

CPE / CPD

Pressure switches for coolants

■ Pressure switch

Overview

These low/high-pressure switches are compatible with coolants. The diaphragm structure used at pressurized section achieves superior stability, so the product can be used to check the pressure of coolant in machine tools, and to check the pressure of water or oil in other industrial machines.

Features

Degree of protection IP65 equivalent (dust proof/water jet proof)

The high-pressure switch incorporates an electronic structure, enabling highly accurate detection and setting.



CONTENTS

- Mechanical pressure switch for coolants (for low pressure) CPE 210
- Electronic pressure switch for coolants (with digital display) CPD 214



Mechanical pressure switch for coolants (for low pressure)

CPE Series

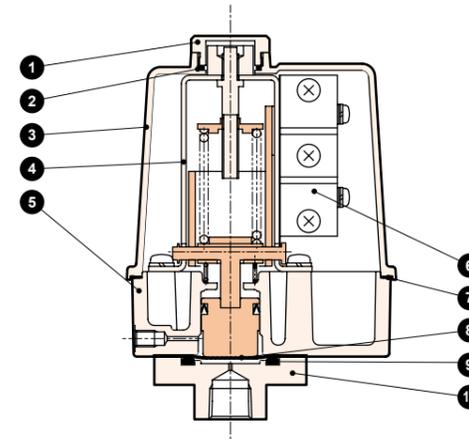
● Pressure adjusting range: 0.05 to 0.8 MPa

Circuit Diagram Symbol



Internal Structure Diagram / Material

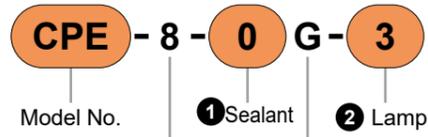
● CPE



Part No.	Part name	Material
1	Cap	A 5056 Aluminum
2	O-ring	NBR Nitrile Rubber
3	Cover	ABS ABS resin
4	Frame	SPC Steel
5	Body	ADC12 Aluminum die-casting
6	Micro switch	-
7	Gasket	NBR Nitrile Rubber
8	Diaphragm	NBR (FKM) Nitrile rubber (fluoro rubber)
9	O-ring	NBR (FKM) Nitrile rubber (fluoro rubber)
10	Port	SUS 303 Stainless steel

Options are shown in ().

Model No. Notation Method



Connection port: Rc1/4 downward
Switch: Standard

1 Sealant

Code	Description
0	Nitrile Rubber
B	Fluoro rubber

2 Lamp

Code	Description
1	For 100/200 VAC
3	For 24 VDC

Specifications

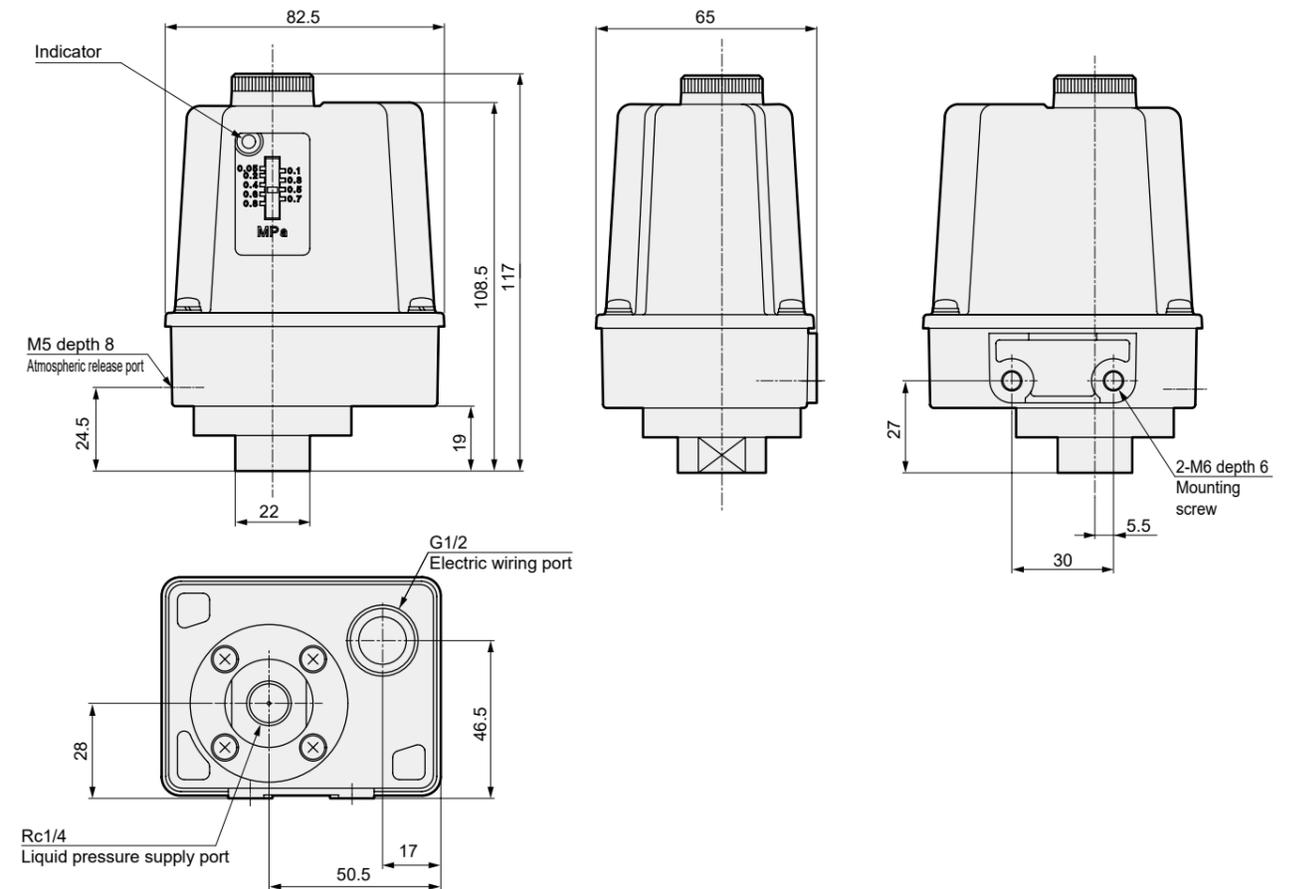
Item	CPE
Working fluid	Coolant, air, other non-corrosive liquids, gases
Rated pressure	MPa 0 to 1.0
Proof pressure (water pressure)	MPa 1.5
Pressure adjusting range	MPa 0.05 to 0.8
Fluid temperature	°C 0 to 50
Ambient temperature	°C 0 to 50
Port size	Rc1/4
Micro switch	Z-15GD-B (OMRON)
Contact array	1ab
Hysteresis	MPa 0.04 or less (set pressure 0.05 to 0.3) 0.1 or less (set pressure 0.31 to 0.8)
Repeatability	MPa ±0.02
Allowable operating frequency cycles/min.	20
Rated voltage	100 VAC, 200 VAC, 24 VDC
Insulation resistance	MΩ 100 or more (with 500 VDC megger)
Weight	kg 0.58
Mounting orientation	Vertical direction with the adjusting screw up
Degree of Protection	IP65 (dust proof/water jet proof) equivalent

Micro switch rated

Load circuit	Non-inductive load (A)				Inductive load (A)			
	Resistance load		Lamp load		Inductive load		Electric motor load	
	N.C	NO	N.C	NO	N.C	NO	N.C	NO
125 VAC	15		3	1.5	15		3	2.5
250 VAC	15		2.5	1.25	15		3	1.5
30 VDC	6		3	1.5	5		5	2.5

Dimensions

● CPE



Pressure switch

Electronic pressure switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure switch

Contact Confirm Switch

For Coolant Pressure Switch



Pneumatic components (pressure switch for coolants)

Safety Precautions

Be sure to read this section before use.

For general pneumatic components precautions, refer to Intro 17 for details.

MEMO

Specific cautions: Mechanical pressure switch for coolants (for low pressure) CPE Series

Design / Selection

CAUTION

■ The lamp is connected to the micro switch's NC terminal and NO terminal. An extremely small current flows even when the load (relay, etc.) is not energized. Pay attention to load selection.

100 VAC 1.5 mA 200 VAC 2.0 mA

24 VDC 1.5 mA

■ Select with considerations to rush current.

Micro switch contact specifications

Rush current	Normally closed circuit	Max. 30 A
	Normally open circuit	Max. 15 A

Starting current should be measured beforehand.

■ Never use this product in an explosive gas atmosphere.

The pressure switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere as explosions or fires could result.

■ Install a damper, absorber or accumulator as necessary if the water hammer, rush pressure or pulsation must be reduced. Pressure exceeding proof pressure even momentarily could damage the CPE.

Pressure switch

Electronic pressure Switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure Switch

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For Coolant Pressure Switch

For precautions during mounting, installation, adjustment, use and maintenance, refer to the CKD Components Product Site (<https://www.ckd.co.jp/kiki/en/>) → "Model No. → [Instruction Manual](#)

Ending

Ending



Electronic pressure switch for coolants (with digital display)

CPD Series

● Pressure adjusting range: 0 to 7 MPa

Circuit Diagram Symbol



Model No. Notation Method

CPD - P70 N - 8

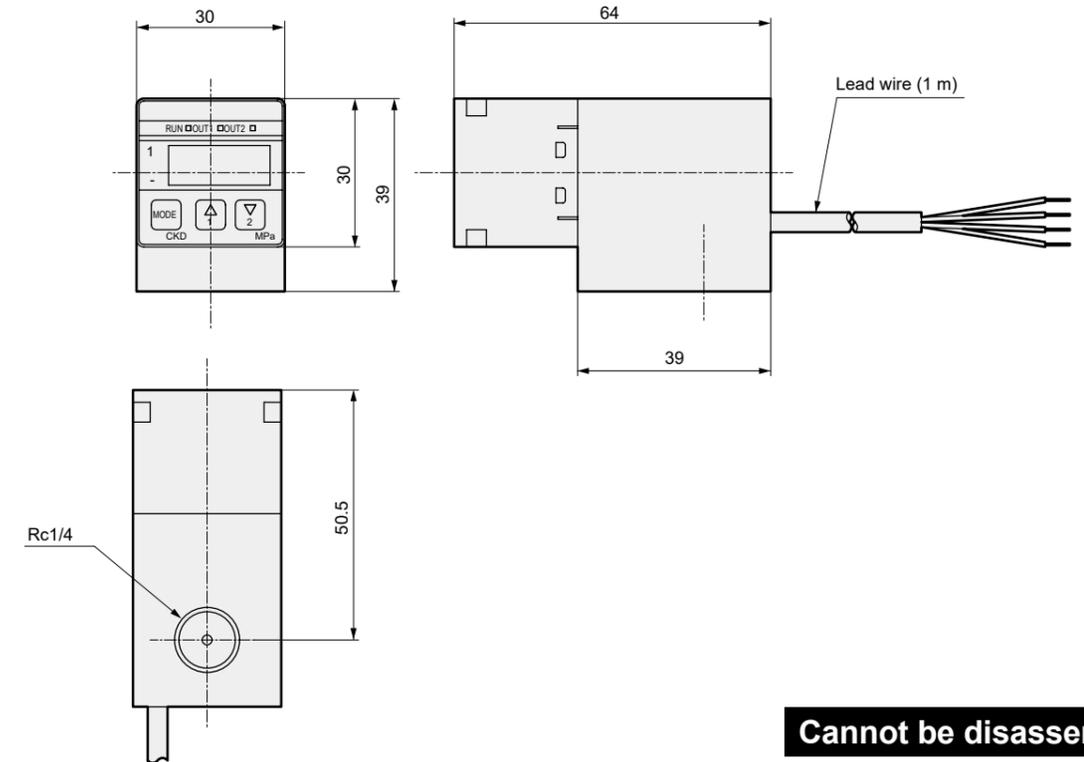
Model No. CPD
Rated pressure: 0 to 7 MPa
Connection port: Rc1/4 Downward outlet
Switch output: NPN Transistor output 2 point

Specifications

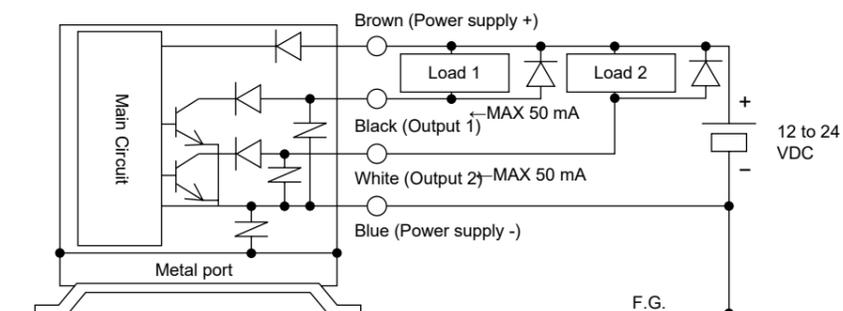
Item	CPD	
Pressure sensitive element	Stainless steel diaphragm pressure sensor	
Working fluid	Coolant/other non-corrosive fluids	
Rated pressure	MPa	0 to 7
Proof pressure (water pressure)	MPa	10.5
Pressure adjusting range	MPa	0 to 7
Fluid temperature	°C	0 to 50
Ambient temperature	°C	0 to 50
Ambient humidity	% RH	0 to 85 (no condensation)
Port size	Rc1/4	
Indicator	3-digit LED display, character height 8 mm	
Indicator accuracy (25°C)	±2%F.S. (±0.14 MPa)	
Temperature characteristics (0 to 50°C)	±4%F.S. (±0.28 MPa)	
Repeatability MPa	±0.02	
Power supply voltage	12 to 24 VDC±10% (ripple rate 1% or less)	
Current consumption	mA	50 or less
Output response time msec	Approx. 5	
Switch output	NPN transistor open collector output 2 points	
Switch output current	mA	MAX 50
Switch output voltage drop	V	2.4 or less
Set value hold	EEPROM	
Lead wire	Oil resistant vinyl cable 4-conductor (0.2 mm ²) 1m	
Weight kg	0.36	
Mounting orientation	Unrestricted	
Degree of Protection	IP65 (dust proof/water jet proof) or equivalent	

Dimensions

● CPD



Wiring method



Pressure switch

Electronic pressure switch

Contact Confirm Switch

For Coolant Pressure Switch

Pressure switch

Electronic pressure switch

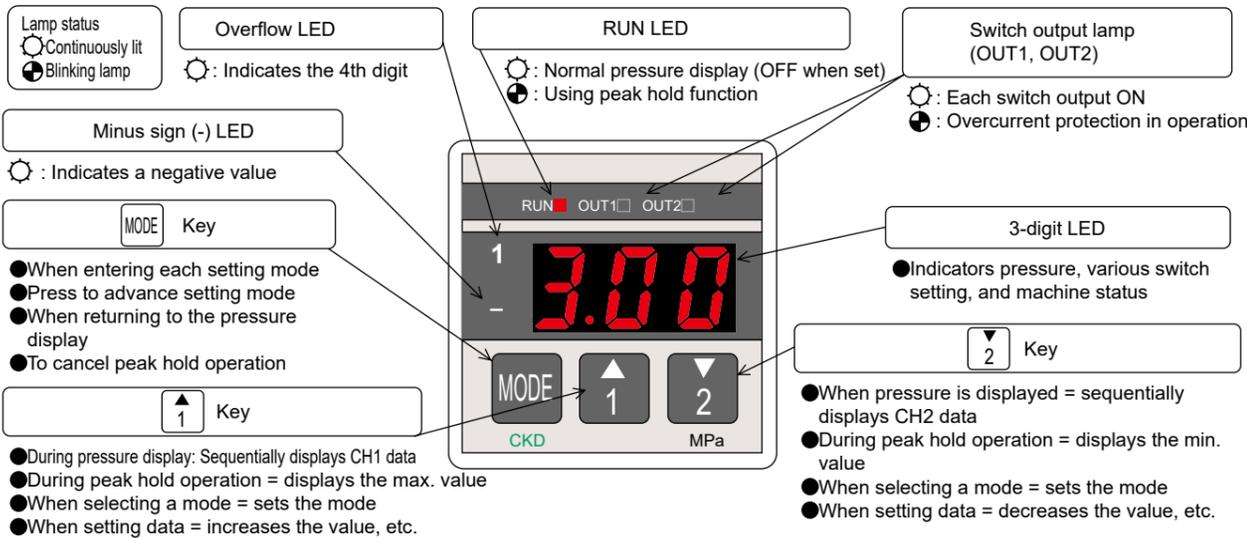
Contact Confirm Switch

For Coolant Pressure Switch

Ending

Ending

Indicator and function



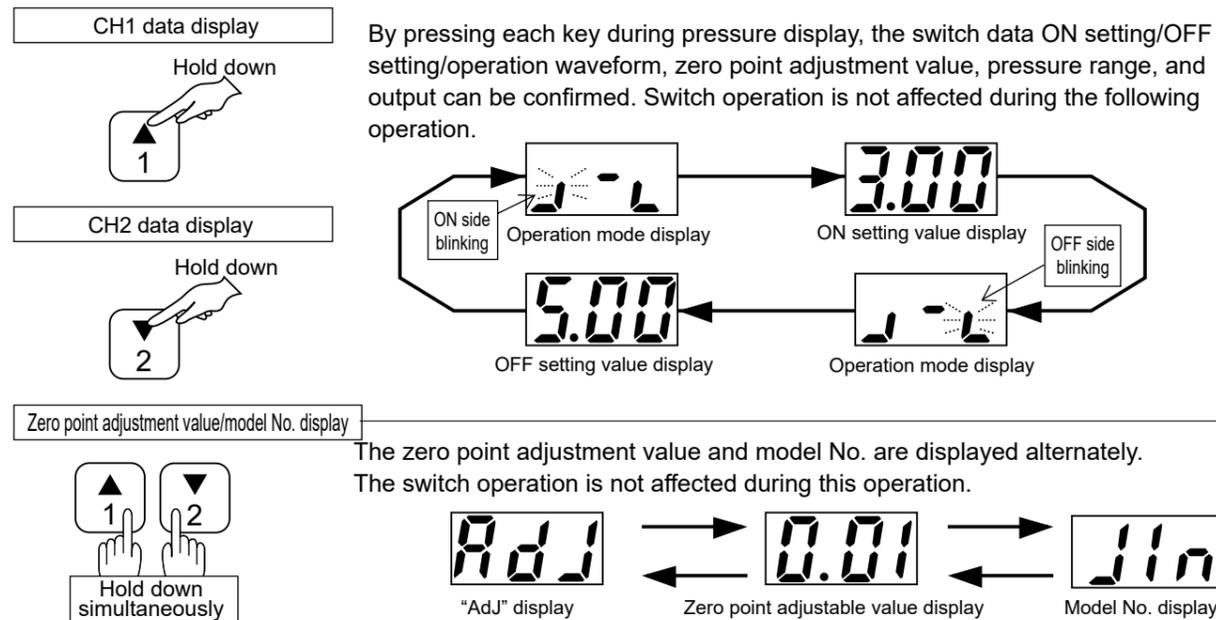
LED display

Numbers and letters are displayed with a combination of LED displays.

Numerals	0	1	2	3	4	5	6	7	8	9
Indicator	0	1	2	3	4	5	6	7	8	9

Numerals	A	B	C	D	H	I	J	L	N	O	P
	(a)	(b)	(c)	(d)	(h)	(i)	(j)	(l)	(n)	(o)	(p)
Indicator	A	b	c	d	H	i	J	L	n	o	P

Confirmation of set value



For details on operation and setting method, refer to CKD components product website (<https://www.ckd.co.jp/kiki/en/>) → "Model No." → Instruction manual



Pneumatic components (pressure switch for coolants)

Safety Precautions

Be sure to read this section before use.

For general pneumatic components precautions, refer to Intro 17 for details.

Electronic pressure switch for coolants (with digital display) CPD Series

Design / Selection

WARNING

- Use this product in accordance with specifications. Use for applications or at load currents, voltages, temperatures, impacts or sites outside of the specifications could result in damage or malfunctions.
- Do not use with high pressure gas. This product is not approved under the High Pressure Gas Safety Act. Do not use for devices subject to the High Pressure Gas Safety Act.
- Never use this product in an explosive gas atmosphere. The pressure switch does not have an explosive-proof structure. Never use in an explosive gas atmosphere as explosions or fires could result.

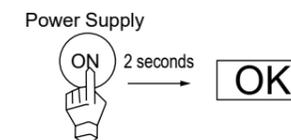
Be careful of internal voltage drop.

When using with a voltage less than the specified voltage, the pressure switch may be activated correctly, but the load may not function correctly. Check the load working voltage to see that the following formula is satisfied:

$$\text{Power supply voltage} - \text{internal voltage drop} > \text{load working voltage}$$

CAUTION

- The product self-diagnoses the internal circuit immediately after power is turned ON, so pressure is not detected immediately. Set the control circuit so that signals are ignored for about 2 seconds after power is turned ON.



- This product's overcurrent protection turns the output OFF when an overcurrent is detected. However, the output is repeatedly turned ON for a short time at a set cycle. This causes power supply voltage to fluctuate and may adversely affect peripheral devices.
- Determine the setting, taking error caused by accuracy limitations and temperature characteristics into consideration.
- Take care when using this product for an interlock circuit. When using the pressure switch for an interlock signal requiring high reliability, provide a double interlock by installing a mechanical protection function or a switch (sensor) other than a pressure switch as a safeguard against breakdown. Regularly inspect and confirm that the interlock activates correctly.

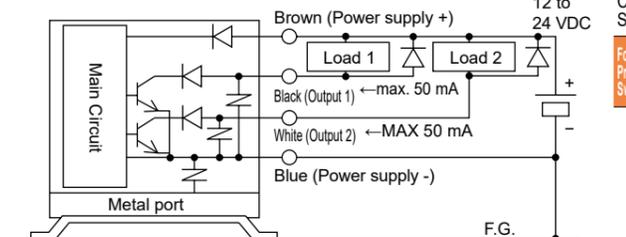
- Take the following countermeasures to prevent malfunction caused by noise.
 - Insert a line filter in the AC power supply line.
 - Use a surge suppressor such as a CR or diode on the inductive load (solenoid valve, relay, etc.) and remove noise from the source.
 - Separate wiring from strong magnetic fields.
 - Connect wiring with shielded wire.
 - Ground the shield wire on the power supply side.

- Working environment
 - Check the temperature of fluid being measured and the environmental temperature in piping.

Circuit and connection method

Check the temperature of fluid being measured and the environmental temperature in piping.

Circuit and connection method



- Install the CPD on a frame or panel connected to the frame ground (F.G.) and, if necessary, directly connect from the CPD port to the F.G. When leading fluids in from an external device, connect via a relay fitting connected to the F.G. (To provide safety when using conductive fluids)

- This CPD power supply is a DC stabilized power supply completely isolated from the AC primary side. Connect either the + side or - side of the power to the FG. A varistor (limit voltage approx. 40 V) is connected between the internal power circuit and port/mounting section of this CPD to prevent dielectric breakdown of the sensor. Avoid withstand voltage and insulation resistance tests between the CPD's internal power supply circuit and port/mounting section. Disconnect CPD wiring first if this testing is required. An excessive potential difference between the CPD power supply and port/ installation section could burn internal parts. After installing, connecting and wiring the CPD, electrical welding of the device/frame, short-circuit accidents, etc., could cause welding current, excessively high voltage caused by welding, or surge voltage, etc., to run through the wiring, ground wire, or fluid path connected between the above devices, damaging wires or devices. Conduct any work such as electrical welding after removing this device and disconnecting all electric wires connected to the FG.

- Install a damper, absorber or accumulator as necessary if the water hammer, rush pressure or pulsation must be reduced. Pressure exceeding proof pressure even momentarily could damage the CPD.

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