
Meta
Chrom

GAS CHROMATOGRAPH "CRYSTALLUX-4000M"

Chromatographic complex "Crystallux-4000M" is an effective solution for routine tasks and also for carrying out serious chromatographic research works. Our purpose was to create a device with high reliability, optimal working characteristics and flexibility with minimal complexity of integration and maintenance. Our GC differs by high profits with minimal investments and low cost of ownership.

Some applications of gas chromatograph

Chromatograph «Crystallux–4000M» is a base for creation of the laboratory analytical systems, designed for the researching and production routine tasks:

-Composition and quality analysis of natural gas, associated gas, liquefied gas and gas condensate with evaluation of heating ability, relative and total density, pressure of saturated steam;
-Detailed and group analysis of motor fuel, including gasoline with evaluation of octane number, density, fraction composition, saturated steam pressure, etc.;
-Analysis of motor fuel on the content of aromatic and oxygen-containing compounds, MMA, etc.;
-Motor fuel, oil and gas analysis on content of and hydrogen sulphide, mercaptans, sulphides, thiophenes and other sulphides;
-Analysis of chemical and petrochemical products;
-Analysis of transformer oil for content of dissolved gases, water, total gas content, antioxidant admixtures, furan derivatives, polychlorinated biphenyl, insulating gas analysis;
-Analysis of toxic admixtures in alcohol drinks, perfumery production, drugs;
-Analysis of the authenticity of alcoholic beverages, including cognacs;
-Analysis of wine and wine materials for content of ethanol, organic acids and other admixtures;
-Analysis of water for the content of volatile halogen-containing and aroma compounds, acetone, methanol, saturated hydrocarbons, mineral oils, etc.;
-Analysis on content of pesticides, herbicides and other toxicants in water, soil, crop products and food;
-Analysis of atmosphere air on content of halogenated and aromatic hydrocarbons, carbon oxides, etc.;
-Analysis of production exhausts and of working area air on containing of saturated, unsaturated and aroma hydrocarbons, carbon oxides, etc.;
-Analysis of toxicity of food products packages, building materials and other domestic materials including toys;

-Analysis of mine air on content of constant gases, carbon oxides and hydrocarbons;
-Analysis of quality of vegetable and animal oils, dairy produce margarines, spreads, milk products, detection of falsification;
-Analysis of biological liquids and tissues of human body for contents of alcohol, drugs, medicaments and poisonous substances;
-Analysis of gas environment of nuclear power stations;
-Analysis of products of blast furnace production, quality of gases, used in metallurgy;
-Analysis of impurities in helium, oxygen, nitrogen, argon by cryogenic concentration method;
-Analysis of oil and chemical reagents for its production on content of volatile organochlorine compounds;
-Analysis of products of color industry;
-Analysis of quality of tobacco products;
-Analysis of propellents, aerosols, coolagents;
-Analysis of adsorbed gases in soil for geologist researches of oils and gas.

Design

Chromatograph is fully automated, starting from injection of a sample and ending with processing of chromatographic information, included: functions of automatic temperature control, electronic flow and pressure control of carrier and auxiliary gases, detector automatic lighting, flame burning control, measuring the signals from detectors with ADC

One computer can work in real time with several analytical modules (up to 8). Information transfer between computer, analytical station, and chromatographs is performed by standard interfaces of RS-232, Ethernet, USB types. Optionally : installation of remote control panel with sensor screen. Control of chromatograph is possible from the distance up to 3000 m, and also remote control and diagnostics of the chromatograph via the Internet.

Replaceable modules

Replaceable analytical module, installed on the column thermostat, determines the chromatograph model and includes detectors (multidetector), injectors and additional devices. The module configuration can be chosen by the customer for the certain analysis conditions.

The modules include two (three) injectors, which can be transformed from capillary into packed type by installing special adapters.
On the customer request we can supply module with any detector set and sample input devices.

Technical characteristics

Parameter	Value
FID detection limit	2×10^{-12} gC/sec for n-hydrocarbons or propane $1,1\times10^{-12}$ gC/sec (special order)
TCD detection limit	8×10^{-10} g/ml for n-hydrocarbons $3,5\times10^{-10}$ g/ml for propane (special order)
ECD detection limit	$1,7\times10^{-14}$g/sec for lindane $3,9\times10^{-15}$ g/sec for lindane (special order)
FPD detection limit	$1,0\times10^{-13}$ gP/sec for methyl parathion $8,0\times10^{-13}$ gS/sec for sulphur compounds
TID detection limit	$1,5\times10^{-14}$ gP/sec for methyl parathion 3×10^{-13} rN/c gN/sec for azobenzene
TChD detection limit	2×10^{-10} g/ml for hydrogen
PID detection limit HID detection limit MSD – relation to signal/noise	5×10^{-13} g/sec for benzene 3×10^{-13} g/sec for carbon in methane (1500:1) for injecting 1×10^{-14} g OFN in hexane
Linear dynamic range FID Linear dynamic range TCD	1×10^{7} 1×10^{6}
Oven volume	14 (19) L
Column temperature	from ambient temperature +3 till +450 °C (by special order from -15 °C with the usage of refrigeration unit) (by special order from -100 °C with the usage of liquid N2)
Temperature setting scale	0,1 °C
Temperature stability	0,01 °C
Temperature programming speed	from 0,1 till 125 °C/min.
Maximum number of isotherms	not less than 30
Column oven cooling speed from 400 till 50 °C	3 min.
Maximum temperature of detector and injector	450 °C
Carrier-gas flow	from 0 till 100 ml/min (by special order from 0 till 500 ml/min)
Carrier-gas pressure (for capillary column)	from 0 till 0,40 MPa (by special order from 0 till 1 MPa)
Maximum gas inlet pressure by special order	0,5 MPa 1,25 MPa
Hydrogen flow	0-500
Air flow	0-1000
Dimensions (width × depth × height)	550×500×500 mm
Weight	39 kg
Electric power supply	from AC voltage (230-240 V), frequency 60 Hz
Maximum power consumption (in the steady)	900 VA

LABORATORY REACTOR PLANTS

Intensification of oil refining process is a prospective task of modern manufacturing. Waist reduction and maximum usage of natural resources is very important from ecological and economical points of view. These tasks can be successfully solved with the help of catalysis.

Development, production and implementation of laboratory reactor plants and pilot plants for testing of catalysts of various purposes.

Examples:
- cracking in fluidized bed;
- hydrofining;
- hydrogenation;
- dehydrogenation;
- dehydratation;
- alkylation, etc.

At the moment development of universal automated transformable plant for the study of hydrofining, hydrogenation, dehydrogenation, alkylation processes is held. It works in temperature ranges from 30°C to 650°C, pressure from 0÷100 Bar and consumption of hydrogen and other gases is up to 1L per minute.

You can order development and production of reactor plant in RPC "Meta-chrom" Co Ltd by reasonable price. Our products are made according to all current standards and it is proven by certificate of conformity. Over the years we also have been developing and implementing equipment for conduction of complex analyses of multicomponent substances.

OUR ADVANTAGES

Attractive price! *2-3 times lower than import analogues.*

Fast and low-cost maintenance and repair.

Modernization for new tasks

Solid experience
Manufacturing quality
High level of automation

Automatic attrition tester by air jet for FCC catalysts for fluidized bed cracking by ASTM D5757-11

Automated laboratory unit for testing catalysts (KDI) for isobutane dehydrogenation in a fluidized bed.

Pilot plant for testing the catalytic activity of iron-potassium catalysts of dehydrogenation

Automatic attrition tester by air jet for fluidized bed cracking catalysts by express-method

Automatic six-channel unit for cracking catalysts testing in fluidized bed (FCC)

Pyrolysis instrument

HYDROGEN GENERATOR HG *(7, 16, 25 L)*

Characteristic of HG 7, 16, 25 L

Produced hydrogen corresponds to requirements. Besides this HG-HP can be used as the source of gas-carrier due to extra gas purification, especially when helium is not available to user, for example during work with thermal conductivity detector (TCD). High thermal conductivity of hydrogen allows TCD to work with better sensitivity in comparison with helium.
Microprocessor controlling of operational modes makes hydrogen generator a standalone device, and also allows it to control general and technical parameters of generator including pressure, consumption, level of water poured into the tank, electrolyzer current, leakproofness of gas mains. All the mains of generator are made of inert materials.

Both types of generators provide:

- Microprocessor controlling
- Multistage system of gas purification
- Reduction of heat release and increase of reliability by means of using power supply of electrolyzer with high efficiency
- Automatic transfusion that ensures avoiding pressure failures
- Protection from hydrogen excess pressure and excess of electrolyzer current
- Increase of electrolyzer service period by means of regulating hydrogen productivity
- Temperature control of oxygen afterburner
- Prevention of ingress of moisture into user's pipes by means of using hydrogen humidity indication.

There are main parameters on LCD display of HG and HG-HP: outlet pressure, preset pressure, electrolyzer current, afterburner temperature, hydrogen consumption.

Control and maintenance

Control and input of parameters is fulfilled through 4-button keyboard. Generators are filled by bidistilled or especially pure water with refilling during its work, without switching off the device, at that hydrogen generators ensure long continuous work. Hydrogen generators allow to reduce greatly or completely eliminate in the majority of cases the use of bottled gas for chromatograph provision. Bidistilled water is used for filling hydrogen generators, quality index of water must be no less than B grade of GOST 11.029.003 – 80 with electric resistivity no less than 1 Ohm m/cm.

Electric power from single-phase network AC power with voltage from 187 to 242 V, frequency (50±1) Hz, work mode – continuous.

Emergency situations during work of generator

Integrated control system measures the pressure and flow rate of hydrogen. In an emergency (like a line break), a lock is triggered adn delivery of hydrogen to user line. In case water level is insufficient, the system will inform about it.

There is no hydrogen reserve in generators that can possibly momentary fill the laboratory or chromatograph, and its productivity will not allow to create an explosive concentration of gas in the room, and that increases its safety.

Technical characteristics

Parameter	HG-7	HG-16	HG-HP-7	HG-HP-16	HG-25
Productivity, l/hour	0-7,5	0-16	0-7,5	0-16	0-25
Maximal outlet pressure, atm	4*	4*	4*	4*	4*
Pressure stability of hydrogen, no less, atm	0,0025	0,0025	0,0025	0,0025	0,0025
Watering of hydrogen, no more than, ppm	5	5	5	5	5
Hydrogen purity, %	99,995	99,995	99,999	99,999	99,995
Pre-mode time, min	30	30	30	30	30
Water consumption, g/l H22	1,0	1,0	1,0	1,0	1,0
Tank volume O2, l	1,0	1,0	11,0	1,0	1,0
Water volume added to the tank O2 if alarm went off no more than, l	0,65	0,65	0,65	0,65	0,65
Afterburner O2	-	-	+	+	-
Power consumption, no more than, VA	130	170	140	175	300
Overall dimensions (width×depth×height), no more than, mm	200×450×500	200×450×500	200×450×500	200×450×500	200×450×500
Mass, no more than, kg	14	15	14	15	17

** 6 atm by request*

HYDROGEN GENERATOR HG -75

Hydrogen generators are used for supply of flame chromatographic detectors. Produced hydrogen corresponds the requirements.

Microprocessor control of generator work modes makes it a standalone device, and it also allows to control basic and technical generator parameters, including pressure, consumption, level of water poured in the tanks, electrolyzer current, leakproofness of gas mains. All mains of generator are made of inert materials.

Both types of generators provide:

- gas purification system
- microprocessor control
- decrease of heat release and reliability improvement by means of using electrolyzer power supply with high efficiency coefficient
- protection from hydrogen pressure excess and electrolyzer current excess
- increase of service life by means of hydrogen productivity regulating
- prevention of moisture ingress to the user's pipes by using control and water level indication.

Indication of generator main parameters on LCD display provided:

- outlet pressure
- electrolyzer current
- hydrogen consumption

Control and insertion of parameters is done by 4-button keypad. Hydrogen generators allow to reduce greatly or completely eliminate, in the majority of cases, the use of bottled gas for chromatograph provision.

There is no hydrogen reserve in generators that can possibly momentary fill the laboratory or chromatograph, and its productivity will not allow to create an explosive concentration of gas in the room, and that increases its safety.

Hydrogen generator HG-75- O2 optionally provides oxygen generation for welding. Generator can be equipped with a catalyc filter.

Electric power from single-phase network AC power with voltage from 187 to 242 V, frequency (50±1) Hz, work mode – continuous.

Technical characteristics

Parameter	HG-75	HG-75-O2
Productivity H_2, l/hour	0-75	0-75
Productivity O_2, l/hour	-	37
Maximal outlet pressure, atm	2	2
Pressure stability of hydrogen, no less, atm	0,0025	0,0025
Watering of hydrogen, no more than, ppm	5	5
Hydrogen purity, %	99,995	99,995
Pre-mode time, min	30	30
Water consumption, g/l H_2	1,0	1,0
Working time without adding water, hour	4	4
Ank volume O_2, L	2,5	2,5
Water volume added to the tank $O2_2$ if alarm went off no more than O, L	1,4	1,4
Power consumption, no more than, VA	800	800
Overall dimensions (width×depth×height), no more than, mm	225×390×550	225×390×550
Mass, no more than, kg	25	26

NITROGEN GENERATOR

Purpose

Usage of generator allows to obtain nitrogen with high purity in the laboratory, it is used for supply chromatograph during the analyses. Nitrogen produced by generator is characterized by high outlet pressure and low moisture content, which allows to use it as carrier-gas even together with ECD.

The principle of the device

Compressed air from the internal source (air compressor, built-in 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.

Working process

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. Pressure at the generator outlet is stabilized by built-in mechanic pressure controller. Nitrogen flow values in user line and oxygen concentrations are detected by in-built sensors and are indicated on digital display.

Emergency situations during work of generator

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 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.

Specifications

Classification of generated nitrogen	PNG-18
Volume fraction of nitrogen, no less than, % vol. (including impurities of inert gases - argon, neon, helium)	99,999
Volume fraction of oxygen, no more, ppm	5
Volume fraction of water vapor, no more, ppm	7
Volume fraction of hydrogen, no more, ppm	2
Volume fraction of total carbon-containing compounds in conversion to methane, no more, ppm	3
Maximal productivity by nitrogen, no less, l/hour	18 (300 мл/мин)
Nominal outlet pressure of nitrogen, atm	4
Settling time of work mode, no more, min	45
Maximal inlet air pressure, atm	5
Compressed air consumption at nominal inlet pressure, no more, l/hour	300
Power consumption, no more, VA	100
Overall dimensions (width×depth×height), no more, mm	210×500×460
Mass of generator, no more, kg	20

Models available for preorder

PNG-15-C	PNG-15CF-C	PNG-18-C	PNG-18CF-C	PNG-18CF-60Z	
PNG-21	PNG-21CF	PNG-21CF-72Z	PNG-60	PNG-120	PNG-180
NG-200	NG-200-R	NG-400	NG-400-R	NG-400-C	NG-600

PURE AIR GENERATOR

Pneumatic part of generators consists of serially connected air compressor, drying filter, receiver, reactor, pressure regulator. Electronic part consists of power unit, control board, indication card, pressure sensors connected with each other by microcontroller. Pressure sensor, connected with receiver, detects moments of compressor switching on/off to develop required excess pressure in the receiver. At the increase of air flow over nominal generator productivity (partial depressurization) indicator "ALARM" lights up and short beeps begin at the same time.

Drying is done by the filter which is automatically regenerated during the work of unit. Catalytic purification of air is done in reactor. Pressure regulator ensures stabilization of outlet pressure, its value is measured by electronic sensor and is displayed on digital board "PRESSURE". Indicator "ALARM" turns on in case of outlet pressure stability failure (downturn of pressure lower than in technical passport), long beeps begin at the same time and compressor stops working. Such situation arises if depressurization of the system takes place: air generator-connection line-gas chromatograph.

Electric power of air generators is from single-phase network AC power with voltage from 187 to 242 V, frequency (50± 1) Hz, work mode – continuous.

Technical characteristics

Name of characteristics	Value
Productivity by air, brought to normal conditions, l/min, no less	1,2
Outlet air pressure, atm	3,5
Outlet pressure stability, no more, atm	0,05
Outlet concentration of hydrocarbons, ppm, no more	0,1
Water vapor concentration at 200C and 100кPa, ppm, no more 10	10
Power consumption, no more, VA	200
Overall dimensions (width×depth×height), no more, mm	210×440×360
Mass of generator, no more, kg	11

MANUAL HEADSPACE SAMPLER

Manual headspace sampler is designed for insertion of volatile components from matrices into chromatograph, such components that are impossible or unwelcome to be inserted. Examples of such matrices are natural, drinking and waste water, soil, biological fluids, food substances and drinks, various polymers, building materials, pharmaceuticals, etc. The usage of device allows avoiding contamination of evaporator, column and detector of chromatograph by non-volatile or semi-volatile compounds, helps to avoid consumption of solvent which is necessary for extraction and helps to increase reproducibility of analyses.

Sampler realizes static method of insertion of equilibrium vapor from above the analyzed liquid (solid sample) in thermostatic vial. This device is independent item and can be applied to any chromatograph.
Realization of the electromagnetic interfusion mode allows to reduce the time of settling balance in the sample and fulfill the analyses of more viscous samples, for example oil or molten polymers.
Using syringe as dispenser allowed to promptly change the volume of injected sample, eliminate "memory" effect by means of syringe purge mode, eliminate "dead zones" in the evaporator input device.

Characteristics

- Thermostat temperature of containers with samples – from ambient temperature to 150 °C.
- Inaccuracy of temperature maintenance - no more than 0,1 °C.
- Volume of container with sample – 20 ml, it is possible to use vials from 6 to 40 ml.
- The number of containers simultaneously thermostated - 4.
- Dosed volume of equilibrium vapor – up to 2 ml.
- Syringe temperature – from ambient temperature to 150 °C.
- Gas consumption for purge – from 5 to 300 ml/min.
- Electric power from AC power with voltage (220)V, frequency (50±1) Hz.
- Overall size (width-depth-height) – 350-270-170 mm.
- Power consumption – no more than 360 VA.
- Weight – no more than 6,5 kg.

AIR COMPRESSORS «META-CHROM»

Air compressors perform supply function for FID in chromatographic equipment and gas analyzers. Air compressor is designed for supply of pure air to flame detectors of gas chromatographs. There are air comressors different productiviti. Some type of compressors can supply a little amount chromatographs, other type can supply hole lab.

Features of air compressors

Equipment produced by "Meta-chrom" company is distinguished by high performance. In-built system of catalytic purification from carbon particles in the compressor can considerably improve sensitivity of devices and, as a result, increase accuracy of the performed analyses. Among the rest consumer qualities of the equipment we should point out low noise level during work of compressor, stable working pressure and low power consumption.

Compressor "AC" consists of series-connected air compressor, drying air filter, indicator tube, reverse valve (pneumatic air distributor), receiver, pressure relay, pressure regulator and output filter. Compressor is equipped with the system of regeneration of built-in air drying filter, which starts automatically and relieves the operator from maintenance works.
Compressor is easy to operate.

Technical characteristics

Name of characteristics	Value
Productivity, no less, l/min	3
Outlet air pressure, MPa	0,25±5%
Pressure stability with constant flow, no more, MPa	0,0007
Engine power consumption, no more, VA	100
Receiver volume, l	9
Noise level, no more, dB	60
Mass, no more, kg	19
Overall dimensions (width×depth×height), no more, mm 235×755×440	235×755×440
Single-phase network voltage	230 V, 50 Hz

DIGITAL VACUUM GAUGE

Purpose and application of vacuum gauge

Unit is designed for measuring of diluted gases pressure. Vacuum gauge gives opportunity to control the work of vacuum pumps, determine degree of rarefaction in technical cavities and oil pipes, perform several tasks in laboratories. Nowadays digital devices are very popular due to simplicity of operation, accuracy of readings and wide range of applications. Vacuum gauge is used in following spheres:

- Chemical industry
- Lyophilization
- Service of pumps of vacuum type
- Systems of molecular distillation
- Spectrometry and analyzers
- Refilling and vacuumizing of cooling systems
- Vacuum thermal insulation, pipelines and double-walled vessels
- Vacuum packaging
- Quality control
- Electronic and semiconductor elements production.

Vacuum gauges are especially relevant in the spheres where one of the main working orientations is examination and analysis of gaseous substances.

Description of vacuum gauge

Device represents vacuum gauge of ionization-thermocouple type with continuous range of pressure measurements. System "automat" of sensor switching and system of emission current control of hardware-software type are used in the device. Digital device is supplied with built-in display, which displays the set and measured parameters. Unit control can be performed either from keyboard located on the corpus of the unit or remotely from PC through interface RS-485 (for control of electronic leak valve of gases).

Design of digital vacuum gauge

Device is equipped with two channels measuring pressure in vacuum system. Low vacuum is measured by channel of thermocouple lamp, which is switched on together with vacuum gauge. When vacuum level reaches the value of 3 Pa, power of ionization lamp is switched on and it measures the vacuum. At that measurement channel of thermocouple lamp is not switched off and is performing the function of fuse. Ionization channel is switched off and data from both sensors is shown on display. Application of device is possible in units with manual and automatic methods of control.

Technical characteristics

- Range of measured pressure by thermocouple lamp ПМТ-2, torr (mm. of mercury) — from 10^{-3} to 10^{-1}, sensitive up to 1 atm.
- Range of measured pressure by ionization lamp ПМИ-51, torr (mm. of mercury) — from $7{,}5\times10^{-8}$ to $7{,}5\times10^{-2}$.
- Range of gas pressures measured by vacuum gauge — from 75 to 10^{-5} Pa (0,1 — $7{,}5\times10^{-7}$ mm of mercury). (In consideration with conversion factors usage of vacuum gauge for measuring of other gases pressures is possible).
- Work with thermocouple converters: ПМТ-2, ПМТ-4М.
- Work with ionization converters: ПМИ-2, ПМИ-51, ПМИ-10-2.
- Indication in different measuring units is provided — Pa, mm of mercury (torr).
- Response time of sensor (ionization type) — 0,1 sec.
- Electric power from single-phase network AC power with voltage from 187 to 242 V, frequency (50±1) Hz, work mode – continuous.
- Value of power consumption (without including PC) — no more than 30 VA.
- Overall dimensions — 165×350×215 mm (width x depth x height).
- Mass — no more than 3 kg.

GAS FILTER

Catalytic purification gas filter is performed in three modifications: for carrier gas, for air and simultaneous purification of carrier and air.

Gas filter application:

1. Purification of carrier gas from excess content of oxygen till qualification of high purity, necessary first of all for the work of ECD of any gas chromatographs, purity of nitrogen no less than 99,9995%. Volume by oxygen – no less than 5-7l. Gas filter can be used for purification of other gases from oxygen (including hydrogen). Restoration of filter catalyst is done by purging with hydrogen

2. Purification of air from organic impurities (content of impurities less than 0.1 ppm) during measuring of mass concentration of hydrocarbons in working zone air and in industrial emissions by means of gas chromatography and for purification of air from organic impurities during detector feeding. Gas filter can be used for purification of other gases from hydrocarbon impurities, for example, nitrogen from hydrocarbons after nitrogen generator. Restoration of filter catalyst is done by purging with pure air.

3. Double filter for nitrogen purification from oxygen and air purification from organic impurities.

Technical characteristics

- Range of temperatures — from 150 to 700 °C. Stability of temperature maintenance in reactor zone – no more than ± 2 °C. Setting and control of temperature are done according to technical specification.
- Preparation period before the mode start — no more than 30 min.
- Electric power from single-phase network AC power with voltage from 187 to 242 V, frequency (50±1) Hz, work mode – continuous.
- Power consumption no more than 300 VA.
- Overall dimensions (width x depth x height) no more than 160x150x340 mm
- Mass, no more than 3,5 kg.

Name of parameter	Sorbent for	
	oxygen absorption	*hydrocarbons absorption*
Reactor volume, ml	85	85
Working temperature, °C	450	550
Max gas consumption, ml/min	500	2000
Content of organic impurities on input/output of filter in recalculation to methane, no more than mg/m³	_	20.0/0.1
Oxygen content on input/output of filter, no more than ppm	800/5	_

CRYOEXTRACTOR EFC-2 *(extraction freezing with centrifugation)*

The device is intended for extraction of target organic substances from liquid and solid samples. Implements a new method of sample preparation in chemical analysis -extraction freezing and centrifugation EFC (RF Patent No. 2303476/2007, No. 2564999/2015; international application PCT/RU2015/000615). Field of application-hydrochemistry, chemical and toxicological analysis, biochemistry, food research, etc.

The main advantages and important qualities of the method of extraction freezing with centrifugation of EFC (RF Patent №2564999/2015) in comparison with existing extraction methods:
- the degree of concentration and efficiency of extraction of organic compounds from water is superior to traditional liquid extraction
- enables the use hydrophilic, water-soluble extractants without additional chemical modification of the sample;
- the resulting extracts do not contain water and dispersed particles, even when using acetonitrile moisture content less than 4%);
- allows substances to be extracted from highly contaminated, dispersed systems directly without any additional operations (e.g. filtering);
- use instead of liquid and solid-phase extraction, including QuEChERS, can significantly improve economic performance, significantly minimizing the amount of extractant and chemical utensils;
- indispensable in the study of thermolabile organic substances, as well as favorable in order to improve working conditions and safety, because it significantly reduces the volatility of toxic solvents and extractable substances;
- obtained acetonitrile extracts are compatible with reversed-phase HPLC regime;
- in the study of biological samples in combination with GC-MS significantly reduces the amount of endogenous co-extractive substances, significantly improving the identification conditions, reducing the contamination of the MS-detector and increases the period of its operation between the phases of required maintenance service;
- control of selectivity of the extraction based on the variation of extractant, pH environment and the conditions of the EFC procedure implementation.

Technical characteristics

- The temperature range of the extraction freezing with centrifugation from - (minus) 28 to +25°C
- Frequency of rotation of the rotor with the possibility of mode programming is 100-8000 rpm./min
- Split factor up to 6600 g
- Power supply of the cryoextractor from AC 220 V, 50 Hz
- Power consumption, not more than 0.3 kW
- Weight of cryoextractor not more than 50 kg
- Overall dimensions (HxWxD), mm x mm x mm not more than 900x600x600
- The number of simultaneously extractable samples:
  - in penicillin bottles with capacity of 15 ml 4
  - in vials of CHROMACOL type with capacity of 12 ml 8

MEASURING-CALCULATING COMPLEX "VULKAN-2005M"

Measuring-calculating complex (MCC) "Vulkan-2005M" is designed for measuring of vapor and gas pressure in the given volume during determination of thermal stability of substances in isothermal mode, that is carried out by customer's certified method, developed specifically for each substance. MCC can be used in different industrial branches, in factory and research laboratories.

MCC work is based on measuring of gas and vapor from decomposition of substances pressure in closed reaction chamber of primary converter in isothermal mode with registration of measurement results in the form of tables, graphs with PC.
Pressure in reaction chambers is measured by direct method with the help pressure tensomodules. Temperature measuring is done with the help of platinum thermal resistance, located in thermostat.
Temperature control function, pressure control, converting of signals into digital form is done in control modules, located directly on thermostats and working offline after temperature setting. Digital signal packages from control modules enter pairing device where they are united into one flow and are further transferred for processing to PC.

Technical characteristics

- Absolute pressure measurement range of gas and vapor during thermal decomposition of substances in the range from 0 to 0,25 MPa
- Pressure measurement permissible error limit – 1% from upper limit of measurement
- Temperature range in reaction volumes of primary converters – from +50 to +200°C (or up to +300°C for modification "01")
- Preset temperature maintenance in thermostats with absolute error no more than 0,1°C
- Discreteness of thermostating temperature setting, equal to 0,1°C
- Thermostating temperature setting error no more than 2°C
- Structure of MCC includes up to 4 thermostats with primary converters
- Time interval between measuring cycles in automatic mode – about 1 second
- Emergency protection triggers when the pressure is exceeded or value temperatures given in control program
- Electric power from AC power network with voltage 220 V minus 15% to +10%, frequency (50+1) Hz
- Time for entering the mode by thermostats from the moment of their switching on is no more than 3,5 hours.
- Power consumption of MCC is no more than 4 kW
- Overall dimensions (width x depth x height) no more than 450 x 460 x 600 mm
- Mass no more than 38 kg
- Time of continuous work of MCC no less than 72 hours.

INDUSTRIAL STREAM GAS CHROMATOGRAPH «PETROCHROM-4000»

Complex analysis of natural gas content and its quality characteristics

- *Fully automatic operation, no operator involvement required!*
- *Reasonable price.*
- *Explosion-proof framework has certificate of conformity of explosion-proof framework.*

Application:

Determination the composition of commercial natural gas in gas equipment and oil-and-gas production equipment, and also equipment of chemical, petrochemical, oil-processing and explosive industries.

Type 1: *Total nitrogen and oxygen determination in natural combustible gas (NCG)*

Type 2: *Separate determination of nitrogen and oxygen*

- Can be installed in explosive areas of rooms of all classes
- Type of protection 1 Exd
- Operation with the help of microcontroller
- Automatic calibration from GSO cylinder
- Data transfer to ASTPC system by protocol Modbus/RTU via cable or via wireless link of GSM standard
- Automatic calculation of characteristics for nature gas by software. Patent for invention № 2439553 from 10.01.12, given for ISC "Petrochrom-4000".

GAS SAMPLE PROBE

You can purchase following types of gas sample probes:

BDP 12-2-9,8 device is used for sampling, keeping and transportation of gas samples that are under pressure. Device is manufactured from aluminum and designed for small-displacement.

Models PGO-50, PGO-400 and PU are used for sampling of liquefied hydrocarbon gases under excess pressure of stationary tanks and/or own vapor.

Parameter	Model				
	BDP7		BDP12		BDP16
Volume, l.	0,7	0,1	2	4	10
Internal diameter, mm.	70	70	120	120	160
Length, mm.	360	480	368	593	800
Working pressure, MPa	9,8				
Number of fillings up to working pressure, times	No less than 5000				
Corpus material	Amg6M				

BDP 12-2-9,8

Parameter	Model PGO-400
Volume, l.	0,4
Internal diameter, mm.	50
Length, mm.	400
Working pressure, MPa	5,0
Corpus material	12x18H10T

PGO-400

Parameter	Model PGO-50M
Volume, l.	0,05
Internal diameter, mm.	35
Length, mm.	325
Working pressure, MPa	9,0
Corpus material	12x18H10T

PGO-50M

REACTOR PIPE FURNACE

Technical characteristics

- *Working temperatures range 20÷650 °C*
- *Number of heating zones – 1*
- *Material – ceramics, S316*
- *Internal diameter by preorder*

Presented in the catalogue photos and characteristics of products are introductory in nature and may differ from the real.

For more information contact the manufacturer.

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ТАМОЖЕННЫЙ СОЮЗ
ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ

Заявитель, Общество с ограниченной ответственностью «Научно производственная фирма «Мета-хром», ОГРН 1021200757270
Адрес: 424000, Россия, Республика Марий Эл, город Йошкар-Ола, улица Баумана, дом 100, Телефон: 88362424997; 88362430440 факс: 88362430440, 88362424997, e-mail: m_chrom@mari-el.ru
в лице Директора Лапина Владимира Авангардовича
заявляет, что оборудование химическое: Генераторы водорода торговой марки ГВ серии ГВ-7; ГВ-12; ГВ-16.

изготовитель: Общество с ограниченной ответственностью «Научно производственная фирма «Мета-хром», Адрес: 424000, Россия, Республика Марий Эл, город Йошкар-Ола, улица Баумана, дом 100, Телефон: 88362424997; 88362430440 факс: 88362430440, 88362424997, e-mail: m_chrom@mari-el.ru
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(подпись) Лапин Владимир Авангардович
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М.П.

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Meta Chrom