

KALANCHA OOO



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Gas Powder Fire Extinguishing Module

"BiZone"

MGPP-110-CO₂-30-RKh-ABCE-U2

USER MANUAL

4854-027-13393076-2012 UM version 3.

City of Sergiyev Posad

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The present manual is intended to study the design, operation principles, installation, technical maintenance and repair, storage, transportation and disposal of the powder fire-extinguishing module **MGPP-110-CO2-30-RKh-ABCE-U2** (further referred to as the **Module**).

Qualified staff trained in design, operation principles and technical maintenance rules OR trained according to "Industrial safety rules for hazardous production facilities with pressurized equipment" is allowed to work with the module.

The staff dealing with the electrical equipment should be additionally allowed to work with the electrical installations of up to 1000W and follow the requirements of the existing Wiring regulation, Safety regulations for the operation of consumers' power plants, User Safety Rules for Operating Electrical Equipment.

1. APPLICATION

1.1. The module is applied for the total flooding fire-extinguishing of fire classes:

- **A** (combustion of solids);
- **B** (combustion of liquids);
- **C** (combustion of gaseous substances);
- **E** (live electrical equipment).

The module ensures the total flooding fire extinguishing of the fire classes A, B, C and live electrical equipment in the premises of the following volume:

- $V = 900\text{m}^3$ for class A fires;
- $V = 600\text{m}^3$ for class B fires.

The module provides for the extinguishing of the fires of Class A and B at the area of 100 m².

1.2 The powder supply from the module can be carried out by piping of not more than 100m length with the maximum possible number of 90-degree turns equal to 6. The piping must be made of the steel water pipes 65 × 4 GOST 3262 or 76x4 GOSTs 8732, 8734 and comply with the requirements of **SP5.13130.2009** (Claims 9.2.10, 9.2.11). The piping must be reinforced with brackets in front of each turn and nozzle.

1.3 The module is intended for use in explosion hazard zones of class 1 according to GOST R 30852.9-2002 (IEC 60079-10:1995) "Explosion-proof electrical equipment. Part 10. Classification of explosion hazard zone." with the possibility of the occurrence of explosive mixtures of IIC category, T4 group according to GOST R 30852.19 (IEC 60079-20:96) "Explosion- proof electrical equipment. Part 20. Data on fuel gases and fumes related to operation activity of electrical equipment." enclosures and exterior installations according to the marking of explosion GOST R 30852.13 (IEC 60079-14:96) "Explosion-proof electrical equipment. Part 14. Electrical installations in explosion hazard zones (except underground openings)." and other regulatory documents regulating the use of electric equipment in explosive hazard zones.

The module is also intended for the use in explosion hazard zones of enclosures and exterior installations according to Chapter 7.3 "Installations in explosion hazard zones" of the "Electric Installations Construction Rules" (EICR).

Explosion-proof mark - **1ExdsIICT4X**;

The sign "X" in the explosion-proof mark of the module indicates the necessity to meet the special security conditions:

- Rub and cleaning with dry wiper materials are prohibited while using in explosion hazard zone.

The module is closed on all sides by galvanized steel cladding to prevent the accumulation of static electricity charges due to the action of jets of air or other gas with dust particles on the surfaces of parts with a paint coating. The thickness of the paint coating is limited to 0.2 mm max for protruding parts of the frame from under the skin.

1.4 The module is not intended to extinguish the burning substances that can be incinerated without air access and to extinguish metals, alloys and organometallic compounds.

1.5 Modules for deliveries to ships and objects of the marine fleet must be delivered with a "Type Approval Certificate of the Russian Maritime Register of Shipping" and have UM design.

1.6 In design, engineering and technological documentation as well as in the purchase orders the modules are indicated as:

MGPP-110-CO₂-30-RKh-ABCE-U2 **TC 4854-027-13393076-2012.**

2. TECHNICAL PARAMETERS

Basic technical parameters of the modules are indicated in Table 1.

Table 1.

Parameter	Value
1. Protected volume, m ³ class B class A Protected area, m ² classes A and B	600 900 100
2. Powder tank capacity, l	105±2,5
3. Amount of powder "Phoenix ABC-70" Specs (TU) 2149-005-18215408-00, kg	80±2
4. Mass of used working gas - liquid Carbon dioxide GOST 8050-85, kg, min	30
5. Total weight of the module (without nozzle), kg, not over	350±15
6. Range of operating temperatures, °C	from -50 ⁰ C to +50 ⁰ C
7. Working pressure in powder tank (membrane burst pressure), MPa, max	1,6
8. Duration of powder discharge, s, not over	10
9. Response time, s, max	1
10. Mass of powder residue after the module activation, %, max	15
11. Parameters of the constant electrical current required to trigger the module (cartridge actuated device): - operating current, A - voltage, V - electrical resistance, Ω - pulsing time, max, s	0,5 9-27 1,5-4,5 0,02
12. Safe current circuit control, A - checking time for max. 5 minutes. - check without any time limit	0,05 0,005
13. Dimensions, mm: width height without nozzle length	630 1740 670
14. Degree of protection according to GOST Standard 14254-96	IP54
15. Climatic modification according to GOST Standard 15150	U2
16. Storage Condition Group	5
17. Service lifetime, years	20
18. Fog variation factor, K₁	1,0
19. Safety factor taking into account the shading zones of the ignition, K₂	1,0

3. STRUCTURE OF THE MODULE

3.1 Gas-powder fire extinguishing module (Fig. 1) consists of the following main parts:

1 - container with powder; 2 - aerator cover; 3 - frame; 4 - cylinders with carbon dioxide; 5 - gas supply pipeline; 6 - switching boxes; 7 - closure-triggering device; 8 – GPEA supply pipeline; 9 - membrane unit; 10 - a bolt for grounding; 11 - nozzles.

The membrane unit, which serves to seal the container with powder, is closed by the transport cover, the nozzles are removed in the transport position.

3.2 There are two modifications of modules depending on the position of the membrane unit on the container with powder:

- If the membrane unit is positioned on top, there is a module with the upper output of the gas-powder extinguishing agent MGPP-110-RKh-VV (Fig. 1a);
- When the position of the membrane unit is below there is a module with the lower output of the gas-powder extinguishing agent MGPP-110-RKh-NV (Fig. 1b).

3.3 The module with the upper output is equipped with the following nozzles:

- Nozzle dwg MPP(N)-100-00-10-00;
- Direct nozzle dwg MPP(N)-100-01-10-00;

3.4 The module with the upper output is equipped with the following nozzles:

- Nozzle on the branch dwg MPP(N) -100-02-10-00;
- Segment nozzle dwg MPP(N) -100-03-10-00.

4. DESIGN AND OPERATION

4.1 The gas-powder fire-extinguishing module is driven by two UP-3M electric starters connected to the start-up circuit from the control device of the automatic fire extinguishing system through an explosion-proof switching device (ref. 6 of Fig. 1). When the UP-3M is triggered, the powder gases drive the punches inside the closure-triggering device (ref. 7 Fig. 1), which break through the membranes on carbon dioxide cylinders. Carbon dioxide from two cylinders through the pipeline through the cap (ref. 2 Fig. 1) enters the container with the powder. Pressure is created in the container with the powder; when a pressure of 1.4 MPa is exceeded, the membrane in the membrane assembly (ref. 9 of Fig. 1) breaks. The gas-powder extinguishing agent enters through the nozzles (ref. 11 Fig. 1) into the protected volume *объем*.

4.2 The module is the main element for the formation of automatic gas powder fire extinguishing systems.

4.3 The main mode of operation of the module is automatic, when the electric signal for operation comes from the control device of the automatic fire extinguishing system installed at the facility.

5. EXPLOSION PROTECTION OF THE MODULE

5.1 Description of module explosion protection 1ExdsIICT4X used in the model MGPP-110-CO₂-30-RKh-ABCE-U2.

Explosion protection of the module meets the requirements of: GOST 12.2.020-76 "Occupational safety standards system. Explosion proof electrical apparatus. Terms and definitions. Classification. Marking", GOST 30852.0-2002. "Explosion proof electrical apparatus. Part 0. General requirements", GOST 30852.1-2002 "Explosion proof electrical equipment. Part 1. "Flameproof enclosure" type explosion protection", GOST 22782.3 "Explosion proof electrical apparatus. Special construction. Technical requirements and methods of testing".

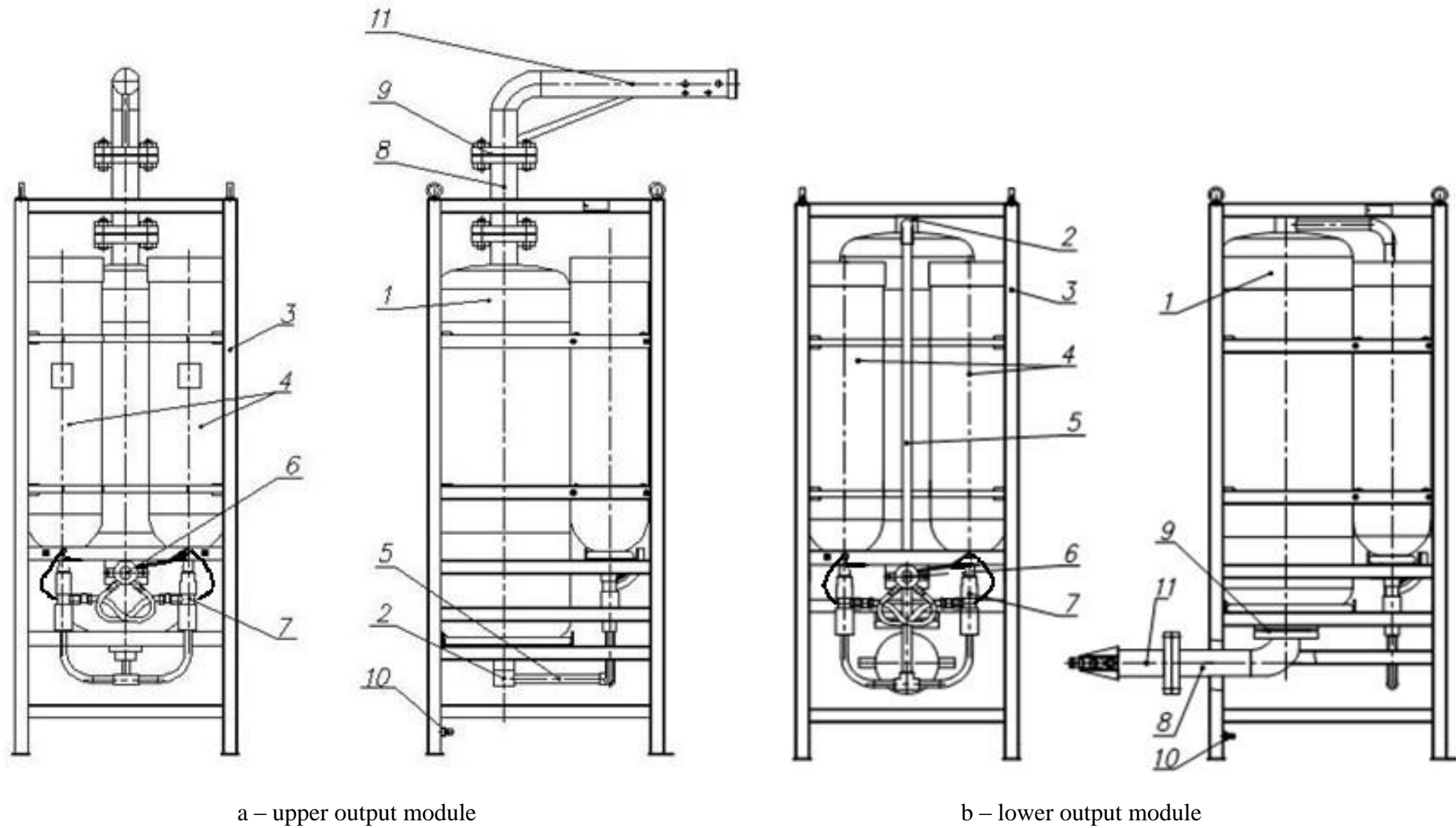
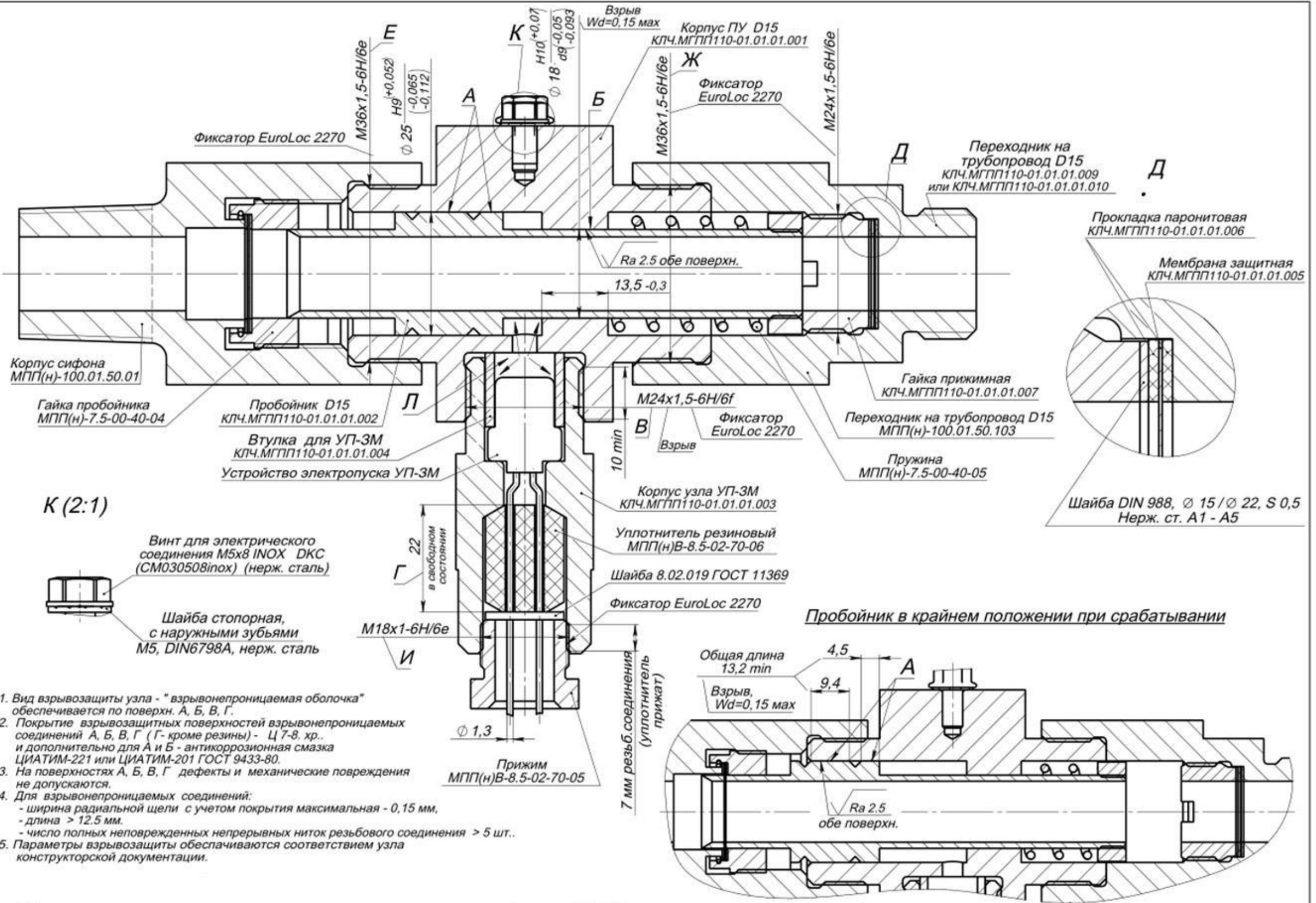


Figure 1. Gas Powder Fire Extinguishing Module MGPP-110-CO₂-30-RKh-ABCE-U2



1. Вид взрывозащиты узла - "взрывонепроницаемая оболочка" обеспечивается по поверхн. А, Б, В, Г.
2. Покрытие взрывозащитных поверхностей взрывонепроницаемых соединений А, Б, В, Г (Г - кроме резины) - Ц 7-8. хр. и дополнительно для А и Б - антикоррозионная смазка ЦИАТИМ-221 или ЦИАТИМ-201 ГОСТ 9433-80.
3. На поверхностях А, Б, В, Г дефекты и механические повреждения не допускаются.
4. Для взрывонепроницаемых соединений:
 - ширина радиальной щели с учетом покрытия максимальная - 0,15 мм,
 - длина > 12,5 мм,
 - число полных неповрежденных непрерывных ниток резьбового соединения > 5 шт..
5. Параметры взрывозащиты обеспечиваются соответствием узла конструкторской документации.

Средства взрывозащиты запорно-пускового устройства (ЗПУ)
МГПП-110-CO2-30-PX-ABCE-У2
Рис. 2

Инв. N подл.	Подп. и дата
Взам. инв. N	Инв. N дубл.
Подп. и дата	

Изм. Лист	N° докум.	Подп.	Дата	4854-027-13393076-2012 PЭ	Лист 8
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Формат А3

Explosion protection of the module is ensured by the use of a closure-triggering device (CTD) and an explosion-proof switching box. CTD is made in the form of a cylinder, inside of which there is a punch intended for opening the membrane on a carbon dioxide cylinder. The movement of the punch is provided by powder gases when the UP-3M electric starter device is activated, which is installed in the housing of the CTD.

The maximum temperature of the external surfaces of the CTD in the most heated places during operation of the electric starter UP-ZM does not exceed + 135 ° C.

The starting device housing is tested at the factory with a hydraulic pressure of 16 MPa.

52 CTD (fig. 2) has the following types of explosion protection:

- flameproof enclosure, explosion protection type "d";
- special type of protection "s";

The free volume of the shell (compartment L):

- in assembled condition - 3.3 cm³;
- when triggered, the punch in the extreme position - 7 cm³.

53 CTD type of explosion protection - " flameproof enclosure, explosion protection type "d".

For all flameproof enclosure connections, the following requirements are met:

- explosion-proof surfaces, except for the rubber sealant, have a Fe/Zn7-8/C coating as a corrosion protection and additionally grease Tsiatim-221 or Tsiatim-201 (GOST 9433-80) for surfaces A and B;
- the largest value of the thread roughness parameter - Ra 3.2;
- threaded joints are locked by EuroLoc 2270 EurotradeGlobalLtd.

Explosion protection is provided on surfaces A, B, C, D:

a) flameproof joint - A:

- slot width taking into account the coating (diametrical clearance) - 0.15 mm max;
- slot length - 13.2 mm min.

b) flameproof joint - B:

- slot width taking into account the coating (diametrical clearance) - 0.149 mm max;
- slot length – 12.7 mm min.

c) flameproof joint - C:

- thread with a pitch of 1.5 mm, length 8.2 mm min;
- the number of complete intact continuous threads of the threaded connection 5pcs;
- fit after coating the threaded connection B - 6H / 6g - 6H/6g.

d) flameproof joint - D:

- cable entry (2 wires) is carried out using a rubber seal;
- the rubber seal is pressed by a clip. The number of complete undamaged continuous threads of the threaded connection 7pcs. Wire Diameter 1.3mm.

54 CTD type of explosion protection - special type of protection "s".

An additional type of explosion protection is provided, ensuring the absence of an explosive mixture in a volume covered by an explosion-proof shell. The volume is sealed at the enterprise when assembling the product, the explosive atmosphere does not enter the sealed volume from the place of operation.

Sealing means:

- protective membrane - in the drawing, ref. E;
- the cable entry is sealed with a rubber seal which is pressed by a clip;
- threaded connections C, F, G, I are sealed with EuroLoc 2270 retainer produced by EurotradeGlobalLtd,
- the space is closed by a membrane in a sealed container volume from the siphon side.

55 The list of materials used in the manufacture of the module is given in Appendix 3.

56 Explosion protection of the electrical circuit to start the module is ensured by the use of an explosion-proof switching box of the ReliON model KKV-A-T Specifications SPEC.425002.2Z2TC with three inputs and with explosion protection marking 1ExdIICT5 / T6.

The use of switching boxes and cable entries of other manufacturers with the same type and degree of explosion protection, subgroup and temperature class not lower than those declared, having a valid certificate of conformity with the requirements of TP TC 012/2011 is allowed.

Cable entries (G $\frac{1}{2}$ threaded fitting and rubber seal) provide explosion protection of the box in accordance with the requirements for type of protection - Flameproof enclosures "d".

The module must have an explosion protection level "Explosion-proof", belonging to subgroup IIC, temperature class T4 (135°C) according to GOST 30852.0-2002, provided with explosion-proof types and "explosion-proof enclosure" and "special".

DO NOT open the case of the box, as well as work on connecting, checking and disconnecting the power supply line, without removing the voltage from the supply line.

5.7 Знак The "X" in the explosion protection marking of the module indicates the need to comply with the Special Conditions for Safe Use, which are as follows:

- when operating in an explosive area, wiping and cleaning using dry wiping materials is prohibited.

The module is closed on all sides by galvanized steel cladding to prevent the accumulation of static electricity charges on the surfaces of parts with a paint coating, due to exposure to jets of air or other gas with dust particles. The thickness of the paintwork is limited to 0.2 mm max for protruding parts of the frame from under the cover.

6. SAFETY MEASURES

6.1. All work with the module must be carried out in compliance with safety requirements, the current "Electrical Installation Code" (EIC), as well as the "Rules for Design and Safe Operation of Pressure Vessels" (Federal Norms and Rules in the Field of Industrial Safety, "Regulations of industrial safety for hazardous facilities using equipment working under excess pressure").

6.2. Persons who are at least 18 years old, who have studied the device, the principle of operation and the user manual, who have undergone special instruction and training in safe working methods, tested knowledge of safety rules in accordance with their position and with respect to the work performed, should carry out work with the module.

6.3. All work related to the installation, dismantling and maintenance of the modules must be carried out by at least two persons.

6.4. The module case must be grounded before connecting the start circuit line to the fire detection equipment.

6.5. The module must be disconnected from the startup system during routine maintenance.

6.6. The module is not allowed to fall and hit.

6.7. The modules belong to class 1 according to GOST 12.2.007.0-75 by the method of protecting a person from electric shock.

6.8. After the module is triggered, you can enter the room after the complete precipitation of the powder. The cleaning of the premises is as follows:

- the bulk of the powder is removed by dry cleaning (sweeping with a brush);
- the remaining powder is removed with a vacuum cleaner;
- at the final stage of powder removal, wet cleaning (with a slightly dampened cloth) can be used, excluding electrical equipment under voltage.

6.9. Personal protective equipment must be used when cleaning powder:

- respirators for respiratory organs;
- rubber gloves for the skin of the hands;
- safety glasses for the organs of vision.

6.10. You should always take into account the possibility of a dangerous physical effect of GPEA jets exiting the spray gun on a person during the design, maintenance and operation of the fire extinguishing system (module).

ATTENTION!

- **Traction force at the expiration of the gas-powder extinguishing agent from the atomizer is 1500 kg.**
- **The speed of the jet at the nozzle exit, depending on the ambient temperature, is 70 – 80 m / s.**
- **During operation of the module, the length of the jet of a gas-powder extinguishing agent exceeds 18 m.**

6.11. The following is FORBIDDEN:

- **OPERATE THE MODULE WITHOUT MAINTENANCE;**
- **OPERATE THE MODULE AFTER THE PERIOD OF REVISION OF THE CYLINDER WITH WORKING GAS;**
- **CONDUCT MAINTENANCE OF THE MODULE WITH THE AUTOMATIC START-UP SYSTEM ON;**
- **REMOVE THE SEAL, DISASSEMBLE THE MEMBRANE ASSEMBLY;**
- **DISASSEMBLE ELECTRIC START UP-3M;**
- **OPERATE MODULES WITH MECHANICAL DAMAGE;**
- **PERFORM ANY FIRE TESTS WITHOUT AGREEMENT OR PRESENCE OF THE REPRESENTATIVE OF THE MANUFACTURING COMPANY.**

7. PREPARATION OF THE MODULE FOR INSTALLATION

7.1. Placement and maintenance of the module at the facility should be carried out in accordance with the requirements of **GOST 12.4.009-83 “Occupational safety standards system. Fire-fighting equipment for protection of units. Basic types. Location and maintenance”**.

It is necessary to weigh the module to determine the total mass of the module before installing the module on the site; the total mass of the module is indicated in section 7 of the passport. The module is weighed on a balance with a weighing limit of up to 500 kg.

7.2 Installation of the module and the location of the nozzle, if necessary, with the supply pipe to the extinguishing object, electrical docking of the module should be carried out in accordance with the project for the automatic installation of fire extinguishing the object, developed by a specialized organization.

It is recommended to use pipelines and equipment described in Part 2 "Installation drawings" when designing an automatic installation of gas-powder fire extinguishing.

7.3 It is allowed to use as pipelines:

- pipe Dn65 GOST 3262;
- pipe 76x4 GOST 10704, GOST 8732, GOST 8734.

7.4 The module is transported to the installation site in accordance with the rules for the carriage of goods in force on this type of transport.

Storage and transportation conditions must correspond to storage conditions group 5 in accordance with GOST 15150-69 (canopies or rooms where fluctuations in temperature and humidity are not significantly different from fluctuations in the open air).

Storage outdoors is prohibited.

7.5 The module can be placed:

- in a protected room;
- in the next room;
- outside the premises in accordance with the design.

7.6 Prepare a flat concrete or asphalt site withstand a load of at least 1750 kg before installing the module.

7.7 Install the module in places that exclude the possibility of mechanical damage, as well as

at a distance of at least **1.5 m** (in the absence of thermal insulation) from heating devices.

7.8 Remove the transportation cover from the pipeline before installing the module.

8. INSTALLATION OF THE MODULE

8.1 It is recommended to be guided by the drawings of the MPP (N) -100 MCh-00-00-00-00 for the installation of the module with the pipelines given in Part 2 of the UM during module installation.

8.2 Install the module on the prepared site and fix it to the floor with anchor bolts ($d = 16\text{mm}$, $h = 150\text{-}160\text{mm}$).

8.3 Fix the top of the module frame with brackets (drawing MPP (N) -100 MCh-00-00-01) to the wall.

8.4 Install nozzles on the module with the upper powder exit (dwg MPP (N) -100-00-10-00).

8.5 Screw in the horizontal piping for the gas supply dwg MPP (N) -100-02-42-00 per module with a lower powder output, from the back wall side. Seal the threaded connection with the help of a fum tape, a polymer sealing thread or in another way, ensuring the tightness of the connection. Next, connect the nozzle to the horizontal pipe.

8.6 When installing the nozzle at a height of more than 2 m from the floor level, as well as when extending the pipeline to 45 m, the nozzle and pipe are fixed using the brackets dwg MPP (N) -100 MCh-00-30-00 and anchor bolts ($h = 150\text{-}200\text{mm}$, $d = 10\text{mm}$) to the wall of the room. Brackets are spaced no more than 3m apart. The fixed intermediate bracket must withstand a load of 300 kG.

8.7 Tighten the bolts on the pipe flanges and the nozzle with a torque wrench with a torque of $10 \pm 0.5 \text{ kgm}$.

Attention! Install a paronite gasket between all flange joints. Mount the flanges in accordance with the recommendations of Appendix C.

8.8 Remove the lower part of the casing on the front of the module by unscrewing the four self-tapping screws.

8.9 Ground the module in accordance with the requirements of the EIC. Attach the object to the grounding device with a wire with a standard tip using the fasteners provided on the module case. The grounding location is shown in Fig. 3, ref. 1.

8.10 Check the tightness of the four union nuts of the gas supply pipe connectors (Fig. 3, ref. 2).

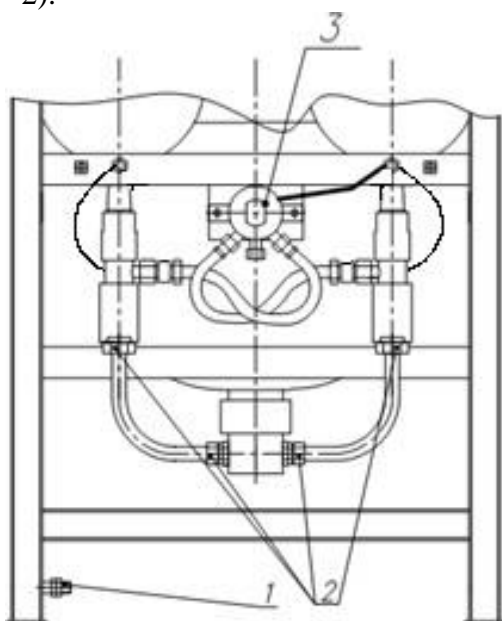


Figure 3.

1 - grounding bolt; 2 - gas pipeline connectors; 3 - cover of the switching box KKV-07e-T

8.11 Remove the cover (Fig. 3, pos. 3) of the explosion-proof switch box. Check the resistance of the UP-3M electric starter circuit through the upper contacts No. 1-2 and No. 5-6 in the terminal block (Fig. 4, pos. 1). The circuit resistance should be between 2.4 - 4.0 ohms. Check the insulation resistance of each wire of the electric start device through the upper contacts of the block in the switching device and the ground terminal. Verification is carried out by a device providing a verification current of not more than 0.05A for no more than 5min.

Note: terminal blocks of various types can be used as a contact block, for example, TV-15, B-326, wago-222 and others.

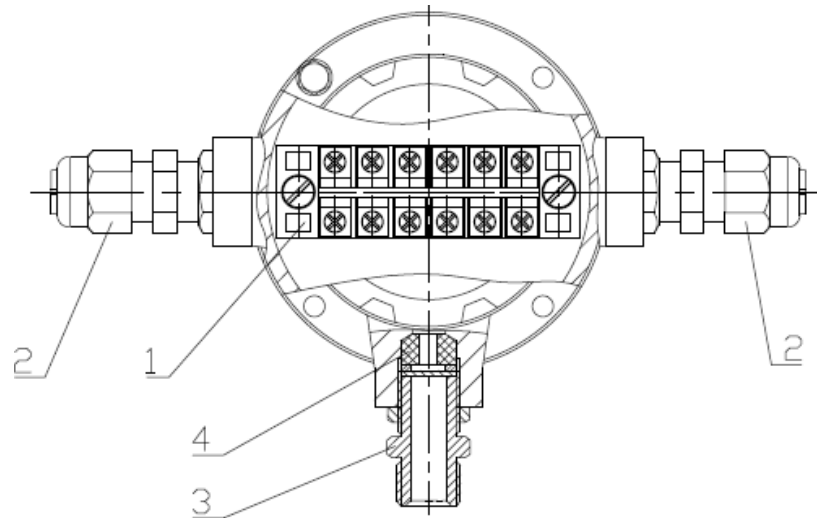


Fig. 4. Explosion-proof switch box.

1 - terminal block; 2 - cable entries from the starting devices UP-3M; 3 - fitting with G ½ thread for the control circuit of the automatic fire extinguishing system; 4 - rubber seal $d_{in}5$ mm.

8.12 Connect the control circuit of the automatic fire extinguishing system through a fitting with a thread G ½ (Fig. 4 pos3). It is recommended to use a 4-core cable with an outer diameter of at least 5 mm for connecting start-up circuits.

8.13 Fig. 5 shows the option of connecting the module to the starting automation unit “S2000-KPB”.

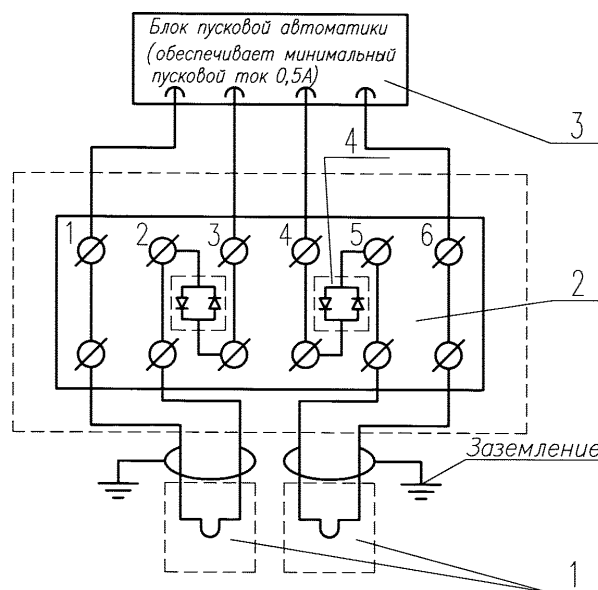


Fig. 5: Connection diagram of the module.

1 - electric starter UP-3M; 2 - terminal block of the switching box; 3 - starting automation unit; 4 - device control the integrity of the starting circuit

Attention! The starter cable must be disconnected when the module is connected. The connection of the starting circuit line to the fire detection equipment should be carried out after completion of all installation work.

8.14 Screw in the cover of the switching device with gasket as far as it will go. Ensure that there is no moisture, foreign particles or contaminants in the cavity of the switching box before installing the cover of the switching device.

8.15 Install the lower part of the casing on four screws on the front of the module.

9. EXPLOSION PROTECTION OF THE MODULE FOR INSTALLATION, OPERATION AND REPAIR.

9.1 Installation of the electrical module starting system should be in accordance with the requirements of 7.3 EIC-98.

9.2 The module is connected to the electric starting circuit of the module through an explosion-proof switching box with three inputs.

9.3 Disconnect the module from the fire extinguishing system during maintenance and repair work.

10. MODULE MAINTENANCE

10.1 The following types of maintenance are provided to maintain the health of the module after putting it into operation:

- M-1 to perform once a month;
- M-2 to perform once a quarter;
- M-3 to perform once a year;
- M-4 to perform every 10 years.

10.2 Maintenance work should be carried out in full and on time, in accordance with the technical documentation for the module and fire detection equipment. All performed routine maintenance should be recorded in the maintenance journal, with a mandatory note of identified deficiencies, work performed, date of work, signature of the person who carried out these works.

10.3 The scope of maintenance is given in table. 2.

Table 2

No.	Maintenance	M-1	M-2	M-3	M-4
1	Visual inspection of the module for damage to the elements, paintwork and fixing the module with anchor bolts	+	+	+	+
2	Visual inspection of the pipeline (if any) for damage to the elements of the pipeline, paintwork and fastening of the pipeline	-	+	+	+
3	Checking the performance of fire detection equipment	-	+	+	+
4	Grounding integrity check	-	-	+	+
5	Powder Recharge	-	-	-	+
6	Inspection of carbon dioxide cylinders in accordance with the requirements of Rostekhnadzor (FRR Order No. 116, clause 4).	-	-	-	+

10.4 Notify the service organization if mechanical damage is detected during routine maintenance in paragraphs 1-2.

To clean and tint damaged areas if damage to the paintwork is detected.

10.5 Maintenance work of paragraphs 3-4 is carried out by the service organization. An inspection is made of all visible elements of the grounding device, checking the contact tightness, correct installation, absence of mechanical damage, tightening of loose bolt contacts when checking

the grounding integrity.

10.6 The work on paragraphs 5-6 service organization dismantle modules have served 10 years and sends them to the manufacturer company or organization has a right to make refilling and repairs modules. New modules are installed in place of the dismantled modules.

10.7 Recharging the module after extinguishing, the manufacturer carries out i.e. charging of carbon dioxide cylinders, containers with powder, assembly and disassembly of the module or organizations authorized by the manufacturer of the module, licensed by the Russian Emergencies Ministry for this type of activity, relevant equipment, and trained personnel.

In this case, use parts and extinguishing powder recommended by the manufacturer.

10.8 **It is necessary to weigh the module to determine the total mass of the module before installing the module on the site; the total mass of the module is indicated in section 7 of the passport The module is weighed on scales with a weighing limit of up to 500 kg.**

11. WARRANTY

The manufacturer guarantees the compliance of the module with the requirements of the technical conditions, subject to the conditions of storage, transportation, installation and operation.

The warranty period of operation of the module is 2 years from the moment the module is accepted by the technical control department of the manufacturer.

The service life of the module is 20 years.

The maximum number of module recharges without replacing the starting-closure device is 10 times. The number of operations when replacing the CTD is not limited.

The manufacturer reserves the right to make changes to the module design that do not impair the technical and consumer characteristics of the module.

12 MARKING AND SEALING

12.1 The markings on the modules include the following data:

- trademark or name of the manufacturer;
- type of product;
- serial number and year of manufacture;
- range of ambient temperature values during operation: $-50^{\circ}\text{C} \div +50^{\circ}\text{C}$;
- explosion protection marking - 1ExdsIICT4X;
- name of the certification center and certificate number.
- sign Ex and EAC

12.2 Membrane assembly bolts are sealed on the module.

13. RECYCLING AND DISPOSAL

13.1 Information on the content of non-ferrous metals and alloys in the module is given in Appendix 1.

13.2 After operation, **the UP-3M electric starting device** is disposed of in accordance with the requirements established by the consumer.

13.3 **The electric starting device UP-3M**, damaged or failed, must be returned to the manufacturer.

13.4 Disposal of fire extinguishing powder is carried out in accordance with clauses 4.6.1, 4.6.5, 4.6.6 of SP 9.13130.2009 and the instructions for "Disposal and Regeneration of Extinguishing Powders" (Moscow; VNIPO, 1988, p. 25).

14. DISMANTLING OF THE MODULE

14.1 Used modules and modules that have served for 10 years are dismantled.

14.2 Dismantle the module in the following sequence:

- disconnect the start-up cable of the control panel of the automatic fire extinguishing system

- from the module;
- disconnect the pipelines for the supply of gas pumps or spray nozzles from the module;
 - remove the module from the installation site and send it to the manufacturer or organization authorized to recharge and repair the modules.

15. MODULE REFILLING

15.1 Disassemble the module. Disconnect the gas pipes, loosen the cylinder clamps and remove the powder and carbon dioxide cylinders from the frame.

15.2 Powder Filling:

- remove the supply line of the extinguishing agent;
- remove the used membrane and paronite gasket;
- unscrew the nut of the bottom cover and remove the cover with an aerator;
- check the inner surface of the container - it must be dry and clean;
- blow a cover with an aerator with compressed air;
- glue the holes in the aerator tube with masking tape 20-25 mm wide in two layers;
- install a sealing ring on the bottom cover, insert the cover with an aerator into the lower neck of the powder container and tighten the nut with a special wrench;
- pour the powder into the container with the powder, the mass of the powder should correspond to paragraph 4 of table 1; clean the neck of the container from powder
- clean the surface of the adapter from the powder, install a paronite gasket with a diameter of 90 mm and a new membrane. Install the membrane up with recesses;
- install the agent supply pipe on the membrane and tighten the bolts;
- seal the two bolts securing the agent supply pipe.

15.3 Carbon dioxide cylinders are refilled in the following sequence:

- remove the cylinders from the frame;
 - disconnect the locking and starting device;
 - disassemble the locking and starting device;
 - inspect the spring; replace it if necessary;
 - remove the punch;
 - assemble the locking and starting device;
 - unscrew the nut from the siphon body. Replace used membrane and, if necessary, gasket.
- Install the nut;
- install a charger on the siphon fitting and connect it to the carbon dioxide line;
 - charge the cylinders with liquid carbon dioxide in an amount of 15 ± 0.5 kg, then pump (1.6 ± 0.1) kg of nitrogen (dried air) into the cylinders and tighten the nut on the siphon until it stops with a torque wrench with a force of 19.5-21.5 kgf / cm;
 - remove the charger and check the cylinders for leaks by washing the nut-fitting connection with soap foam. The exposure time is 1 min.

The appearance of gas bubbles is not allowed. In case of carbon dioxide leakage, tighten the nut additionally; if bubbles reappear, replace the nut, membrane, gasket.

15.4 Install the powder container in the frame and tighten the clamps. Attach a trigger to carbon dioxide cylinders and install the cylinders in the frame. Fix carbon dioxide cylinders to the module frame using clamps. Connect the carbon dioxide supply line to the CTD. Install UP-3M electric starting devices and connect wires from UP-3M to the VUUK switching device (in accordance with the user manual). Attach nozzle.

ATTENTION!

THE CHARGING OF CARBON DIOXIDE CYLINDERS, CONTAINERS WITH POWDER, ASSEMBLY AND DISASSEMBLY OF THE MODULE IS CARRIED OUT ONLY BY ORGANIZATIONS AUTHORIZED BY THE MANUFACTURER OF THE MODULE AND LICENSED BY THE RUSSIAN EMERGENCIES MINISTRY FOR THIS TYPE OF

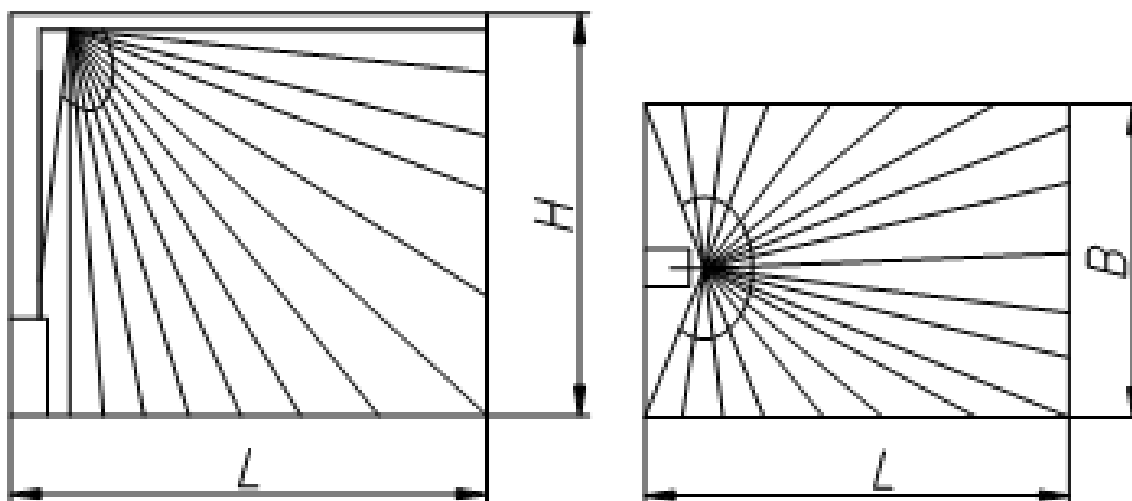
**ACTIVITY, RELEVANT EQUIPMENT AND TRAINED PERSONNEL.
IN THIS CASE, USE PARTS AND EXTINGUISHING POWDER RECOMMENDED BY
THE MANUFACTURER**

APPENDIX 1

INFORMATION ON THE PROCEDURE FOR CALCULATING THE AMOUNT OF MODULES.

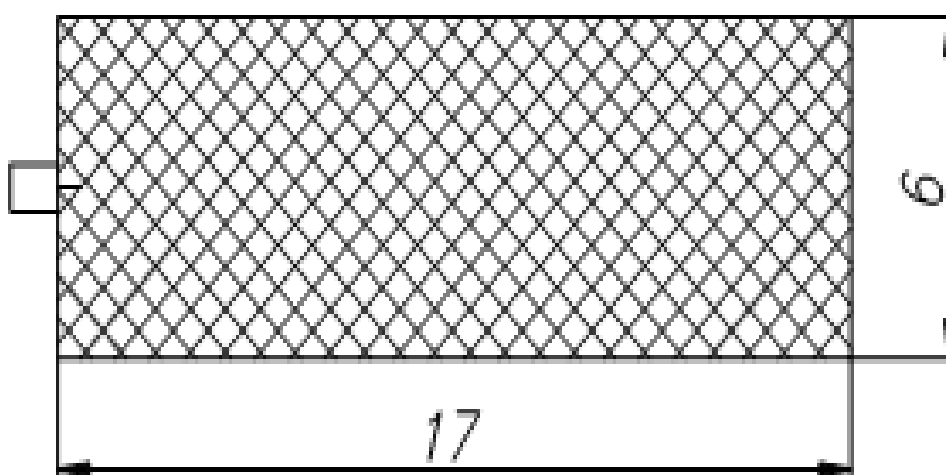
When designing Automatic Gas-Powder Fire Extinguishing Systems for the protection of rooms, outdoor installations, rail loading racks, oil heating furnaces, tanks and tank farms, the Organization Standard STO 4854-039-13393076-2017 "Automatic gas powder fire extinguishing systems. Norms and design rules". The service station is located in the Codex information and legal system (Tekhekspert), www.kodeks.ru.

An increase in the calculated local height of 0.5 m from the height of the fire load is recommended for uniform distribution of the agent and to increase the level of safety when calculating locally by volume.



$$H \leq 8\text{m}, B \leq 10\text{m}, L \leq 18\text{m}$$

Figure A1.1. Total flooding fire extinguishing agent spray chart.



$$\text{Nozzle height} \leq 3.9\text{m.}$$

Figure A1.2. Spray diagram of a gas-powder extinguishing agent for area extinguishing.

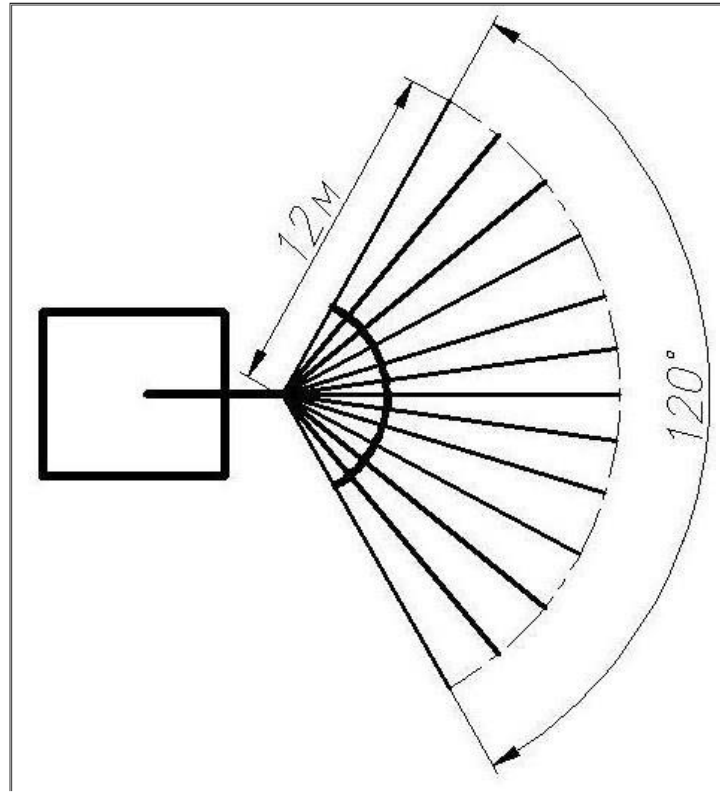


Figure A1.3. Spray diagram of a gas-powder extinguishing agent for a sector nozzle

APPENDIX 2**INFORMATION ON NON-FERROUS METALS AND ALLOYS CONTAINED IN THE MODULE.**

Brand and (or) assortment of non-ferrous metal or alloy	Weight, kg	The location of the component parts of the module containing non-ferrous metals
Aluminum and aluminum alloys		
AK9M2 GOST1583-93	0.112	Nut on the lid of the powder container.
Copper and copper based alloys		
Sheet M3 GOST 1173-2006	0.006	Siphon (washer)
Pipe L63 GOST 494-90	0.433	Siphon (tube)
Bar LS 59-1 GOST 2060-2006	0.027	Siphon (nut)
Tape Br OF-6.5-0.15 GOST 1761-2016	0.006	Siphon (membrane)

APPENDIX 3

INFORMATION ON MATERIALS USED FOR PRODUCTION OF THE MODULE

Designation	Name	Material
Closure-triggering assembly		
KLCh.MGPP110-01.01.01.001	SD D15 body	Hexagon <u>60 GOST 2590-88</u> 20-3GP GOST1050-88
KLCh.MGPP110-01.01.01.002	Punch D15	Circle <u>B 28 GOST 2590-88</u> 45-3GP GOST1050-88
KLCh.MGPP110-01.01.01.009 KLCh.MGPP110-01.01.01.010	Pipe adapter D15	Circle <u>45 GOST 2590-88</u> 20-3GP GOST1050-88
KLCh.MGPP110-01.01.01.003	UP-3M assembly body	Hexagon <u>28 GOST 2879-88</u> 20-3GP GOST1050-88
KLCh.MGPP110-01.01.01.005	Protective membrane	Foil DPRHM 0,15 A5 GOST 618-73
KLCh.MGPP110-01.01.01.006	Paronite gasket	Paronite PON-B 1,0 GOST 481-80
KLCh.MGPP110-01.01.01.007	Hold-down nut	Bar DKRNP 25 ND LS 59-1 GOST 2060-2006
MPP(n)V-8.5-02-70-05	Hold-down	Bar DSHGNP 19x3000 HP 59-1 GOST 2060-2006
	Washer DIN 988, inner Ø15, external Ø22, gauge 0.5	Stainless steel
KLCh.MGPP110-01.01.01.008	Washer	Tape DPRNT 0.4x100 ND BrOF 6.5-0.15 GOST 1761-92
MPP(n)V-8.5-02-70-06	Rubber seal	Rubber B14 TC00511
	Washer A.8.04.019 GOST 11369	Steel 20 GOST 1050-88
MPP(n)-100-01-50-01	Siphon body	Bar DKRNT 45 ND LS-69-1 GOST 2060-2006
MPP(n)-7.5-00-20-01	Closure device body	Bar DKRNT 32 ND LS 59 GOST 2060-2006
MPP(n)-7.5-00-20-02	Sealing washer	Sheet DPRLM 0.5x600x1500 M3 GOST 1173-2006
MPP(n)-7.5-00-20-03	Membrane (diaphragm)	Tape DPRNT 0.4x100 ND BrOF 6.5-0.15 GOST 1761-92
MPP(n)-7.5-00-40-04	Punch nut	Circle <u>25 GOST 2590-88</u> St3-II GOST 535-88
MPP(n)-7.5-00-40-05	Spring	Wire II-2.0 GOST 9389-75
MPP(n)-7.5-00-20-04	Expanding ring	Steel 60S2G GOST 14959-79
KLCh.MGPP110-01.01.01.004	UP-3M bushing	Circle <u>17 GOST 2590-88</u> 20-3GP GOST1050-88

KLCh.MGPP110-01.01.01.006	Paronite gasket	Paronite PON-B 1,0 GOST 481-80
<i>KLCh.MGPP110-00.00.00.000</i> <i>Gas Powder Fire Extinguishing Module</i>		
MPP(n)-100-00-00-08	Angle bar	Angle bar 40x40x1.5 GOST 119771-93
MPP(n)-110-00-00-01	Label MGPP (n) -110	Paper
KLCh.MGPP110-00.00.00.001	Explosion-proofing plate MGPP-110-IIC	Anodized aluminum for metallography, S = 0.5 mm
MPP(n)-100-00-00-02, MPP(n)-100-00-00-03 MPP(n)-100-00-00-04, MPP(n)-100-00-00-05, MPP(n)-100-00-00-06, MPP(n)-100-00-00-07, MPP(n)-100-00-00-05-01, MPP(n)-100-03-00-07	Front wall, rear wall, lower wall, side walls, cover.	Sheet <u>OTs B-PN-NO-0.55x1000x2000 GOST 19904-74</u> OH-KR-1 GOST 14918-80
<i>KLCH.MGPP110-01.00.00.000 MGPP 110 module without shell</i>		
MPP(n)-100-00-00-01	Adapter 1	Bar DShGNP 30ND LS-59-1 GOST 2060-2006
KLCh.MGPP110-01.00.00.002	Cylinder plate	Anodized aluminum for metallography, S = 0.5 mm
KLCh.MGPP110.01.00.00.001	20x20 plate Ground Sign	
<i>MPP(n)-100-03-30-00 Frame</i>		
MPP(n)-100-00-30-13	Sole	Strip <u>B-2 5x50 GOST 103-76</u> St. 3 GOST 14637-89
MPP(n)-100-02-31-04	Front post	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-02-31-05	Rear post	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-00-30-03	Side jumper	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-02-31-07	Carbon dioxide cylinder cramp jumper	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-00-30-04	Jumper	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-01-30-02	Powder cylinder cramp jumper	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-00-31-01	Front top jumper	Pipe 40x40x1.5 TC 14-105-566-93
MPP(n)-100-02-31-09	Junction box plate	Sheet <u>HC B-PN-O-2 (2.5; 3) GOST19904-90</u> KE60 V-IV GOST 16523-89
MPP(n)-100-00-33-01	Cramp	Strip <u>4x20-B-2 GOST 103-76</u> St. 3 GOST 14637-89
MPP(n)-100-00-34-02	Plate	Strip <u>B-2 4x40 GOST 19904-90</u> St. 3 GOST 15637-89
MPP(n)-100-00-36-01	Lifting eye nut plate	Strip <u>B-2 4x40 GOST 103-76</u> St. 3 GOST 14637-89
MPP(n)-100-03-35-01	Gas pipeline jumper	Angle bar <u>40x40x4 GOST 8509-93</u> St. 3 GOST 535-2005
MPP(n)-100-02-31-03	Cylinder support jumper	Angle bar <u>40x40x4 GOST 8509-93</u> St. 3 GOST 535-2005

MPP(n)-100-02-31-03	Cylinder support jumper	Angle bar <u>40x40x4 GOST 8509-93</u> St. 3 GOST 535-2005
MPP(n)-100-02-31-03	Cylinder support jumper	Angle bar <u>40x40x4 GOST 8509-93</u> St. 3 GOST 535-2005
MPP(n)-100-02-31-10	Gas pipeline jumper	Angle bar <u>40x40x4 GOST 8509-93</u> St. 3 GOST 535-2005
MPP(n)-100-01-33-01	Cramp 3	Strip <u>4x20-B-2 GOST 103-76</u> St. 3 GOST 14637-89
MPP(n)-100-01-34-01	D-ring 2	Pipe 15x2,8 GOST 3262-75
MPP(n)-100-03-30-01	Carbon dioxide cylinder rim	Pipe 100x4,5 GOST 3262-75
<i>MPP (n) -100-01-20-00 Cylinder with the upper pipeline</i>		
MPP(n)-100-00-20-01	Paronite gasket	Paronite PON-B 2.0 GOST 481-80
MPP(n)-100-00-20-02	Membrane	Sheet A5M-1 GOST 21631-76
MPP(n)-100-00-20-03	Transport cap	Particleboard, fiberboard or plywood
MPP(n)-100-00-20-04	Rubber sealant	Plate 2F-1 TMKShch-S-5 GOST 7338-90
MPP(n)-100-00-20-11	Upper neck	Steel 20 GOST 1050-88
MPP(n)-100-00-20-12	Lower neck	Steel 20 GOST 1050-88
MPP(n)-8.5-07-21-03	Captive nut	Alloy AK-5 GOST 1583-93
MPP(n)-100-02-21-01	Aerator cover	Alloy AK-5 GOST 1583-93
MPP(n)-100-00-23-02	Cap	Circle <u>18-V-GOST 2590-88</u> St.3 GOST 535-88
MPP(n)-100-00-22-01	Flange (adaptation)	Flange 1-65-25 st. 25 GOST 12820-80
MPP(n)-100-00-22-02	Adapter	Pipe <u>89x10 GOST 8732-78</u> V-20 GOST 8731-87
MPP(n)-100-00-40-01	Pipe	Pipe 65x3.2 GOST 3262-75
MPP(n)-100-00-40-02	Flange (adaptation)	Flange 1-65-16 st. 25 GOST 12820-80
MPP(n)-100-00-40-03	Adapter	Pipe <u>114x18 GOST 8734-75</u> V-20 GOST 8733-87
MPP(n)-100-00-40-04	Bottom flange (adaptation)	Flange 1-65-25 st. 25 GOST 12820-80
MPP(n)-100-02-70-01 VV	Horizontal piping	Pipe 20x2,8 GOST 3262-75
MPP(n)-100-02-70-01 NV	Horizontal piping	Pipe 20x2,8 GOST 3262-75
MPP(n)-100-02-70-02	Vertical piping	Pipe 20x2,8 GOST 3262-75
MPP(n)-100-00-23-01	Upper output aerator tube	Pipe 20x2,8 GOST 3262-75
MPP(n)-100-02-70-03	Branch	Pipe DKRNM 18x1 ND M1 GOST 617-2006
<i>MPP(n)-100-03-20-00 Cylinder with the lower pipeline</i>		
MPP(n)-8.5-07-21-03	Captive nut	Alloy AK-5 1583-93
MPP(n)-100-02-23-01	Lower output aerator tube	Pipe 20x2,8 GOST 3262-75
MPP(n)-100-00-40-04	Top flange (adaptation)	Flange 1-65-25 st. 25 GOST 12820-80

MPP(n)-100-02-41-02	Connector	Pipe	<u>89x10 GOST 8732-78</u> V20 GOST 8731-87
MPP(n)-100-02-41-03	Extinguishing agent supple piping 1	Pipe 65x4	GOST 3262-75
<i>MPP(n)-100-00-10-00 Nozzle</i>			
MPP(n)-100-00-10-01	Side nozzle	Circle	<u>90-B GOST 2590-88</u> Ст.3-II GOST 535-88
MPP(n)-100-00-10-02	Nozzle pipe	Pipe 65x3.2	GOST 3262-75
MPP(n)-100-00-10-03	Pipe 65x3.2	Pipe 65x3.2	GOST 3262-75
MPP(n)-100-00-10-04	Nameplate	Paper	
MPP(n)-100-00-10-05	Disk	Paronite PON 1.0-2.0	GOST 481-80
MPP(n)-100-01-10-02	Nozzle pipe 250	Pipe 65x3.2	GOST 3262-75
MPP(n)-100-00-40-01	Pipe 65x3.2x250	Pipe 65x3.2	GOST 3262-75
<i>MPP(n)-100-02-42-00 Horizontal agent supply pipeline (on request)</i>			
MPP(n)-100-02-42-01	Horizontal Pipeline	Pipe	<u>76x6 GOST 10704-76</u> B-20 GOST 10705-80
MPP(n)-100-00-40-02	Flange (adaptation)	Flange 1-65-16 st. 25	GOST 12820-80
MPP(n)-100-00-40-03	Adapter	Pipe	<u>114x18 GOST 8734-75</u> V-20 GOST 8733-87
<i>MPP(n)-100-01-10-00 Straight nozzle (on request)</i>			
MPP(n)-100-00-10-01	Side nozzle	Circle	<u>90-V GOST 2590-88</u> St3-II GOST 535-88
MPP(n)-100-01-10-02	Nozzle pipe 250	Pipe 65x3.2	GOST 3262-75
<i>MPP(n)-100-02-10-00 Branch nozzle (on request)</i>			
MPP(n)-100-00-10-03	Pipe 65x3.2	Pipe 65x3.2	GOST 3262-75
<i>MPP(n)-100-03-10-00 Segment nozzle (on request)</i>			
MPP(n)-100-03-10-01	Nozzle	Pipe 25x1,5	GOST 8734-75
MPP(n)-100-03-10-02	Nozzle wall	Sheet	<u>B-PN-2 GOST 19904-90</u> St.3 GOST 16523-89
MPP(n)-100-03-10-03	Agent Inlet Pipeline	Pipe 76x2,5	GOST 8734-75
MPP(n)-100-03-10-04	Nozzle body	Sheet	<u>B-PN-2 GOST 19904-90</u> St.3 GOST 16523-89
MPP(n)-100-03-10-04-01	Nozzle body base	Sheet	<u>B-PN-2 GOST 19904-90</u> St.3 GOST 16523-89
MPP(n)-100-03-10-04-02	Nozzle body cover	Sheet	<u>B-PN-2 GOST 19904-90</u> St.3 GOST 16523-89
MPP(n)-100-03-10-05	Turned nozzle	Circle	<u>30-V GOST 2590-88</u> St.3 GOST 535-88

Рис П4.1 Монтаж модуля с верхним выходом и удлинительным трубопроводом подачи ГПОВ.

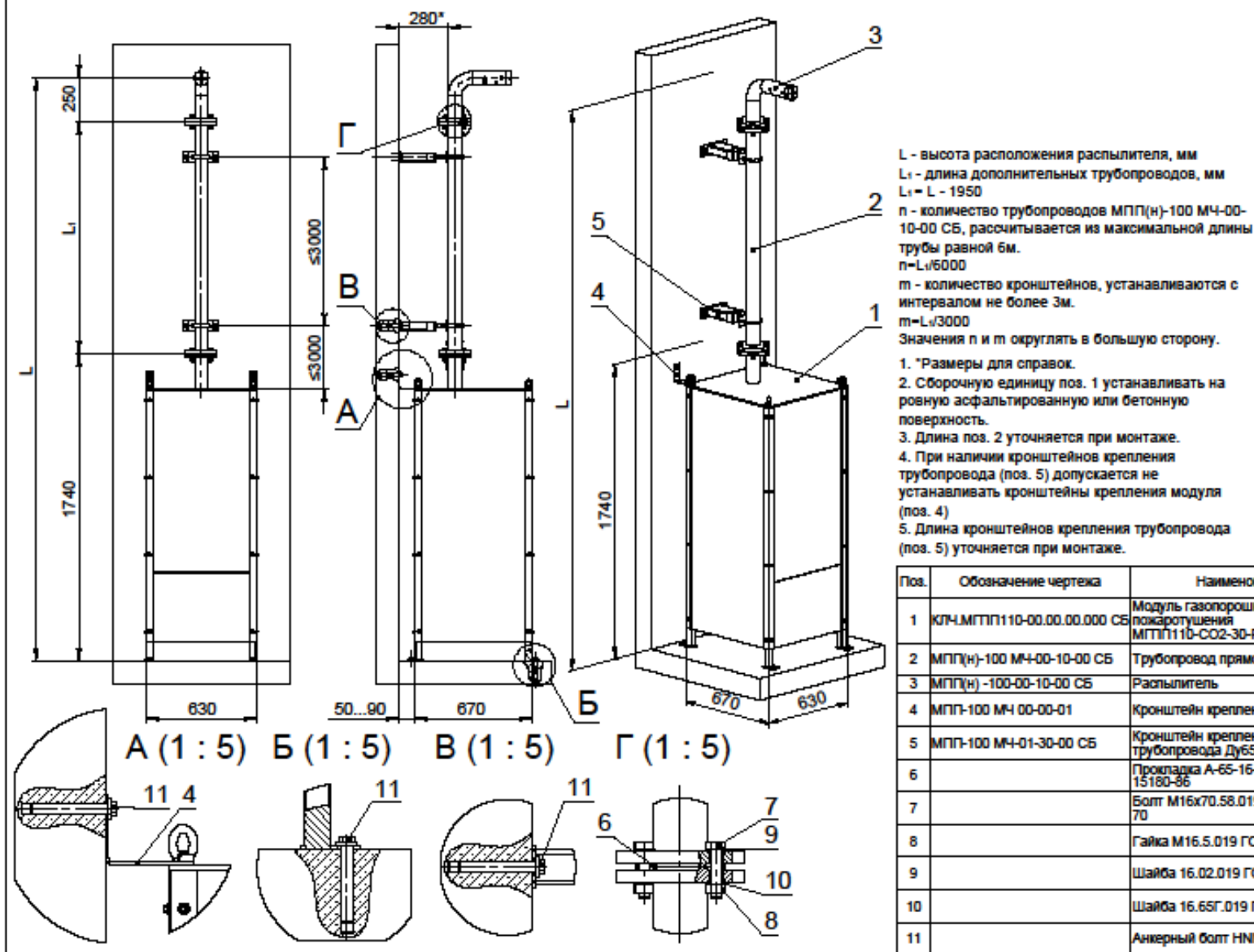
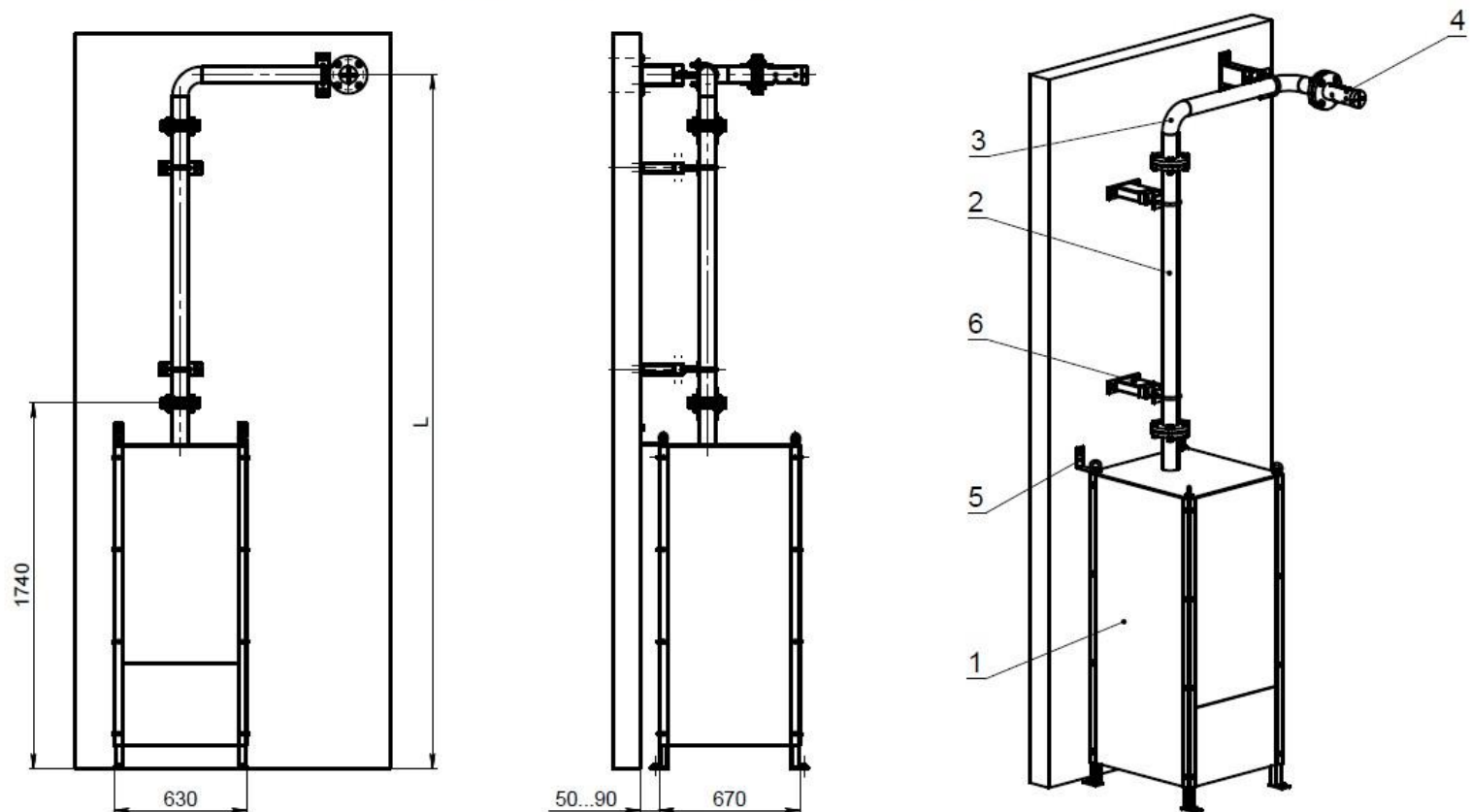
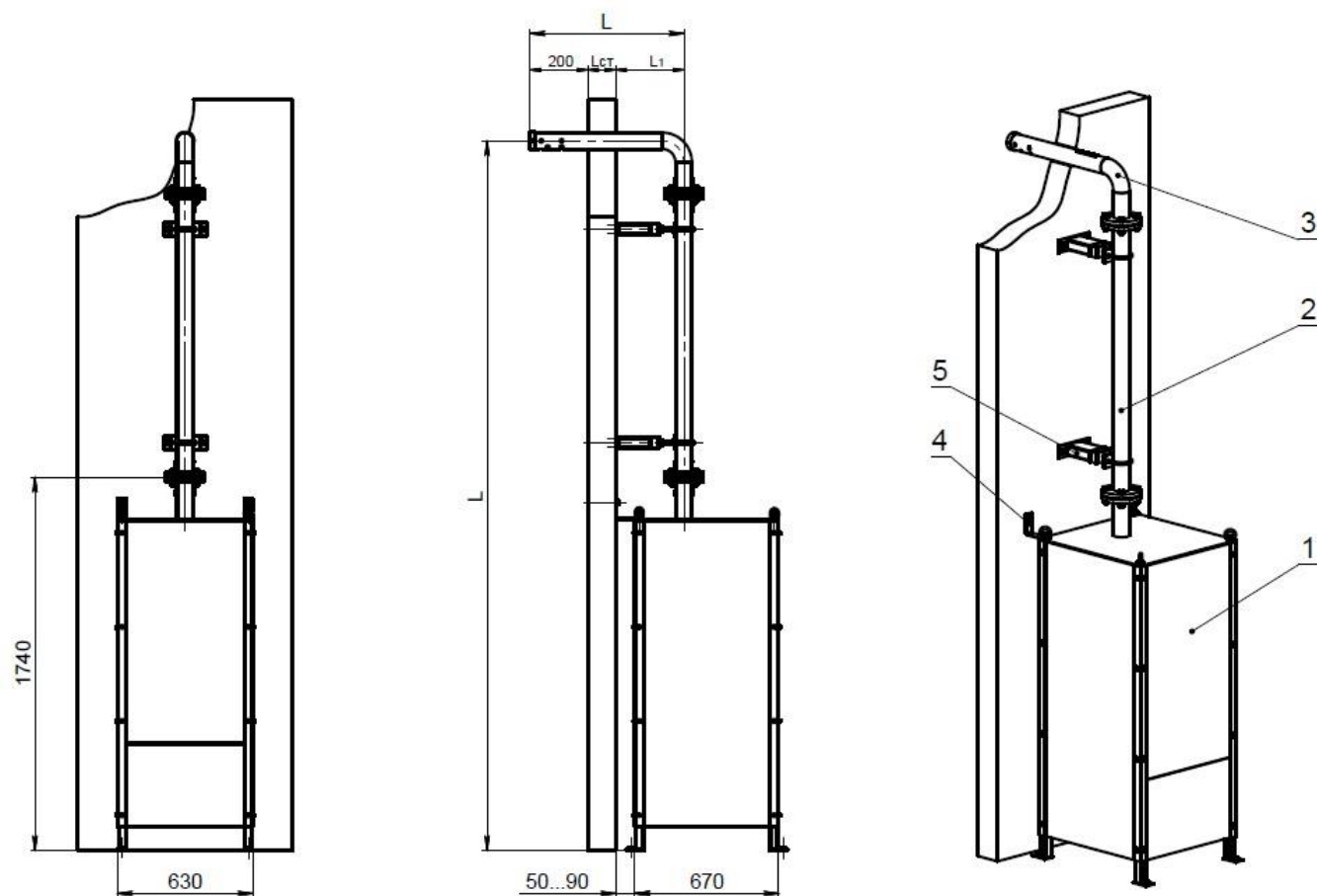


Рис П4.2 Монтаж модуля с верхним выходом и горизонтальным удлинением трубопроводом подачи ГПОВ.



Поз.	Обозначение	Наименование	Кол.
1	КЛЧ.МГПП110-00.00.00.000 СБ	Модуль газопорошкового пожаротушения МГПП110-СО2-30-РХ-АВСЕ-У2 ВВ	1
2	МПП(н)-100 МЧ-00-10-00 СБ	Трубопровод прямой	1
3	КЛЧ.ОТВ 90x65-01.01.000 СБ	Отвод 90 с фланцем	1
4	МПП(н)-100-01-10-00 СБ	Распылитель прямой	1
5	МПП-100 МЧ 00-00-01	Кронштейн крепления модуля	2
6	МПП-100 МЧ-01-30-00 СБ	Кронштейн крепления трубопровода Ду65	3

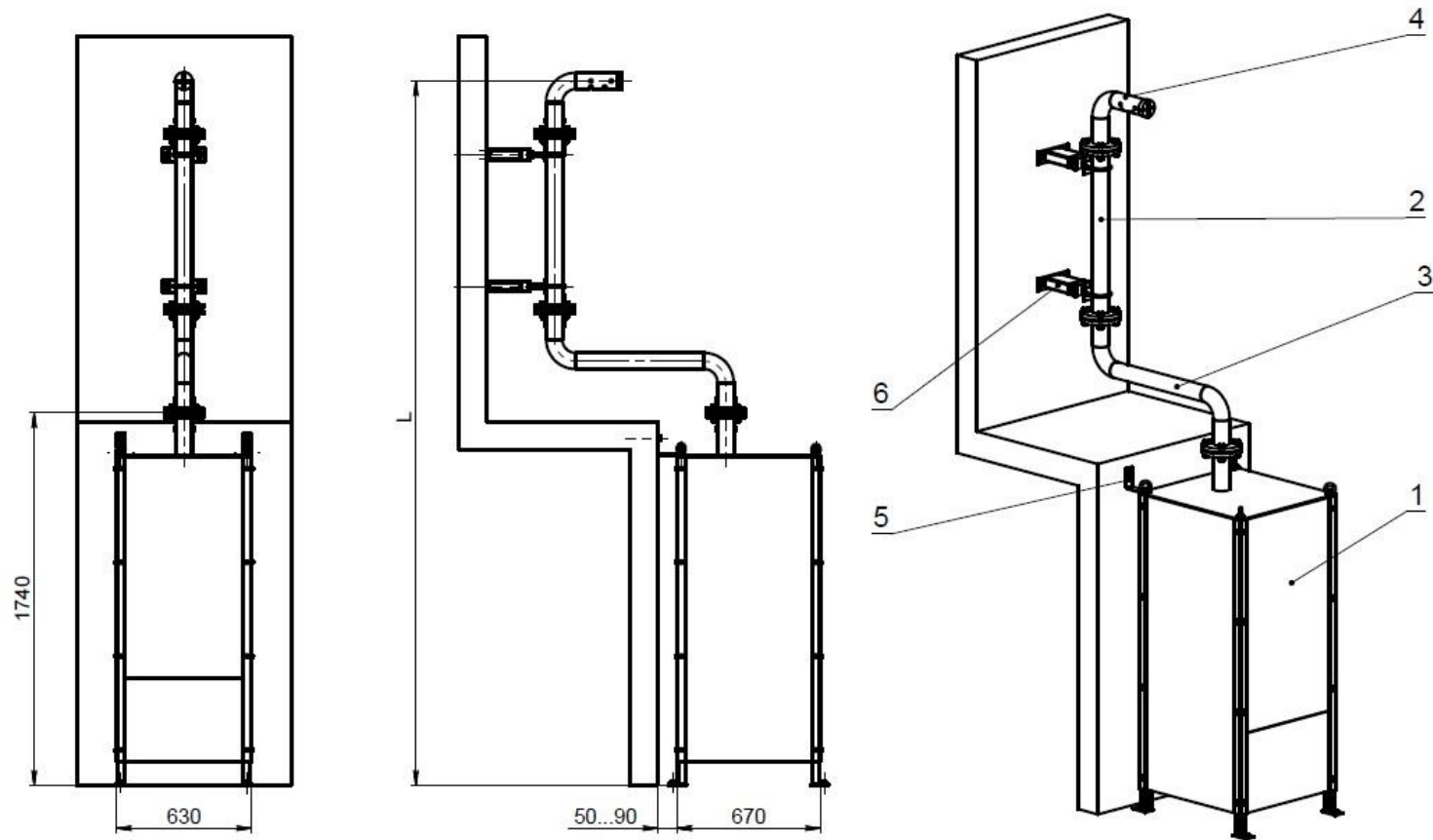
Рис П4.3 Монтаж модуля с верхним выходом и выходом распылителя через стену.



Длина распылителя $L=200+L_{ст}+L_1$
 $L_{ст}$ - толщина стенки, мм
 L_1 - расстояние от стенки до центра
 трубопровода модуля, мм

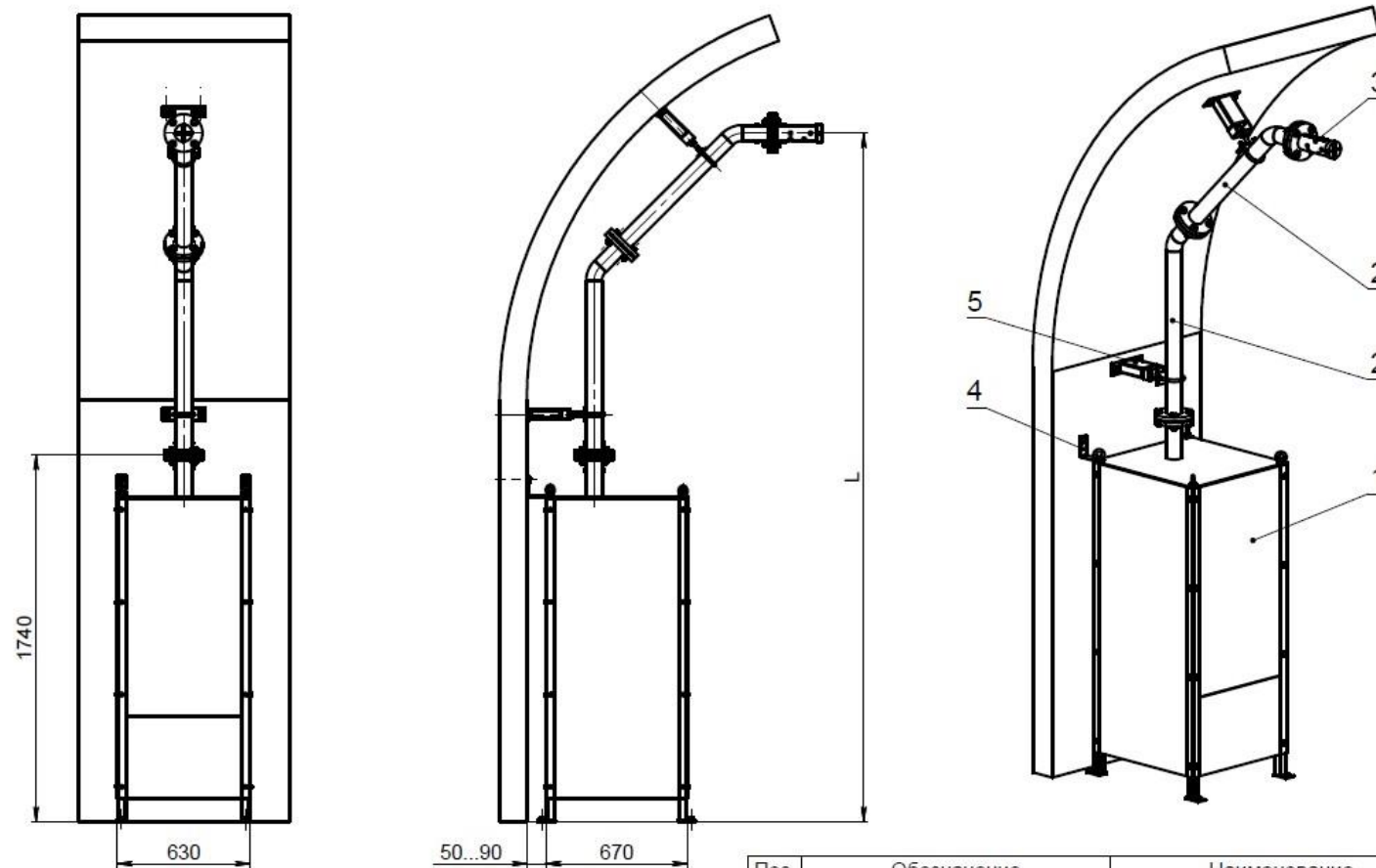
Поз.	Обозначение	Наименование	Кол.
1	КЛЧ.МГПП110-00.00.00.000 СБ	Модуль газопорошкового пожаротушения МГПП110-CO2-30-PX-ABCE-У2 ВВ	1
2	МПП(н)-100 МЧ-00-10-00 СБ	Трубопровод прямой	1
3	МПП(н) -100-00-10-00 СБ	Распылитель	1
4	МПП-100 МЧ 00-00-01	Кронштейн крепления модуля	2
5	МПП-100 МЧ-01-30-00 СБ	Кронштейн крепления трубопровода Ду65	2

Рис П4.4 Монтаж модуля с верхним выходом и трубопроводами на отводах.



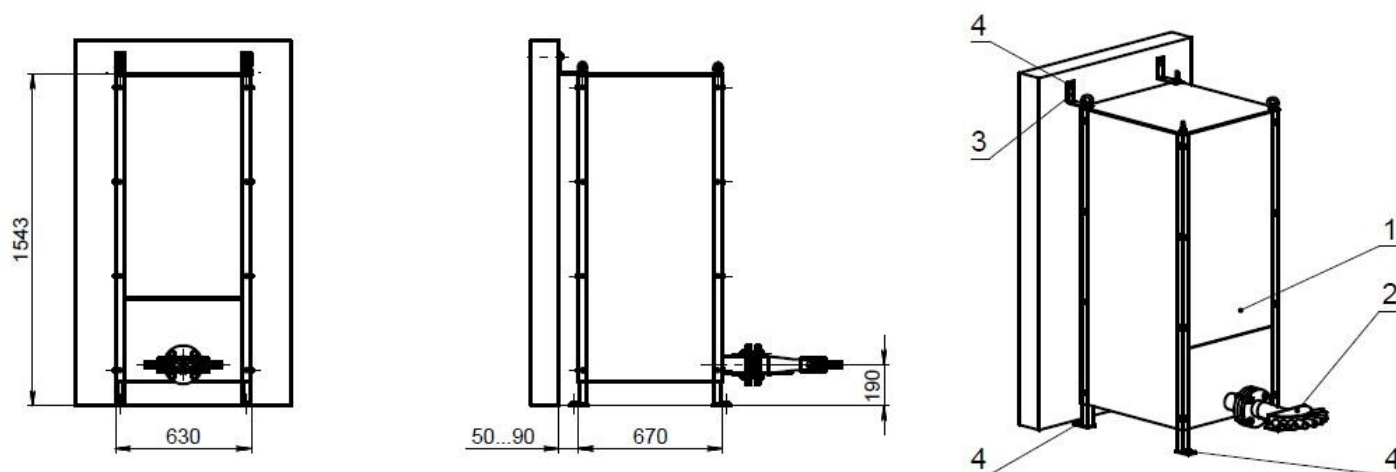
Поз.	Обозначение	Наименование	Кол.
1	КЛЧ.МГПП110-00.00.00.000 СБ	Модуль газопорошкового пожаротушения МГПП110-CO2-30-RX-ABCE-У2 ВВ	1
2	МПП(н)-100 МЧ-00-10-00	Трубопровод прямой	1
3	КЛЧ.ОТВ 90x65-01.01.000 СБ	Отвод 90 с фланцем	1
4	МПП(н) -100-00-10-00 СБ	Распылитель	1
5	МПП-100 МЧ 00-00-01	Кронштейн крепления модуля	2
6	МПП-100 МЧ-01-30-00 СБ	Кронштейн крепления трубопровода Ду65	2

Рис П4.5 Монтаж модуля с верхним выходом в ангарах.



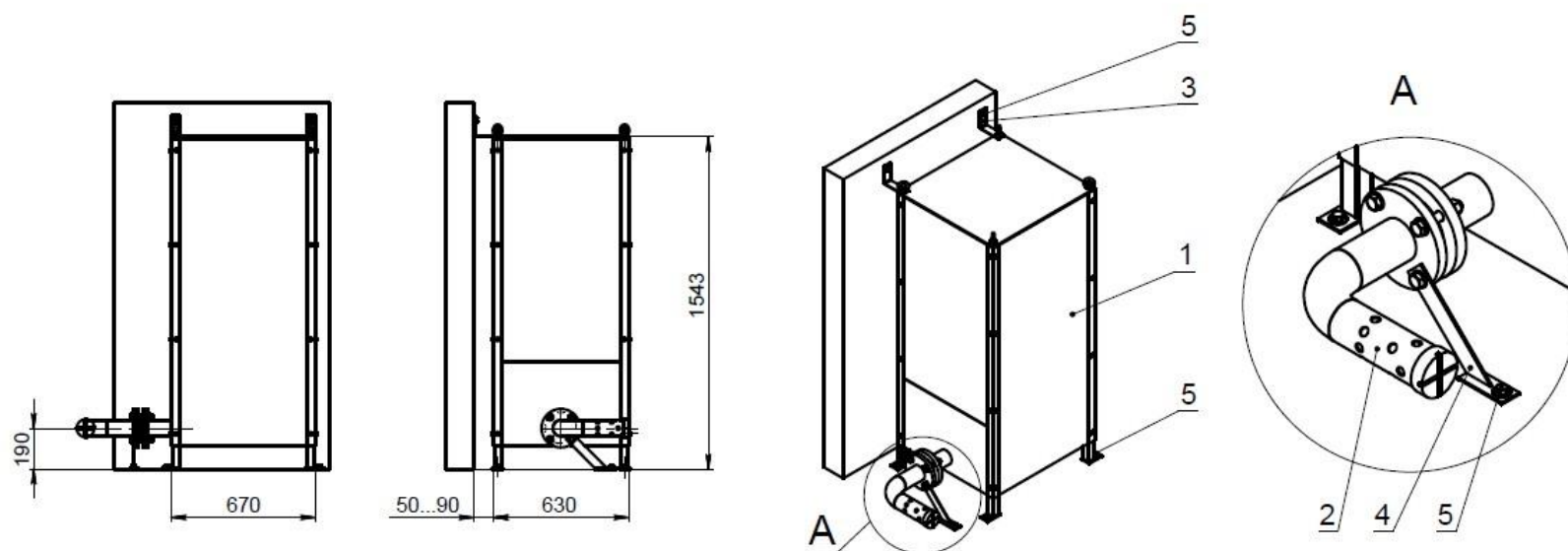
Поз.	Обозначение	Наименование	Кол.
1	КЛЧ.МГПП110-00.00.00.000 СБ	Модуль газопорошкового пожаротушения МГПП110-СО2-30-РХ-АВСЕ-У2 ВВ	1
2	Индивидуальный чертеж	Колено с фланцем 45	2
3	МПП(н)-100-01-10-00 СБ	Распылитель прямой	1
4	МПП-100 МЧ 00-00-01	Кронштейн крепления модуля	2
5	МПП-100 МЧ-01-30-00 СБ	Кронштейн крепления трубопровода Ду65	2

**Рис П4.6 Монтаж модуля с нижним выходом ГПОВ
и сегментным распылителем.**



Поз.	Обозначение	Наименование	Кол.
1	КЛЧ.МГПП110-00.00.00.000-02 СБ	Модуль газопорошкового пожаротушения МГПП110-CO2-30-PX-ABCE-У2 НВ	1
2	МПП(н)-100-03-10-00 СБ	Распылитель сегментный	1
3	МПП-100 МЧ 00-00-01	Кронштейн крепления модуля	2
4		Анкерный болт ННМ 16x147	6

**Рис П4.7 Монтаж модуля с нижним выходом ГПОВ
и распылителем на отводе.**



Поз.	Обозначение	Наименование	Кол.
1	КЛЧ.МГПП110-00.00.00.000-02 СБ	Модуль газопорошкового пожаротушения МГПП110-CO2-30-PX-ABCE-У2 НВ	1
2	МПП(н) -100-02-10-00 СБ	Распылитель на отводе	1
3	МПП-100 МЧ 00-00-01	Кронштейн крепления модуля	2
4	МПП(н)-100 МЧ-02-00-10 СБ	Кронштейн крепления распылителя на отводе	1
5		Анкерный болт ННМ 16x147	7

Figure A4.8. Installation of the module with the upper outlet when mounting in the corner.

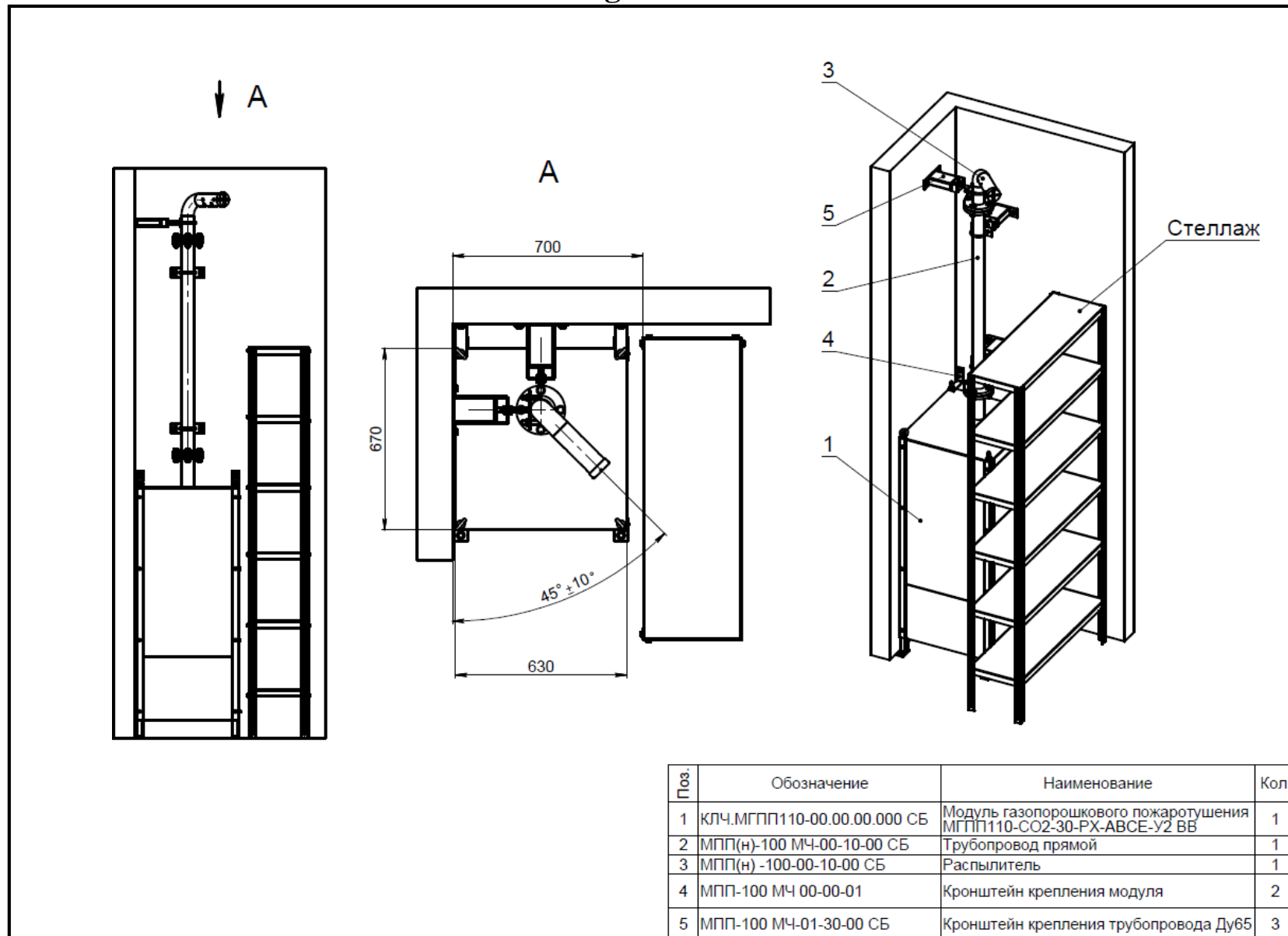
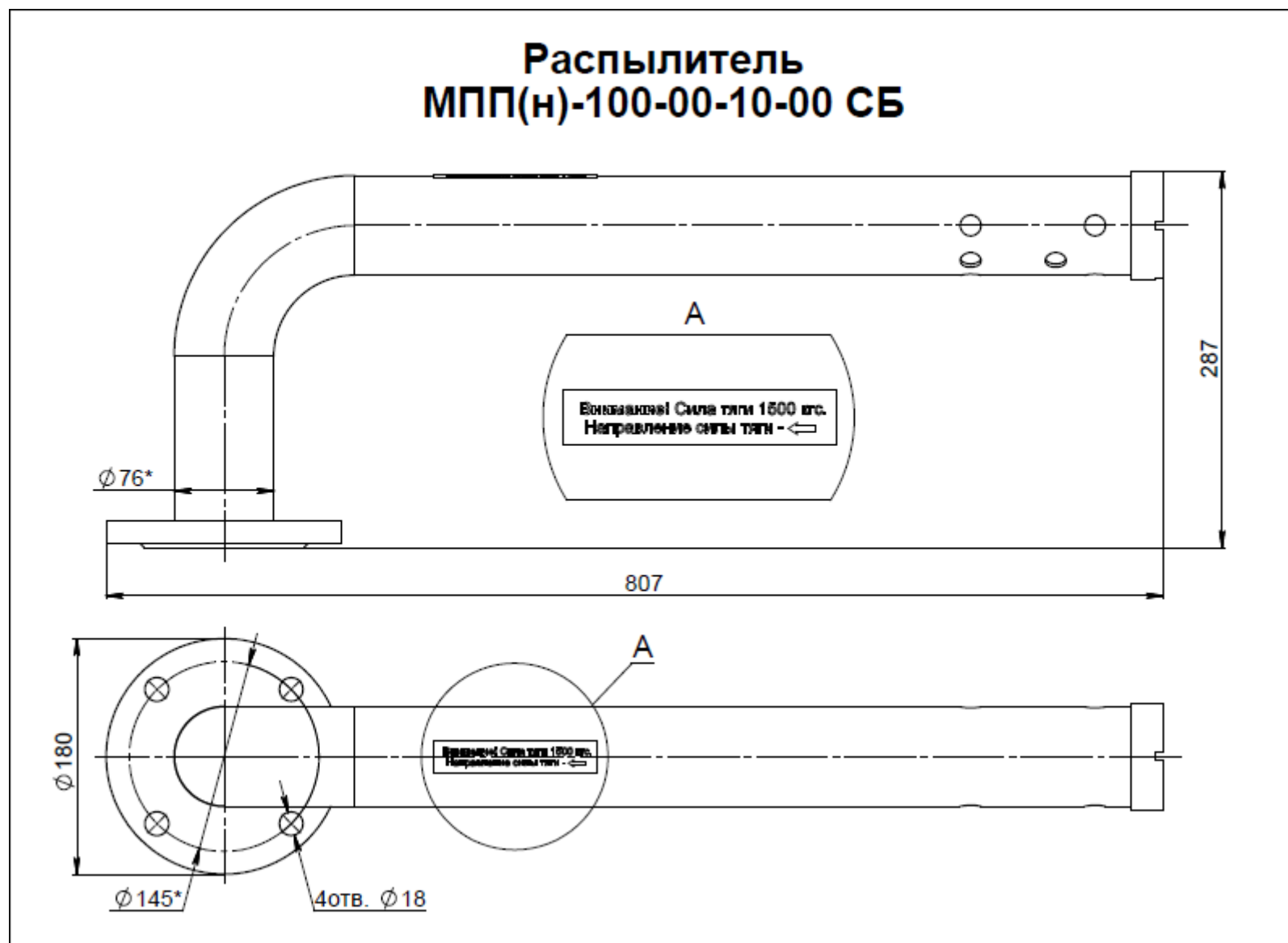
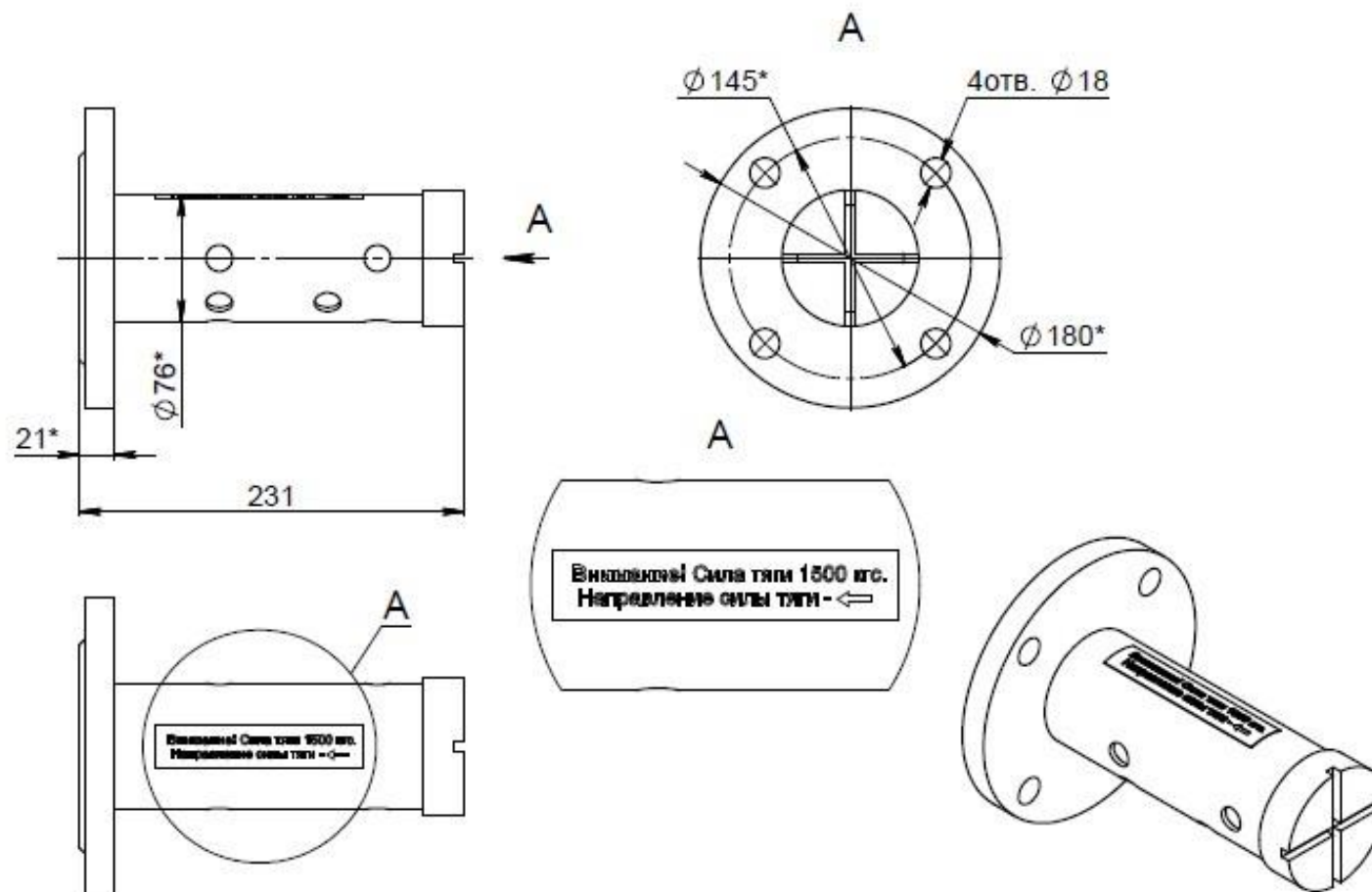


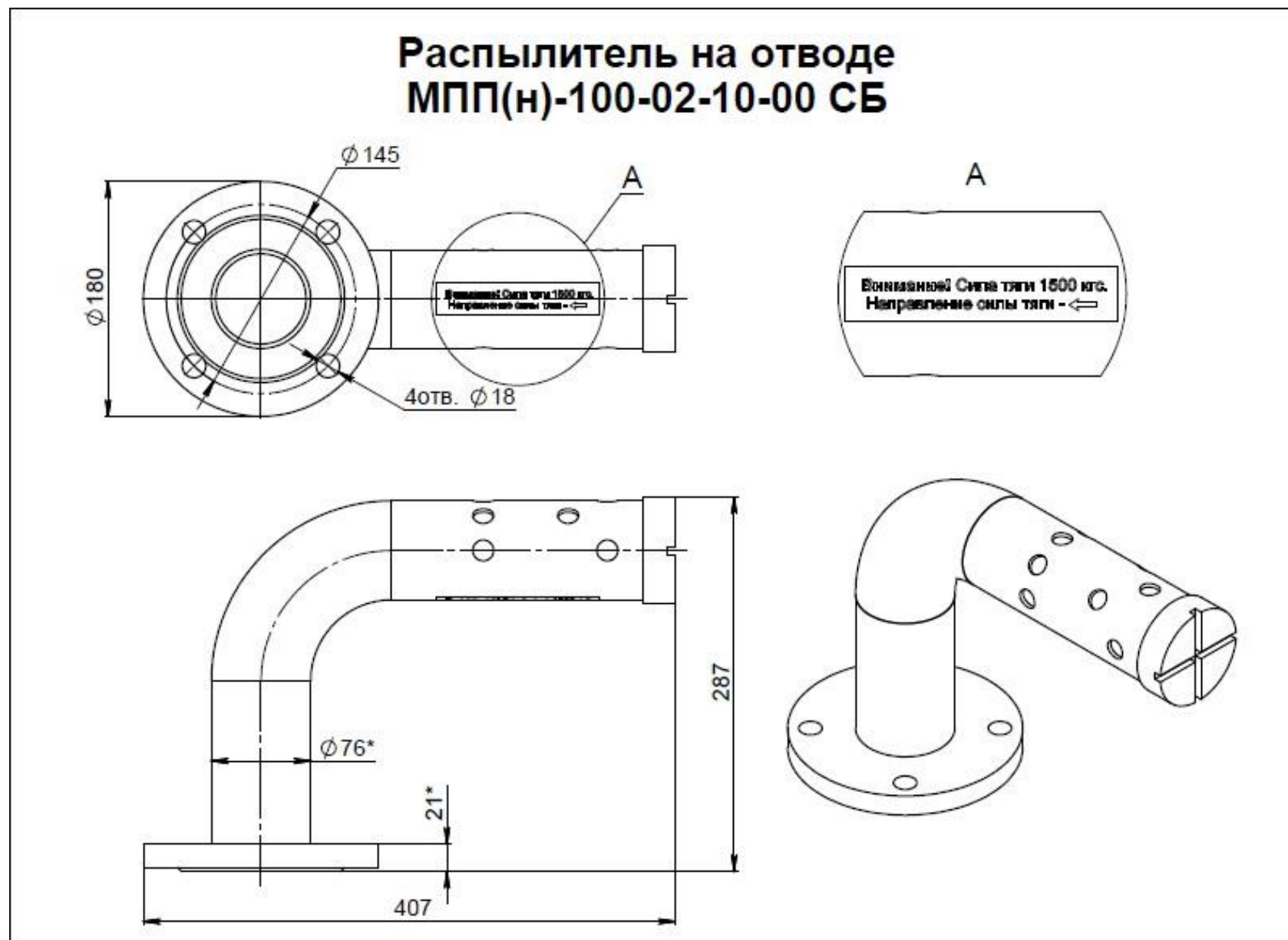
Figure A4.9 Installation of a module with a lower output for a centralized automatic gas-powder fire extinguishing system.



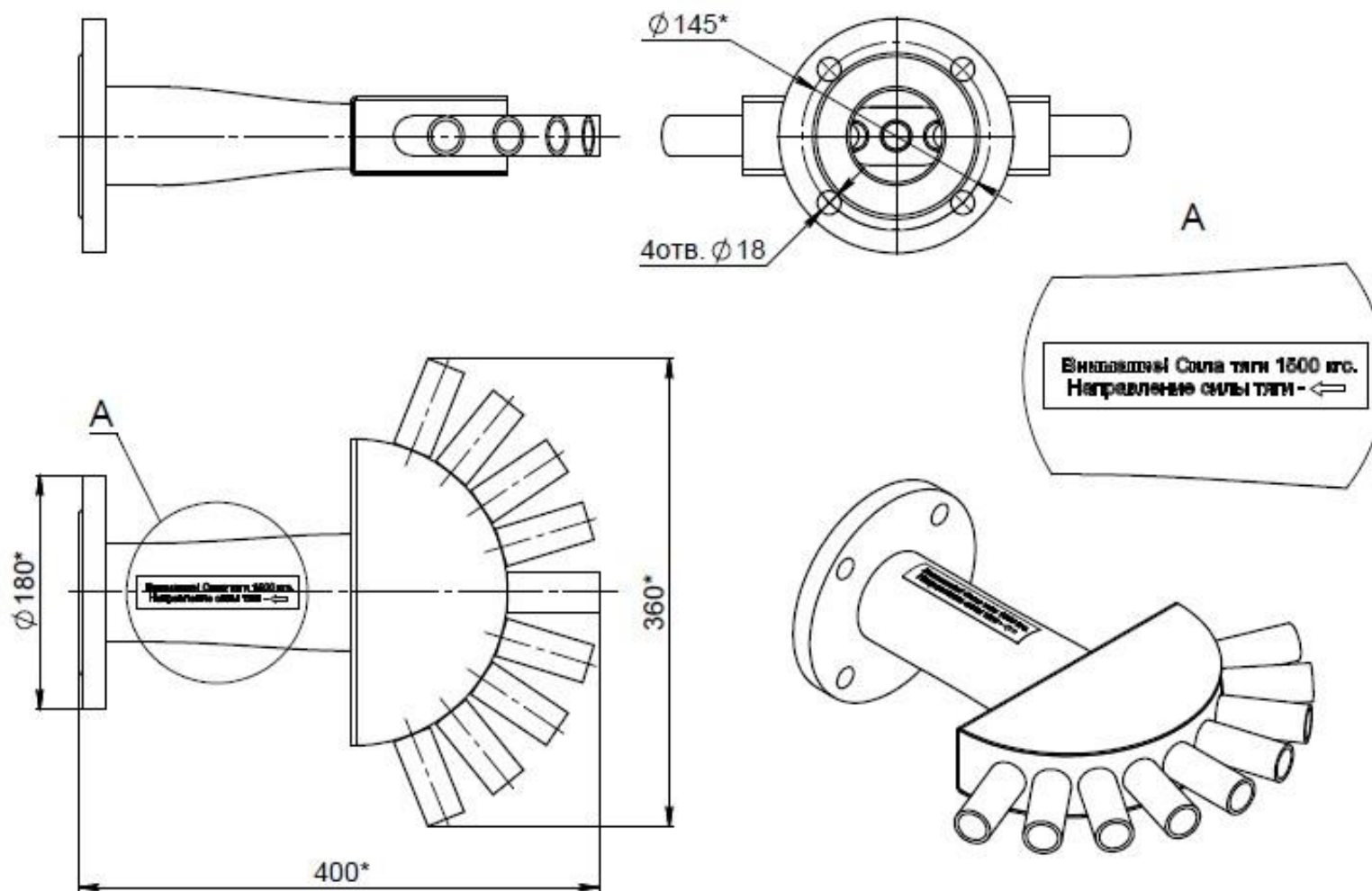


Распылитель прямой МПП(н)-100-01-10-00 СБ

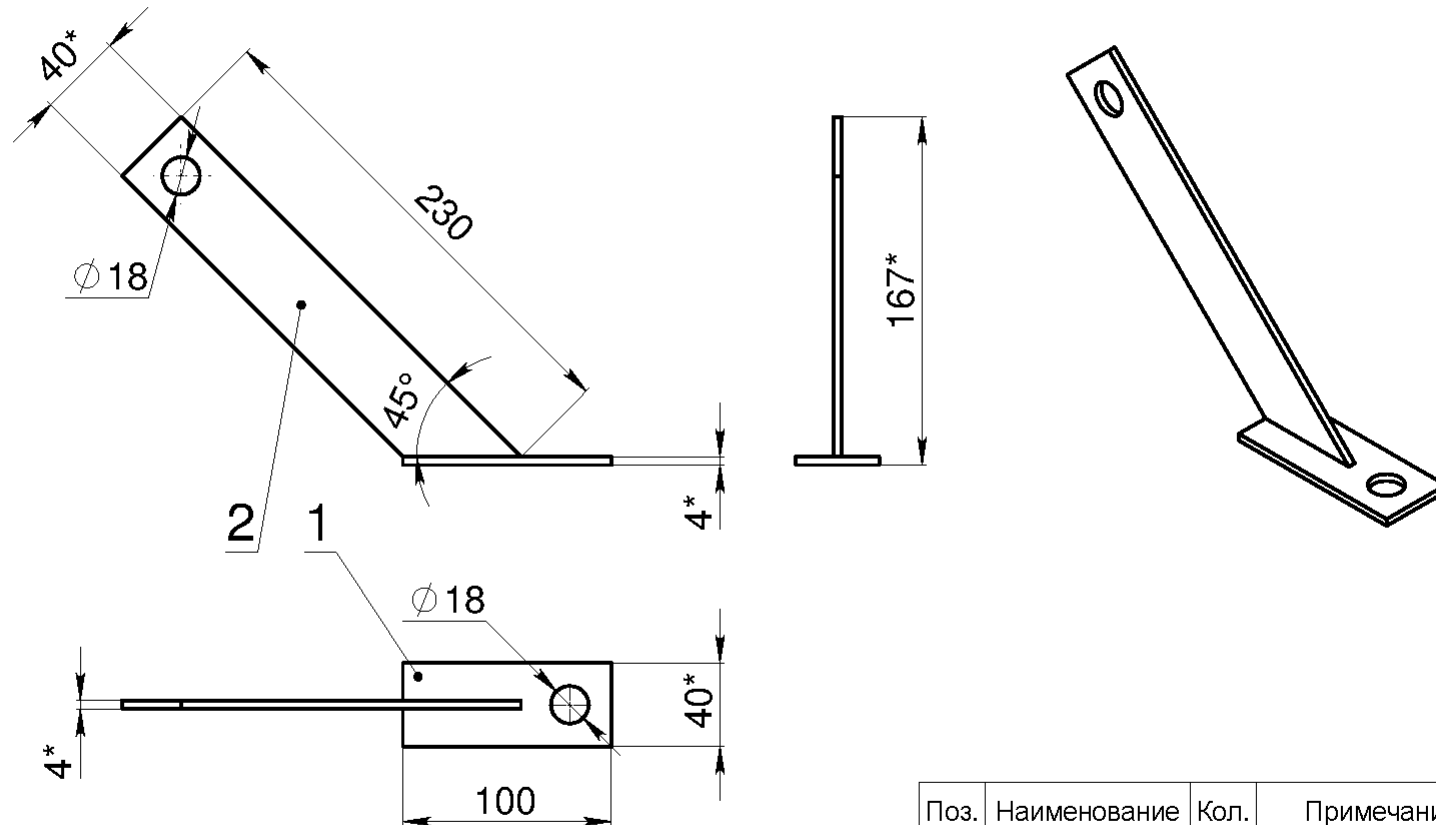




Распылитель сегментный МПП(н)-100-03-10-00 СБ

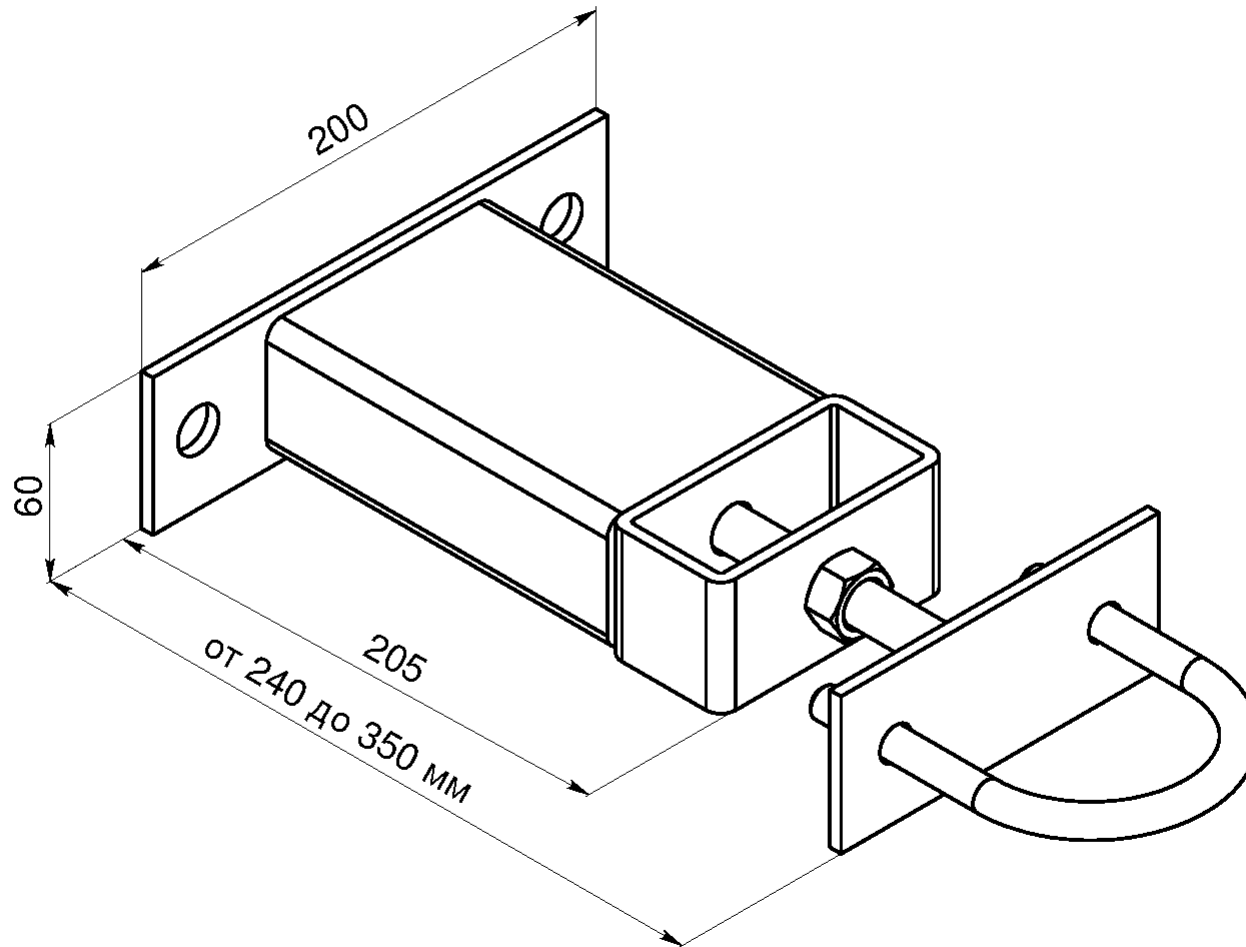


Кронштейн крепления распылителя МПП(н)-100 МЧ.02.00.10

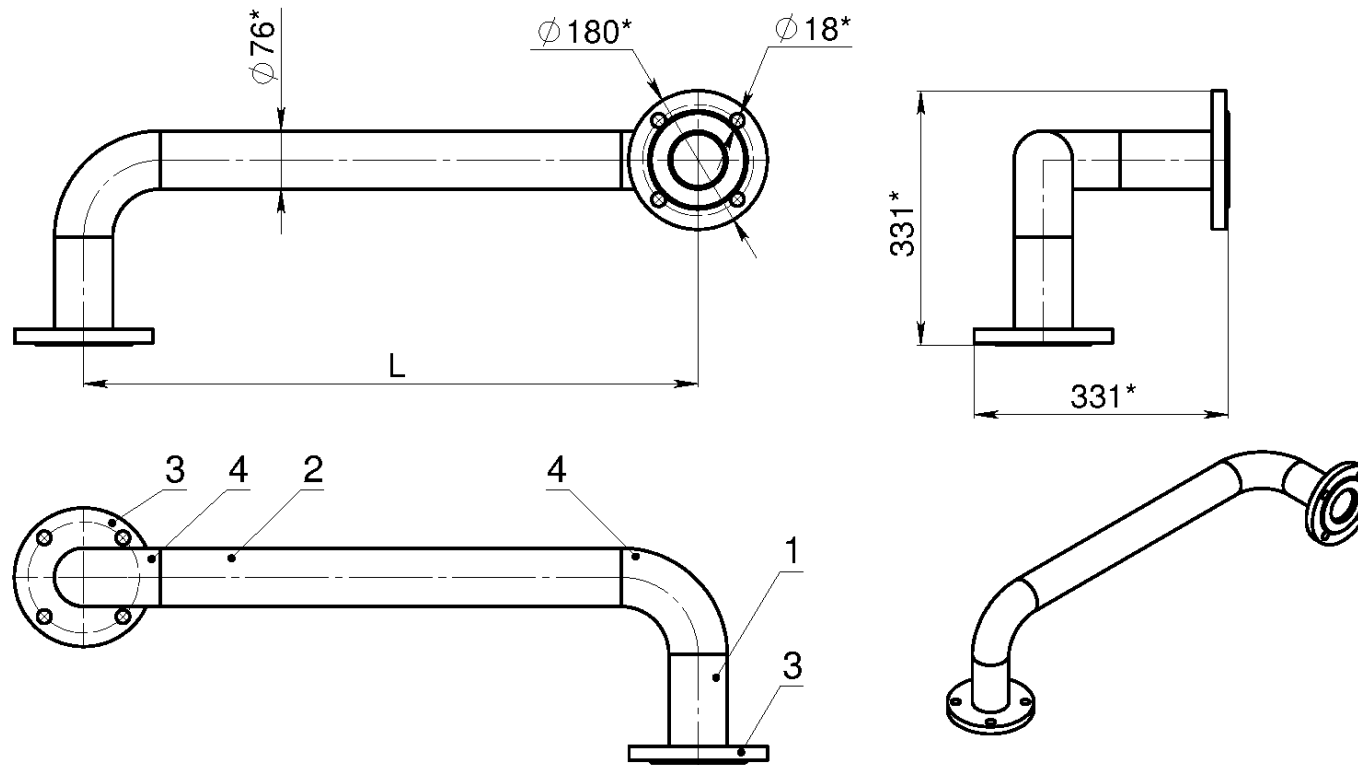


Поз.	Наименование	Кол.	Примечание
1	Опора	1	Полоса 4x40-В L=100 ГОСТ 103-76
2	Растяжка	1	Полоса 4x40-В L=230 ГОСТ 103-76

**Кронштейн крепления трубопровода Ду65
МПП-100 МЧ-01-30-00 СБ**



Отвод 90x65 с поворотом



Поз.	Наименование	Кол.
1	Труба 65 ГОСТ 8734-75	2
2	Труба 65 ГОСТ 8734-75	1
3	Фланец 1-65-16 ГОСТ 12820-80	2
4	Отвод 90-76 ГОСТ 17375-2001	2

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	Revised	Replaced	New	Withdrawn					
1		6, 14	15, 19		19		КО.НИЦ 11-15		10.8.15
2		1, 2, 4 -19	20-24		24		КО.НИЦ 21-16		15.9.16
3		1, 2, 3, 5, 8, 9, 10, 11, 12, 14, 15, 18, 19, 20, 21, 22, 23, 24			24		КО.НИЦ 8-17		25.05.17
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