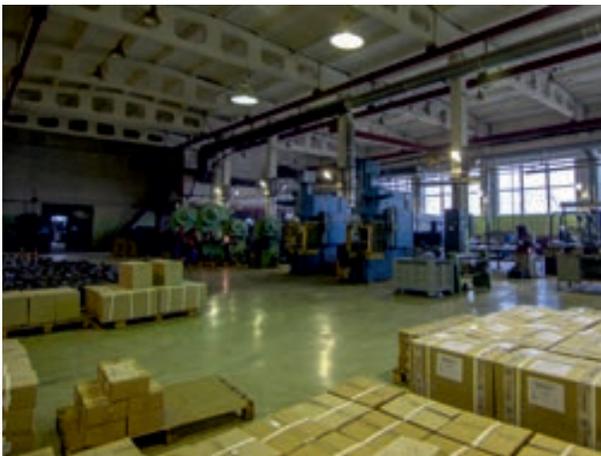


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ABOUT THE COMPANY



ABOUT THE COMPANY

Closed joint stock company “NPG Granit-Salamandra” was founded in 1992 and nowadays holds the leading position in the area of fire extinguishing aerosol production. The company has developed infrastructure with high scientific and production potential. CJSC “NPG Granit-Salamandra” management level conforms the international standards of Quality Management System ISO 9001:2008.

Nowadays CJSC “NPG Granit-Salamandra” represents::

- Production of wide range of fire extinguishing aerosol generators of different models. The model range of generators allows to choose optimal solution for object protection on the basis of characteristic array: intended use, volume, location etc.
- Automatic and autonomous aerosol fire extinguishing installations development on the basis of aerosol fire extinguishing generators. The specialists of Research and Technological Development department designed the range of fire extinguishing systems both for buildings and transportation facilities. Besides that, the specialists of the company can offer individual solutions according to the requirements of particular customer.
- Newest research and development in the area of aerosol fire extinguishing. Constant scientific work, carried out by the specialists of Research and Technological Development department, allows to improve the existing models of generators and design new ones, that meet the increasing market demand.
- Production of modern high-efficient fire-proof compositions for metal constructions under the Holland technology.
- Design, mounting, start-up and adjustment operations of aerosol fire extinguishing systems in different objects

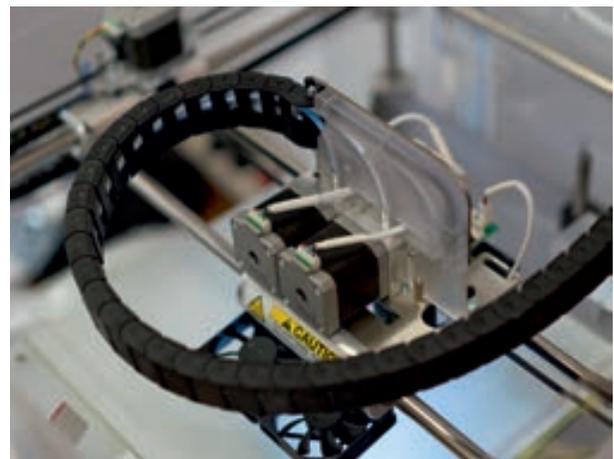
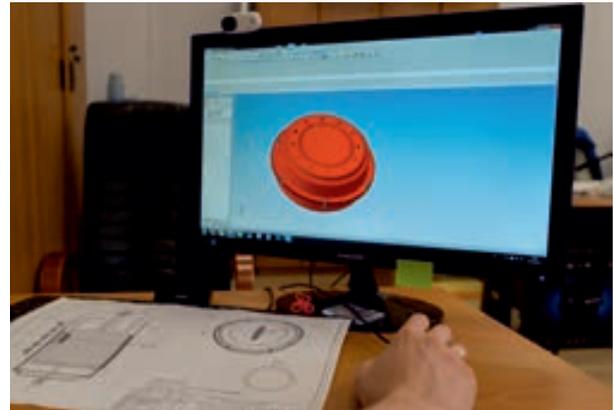
FROM IDEA TO DEVELOPMENT

All the products of the company are designed by the specialists of Research and Technological Development department. The company's Research and Technological Development department provides necessary basic and applied research, experimental development, research tests and production of prototypes of new high-efficient fire-fighting devices.

The specialists of the department constantly work on the production characteristics improvement. The developments of the department are realized immediately. If the tests show the real increase of characteristics, the modifications are certified and brought into serial production.

The company's developments are protected with dozens of patents.

All the products are certified.



OUR PRODUCTION

The production of generators of extinguishing aerosol is carried out on our own factories in the city of Tver with total area more than 8000 m². This is the essential component of our company's success.

Modern hi-tech equipment allows the company to produce the devices of the highest quality. Each step of the production is under control. All the finished products are tested in the technical control department. By virtue of it our customers are fully protected from getting the products of low quality. No defective product can go through the multilevel system of quality control introduced in our production.

Our company has large warehouses, where the finished products are stocked. It allows to have in stocks all the frequently used models of produced generators all the time.

AEROSOL FIRE-FIGHTING METHOD

PRINCIPLE OF OPERATION

The aerosol fire extinguishing method is based on the chemical process of chain reactions suppression in the zone of burning.

The main element of aerosol fire-fighting system is the aerosol fire extinguishing generator. It consists of solid aerosol forming compound inside the metal body, equipped with cooling system and starter.

Pirotechnical impulse from the starter activates the process of compound burning. As a result the cloud of fire extinguishing aerosol forms and suppresses fire. The aerosol particles, forming in the process of compound burning, have very little size (5-10 micron) and can stay suspended during 30-40 minutes. When the extinguishing concentration of aerosol is achieved in the room, the heat release decreases, the temperature of the gas environment in the room reduces and the flaming combustion stops. During 10-15 minutes after termination of generators operation the fire extinguishing concentration of aerosol persists in the room. This makes the repeated ignition impossible.

ADVANTAGES

- Efficiency. Aerosol fire-fighting systems have the highest fire-extinguishing capability among all means of saturation extinguishers ($\rho = 0,05 \text{ kg/m}^3$).
- High performance.
 - Resistance to high and low temperatures ($t = -50/+80 \text{ }^\circ\text{C}$).
 - Resistance to shock and mechanical loads.
- Possibility of electrical installation fire extinguishing without voltage removal
- Ease of installation. Additional equipment settling and communication lines admission are not required.
- Ease of use. Require minimal maintenance. When the generator is triggered, the aerosol can be easily removed from the surface.
- Harmlessness. When triggering makes no harm to the protected object in conditions of proper installation.
- Environmental friendliness.
 - The concentration of harmful substances in the air when the generator is triggered does not exceed the maximum permissible concentration.
 - Harmless to ozone screen.

Aerosol forming compositions exceed all the fire-fighting means, used in volume fire extinguishing, in a number of factors. It is illustrated in the tables below.



COMPARATIVE CHARACTERISTICS OF AEROSOL, GAS AND POWDER COMPOSITIONS, USED FOR VOLUME FIRE-FIGHTING

Characteristics of fire extinguishing compositions	Fire-fighting aerosol	Carbon dioxide, CO ₂	Halocarbon	Inactive gas	Powder
Extinguishing concentration, kg/m ³	0,04 - 0,06	0,6 - 0,7	0,22 - 0,37	0,6 - 0,8	0,6 - 0,7
Operating temperature, -/+°C	-50/+80	-35/+50	-	-	-50/+50

	EFFECT ON HUMAN	EFFECT ON PROPERTY	EFFECT ON ENVIRONMENT
Fire-fighting aerosol	Can be used in human presence in permissible concentration and with proper precautions.	No damage caused.	Friendly to environment. Harmless to ozone screen.
Foam and water	Special protective features necessary.	Corrosive to material and metal constructions due to large water concentration. Harmful to electronic facilities.	Sediment is difficult to remove. Foam is poisonous.
Carbon dioxide, CO ₂	Highly dangerous to humans in fire-fighting concentrations.	Condensation can be harmful to electronics.	CO ₂ release during fire extinguishing is much higher than CO ₂ release from other sources.
Inert gases	May lead to disfunction of oxygen supply to the brain.	No damage caused.	No damage caused.
Halocarbon	It is forbidden to use in human presence.	No damage caused.	Harmful to the environment and to ozone screen.



FIRE EXTINGUISHING
AEROSOL
GENERATORS





COMPARATIVE CHARACTERISTICS OF AEROSOL FIRE-FIGHTING GENERATORS

Name		Protective volume, m ³	Operation time, sec	Mass, kg	Mass of aerosol forming compound, kg	Dimensions, mm diameter x height
AGS - 2/4		21	45	4,6	1,6	167 x 175
AGS - 6/1		3,2	19	1,2	0,35	122 x 69
AGS - 6/2		52	37	12,5	3,5	167 x 420
AGS - 7/1		65	86	5,8	3,4	167 x 355
AGS - 7/2		134	165	10,8	6,8	167 x 495
AGS - 8/1		60	100	11,5	3,25	220 x 217
AGS - 8/2		124	175	19,5	6,7	220 x 348
AGS - 11/1		2,2	7,5	0,61	0,11	122 x 23
AGS - 11/2		3,4	11	0,85	0,17	124 x 32
AGS - 11/3		6	20	1,34	0,3	135 x 52

Name		Protective volume, m ³	Operation time, sec	Mass, kg	Mass of aerosol forming compound, kg	Dimensions, mm diameter x height
AGS - 11/4		18	25	2	0,9	165 x 74
AGS - 11/5		28	50	4	1,4	217 x 94
AGS - 11/6		48	40	4,5	2,4	217 x 94
AGS - 11/7		10	35	2	0,5	165 x 74
AGS - 12/1		0,3	5	0,1	0,015	75 x 20
AGS - 12/2		0,6	8	0,15	0,03	75 x 28
AGS - 12/3		1,1	6	0,5	0,055	105 x 20
AGS - 12/4		2,2	10	0,65	0,11	105 x 28
AGS - 15/1		60	25	4,8	2,4	255 x 106
AGS - 15/2		100	40	6	3,8	272 x 125

FIRE EXTINGUISHING AEROSOL GENERATOR AGS-2/4



DESCRIPTION

Fire extinguishing aerosol generator AGS-2/4 is designed to provide gaseous-aerosol mixture which stops the process of flame burning when reaches the necessary concentration.

Generator is made in a shape of cylinder with metal body, on the end part of which the nozzle cap is located. Generator has a lot of modifications.

When the electrical impulse comes to the starter, that is installed inside the generator, the solid aerosol forming compound ignites. During the burning of it the fire extinguishing aerosol is produced. The aerosol flow goes through the cooling layer and comes out of generator through the nozzle.

APPLICATION AREA

- transportation facilities
- production areas of medium size
- warehouses of medium size
- business offices

TECHNICAL DATA	AGS - 2/4
Maximum protected volume	21
Mass of equipped generator, kg	5,1
Dimensions (diameter x height), mm	167 x 180
Operation time, sec	40
Fire extinguishing class	A  B  E 

PROTECTED OBJECTS



FIRE EXTINGUISHING AEROSOL GENERATOR AGS-6



DESCRIPTION

Fire extinguishing aerosol generator AGS-6 is the mean of volume fire extinguishing. It is designed for localization and suppression of fires of inflammable and combustible liquids, solid combustible materials and electrical equipment, including electrical equipment under voltage.

Generator consists of the body, inside which an aerosol forming compound and the starter are located. Aerosol comes out through the nozzle holes on the side surface of the body. The threaded sleeve for binding of the starter is located in the cover of generator.

After the electric or heat impulse reaches the starter, the aerosol forming compound is ignited. During the burning of it the fire extinguishing aerosol is produced.

APPLICATION AREA

- electrical equipment under voltage up to 40kv
- server cabinets
- radio centers
- automatic telephone stations
- engine area of transportation facilities
- diesel-generator units
- production areas
- business centers
- business offices
- administrative buildings
- stores
- warehouses

TECHNICAL DATA	AGS - 6/1	AGS - 6/2
Maximum protected volume	3,2	52
Mass of equipped generator, kg	1,2	12,5
Dimensions (without starter), mm	122 x 69	167 x 420
Operation time, sec	19	37
Fire extinguishing class	A  B  E 	

PROTECTED OBJECTS



FIRE EXTINGUISHING AEROSOL GENERATOR AGS-7



DESCRIPTION

Fire extinguishing aerosol generator AGS-7 is designed for providing of fire extinguishing aerosol and its distribution to protected room during liquidation of subclass A2 and class B fires, and localization of subclass A1 fires

Generator consists of the body, inside which an aerosol forming compound, the starter and injector are located. Aerosol comes out through the nozzle holes in the cover of the generator. The threaded sleeve for binding of the starter is located in the cover of generator. Generator is installed in the protected room with the special brackets, which are supplied with generator.

Generators AGS-7 can be activated with electrical, heat or combined starters.

APPLICATION AREA

- administrative buildings
- business centers, offices
- covered multilevel parkings
- production areas
- cable tunnels, cable chambers
- stores
- pipelines
- garages
- warehouses

TECHNICAL DATA	AGS - 7/1	AGS - 7/2
Maximum protected volume	65	134
Mass of equipped generator, kg	5,8	10,8
Dimensions (diameter x height), mm	167 x 355	167 x 495
Operation time, sec	86	165
Fire extinguishing class	A  B  E 	

PROTECTED OBJECTS



FIRE EXTINGUISHING AEROSOL GENERATOR AGS-8



DESCRIPTION

Fire extinguishing aerosol generator AGS-8 is designed for providing of fire extinguishing aerosol and its distribution to protected room during liquidation of subclass A2 and class B fires, and localization of subclass A1 fires

Generator is made in a shape of cylinder with metal body, on the end part of which the nozzle cap is located. Generator is installed in the protected room with the special brackets, that allow to settle the direction of aerosol flow within the range from 0 ° to 180 ° . Generators AGS-8 can be activated with electrical or heat starters.

The usage of heat starters, triggering when the temperature in the protected volume reaches 150-170 °C, allows each generator to work completely autonomous.

APPLICATION AREA

- administrative buildings
- business centers, offices
- covered multilevel parkings
- production areas
- cable tunnels, cable chambers
- stores
- pipelines
- garages
- warehouses

TECHNICAL DATA	AGS - 8/1	AGS - 8/2
Maximum protected volume	60	124
Mass of equipped generator, kg	11,5	19,5
Dimensions (diameter x height), mm	220 x 217	220 x 348
Operation time, sec	100	175
Fire extinguishing class		

PROTECTED OBJECTS



FIRE EXTINGUISHING AEROSOL GENERATOR AGS-11



DESCRIPTION

Fire extinguishing aerosol generator AGS-11 is the device, that successfully brings together the advantages of many other types of generators. Having small size, the generator efficiently extinguishes fires in different conditions. Produced aerosol can come out to the protected room through special slotted nozzle. It is the distinctive feature of the generators of 11 series. This technical design significantly improves the performance characteristics of generators.

Due to high resistance to vibratory loads the generator is widely used for transportation facilities protection.

The company produces seven models of generators AGS-11 for different protected volume. Also each model has different modifications that depends on the direction of aerosol flow.

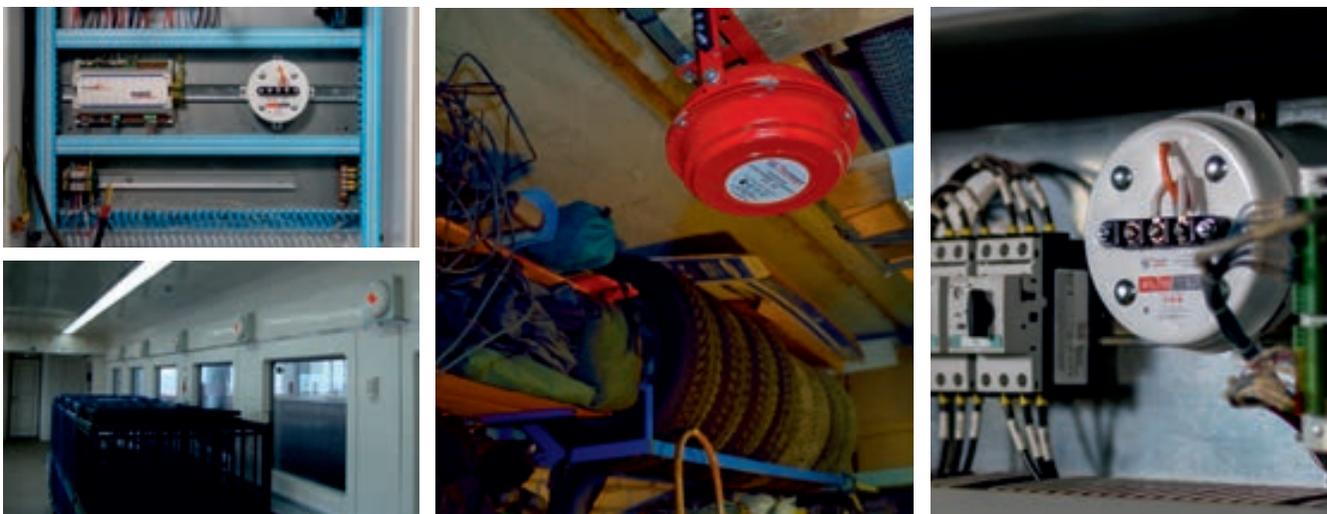
APPLICATION AREA

- electrical equipment under voltage up to 40kV
- engine area of transportation facilities
- constructive and agricultural transport
- military and police transport
- automatic telephone stations
- diesel-generator units
- radio centers
- public and truck transport
- server cabinets
- garages
- railway transport
- rooms of small size

TECHNICAL DATA	AGS - 11/1	AGS - 11/2	AGS - 11/3	AGS - 11/4
Maximum protected volume	2,2	3,4	6	18
Mass of equipped generator, kg	0,61	0,85	1,34	2
Dimensions (diameter x height), mm	122 x 23	124 x 32	135 x 52	165 x 74
Operation time, sec	7,5	11	20	25
Fire extinguishing class	A  B  E 			

TECHNICAL DATA	AGS - 11/5	AGS - 11/6	AGS - 11/7
Maximum protected volume	28	48	10
Mass of equipped generator, kg	4	4,5	2
Dimensions (diameter x height), mm	217 x 94	217 x 94	165 x 74
Operation time, sec	50	40	35
Fire extinguishing class	A  B  E 		

PROTECTED OBJECTS



STANDALONE AEROSOL FIRE EXTINGUISHING UNIT WITH A THERMAL STARTER AGS -12



DESCRIPTION

Standalone aerosol fire extinguishing units with a thermal starter AGS-12 are intended for localization and extinguishing of fires of flammable and combustible liquids, solid combustible materials and electrical equipment, including electrical equipment under voltage. The unit is used for fire protection of small volumes.

The unit consists of the body, inside which an aerosol forming compound and the starter are located. On the side surface of the body, there is a slot nozzle, through which the aerosol exits.

When the heat impulse comes to the starter, the solid aerosol forming compound ignites. During the burning of it the fire extinguishing aerosol is produced.

APPLICATION AREA

- electrical equipment under voltage up to 40 kV
- server cabinets
- automatic telephone stations
- diesel-generator units
- engine area of transportation facilities
- radio centers

TECHNICAL DATA	AGS - 12/1	AGS - 12/2	AGS - 12/3	AGS - 12/4
Maximum protected volume, m ³	0,3	0,6	1,1	2,2
Mass of the unit, kg	0,1	0,15	0,5	0,65
Aerosol fire-fighting capacity, kg/m ³	0,05	0,05	0,05	0,05
Dimensions (diameter x height), mm	75 x 20	75 x 28	105 x 20	105 x 28
Operation time, sec	5	8	6	10
Fire extinguishing class		A 	B 	E 

PROTECTED OBJECTS



FIRE EXTINGUISHING AEROSOL GENERATOR OF OPERATIONAL USE AGS-15



DESCRIPTION

Fire extinguishing aerosol generator of operational use AGS-15 is used before the arrival of fire brigades in the initial phase of fire development by trained security personnel or in the conditions of a developed fire, threatening the lives of firefighters.

Generator AGS-15 consists of the body inside which two aerosol forming compounds are located separated from the body by the heat protection layer. There is a handle for carrying and throwing of the generator. There is a threaded sleeve on the side surface of the shell for binding of the starter. Aerosol comes out through the slit nozzle which is located on the whole side surface of the body.

The generator is triggered by pulling out of safety pin of the starter. The delay composition in the starter provides actuating delay of the generator of 5-7 seconds for its safe throwing to the burning building.

APPLICATION AREA

- public transport
- administrative buildings
- warehouses
- production areas
- business centers
- business offices
- stores

TECHNICAL DATA	AGS - 15/1	AGS - 15/2
Semi-hermetic protected volume, m ³	60	100
Recommended protected volume, m ³	40	80
Dimensions (without starter), mm	255 x 230 x 106	272 x 237 x 125
Operation time, sec	25	40
Actuating delay, sec	5-7	5-7
Fire extinguishing class	A  B  E 	

PROTECTED OBJECTS



OBJECTS PROTECTED BY THE GENERATORS

■ PRODUCTION AREAS



■ COVERED MULTILEVEL PARKINGS



■ ADMINISTRATIVE BUILDINGS



■ GARAGES



■ WAREHOUSES, STORES



■ ELECTRICAL EQUIPMENT (up to 40 kV)



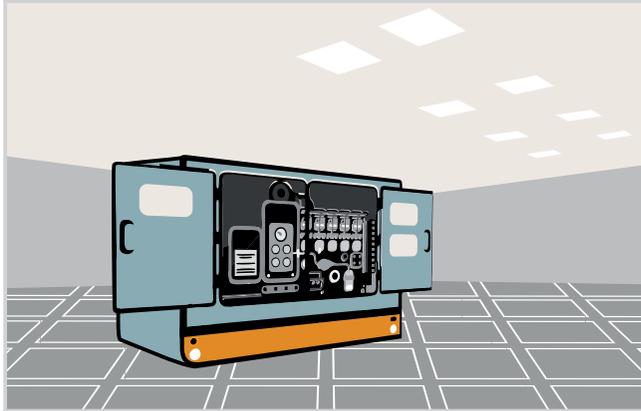
■ CABLE TUNNELS



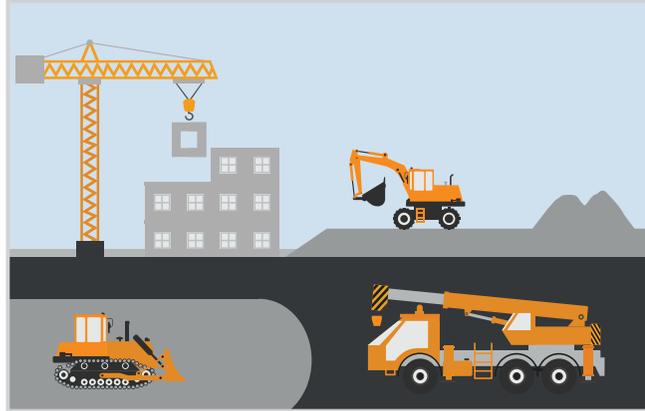
■ SERVER CABINETS



■ DIESEL-GENERATOR UNITS



■ CONSTRUCTIVE, AGRICULTURAL TRANSPORT



■ ENGINE AREA OF TRANSPORTATION FACILITIES



■ PUBLIC TRANSPORT



■ MILITARY AND POLICE TRANSPORT



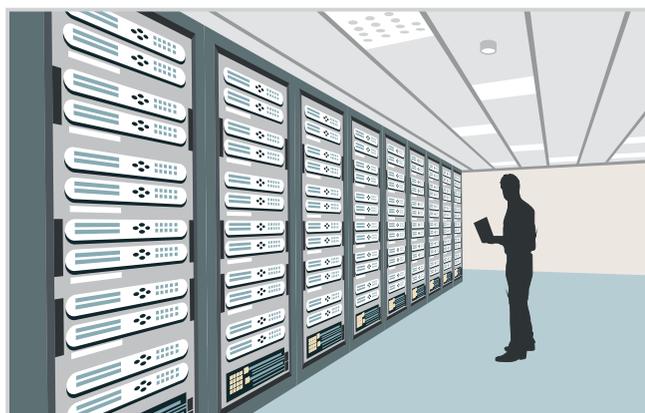
■ RAILWAY TRANSPORT



■ TRUCK TRANSPORT



■ AUTOMATIC TELEPHONE STATIONS





ADDITIONAL
EQUIPMENT
AND FIRE-PROOF
COMPOSITIONS



STARTERS

MANUAL STARTER VUD



Manual starter VUD is screwed into the threaded sleeve on the side surface of the generator and is started manually. The starter is triggered by pulling out the safety pin. Special composition inside the starter provides actuating delay of the generator up to 9 seconds (the actuating delay of the generator is necessary for its safe throwing to the burning building). Manual starter VUD is designed for triggering of fire extinguishing aerosol generator of operational use AGS-15.

ELECTRICAL STARTERS



Electrical starters are designed to install the generators into the aerosol fire extinguishing automatic installations. The starters are triggered by electric impulse. Electrical starters can be screwed or installed inside the generator.

TECHNICAL DATA	VEL screwed	UZTe installed	UZT-7,5 installed	VRp-7,5 screwed
Voltage	2-24 V		12 V	
Minimum starting current	0,4 A		1,6 A	
Duration of electric impulse	not less than 0.5 sec		not less than 0.5 sec	
Resistance of the starter electric chain	2,5 - 4,5 Om		7,5 - 8,0 Om	
Maximum current at the periodic control of electric starting chain should not exceed			0,05 A	

COMBINED STARTERS



Combined starter can trigger the generator both by electric impulse and in autonomous mode at exceeding the set temperature limit of 180°C. The starter is screwed into the threaded sleeve on the side surface of the generator.

TECHNICAL DATA	VELTH	VRTHp-7,5
Voltage	2-24 V	12 V
Minimum starting current	0,4 A	1,6 A
Duration of electric impulse	not less than 0.5 sec	not less than 2.0 sec
Resistance of the starter electric chain	2,5 - 4,5 Om	7,5 - 8,0 Om

Maximum current at the periodic control of electric starting chain should not exceed

0,05 A



TRIGGER ITEMS

HEAT ELECTRICAL STARTER TPE-1



Electrical heat starter TPE-1 is used in aerosol fire extinguishing installations as the device which triggers the generators of fire extinguishing aerosol when the environment temperature rises above the temperature limit which is set for the heat lock of sprinkler which is installed inside the TPE-1. The starter is designed for uninterrupted day-and-night operation.

MODIFICATIONS

TPE-1
TPE-1B

TPE-1T
TPE-1TB

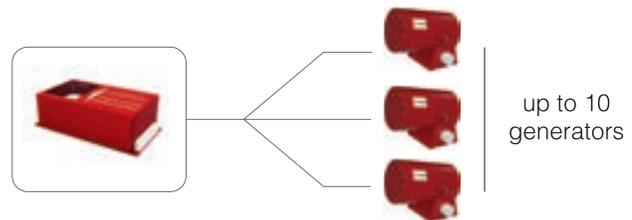
TPE-1H
TPE-1HB

Letter B in the name means that there is a power supply element for generators start-up.
Letter T in the name means that the starter is manufactured for application in transport, on the special bracket.

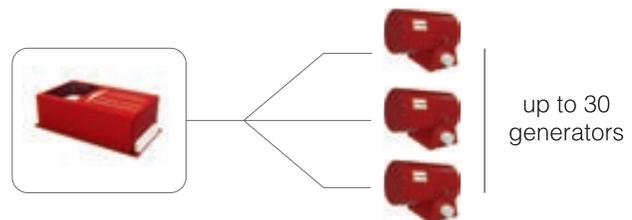
Letter H in the name means that the starter is manufactured in hermetic modification.
Depending on intended purpose the starter can be supplied without power supply element. In this case there is no letter B in the name of the starter.

MANUAL START-UP REMOTE MSR

31MSR-10 for triggering 10 fire extinguishing aerosol generators



MSR-30 for triggering 30 fire Extinguishing aerosol generators



Manual start-up remote MSR is used in aerosol fire extinguishing installations as the device which allows manual start-up of group of fire extinguishing aerosol generators. At the same time MSR is the electrical power source in autonomous fire extinguishing installations.

MSR generates electrical impulse when the hookup group is shorted manually or when the heat lock of TPE-1 is activated.

MSR is designed for uninterrupted day-and-night operation and is used indoors in different heated and unheated premises.

Operating temperature range: from -50°C to +80°C.

SWITCH "BLIK"



Switch "Blik" is used for triggering of fire extinguishing installations for one protected direction.

FIRE-PROOF COMPOSITION “HCA LW”

FIRE-PROOF COMPOSITION “HCA LW”

Nowadays paints, varnishes, mastics and other materials are used to improve the fire resistance. These materials gradually replace bulky fire protection. Using intumescent coating to protect cables and steel constructions, fire resistance limit can be from 0.5 to 2.5 hours.

Our company started the production of water-based fire-proof composition HCA LW based on innovative Holland technology.

Water-based fire-proof composition HCA LW is now ready to use. It is easy to apply, using airless spray, brush or roller. HCA LW is odor free. Due to its unique composition, HCA LW is environmental friendly and nontoxic.

Caused by temperature increase in the conditions of fire the composition intumesces and creates thermal insulation screen, that exceeds many times the original thickness of coating layer and protects the surface beneath it.

	Fire-proof efficiency, min	Dry layer thickness, mm	Composition consumption, kg/m ²	Metal thickness, mm
HCA-LW for metal constructions	45	0,75	1,4	3,4
	90	1,55	2,55	5,82
	120	2,00	3,1	7,75
HCA-LW for cables	Conforms GOST R 53311-2009. Thickness: -0.55 mm (for cables with polyvinylchlorid and polyethylene outer coat) -0.65 mm (for cables with rubber outer coat)			

Fire-proof composition HCA LW is designed for internal works. The composition provides matt surface after applying. The standard colour of fire-proof composition is white.

DESCRIPTION AND APPLICATION AREA

Fire-proof composition HCA LW is designed for steel supporting constructions, cables and wooden constructions. Fire-proof composition is thermal expanding, monopropellant and water-based.