

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 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

Specifications

Performance

Pressure Type	Absolute
Pressure Full Scale Ranges	500 Torr, 1000 Torr, 2000 Torr, 100 psia
Transducer Over Pressure Limit	2x Full Scale for all ranges
Maximum Differential Pressure	45 psid
Burst Pressure	1500 psig
Orifice Full Scale Ranges ¹	50, 200, 1000, 5000, 10000, 20000, 30000, 50000 sccm
Control Modes	Upstream or Downstream
Pressure Measurement Accuracy	±0.5% of Reading
Temperature Coefficients	
Zero	±0.02% of Full Scale/°C
Span	±0.04% of Reading/°C
Pressure Readout Units ²	Torr, kPa, psi, mbar
Pressure Resolution	0.1 Torr
Pressure Control Accuracy ³	±1.0% of Reading (≥10% Full Scale) ±0.2% of Full Scale (<10% Full Scale)
Control Range	>2 to 100% of Full Scale
Typical Response Time ⁴	<1.0 second
Operating Temperature Range	10° to 50°C (50° to 122°F)
Storage Temperature Range	-20° to 80°C (-4° to 176°F)
Storage Humidity Range	0 to 95% relative humidity, non-condensing

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

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

³ Accuracy includes linearity, hysteresis, and repeatability.

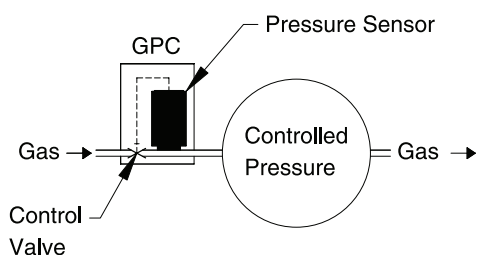
⁴ Excludes system time constant. Control tuning required for optimum performance.

Mechanical

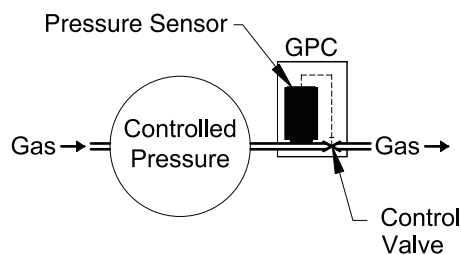
Fittings	Swagelok® 4 VCR Male, 1-1/8" surface mount (C-seal, W-seal), 1/4" Swagelok compression seal
Valve Options	
Type	Normally Closed
Seat Material	PTFE (Teflon®)
Leak Integrity	
External (scc/sec He)	<1 x 10 ⁻¹⁰
Through closed valve	<1.0% of orifice Full Scale (Nitrogen at 25 psig on inlet to atmosphere)
Wetted Materials	
Standard	316L S.S. VAR (equivalent to 316 S.S. SCQ for semiconductor quality), 316 S.S., Elgiloy®, KM-45
Optional (Valve Seat)	PTFE (Teflon)
Surface Finish	<10 µinches, average Ra electropolished
Weight	<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



Digital I/O

DeviceNet™

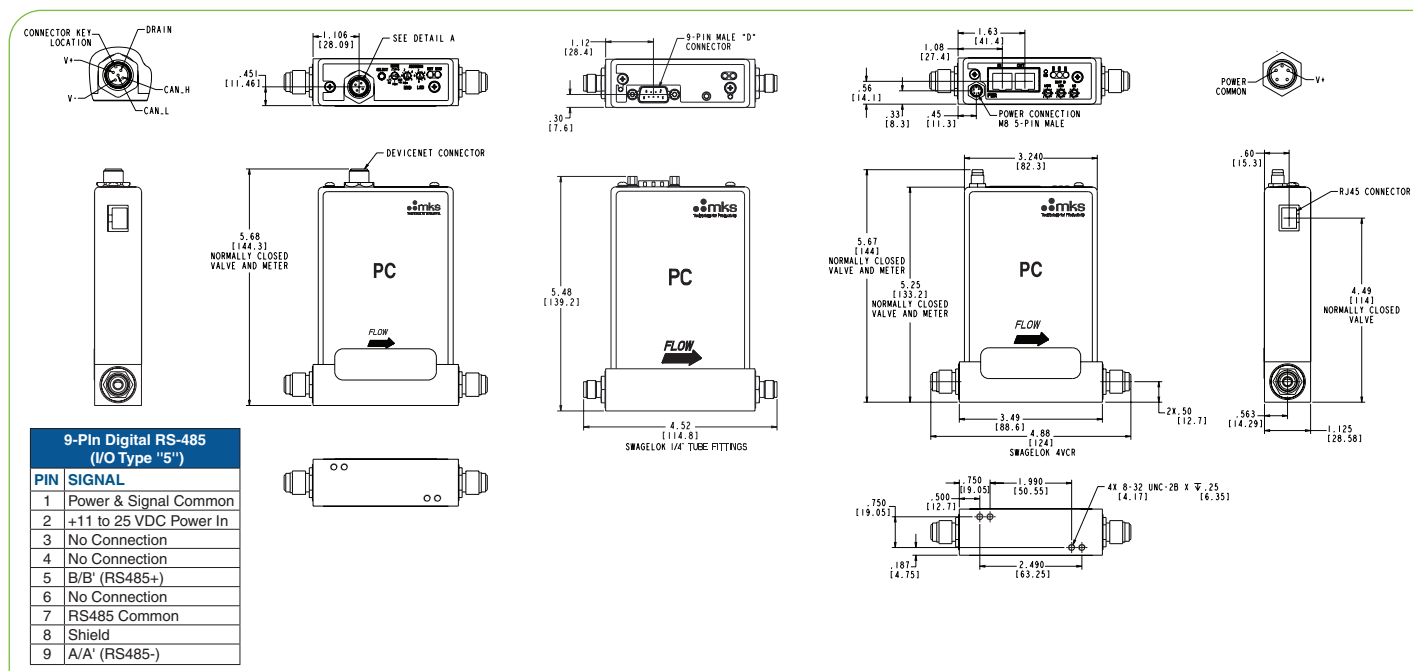
Input Power Required	+11 to +25 VDC per (<4 watts)
Connector	5 pin micro connector (power and comm.)
Data Rate Switch/Selection	4 positions: 125, 250, 500K (Default), (programmable over network)
Comm. Rate (s)	125 Kbps, 250 Kbps, 500 Kbps
MAC ID Switches/Addresses	2 switches, 10 positions; 0,0 to 6,3, 1 to 254
Network Size	Up to 64 nodes
Visual Indicators	LED Network (green/red), LED Module (green/red)
Compliance	CE

EtherCAT®

Input Power Required	+24 VDC (<5 watts)
Connector	2 x RJ-45 (comm.) male, M8 male, 5 pin (power)
Data Rate Switch/Selection	No switch
Comm. Rate (s)	100 Mbps
Mac ID Switches/Addresses	3 switches, 16 positions
Network Size	Up to 4095 nodes
Visual Indicators	LED Power (green), LED Run (green), LED Error (red), LED Comm (green)
Compliance	CE

RS485

Input Power Required	+15 to +24 VDC (<4 watts)
Connector	9 pin Type D male (power and comm.)
Data Rate Switch/Selection	No switch, Set data rate via RS485
Comm. Rate (s)	9.6 Kbps, 19.2 Kbps, 38.4 Kbps
Mac ID Switches/Addresses	Set address over RS485, Station Addresses 0,0 to 9,9
Network Size	Up to 32 nodes
Visual Indicators	LED Comm (yellow), LED Error (red)
Compliance	CE



Dimensional Drawing

Note: Unless otherwise specified, dimensions are nominal values in inches (mm referenced).

Ordering Information

Ordering Code Example: GPCAA13TR62UT10		Code	Configuration
GPCA Pressure Controller		GPCA	GPCA
Pressure Reading			
Absolute		A	A
Pressure Range Full Scale			
500 Torr (mmHg)	52T	13T	
1000 Torr (mmHg)	13T		
2000 Torr (mmHg)	23T		
60 psia	61P		
100 psia	12P		
1000 mbar	13M		
2000 mbar	23M		
5000 mbar	53M		
100 kPa	12K		
200 kPa	22K		
600 kPa	62K		
Fittings (compatible with)			
Swagelok 4 VCR	R	R	
¼" Swagelok	S		
C-Seal	C		
W-seal (1.125")	H		
Electrical Connector			
RS485 (ASCII), 9 pin connector	5	6	
DeviceNet	6		
EtherCAT	8		
Orifice Size (See Note)			
A (50 sccm)	A	2	
#1 (200 sccm)	1		
#2 (1000 sccm)	2		
#3 (5000 sccm)	3		
#4 (10,000 sccm)	4		
#5 (20,0000 sccm)	5		
#6 (30,000 sccm)	6		
#7 (50,000 sccm)	7		
Pressure Control			
Upstream	U	U	
Downstream	D		
Valve Seal Material/Operation			
Teflon/NC	T1	T1	
Reserved for MKS Future Use			
Standard	0	0	
Firmware			
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 available at <http://www.mksinst.com/docs/R/OrificeSelectionAppNote.pdf>



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