

# General Specifications

## Model PK200 Current-To-Pneumatic Converter

GS 21B03D01-00E

[Style: S2]

The Model PK200 Current-to-Pneumatic Converter is used mostly to actuate diaphragm operated valves, air cylinder operated valves, power cylinders or other terminal elements. Beside these, it is used as a simple signal converter in hybrid instrumentation comprising electronic and pneumatic instruments.



### FEATURES

- High Accuracy and High Reliability.
- High Air Delivery, Low Air Consumption.
- Minimum Effects from Process Environments.
- Electronic Feedback Control.

### FUNCTIONAL SPECIFICATIONS

#### Input Signal:

4 to 20 mA or 10 to 50 mA.  
(As for split ranging, consult Yokogawa.)

#### Input Resistance:

PK200 is not a constant resistor.  
Equivalent circuit of PK200 is shown in Figure 1.

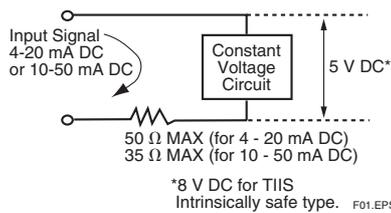


Figure 1. Equivalent Circuit

#### Output Signal:

| Output Signal       | Standard Output                |                              |                         |                              |
|---------------------|--------------------------------|------------------------------|-------------------------|------------------------------|
|                     | Output signal                  | Pressure gauge scale         | Air supply pressure     | Air supply pressure gauge    |
| Pa                  | 20 to 100 kPa                  | 0 to 200 kPa                 | 140 kPa                 | 0 to 200 kPa                 |
| kgf/cm <sup>2</sup> | 0.2 to 1.0 kgf/cm <sup>2</sup> | 0 to 2.0 kgf/cm <sup>2</sup> | 1.4 kgf/cm <sup>2</sup> | 0 to 2.0 kgf/cm <sup>2</sup> |
| bar                 | 0.2 to 1.0 bar                 | 0 to 2.0 bar                 | 1.4 bar                 | 0 to 2.0 bar                 |
| psi                 | 3 to 15 psi                    | 0 to 30 psi                  | 20 psi                  | 0 to 30 psi                  |

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| Output Signal       | Doubled Output                 |                              |                         |                              |
|---------------------|--------------------------------|------------------------------|-------------------------|------------------------------|
|                     | Output signal                  | Pressure gauge scale         | Air supply pressure     | Air supply pressure gauge    |
| Pa                  | 40 to 200 kPa                  | 0 to 400 kPa                 | 240 kPa                 | 0 to 400 kPa                 |
| kgf/cm <sup>2</sup> | 0.4 to 2.0 kgf/cm <sup>2</sup> | 0 to 4.0 kgf/cm <sup>2</sup> | 2.4 kgf/cm <sup>2</sup> | 0 to 4.0 kgf/cm <sup>2</sup> |
| bar                 | 0.4 to 2.0 bar                 | 0 to 4.0 bar                 | 2.4 bar                 | 0 to 4.0 bar                 |
| psi                 | 6 to 30 psi                    | 0 to 60 psi                  | 34 psi                  | 0 to 60 psi                  |

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#### Auto/Manual (A/M) Transfer Switch:

Mounted on front of housing, in manual mode, output signal varied by adjusting the external supply pressure regulator. It can be chosen as option.

#### Zero Adjustment:

Continuously adjustable, externally set.  
Adjustable range; Approximate ±10 % of span.

#### Span Adjustment:

Continuously adjustable.  
Adjustable range; Approximate 100 to 125 % of span.  
(Up to 90% of supply pressure)

#### Air Consumption:

Max. 4 NI/min. or 0.24 Nm<sup>3</sup>/hr at 140 kPa (20 psi) air supply pressure.

#### Output Air Capacity:

Max. 110 NI/min. or 6.6 Nm<sup>3</sup>/hr at 140 kPa (20 psi) air supply pressure.

#### Output Load Capacity:

See Figure 2.

#### Operating Temperature Limits:

–40 to 80 °C (–40 to 176 °F) (General use)  
–20 to 60 °C (–4 to 140 °F)  
(TIIS Flameproof type and TIIS Intrinsically safe type)  
–40 to 60 °C (–40 to 140 °F)  
(FM Explosionproof type and CSA Explosionproof type)

#### Storage Temperature Limits:

–40 to 80 °C (–40 to 176 °F)

#### Humidity limits:

5 to 100 %/RH

#### Required Operating Voltage:

| Input Signal            | Min.            | Max.            |
|-------------------------|-----------------|-----------------|
| 4 to 20mA (except /JS3) | 5.2V (at 4mA)   | 6.0V (at 20mA)  |
| 4 to 20mA (for /JS3)    | 8.2V (at 4mA)   | 9.0V (at 20mA)  |
| 10 to 50mA              | 5.35V (at 10mA) | 6.75V (at 50mA) |

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#### Degrees of Protection:

IP54, NEMA 4X

#### Explosion Protection:

See “Optional Specification”

#### EMC Conformity Standards: CE , N200

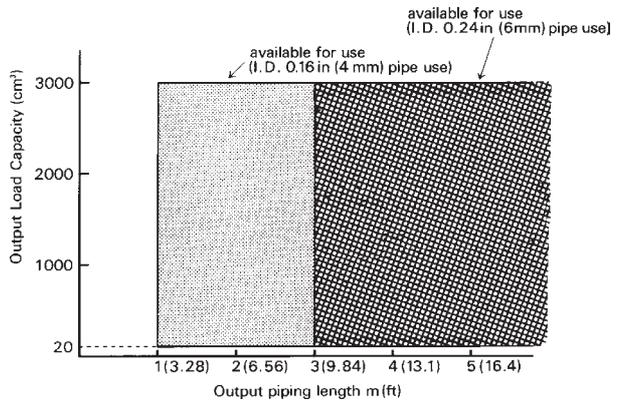
EN61326-1 Class A, Table 2  
(For use in industrial locations)

**■ PERFORMANCE SPECIFICATION**

- Accuracy:1**  
±0.5 % of span
- Linearity:**  
±0.2 % of span
- Hysteresis:**  
0.2 % of span
- Repeatability:**  
0.1 % of span
- Vibration Effect:**  
±0.5% of span (Zero shift)  
(Conditions; 5 - 200 Hz at 2G, Steady state)
- Supply Pressure Effect:**  
±0.1%/10 kPa
- Reverse Polarity Protection:**  
No damage occurs from reversal of normal supply current (4-20 mA) or from misapplication of up to 62 mA.
- Stability:**  
Short term; 0.1 % of F.S./hr  
Long term; 0.2 % of F.S./month
- Position Effect:**  
10 °; ±0.2 % of span    90 °; ±0.4 % of span

**■ PHYSICAL SPECIFICATION**

- Housing and Cover Material:**  
Cast aluminum alloy, finished with polyurethane paint.  
Deep-sea moss-green (Munsell 0.6GY3.1/2.0)
- O-Ring Material:**  
NBR JIS B2401-0977 1 classA
- Pressure Gauge Case:**  
Stainless steel JIS SUS304
- Supply Air, Output Signal:**  
Rc1/4 or 1/4 NPT female
- Electrical Connection:**  
G1/2, G3/4, 1/2 NPT or 3/4 NPT female
- Mounting:**  
Surface or 2-inch pipe.
- Weight:**  
2.8 kg (6.1 lb) (With pressure gauge, without bracket)



**Figure 2. Relationship between Output Load Capacity and Piping Length**

**■ MODEL & SUFFIX CODES**

| Model          | Suffix codes    | Description   |
|----------------|-----------------|---|
| <b>PK200</b>   | .....           | Current-to-Pneumatic Converter  |
| Input signal   | <b>-A</b> ..... | 4 to 20 mA DC   |
|                | <b>-C</b> ..... | 4 to 20/10 to 50 mA DC changeable type  |
| Output signal  | <b>1</b> .....  | Output signal: 20 to 100 kPa      Gauge scale: 0 to 200 kPa                         |
|                | <b>2</b> .....  | Output signal: 40 to 200 kPa      Gauge scale: 0 to 400 kPa                         |
|                | <b>3</b> .....  | Output signal: 0.2 to 1 kgf/cm <sup>2</sup> Gauge scale: 0 to 2 kgf/cm <sup>2</sup> |
|                | <b>4</b> .....  | Output signal: 0.4 to 2 kgf/cm <sup>2</sup> Gauge scale: 0 to 4 kgf/cm <sup>2</sup> |
|                | <b>5</b> .....  | Output signal: 0.2 to 1 bar      Gauge scale: 0 to 2 bar                            |
|                | <b>6</b> .....  | Output signal: 0.4 to 2 bar      Gauge scale: 0 to 4 bar                            |
|                | <b>7</b> .....  | Output signal: 3 to 15 psi      Gauge scale: 0 to 30 psi                            |
|                | <b>8</b> .....  | Output signal: 6 to 30 psi      Gauge scale: 0 to 60 psi                            |
|                | <b>9</b> .....  | Output signal: 3 to 27 psi      Gauge scale: 0 to 60 psi                            |
| Connections    | <b>1</b> .....  | Air connection: Rc1/4      Electric connection: G1/2 female                         |
|                | <b>2</b> .....  | Air connection: Rc1/4      Electric connection: G3/4 female                         |
|                | <b>3</b> .....  | Air connection: 1/4 NPT female      Electric connection: 1/2 NPT female             |
|                | <b>4</b> .....  | Air connection: 1/4 NPT female      Electric connection: 3/4 NPT female             |
| Optional codes |                 | <input type="checkbox"/> Optional specification                                     |

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**OPTIONAL SPECIFICATION**

| Item  | Description  | Code         |
|---|--|--------------|
| AUTO/MANUAL Transfer Switch                       | Mounted on front of housing, in manual mode, output signal varied by adjusting the external supply pressure regulator.   | <b>AM</b>    |
| Double Scale Pressure Gauge                       | Double scales are kPa and kgf/cm <sup>2</sup> . <sup>*6</sup>  | <b>GW</b>    |
| Stainless Steel Screw and Bracket                 | Screw and bracket, both are made of stainless steel.   | <b>SS</b>    |
| Reverse Action                                    | Increasing input signal decreases output pressure.   | <b>RA</b>    |
| Lightning Protector                               | Installed in the terminal box to protect internal circuitry from high voltage surges such as those caused by lightning-induced.  | <b>L</b>     |
| Special Color Finished on Housing Cover           | Amplifier cover only <sup>*7</sup>   | <b>SCF-□</b> |
| Epoxy Coating                                     | Epoxy resin-baked coating <sup>*5</sup>  | <b>X1</b>    |
| Valve Mounting Type                               | Output load capacity and pipe length: more than I. D. 0.16-inch(4 mm) pipe, length 11.8 inch (30 cm) + 20 cc.  | <b>V</b>     |
| Explosionproof type                               | TIIS Flameproof Approval (Ex d IIB+H <sub>2</sub> T6 X) <sup>*1</sup><br>Amb. Temp.: -20 to 60 °C (-4 to 140 °F)<br>Electrical connection: G1/2 female, G3/4 female, and 1/2 NPT female  | <b>JF3</b>   |
|   | FM Explosion proof Approval <sup>*2</sup><br>Explosionproof for Class I, Division 1, Groups B, C and D.<br>Dust-ignitionproof for Class II/III, Division 1, Groups E, F and G. Indoors and Outdoors (NEMA 4X).<br>Amb. Temp.: -40 to 60 °C (-40 to 140 °F)<br>Electrical connection: 1/2 NPT female  | <b>FF1</b>   |
| Intrinsically safe type                           | CSA Intrinsically safe Approval <sup>*4</sup><br>Intrinsically Safe for Class I, Division 1, Groups A, B, C and D. Class II, Division 1, Groups E, F and G. Class III, Division 1 Hazardous Locations Nonincendive for Class I, Division 2, Groups A, B, C and D. Class II, Division 2, Groups F and G. Class III, Division 1 Hazardous Locations. Outdoor Hazardous Locations, Encl Type 4X<br>Temperature Class : T4<br>Amb. Temp.: -40 to 60 °C (-40 to 140 °F)<br>Vmax = 30 V, Imax = 165 mA, Pmax = 0.9 W, Ci = 2 nF, Li=730 μH | <b>CS1</b>   |
|   | TIIS Intrinsically safe Approval (Ex ia IIC T4) <sup>*4</sup><br>Amb. Temp.: -20 to 60 °C (-4 to 140 °F)   | <b>JS3</b>   |
| Attached flameproof packing adapter <sup>*3</sup> | Electrical connection: G1/2 female<br>Applicable cable O.D.: 8 to 12 mm, 1 pc.   | <b>G11</b>   |
|   | Electrical connection: G3/4 female<br>Applicable cable O.D.: 10 to 16 mm, 1 pc.  | <b>G21</b>   |

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- \*1: Applicable for Connections code 1, 2, and 3.  
If cable wiring is to be used to a TIIS flameproof type, select attached flameproof packing adapter /G□.
- \*2: Applicable for Connections code 3.
- \*3: If cable wiring is to be used to a TIIS flameproof type transmitter, add the YOKOGAWA-assured flameproof packing adapter.
- \*4: Applicable for Input signal code A.
- \*5: Not applicable for option code /SCF-□.
- \*6: Applicable for output signal code 1, 2, 3 and 4.
- \*7: /SCF-G1P: Munsell code; N1.5 Black  
/SCF-G2P: Munsell code; 7.5 BG 4/1.5 Jade green  
/SCF-G7P: Metallic silver

**< Ordering Information >**

- Specify the following when ordering
1. Model, suffix codes, and optional codes
  2. Tag Number (if required)

**< Safety Barrier for TIIS Intrinsic Safe Type >**

| Supplier | Type     | Model             |
|----------|----------|-------------------|
| MTL      | Isolator | MTL5046           |
| P+F      |          | KFD2-SCD-Ex 1. LK |

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## DIMENSIONS

Unit:mm (approx.inch)

