



KASKAD®



Aerosol fire-extinguishing system in a factory setting. A red fire extinguisher is shown spraying a white aerosol foam onto a fire burning on a metal table. The background shows industrial equipment and pipes.

**AEROSOL
FIRE-EXTINGUISHING
SYSTEMS**

www.kaskad.net.ru

About company



- SPA "KASKAD" Ltd. is a company with a **25-year-old history** and more than 130 partners all over the world accredited for maintenance of ship aerosol fire-extinguishing (AF) systems. During this years **over 3000 vessels** in more than 17 countries (Azerbaijan, Bulgaria, Great Britain, Estonia, China, Cyprus, Georgia, Greece, Iran, Kazakhstan, Latvia, Malta, Ukraine, Taiwan, Russia) were supplied with the AF systems.
- The company specializes mainly in developing, manufacturing and designing of ship aerosol fire-extinguishing systems.
- AFS equipment is certified by Russian Maritime Register of Shipping RS, Russian River Register RRR, Registro Italiano Navale RINA, International Register of Shipping IRS and China Corporation Register of Shipping CCRS. Our management system certified by Det Norske Veritas DNV and conform to ISO 9001. All the equipment complies with the Circular MSC.1/Circ 1270.



Certificates

DNV-GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of **KASKAD SPA Ltd.** is in conformity with the requirements of the standard: **ISO 9001:2015**

Design, manufacturing, supply, installation, commissioning, acceptance tests, maintenance and inspection of fire-extinguishing equipment, aerosol fire-extinguishing systems and fire safety systems.

TYPE APPROVAL CERTIFICATE No. FP21711ANG

This is to certify that the product identified below satisfies the requirements of the standard quoted under "Reference standard"

FIXED AEROSOL FIRE-EXTINGUISHING SYSTEM

Approved in HAMBURG on November 2, 2016. This Certificate is valid until November 1, 2021.

TYPE APPROVAL CERTIFICATE No. FP25611ANG

This is to certify that the product identified below satisfies the requirements of the standard quoted under "Reference standard"

FIXED AEROSOL FIRE-EXTINGUISHING SYSTEM

Approved in HAMBURG on March 19, 2016.

CERTIFICATE OF TYPE APPROVAL

Fixed Aerosol Fire-Extinguishing System

Approved for a period of 5 years from 21st August 2018 through 20th August 2023.

中國驗船中心 China Corporation Register of Shipping

型式認可證書 Type Approval Certificate

Fixed Aerosol Fire-extinguishing system

Approved Products: Fixed Aerosol Fire-extinguishing System

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОВОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING

СВИДЕТЕЛЬСТВО О ПРИЗНАНИИ ИЗГОТОВИТЕЛЯ RECOGNITION CERTIFICATE FOR MANUFACTURER

Исходное Свидетельство о признании действительно до 23.03.2020

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОВОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING

СВИДЕТЕЛЬСТВО О ТИПОВОМ ОДОБРЕНИИ TYPE APPROVAL CERTIFICATE

Исходное Свидетельство о признании действительно до 04.02.2019

РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОВОДСТВА RUSSIAN MARITIME REGISTER OF SHIPPING

СВИДЕТЕЛЬСТВО О СООТВЕТСТВИИ ПРЕДПРИЯТИЯ CERTIFICATE OF FIRM CONFORMITY

Исходное Свидетельство о соответствии действительно до 27.01.2017

РОССИЙСКАЯ ФЕДЕРАЦИЯ

СВИДЕТЕЛЬСТВО на товарный знак (знак обслуживания) No 356800

Знак No 2007705680

The advantages of AF systems



Cost effective

- The cheapest one among fire-extinguishing systems.



Doesn't require a separate space

- Aerosol generators are placed in a protected space.



Safe for the crew

- Non toxic;
- In case members of the crew are in the protected space at the moment of actuation, they are able to leave it.



Environmentally friendly

- Ozone friendly;
- Doesn't contribute to global warming.



Equipment friendly

- Doesn't cause corrosion;
- Can be used in extinguishing of fires of energized equipment and electric wires under the voltage of up to 40 kV.



Easy to operate

- No need to maintain;
- Annual checks may be carried out by the crew.



No pipes or high-pressure equipment

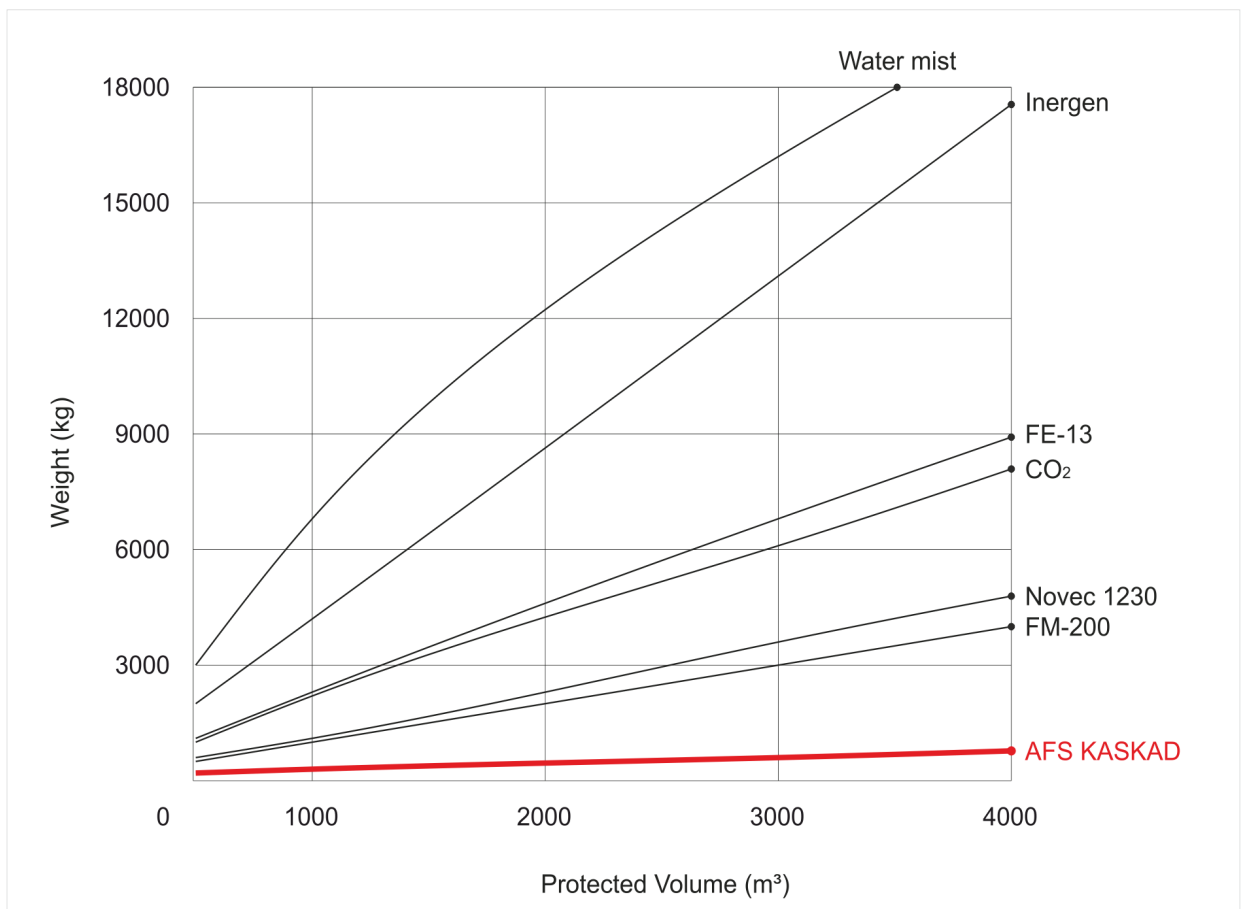
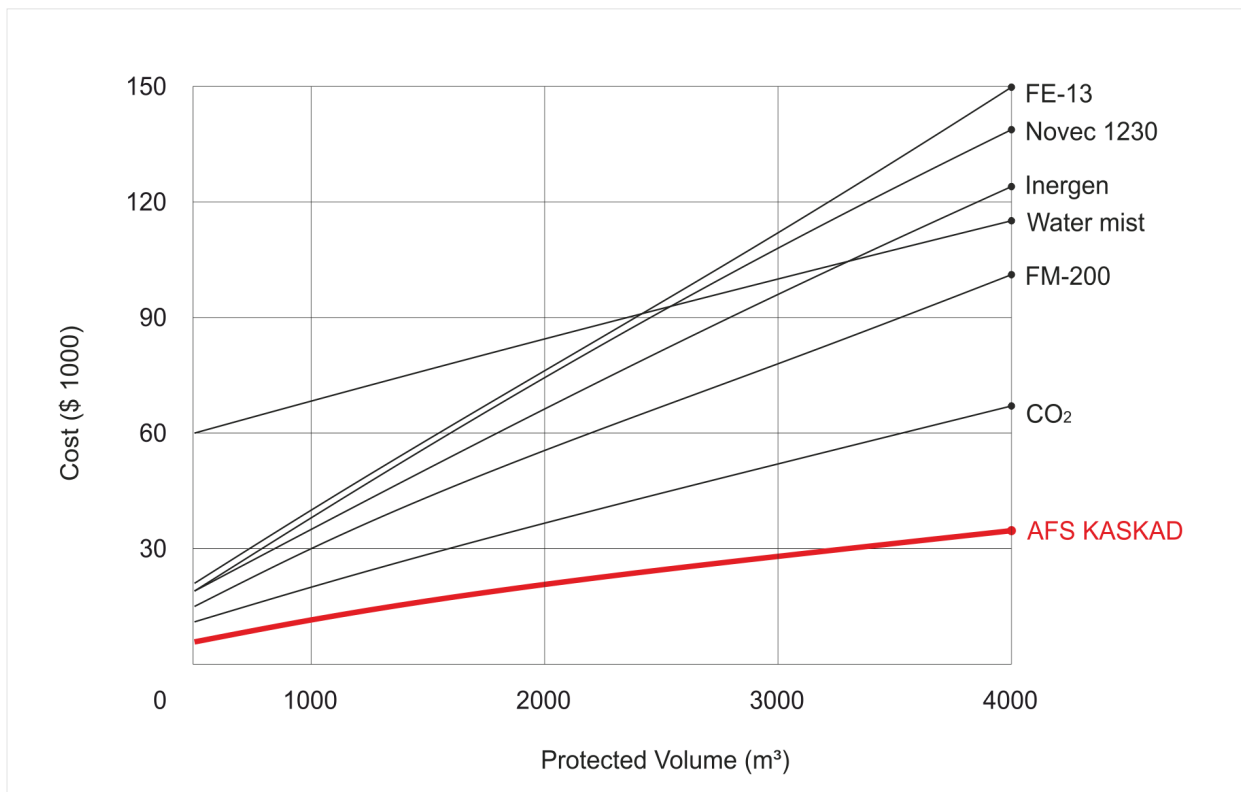
- Fire-extinguishing agents are in solid state in aerosol generators.



Light weight and compact

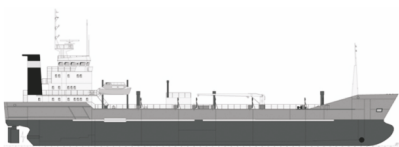
- AF systems are the smallest and the lightest of fire extinguishing systems;
- Easy to install;
- The whole process of installation includes only laying of cable.

Comparison to other fire-extinguishing systems



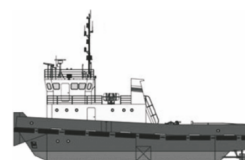
3000 vessels are equipped with AF system





350 tankers

400 tugs



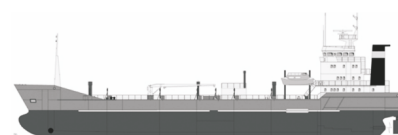
300 support vessels

300 crafts



250 passenger vessels

250 dry cargo vessels



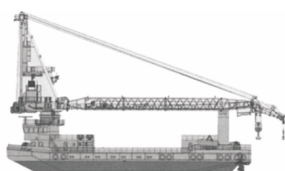
200 patrol ships

130 yachts



40 ferryboats

45 research vessels



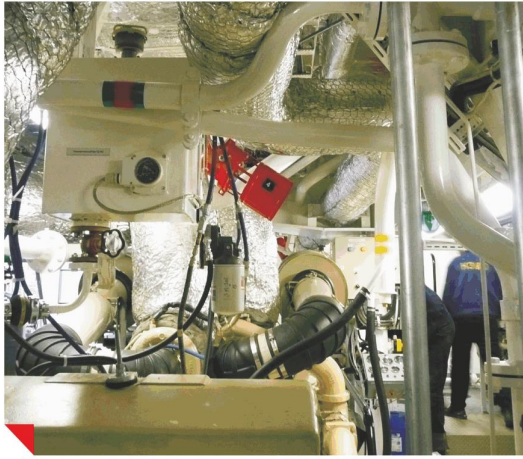
40 floating cranes

25 floating docks



AF system installation



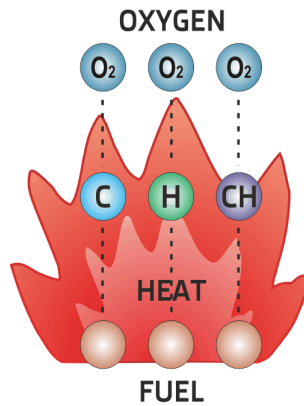


AF system operation principle

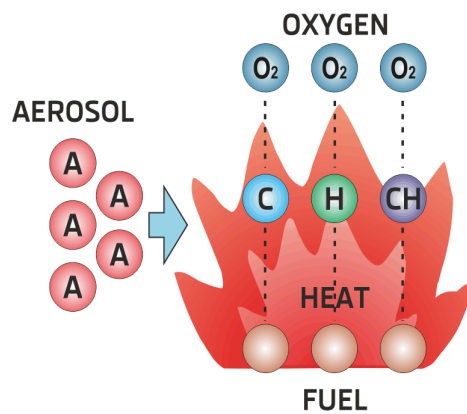
The principle of AF system operation is based on inhibition process of chemical reactions originating in the flame by fine-dispersed particles of fire-extinguishing aerosol.

Fine-dispersed particles of fire-extinguishing aerosol formed during the generator operation fills in the protected space and inhibit chemical reactions originating in the flame.

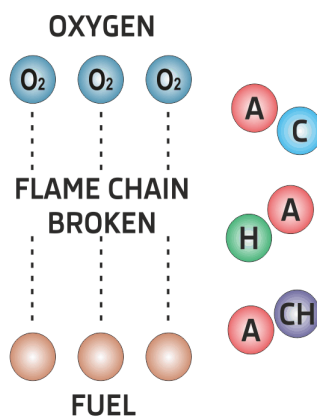
Fire-extinguishing aerosol remains in the air for 30-50 minutes after the generator stops discharge, keeping a fire-extinguishing concentration that excludes a possibility of re-ignition.



Particles of flammable substance evolved when heated aggregate with oxygen molecules and oxidize evolving heat which leads to expansion of chain combustion reaction.



When aerosol fire-extinguishing system is actuated, fine-dispersed particles of aerosol formed from a solid charge fill in all the volume of protected premises.



Aerosol particles are more active than oxygen molecules, therefore they aggregate with particles of flammable substance, which leads to a break of combustion chain reaction.

AF system components



Wheelhouse



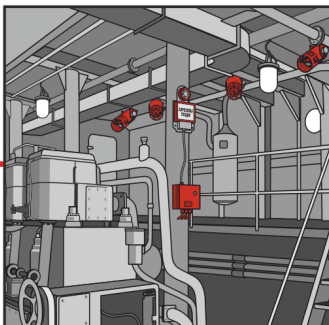
Control and signaling panel CSP

Connection box
CBK1

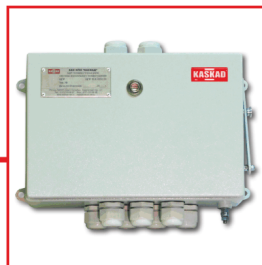


Generator
SOT-1M

Protected space



Generator
SOT-2M

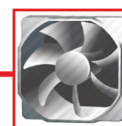
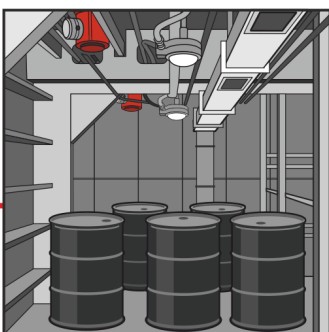


Board of intermediate
relays BIR



Alarm device
OSKS

Explosive
protected space



Ventilation
switch-off



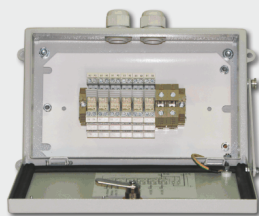
Generator
SOT-2M-KV



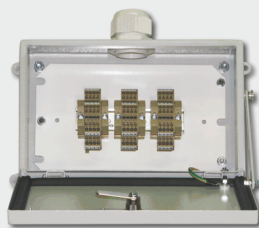
Aerosol fire-extinguishing generators (AFG) which are mounted directly in the protected premises while operating discharge aerosol that is formed from solid aerosol-forming charge. Fire-extinguishing aerosol penetrates in the protected premises and is evenly distributed by volume of the room, and suppresses the burning of liquids and materials, including electrical equipment under pressure. Generator actuation is implemented by electro pulse supply from AFS CSP to the starting assembly. Different aerosol fire-extinguishing generators for example SOT-1M, SOT-2M, SOT-2M KV are applied in the AF system.



Control and signaling panel (CSP) of the AF system is designed for distance actuation of aerosol fire-extinguishing generators, it also gives a signal to deactivate ventilation and other devices and to activate the warning alarm before the AF system is actuated in the protected premises.



Board of intermediate relays (BIR) is designed to control the warning alarm, to deactivate ventilation and other equipment (if available) in protected premises on command from the CSP.



Connection box (CBK1) is designed to lay cable routings of generators starting assemblies into protected premises.



Audible and visual alarms are designed to give "AEROSOL, GO AWAY!", a light and sound signal, when the AF system is actuated. The audible and visual alarm starts functioning when incoming charge is supplied and stops operating when the programmed time of operation passes.

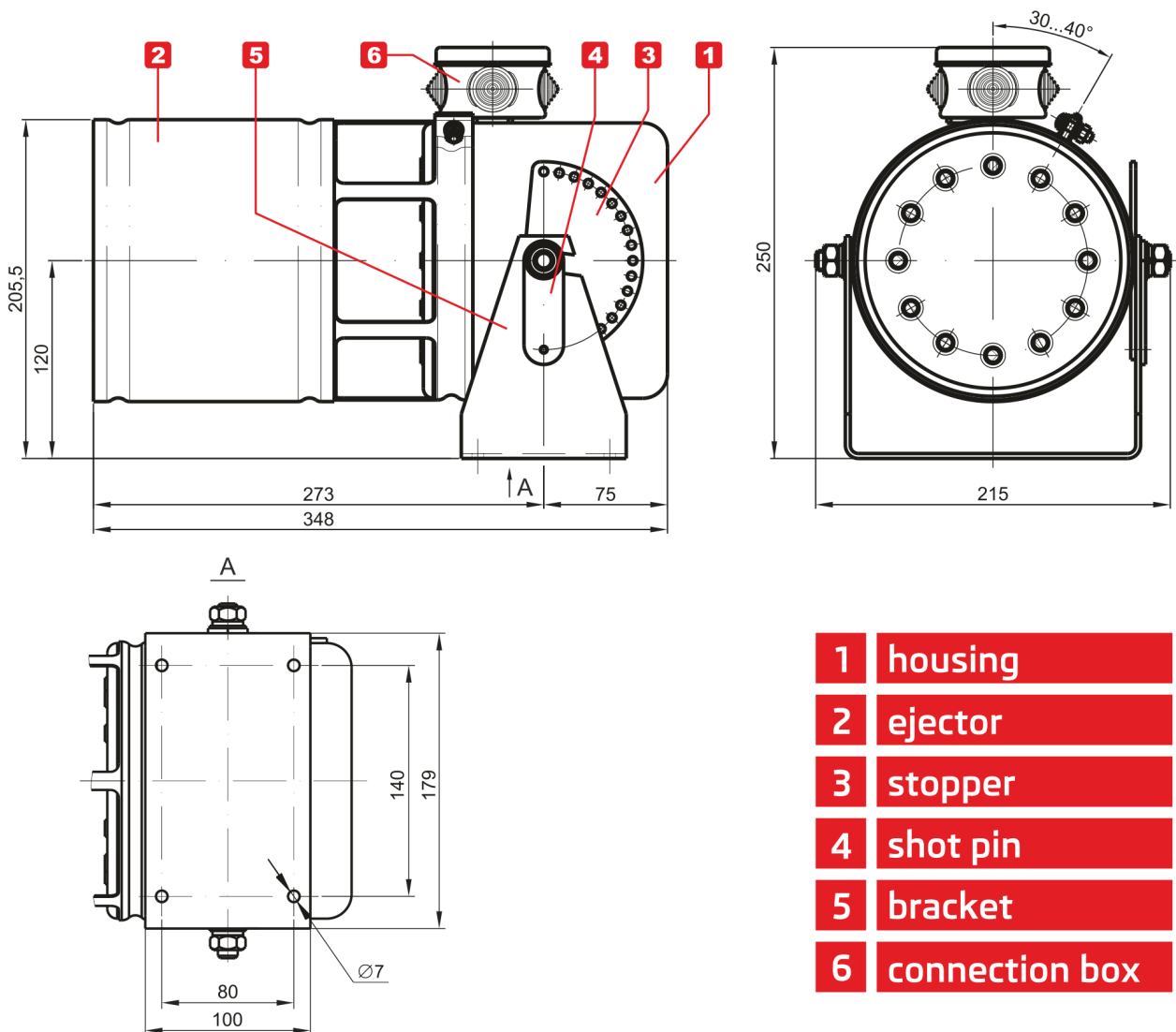
SOT-1M aerosol fire-extinguishing generator



SOT-1M aerosol fire-extinguishing generator is designed for localization and fire extinction of volatile flammable and combustible liquids, solid inflammable materials and electrical equipment, including machinery under the voltage of up to 40 kV, in the non-explosive closed spaces.

SOT-1M generator consists of a housing which contains solid aerosol-forming charge, of an ejector which cools down aerosol jet and of a bracket designed for mounting the generator to the supporting structure. There is an electric connection box, which is designed to connect a generator to a starting circuit. During the operation, SOT-1M generator provides axial discharge of aerosol from outlets in the nozzle cover of the generator housing.

Generator weight, kg	6.7 ± 0.2
Mass of aerosol-forming charge, kg	3.3 ± 0.1
Protected volume (without safety factor), m ³	60
Starting assembly type	built-in, electrical
Time of operation, no more than, s	100
Operation and storage conditions:	
- temperatures range, °C	-40 ... +60
- relative humidity at 25 °C, %	up to 98
Casing protection rate	IP 44



SOT-2M aerosol fire-extinguishing generator

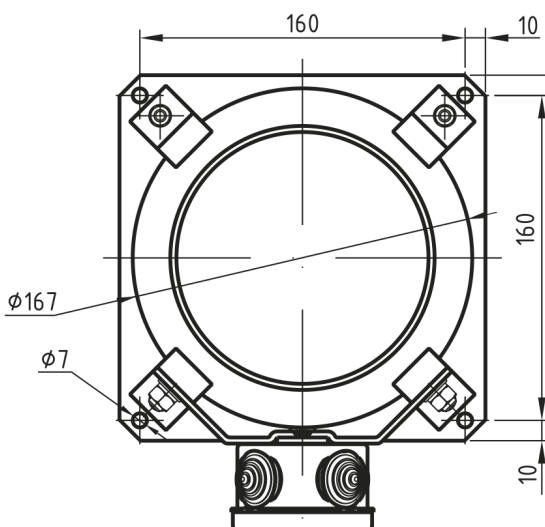
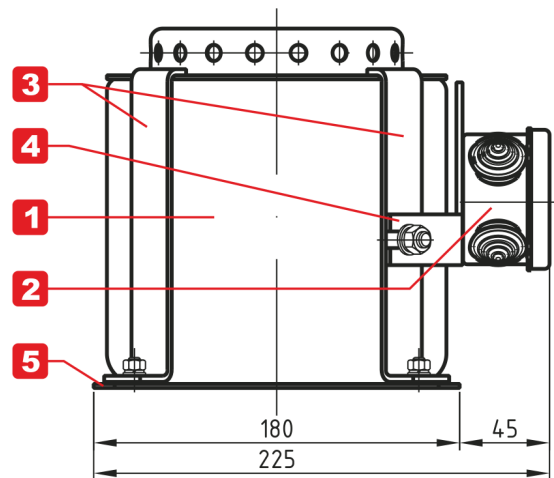
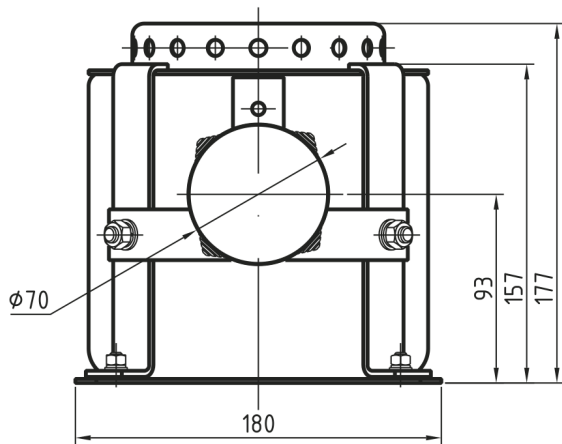


SOT-2M aerosol fire-extinguishing generator is designed for localization and fire extinction of volatile flammable and combustible liquids, solid inflammable materials and electrical equipment, including machinery under the voltage of up to 40 kV, in the non-explosive closed spaces.

SOT-2M generator consists of a housing which contains solid aerosol-forming charge, of aerosol cooling block and of a built-in electric starting assembly, of a mounting attachment designed to install the generator to the supporting constructions. There is an electric connection box placed on the bracket, which is designed to connect a starting assembly with a starting circuit.

SOT-2M generator provides radial discharge of aerosol from outlets in the nozzle cover of the generator housing.

Generator weight, kg	6.1 ± 0.2
Mass of aerosol-forming charge, kg	1.6 + 0.1
Protected volume (without safety factor), m ³	21
Starting assembly type	built-in, electrical
Time of operation, no more than, s	50
Operation and storage conditions:	
- temperatures range, °C	-40 ... +60
- relative humidity at 25 °C, %	up to 98
Casing protection rate	IP 44



- | | |
|---|----------------|
| 1 | housing |
| 2 | connection box |
| 3 | holder |
| 4 | bracket |
| 5 | flange |

SOT-2M-KV aerosol fire-extinguishing generator

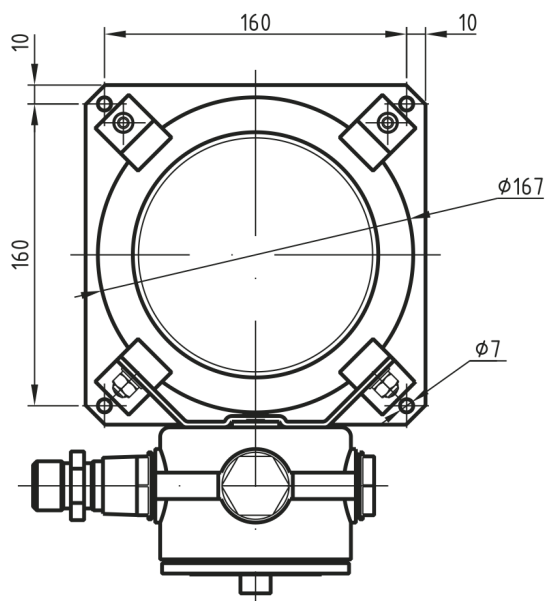
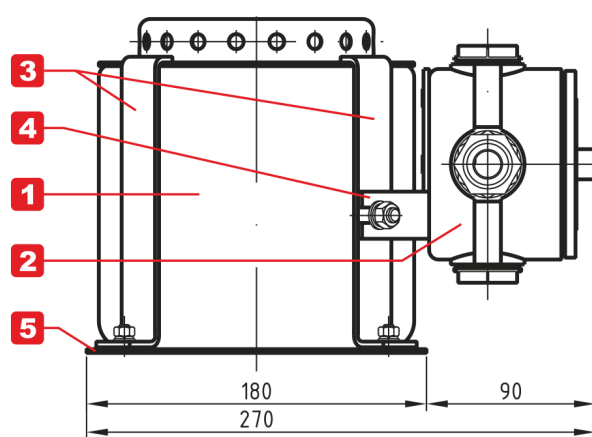
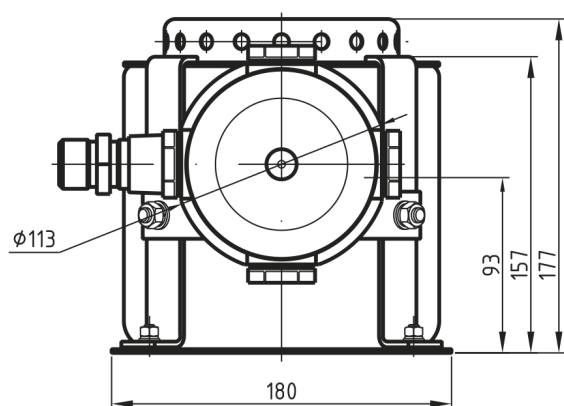


SOT-2M-KV aerosol fire-extinguishing generator is designed for localization and fire extinction of volatile flammable and combustible liquids, solid inflammable materials and electrical equipments, including machinery under the voltage of up to 40 kV, in dangerously explosive areas of B-1a class.

SOT-2M-KV generator consists of a housing which contains solid aerosol-forming charge, of aerosol cooling block and built-in electric starting assembly, of a mounting attachment assigned install the generator to the supporting constructions. There is an electric connection box placed on the bracket, which is designed to connect a starting assembly with a starting circuit.

SOT-2M-KV generator provides radial discharge of aerosol from outlets in the nozzle cover of the generator housing.

Generator weight, kg	7.1 ± 0.2
Mass of aerosol-forming charge, kg	1.6 + 0.1
Protected volume (without safety factor), m ³	21
Starting assembly type	built-in, electrical
Time of operation, no more than, s	50
Operation and storage conditions:	
- temperatures range, °C	-40 ... +60
- relative humidity at 25 °C, %	up to 98
Casing protection rate	IP 44



- 1** housing
- 2** connection box
- 3** holder
- 4** bracket
- 5** flange

AF system Control and Signaling Panel (CSP)

At the moment SPA "KASKAD" Ltd manufactures three models of the control and signaling panel (CSP) of fixed aerosol fire-extinguishing system:



CSP4B-BT is assigned to control fire-extinguishing system containing up to 4 aerosol fire-extinguishing generators with electrical starting assembly at single line of extinguishing. CSP4B-BT has an built-in power source to provide an emergency start in case of absence of ship power supply.



CSP16B is assigned to control fire-extinguishing system containing up to 16 aerosol fire-extinguishing generators with electrical starting assembly, at 4 lines of extinguishing.



CSP64B is assigned to control fire-extinguishing system containing up to 64 aerosol fire-extinguishing generators with electrical starting assembly, at 16 lines of extinguishing.

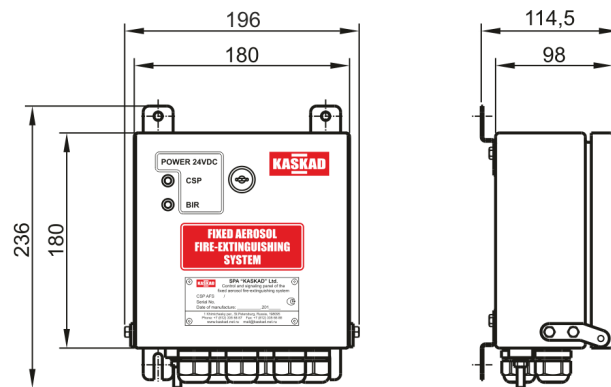
CSP represents a complete construction which is to be vertically mounted. Monitoring and operating units are disposed on the front panel installed under the casing cover.

CSP performs the following functions:

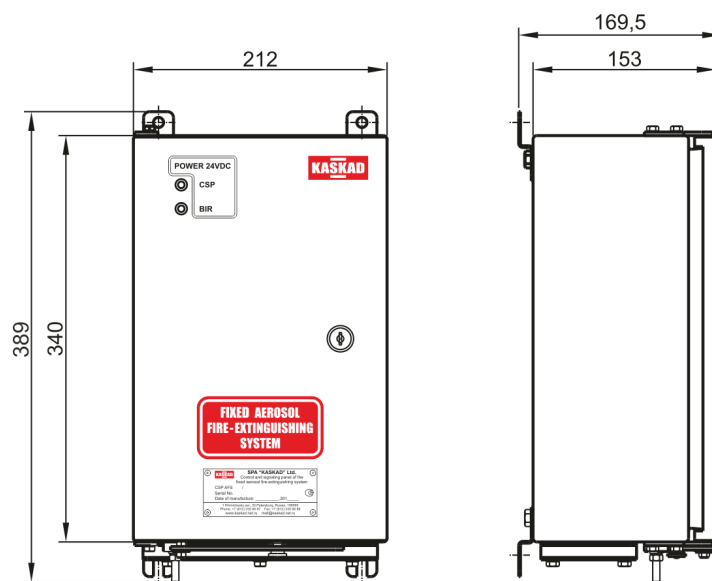
- functional self testing of the device working efficiency;
- automatic continuity test of electric starting circuits with indication of faulty circuits;
- immediate check up of working efficiency of the warning alarm before AFS actuation in the protected premises;
- immediate checking of ventilation capability to be deactivated in the protected premises;
- remote actuation of generators SOT-M type at modes "Extinguishing" (with automatic time delay of actuation) and "Emergency extinguishing" (without time delay of actuation);
- protection against overload and short-circuit current at generator starting and signaling circuit.



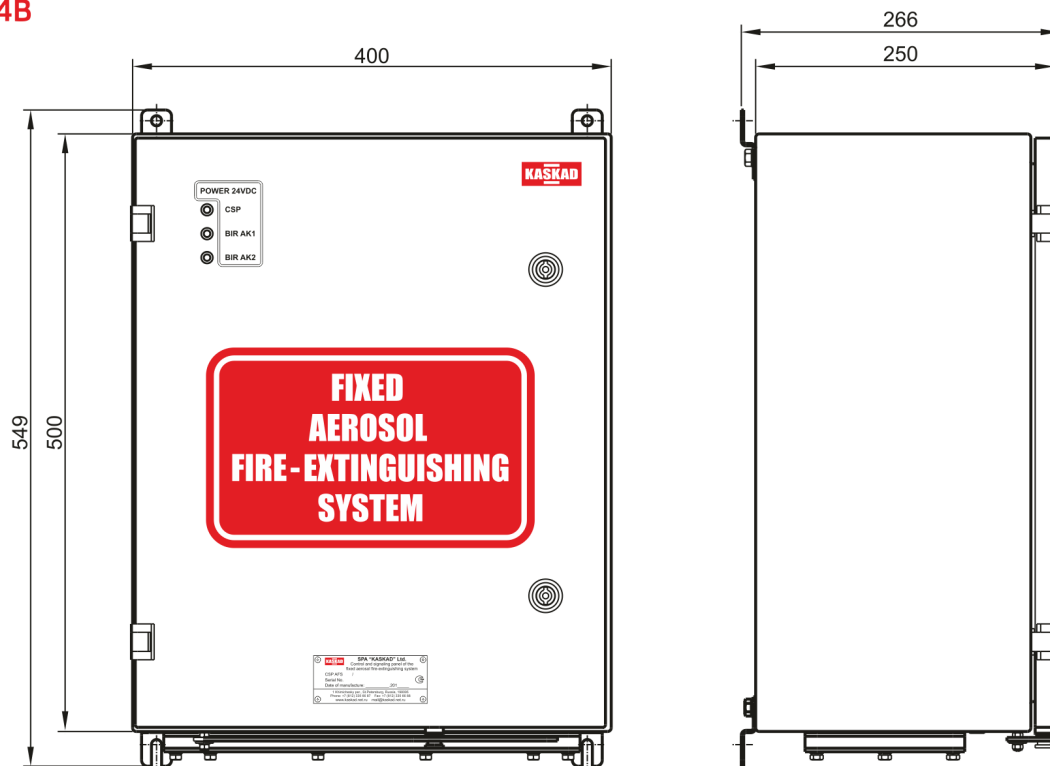
CSP4B-BT



CSP16B



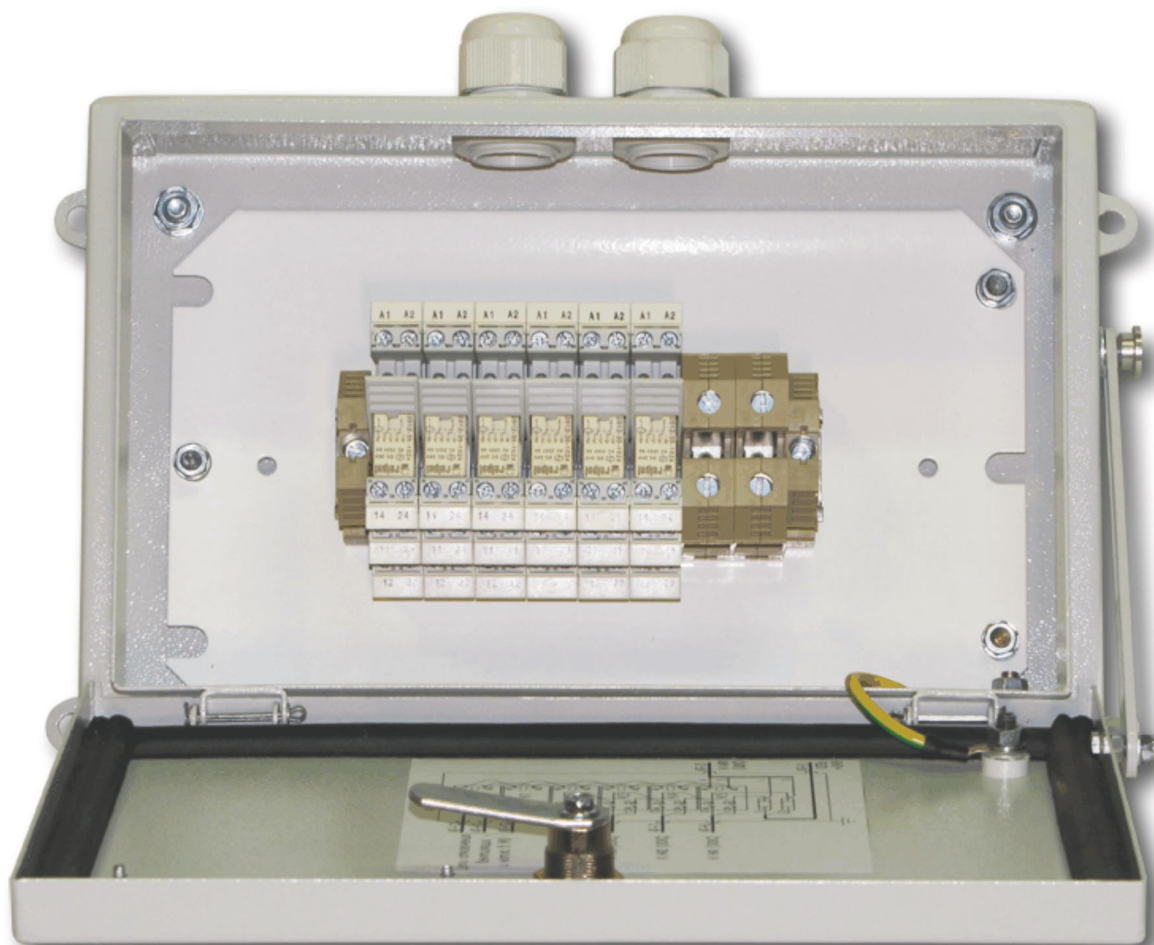
CSP64B



CPS4B-BT/ CSP16B / CSP64B Performance Specifications

Operating voltage, VDC	24 ± 8
Consumption current:	
- at standby mode, no more than, mA	20
- at "System monitoring" mode, no more than, A	0.3
- on "Operating test" button pressing, no more than, A	1.0
- at "Extinguishing" mode, during generators starting, no more than, A	9.0
Generators actuation delay, s	≥ 30
Casing protection rate	IP 44
Maintenance conditions:	
- ambient temperature, °C	0... +45
- ambient relative humidity at 25 °C, %	95 ± 3
CSP4B-BT overall dimensions, mm	236×196×115
CSP4B-BT weight, no more than, kg	5
CSP16B overall dimensions, mm	389×212×170
CSP16B weight, no more than, kg	7
CSP64B overall dimensions, mm	549×400×266
CSP64B weight, no more than, kg	25

Board of intermediate relays (BIR)



Board of intermediate relays (BIR) is designed to control the warning alarm and to deactivate ventilation and other equipment (if available) in protected premises on a signal from CSP.

Weight, kg 2.9
 Casing protection rate IP44

Relays parameters:

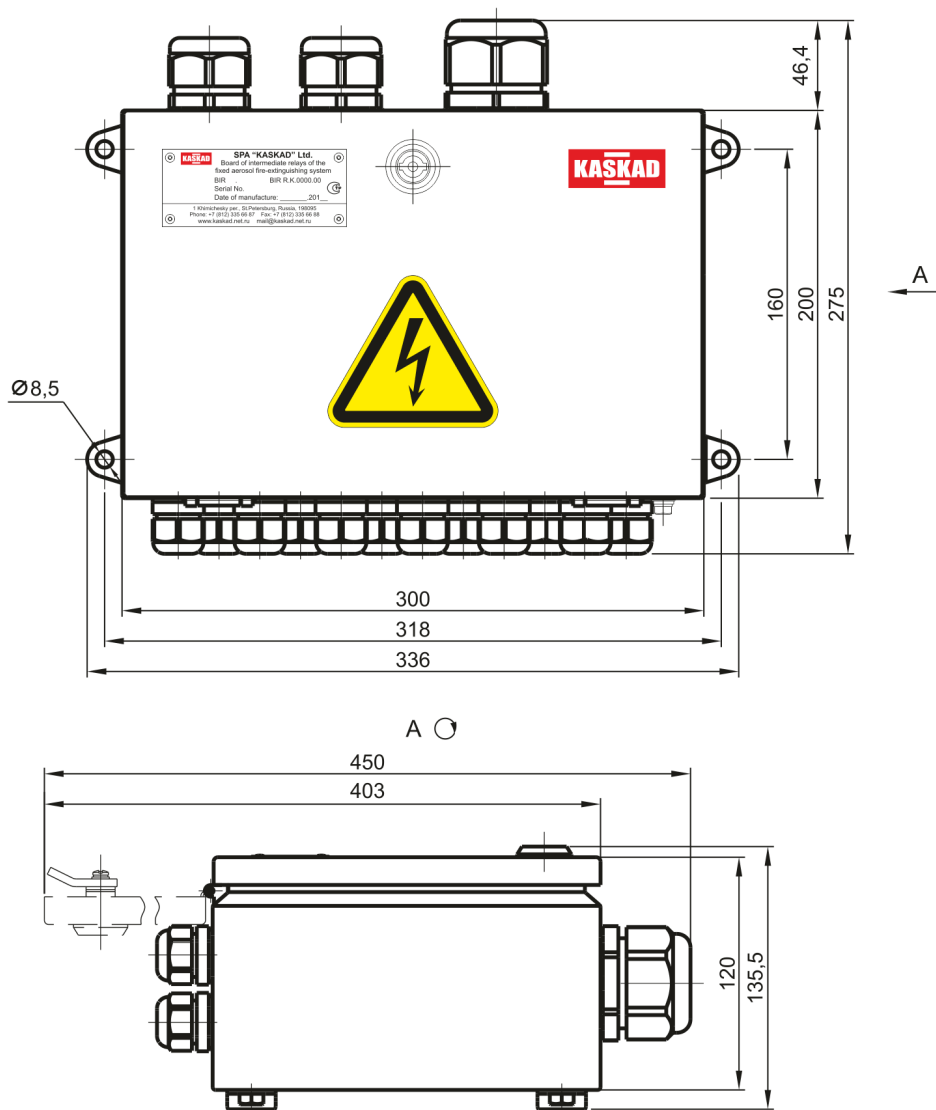
- coil control voltage, VDC 24
 - switched current, no more than, A 8
 - rated switched voltage, VAC 250
 - peak switching power of the contact block, no more than, VA 2000
 - quantity of relays, pcs. Specified when ordering

Contractor parameters:

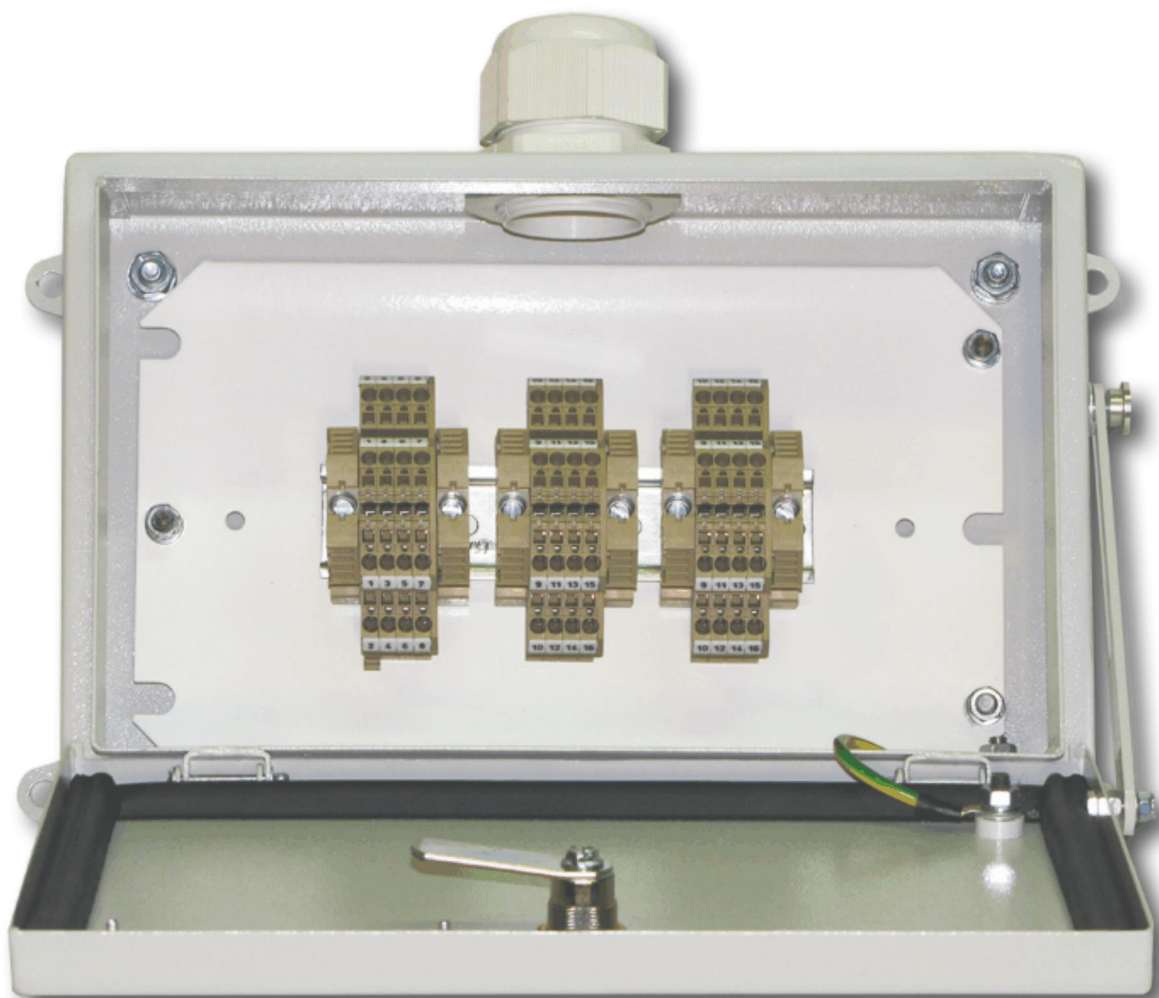
coil control voltage, VDC 24
 - switched current, no more than, A 35
 - rated switched voltage, VAC 380
 - peak switching power of the contact block, no more than, VA 9500
 - quantity of contactors, pcs. Specified when ordering

Terminal blocks parameters:

- rated voltage (IEC947-7-1), V 800
 - rated current (IEC947-7-1), A 125
 - cross-section, no more than, mm² 35
 - quantity of terminal blocks, pcs. 2



Connection box (CBK1)



Connection box (CBK1) is designed to lay cable routings of generators starting assemblies into protected premises.

Weight, kg 2.9
 Casing protection rate IP 44

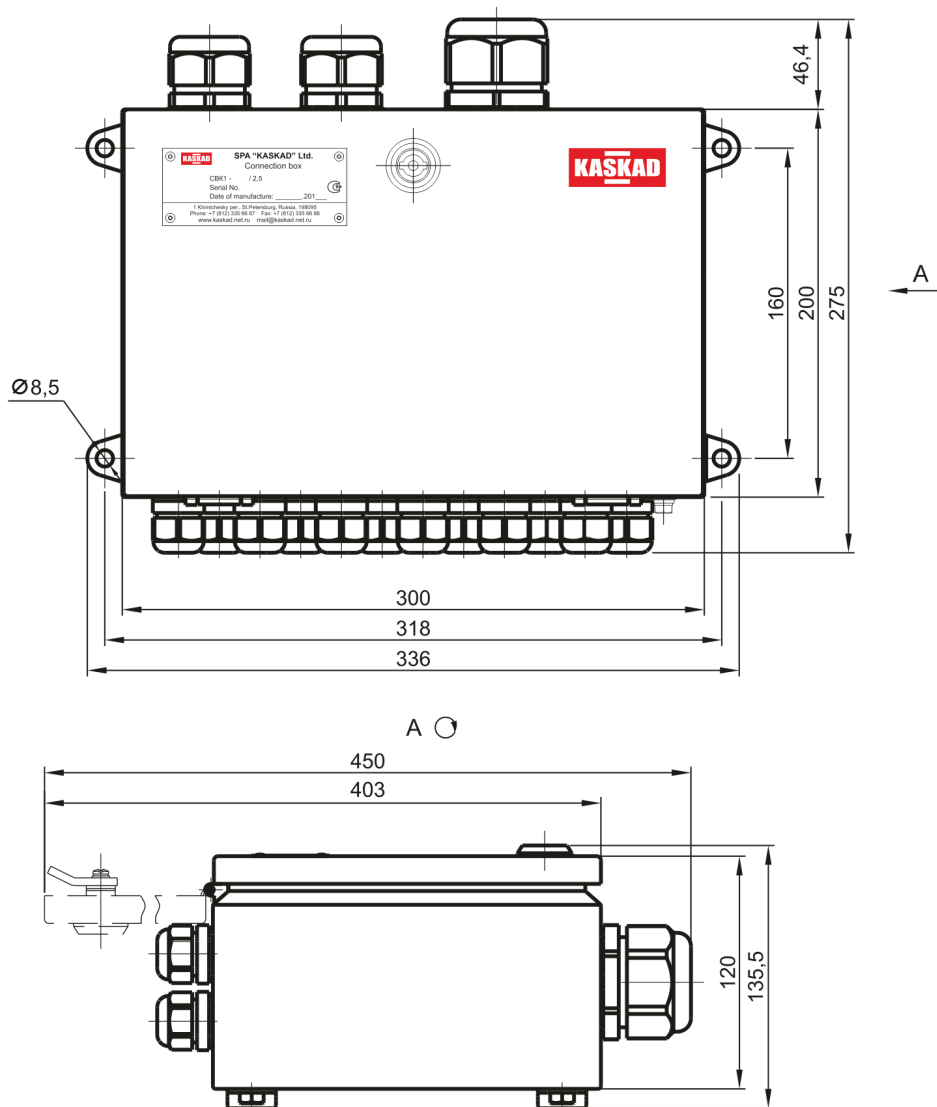
Terminal blocks parameters:

- rated voltage (IEC947-7-1), V 500
- rated current (IEC947-7-1), A 24
- cross-section, no more than, mm² 2.5
- quantity of terminal blocks, no mo than, pcs. 24

Quantity of sealing glands:

- PG16 type (for cable of 9-14 mm in diameter), pcs.
- PG29 type (for cable of 17-25 mm in diameter), pcs.
- PG36 type (for cable of 24-33 mm in diameter), pcs.

Specified when ordering



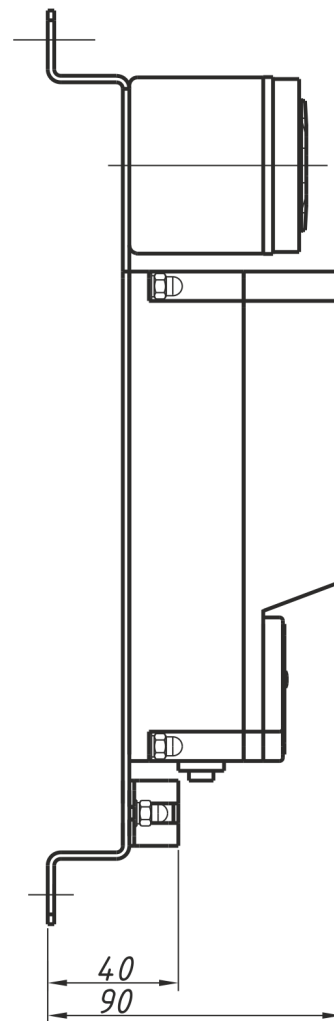
Audible and visual alarm (OSKS)



Audible and visual alarm is designed to give "AEROSOL, GO AWAY!", a warning light and sound signal, used in ship fixed aerosol fire-extinguishing systems (AFS).

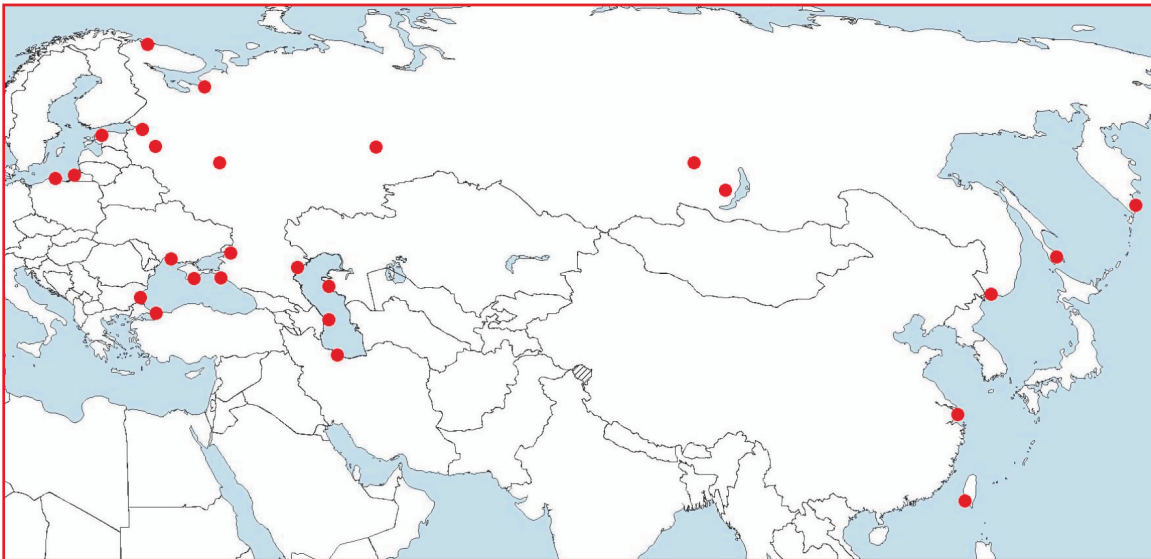
The audible and visual alarm starts functioning when incoming charge is supplied and stops operating when the programmed time of operation passes.

Weight, kg	0.9
Overall dimensions, mm	280×118×90
Casing protection rate	IP44
Operating voltage, V	24 ± 8
Consumption current, no more than, A	0.4
Sound pressure of alerter at distance of 1 m, not less, dB	105
Operating time (variable), s	15-225
Blink frequency, Hz	1



Accredited organizations

More than 130 companies throughout the world have been accredited by SPA "KASKAD" Ltd. for carrying out the AF systems maintenance.



Our clients





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