

# CA2 SERIES

- FIBER SENSORS
- LASER SENSORS
- PHOTOELECTRIC SENSORS
- MICRO PHOTOELECTRIC SENSORS
- AREA SENSORS
- LIGHT CURTAINS / SAFETY COMPONENTS
- PRESSURE / FLOW SENSORS
- INDUCTIVE PROXIMITY SENSORS
- PARTICULAR USE SENSORS
- SENSOR OPTIONS
- SIMPLE WIRE-SAVING UNITS
- WIRE-SAVING SYSTEMS
- MEASUREMENT SENSORS
- STATIC ELECTRICITY PREVENTION DEVICES
- LASER MARKERS
- PLC
- HUMAN MACHINE INTERFACES
- ENERGY CONSUMPTION VISUALIZATION COMPONENTS
- FA COMPONENTS
- MACHINE VISION SYSTEMS
- UV CURING SYSTEMS

Related Information

■ General terms and conditions..... F-7

■ General precautions..... P.1501



[panasonic.net/id/pidsx/global](http://panasonic.net/id/pidsx/global)



- Never use this product in a device for personnel protection.
- In case of using devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

## Convenient functions packed in a small body!

### Ultra-compact

Ultra-compact size of W48 × H24 × D65.5 mm  
**W1.890 × H0.945 × D2.579 in.**  
 It can be mounted even in a tight space.



### Large display

Though the size is compact, the measurement display uses 4 digit, 8 mm **0.315 in** letter height, red 7-segment LEDs.

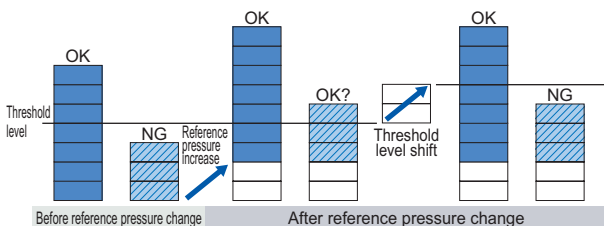


### Incorporates useful functions

“It is troublesome to change threshold value each time...”

#### ▶ Auto-reference function is useful!

This function automatically adds / subtracts the changes to / from the threshold level even if there is a change in the reference pressure.  
 So the threshold level does not need to be changed each time.



Product can be judged as OK or NG.

**Without auto-reference function**  
 Due to change in reference pressure, even an NG product is judged as an OK product.

**With auto-reference function**  
 If auto-reference input is fed before pressure level judgement, when the reference pressure changes, the threshold levels are automatically changed accordingly and correct judgment is possible.

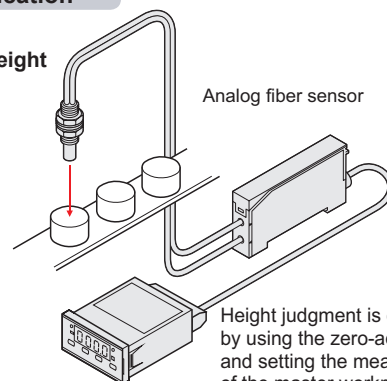
“I want to measure based on the measured value of the master object.”

#### ▶ Zero-adjust function is useful!

This function forcibly sets the standard measured value as “0”. It is convenient to measure objects based on the standard of the measurement of a master object, such as when judging variations in products.

#### Application

##### • Judging object height

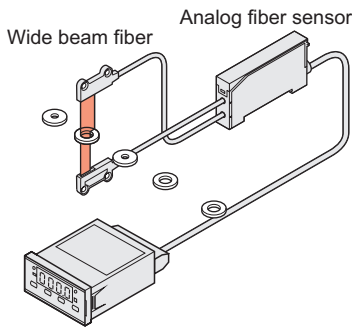


Height judgment is easily done by using the zero-adjust function and setting the measured values of the master workpiece as “0”.

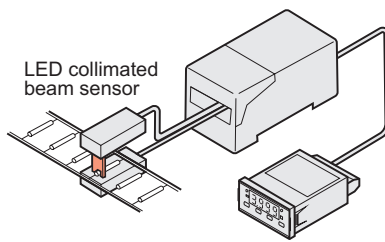
- Selection Guide
- Laser Displacement
- Magnetic Displacement
- Collimated Beam
- Digital Panel Controller
- Metal-sheet
- Double-feed Detection

**APPLICATIONS**

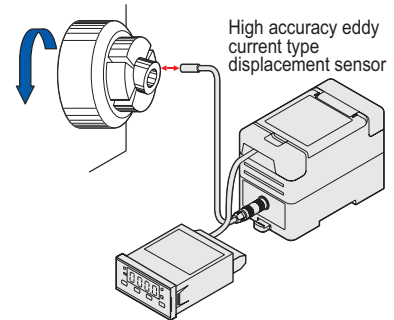
**Measuring inner diameter of rings**



**Thickness discrimination**

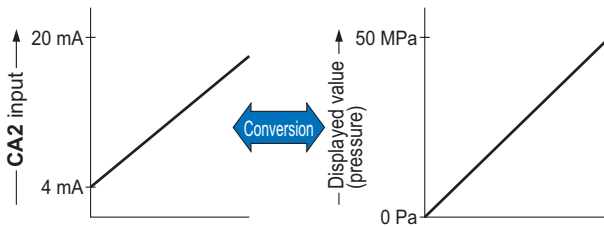


**Detecting improper lathe chuck tightening**



**Flexible scaling**

The input values can be easily converted into different scales by a key operation. Since the need to convert the displayed value is eliminated, the required information can be confirmed immediately.



**Various input ranges**

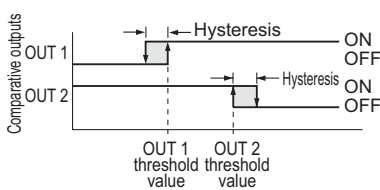
The CA2 series is provided with 5 types of input ranges: 4 to 20 mA, 1 to 5 V, ±1 V, ±5 V and ±10 V. It can be used with any suitable analog sensor.

**Two independent outputs incorporated**

Two independent comparative outputs (OUT 1, OUT 2) have been incorporated. High output comparison operation / low output comparison operation can be set for each output. Further, the hysteresis for each of the outputs can be set arbitrarily.

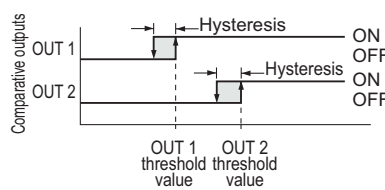
**OUT 1: "H", OUT 2: "L"**

Independent high and low output comparison operation



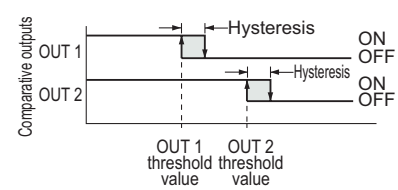
**OUT 1: "H", OUT 2: "H"**

Independent two high output comparison operation



**OUT 1: "L", OUT 2: "L"**

Independent two low output comparison operation



**ORDER GUIDE**

Appearance	Input range	Model No.	Output
	4 to 20 mA	<b>CA2-T1</b>	NPN open-collector transistor
	1 to 5 V	<b>CA2-T2</b>	
	±1 V	<b>CA2-T3</b>	
	±5 V	<b>CA2-T4</b>	
	±10 V	<b>CA2-T5</b>	

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STATIC ELECTRICITY PREVENTION DEVICES

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Collimated Beam

Digital Panel Controller

Metal-sheet Double-feed Detection

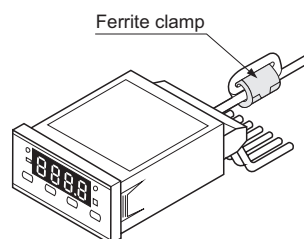
**CA2**

## SPECIFICATIONS

Model No.		CA2-T1	CA2-T2	CA2-T3	CA2-T4	CA2-T5
Item	Supply voltage	24 V DC $\pm 10\%$ Ripple P-P 10 % or less				
	Power consumption	2.8 W or less				
Analog inputs	Input range	4 to 20 mA	1 to 5 V	$\pm 1$ V	$\pm 5$ V	$\pm 10$ V
	Input impedance	20 $\Omega$	1 M $\Omega$			
	No. of inputs	1 No.				
	Input method	Single end input				
	A/D conversion method	Successive approximation method				
	Sampling rate	Selectable from 200 times/sec., 20 times/sec., 10 times/sec. or 5 times/sec.				
Zero-adjust input (0-ADJ.) Auto-reference input (A-REF.)	Input condition: Non-voltage contact or NPN open-collector transistor input Signal condition: Negative logic, Input time duration 10 ms or more Signal level: ON ... 1.5 V or less (output current: 10 mA or less) OFF ... Supply voltage or open Guaranteed No. of zero-adjust input usage: 10 million times or less (for zero-adjust back-up setting)					
Start / hold input	High level (supply voltage, or open): Start, Low level (1.5 V or less): Hold					
Comparative outputs (OUT 1, OUT 2)	NPN open-collector transistor <ul style="list-style-type: none"> <li>• Maximum sink current: 100 mA</li> <li>• Applied voltage: 35 V DC or less (between comparative output and GND)</li> <li>• Residual voltage: 1.3 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current)</li> </ul>					
	Response time	5 ms or less (when start / hold input is used at a sampling rate of 200 times/sec.)				
	Hysteresis	Variable from 1 to 3,999 digits				
Display	4 digit 7-segment red LED display (letter height: 8 mm <b>0.315 in</b> )					
Display	Display refresh rate	Selectable from 20 times/sec., 10 times/sec., 5 times/sec., 2.5 times/sec., 1 time/sec. or 0.5 time/sec.				
	Display range	Selectable span of 4,000 Nos. between -9999 to +9999 is displayed. ("+" is not displayed)				
	Display accuracy	$\pm(0.1\% \text{ F.S.} + 1 \text{ digit})$ at $23 \pm 5\text{ }^\circ\text{C}$ <b><math>73.4 \pm 41\text{ }^\circ\text{F}</math></b> , 35 to 85 % RH				
	Temperature characteristics	$\pm 0.5\% \text{ F.S.}$ over 0 to $+50\text{ }^\circ\text{C}$ <b><math>+32</math> to <math>+122\text{ }^\circ\text{F}</math></b>				
Setting resolution	1 digit					
Threshold value setting range	-9999 to +9999					
Indicators	Polarity indication	Red LED (lights up when the displayed value or the threshold value is negative)				
	OUT 1 operation	Orange LED (Measurement mode: Lights up when OUT 1 is ON. Blinks when display is changed to OUT 1 threshold value display. Setting mode: Blinks when OUT 1 threshold value and comparison conditions are set or when zero scale of scale setting function is set.)				
	OUT 2 operation	Orange LED (Measurement mode: Lights up when OUT 2 is ON. Blinks when display is changed to OUT 2 threshold value display. Setting mode: Blinks when OUT 2 threshold value and comparison conditions are set or when full scale of scale setting function is set.)				
	Auto-reference operation	Green LED (lights up when auto-reference function is used)				
Functions	Auto-reference function, zero-adjust function, scale setting function, threshold value setting function, hysteresis setting function, comparative output timer function, start / hold function, memory clear function, power supply ON-delay function etc.					
Environmental resistance	Ambient temperature	0 to $+55\text{ }^\circ\text{C}$ <b><math>+32</math> to <math>+131\text{ }^\circ\text{F}</math></b> (No dew condensation), Storage: $-20$ to $+70\text{ }^\circ\text{C}$ <b><math>-4</math> to <math>+158\text{ }^\circ\text{F}</math></b>				
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH				
	Voltage withstandability	1,500 V AC for one min. between all supply terminals connected together and enclosure				
	Insulation resistance	100 M $\Omega$ , or more, with 500 V DC megger between all supply terminals connected together and enclosure				
	Vibration resistance	10 to 55 Hz frequency, 1.5 mm <b>0.059 in</b> amplitude in X, Y and Z directions for two hours each				
Shock resistance	294 m/s <sup>2</sup> (30 G) acceleration in X, Y and Z directions for three times each					
Back-up memory	Non-volatile memory (EEPROM), Guaranteed write operations: 1,000,000 or less					
Material	Enclosure: Polycarbonate					
Connecting method	Terminal block connection					
Weight	Net weight: 55 g approx.					

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of  $+20\text{ }^\circ\text{C}$   **$+68\text{ }^\circ\text{F}$** .

2) If this product is to be used as a CE (European standard EMC Directive) approved product, make sure to connect ferrite clamps, with one loop, on all the connection cables, as shown in the right figure. Also, make sure not to exceed 10 m **32.808 ft** in cable length.

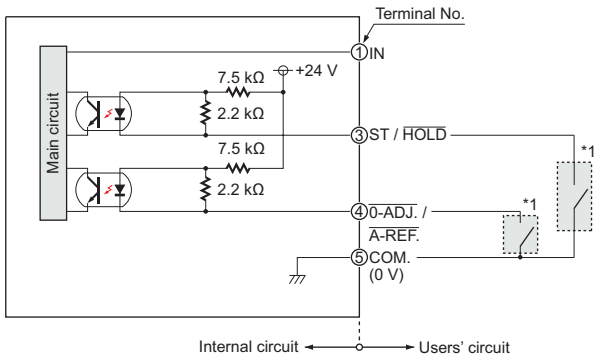


**<Recommended ferrite clamp>**  
 Noise filter for single line  
 ZCAT3035-1330  
 [Manufactured by TDK Corporation]

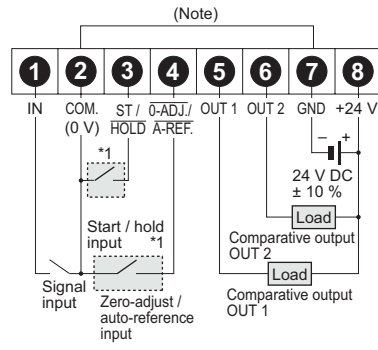
**I/O CIRCUIT AND WIRING DIAGRAMS**

**Input circuit diagram**

**IN, ST / HOLD, 0-ADJ. / A-REF. / COM.**



**Terminal arrangement**



Note: COM. (0 V) is internally connected to GND.

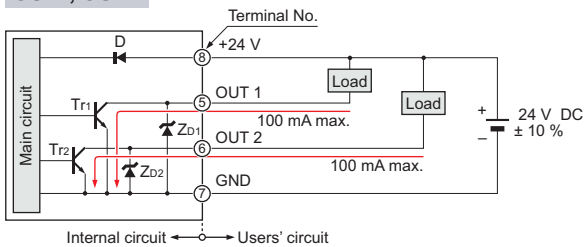
\* 1

Non-voltage contact or NPN open-collector transistor

ON: 1.5 V or less (output current 10 mA or less)  
OFF: Supply voltage, or open

**Output circuit diagram**

**OUT1, OUT2**



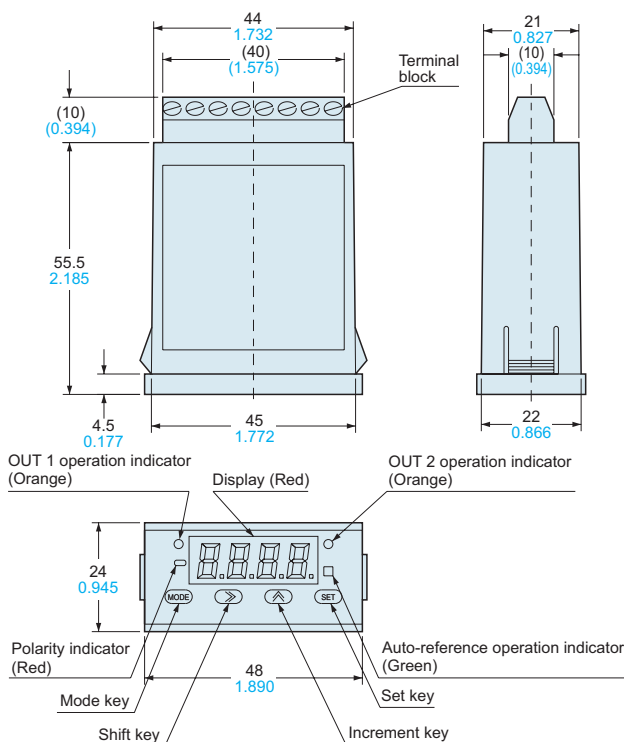
Symbols ... D: Reverse supply polarity protection diode  
ZD1, ZD2: Surge absorption zener diode  
Tr1, Tr2: NPN output transistor

**DIMENSIONS (Unit: mm in)**

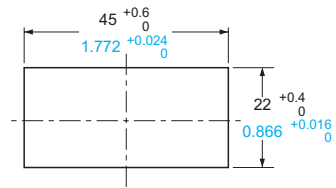
The CAD data in the dimensions can be downloaded from our website.

**CA2-□**

**Digital panel controller**



**Panel cut-out dimensions**



Note: The panel thickness should be 0.5 to 4 mm 0.020 to 0.157 in.

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