Pilot operated 2 port solenoid valve
(general purpose valve)

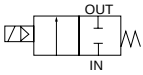
AP11/AP12 Series

- NC (normally closed) type, NO (normally open) type
- Port size: Rc1/4 to Rc1
- Piston structure

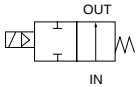
Refer to Ending 17 for more details.

JIS symbol

● AP11: NC (normally closed) type



● AP12: NO (normally open) type



Common specifications

Descriptions	Standard specifications	Optional specifications
Working fluid	Air, water, kerosene, oil (50 mm^2/s or less)	Steam
Working pressure differential range MPa	0.05 to 1.2 (Refer to max. working pressure differential on individual specifications.)	
Max. working pressure MPa	2	1
Withstanding pressure (water) MPa	10	
Fluid temperature (Note 1) ℃	-10 to 60	-10 to 180
Ambient temperature ℃	-20 to 60	-20 to 100
Heat proof class	B	H
Atmosphere	Place free of corrosive gas and explosive gas	
Valve structure	Pilot operated poppet structure, piston structure	
Valve seat leakage (Note 2) cm^3/min. (ANR)	0.2 or less (air)	300 or less (air)
Mounting attitude	Free (within working pressure differential range)	
Body, sealant	Bronze, nitrile rubber	Bronze, PTFE

Note 1: No freezing

Note 2: For AP11 (NC (normally closed)), these values apply at pneumatic pressure 0.05 to 1.2 MPa, and for AP12 (NO (normally open)), these apply at pneumatic pressure 0.05 to 0.9 MPa.

Individual specifications

Descriptions / Model no.	Port size	Orifice (mm)	Min. working pressure diff. (MPa)	Max. working pressure diff. (MPa)							Rated voltage	Apparent power (VA)				Power consumption (W)		Mass (kg)
				Air		Water, kerosene		Oil (50 mm^2/s)		Steam		Holding		Starting		AC	DC	
				AC	DC	AC	DC	AC	DC	AC		50Hz	60Hz	50Hz	60Hz	50/60Hz		
NC (normally closed) type																		
AP11-8A	Rc1/4	10	0.05	1.2	0.9	1.0	0.9	0.9	0.9	1.0	100 VAC 50/60Hz	12	10	17	14	5.2/3.8	11 (8.1)	0.9
AP11-10A	Rc3/8	10		1.2	0.9	1.0	0.9	0.9	0.9	1.0								0.9
AP11-15A	Rc1/2	15		1.2	0.6	1.0	0.6	0.6	0.6	1.0	110 VAC 60Hz	18	15	29	24	6.7/5.7	11 (10.4)	1.4
AP11-20A	Rc3/4	20		1.2	0.6	1.0	0.6	0.6	0.6	1.0								1.8
AP11-25A	Rc1	25		1.2	0.6	1.0	0.6	0.6	0.6	1.0	200 VAC 50/60Hz							2.5
NO (normally open) type																		
AP12-8A	Rc1/4	10	0.05	0.9	0.9	0.9	0.9	0.9	0.9	0.9	220 VAC 60Hz	22	18	35	29	8.7/6.7	15.5 (14)	1.0
AP12-10A	Rc3/8	10		0.9	0.9	0.9	0.9	0.9	0.9	0.9								1.0
AP12-15A	Rc1/2	15		0.5	0.5	0.5	0.5	0.5	0.5	0.5	12 VDC 24 VDC 48 VDC 100 VDC							1.4
AP12-20A	Rc3/4	20		0.5	0.5	0.5	0.5	0.5	0.5	0.5								1.8
AP12-25A	Rc1	25		0.5	0.5	0.5	0.5	0.5	0.5	0.5								2.5

*1: The types above apply up to the basic port size (Rc). Refer to How to order for other combinations.
*2: Refer to column for maximum working pressure differential of AP11 coil with diodes.
*3: Variation of rated voltage should be within ±10%.
*4: The values in ( ) in the power consumption DC column apply for the type with DIN terminal box.

Optional specifications

Sealant	Fluoro rubber		PTFE	
Coil (heat proof class)	B	H	B	H
Fluid temperature (Note 1) ℃	-10 to 60	-10 to 90	-10 to 60	-10 to 180
Ambient temperature ℃	-20 to 60	-20 to 100 (Note 3)	-20 to 60	-20 to 100 (Note 3)
Valve seat leakage (Note 2) cm³/min. (ANR)	0.2 or less (air)		300 or less (air)	

Note 1: No freezing

Note 2: For AP11 (NC (normally closed)), these values apply at pneumatic pressure 0.05 to 1.2 MPa, and for AP12 (NO (normally open)), these apply at pneumatic pressure 0.05 to 0.9 MPa.

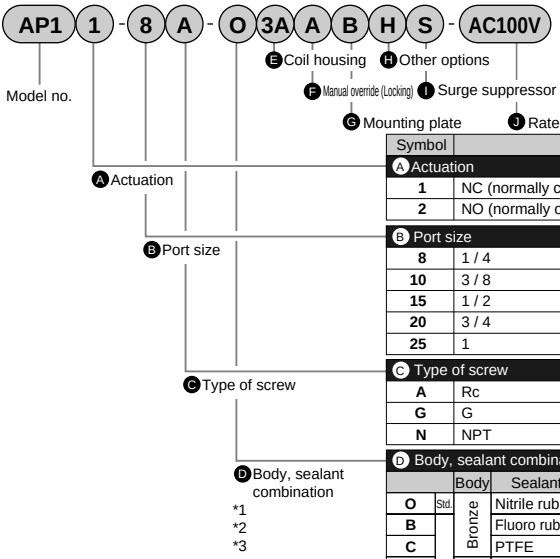
Note 3: The range is -20 to 80℃ when using the square terminal box with an indicator light for the coil housing.

Flow characteristics

Model no.	Port size	Orifice (mm)	Flow characteristics			
			C[dm³/(s·bar)]	b	Cv flow factor	S (mm²)
NC (normally closed) type						
AP11- 8A	Rc 1/4	10	8.1	0.17	1.4	-
AP11-10A	Rc 3/8	10	10	0.19	1.8	-
AP11-15A	Rc 1/2	15	21	0.22	4.5	-
AP11-20A	Rc 3/4	20	-	-	9.3	162
AP11-25A	Rc 1	25	-	-	12.0	231
NO (normally open) type						
AP12- 8A	Rc 1/4	10	8.1	0.17	1.4	-
AP12-10A	Rc 3/8	10	10	0.19	1.8	-
AP12-15A	Rc 1/2	15	21	0.22	4.5	-
AP12-20A	Rc 3/4	20	-	-	9.3	162
AP12-25A	Rc 1	25	-	-	12.0	231

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

How to order



Symbol	Descriptions
A Actuation	
1	NC (normally closed) type
2	NO (normally open) type
B Port size	
8	1 / 4
10	3 / 8
15	1 / 2
20	3 / 4
25	1
C Type of screw	
A	Rc
G	G
N	NPT

D Body, sealant combination

		Body	Sealant	O ring	Treat	Remarks
O	Std.	Bronze	Nitrile rubber	Nitrile rubber	-	Air, water, kerosene, oil (up to 60℃)
B	Option	Bronze	Fluoro rubber	Fluoro rubber	-	Air, kerosene, oil (up to 90℃ *1)
C	Option	Bronze	PTFE	Fluoro rubber	-	Steam (up to 180℃ *1)
D	Option	Stainless steel	Nitrile rubber	Nitrile rubber	-	Air, water, kerosene, oil (up to 60℃)
E	Option	Stainless steel	Fluoro rubber	Fluoro rubber	-	Air, kerosene, oil (up to 90℃ *1)
F	Option	Stainless steel	PTFE	PTFE	-	Steam (up to 180℃ *1)
H	Option	Bronze	Nitrile rubber	Nitrile rubber	Oil-prohibit	Air, water, kerosene, oil (up to 60℃)
J	Option	Bronze	Fluoro rubber	Fluoro rubber	Oil-prohibit	Air, kerosene, oil (up to 90℃ *1)
K	Option	Bronze	PTFE	Fluoro rubber	Oil-prohibit	Steam (up to 180℃ *1)
L	Option	Stainless steel	Nitrile rubber	Nitrile rubber	Oil-prohibit	Air, water, kerosene, oil (up to 60℃)
M	Option	Stainless steel	Fluoro rubber	Fluoro rubber	Oil-prohibit	Air, kerosene, oil (up to 90℃ *1)
N	Option	Stainless steel	PTFE	PTFE	Oil-prohibit	Steam (up to 180℃ *1)

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

E to J

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

<Example 1 of model number>

AP11-15A-03A-AC100V

Series: AP11
A Actuation : NC (normally closed) type
B Port size : 1/2
C Type of thread: Rc
D Body, sealant combination
: Body - bronze, sealant - nitrile rubber
O ring - nitrile rubber
E Coil housing : Open frame lead wire
F to I : Blank
J Rated voltage
:100 VAC 50/60 Hz, 110 VAC 60 Hz

<Example 2 of model number>

AP12-25N-E3KAD-AC200V

Series: AP12
A Actuation : NO (normally open) type
B Port size : 1
C Type of thread : NPT
D Body, sealant combination
: Body - stainless steel, sealant - fluoro rubber
O ring - fluoro rubber
E Coil housing: Open frame square terminal box (G 1/2)
F Manual override (Locking): Selected
G Mounting plate: Blank
H Other options: Cable gland A-15a
I Surge suppressor: Blank
J Rated voltage
: 200 VAC 50/60 Hz, 220 VAC 60 Hz

⚠ Note on model no. selection

Note on (D)

*1: (D): When selecting 4A, 4K, 4H.
*2: When using the valve sealant PTFE with H type coil combinations, an O-ring made of fluoro rubber for steam will be enclosed.
*3: The standard body material for the (B) (port size) 8 (1/4) and 10 (3/8) is brass.

For (E) to (J), the combinations indicated with symbols can be manufactured.
Note that if the (F) to (I) options 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	CTC 19	G 1 / 2		
3A	Std.	Open frame lead wire		A	B				G	H	S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
2C		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
3K	Option	Open frame type	Square terminal box (G1/2)	A	B	D	E	F			S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3H			Square terminal box + light (G1/2)									100 VAC, 200 VAC, 24 VDC, 100 VDC
3P			Square terminal box (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3Q			Square terminal box + light (IP65 or equivalent) (G1/2)									100 VAC, 200 VAC, 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
4K			Square terminal box (G1/2)									
4H			Square terminal box + light (G1/2)									
5A		Open frame type (Diode integrated)	Lead wire	A	B	D	E	F	G	H		100 VAC, 200 VAC
5K			Square terminal box									
5H			Square terminal box + light									
5P			Square terminal box (IP65 or equivalent) (G1/2)									
5Q			Square terminal box + light (IP65 or equivalent) (G1/2)									

⚠ Refer to the following precautions for (E) to (J).

2C		●Grommet lead wire 300 mm
2E 2G 2H		●DIN terminal box
3A 4A 5A		●Open frame Grommet lead wire 300 mm ●4A (Heat proof class H) ●5A (Diode integrated)
3K 3H 4K 4H 5K 5H		●Open frame square terminal box ●4K, 4H (Heat proof class H) ●5K, 5H (Diode integrated)
3P 3Q 5P 5Q		●Open frame square terminal box (IP65 or equivalent) ●5P, 5Q (Diode integrated)

G H		●Conduit ●G (CTC19) ●H (G1/2)

Refer to page 222 for coil selection.

⚠ Note on model no. selection

Note on (E)

*4: 5A, 5K, 5H, 5P and 5Q are coils which convert AC power to DC with a diode.
*5: A DC coil for steam is available for AP11. Contact CKD for more information.

Note on (F) to (I)

*6: The mounting plate ((G) B) is provided only with the (B) (port size) 8 (1/4) or 10 (3/8).
*7: When (D) is C, F, K or N, manual override (item (F) A) is not available.
*8: Select one among D, E, F, G and H for (H).
*9: The surge suppressor is an accessory for the lead wire coil. When using the coil with terminal box, the surge suppressor is mounted in the terminal box.
*10: Surge suppressor is incorporated in coil with diode and (E) 2H 24 VDC coil as standard.
*11: Tropic care treatment (rust-proof coating) is available as a measure against rust. Contact CKD for more information.
Note that the tropic care treatment is not available when the manual override option (A) is selected.

Note on (J)

*12: 100 VAC coil is compatible with 100 VAC 50/60 Hz, 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz, 220 VAC 60 Hz. Note that (E) 5A, 5K, 5H, 5P, and 5Q coils are used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*13: Consult with CKD about other than above voltage.
*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.

Dimensions: AP11 Series

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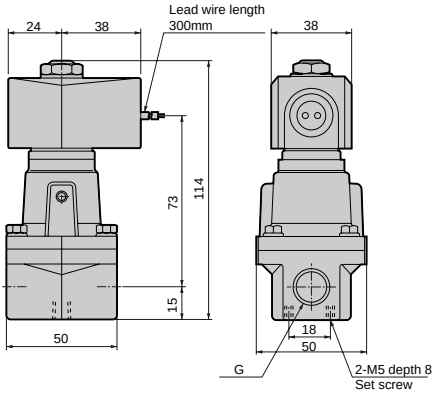
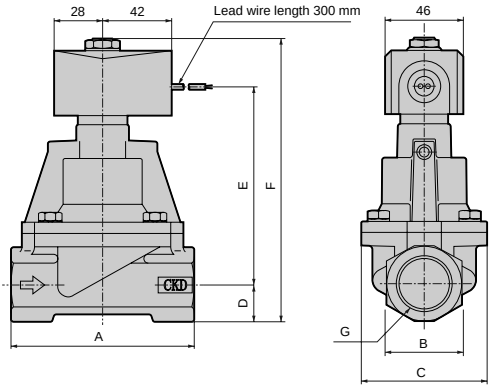
● Open frame lead wire type
AP11-8A/10A-* 3A / 4A / 5A



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

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

● Open frame lead wire type
AP11-15A/20A/25A-* 3A / 4A / 5A



Model no.	A	B	C	D	E	F	G
AP11-15A-A**	90	29	57	14.5	92.5	136	Rc1/2
AP11-20A-A**	100	35	65	17.5	100.5	147	Rc3/4
AP11-25A-A**	110	44	76	22	116	167	Rc1

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

Optional dimensions: AP11 Series

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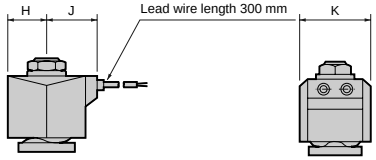
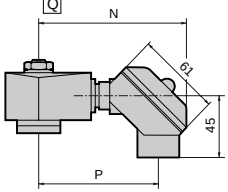
* Refer to open frame lead wire type dimensions on a left page for common dimensions.

● Grommet lead wire type
AP11-8A to 25A-* 2C



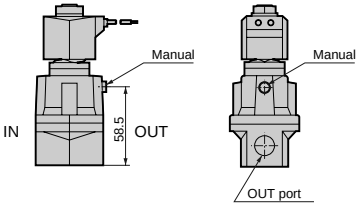
Model no.	H	J	K
AP11-8A to 10A-*2C	20	27	34
AP11-15A to 25A-*2C	23.5	30.5	38

● Open frame type + square terminal box
AP11-8A to 25A-* 3 5 / K H P Q / 4K 4H

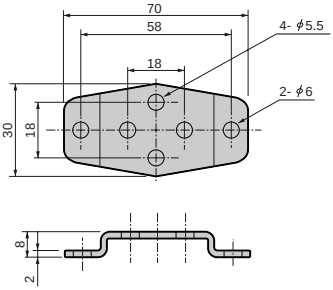


Model no.	N	P
AP11-8A to 10A-***	106	87
AP11-15A to 25A-***	110	91

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

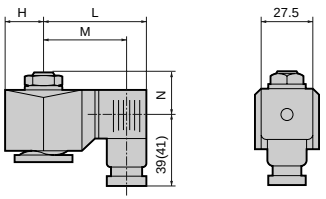


● Mounting plate
AP11-8A/10A-*** B



Mounting plate: GE-100159
Port size 15 (1/2) to 25 (1) mounting plate is not used.

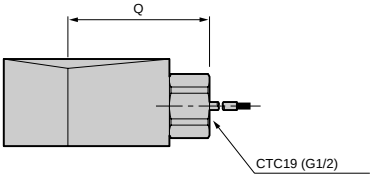
● DIN terminal box
AP11-8A to 25A-* 2E 2G 2H



Dimensions shown in ( ) are for the G1/2.

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

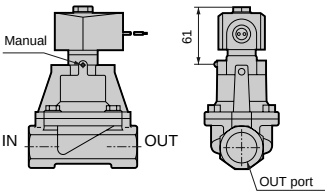
● Open frame type + conduit
AP11-8A to 25A-* 3A 4A 5A / G H



Dimensions shown in ( ) are for the G1/2.

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

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



Dimensions: AP12 Series

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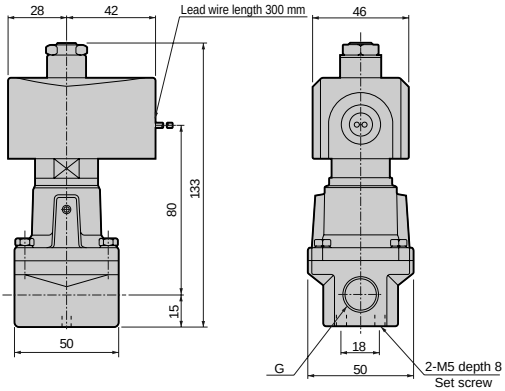
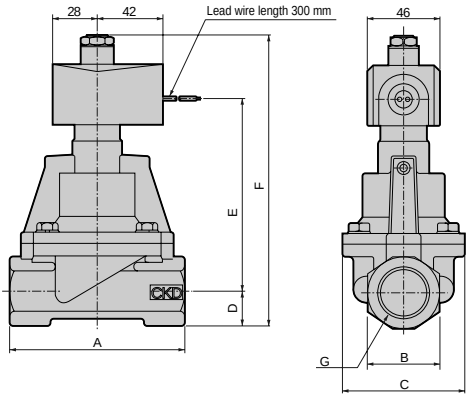
● Open frame lead wire type
AP12-8A/10A-* 3A / 4A / 5A



Model no.	G
AP12-8A-A**	Rc1/4
AP12-10A-A**	Rc3/8

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

● Open frame lead wire type
AP12-15A/20A/25A-* 3A / 4A / 5A



Model no.	A	B	C	D	E	F	G
AP12-15A-*□A	90	29	57	14.5	96.5	149	Rc1/2
AP12-20A-*□A	100	35	65	17.5	104.5	160	Rc3/4
AP12-25A-*□A	110	44	76	22	120	180	Rc1

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

Optional dimensions: AP12 Series

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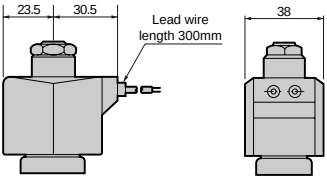
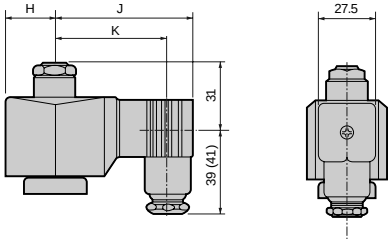
* Refer to open frame lead wire type dimensions on a left page for common dimensions.

● Grommet lead wire type
AP12-8A to 25A-* [2C]



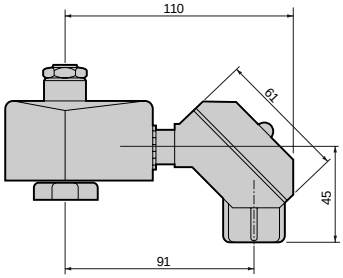
● DIN terminal box
AP12-8A to 25A-* [2E] [2G] [2H]



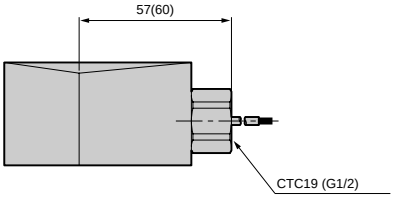
Dimensions shown in ( ) are for the G1/2.

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

● Open frame type + square terminal box
AP12-8A to 25A-* [3] [5] [K] [H] [P] [Q] / [4K] [4H]

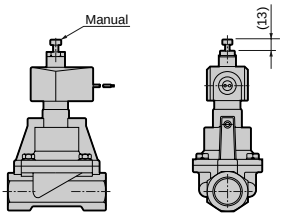


● Open frame type + conduit
AP12-8A to 25A-* [3A] [4A] [5A] [G] [H]

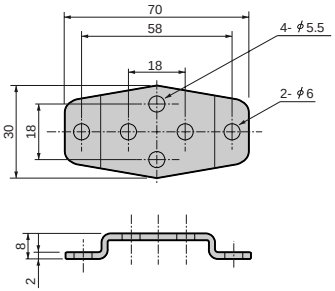


Dimensions shown in ( ) are for the G1/2.

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



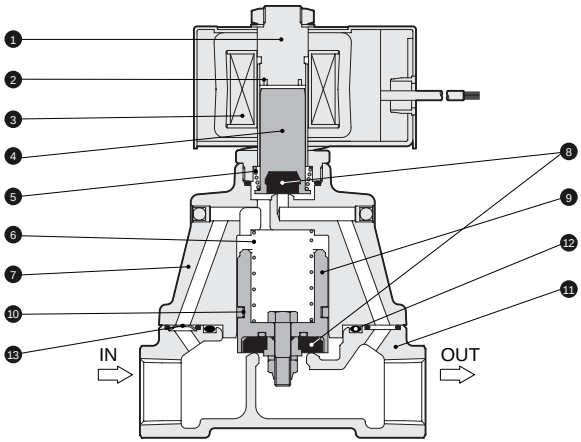
● Mounting plate
AP12-8A/10A-*** [B]



Mounting plate: GE-100159
Port size 15 (1/2) to 25 (1) mounting plate is not used.

Internal structure and main parts materials

● AP11 Series



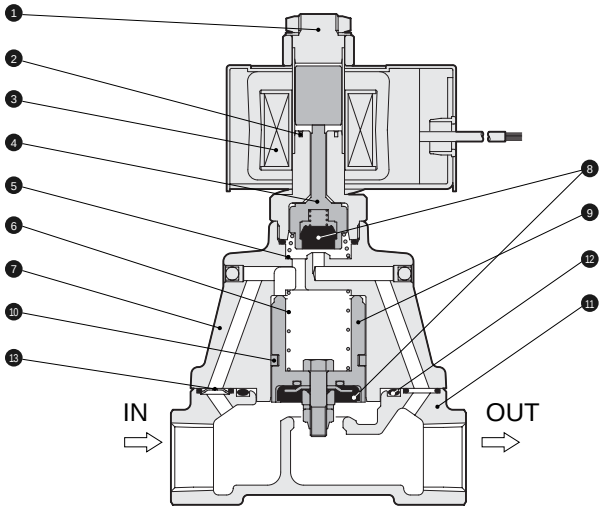
(Figure shows close on operating)

No.	Parts name	Material	
1	Core assembly	SUS405 or equivalent, SUS316L, SUS403*1	Stainless steel
2	Shading coil *2	Cu (Ag when stainless steel body)	Copper (silver when stainless steel body)
3	Coil	-	-
4	Plunger	SUS405 or equivalent	Stainless steel
5	Plunger spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Stuffing	CAC407 (SCS13)*3	Bronze casting (stainless steel casting)
8	Sealant	NBR (FKM, PTFE)	Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
9	Main valve assembly	C3604, SUS303, SUS304 (SUS303, SUS304)	Stainless steel, brass (stainless steel)
10	Piston ring	SUS304, PTFE	Stainless steel, tetrafluoroethylene resin
11	Body	CAC407 (SCS13)*3	Bronze casting (stainless steel casting)
12	O ring	NBR (FKM, PTFE)	Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
13	Orifice plate	SUS304 (SUS303)*3	Stainless steel

Options are shown in ( ).
*1: When the body and sealant combination symbol is other than O or H, the material is SUS405 or equivalent, SUS316L, SUS430.
*2: When using the DC coil or a coil with a diode, no shedding coil is used.
*3: For port size 8 (1/4) or 10 (3/8), the body stuffing material is C3771 (brass) as a standard.
The orifice plate material is SUS303 (stainless steel) for the standard and options.

Internal structure and main parts materials

● AP12 Series



(Figure shows open on operating)

No.	Parts name	Material	
1	Plunger/core assembly	SUS405 or equivalent, SUS316L, SUS304	Stainless steel
2	Shading coil	Cu (Ag when stainless steel body)	Copper (silver when stainless steel body)
3	Coil	-	-
4	NO valve assembly	POM/NBR (SUS303, PFA, FKM or PTFE)	Acetyl resin, nitrile rubber (stainless steel, perfluoroalkoxy resin, fluoro rubber or tetrafluoroethylene resin).
5	Spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Stuffing	CAC407 (SCS13) *1	Bronze casting (stainless steel casting)
8	Sealant	NBR (FKM, PTFE)	Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
9	Main valve assembly	C3604, SUS303, SUS304 (SUS303, SUS304)	Stainless steel, brass (stainless steel)
10	Piston ring	SUS304, PTFE	Stainless steel, tetrafluoroethylene resin
11	Body	CAC407 (SCS13) *1	Bronze casting (stainless steel casting)
12	O ring	NBR (FKM, PTFE)	Nitrile rubber (fluoro rubber, tetrafluoroethylene resin)
13	Orifice plate	SUS304 (SUS303)	Stainless steel

Options are shown in ( ).
*1: For port size 8 (1/4) or 10 (3/8), the body stuffing material is C3771 (brass) as a standard.
The orifice plate material is SUS303 (stainless steel) for the standard and options.