

TUNGUS®



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GENERATOR OF GAS FIRE EXTINGUISHING GGFE-3.0
Passport
Manual instructions GGFE-3.0 PS

[illegible]

10 CERTIFICATE OF ACCEPTANCE AND SALE

Generator of gas fire extinguishing GGFE-3.0 corresponds to the requirements of TU 4854-021-54572789-12 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

Table 1

| Name | Value |
|---|------------------------|
| 1 Dimension, mm, not more than: - height (with a bracket installed) - length (with a bracket installed) - width | 110 350 240 |
| 2 Total weight of GGFE, kg, not more than | 7.8 |
| 3 MPP fast action (time from the moment of sending impulse to GGFE triggering element to the moment of gaseous firefighting substance emission), sec, not more than | 1 |
| 4 Time of gaseous firefighting substance ejecting, sec. | 15...25 |
| 5 Maximal temperature of gases, °C, not more than: - at the output of GGFE; - at 120 mm from GGFE outlet hole | 200 80 |
| 6 Maximal temperature of GGFE frame during and after its operation, °C, not more than: | 180 |
| 7 Volume protected for extinguishing fires subclass A2, class B in premises with nonhermeticity parameter 0.044 m ⁻¹ , m ³ | 3.0 |
| 8 Circuit characteristics of electric triggering unit: - safe current of testing circuit, A, not more than - operating current, A, not less than: - electric resistance, Ohm | 0.03 0.12 8...16 |
| 9 GGFE launching circuit structure: - number of electrical triggering elements, pc. - circuit connection of electrical triggering elements | 3 parallel |

The structure of gaseous firefighting substance is given in Table 2.

Table 2

| Component | Content, % (by volume) |
|------------------|------------------------|
| CO ₂ | 37.5 |
| N ₂ | 22.5 |
| CO | 7.4 |
| H ₂ | 3.0 |
| H ₂ O | 29.1 |
| O ₂ | 0.2 |
| CH ₄ | 0.3 |

There are no solid parts in gaseous firefighting substance.

2.2 The rest technical features and requirements to the device correspond to TU 4854-021-54572789-12.

3 COMPLETENESS OF SET

3.1 GGFE set to be supplied includes:

- a) Generator GGFE -3.0 TU 4854-021-54572789-12 – 1 item;
- b) Passport and manual instructions – 1 item;
- c) GGFE package – 1 item.

4 DESIGN AND OPERATION PRINCIPLE

4.1 GGFE design

4.1.1 GGFE (see Figure 1) consists of a case **1** where three replaceable cartridges **2** containing gas-generating element **3** with electrical-triggering element **4** is placed. Free space of cartridges cases **2** is filled with cooling tablets **5**. Filter-separator **6** is set in each cartridge for gaseous firefighting substance cleaning from mechanical impurities. Filter-separator outlet hole is plugged with self-adhesive film PVC **7**. In the upper part of the case cartridges are tightened with cover **9** by means of screws **8**. To compensate an influence of vibration, rubber rings **10** are set between cartridges **2** and cover **9**. GGFE is covered with a lid **11** tightened with screws **12**. Bared ends of wires of electrical triggering elements **4** are twisted in two groups: one wire from each cartridge, and tinned after twisting, and are fastened in contact screw clamp **13**. Clamp **13** output terminals are closed with wire **14**. GGFE is supplied with bracket **15** which is mounted to lateral surface of case **1** or lid **11** with screws **16**. To avoid self-adhesive PVC film **7** rupture during transportation, storage and installation the apertures of case **1** bottom parts are plugged with self-adhesive film **17** which is removed after device installation in the object.

4.2 Operation principle

4.2.1 After electric pulse sending to the outputs of electric triggering unit **4**, gas-generating elements **3** of cartridges **2** generate a gas which enters the cartridges volume filled with cooling tablets **5**. Passing through cooling tablets, a gas is exposed to a preliminary cleaning from mechanical impurities, becomes cool and thermally decomposes the tablets emitting an additional portion of gaseous firefighting substance. Gaseous substance enters a burning zone through a filter-separators **6** and apertures in bottom part of the case **1**, where its full cleaning from mechanical impurities takes place.

9 WARRANTY

9.1 The factory-manufacturer guarantees the correspondence of GGFE to the requirements of technical specification if the Customer observes operation, transportation and storage conditions.

9.2 Service life is stated to be not more than 10 years and is estimated from the date of GGFE accepting 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;
- negligent storage and transportation of GGFE;
- passport loss;

- expiration of the service life stated from the date of GGFE accepting by Quality Department of the factory-manufacturer.

The procedure of reloading is following:

- Remove GGFE with bracket **15** from a bearing surface (see Figure 1), remove lid **11** from GGFE, disconnect launching cable, and carry the generator to assembling room:

- Extract wires of electrical triggering elements **4** of cartridges **2** from contact screw clamp **14**;

- Remove cover **9** and rubber rings **11** by turning off screws **8**;

- Extract triggered cartridges **2** from GGFE case **1**;

- Install new cartridges **2** in case **1**. Before cartridges assembling check electrical resistance of their electrical triggering elements by safe continuous current not more than 0.03 A. Electrical resistance must be 8...16 Ohms. Check plug **7** availability and case integrity;

- Set rubber rings **11** and lid **9** sequentially, fasten the lid with screws **8**;

- twist bared ends of electrical triggering elements **4** wires, one wire from each cartridge, tin them after twisting, and fasten them in joint box **13**;

- Check electrical resistance of GGFE launching circuit by safe continuous current not more than 0.03 A. Electrical resistance must be 4.0...5.3 Ohms.

- Close output terminals of joint box **13** with wire **14**;

- Install GGFE according to requirements of paragraphs 6.2...6.4.

7.3 Completeness of set for GGFE reloading:

- Cartridge for GGFE SIAV 634234.002.010 – 3 items;

- Rubber ring 050-060-58 GOST 9833-73 – 3 items.

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

8 STORAGE AND TRANSPORTATION

8.1 GGFE refers to hazardous cargoes of 9 class, 9.1 subclass, 913 category; classification number is 9133 according to GOST 19433-88; UN number is 3363.

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

8.3 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.

8.4 When GGFE stored and transported, conditions preventing them from mechanical damage, heating, direct sunlight, rainfalls and aggressive media should be provided.

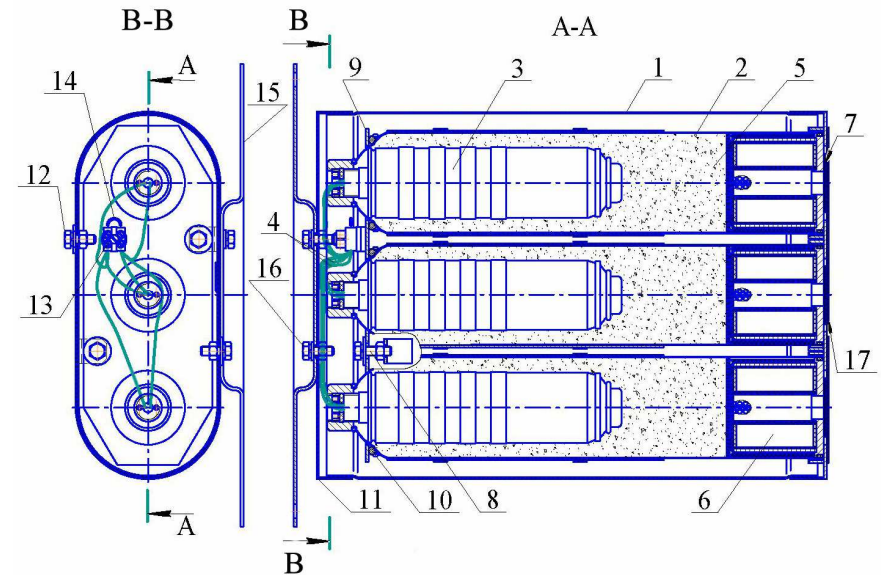


Figure 1

5 SAFETY MEASURES

5.1 Personnel admitted to GGFE maintenance must study the content of the present Passport and follow its requirements.

5.2 Before GGFE connecting, bared ends of cartridges electrical triggering elements wires must be fixed in joint box terminals after their twisting in two groups: one wire from each cartridge, and after tinning. Output terminals of joint box must be closed with wire having a copper core and cross-section not more than 0.5 mm². Extract closing wire straight before generator plugging to control system. Electric safety while GGFE assembling should be provided by meeting the requirements of PUE, PTE, PTB and PZSE.

5.3 After GGFE actuation it must not have case integrity breaking: burnouts, damages and so on.

5.4 After detecting the generator defects during the operation or after its service life, GGFE should be sent to the factory-manufacturer for utilization.

5.5 It is not allowed:

- GGFE keeping near heat sources;
- effecting rainfalls, direct sunlight, aggressive media, and moisture on GGFE;
- infliction of blows at GGFE case;
- dropping from the height more than 2 m;

- GGFE disassembling, introduction of changes in its construction, and its abuse;
- GGFE operating with damaged case (dents, cracks, through holes);
- GGFE outlet hole directing towards the human when working with GGFE.

5.6 It is allowed entering into premises protected after gaseous firefighting substance emission and fire suppression till the moment of ventilation finishing in respiratory organs isolating safety means only.

5.7 Entering in premises without respiratory organs isolating safety means is allowed only after burning products and gaseous firefighting device removing till the safe value (concentration).

5.8 It is necessary to leave premises after first signs of GGFE actuation occurrence.

6 PREPARATION OF GGFE TO OPERATION, LAYOUT AND MOUNTING

6.1 Unpack GGFE and examine the integrity of case. Take off lid **11** (see Figure 1) by removing screws **12**. Check the reliability of bared ends of electrical triggering elements **4** in contact screw clamp **13**.

6.2 Fasten bracket **15** to case **1** or lid **11** with screws **16**.

6.3 Extract wire **15** from contact screw clamp **14**. Check the electrical resistance of GGFE launching circuit with safe continuous current not more than 0.03 A through output terminals of clamp **14**; the electrical resistance must be equal 8...16 Ohms. Cartridges with inappropriate resistance are subject to replacement. Fasten launching cable in the inlet box **13**, preliminary putting it into aperture of lid **11**. Fasten lid **11** to GGFE with screws **12**.

6.4 Fasten GGFE through bracket **16** on a ceiling, wall or other bearing surface located at any angle to floor surface. Positions of holes in the bracket intended to fasten GGFE are given in Figure 2. Remove self-adhesive film **17** from bottom part of case **1**.

Note. Taking into account the convenience of installation performing the order of works to be done according to paragraphs 6.3, and 6.4 may be changed.

6.5 It is not recommended to direct GGFE nozzle-spray towards places of hermetization loss of protected volume shielding (transoms, shutters, chinks) during GGFE installation.

6.6 In case of protection of premises with volume not more than 60 m³ inclusive and with taking into account the nonhermeticity parameter according to table 3 requirements the total number of generators must be determined by a

formula:

$$N = V_p / V_{GGFE},$$

where V_p – volume of premises to be protected, m³;

$V_{GGFE} = 3.0 \text{ m}^3$ – volume protected with one generator.

In case of obtaining fractional number during calculation of GGFE number, the following larger integral number is taken as final.

Generators should be installed in such a way as to provide rapid and uniform filling of a room with gaseous firefighting substance. A simultaneous launch of all generators must be provided.

Table 3 – Nonhermeticity parameter value depending on the volume of premises protected

| Nonhermeticity parameter, m ⁻¹ , not more than | Volume of premises to be protected, m ³ |
|--|---|
| 0.044 | up to 10 |
| 0.033 | from 10 up to 20 |
| 0.028 | from 20 up to 30 |
| 0.022 | from 30 up to 50 |
| 0.018 | from 50 up to 60 |

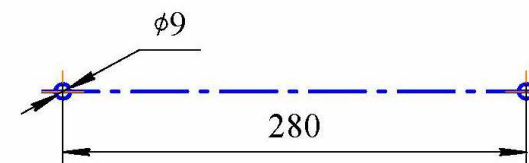


Figure 2

7 MAINTENANCE

7.1 Special technical maintenance within the stated service life, which equals 10 years, is not required. Examine the integrity of launching circuit, GGFE grounding availability, and self-adhesive PVC film covering of outlet apertures of GGFE cartridges once a quarter.

7.2 It is necessary to replace cartridges in case after GGFE actuation.