

Datasheet P-8x2CV

Process Pressure Controllers for Gases



EL-PRESS P-812CV Process Pressure Controller

> Introduction

Bronkhorst® EL-PRESS™ P-8x2CV Process Pressure Controllers (PPC) are designed to pressurise and depressurise a volume (system or device) with one single instrument. The instrument includes a diaphragm type piezo-resistive pressure sensor for pressure measurement and two direct acting, solenoid control valves. The EL-PRESS PPC can be applied to accurately control process pressures up to 200 bar. The instrument can be operated in analog mode or digitally via RS232 or fieldbus.

> Technical specifications

Measurement / control system

| | |
|--|---|
| Pressure ranges | : P-802CV: Min. 17,5...350 mbar / Max. 3,2...64 bar P-812CV: Min. 3,2...64 bar / Max. 5...100 bar P-822CV: Min. 5...100 bar / Max. 10...200 bar |
| Accuracy (incl. linearity and hysteresis) | : ± 0,5% of Full Scale (FS) |
| Pressure control rangeability | : 1 : 20 with flow range 1 : 50 |
| Repeatability | : ≤ 0,25% RD |
| Response time sensor | : 2 msec |
| Max. Kv-value | : $1,56 \times 10^{-3}$ |
| Max. pressure difference (ΔP) | : P-802CV: 64 bar (d) P-812CV: 100 bar (d) P-822CV: 200 bar (d) |
| Max. flow | : approx. 20 l _v /min N ₂ |
| Control stability | : ≤ ± 0,1% FS (typical for 100 ml _v /min N ₂ at specified process volume) |
| Temperature range | : -10...+70°C |
| Temperature sensitivity | : < ± 0,1% FS/°C |
| Leak integrity (outboard) | : tested < 2×10^{-9} mbar l/s He |
| Attitude sensitivity (at 90° change) | : < 0,3 mbar |
| Warm-up time | : negligible |

Calibration

References verified by an ISO 17025 calibration laboratory, directly traceable to Dutch and international standards.

Mechanical Parts

| | |
|------------------------------|--|
| Material (wetted parts) | : stainless steel 316L or comparable |
| Process connections | : compression type or face seal couplings |
| Seals 64/100 bar version | : static and plungers: Viton® / EPDM / Kalrez® |
| Seals 200 bar version | : static: Viton®, plungers: FKM |
| Ingress protection (housing) | : IP40 |

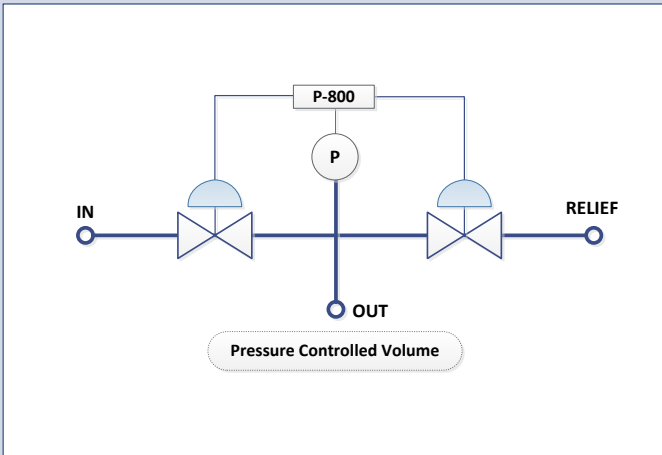
Electrical properties

| | |
|---|---|
| Power supply | : +15...24 Vdc ±10% |
| Power consumption (based on N/C valve) | : Supply at voltage I/O at current I/O 15 V 290 mA 320 mA 24 V 200 mA 215 mA |
| Extra for fieldbus: (if applicable) | PROFIBUS DP : add 53 mA (15 V supply) or 30 mA (24 V supply) EtherCAT® : add 66 mA (15 V supply) or 41 mA (24 V supply) PROFINET : add 77 mA (15 V supply) or 48 mA (24 V supply) DeviceNet™ : add 48 mA (24 V supply) |
| Analog output (0...100%) | : 0...5 (10) Vdc, min. load impedance > 2 kΩ; 0 (4)...20 mA (sourcing), max. load impedance < 375 Ω |
| Analog setpoint (0...100%) | : 0...5 (10) Vdc, min. load impedance > 100 kΩ; 0 (4)...20 mA, load impedance ~250 Ω |
| Digital communication | : standard: RS232; options: PROFIBUS DP, DeviceNet™, EtherCAT®, PROFINET, Modbus RTU/ASCII, FLOW-BUS |

Although all specifications in this datasheet are believed to be accurate, the right is reserved to make changes without notice or obligation.

> Principle of operation

The Process Pressure Controller consists of a piezo-resistive pressure sensor and two direct acting, solenoid control valves. The instrument has a gas inlet for pressurisation, a pressure relief outlet and a system outlet. While pressurizing the system - this will normally be a static volume - the pressure sensor and the inlet valve operate as a forward pressure controller and the relief valve remains shut. When the system requires depressurisation, the inlet valve is shut and the pressure sensor in combination with the relief valve will act as back pressure controller. This dual valve construction is a compact, economical alternative to configurations where forward pressure controllers are combined with separate bleed ports and relief valves. It is considered as a great advantage that the relief valve does not continuously vent to the atmosphere. Furthermore the system can be set for either fast or smooth controlled (de)pressurization.



> Model number identification

| Code | Instrument type | Type | Range | Par | Configurable input/output (pin 5) |
|------|----------------------------|------|-------|-----|---|
| P | EL-PRESS / IN-PRESS series | 0 | 0 | 0 | Disabled, pin 5 is pulled down to 0 Vdc (default selection) |
| | | A | 1 | V | 9...10 Vdc output, controller (default) |
| | | B | 1 | V | 4...20 mA output, controller |
| | | C | 3 | A | Digital output, min/max alarm |
| | | C | 4 | A | Digital output, counter limit reached |
| | | C | 5 | S | Digital output, enabled by setpoint (for shut-off) |
| | | C | 0 | I | Digital output, high/low switch via remote parameter |
| | | D | 9 | B | Digital frequency output, measure |
| | | F | 9 | B | Digital pulse output, batch counter |
| | | H | 1 | P | 4...20 mA input, external pressure sensor |
| | | I | 3 | C | Digital input, controller mode valve close |
| | | I | 8 | C | Digital input, controller mode valve purge |
| | | I | 1 | R | Digital input, reset counter |
| | | I | 2 | R | Digital input, reset alarm |

Supported options, see also pin 5 options table

| Code | Configuration |
|------|-----------------------------------|
| 8 | P-800 Process Pressure Controller |

| Code | Max. pressure |
|------|---------------|
| 0 | Max. 64 barg |
| 1 | Max. 100 barg |
| 2 | Max. 200 barg |

| Code | Pressure sensor code (range) | Inlet | Outlet | Relief | Adapters |
|------|------------------------------|-------|--------|--------|--------------------------|
| 1K1A | 0.35...1.1 bara | 0 | 0 | 0 | None (1/8" bssp inner) |
| 6K0A | 1.1...6 bara | 1 | 1 | 1 | 1/8" OD compression type |
| 21KA | 6...21 bara | 2 | 2 | 2 | 1/4" OD compression type |
| M10A | 21...100 bara (g) | 3 | 3 | 3 | 6 mm OD compression type |
| M40A | 100...200 bara (g) | 8 | 8 | 8 | 1/4" Face seal male |
| 1K1R | 0.35...1.1 barg | 9 | 9 | 9 | Other |
| 6K0R | 1.1...6 barg | | | | |
| 21KR | 6...21 barg | | | | |

| Code | Sealing material |
|------|------------------|
| V | Viton |
| E | EPDM |
| K | Kalrez |

| Code | Valve type indication | Code | Supply voltage |
|------|----------------------------|------|----------------|
| 2CV | Control valve PN64/100/200 | D | +15...24 Vdc |

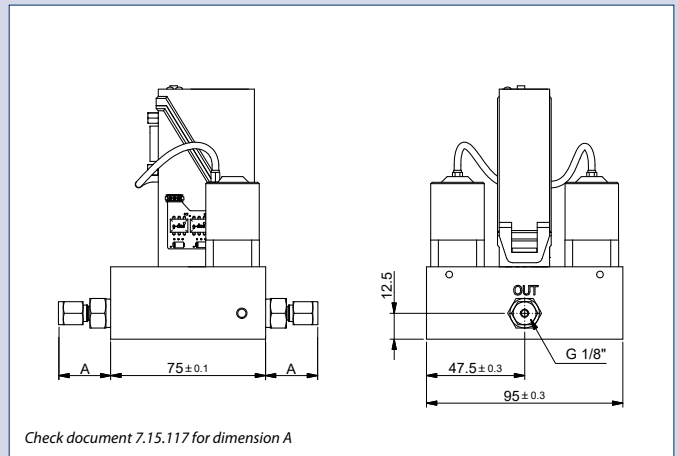
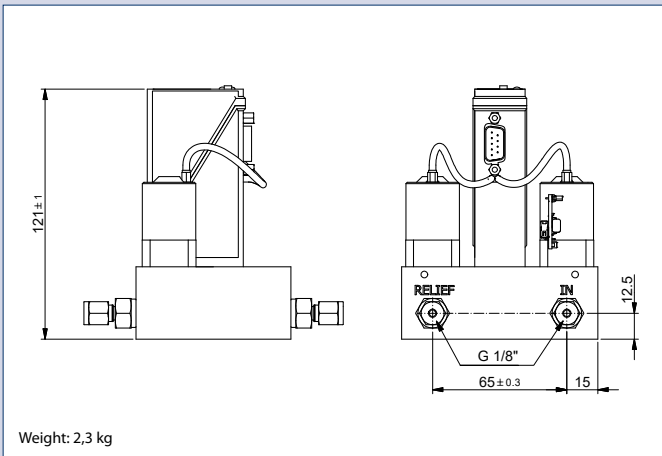
| Code | Analog output (pin 2) | Analog setpoint (pin 3) | Code | Integrated comm. mode (pin 1/6) |
|------|---------------------------------|--------------------------------|------|---------------------------------|
| A | 0...5 Vdc | 0...5 Vdc | A | RS232 - FLOW-BUS (ProPar) |
| B | 0...10 Vdc | 0...10 Vdc | B | RS485 - FLOW-BUS |
| F | 0...20 mA _s sourcing | 0...20 mA _s sinking | C | RS485 - Modbus RTU |
| G | 4...20 mA _s sourcing | 4...20 mA _s sinking | D | RS485 - Modbus ASCII |

| Code | Field bus | Valve type |
|------|-------------|-----------------|
| A | None | Normally Closed |
| D | DeviceNet | Normally Closed |
| M | Modbus** | Normally Closed |
| P | PROFIBUS DP | Normally Closed |
| R | FLOW-BUS | Normally Closed |
| T | EtherCAT | Normally Closed |
| V | PROFINET | Normally Closed |

| Code | Controller mode |
|------|-----------------|
| A | Analog control |
| D | Digital control |

** Default: Modbus RTU, optional Modbus ASCII

> Dimensions (mm) and weight (kg)



> Related products

P-8x2CI Industrial Process Pressure Controller (IPPC)
IP65 ingress protection (housing)

