



CORDIS SERIES
CP1 Dynamic Electronic
Pressure Controls

Operating Instructions



Precise, linear pressure control within a closed-loop system with ultra high resolution and repeatability

Known for reliability, innovation and focus on miniature pneumatics, Clippard’s Cordis Pressure controllers utilize the proven EVP and DVP proportional valve series allowing for steady, accurate and repeatable downstream pressure control as demand or process changes. The result, a very precise linear pressure control within a closed-loop system providing ultra-high resolution and repeatability.

The Cordis uses a microcontroller, an internal or external pressure sensor, and a Clippard proportional valve. The inlet valve is connected to the moderately regulated supply pressure. Once a command is increased, the proportional valve opens up to allow supply pressure to pass over the sensor element which provides an active feedback for the microcontroller to satisfy the set point in the process. If at any point the sensor detects a value higher than the set point, the proportional valve closes and allows process to consume the remaining downstream pressure.

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Technical Data

Table:1

| ELECTRICAL | |
|----------------|---|
| Voltage | 15 to 24 VDC |
| Current Draw | < 250 mA max. |
| Signal/Command | <i>Electrical:</i> 0 to 10 VDC or 0 to 5 VDC |

| PERFORMANCE | |
|------------------|--|
| Accuracy | ± 0.25% of full scale |
| Resolution | ≤ 5 mV |
| Linearity | ± 0.05% BFSL |
| Max. Hysteresis | ± 0.05% of full scale |
| Calibrated Range | 0 to 0.5 psig min. 0 to 150 psig max. |
| Typical Flow | See Page 6 |
| Response Time | < 20 ms typical (<i>application dependent</i>) |

| OPERATING CONDITIONS | |
|-----------------------|----------------------------------|
| Operating Temperature | 32 to 120°F (<i>0 to 49°C</i>) |
| Medium | Clean, dry, non-corrosive gases |
| Mounting Attitude | Any |
| Process Connections | #10-32, M5, Manifold Mount |

| WETTED MATERIALS | |
|------------------|--|
| Elastomers | FKM |
| Manifold | Anodized aluminum |
| Valves | Nickel plated brass and Stainless Steel |
| Pressure Sensor | Silicon, wire bonds, ceramic, Nylon and RTV/epoxy |

| MORE DETAILS | |
|--------------|--|
| Website | clippard.com/link/cordis |

Operational Description

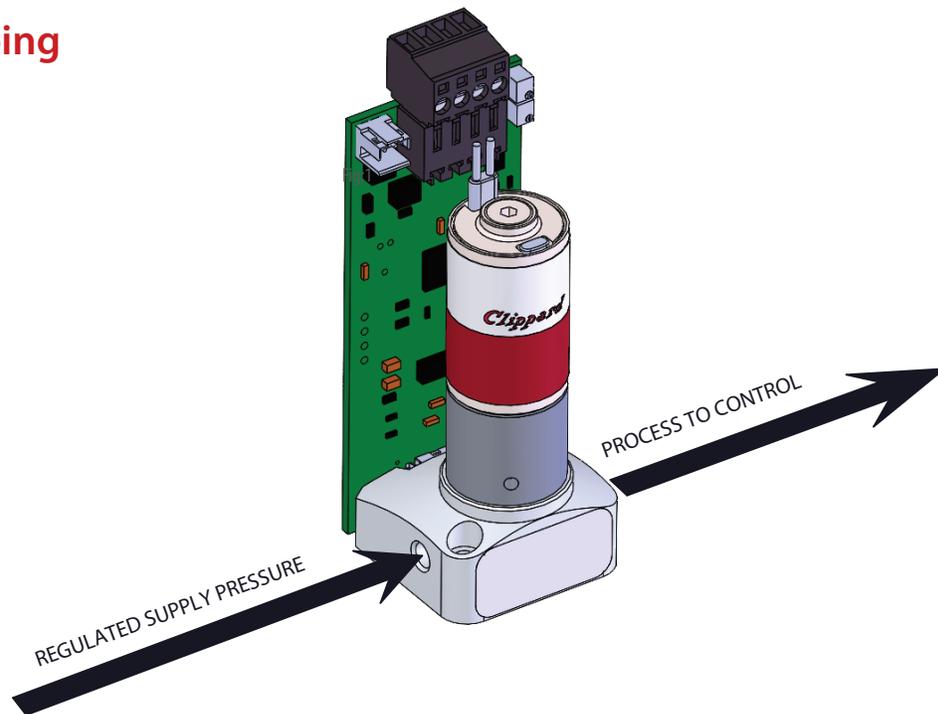
The Cordis is designed to accept a pressure on the inlet port, and control to a user-specific set pressure on the work port. The CP1 contains a microcontroller, integrated pressure sensor, and a Clippard EVP/DVP proportional valve.

For Cordis to control pressure in your process, a regulated supply pressure should be connected to the inlet valve (I). The outlet valve (O) should be connected to the downstream process. As the command signal increases the inlet valve opens to allow pressure downstream. This pressure passes over the internal sensor element which is constantly providing active feedback to the microcontroller. As soon as this feedback matches the user-specified command, the inlet valve closes and holds the commanded pressure downstream. If dynamic conditions exist or if any consumption occurs downstream, the inlet valve will open and instantly compensate to maintain the desired downstream setpoint.

Mounting

The Cordis series can be mounted in any orientation without negatively affecting process control.

Pneumatic Plumbing



Safety & Best Practices

- ⚠ Recommended filtration for supply media is 40 micron or better.
- ⚠ Supply pressure must be regulated to \leq max pressure allowed for calibrated range. See Table: 2 & 3
- ⚠ Disconnect power if supply pressure is not connected.
- ⚠ Inlet pressure must be a minimum of 10% above max calibrated range of Cordis to achieve max output.
- ⚠ Always take precautionary measures while handling exposed circuit boards: Hold circuit board on edges whenever handling device. Store device in antistatic bag to prevent possible ESD from damaging

Calibration

The calibration of the Cordis series is done at the time of manufacture to NIST traceable standards. Each unit is calibrated and the PIDs are set to the Cordis standard tuning. If a customer's specific application details are known prior to manufacture (recommended), the PIDs will be tuned in accordance with the known specifications to provide the most stable and repeatable control. Below are the available calibration ranges and maximum allowed inlet pressure for each range.

Table:2 **Rated Inlet Pressure for Calibrated Range (psig)**

| CALIBRATED RANGE | MAX. INLET PRESSURE |
|------------------|---------------------|
| 0 to 1 psig | 10 psig |
| 0 to 5 psig | 10 psig |
| 0 to 15 psig | 30 psig |
| 0 to 30 psig | 60 psig |
| 0 to 100 psig | 115 psig |
| 0 to 150 psig | 165 psig |

Table:3 **Rated Inlet Pressure for Calibrated Range (bar)**

| CALIBRATED RANGE | MAX. INLET PRESSURE |
|------------------|---------------------|
| 0 to 0,5 bar | 0,70 bar |
| 0 to 1 bar | 2 bar |
| 0 to 2 bar | 4 bar |
| 0 to 7 bar | 8 bar |
| 0 to 10 bar | 11 bar |

Recalibration

The Cordis series does not require recalibration during its lifetime. If the calibration needs to be changed and/or modified, the unit must be returned to Clippard or completed by a certified field technician. Any attempt to recalibrate in the field without prior authorization will void the warranty.

Please contact Clippard for all Return Material Authorization (RMA) requests:

Clippard

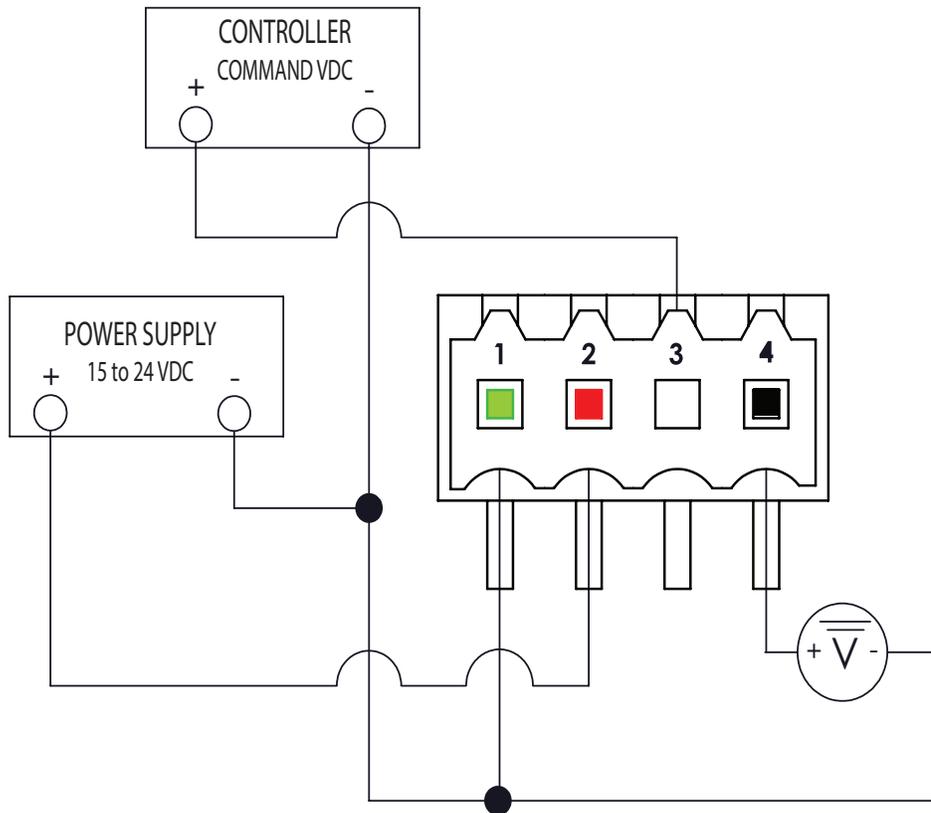
7390 Colerain Avenue | Cincinnati, OH 45239 | sales@clippard.com | 1-877-245-6247

Please have the serial number(s) available for reference.

0 to 10 VDC Electrical Connection

! Make sure AC power is disconnected before DC connections are made

The Cordis requires 15 to 24 VDC on **Pin 2** of the electrical connector. It uses 0 to 10 VDC command signal on **Pin 3** of the electrical connector. The power supply ground, command source ground and **Pin 1** must be tied together. If the analog monitor signal is being used, utilize **Pin 4** to send the 0 to 10 VDC signal to a measuring device like a volt meter, panel meter or acquisition device.



Model Electrical Pin-out

| PIN NUMBER | FUNCTION | COLOR |
|------------|-------------------|-------|
| 1 | DC Common/Ground | Green |
| 2 | Power, 15-24 VDC | Red |
| 3 | +Command Input | White |
| 4 | Analog VDC Output | Black |

Red LED: Power to Unit ON

Reference Serial Configuration Section for Command Change Instructions

Flow & Orifice Selection

Table:10

Internal Valve Flow & Limitations

| PN REF. | ORIFICE SIZE | FLOW @ MAX. PRESSURE | MAX. PRESSURE (P2) |
|---------|--------------|--------------------------|----------------------|
| A | 0.009" EVP | 2.7 l/min (5.72 scfh) | 150 psig (10,34 bar) |
| B | 0.013" EVP | 6.7 l/min (14.2 scfh) | 100 psig (6,89 bar) |
| C | 0.025" EVP | 25.0 l/min (53.0 scfh) | 100 psig (6,89 bar) |
| D | 0.052" DVP | 65.01 l/min (137.7 scfh) | 100 psig (6,89 bar) |
| F | 0.035" DVP | 32.0 l/min (67.8 scfh) | 100 psig (6,89 bar) |

Flow & Valve Selection Notes

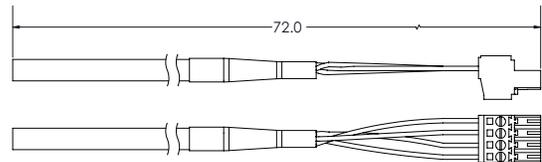
» Max flow assumes a P1 value of (at least) 10% above max pressure listed. Ex: a max pressure out of 50 psig assumes a min P1 value of 55 psig.

Accessories | Cable



<<CPCH-CA4

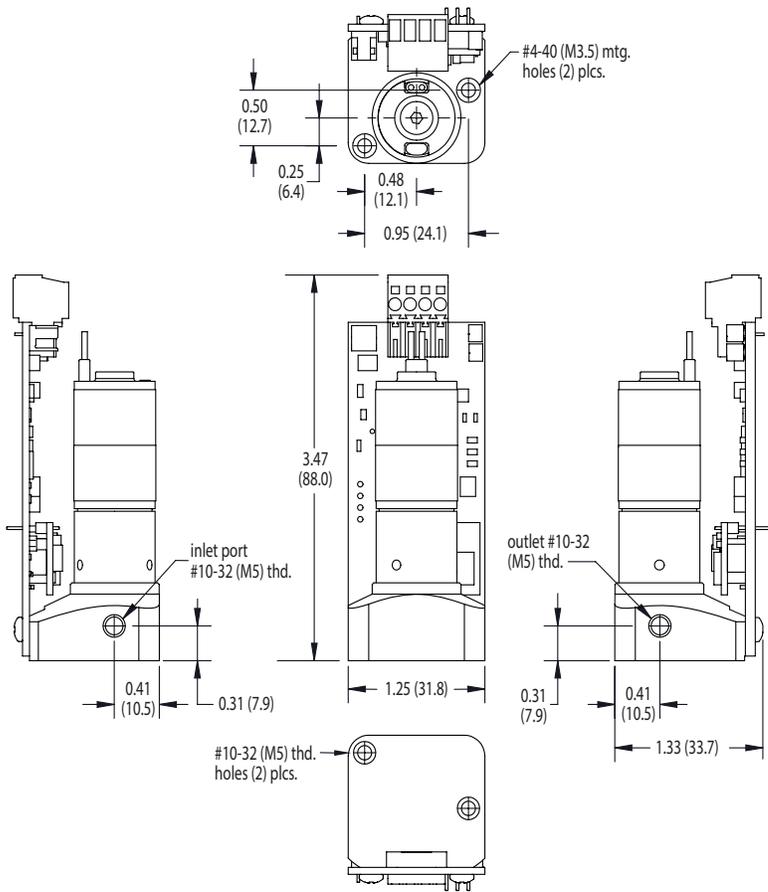
Power Cord, 6' to 4-Pin Mating Connector



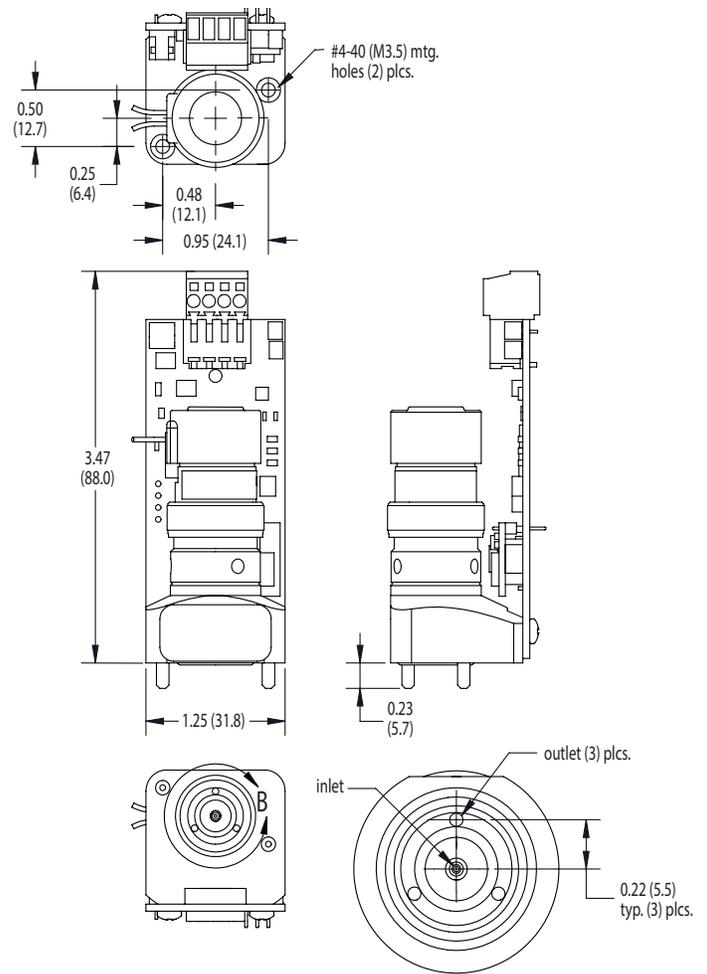
Ordering Information

| Model | Porting | Mount | Signal/Command | Calibrated Pressure Range | Min. Volume/Flow @ Max. Pressure* | |
|--|-------------------|-------------------|----------------------|---|---|--|
| CP1-C Pressure Control | I Imperial | I In-Line | F 0 to 5 VDC | -A 0 to 1 psig -B 0 to 5 psig -C 0 to 15 psig -D 0 to 30 psig -F 0 to 100 psig -G 0 to 150 psig -I 0 to 0,5 bar -J 0 to 1 bar -K 0 to 2 bar -M 0 to 7 bar -N 0 to 10 bar | A ≥0.25 in ³ / 2.7 l/min | |
| | M Metric | M Manifold | E 0 to 10 VDC | | B ≥0.50 in ³ / 6.7 l/min | |
| Example Part No. CP1-CIIF-BA | | | | | C ≥1.00 in ³ / 25.0 l/min | |
| <i>Consult Clippard for availability of non-standard commands and other options.</i> | | | | | D ≥2.00 in ³ / 65.0 l/min | |
| | | | | | F ≥1.00 in ³ / 32.0 l/min | |

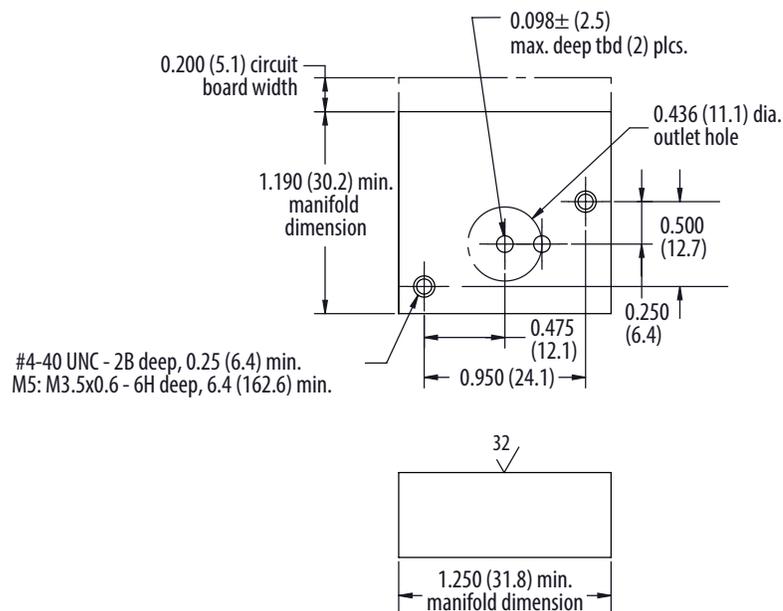
Dimensions | In-Line Mount



Manifold Mount



Mounting Interface





7390 Colerain Avenue
Cincinnati, OH 45239

1-513-521-4261
1-877-245-6247

Cordis, of the heart

Other Useful Materials

Digital vs. Analog Control White Paper

Pressure vs. Flow Control White Paper

Resolution in Proportional Control White Paper

View Frequently Asked Questions

View Web Site

Limited Warranty

All information contained in this publication is for reference only. Proper design engineering procedures should be used to assure any compliances. Clippard Instrument Laboratory, Inc. reserves the right to make changes without notice and does not warrant or guarantee the information contained herein.

Clippard Instrument Laboratory, Inc. (Seller) warrants its products to be free from defects in material and workmanship for a period of one (1) year from the date of sale. Seller's liability shall be limited at seller's option to repair, replace or refund purchase price of product found by seller's examination to be defective. All claims under this warranty must be made in writing to seller's factory sales department giving full details, prior to return of product, postpaid, to factory. Seller shall not be responsible for product failure due to normal wear, accident, buyer's misapplication, abuse, neglect or alteration of product. Seller will not be responsible for any consequential damages. Clippard makes no other warranty of any kind, expressed or implied. Circuits shown in this catalog are for instructional purposes only. All circuits used on equipment and machinery should be thoroughly tested by qualified personnel under actual working conditions to determine their suitability for buyer's intended use. All technical data and operations are average values based on standard production models. Some deviations can be expected and considerations should be given during initial design stages. All operating characteristics are based on new equipment, under normal conditions of use and environments and oil free air supply. Dimensions stated may be nominal and are subject to change without notice. Contact Clippard for specific dimensional tolerances when dimensions are critical.

Proudly made in the USA.

8 - CORDIS | 877-245-6247 | clippard.com | tech@clippard.com

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