



## **CORDIS SERIES**

High Pressure Proportional  
Regulators

# Operating Instructions



The Cordis is a closed-loop pressure control valve system designed to maintain a steady and repeatable downstream pressure under static conditions. Cordis comes in a IP65 rated enclosure for manufacturing and industrial environments. The unit is standard with two Clippard EV electronic valves designed for high pressure control.

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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 5 VDC, 0 to 10 VDC or 4 to 20 mA <i>Serial:</i> 3.3 VDC
PERFORMANCE	
Accuracy	± 0.5% of full scale
Resolution	≤ 50 mV
Linearity	≤ 0.2%
Max. Hysteresis	≤ 0.25%
Typical Flow	See Page 4
Response Time	< 20 ms typical ( <i>application dependent</i> )
OPERATING CONDITIONS	
Operating Temp.	32 to 180°F (0 to 82°C)
Medium	Clean, dry, non-corrosive gases
Mounting Attitude	Any
Process Connections	1/8" NPT or G1/8

WETTED MATERIALS	
Elastomers	Flouorocarbon
Manifold	Anodized aluminum
Valves	Nickel plated brass
Pressure Sensor Wetted Materials	17-4 PH Stainless Steel
IP65 Housing	Polycarbonate
MORE DETAILS	
Website	<a href="http://clippard.com/link/cordis">clippard.com/link/cordis</a>

## 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 CHP-H model contains a microcontroller, integrated stainless steel pressure sensor, and two Clippard digital valves. This unit includes an IP65 enclosure for industrial environments.

For Cordis to control pressure in your process, a regulated supply pressure should be connected to the inlet port (I). The outlet port (O) should be connected to the downstream process and the exhaust port (E) should be open to atmosphere. 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 at any point the sensor measures a higher value (backpressure) than the setpoint or if the user-specified command is lowered, the exhaust valve will modulate open and vent off the excess pressure to maintain stable and accurate pressure control in the process. Likewise, if any consumption occurs downstream, the inlet valve will open to maintain the desired downstream setpoint.

## Mounting

The Cordis high pressure series can be mounted in any orientation without negatively affecting process control, and comes standard with convenient (bottom or side) mounting holes for easy mounting to most flat surfaces. In addition to this, a mounting bracket that doubles as a rear-mount or foot-mount is also available (see Page 12 for more information).

## Pneumatic Plumbing

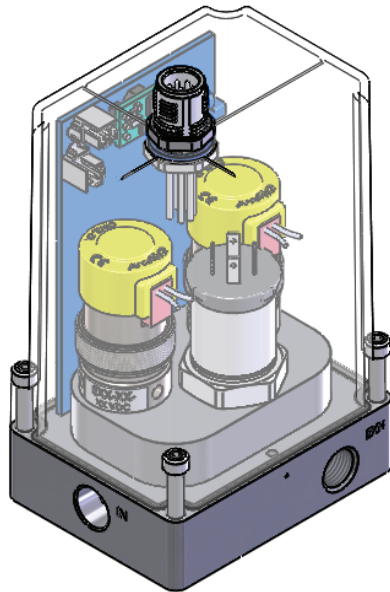









Fig:1

Inlet Port (IN)

Outlet Port (OUT)

Exhaust Port (EXH)

## Safety & Best Practices

-  Recommended filtration for supply media is 40 micron or better.
-  Supply pressure must be regulated to  $\leq 550$  psig
-  Disconnect power if supply pressure is not connected.
-  Exhaust port is threaded 1/8" NPT or G1/8.
-  When changing fittings, thoroughly clean all tape and/or debris from the port connections.
-  Captured exhaust media must be able to vent to atmosphere.
-  Preferred sealant for 1/8" NPT ports is Loctite 545 or face seal. If thread tape is required, make sure to start wrap after the first two threads to reduce the possibility of valve contamination.

## 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	INLET PRESSURE	
	MIN.	MAX.
0 to 200 psig	220 psig	550 psig
0 to 300 psig	330 psig	550 psig
0 to 500 psig	520 psig	550 psig
0 to 1000 psig*	530 psig	1100 psig

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

CALIBRATED RANGE	INLET PRESSURE	
	MIN.	MAX.
0 to 13 bar	15,17 bar	37,92 bar
0 to 20 bar	22,75 bar	37,92 bar
0 to 34 bar	35,85 bar	37,92 bar
0 to 68 bar	36,55 bar	75,85 bar

*\* Depending on the calibration, the 1000 psig unit can be used for any calibration above 500 psig.*

## 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, Ohio 45239  
sales@clippard.com

1-877-245-6247

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

# Electrical Connection | 0 to 10 VDC

 *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.

Fig:4

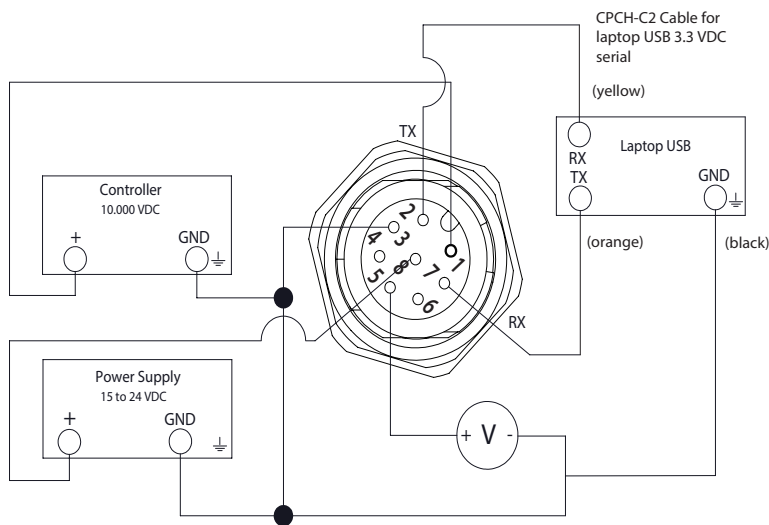


Table:5

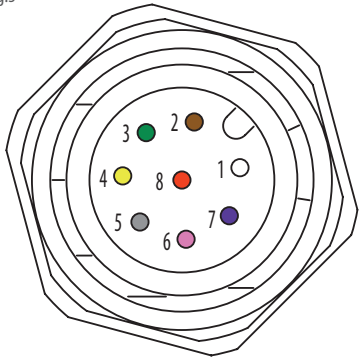
CHP-H Model Electrical Pin-Out

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*

Fig:5



# Electrical Connection | 4 to 20 mA

 *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 to 20 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.

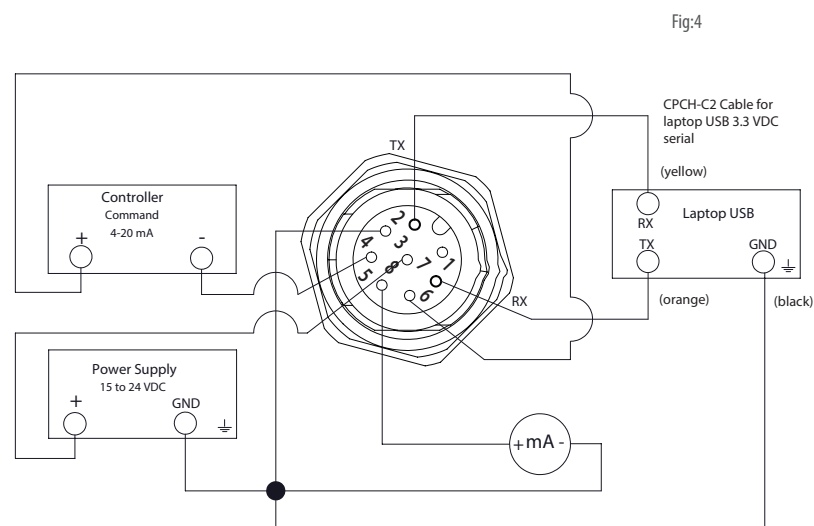


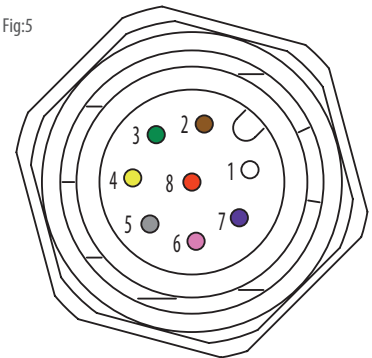
Table:5

*CHP-H Model 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*

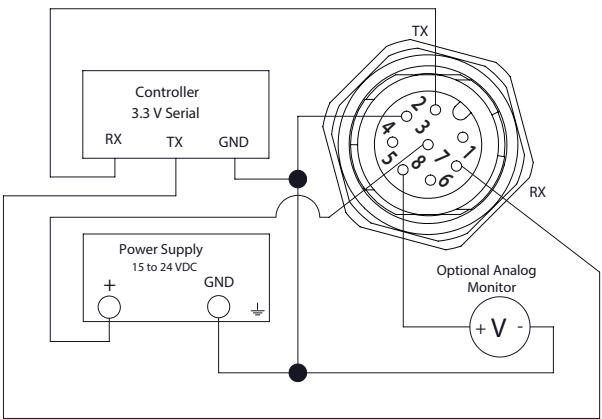
To communicate via Serial with the Cordis, software is required. Many serial software communication solutions are available. If you already have a software solution, please ensure it is configured with the specifications listed below (Table: 6) prior to making the electrical connections to Cordis. The commands can be found on Page 11.

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.

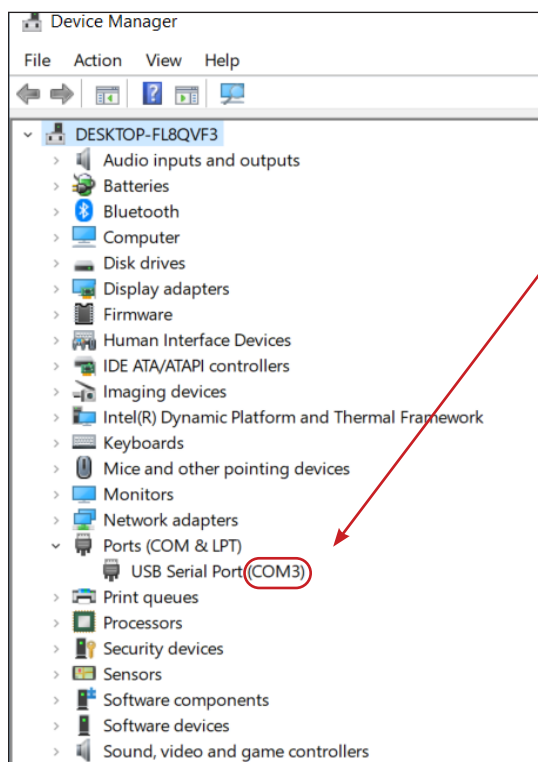
Table:6

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

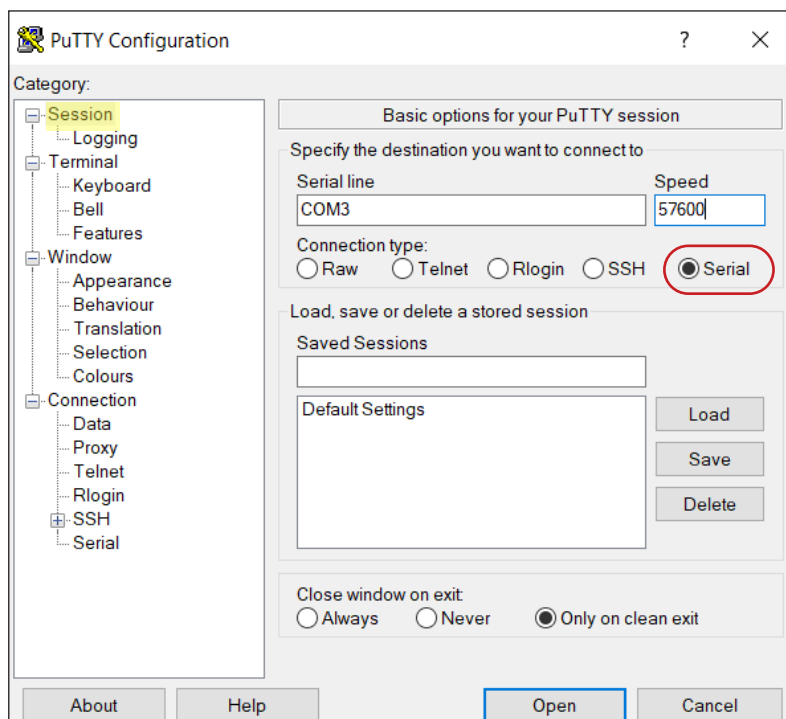


- 1) Ensure proper serial connection to Cordis unit and then connect 3.3 VDC serial to the control device. The wiring schematics can be found on page 5.
- 2) Open Device Manager and identify the serial port assigned to the serial cable.

>>> Many ways to open Device Manager:

<https://www.digitalcitizen.life/ways-open-device-manager-windows>

### STEP - 2

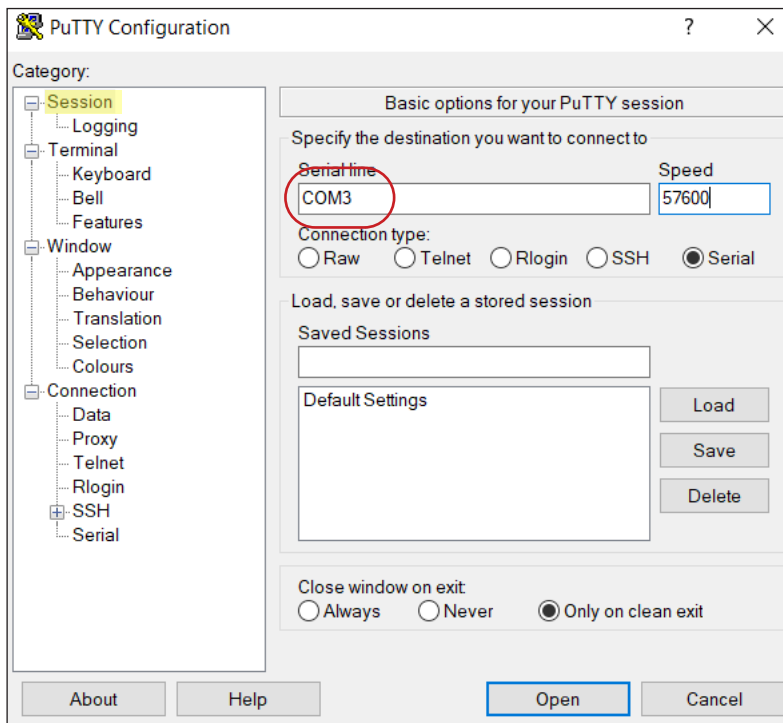


- 1) Open installed Putty program
- 2) Ensure 'Serial' is selected



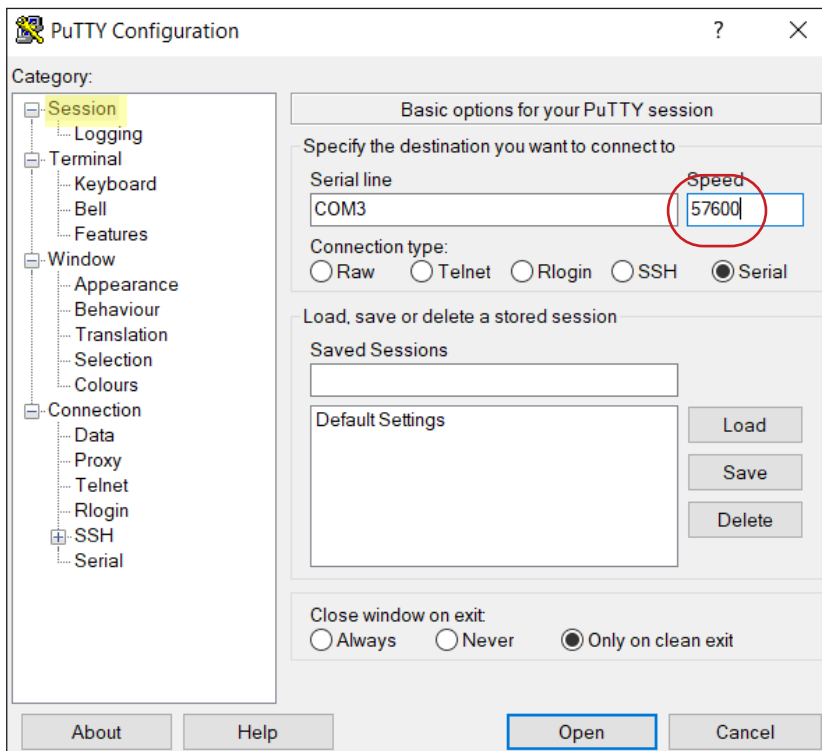
## Serial Configuration | Continued

### STEP - 3



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

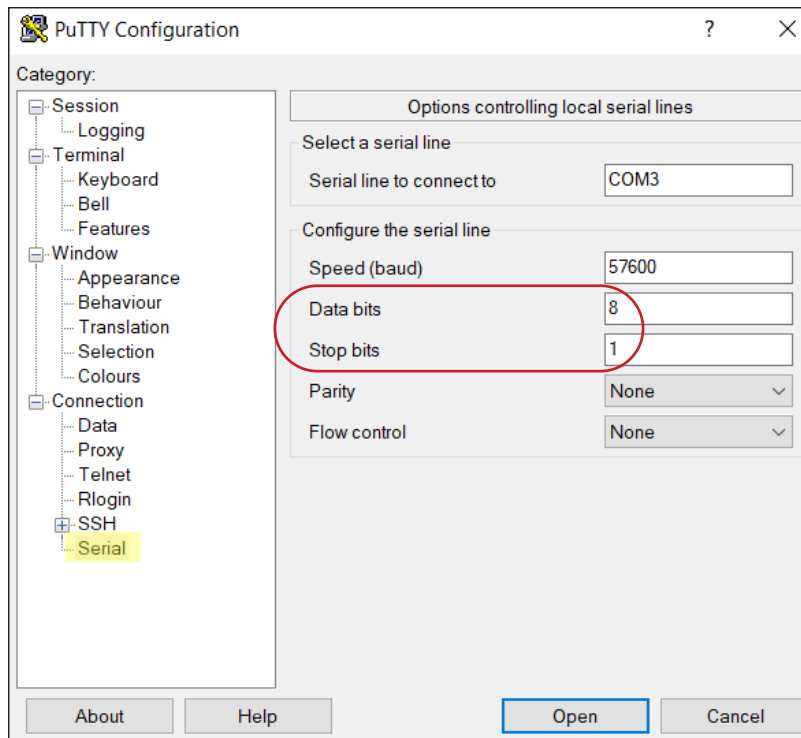
### STEP - 4



Change the speed (baud) setting to: **57600**

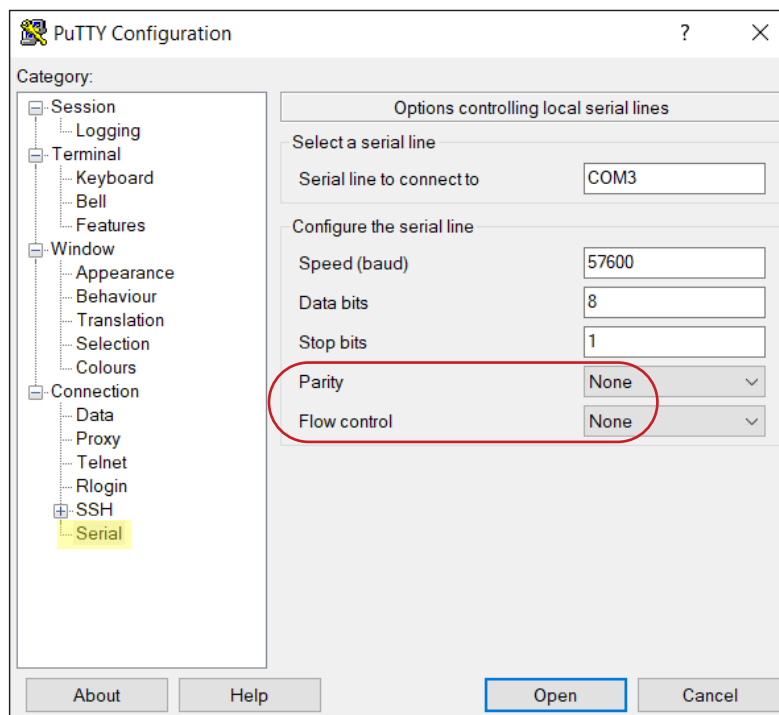
## Serial Configuration | Continued

### STEP - 5



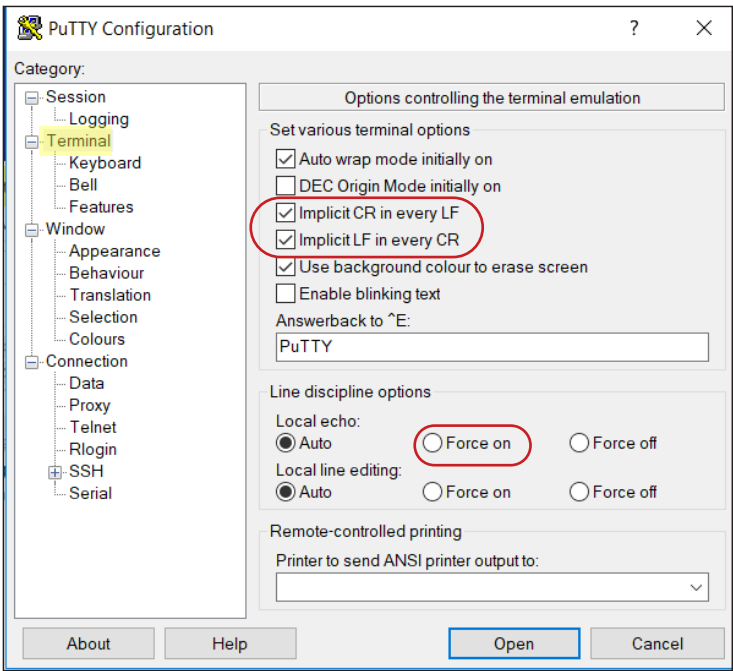
Change **Data Bits** to 8  
and **Stop Bits** to 1

### STEP - 6



Ensure both **Parity** and **Flow Control** are set to None

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

Cordis | Serial Commands

DESCRIPTION	COMMAND ABBREVIATION	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*

# Ordering Information

EXAMPLE PART NUMBER | CHP-HFF-5GH

CHP	-	H	F	F	-	5G	H								
Model	Type		Porting	Signal/Command		Calibrated Pressure Range		Min. Volume/Flow @ Max. Pressure*							
CHP-		H	Housed Unit	F	1/8" NPT	F	0 to 10 VDC	-2G	0 to 200 psig	G	≥0.75 in³ / 3.0 l/min				
		E	CE Housed Unit	G	G1/8	E	0 to 10 VDC	-3G	0 to 300 psig	H	≥1.00 in³ / 6.5 l/min				
						R	3.3 VDC Serial	-5G	0 to 500 psig	I	≥2.00 in³ / 12.5 l/min				
						I	4 to 20 mA	-1K	0 to 1,000 psig						
								-2M	0 to 13 bar						
								-3M	0 to 20 bar						
										-5M	0 to 34 bar				
												-6M	0 to 68 bar		

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

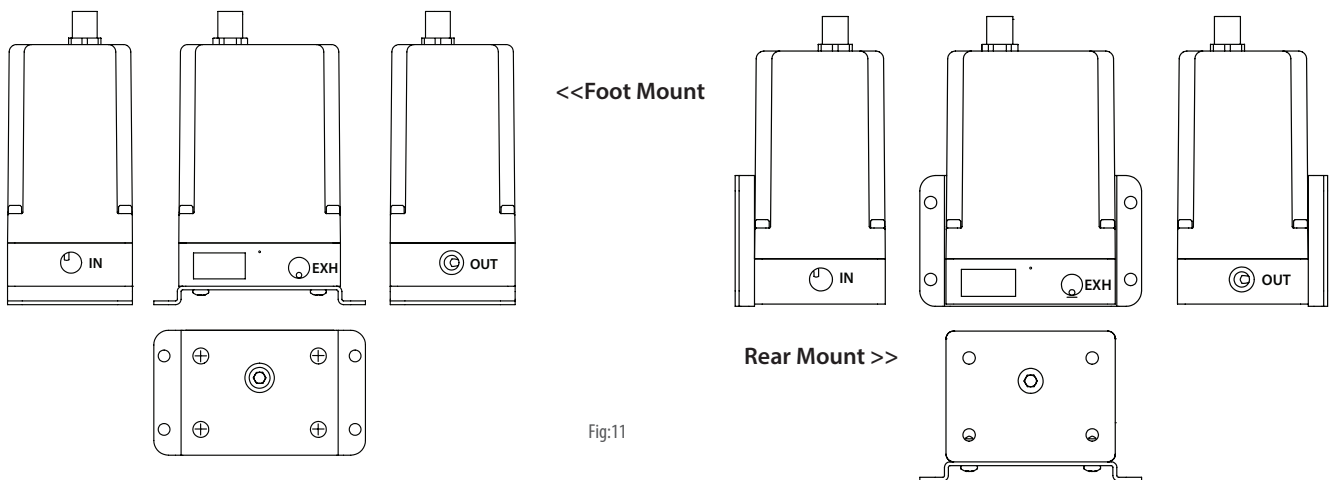
*Consult Clippard for non-standard command and calibrated ranges.*

Table:11

Table:11

## Accessories | Mounting Bracket

Bracket can be used for foot mounting or rear mounting. Complete with 4 screws.  
**Part No:** CPCH-B2.



Bracket dimensions on page 13

## Accessories | Cables

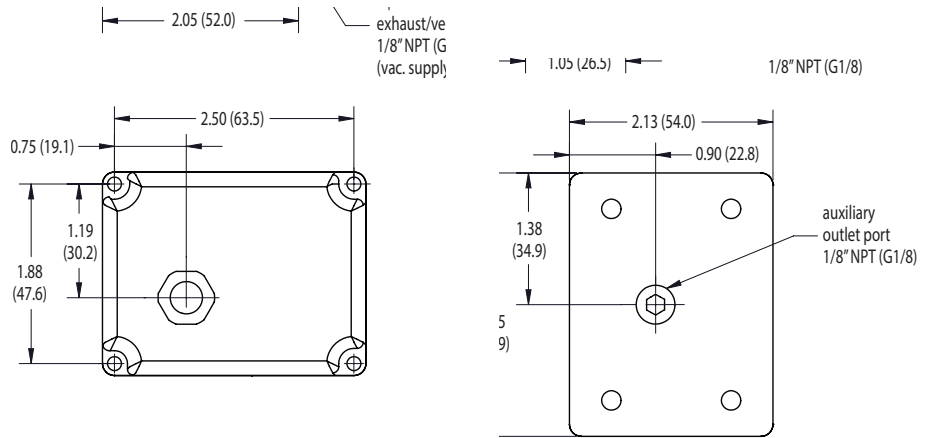
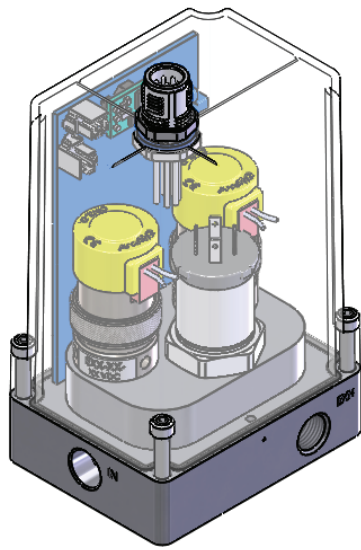


<<CPCH-C1 Molded Actuation Cable, 8-Pin, 6'

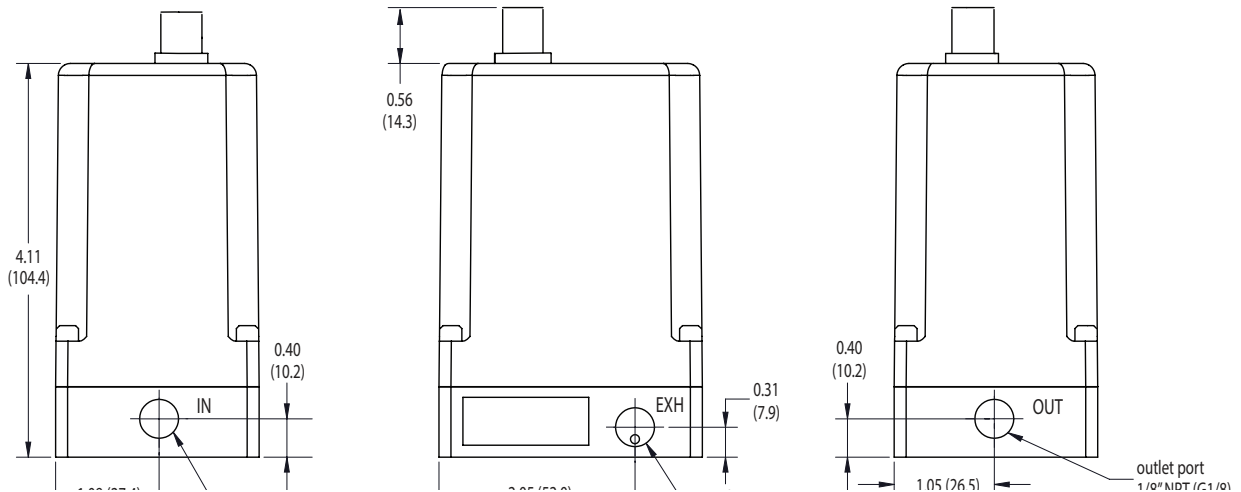


<<CPCH-C2 3.3 VDC Serial Cable, 3'

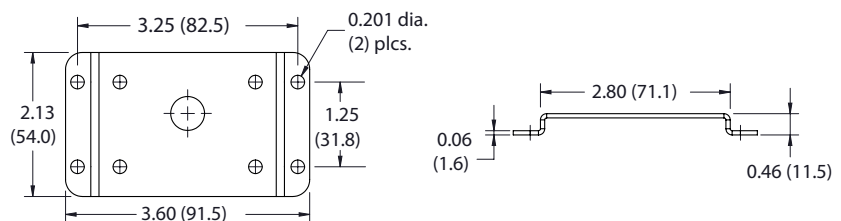
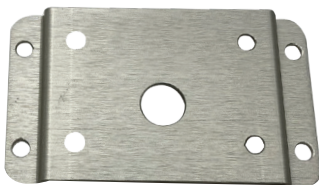
## Dimensions



## CORDIS HIGH PRESSURE CONTROLS



## Mounting Bracket (optional)





7390 Colerain Avenue  
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***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.

**14 - CORDIS | 877-245-6247 | [clippard.com](http://clippard.com) | [tech@clippard.com](mailto:tech@clippard.com)**

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