

FIRST
IN CLEAN
AIR

SERVICE GUIDE

PURAFIL

4

GAGE UNIT

INSTALLATION, OPERATION & MAINTENANCE
INSTRUCTIONS

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1.0 PRE-INSTALLATION INSTRUCTIONS

1.1 SAFETY CONSIDERATIONS

- Read this Service Manual carefully. Be thoroughly familiar with the controls and the proper use of the equipment.
- This manual should be retained with the unit because it contains the information necessary for proper maintenance. There is a pocket envelope provided for this purpose. Attach it permanently to the unit.
- Keep all nuts, bolts, and screws tight to be sure the equipment is in safe working condition.

1.2 RECEIVING INSTRUCTIONS

Upon receiving systems from Purafil, Inc., note any shipping damage, obvious or hidden, to your carrier and on your Bill of Lading. All problems should be handled between the customer and carrier except for U.P.S. shipments, which require the customer to contact Purafil, Inc. for action.

- Units are shipped well-protected in bubble-pack and packaging when ordered as optional equipment.
- Units are well-protected in bubble-pack and placed inside of the unit it is to monitor.
- To unpack unit remove packaging.
- See installation instructions for complete directions on how to mount the unit.

1.3 INSPECTION

The condition of the unit upon its arrival is critical to its proper operation. Prior to start-up, inspect the unit carefully, according to the check list below. Correct any inadequacies before start-up to prevent possible damage or inefficiency. Note, should there be any questions concerning the unit, refer to the numbers found on the unit identification plate, when contacting the PURAFIL® representative.

PRE-OPERATION CHECK LIST

YES	NO	CONDITION
___	___	1. Gage housing is not damaged in shipment
___	___	2. Glass cover is not broken or cracked
___	___	3. All parts are present.
___	___	4. Labels and serial numbers are present.

2.0 OPERATIONAL CONCEPTS AND DETAILS

2.1 GAGE UNIT APPLICATIONS

Gage units are standard equipment on PURAFIL® Positive Pressurization Units and Corrosive-Aire™ Systems. All other PURAFIL® systems offer the gage unit as optional equipment. Gage selection is based on the induced pressure drop unique to the filter type selected. Purafil, Inc. manufactures two magnehelic gage housings for field mounting. One is designed to house two gages, the other three gages. Various combinations of these housings are listed in Figure 2. Although tubing is not provided, all gages are provided with an adjustable red signal flag.

2.2 HOW PURAFIL® SYSTEMS WORK

Each PURAFIL® system is designed to move a specific volume of air. As particulate filters become soiled within the PURAFIL® system, pressure drop across them will decrease. To insure consistency within the recommended guidelines for airflow, the particulate filters must be replaced when the appropriate pressure drop is reached. The gage unit will assure the most effective use of your PURAFIL® system.

2.3 BASIC DESIGN OF THE GAGE UNIT

The magnehelic gage consists of two pressure-tight compartments divided by a flexible diaphragm. Pressure differences between the "high" and "low" sides of the diaphragm creates a balanced position between the two pressures. A spring connected to the support plate of the diaphragm provides calibrated resistance to movement by the diaphragm. Motion passes through a magnetic linkage to the pointer.

3.0 INSTALLATION

3.1 TAP HOLE LOCATIONS

There are four pressure taps on standard horizontal units. All taps should be $13/32$ " in diameter and have the tip of the probe pointing into or away from the direction of airflow. It is recommended that the probes are located in a straight line on the side closest to the gage unit. To locate your taps, follow this procedure:

1. Beginning at the prefilter section, install a probe in the plenum before the prefilter.
2. The second probe is to be installed in the space after the prefilter, yet before the first bank of modules.
3. The third probe is to be installed after the last bank of modules, yet before the final filter.
4. The fourth probe is to be installed in the plenum section after the final filter.

The top of the unit may be used for installation of probes, as well as either side of the unit.

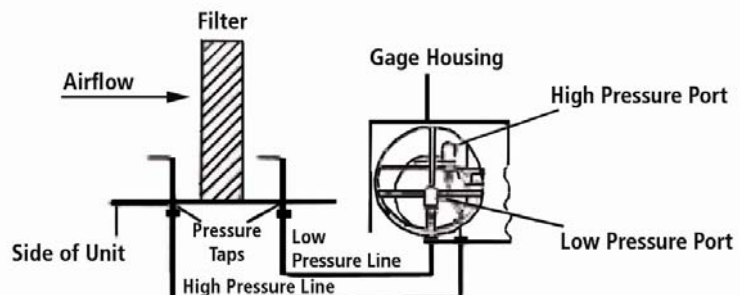
3.2 MOUNTING AND INSTALLATION (For all horizontal and vertical model gages)

Tools/materials needed (when mounting holes are not pre-drilled)

- Drill and $13/32$ " drill bit
- $1/2$ " wrench
- $7/16$ " wrench
- $5/16$ " wrench
- Screwdriver
- Plastic tubing*

*NOTE: Plastic tubing should be $3/16$ " inner diameter and $1/4$ " outer diameter or equivalent (available locally.)

FIGURE 1



3.3 MOUNTING GAGE HOUSING

- 1) Remove cover of gage housing.
- 2) Holding back plate to the wall, mark surface for mounting holes so that the holes line up horizontally.
- 3) Use mounting method consistent with type of wall to which the housing is to be mounted.

3.4 FOR HORIZONTAL UNIT

1. PARTICULATE FILTER GAGE UNIT

- Drill two sets of holes in the unit as follows (one set per particulate filter section.) Drill two 13/32" holes in the unit- one on each side of the filter.
- Secure the static pressure taps with the taps directed into the airflow.
- Connect ¼" plastic tubing from the static pressure taps to the gage. The tap on the downstream side of the filter is connected to the low pressure connection and the tap on the upstream side of the filter is connected to the high pressure connection.

2. OUTSIDE AIR/ROOM PRESSURE GAGE UNIT

Outside Air Gage:

- Run the high pressure connection of the gage to the high pressure port of the P.A.M.S. unit.
- Run the low pressure connection of the gage to the low pressure port of the P.A.M.S. unit.

Room Pressure Gage:

- Run the low pressure gage connection to the desired outside pressure reference (i.e. out of the room or outdoors.)
- Leave the high pressure connection of the gage open.

3.5 FOR VERTICAL UNIT

1. PARTICULATE FILTER GAGE UNIT

- Find correct holes for gage hook-up on the housing unit. There should be one set of holes on each side of each filter in the unit.
- Leaving all holes capped which are not used, place pressure taps in the most accessible side of the unit.
- Secure the static pressure taps with the taps directed into airflow.
- Connect ¼" plastic tubing from the static taps to the gage. The tap on the downstream side of the filter is connected to the low pressure connection of the gage. The tap on the upstream side is connected to the high pressure connection of the gage.

2. OUTSIDE AIR/ROOM PRESSURE GAGE UNIT

Outside Air Gage:

- Run the high pressure connection of the gage to the high pressure port of the P.A.M.S. unit.
- Run the low pressure connection of the gage to the low pressure port of the P.A.M.S. unit.

Room Pressure Gage:

- Run the low pressure gage connection to the desired outside pressure reference (i.e. out of the room or outdoors.)
- Leave the high pressure connection of the gage open.

NOTE:

- The location of static pressure taps is one of primary importance in securing reliable readings. For maximum accuracy, it is essential that the influence of the velocity of the air be eliminated to permit sensing the true static pressure. Note that some installations do not provide a straight approach to the filter bank, which may cause air to swirl and eddy.
- In all cases, be sure to run each line through the rubber grommets hole.

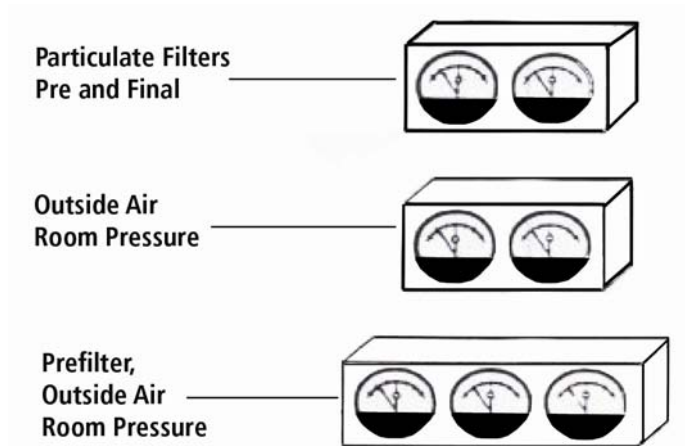
3.6 STATIC TAPS

There are two types of static pressure taps-one has a 90° angled probe. The 90° angled probe should point into or away from airflow. The other static pressure tap is a straight probe mounted through the slot in the track located between the module and prefilter.

3.7 REPLACING THE COVER

- After all lines have been connected, be sure that there are no twists or bends in the tubing.
- Hang the front cover of the gage housing on the back plate.
- Thread the four fasteners into the side of the gage housing.

FIGURE 2



3.8 TO ZERO (SET) THE GAGE AFTER INSTALLATION

- Set the indicating pointer exactly on the zero mark by using the external zero adjustment screw on the bottom of the gage shell.
- Note that the zero check or adjustment can only be made when the high and low pressure taps are both open to the atmosphere.

4.0 INSTALLATION CHECK

Before putting the air filter gages into service, and in the event of initial pressure drops that do not agree with those listed in the data sheet (Figure 5), make the following checks:

1. Check all tubing connections for tightness from gage to the static tap or fitting connection.
2. Check plastic face cover of gage to be sure it is securely in place and airtight.
3. Check static pressure taps or fittings to be sure they are not plugged.
4. Check installation of static taps to be sure static pressure taps point directly into the air stream.

We recommend that gages needing repair be returned to the factory. Parts used in various sub-assemblies vary from one range of gage to another, and use of incorrect components may cause improper operation or failure. Gages repaired at the factory are carefully calibrated and tested to assure "like-new" operation.

5.0 CALIBRATION CHECK

Select a second gage or manometer of known accuracy and in an appropriate range. Using short lengths of rubber or vinyl tubing, connect the high-pressure side of the magnehelic gage and the test gage to two legs of a tee. Very slowly, apply pressure through the third leg. Allow a few seconds for pressure to equalize, fluid to drain, etc., and compare readings. If accuracy is unacceptable, gage may be returned to the factory for recalibration.

6.0 MAINTENANCE PROCEDURE

No lubrication or periodic servicing is required. Keep case exterior and cover clean. DO NOT CLEAN WITH SOLVENTS as they will fog the cover. Occasionally disconnect pressure lines to vent both sides to atmosphere and re-zero.

7.0 TROUBLE SHOOTING

SYMPTOM	PROBLEM	CHECKS/REMEDY
Sluggish readings	Duplicate pressure port not plugged	Plug Pressure Port
	Diaphragm damage due to over pressure	15psi maximum
	Fittings or sensing lines are blocked or pinched	Repair is required
	Cover is loose or "O" ring is damaged or missing	See Section 3.5 in PPU Service Guide
	Ambient Temperature is too low (20°F)	Order special low temperature gages
Gage can't be zeroed (set)	Pointer stuck	Pointer should not be touching scale
		Spring/magnetic assembly should not be touching helix
		No metallic particles should be clinging to magnet
		Cover zero adjustment should be properly engaged in adjusting screw.

Table 1: Gage Identification Codes

Codes	Description	Usage
A	-0.05 - +0.2 iwg	Room Pressure
C	-0.0 - +0.5 iwg	Special Use
D	-0.0 - +1.0 iwg	Prefilters
E	-0.0 - +2.0 iwg	Final Filters
T	0.0 - 2000 cfm	PPU-2000
U	0.0 - 1000 cfm	PPU-1000
V	0.0 - 500 cfm	PPU-500
W	0.0 - 250 cfm	PPU-250
Y	0.0 - 100 fpm	Special Use

Table 2: Model Numbers	
Model Numbers	Gages (Reading from left to right)
DEO	D, E
EEO	E, E
WAO	W, A
VAO	V, A
UAO	U, A
TAO	T, A
DWA	D, W, A
DVA	D, V, A
DUA	D, U, A
DTA	D, T, A

Other combinations may be possible. Contact factory for information.

8.0 WARRANTY INFORMATION

PURAFIL® warrants hardware equipment manufactured by PURAFIL® to be free from defects in material and workmanship under normal use and service for twelve (12) months from startup date or eighteen (18) months from shipment date. PURAFIL'S obligation under this warranty shall be limited to replacing any parts thereof which shall be demonstrated to have been defective. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

PURAFIL MAKES NO WARRANTIES AS TO MERCHANTABILITY OR AS TO THE FITNESS OF THE MERCHANDISE FOR ANY PARTICULAR USE AND SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE, DIRECTLY OR INDIRECTLY, ARISING FROM THE USE OF SUCH MERCHANDISE OR FOR CONSEQUENTIAL DAMAGES. No person, firm or corporation is authorized to assume for PURAFIL® any other liability in connection with the sale of these goods. Equipment, parts and material manufactured by others and incorporated in PURAFIL® equipment are warranted by PURAFIL® ONLY TO THE EXTENT OF THE ORIGINAL MANUFACTURERS LIABILITY TO PURAFIL.