Clippard

Operating Instructions

Clippard's proven EVP proportional valves provide fast, stable control of pilot pressure

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

The Cordis CHV utilizes the same microcontroller, integrated pressure sensor, and two Clippard EVP proportional valves. With the inlet and exhaust valves connected to the pilot area of the integral volume booster, the comparative circuit responds to the given command by referencing the on-board sensor located on the output control path of the booster. If at any point the on-board downstream sensor indicates a value higher or lower than the set point command, the comparative circuit will immediately open either the exhaust or inlet valve to maintain stable and accurate control pressure in the application process, but with significantly higher flow capabilities.

Content

Technical Data

Table:1

ELECTRICAL	
Voltage	15 to 24 VDC
Current Draw	< 250 mA max.
Signal/Command	*Electrical*: 0 to 5 VDC, 0 to 10 VDC or 4 to 20 mA *Serial*: 3.3 VDC

PERFORMANCE	
Accuracy	± 0.5% of full scale
Resolution	≤35 mV
Max. Hysteresis	± 0.50% of full scale
Typical Flow	See Page 16
Response Time	< 20 ms typical *(application dependent)*

OPERATING CONDITIONS	
Operating Temperature	32 to 120°F *(0 to 40°C)*
Medium	Clean, dry, non-corrosive gases
Mounting Attitude	Any
Process Connections	1/4" NPT or G1/4, Outlet & Exhaust

WETTED MATERIALS	
Elastomers	Nitrile
Manifold	Anodized aluminum
Valves	Nickel plated brass
Pressure Sensor	High temperature polyamide, alumina ceramic, silicone epoxy, glass
IP65 Housing	Polycarbonate

MORE DETAILS	
Website	**clippard.com/link/cordis-chv**

Operational Description

The Cordis is designed to accept a pressure on the inlet port, reduce it and control to a user-specific set pressure on the work port. The CHV contains a microcontroller, integrated pressure sensor, and two Clippard proportional valves assembled on to a integral volume booster

For Cordis to control pressure in the process, a regulated supply pressure should be connected to the inlet port (I). The outlet valve (O) should be connected to the downstream process. As the command signal increases, the inlet valve opens to allow pressure to the pilot area of the integral booster. This pilot pressure causes the diaphragm to deflect and open the flow path from the supply port to the outlet port. The output pressure passes over the internal sensor element which is constantly providing active feedback to the microcontroller/comparative circuit. As soon as this feedback matches the user-specified command, the inlet valve closes and holds the commanded pressure downstream.

The CHV controls pressure both in static and dynamic conditions. If the application is dynamic, the unit will maintain output pressure as long as the dynamic flow requirement of the application can be achieved by the maximum flow capabilities. The CHV utilizes either the inlet/fill valve or exhaust/bleed valve based upon change between the Command and Feedback Signals—always striving to maintain the commanded/desired downstream set point.
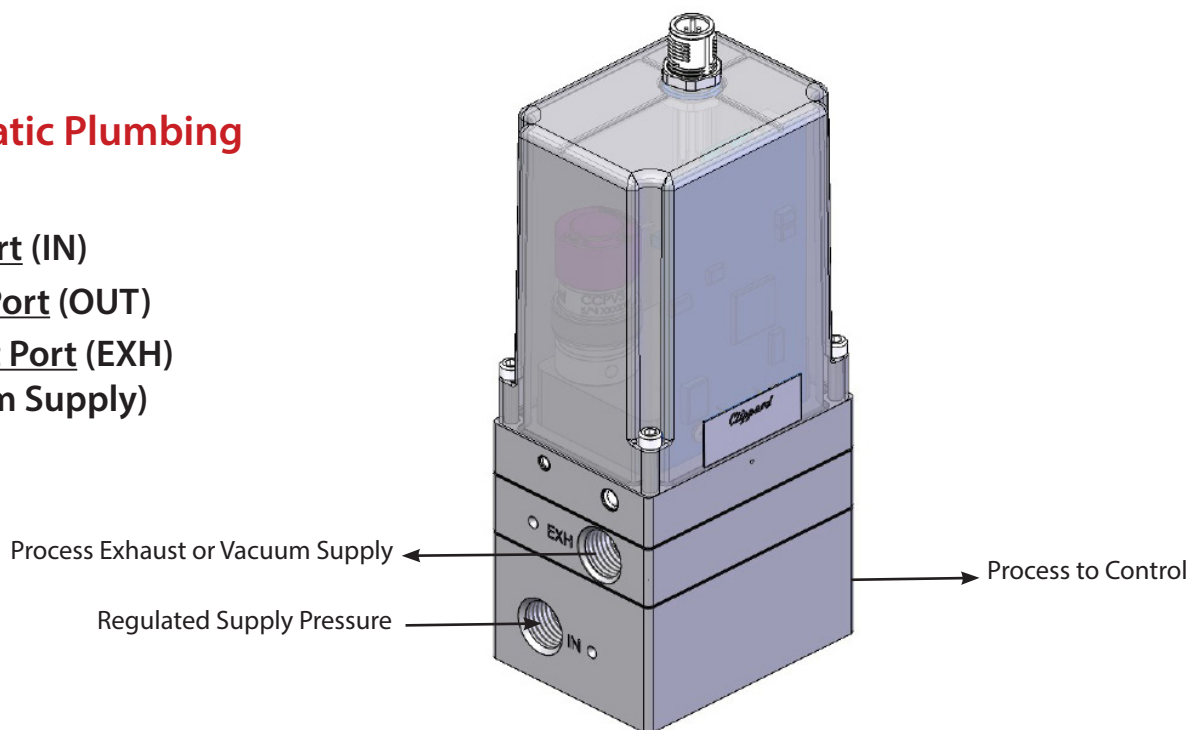
Mounting

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

Pneumatic Plumbing

Inlet Port (IN)

Outlet Port (OUT)

Exhaust Port (EXH)
(Vacuum Supply)

Process Exhaust or Vacuum Supply

Regulated Supply Pressure

Process to Control

Safety & Best Practices

⚠️ **Recommended filtration for supply media is 40 micron or better.**

⚠️ **Supply pressure must be regulated to ≤ 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.**

Calibration

The calibration of the Cordis CHV 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 5 psig	30 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	2 bar
0 to 1 bar	2 bar
0 to 2 bar	4 bar
0 to 4 bar	7 bar
0 to 7 bar	8 bar
0 to 10 bar	11 bar

Recalibration

The Cordis CHV 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 8** of the electrical connector. It uses 0 to 10 VDC command signal on **Pin 1** of the electrical connector. The power supply ground, command source ground and **Pin 3** must be tied together. If the analog monitor signal is being used, utilize **Pin 5** to send the 0 to 10 VDC signal to a measuring device like a volt meter, panel meter or acquisition device.
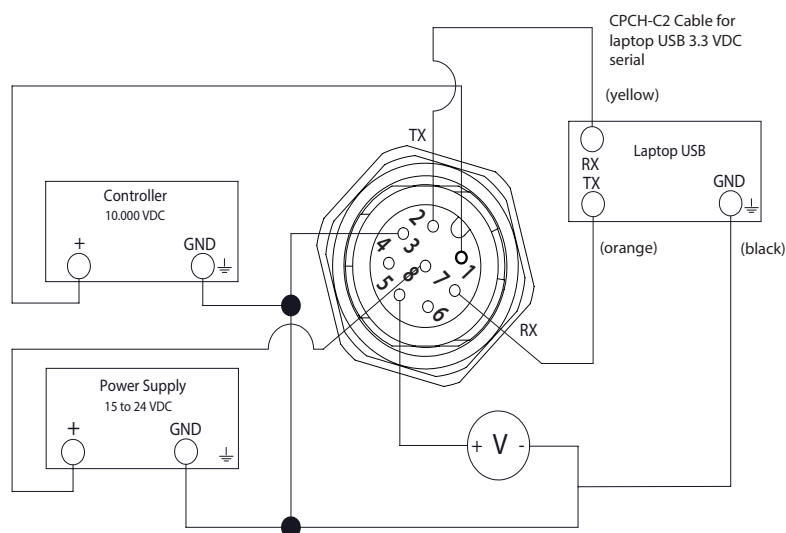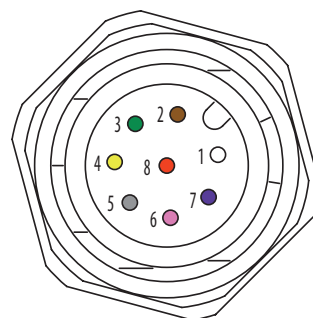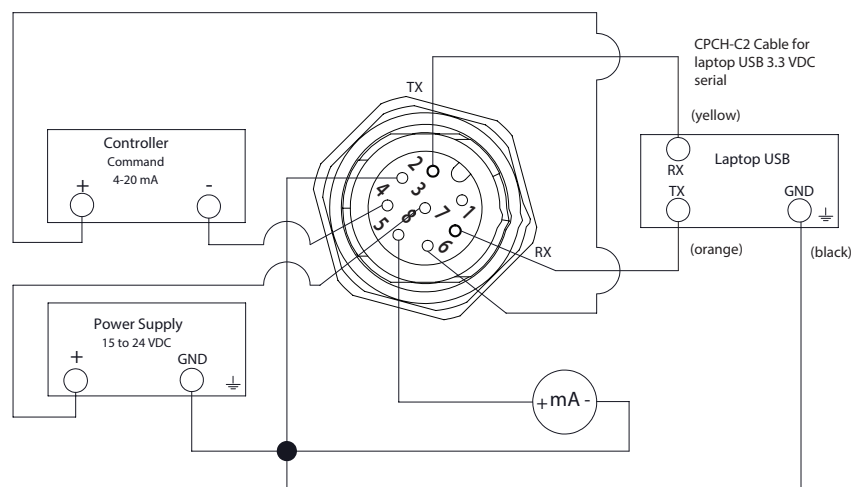

	Electrical Pin-Out	
Table:4		
PIN NUMBER	**FUNCTION**	**COLOR**
1	+Command Input	White
2	3.3 VDC Serial TX	Brown
3	DC Common/Ground	Green
4	Not Used	Yellow
5	Analog VDC Output	Gray
6	Not Used	Pink
7	3.3 VDC Serial RX	Blue
8	Power, 15-24 VDC	Red

Red LED: Power to Unit ON
Solid Blue LED: Analog Mode
Flashing Blue LED: 3.3 VDC Serial Mode

Reference Serial Configuration Section for Command Change Instructions

4-20 mA Electrical Connection

⚠️ *Make sure AC power is disconnected before DC connections are made*

The Cordis requires 15 to 24 VDC on **Pin 8** of the electrical connector. It uses 4 to20 mA command signal on **Pin 6** of the electrical connector. Connect **Pin 4** to DC common or negative 4-20 mA on the control module. If the analog monitor signal is being used, utilize **Pin 5** to send the 4 to 20 mA signal to a measuring device like a mA meter, panel meter or acquisition device.

Table:5	Electrical Pin-Out	
PIN NUMBER	**FUNCTION**	**COLOR**
1	n/c	White
2	3.3 VDC Serial TX	Brown
3	DC Common/Ground	Green
4	-4 to 20 mA Command Return	Yellow
5	4 to 20 mA Output	Gray
6	+4 to 20 mA Command Input	Pink
7	3.3 VDC Serial RX	Blue
8	Power, 15-24 VDC	Red

Red LED: Power to Unit ON
Solid Blue LED: Analog Mode
Flashing Blue LED: 3.3 VDC Serial Mode

Reference Serial Configuration Section for Command Change Instructions
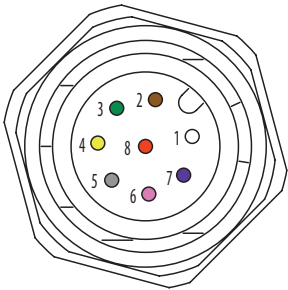
Serial Configuration

⚠️ **Cordis utilizes a 3.3 VDC communication signal**

To communicate via Serial with the Cordis, software is required. Many serial software communication solutions are available. If you already have a software solution, please ensure it is configured with the specifications listed below (Table:6) prior to making the electrical connections to Cordis. The commands can be found on Page 13.

If you do not already have a serial software solution, we recommend PuTTY as a free and open-source solution. PuTTY is one of the most common software packages used for serial communication and can be downloaded here: https://putty.org/

Once downloaded and installed on your windows based machine, please follow the steps below to configure the software prior to making the electrical connections to Cordis. The specifications we will configure and/or confirm within PuTTY are listed in Table:6.

Table:6 **Serial Software Configuration (PuTTY)**

SETTING LABEL	SPECIFICATION
Speed (baud)	57600
Data Bits	8
Stop Bits	1
Parity	None
Flow Control	None
Serial Line	See Steps 1 & 2

Serial Configuration | Continued

STEP - 1
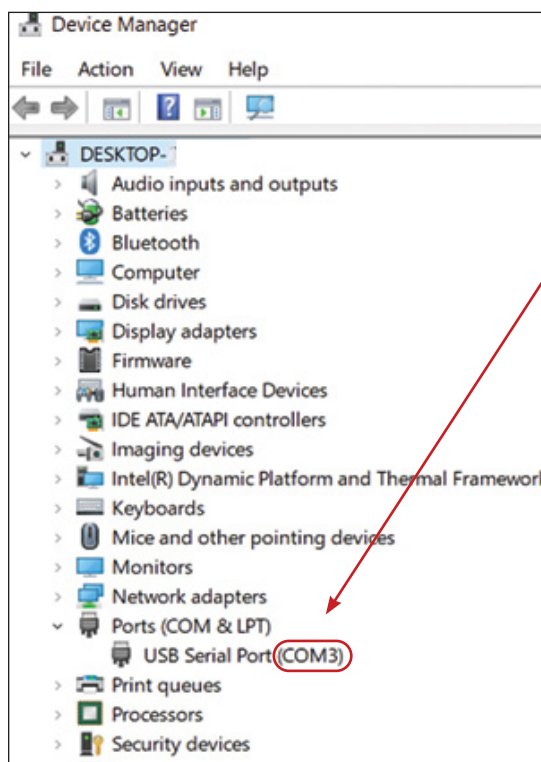
1) Ensure proper serial connection to Cordis unit and then connect 3.3 VDC serial to the control device. The wiring schematics can be found on pages 14 and 15.

2) Open Device Manager and identify the serial port assigned to the serial cable.
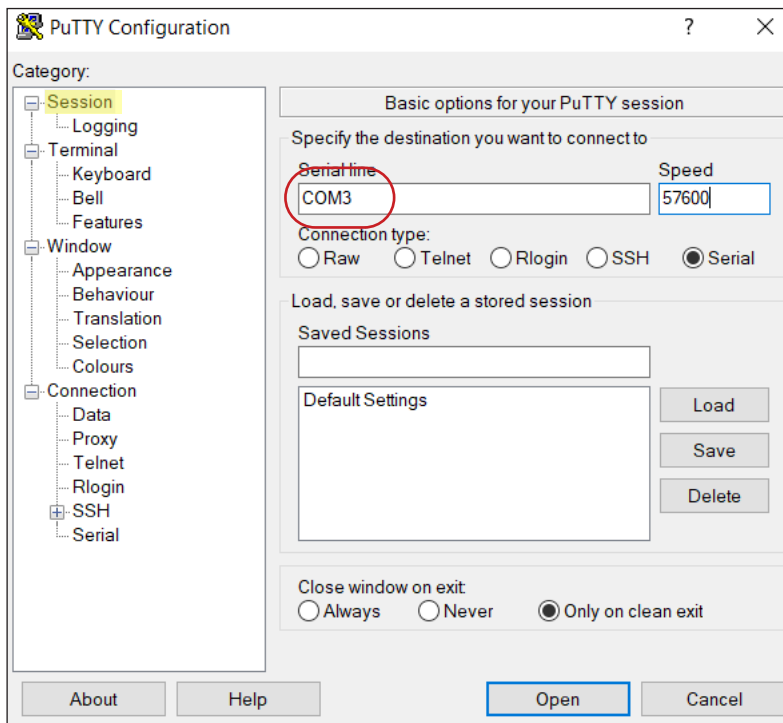
>>> *Many ways to open Device Manager:*
https://www.digitalcitizen.life/ways-open-device-manager-windows

STEP - 2
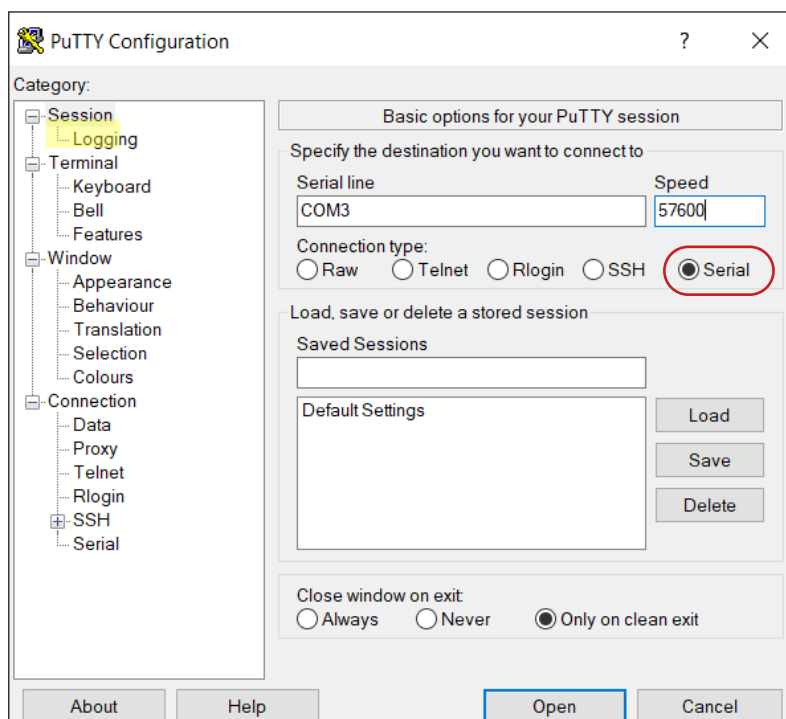
1) Open installed Putty program

2) Ensure '**Serial**' is selected

Serial Configuration | Continued

STEP - 3

Input the port identified in Step - 1 into the Serial Line as shown.

STEP - 4
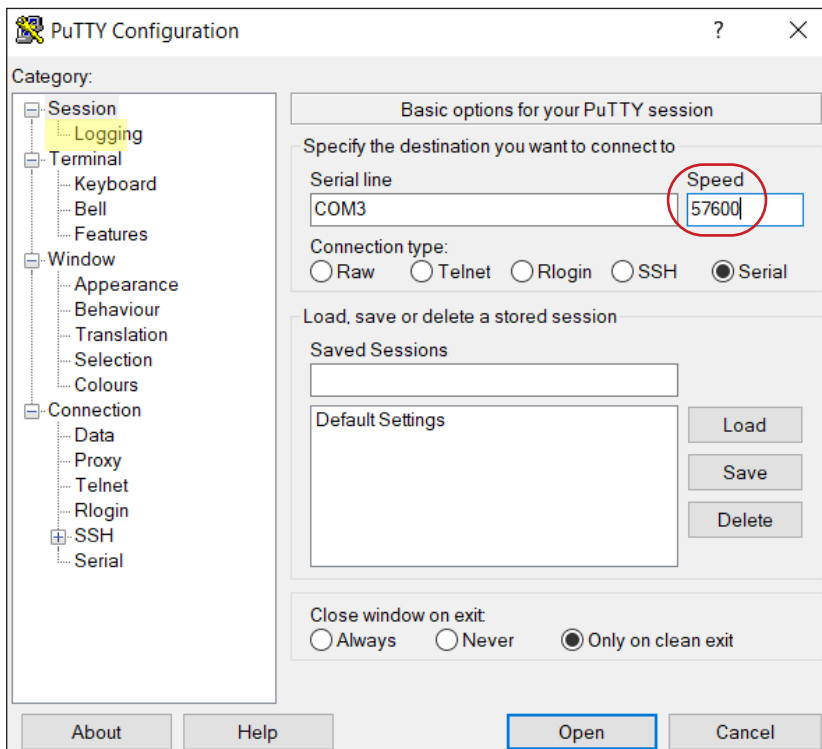
Change the speed (baud) setting to: **57600**

Serial Configuration | Continued

STEP - 5
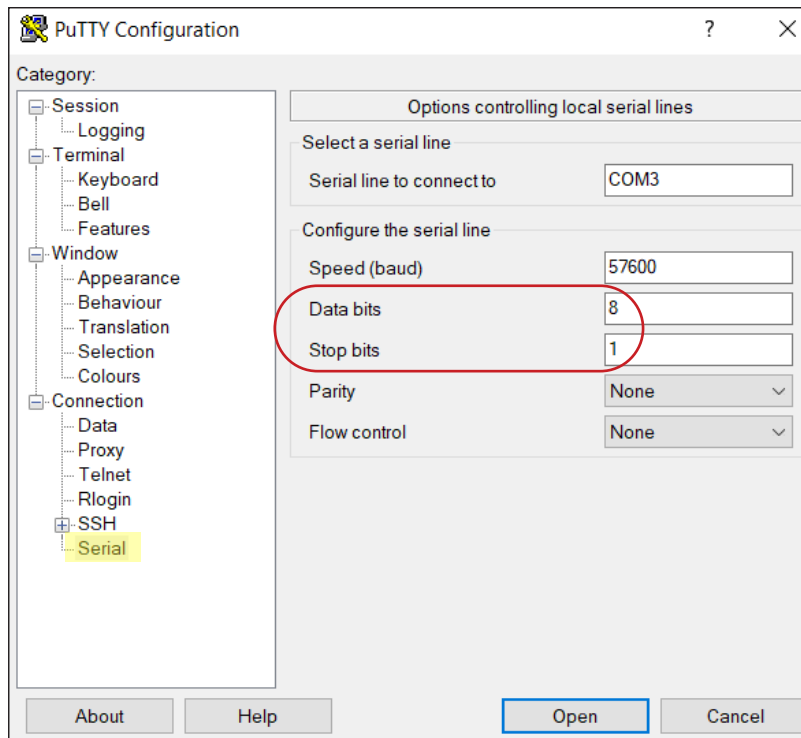
Change **Data Bits** to **8** and **Stop Bits** to **1**

STEP - 6
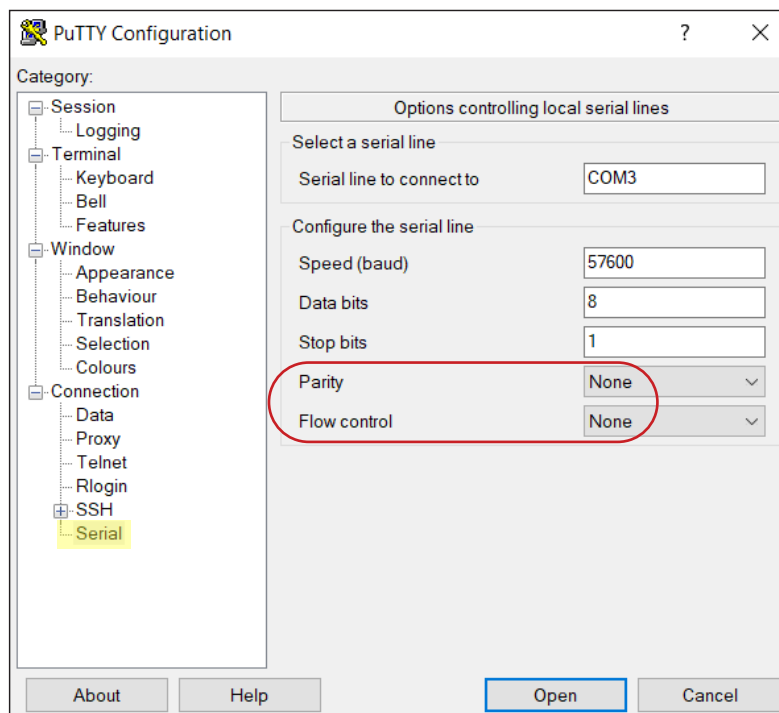
Ensure both **Parity** and **Flow Control** are set to **None**

Serial Configuration | Continued

STEP - 7
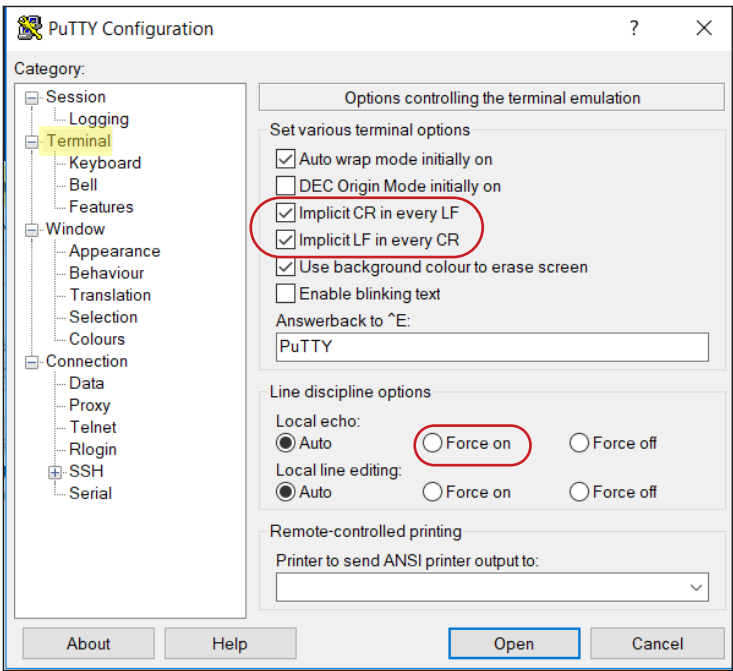
In Terminal settings, check the box for: **Implicit CR in every LF** & **Implicit LF in every CR**

STEP - 8

Once the Cordis is connected and the software is configured, the below commands (Table:7) can be used to change settings, request feedback and control the device.

Note: *If you would like feedback as you type, set the Local Echo to "Force On"*

Serial Commands

Table:7

DESCRIPTION	COMMAND ABREVIATION	INSERT TO SEE CURRENT VALUES	INSERTED EXAMPLE CHANGES	READABLE	WRITABLE
Model No.	ID	?ID	n/a	Y	N
Serial Number	SN	?SN	n/a	Y	N
Proportional "P" Value	PIDP	?PIDP	PIDP: 100	Y	Y
Integral "I" Value	PIDI	?PIDI	PIDI: 0.75	Y	Y
Command Type (0=Analog, 1=Digital)	CT	?CT	CT: 1	Y	Y
Current Command (0 - 100% of Full Scale)	CC	?CC	CC: 50	Y	Y
Monitor Output Signal from Internal Sensor	MON	?MON	n/a	Y	N
Save Settings to ROM	SAVE	n/a	SAVE	N	Y

⚠️ **When entering all Reading Commands, always prefix with "?".   Example: ?PIDP**

⚠️ **Make sure to leave one space between the colon and value when making changes. Example: PIDP: 100**

Serial Connection

⚠️ **Make sure AC power is disconnected before DC connections are made**

The Cordis requires 15 to 24 VDC on **Pin 8** of the electrical connector. It uses serial communication on **Pin 7** to receive and **Pin 2** to send digital responses. The power supply ground, command source ground and **Pin 3** must be tied together.
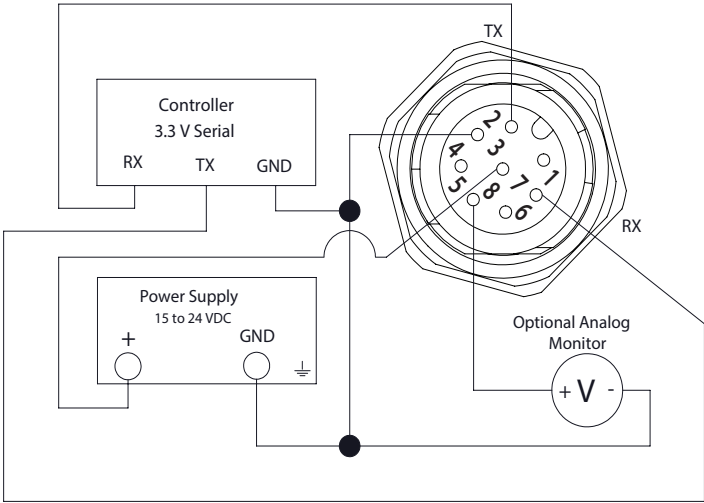

Table:9 — **Electrical Pin-out**

PIN NUMBER	FUNCTION	COLOR
1	+Command Input	White
2	3.3 VDC Serial TX	Brown
3	DC Common/Ground	Green
4	Not Used	Yellow
5	Analog VDC Output	Gray
6	Not Used	Pink
7	3.3 VDC Serial RX	Blue
8	Power, 15-24 VDC	Red

Red LED: Power to Unit ON
Solid Blue LED: Analog Mode
Flashing Blue LED: 3.3 VDC Serial Mode

Reference Serial Configuration Section for Command Change Instructions
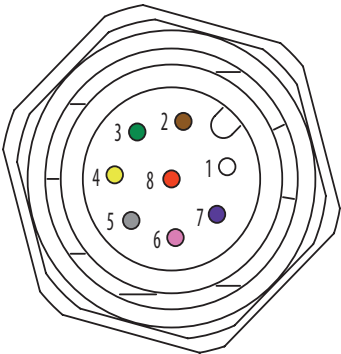
Ordering Information

Model	Type	Porting	Signal/Command	Calibrated Pressure Range	
CHV- Pressure Control	**H** Housed Unit	**F** 1/4" NPT **G** G1/4	**F** 0 to 5 VDC **E** 0 to 10 VDC **R** 3.3 VDC Serial **I** 4 to 20 mA	**-A** 0 to 1 psig **-B** 0 to 5 psig **-C** 0 to 15 psig **-D** 0 to 30 psig **-E** 0 to 60 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 **-L** 0 to 4 bar **-M** 0 to 7 bar **-N** 0 to 10 bar **-O** 0 to 15 psia **-P** 0 to 30 psia **-Q** 0 to 100 psia **-R** -5 to +5 psid **-S** -15 to +15 psid **-W** -1 to +1 psid

Consult Clippard for availability of non-standard commands and other options.

Example Part No. CHV-HFE-G

* All flow ranges are factory tested at 100 psig on the process side.

Positive Pressure Supply to "IN" Port. Vacuum Pressure Supply to "EXH" Port.
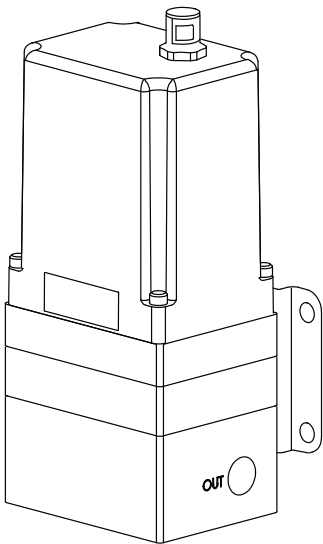
Accessories | Cable & Mounting Bracket

<<**CPCH-C1**   Molded Actuation Cable, 8-Pin, 6'

<<**CPCH-C2**   3.3 VDC Serial Cable, 3'
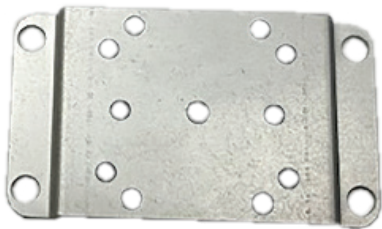
CPCH-B3   Bracket for rear or foot/ base mounting. Four screws included.

Foot/Base Mount >>

Rear Mount >>

Dimensions

0.56" (14.30)

5.98" (151.77)

6.54" (166.07)

#8-32 Mounting Holes

Exhaust / Vent 1/4" NPT (G1/4)

Inlet / Supply 1/4" NPT (G1/4)

EXH

IN

1.71" (45.50)

0.60" (15.24)

0.66" (16.83)

1.46" (37.15)

2.80" (71.2)

Outlet / Work 1/4" NPT (G1/4)

OUT

0.60" (15.24)

1.46" (37.15)

0.88" (22.23)

0.95" (24.13)

0.65" (16.51)

1.50" (38.10)

0.78" (19.69)

1.25" (31.75)

0.78" (19.69)

1.25" (31.75)

1.75" (44.45)

#8-32 Mounting Holes

0.19" (4.76)

3.25" (82.5)

0.201" dia. (2) plcs.

2.13" (54.0)

1.25" (31.8)

3.60" (91.5)

2.80" (71.1)

0.06" (1.6)

0.31" (8.0)

Clippard
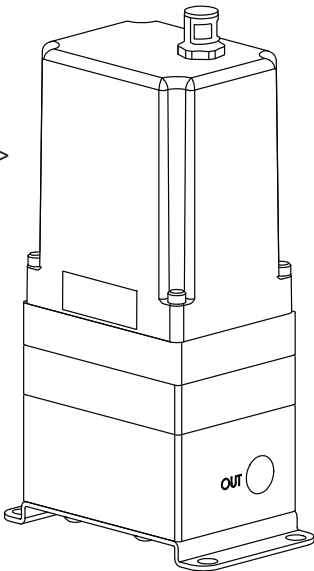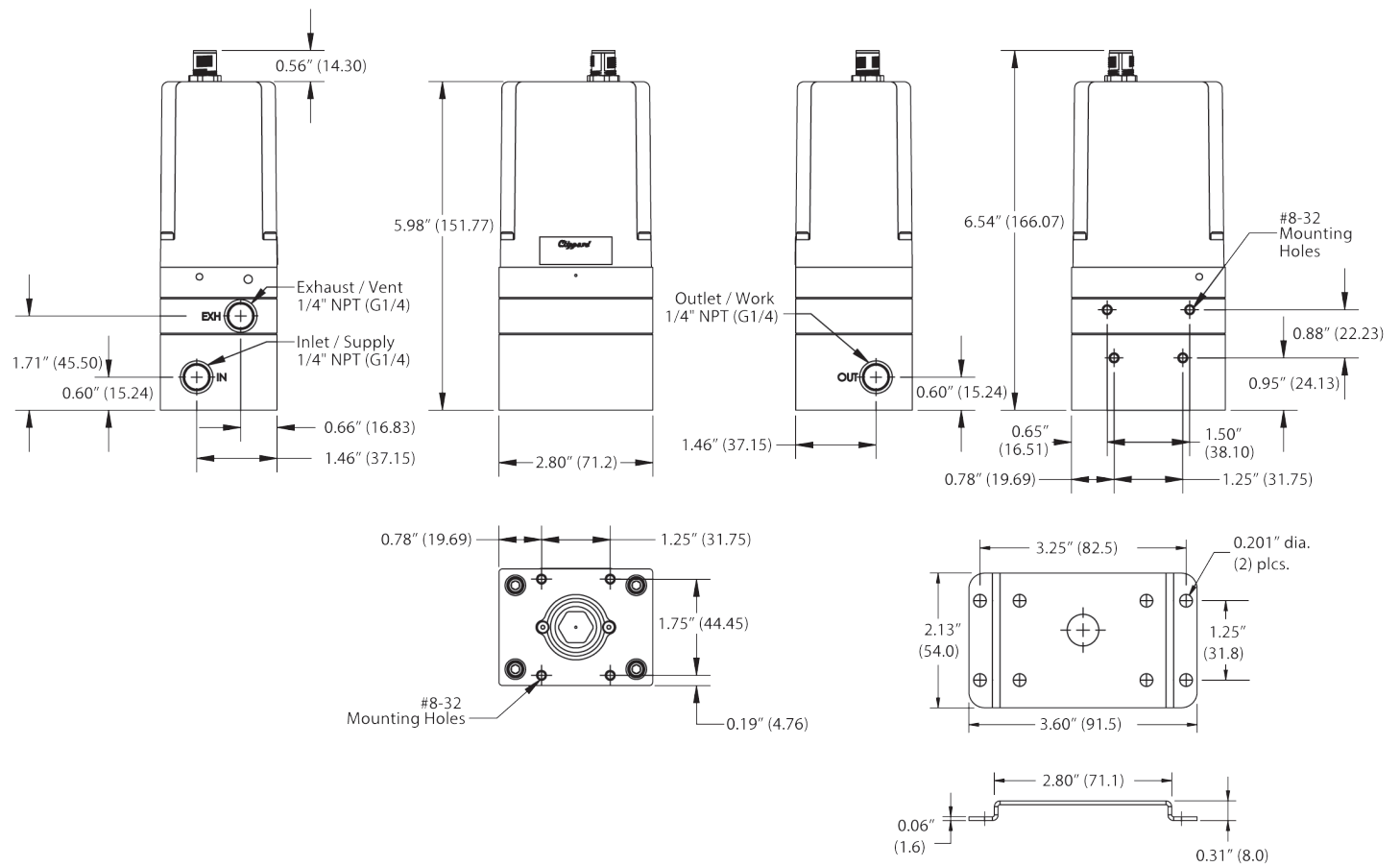
7390 Colerain Avenue
Cincinnati, OH 45239

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