# **CZ-200P**

**Resin Pressure Sensor** 







## Push Rod Pressure Sensor with Built-in Temperature Sensor





RoHS Compliant



RoHS Compliant





Temperature Indicator





The CZ-200P pressure sensor is a push rod lead-type sensor and thus there is no concern of resin contamination, even if a diaphragm rupture occurs.



A SPRON diaphragm with a maximum operating temperature of 550°C and excellent corrosion resistance on the level of Hastelloy C has been added to our lineup. Suitable for pressure measurement of high-function resins (high-temperature melted resins) such as polymer resins.

\* 450°C when using a J-type thermocouple temperature sensor.



A built-in thermocouple temperature sensor type is available as an option. Temperature and resin pressure can be measured using a single mounting hole. The temperature measurement contact is located 2 mm from the diaphragm surface, enabling measurement of a temperature closer to the actual resin temperature. (Thermocouple K/J, Class:2)



The three-layer structure of the lead unit and an optional lead-pipe cover reduce indication fluctuations due to external heat and tightening. In addition, when combined with an indicator with built-in linearization and a converter, high-accuracy pressure measurement to a maximum accuracy of 0.5% FS is possible. (Linearization is an option.)

Standard 1.0% FS becomes 0.5% FS. Standard 2.0% FS becomes 1.0% FS. When placing your order, specify the special indicator with linearization support together with the converter. (Except HASTELLOY C or More than 70MPa.)

Resin Pressure Controller

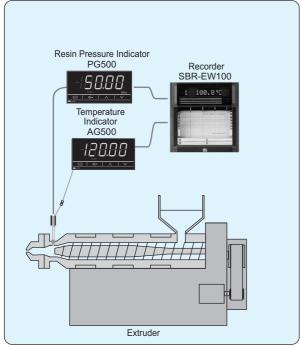
Monitoring and control of resin pressure is performed using a pressure sensor (CZ-200P), pressure sensor indicator (PG500), pressure sensor converter (PCT-300), digital indicator (AG500/REX-AD410), and resin pressure controller (HA930/430). (The application below shows an example of this combination.)

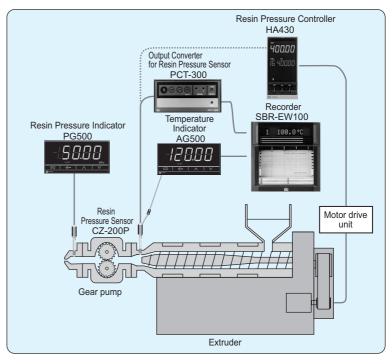




Resin Pressure Controller

#### Applications





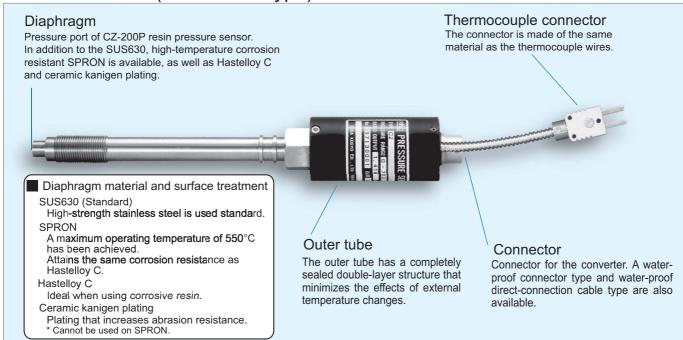
- · SPRON is a registered trademark of SII Micro Parts Ltd.
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A SPRON diaphragm type with a maximum operating temperature of 550°C has been newly added to our lineup.

### Name of Parts (CZ-200P-H type)



#### Specifications

#### Standard Specifications

|                | Construction                | 4 sides adhered strain gauge type wheatstone bridge   |  |  |  |  |  |
|----------------|-----------------------------|---|--|--|--|--|--|
|                | Rated Pressure              | See Pressure range code   |  |  |  |  |  |
|                | Rated Output *1             | 1.0 to 1.8mV/V [ At 150°C of diaphragm temperature] • SPRON type (Code : PN) : At 250°C   |  |  |  |  |  |
|                | Bridge Impressed<br>Voltage | 10V DC (at PCT-300, CT-300)<br>7.7V DC (at PG500,REX-PG410)   |  |  |  |  |  |
|                | Accuracy                    | SUS630 type ( At At 150°C of diaphragm temperature) Within ±1% of full scale Within ±2% of full scale (Over 70 MPa ) SPRON type Less than 70MPa: Within ±1% of full scale More than 480°C of 10,20,70MPa: Within ±2% of full scale More than 100MPa: Within ±2% of full scale More than 480°C of 100MPa: Within ±4% of full scale More than 480°C of 100MPa: Within ±4% of full scale Contact to RKC  |  |  |  |  |  |
| Specifications | Linearity                   | SUS630 type ( At At 150°C of diaphragm temperature) Within ±1% of full scale Within ±2% of full scale (Over 70 MPa ) SPRON type Less than 70MPa: Within ±1% of full scale More than 480°C of 10,20,70MPa: Within ±2% of full scale More than 100MPa: Within ±2% of full scale More than 480°C of 100MPa: Within ±4% of full scale More than 480°C of 100MPa: Within ±4% of full scale Contact to RKC  |  |  |  |  |  |
| Spe            | Hysteresis                  | SUS630 type Within ±0.5% of full scale Within ±1.5% of full scale (Over 50 MPa ) Within ±2% of full scale (Over 70 MPa ) Within ±2% of full scale (Over 70 MPa ) Within ±0.2% of full scale (1MPa type) SPRON type Less than 70MPa : Within ±1% of full scale More than 480°C of 10,20,70MPa : Within ±2% of full scale More than 100MPa : Within ±2% of full scale More than 480°C of 100MPa :Within ±4% of full scale HASTELLOY C type Contact to RKC |  |  |  |  |  |
|                | Reproducibility             | Within ±0.2% of span • More than 480°C of 10,20MPa :Within ±2% of full scale  |  |  |  |  |  |
|                | Zero Balance                | ±0.6mV/V (Within ±40% of span   |  |  |  |  |  |
|                | Bridge Resistance           | $350\Omega \pm 5\Omega$ (Input resistance), $350\Omega \pm 5\Omega$ (Output resistance) *2  |  |  |  |  |  |

|                             | Maximum Temperature of the Diaphragm                                       | 400 C (SPRON type: 550 C)  |  |  |  |
|-----------------------------|--|--|--|--|--|
| eristics                    | Maximum Temperature of the Strain Gauge                                    | 200°C *3   |  |  |  |
| Temperature characteristics | Zero Point Temperature Effect • To the temperature of the diaphragm        | SUS630 type: ±0.2%/10°C<br>±0.3%/10°C (10MPa, 150MPa)<br>SPRON type: 0.1±0.2%/10°C<br>HASTELLOY C type: Contact to RKC |  |  |  |
| mpera                       | Output Temperature<br>Effect   | Output temperature effect is an equal value as zero point. • SPRON type : 0.15±0.2%/10°C                               |  |  |  |
| <u>P</u>                    | Effect of Wind • Without lead pipe cover                                   | Within ±1% of full scale (at wind of 4m/sec)   |  |  |  |
| SS                          | Allowable Overload   | Within 120% of span<br>(Within 500% of 1MPa type, Within 1000% of 0.5MPa type)   |  |  |  |
| cal                         | Marginal Overload  | Within 150% of span (Within 1000% of 1MPa type, Within 2000% of 0.5MPa type)   |  |  |  |
| ani                         | Lead pipe cover material   | SUS630   |  |  |  |
| Mech                        | Marginal Overload  Lead pipe cover material  Recommended tightening torque | Fixed nut type: 30 N·m (300 kgf·cm),<br>Loose nut type: 60 N·m (600 kg·cm)   |  |  |  |
|                             | Output effect of tightening torque   | Within ±0.2% of full scale (at recommended tightening torque) • M14, PF1/4, 1/2-UNF screw type : ±1%                   |  |  |  |

| ugnuening torque | • M14, PF1/4, 1/2-UNF screw type: ±1% |
\*1 The output of each sensor becomes a specific value within the range of 1.0 to 1.8 mV/v.
\*2 As the input side of bridge resistance, the 374Ω±10Ω type is also available. This type is interchangeable with the 350Ω±5Ω type.
\*3 When the temperature at the bottom of outer tube (nut side) is more than 180°C, the temperature at the strain gauge exceed 200°C. If the temperature at the strain gauge exceed 200°C, the performance cannot be assured. Therefore, cover the heat source with a heat insulating material so that the above temperature does not exceed 200°C.

The temperature at the strain gauge can be expected not to rise when:
• the long type of sensor is used or
• the sensor is installed a slant or transversely. If any of the above measures can be taken, take it.

#### Optional Specifications

|                     | Sensor type                    | Thermocouple : K or J ( Ungrounded junction, Class 2 )    |
|---------------------|--------------------------------|---|
| nt section          | Temperature detection position | Internally 2mm from a diaphragm                           |
| rature<br>rrement s | Maximum Temperature            | 550°C (Thermocouple K), 450°C(Thermocouple J)             |
| pera                | Response time                  | Approx. 90 sec (room temperature to 100°C, 98 % response) |
| Tem<br>me           | Response time  Cable length    | Appropx. 100mm (Standard)                                 |

#### Pressure Range

| Nut type          | Range  |
|-------------------|--|
| Fixed Nut type *1 | 0 to 10MPa, 0 to 20MPa, 0 to 35MPa, 0 to 50MPa, 0 to 70MPa, 0 to 100MPa, 0 to 150MPa                               |
| Loose Nut type *2 | 0 to 1MPa, 0 to 2MPa 0 to 3MPa, 0 to 5MPa, 0 to 10MPa, 0 to 20MPa, 0 to 35MPa, 0 to 50MPa, 0 to 70MPa, 0 to 100MPa |

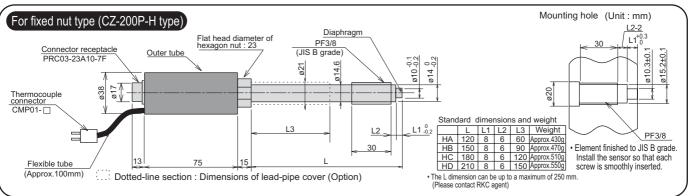
kgf/cm2 type is available. Contact RKC agent.
 For pressure range of 0 - 150MPa, only the SUS630 diaphragm is available.
 For pressure range of 0 - 0.5MPa with loose nut and the range of 0 - 5Mpa with fixed nut, contact RKC agent. (Rated output : 0.5 to 0.9mV/V, Special amplifier type) Minimum range of HASTELLOY C and SPRON diaphragm are 10MPa.

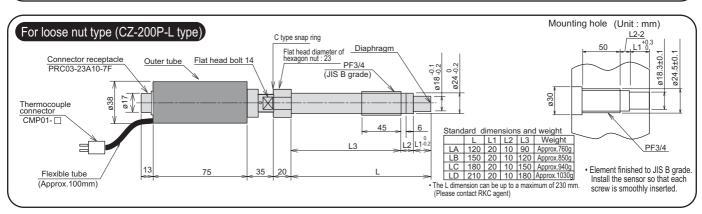


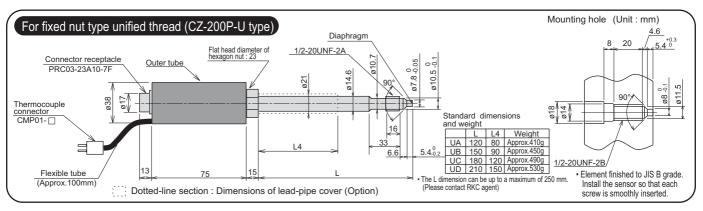




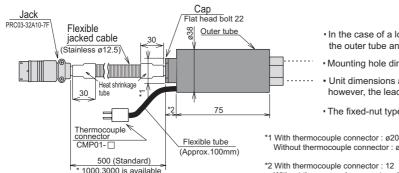
## External Dimensions and Mounting Hole







• When the diaphragm material is SPRON, the cable type is direct connection.



- In the case of a loose nut type or fixed nut type unified screws, the outer tube and cable are as shown at left.
- · Mounting hole dimensions are the same as on the standard product.
- Unit dimensions are the same as the dimensions of the standard product: however, the lead unit (L) dimension 120 mm (HA, LA, UA) is not possible.
- The fixed-nut type is only available with a lead-pipe cover.
- Without thermocouple connector : ø26
  - \*2 With thermocouple connector: 12 Without thermocouple connector: 15

Reference: Screw dimension tolerances

| Class Screw type  | PF1/4,PF3/8 | PF1/2,PF3/4 | M14 x 1.5, M16 x 1.5 | 1/2-20UNF   |
|---|-------------|-------------|----------------------|-------------|
| JIS B grade (Class 2, 2B) Inner diameter tolerances of female screw     | 0 to +0.445 | 0 to +0.541 | 0 to +0.300          | 0 to +0.278 |
| JIS B grade (Class 2, 2B) Effective diameter tolerances of female screw | 0 to +0.250 | 0 to +0.284 | 0 to +0.150          | 0 to +0.141 |



#### Resin Pressure Indicator







#### Specifications

#### Input

Gain setting

Input type

: Strain gauge type pressure sensor
a) Pressure sensor gain setting range: 0.500 to 1.999mV/V
-6.0mV to 15.9mV (Including zero point adjustment range)
b) Pressure sensor gain setting range: 1.000 to 1.999mV/V
-9.8mV to 25.9mV (Including zero point adjustment range)
c) Pressure sensor gain setting range: 2.000 to 2.999mV/V
-12.3mV to 32.6mV (Including zero point adjustment range)
d) Pressure sensor gain setting range: 3.000 to 4.000mV/V
-16.1mV to 42.5mV (Including zero point adjustment range)
a) Gain setting decimal point position:
Three decimal place, Four decimal place
b) Setting range: 0.500 to 4.000mV/V (Three decimal place)
0.5000 to 1.999mV/V Four decimal place)
40.0 to 100.0% (Functions when a resistance for sensitivity adjustment built-in pressure sensor is used)
Up-scale/Down-scale (Selectable)

Shunt resistance output value:

Input impedance Input break action Up-scale/Down-scale (Selectable) 7.7V DC±3% (Within 30mA DC) Sensor power supply Sampling time Input adjustment

: 7.7V DC±3% (Within 30mA DC)
: 0.1 sec
: a) Zero point adjustment
1.Manual setting : -Input span to +Input span
2.Auto-zero function : -5.0 to +5.0mV (Input conversion)
b) Ratio setting
1. Manual setting (Gain adjustment setting) : 0.500 to 1.500
2. Automatic calibration function
Auto calibration is used to automatically set the PV ratio so that the measured value (PV) will be the pressure of the shunt resistance output value.

(Functions when a resistance for sensitivity adjustment built-in pressure sensor is used)
c) Linearize:

 c) Linearize : Use to correct the non-linear nature of pressure sensor CZ-100P/CZ-200P. Select the linearizing type symbol engraved on the rated nameplate attached to the CZ-100P or CZ-200P housing.

d) Digital filter: 0.0 to 100.0 sec (OFF when 0 is set.)

#### Performance

Input accuracy Influence of ambient temperature

±0.1% of Input span

: ±0.006% of Input span/°C
b) Sensor power supply : ±0.013% of Output span/°C

#### Display

Function

: 5-digits (The most significant digit : -1 or 1) Display digit

#### Hold function

Peak hold Highest measured value is held Bottom hold

Lowest measured value is held
- The held values can be reset manually, by external contact signal
or by communication after the confirmation by the operator.
- Data is not backed up when the instrument power supply is off.

#### Digital input (Contact input)

3 points (DI1 and DI2) Number of inputs Input method

Non-voltage contact input (OPEN :  $500 k\Omega$  or more, CLOSE :  $10\Omega$  or less) DI1 : Auto-zero DI2: Hold reset, DI3 : Alarm interlock reset

#### Alarm (Optional)

Number of alarms

. Up to 4 points
. Process High, Process low (Available for hold function)
. Relay output, Form A contact, 250V AC 0.5A (resistive load) Alarm type

Alarm output Other functions

a) Energized/de-energized action is configurable.
b) Delay timer: 0.0 to 600.0 sec)
c) Interlock (latch) function is configurable.

Communication (Optional)

Communication method : RS-485 (2-wire), RS-422A (4-wire)
a) ANSI X3.28 sub-category 2.5A4 (RKC standard)
b) MODBUS-RTU
• Selectable

: 31 units Maximum connection

#### Analog Retransmission Output (Optional)

Output signal : 0 to 1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC

10 to V DC, V to SV DC, T to SV DC, Load resistance : More than  $1 k\Omega$  Output impedance : Less than  $0.1\Omega$  : 0 to 10 mV DC, 0 to 100 mV DC Load resistance : More than  $20 k\Omega$ ) Output impedance : Less than  $10 \Omega$  :4 to 20 mA DC, 0 to 20 mA DC

Load resistance : Less than 600Ω Output impedance : More than  $1M\Omega$  Measured value (PV)

Output type Output accuracy ±0.1% of span Output resolution : More than 12 bits

#### **General Specifications**

: NEMA4X, IP66 Waterproof/Dustproof

Supply voltage

Neuman, 1800

Waterproof/Dustproof protection only effective from the front in panel mounted installation.

a) 90 to 264V AC (50/60Hz, Selectable)
Rating: 100 to 240V AC

b) 21.6 to 26.4V AC ±10% (50/60Hz, Selectable)

b) 21.6 to 26.4V AC ±10% (50/60Hz, Selectable)
Rating : 24V AC
c) 21.6 to 26.4V DC
Rating : 24V DC
a) 100 to 240V AC : Less than 10VA (at 240VAC)
b) 24V AC : Less than 7.0VA Power consumption

Rush current Memory backup

b) 24V AC: Less than 7.0VA
c) 24V DC: Less than 210mA
: Less than 12A
: Backed up by non-volatile memory (FRAM)
• Data retaining period : Approx. 10 years
• Number of writing : Approx. 10,000,000,000 times.
(Depending on storage and operating conditions.)
: More than 20MΩ (500V DC) between measured terminals and ground More than 20MΩ (500V DC) between power terminals and ground 1500V AC for one minute between measured terminals and ground 1500V AC for one minute between power terminals and ground Insulation resistance Dielectric voltage

1500V AC for one minute between power terminals and ground

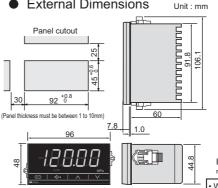
Weight Ambient temperature Ambient humidity Approx. 200g -10 to +50°C (14 to 122°F) 5 to 95% RH (Non condensing)

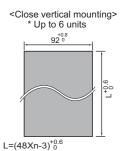
Ambient atmosphere

Free from corrosive and flammable gas and dust.
Free from external noise, vibration, shock, and exposure

to direct sunlight.

#### **External Dimensions**





n : Number of controllers (2=<n=<6)

Waterproof/dustproof is not available for close horizontal mounting

#### Model and Suffix Code

| No.  | Specifications  | Model and Suffix Code  | <u>На</u>        | ardw<br>② | are<br>3 | 4<br>(4) | ling<br>⑤   | _      | / Qu<br>⑦ | <br>art cod<br>9 10 |
|------|-----------------|--|------------------|-----------|----------|----------|-------------|--------|-----------|---------------------|
|      |                 | PG500  |                  | <u></u> * | k 🔲      |          |             |        | -         |                     |
| 1    | Input type      | Standard type Intrinsic safety type Standard type (Loose Nut: 0.0 to 0.5MPa,Fixed Nut: 0 to 5MPa) Intrinsic safety type (Loose Nut: 0.0 to 0.5MPa,Fixed Nut: 0 to 5MPa) For 3.33mV/V output type | A<br>B<br>C<br>D |           |          |          |             |        |           |                     |
| 2    | Power supply    | 100 to 240V AC<br>24V AC/DC  |                  | 4         |          |          |             |        |           |                     |
| 3    | Alarm           | Not supplied<br>Number of alarm output (Specify 1 to 4)  |                  |           | N        |          |             |        |           |                     |
| 4    | Analog output   | Not supplied<br>See Analog Output Signal Code Table, Code: 1 to 8)   |                  |           |          | N        |             |        |           |                     |
| 5    | Communication   | Not supplied<br>RS-422A<br>RS-485  |                  |           |          |          | N<br>4<br>5 |        |           |                     |
| 6    | Initial setting | No quick start code (Default setting) Specify quick start code   |                  |           |          |          |             | N<br>1 |           |                     |
| 7    | Alarm 1         | See Alarm Code Table   |                  |           |          |          |             |        |           |                     |
| 8    | Alarm 2         | See Alarm Code Table   |                  |           |          |          |             |        |           |                     |
| 9    | Alarm 3         | See Alarm Code Table   |                  |           |          |          |             |        |           | □;_                 |
| (10) | Alarm 4         | See Alarm Code Table   |                  |           |          |          |             |        |           |                     |

#### Analog Output Signal Code Table

| ٦ |   | laiog Output | Oig |
|---|---|--------------|-----|
|   | 1 | 0 - 10mV DC  |     |
|   | 2 | 0 - 100mV DC |     |
|   | 3 | 0 - 1V DC    | _   |
|   | 4 | 0 - 5V DC    |     |
|   | 5 | 0 - 10V DC   |     |
| ı | 6 | 1 - 5V DC    |     |

7 0 - 20mA DC

4 - 20mA DC

#### Alarm Code Table

| <u> </u> | idilii oodo labic            |
|----------|------------------------------|
| Н        | Process High                 |
| J        | Process Low                  |
| K        | Process High with Alarm Hold |
| L        | Process Low with Alarm Hold  |

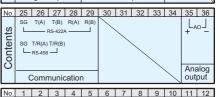
#### Rear Terminals



Terminal cover (Sold separately) Model Code: KFB400-58

Use a solderless terminal for screw size M3X6.

| No.      | 13                                   | 14   | 15   | 16   | 17   | 18       | 19                                  | 20 | 21 | 22 | 23 | 24  |
|----------|--------------------------------------|------|------|------|------|----------|-------------------------------------|----|----|----|----|-----|
| Contents | COM -DI1-J DI2-DI3-DI3-Digital input |      |      |      | SHD  | (Red)    | EXC-<br>(Brown)<br>CZ-200<br>CZ-100 |    |    |    |    |     |
|          |                                      |      |      |      |      | Sens     | or in                               |    |    |    |    |     |
| No.      | 25                                   | 26   | 27   | 28   | 29   | 30       | 31                                  | 32 | 33 | 34 | 35 | 36  |
|          | 00                                   | TIAN | T(D) | D(A) | D(D) | <b> </b> |                                     |    |    |    | 1  | - 1 |



| No.      | 1       | 2                       | 3      | 4          | 5      | 6              | 7          | 8  | 9               | 10          | 11 | 12 |
|----------|---------|-------------------------|--------|------------|--------|----------------|------------|----|-----------------|-------------|----|----|
| Contents | 24'<br> | A40V AC<br>V AC<br>V DC | l I '' | ALM2<br>NO | elay o | COM<br>AL<br>N | ALM4<br>NO | ut | CAL+            | CAL-        |    | /  |
|          | Pow     | er<br>ply               |        | Α          | larm   | outp           | ut         |    | Calibi<br>outpu | ration<br>t |    |    |



# for Resin Pressure Sensor





#### Specifications

Input

Input type Input range RKC's resin pressure sensor CZ-200P (CZ-100P) a)Standard type: 0 to 19.99mV b)Safe explosion proof type: 0 to 11.6mV

• Excepting zero point adjustment range More than 1M $\Omega$ 

Input impedance Input break action

Up scale(The sensor power supply break is the same)

Sensor Power Supply

Applied voltage

a) Standard type : 10V DC b) Safe explosion proof type : 8.2V DC

+0.1 to -0.4% : Less than 30ppm/°C Temperature drift

Zero point

Adjustment range : a) Standard type : ±7mV (Input conversion)

b) Safe explosion proof type : ±6mV (Input conversion)

Temperature drift ±0.02%/°C of span

<u>Gain</u>

a) Standard type: 10.00 to 19.99mV can be used as rating Setting range

(10V etc.)

b) Safe explosion proof type: 5.08 to 11.60mV can be used

as rating (10V etc.)

Setting accuracy ±0.2%/°C of span Less than ±100ppm/°C Temperature drift Optional function

Gain selector switch (Selection 1x/2x)

#### Output

Output signal : 0 to 10V DC (Load resistance : More than 2kΩ)

0 to 10mV DC (Load resistance : More than  $10k\Omega$ ) 1 to 5V DC (Load resistance : More than  $1k\Omega$ ) 4 to 20mA DC (Load resistance : Less than  $600\Omega$ )

Monitor voltage : 0 to 10V DC (Pin size of tester confirming: 2.0)

#### General Specifications

Linearity

: ±0.01% of span : 0.1%p-p of span (0.1 to 10Hz) Response

: 10Hz/100Hz selectable (Factory shipment : 10Hz) : a) 90 to 264V AC (Including supply voltage variation) Power supply

[Rating: 100 to 240V AC] (50/60Hz common use) b) 21.6 to 26.4V AC (Including supply voltage variation)

[Rating : 24V AC] (50/60Hz common use) c) 21.6 to 26.4V DC (Ripple rate 10% p-p or less)

[Rating: 24V DC]

Power consumption : a) 100 to 240V AC : Less than 7.5VA (at 100V) Less than 12.5VA (at 240V)

b) 24V AC : Less than 8VA c) 24V DC : Less than 190mA

Insulation resistance : More than  $100M\Omega$  (500V DC) between input/output terminals and power terminals More than  $100M\Omega$  (500V DC) between input/output terminals and ground

More than 100MΩ (500V DC) between power terminals and ground : 2300V AC for one minute between input/output terminals and power terminals Dielectric voltage

2300V AC for one minute between input/output terminals and ground 2300V AC for one minute between power terminals and ground

: Approx 290g Weight

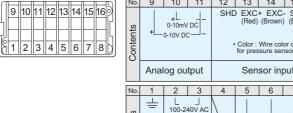
#### Operating Environments

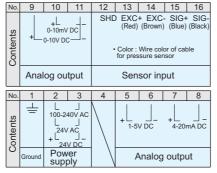
Ambient temperature: 0 to +50°C (32 to 122°F) Ambient humidity : 45 to 85% RH (Non condensing)

Free from corrosive and flammable gas and dust.
Free from external noise, vibration, shock, and exposure

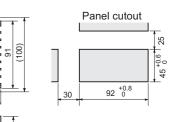
to direct sunlight.

#### Rear Terminals





#### External Dimensions



Unit:mm



#### Model Code

| Specifications   | Model and Suffix Code  |             |             |
|------------------|--|-------------|-------------|
| Specifications   | PCT-300  | - 🗆         |             |
| Туре             | Standard type N Intrinsically safe explosion proof construction pass type E  |             |             |
| Number of output | 2 outputs (0 to 10V DC, 0 to 100mV DC) 3 outputs (0 to 10V DC, 0 to 100mV DC, 1 to 5V DC) 4 outputs (0 to 10V DC, 0 to 100mV DC, 1 to 5V DC, 4 to 20mA DC) | 2<br>3<br>4 |             |
| Option           | Not supplied Gain change switch ( x1 or x2) Linearization function   |             | N<br>G<br>L |

Power supply voltage 100 to 240V DC 24V AC 24V DC



Output converter of panel-incorporated strain gauge pressure sensor. Like the PCT-300, up to four measurement

output points are possible, and gain settings and zero adjustment are easily performed using the front switches.

· The linearization function (overall accuracy of 0.5% FS) is not supported



High-resolution inputs with a sampling cycle of 0.025 seconds and PID constants that can be set in increments of 0.01 seconds enable this controller to control process quantities that change rapidly. A strain gauge type pressure sensor can be directly connected



#### Intrinsically Safe Explosionproof Construction Resin Pressure Meter (For Indoor, outdoor)

The qualification No. of the intrinsically safe explosion proof construction resin pressure meter obtained from the ministry of Labor, Japan, is T55821 (For indoor use) T56658 (For outdoor use). The explosion class and ignition group of the objective gases and steam are i2G3. The qualified consists of the pressure sensor CZ-200P and safety barrier (RZB-001), but the output converter is not subject to qualification testing as a general sending/receiving instrument.

For indoor use, the standard connector or the waterproof connector can be selected. For outdoor use, the waterproof connector must be used.

#### Sensor Specifications

Standard Specifications

|                | andard Specifica            |   |
|----------------|-----------------------------|---|
|                | Construction                | 4 sides adhered strain gauge type wheatstone bridge   |
|                | Rated Pressure              | See Pressure range code   |
|                | Rated Output *1             | 1.0 to 1.8mV/V [ At 150°C of diaphragm temperature] • SPRON type (Code: PN): At 250°C   |
|                | Bridge Impressed<br>Voltage | 10V DC (at PCT-300, CT-300)<br>7.7V DC (at PG500,REX-PG410)   |
| 0              | Accuracy                    | SUS630 type ( At At 150°C of diaphragm temperature) Within ±1% of full scale Within ±2% of full scale (Over 70 MPa ) SPRON type Less than 70MPa: Within ±1% of full scale More than 480°C of 10,20,70MPa: Within ±2% of full scale More than 100MPa: Within ±2% of full scale More than 480°C of 100MPa: Within ±4% of full scale HASTELLOY C type: Contact to RKC  |
| Specifications | Linearity                   | SUS630 type ( At At 150°C of diaphragm temperature) Within ±1% of full scale Within ±2% of full scale (Over 70 MPa ) SPRON type Less than 70MPa: Within ±1% of full scale More than 480°C of 10,207,70MPa: Within ±2% of full scale More than 100MPa: Within ±2% of full scale More than 480°C of 100MPa: Within ±4% of full scale HASTELLOY C type: Contact to RKC   |
|                | Hysteresis                  | SUS630 type Within ±0.5% of full scale Within ±1.5% of full scale (Over 50 MPa) Within ±2% of full scale (Over 70 MPa) Within ±0.2% of full scale (1MPa type) SPRON type Less than 70MPa: Within ±1% of full scale More than 480°C of 10,20,70MPa: Within ±2% of full scale More than 100MPa: Within ±2% of full scale More than 480°C of 100MPa: Within ±4% of full scale HASTELLOY C type: Contact to RKC |
|                | Reproducibility             | Within ±0.2% of span • More than 480°C of 10,20MPa :Within ±2% of full scale  |
|                | Zero Balance                | ±0.6mV/V (Within ±40% of spanh  |
|                | Bridge Resistance           | $350\Omega\pm5\Omega$ (Input resistance), *2 $350\Omega\pm5\Omega$ (Output resistance)  |

| Temperature characteristics   | Maximum Temperature of the Diaphragm                                | 400°C (SPRON type: 550°C)  |
|-------------------------------|---|--|
|                               | Maximum Temperature of the Strain Gauge                             | 200°C *3   |
|                               | Zero Point Temperature Effect • To the temperature of the diaphragm | SUS630 type: ±0.2%/10°C<br>±0.3%/10°C (10MPa, 150MPa)<br>SPRON type: 0.1±0.2%/10°C<br>HASTELLOY C type: Contact to RKC |
|                               | Output Temperature<br>Effect  | Output temperature effect is an equal value as zero point. • SPRON type : 0.15±0.2%/10°C                               |
|                               | Effect of Wind • Without lead pipe cover                            | Within ±1% of full scale (at wind of 4m/sec)   |
| Mechanical<br>characteristics | Allowable Overload  | Within 120% of span<br>(Within 500% of 1MPa type, Within 1000% of 0.5MPa type)   |
|                               | Marginal Overload  Lead pipe cover material  Recommended            | Within 150% of span<br>(Within 1000% of 1MPa type, Within 2000% of 0.5MPa type)  |
|                               | Lead pipe cover material  | SUS630   |
|                               | Recommended tightening torque                                       | Fixed nut type: 30 N•m (300 kgf•cm),<br>Loose nut type: 60 N•m (600 kg•cm)   |
|                               | Output effect of tightening torque                                  | Within ±0.2% of full scale (at recommended tightening torque) • M14, PF1/4, 1/2-UNF screw type: ±1%                    |

| • M14, PF1/4, 1/2-UNF screw type: ±1% 
\*1 The output of each sensor becomes a specific value within the range of 1.0 to 1.8 mV/V. 
\*2 As the input side of bridge resistance, the 374Ω±10Ω type is also available. 
This type is interchangeable with the 350Ω±5Ω type. 
\*3 When the temperature at the bottom of outer tube (nut side) is more than 180°C, the temperature at the strain gauge exceed 200°C. 
If the temperature at the strain gauge exceed 200°C, the performance cannot be assured. Therefore, cover the heat source with a heat insulating material so that the above temperature does not exceed 200°C. 
The temperature at the strain gauge can be expected not to rise when:
• the long type of sensor is used or
• the sensor is installed a slant or transversely. 
If any of the above measures can be taken, take it.

Internally 2mm from a diaphragm

Appropx. 100mm (Standard)

112

86.5

Thermocouple: K or J (Ungrounded junction, Class 2)

550°C (Thermocouple K), 450°C(Thermocouple J)

Approx. 90 sec (room temperature to 100°C, 98 % response)

**Optional Specifications** Sensor type

detection position

Maximum Temperature

Temperature

Response time Cable length

External

**Dimensions** 

# Safety Barrier Specifications

Explosionproof construction Use rated

- : Intrinsically safe explosionproof construction (i2G3) : Power supply circuit 9V 50mA, Signal circuit 6V 50mA, Thermocouple circuit 6V 50mA

Rating for maintaining safety Allowable inductance

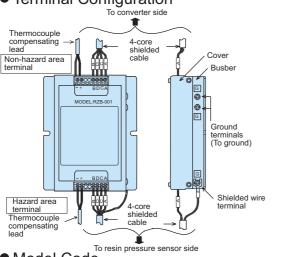
Allowable capacitance

Ambient temperature Ambient humidity Cover

Busbar Ground requirement

Iron (Coating)
Brass (Nickel plating)
Ground this safety barrier so that its grounding
resistance will be less than the grounding reference resistance value of shunt diode type safety barriers (e.g. less than  $1\Omega$ ) conforming to each national standard (Requirements). Approx. 850g

Terminal Configuration



Unit:mm MODEL:RZB-001 99 39.5 137 2-R2.5 103 27 0100000 ∞′ External Hazard area Non-hazard area Wiring Red ) A sensor ,RZB-001A) Brown (CZ-100P,CZ-200P) c¢ С Blue barrier DC D pressure Black В В Safety Red Red (RZB-00 + +White White, Recorder Resin G Ground

## Model Code

| Specification   | Model Code |
|---|------------|
| Intrinsic Safety (For indoor)                                 | RZB-001A1  |
| Intrinsic Safety (Built-in thermocouple circuit, For indoor)  | RZB-001N1  |
| Intrinsic Safety (For outdoor)                                | RZB-001A2  |
| Intrinsic Safety (Built-in thermocouple circuit, For outdoor) | RZB-001N2  |

|                  | Model Code  |                          |
|------------------|---|--------------------------|
| Connection cable | Intrinsically safe circuit side (Hazard area) CZ-200P ← RZB-001 (5m)                      | W-AB-YG-PB-5000          |
| Connection capie | Non-intrinsically safe circuit side (Non hazard area) RZB-001 ← AG500 (1m) or PCT-300(1m) | W-AB-N <b>∑</b> -BA-1000 |

This product has passed the qualification test of intrinsically safe explosion proof when combined with our resin pressure sensor (CZ-100P/CZ-200P) Always combine and use this product with our resin pressure sensor

#### CZ-200P Model and Suffix Code

| Specifications                       | Model and Suffix Code   |  |  |  |  |  |
|--------------------------------------|---|--|--|--|--|--|
| Specifications                       | CZ-200P -   |  |  |  |  |  |
| Screw type                           | Fixed nut type PF3/8 Tip diameter: 10mm Loose nut type PF3/4 Tip diameter: 18mm Fixed nut type 1/2-20UNF Tip diameter: 7.8mm U Fixed nut type PF1/2 Tip diameter: 10mm Fixed nut type PF1/4 Tip diameter: 7.8mm V Fixed nut type M14X1.5 Tip diameter: 10mm W       |  |  |  |  |  |
| Load-pipe<br>length                  | Under nut : L=120mm • Not available for SPRON type Under nut : L=150mm Under nut : L=180mm Under nut : L=210mm Under nut : L=210mm  |  |  |  |  |  |
| Diaphragm<br>material                | SUS630 (Standard) Hastelloy C SPRON  S  P   |  |  |  |  |  |
| Diaphragm                            | Standard Ceramic kanigen plating  • Not available for SPRON type  K   |  |  |  |  |  |
| surface treatment Intrinsically safe | Non-intrinsic safety (Standard) Intrinsic safety (For indoor use) Intrinsic safety (For outdoor use) Intrinsic safety (For outdoor use)   |  |  |  |  |  |
| Pressure range                       | See Pressure Range Code Table   |  |  |  |  |  |
| Linearization *1 function            | Not supplied  For AG500/REX-PG410 (Available for PG410 with S/N 98A ☐ ☐ ☐ ☐ or later)  For PCT-300 ☐ ☐ L (PCT-300 should have linearization function)   |  |  |  |  |  |
| Lead-pipe cover                      | Not supplied • Not available for SPRON and fixed nut type *3 With lead-pipe cover   |  |  |  |  |  |
| Cable connection connector           | Standard connector type  • Not available for SPRON type  Waterproof, connector type, equivalent to IP67 (Not available for built-in sensor type or SPRON type)  waterproof, direct connection type, equivalent to IP67 (Not available for built-in sensor type)  *4 |  |  |  |  |  |
| Temperature sensor                   | Not supplied K type thermocouple (Not available for waterproof connector) J type thermocouple (Not available for waterproof connector) J  |  |  |  |  |  |
| Thermocouple lead length *2          | Standard 100mm (Possible to specify by each 100mm. Maximum 1m.)   |  |  |  |  |  |

- \*1 : Linearization function is not available for pressure range of 0 70MPa or more, hastelloy C diaphragm .
- \*2 : The model code after "\* " is not necessary if there is no option specified after
- \*3 : For a fixed nut type with a SPRON diaphragm, the lead-pipe cover is always included.
- \*4 :The cable length on the SUS630 (standard) with a Hastelloy C diaphragm is 3 m. Please specify whether or not a flexible cover tube is to be included.

#### **Pressure Range Code Table** \* ( ): Range code

| Specifications    | Range  |
|-------------------|--|
| Fixed nut type    | 0 to 10MPa (010P), 0 to 20MPa (020P), 0 to 35MPa (035P), 0 to 50MPa (050P), 0 to 70MPa (070P), 0 to 100MPa (100P), 0 to 150MPa (150P)*1            |
| Loose nut type *2 | 0 to 1MPa (001P), 0 to 2MPa (002P), 0 to 3MPa(003P), 0 to 5MPa (005P), 0 to 10MPa (010P), 0 to 20MPa (020P), 0 to 35MPa (030P), 0 to 50MPa (050P), |
| Loose nut type    | 0 to 70MPa (070P), 0 to 100MPa (100P)  |

#### Cable for Thermocouple

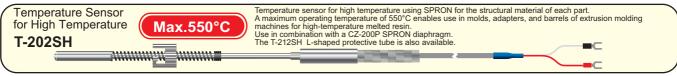
| Specifications                                     |  |        | Model Code        |
|--|--|--------|-------------------|
| Compensation wire (Stainless steel shielded cable) | CZ-200P ← Temperature controller/Indicator (Length : 5m) | Type K | W-BL-KA-DA-005000 |
|  |  | Type J | W-BL-JA-DA-005000 |

#### **Cable for Pressure** $\cdot$ For cables with specifications other than those below, please Please contact RKC agent.

| Specifications |                                     |   |                                   |                  |
|----------------|-------------------------------------|---|-----------------------------------|------------------|
|                | CZ-200P ←→                          | PG500 (Length : 5m) : Y-shaped terminal lugs (M3)   | Heat-resistant glass coated cable | W-AB-NG -PA-5000 |
| Standard Type  | CZ-200P \                           | PCT-300 (Length : 5m) : Y-shaped terminal lugs (M3) | Silicon coated cable              | W-AB-NG -PP-5000 |
| Standard Type  | CZ-200P CT-300 (Length : 5m) : Plug | Heat-resistant glass coated cable                   | W-AB-NS -PA-5000                  |                  |
|                |                                     | Silicon coated cable                                | W-AB-NS -PP-5000                  |                  |

The letter in the ☐ indicates the cable coating type. Select from the three types below.

G: Heat-resistant glass coated cable, V: Vinyl coated cable, S :Silicon coated cable





- Before operating this product, read the instruction manual carefully to avoid incorrect operation.
- This product is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment.
- If it is possible that an accident may occur as a result of the failure of the product or some other abnormality, an appropriate independent protection device must be installed.

Caution for the export trade

All transactions must comply with laws, regulations, and treaties.

Caution for imitated products

As products imitating our product now appear on the market, be careful that you don't purchase these imitated products. We will not warrant such products nor bear the responsibility for any damage and/or accident caused by their use.



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<sup>\*1</sup> For pressure range of 0 - 150MPa, only the SUS630 diaphragm is available.
\*2 For pressure range of 0 - 0.5MPa with loose nut and the range of 0 - 5Mpa with fixed nut, contact RKC agent. (Rated output : 0.5 to 0.9mV/V, Special amplifier type)
Minimum range of HASTELLOY C and SPRON diaphragm are 10MPa.