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Instructions and Methodology of the Operation

1. Introduction and Purpose of the Instrument

The VARIOTEC 460 Tracergas is a professional-grade instrument designed to detect minor leaks, which are often difficult to identify using conventional methods. It operates based on the tracer gas detection principle— a non-invasive and highly effective technique suitable for various applications in the field of non-destructive diagnostics.



2. Operating Principle

The system works by injecting a mixture of hydrogen and nitrogen into the pipeline or structure under inspection. This tracer gas is safe (non-toxic, non-flammable, non-corrosive, and environmentally friendly), cost-effective, and readily available. Due to its lightness and molecular structure, hydrogen escapes through the leak point and penetrates materials such as concrete, asphalt, or paving, quickly rising to the surface. At the surface, the gas is detected by the device's highly sensitive sensor, enabling precise localization of the leak.

3. Technical Specifications

The detector is equipped with:

- A highly sensitive semiconductor sensor (resolution up to 0.1 ppm)

- Dual measurement ranges: surface detection (ppm) and in-depth detection (vol.%)

- High selectivity to the tracer gas, with minimal interference from humidity or methane

- Backlit display with both digital and analog gas concentration readings

- 8 MB internal memory for automatic data logging

- USB communication for data transfer to a PC

- Power supply via AA batteries, including rechargeable types, with up to 8 hours of autonomy

The device is also ATEX certified for use in potentially explosive environments, provided it is used with the certified leather carrying case.

4. Preparation and Field Use

Before use, it is recommended to perform a functional test of the sensor using the integrated test gas generator. Once powered on, the device guides the operator through an intuitive menu system, operated via jog dial and function keys. The user selects the appropriate measurement mode and proceeds with detection using the most suitable probe for the application (e.g., bell probe, flexible probe, etc.).



The operator can comfortably carry the detector using the quickrelease strap system, which allows hands-free handling of the probes and real-time visualization of the measurement results.

5. Practical Applications

The VARIOTEC 460 Tracergas is successfully used in a variety of applications, including:

- Leak detection in underground water distribution networks
- Inspection of heating systems and internal installations
- Monitoring of LPG pipeline networks
- Diagnosis of irrigation systems
- Detection of waterproofing membrane failures and roof leaks
- Testing of industrial components (such as pipes, pumps, engines)



The ability to save data and transfer it to a PC enables the production of clear and professional documentation to be delivered to the client at the end of the operation.

6. Conclusion

Thanks to its high sensitivity, precision, and versatility, the VARIOTEC 460 Tracergas is the ideal instrument for all professionals who need to detect leaks quickly, reliably, and with full traceability. Its combination of advanced technology, operational safety, and user-friendly interface makes it an essential tool for technical diagnostics in the construction, plumbing, and industrial sectors.