



## 1 PURPOSE

1.1 Powder fire extinguishing module MPP(N)-9-I-GE-U2, made in two versions: ceiling-mounted (c) and wall-mounted (w) (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).

The MPP models differ with bracket designs intended to fasten the module to the bearing construction.

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-9(M)-01 SIAV 066614.025.000-04 TU.

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

MPP(N)-9(c)-I-GE-U2 TU 4854-014-54572789-06 (ceiling-mounted) in normal version at temperatures of minus 50°C to plus 50°C;

MPP(N)-9(w)-I-GE-U2 TU 4854-014-54572789-06 (wall-mounted) in normal version at temperatures of minus 50°C to plus 50°C;

MPP(N-T)-9(c)-I-GE-U2 TU 4854-014-54572789-06 (ceiling-mounted) in special version at temperatures of minus 60°C to plus 90°C;

MPP(N-T)-9(w)-I-GE-U2 TU 4854-014-54572789-06 (wall-mounted) in special version at temperatures of minus 60°C to plus 90°C;

MPP(N-T1)-9(c)-I-GE-U2 TU 4854-014-54572789-06 (ceiling-mounted) in wide temperature operation range of minus 60°C to plus 125°C;

MPP(N-T1)-9(w)-I-GE-U2 TU 4854-014-54572789-06 (wall-mounted) in wide temperature operation range of minus 60°C to plus 125°C;

- 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.

## 10 CERTIFICATE OF ACCEPTANCE AND SALE

The fire extinguishing module

MPP(N)-9(c)-I-GE-U2       MPP(N)-9(w)-I-GE-U2

MPP(N-T)-9(c)-I-GE-U2       MPP(N-T)-9(w)-I-GE-U2

MPP(N-T1)-9(c)-I-GE-U2       MPP(N-T1)-9(w)-I-GE-U2

(tick off the necessary)

corresponds to the requirements of TU 4854-014-54572789-06 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

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 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. 12 or p. 13 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.

10.2 Service life is stated to be:

- not more than 10 years for MPP(N)-9-I-GE-U2,
- not more than 5 years for MPP(N-T)-9-I-GE-U2;  
MPP(N-T1)-9-I-GE-U2,

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

9.3 The factory-manufacturer is not responsible for:

- misoperation if the owner does not observe operation rules;

## 2 TECHNICAL CHARACTERISTICS

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

Table 1

Name	Value		
1 Case capacity, lit	9.0 <sub>-0.4</sub>		
2 Dimension, mm, not more than:			
- diameter	286		
- height (with the bracket installed)	268		
3 Total weight of the MPP, kg, not more than	13		
4 Fire extinguishing powder ISTO-1 weight, TU 2149-001-54572789-00, kg	8.6+0.43		
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 3 to 10		
6 Operating time (time of ejecting extinguishing powder), s, not more than	1		
7 Pressure of membrane rupture, MPa	of 2.1 to 2.2		
8 Fire extinguishing ability of the ceiling-mounted MPP:			
8.1*) Surface area (S, m <sup>2</sup> ) and volume (V, m <sup>3</sup> ) to be protected for fires Class A from the height (H, m)	H	S	V
	2	72	144
	3	72	216
8.2*) Surface area (S, m <sup>2</sup> ) and volume (V, m <sup>3</sup> ) to be protected for fires Class B from the height (H, m)	H	S	V
	2	33	54
	3	33	54
9**) Fire extinguishing ability of the ceiling-mounted MPP for fires, Class A from the height (H) up to 13 m of the two floor-by-floor positioned rooms with wall openings to pass gas powder jet (See Figure 4):			
	9.1 Total surface area (S), to be protected, m <sup>2</sup>	36.5	
	9.2 Total volume (V), to be protected, m <sup>3</sup>	153	

Table 1 to be continued

Name	Value
10 <sup>**</sup> ) Fire extinguishing ability of the wall-mounted MPP while smothering fire sites from the height (H) of 2 and 3 m:	
10.1 Surface area (S) to be protected for fires, Class A, m <sup>2</sup>	72
10.2 Volume (V) to be protected for fires, Class A, m <sup>3</sup>	216
10.3 Surface area (S) to be protected for fires, Class B, m <sup>2</sup>	33
10.4 Volume (V) to be protected for fires, Class B, m <sup>3</sup>	54
11 Maximum rank of the model fire site, Class B, when extinguishing at an open area from the height (H) 12 m	233B <sup>**</sup> )
12 Circuit characteristics of electric triggering unit for MPP(N)-9, MPP(N-T)-9 modifications:	
- safe current of testing circuit, A, not more than	0.03
- operating current, A, not less than:	
a) normal version of the MPP	0.15
b) special version of the MPP	0.2
- electric resistance, Ohm	8...16
13 Circuit characteristics of electric triggering unit for MPP(N-T1)-9 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
14 Irregularity coefficient of spraying powder K <sub>1</sub> (SP 5.13130.2009)	1.0
NOTES:	
*) Fire extinguishing ability of the ceiling-mounted MPP while smothering from the height (H):	
- within the range of 2 to 3 m for fires Class A in the volume to be protected is calculated according to the formula: V= 144+72·(H-2);	
- within the range of 3 to 13 m is calculated according to the formulae: S= 72-(H-3), V=216-4.5·(H-3) for fires Class A; S= 33-2.37·(H-3) for fires Class B.	
**) According to GOST R 53286-2009 a model site, rank 233B is the surface of burning petrol (benzine) as a circle with diameter 3.05 m and surface area (S) 7.32 m <sup>2</sup> .	

- Minimal allowable size of the aperture (square or round) above the upper room is  $c_{\min} = 0.2 + 2h_1 \text{tg}15^\circ$  [m];
- The aperture size (square or round) between the upper and the lower rooms is  $d = 0.8h_2 \text{tg}15^\circ$  [m].

Table 3

**Parameters of extinguishing wall-mounted MPP at the installation height of 2 and 3 m (See Figure 6)**

Parameters	Class A	Class B	
		Surface to be protected	Volume to be protected
S, m <sup>2</sup>	72	33	-
V, m <sup>3</sup>	216	-	54
a, m	8.5	5.74	4.24
b, m	8.5	5.74	4.24
h, m	3.0	-	3.0

## 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 at special stations for reloading powder fire extinguishers.

7.3 The delivery set for MPP reloading:

- CGS-9 (M)-01 SIAV 066614.025.000 TU for MPP of normal version; CGS-9 (M)-02 SIAV 066614.025.000 TU for MPP of special version, and CGS-9 (M)-06 SIAV 066614.025.000 TU for MPP of wide temperature operation range (see item 3 on Figure 1) – 1 item;
- rubber ring 020-026-36 GOST 9833-73 (see item 10 on Figure 1) – 1 item;
- fire-extinguishing powder ISTO-1 TU 2149-001-54572789-00 (see item 2 on Figure 1) – 8.6 kg;
- membrane of SIAV 634233.007.005 drawing (see item 6 on Figure 1) – 1 item.

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

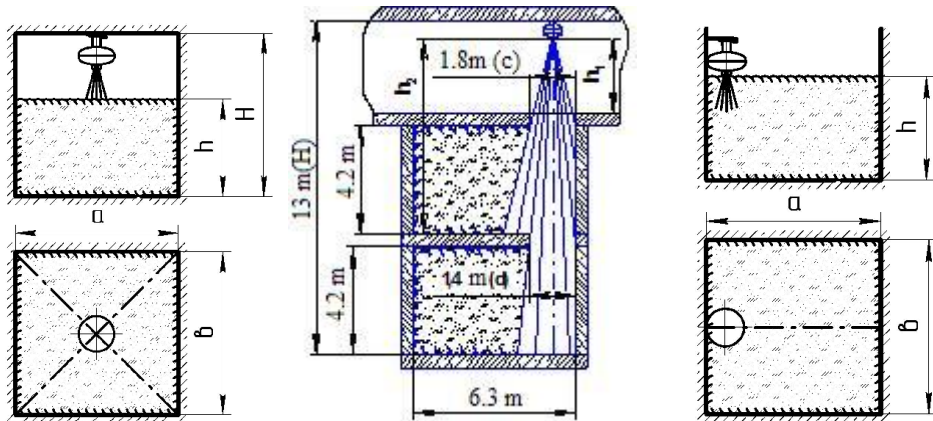


Figure 4

Figure 5

Figure 6

Table 2

**Parameters of extinguishing ceiling-mounted MPP (See Figure 3)**

Parameters	Class A			Class B				
	Surface and volume to be protected			Surface to be protected		Volume <sup>*)</sup> to be protected		
H, m	2	3	13	2; 3	13	2	3	5.8... ...13
S, m <sup>2</sup>	72	72	62	33	9.3	-	-	-
V, m <sup>3</sup>	144	216	171	-	-	54	54	54
a, m	8.5	8.5	7.87	5.5	3.05	5.2	4.24	3.05
b, m	8.5	8.5	7.87	6.0	3.05	5.2	4.24	3.05
h, m	2	3	2.76	-	-	2	3	5.8

NOTE:  
<sup>\*)</sup> – While smothering fires Class B from a height of 2 to 5.8 m the volume 54 m<sup>3</sup> to be protected is defined up to the ceiling, at the height of installation more than 5.8 m parameters of the volume to be protected are stated in the last column of the Table.

**Parameters of extinguishing floor-by-floor positioned rooms** are shown in Figure 5, but it is necessary to meet the following requirements:

- Total surface of the two rooms to be protected  $S_{\Sigma} = 36.5 \text{ m}^2$ ;
- Total volume of the two rooms to be protected  $V_{\Sigma} = 153 \text{ m}^3$ .

If the **H** size is less than 13 m but higher than the ceiling (cover) of the upper room, sizes **c** and **d** (See Figure 4) should be:

### 3 COMPLETENESS OF SET

3.1 The MPP set to be supplied consists of:

- The module MPP TU 4854-014-54572789-06 –1 item;
- Passport and Manual instructions - 1 copy;
- MPP package –1 item.

### 4 DESIGN AND OPERATION PRINCIPLE

4.1 The MPP design

4.1.1 The MPP (See Figures 1 and 2) 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 bottom of the case there is a nozzle-sprayer 5, the output hole of it is closed by membrane 6. The module has the grounding clamp 7. In the upper part the MPP is fitted with bracket 8 to fasten to the ceiling (Figure 1) or bracket 9 to fasten to the wall (Figure 2).

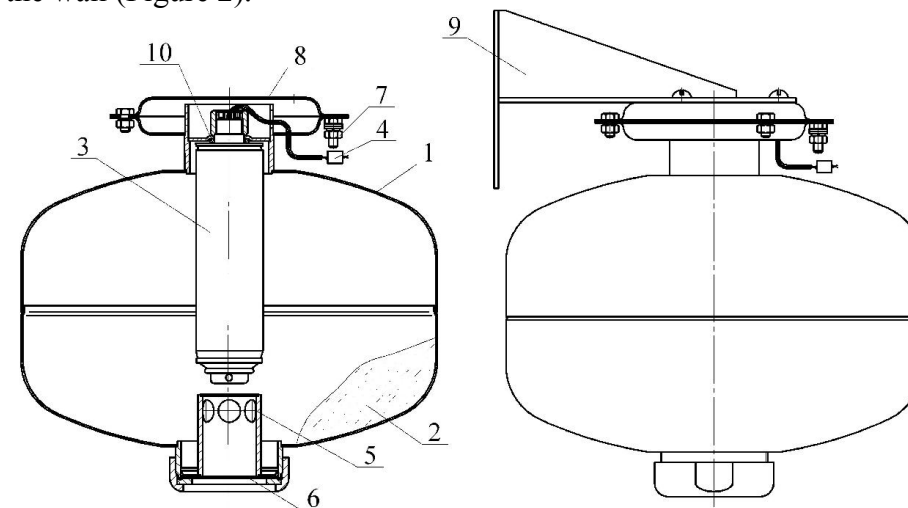


Figure 1

Figure 2

4.1.2 The MPP actuates by means 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 of rainfalls, direct sunlight, aggressive media, moisture;
- 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 damaged case (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: VNIPO, 1988.

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

5.9 The bearing construction, the MPP is fastened to, should sustain the impulse load from the module kickback at the moment of OP ejecting.

### 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 Fasten the bracket **8** (See Figure 1) on the ceiling or bracket **9** (See Figure 2) on the wall. The holes locations in the bracket intended to fasten the MPP on the ceiling are shown in Figures 3a, on the wall in Figure 3b.

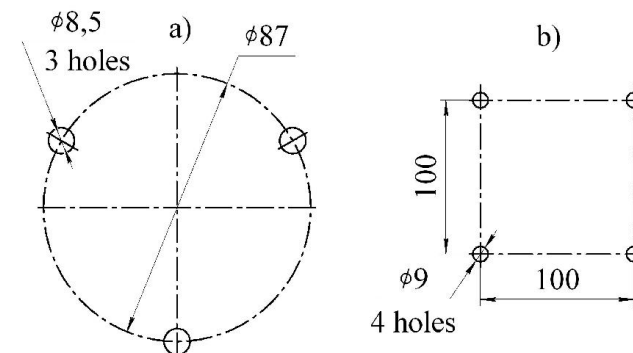


Figure 3

6.3 Connect the MPP with the bracket and fasten the connection with nuts.

6.4 Calculate the necessary number of modules in the volumes protected in accordance with Section 9 SP 5.13130.2009.

6.5 While protecting separate surface parts, i.e. at local protection in rooms or under a shelter at the height of installation (H) to 12 m, the local surface area equals 7.32 m<sup>2</sup> and is a circle.

6.6 The configuration of powder spraying and the area image, where smothering is achieved, are given in Figures 4, 5 and in Table 2 for the ceiling-mounted MPP, and in Figure 6 and Table 3 for wall-mounted version. The angle of spraying of gas-powder jet is 30°.