

**IOM-ALM-0203**

# **AIR LEAKAGE METER**

## **INSTALLATION, OPERATION AND MAINTENANCE MANUAL**

GRAHAM CORPORATION, P.O. Box 719, Batavia, NY 14021-0719  
Corporate and Sales Headquarters: 20 Florence Avenue, Batavia, New York 14020  
Tel.: 585-343-2216 Fax: 585--343-1097 E-MAIL:equipment @ graham-mfg.com WEBSITE:http://www.graham-mfg.com



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## SECTION I - GENERAL INFORMATION

### 1.1 Introduction

During surface condenser operation, one of the main causes of poor or deteriorated performance is the presence of excessive air in-leakage. Leakage rates in excess of design limit the air ejector's ability to adequately remove non-condensibles from the system. As a result, the condenser is forced to operate at a pressure corresponding to the capacity of the air ejectors. The most convenient way to monitor air in-leakage rates is through the use of an air leakage meter. It is an essential tool in the troubleshooting process in that it provides an instant indication of the air in-leakage rate as any air leakage into the system has to exit at the vapor outlet connection of the aftercondenser.

### 1.2 Principle of Operation

Graham air leakage meters operate by directing air flow from the vapor outlet of the air ejector aftercondenser through a given size orifice. The resulting pressure drop across the orifice is then correlated to a flow rate and is displayed on a dial type gauge.

## SECTION II - INSTALLATION

### 2.1 INSTALLATION (See Figure 1)

The meter is shipped with a small piece of foam packing inside to stabilize the meter movement during transit. To remove the packing, remove the small rubber plug from the back of the meter and pull the packing through the hole. Replace the rubber plug.

The air leakage meter assembly should be installed with the gauge located at the top of the cross. This will place the orifice 180 degrees from the gauge at the bottom of the cross. The flow from the orifice will be in the downward direction.

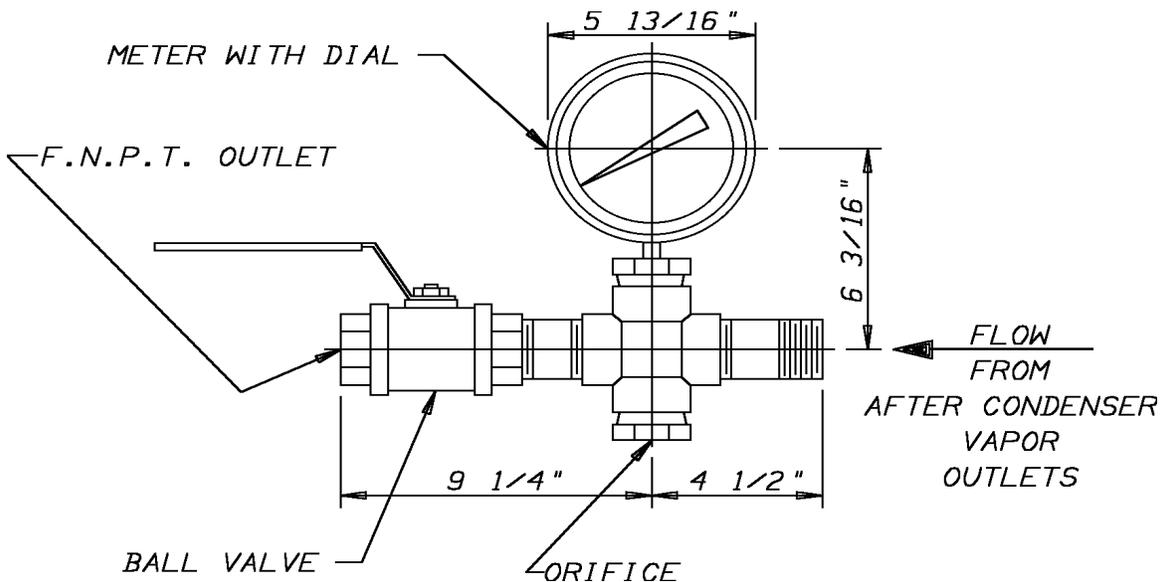


Figure 1

**2.1 INSTALLATION (See Figure 1), continued**

There should not be any obstructions located in the flow downstream of the orifice that could cause backpressure to the gauge. The shipping plug must be removed from the orifice prior to operation.

**2.2 Calibration**

The meter can be removed from the assembly and calibrated as a normal pressure gauge (0-30 inches water), pointer direction versus corresponding pressures are:

<u>Pointer Position</u>	<u>Corresponding Pressure (Inches Water)</u>
0 Meter Reading	0
45 °	9.8
90 ° (vertical)	16.0
Full scale meter reading	21.8

**SECTION III - OPERATION**

Close valve gradually until tightly closed. Observe reading and record. If the dial hand moves past the maximum dial face reading, the gauge should be double checked for calibration. If it is ascertained that the gauge is properly calibrated without adjusting the dial hand, it can be concluded that excessive gases are present.

Open valve. Be sure to leave the valve open at all times except when a reading is required. This is particularly important on startup and shutdown of the vacuum system when gas flow-through the meter will exceed the gauge reading.

**SECTION IV - OPERATOR'S MAINTENANCE**

The gauge should be adequately protected and regularly calibrated as described in Section 2.2. The orifice should be kept free of any obstructions and cleaned routinely.

**Available Operating Ranges**

<u>Standard Ranges</u>	<u>Optional Ranges</u>	
0 - 40 pph	0 - 40 pph and 0 - 18 kg/hr	0 - 9 SCFM
0 - 120 pph	0 - 120 pph and 0 - 54 kg/hr	0 - 27 SCFM
0 - 240 pph	0 - 240 pph and 0 - 109 kg/hr	0 - 40 SCFM
0 - 360 pph	0 - 75.6 L/S	
0 - 720 pph		

## **SECTION V – ORDERING SPARE PARTS**

### **4.1 *Spare Parts Required***

The only parts that should ever need replacing or changing are the meter, dial face and/or orifice.

When ordering spare parts, please address your communication to:

GRAHAM CORPORATION  
20 Florence Avenue  
Batavia, New York 14020

Telephone:	585 / 343-2216
Spare Parts:	800 / 828-8150
Fax:	585 / 343-1097
E-MAIL:	<a href="mailto:equipment@graham-mfg.com">equipment@graham-mfg.com</a>
WEBSITE:	<a href="http://www.graham-mfg.com">http://www.graham-mfg.com</a>

**IMPORTANT -** The following information should be given in order to identify the spare parts required:

1. Serial number of main unit (stamped on nameplate of condenser),
2. Name or description of part required,
3. Method of shipment (i.e. freight, express, etc.).

***Graham Corporation presents the information in this manual as good engineering practice. We cannot be held responsible for any damage to equipment that may result from mal-operation nor for any personal injuries should they occur during normal or abnormal operation.***