

# GPCA

## General Purpose Pressure Controller



The GPCA is a 1.125" (28.6 mm) wide metal-sealed pressure controller well suited for a wide variety of applications requiring pressure control capability from 500 Torr to 100 psi. The GPCA incorporates the latest in digital flow control electronics along with a well proven, thermally stable pressure sensor and mechanical design.

The GPCA digitally controlled pressure controller is available with digital I/O (EtherCAT®, DeviceNet™ or RS485). The digital control electronics utilize the latest in MKS control algorithms providing fast and repeatable response to set point throughout the device control range. Typical response times are less than 1 second dependent on installation conditions. Included is a digital calibration that yields 1% of set point accuracy.

The GPCA is available from 500 Torr to 100 psi Full Scale. Specific units may be selected at time of order.

The user can easily configure the device to other pressure units such as kPa or mbar simply using the device embedded Ethernet user interface and a PC.

The GPCA with 4 VCR® fittings is designed with a 1.125" (28.6 mm) width and standard 4.88" (124 mm overall) length allowing it to fit in standard gas systems. It is also available with the 1.125" (38.6 mm) IGS compatible c-seal and w-seal configurations. The GPCA metal-sealed pressure controller with its 10 microinch, electropolished surface finish is well suited for use in high purity process applications. The GPCA is available with a normally closed or normally open valve and may be configured for controlling either inlet pressure to the device or the outlet pressure of the device.

### Product Features

- Percent of set point accuracy enables precise process control
- Temperature compensated pressure sensor maintains tight accuracy over the operating temperature range
- 10 μinch electropolished 316L per SEMI F-20 surface finish and metal seals enable PC use for high purity applications
- Embedded user interface provides the ability to
  - Easily change device range and units to reduce inventory requirements
  - Monitor device functionality and collect performance data in-situ



### Key Benefits

- Thermally stable pressure sensor and mechanical design
- Fast, repeatable response to set point
- Configurable to other pressure units

## Performance

<b>Pressure Type</b>	Absolute	
<b>Pressure Full Scale Ranges</b>	500 Torr, 1000 Torr, 2000 Torr, 100 psia	
<b>Transducer Over Pressure Limit</b>	2x Full Scale for all ranges	
<b>Maximum Differential Pressure</b>	45 psid	
<b>Burst Pressure</b>	1500 psig	
<b>Flow/Orifice Full Scale Ranges<sup>1</sup></b>	50, 200, 1000, 5000, 10000, 20000, 30000, 50000 sccm	
<b>Control Modes</b>	Upstream or Downstream	
<b>Pressure Measurement Accuracy</b>	±0.5% of Reading	
<b>Temperature Coefficients</b>	<b>Zero Span</b>	<ul style="list-style-type: none"> <li>• ±0.02% of Full Scale/°C</li> <li>• ±0.04% of Reading/°C</li> </ul>
<b>Pressure Readout Units<sup>2</sup></b>	Torr, kPa, psi, mbar	
<b>Pressure Resolution</b>	0.1 Torr	
<b>Pressure Control Accuracy<sup>3</sup></b>	<ul style="list-style-type: none"> <li>• ±1.0% of Reading (≥10% Full Scale)</li> <li>• ±0.2% of Full Scale (&lt;10% Full Scale)</li> </ul>	
<b>Control Range</b>	>2 to 100% of Full Scale	
<b>Typical Response Time<sup>4</sup></b>	<1.0 second	
<b>Operating Temperature Range</b>	10° to 50°C (50° to 122°F)	
<b>Storage Temperature Range</b>	-20° to 80°C (-4° to 176°F)	
<b>Storage Humidity Range</b>	0 to 95% relative humidity, non-condensing	

<sup>1</sup> Orifice Full Scale ranges are nominal Full Scale flow rates for Nitrogen with 15 psig on the inlet and atmosphere on the outlet side.

<sup>2</sup> Some readout units may not be available over every primary I/O.

<sup>3</sup> Accuracy includes linearity, hysteresis, and repeatability.

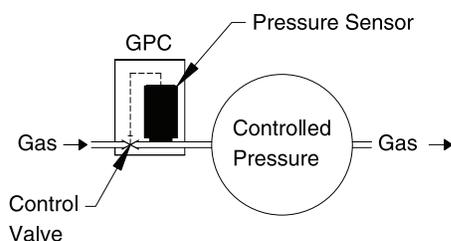
<sup>4</sup> Excludes system time constant. Control tuning required for optimum performance.

## Mechanical

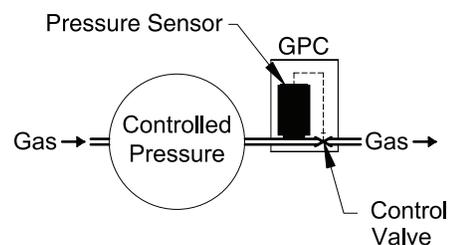
<b>Fittings</b>	Swagelok® 4 VCR Male, 1-1/8" surface mount (C-seal, W-seal), 1/4" Swagelok compression seal	
<b>Valve Options</b>	<b>Type Seat Material</b>	<ul style="list-style-type: none"> <li>• Normally Closed or Normally Open</li> <li>• PTFE (Teflon®)</li> </ul>
<b>Leak Integrity</b>	<b>External (scc/sec He) Through Closed Valve</b>	<ul style="list-style-type: none"> <li>• &lt;1 x 10<sup>-10</sup></li> <li>• &lt;1.0% of orifice Full Scale (Nitrogen at 25 psig on inlet to atmosphere)</li> </ul>
<b>Wetted Materials</b>	<b>Standard Optional (Valve Seat)</b>	<ul style="list-style-type: none"> <li>• 316L S.S. VAR (equivalent to 316 S.S. SCQ for semiconductor quality), 316 S.S., Elgiloy®, KM-45</li> <li>• PTFE (Teflon)</li> </ul>
<b>Surface Finish</b>	10 μinches, average Ra electropolished	
<b>Weight</b>	<3 lbs (1.36 kg)	

Note: The pressure controllers require flow to operate, and will not control pressure in "dead-ended" (zero flow) applications.

### DOWNSTREAM CONTROL



### UPSTREAM CONTROL





Ordering Code Example: GPCAA13TR62UT10	Code	Configuration
<b>Model</b>		
GPCA Pressure Controller	GPCA	GPCA
<b>Pressure Reading</b>		
Absolute	A	A
<b>Pressure Range Full Scale</b>		
500 Torr (mmHg) 1000 Torr (mmHg) 2000 Torr (mmHg) 60 psia 100 psia 1000 mbar 2000 mbar 5000 mbar 100 kPa 200 kPa 600 kPa	52T 13T 23T 61P 12P 13M 23M 53M 12K 22K 62K	13T
<b>Fittings (compatible with)</b>		
Swagelok 4 VCR ¼" Swagelok C-Seal W-seal (1.125")	R S C H	R
<b>Electrical Connector</b>		
RS485 (ASCII), 9 pin connector DeviceNet EtherCAT	5 6 8	6
<b>Orifice Size (See Note)</b>		
A (50 sccm) #1 (200 sccm) #2 (1000 sccm) #3 (5000 sccm) #4 (10,000 sccm) #5 (20,000 sccm) #6 (30,000 sccm) #7 (50,000 sccm)	A 1 2 3 4 5 6 7	2
<b>Pressure Control</b>		
Upstream Downstream	U D	U
<b>Valve Seal Material/Operation</b>		
Teflon/Normally Closed Valve Teflon/Normally Open Valve (DeviceNet Only)	T1 T2	T1
<b>Reserved for Future Use</b>		
Standard	0	0
<b>Firmware</b>		
Customer must specify firmware version at time of order.	10	10

Note: To assess appropriate valve orifice, see MKS Application Note #01/06: Pressure Controller-Valve Orifice Selection Guide.