

Gradiomanometer (Gradio)

Application

The gradiomanometer is a non-radioactive tool used to derive fluid density in a wellbore. It uses a high-resolution, differential transducer to measure the differential pressure over the length of a 24 in. column of fluid. The pressure enters the tool via two ports spaced 24 in. apart and a differential pressure measurement is taken. Since the column height and gravity are constants, the average fluid density is easily calculated. Due to the fast and sensitive response, this measurement can be obtained while continuously moving in the wellbore.

The tool is used to quantitatively establish the density of the fluid or gas in the wellbore and the depths of water/oil, water/gas, and oil/gas contacts are then derived from this information.

The gradiomanometer is used with other tools in a tool string, and transmits its data to either the telemetry tool or the memory adapter tool (MAT).

Features

- Derives Fluid Density in a Well
- Measurements can be Obtained While the Tool is Moving or Stationary

Benefits

The Gradio tool has a convenient field serviceable sensor that is quick and easy to access. The density readings produced by the Gradio tool are very accurate and highly sensitive.

| Gradiomanometer | |
|------------------|-------------|
| Type | Part No. |
| Standard Service | AM002WA0001 |
| H2S Service | AM002WB0001 |



Gradiomanometer (Gradio)

| Spare Parts | |
|----------------------------------|------------------------|
| Type | Part No. |
| Seal Kit | AM012RK0001 |
| O-Ring | PM933RC3x1.5 (x2) |
| Upper Tube Bushing | PM002CB0029 |
| Upper Tube Screw | PM002CB0028 |
| Sockethead Cap Screw #6-32x0.75L | 101452 (x2) |
| Sockethead Cap Screw #6-32x0.25L | 100141 (x2) |
| Bottom Sense Port Plug | PM002SA0027 |
| Gradio Port Plug | PM002SA0004 (x2) |
| Cap Screw 6-32UNCx0.1875 | PM951SB006-32-018 (x2) |
| Feed Thru Pin | PM002UU0034 (x4) |
| Lower Buffer Tube | PM002SA0036 |
| Lower Buffer Tube Extender | PM002SD0020 |
| Accessories | |
| Gradio Fill Pump | AM002UU0005 |
| Multipin Jumper Cable | AM007UU0007 |
| Gradio Fluid | PE545UU0035-1 |

| Specifications | |
|--|---|
| | Details |
| OD | 1.375 in (34.9 mm) |
| Length | 51.6 in. (131 cm) |
| Weight | 15.6 lb (7.1 kg) |
| Resolution | 0.001 g/cc (1 kg/m ³) |
| Accuracy | ± 0.03 g/cc (± 30 kg/m ³) |
| Range | 0 - 2 g/cc (0 - 2,000 kg/m ³) |
| Temperature Rating | 350°F (175°C) |
| Pressure Rating | 15,000 psi (103 MPa) |
| 18V Power Requirement (Memory String) | 27 mA |
| 18V Power Requirement (Telemetry String) | 5 mA |