CHANDLER ENGINEERING®

Ranarex™ Gas Gravitometers

Ranarex Gravitometers from AMETEK Excel in Total Performance

Features

- Accurate
  Eliminates span drift to ensure permanently accurate calibration.
- Sensitive
  Advanced design develops large measuring forces and is virtually friction-free.
- Fast Response
  Gas sample flows continuously at a high rate through a small measuring chamber that purges rapidly.
- Rugged
  Durable, corrosion-resistant materials. Outer case protects against dust, humidity, and shock.
- Low Cost
  Simple design for low equipment cost; simple piping and wiring for low installation cost; rugged construction for low maintenance cost. These features ensure lowest long-term, total cost.
- Easy to Use
  Completely mechanical and easily understood. Installation requires only piping or tubing and electrical power. No special skills required.
- Readable
  Indicating scale is almost 9” wide on stationary model and 6” wide on portable. Can be read from a distance. 12-inch chart has 3.75” pen sweep on recording gravitometer.

Operation

The Ranarex principle and design are simple. The chassis of the gravitometer forms two cylindrical, gas-tight measuring chambers; each has a separate inlet and outlet connection. In each chamber there is an impeller and an impulse wheel, both with axial vanes. These wheels are mounted on separate shafts, facing each other but not touching. An electric motor and drive belt rotate the impellers at the same speed and in the same direction. The impellers draw continuous flow of gas sample into the upper chamber, and reference air into the lower chamber. They spin the gas and air against the vanes of the corresponding impulse wheels. As the spinning gas and air impinge against the vanes, they create torques on the impulse wheels that are proportional to the density of the gas and of the air.

Specific Gravity

These torques are transmitted from the chambers to two external measuring wheels. A flexible tape is wrapped on the measuring wheel rims in the crossed direction so that the torque creates two opposing forces. The measuring wheels are restrained from continuous rotation, but a difference between the torques allows limited motion of the entire system. The measuring system divides the torque of the gas by the torque of the air. This is the same ratio as the density of the gas divided by the density of the air which is —the specific gravity.

The rim of the gas measuring wheel is contoured so that it rotates through equal angles for equal changes in specific gravity. The uniform motion of the gas measuring wheel is transmitted by a link to the readout elements; these can be either an indicator, a recorder, an electronic transmitter, or high/low contacts. To ensure accuracy, the gas sample and the reference air must be measured at ambient temperature, at barometric pressure, and at equal humidity content (either humidified or dry).

Portable Gravitometer

The portable version operates on the same principle as the stationary unit but is scaled down in size and weight. No elaborate setup is required. The unit can be operated from the floor, a bench, or hung from the wall and operated from a standard AC power supply or from a 12-Volt vehicle battery through a DC-AC inverter.

Ranarex gravitometers excel over more complex and costly analyzers in total performance.

Ranarex™ Gas Gravitometers

Specifications

Stationary Model

Accuracy: ±0.5% of actual value

Readings: Indicating only, or Indicating and Recording.

Drive Motor: 115/230 VAC, 50/60 Hz, General Purpose

Chart Drive: 115/230 VAC, 50/60 Hz, General Purpose

Chart Speed: 24-hour/7-day selectable

Recording Chart: 12-inch

Sample Flow Rate: 15-20 Scf/hour

Sample Pressure: 20 psig maximum

Specific Gravity Range: 0.07 to 2.5 in several ranges. Contact factory.

Other Ranges: 0 to 100% CO_2 and H_2 in several ranges. Contact factory.

Ship Weight: 95 lb (43 kg)

Case: Wall or flush-panel mounting.

Portable Model

Accuracy: ±0.5% of actual value

Readings: Indicating only.

Drive Motor:
115 VAC, 60 Hz or 230 VAC, 50 Hz

Sample Flow Rate: 10-15 Scf/hour

Sample Pressure: 20 psig maximum

Specific Gravity Range:
Dual Scale: 0.52 to 1.03 and 0.97 to 1.90

Ambient Air Reference Dryer:
Silica Gel

Ship Weight: 50 lb (23 kg)

Case: Portable with carrying handle.

Options

Stationary Model

- Class I, Group B & D, Div 1 atmospheres
- Battery-powered & spring-wound chart drives; 31-day chart speed
- High/low alarm contacts
- Analog output, 4-20 mA
- Ambient air reference humidifier for wet gas applications
- Ambient air reference dryer for dry gas applications
- Flowmeter for sample and reference gas
- Sample and reference gas regulators
- Gas filters
- Shutoff valves
- NEMA 4X painted carbon steel cubicle with gravitometer and accessories completely assembled, piped, wired and tested. Options available for the cubicle include: cabinet heater, speed loop, 24 VDC power supply for accessories, gas disposal pump, and stainless steel cubicle.

Portable Model

- Power inverter: 12 VDC to 115 VAC or 230 VAC
- Selectable AC power, 115/230 VAC
- Protective treatment for sour gas applications

Applications

- Oil Refining
- Natural Gas Measurement
- Gas Utilities
- Chemical Processing
- Heat Treating Metals
- Combustion Analysis
- Sewage Treatment

Benefits

- Instantaneous Response: No time required for chemical reaction or gas diffusion.
- Excellent Reliability: Components positioned to equalize temperatures of gas sample and reference air during analysis.
- No Chemicals to Replace: Jeweled pivots and permanently lubricated ball bearings minimize wear and virtually eliminate servicing.

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AMETEK®
PROCESS INSTRUMENTS

150 Freeport Road, Pittsburgh, PA 15238
Ph. +1-412-828-9040, Fax +1-412-826-0399
www.ametekpi.com

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SALES AND MANUFACTURING:

USA - Delaware
455 Corporate Blvd., Newark DE 19702 • Tel: +1-302-456-4400, Fax: +1-302-456-4444

USA - Oklahoma
2001 N. Indianwood Ave., Broken Arrow OK 74012 • Tel: +1-918-250-7200, Fax: +1-918-459-0165

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WORLDWIDE SALES AND SERVICE LOCATIONS:

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SINGAPORE
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