



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

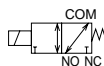
AG31/AG41 Series

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



JIS symbol

- AG31/41: Universal type



Common specifications

Item	Standard specifications	Optional specifications	
Working fluid	Airflow, low vacuum (1.33 x 10 ⁵ 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		
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)							Rated voltage	Apparent power (VA)				Power consumption (W)		Weight (kg)
				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	DC	
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
		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							
-01-2	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	22	17	35	27	8.3/6.2	11 (10.4)	0.45
		2.0	2.0	0.4	0.4 (0.35)	0.4	0.4	0.25	0.2 (0.15)	0.4	220 VAC 60 Hz							
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	12 VDC 24 VDC 48 VDC 100 VDC	22	17	35	27	8.3/6.2	11 (10.4)	0.48
		2.3	2.3	0.7	0.4 (0.25)	0.7	0.4	0.25	0.15 (0.1)	0.7								
-02-2	Rc3/8	2.0	2.0	1.0	0.7 (0.45)	1.0	0.7	0.4	0.3 (0.25)	1.0	12 VDC 24 VDC 48 VDC 100 VDC	22	17	35	27	8.3/6.2	11 (10.4)	0.48
		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	
	B	H	B	H	B	H
Coil (heat proof class)						
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 <small>cm³/min. (ANR)</small>	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 [dm ³ /(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
-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

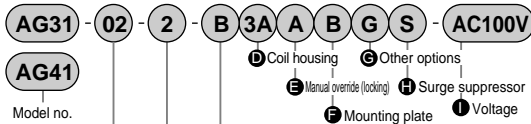
*1: Effective sectional area S and sonic conductance C are converted as $S = 5.0 \times C$.

HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/
AD
APK/
ADK
For
dry air
Explosion
proof
HVB/
HVL
SAB/
SVB
NP/NAP/
NVP
CHB/G
MXB/G
Other G.P.
systems
PD/FAD/
PJ
CVE/
CVSE
CPE/
CPD
Medical
analysis
Custom
order

General purpose valve
Direct acting 3 Port solenoid valve

AG31/41 Series

How to order



Model no.	
AG31	AG41

Symbol	Descriptions	Symbol	Descriptions	Symbol	Descriptions		
A 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		●

B 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	●	●

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

C Body/sealant combination							
	Body	Sealant	Treatment	Remarks			
Blank	Brass	Nitrile rubber	-	Air, water, low vacuum, kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *2)	●	●	
		PTFE		Steam (up to 184°C *2)	●	●	
		Fluoro rubber		Vacuum inspection	Medium vacuum	●	●
D	Stainless steel	Nitrile rubber	-	Air, water, low vacuum, kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *2)	●	●	
		PTFE		Steam (up to 184°C *2)	●	●	
		Fluoro rubber		Vacuum inspection	Medium vacuum	●	●
H	Brass	Nitrile rubber	Oil free	Air, water, low vacuum, kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *2)	●	●	
		PTFE		Steam (up to 184°C *2)	●	●	
		Ethylene propylene diene rubber		Hot water (up to 90°C *2)	●	●	
	Stainless steel	Nitrile rubber		Air, water, low vacuum, kerosene (up to 60°C)	●	●	
		Fluoro rubber		Air, low vacuum, kerosene (up to 90°C *2)	●	●	
		PTFE		Steam (up to 184°C *2)	●	●	
		Ethylene propylene diene rubber		Hot water (up to 90°C *2)	●	●	

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

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

<Example 1 of model number>

AG31-02-1-AC100V
Model no.: AG31

- A** Port size: Rc1/4
 - B** Orifice: TOP - ø1.5, BODY - ø1.5
 - C** Body/sealant combination: Body - bronze, sealant - nitrile rubber
 - D** Coil housing: Grommet lead wire
 - E to H**: Blank
 - I** Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz
- The combinations indicated with ● in the above table are available.

<Example 2 of model number>

AG41-03-2-000ABS-AC100V
Model no.: AG41

- A** Port size: Rc3/8
- B** Orifice: TOP - ø2.3, BODY - ø2.3
- C** Body/sealant combination: Body - bronze, sealant - nitrile rubber
- D** Coil housing: Grommet lead wire
- E** Manual override (locking): Selected
- F** Mounting plate: Selected
- G** Other options: Blank
- H** Surge suppressor: Selected
- I** Voltage: 100 VAC 50/60Hz, 110 VAC 60Hz






▲ Note on model no. selection

- Note on C**
- *1: Leave blank for standard. However, to select options in **D** to **H**, indicate 0 for **C**.
 - *2: When 4A, 4M or 4N is selected for **C**.
 - *3: The ethylene propylene diene rubber seal combination (**C** 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 ① to ④, the combinations indicated with symbols can be manufactured.
Note that if options ⑤ to ⑧ are not required, no symbol is indicated.

④ Coil housing		⑤	⑥	⑦ Other options			⑧	⑨ 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	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)									100 VAC, 200 VAC, 24 VDC				
3A	Lead wire									G	H	100 VAC, 200 VAC		
3M	Open frame type	A	B						S	12 VDC, 24 VDC, 48 VDC, 100 VDC				
3N										HP terminal box (G1/2)	D	E	F	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I										HP terminal box + light (G1/2)	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC			
3J										HP terminal box (IP65 or equivalent) (G1/2)	100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC			
3J	HP 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)	A	B				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)	A	B				G		H	S	100 VAC, 200 VAC			
5M												Lead wire		
5N												HP terminal box (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 ④ to ⑩.

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)
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▲ Note on model no. selection

Note on ④

- *5: Leave blank for the standard coil housing. However, to select options in ⑤ to ⑧, indicate 00 for ④.
- *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 ⑤ to ⑩

- *8: When ④ is C, F, K, N, V or W, the manual override (⑤ A) is not available.
- *9: Select one among D, E, F, G and H for ⑥.
- *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 (④ 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 ⑨

- *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 ④ 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.

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
AD

APK/
ADK

For
dry air

Explosion
proof

HVB/
HVL

SAB/
SVB

NP/NAP/
NVP

CHB/G

MXB/G

Other G.P.
systems

PD/FAD/
PJ

CVE/
CVSE

CPE/
CPD

Medical
analysis

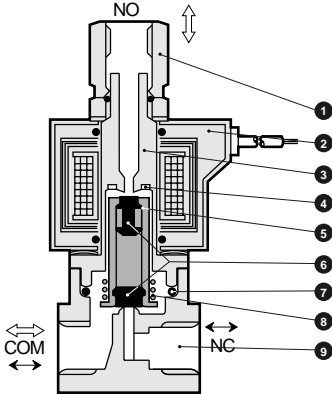
Custom
order

General purpose valve
Direct acting 3 Port Solenoid valve

AG31/41 Series

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
7	O ring	NBR (FKM, EPDM, PTFE) (AS568/019) EPDM: Ethylene propylene diene rubber PTFE: Tetrafluoroethylene resin
8	Plunger spring	SUS304 Stainless steel
9	Body	C3771 (SUS303) Brass (stainless steel)

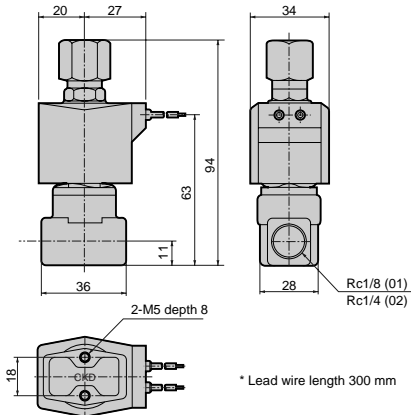
*1: When the body/sealant combination symbol is other than blank or H, the material is SUS405 or equivalent, 316L, 430.

*2: () shows option.

Dimensions: AG31 Series



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

* Lead wire length 300 mm

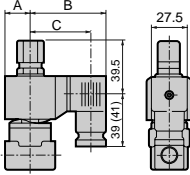
Optional dimensions: AG31 Series



* 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}

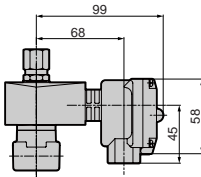


Dimensions shown in () are for G1/2.

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

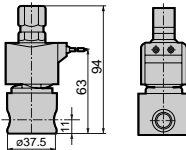
● Open frame type + HP terminal box

AG31-01/02-1 to 2-³ M
⁵ N | ^{4M}
| ^{4N}
J



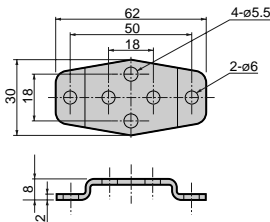
● Stainless steel body

AG31-01/02-1 to 2-^{D/E/F/R/W/L/M/N}



● Mounting plate

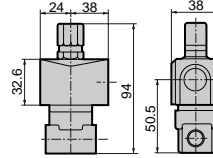
AG31-01/02-1 to 2-^{***} ^B



Mounting plate No. 1 GE-100106

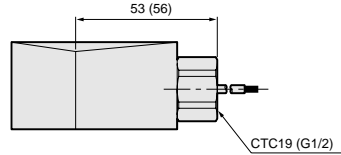
● Open frame type

AG31-01/02-1 to 2-^{3A}
^{4A}
^{5A}



● Open frame type + conduit

AG31-01/02-1 to 2-^{3A} G
^{4A} H
^{5A}

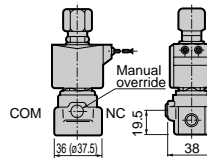


Dimensions shown in () are for G1/2.

● Manual override (locking)

AG31-01/02-1 to 2-^{***} ^A

Figure shows the brass body.



Dimensions shown in () are for stainless steel body.

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
AD

APK/
ADK

For
dry air

Explosion
proof

HVB/
HVL

SAB/
SVB

NP/NAP/
NVP

CHB/G

MXB/G

Other G.P.
systems

PD/FAD/
PJ

CVB/
CVSE

CPE/
CPD

Medical
analysis

Custom
order

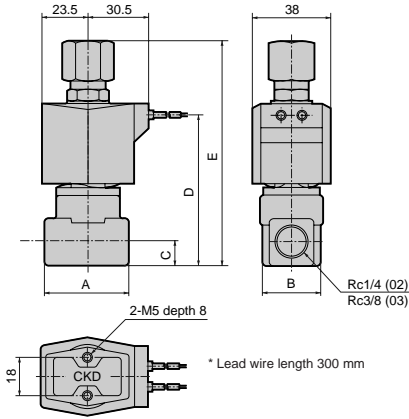
General purpose valve
Direct acting 3 Port solenoid valve

AG31/41 Series

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

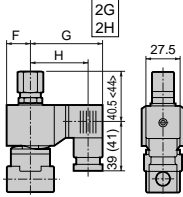
Optional dimensions: AG41 Series



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

● DIN terminal box

AG41-02/03-1 to 2-*

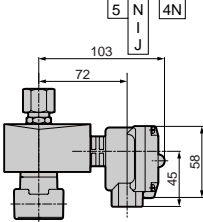


Dimensions shown in <> are for Rc3/8. Dimensions shown in () are for G1/2.

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

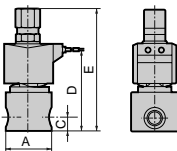
● Open frame type + HP terminal box

AG41-02/03-1 to 2-*



● Stainless steel body

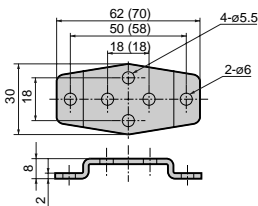
AG41-02/03-1 to 7-D/E/F/R/W/L/M/N



Model no.	A	C	D	E
AG41-02-1 to 2-*	∅37.5	11	68	99.5
AG41-03-1 to 2-*	∅45	12	71	106

● Mounting plate

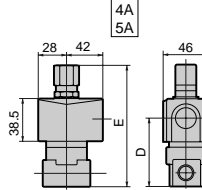
AG41-02/03-1 to 2-***B



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

● Open frame lead wire type

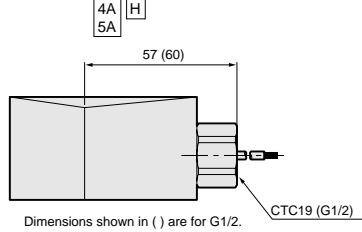
AG41-02/03-1 to 2-*



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

● Open frame type + conduit

AG41-02/03-1 to 2-*

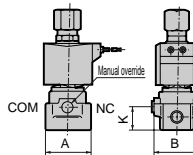


Dimensions shown in () are for G1/2.

● 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 (∅37.5)	38	19.5
AG41-03-1 to 2-***A	40 (∅45.0)	40	22.5

Dimensions shown in () are for stainless steel body.

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

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
AD

APK/
ADK

For
dry air

Explosion
proof

HVB/
HVL

SAB/
SVB

NP/NAP/
NVP

CHB/G

MXB/G

Other G.P.
systems

PD/FAD/
PJ

CVE/
CVSE

CPE/
CPD

Medical
analysis

Custom
order

General purpose valve
Direct acting 3 Port solenoid valve