Study Of The Structure Of An Optoelectronic Device Designed For Product Quality Control

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ABSTRACT

In clause is considered gas the analyzer on a basis optical electronic two-wave generator in which through the gas chamber is used optical feedback. At on an output of the generator a positive pulse the optical feedback on length to a wave λ_1 is provided and at negative - λ_2.

Keywords: Devices, two-wave generator, optoelectronic generator, photo resistor, pulse, spectral characteristic.

Introduction

Gas leaks are common in industrial and residential buildings. These conditions are dangerous for human life in terms of explosion, fire and poisoning. The solution to this problem is especially relevant when there are interruptions in gas systems. Including excessive accumulation of gases in the air can be fatal in many cases. For this reason, the subject considered in this graduation qualification work is extremely relevant [1-2].

The need for hydrocarbons in industrial production enterprises and people's daily life is increasing day by day. In the same way, the oil refining and gas industries are developing very rapidly in all developed countries of the world. However, the lack of gas analyzers that remotely monitor the explosive concentration of hydrocarbons in the atmosphere with small size, high sensitivity, high selectivity, and high speed has caused several problems. Accumulation of explosive concentrations of hydrocarbons in the air is often a danger to human life and also leads to man-made losses. Therefore, today it is of great importance to create and research small-sized, high-sensitivity, high-selectivity, and high-speed gas analyzers that automatically monitor explosive concentrations of hydrocarbons in the atmosphere [3-4].

The main part

It is impossible to imagine the progress of the technological process and the quality indicators of the final product in modern industrial production, especially in the chemical and oil processing industries, without automatic control.

Although the determination of product quality in factory laboratories is carried out with high enough accuracy, the long duration of the determination time and the need for a lot of labor do not satisfy the requirements of industrial production.

Automatic quality analyzers are necessary for quality control of fast manufacturing processes. The creation of automatic quality analyzers used in the industrial scale leads to the

optimization of the technological process from the automatic control of technological processes directly to the automatic control of quantities and quality indicators of the output product.

The creation and use of artificial products with quality properties that surpass natural products is the main achievement of today's technical development [5-9].

The development of new types of polyethylene, synthetic rubber, polymers, semiconductor technology networks depends to some extent on the creation of automatic quality analyzers.

It should be reminded that analyzers play a key role in protecting technological equipment and production managers and supervisors from flammable and toxic substances that accumulate in equipment and workshops.

The quality of the product is characterized by its properties and composition. The composition of the product is characterized by the types of compounds and their amount. The composition of the product can be determined depending on its physical and physicochemical state. All quality control devices can be divided into 3 types: analyzers that control product properties; product composition control analyzers and mixture control analyzers. All analyzers are divided into industrial and laboratory analyzers [10-15].

Industrial analyzers usually automatically take the product change to be tested from the processing system, analyze its composition and properties, and provide a suitable output signal to the amplifier and rectifier devices. Laboratory analyzers are used for periodic quality control of products in scientific and research work, when industrial analyzers are not available, as well as for checking the work of industrial analyzers [16-19].

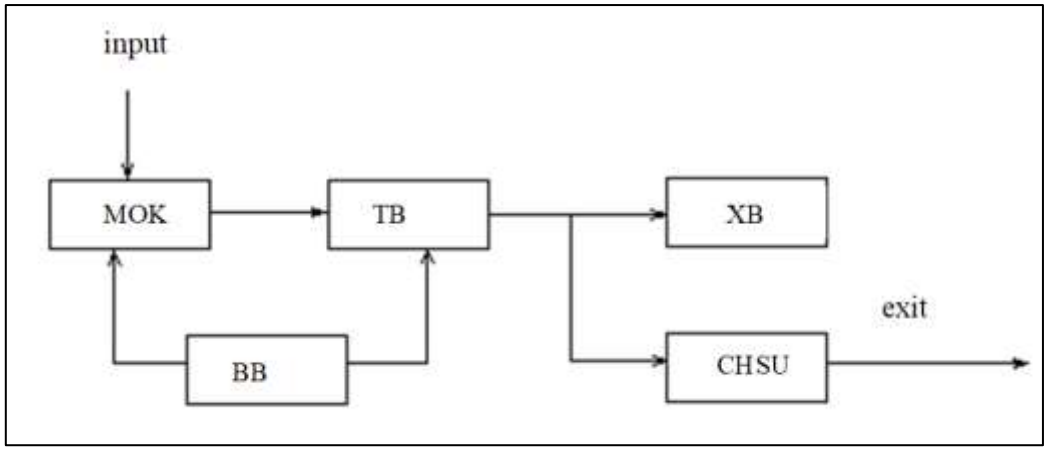

Fig. 1. Structural diagram of an industrial analyzer that analyzes product composition

A NOC-analyzer output device, TB-testing unit, BB-control unit, XP(r) calculator, ChSU-output signal converter

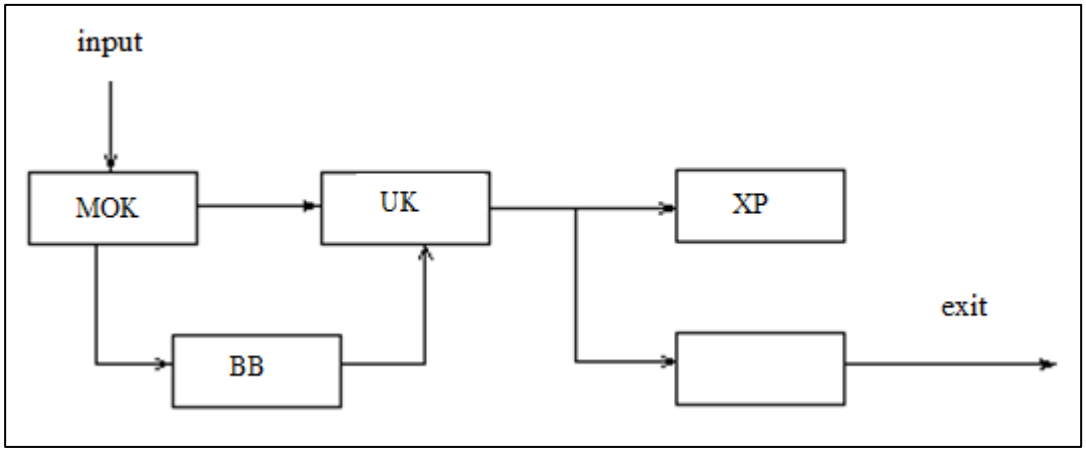

Figure 2. Structural diagram of an industrial analyzer that identifies product properties.

The tested substance is sent from the part of the technological system intended for analysis to the production device of the analyzer, and then to the test block of the form (I) TB to the measuring device of the form (2) – UK .

The results of measuring the composition and condition of the substance using analyzers depend on compliance with the specified conditions of the inspection in a certain quantity:

a) for the quantity of the substance taken for inspection in a cyclic inspection, and for the consumption of the inspected substance in a continuous inspection;

b) the amount or consumption of additional substances involved in the inspection;

c) supply voltage of electrical circuits or pressure supply of the pneumatic measuring device.

Maintaining normal conditions of drilling in cyclic motion, as well as control of the analyzer devices based on the program, is carried out using the control block (BB). The signal corresponding to the composition or state of the substance under investigation is converted into an XP (r) cable in the calculator and transmitted to the standard electrical or pneumatic signal rectifier from the signal transducer.

The devices for controlling the composition and condition of the substance are built based on the indirect measurement method, and the composition and condition of the measured environment are determined based on the measurement of various physical, physico-chemical quantities.

From the above, it can be concluded that devices for automatic control of the physical and physico-chemical state and composition of substances, such devices, measure physical and physico-chemical quantities separately, and thus determine the one-sided quality and quantity at the same time.

Existing analyzers that measure the composition and state of substances, as well as analyzers of mixtures, can be divided into chemical, physico-chemical and physical types.

In the chemical method, chemical reactions are used to determine the quality of a substance. As a result, the component being measured is released or absorbed.

The physicochemical method is based on chemical reactions observed with various physical phenomena. In the physical method, the physical quantities characterizing the composition and state of matter are measured.

Conclusion

Analyzers designed to measure the composition of the most dispersed substances in oil extraction, processing, gas industry and food industry include gas composition analyzers, chromatographs, mass spectrometers, pH-meters, oil product fractional composition analyzers, and titrometers.

Analyzers that determine the state of matter include devices that measure the specific gravity of oil and oil products in the flow, and analyzers of the combustion temperature of oil products.

Mixture analyzers can include analyzers that determine the amount of water and salt in oil and oil products.

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