

INSTRUCTION MANUAL

PARECT PRESSURE SWITCH

PPE

- 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.

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 applications, 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.

Observe the cautions on handling described in this manual, as well as the following instructions :

Precautions

- This product is designed for air and compressed dry air. Do not use it with corrosive and combustible gases.
- Do not touch electric wiring connections (exposed live parts) : this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.

INDEX

PPE

Palect pressure switch

Manual No. SM-235591-A

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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.



1. PRODUCT

1.1 Specifications

Model code	For negative pressure	For positive pressure	
Item	※1 PPE-V01-□	※1 PPE-P01-□	※1 PPE-P10-□
Pressure range	-101.3 to 0kPa	0 to 100kPa	0 to 1MPa
Color of name plate ※2	Red	Green	Blue
Strain transducer	Diffusing semi-conductor strain gage		
Applicable media	Air, compressed dry air		
Proof pressure	0.6MPa	0.3MPa	1.5MPa
Repeatability	±1%F.S.		
Hysteresis	3%F.S. or smaller		
Temperature characteristics	±3%F.S.		
Load voltage	DC10 to 30V		
Load current	5 to 50mA		
Internal voltage drop	4V or lower		
Current leakage	1mA or lower		
Indicator light	Yellow LED comes on at ON		
Flying lead	Standard 3m(oil-proof vinyl cabtype cable 2-core 0.15mm ²)		
Range of working temperature	0 to 50 degree C (must not be frozen)		
Protection	IP65 equivalent		
Mechanical vibration proof	10 to 55Hz Amplitude 1.5mm X, Y and Z each direction 4 hours		
Piping connection	R1/8、ø6mm plug、ø6mm push-in joint		
Mass(with cable)	37g(R1/8type、plug type) 42g(push-in joint type)		
Mass(without cable)	9g(R1/8type、plug type) 14g(push-in joint type)		

※1: □ refers to the symbol appropriate for the piping shape.
(Refer to the model number identification method.)

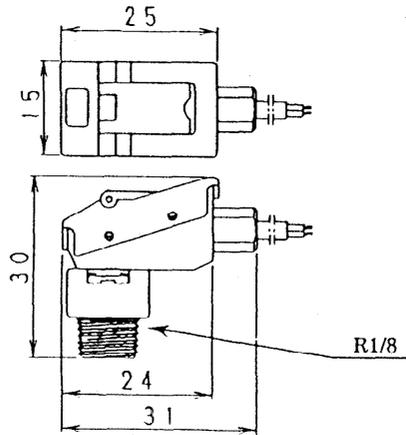
※2: The name plate color varies depending on the pressure range.
(This is to prevent mixed use of switches for different pressures.)



1.2 External dimensions

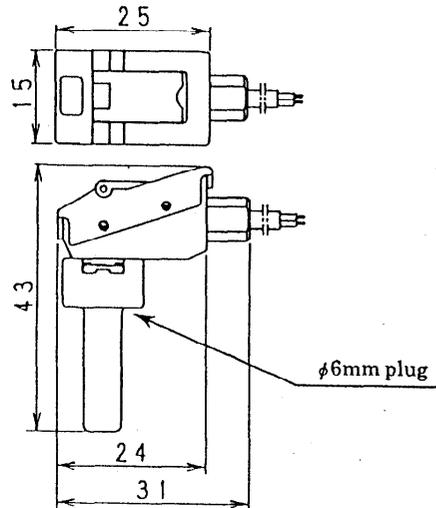
1.2.1 External dimensions

● PPE-□-6

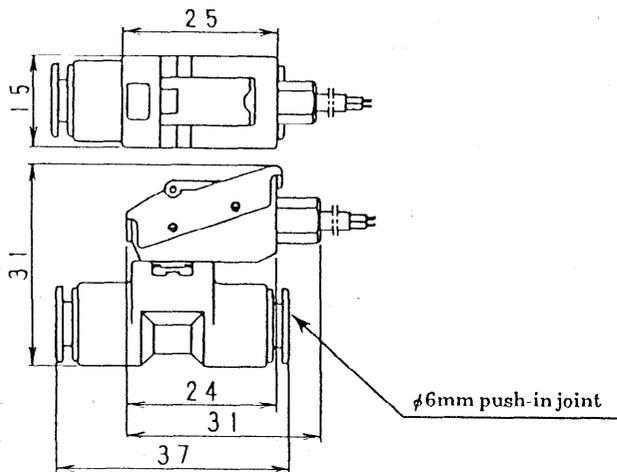


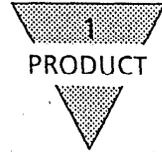
● PPE-□-H6-B

[unit: mm]



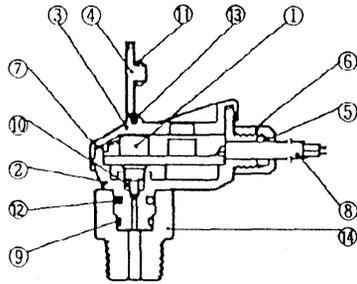
● PPE-□-H6





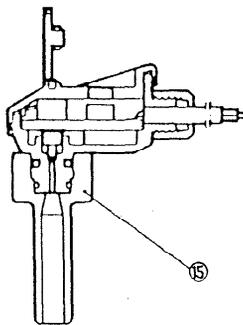
1.3 Internal Structure Drawing

● PPE-6

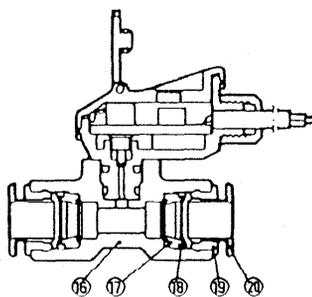


Number	Parts	Material
1	Pressure sensor	Semiconductor strain gauge
2	Body	PBT (GF30%)
3	Cover	PC
4	Trimmer cover	PC
5	Bushing	NBR
6	Bushing holder	A2011
7	Cover gasket	VMQ
8	Cable(3m)	PVC
9	O-ring	NBR
10	O-ring	NBR
11	O-ring	NBR
12	Stopper	SUS304WPB
13	Spring-pin	SUS420
14	R1/8	PBT (GF30%)
15	Plug	PBT (GF30%)
16	Push-in joint	PBT
17	Packing	NBR
18	Chuck	C3604B (non-electrolyte nickle plated)
19	Outer ring	C3604B (non-electrolyte nickle plated)
20	Push ring	POM

● PPE-□-H6-B



● PPE-□-H6





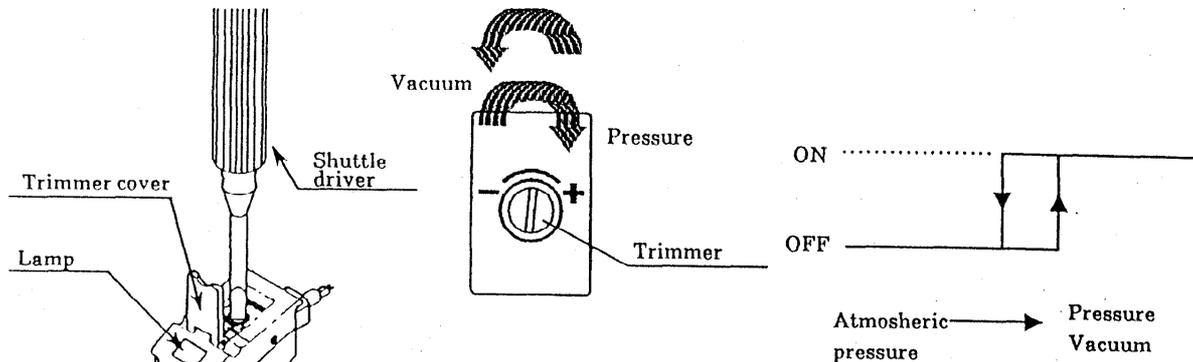
2. CAUTION

2.1 Caution of Handling The Product

- 1) In installation, please be sure to hold the product's main body to prevent any impact to body and stress to the flying lead.
- 2) Please do not apply other media than "indicated" applicable media. In case other media is used, we are not in a position to guarantee the performance of the product and assure the safety. Please never apply corrosive gases, inflammable gases, oxygen etc.
- 3) When vacuum suction is checked and the positive pressure for vacuum break is applied to this product, ensure the pressure does not exceed the specified value.
- 4) Do not disassemble this product. If the product is disassembled, a part may be ejected when pressure is applied.
- 5) Connection area between the body and the joint can be rotated. Do not rotate it repeatedly.
- 6) The protection is equivalent to IP65. Do not use the product in an environment where water splashes. Take necessary measures to prevent leakage of machining oil or coolant fluid.

3. OPERATION

3.1 Pressure Setting Method and Switch Operation



Apply the desired pressure and turn the trimmer.
While viewing the switch indicator, set the ON position.

3) Precautions for setting

(1) Driver

In setting, use a flat edged screwdriver that fits the trimmer groove (0.6W x 2.3L x 0.5D).

(2) Trimmer

The trimmer turning range is 240 degrees. Further turning or turning by force may break the trimmer.

(3) Closing/opening the trimmer cover

After setting, press the trimmer cover with a finger to close it firmly. If the cover is not closed firmly, protection specification (IP65) has not been fulfilled. When setting, open the trimmer cover with a flat edged screw driver.



4. INSTALLATION

4.1 Piping

1) PPE-□-6

Place seal tape or a sealing material and use a wrench at the width across flats (13 mm) of the R1/8 joint for installation.

(Precautions)

The tightening torque must be 1.0 - 1.5 N.m or less. Since it is made of resin, excessive tightening may break the pipe.

2) PPE-□-H6-B

This type should be installed onto CKD 6mm push-in joint.

(Precautions)

- Plug part should be inserted firmly and before use, plug should be checked that it is not come out. In case the plug is not inserted to the end, plug can be come out and leakage may happen.
- Following push-in joints are recommended, GZ series, GW series and GM series.

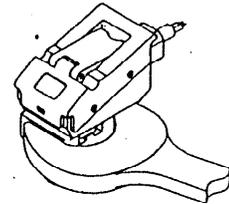
3) PPE-□-H6

Insert 6 mm tubes into 2 quick joints for use.

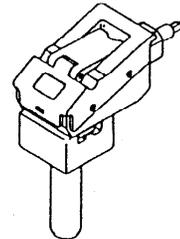
(Precautions)

- Following tubes are recommended
nylon tube, soft nylon tube, Urethane tube,
non-inflammable tube
- Tubes should be inserted firmly and before use tube should be checked that it is not come out. In case the tube is not inserted to the end, tube can be come out and leakage may happen.
- Cut the tube vertically.

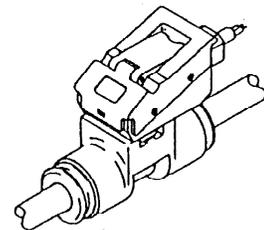
PPE-□-6



PPE-□-H6-B



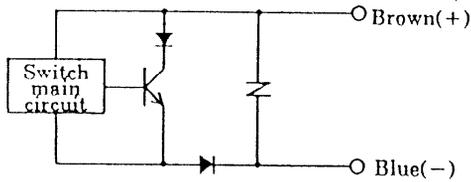
PPE-□-H6



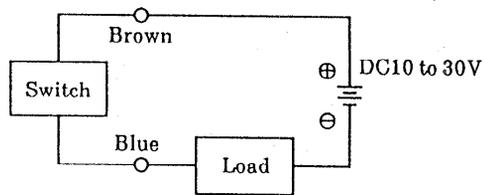
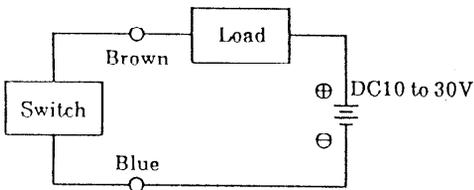
4.2 Wiring

4.2.1 Internal Circuit Diagram and Connection

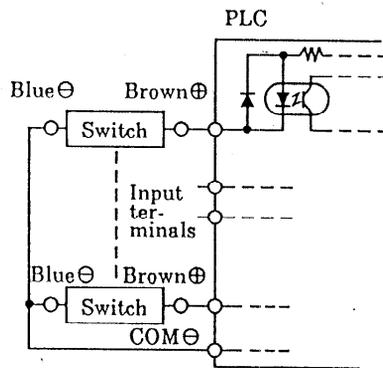
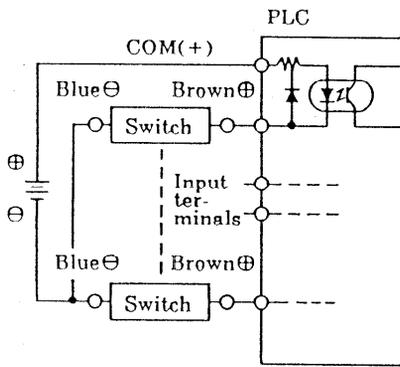
1) Internal circuit diagram



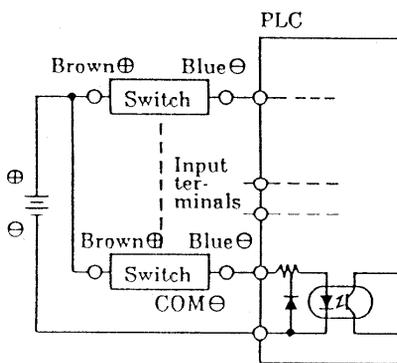
2) Connection to a cable



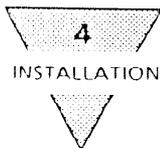
3) Connection to a programmable logic controller (Sequencer)



Connection to source input type (an external power source) Connection to source input type (an internal power source)



Connection to sink input type



4) Precautions for wiring

(1) Wiring

Please be sure that the wiring works are done after the electrical supply was cut. Before and during the wiring works, charged static electricity on body and/or on tools should be discharged. For moving part, flexible cables should be used.

(2) Wiring installation

This product and wiring should be installed as much away as possible from those noise source like strong electric cables. Also please take measures for surge transferred to power source cable.

(3) Power voltage

Do not use this component with higher voltage than specified. If voltage exceeds the specification or alternative current (AC100V) is applied, the equipment may be damaged or burned.

(4) Short-circuiting

Do not short-circuit the wiring, otherwise, damage or burning may occur.

(5) Incorrect wiring

Connect wires to the correct poles or terminals, otherwise, wires may be damaged or burned.

(6) Load

If an inductive load like relay or solenoid valve is used, surge voltage will occur when the switch is turned OFF. Provide flywheel diodes directly to all inductive loads in the same power circuit.

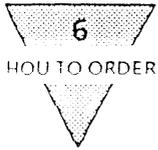
(7) Protection circuit for short-circuiting

If the wiring is short-circuited by mistake, the built-in protection circuit for short-circuiting functions and the switch will remain OFF. After correcting the wiring, turn off the power or short-circuit the brown wire and the blue wire of PPE to return to normal switch operation.

5. MAINTENANCE

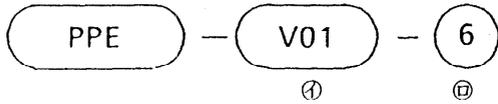
5.1 Trouble Shooting

Ir-regular phenomenon	Cause	Disposal to correct
Switch output dose not turn ON	Non connection	Check outside wiring
	Broken wiring (Breakage by curvature)	The wiring should be changed so that the curvature will not be happened to only one point of the flying lead, or use flexible wires.
	Broken wiring (Breakage by tension)	The wiring should have allowance so that any tensions will not be happened to the flying lead.
	Not enough pressure is applied.	Check applied pressure.
	Incorrect setting	Check the setting values.
	Incorrect wiring (Reverse connection)	Do wiring connection correctly.
	Incorrect wiring (Short-circuiting)	After correcting the wiring, release the operation of the protection circuit by switching ON/OFF the voltage source.
	Miss matching with PLC input (Internal voltage drop max.4V)	Check PLC input spec. (ON voltage) and load voltage.
	Damage of PPE (Sensor breakage by over-pressure)	Replace PPE
	Damage of PPE (Damage of circuit)	Replace PPE
Damage of PPE (Damage of trimmer)	Replace PPE	
Switch output dose not turn OFF	Pressure is kept applied	Check applied pressure.
	Incorrect setting	Check the setting values
	Miss matching with PLC input (Leak current max.1mA)	Check PLC input spec. (OFF current or revertive voltage) and load voltage.
	Damage of PPE (Sensor breakage by over-pressure)	Replace PPE
	Damage of PPE (Damage of circuit)	Replace PPE
	Damage of PPE (Damage of trimmer)	Replace PPE
Switch output is not stable, i.e. switch turns ON and OFF alternately.	The difference between applied pressure and the set pressure is too small.	Review the set pressure or applied pressure.
	The ripple og applied pressure is big.	Review piping connection or the set pressure.
The trimmer cover opens and the air leaks from there.	Sensor breakage by over-pressure	Replace PPE Take measures so that the higher pressure than the proof pressure will not be applied.



6. HOW TO ORDER

6.1 How To Order



① Pressure range		② Piping connection	
V01	0 to -101.3kPa	6	R1/8
P01	0 to 100kPa	H6-B	φ6mm plug
P10	0 to 1MPa	H6	φ6mm push-in joint in-line type

CKD Corporation

2-7-2, Meieki-Minami, Nakamura-ku,
Nagoya 450-0003, Japan

PHONE (052)581-3751

FAX (052)583-9710

· U.S.A.

CKD-USA CORPORATION(HEADQUARTERS)

800 N. York Rd. Bensenville, IL 60106 U.S.A.
PHONE (847)437-9727 FAX (847)437-9728

CKD-USA CORPORATION AUSTIN OFFICE

2112 Rutland Dr. Suite 185 Austin, TX 78758 U.S.A.
PHONE (512)339-3035 FAX (512)339-3136

CKD-USA CORPORATION SAN JOSE OFFICE

2681 Zanker Rd. Unit A San Jose, CA 95134 U.S.A.
PHONE (408)435-0100 FAX (408)435-0101

CKD-USA CORPORATION CINCINNATI OFFICE

1420 Jamike Dr. Erlanger, KY 41018 U.S.A.
PHONE (606)283-2776 FAX (606)283-2785

CKD CREATEC CORPORATION

Two Century Centre 1700 East Golf Rd. Suite 1111
Schaumburg, IL 60173 U.S.A.
PHONE (847)330-1840 FAX (847)240-1419

MILLER FLUID POWER CORPORATION

800 N. York Rd. Bensenville, IL 60106 U.S.A.
PHONE (847)437-9727 FAX (847)437-9728

WILKERSON CORPORATION

1201 W. Mansfield Ave. Englewood, CO 80110 U.S.A.
PHONE (303)761-7601 FAX (303)781-2311

· Canada

MILLER FLUID POWER CANADA LTD.

1214 Kamato Mississauga, Ontario L4W1Y1 Canada
PHONE (800)268-0205 FAX (905)625-8724

· Europe

CKD EUROPE

P.O. Box 1428, 1211, Geneva 26, Switzerland
PHONE (022)3422922 FAX (022)3422947

· Malaysia

M-CKD PRECISION SDN.BHD.

Lot No. 6, Jalan Modal 23/2, Seksyen 23, Kaw. Miel, Fasa 8,
40300 SHAH Alam, Selangor Darul EHSAN, Malaysia
PHONE (03)5411468(6 lines) FAX (03)5411533

· Thailand

CKD-USA CKD THAI CORPORATION LTD.

Bangpakong Industrial Estate 2, 700/58 Moo 1,
Tambol Bankao, Amphur Panthong, Chonburi 20160 Thailand
PHONE (038)214-646-8 FAX (038)213-389

CKD SALES THAI CORPORATION LTD.

Suwan Tower 14/1 Soi Saladaeng 1, Nborth Satarn RD., Bangrak, Bangkok 10500 Thailand
PHONE (662)267-6300 FAX (662)267-6305

· Singapore

CKD SINGAPORE PTE LTD.

705 Sims Dr. #03-01/02/03 Shun Li Industrial Complex 387384 Singapore
PHONE 7 442623 FAX 7442486

· Taiwan

台灣旭開理股份有限公司

(TAIWAN CKD CORPORATION)

中華民國新竹縣竹北市泰和路176號
(No. 176 Taiho Rd. Chupei-City, Hsinchu Taiwan R.O.C.)
PHONE (03)553-5501-03

· China

無錫喜開理氣動工業有限公司

(WUXI CKD PNEUMATIC INDUSTRY CO.,LTD.)

Qingyang South No.3 Rd. Wuxi, Jiangsu 214023 China
PHONE (0510)5729914, 5732914 FAX (0510)5759598

無錫喜開理氣動工業有限公司上海分公司

(WUXI CKD PNEUMATIC INDUSTRY CO.,LTD. SHANGHAI BRANCH)

Sipai Plaza Room 1406, NO.103, Cao-Bao Rd. Shanghai 200233 China
PHONE (021)64758269 FAX (021)64756034

無錫喜開理氣動工業有限公司天津營業所

(WUXI CKD PNEUMATIC INDUSTRY CO.,LTD. TIANJING OFFICE)

No. 148 Bai-Di Rd. Nankai-Qu, Tianjing 300193 China
PHONE (022)27483916 FAX (022)27483916