ANNEX B
(obligatory)

Technical requirements for assembly and installation of the MPP

B.1 Assembly and installation of the MPP at the object to be protected is made with regard to the height of its positioning above the floor 1m and tilt angle of 2 to 20° according to the Passport requirements, also with regard to impulse load from the module kick at the moment of OP.

B.2 The layout of the MPP, dimension and connecting sizes of the fixture intended to install the module are given in Figure B.1.

B.3 The rack is a seamless welded construction where steel angle bar 50×50×4, GOST 8509-86, is used as a material. The fixture is fastened to the floor with four anchor bolts M12 embedded in concrete not less than 200 mm deep.

B.4 The MPP with the supports mounted is fastened to the fixture by four bolts M12, their position is shown in Figure B.1.

B.5 The tilt angle (α) 20° should be set in accordance with Figure B.1. The tilt angle (α) of 0 to 5° should be set by fastening the MPP axles in the groove of the rear vertical angle bars of the bracket supports providing the size (L) according to Table B.1.

To provide the fixing of the nut with spring washer in the groove, an extra flat washer (supplied as spares) is to be set between the groove and spring washer.

Table B.1

Tilt angle (α), degree	0	1	2	3	4	5
Size (L), mm	18	23	28	33	38	44

B.6 All nuts should be tightened hard onto spring washers, GOST 6402-70.

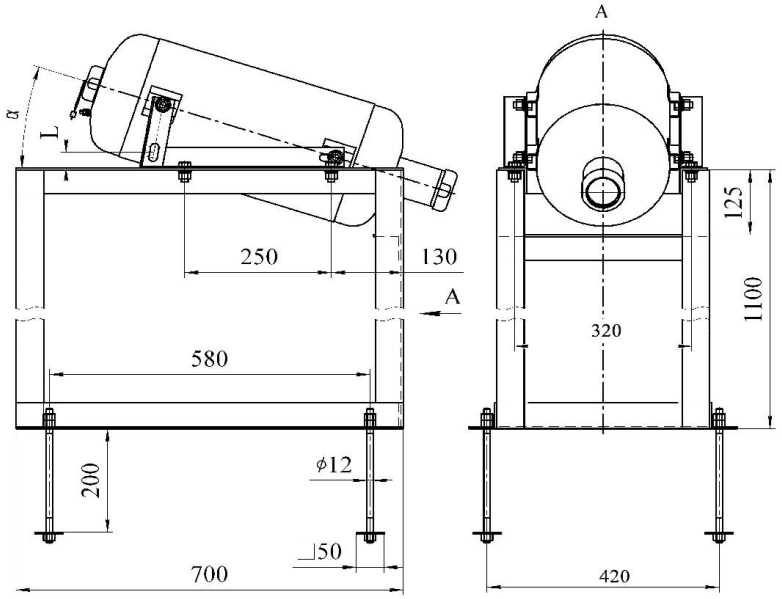

Figure B.1

TUNGUS®

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ГОСТ Р ИСО 9001

POWDER FIRE EXTINGUISHING MODULE
MPP (N)-24-I-GE-U2
Passport and
Manual instructions

1 PURPOSE

1.1 Powder fire extinguishing module MPP(N)-24-I-GE-U2 (hereinafter referred to as the MPP) is intended for automatic smothering fires, Class A (solids), B (liquids), C (gases) and E (electrical equipment under tension without taking into account the value of firefighting powder discharge voltage).

MPP can be equipped with electronic activation device during the usage of which a module obtains a function of self-activation and can be used as an autonomous powder fire-extinguishing mean.

1.2 The MPP is not designed to extinguish the ignition of substances that can burn without air access.

1.3 The MPP is intended to extinguish both the local seats of fire and fires on square and in volume in the room.

1.4 The MPP can be performed in normal version with operating temperatures of minus 50°C to plus 50°C, in special version at operating temperatures of minus 60°C to plus 90°C, or in wide temperature operation range of minus 60°C to plus 125°C. MPP operation is allowed under relative humidity not more than 95% when temperature is 25°C.

1.5 The MPP is a reused-product.

1.6 The fire extinguishing powder is ejected by the gas generated with a cold gas source CGS-10(M) SIAV 066614.025.000 TU.

1.7 Examples of the MPP marking (model) records when ordered:

MPP(N)-24-I-GE-U2 TU 4854-008-54572789-04 in normal version at temperatures of minus 50 °C to plus 50 °C;

MPP(N-T)-24-I-GE-U2 TU 4854-008-54572789-04 in special version at temperatures of minus 60 °C to plus 90 °C;

MPP(N-T1)-24-I-GE-U2 TU 4854-008-54572789-04 in wide temperature operation range of minus 60°C to plus 125°C.

2 TECHNICAL CHARACTERISTICS

2.1 Technical characteristics of the MPP are given in Table 1.

Table 1

Name	Value
1 Case capacity, lit	$24_{-1..2}$
2 Dimension, mm, not more than: - diameter - length	 245 694
3 Total weight of the MPP, kg, not more than	36
4 Fire extinguishing powder ISTO-1 weight, TU 2149-001-54572789-00, kg	22_{-1}
5 MPP fast action (time from the moment of sending impulse to a triggering element of the MPP to the moment of ejecting extinguishing powder out of the module), s	of 5 to 10

10 CERTIFICATE OF ACCEPTANCE AND SALE

The fire extinguishing module

□ MPP(N)-24-I-GE-U2 □ MPP(N-T)-24-I-GE-U2

□ MPP(N-T1)-24-I-GE-U2

(tick off the necessary)

corresponds to the requirements of TU 4854-008-54572789-04 and is considered to be fit for use.

Batch No _____

Manufacturing date_____

(month, year)

Inspector signature and stamp _____

Sold _____

(name of the Seller)

Sale date _____

Shop stamp

ANNEX A

(obligatory)

THE RESULTS OF TECHNICAL MAINTENANCE

Table A.1 - Information about reloading, reexamination

Date	Work to do	Executive (company, name)	Executive's signature and stamp

The alterations not given in the present passport and not affecting the principal technical characteristics, dimension and connecting sizes can be introduced into the module design.

organizations having a license for this kind of activity.

9.2 Disassemble MPP.

9.3 MPP frame utilization is made by means of taking to scrap metal.

9.4 Firefighting powder utilization is made according to paragraph 5.7 requirements.

9.5 CGS utilization should be made according to the following instructions.

9.5.1 Actuate CGS in premises equipped with supply-and-exhaust ventilation. For this purpose CGS is placed in a clamp, connected to a direct current power source, which is correspondent to p. 11 or p. 12 of Table 1. The launch is made distantly without any people inside.

9.5.2 After launching make sure that the premises are ventilated till safe concentration or enter using isolating protective breath means, draw CGS from the clamp using thermo protective gloves, and then utilize according to the requirements of p. 5.8.

10 WARRANTY

10.1 The factory-manufacturer guarantees the correspondence of the MPP to the requirements of technical conditions if the Customer observes operation, transportation and storage conditions stated in the present Passport.

10.2 Service life is stated to be:

- not more than 10 years for MPP(N)-24-I-GE-U2;
- not more than 5 years for MPP(N-T)-24-I-GE-U2;
  MPP(N-T1)-24-I-GE-U2,

and is estimated from the date of accepting the MPP by Quality Department of the factory-manufacturer.

10.3 The factory-manufacturer is not responsible for:

- misoperation if the owner does not observe operation rules;
- negligent storage and transportation of the MPP;
- passport loss;
- after performing certification, reloading the MPP under item 7.2 if they were not carried out at the factory-manufacturer;
- expiration of the service life stated from the date of accepting the MPP by Quality Department of the factory-manufacturer.

Table 1 to be continued

6 Operating time (time of ejecting extinguishing powder), s, not more than	1
7 Pressure of membrane rupture, MPa	1.8±0.05
8 Fire extinguishing ability of the MPP installed with a nozzle down in the room at the height 1m above the floor at the tilt angle of the module axis 20° relative to the horizontal (See Table 2):	
8.1 Surface area (S) to be protected for fires, Class A, m^2 8.2	75
Surface area (S) to be protected for fires, Class B, m^2	58
8.3 Volume (V) to be protected for fires, Class A, m^3	250
9 Fire extinguishing ability of the MPP installed nozzle down in the room at the height 1m above the floor at the tilt angle of the module axis 5° relative to the horizontal in the square channel 2.2×2.2 m:	
9.1 Surface area (S) to be protected for fires, Class A, m^2 9.2	70
Volume (V) to be protected for fires, Class A, m^3	155
9.3 Channel length to be protected (L), m	32
10 Fire extinguishing ability of the MPP at local fire extinguishing at the open area or in the room validated by simultaneous smothering of one model fire site, rank 233B*), and two fires, rank 5B*), if the MPP is installed at a height 1m above the floor surface at a distance (L) from nozzle-sprayer to the center of the surface area to be protected of 12 to 18m **):	
10.1 Surface (S) to be protected, m^2	20.9
11 Circuit characteristics of electric triggering unit for MPP(N)-24, MPP(N-T)-24 modifications:	
- safe current of testing circuit, A, not more than	0.03
- operating current, A, not less than:	0.2
- electric resistance, Ohm	8…16
12 Circuit characteristics of electric triggering unit for MPP(N-T1)-24 modification:	
- safe current of testing circuit, A, not more than	0.2
- operating current, A, not less than:	0.6
- electric resistance, Ohm	2…5
13 Irregularity coefficient of spraying powder K_1 (SP 5.13130.2009)	1

NOTES: *) According to GOST R 53286-2009 model fire sites, ranks 233B and 5B, are the surfaces of burning petrol (benzine) as circles with diameter 3.0 5m and 0.42 m, having surface area (S) 7.32 m^2 and 0.16 m^2, respectively;

**) Tilt angle of the MPP axis installed with nozzle down relative to the horizontal should be: α =3˚ at L =18 m; α =4˚ at L =15 m; α =5˚ at L=12 m.

3 COMPLETENESS OF SET

3.1 The MPP set to be supplied consists of:

a) The module MPP TU 4854-008-54572789-04 –1 item;

b) Passport and Manual instructions - 1 copy;

c) MPP package –1 item.

4 DESIGN AND OPERATION PRINCIPLE

4.1 The MPP design

4.1.1 The MPP (See Figure 1) consists of a case **1** where fire extinguishing powder (OP) **2** and cold gas source (CGS) **3** with electric triggering element **4** are placed. In the front part of the case there is a nozzle-sprayer **5**, the output hole of it is closed by membrane **6**. The module has grounding clamp **7.** On the side surface of the case there are four threaded axles **8** to fasten supports that adjust the tilt angle of the MPP and position it on the fixture. The procedure of assembling the MPP with supports and placing on the fixture is described in Annex B.

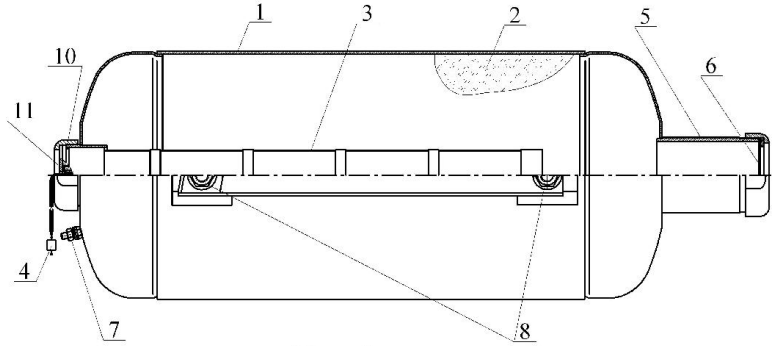

Figure 1

4.1.2 The MPP actuates with the help of current impulse that can be generated by:

- receiving/control, fire alarm, and safeguard devices;
- manual start button;
- self-contained signaling-and-triggering devices (for example, signaling-and-triggering independent automatic device for fire extinguishing setups USPAA-1 TU 4371-032-00226827-99, signaling-and-triggering device USP-101 TU 4371-004-21326303-96).

4.2 Operation

4.2.1 After sending electric pulse to the outputs of the triggering unit **4**, the CGS **3** generates gas which makes OP **2** loose and creates pressure inside the MPP case to rupture membrane **6** and eject through nozzle-sprayer **5** the jet of OP into the zone of burning.

5 SAFETY MEASURES

5.1 The staff who was allowed to operate the MPP should study this Passport and observe its requirements.

5.2 It is not allowed:

- keeping the MPP near heat sources;
- effecting rainfalls, direct sunlight, aggressive media, moisture;

7 MAINTENANCE

7.1 Special technical maintenance is not required. Examine the integrity of the disk (membrane) closing the MPP nozzle-sprayer and the MPP grounding available **once a quarter**. If the disk (membrane) is not intact (damage, holes of puncture, cracks), replace the module.

7.2 Reloading after operating the MPP should be carried out by the MPP factory-manufacturer or MPP factory-manufacturer or in organizations having a license for this kind of activity.

7.3 The delivery set for MPP reloading for MPP(N)-24, MPP(N-T)-24 modifications:

- CGS-24(M)-01 SIAV 066614.025.000 TU for MPP of normal version; CGS-24(M)-02 SIAV 066614.025.000 TU for MPP of special version (see item 3 on Figure 1) – 1 item;
- rubber ring 050-054-25 GOST 9833-73 (see item 10 on Figure 1) – 1 item;
- rubber gasket of SIAV 634233.006.023 drawing (see item 11 on Figure 1) – 1 item;
- fire-extinguishing powder ISTO-1 TU 2149-001-54572789-00 (see item 2 on Figure 1) – 22 kg;
- membrane of SIAV 634233.007.005 drawing (see item 6 on Figure 1) – 1 item.

7.5 The delivery set for MPP reloading for MPP(N-T1)-24 modification:

- CGS-24(M)-06 SIAV 066614.025.000 TU (see item 3 on Figure 1) – 1 item;
- rubber ring 058-062-25 GOST 9833-73 (see item 10 on Figure 1) – 1 item;
- rubber gasket of SIAV 634233.006.023 drawing (see item 11 on Figure 1) – 1 item;
- fire-extinguishing powder ISTO-1 TU 2149-001-54572789-00 (see item 2 on Figure 1) – 22 kg;
- membrane of SIAV 634233.007.005 drawing (see item 6 on Figure 1) – 1 item.

7.6 After MPP checking and reloading notes are made on MPP case (with a label or ticket fastening) and in MPP manual (See Annex A).

8 STORAGE AND TRANSPORTATION

8.1 The MPP transportation and storage conditions should meet the requirements of OG-4 GOST 15150-69.

8.2 The MPP transportation in the factory packing at temperatures of minus 50°C to plus 50°C is allowed by all kinds of transport according to the rules of transporting the goods by this kind of transport and taking into account transport conditions – harsh environment (G), GOST 23170-78.

8.3 When stored and transported the MPP, conditions preventing them from mechanical damage, direct sunlight, rainfalls and aggressive media should be provided.

9 MPP UTILIZATION AFTER FIXED SERVICE LIFE EXPIRATION

9.1 Utilization works should be made by MPP factory-manufacturer or in

- shocking the case and the CGS;
- dropping from the height more than 2 m;
- dismantling the MPP, except for maintenance work according to Section 7 of the present Passport;
- using the MPP with the case damaged (dents, cracks, through holes);
- performing of any fire tests without experimental works program concordance or in case of absence of company-manufacturer representative.

5.3 Before connecting the module, the output ends of the triggering unit should be closed by twisting not less than twice and sealed. Connect the MPP only after its grounding. Electric safety while assembling the MPP should be provided by meeting the requirements PUE, PTE, PTB and PZSE

5.4 Loading, reloading, certification and technical maintenance should be carried out in the rooms specially equipped and designed for it at the MPP factory-manufacturer or in organizations having a license for such kind of activity.

5.5 After detecting the module defects (dents, cracks, through holes) during the operation or after its service life, the module should be sent to the factory-manufacturer or utilized according to p. 9.

5.6 While operating the module is fire- and explosion-proof.

5.7 Fire extinguishing powder has no harmful effect on the body and clothes of people, does not cause damage to property and is easy-to-remove. After MPP actuation to remove the combustion products and fire extinguishing powder in the air it is necessary to use general ventilation. It is allowed to apply mobile ventilations sets for this purpose. The powder fell is removed by vacuum cleaner, dry rag followed by wet cleaning. Extinguishing powder waste utilization should be made according to the instruction: “Utilization and Regeneration of Fire Extinguishing Powders”, Moscow: VNIIPO, 1988.

5.8 CGS utilization after actuation should be made by means of device taking to scrap metal.

5.8 The bearing construction, the MPP is fastened to, should sustain the impulse load from the module kick at the moment of OP ejecting. Fasten the MPP to the bearing surface with foundation bolts, anchor bolts or connection bolt-nut with a diameter M12.

6 PREPARATION OF THE MPP TO OPERATION, LAYOUT AND MOUNTING

6.1 Unpack the MPP, and examine the integrity of case and membrane.

6.2 Installation and fastening of the MPP should be made according to Annex B.

6.3 Layout of modules in the rooms protected should be defined in accordance with SP 5.13130.2009.

6.4 The configuration of powder spraying and the area image, where smothering is achieved, are given in Figures 2, 3, and in Table 2. Surface configuration at local fire extinguishing is shown in Figure 4.

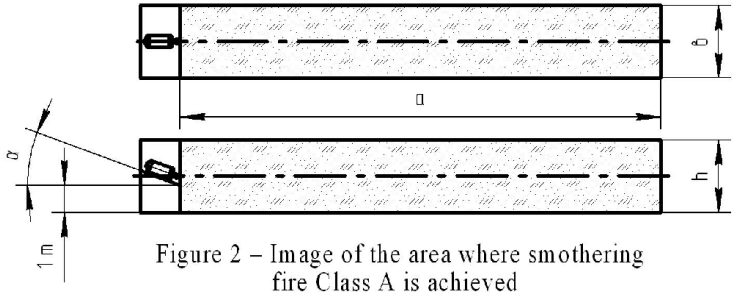

Figure 2 – Image of the area where smothering fire Class A is achieved

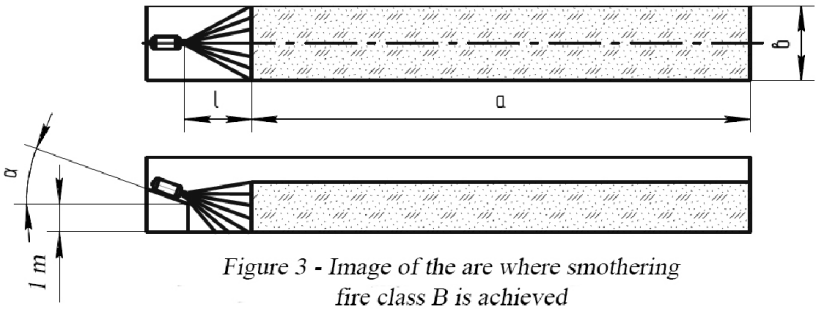

Figure 3 - Image of the are where smothering fire class B is achieved

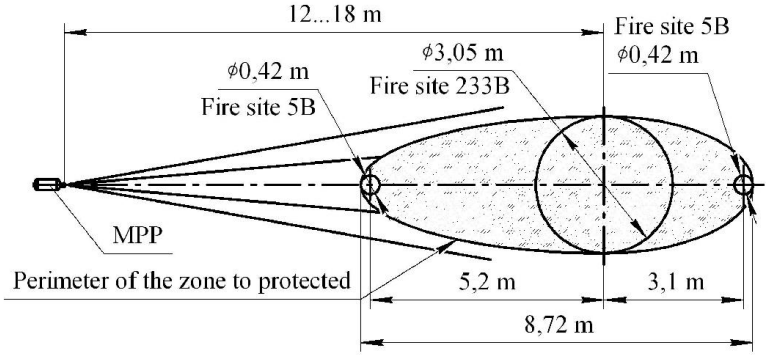

Figure 4 – Scaling image of the area protected at local fire extinguishing

Table 2

Parameters	Class A		Class B
α, degree	20	5	20
S, m^2	75	70	58
V, m^3	250	155	-
à, m	23.5	32.0	18.0
â, m	3.2	2.2	3.2
h, m	3.32	2.2	-
ℓ, m	0	0	4.5