GPN-18

Nitrogen Generator

Generator of pure nitrogen is designed for generation of pure nitrogen in laboratory environment, it is used for chromatograph feeding. Due to high outlet pressure, deep purification and low moisture content produced nitrogen can be used as gas-carrier, including cases when electron capture detector (ECD) is used. Compressed air is used for feeding the generator at pressure 6 atm and consumption no less than 5 l/min from compressor or air line with standard requirements to the quality of air (air for measuring devices).

The Principle of The Device

Compressed air from the internal source (air compressor, technological line with compressed air) is delivered to generator through coalescence filter, where pre-cleaning from dust and oil drops condensation is done. Extraction of nitrogen in the generator is done by air separation by means of short-cycle no-heat adsorption on carbon molecular sieve by two-arm scheme with two alternately working adsorbers. Simultaneously gas is purified from water vapor, carbon dioxide, oils, hydrogen and carbohydrates except methane. Purifications from helium, neon and argon don't happen, purification from methane is minor. State standard 9293-74 doesn't standardize the amount of argon in nitrogen. Real amount of argon in generated nitrogen is about 1%.

All listed not normalized impurities, except methane, hardly affect the possibility of using produced nitrogen as gas-carrier for gas chromatography. Methane contents can be reduced to 0,1 ppm by using catalytic purification filter from organic impurities together with generator. Primary blowing of adsorbers, receiver and internal lines from oxygen, moisture and other impurities is done during first 8 minutes after switching the generator on. Warming up of the reactor and oxygen sensor is done at the same time together with control of oxygen concentration in nitrogen.

Supply of nitrogen to user line starts only after concentration of oxygen in nitrogen reduces to the value less than 20 ppm. Further purification of nitrogen is done at working user line. Time from switching on of the device to entering operational mode (oxygen concentration in nitrogen is less than 5 ppm) can be from 40 min (single-shift work) up to several hours (with intervals more than three days). Pressure at the generator outlet is stabilized by built-in mechanic pressure controller. Nitrogen consumption values in user line and oxygen concentrations are detected by in-built sensors and are indicated on digital display.

In emergencies like line break (significant depressurization of user line), reduction of inlet pressure lower than 4,5 atm, increase of oxygen concentration up to 100 ppm – are controlled accordingly by flow sensor, pressure sensor and oxygen sensor. Delivery of nitrogen to user line is stopped in such cases and indicator "ALARM" lights up together with sound signal. After eliminating the cause of generator shutdown (depressurization of user line is liquidated or inlet pressure is increased) primary 8-minute device blowing is repeated. Supply of nitrogen to the user resumes after oxygen concentration reduces to the values less than 20 ppm.

Beytepe Mahallesi, Beyler Caddesi, 1651. Sokak, No: 8, Çankaya / Ankara, 06810, Türkiye
Tel: +90 312 468 85 30 Fax: +90 312 468 85 33
www.biolab.com.tr biolab@biolab.com.tr