EQUILIBAR®
PRECISION FLUID CONTROL

GP1

Electropneumatic Regulators

FOR PRESSURE CONTROL TO 1,000 PSI

GP1 Functional Description

The Equilibar GP1 series control valve is an electronic pressure regulator designed to precisely control the pressure of inert gaseous media proportional to an electronic signal in pressure ranges up to 1000 psig (69 bar(g)). They are designed for use in non-hazardous, non-explosive environments.

The GP1 consists of two normally closed solenoid valves, a pressure sensor, and a control circuit. One valve is actuated to allow supply media into the system. The second valve is actuated to allow working media to vent to atmosphere. An electronic circuit compares the internal pressure sensor feedback to the user supplied electronic command signal and actuates the appropriate valve until the two signals match.

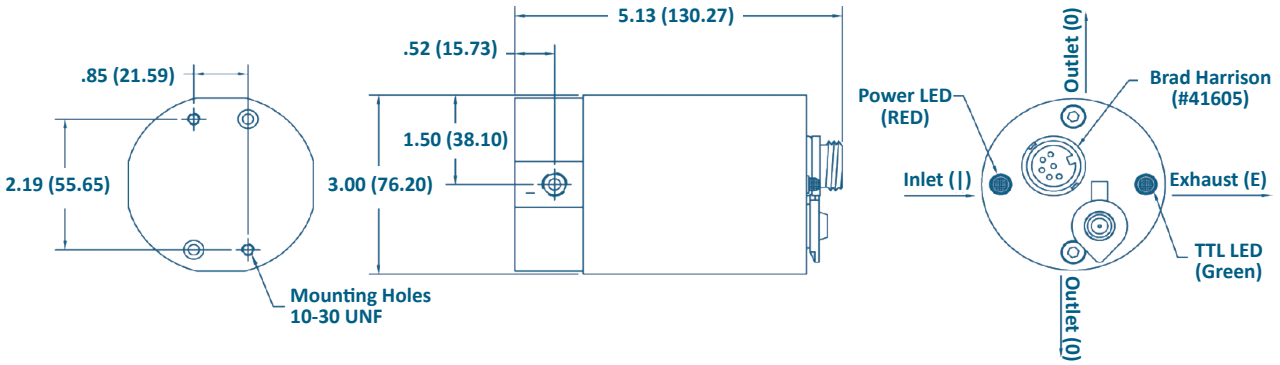
The GP1 can be teamed with a variety of one-to-one ratio high pressure volume boosters for even greater flow.

GP1 product comes with a monitor output signal. This output is an electrical signal originating from the internal sensor used in the control circuit of the GP1 valve. This allows the system parameters to be monitored and provides a signal for data acquisition needs. The output of this signal can be configured to either 0-10 Vdc or 4-20 mA.

FEATURES

- PRECISION PRESSURE CONTROL FROM VACUUM TO 1000 PSIG WITHOUT THE NEED FOR A RATIO AMPLIFIER
- CONSUMES NO AIR IN STEADY STATE
- EXTERNAL SENSOR CLOSED LOOP OPTION AVAILABLE
- FAST, ACCURATE, AND PRECISE HIGH PRESSURE CONTROL OF MEDIA
- MOUNTS IN ANY POSITION
- FOR USE IN NON-HAZARDOUS, NON-ATEX ENVIRONMENTS

DIMENSIONS



Application Highlight

BACK PRESSURE CONTROL UP TO 1000 PSI WITH GP1 AND LF SERIES BPR

A common way to achieve automated back pressure control is with a pilot operated back pressure regulator. Other manufacturers would recommend that you do this by using a low pressure electro-pneumatic regulator (0 – 100 psig for example) to provide a pilot pressure to a ratio operated back pressure regulator with a high ratio (often 8:1 or higher for high pressures). These installations are often inaccurate, due to the high ratio required to operate, and often require a secondary pressure transducer and extensive PID tuning, in order to get acceptable control.

By contrast, the GP1 electronic regulator can be used to pilot operate an Equilibar® LF Series back pressure regulator to get true 1:1 ratio control without any PID tuning or complicated installations (See Fig. 1). The Equilibar LF Series dome-loaded back pressure regulator accepts a pilot pressure equal to the desired upstream pressure and works to match that setpoint. The LF series has near infinite resolution, so the only limitation is the resolution of the pilot regulator, making fine adjustments very simple. The GP1 and the LF Series both operate in a range up to 1000 psig, making them an ideal match for high pressure control.

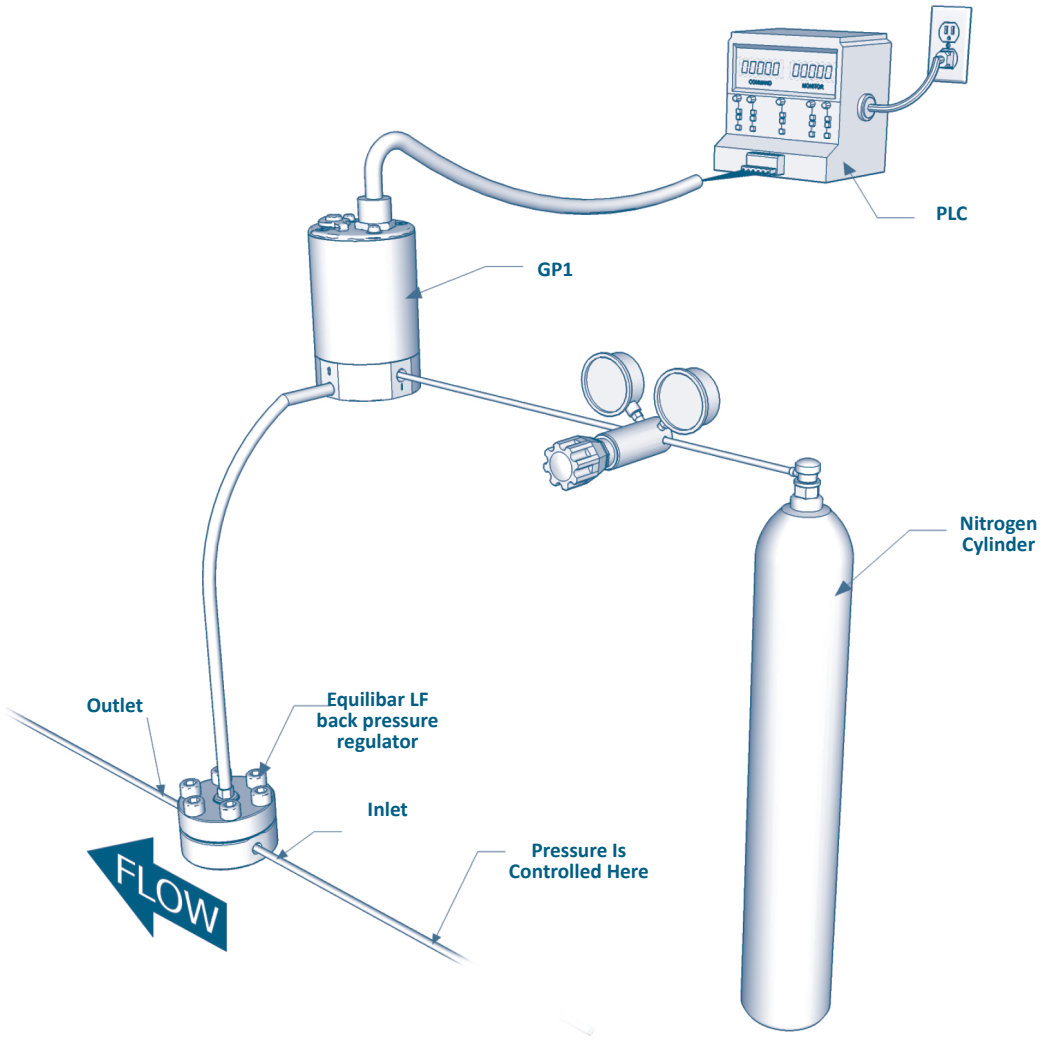


Fig. 1 GP1 electronic regulator used to pilot operate an Equilibar® LF Series back pressure regulator

General Specifications & Performance Characteristics

ELECTRICAL	MINIMUM	TYPICAL	MAXIMUM
Supply Voltage	15VDC	-	24VDC
Supply Current	100mADC	-	950mADC
Command Signal			
Voltage	0VDC	-	10VDC
Current	4mADC	-	20mADC
Analog Monitor Output			
Voltage	0VDC	-	10VDC
Current	4mADC	-	20mADC
TTL			
Satisfied	-	0VDC	-
Not-Satisfied	-	5VDC	-
2nd Loop Input	OVDC	-	10VDC
PNEUMATIC	**MINIMUM**	**TYPICAL**	**MAXIMUM**
Inlet Pressure [1]	Vacuum	110% of full scale calibration	1100 psig (75.8 bar(g))[2]
Pressure Range [1, 3]	Vacuum	-	1000 psig (68.9 bar(g))
Flow Rate	0	-	10 SCFM (17 m^3/hr)
Filtration Required	40 micron	20 micron (supplied with unit)	-
Accuracy (Pressure)	±0.1%F.S.	±0.25%F.S.	±0.5%F.S.
Accuracy (Monitor)	-	±0.3%F.S.	±0.5%F.S.
Hysteresis [4]	±0.2%F.S.	±0.02%F.S.	±0.5%F.S.
Port Size (all)	-	1/8 inch NPT female (1/8 inch BSPP optional)	-
Critical Volume [5]	-	3 in^3	-
PHYSICAL	**MINIMUM**	**TYPICAL**	**MAXIMUM**
Operating Temperature	32°F (0°C)	-	158°F (70°C)
Environment Protection [6]	-	-	NEMA 4 (IP65)
Weight	-	Brass 3.75 LBS (1.75 KG) S.S. 3.73 LBS (1.73 KG)	-
Electrical Connector	-	6 pin molded 16 gauge wire	-

[1] Pressure ranges are customer specified
[2] This is max inlet for valves with orifice size 1 & 2; Max inlet for orifice size 3 is 550 psig / 37.9 bar(g)
[3] Pressure range may be ordered as PSIG or PSIA
[4] User adjustable
[5] The minimum downstream closed volume is determined by the pressure range, orifice size, hysteresis window, plumbing, as well as other factors. Consult factory for small volume applications
[6] CE approval pending

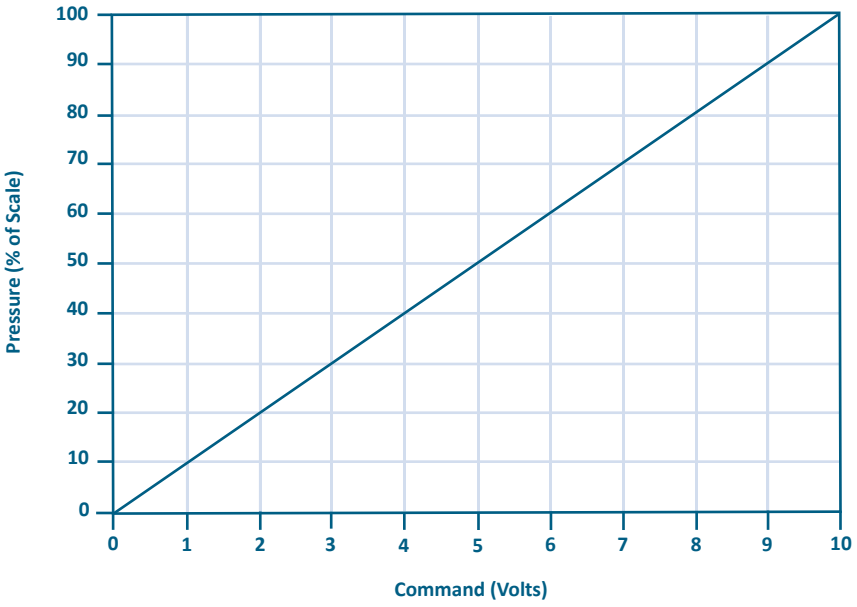
*Not intended for hazardous/explosive environments. *Meant for use with air or inert gases only

WARRANTY

Equilibar products are warranted to the original purchaser only against defects in material or workmanship for one (1) year from the date of manufacture. The extent of Equilibar's liability under this warranty is limited to repair or replacement of the defective unit at Equilibar's option. Equilibar, LLC shall have no liability under this warranty where improper installation or filtration occurred.
All specifications are subject to change without notice. THIS WARRANTY IS GIVEN IN LIEU OF, AND BUYER HEREBY EXPRESSLY WAIVES, WARRANTIES OR LIABILITIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY OBLIGATION OF Equilibar, LLC WITH REGARD TO CONSEQUENTIAL DAMAGES, WARRANTIES OF MERCHANTABILITY, DESCRIPTION, AND FITNESS FOR A PARTICULAR PURPOSE.

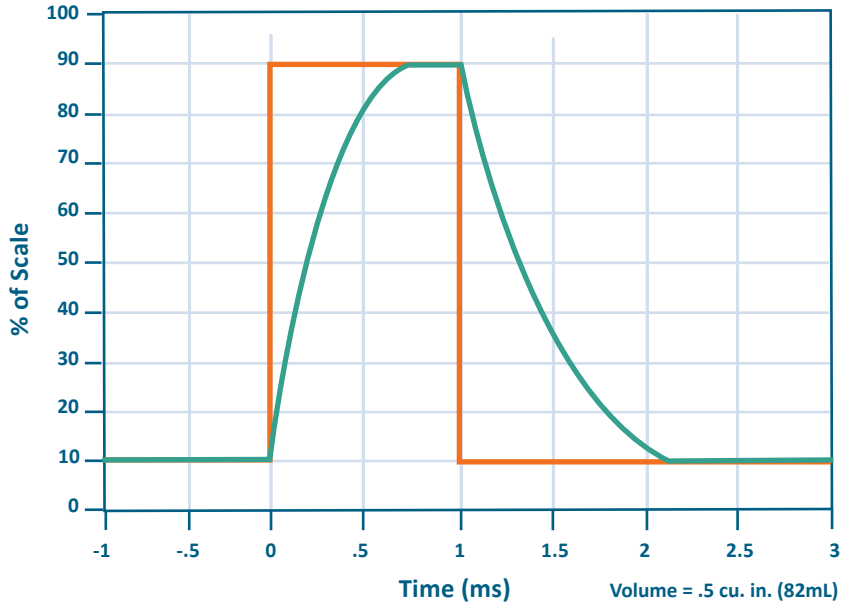
Performance Specifications

LINEARITY



Linear characteristics of GP Series products when given a ramp signal from 0-10 volts. Characteristics would be similar for 4-20mA units.

RESPONSE TO STEP INPUT



Response times for the GP to fill/exhaust a closed chamber. Step command signal is superimposed over pressure trace. Time is determined by difference between command signal and pressure achieved.

WARNING: Installation and use of this product should be under the supervision and control of properly qualified personnel in order to avoid the risk of injury or death.

GP Part Number Information

EXAMPLE PART NUMBER	GP	1	B	N	E	E	Z		P	500	PS	G	1	O2	TF
Your Part Number:	GP														
		1	2	3	4	5	6	7	8	9	10	11	12	13	

1 TYPE

1 Single Loop

2 MANIFOLD MATERIAL

B Brass (Standard)

S 303 Stainless Steel

3 THREAD TYPE

N NPT (Standard)

P BSPP (ISO-G)

4 INPUT SIGNAL RANGE

E 0 to 10 Vdc (Single Ended)

I 4 to 20 mADC (Differential)

K 0 to 5 Vdc

V 1 to 5 Vdc

5 MONITOR SIGNAL RANGE

X No Monitor

E 0 to 10 Vdc

S 4 to 20 mADC (Sourcing)

K 0 to 5 Vdc

V 1 to 5 Vdc

6 ZERO OFFSET

N 0% Pressure Starts Below Atmosphere

P 0% Pressure Starts Above Atmosphere

Z 0% Pressure Starts at Zero (Typical)

7 ZERO OFFSET PRESSURE

5 This is an example. Your number will be the bottom of you desired pressure range. Most often your number will be blank.

8 TYPE

N 0% Pressure Ends Below Atmosphere

P 0% Pressure Ends Above Atmosphere

Z 0% Pressure Ends at Zero

9 FULL SCALE PRESSURE

650 This is an example. Your number will be the top of your desired pressure range.

10 PRESSURE UNIT

PS	PSI	**IH**	Inches Hg
MB	Millibars	**IW**	Inches H_20
BR	Bar	**MW**	mm H_20
KP	Kilopascal	**KG**	Kilograms/cm^2
MP	Megapascal	**TR**	Torr*
MH	mm Hg	**CW**	Centimeters H_20

*Requires A for Pressure Unit of Measure

11 PRESSURE UNIT OF MEASURE

A Absolute Pressure

G Gauge Pressure

12 ORIFICE DIAMETER OF THE SOLENOID VALVES

1 0.012”

2 1/32”

3 3/64”

Please Consult Factory for Valve Sizing Assistance

13 POPULAR OPTIONS

TF No Bleed Orifice

O2 Oxygen Cleaned

O3 Oxygen Cleaned for Non-Oxygen Use

TYPICALLY IN STOCK PARTS[1]

PART NUMBER	TYPE	MANIFOLD MATERIAL	CONNECTION	INPUT SIGNAL RANGE	MONITOR SIGNAL RANGE	FULL SCALE PRESSURE	ORIFICE DIAMETER OF THE SOLENOID VALVES	AVAILABILITY
GP1BNEEZP1000PSG1	Single Loop	Brass	1/8” NPT	0-10 Vdc	0-10 Vdc	0-1000 psig	0.012”	2-3 Days
GP1BNISZP1000PSG1	Single Loop	Brass	1/8” NPT	4-20 mADC (Differential)	4-20 mADC (Sourcing)	0-1000 psig	0.012”	2-3 Days

[1]Usually ships in 2 - 3 days ARO

About Equilibar

Equilibar provides innovative and robust pressure control technology for researchers and engineers worldwide. We are proud to design, manufacture and test our patented back pressure regulators in our factory overlooking the Blue Ridge Mountains near Asheville, NC.

APPLICATION ENGINEERING– WHAT SETS US APART

Unlike mass-market regulator distributors, we focus on working with you, the scientist or engineer with a complex pressure control scenario.

Our application engineers work collaboratively with clients to identify the optimal model, trim, and diaphragm for each application's unique challenges. No matter where you are on the globe, you can stay in close contact with your engineer by email, telephone, videoconferencing or fax.

After installation, your application engineer will support you with start-up information and fine-tuning as needed.

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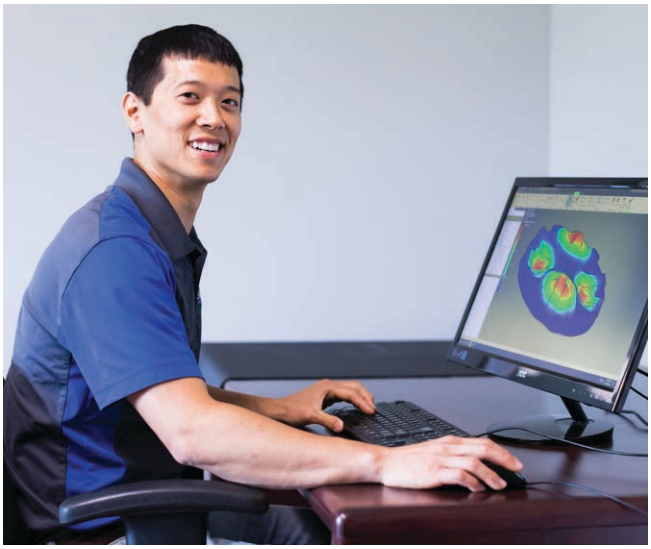
Each application is reviewed by our engineering team to ensure quality performance of our products.



Our engineers offer custom designed solutions for the most difficult pressure control challenges. Feel free to contact us to discuss your situation.

Made in the USA

Equilibar's quality system is **ISO 9001:2015** certified.