TELEDYNE ANALYTICAL INSTRUMENTS

for Turbine Generators

Model 2750
Portable Gas Analyzer

The portable Model 2750 accurately and reliably measures hydrogen-in-CO2 and air-in-CO2 during maintenance purging of hydrogen-cooled turbine generators. These measurements assure that the purging proceeds quickly, efficiently and effectively. Switch-selectable ranges on the instrument make it easy to choose the measurement required. Plus, the 2750 features a third range that alerts the user to air leaks in the hydrogen cooling gas and thus helps assure optimum efficiency during normal generator operation.

Designed for Turbine Generator Applications

The 2750 is a rugged, portable, easy-to-use gas analyzer that monitors purge gases and the cooling gas in hydrogen-cooled turbine generators. Three selectable ranges:

- *Monitor purge gas composition during maintenance purging*
- *Spot-check hydrogen purity during normal generator operation*

The portability of the unit eliminates installation costs and makes it easy to move between generators. There are no moving parts to wear out, no filters to change, and no traps to clean. The 2750 is virtually maintenance free. A simple periodic calibration is all that is needed to assure years of trouble-free service.

Applications

Before workers can perform periodic maintenance inside a hydrogen-cooled turbine generator, the hydrogen (H2) cooling gas must be purged and replaced with a breathable atmosphere (air). However, air / H2 mixtures are potentially explosive, so a maintenance purge is used that proceeds in two stages. First, carbon dioxide (C02) is used to purge out the H2. Then, in the second stage, air purges out the CO2.

Minimlzes Costly Downtime

To minimize downtime, it is important for the 2-step purge process to proceed quickly and effectively. The 2750 helps achieve those objectives. During the first stage of maintenance purging, the unit monitors the changing H2 / CO2 mixture. This allows operators to know the earliest moment to begin the second stage (air purge). This also saves money minimizing CO2 usage. Then, during the second stage, the 2750 monitors air-in-CO2, helping to clarify when workers can begin maintenance.

Assures Optimum Efficiency

In addition to fast and effective purge monitoring, the 2750 also measures air-in-H2 during normal generator operation.

Air leaks reduce H2 purity and increase viscosity. This increases drag on rotors, thus reducing efficiency and increasing heat. Air contamination also reduces the ability of H2 to conduct heat, which also increases heat build-up. This increases electrical resistance and further lower efficiency.

The 2750 monitors the purity of H2 and is therefore important for helping minimize losses due to friction and heat build-up. The 2750 also helps determine whether or not contaminated H2 cooling gas should be replaced.

Sensor Operating Principle

The thermal conductivity sensor measures the concentration of a specific gas between a hot surface resistor and an ambient temperature reference resistor using the thermal conductivity coefficient of the gas itself.

Built for Reliability and Performance

Model 2750

Portable gas analyzer for turbine generators

Sensor Description

The sensor structure consists of an integrated heater located on a thin electrical and thermal insulating membrane. Two thin film resistors are used for heating and measuring the temperature of the membrane. Two resistors are integrated on the silicon beside the membrane for the compensation of the ambient temperature changes.

Gases that have a lower density than air (CH4) cause a decrease on the surface membrane temperature. On the other hand, gases with densities heavier than air (CO2) increase the temperature of the measuring resistor.

Benefits

- Portable, rugged, lightweight
- Sealed reference cell; no need for a flowing reference support gas
- Uses no consumables and is virtually maintenance free
- Minimizes costly maintenance downtime
- Saves money by avoiding needless waste of CO2 purge gas
- Assures optimum efficiency by detecting air contamination
- Proven thermal conductivity detector
- Precise temperature control provides optimum accuracy
- Three switch-selectable ranges for easy choice of desired measurement
- Large, easy to read readout for observing rate of change (trending) of purge gas mixtures

Specifications

Accuracy:	± 5% of range at a constant temperature and pressure (once equilibrium has been achieved)
Resolution:	0.1% (gas) H2, Air and CO2
Operating temp:	0-40° C
Response time:	0 - 90% in less than 10 seconds @ 0.5 SCFH
Flow rate:	0.1 – 2.5 SCFH
Gas connections:	1/8 tube and 3/16 barb
Flowmeter:	Required
Drift rate:	Less than 1% (range) / day
Display:	3-1/2 digit LCD, DPM
Output:	0-1 VDC (0.8 - 1 VDC 80-100% range)
Power:	Universal power adapter 90-264 VAC 47-63 Hz (9 VDC adapter)
Sensor type:	Thermal conductivity
Weight:	4.96 lb. (2.24 kg.)
Enclosure:	NEMA-4X
Dimensions:	Length: 10.6” (269.2 mm) Height: 4.8” (121.9 mm) Width: 9.9” (251.5 mm)
Wetted parts:	Brass, SS, Aluminum, glass, Teflon, nylon

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Warranty

Instrument is warranted for 1 year against defects in material or workmanship

NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

CERTIFIED
ISO 9001 : 2000

Accredited by the Council for Accreditation (RvA)

National Accreditation Program