



JS Manufacturing and Power Engineering Company “Sumygazmash”



JS MANUFACTURING AND POWER ENGINEERING COMPANY “SUMYGAZMASH”



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Dear Colleagues!

“Sumygazmash” Company, that we have honor to present, is Ukrainian serial manufacturer of machines of different types and gas-engineering equipment including movable automobile gas filling trucks and compressor equipment and spare parts. In particular, we are the serial producer of model range (for any inlet pressure) of modern small-size gas-refueling compressor stations (AGNKS), dispensers KPG-2 and KPG-2 performance 01 and other gas equipment. Integrated equipment allows make stations with productivity of 40-1000 refuels a day.

“Sumygazmash” Company is a designer and manufacturer of the components parts for AGNKS equipment: compressors, inter-stage cooling system, dispensers, automatic control system, solenoid valves, ball valves, check and safety valves, gas drying system and other.

All AGNKS models are designed for refueling cars, buses, special vehicles and agricultural vehicles with compressed natural gas (methane). By means of AGNKS the gas is compressed to pressure of 220-250 kgf/cm². After that it is fueled into a vehicle pressure vessel as ready to use motor fuel.

Our AGNKSs are being successfully operated for many years in Ukraine, Russia, Uzbekistan, Tajikistan, Georgia, Armenia and Moldova.

The quality system of the plant complies with ISO 9001:2008 regulations and is confirmed by certificate UA226689 issued Beurau Veritas on September 3, 1999. JSC PEC “Sumygazmash” has permission to start works #104.02.59-73.10.0 and permission to carry out specific type of works #62.03.30-29.56.4 issued by the Ukrainian Industry supervisory authority. All AGNKSs are certified for compliance in Russia # POCC UA.AЯ45.B04588 and permission for application issued by the Federal mining and industry supervision authority of Russia #PPC BK-12900.

Unlike huge CNG stations out AGNKSs are easily located on small territory within living settlement near roads and highways. AGNKSs can be connected to city gas pipelines of any pressure, as well as to main gas pipelines. Besides that AGNKSs can be installed on low pressure wells, coal-bed methane mining wells performing their main task – production of motor-gas fuels and simultaneously degassing coal layers; they also can be installed on crude oil wells with by-passing methane. In order to moth the station is had to be placed on prepared foundation and connected to gas pipeline and electricity network. Water is not used for technological purposes. Gas and the compressor are air-cooled. Heating is not required in technological facilities. AGNKS works in automatic regime. Automatics system controls the station working parameters, automatic start and switch off, also automatic shut down of the station if the working parameters exceed their limits.

Our company carries out all types of activities on installation of AGNKS: supply of equipment, mounting, balancing, commissioning, guarantee service and repairs, after guarantee service, assistance in project development, trains customers and working staff and other services.

AGNKS equipment set consists of compressor block, block of compressed gas accumulators, ramp with posts of simultaneous refueling of 10 vehicles, dispenser, inlet cock-valves block, control system and electric equipment, cable and pipe lines, compressor installation, drying block, air cooling unit, fittings and instruments. Compressor is W-type 5-stage piston compressor with limited lubricant. It is equipped with necessary protecting devices on gas and electric current. Electric drive of the compressor is explosion proof. Block of accumulators is installed out of container and cylinders fastened on frame.

The block of inlet cocks (BIC) is connected to the pipeline with its flange; the BIC output is linked to the compressor block. BIC is designed to clean and purify the input gas from dirt and particulars, registers consumed gas with emphasize on temperature and pressure, and is used for manual shut-off of the input gas from the main pipeline. BIC can be supplied with gas register equipment (gas counter and corrector).



Block of inlet cocks

Compressor block is a main component of the station and it is intended for natural gas pressing, cooling and drying.

In the system of gas drying and preparing using for absorb drying of the compressed natural gas up to humidity level no more than $0,009 \text{ g/m}^3$, energy-efficient technology is used.



Compressor block



**TECHNICAL SPECIFICATION OF AGNKS OF
JS MPEC "SUMYGAZMASH" PRODUCTION**

Main technical data	Type of CNG station (AGNKS)				
	75	140	M-200	300	400
Coercible gas	Natural gas with respective requirements				
Type of piston cross head compressor:	W – type	W – type	W – type	W- type	W – type
Quantity of rows:	3 rows	3 rows	3 rows	3 rows	3 rows
Quantity of stages:	5 stages	4 stages	4 stages	3 stages	2 stages
Overpressure at station inlet In the limits, mpa (kgf/cm ²)	0,05-0,2 (0,5-2)	0,3-0,5 (2-5)	0,5-1,1 (5-11)	1,1-2,4 (11- 24)	2,4-4,2 (24-42)
Station output, nm ³ /h Under inlet overpressure:					
- min	250	430	550	650	750
- max	400	550	650	750	900
Outlet pressure of gas, filled into the vehicle vessel, mpa (kgf/cm ²), no more that	19,6 (200)				
Maximal pressure of gas in accumulators and for refueling movable vehicle gas refueler (pagz), mpa (kgf/cm ²)	24,5 (250)				
The total established capacity, kw	95	106	110	115	120
Overall dimensions of compressor block,					
- length, mm	2 800		2 800		
- width, mm	2 300		2 350		
- height, mm	2 620		2 610		
Station weight in supply scope, kg	13 000		14 000		

Lifetime of the station before capital repairs – 24 000 motor hours.

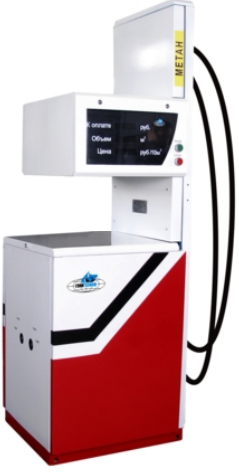
In practice from experience of the operators lifetime is more then 40 000 motor hours.

MAIN TECHNICAL DATA ON THE BLOCK OF ACCUMULATORS (STORAGE BLOCK)



Parameter	AK-14	AK-15	AK-16
Capacity type	Cylinders		
Working pressure, mpa(kgf/cm ²)	25 (250)		
Volume of one cylinder, m ³	0,4	0,5	0,32
Quantity of cylinders	4	4	9
Overall volume of the accumulator block, m ³	1,6	2	2,9
Weight of the accumulator block, kg	4900	5100	7000

MAIN TECHNICAL DATA ON DISPENSERS

	Main technical data	KPG-2	KPG-2-01
	Type	Single hose	Double hose
	Maximum operating pressure, MPA (kgf/cm ²)	24,5 (250)	
	Type of refuelling sistem	1- line or 3-line type	
	Refueled gas pressure, MPA (kgf/cm ²)	17,6- 24,5 (180-250)	
	Max. Relative error, %	±0,5	
	Power capacity , wt	no more than 60	
	Dispenser feed voltage, nominal, v	187 to 242	
	Type of refuelled gas quantity measurement	MASS FLOW METER	
	1 car refueling time (60 m ³) with pressure at dispenser inlet 200 barg, minutes	no more than 6	
	Operating temperatures range, ° c	-30...+50	
	Weight , kg	no more than 175	no more than 250

Dispensers control system SCADA from a PC allows to:

1. Manage 1-8 dispensers;
2. Do refuels in the following regimes: refueling of certain gas volume, refueling for a certain sum of money, full refueling of the pressure vessels.
3. Enter into the database: Company name, Vehicle number, Day of the vehicle pressure vessel check.
4. Dispenser KPG-2 can be connected to the cash register T&T and “Datex”.



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5. Control the vehicle pressure vessel check day, issue a notice of its expiry.
6. Review and print off the following reports: Current report, Shift report, General report on period, enterprise, vehicle number, operator, dispenser number, payment means (cash, cashless), etc, Report on user interference report, Contingency cases.

CONTROL SYSTEM



CS is assigned for the station management on the set algorithm, for parameters control, protection against emergency operating mode and for giving the operator information on condition of parameters and mechanisms.

CS can ensure the functioning of the station with the unary block of inlet cranes and with the coupled block, intended for work with two stations, work with one or several fuel-filling stations.

Adaptation of the CS to the complete set of the equipment is incorporated in the software and is realized on a place of operation from the panel of the operator.

CS can ensure performance of management functions from system of top level on standard industrial networks after addition to its hard- and software on demand of the customer.

CS has a function of the removed monitoring of the work of the station through channels of mobile connection, for this purpose it is necessary to connect GSM modem with a SIM card and an aerial to the CS.

On stability to influence of temperature and humidity of an environment the control panel and feeder switchboard correspond to V4group in accordance with all-Union State Standard 12997-84 (working temperature while operation varies from +5C up to +50C and the highest level of relative humidity is 80 % with +35C).

On stability to influence of sine wave vibrations the control panel and feeder switchboard correspond to L1 group in accordance with all-Union State Standard 12997-84.

The control panel and feeder switchboard are meant to be used outside of explosive zones.

Average service life of the CS is not less than 10 years.

A warranty period of work is not less than 12 months from the date of commissioning, but not more than 24 months from the date of shipment by a manufacturer.

AGNKS MANAGEMENT SYSTEM ALLOWS TO:

1. Manage AGNKS in the repairs and automatic working regimes.
2. Sound and light alarm signals in emergency cases indicating the reason, current parameter points and time.
3. Sound and light alarm signals in case of emergency with equipment or devise indicating type and reason of the break down.
4. Automatic station shut-off at all working regimes.
5. Reviewing current parameter points.
6. Publication of information on stages of the working station.
7. Indication of the state of actuators.
8. Report on compressor working time.

At customer's will, AGNKS can be replenished with industrial logic controller based management system with a graphic displayer, allowing to:

1. Do remote control of AGNKS on the part of the service company, including receiving/sending SMS from GSM-telephone or PC via GSM modem, change setting or program logics of AGNKS.



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2. Remote control of AGNKS from the control centre, including receiving AGNKS technical parameters on PC via the modem.

WARRANTY

The warranty term for the AGNKS equipment exploitation is 12 months after the equipment has been put into operation, but not more than 18 months from the shipment date of equipment to the Customer. The warranty working time must not exceed 3000 motor-hours.

Technical services #1 and technical services #2 are carried out according to the contract commitments:

- ❖ technical services #1 – 1500 motor-hours of the operation time of AGNKS equipment;
- ❖ technical services #2 – 3000 motor-hours of the operation time of AGNKS equipment.

STANDARD BUNDLING FOR CNG STATIONS (AGNKS TYPE)*

№	Appellation	AGNKS				
		75	140	M-200	300	400
1	Compressor unit ❖ gas compressor with electromotor; ❖ gas purifying system and oil separation; ❖ gas cooling system ❖ drying block; ❖ control system and electric - equipment; ❖ container; ❖ fittings and instruments (spare parts).					
2	Block of input cocks ❖ gas counter with correction on temperature and pressure; ❖ valves with manual and remote control.					
3	System of automatics and electrical equipment					
4	Soft-start device					
5	Dispenser with operating system	2	3	3	4	4
6	Block of accumulators					
7	System of inter-block gas pipelines and cables					
8	Installation and commissioning					

*In the table basic bundling is presented.

The term of equipment production is 45-90 days from the moment of prepayment receiving.

JSC MPEC SUMYGAZMASH accepts payments under following conditions:

- prepay 100%;
- prepay 70%, the rest 30% is paid within 3 working bank days once the equipment has been tested at the factory;

JS MPEC “SUMYGAZMASH” is open for business cooperation both in the traditional field of our activity and in new areas, has sufficient capacities and qualified personnel for this purpose.

We can become your partner in realization of any joint projects: from large-scale investments to the development of the high technologies and production.

We'll do our best on our part. We invite you for cooperation!



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