

AUTO PRESSURE REGULATOR GR-511(F)-EPV

CODE: I031424700
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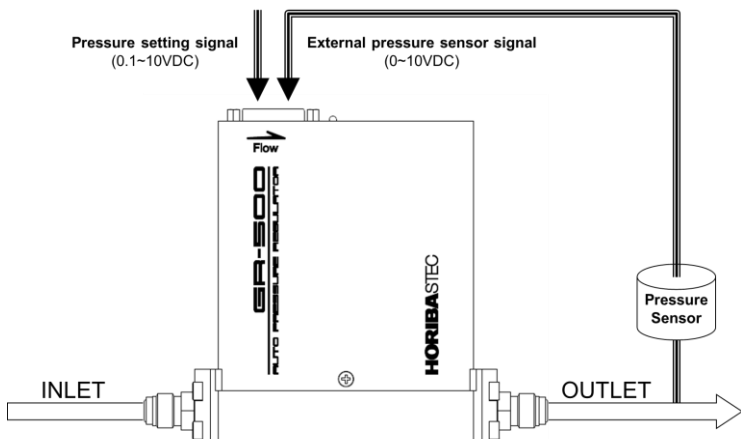
1.SPECIFICATIONS

Model *1	GR-511F-EPV
Valve Type	C: Normally close
Leak integrity	Less than 7×10^{-11} Pa m ³ /s(He)
The maximum operating pressure *2	450 kPa(A)
Pressure resistance *2	1000 kPa(G)
Operating temperature	5 ~ 50 deg.C
Power supply	± 15VDC ±5%
Power consumption	7.5 VA
Interface	Analog
Gas *3	He, Ar, N ₂
Standard fittings	1/4 Inch VCR or equivalent
Pressure full scale	External pressure sensor full scale
Pressure control range	1 ~ 100 %
Pressure setting signal	0.1~10VDC (1 ~ 100 %F.S.)
External pressure input signal *4	0~10VDC (0 ~ 100 %F.S.)
Pressure output signal *5	0~10VDC (0 ~ 100 %F.S.)
Flow full scale *6	20, 50, 100 SCCM
Flow accuracy *7 *8	± 1.0 %R.S. (Flow rate > 25 %F.S.) ± 0.25 %F.S. (Flow rate ≤ 25 %F.S.)
Flow rate output signal	0 ~ 5 VDC (0 ~ 100 %F.S.)
Mounting orientation *9	Free
Weight *10	1.35kg

- *1 F:With flow monitor function type
- *2 (A): Absolute Pressure, (G): Gauge Pressure
- *3 Please consult about other specifications.
- *4 Analog signal reading accuracy is $10V \pm 7mV$ towards calibrated analog voltage 10V.
- *5 Pressure signal introduced from connected external pressure sensor can be monitored.
- *6 SCCM denote gas flow rate in ml/mi under 0 deg.C, 101.3 kPa(A), respectively
- *7 Flow accuracy complies with SEMI E56-0309. Guaranteed for calibration gas (N₂), full scale and pressure condition.
- *8 A flow rate exceeding 100% F.S. cannot be guaranteed for accuracy.
- *9 Please make a zero point adjustment for flow rate in an actual-use environment to eliminate mounting operation effect.
- *10 Reference value with standard fitting

2.PRODUCT OVERVIEW

This device uses an external pressure gauge to control the pressure. There is an external pressure sensor signal pin and pressure setting signal pin on the D-subminiature15 contact pin connector, and pressure control is possible by inputting both signals.



3.ELECTRICAL CONNECTION

Connector to be used D-subminiature 15 contact pin in connector with #4-40UNC screw type.

Pin No.	Signal Name
1	Valve voltage monitor (Minimum resistance:2KΩ)
2	External pressure output signal (Minimum resistance:2KΩ)
3	Valve override close signal *1
4	Valve override open signal *1
5	Power common *2
6	Power supply input (-15VDC, capacity:250mA)
7	Power supply input (+15VDC, capacity:250mA)
8	Pressure setting signal (Input impedance:1MΩ or more)
9	Flow rate output signal (Minimum resistance:2KΩ)
10	External pressure sensor signal input
11	Signal common *2
12	Signal common *2
13	Trip point A *3
14	Trip point B *3
15	Chassis Ground

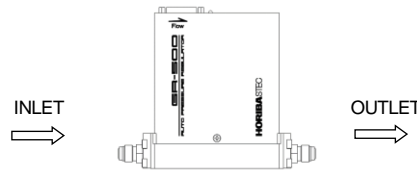
- *1 To activate, connect to signal common (Pin 11, 12). Please make resistance to be less than 50Ω. Please set N.C. (non-connection) when deactivate
- *2 In order to prevent the common voltage change by valve drive current, Power common (Pin 5) and Signal common (Pin 11, 12) have the necessity of connecting by the GND side of a power supply. Power common (Pin 5) and Signal common (Pin 11, 12) are not connected inside the product, please wire separately and connect to become common by the power supply side.
- *3 Open Collector NPN-Type. When connecting the inductive loads such as solenoid, electromagnetic valve, etc., connect the counter-electromotive force preventing diode. Rated current is 10mA@30VDC or 250mA@1V.

To minimize the effect of electrical noise, please be sure to use a shielded cable (less than 30m) with both ends properly grounded. If you use other kinds of cable on the market selling, it may not connect depending on the shape of a plug and hood.

4.HOW TO OPERATE

1) Connection to Gas System

The product case is labeled with a flow direction arrow. Please make sure that the product is mounted in the corrected direction with respect to flow.



Gas inlet and outlet of the product fittings are 1/4 inch VCR or equivalent with male screw fitting as standard. This product can be mounted in any orientation, in most applications, without degradation of performance.

Please make sure that process connections are as leak tight as possible. Confirm leak integrity of the installed product at the gas system connections using a helium mass spectrometer leak detector with sufficient sensitivity.

2) Connection to Electrical System

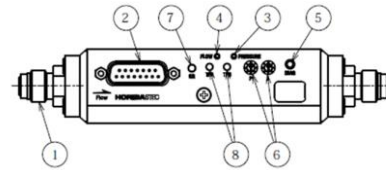
Electrical connection is in accordance with the electrical pin assignments table. Failure to make a proper connection of the cable will cause damage to the product.

Power requirements for direct current are:
more than +15V±5% 250mA
more than -15V±5% 250mA

3) Warming Up Operation

The power is to be supplied more than five minutes without gas flowing, as warming-up operation. It is recommended to maintain 30 minutes as warming up operation. Without warming-up operation, accuracy may have variations. It is recommended to use Zero-Adjust function after power is supplied for more than one hour.

5.Names at each part, and LED indication



No.	Description
①	Fitting: 1/4 inch VCR male compatible
②	D-subminiature 15 connector
③	Pressure signal reading adjustment button
④	Flow zero adjustment button
⑤	Service port
⑥	PID gain switch (P item, I item)
⑦	Status LED
⑧	Trip Point LED

- 1) Status LED ("GR")
Status LED indicates the product's status. Green solid in normal condition. If an error or irregular condition is occurred, Status LED turns to be red solid.
- 2) Trip point LED ("TPA" / "TPB")
This product provides two independent open collector output. When one or both is in active (detected pressure value is exceeded the threshold), corresponding Trip point LED turn to green solid. Otherwise, LEDs turn to be off. An application software is available for setting the threshold for each open collector. Please contact our company for the detail.
- 3) PID gain switch ("P" / "I")
The product can change over the response time in 8 steps by a rotary dip switch. The rotary dip switch is set at 7 as a default value. If the pressure control is not stabilized, change over the response time with this.



6.Zero adjustment

1) Pressure signal reading adjustment

After warming up sufficiently under the operating environment conditions, short "external pressure sensor signal input" (Pin 10) and "signal common" (Pin 11, 12), and press and hold "Pressure reading adjustment button" for more than 1 second, "Pressure signal reading adjustment" to be completed.

2) Flow zero adjustment

Stop the supply of gas and verify the flow rate output fluctuation is less than +/- 0.2% of full scale as a guide, after fully warming up with the product kept under usage environment. Keep the flow zero adjustment switch (arranged on panel) pressed for over one second thereafter, to complete the zero adjustment.

7.CAUTION AND REMINDERS

- 1) Please make sure that process piping system is as leak tight as possible. It is important to purge the entire gas line. If the purge is not sufficient, it might invite troubles such as particle generation, clogging, decrease in throughput, etc.
- 2) Please install gas filter on inlet side of product for eliminating particles and impurities which flow from upstream of gas line.
- 3) Please make sure that the process piping system is made of metal and grounded electrically for electromagnetic compatibility performance.
- 4) Preservation temperature of product is 0 to 80 deg.C. Please avoid the temperature out of range for preservation. Please do not dewing it or make it to failure.
- 5) Never remove the product case, since there is a high voltage portion built inside the product. Removing the case might invite to receive an electric shock, or to result in failure of the product.
- 6) Analog external pressure output signal, Flow rate output signal and Valve voltage monitor signal may be output transitionally within the range of the power supply voltage. When either one or both signal is used, please take care of the input voltage resistance of the system.
- 7) Please do not turn on and off the power repeatedly in a short period. More than three(3) seconds should be kept before turning on the power again. Each ±15V power source should be turned on / off simultaneously. Partial power supply or signal input, and plugging/unplugging while power is supplied, may cause trouble.
- 8) Please make sure of sufficient capacity of power supply source.
- 9) Please do not apply any excessive force or gas pressure on the product body and the cable.
- 10) The flow rate of product at shipment is calibrated at 25 deg.C under 1013hPa(1atm) or 0 deg.C under 1013hPa(1atm).
The following notations are used for gas flow rate units for convenience;
CCM, LM : ml/min, l/min at 25 deg.C under 1013hPa(1atm)
SCCM, SLM : ml/min, l/min at 0 deg.C under 1013hPa(1atm)
- 11) Please keep in mind that the control valve used in the product cannot provide positive shut-off capability. Where positive shut-off is required, a separate isolation valve should be installed for this purpose.
- 12) When using the pneumatic valve in front or behind the product to shut off the gas, the abnormal movement such as overshoots might be occurred depending on an open or shut timing of the pneumatic valve. please open the pneumatic valve prior to input pressure setpoint to the product.
- 13) When the control valve in the product is fully open or when it's out of control, the pressure rate of flow or the pressure rate of gas may exceed the indicated full scale value.
- 14) This is a product for industrial environments. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

*This instruction manual is subject to alteration without notice.

8.PRODUCT WARRANTY

- 1) Period:
This product is warranted for one (1) year (parts and labor) from date of shipment. Repair will be provided free of charge during this period if the product is returned to HORIBA STEC or authorized service representative with a description of the problem.
HORIBA STEC is not responsible for damage due to customer neglect or improper operation of this product.
- 2) Scope:
Warranty coverage is restricted to this product only. HORIBA STEC is not responsible for damage to other components due to improper operation of this product.
- 3) Warranty:
Replacement parts are warranted for ninety (90) days or the remainder of the warranty period (whichever is longer).
- 4) HORIBA STEC is not responsible for damage due to:
 - a) Natural disasters
 - b) Miss-operation or abuse of this product
 - c) Operation or storage in an unsuitable environment
 - d) Operation outside of the rated specifications
 - e) Unauthorized alterations or retrofits to this product

Examples for out of scope of responsibility by HORIBA STEC;
*In case of use of high reaction gas, clogging due to incomplete purge or leakage, etc. in gas line.
*Contamination or clogging by dust or mist, etc.
Repair expense with/without charge is to be determined as examination and/or disassembly of the returned products.


产品中有害物质的名称及含量

Name and amount of hazardous substance used in a product

部件名称 Unit name	有害物质 Hazardous substance					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent chromium (Cr (VI))	多溴联苯 Polybromo- biphenyl (PBB)	多溴二苯醚 Polybromo- diphenyl ether (PBDE)
印刷电路板 Printed board	×	○	○	○	○	○
外壳 Case	○	○	○	○	○	○
机械零部件 Machine parts	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
This form is prepared in accordance with SJ / T 11364.
○: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
Denotes that the amount of the hazardous substance contained in all of the homogeneous materials used in the component is below the limit on the acceptable amount stipulated in the GB/T 26572.
×: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。
Denotes that the amount of the hazardous substance contained in any of the homogeneous materials used in the component is above the limit on the acceptable amount stipulated in the GB/T 26572.

标记的意义
Meaning of Marking

 本标记适用在中华人民共和国售电器电子产品, 标记中央的数字表示环境保护使用期限的年数。(不是表示产品质量保证期间。)
只要遵守这个产品有关的安全和使用注意事项, 从制造日开始算起在这个年限内, 不会给环境污染、人体和财产带来严重的影响。请不要随意废弃本电器电子产品。

For questions or service please contact

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