Instruction Manual
For
Penning Vacuum Gauge
GPH-320C

Single Station Type GPH 320C & GPH 320CS

Multi Station Type GPH 324C & GPH 324CS

Myers Vacuum
1155 Myers Lane
Kittanning, PA 16201
Phone: 724-545-8331
Fax: 724-545-8332
www.myers-vacuum.com

STANDARD WARRENTY

The following warranty will apply only upon condition that Buyer has utilized or operated the goods in strict conformance with operating instructions and manuals appropriate for the goods and any other instructions provided by Seller.

Seller warrants that all goods will be as specified on this order and will be free from defects. No warranty as to fitness, nor suitability to the Buyer's process, nor any other warranty, except of title, shall be implied. Minor deviations from specifications, which do not affect performance of the products covered hereby, shall not be deemed to constitute defects of materials or workmanship or a failure to comply with the specifications referred to herein.

Notice of any claim that the products are in any way defective shall be given the Seller immediately on discovery and the Seller shall thereupon correct the defects by repair or replacement without charge F.O.B. Shipping Point. The liability of the Seller arising out of the supplying of said products, whether based on warranty or otherwise, shall in no case exceed the cost of the parts or products, and all liability shall terminate within one year after shipment from the Seller's plant. The foregoing warranty does not apply to vacuum tubes, diodes, transistors, batteries, lamps or other items which are expendable by nature. No warranty whatever is made with respect to these items and Seller does not agree to repair or replace them. All vacuum gauge sensing elements, such as, thermocouple tubes, Pirani tubes, Philips tubes, etc., are warranted against defects in manufacture in normal use, as determined by Seller's inspection, for a period of 90 days from date of shipment, provided the defective gauge tube is returned to Seller at Kittanning, Pennsylvania for inspection.

STANDARD ACCEPTANCE

The products covered by the order shall be deemed finally inspected and accepted within ten (10) days after delivery thereof, unless notice of rejection or notice of any claim, express or implied, is given in writing to the Seller within said period. Acceptances as aforesaid shall be deemed full performance of the Seller's obligations hereunder save for its obligation under the above warranty.

All correspondence concerning warranty repairs should be addressed to MYERS VACUUM REPAIR, 1155 Myers Lane, Kittanning, PA 16201 Attention Order Services.

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INSTALLATION, OPERATING, AND MAINTENANCE INSTRUCTIONS FOR THE PENNING GAUGE, TYPE GPH-320 AND TYPE GPH-324C

1.0 INTRODUCTION

1.1 Operating Principle

The Penning vacuum gauge (named after its inventor, F. M. Penning) measures pressure as a function of the ion current flowing in a cold cathode pressure sensing tube which operates at high voltage and with a magnetic field. The gauge circuit meter responds to sensing tube ion current, but has a special scale graduated in units of pressure.

1.2 Specifications

AC Power Input:	115 volts, 60 Hz, 18 watts max. *(NOTE: Models bearing letter "S" at the end of the type number are for use on 230 volt,50 Hz power).
Pressure Range:	1 x 10-7 torr to 25 x 10-3 torr; three switched ranges.
Sensing Tube:	GPH-001A (See Figure 2).
Tube Cord Length:	10 feet is standard. Other lengths available (See REPLACEMENT PARTS Section 7)
Response Time:	Limited primarily by response of meter.
Recorder Terminal Volts:	From 6 mv at 1 x 10-6 torr to 2.7 volts at 1 x 10-3 torr. (See Figure 3).
Cabinet:	Half-rack style for bench or rack mounting (See Section 6.0 for details of PK-002 Panel Kit Accessory); GPH-324C requires 3/4 rack space.
Number of Sensing Stations:	GPH-320C: One GPH-324C: One to four (expandable to six)
Cabinet Dimensions:	GPH-320C: 6-1/2 inches high, 8-1/8 inches wide,6-1/2 inches deep. GPH-324C: 6-1/2 inches high, 12-1/8 inches wide,6-1/2 inches deep.

*Wattage shown does not include GPH-010A Control Circuit Accessory

1.3 GPH-010A Control Accessory

AC Power Input:	115/230V, 50/60 Hz (Supplied from gauge power circuit.)
Relay Controlled Output:	Single-pole, double-throw relay contacts rated 3 amps maximum at 120V AC non-inductive load.
Trip Point:	Adjustable from 3 x 10-6 to 25 x 10-3 torr.
Mounting Method:	Plug-in printed circuit card.

2.0 **INSTALLATION**

2.1 Unpacking

Inspect the shipping carton and its contents for damage or shortages. Equipment is normally shipped FOB Kittanning, PA. Any damage in transit is the normal responsibility of the transportation company should be reported to them. The shipping carton contains the items listed below:

2.1.1 The control unit.

2.1.2 The gauge tube. The open tubulation of the tube is plugged with a plastic stopper to prevent foreign particles from entering the tube. Do not remove this plug until you are ready to install the tube in the vacuum system. The magnet in the tube may attract and hold small steel chips, etc.

2.1.3 An instruction manual.

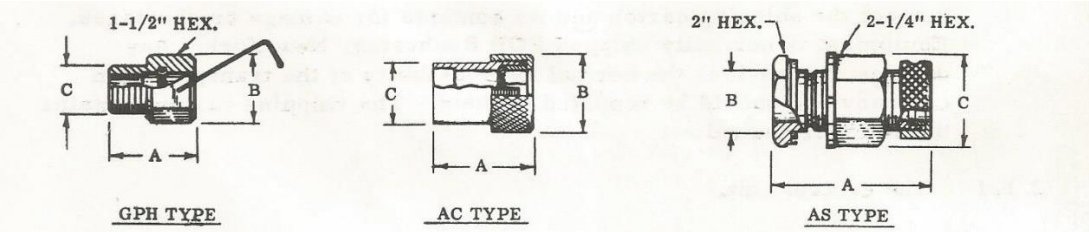
2.2 Installing the Control Unit

2.2.1 Position the gauge control unit for convenience in operation and good meter visibility. A clean location is highly desirable as dust and moisture entering the gauge can result in electrical failure of the high voltage circuitry.

2.2.2 The GPH-320C and GPH-324C and control units can be installed in a standard 19-inch rack cabinet by using a Type PK-002 Rack Adapter Kit as described in Section 6.

2.3 Installing the Gauge Tube(s)

Install the sensing tube(s) in the vacuum system where the pressure is to be measured Avoid locations where heavy back streaming of pump fluid vapors will occur as this will necessitate frequent cleaning of the tube. For convenient installation and quick removal we offer several types of tube of tube connector fittings.



Type	Part Name	Part No.
GPH-002	Tube connector with 1" pipe thread	61504
GPH-003	Tube connector with 1/2" pipe thread	61505
AC	Brass body connector (solder type)	AC-004
AC	Stainless body connector (welding type)	AC-008
AS	Aluminum body (bulkhead seal type)	AS-001-155

DIMENSIONS			
Type	A	B	C
GPH-002	1-7/32	1-3/4	1" NPT
GPH-003	1-9/32	1-3/4	1/2" NPT
AC	2-9/32	1-3/4	1.375
AS	4"	2.598	1.17/32

FIG. 1 TYPICAL GAUGE TUBE CONNECTORS FOR NOMINAL 1" O.D. TUBULATION

Type GPH Tube Connector

This connector has an aluminum body with male pipe threads for attachment to the vacuum system. A Buna-N O-ring makes the seal to the gauge tube, and a spring clip holds the GPH-001 tube in position.

Type AC Tube Connector

This connector is designed for permanent installation by soldering, brazing, or welding into a metal vacuum system. A Viton O-ring provides the seal to the gauge tube. For applications requiring vertical (tube down) mounting, support must be provided for GPH-001 tube.

Type AS Tube Connector

This connector is designed for installation in a 1-17/32" diameter hole in any flat plate (baseplate, bulkhead, etc.) 9/16" to 1-15/16" thick. Viton O- rings make the connector-to-plate and tube-to-connector vacuum seals.

KF 25 to 1” Tube connector (Female) P/N 500234-0025
KF 40 to 1” Tube connector (Female) P/N 500234-0040
KF 50 to 1” Tube connector (Female) P/N 500234-0050
CF 35 (2 ¾” Conflat) to 1” Tube connector (Female) P/N 500235

NOTE: Wherever possible, use the large 1-inch tube connection to minimize errors caused by pumping and/or outgassing of the system if possible, to minimize the effects of outgassing of the sealing O-rings. Rubber tubing is not recommended as a connecting sleeve.

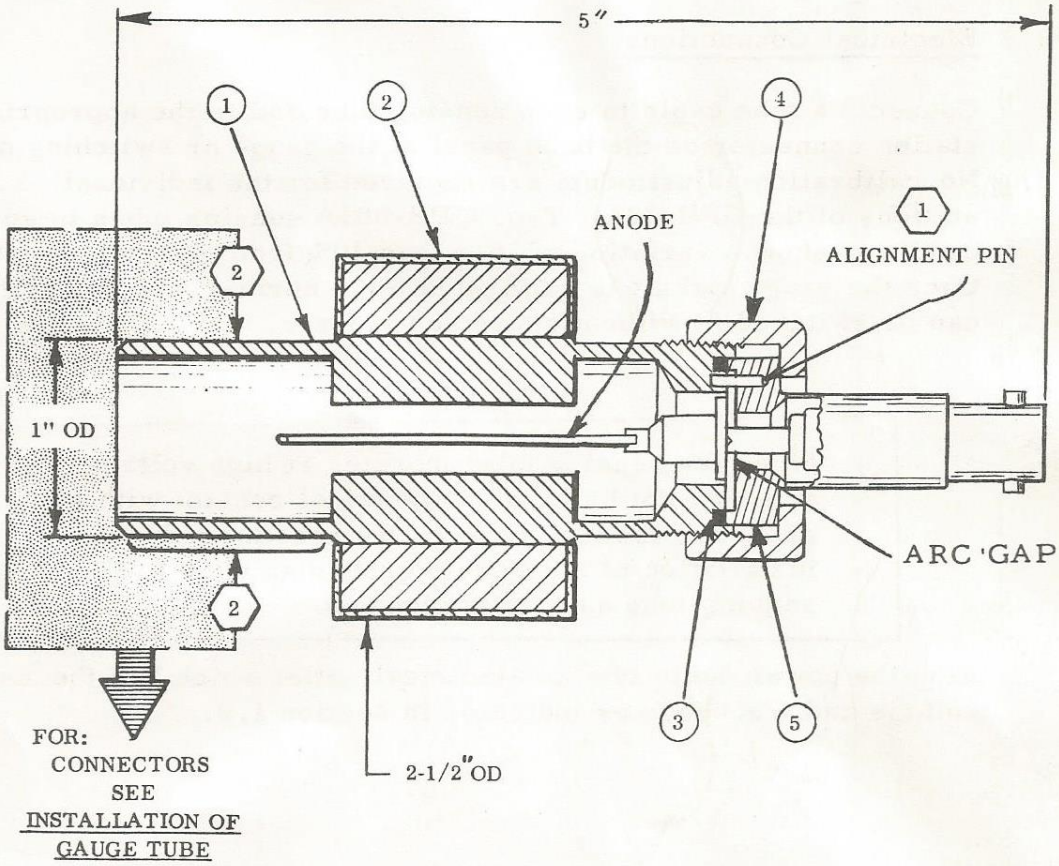
2.4 Electrical Connections

Connect the cable sensing tube to the appropriate station connector on the back panel of the gauge or switching unit. No calibration adjustments are required for the individual stations of the GPH-324. Type GPH-001 sensing tubes in good condition show a variation of less than 10% from normal sensitivity. Once the gauge circuit is calibrated for a normal tube, others tubes can be switched in without appreciable error.

CAUTION:

Since the sensing tube operates at high voltage and may not be in good electrical contact with a grounded vacuum system, we recommend installation of a separate grounding wire to the sensing tube as a safety backup.

Plug the power cable into an electrical outlet which has the correct voltage and frequency as indicated in section 1.2.



CAUTION :
(1) ENGAGE ALIGNMENT PIN BEFORE TIGHTENING CAP NUT ITEM NO. (4)

(2) PROTECT SEAL SURFACE

ITEM NO.	IDENTIFICATION	PART NO.
(1)	CASING ASSEMBLY	61351
(2)	MAGNET	66267
(3)	GASKET	264091-5
(4)	CAP NUT	60053
(5)	ANODE ASSEMBLY	282395

FIG. 2 DISCHARGE GAUGE TUBE TYPE GPH-001A

3.0 **OPERATION**

After the sensing tube has been installed and the electrical connections made, the gauge is ready for operation. A dependable reading on the gauge cannot be obtained until the sensing tube has been outgassed. An outgassing period of a few minutes to an hour or longer may be required for a very contaminated tube. In general, a dependable reading can be obtained if the tube is first allowed to reach equilibrium. If only a general indication of the pressure is required, this warm-up period is unimportant.

Although the gauge will not be damaged by operation of the sensing tube at atmospheric pressure, the control circuit should be turned off when the system pressure is above the operating range of the gauge to prevent rapid contamination of the sensing tube.

When the pressure in the system is approximately 25×10^{-3} torr or less, set the station selector switch (type GPH-324C only) to the desired sensing tube station and turn the gauge on by moving the range selector switch to the 25×10^{-3} position. Allow the tube to reach equilibrium. When the pressure drops to 1×10^{-4} torr or less, move the selector switch to the 10^{-4} position. When the pressure drops to 1x10-5 torr or less, move the selector switch to the 10^{-5} position.

To turn off the gauge, move the range selector switch to the OFF position.

3.1 Sensitivity of the Gauge for Common Gases

If a Penning gauge is calibrated for air, the true pressure for a gas other than air is found by dividing the gauge reading by factor f. The value of f is fairly constant for most gases over the greater part of the operating range.

GAS	f
Helium	0.21
Hydrogen	0.4
Carbon Monoxide	0.95
Nitrogen	1.0
Air (Dry)	1.0
Oxygen	1.23
Carbon Dioxide	1.23
Argon	1.39

3.2 Use of a Recorder

A voltage signal, which is a function of the pressure in the sensing tube, is available at the RECORDER jack on the back panel. The magnitude of the recorder signal may be adjusted (for calibrating the recorder response) means of the potentiometer located adjacent to the recorder jack.

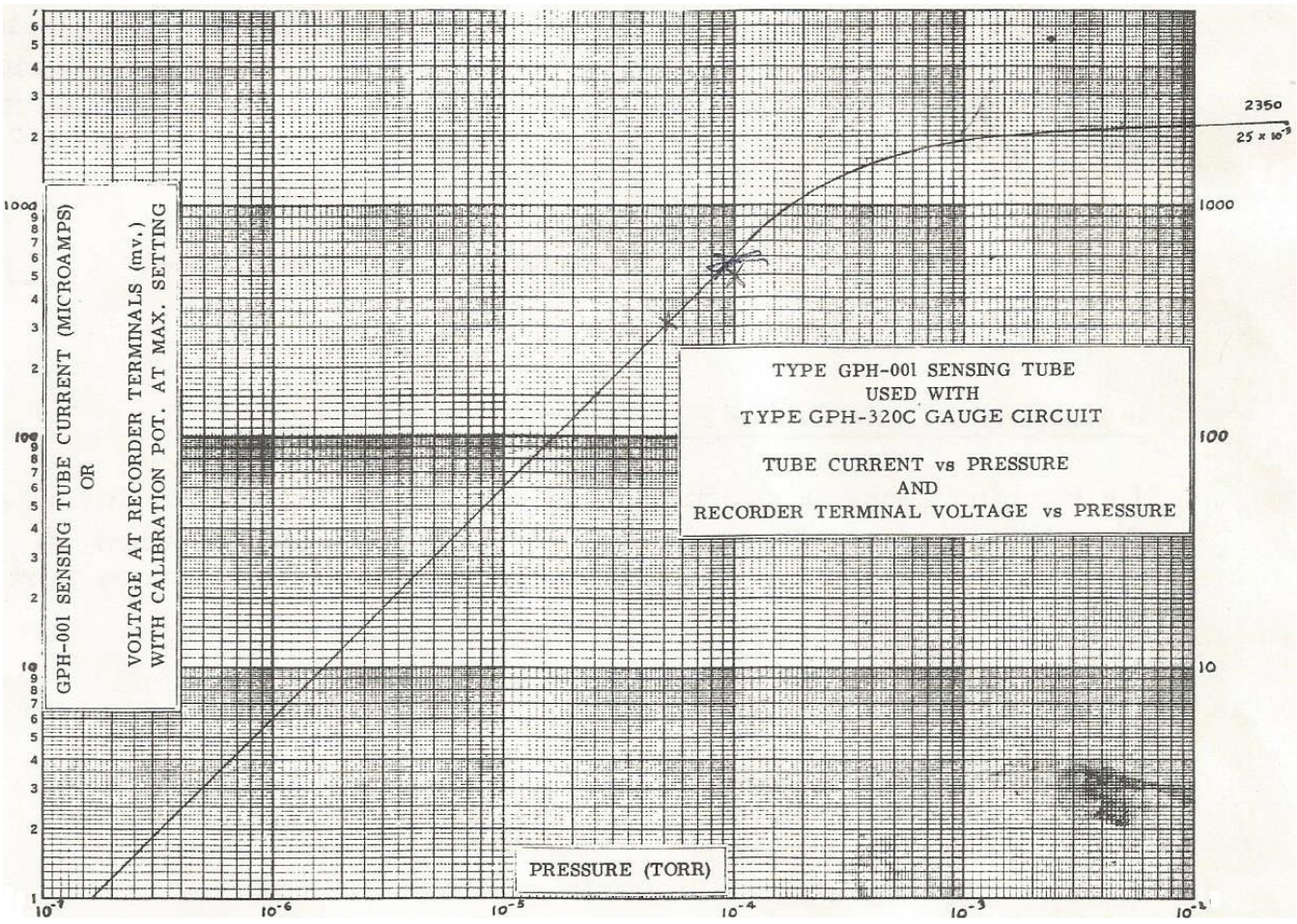
With the recorder calibration potentiometer set for maximum recorder signal, the voltage at the recorder jack terminals will vary with pressures as shown be Figure 3.

The recorder signal is not influenced by the position of the gauge range selector switch and, conversely, the gauge pressure meter is unaffected by the recorder.

Note: The connectors on the rear panel may vary from those shown in this manual. The new recorder connector is 4 pin hex connector. Pin A (Large Pin) is the common pin and is at ground potential. Pin B is the recorder output.

The new control output connector is 7 pin hex connector. Pin A is relay common connection. Pin B is normally open contact, Pin C is normally closed contact.

Mating 4 pin and 7 pin connectors are included with gauge.



4.0 **MAINTENANCE**

4.1 Cleaning the GPH-001 Sensing Tube

The type GPH-001 sensing tube will in time become contaminated with residue from the vacuum system. It may be cleaned as follows:

4.1.1 Unplug the control circuit power cord and disconnect the tube cord from the tube.

4.1.2 Remove the tube from the vacuum system. Although the tube magnet is protected by a blue coating, you should take ordinary precautions to avoid the possibility of demagnetizing.

4.1.3 Unscrew the knurled cap-nut and withdraw the anode assembly from the tube casing. Remove or protect the gasket. Protect the gasket sealing surfaces.

4.1.4 Remove all carbon and residue from inside the tube casing. If suitable equipment is available, vapor blast (liquid honing) is an excellent method. Otherwise, remove deposits using a wire brush, scrapper, or fine abrasive cloth.

Soaking for 5 minutes in a strong sodium hydroxide solution will help to soften tenacious deposits.

CAUTION

Sodium hydroxide will burn skin, eyes and clothing. This solution will also damage the magnet coating. Confine the solution to the inside of the tube casing. If necessary, the magnet may be removed by pressing off with an arbor press. Use non-magnetic tools to avoid altering magnet strength.

4.1.5 Loosen the set screw and remove the anode loop from the rod extending from the center of the high-voltage insulator. Examine the interior of the insulator. If it is dirty, clean it with the vapor blast method or a chemical cleaning solution. Also clean deposits from the anode loop assembly.

4.1.6 Wash the parts in clean water and isopropyl alcohol, and dry them under mild heat. Be sure to flush any particulate matter from inside the anode insulator and dry thoroughly.

4.1.7 Reassemble the anode loop assembly to the center rod. Maintain and arc gap of 0.010-0.015 inches between the projection of the anode support bushing and the grounded mounting ring. (See Figure 2). Make sure the set screw is seated squarely against the support rod so the anode loop is perpendicular to the magnetic field and centered between the pole pieces. Check the anode alignment visually after installing it in the casing.

4.1.8 Clean the vacuum sealing surfaces and lightly coat the O-ring gasket with high quality vacuum grease.

4.1.9 Reassemble the anode assembly to the casing.

4.2 Servicing Control Unit

CAUTION

High voltages are present in the circuit. Use adequately insulated test equipment. Avoid sharp points which would cause corona discharge or field emission discharge when making or repairing solder connections.

Servicing should be done by qualified personnel only.

The only attention likely to be needed by the GPH-324C switching unit is an occasional cleaning of the switch contacts and insulators and lubrication of the switch index mechanism. If the wiring board becomes heavily coated with dust, clean it with alcohol or a good electronic cleaning solvent.

4.3 Calibration

In normal use the gauge should not require recalibration. Errors in pressure indication caused by dirty sensing tubes should be corrected by cleaning as described in Section 4.1. After long use, or if circuit components have been changed, it may be desirable to recalibrate. Recalibration requires reference gauges of known accuracy and a clean vacuum system with provisions for connecting the reference gauge tube and the tube under calibration. A throttling type high-vacuum valve and a precision-metering air inlet valve are needed to control the pressure. The system is normally operated in a near static condition with the high-vacuum valve nearly closed and a small flow through the air inlet valve. Gas flow should be well diffused throughout the test chamber by suitable baffles.

CAUTION

HIGH VOLTAGES ARE PRESENT IN THE PENNING GAUGE CIRCUIT. SERVICING SHOULD BE DONE BY QUALIFIED PERSONNEL ONLY.

4.3.1 Calibration using a Calibration Vacuum System

1. Pump the calibration system down to its base pressure which should be at least one decade below the lowest pressure calibration point. Operate the reference and test gauges for 30 minutes or more.

2. Raise the pressure and stabilize it at 1×10^{-5} torr. Adjust the calibration potentiometer marked 10^{-5} so the meter reads full scale on the 10^{-5} range.

3. Turn the range switch to the 10^{-4} position, raise the pressure to 1×10^{-4} torr and adjust the 10^{-4} potentiometer for a full scale meter reading.

4. Turn the range switch to the 10^{-3} position, raise the pressure to 1×10^{-4} torr. Adjust the calibration potentiometer marked 25×10^{-3} for a meter reading of 1×10^{-3} torr rather than at full scale because small errors at full scale are magnified at the lower portion of the range by the compression of the scale.

4.3.2 Calibration by Current Measurement

If a suitable vacuum system is not available, the gauge can be calibrated electrically by adjusting the calibrating potentiometer to bring the meter into agreement with the Pressure vs. Tube Current curve, Figure 3. The current can be measured as a function of the voltage appearing at the recorder jack J2 on the rear panel of the gauge. With the gauge turned off, set the Recorder Adj. potentiometer for some specific resistance as measured across J2, e.g. 1000 ohms. For this resistance value, 1 micro amp of tube current produces 1 millivolt across J2.

4.3.3 Calibration by Resistor Substitution

If a calibration system is not available, the gauge circuit can be calibrated by disconnecting a sensing tube and substituting the following fixed resistors which simulate the resistance of the sensing tube at the indicated pressures.

Pressure	Resistance	Voltage	Current
1x 10^{-3} torr	456 K ohms	800	1750 uA
1 x 10^{-4} torr	3.85 megohms	2400	623 uA
1 x 10^{-5} torr	55 megohms	3200	58 uA

Note the operating voltage and use appropriate high-voltage resistors, or connect a sufficient number of standard resistors in series to withstand the voltage.

5.0 RELAY CONTROL CIRCUIT ACCESSORY GPH-010A

5.1 Description

The relay control circuit accessory consists of a printed circuit board that plugs into a connector inside the gauge and provides S.P.D.T. relay contacts rated at 3 amperes for external alarm or process control applications. The trip point can be adjusted to cover the pressure range from 25 x 10^{-3} torr to approx. 3 x 10^{-6} torr. The trip point is independent of the range switch position. Both normally open and normally closed contacts are brought to a connector on the rear panel of the gauge. A mating connector is provided.

In a multi-station gauge, the relay control accessory responds to whichever sensing tube is selected by the station selector switch. When the selector switch is moved to another station, the control function is also transferred to that station.

5.2 Installation

5.2.1 There is a jumper connected to the primary tap of the transformer on the printed circuit board of the GPH-010A accessory. This jumper selects the operating voltage (115/230) of the control circuit. **MAKE SURE THAT YOU SET THIS JUMPER SO THE VOLTAGE OF THE CONTROL CIRCUIT IS THE SAME AS THE VOLTAGE OF THE GAUGE.**

5.2.2 Remove the plastic feet and cover from the gauge.

5.2.3 Loosen the four truss-head screws that hold the rear panel (it is not necessary to completely remove these screws).

5.2.4 Place the relay control circuit board in the connector on the gauge printed circuit board and tighten the rear panel screws. Be sure that the circuit board nests in the bracket on the rear panel.

5.2.5 Replace the gauge cover and plastic feet.

5.2.6 Connect the circuit to be controlled to the female plug provided. Pin 1 is common, pin 2 is normally closed, and pin 3 normally open.

5.3 Relay Control Point Adjustment

Adjust the potentiometer labeled CONTROL PT ADJUST (accessible through a hole in the rear panel) so that the relay trips at the desired pressure.

6.0 PANEL KIT FOR RACK MOUNTING

6.1 Description: The type PK-002 panel kit consists of a 19-inch wide cabinet assembly that will accept combinations of quarter, half, or three quarter rack-mountable cabinets. Blank panel assemblies are provided to fill unused sections of the panel kit. See Figure 4.

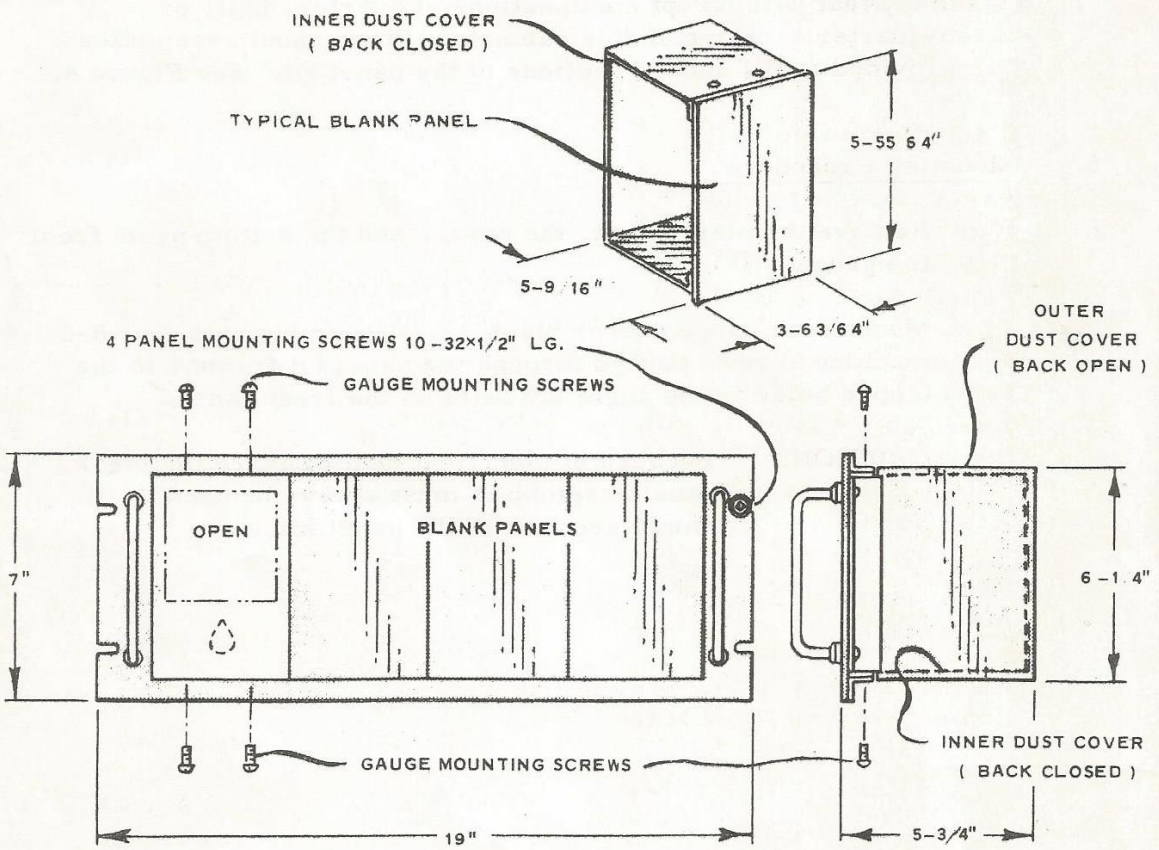
6.2 Mounting Procedure

6.2.1 Remove the plastic feet, the cover, and the bottom panel from the gauge.

6.2.2 Mount each gauge and/or blank panel assembly with four 8-32 machine screws that go through the panel kit frame into the tapped holes in the angle brackets on the front panels.

CAUTION

Because of electrical shock hazard, the blank panel assemblies must always be used to fill empty sections in the panel kit.



NOTE:

FOR PANEL MOUNTING GAUGES REMOVE RUBBER FEET, BASE, & GAUGE COVER.

INDIVIDUAL GAUGE COVER MOUNTING SCREWS RETAINED AFTER COVER IS REMOVED FOR MOUNTING GAUGE TO PANEL MOUNTING KIT.

FIG. 4 TYPE PK-002 PANEL MOUNTING KIT ACCESSORY

7.0 REPLACEMENT PARTS LIST FOR THE PENNING GAUGE, TYPE GPH-320C AND TYPE GPH-324C

MINIMUM ORDER BILLING OF $75.00 PER ORDER. PLEASE INCLUDE PART NUMBER AND DESCRIPTION OF EACH PART ORDERED.

Description	Part No.
Electrical components	See Ass'y Drawing
Power Cord Assembly, 8 ft.	5506953
Meter, 0-20 micro amp (MI)	277061
Pilot Light, neon (DSI)	266622-1
Receptacle, high voltage (J4)	6091466
Jack, Recorder (J2)	267272
Tube Cable Assembly with Connector (10 ft.)	5508271-1
Discharge Tube GPH-001A	282396
Anode Assembly	282395
Gasket	264091-5
Magnet	66267

7.1 Accessories

Vacuum Fittings listed in Section 2.3	
Cable Assembly, Discharge Tube	
10’	282394-1
15'	282394-2
25'	282394-3
50'	282394-4
100'	282394-5
200’	282394-6
Panel Mounting Kit PK-002	277243
Discharge Tube with Pyrex tubulation GPH-005	272093
Control Circuit GPH-010A	5506918

ASSISTANCE FROM MYERS VACUUM, INC

Myers offers the customer services listed below. Rates for these services are available from your Myers Vacuum Field Sales Office.

Equipment Field Service

1. Emergency Service takes top priority. If your system does not operate, contact your Myers Vacuum Field Sales Office to arrange for a service call as soon as possible.

2. Scheduled Service is useful when your equipment requires check-out after installation, cleaning, repairing, rebuilding, modernizing, or moving to a new location.

3. Field Instruction can be given on the customer's equipment when desired.

4. Information includes the latest techniques and suggestions for more efficient operation.

NOTE: Equipment Field Service does not include process assistance or service connections such as electrical or water service.

Myers Vacuum In-Plant Service

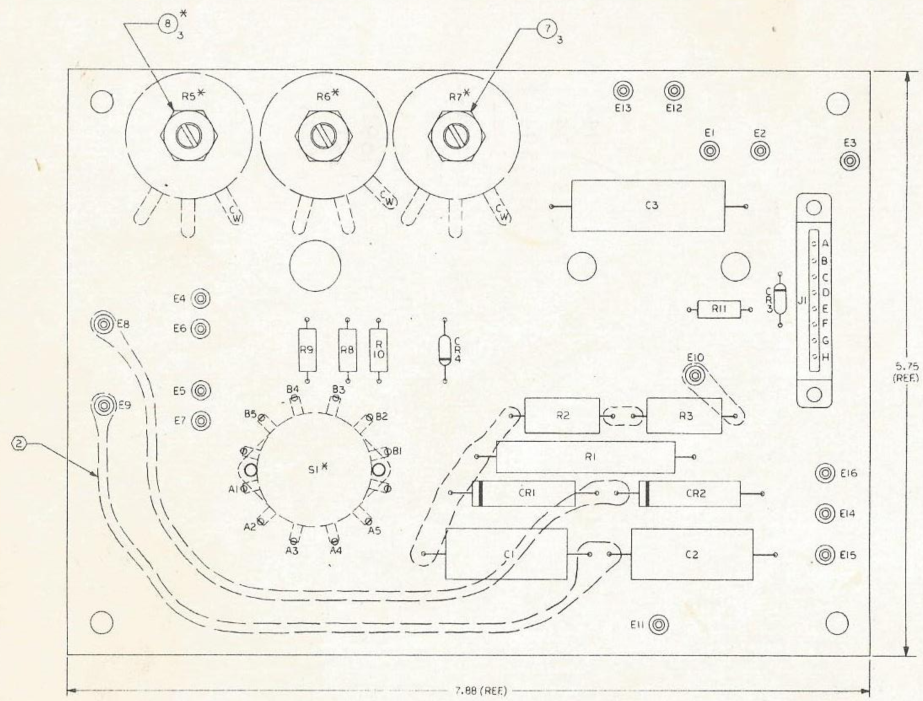
1. Instruction on system operation, technique, and equipment maintenance can be provided for customer personnel at the Myers plant in Kittanning, PA.

2. Scheduling of this instruction can be arranged through your Myers Vacuum Field Sales Office.

3. Warranty Repair Service: Products falling within the conditions of the Myers Standard Warranty will be repaired or replaced without cost other than transportation charges.

4. Factory Repair or Recalibration Service: Myers products may be shipped prepaid to our factory in Kittanning, PA for repair or recalibration. Cost estimates will be furnished when requested. On many standard products we can offer a fixed charge repair service which includes all necessary repairs, calibration where applicable, and upgrading of the product to include, as far as possible, all engineering changes to date.

D-280461 REV. A



NOTES:
1. ITEMS MARKED WITH ASTERISK MOUNTED ON WIRING (OPPOSITE) SIDE OF BOARD.
② DASHED TRACES SHOWN (ON WIRE SIDE) TO BE COVERED W/ CONFORMAL COATING OF URETHANE INSULATING COMPOUND (ITEM 50).

TITLE ASS'Y – PRINTED CIRCUIT BOARD — PART NO D280461

	ITEM	PART NO	DESCRIPTION	UNIT QTY	STOCK NO	TOT QTY	QTY AVA	QTY ORD	ORDER NO
	1	D-280463	PRINTED CIRCUIT BOARD	1					
	2								
	3	A-65512-8	CONNECTOR-P.C. (J1)	1					
	4								
	5	A-39344	TERMINAL-TAPER PIN (E1-16)	16					
	6								
	7	A-61137	LOCK-SHAFT	3					
*	8	0299-1509	WASHER-LOCK, INT. TH., 3/8	3					
	9								
	10								
*	11	A-262110	SWITCH-ROTARY, 4 POS. (S1)	1					
	12								
	13								
*	14	A-61114	POTENTIOMETER-750Ω, 2W (R5)	1					
*	15	A-61115	POTENTIOMETER-3K, 2W (R6)	1					
*	16	A-61116	POTENTIOMETER-25K, 2W (R7)	1					
	17								
	18								
	19	A-279974-1	RESISTOR-100M, 2W, 20% (R1)	1					
	20	A-7140-9135	RESISTOR-91K, 2W, 5% (R2,3)	2					
	21	A-7138-2235	RESISTOR-22K, 1/2W, 5% (R8)	1					
	22	A-7138-3935	RESISTOR-39K, 1/2W, 5% (R9)	1					
	23	A-7138-1035	RESISTOR-10K, 1/2W, 5% (R10)	1					
	24	A-7138-2025	RESISTOR-2K, 1/2W, 5% (R11)	1					
	25								
	26								
	27								
	28								
	29	A-279970-1	CAPACITOR-.01µF, 4KV (C1,2)	2					
	30	A-271042	CAPACITOR-1µF, 100V (C3)	1					
	31								
	32								
	33								
△A	34	A-277095-1	RECTIFIER-SIL., HI-VOLT. (CR1,2)	2					
	35								
	36								
	37	B-261031-18	DIODE-REGULATOR, IN752A (CR3)	1					
	38	A-261023-27	DIODE-RECTIFIER, IN4005 (CR4)	1					
	39								
	40								
	41								
	42								
	43								
	44								
	45								
	46								
	47								
	48								
	49								
	50	A-280036	URETHANE ELEC. INSUL. COMPOUND	A/R					

REV.	DESCRIPTION	BY	DATE
A	ITEM 34 WAS A-277095 CORRECT WIRING TERM. C&D PG. 2	S.D.	6/7/76

TOLERANCE UNLESS OTHERWISE SPECIFIED: 2 PLACE DECIMAL ± /; 3 PLACE DECIMAL ± /; ANGLES ± /; BREAK SHARP CORNERS .015 MAX.; MACHINE SURFACES √ MAX.

NEXT ASSEMBLY: E-280460

CVC Products, Inc. ROCHESTER, NEW YORK 14603

DRAWN 4-8-76 S. Donaldson — CHECKED — APPROVED 4-19-76

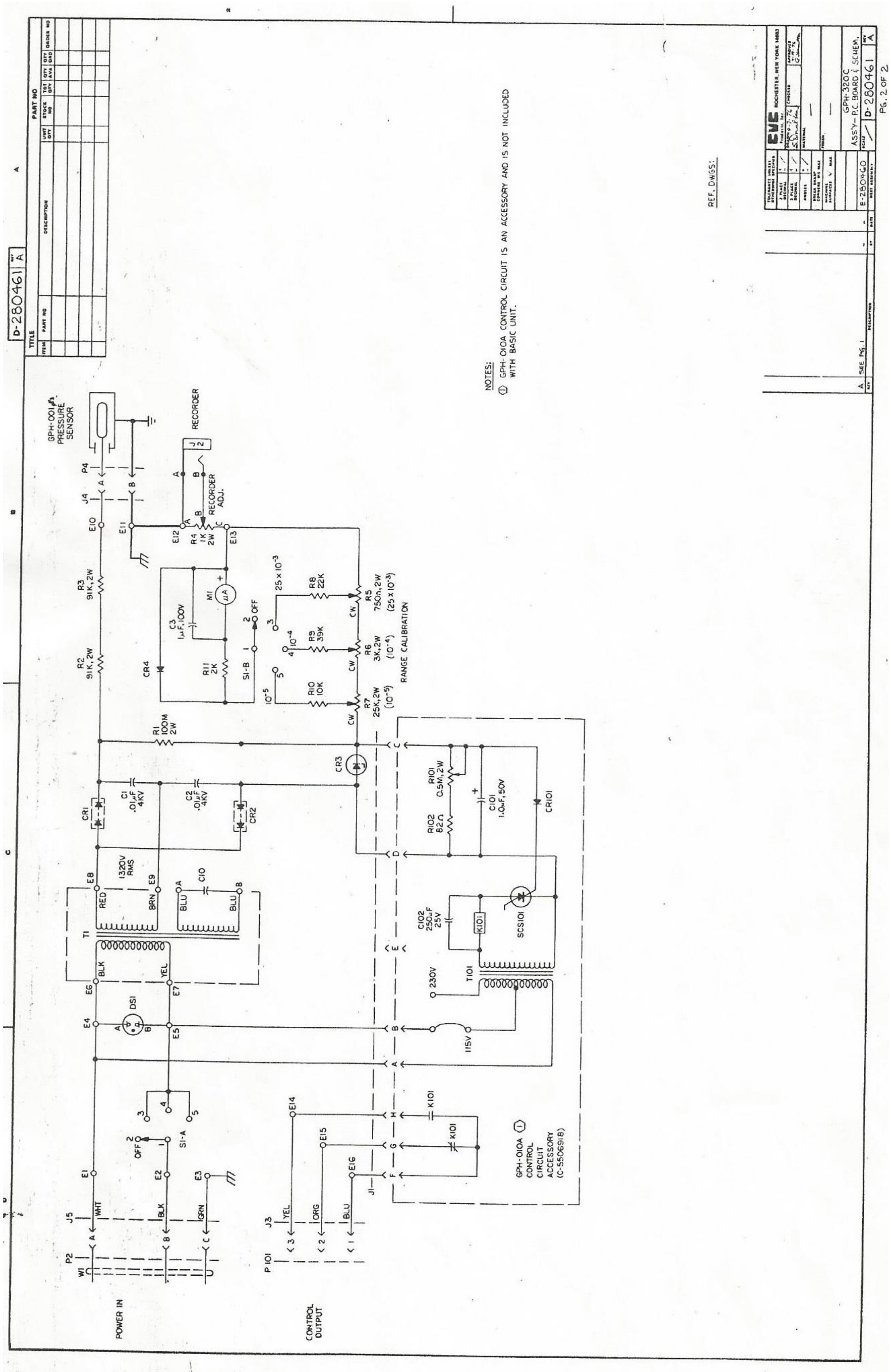
MATERIAL —

FINISH —

GPH-320C
ASS'Y-P.C. BRD. & SCHEMATIC

SCALE 2:1 — D-280461 — REV. A

PG. 1 OF 2


D-280461 A
NOTES:
① GPH-010A CONTROL CIRCUIT IS AN ACCESSORY AND IS NOT INCLUDED WITH BASIC UNIT.
REF. DWGS:
GPH-320C
ASS'Y-P.C. BOARD & SCHEM.
D-280461 A
PG. 2 OF 2
GPH-001 PRESSURE SENSOR
RECORDER
RECORDER ADJ.
RANGE CALIBRATION
POWER IN
CONTROL OUTPUT
GPH-010A CONTROL CIRCUIT ACCESSORY (C-5506918)
1320V RMS
115V
230V