AB/AG

(General purpose valve)

General purpose direct acting 2, 3 port solenoid valve

■ For air, vacuum, water, oil

Overview

The general purpose valve series enables control of various types of fluids including water, air, oil and vacuums. In addition to the high reliability and high quality of the valve, a variety of options and variations are available.

Features

Various working fluids control
Various types of fluids can be handled by selecting the proper body material and sealant.

Wide option range
Including open frame, coil with diode and terminal boxes.

A great variety of series and variations
Including direct acting compact type Rc1/8 (port size) to Rc1.

CONTENTS

⚠ Always read the precautions in the Introduction and page 124 before starting use.

Series variation

General purpose direct acting 2, 3 port solenoid valve

No. of port	Model		Structure	Actuation		Air	Low vacuum (1.33×10^2 Pa (abs))	
2 port		AB21	Discrete	NC (normally closed) type		●		
		AB31				●	●	
		AB41				●	●	
		AB42		NO (normally open) type		●	●	
		AB71		NC (normally closed) type		●		
		GAB312	Manifold	NC (normally closed) type	Common supply	●	●	
		GAB352			Individual supply	●	●	
		GAB412			Common supply	●	●	
		GAB452			Individual supply	●	●	
		GAB422		NO (normally open) type	Common supply	●	●	
3 port		AG31	Discrete	Universal type		●	●	
		AG41				●	●	
		AG33		NC pressurization type		●	●	
		AG43				●	●	
		AG34		NO pressurization type		●	●	
		AG44				●	●	
	Manifold 	GAG31	Manifold	Universal type	Common supply / individual exhaust	●	●	
		GAG35			Common supply / separate flow	●	●	
		GAG41			Common supply / individual exhaust	●	●	
		GAG45			Common supply / separate flow	●	●	
	Actuator 	GAG33		NC pressurization type	Common supply / individual exhaust	●	●	
		GAG43				●	●	
		GAG34	Actuator	NO pressurization type		●	●	
		GAG44				●	●	

Working fluid					Port size						Page
Water	Kerosene	Oil (50 mm²/s or less)	Hot water	Steam	Rc1/8	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1	
●		●			●	●					126
●	●	●	●	●	●*4	●*4					130
●	●	●	●	●		●*4	●*4	●*4			130
●	●	●	●	●		●*4	●*4				130
●	●	●*1						●	●	●	144
●	●	●	●	●		●*2	●*2				148
●	●	●	●	●		●*2	●*2				148
●	●	●	●	●		●*2	●*2				148
●	●	●	●	●		●*2	●*2				148
●	●	●	●	●		●*2	●*2				158
●	●	●	●	●	●*4	●*4					166
●	●	●	●	●		●*4	●*4				166
●	●	●	●	●	●*4	●*4					184
●	●	●	●	●		●*4	●*4				184
●	●	●	●		●*4	●*4					202
●	●	●	●			●*4	●*4				202
●	●	●	●	●	●*2 *3	●*2 *3					174
●	●	●	●	●	●*2 *3	●*2 *3					174
●	●	●	●	●		●*2 *3	●*2 *3				174
●	●	●	●	●		●*2 *3	●*2 *3				174
●	●	●	●	●	●*2 *3	●*2 *3					192
●	●	●	●	●		●*2 *3	●*2 *3				192
●	●	●	●		●*2 *3	●*2 *3					210
●	●	●	●			●*2 *3	●*2 *3				210

* Refer to page 122 for details on the coil system.

*1: 20 mm²/s for AB71 Series.

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

*3: ● indicates the NO port.

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

Coil selection guide

● Coil housing types and selection guide

A wide variety is available to match applications.

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

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

Coil variation

Open frame type

			Appearance
Heat proof class B mold	● DC and AC (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP61 or equivalent ● Outdoor use not available	Grommet lead wire	● Lead wire length 300 mm		Blank 6C
Heat proof class B mold	● DC and AC (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP61 or equivalent ● Outdoor use not available	DIN terminal box	● Easy wiring and maintenance ● Reliable electric protection (ground terminal) ● Light available (optional-100/200 VAC and 24 VDC only)		2E 2G 2H 6E 6G 6H
Heat proof class B mold	● DC and AC (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP65 or equivalent ● Outdoor use not available	Lead wire	● Lead wire length 300 mm ● Conduit (CTC19) for direct conduit wiring can be mounted		3A
Heat proof class B mold	● DC and AC (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP21 or equivalent ● Outdoor use not available	HP terminal box	● Easy wiring ● Light available (optional-100/200 VAC and 24/100 VDC only)		3M 3N
Heat proof class B mold	● DC and AC (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP65 or equivalent ● Outdoor use not available	HP terminal box	● Easy wiring ● Light available (optional-100/200 VAC and 24/100 VDC only)		3I 3J
Heat proof class H taped	● AC dedicated (50/60 Hz common) ● High temperature fluid and high ambient temperature available ● Heat proof temperature 180˚C ● Protection property symbols: IP00 ● Outdoor use not available	Lead wire	● Lead wire length 300 mm ● Conduit (CTC19) for direct conduit wiring can be mounted		4A
		HP terminal box	● Easy wiring ● Light available (optional-100/200 VAC only)		4M 4N
Heat proof class B mold with diode	● A diode is mounted on the coil section for direct-current conversion (AC-DC conversion) ● Perfect for places where beat can be a problem ● AC dedicated (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP65 or equivalent ● Outdoor use not available	Lead wire	● Lead wire length 300 mm ● Conduit (CTC19) for direct conduit wiring can be mounted		5A
Heat proof class B mold with diode	● A diode is mounted on the coil section for direct-current conversion (AC-DC conversion) ● Perfect for places where beat can be a problem ● AC dedicated (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP21 or equivalent ● Outdoor use not available	HP terminal box	● Easy wiring ● Light available (optional-100/200 VAC only)		5M 5N
Heat proof class B mold with diode	● A diode is mounted on the coil section for direct-current conversion (AC-DC conversion) ● Perfect for places where beat can be a problem ● AC dedicated (50/60 Hz common) ● Heat proof temperature 130˚C ● Protection property symbols: IP65 or equivalent ● Outdoor use not available	HP terminal box	● Easy wiring ● Light available (optional-100/200 VAC only)		5I 5J
		Conduit	● Use a conduit (CTC19 or G1/2) when using direct conduit wiring for the open frame lead wire.		G H

● Repair parts table per coil option

Coil option symbol	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: It is available only for AB41.

Safety precautions

Always read this section before starting use.

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

Design & Selection

⚠ WARNING

1 Working fluid

(1) Consult with CKD before using this valve for active gas (combustion gas, acetylene gas, etc.).

(2) Valves for LPG (propane gas, butane gas) are available as custom order, so consult with CKD.

(3) When using this valve for dry air or inert gas, the life can be shortened considerably due to wear. Use a valve for dry air.

(4) This valve cannot be used for maintaining the vacuum. Consult with CKD when the vacuum needs to be maintained.

⚠ Caution

1 Continuous energizing

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

2 Suction sound

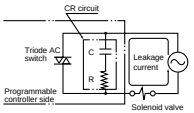
With the AC voltage specifications, a large suction sound may be heard momentarily after energizing. To avoid the suction sound, select the coil with diode or the DC voltage. The suction sound will drop.

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
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

Installation, Piping & Wiring

⚠ CAUTION

1 Piping

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

(2) When passing steam, steam generated from a boiler will contain a large amount of drainage. Always install a drain trap.

(3) When passing steam, water replenished to the boiler will contain matters such as "calcium salt" and "magnesium salt". These matters will react with oxygen and carbon oxide causing scales and sludge, so always install a "water softener" and a filter for steam.

2 Wiring

(1) Refer to page 53 in the Introduction for details on connecting the terminal box.

When Using

⚠ CAUTION

1 Manual operation

Always observe the following points when using a manual override.

<For NC (normally closed) type>

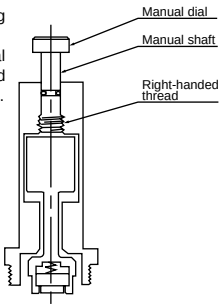
Opening: Insert a flat-tip screwdriver into the slit on the manual shaft, and turn it approx. 120° to the right or left. The plunger will rise up and the valve will open. (For the 3 port valve, the NC side valve seat will open and the NO side valve seat will close.)
The open state is held even when the screwdriver is removed. Always return the valve to the original position after use.

Closing: Turn the manual shaft from the open position to the vertical position. The plunger will lower and the valve will close. (For the 3 port valve, the NC side valve seat will close and the NO side valve seat will open.) (Refer to the following drawings.)

<For NO (normally open) type>

(1) Closing the valve with manual operations
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) Resetting (when not using 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 N·m	-	8 to 16 N·m
AG	30 to 45 N·m	8 to 16 N·m	8 to 16 N·m

Working environment

⚠ CAUTION

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

Explanation of protection property symbols and examination method of IP65

● Protective structure

Note: IP-65 is a standard as followings.

■ IEC (International Electrotechnical Commission) standards

(IEC60529 (IEC529:1989-11))

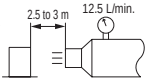
IP-**

Protection property symbols (International Protection)

1st characteristic number (protection grade for foreign solid)

Grade	Degree of protection	
6	Dust proof type 	Powder and dust do not enter inside.

2nd characteristic number (protection grade for entry of water)

Grade	Degree of protection		Overview of test method (fresh water is used)
5	Protection for jet 	No harmful effects occur even when water is sprayed with nozzles from all directions.	Using the following test device, spray water for 1 minute per 1 m^2 of test sample (exterior) surface area from all directions, for a total of 3 minutes or more.  Spray nozzle inner diameter: ø6.3 mm

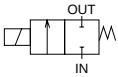
Direct acting 2 port solenoid valve
(general purpose valve)

AB21 Series

- NC (normally closed) type
- Port size: Rc1/8, Rc1/4

RoHS

JIS symbol



Common specifications

Item	AB21
Working fluid	Air, water, kerosene, oil (50 mm²/s or less)
Working pressure differential range MPa	0 to 1.5 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	1.5
Withstanding pressure (water) MPa	3
Fluid temperature ˚C	-10 to 40 (no freezing)
Ambient temperature ˚C	-20 to 50
Heat proof class	B
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Direct acting poppet structure
Valve seat leakage cm³/min. (ANR)	0.2 or less
Mounting attitude	Free

Individual specifications

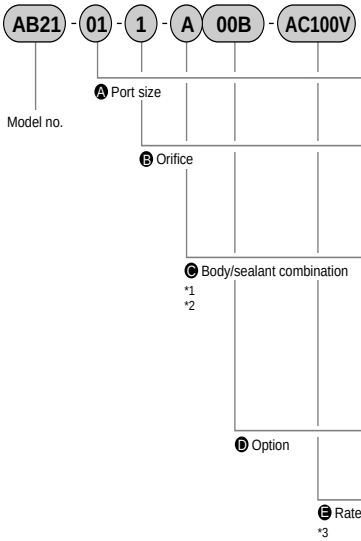
Item / Model no.	Port size	Orifice (mm)	Max. working pressure differential (MPa)						Rated voltage	Apparent power (VA)				Power consumption (W)	
			Air		Water, kerosene		Oil (50 mm²/s)			Holding		Starting		AC 50/60 Hz	DC
			AC	DC	AC	DC	AC	DC		50 Hz	60 Hz	50 Hz	60 Hz		
AB21-01-1	Rc1/8	1.5	1.5	1.0	1.5	1.0	0.9	1.0	100 VAC 50/60 Hz 110 VAC 60 Hz	11	9	15.4	12.6	5.5/4.2	7
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 220 VAC 60 Hz						
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 (mm)	Flow characteristics		
			C [dm³/(s·bar)]	b	Cv flow factor
NC (normally closed) type					
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 sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

How to order



Symbol	Descriptions
Ⓐ Port size	
01	Rc1/8
02	Rc1/4
Ⓑ Orifice	
1	ø1.5
2	ø2
3	ø3
5	ø4

Ⓒ Body/sealant combination

		Body	Sealant	Remarks
Blank	Std.	Aluminum	Nitrile rubber	Air, kerosene, oil
2			Fluoro rubber	Air, kerosene, oil
A	Option	Brass	Nitrile rubber	Air, water, kerosene, oil
B			Fluoro rubber	Air, water, kerosene, oil

Refer to page 36 in the Introduction for details on the material combinations.

Ⓓ Option		
Blank	None	
00B	Mounting plate	

Ⓔ Rated voltage		
AC100V	100 VAC 50/60 Hz, 110 VAC 60 Hz	Consult with CKD for other optional voltages.
AC200V	200 VAC 50/60 Hz, 220 VAC 60 Hz	

<Example of model number>

AB21-01-1-A00B-AC100V

Model no.: AB21

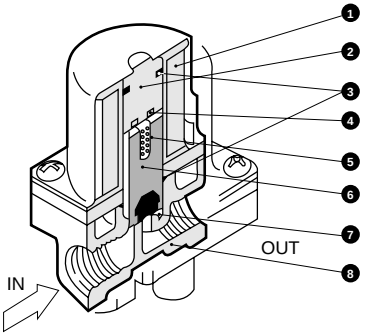
Ⓐ Port size: Rc1/8
Ⓑ Orifice: ø1.5
Ⓒ Body/sealant combination:
: Body - brass, sealant - nitrile rubber
Ⓓ Option: Mounting plate
Ⓔ Rated voltage: 100 VAC 50/60 Hz, 110 VAC 60 Hz

⚠ Note on model no. selection

*1: For Ⓑ 1 (orifice ø1.5), only Ⓒ A or B is available.
*2: When using for water, select the brass (option symbol: A or B) body.
*3: The voltage fluctuation must be within ±10% of the rated voltage.
*4: Leave Ⓒ blank for standard. However, to select 00B for Ⓓ, indicate 0 for Ⓒ.

Internal structure and parts list

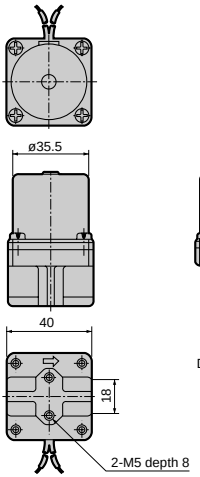
● AB21 Series



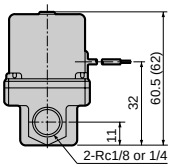
No.	Parts name	Material
1	Coil	—
2	Core assembly	Stainless steel
3	O ring	Fluoro rubber
4	Shading coil	Copper
5	Plunger spring	Stainless steel
6	Plunger	Stainless steel
7	Sealant	Nitrile or fluoro rubber
8	Body	Aluminum or brass

Dimensions

● AB21-01/02-1 to 5-*

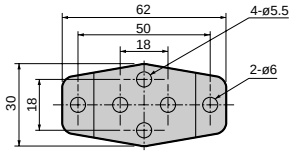


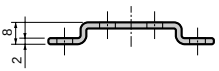
* Lead wire length 250 mm



Dimensions shown in ( ) are for brass body.

● Mounting plate
AB21-01/02-1 to 5-*00B





Mounting plate
No. 1
GE-100106

Discrete direct acting 2 port solenoid valve
(general purpose valve)

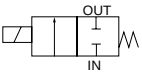
AB31·AB41 Series ● NC (normally closed) type
AB42 Series ● NO (normally open) type

● Port size: Rc1/8 to Rc1/2

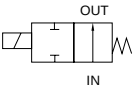
CE RoHS CAD

JIS symbol

● AB31/41: NC (normally closed) type



● AB42: NO (normally open) type



Common specifications

Item	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 range MPa	0 to 5 (refer to max. working pressure differential in individual specifications.)		
Withstanding pressure (water) MPa	25		
Fluid temperature (Note 1) °C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature °C	-20 to 60	-20 to 100	
Heat proof class	B	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 attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Item / Model no.	Port size	Orifice (mm)	Max. working pressure differential (MPa) Air AC	Air DC	Water, hot water, kerosene AC	Water, hot water, kerosene DC	Oil (50 mm^2/s) AC	Oil (50 mm^2/s) DC	Steam AC	Max. working pressure (MPa)	Rated voltage	Apparent power (VA) Holding 50 Hz	Holding 60 Hz	Starting 50 Hz	Starting 60 Hz	Power consumption (W) AC 50/60 Hz	Power consumption (W) DC	Weight (kg)
NC (normally closed) type																		
AB31-$^{01}_{02}$-1	Rc1/8 Rc1/4	1.5	2.5	2.5	2.5	2.5	2.5	2.5	1.0	5 (5 (fluid; 1 for steam))	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	12	10	17	14	5.2/3.8	11 (8.1) *5	0.35
-2		2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.0									
-3		3.0	1.0	0.5	0.7	0.5	0.5	0.5	0.7									
-4		3.5	0.6	0.4	0.5	0.4	0.4	0.4	0.5									
-5		4.0	0.4	0.25	0.3	0.25	0.25	0.25	0.3									
-6		5.0	0.2	0.15	0.15	0.15	0.15	0.15	0.15									
AB41-$^{02}_{03}$-1	Rc1/4 Rc3/8	1.5	5.0	4.0	4.5	4.0	4.0	4.0	1.0			18	15	29	24	6.7/5.7	11 (10.4) *5 (7) *7	0.43 (Rc1/4) 0.45 (Rc3/8)
-2		2.0	3.0	2.5	2.7	2.5	2.5	2.5	1.0									
-3		3.0	1.5	0.9	1.3	0.9	0.9	0.9	1.0									
-4		3.5	1.2	0.6	0.9	0.6	0.6	0.6	0.9									
-5		4.0	1.0	0.5	0.7	0.5	0.5	0.5	0.7									
-6		5.0	0.6	0.25	0.4	0.25	0.25	0.25	0.4									
-7		7.0	0.25	0.1	0.2	0.1	0.15	0.1	0.2									
AB41-$^{03}_{04}$-8	Rc3/8 Rc1/2	10.0	0.1	0.05 (0.03) *8	0.1	0.05 (0.03) *8	0.05	0.05 (0.03) *8										0.54
NO (normally open) type																		
AB42-$^{02}_{03}$-1	Rc1/4 Rc3/8	1.5	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2 (5 (fluid; 1 for steam))		22	18	35	29	8.7/6.7	15.5 (14)	0.50 (Rc1/4) 0.52 (Rc3/8)
-2		2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0									
-3		3.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7									
-4		3.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5									
-5		4.0	0.4	0.4	0.4	0.4	0.4	0.4	0.4									
-6		5.0	0.25	0.25	0.25	0.25	0.25	0.25	0.25									
-7		7.0	0.15	0.15	0.15	0.15	0.15	0.15	0.15									

*1: The model numbers above show the basic port size (Rc) and orifice diameter. Refer to How to order for other combinations (e.g., for steam).
*2: The port size symbol 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 must be within ±10% of the rated voltage.
*5: Power consumption of coil housing 2E/2G/2H is indicated.
*6: When using with a low vacuum, vacuum the OUT port side.
*7: Power consumption of coil housing 6C/6E/6G/6H is indicated.
*8: The DC voltage of coil housing 2E/2G/2H and the max. working pressure differential of coil housing 6C/6G/6H are indicated.

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

Sealant material	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)	Flow characteristics		
			C [dm³/(s·bar)]	b	Cv flow factor
NC (normally closed) type					
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 (1.5)	0.49 (0.47)	0.42 (0.40)
-5		4.0	2.1 (1.9)	0.48 (0.47)	0.54 (0.48)
-6		5.0	3.0 (2.6)	0.42 (0.38)	0.8 (0.62)
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 (1.5)	0.49 (0.47)	0.42 (0.40)
-5		4.0	2.1 (1.9)	0.48 (0.47)	0.54 (0.48)
-6		5.0	3.0 (2.6)	0.42 (0.38)	0.8 (0.62)
-7		7.0	4.8 (4.6)	0.29 (0.37)	1.0 (0.82)
AB41-$^{03}_{04}$-8	Rc3/8 Rc1/2	10.0	9.3 (8.1)	0.36 (0.31)	1.88 (1.5)
NO (normally open) type					
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 (1.5)	0.49 (0.47)	0.4
-5		4.0	2.1 (1.9)	0.48 (0.47)	0.47
-6		5.0	3.0 (2.6)	0.42 (0.38)	0.63 (0.62)
-7		7.0	4.8 (4.6)	0.29 (0.37)	1.0 (0.82)

*1: Effective sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*2: Values shown in ( ) are for stainless steel body.

How to order

● NC (normally closed) type

AB31 - 02 - 3 - 0 - 3A - A - B - G - S - ( ) - AC100V

AB41

Model no.

Ⓓ Coil housing
Ⓔ Manual override (locking)
Ⓕ Mounting plate
Ⓖ Other options
Ⓗ Surge suppressor
Ⓘ Copper and PTFE free
Ⓙ Voltage

Ⓐ Port size

Symbol	Descriptions	Symbol	Descriptions	Symbol	Descriptions	Model no. AB31	AB41	AB41 Low pressure large flow rate
Ⓐ 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			●

Ⓑ Orifice

1	ø1.5	●	●	
2	ø2	●	●	
3	ø3	●	●	
4	ø3.5	●	●	
5	ø4	●	●	
6	ø5	●	●	
7	ø7		●	
8	ø10			

Ⓒ Body/sealant combination

		Body	Sealant	Treatment	Remarks			
Blank	Std.	Brass or bronze	Nitrile rubber	-	Air, water, low vacuum, kerosene (up to 60˚C)	●	●	●
B	Option	Brass or bronze	Fluoro rubber	-	Air, low vacuum, kerosene (up to 90˚C *2)	●	●	●
C	Option	Brass or bronze	PTFE	-	Steam (up to 184˚C *2)	●	●	
V	Option	Brass or bronze	Fluoro rubber	Vacuum inspection	Medium vacuum	●	●	●
D	Option	Stainless steel	Nitrile rubber	-	Air, water, low vacuum, kerosene (up to 60˚C)	●	●	●
E	Option	Stainless steel	Fluoro rubber	-	Air, low vacuum, kerosene (up to 90˚C *2)	●	●	●
F	Option	Stainless steel	PTFE	-	Steam (up to 184˚C *2)	●	●	
W	Option	Stainless steel	Fluoro rubber	Vacuum inspection	Medium vacuum	●	●	●
H	Option	Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●	●
J	Option	Brass	Fluoro rubber	Oil free	Air, low vacuum, kerosene (up to 90˚C *2)	●	●	●
K	Option	Brass	PTFE	Oil free	Steam (up to 184˚C *2)	●	●	
P	Option	Brass	Ethylene propylene diene rubber	Oil free	Hot water (up to 90˚C *2)	●	●	●
L	Option	Stainless steel	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●	●
M	Option	Stainless steel	Fluoro rubber	Oil free	Air, low vacuum, kerosene (up to 90˚C *2)	●	●	●
N	Option	Stainless steel	PTFE	Oil free	Steam (up to 184˚C *2)	●	●	
R	Option	Stainless steel	Ethylene propylene diene rubber	Oil free	Hot water (up to 90˚C *2)	●	●	●

Ⓒ Body/sealant combination
*1
*2
*3
*4
*5
*6
*7

Refer to page 36 in the Introduction for details on the material combinations.

Ⓓ to Ⓙ

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.

<Example 1 of model number>

AB31-02-3-AC100V
Model no.: AB31

Ⓐ Port size: Rc1/4
Ⓑ Orifice: ø3
Ⓒ Body/sealant combination: Body - brass, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ to Ⓘ: Blank
Ⓙ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

AB41-02-3-AC100V
Model no.: AB41

Ⓐ Port size: Rc1/4
Ⓑ Orifice: ø3
Ⓒ Body/sealant combination: Body - brass, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ Manual override (locking): Selected
Ⓕ to Ⓗ: Blank
Ⓘ Surge suppressor: Selected
Ⓙ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

Note on Ⓒ

*1: Leave blank for standard. However, to select options in Ⓓ to Ⓘ, indicate 0 for Ⓒ.
*2: When 4A, 4M or 4N is selected for Ⓓ.
*3: The body for the low pressure large flow rate AB41-$^{03}_{04}$-8 is bronze (standard) or stainless steel (optional).
*4: For option symbols V and W, vacuum is inspected at "leakage amount: 1.33 x 10^{-6} Pa·m^3/s or less".
*5: When Ⓒ of the low pressure large flow rate AB41-$^{03}_{04}$-8 is V or W, DC voltage is not available.
*6: The ethylene propylene diene rubber seal combination (Ⓒ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)
*7: When Ⓒ is C, F, K, P, N or R, the coil housings Ⓓ 6C, 6E, 6G and 6H cannot be selected.

For Ⓓ to Ⓙ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓔ to Ⓘ are not required, no symbol is indicated.

Ⓓ Coil housing				Ⓔ	Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ	Ⓙ Rated voltage
Descriptions				Manual override (locking)	Mounting plate	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Copper and PTFE free	Descriptions
						A-15a	A-15b	A-15c	CTC19	G1/2			
Blank	Std.	Grommet lead wire		A	B						S	P6	100 VAC, 200 VAC
2E		DIN terminal box	(G1/2)										100 VAC, 200 VAC
2G		DIN terminal box	(Pg11)										12 VDC, 24 VDC, 48 VDC, 100 VDC
2H		DIN terminal box + small light	(Pg11)							H			100 VAC, 200 VAC, 24 VDC
3A	Option	Open frame type	Lead wire	A	B	D	E	F	G	H	S	P6	100 VAC, 200 VAC
3M			HP terminal box (G1/2)										12 VDC, 24 VDC, 48 VDC, 100 VDC
3N			HP terminal box + light (G1/2)										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 terminal box + light (IP65 or equivalent) (G1/2)										100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H)	Lead wire	A	B	D	E	F	G	H	S	P6	100 VAC, 200 VAC
4M			HP terminal box (G1/2)										
4N			HP terminal box + light (G1/2)										
5A		Open frame type (diode integrated)	Lead wire	A	B	D	E	F	G	H		P6	100 VAC, 200 VAC
5M			HP terminal box (G1/2)										
5N			HP terminal box + light (G1/2)										
5I			HP terminal box (IP65 or equivalent) (G1/2)										
5J			HP terminal box + light (IP65 or equivalent) (G1/2)										
6C		Grommet lead wire	7W	A	B						S	P6	12 VDC, 24 VDC
6E		DIN terminal box	(G1/2) 7W										
6G		DIN terminal box	(Pg11) 7W										
6H		DIN terminal box + small light	(Pg11) 7W							H			24 VDC

⚠ Refer to the following precautions for Ⓓ to Ⓙ.

Blank, 6C

● Grommet lead wire 300 mm

2E, 2G, 2H, 6E, 6G, 6H

● DIN terminal box

3A, 4A, 5A

● Open frame type grommet lead wire 300 mm
● 4A (heat proof class H)
● 5A (diode integrated)

3M, 3N, 4M, 4N, 5M, 5N

● Open frame HP terminal box
● 4M, 4N (heat proof class H)
● 5M, 5N (diode integrated)

3I, 3J, 5I, 5J

● Open frame HP terminal box (IP65 or equivalent)
● 5I, 5J (diode integrated)

Refer to page 122 for coil selection.

G, H

● Conduit
● G (CTC19)
● H (G1/2)

⚠ Note on model no. selection

Note on Ⓓ

*8: Leave blank for the standard coil housing. However, to select options in Ⓔ to Ⓘ, indicate 00 for Ⓓ.
*9: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*10: A DC coil for steam is available for AB41. Contact CKD for more information.
*11: 6C, 6E, 6G or 6H can be selected for only AB41.
*12: The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Note on Ⓔ to Ⓘ

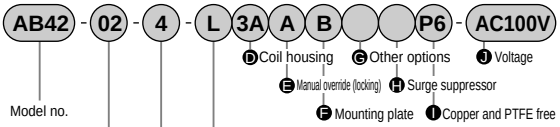
*13: The manual override (Ⓔ A) is not available for the low pressure large flow rate AB41-⌘-8.
*14: When Ⓒ is C, F, K, N, V or W, the manual override (Ⓔ A) is not available.
*15: Select one among D, E, F, G and H for Ⓖ.
*16: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*17: As standard, the surge suppressor is incorporated in the coil with diode and the 24 VDC coil (Ⓓ 2H/6H), so the surge suppressor symbol S cannot be selected.
*18: Ⓘ P6 is available only when Ⓒ is L, M or R.
*19: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that the tropicalization is not available when the manual override option A and the coil option 6C/6E/6G/6H are selected.

Note on Ⓙ

*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. Note that the coils Ⓓ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*21: For voltages other than above, consult with 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.

How to order

● NO (normally open) type



Ⓐ Port size

Ⓑ Orifice

Ⓒ Body/sealant combination

*1

*2

*3

*4

Symbol	Descriptions	Symbol	Descriptions	Symbol	Descriptions
Ⓐ Port size					
02	Rc1/4	**2G**	G 1/4	**2N**	1/4NPT
03	Rc3/8	**3G**	G 3/8	**3N**	3/8NPT

Ⓑ Orifice	
1	ø1.5
2	ø2
3	ø3
4	ø3.5
5	ø4
6	ø5
7	ø7

Ⓒ Body/sealant combination

	Opt.	Body	Sealant	Treatment	Remarks
Blank	Option	Brass	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	Medium vacuum
D		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	Medium vacuum
H		Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)
K			PTFE		Steam (up to 184˚C *2)
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)
N			PTFE		Steam (up to 184˚C *2)
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)

Refer to page 36 in the Introduction for details on the material combinations.

Ⓓ to Ⓙ

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

<Example 1 of model number>

AB42-02-1-AC100V
Model no.: AB42

Ⓐ Port size: Rc1/4
Ⓑ Orifice: ø1.5
Ⓒ Body/sealant combination:
Body - brass, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ to Ⓘ: Blank
Ⓙ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

AB42-03-6-000AS-AC100V
Model no.: AB42

Ⓐ Port size: Rc3/8
Ⓑ Orifice: ø5
Ⓒ Body/sealant combination:
Body - brass, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ Manual override (locking): Selected
Ⓕ Ⓖ: Blank
Ⓗ Surge suppressor: Selected
Ⓙ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

Note on Ⓒ

*1: Leave blank for standard. However, to select options in Ⓓ to Ⓘ, indicate 0 for Ⓒ.
*2: When 4A, 4M or 4N is selected for Ⓓ.
*3: For option symbols V and W, vacuum is inspected at "leakage amount: 1.33×10^{-6} Pa·m^3/s or less".
*4: The ethylene propylene diene rubber seal combination (Ⓒ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

For Ⓓ to Ⓙ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓔ to Ⓘ are not required, no symbol is indicated.

Ⓓ Coil housing				Ⓔ	Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ	Ⓙ Rated voltage
Descriptions				Manual override (locking)	Mounting plate	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Copper and PTFE free	Descriptions
						A-15a	A-15b	A-15c	CTC19	G1/2			
Blank	Std.	Grommet lead wire		**A**	**B**						**S**	**P6**	100 VAC, 200 VAC
2E		DIN terminal box	(G1/2)										100 VAC, 200 VAC
2G		DIN terminal box	(Pg11)										12 VDC, 24 VDC, 48 VDC, 100 VDC
2H		DIN terminal box + small light	(Pg11)							**H**			100 VAC, 200 VAC, 24 VDC
3A		Open frame type	Lead wire	**A**	**B**				**G**	**H**	**S**	**P6**	100 VAC, 200 VAC
3M			HP terminal box (G1/2)										12 VDC, 24 VDC, 48 VDC, 100 VDC
3N			HP terminal box + light (G1/2)			**D**	**E**	**F**					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 terminal box + light (IP65 or equivalent) (G1/2)										100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A	Option	Open frame type (heat proof class H)	Lead wire	**A**	**B**				**G**	**H**	**S**	**P6**	100 VAC, 200 VAC
4M			HP terminal box (G1/2)			**D**	**E**	**F**					
4N			HP terminal box + light (G1/2)										
5A		Open frame type (diode integrated)	Lead wire	**A**	**B**				**G**	**H**		**P6**	100 VAC, 200 VAC
5M			HP terminal box (G1/2)			**D**	**E**	**F**					
5N			HP terminal box + light (G1/2)										
5I			HP terminal box (IP65 or equivalent) (G1/2)										
5J			HP terminal box + light (IP65 or equivalent) (G1/2)										

⚠ Refer to the following precautions for Ⓓ to Ⓙ.

Blank		● Grommet lead wire 300 mm
2E 2G 2H		● DIN terminal box
3A 4A 5A		● Open frame type grommet lead wire 300 mm ● 4A (heat proof class H) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (heat proof class 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 122 for coil selection.

⚠ Note on model no. selection

Note on Ⓓ

*5: Leave blank for the standard coil housing. However, to select options in Ⓔ to Ⓘ, indicate 00 for Ⓓ.
*6: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.

Note on Ⓔ to Ⓘ

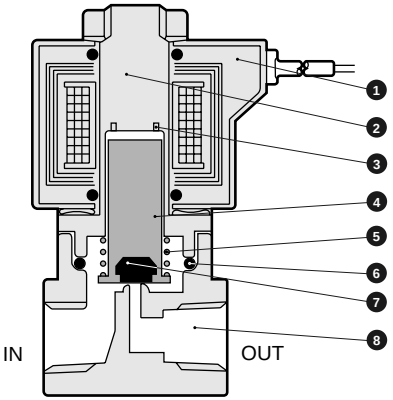
*7: When Ⓒ is C, F, K, N, V or M, the manual override (Ⓔ A) is not available.
*8: Select one among D, E, F, G and H for Ⓖ.
*9: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*10: As standard, the surge suppressor is incorporated in the coil with diode and the 24 VDC coil (Ⓓ 2H), so the surge suppressor symbol S cannot be selected.
*11: Ⓘ P6 is available only when Ⓒ is L.
*12: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that the tropicalization is not available when the manual override option A is selected.

Note on Ⓙ

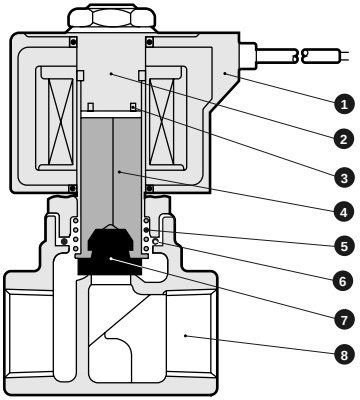
*13: 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. Note that the coils Ⓓ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*14: For voltages other than above, consult with CKD.
*15: 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.

Internal structure and parts list

● AB31 Series
● AB41-02/03-1 to 7



● AB41-03/04-8



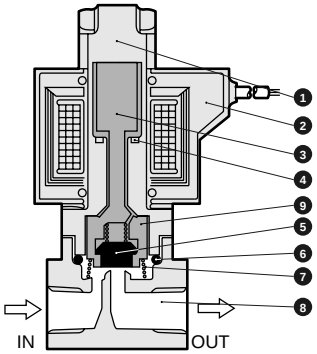
No.	Parts name	Material		No.	Parts name	Material	
1	Coil	—	—	5	Plunger spring	SUS304	Stainless steel
2	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel	6	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
3	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)	7	Sealant	NBR (FKM, EPDM, PTFE)	
4	Plunger	SUS405 or equivalent	Stainless steel	8	Body	C3771 or CAC408 (SCS13)	Brass or bronze (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, or when the coil housing is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent, 316L, 430.

*2: ( ) shows option. Note that PTFE is not available for AB41-$^{03}_{04}$-8.

Internal structure and parts list

● AB42



No.	Parts name	Material		No.	Parts name	Material	
1	Core assembly	SUS405 or equivalent, 316L, 304	Stainless steel	6	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)	NBR: Nitrile rubber (EPDM: Ethylene propylene diene rubber) (FKM: Fluoro rubber) (PTFE: Tetrafluoroethylene resin)
2	Coil	—	—				
3	Plunger	SUS405 or equivalent	Stainless steel	7	Spring	SUS304	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)	8	Body	C3771 (SUS303)	Brass (stainless steel)
5	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber (EPDM: Ethylene propylene diene rubber) (FKM: Fluoro rubber) (PTFE: Tetrafluoroethylene resin)	9	NO valve	POM (SUS303, PFA)	Option symbol : Blank/0D/HI/LV/W - polyacetal resin : Other than above - stainless steel, perfluoroalkoxy resin

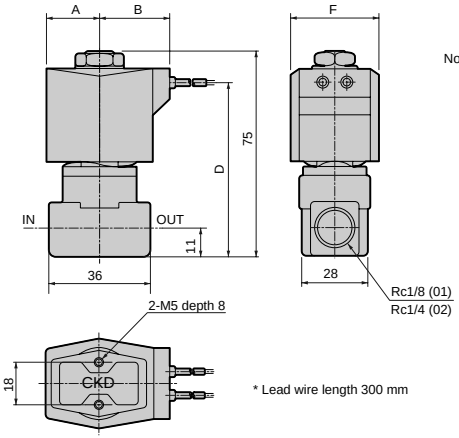
( ) shows option.

Dimensions: AB31 Series

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

Note 1: The AB31 Series is an open when energized type 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.

Note 2: The dimensions are the same for the G or NPT thread port size.



* Lead wire length 300 mm

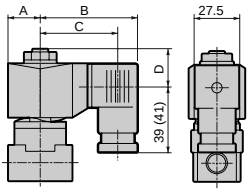
Model no.	A	B	D	F
AB31-01-1 to 6-AC -02-1 to 6-AC	20	27	63	34

Optional dimensions: AB31 Series

CAD

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

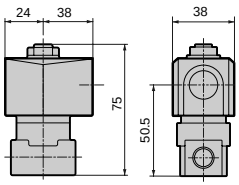
● DIN terminal box
AB31-01/02-1 to 6-*[2 E G H]



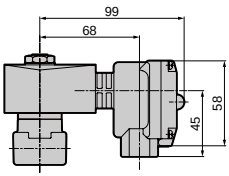
Dimensions shown in ( ) are for G1/2.

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

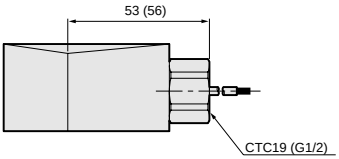
● Open frame lead wire type
AB31-01/02-1 to 6-*[3A 4A 5A]



● Open frame type + HP terminal box
AB31-01/02-1 to 6-*[3 5][M N I J]·[4M 4N]

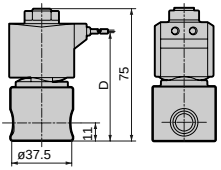


● Open frame type + conduit
AB31-01/02-1 to 6-*[3A 4A 5A][G H]



Dimensions shown in ( ) are for G1/2.

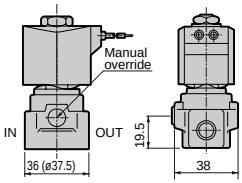
● Stainless steel body
AB31-01/02-1 to 6-[D/E/F/R/W/L/M/N]



Model no.	D
Blank	63

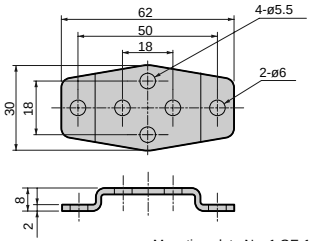
● Manual override (locking)
AB31-01/02-1 to 6-***[A]

Figure shows the brass body.



Dimensions shown in ( ) are for stainless steel body.

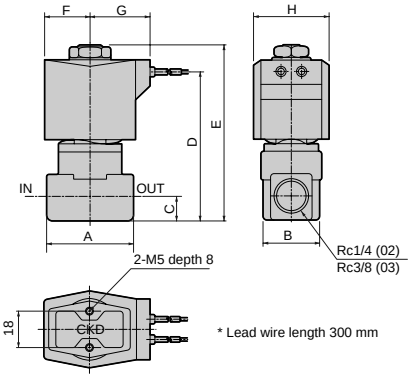
● Mounting plate
AB31-01/02-1 to 6-***[B]



Mounting plate No. 1 GE-100106

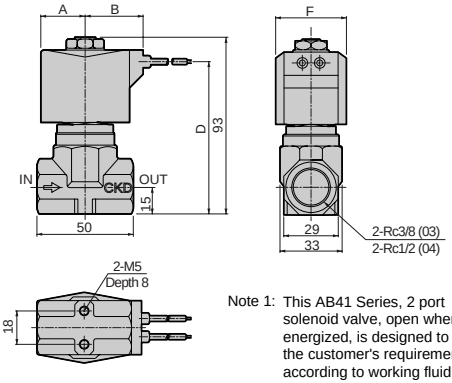
Dimensions: AB41 Series

● Grommet lead wire type
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 type
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	38

Note 1: This AB41 Series, 2 port solenoid valve, open when energized, is designed to meet the customer's requirement according to working fluid, body and seal materials, relation between flow rate and the required pressure (converted to orifice diameter and pressure), and ambient temperature and conditions (converted to coil specifications).

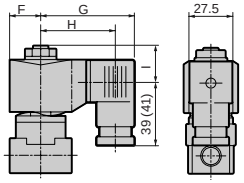
Note 2: The dimensions are the same for the G or NPT thread port size.

Optional dimensions: AB41 Series

CAD

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

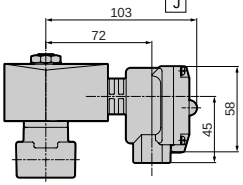
● DIN terminal box
AB41-02/03/04-1 to 8-* [2 6] [E G H]



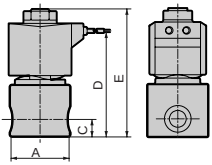
Dimensions shown in ( ) are for G1/2.

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

● Open frame type + HP terminal box
AB41-02/03/04-1 to 8-* [3 5] [M N I J] · [4M 4N]



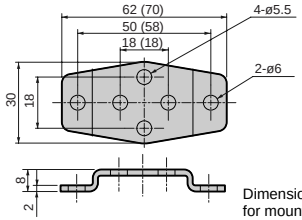
● Stainless steel body
AB41-02/03/04-1 to 8- [D/F/R/W/L/M/N/E]



Model no.	A	C	D	E
AB41-02-1 to 6-AC	ø37.5	11	68	80.5
AB41-02-7-AC -03-1 to 7-AC	ø45.0	12	71	83.5
AB41-03-8-AC -04-8-AC	50*1	15	80	93

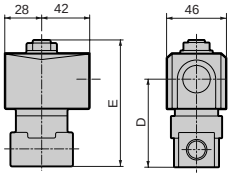
*1: The max. dimension is ø54.

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



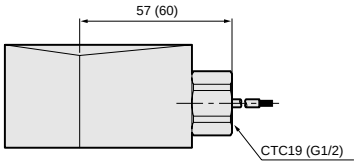
Dimensions shown in ( ) are for mounting plate No. 2.

● Open frame lead wire type
AB41-02/03/04-1 to 8-* [3A 4A 5A]



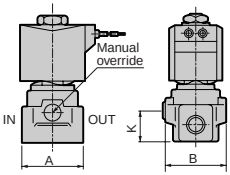
Model no.	D	E
AB41-02-1 to 6- A**	52.0	80.5
AB41-02-7- A -03-1 to 7-** A**	55.0	83.5
AB41-03/04-8- A**	64	93

● Open frame type + conduit
AB41-02/03/04-1 to 8-* [3A 4A 5A] [G H]



Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
AB41-02/03-1 to 7-*** [A]
Figure shows the brass body.



Note: No manual override is available for AB41-03/04-8.

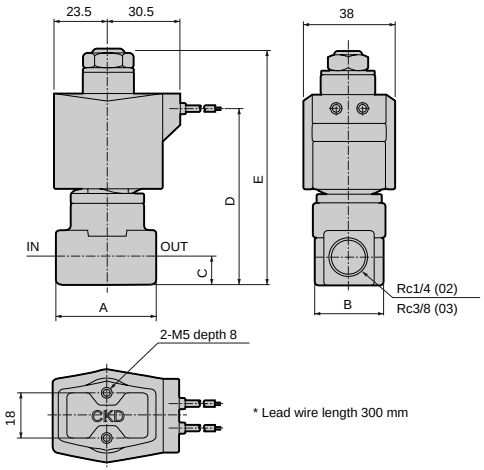
Model no.	A	B	K
AB41-02-1 to 6-*A**	36 (ø37.5)	38	19.5
AB41-02-7-*A -03-1 to 7-***A**	40 (ø45.0)	40	22.5

Dimensions shown in ( ) are for stainless steel body.

Model no.	Applicable model
Mounting plate No. 1 GE-100106	● AB41-02/03-1 to 7 Series ● Stainless steel body AB41-02-1 to 6- [D/E/F/L/M/N/R/W]
Mounting plate No. 2 GE-100159	● AB41-03/04-8 Series ● Stainless steel body AB41-02-7- [D/E/F/L/M/N/R/W] AB41-03-1 to 7- [D/E/F/L/M/N/R/W]

Dimensions: AB42 Series

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



<Reference> 2 port direct acting valve, closed when energized, is open when de-energized. This type is commonly used to be continuously energized.
The dimensions are the same for the G or NPT thread port size.

Note 1: The dimensions are the same for the G or NPT thread port size.

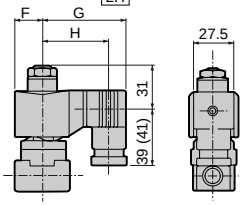
Model no.	A	B	C	D	E
AB42-02-1 to 6	36	28	11	72	94
AB42-02-7	40	28	12	75	97
AB42-03-1 to 7	40	28	12	75	97

Optional dimensions: AB42 Series

CAD

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

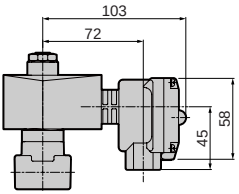
● DIN terminal box
AB42-02/03-1 to 7-* [2E / 2G / 2H]



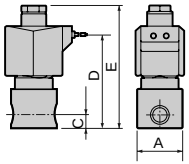
Dimensions shown in ( ) are for G1/2.

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

● Open frame type + HP terminal box
AB42-02/03-1 to 7-* [3 / 5] [M / N / I / J] [4M / 4N]

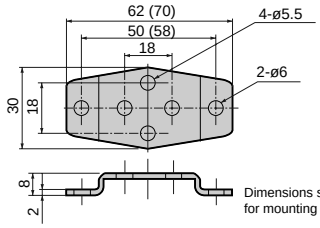


● Stainless steel body
AB42-02/03-1 to 7-[D/E/F/R/W/L/M/N]



Model no.	A	C	D	E
AB42-02-1 to 6	ø37.5	11	72	94
AB42-02-7	ø45.0	12	75	97
AB42-03-1 to 7	ø45.0	12	75	97

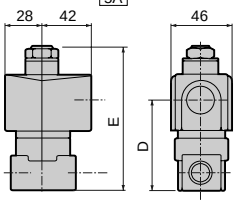
● Mounting plate
AB42-02/03-1 to 7-***[B]



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

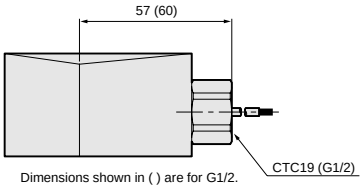
Code	Applicable model
Mounting plate No. 1 GE-100106	● AB42-02/03-1 to 7 Series ● Stainless steel body AB42-02-1 to 6-[D/E/F/L/M/N/R/W]
Mounting plate No. 2 GE-100159	● Stainless steel body AB42-02-7-[D/E/F/L/M/N/R/W] AB42-03-1 to 7-[D/E/F/L/M/N/R/W]

● Open frame lead wire type
AB42-02/03-1 to 7-* [3A / 4A / 5A]



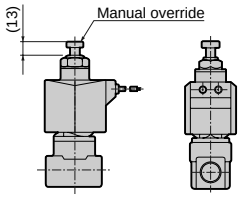
Model no.	D	E
AB42-02-1 to 6	56	94
AB42-02-7	59	97
AB42-03-1 to 7	59	97

● Open frame type + conduit
AB42-02/03-1 to 7-* [3A / 4A / 5A] [G / H]



Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
AB42-02/03-1 to 7-***[A]



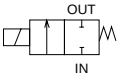
Large bore size direct acting 2 port solenoid valve (general purpose valve)

AB71 Series

- NC (normally closed) type
- Port size: Rc1/2, Rc3/4, Rc1

RoHS CAD

JIS symbol



Specifications

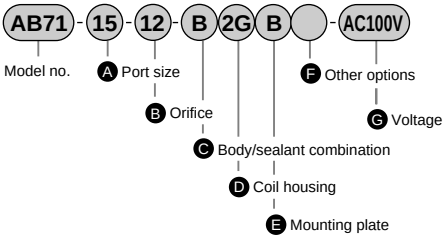
Item		AB71-15-12	AB71-20-15	AB71-25-18
Working fluid		Air, water, kerosene, oil (20 mm²/s)		
Working pressure range	Air	AC: 0 to 100, DC: 0 to 80	AC: 0 to 70, DC: 0 to 40	AC: 0 to 40, DC: 0 to 30
kPa	Water, kerosene, oil	AC: 0 to 80, DC: 0 to 80	AC: 0 to 50, DC: 0 to 40	AC: 0 to 30, DC: 0 to 30
Withstanding pressure (water) MPa		1		
Fluid viscosity mm²/s		20 or less		
Fluid temperature ˚C		-5 to 60 (no freezing)		
Ambient temperature ˚C		-10 to 60		
Valve seat leakage cm³/min. (ANR)		0.2 or less (air)		
Port size		Rc1/2	Rc3/4	Rc1
Orifice mm		12	15	18
Mounting attitude		Limited to vertical position with coil facing upward to horizontal position		
Electric specifications				
Rated voltage		100 VAC 50/60 Hz, 200 VAC 50/60 Hz, 110 VAC 60 Hz, 220 VAC 60 Hz, 12 VDC, 24 VDC, 48 VDC, 100 VDC		
Apparent power VA	Holding (50/60 Hz)	32/26		
	Starting (50/60 Hz)	123/106		
Power consumption W		AC: 13/11 (50/60 Hz), DC: 20		

Flow characteristics

Model no.	Port size	Orifice (mm)	Flow characteristics			
			C [dm³/(s·bar)]	b	Cv flow factor	S (mm²)
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 sectional area S and sonic conductance C are converted as $S \approx 5.0 \times C$.

How to order



Symbol	Descriptions
A Port size	
15	Rc1/2
20	Rc3/4
25	Rc1

B Orifice	
12	ø12 (only AB71-15 (port size Rc1/2))
15	ø15 (only AB71-20 (port size Rc3/4))
18	ø18 (only AB71-25 (port size Rc1))

C Body/sealant combination				
	Body	Stuffing	Sealant	Treatment
B	Bronze	Brass	Fluoro rubber	D
J	Bronze	Brass	Fluoro rubber	Oil free

<Example of model number>

AB71-15-12-B2EB-AC100V
Model no.: AB71

Ⓐ Port size: Rc1/2
Ⓑ Orifice: ø12
Ⓒ Body/sealant combination: Body - bronze, stuffing - brass, sealant - fluoro rubber
Ⓓ Coil housing: DIN terminal box (G1/2)
Ⓔ Mounting plate: Selected
Ⓕ Other options: Blank
Ⓖ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

Ⓓ Coil housing			Ⓔ	Ⓕ Other options					Ⓖ Rated voltage
Descriptions			Mounting plate	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Descriptions
				A-15a	A-15b	A-15c	CTC19	G1/2	
2C	Std.	Grommet lead wire	**B**						100 VAC, 200 VAC
2E	Option	DIN terminal box (G1/2)							
2G		DIN terminal box (Pg11)							
2H		DIN terminal box + small light (Pg11)						**H**	
3A		Open frame type — Lead wire	**B**				**G**	**H**	100 VAC, 200 VAC
3M		Open frame type — HP terminal box (G1/2)		**D**	**E**	**F**			12 VDC, 24 VDC, 48 VDC, 100 VDC
3N		Open frame type — HP terminal box + light (G1/2)							100 VAC, 200 VAC, 24 VDC, 100 VDC
5A		Open frame type (diode integrated) — Lead wire	**B**				**G**	**H**	100 VAC, 200 VAC
5M		Open frame type (diode integrated) — HP terminal box (G1/2)		**D**	**E**	**F**			
5N		Open frame type (diode integrated) — HP terminal box + light (G1/2)							

For Ⓓ to Ⓖ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓔ and Ⓕ are not required, no symbol is indicated.

⚠ Note on model no. selection

Note on Ⓒ

*1: Refer to page 36 in the Introduction for details on the material combinations.

Note on Ⓓ

*2: Refer to page 4 for coil selection.
*3: 5A, 5M and 5N are coils for which AC power is converted to DC with a diode.
*4: When working fluid is air, type 5A is recommended.
*5: Contact CKD for details on the heat proof class H coil.

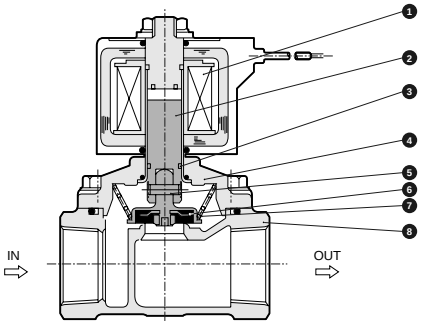
Note on Ⓕ

*6: Select one among D, E, F, G and H for Ⓕ.

Note on Ⓖ

*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.
Note that the coils Ⓓ 5A/5K/5H can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*8: For voltages other than above, consult with CKD.
*9: Lead wire length is 300 mm. Additional lengths are available in 500 mm increments. Contact CKD for details.

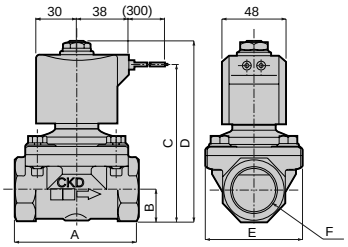
Internal structure and parts list



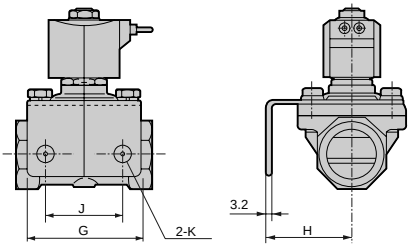
No.	Parts name	Material	
1	Coil	——	——
2	Plunger	SUS405	Stainless steel
3	Wear ring	PTFE	Tetrafluoroethylene resin
4	Stuffing assembly	C3771	Brass
	(Core assembly)	SUS405, Cu	Stainless steel, copper
5	Spring pin	SUS420	Stainless steel
6	Main valve	SUS304, FKM	Stainless steel, fluoro rubber
7	Main valve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

Dimensions CAD

● Grommet lead wire type
AB71-*-*-*2C



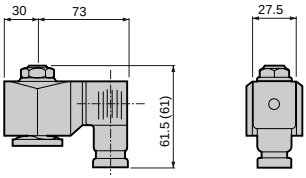
● Mounting plate
AB71-*-*-** B



Model no.	A	B	C	D	E	F	G	H	J	K
AB71-15-12	71	14.5	95	110.5	50	Rc1/2	56	45	40	ø9
AB71-20-15	80	17.5	101	116	60	Rc3/4	63	50	45	ø9
AB71-25-18	90	22.5	111	126	71	Rc1	75	56	50	ø11

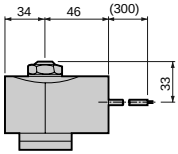
Optional dimensions

● DIN terminal box
AB71-*-*-*2 [E G H]

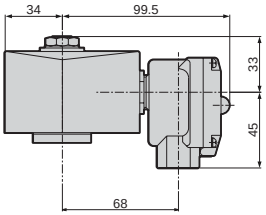


Dimensions shown in ( ) are for G1/2.

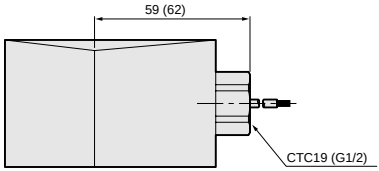
● Open frame lead wire type
AB71-*-*-* [3A 5A]



● Open frame type + HP terminal box
AB71-*-*-* [3 5] [M N]



● Open frame type + conduit
AB71-*-*-* [3A 5A] [G H]



Dimensions shown in ( ) are for G1/2.

Direct acting 2 port solenoid valve, manifold and actuator (general purpose valve)

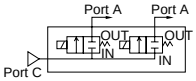
GAB312/GAB352/GAB412/GAB452 Series

- NC (normally closed) type
- Common supply type (port C pressurization), individual supply type (port A pressurization)

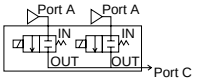
CE RoHS CAD

JIS symbol

- GAB312/412
  (Common supply type / port C pressurization)



- GAB352/452
  (Individual supply type / port A pressurization)



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water	Steam
Working pressure differential range MPa	0 to 5 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	5		1
Withstanding pressure (water) MPa	10		
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100	
Heat proof class	B	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 attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Model no.	Port size	Orifice (mm)	Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)	
			Air		Water, hot water, kerosene		Oil (50 mm^2/s)		Steam		Holding		Starting		AC	DC
			AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz	
GAB312/352-1	—	1.5	2.5	2.5	2.5	2.5	2.5	2.5	1.0	100 VAC 50/60 Hz	12	10	17	14	5.2/3.8	11 (8.1) *5
-2		2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.0							
-3		3.0	1.0	0.5	0.7	0.5	0.5	0.5	0.7	110 VAC 60 Hz						
-4		3.5	0.6	0.4	0.5	0.4	0.4	0.4	0.5							
-5		4.0	0.4	0.25	0.3	0.25	0.25	0.25	0.3							
-6		5.0	0.2	0.15	0.15	0.15	0.15	0.15	0.15	200 VAC 50/60 Hz						
GAB412/452-1	—	1.5	5.0	4.0	4.5	4.0	4.0	4.0	1.0		18	15	29	24	6.7/5.7	11 (10.4) *5 (7) *7
-2		2.0	3.0	2.5	2.7	2.5	2.5	2.5	1.0	220 VAC 60 Hz						
-3		3.0	1.5	0.9	1.3	0.9	0.9	0.9	1.0							
-4		3.5	1.2	0.6	0.9	0.6	0.6	0.6	0.9	12 VDC						
-5		4.0	1.0	0.5	0.7	0.5	0.5	0.5	0.7	24 VDC						
-6		5.0	0.6	0.25	0.4	0.25	0.25	0.25	0.4	48 VDC						
-7		7.0	0.25	0.1	0.2	0.1	0.15	0.1	0.2	100 VDC						

*1: The model numbers above show the basic orifice diameter. Refer to How to order for other combinations (e.g., for steam).
*2: Refer to How to order (page 150) and Dimensions (page 154) for the port size.
*3: Refer to DC column for the max. working pressure differential of coil with diode.
*4: The voltage fluctuation must be within ±10% of the rated voltage.
*5: Power consumption of coil housing 2E/2G/2H is indicated.
*6: When using with a low vacuum, vacuum the NO port side.
*7: Power consumption of coil housing 6C/6E/6G/6H is indicated.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)	Flow characteristics		
			C [dm³/(s·bar)]	b	Cv flow factor
GAB312/352-1	–	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
GAB412/452-1	–	1.5	0.29	0.53	0.10
-2		2.0	0.53	0.5	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 sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.

How to order

● Common supply type (port C pressurization)

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

- ○: ● Individual supply type (port A pressurization) → GAB352
- 1: ● Common supply type (port C pressurization) → GAB412
- 5: ● Individual supply type (port A pressurization) → GAB452
- B: Model no.
- 3A: Ⓐ Type of thread
- A: Ⓑ Orifice
- G: Ⓒ Station no. *2
- S: Ⓓ Body/sealant combination *3 *4 *5 *6
- AC100V: Ⓔ Coil housing, Ⓗ Surge suppressor, Ⓕ Manual override (locking), Ⓖ Other options, Ⓘ Voltage

Symbol	Descriptions	Model no. GAB312 GAB352	Model no. GAB412 GAB452
Ⓐ Type of thread			
Blank	Rc	●	●
G	G	●	●
N	NPT	●	●
Ⓑ Orifice			
1	ø1.5	●	●
2	ø2	●	●
3	ø3	●	●
4	ø3.5	●	●
5	ø4	●	●
6	ø5	●	●
7	ø7		●
Ⓒ Station no.			
2 to 10	2 stations to 10 stations	●	●
0	Actuator only	●	●

Ⓓ Body/sealant combination

		Body	Sealant	Treatment	Remarks		
Blank	Std.	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
B			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
C			PTFE		Steam (up to 184˚C *4)	●	●
D	Option	Stainless steel	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
E			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
F			PTFE		Steam (up to 184˚C *4)	●	●
H		Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
K			PTFE		Steam (up to 184˚C *4)	●	●
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *4)	●	●
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)	●	●
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
N			PTFE		Steam (up to 184˚C *4)	●	●
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *4)	●	●

Refer to page 36 in the Introduction for details on the material combinations.

Ⓔ to Ⓘ

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.

<Example 1 of model number>

GAB312G-1-3-AC200V

Model no.: GAB312 (common supply type / port C pressurization)

- Ⓐ Type of thread: G
- Ⓑ Orifice: ø1.5
- Ⓒ Station no.: 3 stations
- Ⓓ Body/sealant combination: Body - brass, sealant - nitrile rubber
- Ⓔ Coil housing: Grommet lead wire
- Ⓕ to Ⓗ: Blank
- Ⓘ Rated voltage: 200 VAC 50/60Hz, 220 VAC 60Hz

<Example 2 of model number>

GAB352-5-2-000AS-AC200V

Model no.: GAB352 (individual supply type / port A pressurization)

- Ⓐ Type of thread: Rc
- Ⓑ Orifice: ø4
- Ⓒ Station no.: 2 stations
- Ⓓ Body/sealant combination: Body - brass, sealant - nitrile rubber
- Ⓔ Coil housing: Grommet lead wire
- Ⓕ Manual override (locking): Selected
- Ⓖ Other options: Blank
- Ⓗ Surge suppressor: Selected
- Ⓘ Rated voltage: 200 VAC 50/60Hz, 220 VAC 60Hz

⚠ Note on model no. selection

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

Note on Ⓒ and Ⓓ

*2: Consult with CKD about more than 10 stations manifold.

*3: Leave blank for standard. However, to select options in Ⓔ to Ⓗ, indicate 0 for Ⓓ.

*4: When 4A, 4M or 4N is selected for Ⓓ.

*5: The ethylene propylene diene rubber seal combination (Ⓓ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

*6: When Ⓓ is C, F, K, P, N or R, the coil housings Ⓔ 6C, 6E, 6G and 6H cannot be selected.

For Ⓔ to Ⓘ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓕ to Ⓗ are not required, no symbol is indicated.

Ⓔ Coil housing				Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Descriptions				Manual override (locking)	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Descriptions
					A-15a	A-15b	A-15c	CTC19	G1/2		
Blank	Std.	Grommet lead wire		A						S	100 VAC, 200 VAC
2E		DIN terminal box	(G1/2)								100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G		DIN terminal box	(Pg11)								
2H		DIN terminal box + small light	(Pg11)						H		100 VAC, 200 VAC, 24 VDC
3A		Open frame type	Lead wire					G	H	S	100 VAC, 200 VAC
3M			HP terminal box	(G1/2)							12 VDC, 24 VDC, 48 VDC, 100 VDC
3N			HP terminal box + light	(G1/2)	D	E	F				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 terminal box + light (IP65 or equivalent)	(G1/2)							100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A	Option	Open frame type (heat proof class H)	Lead wire	A	D	E	F	G	H	S	100 VAC, 200 VAC
4M			HP terminal box	(G1/2)							
4N			HP terminal box + light	(G1/2)							
5A		Open frame type (diode integrated)	Lead wire	A	D	E	F	G	H		100 VAC, 200 VAC
5M			HP terminal box	(G1/2)							
5N			HP terminal box + light	(G1/2)							
5I			HP terminal box (IP65 or equivalent)	(G1/2)							
5J			HP terminal box + light (IP65 or equivalent)	(G1/2)							
6C		Grommet lead wire	7W	A						S	12 VDC, 24 VDC
6E		DIN terminal box	(G1/2) 7W								
6G		DIN terminal box	(Pg11) 7W								
6H		DIN terminal box + small light	(Pg11) 7W						H		24 VDC

⚠ Refer to the following precautions for Ⓔ to Ⓘ.

Blank
6C

● Grommet lead wire 300 mm

2E
2G
2H
6E
6G
6H

● DIN terminal box

3A
4A
5A

● Open frame type
grommet lead wire 300 mm
● 4A (heat proof class H)
● 5A (diode integrated)

3M
3N
4M
4N
5M
5N

● Open frame HP terminal box
● 4M, 4N (heat proof class H)
● 5M, 5N (diode integrated)

3I
3J
5I
5J

● Open frame HP terminal box
(IP65 or equivalent)
● 5I, 5J (diode integrated)

* Refer to page 122 for coil selection.

G
H

● Conduit
● G (CTC19)
● H (G1/2)

⚠ Note on model no. selection

Note on Ⓔ

*7: Leave blank for the standard coil housing. However, to select options in Ⓕ, Ⓖ or Ⓗ, indicate 00 for Ⓔ.
*8: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*9: A DC coil for steam is available for GAB4*2. Contact CKD for more information.
*10: The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.
*11: 6C, 6E, 6G or 6H is available only for GAB412.

Note on Ⓕ to Ⓗ

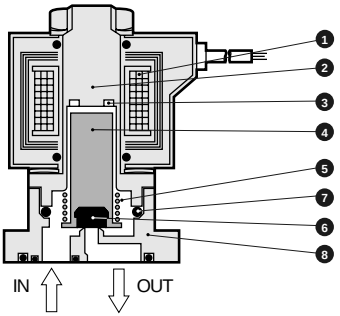
*12: When Ⓓ is C, F, K or N, the manual override (Ⓕ A) is not available.
*13: Select one among D, E, F, G and H for Ⓖ.
*14: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*15: As standard, the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

Note on Ⓘ

*17: 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. Note that the coils Ⓔ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*18: For voltages other than above, consult with CKD.
*19: 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.

Internal structure and parts list

● GAB312/GAB352/GAB412/GAB452 Actuator



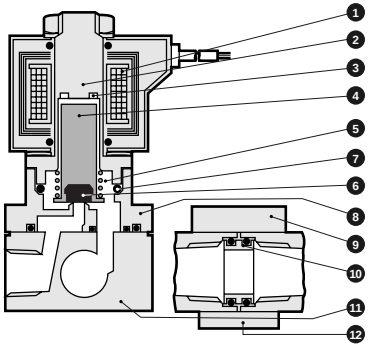
No.	Parts name	Material	
1	Coil	—	—
2	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
3	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
4	Plunger	SUS405 or equivalent	Stainless steel
5	Plunger spring	SUS304	Stainless steel
6	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber
7	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)	EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
8	Body	C3771 (SCS13)	Brass (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, or when the coil housing is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent, 316L, 430.

*2: ( ) shows option.

Internal structure and parts list

● GAB312/GAB352/GAB412/GAB452 Manifold



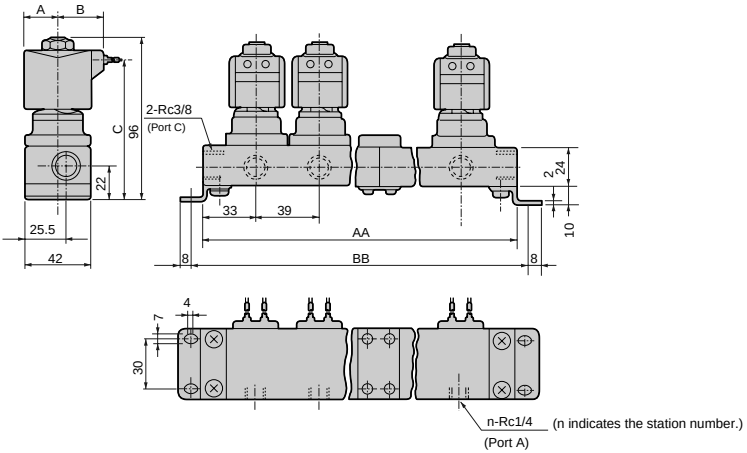
No.	Parts name	Material	
1	Coil	—	—
2	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
3	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
4	Plunger	SUS405 or equivalent	Stainless steel
5	Plunger spring	SUS304	Stainless steel
6	Sealant	NBR (FKM, EPDM,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

*1: When the body/sealant combination symbol is other than blank or H, or when the coil housing is 6C, 6E, 6G or 6H, the material is SUS405 or equivalent, 316L, 430.

*2: ( ) shows option.

Dimensions: GAB312/352 Series

● Manifold (grommet lead wire type)
GAB312/352-1 to 6-[2 to 10] -*[Blank]

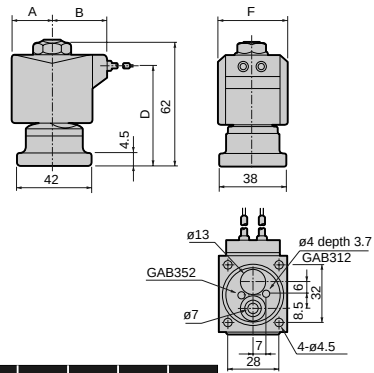


Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106	122	2 stations x 1	**7**	329	345	5 stations + 2 stations
3	145	161	3 stations x 1	**8**	368	384	5 stations + 3 stations
4	212	228	2 stations x 2	**9**	435	451	3 stations x 3
5	223	239	5 stations x 1	**10**	446	462	5 stations x 2
6	290	306	3 stations x 2	Consult with CKD about more than 10 stations manifold.			

*1: A manifold is configured by combining 2-, 3- and 5-station modules.
*2: The dimensions are the same for the G or NPT thread port size.

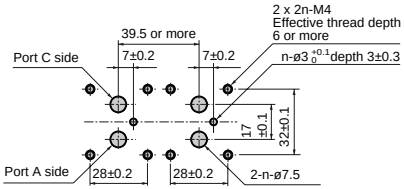
Model no.	A	B	C
Blank	20	27	84

● Actuator (grommet lead wire type)
GAB312/352-1 to 6-[0] -*[Blank]



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

● Recommended dimensions for actuator mounting



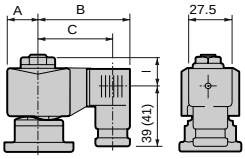
■ Machining drawing when using 2 actuators

Optional dimensions: GAB312/352 Series

CAD

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

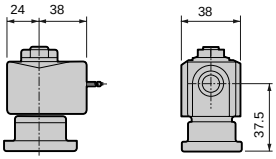
● DIN terminal box
GAB312/352-1 to 6-0 to 10-* [2 E G H]



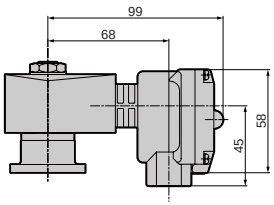
Dimensions shown in ( ) are for G1/2.

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

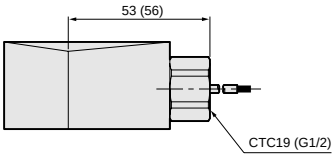
● Open frame lead wire type
GAB312/352-1 to 6-0 to 10-* [3A 4A 5A]



● Open frame type + HP terminal box
GAB312/352-1 to 6-0 to 10-* [3 5] [M N I J] · [4M 4N]

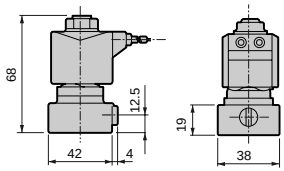


● Open frame type + conduit
GAB312/352-1 to 6-0 to 10-* [3A 4A 5A] [G H]



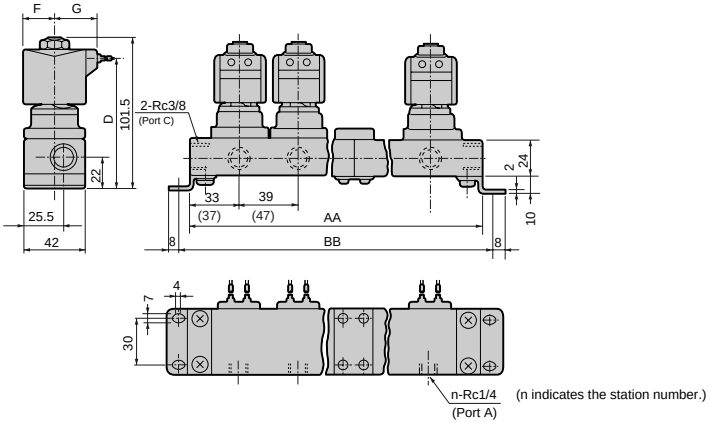
Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAB312/352-1 to 6-0 to 10-*** [A]



Dimensions: GAB412/452 Series

● Manifold (grommet lead wire type)
GAB412/452-1 to 7- 2 to 10 -* Blank · 6C

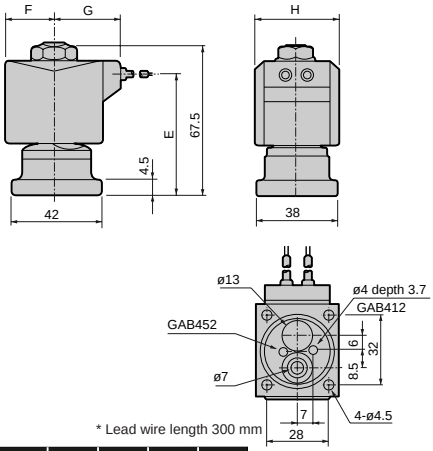


Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106 (122)	122 (138)	2 stations x 1	**7**	329 (385)	345 (401)	5 stations + 2 stations
3	145 (169)	161 (185)	3 stations x 1	**8**	368 (432)	384 (448)	5 stations + 3 stations
4	212 (244)	228 (260)	2 stations x 2	**9**	435 (507)	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	Consult with CKD about more than 10 stations manifold.			

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

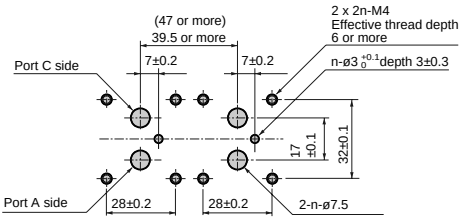
*1: A manifold is configured by combining 2-, 3- and 5-station modules.
*2: Dimensions in ( ) are for the open frame type.
*3: The dimensions are the same for the G or NPT thread port size.

● Actuator (grommet lead wire type)
GAB412/452-1 to 7-0-* Blank · 6C



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

● Recommended dimensions for actuator mounting



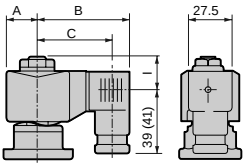
■ Machining drawing when using 2 actuators

Optional dimensions: GAB412/452 Series

CAD

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

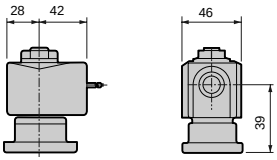
● DIN terminal box
GAB412/452-1 to 7-0 to 10-* 2 6 E G H



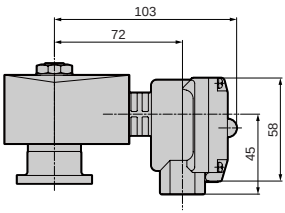
Dimensions shown in ( ) are for G1/2.

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

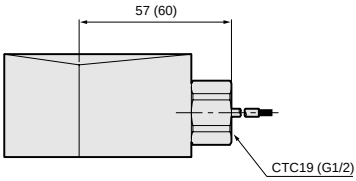
● Open frame lead wire type
GAB412/452-1 to 7-0 to 10-* 3A 4A 5A



● Open frame type + HP terminal box
GAB412/452-1 to 7-0 to 10-* 3 5 M N I J · 4M 4N

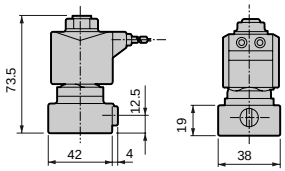


● Open frame type + conduit
GAB412/452-1 to 7-0 to 10-* 3A 4A 5A G H



Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAB412/452-1 to 7-0 to 10-*** A



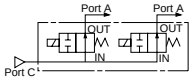
Direct acting 2 port solenoid valve, manifold and actuator (general purpose valve)

GAB422 Series

- NO (normally closed) type
- Common supply type (port C pressurization)

Manifold circuit structure

- GAB422
  (Common supply type / port C pressurization)



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water	Steam
Working pressure differential range MPa	0 to 2 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	2		1
Withstanding pressure (water) MPa	10		
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100	
Heat proof class	B	H	
Atmosphere	Place free of corrosive gas and explosive gas		
Valve structure	Direct acting poppet structure		
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)		300 or less (air)
Mounting attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Item / Model no.	Port size	Orifice (mm)	Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)	
			Air		Water, hot water, kerosene		Oil (50 mm^2/s)		Steam		Holding		Starting		AC 50/60 Hz	DC
			AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz		
GAB422-1	—	1.5	2.0	2.0	2.0	2.0	2.0	2.0	1.0	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz 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 show the basic orifice diameter. Refer to How to order for other combinations.
*2: Refer to How to order (page 160) and Dimensions (page 164) for the port size.
*3: The voltage fluctuation must be within ±10% of the rated voltage.
*4: Values in ( ) are for the type with DIN terminal box and DC voltage specifications.
*5: Refer to DC column for the max. working pressure differential of coil with diode.
*6: When using with a low vacuum, vacuum the OUT port side.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

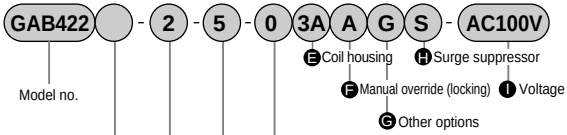
Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)	Flow characteristics		
			C [dm³/(s·bar)]	b	Cv flow factor
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	0.47
-6		5.0	2.6	0.38	0.62
-7		7.0	4.6	0.37	0.82

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

How to order



Ⓐ Type of thread

Symbol	Descriptions
Blank	Rc
G	G
N	NPT

Ⓑ Orifice

1	ø1.5
2	ø2
3	ø3
4	ø3.5
5	ø4
6	ø5
7	ø7

Ⓒ Station no.

*2

2	2 stations
to	to
10	10 stations
0	Actuator only

Ⓓ Body/sealant combination

*3
*4
*5

	Stn.	Body	Sealant	Treatment	Remarks
Blank	Option	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)
B			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)
C			PTFE		Steam (up to 184˚C *4)
D		Stainless steel	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)
E			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)
F			PTFE		Steam (up to 184˚C *4)
H		Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)
K			PTFE		Steam (up to 184˚C *4)
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *4)
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)
N			PTFE		Steam (up to 184˚C *4)
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *4)

Refer to page 36 in the Introduction for details on the material combinations.

Ⓔ to Ⓘ

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

<Example 1 of model number>

GAB422N-2-6-AC100V

Model no.: GAB422 (normally open / common supply type)

Ⓐ Type of thread: NPT
Ⓑ Orifice: ø2
Ⓒ Station no.: 6 stations
Ⓓ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓔ Coil housing: Grommet lead wire
Ⓕ to Ⓗ Blank
Ⓘ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

GAB422-3-0-000AS-AC100V

Model no.: GAB422 (normally open / common supply type)

Ⓐ Type of thread: Rc
Ⓑ Orifice: ø3
Ⓒ Station no.: Actuator only
Ⓓ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓔ Coil housing: Grommet lead wire
Ⓕ Manual override (locking):
Selected
Ⓖ Other options: Blank
Ⓗ Surge suppressor: Selected
Ⓘ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

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

Note on Ⓒ and Ⓓ

*2: Consult with CKD about more than 10 stations manifold.
*3: Leave blank for standard. However, to select options in Ⓔ to Ⓗ, indicate 0 for Ⓓ.
*4: When 4A, 4M or 4N is selected for Ⓓ.
*5: The ethylene propylene diene rubber seal combination (Ⓓ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

For Ⓔ to Ⓘ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓕ to Ⓗ are not required, no symbol is indicated.

Ⓔ Coil housing				Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Descriptions				Manual override (locking)	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Descriptions
					A-15a	A-15b	A-15c	CTC19	G1/2		
Blank	Std.	Grommet lead wire		A						S	100 VAC, 200 VAC
2E		DIN terminal box	(G1/2)								100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G		DIN terminal box	(Pg11)								
2H		DIN terminal box + small light	(Pg11)						H		100 VAC, 200 VAC, 24 VDC
3A	Option	Open frame type	Lead wire	A				G	H	S	100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
3M			HP terminal box (G1/2)		D	E	F				
3N			HP terminal box + light (G1/2)								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 terminal box + light (IP65 or equivalent) (G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H)	Lead wire	A	D	E	F	G	H	S	100 VAC, 200 VAC
4M			HP terminal box (G1/2)								
4N			HP terminal box + light (G1/2)								
5A		Open frame type (diode integrated)	Lead wire	A	D	E	F	G	H		100 VAC, 200 VAC
5M			HP terminal box (G1/2)								
5N			HP terminal box + light (G1/2)								
5I			HP terminal box (IP65 or equivalent) (G1/2)								
5J			HP terminal box + light (IP65 or equivalent) (G1/2)								

⚠ Refer to the following precautions for Ⓔ to Ⓘ.

Blank		● Grommet lead wire 300 mm
2E 2G 2H		● DIN terminal box
3A 4A 5A		● Open frame type grommet lead wire 300 mm ● 4A (heat proof class H) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (heat proof class 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 122 for coil selection.

⚠ Note on model no. selection

Note on Ⓔ

*6: Leave blank for the standard coil housing. However, to select options in Ⓕ, Ⓖ or Ⓗ, indicate 00 for Ⓔ.
*7: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.

Note on Ⓕ to Ⓗ

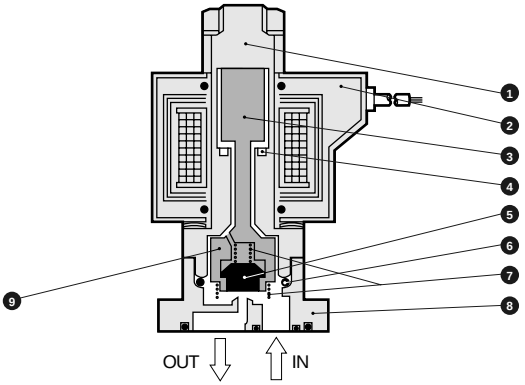
*8: When Ⓓ is C, F, K or N, the manual override (Ⓕ A) is not available.
*9: Select one among D, E, F, G and H for Ⓖ.
*10: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*11: As standard, the surge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

Note on Ⓘ

*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.
Note that the coils Ⓔ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*14: For voltages other than above, consult with 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.

Internal structure and parts list

● GAB422 Actuator

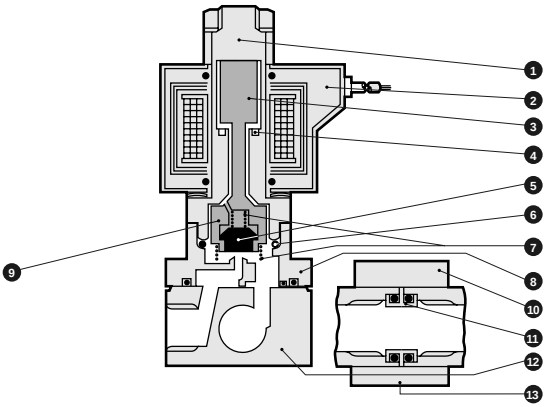


No.	Parts name	Material		No.	Parts name	Material	
1	Core assembly	SUS405 or equivalent, 316L, 304	Stainless steel	8	Body	C3771 (SCS13)	Brass (stainless steel)
2	Coil	—	—	9	NO valve	POM (SUS303, PFA)	Option symbol : Blank/0/D/H/L - polyacetal resin : Other than above - stainless steel, perfluoroalkoxy resin
3	Plunger	SUS405 or equivalent	Stainless steel				
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)				
5	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin				
6	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)					
7	Spring	SUS304	Stainless steel				

( ) shows option.

Internal structure and parts list

● GAB422 Manifold

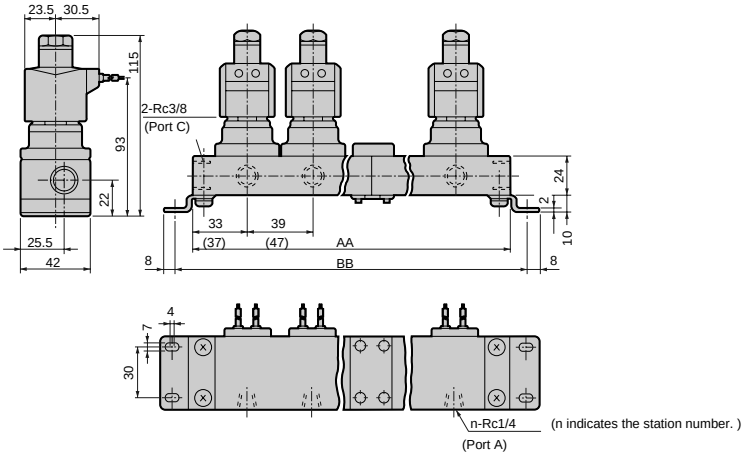


No.	Parts name	Material		No.	Parts name	Material	
1	Core assembly	SUS405 or equivalent, 316L, 304	Stainless steel	8	Body	C3771 (SCS13)	Brass (stainless steel)
2	Coil	—	—	9	NO valve	POM (SUS303, PFA)	Option symbol : Blank/0D/H/L - polyacetal resin : Other than above - stainless steel, perfluoroalkoxy resin
3	Plunger	SUS405 or equivalent	Stainless steel				
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)	10	Holder	SPCC	Steel
5	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber (FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin)	11	Connector	C3604 (SUS304)	Brass (stainless steel)
6	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)		12	Sub-plate	C3604 (SUS303)	Brass (stainless steel)
7	Spring	SUS304	Stainless steel	13	Connecting plate	SPCC	Steel

( ) shows option.

Dimensions: Manifold

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

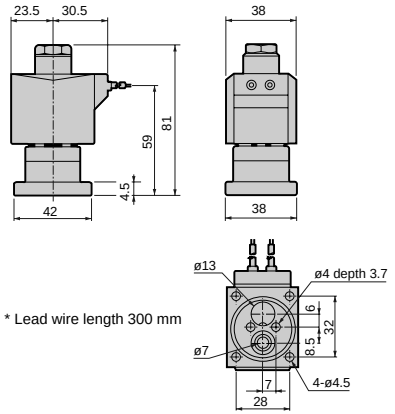


Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106 (122)	122 (138)	2 stations x 1	**7**	329 (385)	345 (401)	5 stations + 2 stations
3	145 (169)	161 (185)	3 stations x 1	**8**	368 (432)	384 (448)	5 stations + 3 stations
4	212 (244)	228 (260)	2 stations x 2	**9**	435 (507)	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	Consult with CKD about more than 10 stations manifold.			

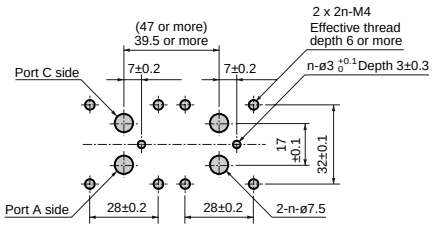
*1: A manifold is configured by combining 2-, 3- and 5-station modules.
*2: Dimensions shown in ( ) are for the open frame type.
*3: GAB422 Series with DIN terminal box and DC voltage specifications has the same dimensions as the open frame type.
*4: The dimensions are the same for the G or NPT thread port size.

Dimensions: Actuator

● Grommet lead wire type
GAB422-1 to 7-0



● Recommended dimensions for actuator mounting



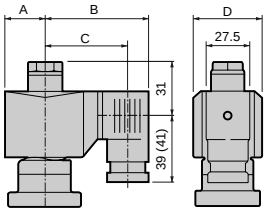
■ Machining drawing when using 2 actuators

Optional dimensions

CAD

* Refer to the dimensions for grommet lead wire with all wave rectifier on the left page for common dimensions.

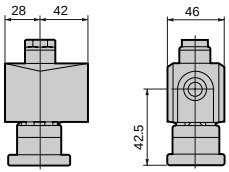
● DIN terminal box
GAB422-1 to 7-0 to 10-* [2E / 2G / 2H]



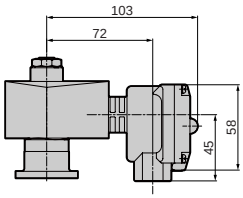
Dimensions shown in ( ) are for G1/2.

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

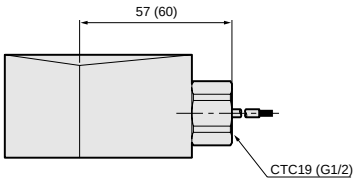
● Open frame lead wire type
GAB422-1 to 7-0 to 10-* [3A / 4A / 5A]



● Open frame type + HP terminal box
GAB422-1 to 7-0 to 10-* [3 / 5] [M / N / I / J] [4M / 4N]

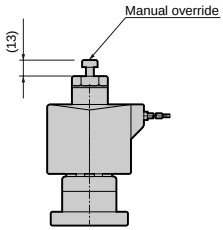


● Open frame type + conduit
GAB422-1 to 7-0 to 10-* [3A / 4A / 5A] [G / H]



Dimensions shown in ( ) are for G1/2.

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



Discrete direct acting 3 port solenoid valve
(general purpose valve)

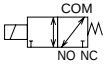
AG31/AG41 Series

- Universal type
- Port size: Rc1/8, Rc1/4, Rc3/8

CE RoHS CAD

JIS symbol

- AG31/41: Universal type



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water	Steam
Working pressure differential range MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	1		
Withstanding pressure (water) MPa	25		
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100	
Heat proof class	B	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 attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Item / Model no.	Port size	Orifice (mm) TOP	Orifice (mm) BODY	Max. working pressure differential (MPa) Air AC	Air DC	Water, hot water, kerosene AC	Water, hot water, kerosene DC	Oil (50 mm^2/s) AC	Oil (50 mm^2/s) DC	Steam AC	Rated voltage	Apparent power (VA) Holding 50 Hz	Holding 60 Hz	Starting 50 Hz	Starting 60 Hz	Power consumption (W) AC 50/60 Hz	Power consumption (W) DC	Weight (kg)
AG31-01-1	Rc1/8	1.5	1.5	0.7	0.7	0.7	0.7	0.6	0.6 (0.5)	0.7	100 VAC 50/60 Hz	14	11	20	16	6/4.2	11 (8.1)	0.36
-01-2		2.0	2.0	0.4	0.4 (0.35)	0.4	0.4	0.25	0.2 (0.15)	0.4	110 VAC 60 Hz							
-02-1	Rc1/4	1.5	1.5	0.7	0.7	0.7	0.7	0.6	0.6 (0.5)	0.7	200 VAC 50/60 Hz							
-02-2		2.0	2.0	0.4	0.4 (0.35)	0.4	0.4	0.25	0.2 (0.15)	0.4								
AG41-02-1	Rc1/4	2.0	2.0	1.0	0.7 (0.45)	1.0	0.7	0.4	0.3 (0.25)	1.0	220 VAC 60 Hz	22	17	35	27	8.3/6.2	11 (10.4)	0.45
-02-2		2.3	2.3	0.7	0.4 (0.25)	0.7	0.4	0.25	0.15 (0.1)	0.7	12 VDC 24 VDC 48 VDC 100 VDC							
-03-1	Rc3/8	2.0	2.0	1.0	0.7 (0.45)	1.0	0.7	0.4	0.3 (0.25)	1.0								0.48
-03-2		2.3	2.3	0.7	0.4 (0.25)	0.7	0.4	0.25	0.15 (0.1)	0.7								

*1: The model numbers above show the basic port size (Rc) and orifice diameter. 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 must be within ±10% of the rated voltage.
*4: Values in ( ) are for the type with DIN terminal box and DC voltage specifications, and indicate the max. working pressure differential when pressurizing from the NO port.
*5: When continuously energizing the valve, use a fluoro rubber seal.
*6: When the sealant is PTFE, the NO port cannot be pressurized.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

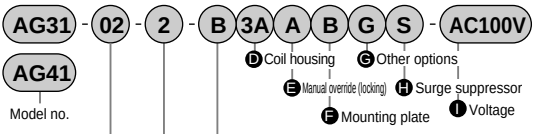
Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)		Flow characteristics					
		TOP	BODY	C [dm³/(s·bar)]		b		Cv flow factor	
				TOP	BODY	TOP	BODY	TOP	BODY
AG31-01-1	Rc1/8	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-01-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-02-1	Rc1/4	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-02-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
AG41-02-1	Rc1/4	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-02-2		2.3	2.3	0.74	0.74	0.66	0.53	0.19	0.19
-03-1	Rc3/8	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-03-2		2.3	2.3	0.74	0.74	0.66	0.53	0.19	0.19

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

How to order



Ⓐ Port size

Ⓑ Orifice

Ⓒ Body/sealant combination
*1
*2
*3
*4

Symbol	Descriptions	Symbol	Descriptions	Symbol	Descriptions	Model no. AG31	Model no. AG41
Ⓐ Port size							
01	Rc1/8	**1G**	G 1/8	**1N**	1/8NPT	●	
02	Rc1/4	**2G**	G 1/4	**2N**	1/4NPT	●	●
03	Rc3/8	**3G**	G 3/8	**3N**	3/8NPT		●

Ⓑ Orifice	AG31		AG41			
	TOP	BODY	TOP	BODY		
1	ø1.5	ø1.5	ø2.0	ø2.0	●	●
2	ø2.0	ø2.0	ø2.3	ø2.3	●	●

Ⓒ Body/sealant combination		Body	Sealant	Treatment	Remarks		
Blank	Std.	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
B	Option	Brass	Fluoro rubber	–	Air, low vacuum, kerosene (up to 90˚C *2)	●	●
C	Option	Brass	PTFE	–	Steam (up to 184˚C *2)	●	●
V	Option	Brass	Fluoro rubber	Vacuum inspection	Medium vacuum	●	●
D	Option	Stainless steel	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
E	Option	Stainless steel	Fluoro rubber	–	Air, low vacuum, kerosene (up to 90˚C *2)	●	●
F	Option	Stainless steel	PTFE	–	Steam (up to 184˚C *2)	●	●
W	Option	Stainless steel	Fluoro rubber	Vacuum inspection	Medium vacuum	●	●
H	Option	Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
J	Option	Brass	Fluoro rubber	Oil free	Air, low vacuum, kerosene (up to 90˚C *2)	●	●
K	Option	Brass	PTFE	Oil free	Steam (up to 184˚C *2)	●	●
P	Option	Brass	Ethylene propylene diene rubber	Oil free	Hot water (up to 90˚C *2)	●	●
L	Option	Stainless steel	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
M	Option	Stainless steel	Fluoro rubber	Oil free	Air, low vacuum, kerosene (up to 90˚C *2)	●	●
N	Option	Stainless steel	PTFE	Oil free	Steam (up to 184˚C *2)	●	●
R	Option	Stainless steel	Ethylene propylene diene rubber	Oil free	Hot water (up to 90˚C *2)	●	●

Refer to page 36 in the Introduction for details on the material combinations.

Ⓓ to Ⓘ

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.

<Example 1 of model number>

AG31-02-1-AC100V
Model no.: AG31
Ⓐ Port size: Rc1/4
Ⓑ Orifice: TOP - ø1.5, BODY - ø1.5
Ⓒ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ to Ⓗ: Blank
Ⓘ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

AG41-03-2-000ABS-AC100V
Model no.: AG41
Ⓐ Port size: Rc3/8
Ⓑ Orifice: TOP - ø2.3, BODY - ø2.3
Ⓒ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ Manual override (locking):
Selected
Ⓕ Mounting plate: Selected
Ⓖ Other options: Blank
Ⓗ Surge suppressor: Selected
Ⓘ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

Note on Ⓒ

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

For Ⓓ to Ⓘ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓔ to Ⓗ are not required, no symbol is indicated.

Ⓓ Coil housing			Ⓔ	Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Descriptions			Manual override (locking)	Mounting plate	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Descriptions
					A-15a	A-15b	A-15c	CTC19	G1/2		
Blank	Std.	Grommet lead wire	**A**	**B**						**S**	100 VAC, 200 VAC
2E		DIN terminal box (G1/2)									100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G		DIN terminal box (Pg11)									
2H		DIN terminal box + small light (Pg11)							**H**		100 VAC, 200 VAC, 24 VDC
3A	Option	Open frame type — Lead wire	**A**	**B**				**G**	**H**	**S**	100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
3M		Open frame type — HP terminal box (G1/2)			**D**	**E**	**F**				
3N		Open frame type — HP terminal box + light (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I		Open frame type — HP terminal box (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J		Open frame type — HP terminal box + light (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H) — Lead wire	**A**	**B**				**G**	**H**	**S**	100 VAC, 200 VAC
4M		Open frame type (heat proof class H) — HP terminal box (G1/2)			**D**	**E**	**F**				
4N		Open frame type (heat proof class H) — HP terminal box + light (G1/2)									
5A		Open frame type (diode integrated) — Lead wire	**A**	**B**				**G**	**H**		100 VAC, 200 VAC
5M		Open frame type (diode integrated) — HP terminal box (G1/2)			**D**	**E**	**F**				
5N		Open frame type (diode integrated) — HP terminal box + light (G1/2)									
5I		Open frame type (diode integrated) — HP terminal box (IP65 or equivalent) (G1/2)									
5J		Open frame type (diode integrated) — HP terminal box + light (IP65 or equivalent) (G1/2)									

⚠ Refer to the following precautions for Ⓓ to Ⓘ.

Blank

● Grommet lead wire 300 mm

2E
2G
2H

● DIN terminal box

3A
4A
5A

● Open frame type grommet lead wire 300 mm
● 4A (heat proof class H)
● 5A (diode integrated)

3M
3N
4M
4N
5M
5N

● Open frame HP terminal box
● 4M, 4N (heat proof class H)
● 5M, 5N (diode integrated)

3I
3J
5I
5J

● Open frame HP terminal box (IP65 or equivalent)
● 5I, 5J (diode integrated)

* Refer to page 122 for coil selection.

G
H

● Conduit
● G (CTC19)
● H (G1/2)

⚠ Note on model no. selection

Note on Ⓓ

*5: Leave blank for the standard coil housing. However, to select options in Ⓔ to Ⓗ, indicate 00 for Ⓓ.
*6: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*7: A DC coil for steam is available for AG41. Contact CKD for more information.

Note on Ⓔ to Ⓗ

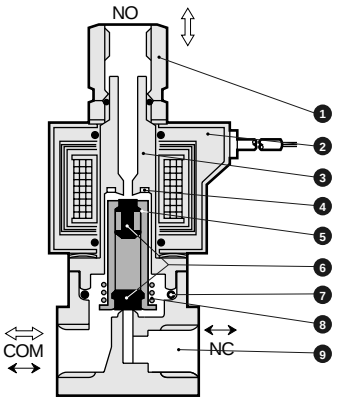
*8: When Ⓒ is C, F, K, N, V or W, the manual override (Ⓔ A) is not available.
*9: Select one among D, E, F, G and H for Ⓖ.
*10: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*11: As standard,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

Note on Ⓘ

*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. Note that the coils Ⓓ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*14: For voltages other than above, consult with 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.

Internal structure and parts list

● AG31/41 Series



No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
7	O ring	NBR (FKM, EPDM, PTFE) (AS568/019)	
8	Plunger spring	SUS304	Stainless steel
9	Body	C3771 (SUS303)	Brass (stainless steel)

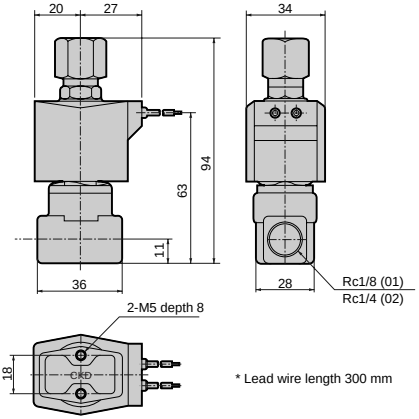
*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.

*2: ( ) shows option.

Dimensions: AG31 Series

CAD

● Grommet lead wire type
AG31-01/02-1 to 2



* Lead wire length 300 mm

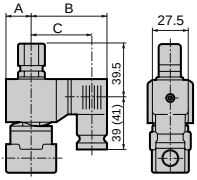
<Reference> As the JIS symbol flow shows, pressure can be applied from any of the three piping ports. Generally, two orifices (TOP, BODY) have the same values and rated pressure.
When de-energized:
COM → NO or NO → COM
When energized:
COM → NC or NC → COM

Note 1: The dimensions are the same for the G or NPT thread port size

Optional dimensions: AG31 Series

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

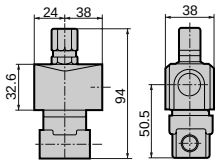
● DIN terminal box
AG31-01/02-1 to 2-* [2E / 2G / 2H]



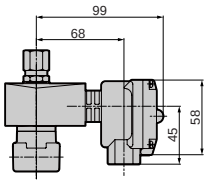
Dimensions shown in ( ) are for G1/2.

Voltage	A	B	C
AC	20	62	50.5 (50)
DC	21	63.5	52 (51.5)

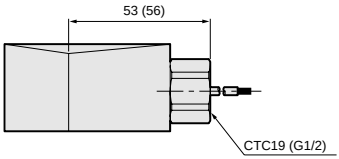
● Open frame type
AG31-01/02-1 to 2-* [3A / 4A / 5A]



● Open frame type + HP terminal box
AG31-01/02-1 to 2-* [3 / 5] [M / N / I / J] [4M / 4N]

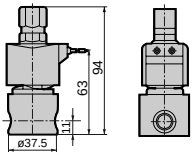


● Open frame type + conduit
AG31-01/02-1 to 2-* [3A / 4A / 5A] [G / H]

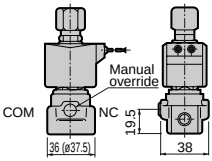


Dimensions shown in ( ) are for G1/2.

● Stainless steel body
AG31-01/02-1 to 2- [D/E/F/R/W/L/M/N]

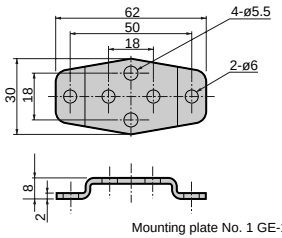


● Manual override (locking)
AG31-01/02-1 to 2-*** [A]
Figure shows the brass body.



Dimensions shown in ( ) are for stainless steel body.

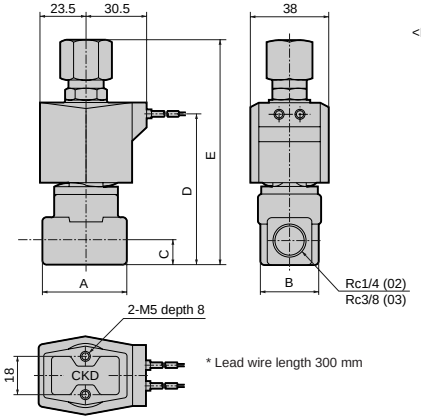
● Mounting plate
AG31-01/02-1 to 2-*** [B]



Mounting plate No. 1 GE-100106

Dimensions: AG41 Series

● Grommet lead wire type
AG41-02/03-1 to 2



<Reference> As the JIS symbol flow shows, pressure can be applied from any of the three piping ports. Generally, two orifices (TOP, BODY) have the same values and rated pressure.
When de-energized:
COM → NO or NO → COM
When energized:
COM → NC or NC → COM

Note 1: The dimensions are the same for the G or NPT thread port size.

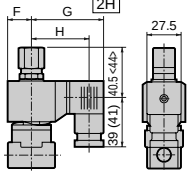
Model no.	A	B	C	D	E
AG41-02-1 to 2	36	28	11	68	99.5
AG41-03-1 to 2	40	28	12	71	106

Optional dimensions: AG41 Series

CAD

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

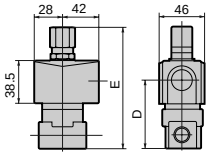
● DIN terminal box
AG41-02/03-1 to 2-* [2E / 2G / 2H]



Dimensions shown in < > are for Rc3/8. Dimensions shown in ( ) are for G1/2.

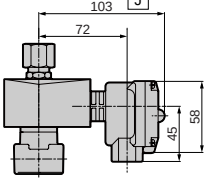
Voltage	F	G	H
AC	23.5	65.5	54 (53.5)
DC	23.5	66	54.5 (54)

● Open frame lead wire type
AG41-02/03-1 to 2-* [3A / 4A / 5A]

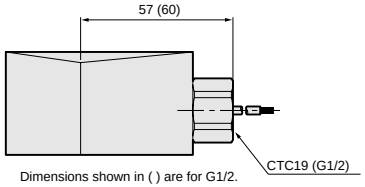


Model no.	D	E
AG41-02-1 to 2-A**	52	99.5
AG41-03-1 to 2-A**	55	106

● Open frame type + HP terminal box
AG41-02/03-1 to 2-* [3 / 5] [M / N / I / J] [4M / 4N]

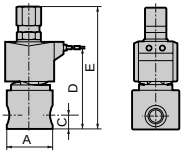


● Open frame type + conduit
AG41-02/03-1 to 2-* [3A / 4A / 5A] [G / H]



Dimensions shown in ( ) are for G1/2.

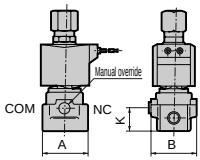
● Stainless steel body
AG41-02/03-1 to 7-[D/E/F/R/W/L/M/N]



Model no.	A	C	D	E
AG41-02-1 to 2-*	ø37.5	11	68	99.5
AG41-03-1 to 2-*	ø45	12	71	106

● Manual override (locking)
AG41-02/03-1 to 2***[A]

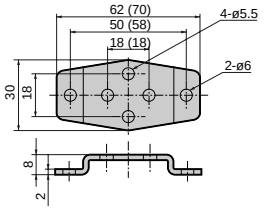
Figure shows the brass body.



Model no.	A	B	K
AG41-02-1 to 2-*A**	36 (ø37.5)	38	19.5
AG41-03-1 to 2-*A**	40 (ø45.0)	40	22.5

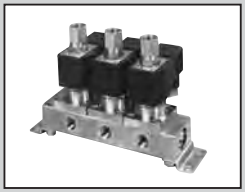
Dimensions shown in ( ) are for stainless steel body.

● Mounting plate
AG41-02/03-1 to 2-***[B]



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

Code	Applicable model
Mounting plate No. 1 GE-100106	● AG41-02/03-1 to 2 Series ● Stainless steel body AG41-02-1 to 2-[D/E/F/L/M/N/R/W]
Mounting plate No. 2 GE-100159	● Stainless steel body AG41-03-1 to 2-[D/E/F/L/M/N/R/W]



Direct acting 3 port solenoid valve, manifold and actuator (general purpose valve)

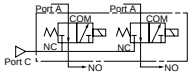
GAG31*/GAG35*, GAG41*/GAG45* Series

- Universal type
- Common supply / individual exhaust type, common supply / separate flow type

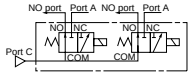
CE RoHS CAD

Manifold circuit structure

- GAG31*/41* (Common supply / individual exhaust type)



- GAG352/452 (Common supply / separate flow type)



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water	Steam
Working pressure differential range MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	1		
Withstanding pressure (water) MPa	10		
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100	
Heat proof class	B	H	
Atmosphere	Place free of corrosive gas and explosive gas		
Valve structure	Direct acting poppet structure		
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)		300 or less (air)
Mounting attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Item / Model no.	NO port size	Orifice (mm)		Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)	
				Air		Water, hot water, kerosene		Oil (50 mm^2/s)		Steam		Holding		Starting		AC	DC
		TOP	BODY	AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz	
GAG311-1	Rc1/8	1.5	1.5	0.7	0.7	0.7	0.7	0.6	0.6 (0.5)	0.7	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz	14	11	20	16	6/4.2	11 (8.1)
-2		2.0	2.0	0.4	0.4 (0.35)	0.4	0.4	0.25	0.2 (0.15)	0.4							
GAG312-1	Rc1/4	1.5	1.5	0.7	0.7	0.7	0.7	0.6	0.6 (0.5)	0.7							
-2		2.0	2.0	0.4	0.4 (0.35)	0.4	0.4	0.25	0.2 (0.15)	0.4							
GAG412-1	Rc1/4	2.0	2.0	1.0	0.7 (0.45)	1.0	0.7	0.4	0.3 (0.25)	1.0	220 VAC 60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	22	17	35	27	8.3/6.2	11 (10.4)
-2		2.3	2.3	0.7	0.4 (0.25)	0.7	0.4	0.25	0.15 (0.1)	0.7							
GAG413-1	Rc3/8	2.0	2.0	1.0	0.7 (0.45)	1.0	0.7	0.4	0.3 (0.25)	1.0							
-2		2.3	2.3	0.7	0.4 (0.25)	0.7	0.4	0.25	0.15 (0.1)	0.7							

*1: The model numbers above show the basic NO port size and orifice diameter. Refer to How to order for other combinations.
*2: Refer to How to order (page 176) and Dimensions (page 180) for the port sizes of port A and C.
*3: Refer to DC column for the max. working pressure differential of coil with diode.
*4: The voltage fluctuation must be within ±10% of the rated voltage.
*5: Values in ( ) are for the type with DIN terminal box and DC voltage specifications, and indicate the max. working pressure differential when pressurizing from the NO port.
*6: When continuously energizing the valve, use a fluoro rubber seal.
*7: When the sealant is PTFE, the NO port cannot be pressurized.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)		Flow characteristics					
		TOP	BODY	C [dm³/(s·bar)]		b		Cv flow factor	
				TOP	BODY	TOP	BODY	TOP	BODY
GAG311-1	Rc1/8	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
GAG312-1	Rc1/4	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
GAG412-1	Rc1/4	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-2		2.3	2.3	0.74	0.74	0.66	0.53	0.19	0.19
GAG413-1	Rc3/8	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-2		2.3	2.3	0.74	0.74	0.66	0.53	0.19	0.19

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

How to order

● Common supply / individual exhaust type (port C pressurization)

GAG31 1 ○ - 1 - 7 - 0 3A A G S - AC100V

- GAG31: ● Common supply / individual exhaust type (port C pressurization)
- GAG35: ● Common supply / separate flow type (port C pressurization)
- GAG41: ● Common supply / individual exhaust type (port C pressurization)
- GAG45: ● Common supply / separate flow type (port C pressurization)

Model no.

Ⓐ NO port size

Ⓑ Type of thread

Ⓒ Orifice

Ⓓ Station no. *2

Ⓔ Body/sealant combination *3 *4 *5

Ⓕ Coil housing

Ⓖ Manual override (locking)

Ⓗ Other options

Ⓘ Surge suppressor

Ⓙ Voltage

Symbol	Descriptions	Model no. GAG3**	Model no. GAG4**
Ⓐ NO port size			
1	1/8	●	
2	1/4	●	●
3	3/8		●
Ⓑ Type of thread			
Blank	Rc	●	●
G	G	●	●
N	NPT	●	●

Ⓒ Orifice

	GAG3** TOP	GAG3** BODY	GAG4** TOP	GAG4** BODY	GAG3**	GAG4**
1	ø1.5	ø1.5	ø2.0	ø2.0	●	●
2	ø2.0	ø2.0	ø2.3	ø2.3	●	●

Ⓓ Station no.

2	2 stations		
to	to	●	●
10	10 stations		
0	Actuator only	●	●

Ⓔ Body/sealant combination

	Body		Sealant	Treatment	Remarks		
Blank	Std.	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60°C)	●	●
B			Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *4)	●	●
C			PTFE		Steam (up to 184°C *4)	●	●
D		Stainless steel	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60°C)	●	●
E			Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *4)	●	●
F			PTFE		Steam (up to 184°C *4)	●	●
H	Option	Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60°C)	●	●
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *4)	●	●
K			PTFE		Steam (up to 184°C *4)	●	●
P			Ethylene propylene diene rubber		Hot water (up to 90°C *4)	●	●
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60°C)	●	●
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *4)	●	●
N			PTFE		Steam (up to 184°C *4)	●	●
R			Ethylene propylene diene rubber		Hot water (up to 90°C *4)	●	●

Refer to page 36 in the Introduction for details on the material combinations.

Ⓕ to Ⓙ

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.

<Example 1 of model number>

GAG311-1-4-AC200V

Model no.: GAG311 (common supply / individual exhaust type / port C pressurization)

- Ⓐ NO port size: 1/8
- Ⓑ Type of thread: Rc
- Ⓒ Orifice: TOP - ø1.5, BODY - ø1.5
- Ⓓ Station no.: 4 stations
- Ⓔ Body/sealant combination: Body - bronze, sealant - nitrile rubber
- Ⓕ Coil housing: Grommet lead wire
- Ⓖ to Ⓘ: Blank
- Ⓙ Voltage: 200 VAC 50/60Hz, 220 VAC 60Hz

<Example 2 of model number>

GAG352G-2-7-000AS-AC200V

Model no.: GAG352 (common supply / separate flow type / port C pressurization)

- Ⓐ NO port size: 1/4
- Ⓑ Type of thread: G
- Ⓒ Orifice: TOP - ø2.0, BODY - ø2.0
- Ⓓ Station no.: 7 stations
- Ⓔ Body/sealant combination: Body - bronze, sealant - nitrile rubber
- Ⓕ Coil housing: Grommet lead wire
- Ⓖ Manual override (locking): Selected
- Ⓗ Other options: Blank
- Ⓘ Surge suppressor: Selected
- Ⓙ Voltage: 200 VAC 50/60Hz, 220 VAC 60Hz

⚠ Note on model no. selection

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

Note on Ⓓ and Ⓔ

*2: Consult with CKD about more than 10 stations manifold.

*3: Leave blank for standard. However, to select options in Ⓕ to Ⓘ, indicate 0 for Ⓔ.

*4: When 4A, 4M or 4N is selected for Ⓔ.

*5: The ethylene propylene diene rubber seal combination (Ⓔ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

For Ⓕ to Ⓙ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓖ to Ⓘ are not required, no symbol is indicated.

Ⓕ Coil housing				Ⓖ	Ⓗ Other options					Ⓘ	Ⓙ Rated voltage
Descriptions				Manual override (locking)	Cable gland (Marine cable gland) A-15a	A-15b	A-15c	Conduit (Conduit pipe) CTC19	G1/2	Surge suppressor	Descriptions
Blank	Std	Grommet lead wire		A						S	100 VAC, 200 VAC
2E	Option	DIN terminal box	(G1/2)								100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G		DIN terminal box	(Pg11)								
2H		DIN terminal box + small light	(Pg11)						**H**		100 VAC, 200 VAC, 24 VDC
3A		Open frame type: Lead wire		A				**G**	**H**	S	100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
3M		Open frame type: HP terminal box	(G1/2)		**D**	**E**	**F**				
3N		Open frame type: HP terminal box + light	(G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I		Open frame type: HP terminal box (IP65 or equivalent)	(G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J		Open frame type: HP terminal box + light (IP65 or equivalent)	(G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H): Lead wire		A				**G**	**H**	S	100 VAC, 200 VAC
4M		Open frame type (heat proof class H): HP terminal box	(G1/2)		**D**	**E**	**F**				
4N		Open frame type (heat proof class H): HP terminal box + light	(G1/2)								
5A		Open frame type (diode integrated): Lead wire		A				**G**	**H**		100 VAC, 200 VAC
5M		Open frame type (diode integrated): HP terminal box	(G1/2)		**D**	**E**	**F**				
5N		Open frame type (diode integrated): HP terminal box + light	(G1/2)								
5I		Open frame type (diode integrated): HP terminal box (IP65 or equivalent)	(G1/2)								
5J		Open frame type (diode integrated): HP terminal box + light (IP65 or equivalent)	(G1/2)								

⚠ Refer to the following precautions for Ⓕ to Ⓙ.

Blank

● Grommet lead wire 300 mm

2E
2G
2H

● DIN terminal box

3A
4A
5A

● Open frame type
grommet lead wire 300 mm
● 4A (heat proof class H)
● 5A (diode integrated)

3M
3N
4M
4N
5M
5N

● Open frame HP terminal box
● 4M, 4N (heat proof class 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 122 for coil selection.

⚠ Note on model no. selection

Note on Ⓕ

*6: Leave blank for the standard coil housing. However, to select options in Ⓖ, Ⓗ or Ⓘ, indicate 00 for Ⓕ.
*7: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*8: A DC coil for steam is available for GAG4**. Contact CKD for more information.

Note on Ⓔ to Ⓘ

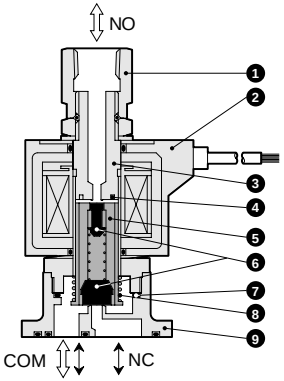
*9: When Ⓔ is C, F, K or N, the manual override (Ⓖ A) is not available.
*10: Select one among D, E, F, G and H for Ⓗ.
*11: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*12: As standard, the surge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

Note on Ⓙ

*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. Note that the coils Ⓕ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*15: For voltages other than above, consult with 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.

Internal structure and parts list

● GAG31*/GAG35*/GAG41*/GAG45* Actuator

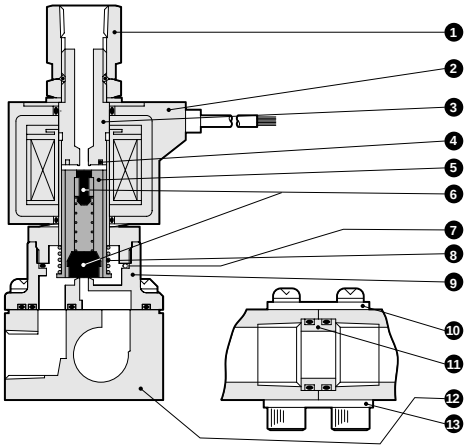


No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
7	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)	
8	Plunger spring	SUS304	Stainless steel
9	Body	C3771 (SCS13)	Brass (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.
*2: ( ) shows option.

Internal structure and parts list

● GAG31*/GAG35*/GAG41*/GAG45* Manifold



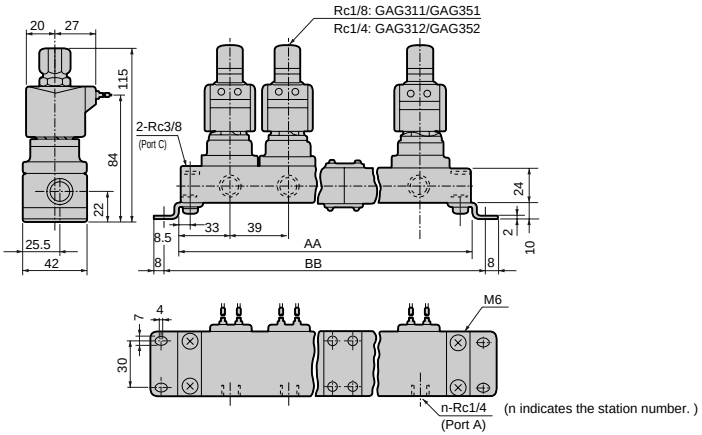
No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	Sealant	NBR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

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.

*2: ( ) shows option.

Dimensions: GAG31*/GAG35* Series

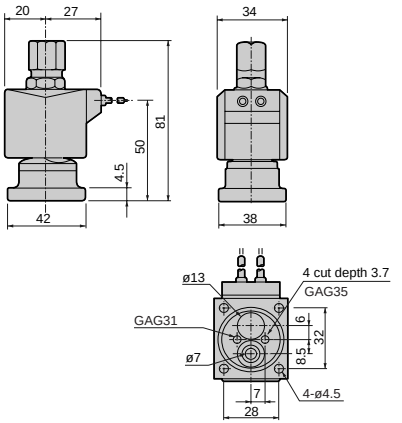
● Manifold (grommet lead wire type)
GAG3**-1 to 2- 2 to 10



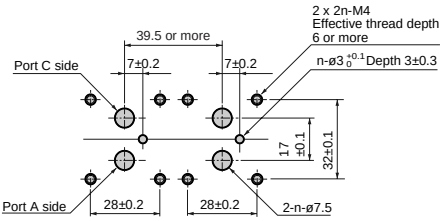
Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106	122	2 stations x 1	**7**	329	345	5 stations + 2 stations
3	145	161	3 stations x 1	**8**	368	384	5 stations + 3 stations
4	212	228	2 stations x 2	**9**	435	451	3 stations x 3
5	223	239	5 stations x 1	**10**	446	462	5 stations x 2
6	290	306	3 stations x 2	Consult with CKD about more than 10 stations manifold.			

*1: A manifold is configured by combining 2-, 3- and 5-station modules.
*2: The dimensions are the same for the G or NPT thread port size.

● Actuator (grommet lead wire type)
GAG3**-1 to 2- 0



● Recommended dimensions for actuator mounting



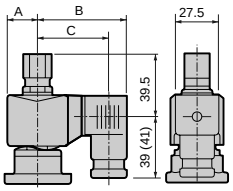
■ Machining drawing when using 2 actuators

Optional dimensions: GAG31*/GAG35*

CAD

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

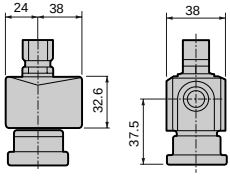
● DIN terminal box
GAG3**-1 to 2-0 to 10-* [2E] [2G] [2H]



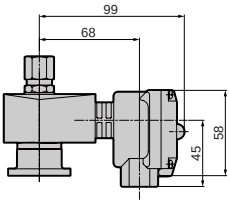
Dimensions shown in ( ) are for G1/2.

Voltage	A	B	C
AC	20	62	50.5 (50)
DC	21	63.5	52 (51.5)

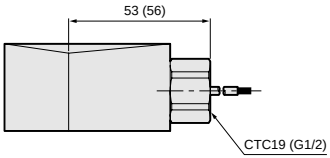
● Open frame lead wire type
GAG3**-1 to 2-0 to 10-* [3A] [4A] [5A]



● Open frame type + HP terminal box
GAG3**-1 to 2-0 to 10-* [3 5] [M N I J] · [4M 4N]

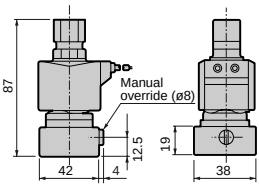


● Open frame type + conduit
GAG3**-1 to 2-0 to 10-* [3A 4A 5A] [G H]



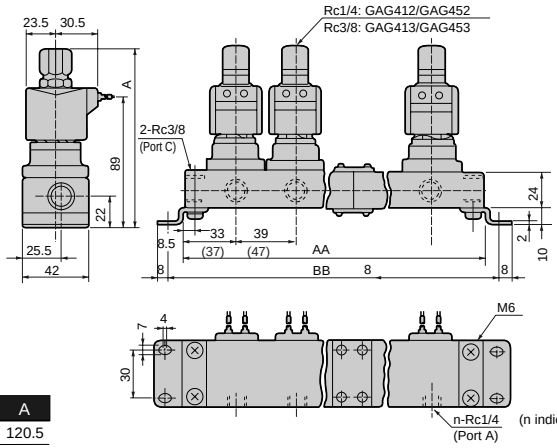
Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAG3**-1 to 2-0 to 10-***[A]



Dimensions: GAG41*/45* Series

● Manifold (grommet lead wire type)
GAG4**-1 to 2- 2 to 10



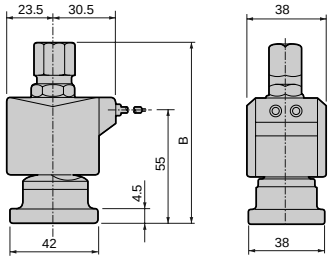
(n indicates the station number.)

Model no.	A
GAG412/452-1 to 2	120.5
GAG413/453-1 to 2	124

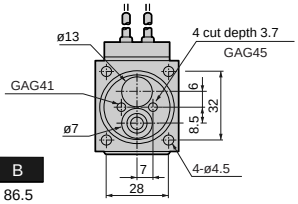
Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106 (122)	122 (138)	2 stations x 1	**7**	329 (385)	345 (401)	5 stations + 2 stations
3	145 (169)	161 (185)	3 stations x 1	**8**	368 (432)	384 (448)	5 stations + 3 stations
4	212 (244)	228 (260)	2 stations x 2	**9**	435 (507)	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	Consult with CKD about more than 10 stations manifold.			

*1: A manifold is configured by combining 2-, 3- and 5-station modules.
*2: Dimensions in ( ) are for the open frame type.
*3: The dimensions are the same for the G or NPT thread port size.

● Actuator (grommet lead wire type)
GAG4**-1 to 2- 0

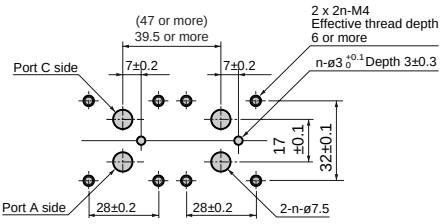


* Lead wire length 300 mm



Model no.	B
GAG412/452-1 to 2	86.5
GAG413/453-1 to 2	90

● Recommended dimensions for actuator mounting

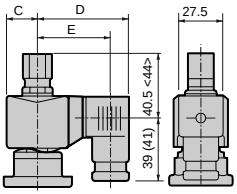


■ Machining drawing when using 2 actuators

Optional dimensions: GAG41*/45* Series

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

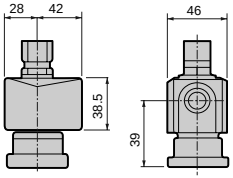
● DIN terminal box
GAG4**-1 to 2-0 to 10-* [2E / 2G / 2H]



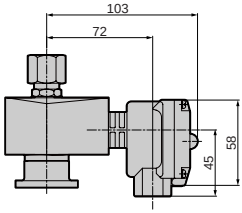
Dimensions shown in ( ) are for G1/2. Dimensions shown in < > are for Rc3/8.

Voltage	C	D	E
AC	23.5	65.5	54 (53.5)
DC	23.5	66	54.5 (54)

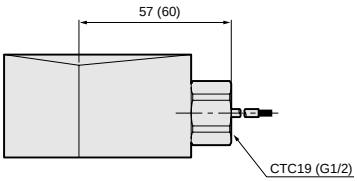
● Open frame lead wire type
GAG4**-1 to 2-0 to 10-* [3A / 4A / 5A]



● Open frame type + HP terminal box
GAG4**-1 to 2-0 to 10-* [3 / 5] [M / N / I / J] [4M / 4N]

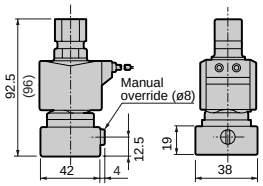


● Open frame type + conduit
GAG4**-1 to 2-0 to 10-* [3A / 4A / 5A] [G / H]



Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAG4**-1 to 2-0 to 10-*** [A]



Discrete direct acting 3 port solenoid valve
(general purpose valve)

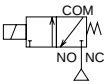
AG33/AG43 Series

- NC pressurization type
- Port size: Rc1/8, Rc1/4, Rc3/8

CE RoHS CAD

JIS symbol

● AG33/43: NC pressurization type



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water	Steam
Working pressure differential range MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	1		
Withstanding pressure (water) MPa	25		
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100	
Heat proof class	B	H	
Atmosphere	Place free of corrosive gas and explosive gas		
Valve structure	Direct acting poppet structure		
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)		300 or less (air)
Mounting attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Item / Model no.	Port size	Orifice (mm)		Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)	
				Air		Water, hot water, kerosene		Oil (50 mm^2/s)		Steam		Holding		Starting		AC	DC
		TOP	BODY	AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz	
AG33-01-1	Rc1/8	1.5	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz	14	11	20	16	6/4.2	11 (8.1)
-01-2		2.0	2.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7							
-02-1	Rc1/4	1.5	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0							
-02-2		2.0	2.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7							
AG43-02-4	Rc1/4	3.0	3.0	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7	220 VAC 60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	22	17	35	27	8.3/6.2	11 (10.4)
-02-5		3.5	3.0	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4							
-03-4	Rc3/8	3.0	3.0	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7							
-03-5		3.5	3.0	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4							

*1: The model numbers above show the basic port size (Rc) and orifice diameter. 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 must be within ±10% of the rated voltage.
*4: Values in ( ) are for the type with DIN terminal box and DC voltage specifications.
*5: When using with vacuum, vacuum the NO port side.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

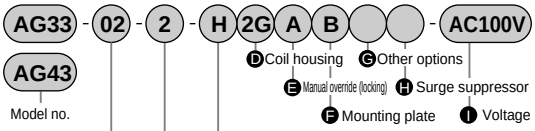
Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)		Flow characteristics					
		TOP	BODY	C [dm³/(s·bar)]		b		Cv flow factor	
				TOP	BODY	TOP	BODY	TOP	BODY
AG33-01-1	Rc1/8	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-01-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-02-1	Rc1/4	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-02-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
AG43-02-4	Rc1/4	3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31
-02-5		3.5	3.0	1.5	1.1	0.62	0.52	0.40	0.31
-03-4	Rc3/8	3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31
-03-5		3.5	3.0	1.5	1.1	0.62	0.52	0.40	0.31

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

How to order



Ⓐ Port size

Symbol	Descriptions	Symbol	Descriptions	Symbol	Descriptions	Model no. AG33	Model no. AG43
Ⓐ Port size							
01	Rc1/8	**1G**	G 1/8	**1N**	1/8NPT	●	
02	Rc1/4	**2G**	G 1/4	**2N**	1/4NPT	●	●
03	Rc3/8	**3G**	G 3/8	**3N**	3/8NPT		●

Ⓑ Orifice

	AG33		AG43			
	TOP	BODY	TOP	BODY		
1	ø1.5	ø1.5	-	-	●	
2	ø2.0	ø2.0	-	-	●	
4	-	-	ø3.0	ø3.0		●
5	-	-	ø3.5	ø3.0		●

Ⓒ Body/sealant combination

		Body	Sealant	Treatment	Remarks		
Blank	Std.	Brass	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)	●	●
D	Option	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)	●	●
H		Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
K			PTFE		Steam (up to 184˚C *2)	●	●
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)	●	●
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)	●	●
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
N			PTFE		Steam (up to 184˚C *2)	●	●
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)	●	●

Refer to page 36 in the Introduction for details on the material combinations.

Ⓓ to Ⓘ

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.

<Example 1 of model number>

AG33-02-1-AC100V
Model no.: AG33

Ⓐ Port size: Rc1/4
Ⓑ Orifice: TOP - ø1.5, BODY - ø1.5
Ⓒ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ to Ⓗ: Blank
Ⓘ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

AG43-03-4-000ABS-AC100V
Model no.: AG43

Ⓐ Port size: Rc3/8
Ⓑ Orifice: TOP - ø3.0, BODY - ø3.0
Ⓒ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ Manual override (locking):
Selected
Ⓕ Mounting plate: Selected
Ⓖ Other options: Blank
Ⓗ Surge suppressor: Selected
Ⓘ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

Note on Ⓒ

*1: Leave blank for standard. However, to select options in Ⓓ to Ⓗ, indicate 0 for Ⓒ.
*2: When 4A, 4M or 4N is selected for Ⓒ.
*3: The ethylene propylene diene rubber seal combination (Ⓒ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

For Ⓓ to Ⓘ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓔ to Ⓗ are not required, no symbol is indicated.

Ⓓ Coil housing			Ⓔ	Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Descriptions			Manual override (locking)	Mounting plate	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Descriptions
					A-15a	A-15b	A-15c	CTC19	G1/2		
Blank	Std.	Grommet lead wire	**A**	**B**						**S**	100 VAC, 200 VAC
2E		DIN terminal box (G1/2)									100 VAC, 200 VAC
2G		DIN terminal box (Pg11)									12 VDC, 24 VDC, 48 VDC, 100 VDC
2H		DIN terminal box + small light (Pg11)							**H**		100 VAC, 200 VAC, 24 VDC
3A	Option	Open frame type — Lead wire	**A**	**B**				**G**	**H**	**S**	100 VAC, 200 VAC
3M		Open frame type — HP terminal box (G1/2)									12 VDC, 24 VDC, 48 VDC, 100 VDC
3N		Open frame type — HP terminal box + light (G1/2)			**D**	**E**	**F**				100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I		Open frame type — HP terminal box (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J		Open frame type — HP terminal box + light (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H) — Lead wire	**A**	**B**				**G**	**H**	**S**	100 VAC, 200 VAC
4M		Open frame type (heat proof class H) — HP terminal box (G1/2)			**D**	**E**	**F**				
4N		Open frame type (heat proof class H) — HP terminal box + light (G1/2)									
5A		Open frame type (diode integrated) — Lead wire	**A**	**B**				**G**	**H**		100 VAC, 200 VAC
5M		Open frame type (diode integrated) — HP terminal box (G1/2)									
5N		Open frame type (diode integrated) — HP terminal box + light (G1/2)			**D**	**E**	**F**				
5I		Open frame type (diode integrated) — HP terminal box (IP65 or equivalent) (G1/2)									
5J		Open frame type (diode integrated) — HP terminal box + light (IP65 or equivalent) (G1/2)									

⚠ Refer to the following precautions for Ⓓ to Ⓘ.

Blank

● Grommet lead wire 300 mm

2E
2G
2H

● DIN terminal box

3A
4A
5A

● Open frame type grommet lead wire 300 mm
● 4A (heat proof class H)
● 5A (diode integrated)

3M
3N
4M
4N
5M
5N

● Open frame HP terminal box
● 4M, 4N (heat proof class H)
● 5M, 5N (diode integrated)

3I
3J
5I
5J

● Open frame HP terminal box (IP65 or equivalent)
● 5I, 5J (diode integrated)

* Refer to page 122 for coil selection.

G
H

● Conduit
● G (CTC19)
● H (G1/2)

⚠ Note on model no. selection

Note on ❶

*4: Leave blank for the standard coil housing. However, to select options in Ⓔ to Ⓗ, indicate 00 for Ⓓ.
*5: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*6: A DC coil for steam is available for AG43. Contact CKD for more information.

Note on ❷ to ❹

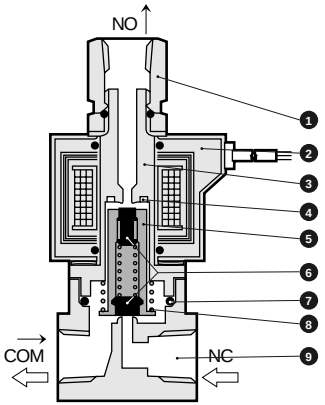
*7: When Ⓒ is C, F, K or N, the manual override (Ⓔ A) is not available.
*8: Select one among D, E, F, G and H for Ⓖ.
*9: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*10: As standard, the surge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

Note on ❺

*12: 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. Note that the coils Ⓓ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*13: For voltages other than above, consult with CKD.
*14: 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.

Internal structure and parts list

● AG33/43 Series



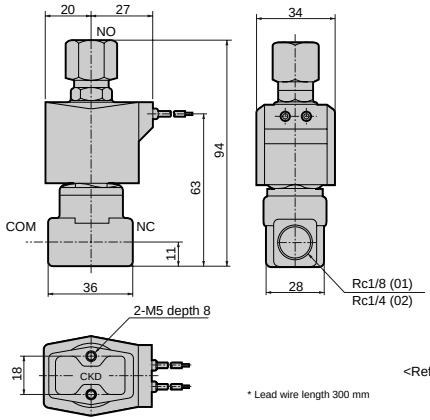
No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
7	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)	
8	Plunger spring	SUS304	Stainless steel
9	Body	C3771 (SUS303)	Brass (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.
*2: ( ) shows option.

Dimensions: AG33 Series

CAD

● Grommet lead wire type
AG33-01/02-1 to 2



* Lead wire length 300 mm

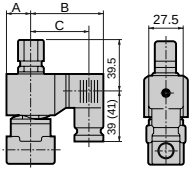
<Reference> As the JIS symbol flow shows, this is dedicated for NC port pressurization. Pressure cannot be applied from the other connection ports.
When de-energized: COM → NO
When energized: NC → COM

Note 1: The dimensions are the same for the G or NPT thread port size.

Optional dimensions: AG33 Series

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

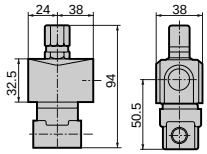
● DIN terminal box
AG33-01/02-1 to 2-* [2E / 2G / 2H]



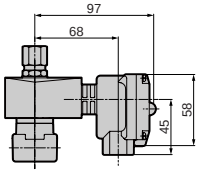
Dimensions shown in ( ) are for G1/2.

Voltage	A	B	C
AC	20	62	50.5 (50)
DC	21	63.5	52 (51.5)

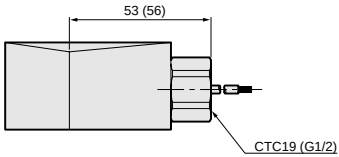
● Open frame lead wire type
AG33-01/02-1 to 2-* [3A / 4A / 5A]



● Open frame type + HP terminal box
AG33-01/02-1 to 2-* [3 / 5] [M / N / I / J] [4M / 4N]

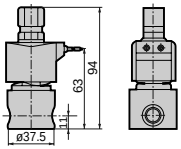


● Open frame type + conduit
AG33-01/02-1 to 2-* [3A / 4A / 5A] [G / H]

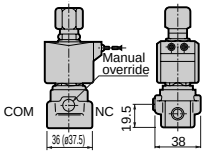


Dimensions shown in ( ) are for G1/2.

● Stainless steel body
AG33-01/02-1 to 2- [D/E/F/R/L/M/N]

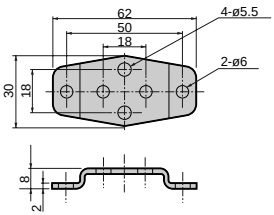


● Manual override (locking)
AG33-01/02-1 to 2-*** [A]
Figure shows the brass body.



Dimensions shown in ( ) are for stainless steel body.

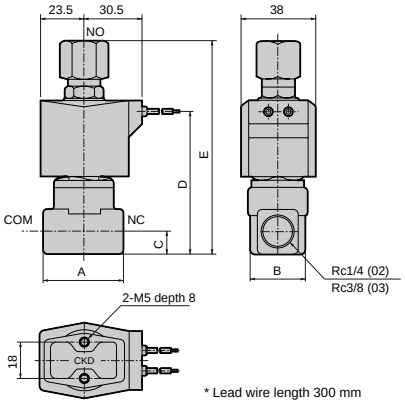
● Mounting plate
AG33-01/02-1 to 2-*** [B]



Mounting plate No. 1 GE-100106

Dimensions: AG43 Series

● Grommet lead wire type
AG43-02/03-4 to 5



* Lead wire length 300 mm

<Reference> As the JIS symbol flow shows, this is dedicated for NC port pressurization. Pressure cannot be applied from the other connection ports.
When de-energized: COM → NO
When energized: NC → COM

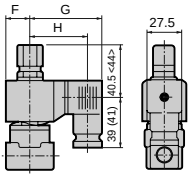
Note 1: The dimensions are the same for the G or NPT thread port size.

Model no.	A	B	C	D	E
AG43-02-4 to 5	36	28	11	68	99.5
AG43-03-4 to 5	40	28	12	71	106

Optional dimensions: AG43 Series

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

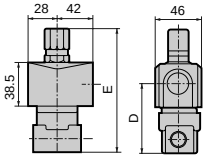
● DIN terminal box
AG43-02/03-4 to 5-* [2E / 2G / 2H]



Dimensions shown in < > are for Rc3/8. Dimensions shown in ( ) are for G1/2.

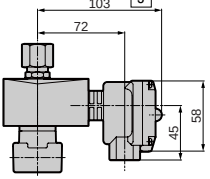
Voltage	F	G	H
AC	23.5	65.5	54 (53.5)
DC	23.5	66	54.5 (54)

● Open frame lead wire type
AG43-02/03-4 to 5-* [3A / 4A / 5A]

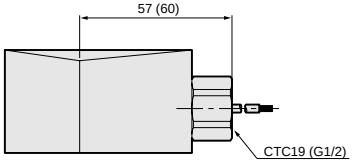


Model no.	D	E
AG43-02-4 to 5-A**	52.0	99.5
AG43-03-4 to 5-A**	55.0	106

● Open frame type + HP terminal box
AG43-02/03-4 to 5-* [3 / 5] [M / N / I / J] [4M / 4N]

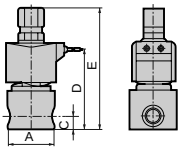


● Open frame type + conduit
AG43-02/03-4 to 5-* [3A / 4A / 5A] [G / H]



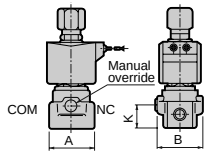
Dimensions shown in ( ) are for G1/2.

● Stainless steel body
AG43-02/03-4 to 5- [D/E/F/R/L/M/N]



Model no.	A	C	D	E
AG43-02-4 to 5-*	ø37.5	11	68	99.5
AG43-03-4 to 5-*	ø45	12	71	106

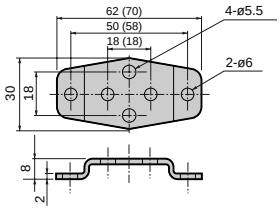
● Manual override (locking)
AG43-02/03-4 to 5***[A]
Figure shows the brass body.



Model no.	A	B	K
AG43-02-4 to 5-*A**	36 (ø37.5)	38	19.5
AG43-03-4 to 5-*A**	40 (ø45.0)	40	22.5

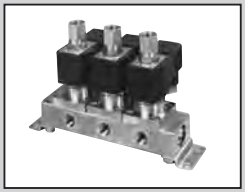
Dimensions shown in ( ) are for stainless steel body.

● Mounting plate
AG43-02/03-4 to 5-***[B]



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

Code	Applicable model
Mounting plate No. 1 GE-100106	● AG43-02/03-4 to 5 Series ● Stainless steel body AG43-02-4 to 5-[D/E/F/L/M/N/R]
Mounting plate No. 2 GE-100159	● Stainless steel body AG43-03-4 to 5-[D/E/F/L/M/N/R]



Direct acting 3 port solenoid valve, manifold and actuator (general purpose valve)

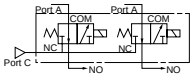
GAG33*/GAG43* Series

- NC pressurization type
- Common supply / individual exhaust type

CE RoHS CAD

JIS symbol

- GAG33*/GAG43* (Common supply / individual exhaust type)



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water	Steam
Working pressure differential range MPa	0 to 1 (refer to max. working pressure differential in individual specifications.)		
Max. working pressure MPa	1		
Withstanding pressure (water) MPa	10		
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100	
Heat proof class	B	H	
Atmosphere	Place free of corrosive gas and explosive gas		
Valve structure	Direct acting poppet structure		
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)		300 or less (air)
Mounting attitude	Free		
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber	Brass, PTFE

Note 1: No freezing

Individual specifications

Item / Model no.	NO port size	Orifice (mm)		Max. working pressure differential (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)	
				Air		Water, hot water, kerosene		Oil (50 mm^2/s)		Steam		Holding		Starting		AC	DC
		TOP	BODY	AC	DC	AC	DC	AC	DC	AC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz	
GAG331-1	Rc1/8	1.5	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz	14	11	20	16	6/4.2	11 (8.1)
-2		2.0	2.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7							
GAG332-1	Rc1/4	1.5	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0							
-2		2.0	2.0	0.7	0.7	0.7	0.7	0.7	0.7	0.7							
GAG432-4	Rc1/4	3.0	3.0	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7	220 VAC 60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	22	17	35	27	8.3/6.2	11 (10.4)
-5		3.5	3.0	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4							
GAG433-4	Rc3/8	3.0	3.0	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7	0.7 (0.55)	0.7							
-5		3.5	3.0	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4	0.4 (0.25)	0.4							

*1: The model numbers above show the basic NO port size (Rc) and orifice diameter. Refer to How to order for other combinations.
*2: Refer to How to order (page 194) and Dimensions (page 198) for the port sizes of port A and C.
*3: Refer to DC column for the max. working pressure differential of coil with diode.
*4: Values in ( ) are for the type with DIN terminal box and DC voltage specifications.
*5: The voltage fluctuation must be within ±10% of the rated voltage.
*6: When using with a low vacuum, vacuum the NO port side.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber		PTFE	
Coil (heat proof class)	B	H	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90	-10 to 60	-10 to 184
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)				300 or less (air)	

Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)		Flow characteristics					
		TOP	BODY	C [dm³/(s·bar)]		b		Cv flow factor	
				TOP	BODY	TOP	BODY	TOP	BODY
GAG331-1	Rc1/8	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
GAG332-1	Rc1/4	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
GAG432-4	Rc1/4	3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31
-5		3.5	3.0	1.5	1.1	0.62	0.52	0.4	0.31
GAG433-4	Rc3/8	3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31
-5		3.5	3.0	1.5	1.1	0.62	0.52	0.4	0.31

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

How to order

● Common supply / individual exhaust type (port C pressurization)

GAG33 1 ○ - 2 - 6 - B 4A A G S - AC100V

- GAG33: Model no.
- 1: Ⓐ NO port size
- ○: Ⓑ Type of thread
- 2: Ⓒ Orifice
- 6: Ⓓ Station no. *2
- B: Ⓔ Body/sealant combination
- 4A: Ⓕ Coil housing
- A: Ⓖ Manual override (locking)
- G: Ⓗ Other options
- S: Ⓘ Surge suppressor
- AC100V: Ⓙ Voltage

● Common supply / individual exhaust type (port C pressurization)

GAG43: Model no.

Symbol	Descriptions	Model no. GAG33*	Model no. GAG43*
Ⓐ NO port size			
1	1/8	●	
2	1/4	●	●
3	3/8		●
Ⓑ Type of thread			
Blank	Rc	●	●
G	G	●	●
N	NPT	●	●

Ⓒ Orifice

	GAG33* TOP	GAG33* BODY	GAG43* TOP	GAG43* BODY	GAG33*	GAG43*
1	ø1.5	ø1.5	–	–	●	
2	ø2.0	ø2.0	–	–	●	
4	–	–	ø3.0	ø3.0		●
5	–	–	ø3.5	ø3.5		●

Ⓓ Station no.			
2 to **10**	2 stations to 10 stations	●	●
0	Actuator only	●	●

Ⓔ Body/sealant combination

		Body	Sealant	Treatment	Remarks		
Blank	Std.	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
B			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
C			PTFE		Steam (up to 184˚C *4)	●	●
D	Option	Stainless steel	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
E			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
F			PTFE		Steam (up to 184˚C *4)	●	●
H		Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
K			PTFE		Steam (up to 184˚C *4)	●	●
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *4)	●	●
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)	●	●
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *4)	●	●
N			PTFE		Steam (up to 184˚C *4)	●	●
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *4)	●	●

Refer to page 36 in the Introduction for details on the material combinations.

Ⓕ to Ⓙ

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.

<Example 1 of model number>

GAG331-1-4-AC200V

Model no.: GAG331 (common supply / individual exhaust type / port C pressurization)

- Ⓐ NO port size: 1/8
- Ⓑ Type of thread: Rc
- Ⓒ Orifice: TOP - ø1.5, BODY - ø1.5
- Ⓓ Station no.: 4 stations
- Ⓔ Body/sealant combination: Body - bronze, sealant - nitrile rubber
- Ⓕ Coil housing: Grommet lead wire
- Ⓖ to Ⓘ: Blank
- Ⓙ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

GAG332G-2-7-000AS-AC200V

Model no.: GAG332 (common supply / individual exhaust type / port C pressurization)

- Ⓐ NO port size: 1/4
- Ⓑ Type of thread: G
- Ⓒ Orifice: TOP - ø2.0, BODY - ø2.0
- Ⓓ Station no.: 7 stations
- Ⓔ Body/sealant combination: Body - bronze, sealant - nitrile rubber
- Ⓕ Coil housing: Grommet lead wire
- Ⓖ Manual override (locking): Selected
- Ⓗ Other options: Blank
- Ⓘ Surge suppressor: Selected
- Ⓙ Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

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

Note on Ⓓ and Ⓔ

*2: Consult with CKD about more than 10 stations manifold.
*3: Leave blank for standard. However, to select options in Ⓕ to Ⓘ, indicate 0 for Ⓔ.
*4: When 4A, 4M or 4N is selected for Ⓔ.
*5: The ethylene propylene diene rubber seal combination (Ⓔ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

For Ⓕ to Ⓙ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓖ to Ⓘ are not required, no symbol is indicated.

Ⓕ Coil housing				Ⓖ	Ⓗ Other options					Ⓘ	Ⓙ Rated voltage
Descriptions				Manual override (locking)	Cable gland (Marine cable gland) A-15a	A-15b	A-15c	Conduit (Conduit pipe) CTC19	G1/2	Surge suppressor	Descriptions
Blank	Std.	Grommet lead wire		A						S	100 VAC, 200 VAC
2E	Option	DIN terminal box	(G1/2)								100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G		DIN terminal box	(Pg11)								
2H		DIN terminal box + small light	(Pg11)						H		100 VAC, 200 VAC, 24 VDC
3A		Open frame type: Lead wire		A				G	H	S	100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
3M		Open frame type: HP terminal box	(G1/2)		D	E	F				
3N		Open frame type: HP terminal box + light	(G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I		Open frame type: HP terminal box (IP65 or equivalent)	(G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J		Open frame type: HP terminal box + light (IP65 or equivalent)	(G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H): Lead wire		A				G	H	S	100 VAC, 200 VAC
4M		Open frame type (heat proof class H): HP terminal box	(G1/2)		D	E	F				
4N		Open frame type (heat proof class H): HP terminal box + light	(G1/2)								
5A		Open frame type (diode integrated): Lead wire		A				G	H		100 VAC, 200 VAC
5M		Open frame type (diode integrated): HP terminal box	(G1/2)		D	E	F				
5N		Open frame type (diode integrated): HP terminal box + light	(G1/2)								
5I		Open frame type (diode integrated): HP terminal box (IP65 or equivalent)	(G1/2)								
5J		Open frame type (diode integrated): HP terminal box + light (IP65 or equivalent)	(G1/2)								

⚠ Refer to the following precautions for Ⓕ to Ⓙ.

Blank

● Grommet lead wire 300 mm

2E
2G
2H

● DIN terminal box

3A
4A
5A

● Open frame type
grommet lead wire 300 mm
● 4A (heat proof class H)
● 5A (diode integrated)

3M
3N
4M
4N
5M
5N

● Open frame HP terminal box
● 4M, 4N (heat proof class 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 122 for coil selection.

⚠ Note on model no. selection

Note on Ⓕ

*6: Leave blank for the standard coil housing. However, to select options in Ⓖ, Ⓗ or Ⓘ, indicate 00 for Ⓕ.
*7: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*8: A DC coil for steam is available for GAG43**. Contact CKD for more information.

Note on Ⓖ to Ⓘ

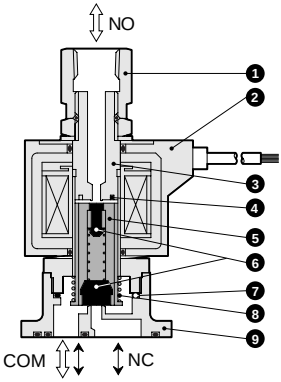
*9: When Ⓔ is C, F, K or N, the manual override (Ⓖ A) is not available.
*10: Select one among D, E, F, G and H for Ⓗ.
*11: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*12: As standard, the surge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

Note on Ⓙ

*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. Note that the coils Ⓕ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*15: For voltages other than above, consult with 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.

Internal structure and parts list

● GAG33*/GAG43* Series Actuator



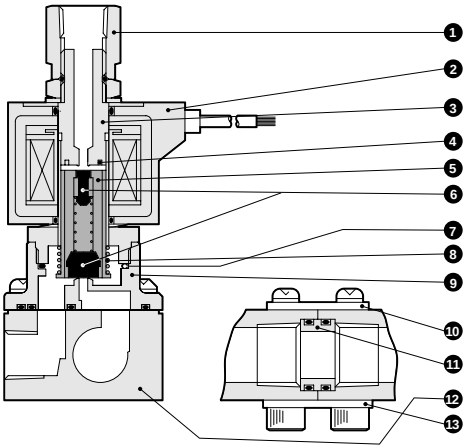
No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
7	O ring	NBR (FKM, EPDM, PTFE) (size: AS568-019)	
8	Plunger spring	SUS304	Stainless steel
9	Body	C3771 (SCS13)	Brass (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.

*2: ( ) shows option.

Internal structure and parts list

● GAG33*/GAG43* Manifold

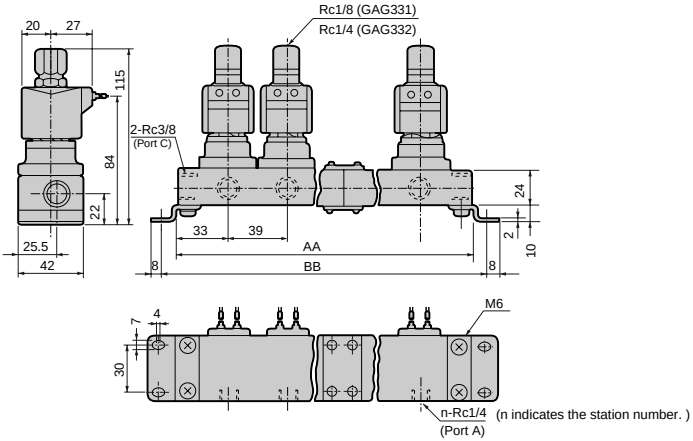


No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	Sealant	NBR (FKM, EPDM, PTFE)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
7	O ring	NBR (FKM, EPDM, PTFE) (ASS568/019)	
8	Plunger spring	SUS304	Stainless steel
9	Body	C3771 (SCS13)	Brass (stainless steel)
10	Holder	SPCC	Steel
11	Connector	C3604 (SUS304)	Brass (stainless steel)
12	Sub-plate	C3604 (SUS303)	Brass (stainless steel)
13	Connecting plate	SPCC	Steel

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.
*2: ( ) shows option.

Dimensions: GAG331/GAG332 Series

● Manifold (grommet lead wire type)
GAG33*-1 to 2- 2 to 10

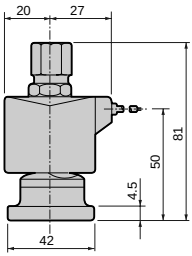


Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106	122	2 stations x 1	**7**	329	345	5 stations + 2 stations
3	145	161	3 stations x 1	**8**	368	384	5 stations + 3 stations
4	212	228	2 stations x 2	**9**	435	451	3 stations x 3
5	223	239	5 stations x 1	**10**	446	462	5 stations x 2
6	290	306	3 stations x 2	Consult with CKD about more than 10 stations manifold.			

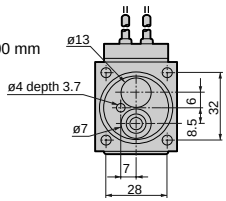
*1: A manifold is configured by combining 2-, 3- and 5-station modules.

*2: The dimensions are the same for the G or NPT thread port size.

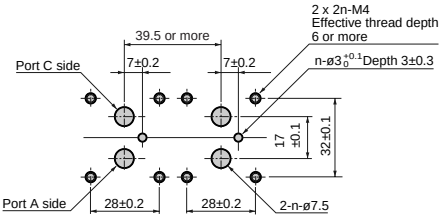
● Actuator (grommet lead wire type)
GAG33*-1 to 2- 0



* Lead wire length 300 mm



● Recommended dimensions for actuator mounting



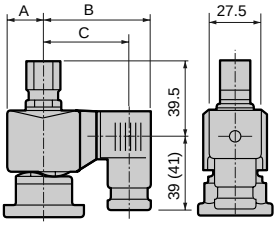
■ Machining drawing when using 2 actuators

Optional dimensions: GAG331/GAG332 Series

CAD

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

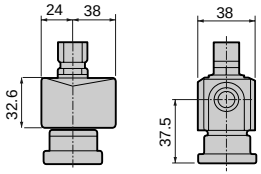
● DIN terminal box
GAG33*-1 to 2-0 to 10-* 2E / 2G / 2H



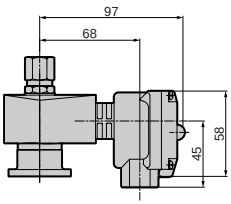
Dimensions shown in ( ) are for G1/2.

Voltage	A	B	C
AC	20	62	50.5 (50)
DC	21	63.5	52 (51.5)

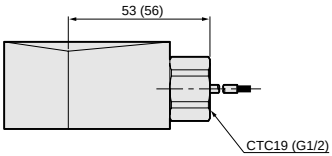
● Open frame lead wire type
GAG33*-1 to 2-0 to 10-* 3A / 4A / 5A



● Open frame type + HP terminal box
GAG33*-1 to 2-0 to 10-* 3 5 · M N I J · 4M 4N

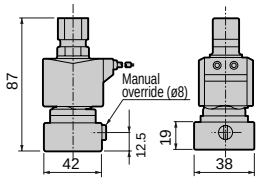


● Open frame type + conduit
GAG33*-1 to 2-0 to 10-* 3A 4A 5A · G H



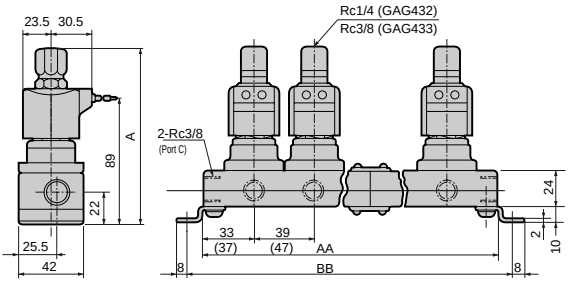
Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAG33*-1 to 2-0 to 10-***A



Dimensions: GAG432/GAG433 Series

● Manifold (grommet lead wire type)
GAG43*-4 to 5-2 to 10



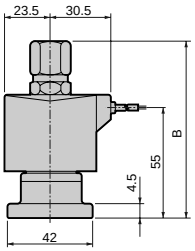
(n indicates the station number.)

Model no.	A
GAG432-4 to 5	120.4
GAG433-4 to 5	124

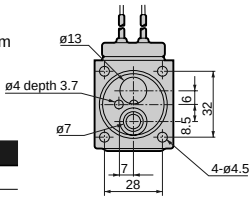
Station no.	AA	BB	Manifold structure	Station no.	AA	BB	Manifold structure
2	106 (122)	122 (138)	2 stations x 1	**7**	329 (385)	345 (401)	5 stations + 2 stations
3	145 (169)	161 (185)	3 stations x 1	**8**	368 (432)	384 (448)	5 stations + 3 stations
4	212 (244)	228 (260)	2 stations x 2	**9**	435 (507)	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	Consult with CKD about more than 10 stations manifold.			

*1: A manifold is configured by combining 2-, 3- and 5-station modules.
*2: Dimensions shown in ( ) are for the open frame type.
*3: The dimensions are the same for the G or NPT thread port size.

● Actuator (grommet lead wire type)
GAG43*-4 to 5-0

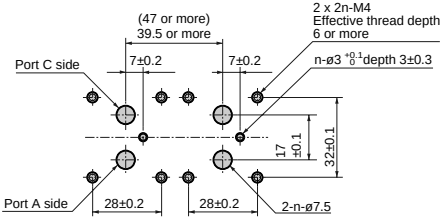


* Lead wire length 300 mm



Model no.	B
GAG432-4 to 5	86.5
GAG433-4 to 5	90

● Recommended dimensions for actuator mounting



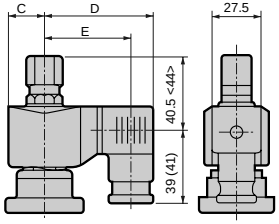
■ Machining drawing when using 2 actuators

Optional dimensions: GAG432/GAG433 Series

CAD

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

● DIN terminal box
GAG43*-4 to 5-0 to 10-* 2E / 2G / 2H

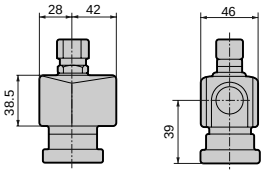


Dimensions shown in < > are for Rc3/8.

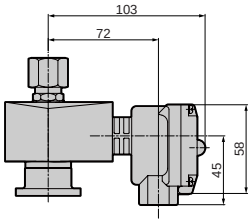
Dimensions shown in ( ) are for G1/2.

Voltage	C	D	E
AC	23.5	65.5	54 (53.5)
DC	23.5	66	54.5 (54)

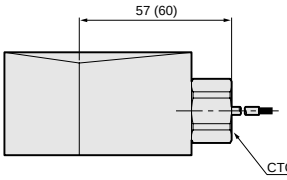
● Open frame lead wire type
GAG43*-4 to 5-0 to 10-* 3A / 4A / 5A



● Open frame type + HP terminal box
GAG43*-4 to 5-0 to 10-* 3 / 5 M / N / I / J 4M / 4N

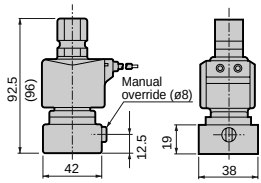


● Open frame type + conduit
GAG43*-4 to 5-0 to 10-* 3A / 4A / 5A G / H



Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAG43*-4 to 5-0 to 10-***A



Dimensions shown in ( ) are for GAG433.

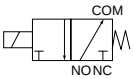
Discrete direct acting 3 port solenoid valve
(general purpose valve)

AG34/AG44 Series

- NO pressurization type
- Port size: Rc1/8, Rc1/4, Rc3/8

JIS symbol

- AG34/44: NO pressurization type



Common specifications

Item	Standard specifications	Optional specifications
Working fluid	Airflow, low vacuum (1.33 x 10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water
Working pressure differential range MPa	0 to 1.5 (refer to max. working pressure differential in individual specifications.)	
Max. working pressure MPa	1.5	
Withstanding pressure (water) MPa	25	
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90
Ambient temperature ˚C	-20 to 60	-20 to 100
Heat proof class	B	H
Atmosphere	Place free of corrosive gas and explosive gas	
Valve structure	Direct acting poppet structure	
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)	
Mounting attitude	Free	
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber

Note 1: No freezing

Individual specifications

Item / Model no.	Port size	Orifice (mm)		Max. working pressure differential (MPa)						Rated voltage	Apparent power (VA)				Power consumption (W)	
				Air		Water, hot water, kerosene		Oil (50 mm^2/s)			Holding		Starting		AC	DC
		TOP	BODY	AC	DC	AC	DC	AC	DC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz	
AG34-01-1	Rc1/8	1.5	1.5	1.0	1.0	1.0	1.0	1.0	0.7	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	14	11	20	16	6/4.2	11 (8.1)
-01-2		2.0	2.0	0.7	0.45	0.7	0.6 (0.45)	0.3	0.2							
-02-1	Rc1/4	1.5	1.5	1.0	1.0	1.0	1.0	1.0	0.7							
-02-2		2.0	2.0	0.7	0.45	0.7	0.6 (0.45)	0.3	0.2							
AG44-02-1	Rc1/4	2.0	2.0	1.2	0.75	1.5	1.0	1.0	0.45		22	17	35	27	8.3/6.2	11 (10.4)
-02-3		2.0	3.0	1.2	0.75	1.5	0.9	1.0	0.45							
-02-4		3.0	3.0	0.4	0.3 (0.25)	0.5	0.3	0.3	0.2 (0.15)							
-03-1	Rc3/8	2.0	2.0	1.2	0.75	1.5	1.0	1.0	0.45							
-03-3		2.0	3.0	1.2	0.75	1.5	0.9	1.0	0.45							
-03-4		3.0	3.0	0.4	0.3 (0.25)	0.5	0.3	0.3	0.2 (0.15)							

*1: The model numbers above show the basic port size (Rc) and orifice diameter. 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 must be within ±10% of the rated voltage.
*4: Values in ( ) are for the type with DIN terminal box and DC voltage specifications.
*5: When using with a low vacuum, vacuum the NC port side.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber	
Coil (heat proof class)	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)			

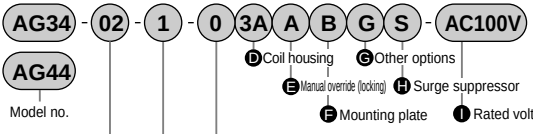
Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)		Flow characteristics					
				C [dm³/(s·bar)]		b		Cv flow factor	
		TOP	BODY	TOP	BODY	TOP	BODY	TOP	BODY
AG34-01-1	Rc1/8	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-01-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-02-1	Rc1/4	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-02-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
AG44-02-1	Rc1/4	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-02-3		2.0	3.0	0.53	1.1	0.54	0.52	0.15	0.31
-02-4		3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31
-03-1	Rc3/8	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-03-3		2.0	3.0	0.53	1.1	0.54	0.52	0.15	0.31
-03-4		3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31

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

How to order



Ⓐ Port size

Symbol	Descriptions	Symbol	Descriptions	Symbol	Descriptions	Model no. AG34	Model no. AG44
01	Rc1/8	**1G**	G 1/8	**1N**	1/8NPT	●	
02	Rc1/4	**2G**	G 1/4	**2N**	1/4NPT	●	●
03	Rc3/8	**3G**	G 3/8	**3N**	3/8NPT		●

Ⓑ Orifice

	AG34		AG44			
	TOP	BODY	TOP	BODY		
1	ø1.5	ø1.5	ø2.0	ø2.0	●	●
2	ø2.0	ø2.0	–	–	●	
3	–	–	ø2.0	ø3.0		●
4	–	–	ø3.0	ø3.0		●

Ⓒ Body/sealant combination

		Body	Sealant	Treatment	Remarks		
Blank	Spec.	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
B			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
D		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)	●	●
H	Option	Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)	●	●
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)	●	●
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)	●	●

*1
*2
*3
*4

Refer to page 36 in the Introduction for details on the material combinations.

Ⓓ to Ⓘ

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.

<Example 1 of model number>

AG34-1G-1-AC100V
Model no.: AG34

Ⓐ Port size: G 1/8
Ⓑ Orifice: TOP - ø1.5, BODY - ø1.5
Ⓒ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ to Ⓗ: Blank
Ⓘ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

<Example 2 of model number>

AG44-03-4-000ABS-AC100V
Model no.: AG44

Ⓐ Port size: Rc3/8
Ⓑ Orifice: TOP - ø3.0, BODY - ø3.0
Ⓒ Body/sealant combination:
Body - bronze, sealant - nitrile rubber
Ⓓ Coil housing: Grommet lead wire
Ⓔ Manual override (locking):
Selected
Ⓕ Mounting plate: Selected
Ⓖ Other options: Blank
Ⓗ Surge suppressor: Selected
Ⓘ Rated voltage: 100 VAC 50/60Hz, 110 VAC 60Hz

⚠ Note on model no. selection

Note on Ⓒ

*1: Leave blank for standard. However, to select options in Ⓓ to Ⓕ, indicate 0 for Ⓒ.
*2: When 4A, 4M or 4N is selected for Ⓒ.
*3: The ethylene propylene diene rubber seal combination (Ⓒ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)
*4: Even if nitrile rubber is selected for the sealant, the NO side sealant will be fluoro rubber.

For Ⓓ to Ⓘ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓔ to Ⓗ are not required, no symbol is indicated.

Ⓓ Coil housing				Ⓔ	Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Descriptions				Manual override (locking)	Mounting plate	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Descriptions
						A-15a	A-15b	A-15c	CTC19	G1/2		
Blank	Std.	Grommet lead wire		**A**	**B**						**S**	100 VAC, 200 VAC
2E		DIN terminal box	(G1/2)									100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
2G		DIN terminal box	(Pg11)									
2H		DIN terminal box + small light	(Pg11)							**H**		100 VAC, 200 VAC, 24 VDC
3A	Option	Open frame type	Lead wire	**A**	**B**				**G**	**H**	**S**	100 VAC, 200 VAC 12 VDC, 24 VDC, 48 VDC, 100 VDC
3M			HP terminal box (G1/2)			**D**	**E**	**F**				
3N			HP terminal box + light (G1/2)									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 terminal box + light (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H)	Lead wire	**A**	**B**	**D**	**E**	**F**	**G**	**H**	**S**	100 VAC, 200 VAC
4M			HP terminal box (G1/2)									
4N			HP terminal box + light (G1/2)									
5A		Open frame type (diode integrated)	Lead wire	**A**	**B**	**D**	**E**	**F**	**G**	**H**		100 VAC, 200 VAC
5M			HP terminal box (G1/2)									
5N			HP terminal box + light (G1/2)									
5I			HP terminal box (IP65 or equivalent) (G1/2)									
5J			HP terminal box + light (IP65 or equivalent) (G1/2)									

⚠ Refer to the following precautions for Ⓓ to Ⓘ.

Blank		● Grommet lead wire 300 mm
2E 2G 2H		● DIN terminal box
3A 4A 5A		● Open frame type grommet lead wire 300 mm ● 4A (heat proof class H) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (heat proof class 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 122 for coil selection.

⚠ Note on model no. selection

Note on Ⓓ

*5: Leave blank for the standard coil housing. However, to select options in Ⓔ to Ⓗ, indicate 00 for Ⓗ.
*6: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*7: A DC coil for steam is available for AG44. Contact CKD for more information.

Note on Ⓔ to Ⓗ

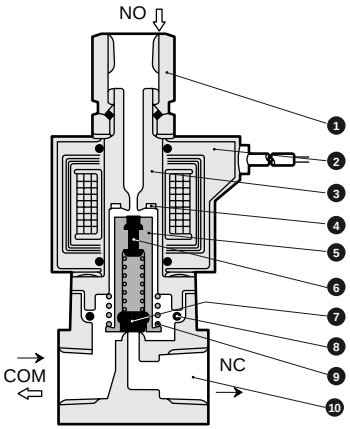
*8: Select one among D, E, F, G and H for Ⓖ.
*9: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*10: As standard, the surge suppressor is incorporated in the coil with diode and the 24 VDC coil (Ⓓ 2H), so the surge suppressor symbol S cannot be selected.
*11: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that the tropicalization is not available when the manual override option A is selected.

Note on Ⓘ

*12: 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. Note that the coils Ⓓ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*13: For voltages other than above, consult with CKD.
*14: 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.

Internal structure and parts list

● AG34/AG44 Series



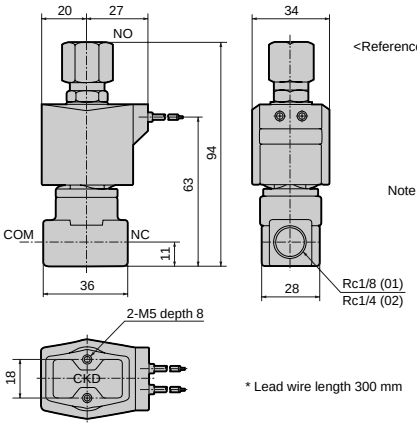
No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	NO valve sealant	FKM (FKM, EPDM)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber
7	NC valve sealant	NBR (FKM, EPDM)	
8	O ring	NBR (FKM, EPDM) (size: AS568-019)	
9	Plunger spring	SUS304	Stainless steel
10	Body	C3771 (SUS303)	Brass (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.
*2: ( ) shows option.

Dimensions: AG34 Series

CAD

● Grommet lead wire type
AG34-01/02-1 to 2



<Reference> As the JIS symbol flow shows, this is dedicated for NO port pressurization. Pressure cannot be applied from the other connection ports.
When de-energized:
NO → COM
When energized:
COM → NC

Note 1: The dimensions are the same for the G or NPT thread port size.

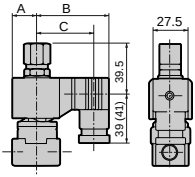
* Lead wire length 300 mm

Optional dimensions: AG34 Series

CAD

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

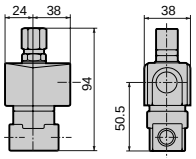
● DIN terminal box
AG34-01/02-1 to 2-* [2E / 2G / 2H]



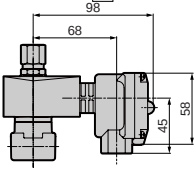
Dimensions shown in ( ) are for G1/2.

Voltage	A	B	C
AC	20	62	50.5 (50)
DC	21	63.5	52 (51.5)

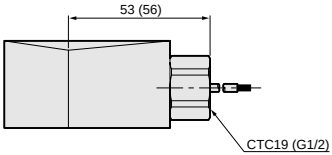
● Open frame lead wire type
AG34-01/02-1 to 2-* [3A / 4A / 5A]



● Open frame type + HP terminal box
AG34-01/02-1 to 2-* [3 / 5] [M / N / I / J] [4M / 4N]

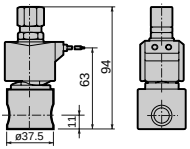


● Open frame type + conduit
AG34-01/02-1 to 2-* [3A / 4A / 5A] [G / H]

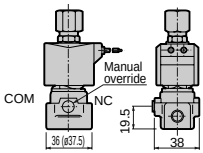


Dimensions shown in ( ) are for G1/2.

● Stainless steel body
AG34-01/02-1 to 2-[D/E/R/L/M]

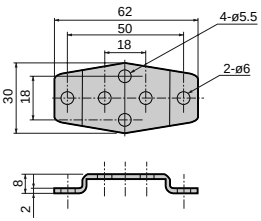


● Manual override (locking)
AG34-01/02-1 to 2-***[A]
Figure shows the brass body.



Dimensions shown in ( ) are for stainless steel body.

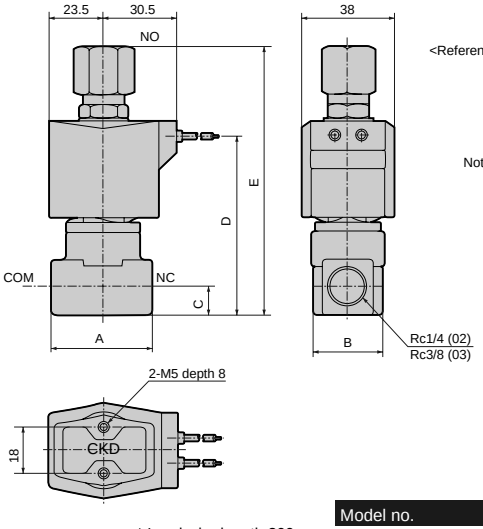
● Mounting plate
AG34-01/02-1 to 2-***[B]



Mounting plate No. 1 GE-100106

Dimensions: AG44 Series

● Grommet lead wire type
AG44-02/03-1/3/4



<Reference> As the JIS symbol flow shows, this is dedicated for NO port pressurization. Pressure cannot be applied from the other connection ports.
When de-energized: NO → COM
When energized: COM → NC

Note 1: The dimensions are the same for the G or NPT thread port size.

* Lead wire length 300 mm

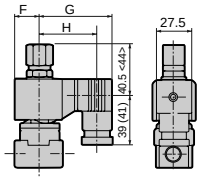
Model no.	A	B	C	D	E
AG44-02-1 to 4	36	28	11	68	99.5
AG44-03-1 to 4	40	28	12	71	106

Optional dimensions: AG44 Series

CAD

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

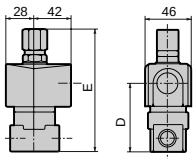
● DIN terminal box
AG44-02/03-1/3/4-* 2E / 2G / 2H



Dimensions shown in < > are for Rc3/8. Dimensions shown in ( ) are for G1/2.

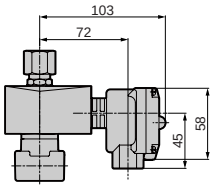
Voltage	F	G	H
AC	23.5	65.5	54 (53.5)
DC	23.5	66	54.5 (54)

● Open frame lead wire type
AG44-02/03-1/3/4-* 3A / 4A / 5A

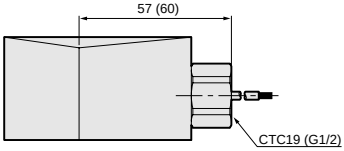


Model no.	D	E
AG44-02-1 to 4- A**	52.0	99.5
AG44-03-1 to 4- A**	55.0	106

● Open frame type + HP terminal box
AG44-02/03-1/3/4-* 3 / 5 M / N / I / J 4M / 4N

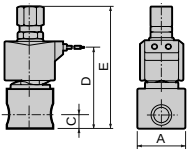


● Open frame type + conduit
AG44-02/03-1/3/4-* 3A / 4A / 5A G / H



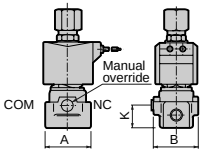
Dimensions shown in ( ) are for G1/2.

● Stainless steel body
AG44-02/03-1 to 4-D/E/L/M/R



Model no.	A	C	D	E
AG44-02-1 to 4-*	ø37.5	11	68	99.5
AG44-03-1 to 4-*	ø45	12	71	106

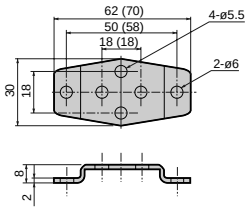
● Manual override (locking)
AG44-02/03-1 to 4-*** A
Figure shows the brass body.



Model no.	A	B	K
AG44-02-1 to 4-*A**	36 (ø37.5)	38	19.5
AG44-03-1 to 4-*A**	40 (ø45.0)	40	22.5

Dimensions shown in ( ) are for stainless steel body.

● Mounting plate
AG44-02/03-1 to 4-***B



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

Code	Applicable model
Mounting plate No. 1 GE-100106	● AG44-02/03-1 to 4 Series ● Stainless steel body AG44-02-1 to 4-D/E/L/M/R
Mounting plate No. 2 GE-100159	● Stainless steel body AG44-03-1 to 4-D/E/L/M/R

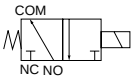
Direct acting 3 port solenoid valve, actuator (general purpose valve)

GAG34*/GAG44* Series

● NO pressurization type

JIS symbol

● GAG34*/44*: NO pressurization type



Common specifications

Item	Standard specifications	Optional specifications
Working fluid	Airflow, low vacuum (1.33×10^2 Pa (abs)), water, kerosene, oil (50 mm^2/s or less)	Hot water
Working pressure differential range MPa	0 to 1.5 (refer to max. working pressure differential in individual specifications.)	
Max. working pressure MPa	1.5	
Withstanding pressure (water) MPa	10	
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90
Ambient temperature ˚C	-20 to 60	-20 to 100
Heat proof class	B	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)	
Mounting attitude	Free	
Body, sealant	Brass, nitrile rubber	Brass, ethylene propylene diene rubber

Note 1: No freezing

Individual specifications

Item / Model no.	NO port size	Orifice (mm) TOP	Orifice (mm) BODY	Max. working pressure differential (MPa) Air AC	Air DC	Water, hot water, kerosene AC	Water, hot water, kerosene DC	Oil (50 mm^2/s) AC	Oil (50 mm^2/s) DC	Rated voltage	Apparent power (VA) Holding 50 Hz	Holding 60 Hz	Starting 50 Hz	Starting 60 Hz	Power consumption (W) AC 50/60 Hz	Power consumption (W) DC
GAG341-1	Rc1/8	1.5	1.5	1.0	1.0	1.0	1.0	1.0	0.7	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz 12 VDC 24 VDC 48 VDC 100 VDC	14	11	20	16	6/4.2	11 (8.1)
-2		2.0	2.0	0.7	0.45	0.7	0.6 (0.45)	0.3	0.2							
GAG342-1	Rc1/4	1.5	1.5	1.0	1.0	1.0	1.0	1.0	0.7							
-2		2.0	2.0	0.7	0.45	0.7	0.6 (0.45)	0.3	0.2							
GAG442-1	Rc1/4	2.0	2.0	1.2	0.75	1.5	1.0	1.0	0.45		22	17	35	27	8.3/6.2	11 (10.4)
-3		2.0	3.0	1.2	0.75	1.5	0.9	1.0	0.45							
-4		3.0	3.0	0.4	0.3 (0.25)	0.5	0.3	0.3	0.2 (0.15)							
GAG443-1	Rc3/8	2.0	2.0	1.2	0.75	1.5	1.0	1.0	0.45							
-3		2.0	3.0	1.2	0.75	1.5	0.9	1.0	0.45							
-4		3.0	3.0	0.4	0.3 (0.25)	0.5	0.3	0.3	0.2 (0.15)							

*1: The model numbers above show the basic NO port size (Rc) and orifice diameter. 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 must be within ±10% of the rated voltage.
*4: Values in ( ) are for the type with DIN terminal box and DC voltage specifications.
*5: When using with a low vacuum, vacuum the NC port side.

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

Sealant	Fluoro rubber		Ethylene propylene diene rubber	
Coil (heat proof class)	B	H	B	H
Fluid temperature (Note 1) ˚C	-10 to 60	-10 to 90	-10 to 60	-10 to 90
Ambient temperature ˚C	-20 to 60	-20 to 100 (Note 2)	-20 to 60	-20 to 100 (Note 2)
Valve seat leakage cm³/min. (ANR)	0.2 or less (air)			

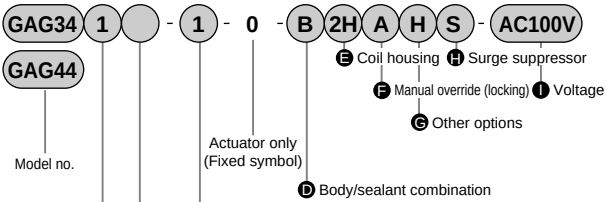
Note 1: No freezing
Note 2: The range is -20 to 80˚C when using the HP terminal box with indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)		Flow characteristics					
				C [dm³/(s·bar)]		b		Cv flow factor	
		TOP	BODY	TOP	BODY	TOP	BODY	TOP	BODY
GAG341-1	Rc1/8	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
GAG342-1	Rc1/4	1.5	1.5	0.29	0.29	0.64	0.53	0.09	0.09
-2		2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
GAG442-1	Rc1/4	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-3		2.0	3.0	0.53	1.1	0.54	0.52	0.15	0.31
-4		3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31
GAG443-1	Rc3/8	2.0	2.0	0.53	0.53	0.54	0.52	0.15	0.15
-3		2.0	3.0	0.53	1.1	0.54	0.52	0.15	0.31
-4		3.0	3.0	1.1	1.1	0.72	0.52	0.31	0.31

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

How to order



Symbol	Descriptions	Model no. GAG34*	Model no. GAG44*
A NO port size			
1	1/8	●	
2	1/4	●	●
3	3/8		●
B Type of thread			
Blank	Rc	●	●
G	G	●	●
N	NPT	●	●

C Orifice

	GAG34*		GAG44*			
	TOP	BODY	TOP	BODY		
1	ø1.5	ø1.5	ø2.0	ø2.0	●	●
2	ø2.0	ø2.0	–	–	●	
3	–	–	ø2.0	ø3.0		●
4	–	–	ø3.0	ø3.0		●

D Body/sealant combination

		Body	Sealant	Treatment	Remarks		
Blank	Std.	Brass	Nitrile rubber	–	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
B			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
D	Option	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)	●	●
H		Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60˚C)	●	●
J			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
P			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)	●	●
L		Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60˚C)	●	●
M			Fluoro rubber		Air, low vacuum, kerosene (up to 90˚C *2)	●	●
R			Ethylene propylene diene rubber		Hot water (up to 90˚C *2)	●	●

Refer to page 36 in the Introduction for details on the 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.

<Example 1 of model number>

GAG341-1-0-AC200V
Model no.: GAG341

- A NO port size: 1/8
- B Type of thread: Rc
- C Orifice: TOP - ø1.5, BODY - ø1.5
- D Body/sealant combination: Body - bronze, sealant - nitrile rubber
- E Coil housing: Grommet lead wire
- F to H: Blank
- I Voltage: 200 VAC 50/60Hz, 220 VAC 60Hz

<Example 2 of model number>

GAG342G-2-0-000AS-AC200V
Model no.: GAG342

- A NO port size: 1/4
- B Type of thread: G
- C Orifice: TOP - ø2.0, BODY - ø2.0
- D Body/sealant combination: Body - bronze, sealant - nitrile rubber
- E Coil housing: Grommet lead wire
- F Manual override (locking): Selected
- G Other options: Blank
- H Surge suppressor: Selected
- I Voltage: 200 VAC 50/60Hz, 220 VAC 60Hz

⚠ Note on model no. selection

Note on D

*1: Leave blank for standard. However, to select options in E to H, indicate 0 for C.
*2: When 4A, 4M or 4N is selected for D.
*3: The ethylene propylene diene rubber seal combination (D P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)
*4: Even when nitrile rubber is selected for the sealant, the NO side sealant is fluoro rubber.

For Ⓔ to Ⓘ, the combinations indicated with symbols can be manufactured.
Note that if options Ⓕ to Ⓗ are not required, no symbol is indicated.

Ⓔ Coil housing				Ⓕ	Ⓖ Other options					Ⓗ	Ⓘ Rated voltage
Descriptions				Manual override (locking)	Cable gland (Marine cable gland)			Conduit (Conduit pipe)		Surge suppressor	Descriptions
					A-15a	A-15b	A-15c	CTC19	G1/2		
Blank	Std.	Grommet lead wire		**A**						**S**	100 VAC, 200 VAC
2E		DIN terminal box	(G1/2)								100 VAC, 200 VAC
2G		DIN terminal box	(Pg11)								12 VDC, 24 VDC, 48 VDC, 100 VDC
2H		DIN terminal box + small light	(Pg11)						**H**		100 VAC, 200 VAC, 24 VDC
3A	Option	Open frame type	Lead wire	**A**				**G**	**H**	**S**	100 VAC, 200 VAC
3M			HP terminal box (G1/2)								12 VDC, 24 VDC, 48 VDC, 100 VDC
3N			HP terminal box + light (G1/2)		**D**	**E**	**F**				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 terminal box + light (IP65 or equivalent) (G1/2)								100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame type (heat proof class H)	Lead wire	**A**				**G**	**H**	**S**	100 VAC, 200 VAC
4M			HP terminal box (G1/2)		**D**	**E**	**F**				
4N			HP terminal box + light (G1/2)								
5A		Open frame type (diode integrated)	Lead wire	**A**				**G**	**H**		100 VAC, 200 VAC
5M			HP terminal box (G1/2)		**D**	**E**	**F**				
5N			HP terminal box + light (G1/2)								
5I			HP terminal box (IP65 or equivalent) (G1/2)								
5J			HP terminal box + light (IP65 or equivalent) (G1/2)								

⚠ Refer to the following precautions for Ⓔ to Ⓘ.

Blank		● Grommet lead wire 300 mm
2E 2G 2H		● DIN terminal box
3A 4A 5A		● Open frame type grommet lead wire 300 mm ● 4A (heat proof class H) ● 5A (diode integrated)
3M 3N 4M 4N 5M 5N		● Open frame HP terminal box ● 4M, 4N (heat proof class 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 122 for coil selection.

⚠ Note on model no. selection

Note on Ⓔ

*5: Leave blank for the standard coil housing. However, to select options in Ⓕ, Ⓖ or Ⓗ, indicate 00 for Ⓔ.
*6: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
*7: A DC coil for steam is available for GAG44. Contact CKD for more information.

Note on Ⓕ to Ⓗ

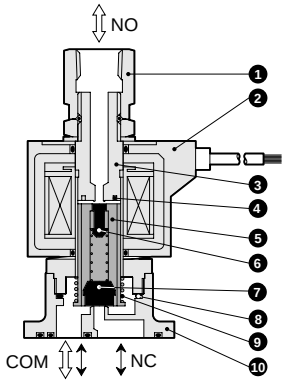
*8: Select one among D, E, F, G and H for Ⓖ.
*9: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*10: As standard, the surge suppressor is incorporated in the coil with diode and the 24 VDC coil (Ⓔ 2H), so the surge suppressor symbol S cannot be selected.
*11: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that the tropicalization is not available when the manual override option A is selected.

Note on Ⓘ

*12: 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. Note that the coils Ⓔ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*13: For voltages other than above, consult with CKD.
*14: 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.

Internal structure and parts list

● GAG34*/GAG44* Actuator



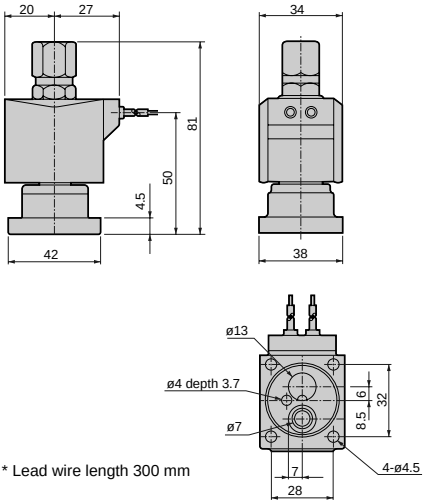
No.	Parts name	Material	
1	Socket	C3604 (SUS303)	Brass (stainless steel)
2	Coil	—	—
3	Core assembly	SUS405 or equivalent, 316L, 403 *1	Stainless steel
4	Shading coil	Cu (Ag when stainless steel body)	Copper (silver for stainless steel body)
5	Plunger	SUS405 or equivalent	Stainless steel
6	NO valve sealant	FKM (FKM, EPDM)	NBR: Nitrile rubber FKM: Fluoro rubber EPDM: Ethylene propylene diene rubber
7	NC valve sealant	NBR (FKM, EPDM)	
8	O ring	NBR (FKM, EPDM) (size: AS568-019)	
9	Plunger spring	SUS304	Stainless steel
10	Body	C3771 (SUS303)	Brass (stainless steel)

*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.
*2: ( ) shows option.

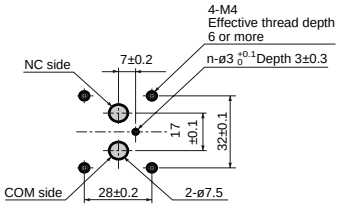
Dimensions: GAG341/GAG342 Series

CAD

● Actuator (grommet lead wire type)
GAG34*-1 to 2-0



● Recommended dimensions for actuator mounting

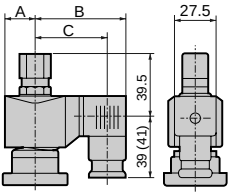


Optional dimensions: GAG341/GAG342 Series

CAD

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

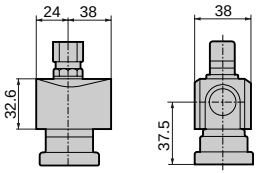
● DIN terminal box
GAG34*-1 to 2-0-* [2E / 2G / 2H]



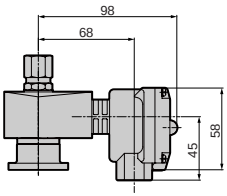
Dimensions shown in ( ) are for G1/2.

Voltage	A	B	C
AC	20	62	50.5 (50)
DC	21	63.5	52 (51.5)

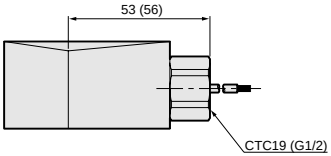
● Open frame lead wire type
GAG34*-1 to 2-0-* [3A / 4A / 5A]



● Open frame type + HP terminal box
GAG34*-1 to 2-0-* [3 / 4 / 5] [M / N]

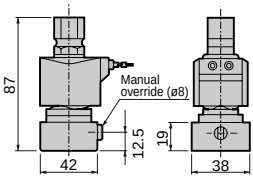


● Open frame type + conduit
GAG34*-1 to 2-0-* [3A / 4A / 5A] [G / H]



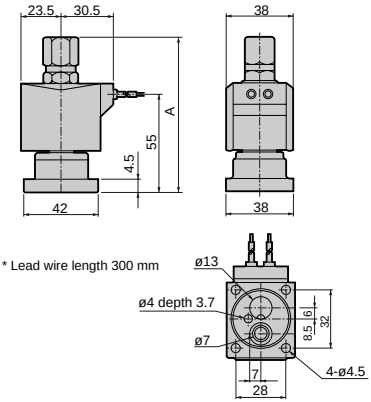
Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAG34*-1 to 2-0-***[A]

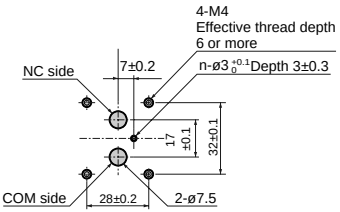


Dimensions: GAG442/GAG443 Series

● Actuator (grommet lead wire type)
GAG44*-1/3/4-0



● Recommended dimensions for actuator mounting



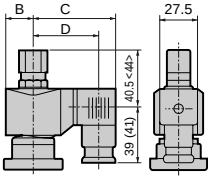
Model no.	A
GAG442-1/3/4	86.5
GAG443-1/3/4	90

Optional dimensions: GAG442/GAG443 Series

CAD

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

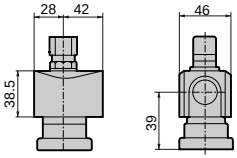
● DIN terminal box
GAG44*-1/3/4-0-* 2E / 2G / 2H



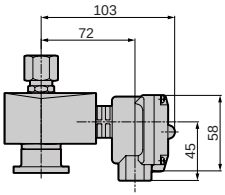
Dimensions shown in ( ) are for G1/2. Dimensions shown in < > are for Rc3/8.

Voltage	B	C	D
AC	23.5	65.5	54 (53.5)
DC	23.5	66	54.5 (54)

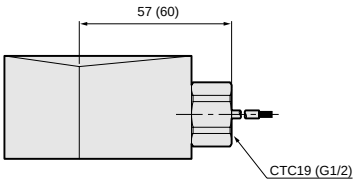
● Open frame lead wire type
GAG44*-1/3/4-0-* 3A / 4A / 5A



● Open frame type + HP terminal box
GAG44*-1/3/4-0-* 3 / 4 / 5 M / N

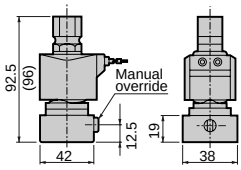


● Open frame type + conduit
GAG44*-1/3/4-0-* 3A / 4A / 5A G / H



Dimensions shown in ( ) are for G1/2.

● Manual override (locking)
GAG44*-1/3/4-0-***A



Dimension shown in ( ) is for G1/2.