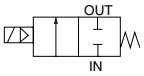
Pilot kick type 2 port solenoid valve
(general purpose valve)

# APK11 Series

- NC (normally closed) type
- Port size: Rc 1/4 to Rc1
- Piston structure

## JIS symbol




## Common specifications

| Item | Standard specifications | Optional specifications |
|---|---|---|
| Working fluid | Air, low vacuum (1.33 x $10^3$ Pa (abs)), water, kerosene, oil (20 $mm^2/s$ or less) | Steam |
| Working pressure differential range MPa | 0 to 1.0 (refer to max. working pressure differential in individual specifications.) | |
| Max. working pressure MPa | 2 | 1 |
| Withstanding pressure (water) MPa | 4 | |
| Fluid temperature °C | -10 to 60 (Note 1) | 5 to 180 |
| Ambient temperature °C | -10 to 60 | |
| Heat proof class | B | H |
| Atmosphere | Place free of corrosive gas and explosive gas | |
| Valve structure | Pilot kick type poppet, piston structure | |
| Valve seat leakage (Note 2) $cm^3$/min. (ANR) | 0.2 or less (air) | 400 or less (air) |
| Mounting attitude | Limited to range between vertical position with coil facing upward and horizontal position (Note 3) | |
| Body, sealant | Bronze, nitrile rubber | Bronze, PTFE |

Note 1: No freezing
Note 2: This applies to pneumatic pressures between 0.05 and 1.0 MPa.
When using at a pressure less than 0.05 MPa, the sealant may be unstable.
Consult with CKD in this case.
Note 3: If working pressure is less than 0.05 MPa, installation is limited to vertical position.

## Individual specifications

| Model no. / Item | 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 (20 $mm^2/s$) | | Steam | | | Holding | | Starting | | AC | DC | |
| | | | | AC | DC | AC | DC | AC | DC | AC | | | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50/60 Hz | | |
| **APK11-8A** | Rc1/4 | 12 | 0 | 1.0 | 0.7 | 1.0 | 0.7 | 0.7 | 0.6 | 1.0 | | 100 VAC 50/60 Hz<br>110 VAC 60 Hz<br>200 VAC 50/60 Hz<br>220 VAC 60 Hz<br>12 VDC<br>24 VDC<br>48 VDC<br>100 VDC | 24 | 19 | 61 | 54 | 10/8 | 11 | 0.7 |
| **APK11-10A** | Rc3/8 | 12 | | | | | | | | | | | | | | | | | 0.7 |
| **APK11-15A** | Rc1/2 | 16 | | | | | | | | | | | 32 | 26 | 123 | 106 | 13/11 | 20 | 1.0 |
| **APK11-20A** | Rc3/4 | 23 | | | 0.6 | | 0.6 | | 0.5 | | | | | | | | | | 1.3 |
| **APK11-25A** | Rc1 | 28 | | | | | | | | | | | | | | | | | 1.7 |

*1: The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.
*2: Voltage fluctuation should be within ±10% of the rated voltage.
*3: Refer to DC column for the maximum working pressure differential of coil with diode.
*4: When using with a low vacuum, vacuum the OUT port side.

## Optional specifications

| Sealant | Fluoro rubber | | PTFE | |
|---|---|---|---|---|
| Coil (heat proof class) | B | H | B | H |
| Fluid temperature °C | 5 to 60 | 5 to 90 | -10 to 60 (Note 1) | 5 to 180 |
| Ambient temperature °C | -10 to 60 | | | |
| Valve seat leakage (Note 2) cm³/min. (ANR) | 0.2 or less (air) | | 400 or less (air) | |

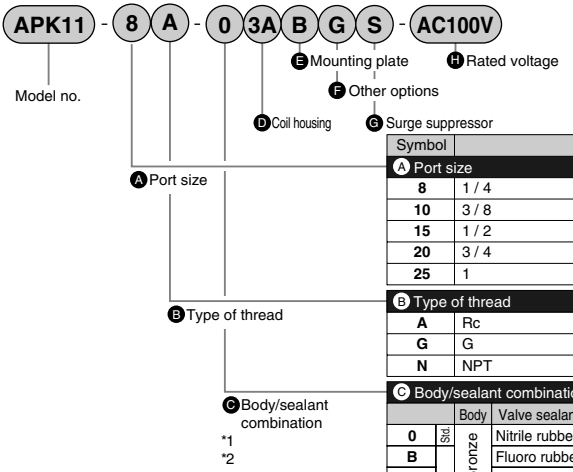
Note 1: No freezing
Note 2: This applies to pneumatic pressures between 0.05 and 1.0 MPa. When using at a pressure less than 0.05 MPa, the sealant may be unstable. Consult with CKD in this case.

## Flow characteristics

| Model no. | Port size | Orifice (mm) | Flow characteristics | | | |
|---|---|---|---|---|---|---|
| | | | C [dm³/(s·bar)] | b | Cv flow factor | S (mm²) |
| **APK11-8A** | Rc1/4 | 12 | 9.4 | 0.41 | 2.2 | – |
| **APK11-10A** | Rc3/8 | 12 | 15 | 0.37 | 2.7 | – |
| **APK11-15A** | Rc1/2 | 16 | 20 | 0.31 | 4.5 | – |
| **APK11-20A** | Rc3/4 | 23 | – | – | 8.6 | 162 |
| **APK11-25A** | Rc1 | 28 | – | – | 12 | 231 |

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

## How to order




| Symbol | Descriptions |
|---|---|
| **A Port size** | |
| **8** | 1 / 4 |
| **10** | 3 / 8 |
| **15** | 1 / 2 |
| **20** | 3 / 4 |
| **25** | 1 |
| **B Type of thread** | |
| **A** | Rc |
| **G** | G |
| **N** | NPT |

**C Body/sealant combination**

| | | Body | Valve sealant | O ring | Treatment | Remarks |
|---|---|---|---|---|---|---|
| **0** | Std. | Bronze | Nitrile rubber | Nitrile rubber | – | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **B** | Option | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **C** | | | PTFE | Fluoro rubber | | Steam (up to 180˚C *1) |
| **D** | | Stainless steel | Nitrile rubber | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **E** | | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **F** | | | PTFE | PTFE | | Steam (up to 180˚C *1) |
| **H** | | Bronze | Nitrile rubber | Nitrile rubber | Oil free | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **J** | | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **K** | | | PTFE | Fluoro rubber | | Steam (up to 180˚C *1) |
| **L** | | Stainless steel | Nitrile rubber | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **M** | | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **N** | | | PTFE | PTFE | | Steam (up to 180˚C *1) |

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

**D to H**

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

<Example 1 of model number>
**APK11-20A-02C-AC100V**
Series: APK11
A Port size: 3/4
B Type of thread: Rc
C Body/sealant combination
: Body - bronze, valve sealant - nitrile rubber, O ring - nitrile rubber
D Coil housing: Grommet lead wire
F to I : Blank
J Rated voltage
: 100 VAC 50/60 Hz, 110 VAC 60 Hz

<Example 2 of model number>
**APK11-10G-C4ABS-AC200V**
Series: APK11
A Port size: 3/8
B Type of thread: G
C Body/sealant combination
: Body - bronze, valve sealant - PTFE, O ring - fluoro rubber
D Coil housing
: Open frame lead wire (class H coil)
E Mounting plate: Selected
F Other options: Blank
G Surge suppressor: Selected
H Rated voltage
: 200 VAC 50/60 Hz, 220 VAC 60 Hz

### ⚠ Note on model no. selection

Note on C

*1: Ⓒ: When selecting 4A, 4M or 4N.
*2: When using the PTFE valve sealant with class H coil, the O ring material will be fluoro rubber for steam.

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

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

⚠ Refer to the following precautions for Ⓓ to Ⓗ.

| | |
|---|---|
| 2C |  ● Grommet lead wire 300 mm |
| 2E<br>2G<br>2H |  ● DIN terminal box |
| 3A<br>4A<br>5A |  ● Open frame grommet lead wire 300 mm<br>● 4A (heat proof class H)<br>● 5A (diode integrated) |
| 3M<br>3N<br>4M<br>4N<br>5M<br>5N |  ● Open frame HP terminal box<br>● 4M, 4N (heat proof class H)<br>● 5M, 5N (diode integrated) |
| 3I<br>3J<br>5I<br>5J |  ● Open frame HP terminal box (IP65 or equivalent)<br>● 5I, 5J (diode integrated) |

| | |
|---|---|
| G<br>H |  ● Conduit<br>● G (CTC19)<br>● H (G1/2) |

Refer to page 224 for coil selection.

## ⚠ Note on model no. selection

Note on Ⓓ

*3: 5A, 5M and 5N are coils for which AC power is converted to DC with a diode.
*4: A waterproof coil (excluding heat proof class H) with square terminal box is available. Contact CKD for more information.

Note on Ⓔ to Ⓖ

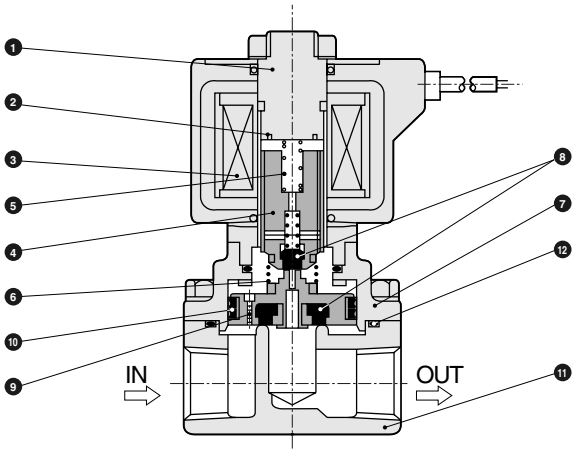
*5: The mounting plate (Ⓔ B) can be mounted only on Ⓐ (port size) 8 (1/4) or 10 (3/8).
*6: Select one among D, E, F, G and H for Ⓕ.
*7: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*8: The surge suppressor is incorporated in the coil with diode as standard.
*9: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.

Note on Ⓗ

*10: 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 can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*11: For voltages other than above, consult with CKD.
*12: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

## Internal structure and parts list

● APK11-8A/10A

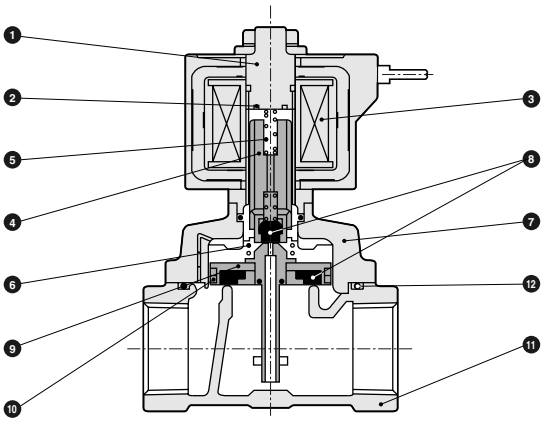



| No. | Parts name | Material | |
|---|---|---|---|
| 1 | Core assembly | SUS405 or equivalent, SUS316L, SUS403 *1 | Stainless steel |
| 2 | Shading coil *2 | Cu (Ag for stainless steel body) | Copper (silver for stainless steel body) |
| 3 | Coil | – | – |
| 4 | Plunger assembly | SUS405 or equivalent, SUS304, NBR (SUS405 or equivalent, SUS304, FKM, PFA or PTFE) | Stainless steel |
| 5 | Plunger spring | SUS304 | Stainless steel |
| 6 | Kick spring | SUS304 | Stainless steel |
| 7 | Stuffing | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| 8 | Sealant | NBR (FKM, PTFE) | Nitrile rubber (fluoro rubber or tetrafluoroethylene resin) |
| 9 | Main valve assembly | SUS303, SUS304, NBR (SUS303, SUS304, FKM or PTFE) | Stainless steel |
| 10 | Seal ring set | SUS304, PTFE | Stainless steel, tetrafluoroethylene resin |
| 11 | Body | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| 12 | O ring | NBR (FKM, PTFE) | Nitrile rubber (fluoro rubber or tetrafluoroethylene resin) |

( ) shows options.
*1: When the body/sealant combination symbol is other than O and H, 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

● APK11-15A/20A/25A

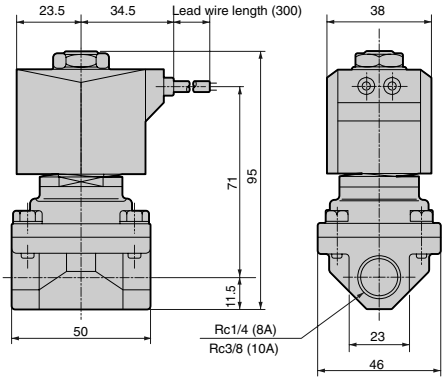



| No. | Parts name | Material | |
|---|---|---|---|
| 1 | Core assembly | SUS405 or equivalent, SUS316L, SUS403 *1 | Stainless steel |
| 2 | Shading coil *2 | Cu (Ag for stainless steel body) | Copper (silver for stainless steel body) |
| 3 | Coil | – | – |
| 4 | Plunger assembly | SUS405 or equivalent, SUS304, NBR (SUS405 or equivalent, SUS304, FKM, PFA or PTFE) | Stainless steel |
| 5 | Plunger spring | SUS304 | Stainless steel |
| 6 | Kick spring | SUS304 | Stainless steel |
| 7 | Stuffing | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| 8 | Sealant | NBR (FKM or PTFE) | Nitrile rubber (fluoro rubber or tetrafluoroethylene resin) |
| 9 | Main valve assembly | SUS303, SUS304, NBR (SUS303, SUS304, FKM or PTFE) | Stainless steel |
| 10 | Seal ring set | SUS304, PTFE | Stainless steel, tetrafluoroethylene resin |
| 11 | Body | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| 12 | O ring | NBR (FKM or PTFE) | Nitrile rubber (fluoro rubber or tetrafluoroethylene resin) |

( ) shows options.
*1: When the body/sealant combination symbol is other than O and H, the material is SUS405 or equivalent, SUS316L, SUS430.
*2: When using the DC coil or a coil with diode, no shedding coil is used.

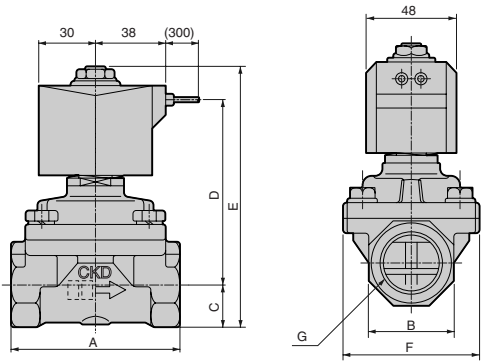
## Dimensions

● Grommet lead wire type
APK11-8A/10A-*2C




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

● Grommet lead wire type
APK11-15A/20A/25A-*2C



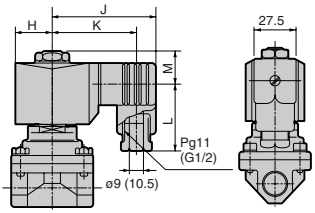

| Model no. | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| APK11-15A-*2C | 71 | 27 (29) | 14.5 | 89 | 119.5 | 50 | Rc1/2 |
| APK11-20A-*2C | 80 | 32 (35) | 17.5 | 93 | 126.5 | 60 | Rc3/4 |
| APK11-25A-*2C | 90 | 41 (45) | 22.5 | 99 | 137.5 | 71 | Rc1 |

*1: The dimensions are the same for the G or NPT thread port size.
*2: Dimensions shown in ( ) are for stainless steel body.

## Optional dimensions

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

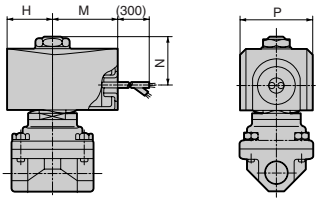
● DIN terminal box
APK11-8A to 25A-* 2E / 2G / 2H




Dimensions shown in ( ) are for G1/2.

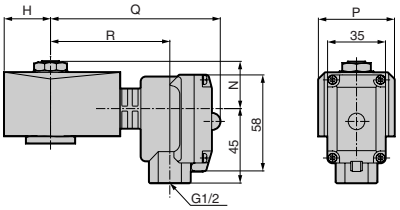
| Model no. | H | J | K | L | M |
|---|---|---|---|---|---|
| APK11-8A/10A | 23.5 | 65.5 | 54 (53.5) | 39 (41) | 22 |
| APK11-15A/20A/25A | 30 | 73 | 61.5 (61) | 39 (41) | 24 |

● Open frame lead wire type
APK11-8A to 25A-* 3A / 4A / 5A



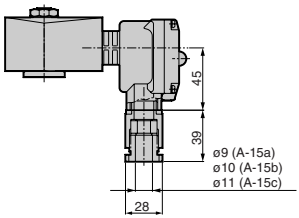

| Model no. | H | M | N | P |
|---|---|---|---|---|
| APK11-8A/10A | 28 | 42 | 29 | 46 |
| APK11-15A/20A/25A | 34 | 46 | 33 | 56 |

● Open frame type + HP terminal box
APK11-8A to 25A-* 3 M / 4 N / 5

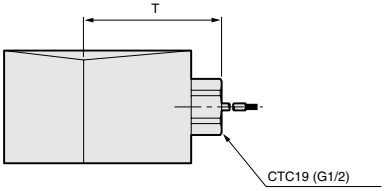



| Model no. | H | N | P | Q | R |
|---|---|---|---|---|---|
| APK11-8A/10A | 28 | 29 | 46 | 103 | 72 |
| APK11-15A/20A/25A | 34 | 33 | 56 | 98 | 68 |

● Open frame type + cable gland
APK11-8A to 25A-* 3 M D / 4 N E / 5 F



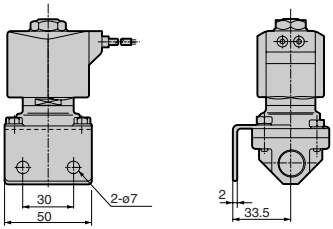

● Open frame type + conduit
APK11-8A to 25A-* 3A G / 4A H / 5A




Dimensions shown in ( ) are for G1/2.

| Model no. | T |
|---|---|
| APK11-8A/10A | 57 (60) |
| APK11-15A to 25A | 59 (62) |

● Mounting plate
APK11-8A/10A-*** B



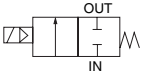
Pilot kick type 2 port solenoid valve
(general purpose valve)

# APK21 Series

- NC (normally closed) type
- Port size: Rc1 1/4 to Rc2, 32 to 50 flange
- Piston structure

RoHS CAD

## JIS symbol




## Common specifications

| Item | Standard specifications | Optional specifications |
|---|---|---|
| Working fluid | Air, low vacuum (1.33 x $10^3$ Pa (abs)), water, kerosene, oil (20 $mm^2$/s or less) | Steam |
| Working pressure differential range MPa | 0 to 0.7 (refer to max. working pressure differential in individual specifications.) | |
| Max. working pressure MPa | 1 | |
| Withstanding pressure (water) ˚C | 3.2 | |
| Fluid temperature ˚C | -10 to 60 (Note 1) | 5 to 180 |
| Ambient temperature | -10 to 60 | |
| Heat proof class | B | H |
| Atmosphere | Place free of corrosive gas and explosive gas | |
| Valve structure | Pilot kick type poppet, piston structure | |
| Valve seat leakage (Note 2) $cm^3$/min. (ANR) | 1 or less (air) | 800 or less (air) |
| Mounting attitude | Limited to vertical position with coil facing upward | |
| Body, sealant | Bronze, nitrile rubber | Bronze, PTFE |

Note 1: No freezing
Note 2: This applies to pneumatic pressures between 0.05 and 0.7 MPa. When using at a pressure less than 0.05 MPa, the sealant may be unstable. Consult with CKD in this case.

## 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 (20 $mm^2$/s) | | Steam | | Holding | | Starting | | AC | DC | |
| | | | | AC | DC | AC | DC | AC | DC | AC | | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50/60 Hz | | |
| **APK21-32A** | Rc1 1/4 | 35 | 0 | 0.7 | 0.6 | 0.7 | 0.6 | 0.5 | 0.5 | 0.7 | 100 VAC 50/60 Hz<br>200 VAC 50/60 Hz<br>12 VDC<br>24 VDC<br>48 VDC<br>100 VDC | 64 | 69 | 274 | 289 | 44/48 | 20 | 4.5 |
| **APK21-32F** | 32 flange | | | | | | | | | | | | | | | | | 8 |
| **APK21-40A** | Rc1 1/2 | 43 | | | | | | | | | | | | | | | | 5.5 |
| **APK21-40F** | 40 flange | | | | | | | | | | | | | | | | | 9 |
| **APK21-50A** | Rc2 | 53 | | | | | | | | | | | | | | | | 7 |
| **APK21-50F** | 50 flange | | | | | | | | | | | | | | | | | 11.5 |

*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: When using with a low vacuum, vacuum the OUT port side.

## Optional specifications

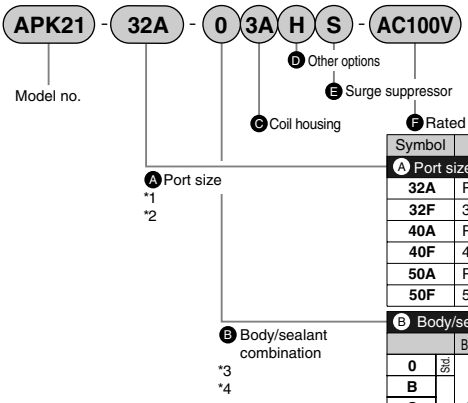
| Sealant | Fluoro rubber | | PTFE | |
|---|---|---|---|---|
| Coil (heat proof class) | B | H | B | H |
| Fluid temperature ˚C | 5 to 60 | 5 to 90 | -10 to 60 (Note 1) | 5 to 180 |
| Ambient temperature ˚C | -10 to 60 | | | |
| Valve seat leakage (Note 2) cm³/min. (ANR) | 1 or less (air) | | 800 or less (air) | |

Note 1: No freezing
Note 2: This applies to pneumatic pressures between 0.05 and 0.7 MPa. When using at a pressure less than 0.05 MPa, the sealant may be unstable. Consult with CKD in this case.

## Flow characteristics

| Model no. | Port size | Orifice (mm) | Cv flow factor | Effective sectional area ($mm^2$) |
|---|---|---|---|---|
| **APK21-32A** | Rc1 1/4 | 35 | 25 | 460 |
| **APK21-32F** | 32 flange | | | |
| **APK21-40A** | Rc1 1/2 | 43 | 34 | 625 |
| **APK21-40F** | 40 flange | | | |
| **APK21-50A** | Rc2 | 53 | 53 | 975 |
| **APK21-50F** | 50 flange | | | |

How to order




| Symbol | Descriptions |
|---|---|
| **Ⓐ Port size** | |
| **32A** | Rc1 1/4 |
| **32F** | 32 flange |
| **40A** | Rc1 1/2 |
| **40F** | 40 flange |
| **50A** | Rc2 |
| **50F** | 50 flange |

**Ⓑ Body/sealant combination**

| | | Body | Valve sealant | O ring | Treatment | Remarks |
|---|---|---|---|---|---|---|
| **0** | Std. | Bronze | Nitrile rubber | Nitrile rubber | – | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **B** | Option | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **C** | | | PTFE | Fluoro rubber | | Steam (up to 180˚C *3) |
| **D** | | Stainless steel | Nitrile rubber | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **E** | | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **F** | | | PTFE | PTFE | | Steam (up to 180˚C *3) |
| **H** | | Bronze | Nitrile rubber | Nitrile rubber | Oil free | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **J** | | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **K** | | | PTFE | Fluoro rubber | | Steam (up to 180˚C *3) |
| **L** | | Stainless steel | Nitrile rubber | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **M** | | | Fluoro rubber | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **N** | | | PTFE | PTFE | | Steam (up to 180˚C *3) |

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

**Ⓒ to Ⓕ**

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

<Example 1 of model number>
**APK21-32F-03A-DC24V**
Series: APK21
Ⓐ Port size: 32 flange
Ⓑ Body/sealant combination
: Body - bronze, valve sealant - nitrile rubber, O ring - nitrile rubber
Ⓒ Coil housing: Open frame lead wire
Ⓓ Ⓔ : Blank
Ⓕ Rated voltage: 24 VDC

<Example 2 of model number>
**APK21-50F-B4MD-AC100V**
Series: APK21
Ⓐ Port size: 50 flange
Ⓑ Body/sealant combination
: Body - bronze, valve sealant - fluoro rubber, O ring - fluoro rubber
Ⓒ Coil housing: Open frame type (class H coil) with HP terminal box (G1/2)
Ⓓ Other options: Cable gland A-15a
Ⓔ Surge suppressor: Blank
Ⓕ Rated voltage: 100 VAC 50/60 Hz

### ⚠ Note on model no. selection

*1: The companion flange is JIS B2210 10K. (No flange is enclosed with the product, but must be purchased separately.)
*2: G and NPT threads are used for piping port. Contact CKD for details.

Note on Ⓑ

*3: Ⓑ : When selecting 4A, 4M or 4N.
*4: When using the PTFE valve sealant with class H coil, the O ring material will be fluoro rubber for steam.

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

| Ⓒ Coil housing | | | | Ⓓ Other options | | | | Ⓔ | Ⓕ Rated voltage |
|---|---|---|---|---|---|---|---|---|---|
| Descriptions | | | | Cable gland (Marine cable gland) A-15a A-20a | Cable gland (Marine cable gland) A-15b A-20b | Cable gland (Marine cable gland) A-15c A-20c | Conduit (Conduit pipe) G1/2 | Surge suppressor | Descriptions |
| 3A | Std. | Open frame type | Lead wire | D | E | F | H | S | 100 VAC, 200 VAC, 12 VCD, 24 VDC, 48 VDC, 100 VDC |
| 3M | | | HP terminal box (G1/2) | | | | | | |
| 3N | | | HP terminal box + light (G1/2) | | | | | | 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC |
| 4A | Option | Open frame type (Heat proof class H) | Lead wire | D | E | F | H | S | 100 VAC, 200 VAC |
| 4M | | | HP terminal box (G1/2) | | | | | | |
| 4N | | | HP terminal box + light (G1/2) | | | | | | |
| 5A | | Open frame type (Diode integrated) | Lead wire | D | E | F | H | | 100 VAC, 200 VAC |
| 5M | | | HP terminal box (G1/2) | | | | | | |
| 5N | | | HP terminal box + light (G1/2) | | | | | | |

⚠ Refer to the following precautions for Ⓒ to Ⓕ.

3A
4A
5A

● Open frame lead wire 300 mm
● Direct conduit wiring thread CTC19 integrated

H

● Conduit (G1/2)

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

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

Refer to page 225 for coil selection.

## ⚠ Note on model no. selection

Note on Ⓒ

*5: 5A, 5M and 5N are coils for which AC power is converted to DC with a diode.

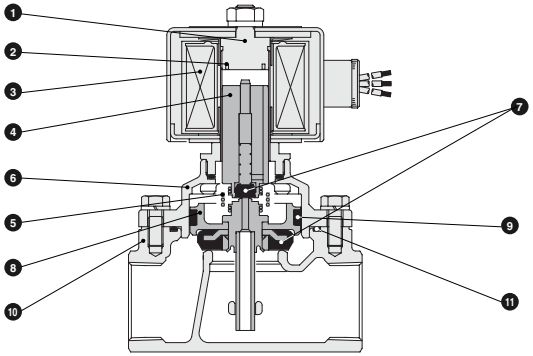
Note on Ⓓ and Ⓔ

*6: Select one among D, E, F and H for Ⓓ.
*7: 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.
*8: The surge suppressor is incorporated in the coil with diode as standard.
*9: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.

Note on Ⓕ

*10: For voltages other than above, consult with CKD.
*11: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

## Internal structure and parts list

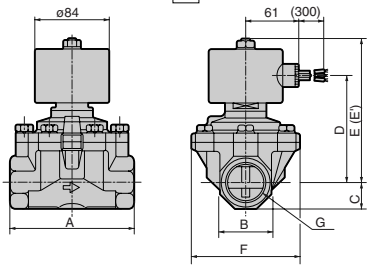



| No. | Parts name | Material | |
|---|---|---|---|
| **1** | Core assembly | SUS405 or equivalent, SUS316L, SUS403 | Stainless steel |
| **2** | Shading coil *1 | Cu (Ag for stainless steel body) | Copper (silver for stainless steel body) |
| **3** | Coil | – | – |
| **4** | Plunger assembly | SUS405 or equivalent, SUS304, C3604, NBR (SUS405 or equivalent, SUS304, FKM, PFA or PTFE) | Stainless steel |
| **5** | Kick spring | SUS304 | Stainless steel |
| **6** | Stuffing | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| **7** | Sealant | NBR (FKM, PTFE) | Nitrile rubber (fluoro rubber or tetrafluoroethylene resin) |
| **8** | Main valve assembly | SUS303, SUS304, C3604, NBR (SUS303, SUS304, FKM or PTFE) | Stainless steel, brass (stainless steel) |
| **9** | Seal ring set | SUS304, PTFE | Stainless steel, tetrafluoroethylene resin |
| **10** | Body | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| **11** | O ring | NBR (FKM, PTFE) | Nitrile rubber (fluoro rubber or tetrafluoroethylene resin) |

( ) shows options.
*1: When using the DC coil or a coil with diode, no shedding coil is used.

## Dimensions

● Open frame lead wire type (Rc screw-in type)
APK21-32A/40A/50A-* 3A 4A



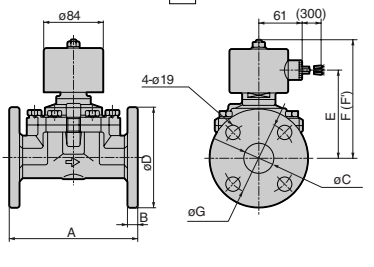

● Conduit size
Sheet steel conduit thread
JIS B0204 CTC19
● Lead wire

| 30/0.18 (0.75 mm²) | |
|---|---|
| Length | 300 mm |

The dimensions (E') apply only to the APK21-32A/40A/50A-*3A DC specifications.

| Model no. | A | B | C | D | E | E' | F | G |
|---|---|---|---|---|---|---|---|---|
| **APK21-32A-*□A** | 125 | 54 | 27 | 116.5 | 158.5 | 183.5 | 112 | Rc1 1/4 |
| **APK21-40A-*□A** | 140 | 60 | 30 | 123.5 | 165.5 | 190.5 | 122 | Rc1 1/2 |
| **APK21-50A-*□A** | 160 | 74 | 37 | 132.5 | 174.5 | 199.5 | 132 | Rc2 |

● Open frame lead wire type (flange type)
APK21-32F/40F/50F-* 3A 4A




● Conduit size
Sheet steel conduit thread
JIS B0204 CTC19
● Lead wire

| 30/0.18 (0.75 mm²) | |
|---|---|
| Length | 300 mm |

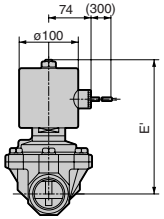
The dimensions (F') apply only to the APK21-32F/40F/50F-*3A DC specifications.

| Model no. | A | B | C | D | E | F | F' | G |
|---|---|---|---|---|---|---|---|---|
| **APK21-32F-*□A** | 170 | 12 | 36 | 135 | 116.5 | 158.5 | 183.5 | 100 |
| **APK21-40F-*□A** | 180 | 14 | 42 | 140 | 123.5 | 165.5 | 190.5 | 105 |
| **APK21-50F-*□A** | 180 | 14 | 53 | 155 | 132.5 | 174.5 | 199.5 | 120 |

## Optional dimensions CAD

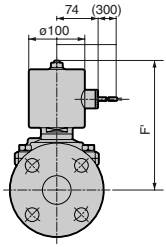
* Refer to the open frame lead wire type dimensions on the left page for common dimensions.

● Open frame diode integrated lead wire type (Rc screw-in type)
APK21-32A/40A/50A-* 5A



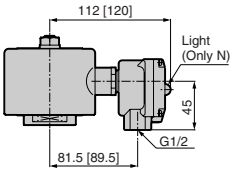

| Model no. | E' |
|---|---|
| **APK21-32A-*5A** | 183.5 |
| **APK21-40A-*5A** | 190.5 |
| **APK21-50A-*5A** | 199.5 |

● Open frame diode integrated lead wire type (flange type)
APK21-32F/40F/50F-* 5A



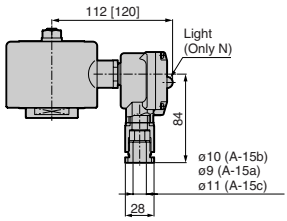

| Model no. | F' |
|---|---|
| **APK21-32F-*5A** | 183.5 |
| **APK21-40F-*5A** | 190.5 |
| **APK21-50F-*5A** | 199.5 |

● Open frame type + HP terminal box
APK21-32[A/F] to 50[A/F]-* 3 4 5 M N



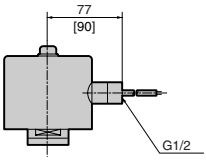

Values in [ ] are for the APK21-32[A/F] to 50[A/F]-*5 M N type.

● Open frame type + cable gland
APK21-32[A/F] to 50[A/F]-* 3 4 5 M N D E F




Values in [ ] are for the APK21-32[A/F] to 50[A/F]-*5 M N type.

● Open frame type + conduit
APK21-32[A/F] to 50[A/F]-* 3A 4A 5A H




Values in [ ] are for the APK21-32[A/F] to 50[A/F]-*5 M N type.

Pilot kick type 2 port solenoid valve
(general purpose valve)

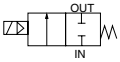
# ADK11/ADK12 Series

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

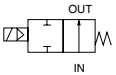
CE Excluding ADK12 RoHS CAD

## JIS symbol

● ADK11: NC (normally closed) type




● ADK12: NO (normally open) type




## Common specifications

| Item | Standard specifications | Optional specifications |
|---|---|---|
| Working fluid | Air, low vacuum (1.33 x $10^3$ Pa (abs)), water, kerosene, oil (50 $mm^2/s$ or less) | Hot water |
| Working pressure differential range MPa | 0 to 1.0 (refer to max. working pressure differential in individual specifications.) | |
| Max. working pressure MPa | 2 | |
| Withstanding pressure (water) MPa | 4 | |
| Fluid temperature (Note 1) ˚C | -10 to 60 | -10 to 90 |
| Ambient temperature ˚C | -10 to 60 | |
| Heat proof class | B | H |
| Atmosphere | Place free of corrosive gas and explosive gas | |
| Valve structure | Pilot kick type poppet, diaphragm structure | |
| Valve seat leakage (Note 2) $cm^3$/min. (ANR) | 1 or less (air) | |
| Mounting attitude | Free | |
| Body, sealant | Bronze, nitrile rubber | Bronze, ethylene propylene diene rubber |

Note 1: No freezing

Note 2: For ADK11 (NC (normally closed) type), these values apply to pneumatic pressure 0.02 to 1.0 MPa, and for ADK12 (NO (normally open) type), these apply to pneumatic pressure 0.02 to 0.6 MPa. When used at a pressure less than 0.02 MPa, the sealant may be unstable. Consult with CKD in this case.

## Individual specifications

| Item / Model no. | Port size | Orifice (mm) | Min. working pressure diff. (MPa) | Max. working pressure diff. (MPa) Air AC | Air DC | Water, kerosene AC | Water, kerosene DC | Oil (50 $mm^2/s$) AC | Oil (50 $mm^2/s$) DC | Rated voltage | Apparent power (VA) Holding 50 Hz | Holding 60 Hz | Starting 50 Hz | Starting 60 Hz | Power consumption (W) AC 50/60 Hz | Power consumption (W) DC | Weight (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NC (normally closed) type | | | | | | | | | | | | | | | | | |
| **ADK11-8A** | Rc1/4 | 12 | 0 | 1 | 0.7 | 1 | 0.7 | 0.7 | 0.6 | 100 VAC 50/60 Hz | 24 | 19 | 61 | 54 | 10/8 | 11*2 (10.4) | 0.65 |
| **ADK11-10A** | Rc3/8 | 12 | | | | | | | | 110 VAC 60 Hz | | | | | | | 0.65 |
| **ADK11-15A** | Rc1/2 | 16 | | | | | | | | 200 VAC 50/60 Hz | | | | | | | 0.9 |
| **ADK11-20A** | Rc3/4 | 23 | | | 0.6 | | 0.6 | 0.6 | 0.5 | 220 VAC 60 Hz | 25 | 21 | 84 | 75 | 10/8.5 | 14*3 [17] | 1.0 |
| **ADK11-25A** | Rc1 | 28 | | | | | | | | 12 VDC | | | | | | | 1.4 |
| NO (normally open) type | | | | | | | | | | 24 VDC | | | | | | | |
| **ADK12-15A** | Rc1/2 | 16 | 0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 | 0.5 | 48 VDC | 30 | 25 | 180 | 150 | 13/11 | 14 | 1.0 |
| **ADK12-20A** | Rc3/4 | 23 | | | | | | | | 100 VDC | | | | | | | 1.2 |
| **ADK12-25A** | Rc1 | 28 | | | | | | | | | | | | | | | 1.6 |

*1: The model numbers above show the basic port size (Rc). Refer to How to order for other combinations.
*2: The value in ( ) is the power consumption for the type with DIN terminal box.
*3: The value in [ ] is the power consumption for the coil with diode.
*4: Refer to DC column for the maximum working pressure differential of coil with diode.
*5: Voltage fluctuation should be within ±10% of the rated voltage.
*6: Consider using the AB71 Series if the pressure is 0.02 MPa or less.
*7: When using with a low vacuum, vacuum the OUT port side.

## Optional specifications

| Sealant | Fluoro rubber | | Ethylene propylene diene rubber | |
|---|---|---|---|---|
| Coil (heat proof class) | B | H | B | H |
| Fluid temperature ˚C | 5 to 60 | 5 to 90 | -10 to 60 (Note 1) | -10 to 90 (Note 1) |
| Ambient temperature ˚C | -10 to 60 | | | |
| Valve seat leakage (Note 2) cm³/min. (ANR) | 1 or less (air) | | | |

Note 1: No freezing
Note 2: For ADK11 (NC (normally closed) type), these values apply to pneumatic pressure 0.02 to 1.0 MPa, and for ADK12 (NO (normally open) type), these apply to pneumatic pressure 0.02 to 0.6 MPa.
When used at a pressure less than 0.02 MPa, the sealant may be unstable. Consult with CKD in this case.

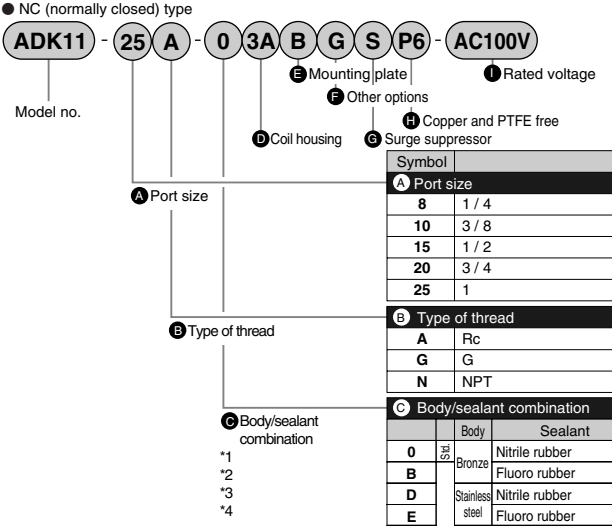
## Flow characteristics

| Model no. | Port size | Orifice (mm) | Flow characteristics | | | |
|---|---|---|---|---|---|---|
| | | | C [dm³/(s·bar)] | b | Cv flow factor | S (mm²) |
| NC (normally closed) type | | | | | | |
| **ADK11-8A** | Rc1/4 | 12 | 9.2 | 0.36 | 2.0 | – |
| **ADK11-10A** | Rc3/8 | 12 | 11 | 0.46 | 2.4 | – |
| **ADK11-15A** | Rc1/2 | 16 | 20 | 0.31 | 4.5 | – |
| **ADK11-20A** | Rc3/4 | 23 | – | – | 8.6 | 162 |
| **ADK11-25A** | Rc1 | 28 | – | – | 12.0 | 231 |
| NO (normally open) type | | | | | | |
| **ADK12-15A** | Rc1/2 | 16 | 20 | 0.31 | 4.5 | – |
| **ADK12-20A** | Rc3/4 | 23 | – | – | 8.6 | 162 |
| **ADK12-25A** | Rc1 | 28 | – | – | 12.0 | 231 |

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

## How to order

● NC (normally closed) type




| Symbol | Descriptions |
|---|---|
| **A Port size** | |
| **8** | 1 / 4 |
| **10** | 3 / 8 |
| **15** | 1 / 2 |
| **20** | 3 / 4 |
| **25** | 1 |
| **B Type of thread** | |
| **A** | Rc |
| **G** | G |
| **N** | NPT |

**C Body/sealant combination**

| | | Body | Sealant | Treatment | Remarks |
|---|---|---|---|---|---|
| **0** | Std. | Bronze | Nitrile rubber | – | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **B** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **D** | | Stainless steel | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **E** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **H** | Option | Bronze | Nitrile rubber | Oil free | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **J** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **P** | | | Ethylene propylene diene rubber | | Hot water (up to 90˚C *1) |
| **L** | | Stainless steel | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **M** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **R** | | | Ethylene propylene diene rubber | | Hot water (up to 90˚C *1) |

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>
**ADK11-15A-02C-AC100V**
Series: APK11
- A Port size: 1/2
- B Type of thread: Rc
- C Body/sealant combination
  : Body - bronze, sealant - nitrile rubber
- D Coil housing: Grommet lead wire
- E to G : Blank
- I Rated voltage
  : 100 VAC 50/60 Hz, 110 VAC 60 Hz

<Example 2 of model number>
**ADK11-20N-B4ABS-AC200V**
Series: ADK11
- A Port size: 3/4
- B Type of thread: NPT
- C Body/sealant combination
  : Body - bronze, sealant - fluoro rubber
- D Coil housing
  : Open frame lead wire (class H coil)
- E Mounting plate: Selected
- F Other options: Blank
- G Surge suppressor: Selected
- I Rated voltage
  : 200 VAC 50/60 Hz, 220 VAC 60 Hz

### ⚠ Note on model no. selection

Note on C

*1: Ⓒ: When selecting 4A, 4M or 4N.
*2: Only Ⓐ (port size) 15 (1/2), 20 (3/4) or 25 (1) is available for Ⓒ P/R.
*3: The maximum working pressure differential is 0.6 MPa for the ethylene propylene diene rubber seal combination (Ⓒ P/R).
*4: The ethylene propylene diene rubber seal combination (Ⓒ P/R) cannot be used with air. (Compressed air contains oil, and ethylene propylene diene rubber is not oil-resistant.)

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

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

⚠ Refer to the following precautions for Ⓓ to Ⓘ.

| | | |
|---|---|---|
| 2C |  | ● Grommet lead wire 300 mm |
| 2E<br>2G<br>2H |  | ● DIN terminal box |
| 3A<br>4A<br>5A |  | ● Open frame grommet lead wire 300 mm<br>● 4A (heat proof class H)<br>● 5A (diode integrated) |
| 3M<br>3N<br>4M<br>4N<br>5M<br>5N |  | ● Open frame HP terminal box<br>● 4M, 4N (heat proof class H)<br>● 5M, 5N (diode integrated) |
| 3I<br>3J<br>5I<br>5J |  | ● Open frame HP terminal box (IP65 or equivalent)<br>● 5I, 5J (diode integrated) |

| | | |
|---|---|---|
| G<br>H |  | ● Conduit<br>● G (CTC19)<br>● H (G1/2) |

Refer to page 224 for coil selection.

## ⚠ Note on model no. selection

Note on Ⓓ

*5: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.

Note on Ⓔ to Ⓖ

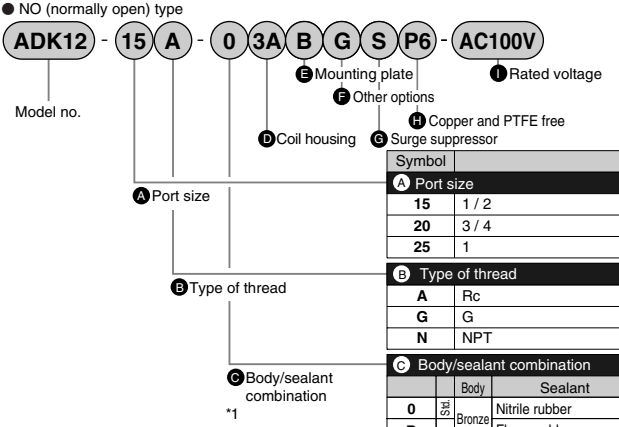
*6: Select one among D, E, F, G and H for Ⓕ.
*7: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*8: As standard, the surge suppressor is incorporated in the coil with diode and the 24 VDC coil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

Note on Ⓘ

*10: 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.
*11: For voltages other than above, consult with CKD.
*12: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

## How to order

● NO (normally open) type




| Symbol | Descriptions |
|---|---|
| **A Port size** | |
| **15** | 1 / 2 |
| **20** | 3 / 4 |
| **25** | 1 |
| **B Type of thread** | |
| **A** | Rc |
| **G** | G |
| **N** | NPT |

**C Body/sealant combination**

| | | Body | Sealant | Treatment | Remarks |
|---|---|---|---|---|---|
| **0** | Std. | Bronze | Nitrile rubber | – | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **B** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **D** | | Stainless steel | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **E** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **H** | Option | Bronze | Nitrile rubber | Oil free | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **J** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **P** | | | Ethylene propylene diene rubber | | Hot water (up to 90˚C *1) |
| **L** | | Stainless steel | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **M** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *1) |
| **R** | | | Ethylene propylene diene rubber | | Hot water (up to 90˚C *1) |

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>
**ADK12-20A-03A-DC24V**
Series: ADK12
A Port size: 3/4
B Type of thread: Rc
C Body/sealant combination
: Body - bronze, sealant - nitrile rubber
D Coil housing: Open frame lead wire
E to G: Blank
I Rated voltage: 24 VDC

<Example 2 of model number>
**ADK12-15G-B3NBD-AC100V**
Series: ADK12
A Port size: 1/2
B Type of thread: G
C Body/sealant combination
: Body - bronze, sealant - fluoro rubber
D Coil housing: Open frame type
with HP terminal box + light (G1/2)
E Mounting plate: Selected
F Other options: Cable gland A-15a
G Surge suppressor: Blank
I Rated voltage
: 100 VAC 50/60 Hz, 110 VAC 60 Hz

⚠ Note on model no. selection

Note on C

*1: Ⓒ: When selecting 4A, 4M or 4N.

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

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

⚠ Refer to the following precautions for Ⓓ to Ⓘ.

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)

G
H

● Conduit
● G (CTC19)
● H (G1/2)

Refer to page 224 for coil selection.

## ⚠ Note on model no. selection

Note on Ⓓ

*2: 5A, 5M, 5N, 5I and 5J are coils for which AC power is converted to DC with a diode.

Note on Ⓔ to Ⓖ

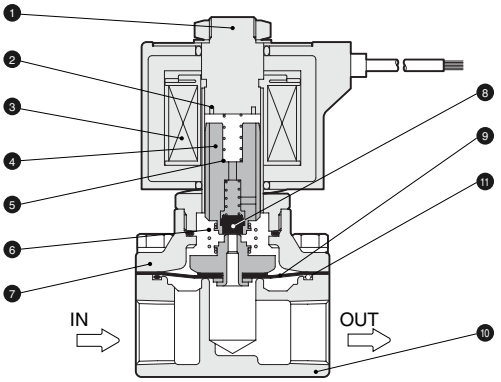
*3: Select one among D, E, F, G and H for Ⓕ.
*4: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*5: The surge suppressor is incorporated in the coil with diode as standard.
*6: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.

Note on Ⓘ

*7: 100 VAC coil is compatible with 100 VAC 50/60 Hz and 110 VAC 60 Hz, and 200 VAC coil is compatible with 200 VAC 50/60 Hz and 220 VAC 60 Hz. Note that the coils Ⓓ 5A/5M/5N/5I/5J can be used only with 100 VAC 50/60 Hz or 200 VAC 50/60 Hz.
*8: For voltages other than above, consult with CKD.
*9: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

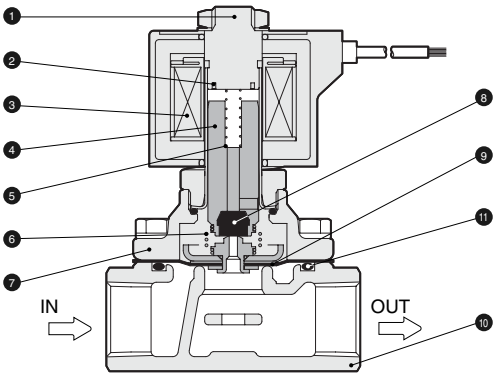
## Internal structure and parts list

● ADK11-8A/10A




8A/10A

● ADK11-15A/20A/25A



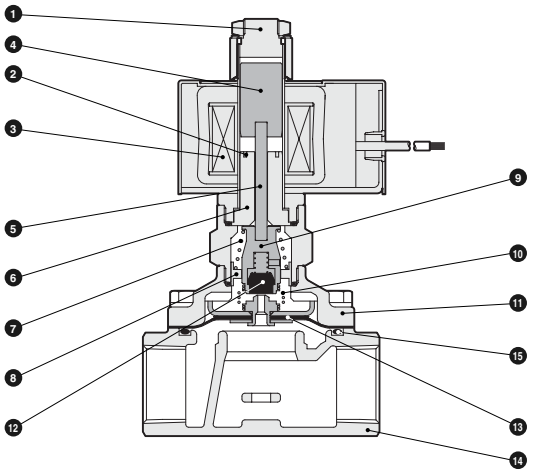

15A to 25A

| No. | Parts name | Material | |
|---|---|---|---|
| 1 | Core assembly | SUS405 or equivalent, SUS316L, SUS403 | Stainless steel |
| 2 | Shading coil *1 | Cu (Ag for stainless steel body) | Copper (silver for stainless steel body) |
| 3 | Coil | – | – |
| 4 | Plunger assembly | SUS405 or equivalent, SUS304, NBR (SUS405 or equivalent, SUS304, FKM or EPDM) *2,3 | Stainless steel |
| 5 | Plunger spring | SUS304 | Stainless steel |
| 6 | Kick spring | SUS304 | Stainless steel |
| 7 | Stuffing | C3771 (SCS13) | Brass (stainless steel casting) |
| 8 | Sealant | NBR (FKM, EPDM) | Nitrile rubber (fluoro rubber or ethylene propylene diene rubber) |
| 9 | Diaphragm assembly | SUS303, SUS304, NBR (SUS303, SUS304, FKM or EPDM) *3 | Stainless steel, nitrile rubber (stainless steel, fluoro rubber or ethylene propylene diene rubber) |
| 10 | Body | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| 11 | O ring | NBR (FKM, EPDM) | Nitrile rubber (fluoro rubber or ethylene propylene diene rubber) |

( ) shows options.
*1: When using the DC coil or a coil with diode, no shedding coil is used.
*2: SUS304 is not used for port size 15 (1/2) to 25 (1).
*3: EPDM is not compatible with port size 8 (1/4) and 10 (3/8).

## Internal structure and parts list

● ADK12 Series

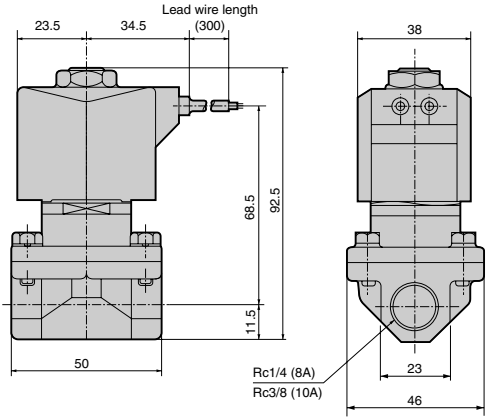



| No. | Parts name | Material | |
|---|---|---|---|
| 1 | Core assembly | SUS403, SUS316L, SUS304 *1 | Stainless steel |
| 2 | Shading coil *2 | Cu (Ag for stainless steel body) | Copper (silver for stainless steel body) |
| 3 | Coil | - | - |
| 4 | Plunger | SUS405 or equivalent | Stainless steel |
| 5 | Push rod | SUS304 | Stainless steel |
| 6 | Fixed ferrous core | SUS405 or equivalent | Stainless steel |
| 7 | Spring | SUS304 | Stainless steel |
| 8 | Spring holder | POM (SUS303) | Acetal resin (stainless steel) |
| 9 | NO valve assembly | SUS303, SUS304, NBR (SUS303, SUS304, FKM or EPDM) | Stainless steel, nitrile rubber (stainless steel, fluoro rubber or ethylene propylene diene rubber) |
| 10 | Kick spring | SUS304 | Stainless steel |
| 11 | Stuffing | C3771 (SCS13) | Brass (stainless steel casting) |
| 12 | Sealant | NBR (FKM, EPDM) | Nitrile rubber (fluoro rubber or ethylene propylene diene rubber) |
| 13 | Diaphragm assembly | SUS303, SUS304, NBR (SUS303, SUS304, FKM or EPDM) | Stainless steel, nitrile rubber (stainless steel, fluoro rubber or ethylene propylene diene rubber) |
| 14 | Body | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| 15 | O ring | NBR (FKM, EPDM) | Nitrile rubber (fluoro rubber or ethylene propylene diene rubber) |

( ) shows options.
*1: When the body/sealant combination symbol is other than O and H, the material is SUS430, SUS316L, SUS304.
*2: When using the DC coil or a coil with diode, no shedding coil is used.

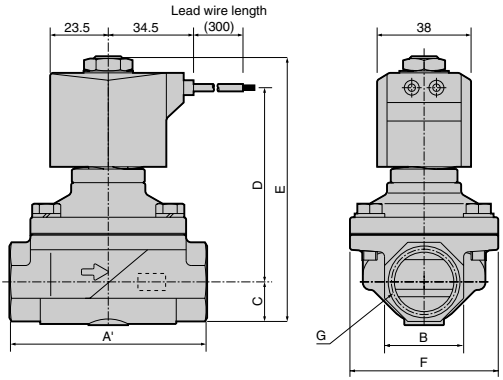
## Dimensions: ADK11 Series

● Grommet lead wire type
ADK11-8A/10A-*2C




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

● Grommet lead wire type
ADK11-15A/20A/25A-*2C



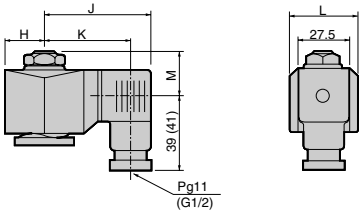

Note 1: The dimensions are the same for the G or NPT thread port size.
Note 2: Dimensions shown in ( ) are for SUS body.

| Model no. | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| ADK11-15A-02C | 71 | 27 (29) | 14.5 | 75.5 | 102 | 50 | Rc1/2 |
| ADK11-20A-02C | 80 | 32 (35) | 17.5 | 79 | 108.5 | 60 | Rc3/4 |
| ADK11-25A-02C | 90 | 41 (45) | 22.5 | 84.5 | 119 | 71 | Rc1 |

## Optional dimensions: ADK11 Series

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

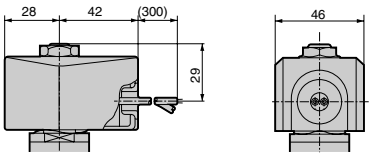
● DIN terminal box
ADK11-8A to 25A-* [2E / 2G / 2H]



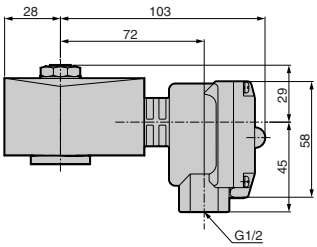

Dimensions shown in ( ) are for G1/2.

| Model no. | H | J | K | L | M |
|---|---|---|---|---|---|
| **ADK11-8A~25A-*2□-AC** | 23.5 | 65.5 | 54 (53.5) | 38 | 22 |
| **ADK11-8A/10A-*2□-DC** | 23.5 | 66 | 54.5 (54) | 38 | 22 |
| **ADK11-15A~25A-*2□-DC** | 28 | 72 | 60.5 (60) | 46 | 22 |

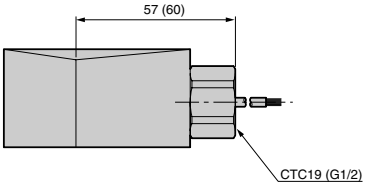
● Open frame lead wire
ADK11-8A to 25A-* [3A / 4A / 5A]




● Open frame type + HP terminal box
ADK11-8A to 25A-* [3 / 5] [M / N / I / J] / [4M / 4N]

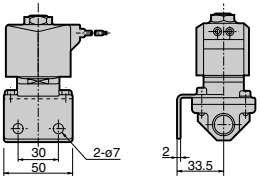



● Open frame type + conduit
ADK11-8A to 25A-* [3A / 4A / 5A] [G / H]

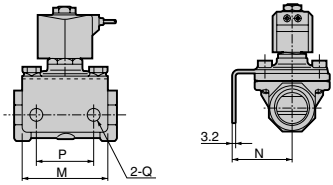



Dimensions shown in ( ) are for G1/2.

● Mounting plate
ADK11-8A/10A-*** [B]



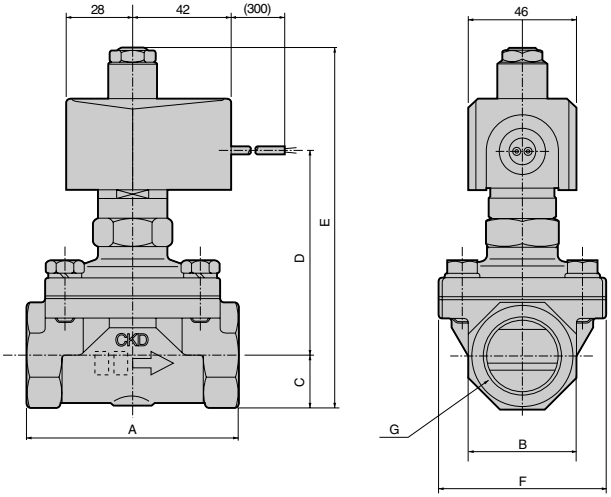

● Mounting plate
ADK11-15A/20A/25A-*** [B]




| Model no. | M | N | P | Q |
|---|---|---|---|---|
| **ADK11-15A-***B** | 56 | 45 | 40 | ø9 |
| **ADK11-20A-***B** | 63 | 50 | 45 | ø9 |
| **ADK11-25A-***B** | 75 | 56 | 50 | ø11 |

## Dimensions: ADK12 Series

● Open frame lead wire type
ADK12-15A/20A/25A-*3A



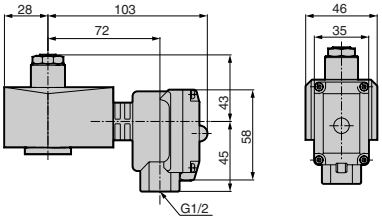

Note 1: The dimensions are the same for the G or NPT thread port size.

| Model no. | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| **ADK12-15A-03A** | 71 | 27 (29) | 14.5 | 77 | 134.5 | 50 | Rc1/2 |
| **ADK12-20A-03A** | 80 | 32 (35) | 17.5 | 80.5 | 141 | 60 | Rc3/4 |
| **ADK12-25A-03A** | 90 | 41 (45) | 22.5 | 86 | 151.5 | 71 | Rc1 |

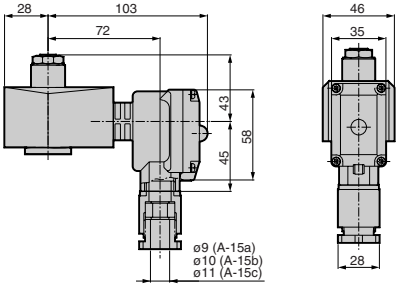
## Optional dimensions: ADK12 Series

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

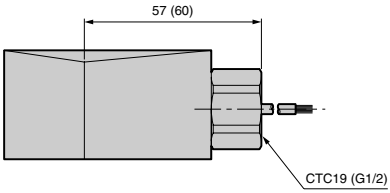
● Open frame type + HP terminal box
ADK12-15A/20A/25A-* [3 5] [M N I J] / [4M 4N]




● Open frame type + cable gland
ADK12-15A/20A/25A-* [3 4 5] [M N] [D E F]

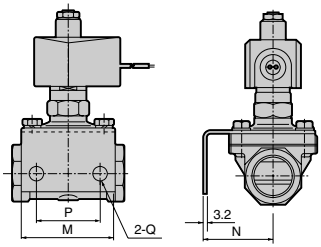



● Open frame type + conduit
ADK12-15A/20A/25A-* [3A 4A 5A] [G H]




Dimensions shown in ( ) are for G1/2.

● Mounting plate
ADK12-15A/20A/25A-*** B




| Model no. | M | N | P | Q |
|---|---|---|---|---|
| **ADK12-15A-***B** | 56 | 45 | 40 | ø9 |
| **ADK12-20A-***B** | 63 | 50 | 45 | ø9 |
| **ADK12-25A-***B** | 75 | 56 | 50 | ø11 |

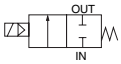
Pilot kick type 2 port solenoid valve
(general purpose valve)

# ADK21 Series

- NC (normally closed) type
- Port size: Rc1 1/4 to Rc2, 32 to 50 flange
- Diaphragm structure

RoHS CAD

## JIS symbol




## Common specifications

| Item | Standard specifications |
|---|---|
| Working fluid | Air, low vacuum (1.33 x $10^3$ Pa (abs)), water, kerosene, oil (50 $mm^2/s$ or less) |
| Working pressure differential range MPa | 0 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 kick type poppet, diaphragm structure |
| Valve seat leakage (Note 1) $cm^3$/min. (ANR) | 1 or less (air) |
| Mounting attitude | Limited to vertical position with coil facing upward |
| Body, sealant | Bronze, nitrile rubber |

Note 1: This applies to pneumatic pressures between 0.02 and 0.7 MPa. When used at a pressure less than 0.02 MPa, the sealant may be unstable. Consult with CKD in this case.

## 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 | 50 Hz | 60 Hz | 50/60 Hz | | |
| **ADK21-32A** | Rc1 1/4 | 35 | 0 | 0.7 | 0.6 | 0.7 | 0.6 | 0.5 | 0.5 | 100 VAC 50/60 Hz | 64 | 69 | 274 | 289 | 44/48 | 20 | 4.5 |
| **ADK21-32F** | 32 flange | | | | | | | | | 200 VAC 50/60 Hz | | | | | | | 8 |
| **ADK21-40A** | Rc1 1/2 | 43 | | | | | | | | 12 VDC | | | | | | | 5.5 |
| **ADK21-40F** | 40 flange | | | | | | | | | 24 VDC | | | | | | | 9 |
| **ADK21-50A** | Rc2 | 53 | | | | | | | | 48 VDC | | | | | | | 7 |
| **ADK21-50F** | 50 flange | | | | | | | | | 100 VDC | | | | | | | 11.5 |

*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: When using with a low vacuum, vacuum the OUT port side.

## Optional specifications

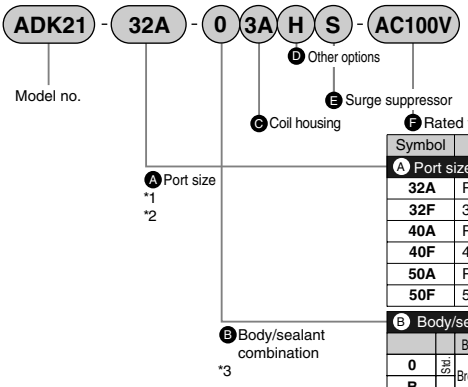
| Sealant | Fluoro rubber | |
|---|---|---|
| Coil (heat proof class) | B | H |
| Fluid temperature ˚C | 5 to 60 | 5 to 90 |
| Ambient temperature ˚C | -10 to 60 | |
| Valve seat leakage (Note 1) cm³/min (ANR) | 1 or less (air) | |

Note 1: This applies to pneumatic pressures between 0.02 and 0.7 MPa. When used at a pressure less than 0.02 MPa, the sealant may be unstable. Consult with CKD in this case.

## Flow characteristics

| Model no. | Port size | Orifice (mm) | Cv flow factor | Effective sectional area (mm²) |
|---|---|---|---|---|
| **ADK21-32A** | Rc1 1/4 | 35 | 25 | 460 |
| **ADK21-32F** | 32 flange | | | |
| **ADK21-40A** | Rc1 1/2 | 43 | 34 | 625 |
| **ADK21-40F** | 40 flange | | | |
| **ADK21-50A** | Rc2 | 53 | 53 | 975 |
| **ADK21-50F** | 50 flange | | | |

How to order




| Symbol | Descriptions |
|---|---|
| Ⓐ Port size | |
| **32A** | Rc1 1/4 |
| **32F** | 32 flange |
| **40A** | Rc1 1/2 |
| **40F** | 40 flange |
| **50A** | Rc2 |
| **50F** | 50 flange |

Ⓑ Body/sealant combination

| | | Body | Sealant | Treatment | Remarks |
|---|---|---|---|---|---|
| **0** | Std. | Bronze | Nitrile rubber | - | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **B** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **D** | | Stainless steel | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **E** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **H** | Option | Bronze | Nitrile rubber | Oil free | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **J** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |
| **L** | | Stainless steel | Nitrile rubber | | Air, water, low vacuum, kerosene, oil (up to 60˚C) |
| **M** | | | Fluoro rubber | | Air, low vacuum, kerosene, oil (up to 90˚C *3) |

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

Ⓒ to Ⓕ

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

<Example 1 of model number>

**ADK21-50F-03A-DC24V**
Series: ADK21
Ⓐ Port size : 50 flange
Ⓑ Body/sealant combination
: Body - bronze, sealant - nitrile rubber
Ⓒ Coil housing : Open frame lead wire
ⒹⒺ : None
Ⓕ Rated voltage : 24 VDC

<Example 2 of model number>

**ADK21-40F-B4MD-AC200V**
Series: ADK21
Ⓐ Port size : 40 flange
Ⓑ Body/sealant combination
: Body - bronze, sealant - fluoro rubber
Ⓒ Coil housing : Open frame type (class H coil) with HP terminal box (G1/2)
Ⓓ Other options : Cable gland A-15a
Ⓔ Surge suppressor : Blank
Ⓕ Rated voltage : 200 VAC 50/60 Hz

⚠ Note on model no. selection

*1: The companion flange is JIS B2210 10K. (No flange is enclosed with the product, but must be purchased separately.)
*2: G and NPT threads are used for piping port. Contact CKD for details.

Note on Ⓑ

*3: Ⓑ: When selecting 4A, 4M or 4N.

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

| Ⓒ Coil housing | | | | Ⓓ Other options | | | | Ⓔ | Ⓕ Rated voltage |
|---|---|---|---|---|---|---|---|---|---|
| Descriptions | | | | Cable gland (Marine cable gland) A-15a A-20a | Cable gland (Marine cable gland) A-15b A-20b | Cable gland (Marine cable gland) A-15c A-20c | Conduit (Conduit pipe) G1/2 | Surge suppressor | Descriptions |
| 3A | Std. | Open frame type | Lead wire | D | E | F | H | S | 100 VAC, 200 VAC, 12 VCD, 24 VDC, 48 VDC, 100 VDC |
| 3M | | | HP terminal box (G1/2) | | | | | | |
| 3N | | | HP terminal box + light (G1/2) | | | | | | 100 VAC, 200 VAC, 12 VDC, 24 VDC, 100 VDC |
| 4A | Option | Open frame type (Heat proof class H) | Lead wire | D | E | F | H | S | 100 VAC, 200 VAC |
| 4M | | | HP terminal box (G1/2) | | | | | | |
| 4N | | | HP terminal box + light (G1/2) | | | | | | |
| 5A | | Open frame type (Diode integrated) | Lead wire | D | E | F | H | | 100 VAC, 200 VAC |
| 5M | | | HP terminal box (G1/2) | | | | | | |
| 5N | | | HP terminal box + light (G1/2) | | | | | | |

⚠ Refer to the following precautions for Ⓒ to Ⓕ.

3A
4A
5A

● Open frame lead wire 300 mm
● Direct conduit wiring thread CTC19 integrated

H

● Conduit (G1/2)

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

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

Refer to page 225 for coil selection.

## ⚠ Note on model no. selection

Note on Ⓒ

*4: 5A, 5M and 5N are coils for which AC power is converted to DC with a diode.

Note on Ⓓ and Ⓔ

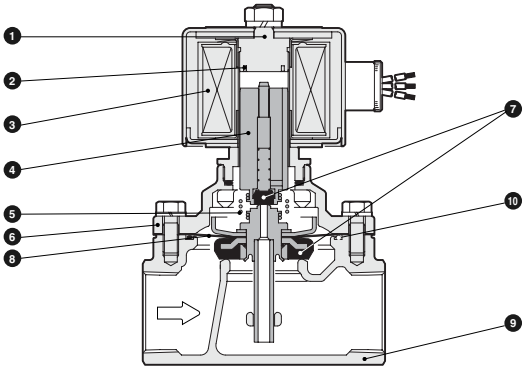
*5: Select one among D, E, F and H for Ⓓ.
*6: The surge suppressor is an accessory for the lead wire coil. When selecting a coil with terminal box, the surge suppressor is mounted in the terminal box.
*7: The surge suppressor is incorporated in the coil with diode as standard.
*8: Tropicalization (rust-proof coating) is available as a measure against rust. Contact CKD for more information.

Note on Ⓕ

*9: For voltages other than above, consult with CKD.
*10: The lead wire is available in the standard 300 mm length, and 500 mm, 1000 mm, 2000 mm and 3000 mm lengths. Contact CKD for more information.

## Internal structure and parts list

● ADK21 Series

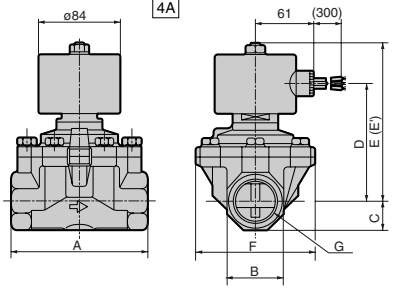


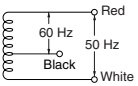

| No. | Parts name | Material | |
|---|---|---|---|
| **1** | Core assembly | SUS405 or equivalent, SUS316L, SUS403 | Stainless steel |
| **2** | Shading coil *1 | Cu (Ag for stainless steel body) | Copper (silver for stainless steel body) |
| **3** | Coil | - | - |
| **4** | Plunger assembly | SUS405 or equivalent, SUS304, C3604, NBR (SUS405 or equivalent, SUS304, FKM) | Stainless steel |
| **5** | Kick spring | SUS304 | Stainless steel |
| **6** | Stuffing | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| **7** | Sealant | NBR (FKM) | Nitrile rubber (fluoro rubber) |
| **8** | Diaphragm assembly | SUS303, SUS304, C3604, NBR (SUS303, SUS304, FKM) | Stainless steel, nitrile rubber (stainless steel, fluoro rubber) |
| **9** | Body | CAC408 (SCS13) | Bronze casting (stainless steel casting) |
| **10** | O ring | NBR (FKM) | Nitrile rubber (fluoro rubber) |

( ) shows options.
*1: When using the DC coil or a coil with diode, no shedding coil is used.

## Dimensions CAD

● Open frame lead wire type (Rc screw-in type)
ADK21-32A/40A/50A-* 3A 4A



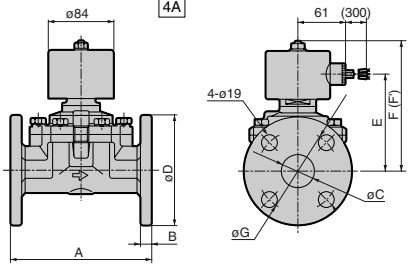

● Conduit size
Sheet steel conduit thread
JIS B0204 CTC19
● Lead wire

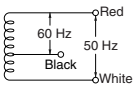
| 30/0.18 (0.75 mm²) | |
|---|---|
| Length | 300 mm |

The dimensions (E') apply only to the ADK21-32A/40A/50A-*3A DC specifications.

| Model no. | A | B | C | D | E | E' | F | G |
|---|---|---|---|---|---|---|---|---|
| **ADK21-32A-*□A** | 125 | 54 | 27 | 116.5 | 158.5 | 183.5 | 112 | Rc1 1/4 |
| **ADK21-40A-*□A** | 140 | 60 | 30 | 123.5 | 165.5 | 190.5 | 122 | Rc1 1/2 |
| **ADK21-50A-*□A** | 160 | 74 | 37 | 132.5 | 174.5 | 199.5 | 132 | Rc2 |

● Open frame lead wire type (flange type)
ADK21-32F/40F/50F-* 3A 4A




● Conduit size
Sheet steel conduit thread
JIS B0204 CTC19
● Lead wire

| 30/0.18 (0.75 mm²) | |
|---|---|
| Length | 300 mm |

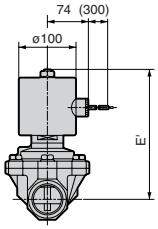
The dimensions (F') apply only to the ADK21-32F/40F/50F-*3A DC specifications.

| Model no. | A | B | C | D | E | F | F' | G |
|---|---|---|---|---|---|---|---|---|
| **ADK21-32F-*□A** | 170 | 12 | 36 | 135 | 116.5 | 158.5 | 183.5 | 100 |
| **ADK21-40F-*□A** | 180 | 14 | 42 | 140 | 123.5 | 165.5 | 190.5 | 105 |
| **ADK21-50F-*□A** | 180 | 14 | 53 | 155 | 132.5 | 174.5 | 199.5 | 120 |

## Optional dimensions

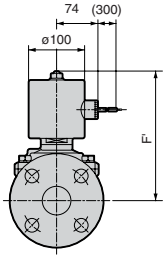
* Refer to the open frame lead wire type dimensions on the left page for common dimensions.

● Open frame diode integrated lead wire type (Rc screw-in type)
ADK21-32A/40A/50A-* 5A



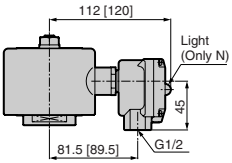

| Model no. | E' |
|---|---|
| **ADK21-32A-*5A** | 183.5 |
| **ADK21-40A-*5A** | 190.5 |
| **ADK21-50A-*5A** | 199.5 |

● Open frame diode integrated lead wire type (flange type)
ADK21-32F/40F/50F-* 5A



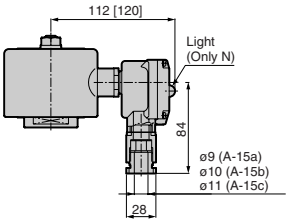

| Model no. | F' |
|---|---|
| **ADK21-32F-*5A** | 183.5 |
| **ADK21-40F-*5A** | 190.5 |
| **ADK21-50F-*5A** | 199.5 |

● Open frame type + HP terminal box
ADK21-32[A/F] to 50[A/F] -* 3/4/5 M/N



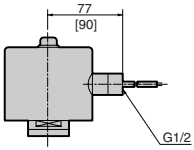

Values in [ ] are for the APK21-32[A/F] to 50[A/F] -*5 M/N type.

● Open frame type + cable gland
ADK21-32[A/F] to 50[A/F] -* 3/4/5 M/N D/E/F




Values in [ ] are for the APK21-32[A/F] to 50[A/F] -*5 M/N type.

● Open frame type + conduit
ADK21-32[A/F] to 50[A/F] -* 3A/4A/5A H




Values in [ ] are for the APK21-32[A/F] to 50[A/F] -*5 M/N type.

# Pilot kick type 2 port solenoid valve

(General purpose valve)

General purpose pilot operated 2, 3 port solenoid valve (general purpose valve)

Pilot operated piston structure AP

Electronic Catalog file list is applied to "CAD DATA 2006".

| Model no. | DXF | | MICRO CADAM |
|---|---|---|---|
| | Folder name | Filename | Filename (GROUP: CAD, USER: STDLIB) |
| ● AP11/12: pages 234 to 237 | | | |
| AP11-8A/10A | AP1 | ap11_8a_10a | CKD-AP11-8A/10A |
| AP11-15A | | ap11_15a | CKD-AP11-15A |
| AP11-20A | | ap11_20a | CKD-AP11-20A |
| AP11-25A | | ap11_25a | CKD-AP11-25A |
| AP11-32A | | ap11_32a | CKD-AP11-32A |
| AP11-40A | | ap11_40a | CKD-AP11-40A |
| AP11-50A | | ap11_50a | CKD-AP11-50A |
| AP11-32F | | ap11_32f | CKD-AP11-32F |
| AP11-40F | | ap11_40f | CKD-AP11-40F |
| AP11-50F | | ap11_50f | CKD-AP11-50F |
| AP11-8A/10A-A | | ap11_8a_10a_a | CKD-AP11-8A/10A-A |
| AP11-15A-A | | ap11_15a_a | CKD-AP11-15A-A |
| AP11-20A-A | | ap11_20a_a | CKD-AP11-20A-A |
| AP11-25A-A | | ap11_25a_a | CKD-AP11-25A-A |
| AP11-32A-A | | ap11_32a_a | CKD-AP11-32A-A |
| AP11-40A-A | | ap11_40a_a | CKD-AP11-40A-A |
| AP11-50A-A | | ap11_50a_a | CKD-AP11-50A-A |
| AP11-32F-A | | ap11_32f_a | CKD-AP11-32F-A |
| AP11-40F-A | | ap11_40f_a | CKD-AP11-40F-A |
| AP11-50F-A | | ap11_50f_a | CKD-AP11-50F-A |
| AP12-8A/10A | | ap12_8a_10a | CKD-AP12-8A/10A |
| AP12-15A | | ap12_15a | CKD-AP12-15A |
| AP12-20A | | ap12_20a | CKD-AP12-20A |
| AP12-25A | | ap12_25a | CKD-AP12-25A |
| AP12-32A | | ap12_32a | CKD-AP12-32A |
| AP12-40A | | ap12_40a | CKD-AP12-40A |
| AP12-50A | | ap12 50a | CKD-AP12-50A |
| AP12-32F | | ap12_32f | CKD-AP12-32F |
| AP12-40F | | ap12_40f | CKD-AP12-40F |
| AP12-50F | | ap12_50f | CKD-AP12-50F |
| AP12-15A-A | | ap12_15a_a | CKD-AP12-15A-A |
| AP12-20A-A | | ap12_20a_a | CKD-AP12-20A-A |
| AP12-25A-A | | ap12_25a_a | CKD-AP12-25A-A |
| AP12-32A-A | | ap12_32a_a | CKD-AP12-32A-A |
| AP12-40A-A | | ap12_40a_a | CKD-AP12-40A-A |
| AP12-50A-A | | ap12_50a_a | CKD-AP12-50A-A |
| AP12-32F-A | | ap12_32f_a | CKD-AP12-32F-A |
| AP12-40F-A | | ap12_40f_a | CKD-AP12-40F-A |
| AP12-50F-A | | ap12 50f_a | CKD-AP12-50F-A |
| (AP AD) grommet/DIN terminal box/ open frame/SUS body | | ap_ad_f | CKD-AP/AD-F |
| Mounting plate, cable gland, conduit | | ap_ad_other_f | CKD-AP/AD-OTHER-F |
| ● AP21/22: pages 244 to 247 | | | |
| AP21-32A | AP2 | ap21_32a | CKD-AP21-32A |
| AP21-40A | | ap21_40a | CKD-AP21-40A |
| AP21-50A | | ap21_50a | CKD-AP21-50A |
| AP21-32F | | ap21_32f | CKD-AP21-32F |
| AP21-40F | | ap21_40f | CKD-AP21-40F |
| AP21-50F | | ap21_50f | CKD-AP21-50F |
| AP21-32A-A | | ap21_32a_a | CKD-AP21-32A-A |
| AP21-40A-A | | ap21_40a_a | CKD-AP21-40A-A |
| AP21-50A-A | | ap21_50a_a | CKD-AP21-50A-A |
| AP21-32F-A | | ap21_32f_a | CKD-AP21-32F-A |
| AP21-40F-A | | ap21_40f_a | CKD-AP21-40F-A |
| AP21-50F-A | | ap21_50f_a | CKD-AP21-50F-A |
| AP22-32A | | ap22_32a | CKD-AP22-32A |
| AP22-40A | | ap22_40a | CKD-AP22-40A |
| AP22-50A | | ap22_50a | CKD-AP22-50A |
| AP22-32F | | ap22_32f | CKD-AP22-32F |
| AP22-40F | | ap22_40f | CKD-AP22-40F |
| AP22-50F | | ap22_50f | CKD-AP22-50F |
| AP22-32A-A | | ap22_32a_a | CKD-AP22-32A-A |
| AP22-40A-A | | ap22_40a_a | CKD-AP22-40A-A |
| AP22-50A-A | | ap22_50a_a | CKD-AP22-50A-A |
| AP22-32F-A | | ap22_32f_a | CKD-AP22-32F-A |
| AP22-40F-A | | ap22_40f_a | CKD-AP22-40F-A |
| AP22-50F-A | | ap22_50f_a | CKD-AP22-50F-A |
| (AP AD) grommet/DIN terminal box/ open frame/SUS body | | ap_ad_f | CKD-AP/AD-F |
| Mounting plate, cable gland, conduit | | ap_ad_other_f | CKD-AP/AD-OTHER-F |

## Pilot operated diaphragm structure AD

Electronic Catalog file list is applied to "CAD DATA 2006".

| Model no. | DXF | | MICRO CADAM |
|---|---|---|---|
| | Folder name | Filename | Filename (GROUP: CAD, USER: STDLIB) |
| ● AD11/12: pages 254 to 257 | | | |
| AD11-8A/10A | AD1 | ad11_8a_10a | CKD-AD11-8A/10A |
| AD11-15A | | ad11_15a | CKD-AD11-15A |
| AD11-20A | | ad11_20a | CKD-AD11-20A |
| AD11-25A | | ad11_25a | CKD-AD11-25A |
| AD11-32A | | ad11_32a | CKD-AD11-32A |
| AD11-40A | | ad11_40a | CKD-AD11-40A |
| AD11-50A | | ad11_50a | CKD-AD11-50A |
| AD11-32F | | ad11_32f | CKD-AD11-32F |
| AD11-40F | | ad11_40f | CKD-AD11-40F |
| AD11-50F | | ad11_50f | CKD-AD11-50F |
| AD11-15A-A | | ad11_15a_a | CKD-AD11-15A-A |
| AD11-20A-A | | ad11_20a_a | CKD-AD11-20A-A |
| AD11-25A-A | | ad11_25a_a | CKD-AD11-25A-A |
| AD11-32A-A | | ad11_32a_a | CKD-AD11-32A-A |
| AD11-40A-A | | ad11_40a_a | CKD-AD11-40A-A |
| AD11-50A-A | | ad11_50a_a | CKD-AD11-50A-A |
| AD11-32F-A | | ad11_32f_a | CKD-AD11-32F-A |
| AD11-40F-A | | ad11_40f_a | CKD-AD11-40F-A |
| AD11-50F-A | | ad11_50f_a | CKD-AD11-50F-A |
| AD12-15A | | ad12_15a | CKD-AD12-15A |
| AD12-20A | | ad12_20a | CKD-AD12-20A |
| AD12-25A | | ad12_25a | CKD-AD12-25A |
| AD12-32A | | ad12_32a | CKD-AD12-32A |
| AD12-40A | | ad12_40a | CKD-AD12-40A |
| AD12-50A | | ad12_50a | CKD-AD12-50A |
| AD12-32F | | ad12_32f | CKD-AD12-32F |
| AD12-40F | | ad12_40f | CKD-AD12-40F |
| AD12-50F | | ad12_50f | CKD-AD12-50F |
| AD12-15A-A | | ad12_15a_a | CKD-AD12-15A-A |
| AD12-20A-A | | ad12_20a_a | CKD-AD12-20A-A |
| AD12-25A-A | | ad12_25a_a | CKD-AD12-25A-A |
| AD12-32A-A | | ad12_32a_a | CKD-AD12-32A-A |
| AD12-40A-A | | ad12_40a_a | CKD-AD12-40A-A |
| AD12-50A-A | | ad12_50a_a | CKD-AD12-50A-A |
| AD12-32F-A | | ad12_32f_a | CKD-AD12-32F-A |
| AD12-40F-A | | ad12_40f_a | CKD-AD12-40F-A |
| AD12-50F-A | | ad12_50f_a | CKD-AD12-50F-A |
| (AP AD) grommet/DIN terminal box/ open frame/SUS body | | ap_ad_f | CKD-AP/AD-F |
| Mounting plate, cable gland, conduit | | ap_ad_other_f | CKD-AP/AD-OTHER-F |
| ● AD21/22: pages 264 to 267 | | | |
| AD21-32A | AD2 | ad21_32a | CKD-AD21-32A |
| AD21-40A | | ad21_40a | CKD-AD21-40A |
| AD21-50A | | ad21_50a | CKD-AD21-50A |
| AD21-32F | | ad21_32f | CKD-AD21-32F |
| AD21-40F | | ad21_40f | CKD-AD21-40F |
| AD21-50F | | ad21_50f | CKD-AD21-50F |
| AD21-32A-A | | ad21_32a_a | CKD-AD21-32A-A |
| AD21-40A-A | | ad21_40a_a | CKD-AD21-40A-A |
| AD21-50A-A | | ad21_50a_a | CKD-AD21-50A-A |
| AD21-32F-A | | ad21_32f_a | CKD-AD21-32F-A |
| AD21-40F-A | | ad21_40f_a | CKD-AD21-40F-A |
| AD21-50F-A | | ad21_50f_a | CKD-AD21-50F-A |
| AD22-32A | | ad22_32a | CKD-AD22-32A |
| AD22-40A | | ad22_40a | CKD-AD22-40A |
| AD22-50A | | ad22_50a | CKD-AD22-50A |
| AD22-32F | | ad22_32f | CKD-AD22-32F |
| AD22-40F | | ad22_40f | CKD-AD22-40F |
| AD22-50F | | ad22_50f | CKD-AD22-50F |
| AD22-32A-A | | ad22_32a_a | CKD-AD22-32A-A |
| AD22-40A-A | | ad22_40a_a | CKD-AD22-40A-A |
| AD22-50A-A | | ad22_50a_a | CKD-AD22-50A-A |
| AD22-32F-A | | ad22_32f_a | CKD-AD22-32F-A |
| AD22-40F-A | | ad22_40f_a | CKD-AD22-40F-A |
| AD22-50F-A | | ad22_50f_a | CKD-AD22-50F-A |
| (AP AD) grommet/DIN terminal box/ open frame/SUS body | | ap_ad_f | CKD-AP/AD-F |
| Mounting plate, cable gland, conduit | | ap_ad_other_f | CKD-AP/AD-OTHER-F |

# Pilot kick type 2 port solenoid valve

(General purpose valve)

Pilot kick type piston structure APK

Electronic Catalog file list is applied to "CAD DATA 2006".

| Model no. | DXF | | MICRO CADAM |
|---|---|---|---|
| | Folder name | Filename | Filename (GROUP: CAD, USER: STDLIB) |
| ● APK11: pages 272 to 273 | | | |
| APK11-8A/10A | APK1 | apk11_8a_10a | CKD-APK11-8A/10A |
| APK11-15A | | apk11_15a | CKD-APK11-15A |
| APK11-20A | | apk11_20a | CKD-APK11-20A |
| APK11-25A | | apk11_25a | CKD-APK11-25A |
| Accessory for APK1* (DIN terminal box open frame) | | apk1_f | CKD-APK1-F |
| APK/ADK common accessory (Mounting plate, cable gland, conduit) | | adk_apk_other_f | CKD-ADK/APK-OTHER-F |
| ● APK21: pages 278 to 279 | | | |
| APK21-32A | APK2 | apk21_32a | CKD-APK21-32A |
| APK21-40A | | apk21_40a | CKD-APK21-40A |
| APK21-50A | | apk21_50a | CKD-APK21-50A |
| APK21-32F | | apk21_32f | CKD-APK21-32F |
| APK21-40F | | apk21_40f | CKD-APK21-40F |
| APK21-50F | | apk21_50f | CKD-APK21-50F |
| Accessory for APK2* (Open frame round terminal) | | adk2_apk2_f | CKD-ADK2/APK2-F |
| APK/ADK common accessory (Mounting plate, cable gland, conduit) | | adk_apk_other_f | CKD-ADK/APK-OTHER-F |

Pilot kick type diaphragm structure ADK

| Model no. | DXF | | MICRO CADAM |
|---|---|---|---|
| | Folder name | Filename | Filename (GROUP: CAD, USER: STDLIB) |
| ● ADK11: pages 288 to 291 | | | |
| ADK11-8A/10A | ADK1 | adk11_8a_10a | CKD-ADK11-8A/10A |
| ADK11-15A | | adk11_15a | CKD-ADK11-15A |
| ADK11-20A | | adk11_20a | CKD-ADK11-20A |
| ADK11-25A | | adk11_25a | CKD-ADK11-25A |
| ADK12-15A | | adk12_15a | CKD-ADK12-15A |
| ADK12-20A | | adk12_20a | CKD-ADK12-20A |
| ADK12-25A | | adk12_25a | CKD-ADK12-25A |
| APK/ADK common accessory (Mounting plate, cable gland, conduit) | | adk_apk_other | CKD-ADK/APK-OTHER-F |
| Accessory for ADK1* (DIN terminal box open frame) | | adk1_f | CKD-ADK1-F |
| ● ADK21: pages 296 to 297 | | | |
| ADK21-32A | ADK2 | adk21_32a | CKD-ADK21-32A |
| ADK21-40A | | adk21_40a | CKD-ADK21-40A |
| ADK21-50A | | adk21_50a | CKD-ADK21-50A |
| ADK21-32F | | adk21_32f | CKD-ADK21-32F |
| ADK21-40F | | adk21_40f | CKD-ADK21-40F |
| ADK21-50F | | adk21_50f | CKD-ADK21-50F |
| Accessory for APK ADK2* (Open frame round terminal) | | adk2_apk2vf | CKD-ADK2/APK2-F |
| APK/ADK common accessory (Mounting plate, cable gland, conduit) | | adk_apk_other | CKD-ADK/APK-OTHER-F |

# AP/APK/AD/ADK

(General purpose valve)

## General purpose pilot operated 2 port solenoid valve

■ **For air, vacuum, water, oil**

### Overview

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

### Features

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

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

**A great variety of series and variation**
A wide selection is available from the Rc1/4 to large 50 flanges with series such as pilot operated diaphragm and piston valves, and pilot kick type diaphragm and piston valves.

### CONTENTS



⚠ Always read the precautions in the Introduction and page 226 before starting use.

| No. of port | Model | | Structure | Actuation | Working fluid | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Air | Low vacuum (1.33 x 103 Pa [abs]) | Water | Kerosene | Oil (50 mm²/s or less) | Hot water | Steam | |
| 2 port |  | AP11 *1 | Pilot operated (Piston structure) | NC (normally closed) type | ● | | ● | ● | ● | | ● | |
| | | AP12 *1 | | NO (normally open) type | ● | | ● | ● | ● | | ● | |
| | | AP21 | | NC (normally closed) type | ● | | ● | ● | ● | | ● | |
| | | AP22 | | NO (normally open) type | ● | | ● | ● | ● | | ● | |
| |  | AD11 *1 | Pilot operated (Diaphragm structure) | NC (normally closed) type | ● | | ● | ● | ● | | | |
| | | AD12 *1 | | NO (normally open) type | ● | | ● | ● | ● | | | |
| | | AD21 | | NC (normally closed) type | ● | | ● | ● | ● | | | |
| | | AD22 | | NO (normally open) type | ● | | ● | ● | ● | | | |
| |  | APK11 | Pilot kick type (Piston kick drive) | NC (normally closed) type | ● | ● | ● | ● | ● *2 | | ● | |
| | | APK21 | | NC (normally closed) type | ● | ● | ● | ● | ● *2 | | ● | |
| |  | ADK11 | Pilot kick type (Diaphragm structure) | NC (normally closed) type | ● | ● | ● | ● | ● | ● | | |
| | | ADK12 | | NO (normally open) type | ● | ● | ● | ● | ● | ● | | |
| | | ADK21 | | NC (normally closed) type | ● | ● | ● | ● | ● | | | |

*2: 20 mm²/s or less for APK11/12 Series.

| | Port size | | | | | | | | | | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rc1/4 | Rc3/8 | Rc1/2 | Rc3/4 | Rc1 | Rc1 1/4 | 32 flange | Rc1 1/2 | 40 flange | Rc2 | 50 flange | |
| | ●*3 | ●*3 | ●*3 | ●*3 | ●*3 | | | | | | | 228 |
| | ●*3 | ●*3 | ●*3 | ●*3 | ●*3 | | | | | | | 228 |
| | | | | | | ● | ● | ● | ● | ● | ● | 238 |
| | | | | | | ● | ● | ● | ● | ● | ● | 238 |
| | ●*3 | ●*3 | ●*3 | ●*3 | ●*4 | | | | | | | 248 |
| | | | ●*3 | ●*3 | ●*4 | | | | | | | 248 |
| | | | | | | ● | ● | ● | ● | ● | ● | 258 |
| | | | | | | ● | ● | ● | ● | ● | ● | 258 |
| | ●*3 | ●*3 | ●*3 | ●*3 | ●*3 | | | | | | | 268 |
| | | | | | | ● | ● | ● | ● | ● | ● | 276 |
| | ●*3 | ●*3 | ●*3 | ●*3 | ●*3 | | | | | | | 282 |
| | | | ●*3 | ●*3 | ●*3 | | | | | | | 282 |
| | | | | | | ● | ● | ● | ● | ● | ● | 294 |

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

Refer to page 222 for details on the coil system.

# Coil selection guide

● Coil housing types and selection guide
A wide variety is available to match applications.
Refer to the structure and features to select the optimum model.

AP/AD*

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

● Repair parts table per coil option

| Coil option symbol | Voltage | Repair parts | | | |
|---|---|---|---|---|---|
| | | Plunger assembly | Core assembly | Coil assembly | Actuator assembly *1 |
| 0 or 2C | AC | ○ | ○ | ○ | ○ |
| 6C *2 | DC | — | — | — | ○ |
| 2E 2G 2H | AC | ○ | ○ | ○ | ○ |
| 2E 2G 2H | DC | ○ | ○ | ○ | ○ |
| 6E 6G 6H *2 | DC | — | — | — | ○ |
| 3A | AC | ○ | ○ | ○ | ○ |
| | DC | | ○ | ○ | ○ |
| 3M 3N | AC | ○ | ○ | ○ | ○ |
| | DC | | ○ | ○ | ○ |
| 3I 3J | AC | ○ | ○ | ○ | ○ |
| | DC | | ○ | ○ | ○ |
| 4A | AC | ○ | ○ | ○ | ○ |
| 4M 4N | AC | ○ | ○ | ○ | ○ |
| 5A | AC | ○ | ○ | ○ | ○ |
| 5M 5N | AC | ○ | ○ | ○ | ○ |
| 5I 5J | AC | ○ | ○ | ○ | ○ |

*1: The actuator assembly includes the coil assembly, core assembly and plunger assembly.
*2: As 6C, 6E, 6G and 6H are dedicated parts, they are provided as part of the actuator assembly.

# Coil selection guide

● Coil housing types and selection guide
Wide coil variation is available.
Refer to the structure and features to select the optimum model.

## APK11/ADK1*

| Coil variations | | | | Appearance |
|---|---|---|---|---|
| | Heat proof class B mold | ● AC dedicated (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP61 or equivalent<br>● Outdoor use not available | Grommet lead wire: ● Lead wire length 300 mm | 2C |
| | Heat proof class B mold | ● DC and AC (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP61 or equivalent<br>● Outdoor use not available | DIN terminal box: ● Easy wiring and maintenance<br>● Reliable electric protection (ground terminal)<br>● Light available (optional - 100, 200 VAC and 24 VDC only) | 2E<br>2G<br>2H |
| | Heat proof class B mold | ● DC and AC (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP65 or equivalent<br>● Outdoor use not available | Lead wire: ● Lead wire length 300 mm<br>● Conduit (CTC19) for direct conduit wiring can be mounted | 3A |
| | Heat proof class B mold | ● DC and AC (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP21 or equivalent<br>● Outdoor use not available | HP terminal box: ● Easy wiring<br>● Light available (optional - 100, 200 VAC / 24, 100 VDC only) | 3M<br>3N |
| | Heat proof class B mold | ● DC and AC (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP65 or equivalent<br>● Outdoor use not available | HP terminal box: ● Easy wiring<br>● Light available (optional - 100, 200 VAC / 24, 100 VDC only) | 3I<br>3J<br>*1 |
| Open frame type | Heat proof class H taped | ● AC dedicated (50/60 Hz common)<br>● Heat proof temperature 180˚C<br>● High temperature fluid and high ambient temperature available<br>● Outdoor use not available<br>● Protection property symbols: IP00 | Lead wire: ● Lead wire length 300 mm<br>● Conduit (CTC19) for direct conduit wiring can be mounted | 4A |
| | | | HP terminal box: ● Easy wiring<br>● Light available (optional - 100, 200 VAC only) | 4M<br>4N |
| | Heat proof class B mold with diode | ● A diode is mounted on the coil section for direct-current conversion (AC-DC conversion)<br>● AC dedicated (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP65 or equivalent<br>● Perfect for places where beat can be a problem<br>● Outdoor use not available | Lead wire: ● Lead wire length 300 mm<br>● Conduit (CTC19) for direct conduit wiring can be mounted | 5A |
| | Heat proof class B mold with diode | ● A diode is mounted on the coil section for direct-current conversion (AC-DC conversion)<br>● AC dedicated (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP21 or equivalent<br>● Perfect for places where beat can be a problem<br>● Outdoor use not available | HP terminal box: ● Easy wiring<br>● Light available (optional - 100, 200 VAC only) | 5M<br>5N |
| | Heat proof class B mold with diode | ● A diode is mounted on the coil section for direct-current conversion (AC-DC conversion)<br>● AC dedicated (50/60 Hz common)<br>● Heat proof temperature 130˚C<br>● Protection property symbols: IP65 or equivalent<br>● Perfect for places where beat can be a problem<br>● Outdoor use not available | HP terminal box: ● Easy wiring<br>● Light available (optional - 100, 200 VAC only) | 5I<br>5J<br>*1 |
| | | | Conduit: ● Use a conduit (CTC19 or G1/2) when using direct conduit wiring for the open frame lead wire. | G<br>H |

*1: Only ADK1* is supported.

# APK21/ADK21

Open frame type

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

# Safety precautions

**Always read this section before starting use.**

## Pilot operated 2 port solenoid valve (AP/AD) and pilot kick type 2 port solenoid valve (APK/ADK)

### Design & Selection

## ⚠ WARNING

**1 Working fluid**

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

(2) This valve cannot be used for maintaining the vacuum.

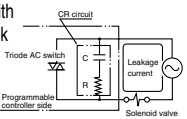
## ⚠ CAUTION

**1 Fluid viscosity**

The fluid viscosity must be 50 mm²/s or less. Malfunctions could occur if the viscosity is higher than 50 mm²/s. (This value is 20 mm²/s or less for the APK Series.)

**2 Leakage current from other fluid control components**

When operating the solenoid valve with a programmable controller, etc., check that the output leakage current from the programmable controller is within the following specifications.




| Voltage / Series no. | AC | | AC diode | | DC | |
|---|---|---|---|---|---|---|
| | 100 V | 200 V | 100 V | 200 V | 12 V | 24 V |
| AP, AD | 6 mA or less | 3 mA or less | 2 mA or less | 1 mA or less | 2 mA or less | 1 mA or less |
| APK, ADK | 6 mA or less | 3 mA or less | 2 mA or less | 1 mA or less | 2 mA or less | 1 mA or less |

### Installation, Piping & Wiring

## ⚠ CAUTION

**1 Installation**

(1) As a general rule, the valve must be installed vertically with the coil facing upward.

**2 Piping**

(1) If the pipe vibrates when the solenoid valve is opened and closed, securely fix the piping.

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

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

(4) When the regulator and solenoid valve are directly coupled, the parts could mutually vibrate causing resonance and chattering.

(5) If the piping cross-section area on the fluid inlet is reduced, the operation may become unstable due to a differential pressure fault during valve operation. The piping on the fluid inlet must have a size that matches the valve port size.

**3 Wiring**

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

### When Using

## ⚠ CAUTION

**1 Instantaneous leakage**

With the pilot operated type or pilot kick type 2 port valve, if sudden pressure is applied when the pump starts while the valve is closed, the valve may open for an instant causing fluid to leak. Caution is required during use.

**2 Operation**

Do not apply back pressure. The valve could malfunction.

**3 Water hammer**

If water hammering occurs causing a problem, consider using the CKD "WHL type" or "RSV type" solenoid valve or a motor valve.

**4 Manual operation**

Always observe the following points when using a manual override.

<For NO (normally open) type>

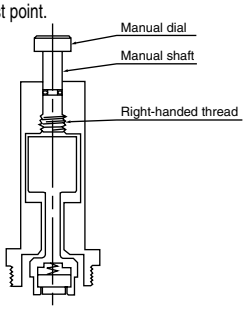
Opening: Insert a flat-tip screwdriver into the slit on the manual shaft, and turn it approx. 120° to the right or left. The plunger will rise up, and the valve will open.
The open state is held even when the screwdriver is removed. Always return the valve to the original position after use.

Closing: Turn the manual shaft from the open position to the vertical position. The plunger will lower and the valve will close. (Refer to the following drawings.)


<For NO (normally open) type>

(1) Closing the valve with manual operations
The manual shaft is threaded, so hold the manual dial and rotate the shaft clockwise.
When the manual dial has been rotated downward 5 to 6 mm and no longer rotates, the solenoid valve will switch to closing operation.

(2) Resetting (when not using manual override)
Always rotate the manual dial counterclockwise and return it to the highest point.



## Maintenance

# ⚠ CAUTION

**1 Thermal insulation cover**

When piping for steam or hot water, etc., use an insulating cover structure that can be disassembled for maintenance purposes. Avoid placing an insulating cover on the entire solenoid valve or on the coil section. The coil could burn.

**2 Tightening torque**

When disassembling or assembling, tighten the body bolt, core assembly and nut with the following tightening torques.

| | | Body bolt tightening torque | Core assembly tightening torque | Nut tightening torque |
|---|---|---|---|---|
| AP$^{11}_{12}$<br>AD$^{11}_{12}$ | 8A<br>10A | 3 to 4 N·m | 30 to 45 N·m<br>(45 to 60 N·m for APK11-15A to 25A) | 8 to 16 N·m |
| APK11<br>ADK$^{11}_{12}$ | 15A<br>20A | 5 to 7 N·m | | |
| | 25A | 9 to 12 N·m | | |
| AP$^{21}_{22}$<br>AD$^{21}_{22}$ | 32$^{A}_{F}$<br>40$^{A}_{F}$<br>50$^{A}_{F}$ | 18 to 28 N·m | | |
| APK21<br>ADK21 | 32$^{A}_{F}$<br>40$^{A}_{F}$<br>50$^{A}_{F}$ | | 80 to 120 N·m | |

## Working Environment

# ⚠ CAUTION

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

### Explanation of protection property symbols and examination method of IP65

**●Protective structure**

Note: IP-65 is a standard as followings.

■IEC (International Electrotechnical Commission) standards

(IEC60529 (IEC529:1989-11))

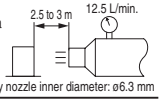
IP-**□ □

Protection property symbols (International Protection)

**1st characteristic number (protection grade for foreign solid)**

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

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

| Grade | Degree of protection | | Overview of test method (fresh water is used) |
|---|---|---|---|
| 5 | Protection for jet  | No harmful effects occur even when water is sprayed with nozzles from all directions. | Using the following test device, spray water for 1 minute per 1 m² of test sample (exterior) surface area from all directions, for a total of 3 minutes or more.   Spray nozzle inner diameter: ø6.3 mm |