CKD

SM-7012-A

# INSTRUCTION MANUAL

## PRESSURE SWITCH FOR AIR

## APE

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

# For Safety Use

To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, read this operation manual carefully for proper operation.

# INDEX

APE
Pressure Switch for Air
Manual No. SM-7012-A



NOTE : Letters & figures enclosed within Gothic style bracket (examples such as [C2-4PP07] · [V2-503-B] etc. ) are editorial symbols being unrelated with contents of the book.

Jul.31.1996
Revision ; Jan.28.1999

# 1. PRODUCT

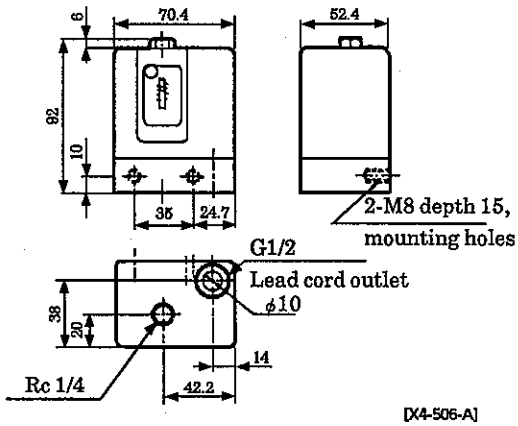
## 1.1 Specifications

| Model code / Items | | APE |
|---|---|---|
| Media | | Compressed air |
| Max. working pressure | MPa | 1.0 |
| Proof pressure | MPa | 1.5 |
| Range of pressure adjustment | MPa | 0.1to 0.8 |
| Media temperature | °C | 5 to 60 |
| Type of micro switch | | Z-15GD-B (Make of OMRON) |
| Configuration of contact | ab | 1 |
| Hysterisis | MPa | Hysterisis within 0.049 at 0.1 to 0.49 |
| | | Hysterisis within 0.078 at 0.5 to 0.8 |
| Repeatability | MPa | Within ±0.02 {0.2} against set pressure |
| Ambient temperature | °C | −5 to 60 (Not to be frozen) |
| Ambient humidity | % | 90 or lower |
| Allowable operation frequency | Times/s | 20 |
| Insulation resistance | MΩ | 100 or over (with DC500V megger) |
| Mounting posture | | Optional |
| Weight of product | kg | 0.57 |

| Ratings of microswitch | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Load | Non-inductive load (A) | | | | Inductive load (A) | | | |
| Circuit | Resistance load | | Lamp load | | Inductive load | | Motor load | |
| Voltage | N.C | N.O | N.C | N.O | N.C | N.O | N.C | N.O |
| AC125V | 15 | 15 | 3.0 | 1.5 | 15 | 15 | 5.0 | 2.5 |
| AC250V | 15 | 15 | 2.5 | 1.25 | 15 | 15 | 3.0 | 1.5 |
| DC30V | 6.0 | 6.0 | 3.0 | 1.5 | 5.0 | 5.0 | 5.0 | 2.5 |

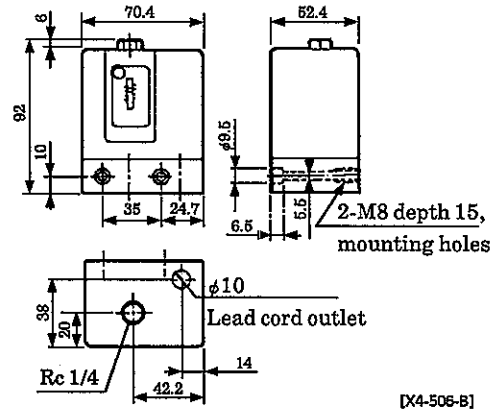
## 1.2 External dimensions

- Model APE-8T



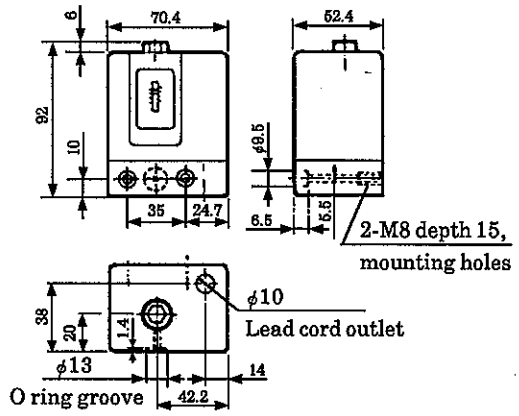

[X4-506-A]

- Model APE-8N




[X4-506-B]

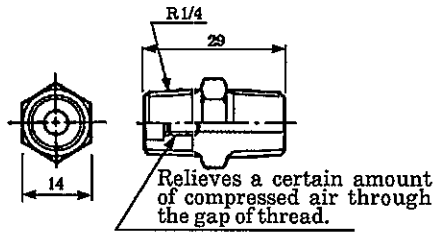
- Model APE-8F




[X4-506-C]

Related component

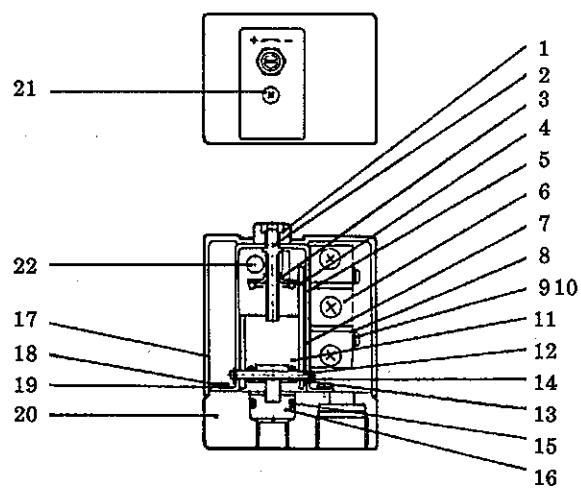
- Pressure damping nipple
  (Parts name: APE - Nipple)
  (Model code: 6556)




[X4-506-D]

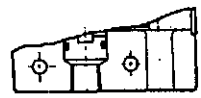
## 1.3 Internal structure and parts list

● Model:APE-8T



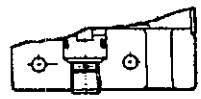

[X4-506-E]

● Model:APE-8N



[X4-506-F]

● Model:APE-8F



[X4-506-G]

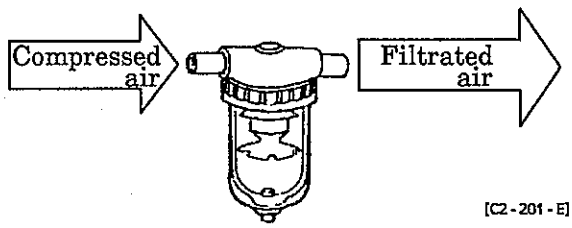
| Item No | Parts name | Material | Remarks | Item No | Parts name | Material | Remarks |
|---|---|---|---|---|---|---|---|
| 1 | Nut | Steel | | 14 | Spring retainer | Steel | |
| 2 | Adjusting screw | Steel | | 15 | Y packing | Nitrile rubber | |
| 3 | Spring retainer | Steel | | 16 | Piston | Polyacetal | |
| 4 | Lever | Steel | | 17 | Cover | Acrylonitrile butadiene styrene | |
| 5 | Insulation board | | | | | | |
| 6 | Microswitch | | Z-15GD-B | 18 | Cross recessed machine screw | Steel | M4×10 |
| 7 | Frame | Steel | | | | | |
| 8 | Flat washer | Steel | Nominal 3 | 19 | Spring seat | Steel | Nominal 4 |
| 9 | Cross recessed machine screw | Steel | M3×20 | 20 | Body | Zinc alloy die-casting | |
| 10 | Spring seat | Steel | Nominal 3 | 21 | Cover mounting screw | Steel | M3, machine screw |
| 11 | Spring | Piano wire | | | | | |
| 12 | Pin | Steel | | 22 | Lamp | | Model with lamp only |
| 13 | E shape snap ring | Steel | | | | | |

Note: Disassembling of this pressure switch is not practical except the cover 17.

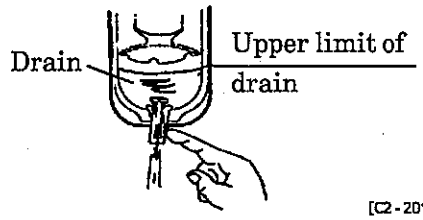
## 2. CAUTION

### 2.1 Fluid

1) Use the compressed air, filtrated and dehumidified. Carefully select a filter of an adequate filtration rate (5$\mu$m or lower preferred), flow rate and its mounting location (as closest to directional control valve as possible).
2) Be sure to drain out the accumulation in filter periodically.
3) Note that the intrusion of carbide of compressor oil (such as carbon or tarry substance) into the circuit causes malfunction of solenoid valve and cylinder. Be sure to carry out thorough inspection and maintenance of compressor.



[C2-201-E]



[C2-201-F]

## 3. OPERATION

1) Keep the working pressure within 0.8MPa.
2) Set the working pressure in accordance with the following procedures.
   (1) Set the required pressure by means of turning the pressure adjusting screw provided atop of cover after loosening its lock nut. Set value increases when turning the screw to + direction while it decreases when turning the screw to - direction. (Tools required: Open ended spanner of 13 mm and minus tip screw driver)
   Make ascertain to tighten the lock nut after setting required pressure.
   (2) Regard the graduated face plate a general guidance only. (Tolerance of graduation is $\pm$0.05MPa)

# 4. INSTALLATION

## 4.1 Precautions on wiring

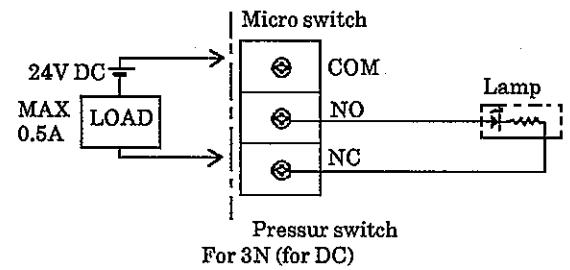
1) Wire to the internal microswitch after taking a cover by loosening cover setting screw.

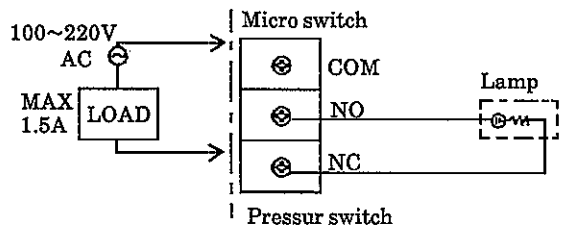
2) In case of switch with an indicator lamp

(1) Carefully select the load as there is such a slight flow of current as shown below even while the load (relay, etc.) is not energized because the indicator lamp is connected with terminals of NC and NO of microswitch.

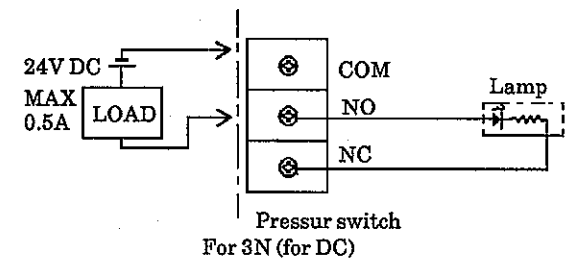
| | |
|---|---|
| AC110V | 1.5mA |
| AC220V | 2.0mA |
| DC24V | 4.5mA |

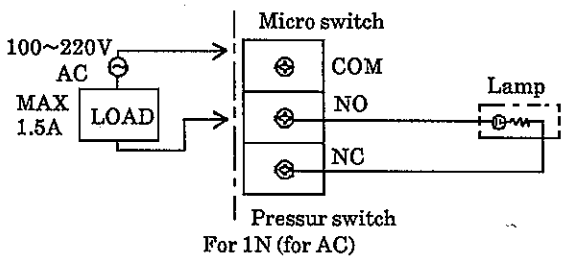
(2) Connect the indicator lamp between Common terminal and NC terminal of microswitch when intending to make the lamp lit with the pressure exceeding the set value and make the lamp goes off when the pressure drops off. Stick the name plate reading "Lamp lits when pressure exceeds" on te cover.




(3) Connect the indicator lamp between Common terminal and NO terminal of microswitch when intending to make the lamp goes off when the pressure exceeding thesevalue and make the lamp stay on when the pressure goes over the set value. Stick the name plate reading "Lamp goes off when pressure exceeds" on the cover.

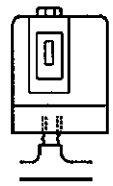
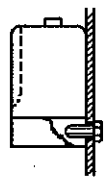
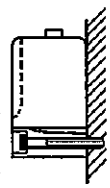


## 4.2 Precautions on piping and handling

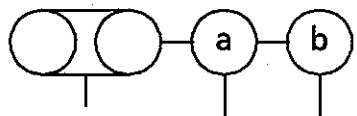
1) Particular precautions such as follow are required due to the cover being made of resin.
   (1) Avoid installation of the switch in the ambient where excessive high temperature is expected.
   (2) Hold the body of the switch with fingers during the course of piping and/orits installation.
2) Make certain of connecting it to the filtrated air line.
3) Install a cushion damper nipple where sensing a sudden pressure change such as air cylinder pressure is intended.

- Note 1: Combination of installation, piping and wiring

<table>
<tr><th colspan="2">Mounting type</th><th>Applicable model</th><th>Piping method</th><th>Connecting port</th></tr>
<tr><td rowspan="2">Piping</td><td rowspan="2">  <br>[X4-406-C]</td><td>8T</td><td rowspan="4">Rc1/4</td><td>G1/2</td></tr>
<tr><td>8N</td><td>φ10</td></tr>
<tr><td rowspan="3">Reverse side mounting</td><td rowspan="3">  <br>[X4-406-D]</td><td>8T</td><td>G1/2</td></tr>
<tr><td>8N</td><td rowspan="3">φ10</td></tr>
<tr><td>8F</td><td>Connection with O ring on reverse side</td></tr>
<tr><td rowspan="2">Front side mounting</td><td rowspan="2">  <br>[X4-406-E]</td><td>8N</td><td>Rc1/4</td></tr>
<tr><td>8F</td><td>Connection with O ring on reverse side</td></tr>
</table>

- Note 2: An O ring (JIS B2401 P10) and two M5×55ℓ , socket headed bolts are furnished together with APE-8F on delivery.

# 5. HOW TO ORDER




APE

Switch type for air variable pressure

| ⓑ Indicator Lamp | |
|---|---|
| No code | Without a lamp |
| 1N | With a lamp, for AC100V/200V |
| 3N | With a lamp, for DC24V |

| ⓐ Type of wiring and piping | | |
|---|---|---|
| 8T | Standard | Air piping port Rc 1/4, Lead cord outlet G 1/2 |
| 8N | Standard | Air piping port Rc 1/4, Lead cord outlet $\phi$10 |
| 8F | Optional | Air piping port O ring connection, Lead cord outlet $\phi$10 |

Note: Affix a letter N following the coding figure 8 when ordering for NPT type threading ports.
For example APE - 8NT
APE - 8NN, etc.