

Pilot operated 2 port solenoid valve
(general purpose valve)

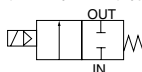
AD21/AD22 Series

- NC (normally closed) type, NO (normally open) type
- Port size: Rc1 1/4 to Rc2, 32 to 50 flange
- Diaphragm structure

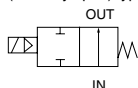


JIS symbol

- AD21:
NC (normally closed) type



- AD22:
NO (normally open) type



Common specifications

Item	Standard specifications
Working fluid	Air, water, kerosene, oil (50 mm ² /s or less)
Working pressure differential range MPa	0.02 to 0.7 (refer to max. working pressure differential in individual specifications.)
Max. working pressure MPa	1
Withstanding pressure (water) MPa	3.2
Fluid temperature °C	-10 to 60 (no freezing)
Ambient temperature °C	-10 to 60
Heat proof class	B
Atmosphere	Place free of corrosive gas and explosive gas
Valve structure	Pilot operated poppet, diaphragm structure
Valve seat leakage (Note 1) cm ³ /min. (ANR)	1 or less (air)
Mounting attitude	Free (within working pressure differential range)
Body, sealant	Bronze, nitrile rubber

Note 1: For AD21 (NC (normally closed) type), these values apply to pneumatic pressure 0.02 to 0.7 MPa, and for AD22 (NO (normally open) type), these apply to pneumatic pressure 0.02 to 0.5 MPa.

Individual specifications

Item Model no.	Port size	Orifice (mm)	Min. working pressure diff. (MPa)	Max. working pressure diff. (MPa)						Rated voltage	Apparent power (VA)				Power consumption (W)		Weight (kg)
				Air		Water, kerosene		Oil (50 mm ² /s)			Holding	Starting	AC	DC			
				AC	DC	AC	DC	AC	DC						50 Hz	60 Hz	
NC (normally closed) type																	
AD21-32A	Rc1 1/4	35	0.02	0.7	0.6	0.7	0.6	0.6	0.6	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz	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	0.02	0.7	0.6	0.7	0.6	0.6	0.6	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz	18	15	29	24	6.7/5.7	11 (10.4) ^{*4} (7) ^{*5}	4.5
AD21-40F	40 flange																8
AD21-50A	Rc2	53	0.02	0.7	0.6	0.7	0.6	0.6	0.6	100 VAC 50/60 Hz 110 VAC 60 Hz 200 VAC 50/60 Hz 220 VAC 60 Hz	18	15	29	24	6.7/5.7	11 (10.4) ^{*4} (7) ^{*5}	6
AD21-50F	50 flange																10
NO (normally open) type																	
AD22-32A	Rc1 1/4	35	0.02	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	22	18	35	29	8.7/6.7	15.5 (14)	3.5
AD22-32F	32 flange																7
AD22-40A	Rc1 1/2	43	0.02	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	22	18	35	29	8.7/6.7	15.5 (14)	4.5
AD22-40F	40 flange																8
AD22-50A	Rc2	53	0.02	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	22	18	35	29	8.7/6.7	15.5 (14)	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 maximum working pressure differential of coil with diode.

*3: Voltage fluctuation should be within ±10% of the rated voltage.

*4: Power consumption of coil housing 2E/2G/2H is indicated.

*5: Power consumption of coil housing 6C/6E/6G/6H is indicated.

Optional specifications

Sealant	Fluoro rubber	
Coil (heat proof class)	B	H
Fluid temperature °C	5 to 60	5 to 90
Ambient temperature °C	-10 to 60	-10 to 100 (Note 2)
Valve seat leakage (Note 1) cm ³ /min. (AIR)	1 or less (air)	

Note 1: For AD21 (NC (normally closed) type), these values apply to pneumatic pressure 0.02 to 0.7 MPa, and for AD22 (NO (normally open) type), these apply to pneumatic pressure 0.02 to 0.5 MPa.

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)	Cv flow factor	Effective sectional area (mm ²)
NC (normally closed) type				
AD21-32A	Rc1 1/4	35	25	460
AD21-32F	32 flange			
AD21-40A	Rc1 1/2	43	34	625
AD21-40F	40 flange			
AD21-50A	Rc2	53	53	975
AD21-50F	50 flange			
NO (normally open) type				
AD22-32A	Rc1 1/4	35	25	460
AD22-32F	32 flange			
AD22-40A	Rc1 1/2	43	34	625
AD22-40F	40 flange			
AD22-50A	Rc2	53	53	975
AD22-50F	50 flange			

HNB/G

USB/G

FAB/G

FGB/G

FVB

FWB/G

FHB

FLB

AB

AG

AP/
ADAPK/
ADKFor
dry airExplosion
proofHVB/
HVLSAB/
SVBNP/NAP/
NVP

CHB/G

MXB/G

Other G.P.
systemsPD/FAD/
PJCVE/
CVSECPE/
CPDMedical
analysisCustom
order






General purpose valve

Pilot operated 2 port solenoid valve


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

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

⚠ Refer to the following precautions for Ⓓ to Ⓗ.

2C 6C		● Grommet lead wire 300 mm
2E 2G 2H 6E 6G 6H		● DIN terminal box
3A 4A 5A		● Open frame 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 222 for coil selection.

G H		● Conduit ● G (CTC19) ● H (G1/2)
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⚠ Note on model no. selection

Note on Ⓓ

- *4: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.
- *5: 6C, 6E, 6G and 6H are available only for AD21.
- *6: The coil housings 6C, 6E and 6G are 12 VDC and 24 VDC dedicated. 6H is 24 VDC dedicated.

Note on Ⓔ to Ⓖ

- *7: Select one among D, E, F, G and H for Ⓗ.
- *8: 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.
- *9: 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.
- *10: 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 Ⓓ

- *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. 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.
- *12: For voltages other than above, consult with 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.

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

CV/E/
CVSE

CPE/
CPD

Medical
analysis

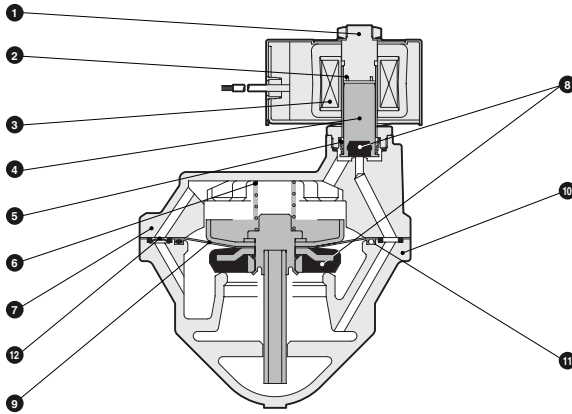
Custom
order

General purpose valve
Pilot Operated 2 port Solenoid valve

AD21/AD22 Series

Internal structure and parts list

● AD21 Series



No.	Parts name	Material	
1	Core assembly	SUS405 or equivalent, SUS316L, SUS403 *1	Stainless steel
2	Shading coil *2	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)
3	Coil	-	-
4	Plunger	SUS405 or equivalent	Stainless steel
5	Plunger spring	SUS304	Stainless steel
6	Valve spring	SUS304	Stainless steel
7	Stuffing	CAC408 (SCS13)	Bronze casting (stainless steel casting)
8	Sealant	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

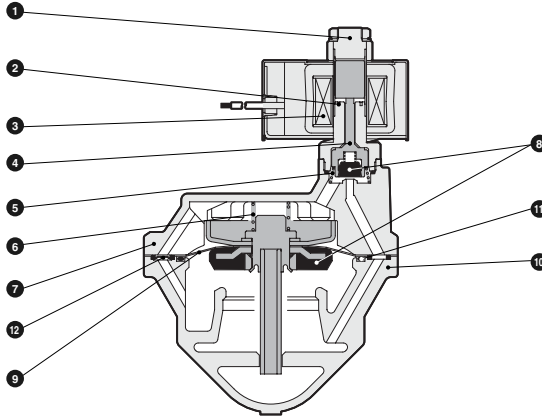
() shows options.

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

*2: When using the DC coil or a coil with diode, no shedding coil is used.

Internal structure and parts list

● AD22 Series



No.	Parts name	Material		
1	Plunger/core assembly	SUS405 or equivalent, SUS316L, SUS304	Stainless steel	HNB/G
2	Shading coil	Cu (Ag for stainless steel body)	Copper (silver for stainless steel body)	USB/G
3	Coil	-	-	FAB/G
4	NO valve assembly	POM, NBR (SUS303, PFA, FKM)	Acetal resin, nitrile rubber (stainless steel, perfluoroalkoxy resin, fluoro rubber)	FGB/G
5	Spring	SUS304	Stainless steel	FVB
6	Valve spring	SUS304	Stainless steel	FWB/G
7	Stuffing	CAC408 (SCS13)	Bronze casting (stainless steel casting)	FHB
8	Sealant	NBR (FKM)	Nitrile rubber (fluoro rubber)	FLB
9	Diaphragm assembly	SUS303, SUS304, NBR (SUS303, SUS304, FKM)	Stainless steel, nitrile rubber (stainless steel, fluoro rubber)	AB
10	Body	CAC408 (SCS13)	Bronze casting (stainless steel casting)	AG
11	O ring	NBR (FKM)	Nitrile rubber (fluoro rubber)	AP/AD
12	Orifice plate	SUS304	Stainless steel	APK/ADK

() shows options.

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
Pilot operated 2 port solenoid valve

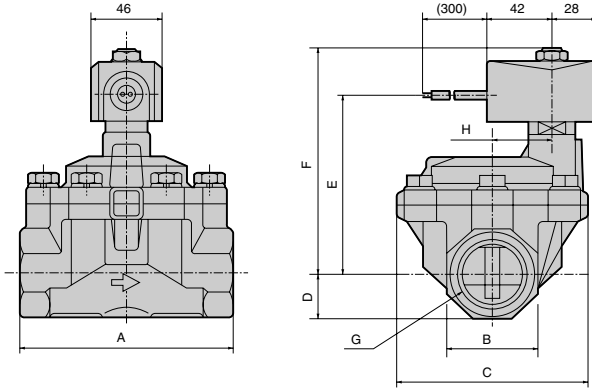
AD21/AD22 Series

Dimensions: AD21 Series

- Open frame lead wire type (Rc screw-in type)

AD21-32A/40A/50A-[□]

3A
4A
5A

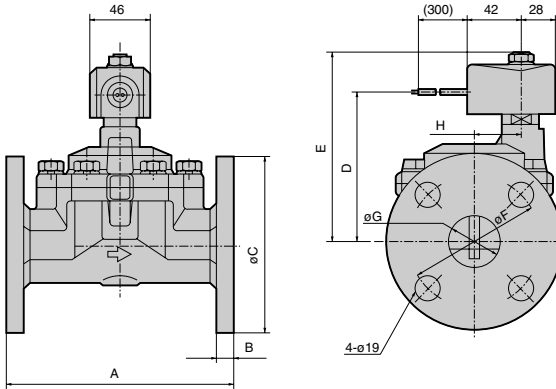


Model no.	A	B	C	D	E	F	G	H
AD21-32A- [□] A	125	54	112	27	107	136	Rc1 1/4	32
AD21-40A- [□] A	140	60	122	30	113	142	Rc1 1/2	38
AD21-50A- [□] A	160	74	132	37	121	150	Rc2	45

- Open frame lead wire type (flange type)

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	32
AD21-40F- [□] A	180	14	140	113	142	105	42	38
AD21-50F- [□] A	180	14	155	121	150	120	53	45

Optional dimensions: AD21 Series



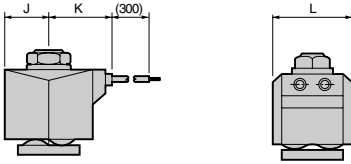
* Refer to the open frame lead wire type dimensions on the left page for common dimensions.

- Grommet lead wire type
AD21-32^ø to 50^ø - *

2	E
6	G
	H

 /

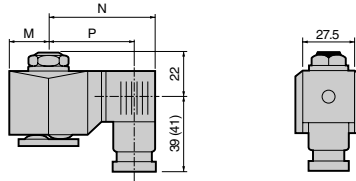
6	C
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Model no.	J	K	L
AD21-32^ø to 50^ø - *2C	23.5	34.5	38
AD21-32^ø to 50^ø - *6C	24	30.5	39

- DIN terminal box
AD21-32^ø to 50^ø - *

2	E
6	G
	H

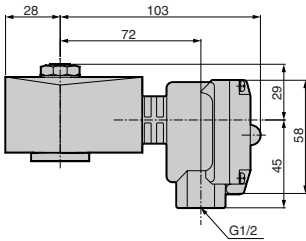


Dimensions shown in () are for G1/2.

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

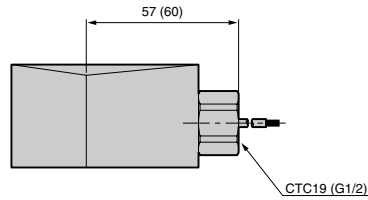
- Open frame type + HP terminal box
AD21-32^ø to 50^ø - *

3	M	4M
5	N	4N
	I	J



- Open frame type + conduit
AD21-32^ø to 50^ø - *

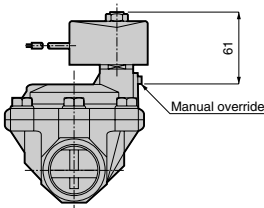
3	A	G
4	A	H
5	A	



Dimensions shown in () are for G1/2.

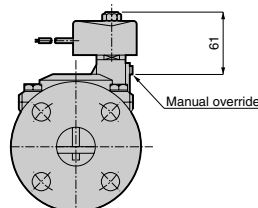
- Manual override (locking, Rc screw-in type)
AD21-32A/40A/50A - **

A



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

A



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/
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CHB/G
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General purpose valve
Pilot operated 2 port solenoid valve

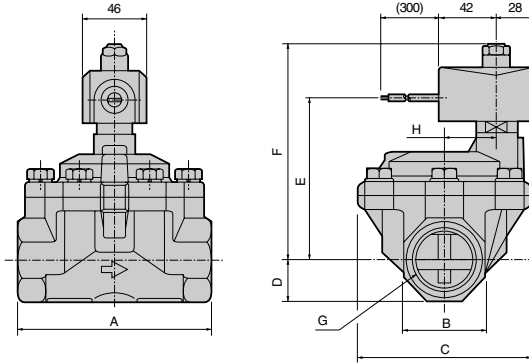
AD21/AD22 Series

Dimensions: AD22 Series

- Open frame lead wire type (Rc screw-in type)

AD22-32A/40A/50A-*

3A
4A
5A

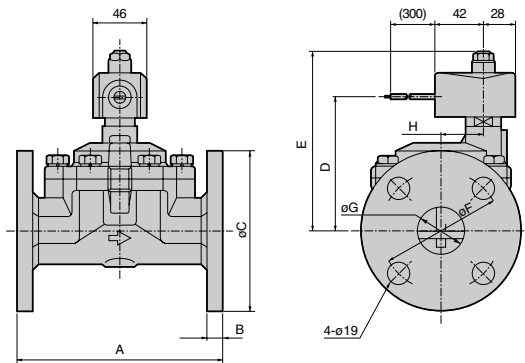


Model no.	A	B	C	D	E	F	G	H
AD22-32A-*□A	125	54	112	27	111	149.5	Rc1 1/4	32
AD22-40A-*□A	140	60	122	30	117	155.5	Rc1 1/2	38
AD22-50A-*□A	160	74	132	37	125	163.5	Rc2	45

- Open frame lead wire type (flange type)

AD22-32F/40F/50F-*

3A
4A
5A



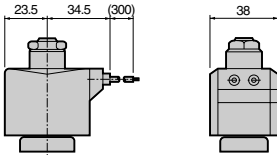
Model no.	A	B	C	D	E	F	G	H
AD22-32F-*□A	170	12	135	111	149.5	100	36	32
AD22-40F-*□A	180	14	140	117	155.5	105	42	38
AD22-50F-*□A	180	14	155	125	163.5	120	53	45

Optional dimensions: AD22 Series

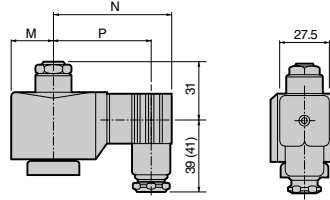


* Refer to the open frame lead wire type dimensions on the left page for common dimensions.

- Grommet lead wire type
AD22-32^ø to 50^ø - * [2C]



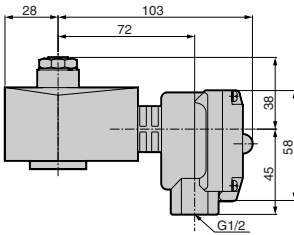
- DIN terminal box
AD22-32^ø to 50^ø - *



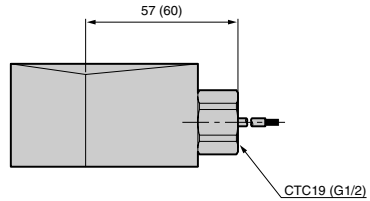
Dimensions shown in () are for G1/2.

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

- Open frame type + HP terminal box
AD22-32^ø to 50^ø - * [M/4M]
[N/4N]
[J]

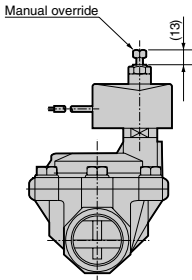


- Open frame type + conduit
AD22-32^ø to 50^ø - * [3A]
[4A]
[5A] [G]
[H]

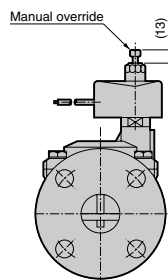


Dimensions shown in () are for G1/2.

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



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



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
Pilot operated 2 port solenoid valve