



Pilot operated 2-port solenoid valve
General purpose

AD11/AD12 Series

- NC (open when energized), NO (closed when energized)
- Port size: Rc1/4 to Rc1
- Diaphragm drive

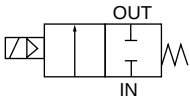


Refer to the Ending for details.

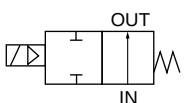


JIS symbol

- AD11: NC (open when energized)



- AD12: NO (closed when energized)



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	Standard specifications
Working fluid	Air/water/kerosene/oil (50 mm ² /s or less)
Working pressure differential MPa	0.02 to 1.0 (refer to max. working pressure differential in individual specifications)
Max. working pressure MPa	2 (≈290 psi, 20 bar)
Proof pressure (water pressure) MPa	8 (≈1200 psi, 80 bar)
Fluid temperature (*1) °C	-10 (14°F) to 60 (140°F)
Ambient temperature °C	-20 (-4°F) to 60 (140°F)
Thermal class	Thermal class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Pilot operated poppet, diaphragm drive
Valve seat leakage (*2) cm ³ /min(ANR)	0.2 or less (air)
Mounting orientation	Free (within working pressure differential range)
Body/seal material	Bronze/nitrile rubber

*1 : No freezing.

*2 : Pneumatic pressure used for measurement is 0.02 to 1.0 MPa for AD11 (NC [open when energized]), and 0.02 to 0.5 MPa for AD12 (NO [closed when energized]).

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	Port size	Orifice size (mm)	Min. working pressure differential (MPa)	Max. working pressure differential (MPa)						Rated voltage	Apparent power (VA)				Power consumption (W)		Weight (kg)	
Model No.				Air		Water/kerosene		Oil (50 mm ² /s)			When holding		When starting		AC	DC		
				AC	DC	AC	DC	AC	DC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz			
NC (open when energized)																		
AD11-8A	Rc1/4	10	0.02	1.0	0.7	1.0	0.7	0.7	0.7	100 VAC 50/60 Hz	18	15	29	24	6.7/5.7	12	0.4	
AD11-10A	Rc3/8	10		*5	1.0	0.7	1.0	0.7	0.7	0.7						*7	(7)*6	0.4
AD11-15A	Rc1/2	15	0.02	1.0	0.6	0.7	0.6	0.6	0.6	200 VAC 50/60 Hz	18	15	29	24	6.7/5.7	11	1.2	
AD11-20A	Rc3/4	20		1.0	0.6	0.7	0.6	0.6	0.6	*7						(10.4)*4	1.2	
AD11-25A	Rc1	25		1.0	0.6	0.7	0.6	0.6	0.6	12 VDC						(7)*6	1.9	
NO (closed when energized)										24 VDC								
AD12-15A	Rc1/2	15	0.02	0.5	0.5	0.5	0.5	0.5	0.5	48 VDC	22	18	35	29	8.7/6.7	15.5	1.2	
AD12-20A	Rc3/4	20								100 VDC						(14)*4	1.5	
AD12-25A	Rc1	25								100 VDC						(14)*4	1.9	

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

*2 : Refer to DC column for the max. working pressure differential of AD11 type coil with diode.

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

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

*5 : For fluoro rubber seal, the min. working pressure differential of port size 8 (1/4) and 10 (3/8) is 0.05 MPa.

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

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

Optional specifications

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

*1 : No freezing.

*2 : Pneumatic pressure used for measurement is 0.02 to 1.0 MPa for AD11 (NC [open when energized]), and 0.02 to 0.5 MPa for AD12 (NO [closed when energized]).

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

Flow characteristics

Model No.	Port size	Orifice size (mm)	Flow characteristics			
			C[dm³/(s·bar)]	b	Cv	S(mm²)
NC (open when energized)						
AD11-8A	Rc1/4	10	8.1	0.17	1.5	-
AD11-10A	Rc3/8	10	10	0.19	1.8	-
AD11-15A	Rc1/2	15	21	0.22	4.5	-
AD11-20A	Rc3/4	20	-	-	9.3	162
AD11-25A	Rc1	25	-	-	12.0	231
NO (closed when energized)						
AD12-15A	Rc1/2	15	21	0.22	4.5	-
AD12-20A	Rc3/4	20	-	-	9.3	162
AD12-25A	Rc1	25	-	-	12.0	231

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

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

AD11/AD12 Series

How to order

AD1 1 - 15 A - 0 3A A B G S - AC100V

Model No.

E Coil housing		H Other options		Model No.			
F Manual override (locking)		I With surge suppressor					
G Mounting plate		J Rated voltage		AD11	AD12		
Code		Description					
A Actuation							
1	NC (open when energized)			●			
2	NO (closed when energized)				●		
B Port size							
8	1/4			●			
10	3/8			●			
15	1/2			●	●		
20	3/4			●	●		
25	1			●	●		
C Thread							
A	Rc			●	●		
G	G			●	●		
N	NPT			●	●		
D Body/sealant combination							
	Body	Seal	Treatment	Remarks			
0	Std. Bronze	Nitrile rubber	-	Air/water/kerosene/oil (up to 60°C)	●	●	
B		Fluoro rubber		Air/kerosene/oil (up to 90°C*1)	●	●	
D		Nitrile rubber		Air/water/kerosene/oil (up to 60°C)	●	●	
E		Fluoro rubber		Air/kerosene/oil (up to 90°C*1)	●	●	
H	Option Bronze	Nitrile rubber	Oil- prohibited	Air/water/kerosene/oil (up to 60°C)	●	●	
J		Fluoro rubber		Air/kerosene/oil (up to 90°C*1)	●	●	
L	Stainless steel	Nitrile rubber		Air/water/kerosene/oil (up to 60°C)	●	●	
M		Fluoro rubber		Air/kerosene/oil (up to 90°C*1)	●	●	
Refer to Intro Page 39 for reference on material combinations.							
E to J							
Refer to page 275 for details on the coil housing, other options and voltage, etc.							

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

[Example of model No. 1]
AD11-20A-03A-AC100V

Model : AD11

- A** Actuation : NC (open when energized)
- B** Port size : Rc3/4
- C** Thread : Rc
- D** Body/sealant combination : Body - bronze, sealant - nitrile rubber
- E** Coil housing : Open frame lead wire
- F** ~ **I** : None
- J** Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

[Example of model No. 2]
AD12-15G-D2CAS-AC200V

Model : AD12

- A** Actuation : NO (closed when energized)
- B** Port size : Rc1/2
- C** Thread : G
- D** Body/sealant combination : Body - stainless steel, sealant - nitrile rubber
- E** Coil housing : Grommet lead wire
- F** Manual override (locking) : Selected
- G** ~ **H** : None
- I** Surge suppressor : With surge suppressor
- J** Rated voltage : 200 VAC 50/60 Hz, 220 VAC 60 Hz

⚠ Precautions for model No. selection

Notes for **D**

*1 : When Item **D** 4A/4M/4N is selected.

*2 : For Item **D** (port size) 8 (1/4) and 10 (3/8), stainless body is not available.

*3 : For Item **D** (port size) 8 (1/4) and 10 (3/8), the standard body material is copper alloy.

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

E Coil housing			F	G	H Other options				I	J Rated voltage		
Description			Manual override (Locking)	Mounting plate	Cable gland			Conduit		With surge suppressor	Description	
					(marine cable gland)			(conduit piping)				
					A-15a	A-15b	A-15c	CTC19	G1/2			
3A	Option	Open frame lead wire (IP65 equivalent)	A	B *9				G	H	S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC	
2C		Grommet lead wire	A	B *9						S	100 VAC, 200 VAC	
2E		With DIN terminal box (G1/2)									100 VAC, 200 VAC	
2G		With DIN terminal box (Pg11)									12 VDC, 24 VDC, 48 VDC, 100 VDC	
2H		DIN terminal box with small lamp(Pg11)									100 VAC, 200 VAC, 24 VDC	
3M		Open frame	With HP terminal box(G1/2)	A	B *9	D	E	F			S	100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3N			HP terminal box with lamp(G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
3I			HP term box (IP65, equiv) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 48 VDC, 100 VDC
3J			HP term box, lamp (IP65, equiv) (G1/2)									100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC
4A		Open frame (Thermal class 180 (H))	Lead wire	A	B *9				G	H	S	100 VAC, 200 VAC
4M			With HP terminal box (G1/2)			D	E	F				
4N			HP terminal box with lamp(G1/2)									
5A		Open frame (diode integrated)	Lead wire (IP65 or equivalent)	A	B *9				G	H		100 VAC, 200 VAC
5M			With HP terminal box(G1/2)			D	E	F				
5N	HP terminal box with lamp(G1/2)											
5I	HP term box (IP65, equiv) (G1/2)											
5J	HP term box, lamp (IP65, equiv) (G1/2)											
6C		Grommet lead wire 7W	A	B *9						S	12 VDC, 24 VDC	
6E	With DIN terminal box(G1/2)7W											
6G	With DIN terminal box(Pg11)7W											
6H	DIN terminal box with small lamp(Pg11)7W											H

Refer to the following cautions for ⑤ to ⑪.

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

Refer to page 248 for coil selection.

G H		● Conduit ● G(CTC19) ● H(G1/2)
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Precautions for model No. selection

Notes for ⑤

- *4 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.
- *5 : For Item ⑤ (port size) 8(1/4)/10(3/8), DC power supply with DIN terminal box is not available.
- *6 : For 6C/6E/6G/6H, only AD11 can be selected.
- *7 : The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Notes for Items ⑥ to ⑪

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

Notes for ⑪

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

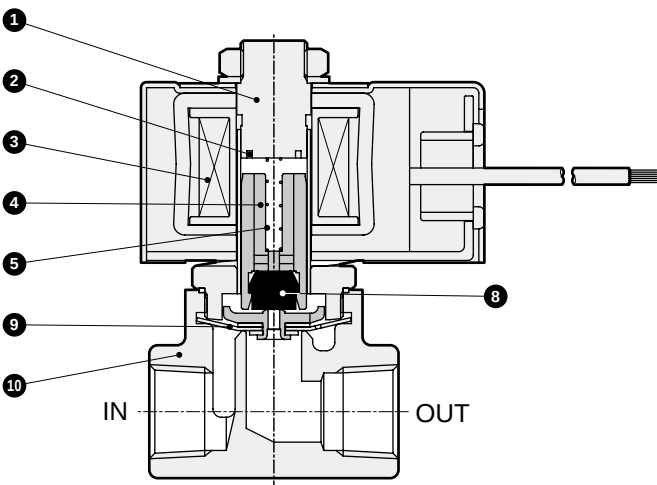
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FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S [◇] B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH/ CPE/D
LifeSci
Gas- Combus
Auto- Water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

AD11/AD12 Series

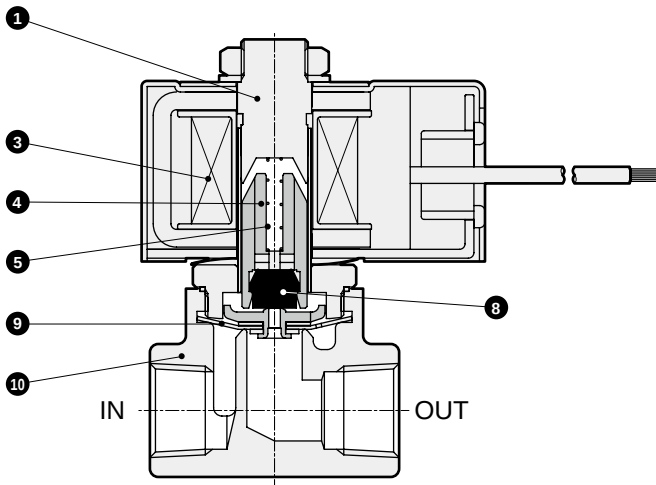
EXA
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HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S◇B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH/ CPE/D
LifeSci
Gas- Combus
Auto- Water
Outdoor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

Internal structure and parts list

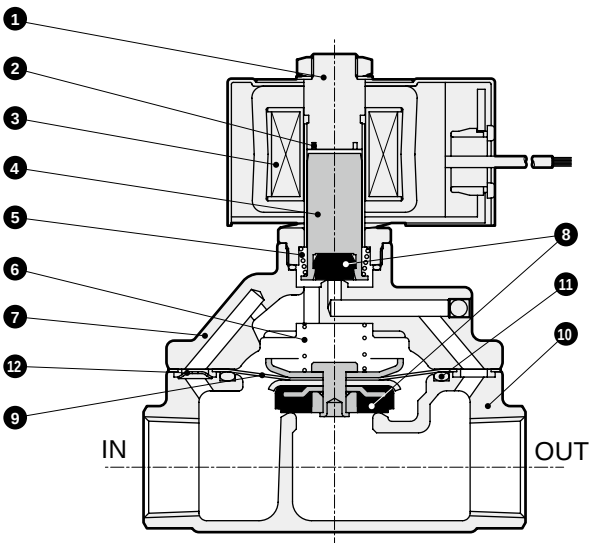
● AD11-8A/10A (AC)



● AD11-8A/10A (DC/diode integrated)



● AD11-15A/20A/25A



No.	Part name	Material
1	Core assembly	SUS405 or equiv./SUS316L/SUS403 *1
2	Shading coil *2	Cu (Ag for stainless steel body)
3	Coil	-
4	Plunger	SUS405 or equiv.
5	Plunger spring	SUS304
6	Valve spring	SUS304
7	Stuffing *3	CAC408(SCS13)
8	Seal	NBR(FKM)
9	Diaphragm assembly	SUS303/SUS304/NBR (SUS303/SUS304/FKM)
10	Body	CAC408(SCS13)*4
11	O-ring	NBR(FKM)
12	Orifice plate *3	SUS304

() shows options.

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

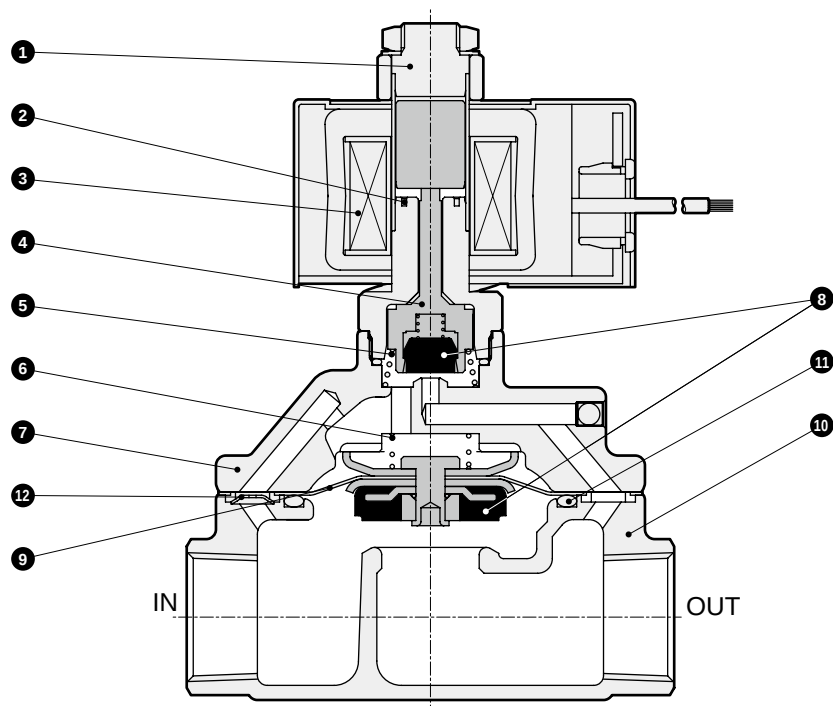
*2 : No shading coil is used for DC coil or coil with diode.

*3 : For port size 8 (1/4) and 10 (3/8), stuffing and orifice plate are not used.

*4 : For port size 8 (1/4) and 10 (3/8), the standard body material is C3771 (copper alloy).

Internal structure and parts list

● AD12-15A/20A/25A



No.	Part name	Material
1	Plunger/core assembly	SUS405 or equiv./SUS316L/SUS304 Stainless steel
2	Shading coil	Cu (Ag for stainless steel body) Copper (silver for stainless steel body)
3	Coil	-
4	NO valve	POM(PPS) Body/sealant combination When O/D/H/L: Polyacetal resin When B/E/J/M: Polyphenylene sulfide resin
5	Spring	SUS304 Stainless steel
6	Valve spring	SUS304 Stainless steel
7	Body	CAC408(SCS13) Bronze casting (stainless steel casting)
8	Seal	NBR(FKM) Nitrile rubber (fluoro rubber)
9	Diaphragm assembly	SUS303/SUS304/NBR (SUS303/SUS304/FKM) Stainless steel/nitrile rubber (stainless steel/fluoro rubber)
10	Body	CAC408(SCS13) Bronze casting (stainless steel casting)
11	O-ring	NBR(FKM) Nitrile rubber (fluoro rubber)
12	Orifice plate	SUS304 Stainless steel

() shows options.

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

AD11/AD12 Series

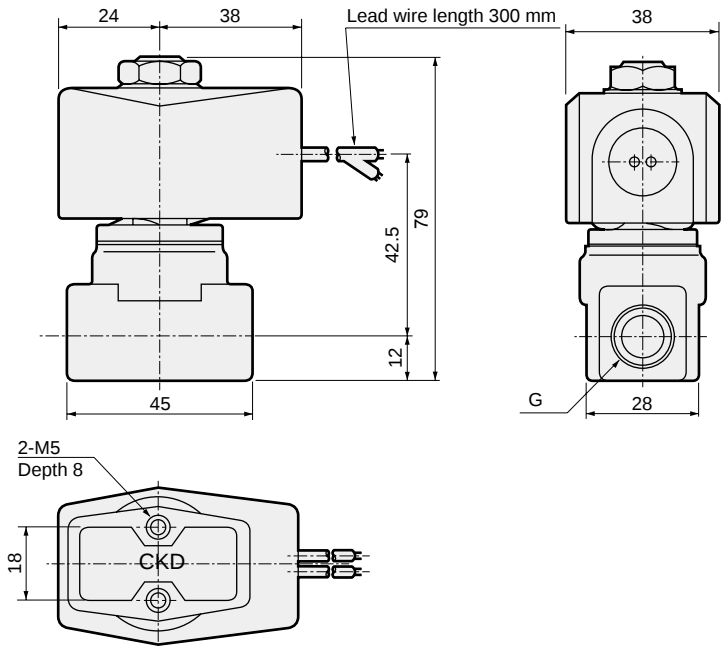
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FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S ◇ B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
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Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH/ CPE/D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

Dimensions: AD11 Series



- Open frame lead wire
AD11-8A/10A-*

3A
4A
5A

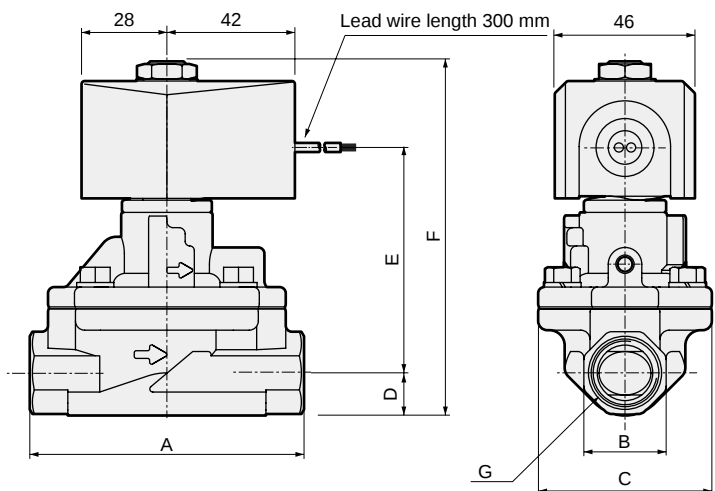


Model No.	G
AD11-8A-□A	Rc1/4
AD11-10A-□A	Rc3/8

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

- Open frame lead wire
AD11-15A/20A/25A-*

3A
4A
5A



Model No.	A	B	C	D	E	F	G
AD11-15A-□A	90	27	57	14	73.5	116.5	Rc1/2
AD11-20A-□A	100	32	65	17	79.5	125.5	Rc3/4
AD11-25A-□A	110	41	76	20.5	85	134.5	Rc1

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

Optional dimensions: AD11 Series



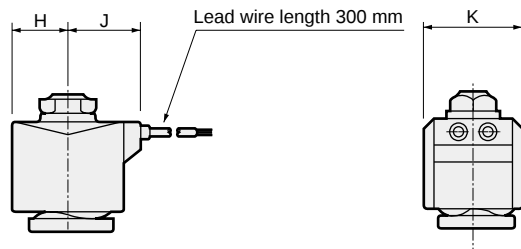
* Refer to the open frame lead wire dimensions on page 278 for common dimensions.

- Grommet lead wire
AD11-8A to 25A*

2C

 /

6C



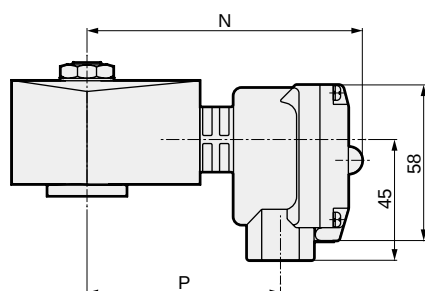
Model No.	H	J	K
AD11-8A to 10A*2C	20	27	34
AD11-15A to 25A*2C	23.5	30.5	38
AD11-8A to 25A*6C	24	30.5	39

- Open frame + HP terminal box
AD11-8A to 25A*

3M
5N
I
J

 /

4M
4N

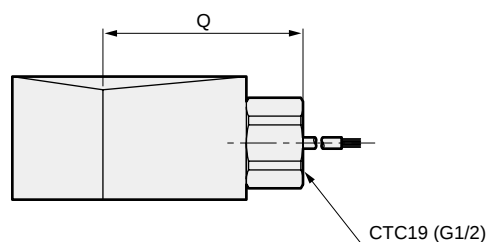


Model No.	N	P
AD11-8A to 10A*□□	99	68
AD11-15A to 25A*□□	103	72

- Open frame + conduit
AD11-8A to 25A*

3A
4A
5A

G
H

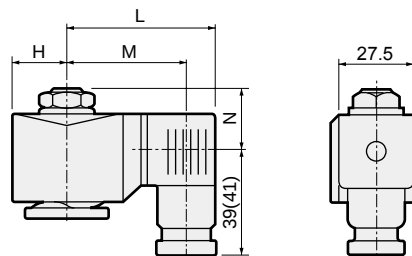


Dimensions shown in () are for G1/2.

Model No.	Q
AD11-8A to 10A	53(56)
AD11-15A to 25A	57(60)

- With DIN terminal box
AD11-8A to 25A*

2E
6G
H



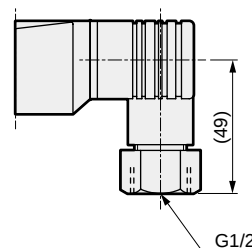
Dimensions shown in () are for G1/2.

Model No.	H	L	M	N
AD11-8A/10A*2□-AC	20	62	50.5(50)	20.5
AD11-15A to 25A*2□-AC	23.5	65.5	54(53.5)	22
AD11-15A to 25A*2□-DC	23.5	66	54.5(54)	22
AD11-8A to 25A-6□-DC	24	68	56.5(56)	22

- DIN terminal box with small lamp + conduit (G1/2)
AD11-8A to 25A*

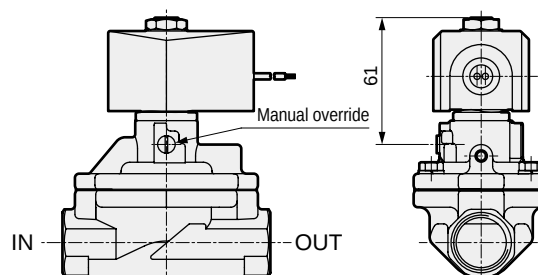
2H

H



- Manual override (locking)
AD11-15A/20A/25A***

A



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

AD11/AD12 Series

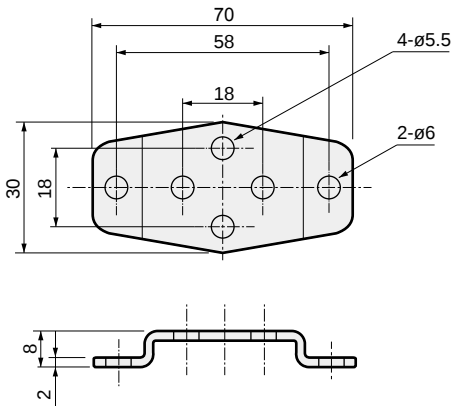
EXA
FWD
HNB/G
USB/G
FAB/G
FGB/G
FVB
FWB/G
FHB
FLB
AB
AG
AP/ AD
APK/ ADK
DryAir
EX- XPLNprf
XPLNprf
HVB/ HVL
S◇B/ NAB
LAD/ NAD
Water- Rela
NP/NAP/ NVP
SNP
CHB/G
MXB/G
Other valves
SWD/ MWD
DustColl
CVE/ CVSE
CCH/ CPE/D
LifeSci
Gas- Combus
Auto- Water
Outdoor
SpecFld
Custom
Ending

Optional dimensions: AD11 Series



* Refer to the open frame lead wire dimensions on page 278 for common dimensions.

- Mounting plate
AD11-8A/10A-***B



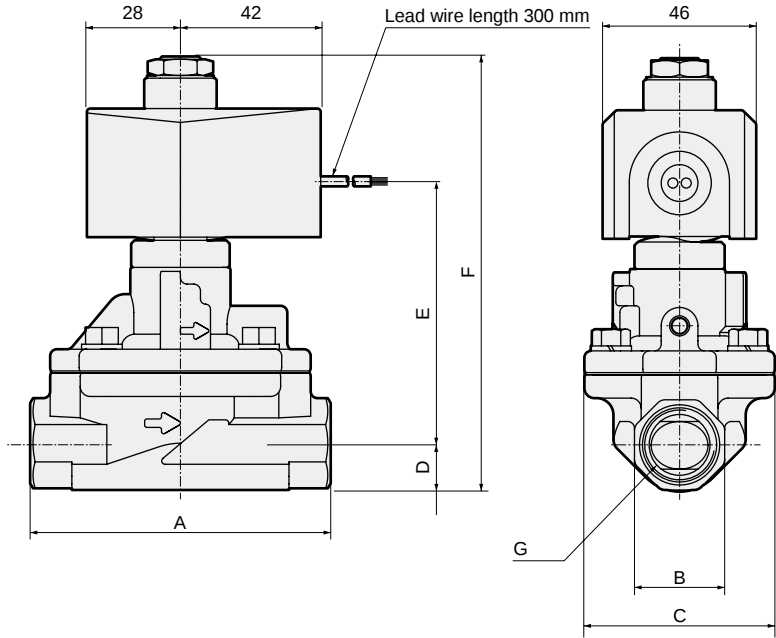
Mounting plate model	Compatibility
AD11-8A-MOUNT-PLATE-KIT	● AD11-8A Series
AD11-10A-MOUNT-PLATE-KIT	● AD11-10A Series

* Material: Steel/Zinc plated
* Mounting plate is not available for port sizes 15 (1/2) to 25 (1).

Dimensions: AD12 Series



- Open frame lead wire
AD12-15A/20A/25A-*
3A
4A
5A



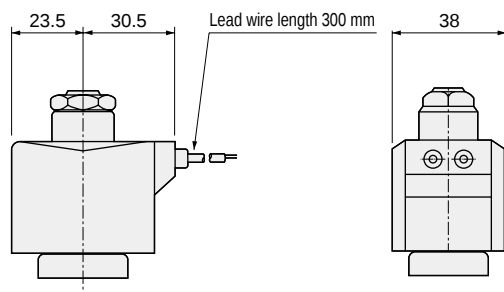
Model No.	A	B	C	D	E	F	G
AD12-15A-*□A	90	27	57	14	77.5	129.5	Rc1/2
AD12-20A-*□A	100	32	65	17	83.5	138.5	Rc3/4
AD12-25A-*□A	110	41	76	20.5	89	147.5	Rc1

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

Optional dimensions: AD12 Series

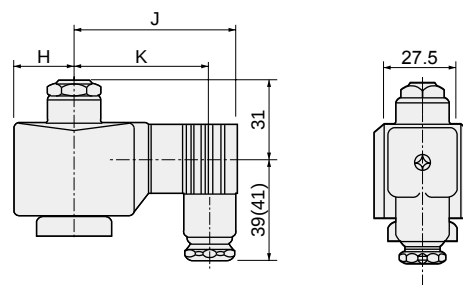


- Grommet lead wire
AD12-15A/20A/25A-* **2C**



* Refer to the open frame lead wire dimensions on page 280 for common dimensions.

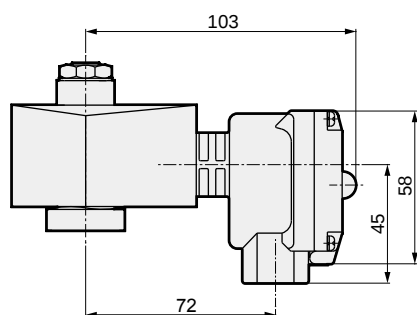
- With DIN terminal box
AD12-15A/20A/25A-* **2E**
2G
2H



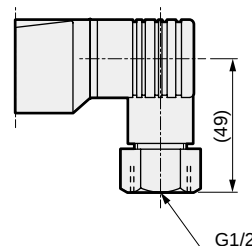
Dimensions shown in () are for G1/2.

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

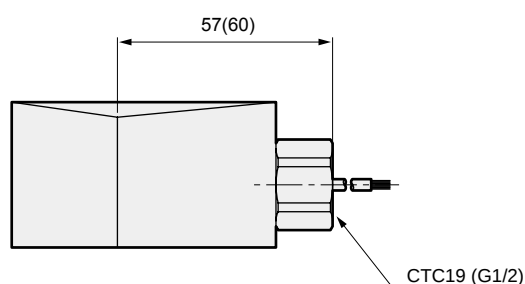
- Open frame + HP terminal box
AD12-15A/20A/25A-* **3** **M** **4M**
5 **N** **4N**
J



- DIN terminal box with small lamp + conduit (G1/2)
AD12-15A/20A/25A-* **2H** **H**

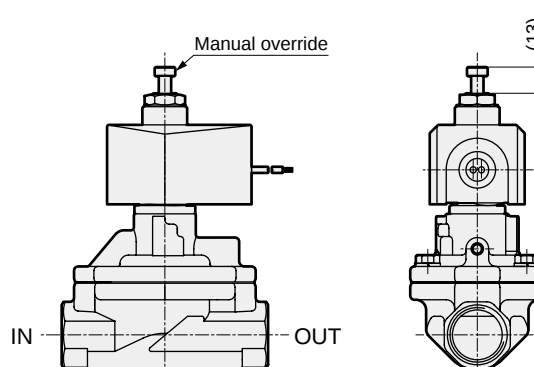


- Open frame + conduit
AD12-15A to 25A-* **3A** **G**
4A **H**
5A



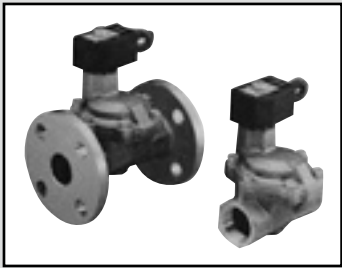
Dimensions shown in () are for G1/2.

- Manual override (locking)
AD12-15A/20A/25A-*** **A**



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

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



Pilot operated 2-port solenoid valve
General purpose

AD21/AD22 Series

- NC (open when energized), NO (closed when energized)
- Port size: Rc1¹/₄ to Rc2, 32 to 50 flange
- Diaphragm drive

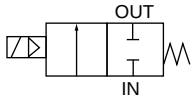


Refer to the Ending for details.

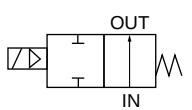


JIS symbol

- AD21: NC (open when energized)



- AD22: NO (closed when energized)



Common specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	Standard specifications
Working fluid	Air/water/kerosene/oil (50 mm ² /s or less)
Working pressure differential MPa	0.02 to 0.7 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	1 (≈150 psi, 10 bar)
Proof pressure (water pressure) MPa	3.2 (≈460 psi, 32 bar)
Fluid temperature °C	-10 (14°F) to 60 (140°F) (no freezing)
Ambient temperature °C	-10 (14°F) to 60 (140°F)
Thermal class	Thermal class 130 (B)
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Pilot operated poppet, diaphragm drive
Valve seat leakage (*1) cm ³ /min(ANR)	1 or less (air)
Mounting orientation	Free (within working pressure differential range)
Body/seal material	Bronze/nitrile rubber

*1 : Pneumatic pressure used for measurement is 0.02 to 0.7 MPa for AD21 (NC [open when energized]), and 0.02 to 0.5 MPa for AD22 (NO [closed when energized]).

Individual specifications

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Item	Port size	Orifice size (mm)	Min. working pressure differential (MPa)	Max. working pressure differential (MPa)						Rated voltage	Apparent power (VA)				Power consump (W)		Weight (kg)
Model No.				Air		Water/kerosene		Oil (50 mm ² /s)			When holding		When starting		AC	DC	
				AC	DC	AC	DC	AC	DC		50 Hz	60 Hz	50 Hz	60 Hz	50/60 Hz		
NC (open when energized)																	
AD21-32A	Rc1 ¹ / ₄	35	0.02 (≈2.9 psi, 0.2 bar)	0.7	0.6	0.7	0.6	0.6	0.6	100 VAC 50/60 Hz *6 200 VAC 50/60 Hz *6 12 VDC 24 VDC 48 VDC 100 VDC	18	15	29	24	6.7/5.7	11 (10.4) *4 (7) *5	3.5
AD21-32F	32 flange																7
AD21-40A	Rc1 ¹ / ₂	43															4.5
AD21-40F	40 flange																8
AD21-50A	Rc2	53															6
AD21-50F	50 flange																10
NO (closed when energized)																	
AD22-32A	Rc1 ¹ / ₄	35	0.02 (≈2.9 psi, 0.2 bar)	0.5	0.5	0.5	0.5	0.5	0.5	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) *4	3.5
AD22-32F	32 flange																7
AD22-40A	Rc1 ¹ / ₂	43															4.5
AD22-40F	40 flange																8
AD22-50A	Rc2	53															6
AD22-50F	50 flange																10

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

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

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

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

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

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

Optional specifications

Sealant	Fluoro rubber	
Coil (thermal class)	Class 130 (B)	Class 180 (H)
Fluid temperature °C	5 to 60	5 to 90
Ambient temperature °C	-10 to 60	-10 to 100 (*2)
Valve seat leakage (*1) cm ³ /min(ANR)	1 or less (air)	

*1 : Pneumatic pressure used for measurement is 0.02 to 0.7 MPa for AD21 (NC [open when energized]), and 0.02 to 0.5 MPa for AD22 (NO [closed when energized]).

*2 : -10 to 80°C when coil housing is HP terminal box with lamp.

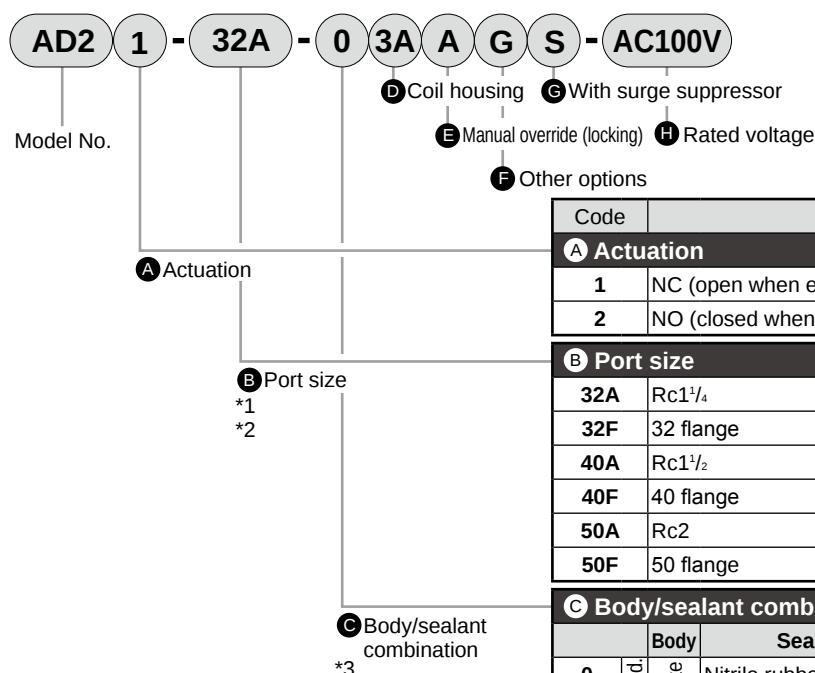
Flow characteristics

Model No.	Port size	Orifice size (mm)	Cv	Effective cross-sectional area (mm ²)
NC (open when energized)				
AD21-32A	Rc1¼	35	25	460
AD21-32F	32 flange			
AD21-40A	Rc1½	43	34	625
AD21-40F	40 flange			
AD21-50A	Rc2	53	53	975
AD21-50F	50 flange			
NO (closed when energized)				
AD22-32A	Rc1¼	35	25	460
AD22-32F	32 flange			
AD22-40A	Rc1½	43	34	625
AD22-40F	40 flange			
AD22-50A	Rc2	53	53	975
AD22-50F	50 flange			

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

AD21/AD22 Series

How to order



Code	Description			
A Actuation				
1	NC (open when energized)			
2	NO (closed when energized)			
B Port size				
32A	Rc1 ¹ / ₄			
32F	32 flange			
40A	Rc1 ¹ / ₂			
40F	40 flange			
50A	Rc2			
50F	50 flange			
C Body/sealant combination				
	Body	Seal	Treatment	Remarks
0	Std. Option	Bronze	-	Air/water/kerosene/oil (up to 60°C)
B		Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
D		Nitrile rubber		Air/water/kerosene/oil (up to 60°C)
E		Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
H		Bronze	Oil- prohibited	Air/water/kerosene/oil (up to 60°C)
J		Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
L		Nitrile rubber		Air/water/kerosene/oil (up to 60°C)
M		Fluoro rubber		Air/kerosene/oil (up to 90°C*3)
Refer to Intro Page 39 for reference on material combinations				
D to H				
Refer to page 285 for details on the coil housing, other options and voltage, etc.				

[Example of model No. 1]

AD21-32A-B4A-AC100V

Model : AD21

- A** Actuation : NC (open when energized)
B Port size : Rc1¹/₄
C Body/sealant combination : Body - bronze, sealant - fluoro rubber
D Coil housing : Open frame lead wire (thermal class 180(H) coil)
E to G : None
H Rated voltage : 100 VAC 50/60 Hz, 110 VAC 60 Hz

[Example of model No. 2]

AD22-40F-02HHS-AC200V

Model : AD22

- A** Actuation : NO (closed when energized)
B Port size : 40 flange
C Body/sealant combination : Body - bronze, sealant - nitrile rubber
D Coil housing : DIN terminal box with small light (Pg11)
E Manual override (locking): None
F Other options : Conduit G1/2
G Surge suppressor : With surge suppressor
H Rated voltage : 200 VAC 50/60 Hz, 220 VAC 60 Hz

⚠ Precautions for model No. selection

*1 : The companion flange is JIS B2210 10K. (Flange is not enclosed with the product and must be purchased separately.)

*2 : As G and NPT threads can also be used for piping port threads, contact CKD for details.

Notes for **C**

*3: When Item © 4A/4M/4N is selected.

For Items ㉔ to ㉨, the combinations indicated with codes are available.
Note that if options for Items ㉔ to ㉨ are not required, they should be left blank.

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

Refer to the following cautions for ㉔ to ㉨.

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

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

Precautions for model No. selection

Notes for ㉔

- *4 : Coils for 5A/5M/5N/5I/5J have a diode to convert AC to DC voltage.
- *5 : For 6C/6E/6G/6H, only AD21 can be selected.
- *6 : The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Notes for ㉔ to ㉔

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

Notes for ㉔

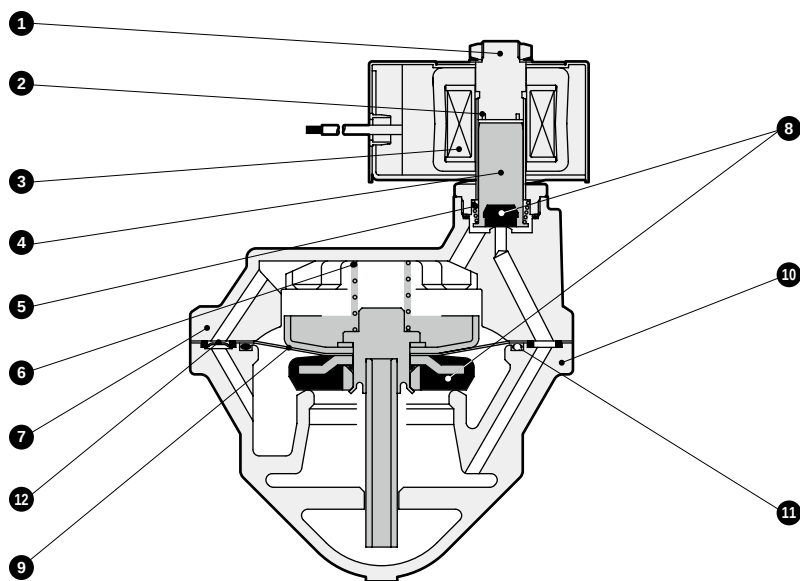
- *11 : 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. However, coils for Item ㉔ 5A/5M/5N/5I/5J can be used with 100 VAC 50/60 Hz and 200 VAC 50/60 Hz only.
- *12 : For voltages other than above, contact CKD.
- *13 : The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

Refer to page 248 for coil selection.

AD21/AD22 Series

Internal structure and parts list

● AD21 Series



(The figure shows the closing operation)

No.	Part name	Material
1	Core assembly	SUS405 or equiv./SUS316L/SUS403 *1
2	Shading coil *2	Cu (Ag for stainless steel body)
3	Coil	-
4	Plunger	SUS405 or equiv.
5	Plunger spring	SUS304
6	Valve spring	SUS304
7	Body	CAC408(SCS13)
8	Seal	NBR(FKM)
9	Diaphragm assembly	SUS303/SUS304/NBR (SUS303/SUS304/FKM)
10	Body	CAC408(SCS13)
11	O-ring	NBR(FKM)
12	Orifice plate	SUS304

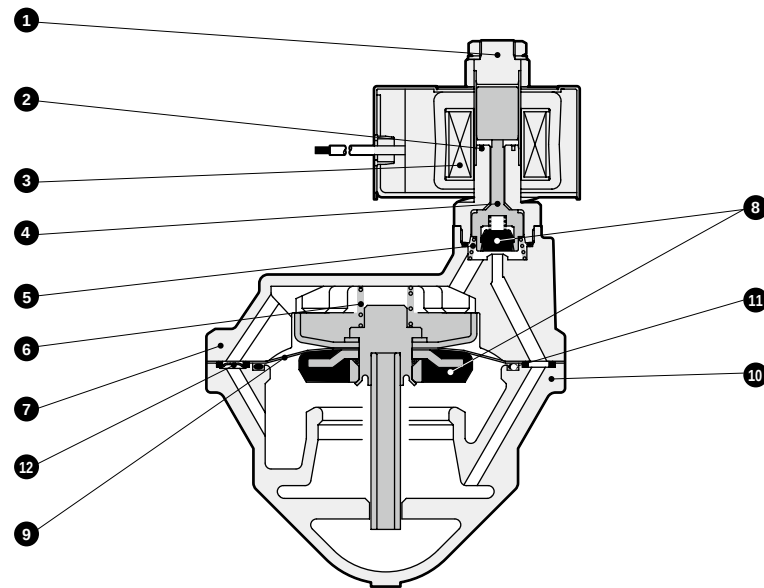
() shows options.

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

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

Internal structure and parts list

● AD22 Series



(The figure shows the opening operation)

No.	Part name	Material	
1	Plunger/core assembly	SUS405 or equiv./SUS316L/SUS304	Stainless steel
2	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
3	Coil	-	-
4	NO valve	POM(PPS)	Body/sealant combination When O/D/H/L: Polyacetal resin When B/E/J/M: Polyphenylene sulfide resin
5	Spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Body	CAC408(SCS13)	Bronze casting (stainless steel casting)
8	Seal	NBR(FKM)	Nitrile rubber (fluoro rubber)
9	Diaphragm assembly	SUS303/SUS304/NBR (SUS303/SUS304/FKM)	Stainless steel/nitrile rubber (stainless steel/fluoro rubber)
10	Body	CAC408(SCS13)	Bronze casting (stainless steel casting)
11	O-ring	NBR(FKM)	Nitrile rubber (fluoro rubber)
12	Orifice plate	SUS304	Stainless steel

() shows options.

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

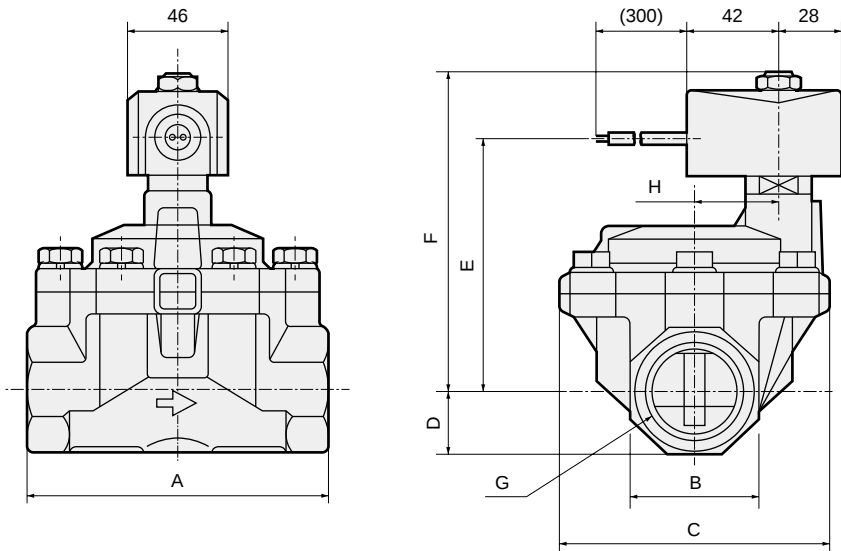
AD21/AD22 Series

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

Dimensions: AD21 Series

- Open frame lead wire (Rc screw-in)
AD21-32A/40A/50A-*

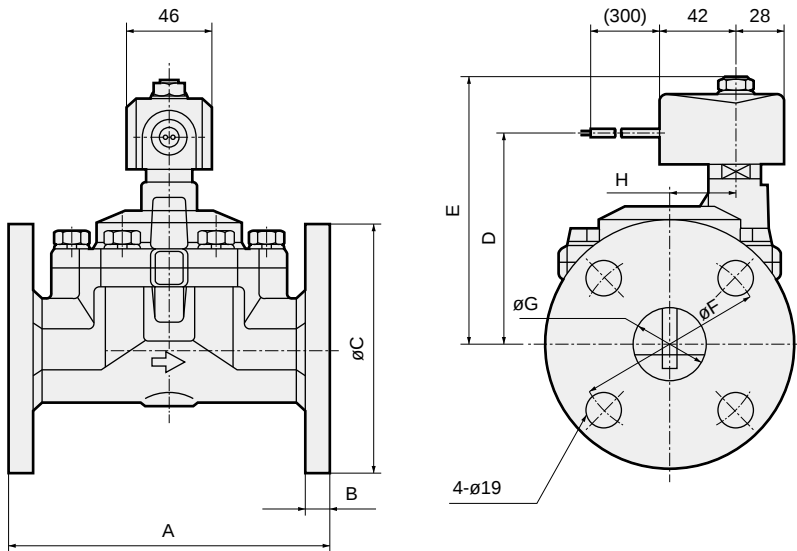
3A
4A
5A



Model No.	A	B	C	D	E	F	G	H
AD21-32A-*□A	125	54	112	27	107	136	Rc1 ¹ / ₄	32
AD21-40A-*□A	140	60	122	30	113	142	Rc1 ¹ / ₂	38
AD21-50A-*□A	160	74	132	37	121	150	Rc2	45

- Open frame lead wire (flange)
AD21-32F/40F/50F-*

3A
4A
5A



Model No.	A	B	C	D	E	F	G	H
AD21-32F-*□A	170	12	135	107	136	100	36(35)	32
AD21-40F-*□A	180	14	140	113	142	105	42	38
AD21-50F-*□A	180	14	155	121	150	120	53(52)	45

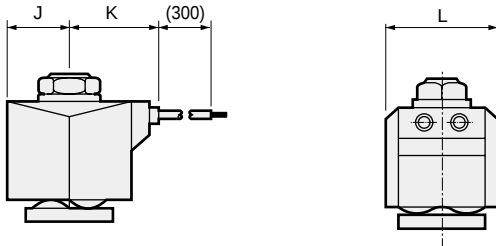
Dimensions shown in () are for stainless steel body.

Optional dimensions: AD21 Series



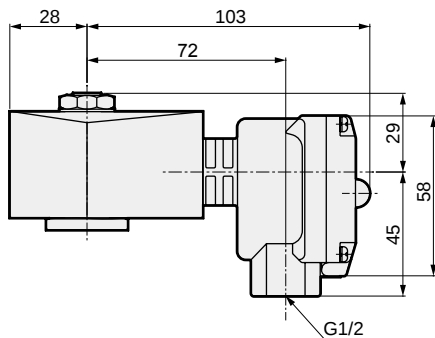
* Refer to the open frame lead wire dimensions on page 288 for common dimensions.

- Grommet lead wire
AD21-32_F to 50_F -* **2C** / **6C**

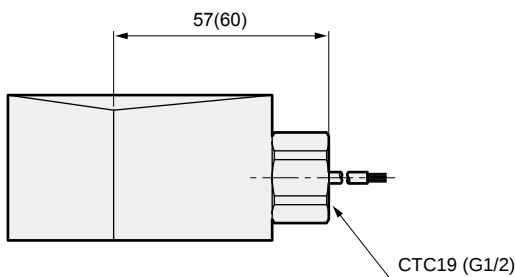


Model No.	J	K	L
AD21-32 _F to 50 _F -*2C	23.5	34.5	38
AD21-32 _F to 50 _F -*6C	24	30.5	39

- Open frame + HP terminal box
AD21-32_F to 50_F -* **3M** / **4M**
5N / **4N**
I / **J**

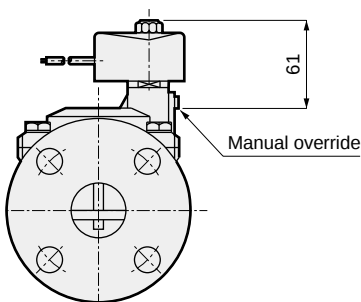


- Open frame + conduit
AD21-32_F to 50_F -* **3A** / **G**
4A / **H**
5A

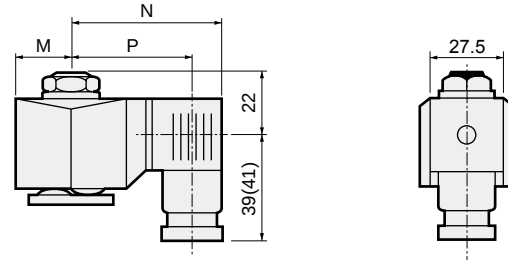


Dimensions shown in () are for G1/2.

- Manual override (locking, flange)
AD21-32F/40F/50F-*** **A**



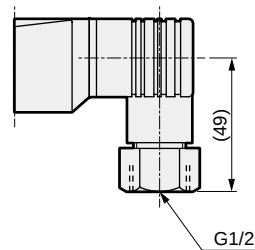
- With DIN terminal box
AD21-32_F to 50_F -* **2E** / **6G**
H



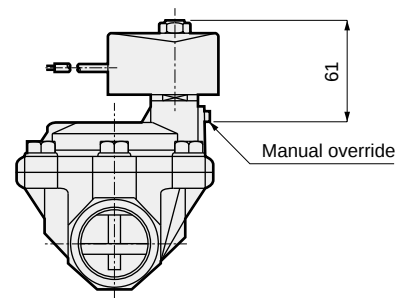
Dimensions shown in () are for G1/2.

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

- DIN terminal box with small lamp + conduit (G1/2)
AD21-32_F to 50_F -* **2H** / **H**



- Manual override (locking, Rc screw-in)
AD21-32A/40A/50A-*** **A**



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

AD21/AD22 Series

EXA

Dimensions: AD22 Series



FWD

● Open frame lead wire (Rc screw-in)

AD22-32A/40A/50A-*
3A
4A
5A

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
AD

APK/
ADK

DryAir

EX-
XPLNprf

XPLNprf

HVB/
HVL

S ◇ B/
NAB

LAD/
NAD

Water-
Rela

NP/NAP/
NVP

SNP

CHB/G

MXB/G

Other
valves

SWD/
MWD

DustColl

CVE/
CVSE

CCH/
CPE/D

LifeSci

Gas-
Combus

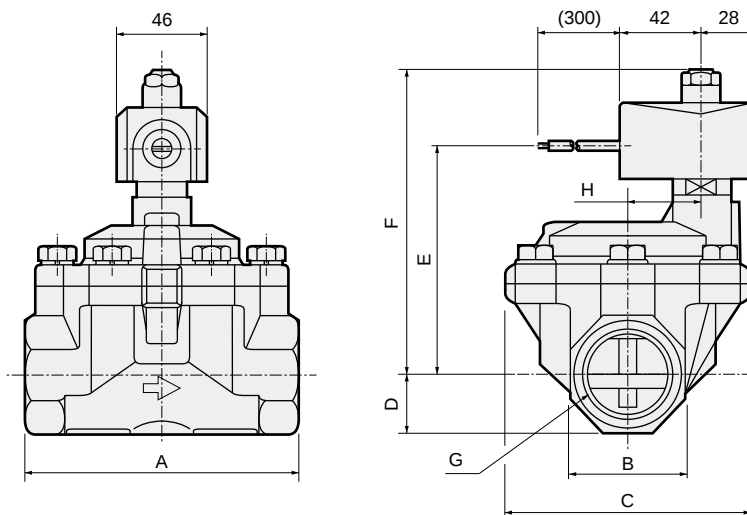
Auto-
Water

Outdoor

SpecFld

Custom

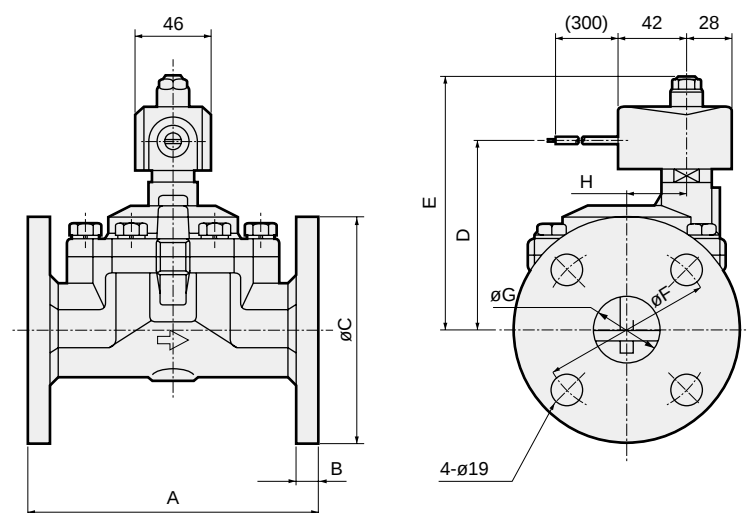
Ending



Model No.	A	B	C	D	E	F	G	H
AD22-32A-*□A	125	54	112	27	111	149.5	Rc1 ¹ / ₄	32
AD22-40A-*□A	140	60	122	30	117	155.5	Rc1 ¹ / ₂	38
AD22-50A-*□A	160	74	132	37	125	163.5	Rc2	45

● Open frame lead wire (flange)

AD22-32F/40F/50F-*
3A
4A
5A



Model No.	A	B	C	D	E	F	G	H
AD22-32F-*□A	170	12	135	111	149.5	100	36(35)	32
AD22-40F-*□A	180	14	140	117	155.5	105	42	38
AD22-50F-*□A	180	14	155	125	163.5	120	53(52)	45

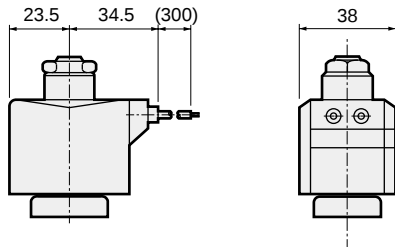
Dimensions shown in () are for stainless steel body.

Optional dimensions: AD22 Series

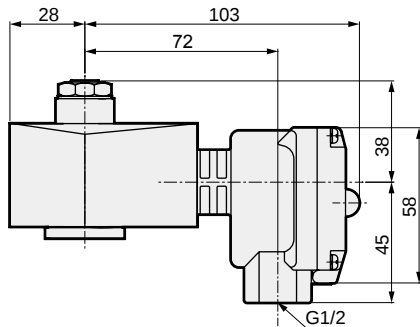


* Refer to the open frame lead wire dimensions on page 290 for common dimensions.

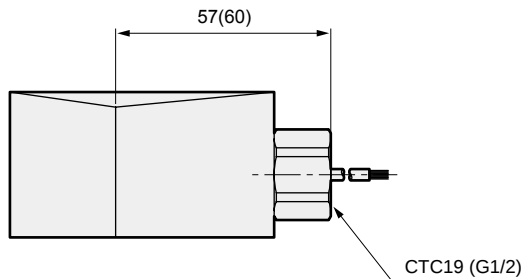
- Grommet lead wire
AD22-32^A to 50^F - * **2C**



- Open frame + HP terminal box
AD22-32^A to 50^F - * **3 M / 4M**
5 N / 4N
I J

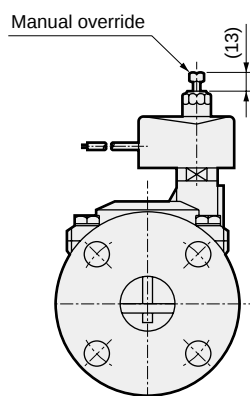


- Open frame + conduit
AD22-32^A to 50^F - * **3A G**
4A H
5A

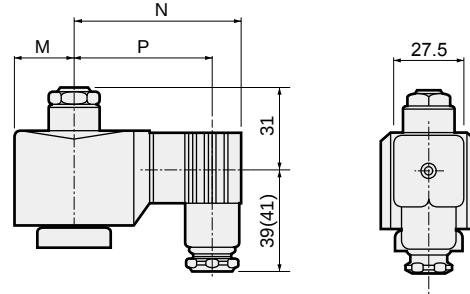


Dimensions shown in () are for G1/2.

- Manual override (locking, flange)
AD22-32F/40F/50F-*** **A**



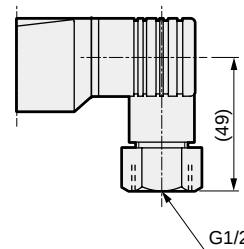
- With DIN terminal box
AD22-32^A to 50^F - * **2E**
2G
2H



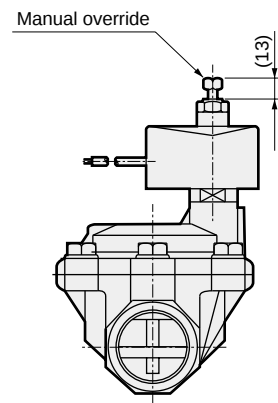
Dimensions shown in () are for G1/2.

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

- DIN terminal box with small lamp + conduit (G1/2)
AD22-32^A to 50^F - * **2H H**



- Manual override (locking, Rc screw-in)
AD22-32A/40A/50A-*** **A**



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