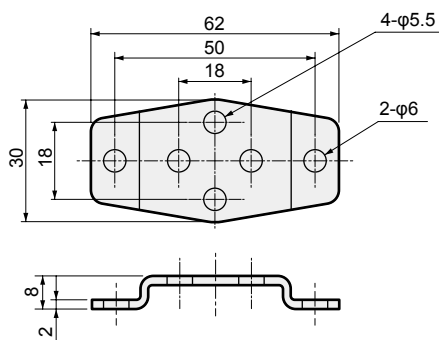
Dimensions shown in () are for stainless steel body.

● Mounting plate

AB31-01/02-1 to 6-***

B

Material: Steel
Zinc plated



Mounting plate No.1 GE-100106

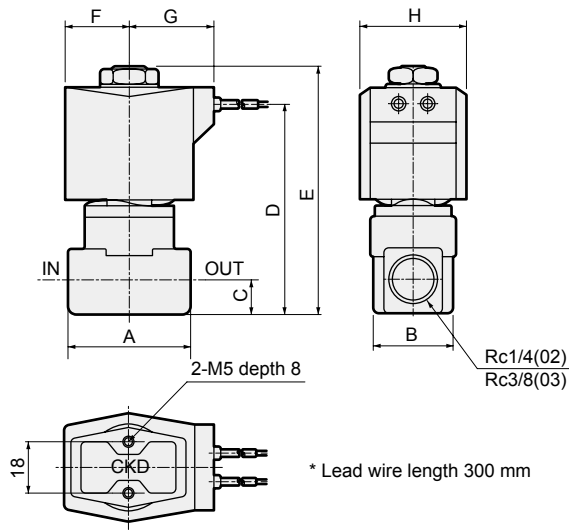
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/AD
APK/ADK
DryAir
EX-XPLNprf
XPLNprf
HVB/HVL
SΔB/NAB
LAD/NAD
Water-Rela
NP/NAP/NVP
SNP
CHB/G
MXB/G
Other valves
SWD/MWD
DustColl
CVE/CVSE
CCH/CPE/D
LifeSci
Gas-Combus
Auto-Water
SpecFld
Custom
Ending

AB31/41/42 Series



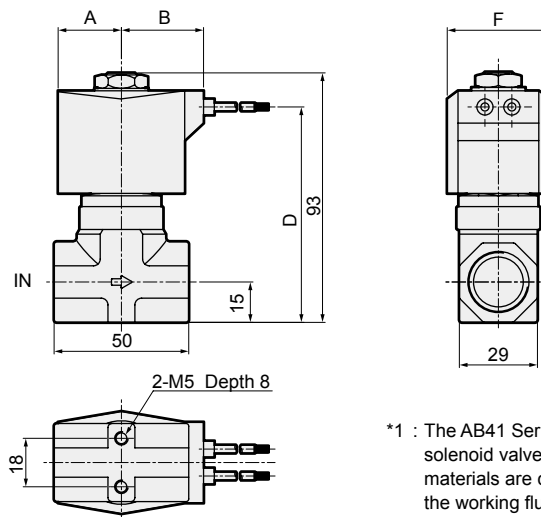
Dimensions: AB41 Series

● Grommet lead wire
AB41-02/03-1 to 7-* Blank / 6C



Model No.	A	B	C	D	E	F	G	H
AB41-02-1 to 6-AC	36	28	11	68	80.5	23.5	30.5	38
AB41-02-7-AC -03-1 to 7-AC	40	28	12	71	83.5	23.5	30.5	38
AB41-02-1 to 6-6C-DC	36	28	11	68	80.5	24	30.5	39
AB41-02-7-6C-DC -03-1 to 7-6C-DC	40	28	12	71	83.5	24	30.5	39

● Grommet lead wire
AB41-03/04-8-* Blank / 6C



Model No.	A	B	D	F
AB41-03-8-AC -04-8-AC	23.5	30.5	80	38
AB41-03-8-6C-DC -04-8-6C-DC	24	30.5	80	39

*1 : The AB41 Series is an NC 2-port solenoid valve. The body and sealant materials are combined according to the working fluid, and the orifice and pressure are selected according to the relation of the required flow rate and pressure. The coil specifications are determined according to the fluid temperature and ambient conditions, allowing the optimum valve to be selected.

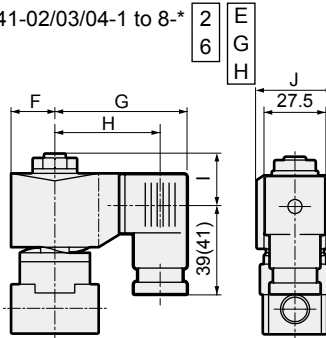
*2 : The dimensions are the same for port sizes of G and NPT threads.

Optional dimensions: AB41 Series



* Refer to the dimensions of grommet lead wire on the left page for common dimensions.

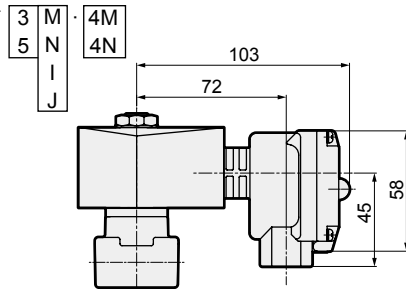
- With DIN terminal box
AB41-02/03/04-1 to 8-*



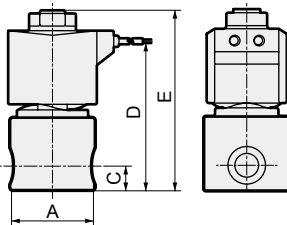
Dimensions shown in () are for G1/2.

Voltage	F	G	H	I	J
AC (2E/2G/2H)	23.5	65.5	54(53.5)	22	38
DC (2E/2G/2H)	23.5	66	54.5(54)	22	38
DC (6E/6G/6H)	24	68	56.5(56)	22	39

- Open frame + HP terminal box
AB41-02/03/04-1 to 8-*



- Stainless steel body + grommet lead wire
AB41-02/03/04-1 to 8-D/F/R/W/L/M/N/E

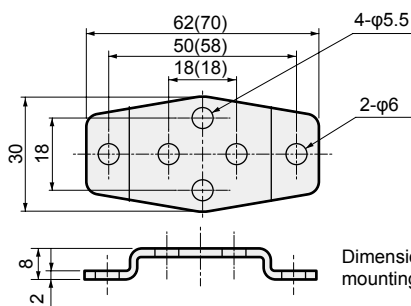


Model No.	A	C	D	E
AB41-02-1 to 6-AC	φ37.5	11	68	80.5
AB41-02-7-AC -03-1 to 7-AC	φ45.0	12	71	83.5
AB41-03-8-AC -04-8-AC	50*1	15	80	93

*1: The max. dimension is φ54.

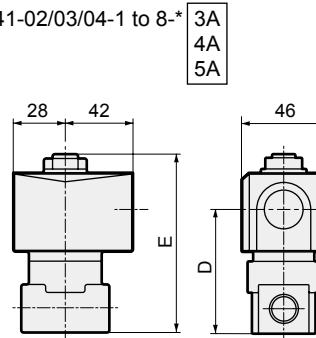
- Mounting plate
AB41-02/03/04-1 to 8-***B

Material: Steel
Zinc plated



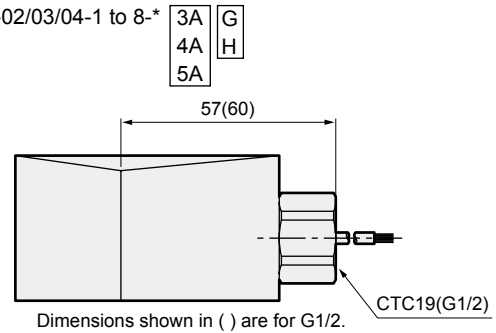
Dimensions shown in () are for mounting plate No. 2.

- Open frame lead wire
AB41-02/03/04-1 to 8-*



Model No.	D	E
AB41-02-1 to 6-* <u>A</u>	52.0	80.5
AB41-02-7-* <u>A</u> -03-1 to 7-* <u>A</u>	55.0	83.5
AB41-03/04-8-* <u>A</u>	64	93

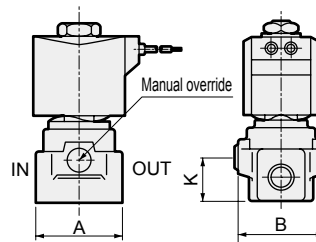
- Open frame + conduit
AB41-02/03/04-1 to 8-*



Dimensions shown in () are for G1/2.

- Manual override (locking)

AB41-02/03-1 to 7-***A
The figure shows copper alloy body.



Note: The manual override is not supplied with AB41-03/04-8.

Model No.	A	B	K
AB41-02-1 to 6-*** <u>A</u>	36(φ37.5)	38	19.5
AB41-02-7-*** <u>A</u> -03-1 to 7-*** <u>A</u>	40(φ45.0)	40	22.5

Dimensions shown in () are for stainless steel body.

Model No.	Compatibility
Mounting plate No. 1 GE-100106	<ul style="list-style-type: none"> ● AB41-02/03-1 to 7 Series ● Stainless steel body AB41-02-1 to 6-<u>D/E/F/L/M/N/R/W</u>
Mounting plate No. 2 GE-100159	<ul style="list-style-type: none"> ● AB41-03/04-8 Series ● Stainless steel body AB41-02-7-<u>D/E/F/L/M/N/R/W</u> AB41-03-1 to 7-<u>D/E/F/L/M/N/R/W</u>

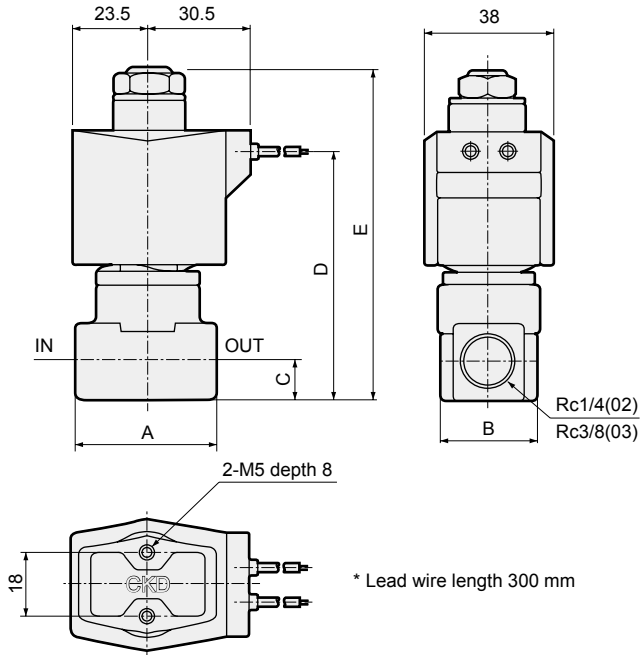
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S ^Δ B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH/ CPE/D
LifeSci
Gas- Combus
Auto- Water
SpecFld
Custom
Ending

AB31/41/42 Series



Dimensions: AB42 Series

- Grommet lead wire
AB42-02/03-1 to 7



[Reference] Normally-open direct acting 2-port valve is open when not energized and closed when energized. This structure is suitable for use in the open state for long periods.

*1 : The dimensions are the same for port sizes of G and NPT threads.

Model No.	A	B	C	D	E
AB42-02-1 to 6	36	28	11	72	94
AB42-02-7	40	28	12	75	97
AB42-03-1 to 7	40	28	12	75	97

- 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

Optional dimensions: AB42 Series

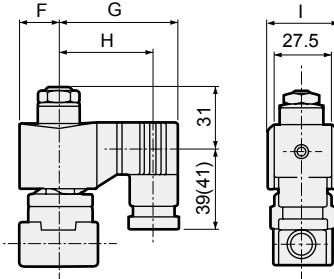


* Refer to the dimensions of grommet lead wire on the left page for common dimensions.

● With DIN terminal box

AB42-02/03-1 to 7-*

2E
2G
2H



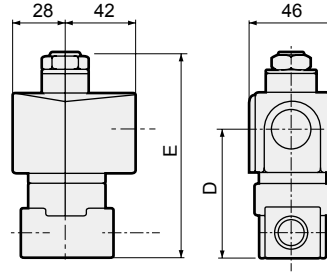
Dimensions shown in () are for G1/2.

Voltage	F	G	H	I
AC	23.5	65.5	54(53.5)	38
DC	28	72	60.5(60)	46

● Open frame lead wire

AB42-02/03-1 to 7-*

3A
4A
5A

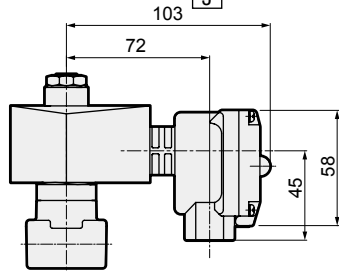


Model No.	D	E
AB42-02-1 to 6	56	94
AB42-02-7	59	97
AB42-03-1 to 7	59	97

● Open frame + HP terminal box

AB42-02/03-1 to 7-*

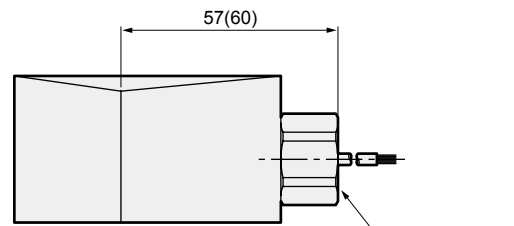
3M	4M
5N	4N
I	
J	



● Open frame + conduit

AB42-02/03-1 to 7-*

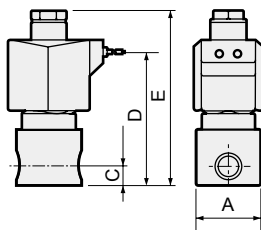
3A	G
4A	H
5A	



Dimensions shown in () are for G1/2.

● Stainless steel body + grommet lead wire

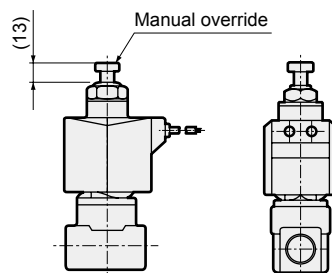
AB42-02/03-1 to 7- [D/E/F/R/W/L/M/N]



Model No.	A	C	D	E
AB42-02-1 to 6	φ37.5	11	72	94
AB42-02-7	φ45.0	12	75	97
AB42-03-1 to 7	φ45.0	12	75	97

● Manual override (locking)

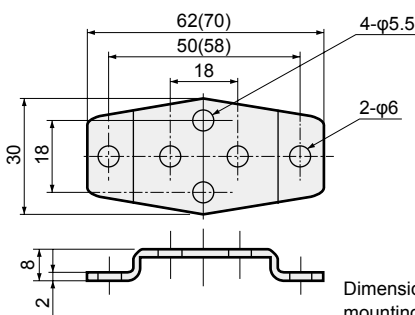
AB42-02/03-1 to 7-*** [A]



● Mounting plate

AB42-02/03-1 to 7-*** [B]

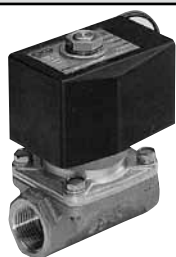
Material: Steel
Zinc plated



Dimensions shown in () are for mounting plate No. 2.

Category	Compatibility
Mounting plate No. 1 GE-100106	<ul style="list-style-type: none"> ● AB42-02/03-1 to 7 Series ● Stainless steel body AB42-02-1 to 6- [D/E/F/L/M/N/R/W]
Mounting plate No. 2 GE-100159	<ul style="list-style-type: none"> ● Stainless steel body AB42-02-7- [D/E/F/L/M/N/R/W] AB42-03-1 to 7- [D/E/F/L/M/N/R/W]

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



Large bore size direct acting 2-port solenoid valve
(general purpose valve)

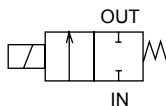
AB71 Series

- NC
- Port size: Rc1/2, Rc3/4, Rc1



- 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 $\hat{\Delta}$ 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

JIS symbol



Specifications

1 MPa \approx 145.0 psi, 1 MPa = 10 bar

Descriptions		AB71-15-12	AB71-20-15	AB71-25-18
Working fluid		Air/water/kerosene/oil (20 mm ² /s)		
Working pressure differential MPa	Air	AC:0 to 0.1, DC:0 to 0.08	AC:0 to 0.07, DC:0 to 0.04	AC:0 to 0.04, DC:0 to 0.03
	Fluids	AC:0 to 0.08, DC:0 to 0.08	AC:0 to 0.05, DC:0 to 0.04	AC:0 to 0.03, DC:0 to 0.03
Proof pressure (water pressure) MPa		1 (\approx 150 psi, 10 bar)		
Fluid viscosity mm ² /s		20 or less		
Fluid temperature °C		-5 (23°F) to 60 (140°F) (no freezing)		
Ambient temperature °C		-10 (14°F) to 60 (140°F)		
Valve seat leakage cm ³ /min(ANR)		0.2 or less (air)		
Port size		Rc1/2	Rc3/4	Rc1
Orifice size mm		12	15	18
Mounting orientation		Limited to the range of vertical direction with the coil on top to horizontal direction.		
Weight kg		1.0	1.2	1.6

Electrical specifications

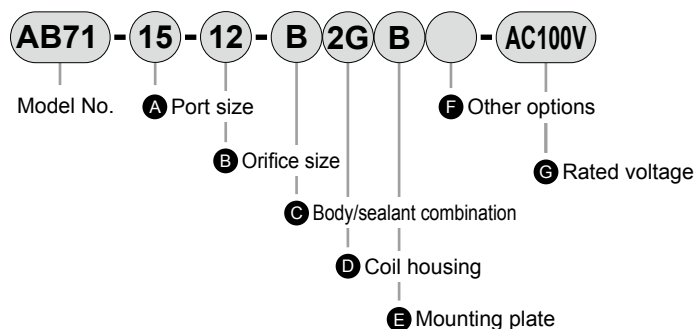
Rated voltage		100 VAC50/60 Hz, 200 VAC50/60 Hz, 110 VAC60 Hz, 220 VAC60 Hz, 12 VDC, 24 VDC, 48 VDC, 100 VDC		
Apparent power VA	When holding (50/60 Hz)	32/26		
	When starting (50/60 Hz)	123/106		
Power consumption W		AC:13/11(50/60 Hz), DC:20		

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics			
			C[dm ³ /(s·bar)]	b	Cv	S(mm ²)
AB71-15-12	Rc1/2	12	15	0.21	2.8	-
AB71-20-15	Rc3/4	15	-	-	4.3	106
AB71-25-18	Rc1	18	-	-	6.3	148

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

How to order



Code	Content			
A Port size				
15	Rc1/2			
20	Rc3/4			
25	Rc1			
B Orifice size				
12	φ12 (AB71-15 [port size Rc1/2] only)			
15	φ15 (AB71-20 [port size Rc3/4] only)			
18	φ18 (AB71-25 [port size Rc1] only)			
C Body/sealant combination				
	Body	Body	Seal	Treatment
B	Bronze	Copper alloy	Fluoro rubber	-
J	Bronze	Copper alloy	Fluoro rubber	Oil free

[Example of model No.]

AB71-15-12-B2EB-AC100V

Model: AB71

- A** Port size : Rc1/2
- B** Orifice size : φ12
- C** Body/sealant combination : Body - bronze, stuffing - copper alloy, seal - fluoro rubber
- D** Coil housing : With DIN terminal box (G1/2)
- E** Mounting plate : With
- F** Other options : None
- G** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

D Coil housing			E	F Other options			G Rated voltage			
Content			Mounting plate	Cable gland		Conduit		Content		
				(marine cable gland)		(conduit piping)				
2C	Std.	Grommet lead wire	B	A-15a	A-15b	A-15c	CTC19	G1/2	100 VAC, 200 VAC	
2E	Option	With DIN terminal box (G1/2)		B	D	E	F	G		H
2G		With DIN terminal box (Pg11)								
2H		DIN terminal box with small lamp (Pg11)								
3A	Open Frame	Lead wire (IP65 or equivalent)	B						D	
3M		With HP terminal box (G1/2)		12 VDC, 24 VDC, 48 VDC, 100 VDC						
3N	HP terminal box with lamp (G1/2)	100 VAC, 200 VAC, 24 VDC, 100 VDC								
5A	Open Frame (diode integrated)	Lead wire (IP65 or equivalent)		B	D	E	F	G		H
5M		With HP terminal box (G1/2)								
5N		HP terminal box with lamp (G1/2)								

For Items **D** to **G**, the combinations indicated with codes are available.
Note that if options for Items **E** and **F** are not required, they should be left blank.

⚠ Precautions for model No. selection

Notes for **C**

*1 : Refer to Intro Page 39 for reference on material combinations.

Notes for **D**

- *2 : Refer to page 148 for coil selection.
- *3 : Coils for 5A/5M/5N have a diode to convert AC to DC voltage.
- *4 : When the fluid is air, 5A type is recommended.
- *5 : For availability of coil of thermal class H, contact CKD.

Notes for **F**

*6 : For Item **F**, select an option from D, E, F, G and H.

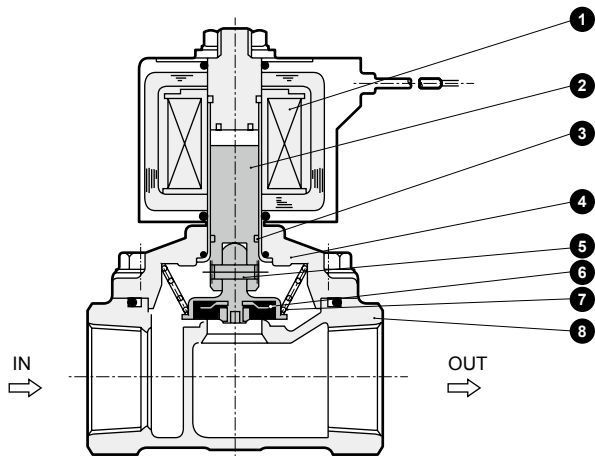
Notes for **G**

- *7 : 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, **D** 5A/5K/5H coils can be used with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
- *8 : For voltages other than above, contact CKD.
- *9 : The lead wire is available in 300 mm length (standard) and 500 mm length. Contact CKD for more information.

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
SDB/NAB
LAD/NAD
Water-Rela
NP/NAP/NVP
SNP
CHB/G
MXB/G
Other valves
SWD/MWD
DustCoil
CVE/CVSE
CCH/CPE/D
LifeSci
Gas-Combus
Auto-Water
SpecFld
Custom
Ending

AB71 Series

Internal structure and parts list



No.	Part name	Material
1	Coil	-
2	Plunger	SUS405 Stainless steel
3	Wear ring	PTFE Tetrafluoroethylene resin
4	Stuffing assembly (Core assembly)	C3771 SUS405, Cu Copper alloy Stainless steel, copper
5	Spring pin	SUS420 Stainless steel
6	Main valve	SUS304, FKM Stainless steel, fluoro rubber
7	Main valve spring	SUS304 Stainless steel
8	Body	CAC407 Bronze

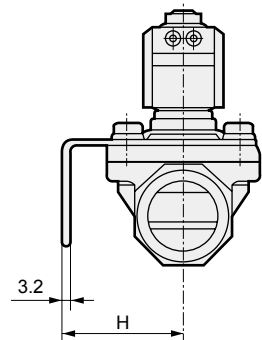
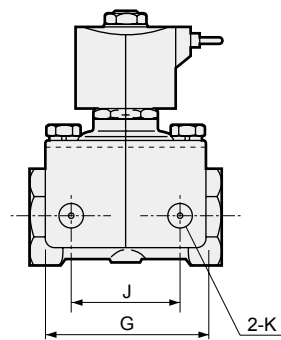
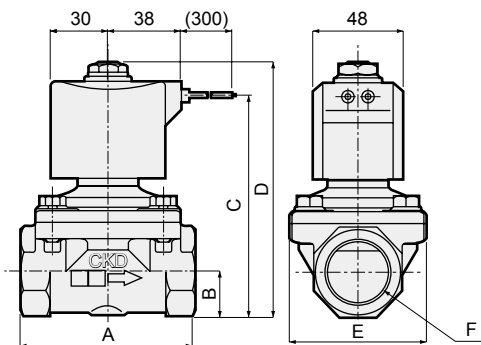
Dimensions



● Grommet lead wire
AB71-**-**2C

● With mounting plate
AB71-**-** B

Material: Steel
Zinc plated



Model No.	A	B	C	D	E	F	G	H	J	K	
CVE/ CVSE	AB71-15-12	71	14.5	95	110.5	50	Rc1/2	56	45	40	φ9
CCH / CPE/D	AB71-20-15	80	17.5	101	116	60	Rc3/4	63	50	45	φ9
	AB71-25-18	90	22.5	111	126	71	Rc1	75	56	50	φ11

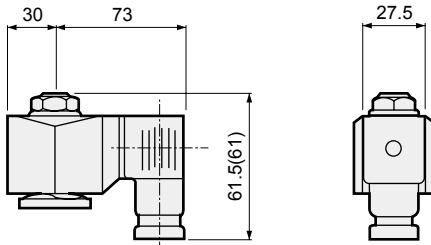
Optional dimensions



- With DIN terminal box

AB71-**-**2

E
G
H

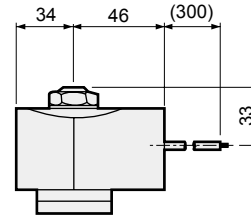


Dimensions shown in () are for G1/2.

- Open frame lead wire

AB71-**-**

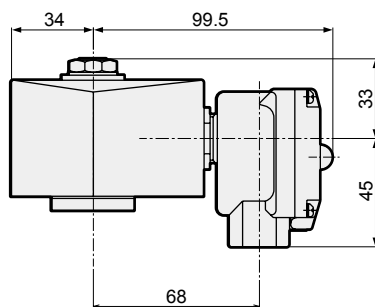
3A
5A



- Open frame + HP terminal box

AB71-**-**

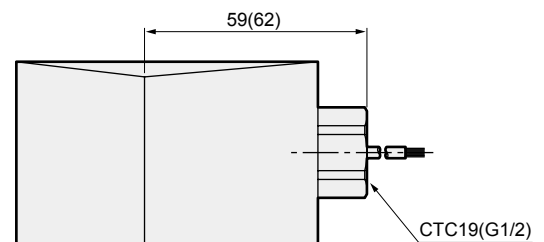
3	M
5	N



- Open frame + conduit

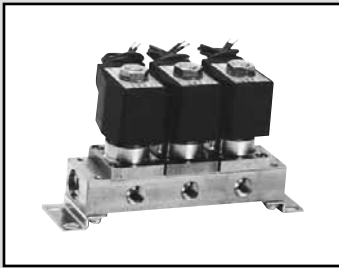
AB71-**-**

3A	G
5A	H



Dimensions shown in () are for G1/2.

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



Direct acting 2-port solenoid valve, manifold/actuator
(General purpose valve)

GAB312/GAB352/GAB412/GAB452 Series

● NC

● Common supply (port C pressurization), individual supply (port A pressurization)

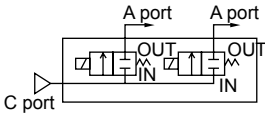
CE Refer to the Ending for details.



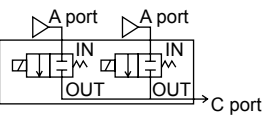
- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/AD
- APK/ADK
- DryAir
- EX-XPLNprf
- XPLNprf
- HVB/HVL
- LAD/NAD
- Water-Rela
- NP/NAP/NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/MWD
- DustColl
- CVE/CVSE
- CCH/CPE/D
- LifeSci
- Gas-Combus
- Auto-Water
- SpecFld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

JIS symbol

● GAB312/412
(Common supply/port C pressurization)



● GAB352/452
(Individual supply/port A pressurization)



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Standard specifications	Optional specifications	
Working fluid	Air/low vacuum [1.33 x 10 ⁵ Pa (abs)]/water/kerosene/oil (50 mm ² /s or less)	Hot water	Steam
Working pressure differential MPa	0 to 5 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	5 (≈730 psi, 50 bar)	1 (≈150 psi, 10 bar)	
Proof pressure (water pressure) MPa	10 (≈1500 psi, 100 bar)		
Fluid temperature (*1) °C	-10 (14°F) to 60 (140°F)	-10 (14°F) to 90 (194°F)	-10 (14°F) to 184 (363.2°F)
Ambient temperature °C	-20 (-4°F) to 60 (140°F)	-20 (-4°F) to 100 (212°F)	
Thermal class	Class 130 (B)	Class 180 (H)	
Atmosphere	Place free of corrosive gas and explosive gas		
Valve structure	Direct acting poppet structure		
Valve seat leakage cm ³ /min(ANR)	0.2 or less (air)	300 or less (air)	
Mounting orientation	Unrestricted		
Body/seal material	Copper alloy/nitrile rubber	Copper alloy/EPM rubber	Copper alloy/PTFE

*1: No freezing.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Model No.	Port size	Orifice size (mm)	Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)		
			Air		Water(hot)/Kerosene		Oil (50 mm ² /s)				When holding		When starting		AC 50/60 Hz	DC	
			AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz			
GAB312/352-1	-	1.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	1.0	100 VAC 50/60 Hz *8	12	10	17	14	5.2/3.8	11 (8.1)*5
		2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.0							
		3.0	1.0	0.5	0.7	0.5	0.5	0.5	0.5	0.7							
		3.5	0.6	0.4	0.5	0.4	0.4	0.4	0.4	0.5							
		4.0	0.4	0.25	0.3	0.25	0.25	0.25	0.25	0.3							
		5.0	0.2	0.15	0.15	0.15	0.15	0.15	0.15	0.15							
GAB412/452-1	-	1.5	5.0	4.0	4.5	4.0	4.0	4.0	4.0	1.0	200 VAC 50/60 Hz *8	18	15	29	24	6.7/5.7	11 (10.4)*5 (7)*7
		2.0	3.0	2.5	2.7	2.5	2.5	2.5	2.5	1.0							
		3.0	1.5	0.9	1.3	0.9	0.9	0.9	0.9	1.0							
		3.5	1.2	0.6	0.9	0.6	0.6	0.6	0.6	0.9							
		4.0	1.0	0.5	0.7	0.5	0.5	0.5	0.5	0.7							
		5.0	0.6	0.25	0.4	0.25	0.25	0.25	0.25	0.4							
		7.0	0.25	0.1	0.2	0.1	0.15	0.1	0.1	0.2							

*1 : The model numbers above are for basic orifice sizes. Refer to How to order for other combinations (e.g., for steam).

*2 : For port size, refer to How to order (page 174) and dimensions (page 178).

*3 : Refer to DC column for the max. working pressure differential of coil with diode.

*4 : The voltage fluctuation range must be within ±10% of the rated voltage.

*5 : Power consumption of coil housings 2E/2G/2H.

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

*7 : Power consumption of coil housings 6C/6E/6G/6H.

*8 : The 100 VAC (50/60 Hz) can be used with 110 VAC (60 Hz). The 200 VAC (50/60 Hz) can be used with 220 VAC (60 Hz). However, this does not apply to coil housings 5A/5M/5N/5I/5J.

Weight

Model No.	Weight (kg)									
	Actuator only	2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
GAB312 GAB352	0.34	1.4	2.0	2.8	3.2	4.0	4.6	5.2	6.0	6.3
GAB412 GAB452	0.42	1.6	2.2	3.1	3.6	4.5	5.1	5.8	6.7	7.1

Optional specifications (fluid temperature, ambient temperature, valve seat leakage)

Sealant	Fluoro rubber		Ethylene propylene rubber		PTFE	
Coil (thermal class)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)
Fluid temperature (*1) °C	-10 to 60	-10 to 90	0 to 60 (*3)	0 to 90 (*3)	-10 to 60	-10 to 184
Ambient temperature °C	-20 to 60	-20 to 100 (*2)	-20 to 60	-20 to 100 (*2)	-20 to 60	-20 to 100 (*2)
Valve seat leakage cm ³ /min(ANR)	0.2 or less (air)				300 or less (air)	

*1 : No freezing.

*2 : -20 to 80°C when coil housing is HP terminal box with lamp.

*3 : The lowest temperature is 0°C since the fluid is water.

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics		
			C[dm ³ /(s·bar)]	b	Cv
GAB312/352-1	-	1.5	0.29	0.53	0.10
		2.0	0.53	0.52	0.15
		3.0	1.1	0.52	0.31
		3.5	1.5	0.47	0.40
		4.0	1.9	0.47	0.48
		5.0	2.6	0.38	0.62
GAB412/452-1	-	1.5	0.29	0.53	0.10
		2.0	0.53	0.5	0.15
		3.0	1.1	0.52	0.31
		3.5	1.5	0.47	0.40
		4.0	1.9	0.47	0.48
		5.0	2.6	0.38	0.62
		7.0	4.6	0.37	0.82

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

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 \diamond 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

GAB312/352/412/452 Series

How to order

● Common supply (port C pressurization)

GAB312 - **1** - **5** - **B** **3A** **A** **G** **S** - **AC100V**

● Individual supply (port A pressurization)

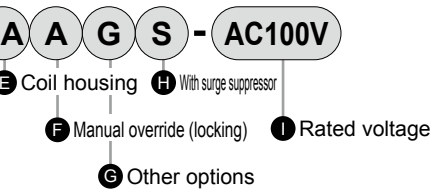
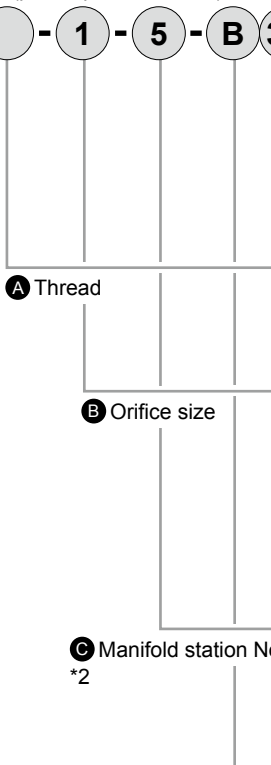
GAB352

● Common supply (port C pressurization)

GAB412

● Individual supply (port A pressurization)

GAB452



Model No.	
GAB312	GAB412
GAB352	GAB452

Code	Content	GAB312	GAB412				
A Thread							
Blank	Rc	●	●				
G	G	●	●				
N	NPT	●	●				
B Orifice size							
1	φ1.5	●	●				
2	φ2	●	●				
3	φ3	●	●				
4	φ3.5	●	●				
5	φ4	●	●				
6	φ5	●	●				
7	φ7		●				
C Manifold station No.							
2 to 10	2 stations to 10 stations	●	●				
0	Actuator only	●	●				
D Body/sealant combination							
	Body	Seal	Treatment	Remarks	GAB312	GAB412	
Blank	Std. Copper alloy	Nitrile rubber	-	Air/water/low vacuum/kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *4)	●	●	
		PTFE		Steam (up to 184°C *4)	●	●	
D	Stainless steel	Nitrile rubber	-	Air/water/low vacuum/kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *4)	●	●	
		PTFE		Steam (up to 184°C *4)	●	●	
H	Option Copper alloy	Nitrile rubber	Oil free	Air/water/low vacuum/kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air/low vacuum/kerosene (up to 90°C *4)	●	●	
		PTFE		Steam (up to 184°C *4)	●	●	
J	Option Copper alloy	Ethylene propylene rubber		Hot water (up to 90°C *4)	●	●	
		Stainless steel		Nitrile rubber	Air/water/low vacuum/kerosene (up to 60°C)	●	●
				Fluoro rubber	Air/low vacuum/kerosene (up to 90°C *4)	●	●
PTFE	Steam (up to 184°C *4)		●	●			
R	Stainless steel	Ethylene propylene rubber	Hot water (up to 90°C *4)	●	●		

Refer to Intro Page 39 for reference on material combinations.

E to I
Refer to the following page for details on the coil housing, other options and voltage, etc.

The combinations indicated with ● in the above table are available.

⚠ Precautions for model No. selection

*1 : Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Notes for C to D

- *2 : For 11 or more manifold station No., contact CKD.
- *3 : Leave blank for standard. However, to select options in (E), (F), (G) or (H), indicate 0 for Item (D).
- *4 : When Item (D) 4A/4M/4N is selected.
- *5 : The ethylene propylene rubber seal combination (Item (D) P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene rubber is not oil-resistant.)
- *6 : When Item (D) is C, F, K, P, N or R, the Item (E) coil housings 6C, 6E, 6G and 6H cannot be selected.
- *7 : For PTFE seal, O-ring material of sub-plate connection will be FKM.

[Example of model No. 1]
GAB312G-1-3-AC200V

Model: GAB312 (common supply, port C pressurization)

- (A) Thread : G
- (B) Orifice size : φ1.5
- (C) Manifold station No. : 3 stations
- (D) Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- (E) Coil housing : Grommet lead wire
- (F) to (H) : None
- (G) Rated voltage : 200 VAC 50/60 Hz, 220 VAC 60 Hz

[Example of model No. 2]
GAB352-5-2-000AS-AC200V

Model: GAB352 (individual supply/port A pressurization)


- (A) Thread : Rc
- (B) Orifice size : φ4
- (C) Manifold station No. : 2 stations
- (D) Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- (E) Coil housing : Grommet lead wire
- (F) Manual override (locking) : Selected
- (G) Other options : None
- (H) Surge suppressor : With surge suppressor
- (I) Rated voltage : 200 VAC 50/60 Hz, 220 VAC 60 Hz

For Items (E) to (I), the combinations indicated with codes are available.
 Note that if options for Items (F) to (H) are not required, they should be left blank.

(E) Coil housing		(F) Manual override (Locking)	(G) Other options					(H) With surge suppressor	(I) Rated voltage			
Content			Cable gland			Conduit			Content			
			(marine cable gland)			(conduit piping)						
			A-15a	A-15b	A-15c	CTC19	G1/2					
Blank	Std.	Grommet lead wire							100 VAC, 200 VAC			
2E		With DIN terminal box (G1/2)						S	100 VAC, 200 VAC			
2G		With DIN terminal box (Pg11)							12 VDC, 24 VDC, 48 VDC, 100 VDC			
2H		DIN terminal box with small lamp (Pg11)							H	100 VAC, 200 VAC, 24 VDC		
3A	Open frame	Lead wire (IP65 or equivalent)						G	H	100 VAC, 200 VAC		
3M		With HP terminal box (G1/2)								12 VDC, 24 VDC, 48 VDC, 100 VDC		
3N		HP terminal box with lamp (G1/2)						S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC			
3I		HP terminal box (IP65 or equivalent) (G1/2)							100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC			
3J		HP term box, lamp (IP65, equiv) (G1/2)							100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC			
4A	Option Open frame (Thermal class 180 (H))	Lead wire						G	H	S	100 VAC, 200 VAC	
4M		With HP terminal box (G1/2)									100 VAC, 200 VAC	
4N		HP terminal box with lamp (G1/2)										
5A	Open frame (diode integrated)	Lead wire (IP65 or equivalent)						G	H	S	100 VAC, 200 VAC	
5M		With HP terminal box (G1/2)										
5N		HP terminal box with lamp (G1/2)										
5I		HP terminal box (IP65 or equivalent) (G1/2)										
5J		HP term box, lamp (IP65, equiv) (G1/2)										
6C		Grommet lead wire 7W								S	12 VDC, 24 VDC	
6E		With DIN terminal box (G1/2) 7W										
6G		With DIN terminal box (Pg11) 7W										
6H		DIN terminal box with small lamp (Pg11) 7W						H			24 VDC	

⚠ Refer to the following cautions for Items (E) to (I).

Blank 6C		● Grommet lead wire 300 mm
2E 2G 2H 6E 6G 6H		● DIN terminal box
3A 4A 5A		● Open frame lead wire 300 mm ● 4A (Thermal class 180 (H)) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (Thermal class 180 (H)) ● 5M, 5N (diode integrated)
3I 3J 5I 5J		● Open frame HP terminal box (IP65 or equivalent) ● 5I, 5J (diode integrated)

G H		● Conduit ● G(CTC19) ● H(G1/2)
--------	--	--------------------------------------

⚠ Precautions for model No. selection

Notes for (E)

- *8 : Leave blank for the standard coil housing. However, to select options in (F), (G) or (H), indicate 00 for Item (E).
- *9 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.
- *10: A DC coil for steam is available for GAB4*2. Contact CKD for more information.
- *11: The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.
- *12: For 6C/6E/6G/6H, only GAB4*2 is available.

Notes for (F) to (H)

- *13: When Item (D) is C, F, K or N, the manual override (Item (F)A) is not available.
- *14: For Item (G), select an option from D, E, F, G and H.
- *15: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- *16: As standard, the surge suppressor is built into the coil with diode and the 24 VDC coil (Item (E)2H/6H), so surge suppressor code S cannot be selected.
- *17: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information. Note that tropicalization is not available when the manual override option (A) and the coil option 6C/6E/6G/6H are selected.

Notes for (I)

- *18: 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item (E) 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *19: For voltages other than above, contact CKD.
- *20: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

Refer to page 148
for coil selection.

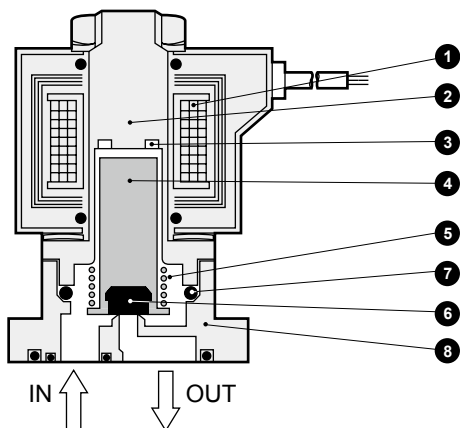
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
SDB/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustCoil
CVE/ CVSE
CCH / CPE/D
LifeSci
Gas- Combus
Auto- Water
SpecFld
Custom
Ending

GAB312/352/412/452 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
- S \updownarrow 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

Internal structure and parts list

● GAB312/GAB352/GAB412/GAB452 actuator



No.	Part name	Material
1	Coil	-
2	Core assembly	SUS405 or equiv./316L/403 *1
3	Shading coil	Cu (Ag for stainless steel body) Copper (silver for stainless steel body)
4	Plunger	SUS405 or equiv.
5	Plunger spring	SUS304
6	Seal	NBR (FKM/EPDM/PTFE)
7	O-ring	NBR (FKM/EPDM/PTFE) (Size: AS568-019)
8	Body	C3771(SCS13)

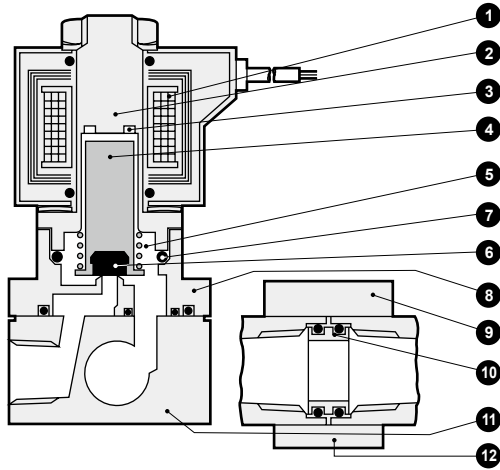
*1 : When the body/sealant combination code is other than blank and H, or the coil housing code is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent/SUS316L/SUS430.

*2 : () shows options.

*3 : 4 body mounting screws and 2 O-rings are attached to the actuator only.

Internal structure and parts list

● GAB312/GAB352/GAB412/GAB452 manifold



No.	Part name	Material
1	Coil	-
2	Core assembly	SUS405 or equiv./316L/403 *1
3	Shading coil	Cu (Ag for stainless steel body) / Copper (silver for stainless steel body)
4	Plunger	SUS405 or equiv. / Stainless steel
5	Plunger spring	SUS304 / Stainless steel
6	Seal	NBR (FKM/EPDM/PTFE) / NBR: Nitrile rubber / FKM: Fluoro rubber / EPDM: Ethylene propylene rubber / PTFE: Tetrafluoroethylene resin
7	O-ring	NBR (FKM/EPDM/PTFE) (Size: AS568-019)
8	Body	C3771(SCS13) / Copper alloy (stainless steel)
9	Holder	SPCC / Steel
10	Connector	C3604(SUS304) / Copper alloy (stainless steel)
11	Sub-plate	C3604(SUS303) / Copper alloy (stainless steel)
12	Connecting plate	SPCC / Steel

*1 : When the body/sealant combination code is other than blank and H, or the coil housing code is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent/SUS316L/SUS430.

*2 : () shows options.

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

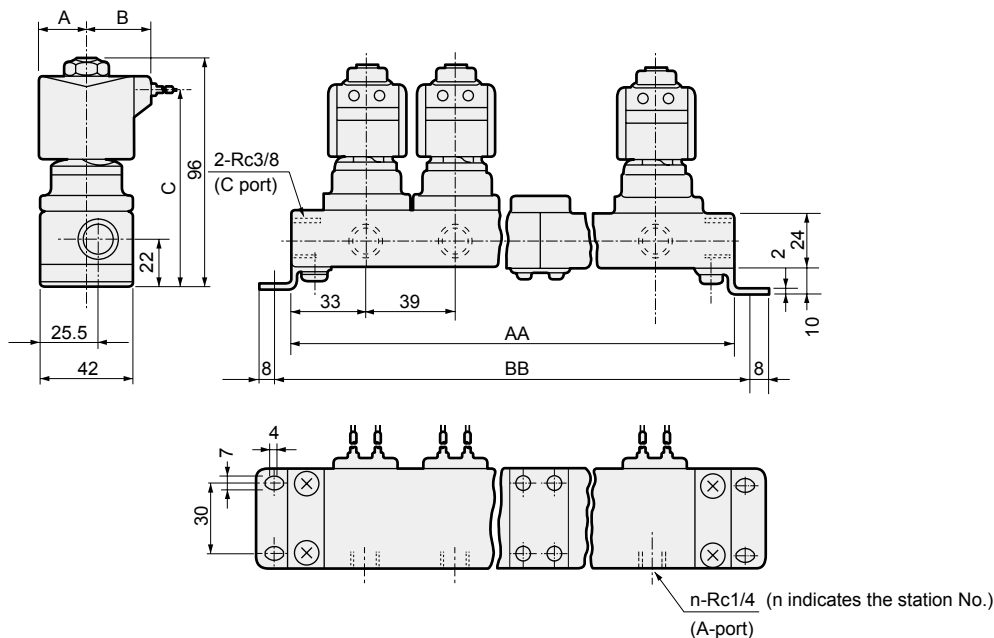
GAB312/352/412/452 Series



Dimensions: GAB312/352 Series

● Manifold (grommet lead wire)

GAB312/352-1 to 6- [2 to 10] - * [Blank]



Station No.	AA	BB	Manifold configuration	Station No.	AA	BB	Manifold configuration
2	106	122	2 stations x 1	7	329	345	5 stations + 2 stations
3	145	161	3 stations x 1	8	368	384	5 stations + 3 stations
4	212	228	2 stations x 2	9	435	451	3 stations x 3
5	223	239	5 stations x 1	10	446	462	5 stations x 2
6	290	306	3 stations x 2	Contact CKD for 11 stations or more.			

Model No.	A	B	C
Blank	20	27	84

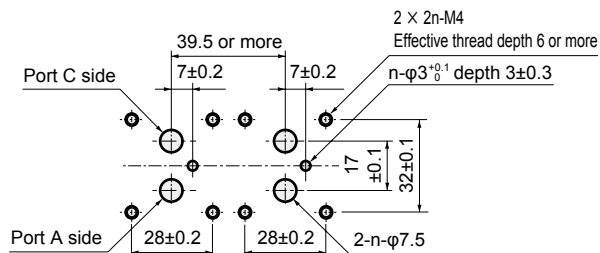
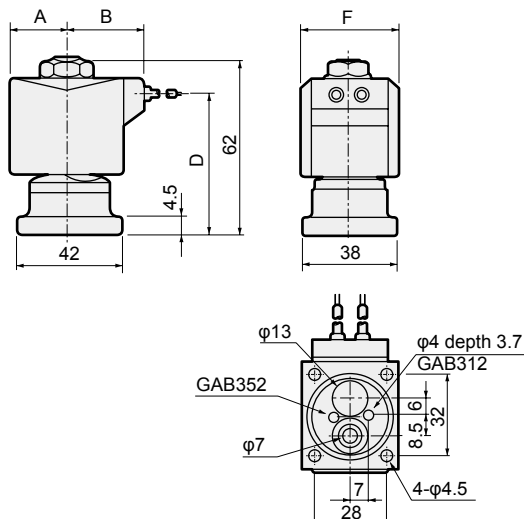
*1 : Manifold configuration combines 2-station, 3-station and 5-station units.

*2 : The dimensions are the same for port sizes of G and NPT threads.

● Actuator (grommet lead wire)

GAB312/352-1 to 6- [0] - * [Blank]

● Recommended dimensions for actuator mounting



■ Machining drawing when using 2 actuators

Model No.	A	B	D	F
Blank	20	27	50	34

GAB312/352/412/452 Series

Optional dimensions: GAB312/352 Series

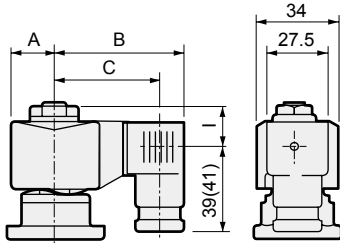


* Refer to the dimensions of grommet lead wire on the left page for common dimensions.

● With DIN terminal box

GAB312/352-1 to 6-0 to 10-*

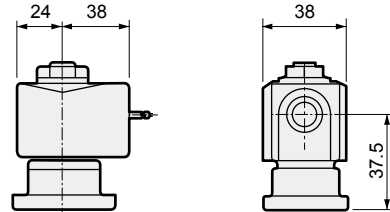
2	E
G	H



● Open frame lead wire

GAB312/352-1 to 6-0 to 10-*

3A
4A
5A



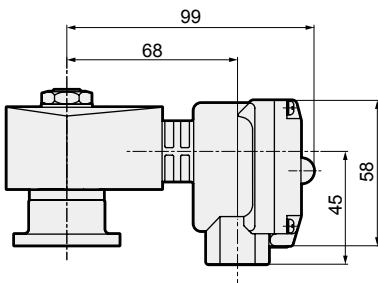
Dimensions shown in () are for G1/2.

Voltage	A	B	C	I
AC (2E/2G/2H)	20	62	50.5(50)	20.5
DC (2E/2G/2H)	21	63.5	52(51.5)	20.5

● Open frame + HP terminal box

GAB312/352-1 to 6-0 to 10-*

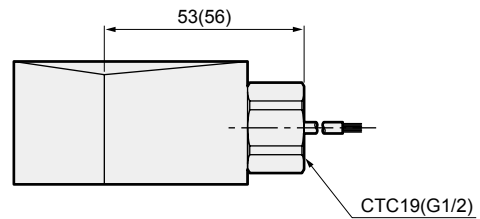
3	M	4M
5	N	4N
	I	
	J	



● Open frame + conduit

GAB312/352-1 to 6-0 to 10-*

3A	G
4A	H
5A	

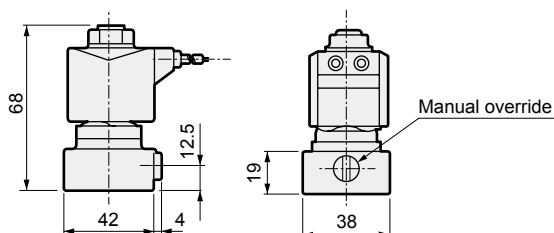


Dimensions shown in () are for G1/2.

● Manual override (locking)

GAB312/352-1 to 6-0 to 10-***

A



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

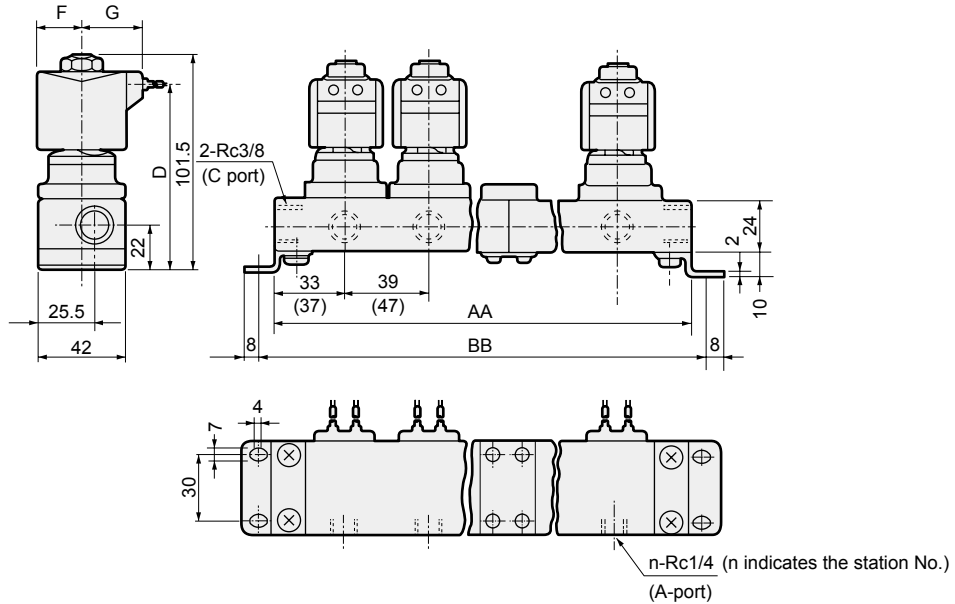
GAB312/352/412/452 Series



Dimensions: GAB412/452 Series

● Manifold (grommet lead wire)

GAB412/452-1 to 7- [2 to 10] - * [Blank] / [6C]



Station No.	AA	BB	Manifold configuration	Station No.	AA	BB	Manifold configuration
2	106(122)	122(138)	2 stations x 1	7	329(385)	345(401)	5 stations + 2 stations
3	145(169)	161(185)	3 stations x 1	8	368(432)	384(448)	5 stations + 3 stations
4	212(244)	228(260)	2 stations x 2	9	435(507)	451(523)	3 stations x 3
5	223(263)	239(279)	5 stations x 1	10	446(526)	462(542)	5 stations x 2
6	290(338)	306(354)	3 stations x 2	Contact CKD for 11 stations or more.			

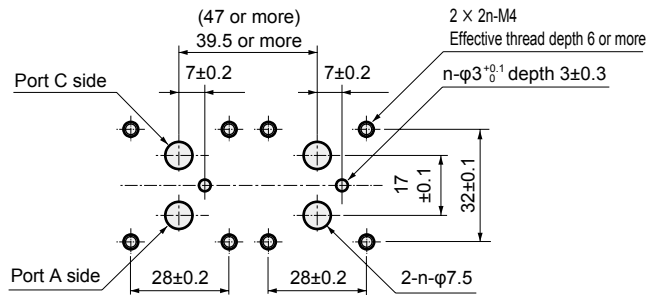
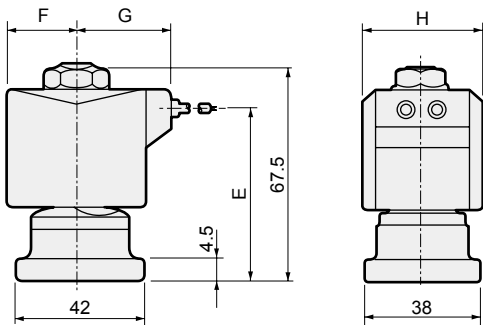
Model No.	F	G	D
Blank	23.5	30.5	89
6C	24	30.5	87.5

*1 : Manifold configuration combines 2-station, 3-station and 5-station units.
 *2 : Dimensions shown in () are for open frame.
 *3 : The dimensions are the same for port sizes of G and NPT threads.

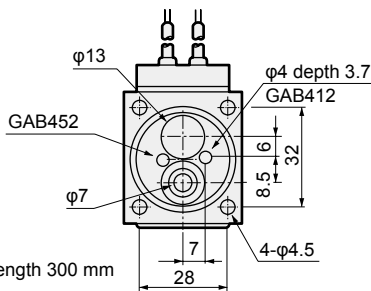
● Actuator (grommet lead wire)

GAB412/452-1 to 7-0 - * [Blank] / [6C]

● Recommended dimensions for actuator mounting



■ Machining drawing when using 2 actuators



* Lead wire length 300 mm

Model No.	F	G	E	H
Blank	23.5	30.5	55	38
6C	24	30.5	55	39

GAB312/352/412/452 Series

Optional dimensions: GAB412/452 Series

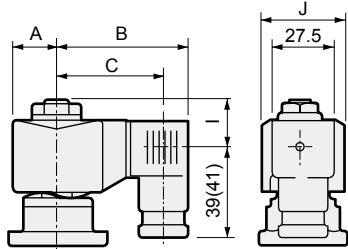


* Refer to the dimensions of grommet lead wire on the left page for common dimensions.

● With DIN terminal box

GAB412/452-1 to 7-0 to 10-*

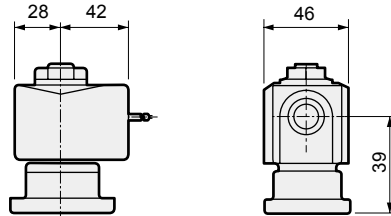
2	E
6	G
	H



● Open frame lead wire

GAB412/452-1 to 7-0 to 10-*

3A
4A
5A



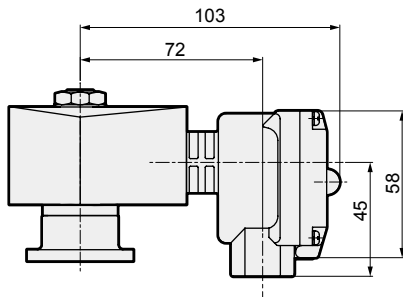
Dimensions shown in () are for G1/2.

Voltage	A	B	C	I	J
AC (2E/2G/2H)	23.5	65.5	54(53.5)	22	38
DC (2E/2G/2H)	23.5	66	54.5(54)	22	38
DC (6E/6G/6H)	24	68	56.5(56)	22	39

● Open frame + HP terminal box

GAB412/452-1 to 7-0 to 10-*

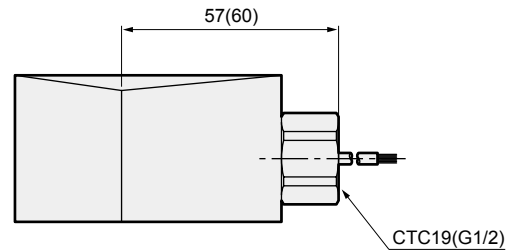
3	M	4M
5	N	4N
	I	
	J	



● Open frame + conduit

GAB412/452-1 to 7-0 to 10-*

3A	G
4A	H
5A	

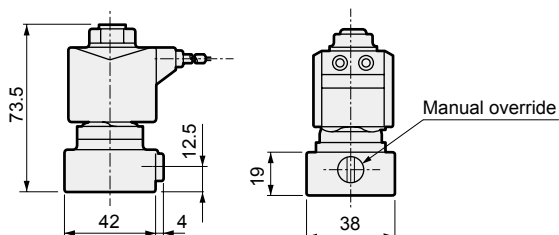


Dimensions shown in () are for G1/2.

● Manual override (locking)

GAB412/452-1 to 7-0 to 10-***

A



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



Direct acting 2-port solenoid valve, manifold/actuator
(General purpose valve)

GAB422 Series

- NO
- Common supply (port C pressurization)

CE Refer to the Ending for details.

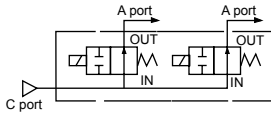


- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/AD
- APK/ADK
- DryAir
- EX-XPLNprf
- XPLNprf
- HVB/HVL
- SAB/NAB
- LAD/NAD
- Water-Rela
- NP/NAP/NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/MWD
- DustColl
- CVE/CVSE
- CCH/CPE/D
- LifeSci
- Gas-Combus
- Auto-Water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

Manifold circuit configuration Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

- GAB422
(Common supply/port C pressurization)



Descriptions	Standard specifications	Optional specifications	
Working fluid	Air/low vacuum (1.33 x 10 ⁵ Pa (abs)) / water/kerosene/oil (50 mm ² /s or less)	Hot water	Steam
Working pressure differential MPa	0 to 2 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	2 (≈290 psi, 20 bar)	1 (≈150 psi, 10 bar)	
Proof pressure (water pressure) MPa	10 (≈1500 psi, 100 bar)		
Fluid temperature (*1) °C	-10 (14°F) to 60 (140°F)	-10 (14°F) to 90 (194°F)	-10 (14°F) to 184 (363.2°F)
Ambient temperature °C	-20 (-4°F) to 60 (140°F)	-20 (-4°F) to 100 (212°F)	
Thermal class	Class 130 (B)	Class 180 (H)	
Atmosphere	Place free of corrosive gas and explosive gas		
Valve structure	Direct acting poppet structure		
Valve seat leakage cm ³ /min(ANR)	0.2 or less (air)	300 or less (air)	
Mounting orientation	Unrestricted		
Body/seal material	Copper alloy/nitrile rubber	Copper alloy/EPM rubber	Copper alloy/PTFE

*1 : No freezing.

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions Model No.	Port size	Orifice size (mm)	Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)	
			Air		Water(hot)/Kerosene		Oil (50 mm ² /s)		Steam		When holding		When starting		AC	DC
			AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz	DC
GAB422-1	-	1.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	100 VAC 50/60 Hz *7 200 VAC 50/60 Hz *7 12 VDC 24 VDC 48 VDC 100 VDC	22	18	35	29	8.7/6.7	15.5 (14)
GAB422-2		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0							
GAB422-3		3.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7							
GAB422-4		3.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5							
GAB422-5		4.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4							
GAB422-6		5.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25							
GAB422-7		7.0	0.15	0.15	0.15	0.15	0.15	0.15	0.15							

*1 : The model numbers above are for basic orifice sizes. Refer to How to order for other combinations.

*2 : For port size, refer to How to order (page 184) and dimensions (page 188).

*3 : The voltage fluctuation range must be within ±10% of the rated voltage.

*4 : Values shown in () are for the DC voltage type with DIN terminal box.

*5 : Refer to DC column for the max. working pressure differential of coil with diode.

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

*7 : The 100 VAC (50/60 Hz) can be used with 110 VAC (60 Hz). The 200 VAC (50/60 Hz) can be used with 220 VAC (60 Hz). However, this does not apply to coil housings 5A/5M/5N/5I/5J.

Weight

Model No.	Weight (kg)									
	Actuator only	2 stations	3 stations	4 stations	5 stations	6 stations	7 stations	8 stations	9 stations	10 stations
GAB422	0.47	1.7	2.4	3.3	3.8	4.8	5.5	6.2	7.2	7.6

Optional specifications (fluid temperature, ambient temperature, valve seat leakage)

Sealant	Fluoro rubber		Ethylene propylene rubber		PTFE	
	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)
Coil (thermal class)						
Fluid temperature (*1) °C	-10 to 60	-10 to 90	0 to 60 (*3)	0 to 90 (*3)	-10 to 60	-10 to 184
Ambient temperature °C	-20 to 60	-20 to 100 (*2)	-20 to 60	-20 to 100 (*2)	-20 to 60	-20 to 100 (*2)
Valve seat leakage cm ³ /min(ANR)	0.2 or less (air)				300 or less (air)	

*1 : No freezing.

*2 : -20 to 80°C when coil housing is HP terminal box with lamp.

*3 : The lowest temperature is 0°C since the fluid is water.

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics		
			C[dm ³ /(s·bar)]	b	Cv
GAB422-1	-	1.5	0.29	0.53	0.10
-2		2.0	0.53	0.52	0.15
-3		3.0	1.1	0.52	0.31
-4		3.5	1.5	0.47	0.40
-5		4.0	1.9	0.47	0.48
-6		5.0	2.6	0.38	0.62
-7		7.0	4.6	0.37	0.82

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

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

GAB422 Series

How to order

GAB422 - **2** - **5** - **0** **3A** **A** **G** **S** - **AC100V**

Model No.

E Coil housing **H** With surge suppressor

F Manual override (locking) **I** Rated voltage

G Other options

A Thread

B Orifice size

C Manifold station No.
*2

D Body/sealant combination
*3
*4
*5
*6

Code	Content
A Thread	
Blank	Rc
G	G
N	NPT

B Orifice size	
1	φ1.5
2	φ2
3	φ3
4	φ3.5
5	φ4
6	φ5
7	φ7

C Manifold station No.	
2	2 stations
to	to
10	10 stations
0	Actuator only

D Body/sealant combination						
	Body	Seal	Treatment	Remarks		
Blank	Std.	Copper alloy	-	Nitrile rubber	Air/water/low vacuum/kerosene (up to 60°C)	
				Fluoro rubber	Air/low vacuum/kerosene (up to 90°C *4)	
				PTFE	Steam (up to 184°C *4)	
D	Stainless steel	-	-	Nitrile rubber	Air/water/low vacuum/kerosene (up to 60°C)	
				Fluoro rubber	Air/low vacuum/kerosene (up to 90°C *4)	
				PTFE	Steam (up to 184°C *4)	
H	Option	Copper alloy	Oil free	Nitrile rubber	Air/water/low vacuum/kerosene (up to 60°C)	
				Fluoro rubber	Air/low vacuum/kerosene (up to 90°C *4)	
				PTFE	Steam (up to 184°C *4)	
P	Copper alloy	-	-	Ethylene propylene rubber	Hot water (up to 90°C *4)	
				Stainless steel	Nitrile rubber	Air/water/low vacuum/kerosene (up to 60°C)
					Fluoro rubber	Air/low vacuum/kerosene (up to 90°C *4)
N	PTFE	Steam (up to 184°C *4)				
R	Ethylene propylene rubber	Hot water (up to 90°C *4)				

Refer to Intro Page 39 for reference on material combinations.

E to I
For details on the coil housing, other options and voltage, etc., refer to the following page.

⚠ Precautions for model No. selection

*1 : Orders for only the masking plate and sub-plate are also available. Contact CKD for details.

Notes for C to D

- *2 : For 11 or more manifold station No., contact CKD.
- *3 : Leave blank for standard. However, to select options in (E),(F),(G) or (H), indicate 0 for Item (D).
- *4 : When Item (D) 4A/4M/4N is selected.
- *5 : The ethylene propylene rubber seal combination (Item (D) P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene rubber is not oil-resistant.)
- *6 : For PTFE seal, O-ring material of sub-plate connection will be FKM.

[Example of model No. 1] GAB422N-2-6-AC100V

Model : GAB422 (normally open/common supply)

- A** Thread : NPT
- B** Orifice size : φ2
- C** Manifold station No. : 6 stations
- D** Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- E** Coil housing : Grommet lead wire
- F** to **H** : None
- I** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

[Example of model No. 2] GAB422-3-0-000AS-AC100V




Model : GAB422 (normally open/common supply)

- A** Thread : Rc
- B** Orifice size : φ3
- C** Manifold station No. : Actuator only
- D** Body/sealant combination : Body - copper alloy, sealant - nitrile rubber
- E** Coil housing : Grommet lead wire
- F** Manual override (locking) : Selected
- G** Other options : None
- H** Surge suppressor : With surge suppressor
- I** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz


For Items (E) to (I), the combinations indicated with codes are available.
 Note that if options for Items (F) to (H) are not required, they should be left blank.

(E) Coil housing		(F) Manual override (Locking)	(G) Other options					(H) With surge suppressor	(I) Rated voltage	
Content		A	Cable gland			Conduit		S	Content	
			A-15a	A-15b	A-15c	CTC 19	G 1/2			
Blank	Std. Grommet lead wire	A						S	100 VAC, 200 VAC	
2E	With DIN terminal box (G1/2)								100 VAC, 200 VAC	
2G	With DIN terminal box (Pg11)								12 VDC, 24 VDC, 48 VDC, 100 VDC	
2H	DIN terminal box with small lamp (Pg11)					H			100 VAC, 200 VAC, 24 VDC	
3A	Option Open frame	A				G	H	S	100 VAC, 200 VAC	
3M			Lead wire (IP65 or equivalent)						12 VDC, 24 VDC, 48 VDC, 100 VDC	
3N			With HP terminal box(G1/2)	D	E	F			100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC	
3I			HP terminal box with lamp (G1/2)						100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC	
3J			HP terminal box (IP65 or equivalent)(G1/2)						100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC	
4A	Option Open frame (Thermal class 180 (H))	A				G	H	S	100 VAC, 200 VAC	
4M			Lead wire							
4N			With HP terminal box(G1/2)	D	E	F				
5A	Option Open frame (diode integrated)	A				G	H	S	100 VAC, 200 VAC	
5M			Lead wire (IP65 or equivalent)							
5N			With HP terminal box(G1/2)	D	E	F				
5I			HP terminal box with lamp (G1/2)							
5J	HP terminal box (IP65 or equivalent)(G1/2)									

Refer to the following cautions for Items (E) to (I).

Blank		● Grommet lead wire 300 mm
2E 2G 2H		● DIN terminal box
3A 4A 5A		● Open frame lead wire 300 mm ● 4A (Thermal class 180 (H)) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (Thermal class 180 (H)) ● 5M, 5N (diode integrated)
3I 3J 5I 5J		● Open frame HP terminal box (IP65 or equivalent) ● 5I, 5J (diode integrated)

Refer to page 148 for coil selection.

G H		● Conduit ● G(CTC19) ● H(G1/2)
--------	--	--------------------------------------

Precautions for model No. selection

Notes for (E)

- *7 : Leave blank for the standard coil housing. However, to select options in (F), (G) or (H), indicate 00 for Item E.
- *8 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.

Notes for (F) to (H)

- *9 : When Item (D) is C, F, K or N, the manual override (Item (F) A) is not available.
- *10: For Item (G), select an option from D, E, F, G and H.
- *11: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- *12: As standard, the surge suppressor is built into the coil with diode and the 24 VDC coil (Item (E) 2H), so the surge suppressor S cannot be selected.
- *13: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information. Note that tropicalization is not available when the manual override option (A) is selected.

Notes for (I)

- *14: 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item (E) 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *15: For voltages other than above, contact CKD.
- *16: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

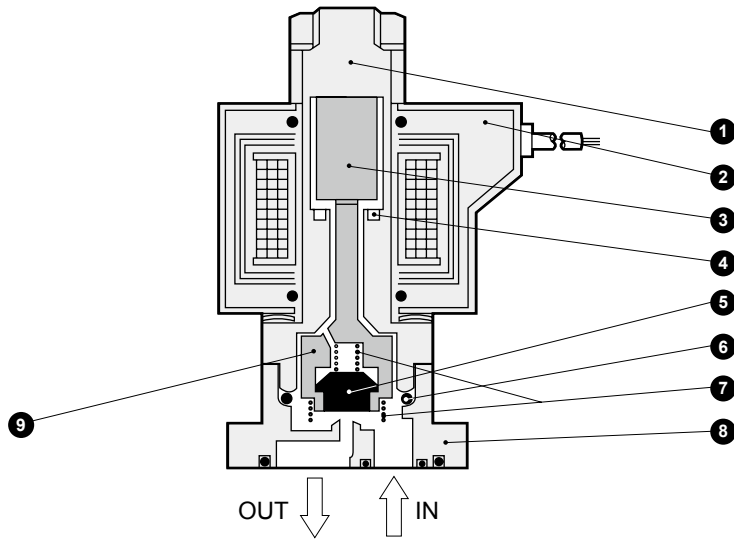
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
DryAir
EX-
XPLNprf
XPLNprf
HVB/
HVL
S B/
NAB
LAD/
NAD
Water-
Rela
NP/NAP/
NVP
SNP
CHB/G
MXB/G
Other
valves
SWD/
MWD
DustCoil
CVE/
CVSE
CCH /
CPE/D
LifeSci
Gas-
Combus
Auto-
Water
SpecFld
Custom
Ending

GAB422 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

● GAB422 actuator



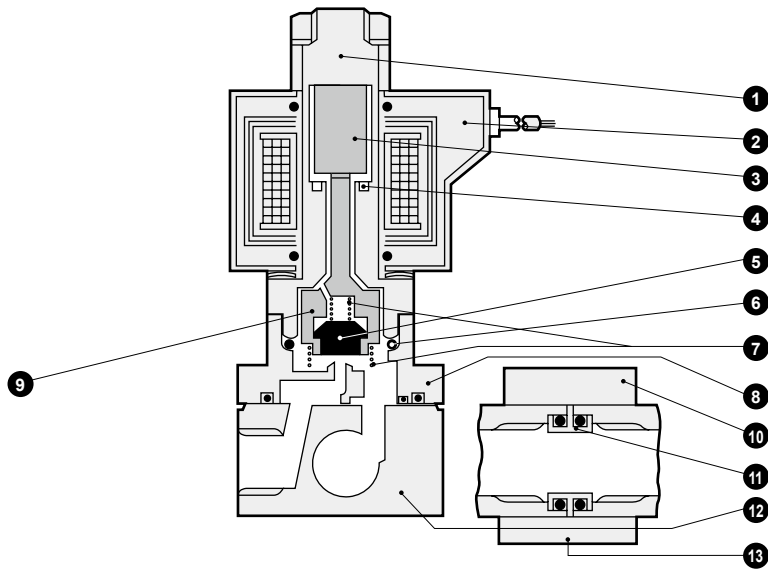
No.	Part name	Material	No.	Part name	Material
1	Core assembly	SUS405 or equiv./316L/304	8	Body	C3771(SCS13) Copper alloy (stainless steel)
2	Coil	-	9	NO Valve	POM (SUS303/PFA) Option code
3	Plunger	SUS405 or equiv.			1: Blank/OD/H/L: Polyacetal resin
4	Shading coil	Cu (Ag for stainless steel body) Copper (silver for stainless steel body)			2: Other than the above: Stainless steel/perfluoroalkoxy resin
5	Seal	NBR (FKM/EPDM/PTFE)			
6	O-ring	NBR (FKM/EPDM/PTFE) (Size: AS568-019)			
7	Spring	SUS304			

* 4 body mounting screws and 2 O-rings are attached to the actuator only.

() shows options.

Internal structure and parts list

● GAB422 manifold



No.	Part name	Material	No.	Part name	Material
1	Core assembly	SUS405 or equiv./316L/304	8	Body	C3771(SCS13) Copper alloy (stainless steel)
2	Coil	-	9	NO Valve	POM (SUS303/PFA) Option code Blank/O/D/H/L: Polyacetal resin Other than the above: Stainless steel/perfluoroalkoxy resin
3	Plunger	SUS405 or equiv.	10	Holder	SPCC Steel
4	Shading coil	Cu (Ag for stainless steel body)	11	Connector	C3604(SUS304) Copper alloy (stainless steel)
5	Seal	NBR (FKM/EPDM/PTFE)	12	Sub-plate	C3604(SUS303) Copper alloy (stainless steel)
6	O-ring	NBR (FKM/EPDM/PTFE) (Size: AS568-019)	13	Connecting plate	SPCC Steel
7	Spring	SUS304			

() shows options.

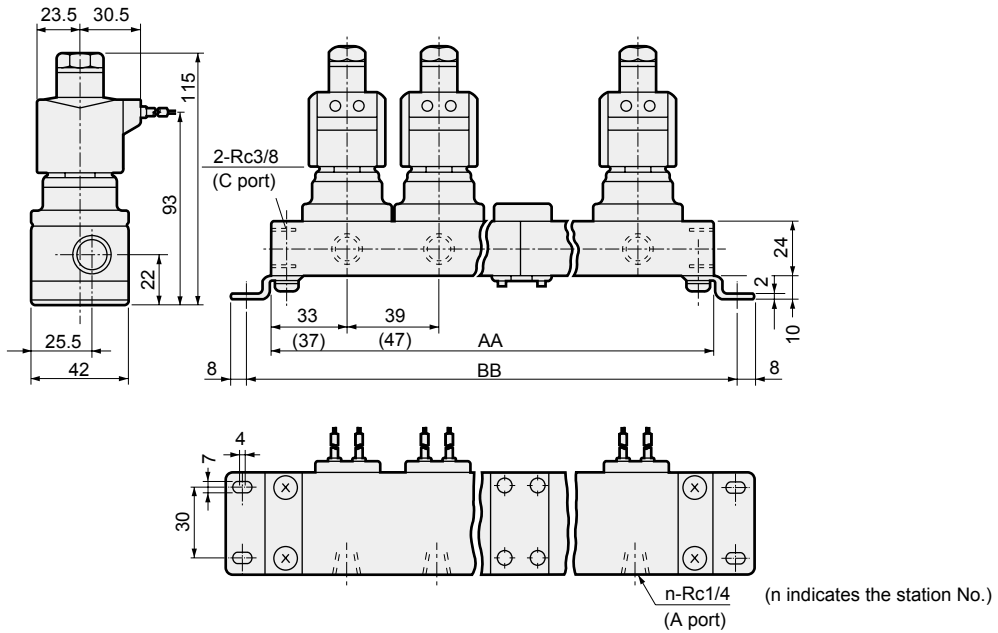
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S \diamond B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH / CPE/D
LifeSci
Gas- Combus
Auto- Water
SpecFld
Custom
Ending

GAB422 Series



Dimensions: Manifold

- Grommet lead wire
GAB422-1 to 7-2 to 10



Station No.	AA	BB	Manifold configuration	Station No.	AA	BB	Manifold configuration
2	106(122)	122(138)	2 stations x 1	7	329(385)	345(401)	5 stations + 2 stations
3	145(169)	161(185)	3 stations x 1	8	368(432)	384(448)	5 stations + 3 stations
4	212(244)	228(260)	2 stations x 2	9	435(507)	451(523)	3 stations x 3
5	223(263)	239(279)	5 stations x 1	10	446(526)	462(542)	5 stations x 2
6	290(338)	306(354)	3 stations x 2	Contact CKD for 11 stations or more.			

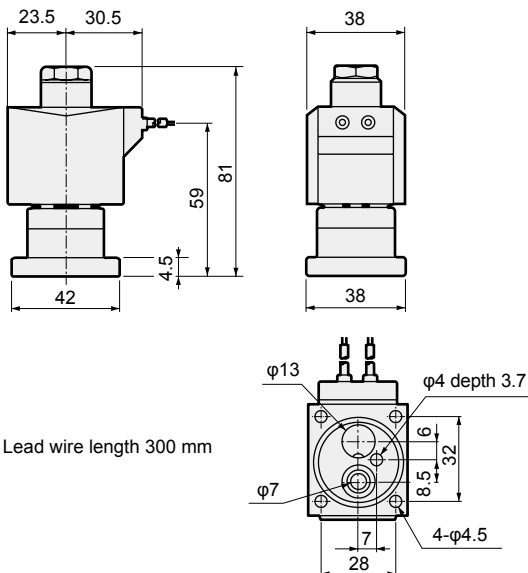
- *1 : Manifold configuration combines 2-station, 3-station and 5-station units.
- *2 : Dimensions shown in () are for open frame.
- *3 : Dimensions for open frame will be applied to the DC voltage type of GAB422 Series with DIN terminal box.
- *4 : The dimensions are the same for port sizes of G and NPT threads.

Dimensions: Actuator

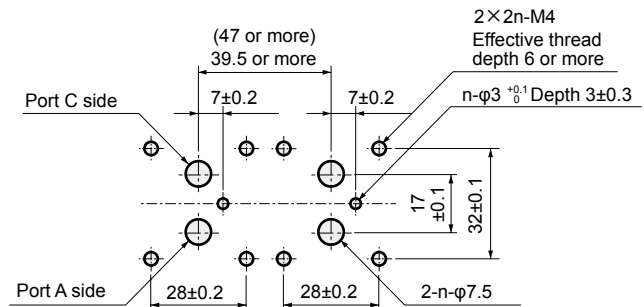


- Grommet lead wire
GAB422-1 to 7-0

- Recommended dimensions for actuator mounting



* Lead wire length 300 mm



■ Machining drawing when using 2 actuators

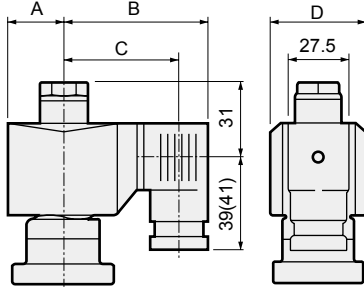
Optional dimensions



* Refer to the dimensions of grommet lead wire on the left page for common dimensions.

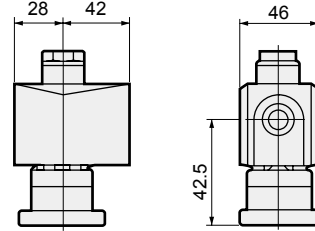
- With DIN terminal box
GAB422-1 to 7-0 to 10-*

2E
2G
2H



- Open frame lead wire
GAB422-1 to 7-0 to 10-*

3A
4A
5A

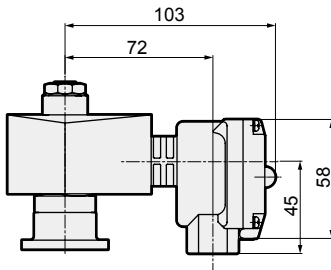


Dimensions shown in () are for G1/2.

Voltage	A	B	C	D
AC	23.5	65.5	54(53.5)	38
DC	28	72	60.5(60)	46

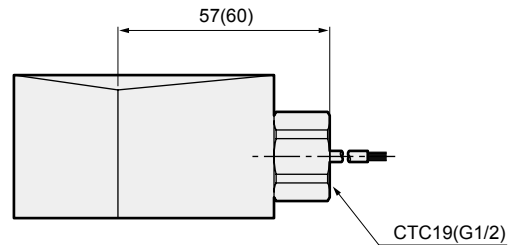
- Open frame + HP terminal box
GAB422-1 to 7-0 to 10-*

3M / 4M
5N / 4N
1I
J



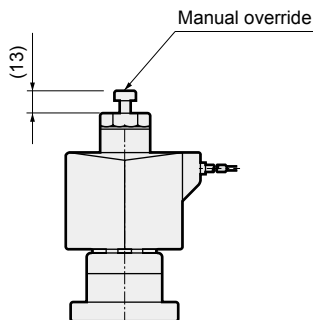
- Open frame + conduit
GAB422-1 to 7-0 to 10-*

3A	G
4A	H
5A	



Dimensions shown in () are for G1/2.

- Manual override (locking)
GAB422-1 to 7-0 to 10-***A



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



Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series: product-specific cautions

Direct acting 2, 3-port solenoid valve (AB/GAB/AG/GAG)

Design/selection

⚠ WARNING

1 Working fluids

- (1) Contact CKD before using this valve for active gas (combustion gas, acetylene gas, etc.).
- (2) Since valves for LPG (propane gas, butane gas) are available as custom orders, contact CKD.
- (3) When using this valve for dry air or inert gas, the life can be shortened considerably due to wear. Use a valve intended for dry air.
- (4) This valve cannot be used for maintaining vacuum. Consult with CKD when the vacuum needs to be maintained.

⚠ CAUTION

1 Continuous energizing

Use the NO pressurization when using the 3-port valve in a continuously energized state with the NO port pressurized. When continuously energizing the universal or NC pressurization, use a fluoro rubber seal.

2 Suction sound

With the AC voltage specifications, a loud suction sound may be heard momentarily after energizing. To avoid a suction sound, select a coil with a diode or the DC voltage model. The suction sound volume will be reduced.

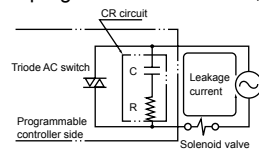
3 Fluid viscosity

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

4 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.



Voltage Model No.	AC		AC diode		DC			
	100 V	200 V	100 V	200 V	12 V	24 V	48 V	100 V
AB,AG	6 mA or less	3 mA or less	2 mA or less	1 mA or less	2 mA or less	1 mA or less	0.5 mA or less	0.2 mA or less

Mounting, piping and wiring

⚠ CAUTION

1 Piping

- (1) Always hold the socket with a wrench, etc., if the NO side is a socket.
- (2) For steam fluids, steam generated from a boiler will contain a large amount of drainage. Always install a drain trap.
- (3) When passing steam, the make-up water in the boiler will contain substances such as "calcium salt" and "magnesium salt". As these substances will react with oxygen and carbon dioxide, and cause scales and sludge to form, always install a "water softener" and a filter for steam.

2 Wiring

- (1) Refer to Intro Page 64 for information on how to wire a terminal box.

When using the product

⚠ CAUTION

1 Manual operation

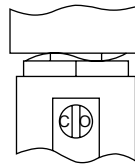
When using a product with a manual override, follow the operations below:

[For NC]

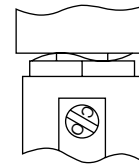
Opening : Insert a flathead screwdriver into the slit on the manual adjustment shaft, and turn it approx. 120° to the right or left. The plunger will rise and the valve will open. (For the 3-port valve, the NC side valve seat will open and the NO side valve seat will close.)

The open state is held even when the screwdriver is removed. Always return the valve to the original position after use.

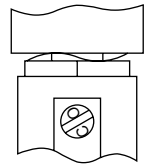
Closing : From the open position, turn the manual adjustment shaft so that the slit is returned to the perpendicular position, which will lower the plunger and close the valve. (For the 3-port valve, the NC side valve seat will close and the NO side valve seat will open.) (Refer to the figure below)



Valve closed state



Valve open state



Valve open state

[For NO]

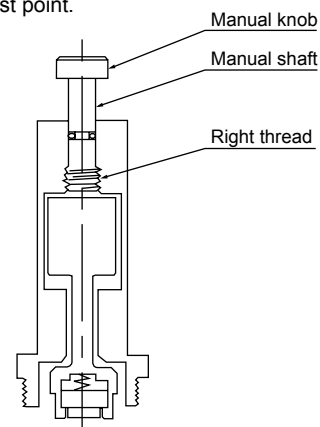
(1) When closing the valve with manual operation

The manual shaft is threaded, so hold the manual dial and rotate the shaft clockwise.

When the manual dial has been rotated downward 5 to 6 mm and no longer rotates, the solenoid valve will switch to closing operation.

(2) Reset (when not using a manual override)

Always rotate the manual dial counterclockwise and return it to the highest point.



Maintenance

⚠ CAUTION

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

Model No.	Core assembly tightening torque	Socket tightening torque	Nut tightening torque
AB	30 to 45 Nm	-	8 to 16 Nm
AG	30 to 45 Nm	8 to 16 Nm	8 to 16 Nm

Working environment

CAUTION

IP65 (IEC60529 [IEC529:1989-11]) standards are applied to the test. Avoid use in conditions where water or cutting oil directly contacts the valve.

Degree of protection of IP65 and explanation of test method

● Degree of protection

Note: IP65 is based on the following testing method.

■ IEC (International Electrotechnical Commission) standards

(IEC60529 [IEC529:1989-11])

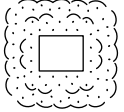
IP-□□

Degree of protection (International Protection)

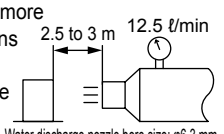
1st characteristic No. (degree of protection for foreign solid matter)

2nd characteristic No. (degree of protection for water entry)

Grade	Degree of protection
6	Dust proof No inflow of dust.



Grade	Degree of protection	Overview of test method (fresh water is used)
5	Protection against water jets No harmful effects occur even when water is sprayed with nozzles from all directions.	The sample (exterior) is exposed to water jetting of 1 m ² per minute for a total of 3 minutes or more from all directions with the testing equipment in the figure below. Water discharge nozzle bore size: φ6.3 mm







- 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

Series variation

Multi-fluid control pilot operated 2-port solenoid valve

* Refer to page 328 for the dry air (-Z).

No. of ports	Model	Structure	Actuation	Working fluid							
				Air	Low vacuum [1.33 x 10 ⁵ Pa (abs)]	Water	Kerosene	Oil [50 mm ² /s or less]	Hot water	Steam	
2-port		AP11	Pilot operated	NC	●		●	●	●		●
		AP12	(Piston drive)	NO	●		●	●	●		●
		AP21		NC	●		●	●	●		●
		AP22		NO	●		●	●	●		●
		AD11	Pilot operated	NC	●		●	●	●		
		AD12	(Diaphragm drive)	NO	●		●	●	●		
		AD21		NC	●		●	●	●		
		AD22		NO	●		●	●	●		
		APK11	Pilot kick	NC	●	●	●	●	●* ₁		●
		APK21	(Piston kick structure)	NC	●	●	●	●	●* ₁		●
		ADK11	Pilot kick	NC	●	●	●	●	●	●	
		ADK12	(Diaphragm drive)	NO	●	●	●	●	●	●	
ADK21			NC	●	●	●	●	●			

*1: 20 mm²/s or less for APK11/21 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

	Port size											Page
	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1	Rc1 ^{1/4}	32 flange	Rc1 ^{1/2}	40 flange	Rc2	50 flange	
	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}							252
	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}							252
						●	●	●	●	●	●	262
						●	●	●	●	●	●	262
	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}							272
			● ^{*2}	● ^{*2}	● ^{*2}							272
						●	●	●	●	●	●	282
						●	●	●	●	●	●	282
	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}							292
						●	●	●	●	●	●	300
	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}	● ^{*2}							306
			● ^{*2}	● ^{*2}	● ^{*2}							306
						●	●	●	●	●	●	318

*2: Refer to each How to order column for the thread.

Refer to page 248 for details on the coil system.

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












Coil selection guide

● Coil housing types and selection guide

Various types are available according to the application.
Refer to the structure and features to select the optimum model.

For AP/AD*

- 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-Combust
- Auto-Water
- SpecFld
- Custom
- Ending











Coil system		Open frame		Appearance	
Coil system	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● AC dedicated (50/60 Hz common) ● Degree of protection: IP61 or equivalent ● Cannot be used outdoors 	Grommet lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm 	 <div style="float: right; border: 1px solid black; padding: 2px;">2C 6C</div>
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP61 or equivalent ● Cannot be used outdoors 	DIN terminal box	<ul style="list-style-type: none"> ● Easy wiring and maintenance ● Enhanced electrical safety (by grounding the ground terminal) ● Light available (Optional - 100 VAC, 200 VAC and 24 VDC) 	 <div style="float: right; border: 1px solid black; padding: 2px;">2E 2G 2H 6E 6G 6H</div>
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	Lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 	 <div style="float: right; border: 1px solid black; padding: 2px;">3A</div>
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC) 	 <div style="float: right; border: 1px solid black; padding: 2px;">3M 3N</div>
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC) 	 <div style="float: right; border: 1px solid black; padding: 2px;">3I 3J</div>
	Thermal class 180 (H) Taped	<ul style="list-style-type: none"> ● AC dedicated (50/60 Hz common) ● High temperature fluids and high ambient temperatures usable ● Cannot be used outdoors ● Degree of protection: IP00 	Lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 	 <div style="float: right; border: 1px solid black; padding: 2px;">4A</div>
	Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	Lead wire	<ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 	 <div style="float: right; border: 1px solid black; padding: 2px;">4M 4N</div>
	Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 	 <div style="float: right; border: 1px solid black; padding: 2px;">5A</div>
	Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 	 <div style="float: right; border: 1px solid black; padding: 2px;">5M 5N</div>
	Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	HP terminal box	<ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 	 <div style="float: right; border: 1px solid black; padding: 2px;">5I 5J</div>
		Conduit	<ul style="list-style-type: none"> ● Use a conduit (CTC19 or G1/2) when using direct conduit wiring for the open frame lead wire. 	 <div style="float: right; border: 1px solid black; padding: 2px;">G H</div>	

Coil selection guide

● Coil housing types and selection guide

Various types are available according to the application.








Refer to the structure and features to select the optimum model.

For APK11/ADK1*		Appearance			
Coil system	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● AC dedicated (50/60 Hz common) ● Degree of protection: IP61 or equivalent ● Cannot be used outdoors 	Grommet lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm 	 2C	
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP61 or equivalent ● Cannot be used outdoors 	DIN terminal box <ul style="list-style-type: none"> ● Easy wiring and maintenance ● Enhanced electrical safety (by grounding the ground terminal) ● Light available (Optional - 100 VAC, 200 VAC and 24 VDC) 	 2E 2G 2H	
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	Lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 	 3A	
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Cannot be used outdoors 	HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (optional 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC) 	 3M 3N	
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (optional 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC) 	 3I 3J	
	Open frame	Thermal class 180 (H) Taped	<ul style="list-style-type: none"> ● AC dedicated (50/60 Hz common) ● High temperature fluids and high ambient temperatures usable ● Cannot be used outdoors ● Degree of protection: IP00 	Lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 	 4A
		Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	Lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm ● Conduit (CTC19) for direct piping can be attached. 	 5A
		Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 	 5M 5N
		Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 	 5I 5J
		Conduit	<ul style="list-style-type: none"> ● Use a conduit (CTC19 or G1/2) when using direct conduit wiring for the open frame lead wire. 	 G H	

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
SDB/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

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

For APK21/ADK21

Open frame	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC ● Degree of protection: IP65 or equivalent ● Cannot be used outdoors 	Lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm ● With CTC19 thread for direct conduit piping 	Appearance 	3A
	Thermal class 130 (B) Mold	<ul style="list-style-type: none"> ● For DC and AC ● Degree of protection: IP21 or equivalent ● Cannot be used outdoors 	HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (options 100 VAC, 200 VAC, 24 VDC, 100 VDC) 		3M 3N
	Thermal class 180 (H) Taped	<ul style="list-style-type: none"> ● AC dedicated ● High temperature fluids and high ambient temperatures usable ● Degree of protection: IP00 ● Cannot be used outdoors 	Lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm ● With CTC19 thread for direct conduit piping 		4A
			HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 		4M 4N
	Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP65 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	Lead wire <ul style="list-style-type: none"> ● Lead wire length 300 mm ● With CTC19 thread for direct conduit piping 		5A
	Thermal class 130 (B) mold with diode	<ul style="list-style-type: none"> ● Diode in the coil converts AC to DC. ● AC dedicated (50/60 Hz common) ● Degree of protection: IP21 or equivalent ● Perfect for places where whirring noise should be prevented. ● Cannot be used outdoors 	HP terminal box <ul style="list-style-type: none"> ● Easy wiring ● Light available (Optional - 100 VAC, 200 VAC) 		5M 5N
			Conduit <ul style="list-style-type: none"> ● Use a conduit (G1/2) when using direct conduit wiring for the open frame lead wire. 		H

● Repair parts compatibility table by coil option

Coil option code	Supported voltage	Repair parts			
		Plunger assembly	Core assembly	Coil assembly	Actuator assembly *1
2C	AC	○	○	○	-
6C *2	DC	-	-	-	○
2E 2G 2H	AC	○	○	○	-
2E 2G 2H	DC	○	○	○	-
6E 6G 6H *2	DC	-	-	-	○
3A	AC	○	○	○	-
	DC		○	○	-
3M 3N	AC	○	○	○	-
	DC		○	○	-
3I 3J	AC	○	○	○	-
	DC		○	○	-
4A	AC	○	○	○	-
4M 4N	AC	○	○	○	-
5A	AC	○	○	○	-
5M 5N	AC	○	○	○	-
5I 5J	AC	○	○	○	-

*1 : The actuator assembly includes the coil assembly, core assembly and plunger assembly.

*2 : As 6C, 6E, 6G and 6H are dedicated parts, they are provided as part of the actuator assembly.

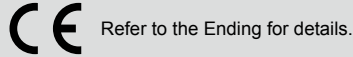
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S Δ B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH / CPE/D
LifeSci
Gas- Combus
Auto- Water
SpecFld
Custom
Ending



Pilot operated 2-port solenoid valve
(general purpose valve)

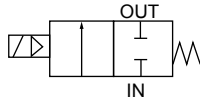
AP11/AP12 Series

- NC, NO
- Port size: Rc1/4 to Rc1
- Piston drive

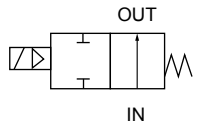


JIS symbol

- AP11: NC



- AP12: NO



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Standard specifications	Optional specifications
Working fluid	Air/water/kerosene/oil (50 mm ² /s or less)	Steam
Working pressure differential MPa	0.05 to 1.2 (refer to max. working pressure differential in individual specifications.)	
Max. working pressure MPa	2 (≈290 psi, 20 bar)	1 (≈150 psi, 10 bar)
Proof pressure (water pressure) MPa	10 (≈1500 psi, 100 bar)	
Fluid temperature (*1) °C	-10 (14°F) to 60 (140°F)	-10 (14°F) to 180 (356°F)
Ambient temperature °C	-20 (-4°F) to 60 (140°F)	-20 (-4°F) to 100 (212°F)
Thermal class	Class 130 (B)	Class 180 (H)
Atmosphere	Place free of corrosive gas and explosive gas	
Valve structure	Pilot operated poppet, piston drive	
Valve seat leakage (*2) cm ³ /min(ANR)	0.2 or less (air)	300 or less (air)
Mounting orientation	Free (within working pressure differential range)	
Body/seal material	Bronze/nitrile rubber	Bronze/PTFE

*1 : No freezing.

*2 : Pneumatic pressure used for measurement is 0.05 to 1.2 MPa for AP11 (NC), 0.05 to 0.9 MPa for AP12-8A/10A (NO), and 0.05 to 0.5 MPa for AP12-15A/20A/25A (NO).

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions Model No.	Port size	Orifice size (mm)	Min. working pressure differential (MPa)	Max. working pressure differential (MPa)						Rated voltage	Apparent power (VA)				Power consump (W)		Weight (kg)		
				Air		Water/kerosene		Oil (50 mm ² /s)			Steam	When holding		When starting		AC		DC	
				AC	DC	AC	DC	AC	DC			AC	DC	50/60 Hz	DC				
NC																			
AP11-8A	Rc1/4	10	0.05	1.2	0.9	1.0	0.9	0.9	0.9	1.0	100 VAC 50/60 Hz *6	12	10	17	14	5.2/3.8	11 (8.1) ^{*4} (7) ^{*5}	0.9	
AP11-10A	Rc3/8	10		1.2	0.9	1.0	0.9	0.9	0.9	1.0		18	15	29	24	6.7/5.7	11 (10.4) ^{*4} (7) ^{*5}	1.4	
AP11-15A	Rc1/2	15		1.2	0.6	1.0	0.6	0.6	0.6	1.0									2.5
AP11-20A	Rc3/4	20		1.2	0.6	1.0	0.6	0.6	0.6	1.0									
AP11-25A	Rc1	25		1.2	0.6	1.0	0.6	0.6	0.6	1.0									
NO																			
AP12-8A	Rc1/4	10	0.05	0.9	0.9	0.9	0.9	0.9	0.9	0.9	12 VDC 24 VDC 48 VDC 100 VDC	22	18	35	29	8.7/6.7	15.5 (14) ^{*4}	1.0	
AP12-10A	Rc3/8	10		0.9	0.9	0.9	0.9	0.9	0.9	0.9								1.0	
AP12-15A	Rc1/2	15		0.5	0.5	0.5	0.5	0.5	0.5	0.5								1.4	
AP12-20A	Rc3/4	20		0.5	0.5	0.5	0.5	0.5	0.5	0.5								1.8	
AP12-25A	Rc1	25		0.5	0.5	0.5	0.5	0.5	0.5	0.5								2.5	

*1 : The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.

*2 : Refer to DC column for the max. working pressure differential of AP11 type coil with diode.

*3 : The voltage fluctuation range must be within ±10% of the rated voltage.

*4 : Power consumption of coil housings 2E/2G/2H.

*5 : Power consumption of coil housings 6C/6E/6G/6H.

*6 : The 100 VAC (50/60 Hz) can be used with 110 VAC (60 Hz). The 200 VAC (50/60 Hz) can be used with 220 VAC (60 Hz). However, this does not apply to coil housings 5A/5M/5N/5I/5J.

Optional specifications

Sealant	Fluoro rubber		PTFE	
Coil (thermal class)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)
Fluid temperature (*1) °C	-10 to 60	-10 to 90	-10 to 60	-10 to 180
Ambient temperature °C	-20 to 60	-20 to 100 (*3)	-20 to 60	-20 to 100 (*3)
Valve seat leakage (*2) cm ³ /min(ANR)	0.2 or less (air)		300 or less (air)	

*1 : No freezing.

*2 : Pneumatic pressure used for measurement is 0.05 to 1.2 MPa for AP11 (NC), 0.05 to 0.9 MPa for AP12-8A/10A (NO), and 0.05 to 0.5 MPa for AP12-15A/20A/25A (NO).

*3 : -20 to 80°C when coil housing is HP terminal box with lamp.

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics			
			C[dm ³ /(s·bar)]	b	Cv	S(mm ²)
NC						
AP11- 8A	Rc1/4	10	8.1	0.17	1.4	-
AP11-10A	Rc3/8	10	10	0.19	1.8	-
AP11-15A	Rc1/2	15	21	0.22	4.5	-
AP11-20A	Rc3/4	20	-	-	9.3	162
AP11-25A	Rc1	25	-	-	12.0	231
NO						
AP12- 8A	Rc1/4	10	8.1	0.17	1.4	-
AP12-10A	Rc3/8	10	10	0.19	1.8	-
AP12-15A	Rc1/2	15	21	0.22	4.5	-
AP12-20A	Rc3/4	20	-	-	9.3	162
AP12-25A	Rc1	25	-	-	12.0	231

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

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

AP11/AP12 Series

How to order

Model No. **AP1 1 - 8 A - 0 3A A B H S - AC100V**

- Ⓔ Coil housing
- Ⓕ Other options
- Ⓖ Manual override (locking)
- Ⓗ With surge suppressor
- Ⓙ Mounting plate
- ⓫ Rated voltage

Ⓐ Actuation

Ⓑ Port size

Ⓒ Thread

Ⓓ Body/sealant combination

- *1
- *2
- *3
- *4

[Example of model No. 1]
AP11-15A-03A-AC100V

Model : AP11

- Ⓐ Actuation : NC
- Ⓑ Port size : 1/2
- Ⓒ Thread : Rc
- Ⓓ Body/sealant combination : Body - bronze, sealant - nitrile rubber
O-ring - nitrile rubber

- Ⓔ Coil housing : Open frame lead wire
- Ⓕ to Ⓗ : None
- ⓫ Rated voltage : 100 VAC 50/60 Hz,
110 VAC 60 Hz

[Example of model No. 2]
AP12-25N-E3MAD-AC200V

Model : AP12

- Ⓐ Actuation : NO
- Ⓑ Port size : 1
- Ⓒ Thread : NPT
- Ⓓ Body/sealant combination : Body - stainless steel, sealant - fluoro rubber
O-ring - fluoro rubber

- Ⓔ Coil housing : Open frame + HP terminal box (G1/2)
- Ⓖ Manual override (locking) : Selected
- Ⓙ Mounting plate : None
- Ⓕ Other options : Cable gland A-15a
- Ⓗ Surge suppressor : None
- ⓫ Rated voltage : 200 VAC 50/60 Hz, 220 VAC 60 Hz

Code	Content
Ⓐ Actuation	
1	NC
2	NO

Ⓑ Port size	
8	1/4
10	3/8
15	1/2
20	3/4
25	1

Ⓒ Thread	
A	Rc
G	G
N	NPT

Ⓓ Body/sealant combination					
	Body	Seal	O-ring	Treatment	Remarks
Std.	Bronze	Nitrile rubber	Nitrile rubber	-	Air/water/kerosene/oil (up to 60°C)
		Fluoro rubber	Fluoro rubber		Air/kerosene/oil (up to 90°C*1)
		PTFE	Fluoro rubber		Steam (up to 180°C *1)
Option	Stainless steel	Nitrile rubber	Nitrile rubber		Air/water/kerosene/oil (up to 60°C)
		Fluoro rubber	Fluoro rubber		Air/kerosene/oil (up to 90°C*1)
	Bronze	PTFE	Fluoro rubber		Steam (up to 180°C *1)
		Nitrile rubber	Nitrile rubber	Air/water/kerosene/oil (up to 60°C)	
Stainless steel	Fluoro rubber	Fluoro rubber	Air/kerosene/oil (up to 90°C*1)		
	PTFE	PTFE	Steam (up to 180°C *1)		

Refer to Intro Page 39 for reference on material combinations.

Ⓔ to ⓫
Refer to the following page for details on the coil housing, other options and voltage, etc.

⚠ Precautions for model No. selection

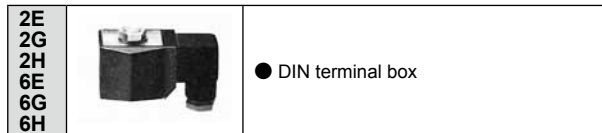
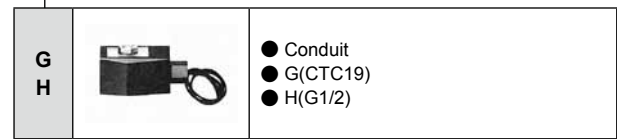
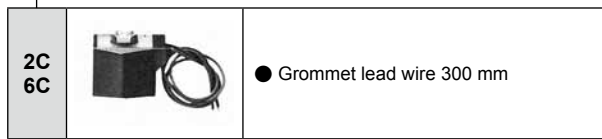
Notes for Ⓓ

- *1 : When Item Ⓔ 4A/4M/4N is selected.
- *2 : When using the PTFE valve seal with thermal class 180(H) coil, the O-ring material is fluoro rubber for steam.
- *3 : For Item Ⓑ (port size) 8 (1/4) and 10 (3/8), the standard body material is copper alloy.
- *4 : When Item Ⓓ is C, F, K or N, Item Ⓔ Coil housings 6C, 6E, 6G and 6H cannot be selected.

For Items ⑤ to ⑪, the combinations indicated with codes are available.
Note that if options for Items ⑤ to ⑪ are not required, they should be left blank.

⑤ Coil housing		⑥	⑦	⑧ Other options					⑨	⑩ Rated voltage	
Content		Manual override (Locking)	Mounting plate	Cable gland			Conduit		With surge suppressor	Content	
				(marine cable gland)			(conduit piping)				
				A-15a	A-15b	A-15c	CTC19	G1/2			
3A	Open frame lead wire (IP65 equivalent)	A *9	B *8					G	H	S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
2C	Grommet lead wire										100 VAC, 200 VAC
2E	With DIN terminal box (G1/2)	A	B							S	100 VAC, 200 VAC
2G	With DIN terminal box (Pg11)	*9	*8								12 VDC, 24 VDC, 48 VDC, 100 VDC
2H	DIN terminal box with small lamp (Pg11)								H		100 VAC, 200 VAC, 24 VDC
3M	Open frame										100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3N	With HP terminal box (G1/2)	A	B							S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I	HP terminal box (IP65, equiv) (G1/2)	*9	*8	D	E	F					100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J	HP terminal box, lamp (IP65, equiv) (G1/2)										100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A	Open frame							G	H	S	100 VAC, 200 VAC
4M	With HP terminal box (G1/2)	A	B								100 VAC, 200 VAC
4N	HP terminal box with lamp (G1/2)	*9	*8	D	E	F					100 VAC, 200 VAC
5A	Open frame							G	H		100 VAC, 200 VAC
5M	With HP terminal box (G1/2)	A	B								100 VAC, 200 VAC
5N	HP terminal box with lamp (G1/2)	*9	*8	D	E	F					100 VAC, 200 VAC
5I	HP terminal box (IP65, equiv) (G1/2)										100 VAC, 200 VAC
5J	HP terminal box, lamp (IP65, equiv) (G1/2)										100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
6C	Grommet lead wire 7W										12 VDC, 24 VDC
6E	With DIN terminal box (G1/2) 7W	A	B							S	12 VDC, 24 VDC
6G	With DIN terminal box (Pg11) 7W	*9	*8								24 VDC
6H	DIN terminal box with small lamp (Pg11) 7W								H		24 VDC

⚠ Refer to the following cautions for ⑤ to ⑪.



⚠ Precautions for model No. selection

Notes for ⑤

- *5 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.
- *6 : DC coil for steam is available for AP11. Contact CKD for more information.
* For 6C/6E/6G/6H, only AP11 is available.
- *7 : The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Notes for Items ⑥ to ⑩

- *8 : The mounting plate (Item ⑦ B) can be mounted only on Item ⑧ (port size) 8 (1/4) or 10 (3/8).
- *9 : When Item ⑨ is C, F, K or N, the manual override (Item ⑥ A) is not available.
- *10 : For Item ⑧, select an option from D, E, F, G and H.
- *11 : The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- *12 : As standard, the surge suppressor is built into the coil with diode and the 24 VDC coil (Item ⑤ 2H, 6H), so surge suppressor code S cannot be selected.
- *13 : Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that tropicalization is not available when the manual override option (A) and the coil option 6C/6E/6G/6H are selected.

Notes for ⑪

- *14 : 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item ⑤ 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *15 : For voltages other than above, contact CKD.
- *16 : The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

Refer to page 248 for coil selection.

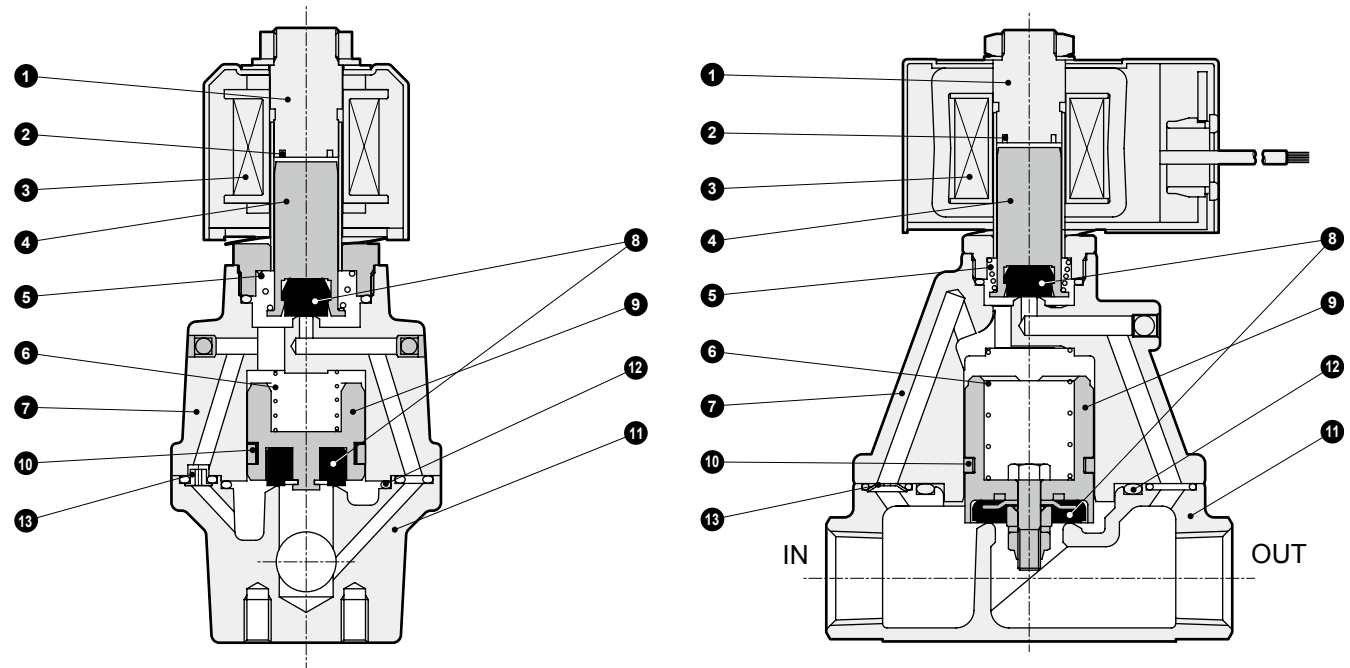
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/AD
APK/ADK
DryAir
EX-XPLNprf
XPLNprf
HVB/HVL
SAB/NAB
LAD/NAD
Water-Rela
NP/NAP/NVP
SNP
CHB/G
MXB/G
Other valves
SWD/MWD
DustCoil
CVE/CVSE
CCH/CPE/D
LifeSci
Gas-Combus
Auto-Water
SpecFld
Custom
Ending

AP11/AP12 Series

Internal structure and parts list

● AP11-8A/10A

● AP11-15A/20A/25A



(The figure shows the closing operation)

No.	Part name	Material
1	Core assembly	SUS405 or equiv./SUS316L/SUS403 *1 ;Stainless steel
2	Shading coil *2	Cu (Ag for stainless steel body) ;Copper (silver for stainless steel body)
3	Coil	- ;-
4	Plunger	SUS405 or equiv. ;Stainless steel
5	Plunger spring	SUS304 ;Stainless steel
6	Valve spring	SUS304 ;Stainless steel
7	Body	CAC408(SCS13)*3 ;Bronze casting (stainless steel casting)
8	Seal	NBR(FKM, PTFE) ;Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
9	Main valve assembly	C3604/SUS303/SUS304 (SUS303/SUS304) ;Stainless steel/copper alloy (stainless steel)
10	Piston ring	SUS304/PTFE ;Stainless steel/tetrafluoroethylene resin
11	Body	CAC408(SCS13)*3 ;Bronze casting (stainless steel casting)
12	O-ring	NBR(FKM, PTFE) ;Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
13	Orifice plate	SUS304(SUS303)*3 ;Stainless steel

() shows options.

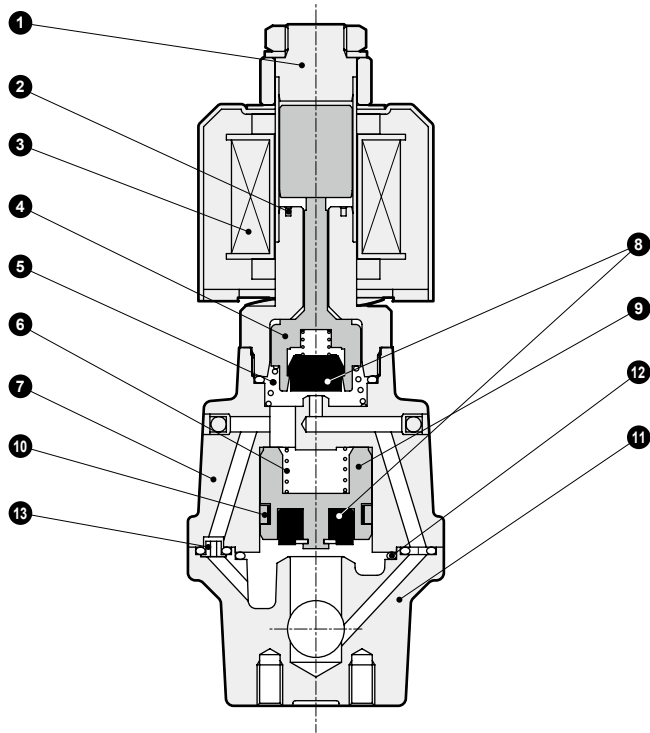
*1 : When the body/sealant combination code is other than O and H, or the coil housing code is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent/SUS316L/SUS430.

*2 : No shading coil is used for DC coil or coil with diode.

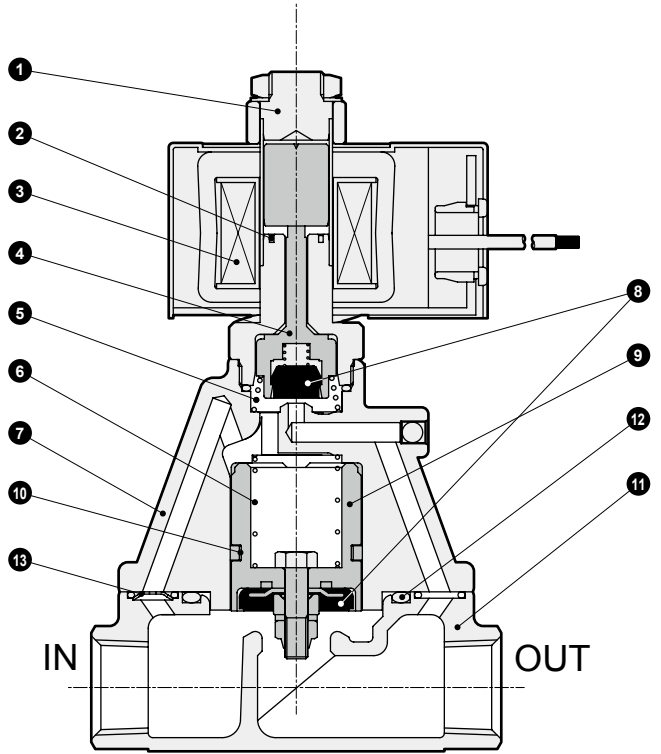
*3 : For port size 8 (1/4) and 10 (3/8), the body material is C3771 (copper alloy) as standard, and the orifice plate material is SUS303 (stainless steel) for both the standard and options.

Internal structure and parts list

● AP12-8A-10A



● AP12-15A/20A/25A



(The figure shows the opening operation)

No.	Part name	Material	
1	Plunger/core assembly	SUS405 or equiv./SUS316L/SUS304	Stainless steel
2	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
3	Coil	-	-
4	NO Valve assembly	POM/NBR (SUS303/PFA/FKM or PTFE)	Acetal resin, nitrile rubber (stainless steel, perfluoroalkoxy resin, fluoro rubber or tetrafluoroethylene resin)
5	Spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Body	CAC408(SCS13) *1	Bronze casting (stainless steel casting)
8	Seal	NBR(FKM, PTFE)	Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
9	Main valve assembly	C3604/SUS303/SUS304 (SUS303/SUS304)	Stainless steel/copper alloy (stainless steel)
10	Piston ring	SUS304/PTFE	Stainless steel/tetrafluoroethylene resin
11	Body	CAC408(SCS13) *1	Bronze casting (stainless steel casting)
12	O-ring	NBR(FKM, PTFE)	Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
13	Orifice plate	SUS304(SUS303) *1	Stainless steel

() shows options.

*1 : For port size 8 (1/4) and 10 (3/8), the standard body material is C3771 (copper alloy) and the standard orifice plate material is SUS303 (stainless steel) for both standard and options.

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

AP11/AP12 Series

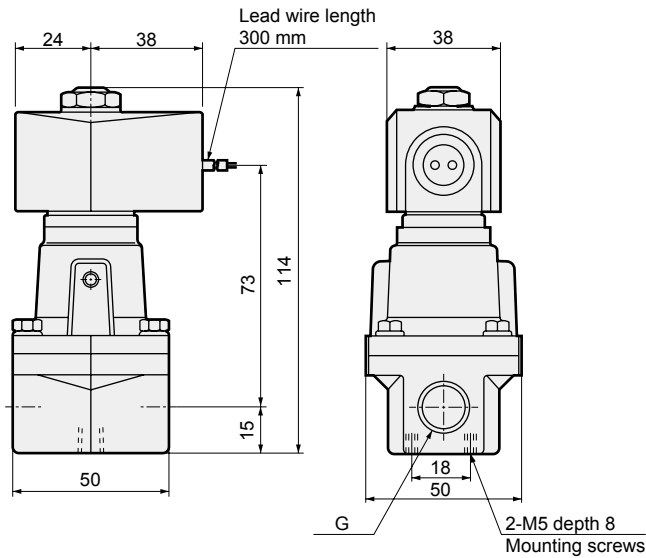


Dimensions: AP11 Series

- 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

● Open frame lead wire
AP11-8A/10A-*

- 3A
- 4A
- 5A

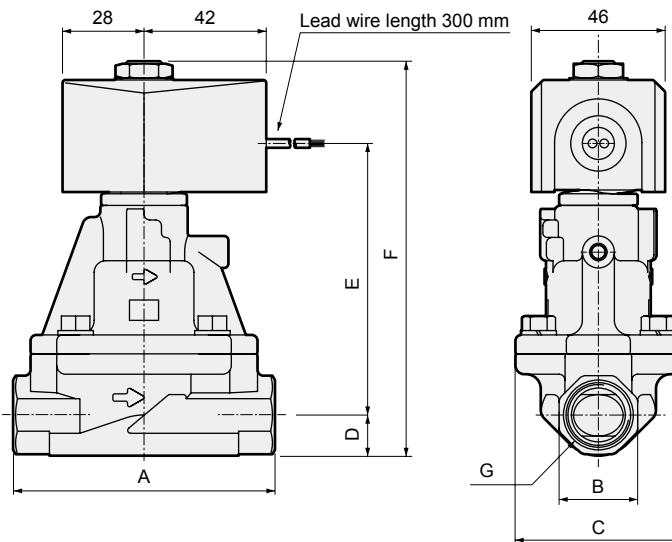


Model No.	G
AP11-8A-*□A	Rc1/4
AP11-10A-*□A	Rc3/8

*1: The dimensions are the same for port sizes of G and NPT threads.

● Open frame lead wire
AP11-15A/20A/25A-*

- 3A
- 4A
- 5A



Model No.	A	B	C	D	E	F	G
AP11-15A-*□A	90	27	57	14	92.5	135.5	Rc1/2
AP11-20A-*□A	100	32	65	17	100.5	146.5	Rc3/4
AP11-25A-*□A	110	41	76	20.5	116	165.5	Rc1

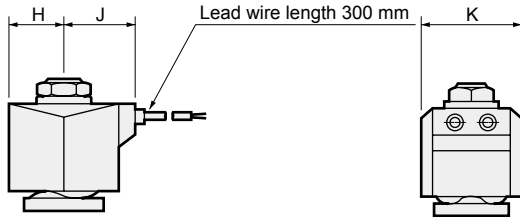
*1 : The dimensions are the same for port sizes of G and NPT threads.

Optional dimensions: AP11 Series



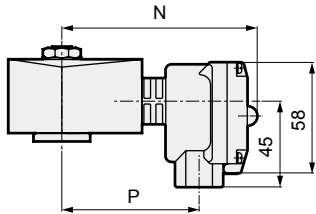
* Refer to the open frame lead wire dimensions on the left page for common dimensions.

- Grommet lead wire
AP11-8A to 25A-***2C** / **6C**



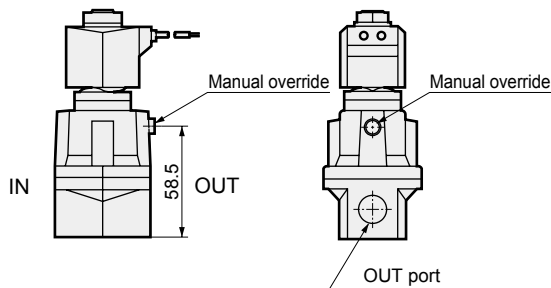
Model No.	H	J	K
AP11-8A to 10A-*2C	20	27	34
AP11-15A to 25A-*2C	23.5	30.5	38
AP11-8A to 25A-*6C	24	30.5	39

- Open frame + HP terminal box
AP11-8A to 25A-***3M** / **4M**
5N / **4N**
J



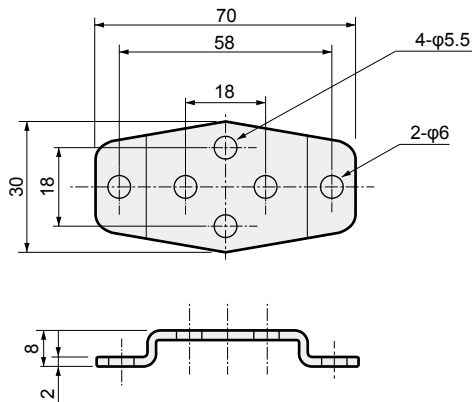
Model No.	N	P
AP11-8A to 10A-*□□	99	68
AP11-15A to 25A-*□□	103	72

- Manual override (locking)
AP11-8A/10A-*****A**



- Mounting plate
AP11-8A/10A-*****B**

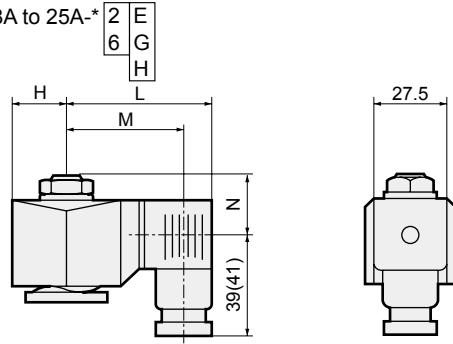
Material: Steel
Zinc plated



Mounting plate: GE-100159

* Mounting plate is not available for port size 15 (1/2) to 25 (1).

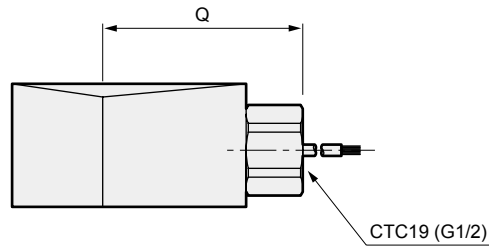
- With DIN terminal box
AP11-8A to 25A-***2E** / **6G**
H



Dimensions shown in () are for G1/2.

Model No.	H	L	M	N	Model No.	H	L	M	N
AP11-8A to 10A-*2□-AC	20	62	50.5(50)	20.5	AP11-15A to 25A-*2□-AC	23.5	65.5	54(53.5)	22
AP11-8A to 10A-*2□-DC	21	63.5	52(51.5)	20.5	AP11-15A to 25A-*2□-DC	23.5	66	54.5(54)	22
AP11-8A to 25A-*6□-DC	24	68	56.5(56)	22					

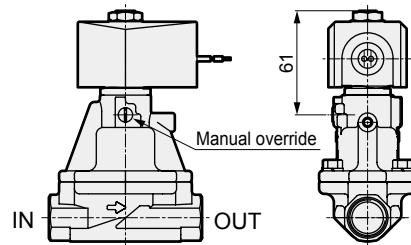
- Open frame + conduit
AP11-8A to 25A-***3A** / **4A** / **5A**
G / **H**



Dimensions shown in () are for G1/2.

Model No.	Q
AP11-8A to 10A	53(56)
AP11-15A to 25A	57(60)

- Manual override (locking)
AP11-15A/20A/25A-*****A**



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

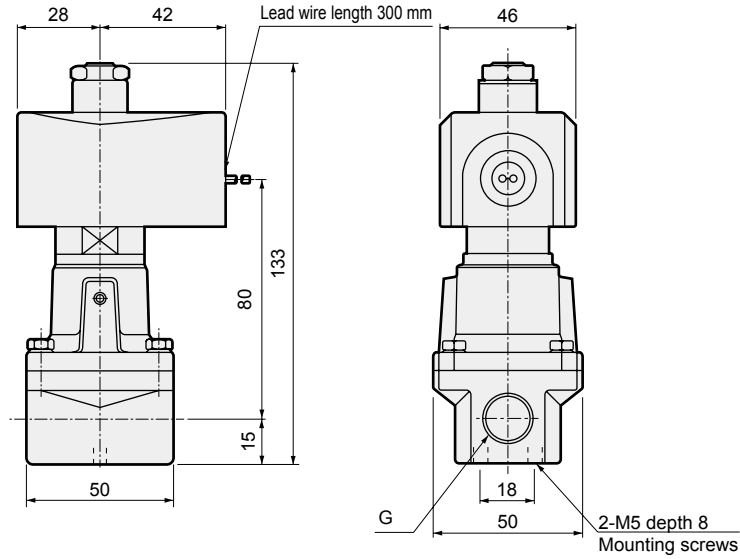
AP11/AP12 Series



Dimensions: AP12 Series

● Open frame lead wire
AP12-8A/10A-*

3A
4A
5A

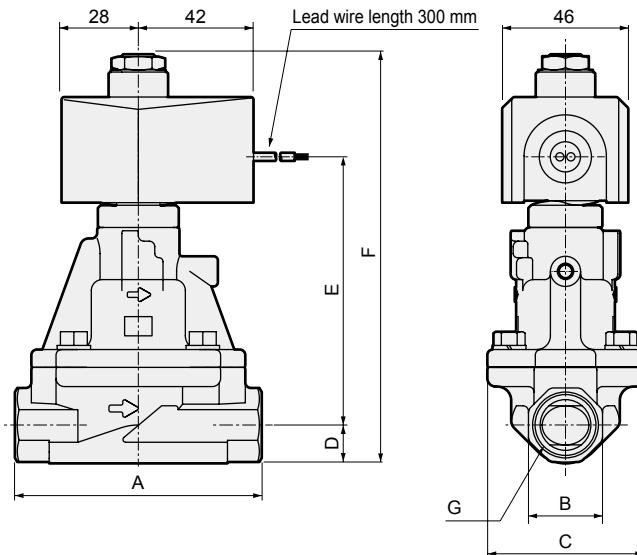


Model No.	G
AP12-8A-□A	Rc1/4
AP12-10A-□A	Rc3/8

*1: The dimensions are the same for port sizes of G and NPT threads.

● Open frame lead wire
AP12-15A/20A/25A-*

3A
4A
5A



Model No.	A	B	C	D	E	F	G
AP12-15A-□A	90	27	57	14	96.5	148.5	Rc1/2
AP12-20A-□A	100	32	65	17	104.5	159.5	Rc3/4
AP12-25A-□A	110	41	76	20.5	120	178.5	Rc1

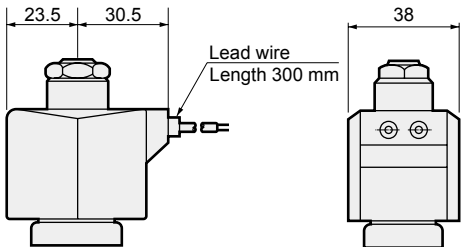
*1 : The dimensions are the same for port sizes of G and NPT threads.

Optional dimensions: AP12 Series

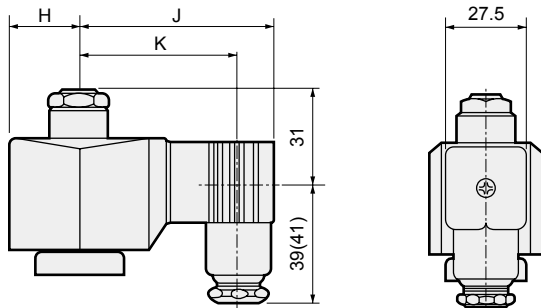


* Refer to the open frame lead wire dimensions on the left page for common dimensions.

- Grommet lead wire
AP12-8A to 25A-*(2C)



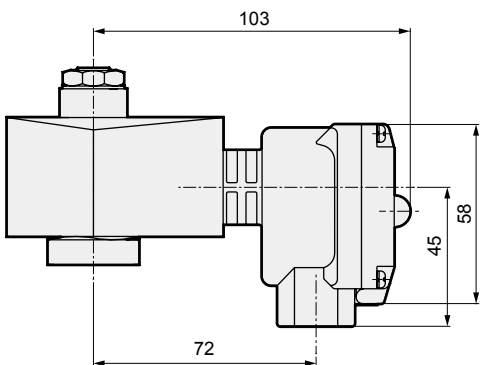
- With DIN terminal box
AP12-8A to 25A-*(2E, 2G, 2H)



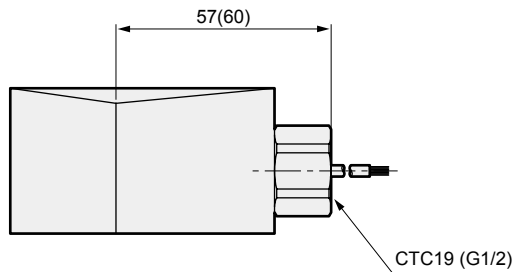
Dimensions shown in () are for G1/2.

Voltage	H	J	K
AC	23.5	65.5	54(53.5)
DC	28	72	60.5(60)

- Open frame + HP terminal box
AP12-8A to 25A-*(3M, 5N, 4M, 4N, I, J)

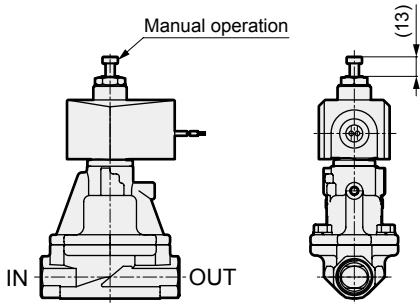


- Open frame + conduit
AP12-8A to 25A-*(3A, 4A, 5A, G, H)



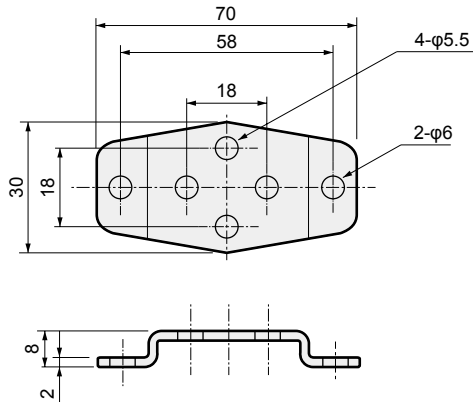
Dimensions shown in () are for G1/2.

- Manual override (locking)
AP12-15A/20A/25A-***(A)



- Mounting plate
AP12-8A/10A-***(B)

Material: Steel
Zinc plated



Mounting plate: GE-100159

* Mounting plate is not available for port size 15 (1/2) to 25 (1).

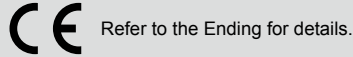
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S/B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH / CPE/D
LifeSci
Gas- Combus
Auto- Water
SpecFld
Custom
Ending



Pilot operated 2-port solenoid valve
(general purpose valve)

AP21/AP22 Series

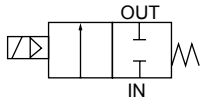
- NC, NO
- Port size: Rc1¹/₄ to Rc2, 32 to 50 flange
- Piston drive



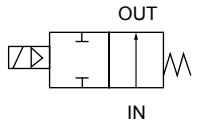
- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/AD
- APK/ADK
- DryAir
- EX-XPLNprf
- XPLNprf
- HVB/HVL
- SAB/NAB
- LAD/NAD
- Water-Rela
- NP/NAP/NVP
- SNP
- CHB/G
- MXB/G
- Other valves
- SWD/MWD
- DustColl
- CVE/CVSE
- CCH/CPE/D
- LifeSci
- Gas-Combus
- Auto-Water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

JIS symbol

● AP21: NC



● AP22: NO



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Standard specifications	Optional specifications
Working fluid	Air/water/kerosene/oil (50 mm ² /s or less)	Steam
Working pressure differential MPa	0.05 to 1.2 (refer to max. working pressure differential in individual specifications.)	
Max. working pressure MPa	1.6 (≈230 psi, 16 bar)	1 (≈150 psi, 10 bar)
Proof pressure (water pressure) MPa	3.2 (≈460 psi, 32 bar)	
Fluid temperature °C	-10 (14°F) to 60 (140°F) (*1)	5 (41°F) to 180 (356°F)
Ambient temperature °C	-10 (14°F) to 60 (140°F)	
Thermal class	Class 130 (B)	Class 180 (H)
Atmosphere	Place free of corrosive gas and explosive gas	
Valve structure	Pilot operated poppet, piston drive	
Valve seat leakage (*2) cm ³ /min(ANR)	1 or less (air)	400 or less (air)
Mounting orientation	Free (within working pressure differential range)	
Body/seal material	Bronze/nitrile rubber	Bronze/PTFE

*1 : No freezing.

*2 : Pneumatic pressure used for measurement is 0.05 to 1.2 MPa for AP21 (NC), and 0.05 to 0.5 MPa for AP22 (NO).

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Descriptions	Port size	Orifice size (mm)	Min. working pressure differential (MPa)	Max. working pressure differential (MPa)								Rated voltage	Apparent power (VA)				Power consump (W)		Weight (kg)																																									
				Air		Water/kerosene		Oil (50 mm ² /s)		Steam	When holding		When starting		AC	DC																																												
Model No.				AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz																																												
NC																																																												
AP21-32A	Rc1 ¹ / ₄	35	0.05	1.2	0.6	1.0	0.6	0.6	0.6	1.0	100 VAC 50/60 Hz	18	15	29	24	6.7/5.7	11	3.5																																										
AP21-32F	32 flange										*6							7																																										
AP21-40A	Rc1 ¹ / ₂	43									0.05							1.2	0.6	1.0	0.6	0.6	0.6	1.0	200 VAC 50/60 Hz	18	15	29	24	6.7/5.7	11	4.5																												
AP21-40F	40 flange																								*6							8																												
AP21-50A	Rc2	53																							0.05							1.2	0.6	1.0	0.6	0.6	0.6	1.0	12 VDC	18	15	29	24	6.7/5.7	11	6														
AP21-50F	50 flange																																						24 VDC							8														
			0.05	1.2	0.6	1.0	0.6	0.6	0.6	1.0		48 VDC	18	15	29	24	6.7/5.7																						11							6														
												0.05																																		1.2	0.6	1.0	0.6	0.6	0.6	1.0	100 VDC	18	15	29	24	6.7/5.7	11	10
NO																																																												
AP22-32A	Rc1 ¹ / ₄	35									0.05							0.5	0.5	0.5	0.5	0.5	0.5	0.5		100 VAC 50/60 Hz	22	18	35	29	8.7/6.7																						15.5							3.5
AP22-32F	32 flange																								*6	7																																		
AP22-40A	Rc1 ¹ / ₂	43																							0.05	0.5						0.5	0.5	0.5	0.5	0.5	0.5	200 VAC 50/60 Hz		22	18	35	29	8.7/6.7	15.5															4.5
AP22-40F	40 flange		*6	8																																																								
AP22-50A	Rc2	53	0.05	0.5	0.5	0.5	0.5	0.5	0.5	0.5		12 VDC	22	18	35	29	8.7/6.7																					15.5	6																					
AP22-50F	50 flange											24 VDC																											8																					
											0.05	0.5						0.5	0.5	0.5	0.5	0.5	0.5	48 VDC			22	18	35	29	8.7/6.7								15.5							6														
																								0.05																						0.5	0.5	0.5	0.5	0.5	0.5	0.5	100 VDC	22	18	35	29	8.7/6.7	15.5	10

*1 : The model numbers above show the basic port size. Refer to How to order for other combinations.

*2 : Refer to DC column for the max. working pressure differential of coil with diode.

*3 : The voltage fluctuation range must be within ±10% of the rated voltage.

*4 : Power consumption of coil housings 2E/2G/2H.

*5 : Power consumption of coil housings 6C/6E/6G/6H.

*6 : The 100 VAC (50/60 Hz) can be used with 110 VAC (60 Hz). The 200 VAC (50/60 Hz) can be used with 220 VAC (60 Hz). However, this does not apply to coil housings 5A/5M/5N/5I/5J.

Optional specifications

Sealant	Fluoro rubber		PTFE	
Coil (thermal class)	Class 130 (B)	Class 180 (H)	Class 130 (B)	Class 180 (H)
Fluid temperature °C	-10 to 60 (*1)	-10 to 90 (*1)	-10 to 60 (*1)	5 to 180
Ambient temperature °C	-10 to 60			
Valve seat leakage (*2) cm ³ /min(ANR)	1 or less (air)		400 or less (air)	

*1 : No freezing.

*2 : Pneumatic pressure used for measurement is 0.05 to 1.2 MPa for AP21 (NC), and 0.05 to 0.5 MPa for AP22 (NO).

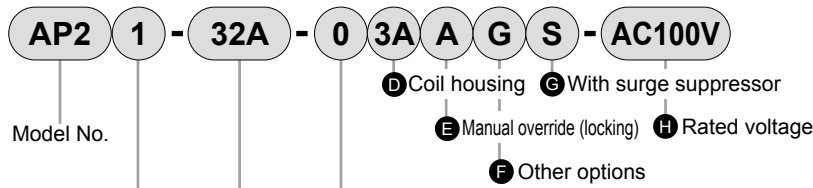
Flow characteristics

Model No.	Port size	Orifice size (mm)	Cv	Effective cross-sectional area (mm ²)
NC				
AP21-32A	Rc1 ¹ / ₄	35	25	460
AP21-32F	32 flange			
AP21-40A	Rc1 ¹ / ₂	43	34	625
AP21-40F	40 flange			
AP21-50A	Rc2	53	53	975
AP21-50F	50 flange			
NO				
AP22-32A	Rc1 ¹ / ₄	35	25	460
AP22-32F	32 flange			
AP22-40A	Rc1 ¹ / ₂	43	34	625
AP22-40F	40 flange			
AP22-50A	Rc2	53	53	975
AP22-50F	50 flange			

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

AP21/AP22 Series

How to order



Code	Content				
A Actuation					
1	NC				
2	NO				
B Port size					
32A	Rc1 ¹ / ₄				
32F	32 flange				
40A	Rc1 ¹ / ₂				
40F	40 flange				
50A	Rc2				
50F	50 flange				
C Body/sealant combination					
	Body	Seal	O-ring	Treatment	Remarks
0	Std. Bronze	Nitrile rubber	Nitrile rubber	-	Air/water/kerosene/oil (up to 60°C)
		Fluoro rubber	Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
		PTFE	Fluoro rubber		Steam (up to 180°C *3)
D	Stainless steel	Nitrile rubber	Nitrile rubber	-	Air/water/kerosene/oil (up to 60°C)
		Fluoro rubber	Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
		PTFE	PTFE		Steam (up to 180°C *3)
H	Option Bronze	Nitrile rubber	Nitrile rubber	Oil free	Air/water/kerosene/oil (up to 60°C)
		Fluoro rubber	Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
		PTFE	Fluoro rubber		Steam (up to 180°C *3)
L	Stainless steel	Nitrile rubber	Nitrile rubber	Oil free	Air/water/kerosene/oil (up to 60°C)
		Fluoro rubber	Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
		PTFE	PTFE		Steam (up to 180°C *3)

Refer to Intro Page 39 for reference on material combinations.

D to H
Refer to the following page for details on the coil housing, other options and voltage, etc.

[Example of model No. 1]
AP21-32A-02C-AC100V

- Model : AP21
- A** Actuation : NC
 - B** Port size : Rc1¹/₄
 - C** Body/sealant combination : Body - bronze, sealant - nitrile rubber, O-ring - nitrile rubber
 - D** Coil housing : Grommet lead wire
 - E** to **G** : None
 - H** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

[Example of model No. 2]
AP22-40F-H3AAS-AC200V

- Model : AP22
- A** Actuation : NO
 - B** Port size : 40 flange
 - C** Body/sealant combination : Body - bronze, sealant - nitrile rubber, O-ring - nitrile rubber (oil free)
 - D** Coil housing : Open frame lead wire
 - E** Manual override (locking) : Selected
 - F** Other options : None
 - G** Surge suppressor : With surge suppressor
 - H** Rated voltage : 200 VAC 50/60 Hz, 220 VAC 60 Hz

⚠ Precautions for model No. selection

- *1 : The companion flange is JIS B2210 10K. (Flange is not enclosed with the product and must be purchased separately.)
- *2 : As G and NPT threads can also be used for piping port threads, contact CKD for details.




Notes for **C**

- *3 : When Item **C** 4A/4M/4N is selected.
- *4 : When using the PTFE valve seal with thermal class 180(H) coil, the O-ring material is fluoro rubber for steam.
- *5 : When Item **C** is C, F, K or N, Item **D** Coil housings 6C, 6E, 6G and 6H cannot be selected.


For Items ① to ④, the combinations indicated with codes are available.
 Note that if options for Items ⑤ to ⑧ are not required, they should be left blank.

① Coil housing		②	③ Other options					④	⑤ Rated voltage	
Content	Option	Manual override (Locking)	Cable gland (marine cable gland)			Conduit (conduit piping)		With surge suppressor	Content	
			A-15a	A-15b	A-15c	CTC19	G1/2			
			3A	Open frame lead wire (IP65 equivalent)	A *10					
2C	Grommet lead wire								100 VAC, 200 VAC	
2E	With DIN terminal box (G1/2)	A						S	100 VAC, 200 VAC	
2G	With DIN terminal box (Pg11)	*10							12 VDC, 24 VDC, 48 VDC, 100 VDC	
2H	DIN terminal box with small lamp (Pg11)						H		100 VAC, 200 VAC, 24 VDC	
3M	With HP terminal box (G1/2)	A							100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC	
3N	Open frame HP terminal box with lamp (G1/2)		D	E	F			S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC	
3I	HP terminal box (IP65 or equivalent) (G1/2)	*10							100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC	
3J	HP term box, lamp (IP65, equiv) (G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC	
4A	Open frame Lead wire	A				G	H	S		
4M	With HP terminal box (G1/2)	*10	D	E	F				100 VAC, 200 VAC	
4N	Open frame (Thermal class 180 (H)) HP terminal box with lamp (G1/2)									
5A	Lead wire (IP65 or equivalent)	A				G	H			
5M	With HP terminal box (G1/2)									
5N	Open frame HP terminal box with lamp (G1/2)	*10	D	E	F				100 VAC, 200 VAC	
5I	diode integrated HP terminal box (IP65 or equivalent) (G1/2)									
5J	HP term box, lamp (IP65, equiv) (G1/2)									
6C	Grommet lead wire 7W	A						S	12 VDC, 24 VDC	
6E	With DIN terminal box (G1/2) 7W	*10								
6G	With DIN terminal box (Pg11) 7W									
6H	DIN terminal box with small lamp (Pg11) 7W						H		24 VDC	

⚠ Refer to the following cautions for ① to ④.

2C 6C		● Grommet lead wire 300 mm
2E 2G 2H 6E 6G 6H		● DIN terminal box
3A 4A 5A		● Open frame Lead wire 300 mm ● 4A (Thermal class 180 (H)) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (Thermal class 180 (H)) ● 5M, 5N (diode integrated)
3I 3J 5I 5J		● Open frame HP terminal box (IP65 or equivalent) ● 5I, 5J (diode integrated)

Refer to page 248 for coil selection.

G H		● Conduit ● G(CTC19) ● H(G1/2)
--------	--	--------------------------------------

⚠ Precautions for model No. selection

Notes for ①

- *6 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.
- *7 : A DC coil for steam is available for AP21. Contact CKD for more information.
- *8 : For 6C/6E/6G/6H, only AP21 is available.
- *9 : The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Notes for ② to ④

- *10: When Item ② is C, F, K or N, the manual override (Item ② A) is not available.
- *11: For Item ③, select an option from D, E, F, G and H.
- *12: The surge suppressor is attached with the lead wire coil. When selecting a coil with a terminal box, the surge suppressor is mounted in the terminal box.
- *13: As standard, the surge suppressor is built into the coil with diode and the 24 VDC coil (Item ① 2H, 6H), so surge suppressor code S cannot be selected.
- *14: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that tropicalization is not available when the manual override option (A) and the coil option 6C/6E/6G/6H are selected.

Notes for ⑤

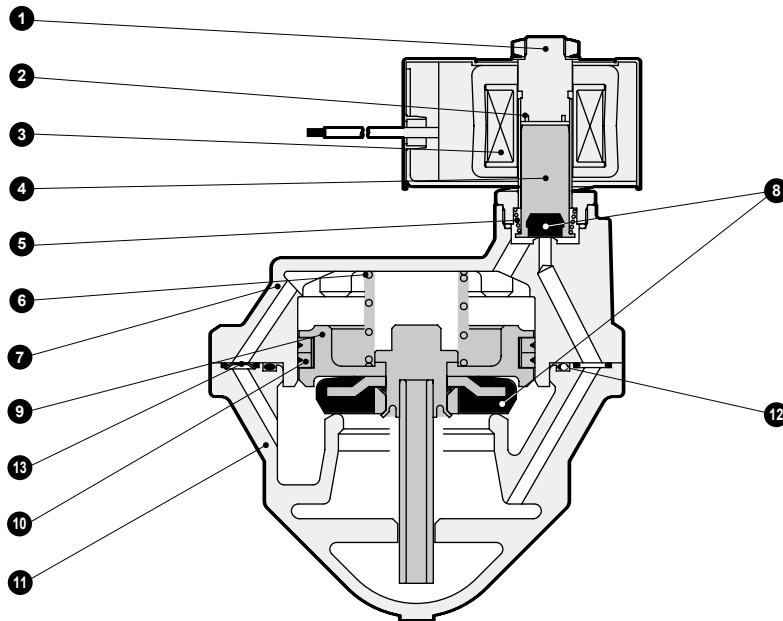
- *15: 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item ① 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *16: For voltages other than above, contact CKD.
- *17: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

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

AP21/AP22 Series

Internal structure and parts list

● AP21 Series



No.	Part name	Material	
1	Core assembly	SUS405 or equiv./SUS316L/SUS403 *1	Stainless steel
2	Shading coil *2	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
3	Coil	-	-
4	Plunger	SUS405 or equiv.	Stainless steel
5	Plunger spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Body	CAC408(SCS13)	Bronze casting (stainless steel casting)
8	Seal	NBR(FKM, PTFE)	Nitrile rubber (fluoro rubber or tetrafluoroethylene resin)
9	Main valve assembly	C3604/SUS303/SUS304 (SUS303/SUS304)	Stainless steel/copper alloy (stainless steel)
10	Seal ring set	SUS304/PTFE	Stainless steel/tetrafluoroethylene resin
11	Body	CAC408(SCS13)	Bronze casting (stainless steel casting)
12	O-ring	NBR(FKM, PTFE)	Nitrile rubber (fluoro rubber or tetrafluoroethylene resin)
13	Orifice plate	SUS304	Stainless steel

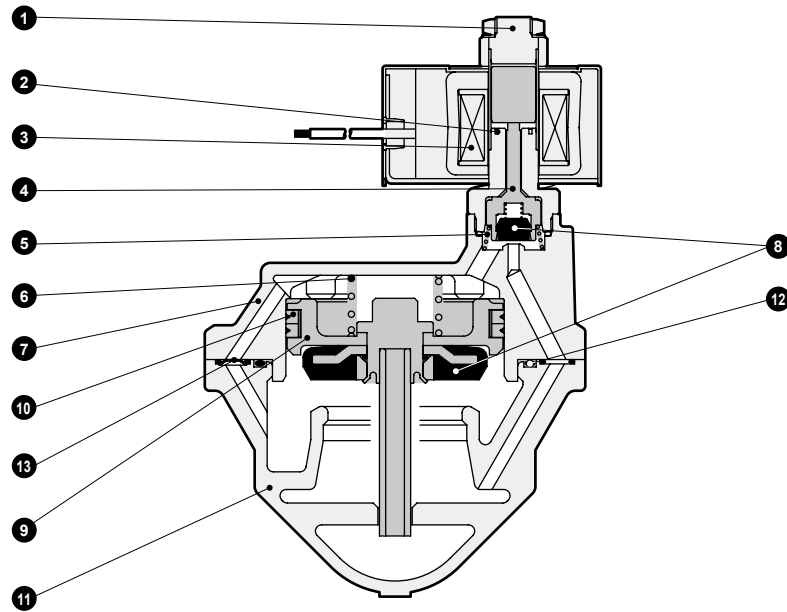
() shows options.

*1 : When the body/sealant combination code is other than O and H, or the coil housing code is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent/SUS316L/SUS430.

*2 : No shading coil is used for DC coil or coil with diode.

Internal structure and parts list

● AP22 Series



No.	Part name	Material	
1	Plunger/core assembly	SUS405 or equiv./SUS316L/SUS304	Stainless steel
2	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
3	Coil	-	-
4	NO valve assembly	POM/NBR (SUS303/PFA/FKM or PTFE)	Acetal resin, nitrile rubber (stainless steel, perfluoroalkoxy resin, fluoro rubber or tetrafluoroethylene resin)
5	Spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Body	CAC408(SCS13)	Bronze casting (stainless steel casting)
8	Seal	NBR (FKM or PTFE)	Nitrile rubber (fluoro rubber or tetrafluoroethylene resin)
9	Main valve assembly	C3604/SUS303/SUS304 (SUS303/SUS304)	Stainless steel/copper alloy (stainless steel)
10	Seal ring set	SUS304/PTFE	Stainless steel/tetrafluoroethylene resin
11	Body	CAC408(SCS13)	Bronze casting (stainless steel casting)
12	O-ring	NBR(FKM, PTFE)	Nitrile rubber (fluoro rubber or tetrafluoroethylene resin)
13	Orifice plate	SUS304	Stainless steel

() shows options.

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

AP21/AP22 Series

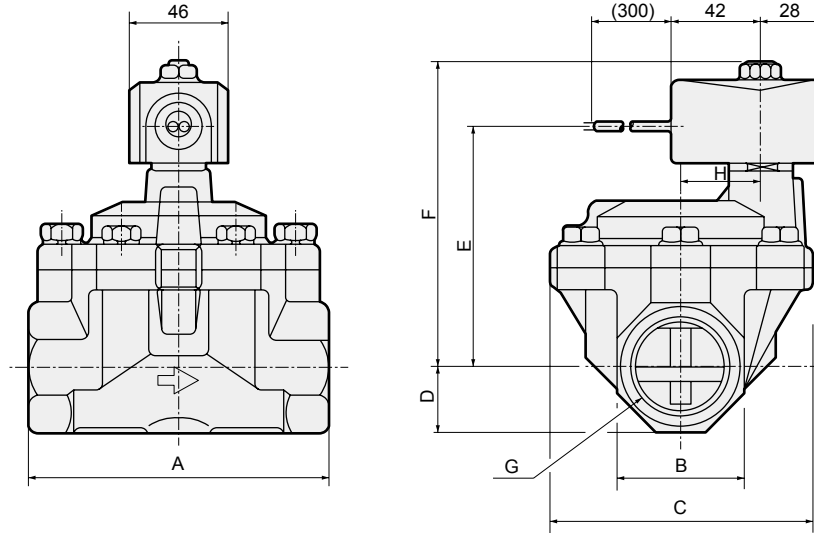
Dimensions: AP21 Series



- Open frame lead wire (Rc screw-in)

AP21-32A/40A/50A-*

3A
4A
5A

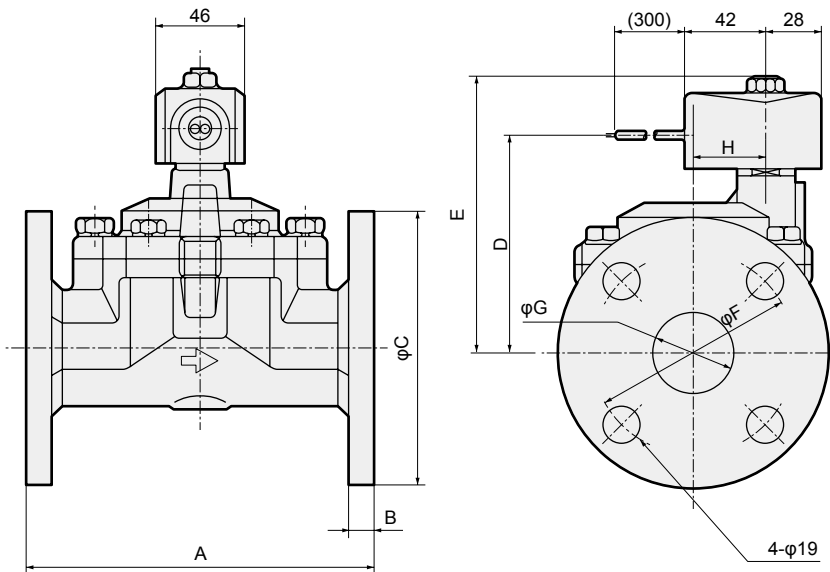


Model No.	A	B	C	D	E	F	G	H
AP21-32A-*□A	125	54	112	27	106.5	135.5	Rc1 ¹ / ₄	32
AP21-40A-*□A	140	60	122	30	112.5	141.5	Rc1 ¹ / ₂	38
AP21-50A-*□A	160	74	132	37	120.5	149.5	Rc2	45

- Open frame lead wire (flange)

AP21-32F/40F/50F-*

3A
4A
5A



Model No.	A	B	C	D	E	F	G	H
AP21-32F-*□A	170	12	135	106.5	135.5	100	36	32
AP21-40F-*□A	180	14	140	112.5	141.5	105	42	38
AP21-50F-*□A	180	14	155	120.5	149.5	120	53	45

- 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

Optional dimensions: AP21 Series



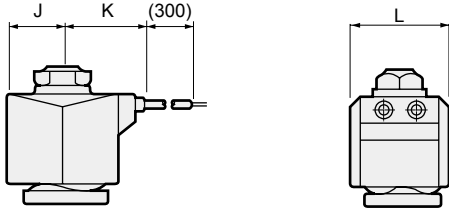
* Refer to the open frame lead wire dimensions on the left page for common dimensions.

- Grommet lead wire
AP21-32^φ to 50^φ - *

2	C
---	---

 /

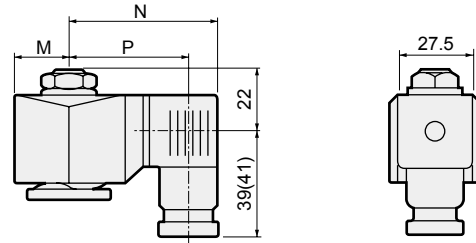
6	C
---	---



Model No.	J	K	L
AP21-32 ^φ to 50 ^φ - *2C	23.5	34.5	38
AP21-32 ^φ to 50 ^φ - *6C	24	30.5	39

- With DIN terminal box
AP21-32^φ to 50^φ - *

2	E
6	G
	H



Dimensions shown in () are for G1/2.

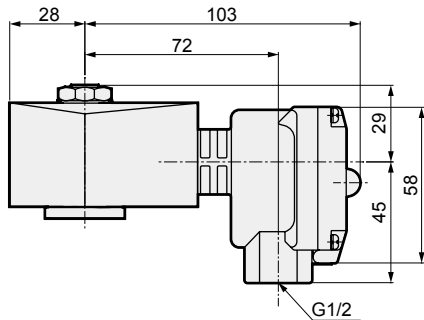
Voltage	M	N	P
AC (2E/2G/2H)	23.5	65.5	54(53.5)
DC (2E/2G/2H)	23.5	66	54.5(54)
DC (6E/6G/6H)	24	68	56.5(56)

- Open frame + HP terminal box
AP21-32^φ to 50^φ - *

3	M
5	N
	I
	J

 /

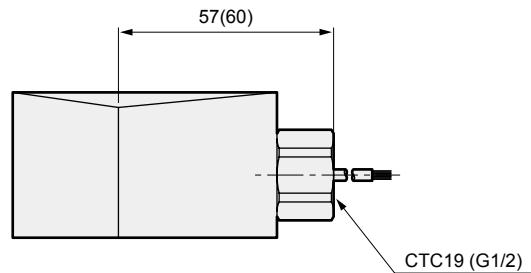
4	M
	4N



- Open frame + conduit
AP21-32^φ to 50^φ - *

3	A
4	A
5	A

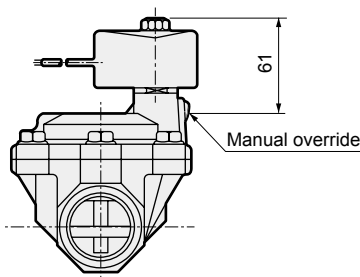
G
H



Dimensions shown in () are for G1/2.

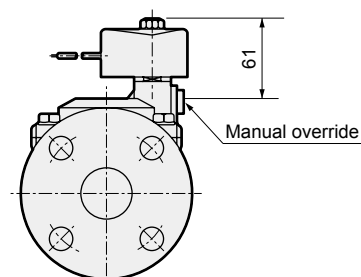
- Manual override (locking, Rc screw-in)
AP21-32A/40A/50A - ***

A



- Manual override (locking, flange)
AP21-32F/40F/50F - ***

A



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

AP21/AP22 Series

Dimensions: AP22 Series

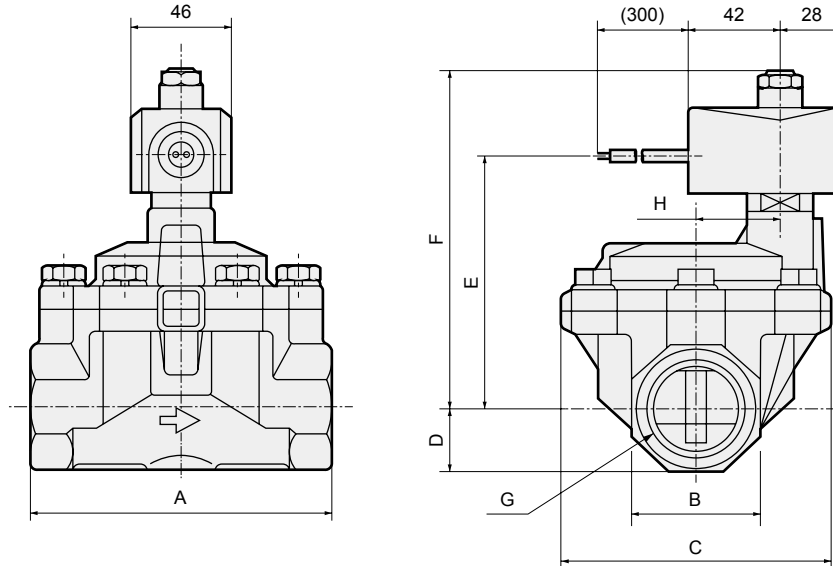


- EXA
- FWD
- HNB/G
- USB/G
- FAB/G
- FGB/G
- FVB
- FWB/G
- FHB
- FLB
- AB
- AG
- AP/
AD
- APK/
ADK
- DryAir
- EX-
XPLNprf
- XPLNprf
- HVB/
HVL
- S ∇ B/
NAB
- LAD/
NAD
- Water-
Rela
- NP/NAP/
NVP
- SNP
- CHB/G
- MXB/G
- Other
valves
- SWD/
MWD
- DustColl
- CVE/
CVSE
- CCH /
CPE/D
- LifeSci
- Gas-
Combus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

● Open frame lead wire (Rc screw-in)

AP22-32A/40A/50A-*

3A
4A
5A

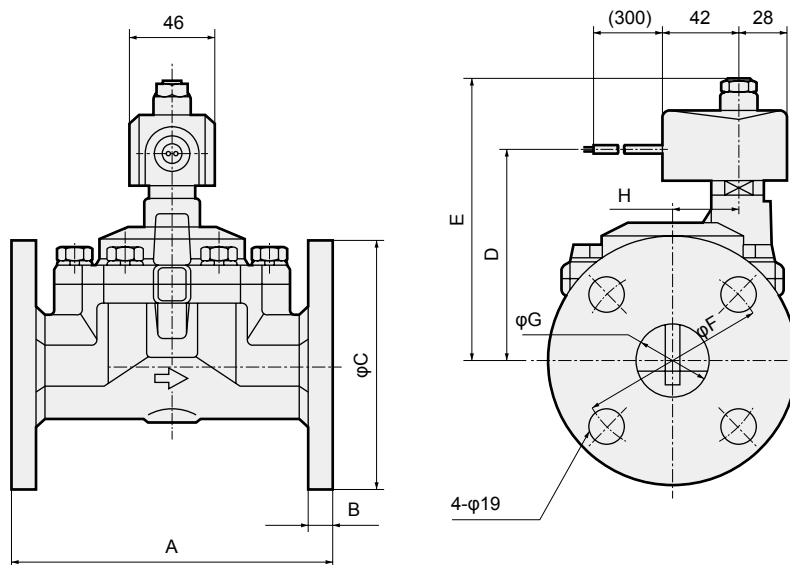


Model No.	A	B	C	D	E	F	G	H
AP22-32A-*□A	125	54	112	27	110.5	149	Rc1 $\frac{1}{4}$	32
AP22-40A-*□A	140	60	122	30	116.5	155	Rc1 $\frac{1}{2}$	38
AP22-50A-*□A	160	74	132	37	124.5	163	Rc2	45

● Open frame lead wire (flange)

AP22-32F/40F/50F-*

3A
4A
5A



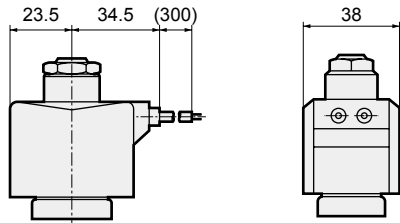
Model No.	A	B	C	D	E	F	G	H
AP22-32F-*□A	170	12	135	110.5	149	100	36	32
AP22-40F-*□A	180	14	140	116.5	155	105	42	38
AP22-50F-*□A	180	14	155	124.5	163	120	53	45

Optional dimensions: AP22 Series

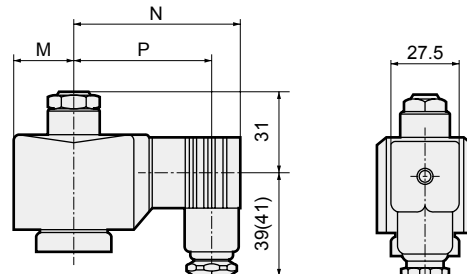


* Refer to the open frame lead wire dimensions on the left page for common dimensions.

- Grommet lead wire
AP22-32^A to 50^A - * **2C**



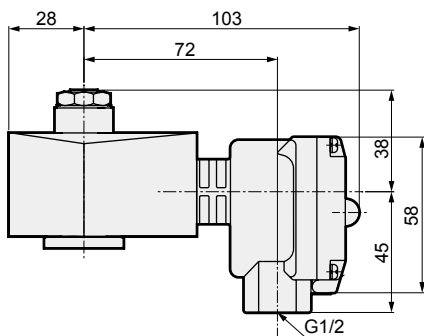
- With DIN terminal box
AP22-32^A to 50^A - * **2E**
2G
2H



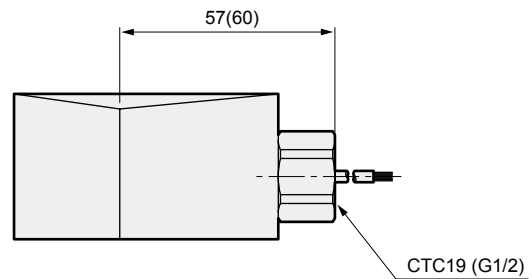
Dimensions shown in () are for G1/2.

Voltage	M	N	P
AC	23.5	65.5	54(53.5)
DC	28	72	60.5(60)

- Open frame + HP terminal box
AP22-32^A to 50^A - * **3** M / **4M**
5 N / **4N**
I
J

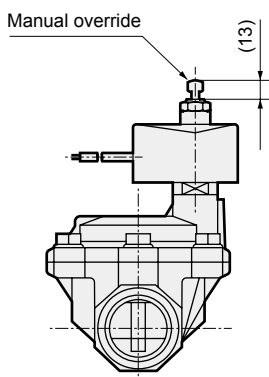


- Open frame + conduit
AP22-32^A to 50^A - * **3A** **G**
4A **H**
5A

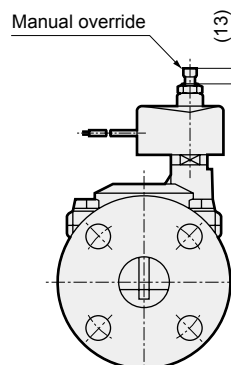


Dimensions shown in () are for G1/2.

- Manual override (locking, Rc screw-in)
AP22-32A/40A/50A - *** **A**



- Manual override (locking, flange)
AP22-32F/40F/50F - *** **A**



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 ^Δ 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



Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

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

Precautions for each model series: product-specific cautions

Pilot operated 2-port solenoid valve (AP/AD) and pilot kick 2-port solenoid valve (APK/ADK)

Design/selection

⚠ WARNING

1 Working fluids

- (1) When using this valve for dry air or inert gas, the life can be shortened considerably due to wear. Use a valve intended for dry air.
- (2) This valve cannot be used for maintaining vacuum.

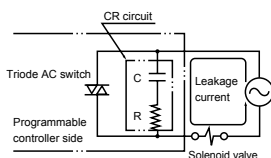
⚠ CAUTION

1 Fluid viscosity

The fluid viscosity must be 50 mm²/s or less. Malfunctions could occur if the viscosity is higher than 50 mm²/s.
(For APK Series, 20 mm²/s or less)

2 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.



Model No.	AC		AC diode		DC	
	100 V	200 V	100 V	200 V	12 V	24 V
AP,AD	6 mA or less	3 mA or less	2 mA or less	1 mA or less	2 mA or less	1 mA or less
APK,ADK	6 mA or less	3 mA or less	2 mA or less	1 mA or less	2 mA or less	1 mA or less

Mounting, piping and wiring

⚠ CAUTION

1 Mounting

- (1) As a general rule, the mounting orientation is vertical, with the coil on top.

2 Piping

- (1) If the pipe vibrates when the solenoid valve is opened and closed, securely fix the piping.
- (2) For steam fluids, steam generated from a boiler will contain a large amount of drainage. Always install a drain trap.
- (3) When passing steam, the make-up water in the boiler will contain substances such as "calcium salt" and "magnesium salt". As these substances will react with oxygen and carbon dioxide, and cause scales and sludge to form, always install a "water softener" and a filter for steam.
- (4) When the regulator and solenoid valve are directly coupled, the parts could mutually vibrate, causing resonance and chattering.
- (5) If the piping cross-sectional area on the fluid inlet is reduced, the operation may become unstable due to differential pressure failure during valve operation. For the fluid inlet, use piping of a piping size that matches the port size of the valve. Do not use a needle valve.

3 Wiring

- (1) Refer to Intro Page 64 for information on how to wire a terminal box.

When using the product

⚠ CAUTION

1 Sudden leakage

With the pilot operated or pilot kick 2-port valve, if the pressure is suddenly applied when the pump starts while the valve is closed, the valve may open for an instant causing fluid to leak. Caution is required during use.

2 Operation

Do not apply back pressure. This could lead to malfunction.

3 Water hammer

If the water hammer poses problems, consider using the CKD "RSV type" solenoid valve or a motor valve.

4 Manual operation

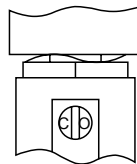
When using a product with a manual override, follow the operations below:
[For NC]

Opening: Insert a flathead screwdriver into the slit on the manual adjustment shaft, and turn it approx. 120° to the right or left. The plunger will rise and the valve will open.

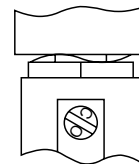
The open state is held even when the screwdriver is removed.

Always return the valve to the original position after use.

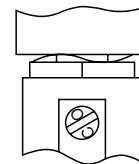
Closing: From the open position, turn the manual adjustment shaft so that the slit is returned to the perpendicular position, which will lower the plunger and close the valve. (Refer to the figure below)



Valve closed state



Valve open state



Valve open state

[For NO]

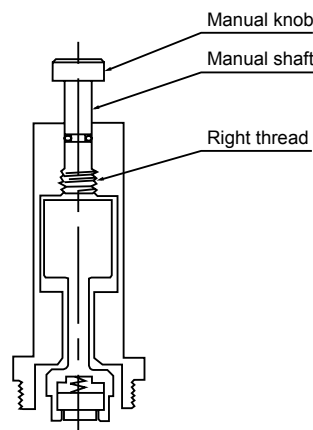
(1) When closing the valve with manual operation

The manual shaft is threaded, so hold the manual dial and rotate the shaft clockwise.

When the manual dial has been rotated downward 5 to 6 mm and no longer rotates, the solenoid valve will switch to closing operation.

(2) Reset (when not using a manual override)

Always rotate the manual dial counterclockwise and return it to the highest point.



Maintenance

⚠ CAUTION

1 Thermal insulation cover

When piping for steam or hot water, etc., use an insulating cover structure that can be disassembled for maintenance purposes.

Avoid placing an insulating cover on the entire solenoid valve or on the coil section. The coil could burn.

2 Tightening torque

When disassembling or assembling, tighten the body bolt, core assembly and nut with the following tightening torques.

		Body bolt tightening torque	Core assembly tightening torque	Nut tightening torque
AP ₁₂ ¹¹ AD ₁₂ ¹¹	8A	3 to 4 Nm	30 to 45 Nm (45 to 60 Nm for APK11-15A to 25A)	8 to 16 Nm
	10A			
APK11 ADK ₁₂ ¹¹	15A	5 to 7 Nm		
	20A	9 to 12 Nm		
AP ₂₂ ²¹ AD ₂₂ ²¹	25A		18 to 28 Nm	
	32 _F ^A			
	40 _F ^A			
APK21 ADK21	50 _F ^A	80 to 120 Nm		
	32 _F ^A			
	40 _F ^A			
	50 _F ^A			

Working environment

⚠ CAUTION

IP65 (IEC60529 [IEC529:1989-11]) standards are applied to the test. Avoid use in conditions where water or cutting oil directly contacts the valve.

Degree of protection of IP65 and explanation of test method

● Degree of protection

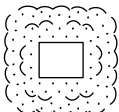
Note: IP65 is based on the following testing method.

■ IEC (International Electrotechnical Commission) standards (IEC60529 [IEC529:1989-11])

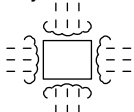
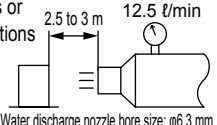
IP-

Degree of protection (International Protection)

1st characteristic No. (degree of protection for foreign solid matter)

Grade	Degree of protection	
6	Dust proof 	No inflow of dust.

2nd characteristic No. (degree of protection for water entry)

Grade	Degree of protection		Overview of test method (fresh water is used)
5	Protection against water jets 	No harmful effects occur even when water is sprayed with nozzles from all directions.	The sample (exterior) is exposed to water jetting of 1 m ² per minute for a total of 3 minutes or more from all directions with the testing equipment in the figure below. 

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- Combust
Auto- Water
SpecFld
Custom
Ending

