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# PRODUCT CATALOG



**Joint Stock Company "PTS"** is a recognized leading Russian manufacturer and supplier of **personal protective equipment**, fire-technical and rescue equipment for the fire services, rescue units, utilities and staff of industrial enterprises of departmental identity.

One of the main activities of JSC "PTS" is the development and manufacture of breathing apparatus with compressed air BACA. Since the beginning of the first edition in 1999, the breathing apparatus of "PTS" brand, working in a variety of climates, from Kaliningrad to Chukotka, have proven their reliability and user-friendliness, ease of operation and maintenance. Technical experts of JSC "PTS" perform continuous improvement of breathing apparatus with a view to their compliance with the modern requirements of customers and applicable safety standards, which is confirmed by the certificates obtained.

Recent developments in this area – is a breathing apparatus **PTS "Profi" -MT**, equipped with a system designed for the use with "Mayak spasatelya" complex, providing the search and discovery of the personnel of the fire and rescue units, got in difficult circumstances, lost the opportunity of further independent movement. As well as a full face mask **PTS "Browse" -M** with the case of elastic rubber that provides a comfortable fit and secure seal over any contour of the face and head shape.

The new direction of JSC "PTS" in the field of personal respiratory protection and human vision – is a breathing apparatus with the compressed oxygen BACA with the closed cycle of breath, providing the protection for at least 4 hours. Using domestic experience and advanced developments of its own design database, JSC "PTS" prepared for serial production the isolating breathing apparatus with compressed oxygen and excessive gas mixture pressure in the respiratory system of **PTS "OXY-Ogneborets"** - for firemen and **PTS "OXY-gornospas"** - for work in the underground conditions.

For maintenance of breathing apparatus and their facial parts JSC "PTS" makes testing equipment:

- **System "SKAD"** with inflatable head form and a set of adapters allows you to inspect all types of breathing apparatus with compressed air and facial parts, both domestic and foreign production;

- **System "Expert-7000"** is intended for long-term tests of RPE with compressed air with the registration of stationary and dynamic parameters in a graphical and protocol form;

- **PTS system "OXY-test"** – for the control of parameters of the breathing apparatus with compressed oxygen with breathing closed-loop.

For the filling of cylinders with compressed air JSC "PTS" produces a series of modern high-pressure compressors **PTS "Vector"**, with capacity from 90 to 700 l/min for the operating pressure of

30,0MPa both figuratively and fixed version.

For the hydraulic test of steel and metal-composite cylinders JSC "PTS" designed the test unit **PTS "Cyclone" -450**, allowing the simultaneous testing of 2 to 4 cylinders with a capacity from 2 to 12 liters.

One of the main conditions of the combat capability of fire departments and emergency services in firefighting, rescue and elimination of consequences of natural and man-made disasters - is the ensure of reliable personal protection of personnel from exposure of harmful environmental factors such as elevated temperatures and heat fluxes of greater intensity, flame emissions, chemical and radiological contamination.

JSC "PTS" – is the only producer in Russia, which since 2000 develops and manufactures a wide range of standard combat and special protective clothing for firefighters and rescuers. All items of protective clothing – are modern personal protective equipment, developed in accordance with applicable regulatory requirements, certified in the prescribed manner and made of modern materials and components. At the moment JSC "PTS" successfully solves the problem of complex personal protection of firefighters and rescuers, improving its own design-unified line of protective clothing.

The most structurally complex serial products of the manufactured clothing: heat set **"TK-800-40-T"**, thermal aggressive resistant suits **"TASK"**, **"TASK-V"**, **"TASK-T"**, **"TASK-M"**, **"TASK-MT"** and radiation-protective clothing sets **"RZK"**, **"RZK-T"**, **"RZK-M"**, **"RZK-MT"**.

Modern emergencies require firefighters and rescue workers not only to be equipped with a special protective and appropriate equipment, as well as to be specially trained. This can only be achieved through continuous training process, specified by the training program for the personnel of the State Fire Service of Emergency Situations of Russia. Taking into account the above, JSC "PTS" developed and commercially produces a number of training facilities and landfills, in mobile and stationary versions.

According to "Concept of improvement of gas and smoke proof service in the State Fire Service of Emergency Situations of Russia", approved by order of the Minister of the Russian Emergency Situations of Russia №624 dated December 31, 2002, of JSC "PTS" together with the Department of PSIGP of Academy of SFS of MES of Russia developed and made commercially available since 2003 the mobile training complex – **Heat and smoke camera PTS "GROT"**, designed for practical training to prepare firefighters and rescue workers to work in unbreathable environment.

During the years of operation Heat and smoke camera PTS





"GROT" received numerous positive responses of specialists and has been awarded for the best technical solution. In the design of the complex there were used several innovative ideas that were not previously been used in other manufacturers of these systems. This particularly applies to the management and control system, which is patented in Russia. Based on the development of mobile complex PTS "GROT" there was designed and implemented a variety of stationary training complexes on specific needs and requirements of customers.

Since 2006, JSC "PTS" offers fire training ranges of **PTS "LAVA"** which still have no analogues in Russia and are as good as the technical equipment of foreign developments. Fire range PTS "LAVA" allows firefighters and rescuers in full to feel real fire conditions, work out methods and various ways of its extinguishing, to form a psychological readiness to act in a variety of emergency situations.

In 2010, under the order of the Ministry of Emergency Situations of Russia, JSC "PTS" designed and built the first Russian automated training fire complex **"Firing House"** ("Ognevoy Dom"). This complex is built on the basis of 20-foot containers, equipped with modern training modules (simulators) and the latest intelligent systems of management and security, and allows the multiple practical training of personnel, simulating various emergency situations close to real conditions.

Since 2011, JSC "PTS" has started the production and release of a stationary Fire training complex **PTS "UGOLYEK"** based on a 20-foot container, designed to conduct training of firefighters and rescuers under the impact of fire hazards (smoke, high temperature, open flame, radiant heat) occurring during the combustion of the combustible load in the furnace as a solid fuel. Classes in fire training complex PTS "UGOLYEK" are the final phase of initial training and of gas and smoke rescuers conducted with gas and smoke rescuers trained in training complexes of PTS "GROT-K" and the PTS "LAVA".

A new direction in the field of professional training of firefighters and rescuers – is a production of stationary training complexes of container type PTS "GROT-K" and PTS "LAVA-K".

Level of training of JSC "PTS" specialists, its production and research base allow to perform new developments and make serial production of a wide range of products. All products are designed in accordance with applicable regulatory requirements and are certified in the prescribed manner. The quality of manufactured products is confirmed by certificate of quality management **ISO 9001:2011**. For the development and commercial production of a number of products, including the emergency isolation suits for fire fighting and emergency response when the ionizing radiation and corrosive environment

exposure, the experts of our company were awarded with the prize of the Ministry of Emergency Situations of Russia, and the products themselves are protected by patents, registered in the State Register of Utility Models of the Russian Federation.

To work on the creation of products "PTS" also involved Leading organizations specializing on the respective fields of science and technology, in particular, the FSI Fire Safety Research Institute MES of Russia, Institute of Nuclear Research, Research Institute of elastomeric materials and products, Military University of Radiation, Chemical and Biological Defense of Ministry of Defense of Russia and others.

- In our company, there is a **specialized service center**, allowing the test and repair of breathing apparatus and compressor equipment and perform all regulated test and repair works, efficiently and in a short time. All work is done by qualified personnel, which ensures the high quality of work and services.

Service Center of JSC "PTS" has the permission to carry out activities on technical examination of steel and metal-composite air cylinders with a capacity of 2 to 50 liters with a working pressure of 200 and 300 bar.

- Furthermore, JSC "PTS" company has its own **Training Center** which hosts training workshops on gas and smoke rescuers and GDZS masters training bases on the use and maintenance of breathing apparatus with compressed air and **high pressure air compressors**.

**JSC "PTS" company provides a full range of works, metal processing:**

- Laser cutting of metal
- Bending of metal and sheet steel
- Argon arc welding
- Machining
- Powder coating

**As well as laser cutting and engraving of any non-metallic materials** (fabric, plastic, plexiglass, wood, plywood, cardboard, PET, polystyrene, leather, foam, acrylic thickness up to 15 mm.)

At the end of 2013 in Lagovskoe village of Podolsky Municipal District there was completed the construction of our new Factory of special fire-technical equipment. To date, the number of employees is about 300 employees and production-storage and office space is 16000 m<sup>2</sup>.

***We hope that our products will be faithful and reliable assistants in your difficult but noble work!***







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BREATHING APPARATUS  
WITH COMPRESSED OXYGEN

BREATHING APPARATUS  
WITH COMPRESSED AIR

HOSE BREATHING  
APPARATUS AND COMPRESSED  
AIR SUPPLY SYSTEMS

FULL-FACE MASKS  
AND RESPIRATORS

SELF-RESCUE BREATHING APPARATUS  
WITH COMPRESSED AIR

TEST EQUIPMENT  
AND  
CONTROL SYSTEMS

CYLINDERS AND VALVES

# BREATHING AND RESPIRATORY EQUIPMENT







### Breathing and Respiratory Equipment PTS "OXI" - Breathing Apparatus with Compressed Oxygen

According to  
GOST R 12.4.253-2011  
requirements



PTS "OXI" are the 4-hour breathing apparatus with compressed oxygen with closed-cycle respiration under overpressure.

**FIRST RUSSIAN  
OXYGEN APPARATUS  
WITH OVERPRESSURE**

#### Technical characteristics of the PTS "OXI" apparatus:

- combined oxygen supply: continuous ( $1.7 \pm 0.1$  l/min) + pulmonary automatic;
- signalling about actuation with closed cylinder valves both when you breathe in and out;
- pulmonary ventilation providing overpressure under the mask: up to 85 l/min; the apparatus casing is made of antistatic material;
- the breathing bag volume, min. 5 l;
- casing overall dimensions: 570x380x210 mm;
- weight, max. 14 kg;
- oxygen reserve - 500 l;
- operated at an ambient temperature of minus 40 °C to plus 60 °C and relative humidity up to 95%;
- protective power time, min. 240 min.



**PTS "OXI-fire-fighter"** is a breathing apparatus with compressed oxygen with closed-cycle respiration under overpressure designed for respiratory and vision protection of fire-fighters against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment by fire-fighting in buildings, structures and production facilities of different application.

**FIRST RUSSIAN  
OXYGEN APPARATUS  
WITH OVERPRESSURE**

**PTS "OXI-mine-rescuer"** is a self-contained breathing apparatus with compressed oxygen under overpressure designed for respiratory and vision protection of mine-rescuers against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment by underground mine-rescuing and technical operations, including those under fire conditions in mines.

**Distinctive features  
of the PTS "OXI-mine-rescuer":**

- combined oxygen supply: continuous ( $1.5 \pm 0.1$  l/min) + pulmonary automatic;
- the apparatus is equipped with shut-device to stop the oxygen supply to the pressure gauge through the high pressure hose in case it loses its leak tightness;
- the signalling device is equipped with a cut-off whistle valve to stop the oxygen supply to it with a view to the breathing oxygen economy.

**According to  
GOST R 53256-2009  
requirements**



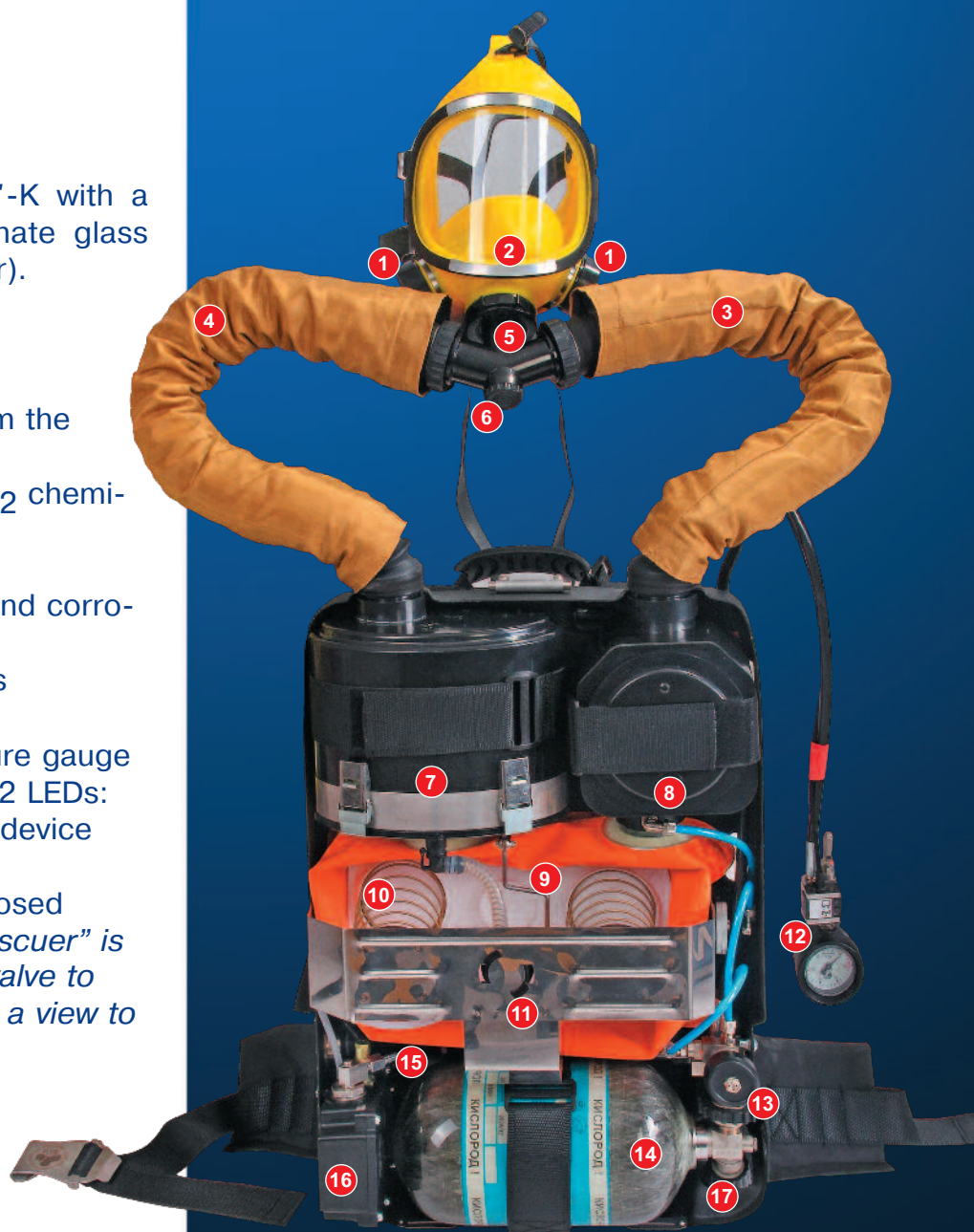


## Internal arrangement

1. Intercom
2. Full-face mask PTS "Obzor"-K with a panoramic triplex or polycarbonate glass (with or without windscreen wiper).
3. Inhale hose
4. Exhale hose
5. Valve box
6. Plug for moisture removal from the valve box
7. Regenerative cartridge for CO<sub>2</sub> chemical absorber
8. Refrigerator
9. Breathing bag made of heat and corrosion resistant fabric
10. Breathing bag backup springs
11. Excess pressure valve
12. Signalling device with pressure gauge and indicator unit equipped with 2 LEDs:  
*first one* - state of the signalling device battery charge,  
*second one* - actuation with a closed cylinder valve (The "OXI-mine-rescuer" is equipped with a cut-off whistle valve to stop the oxygen supply to it with a view to the breathing oxygen economy)



EXTERNAL VIEW.  
SUSPENSION SYSTEM



13. The monoblock includes: reduction gear with safety valve, bypass (The "OXI-mine-rescuer" is equipped with shut-device to stop the oxygen supply to the pressure gauge through the high pressure hose in case it loses its leak tightness)

14. Composite cylinder with compressed oxygen with a capacity of 2.5 l

15. Valve for moisture removal from the breathing bag

16. Signalling device announcing actuation with a closed valve

17. The apparatus casing is made of anti-static material



## URP



URP is firefighter's respiratory support package designed for oxygen (oxygen-air) therapy and manual artificial lungs ventilation at incident scene. Firefighter's respiratory support package constitutes a set of complementary parts.

Transportation bag designed in the shape of a cylinder. It is made of high quality durable material and equipped with a zipper type "lightning" with two locks, two handles and a shoulder strap for carrying. The bag is equipped with internal fastening for oxygen cylinder and pockets for placing equipment. The bag is bright blue color with two transversal light reflective signal stripes. The package bag material protects the contents of the bag from rain and eventual shocks.

2.5-liter metal composite oxygen cylinder with working pressure of 19.6 MPa (200 bar) is meant to be used in the capacity of oxygen source. Medical oxygen (GOST 5583-78) is a component of breathing gas mixture. Oxygen storage is 500 dm<sup>3</sup>. The reducer operation provides oxygen supply and flow adjustment with visual control on the flow indicator scale. The reducer is operable at oxygen pressure in the cylinder from 19.6 to 1.0 MPa and provides a smooth change of oxygen supply from 0 to 25 l/min.

Package weight: 5.5 kg. Bag dimensions: diameter – 220 mm, length – 540 mm. The service life is 5 years.



Square bag version  
(optional)





## PTS "Profi-M"

**PTS "Profi-M" Breathing Apparatus** are developed using the latest design solutions and designed for respiratory and vision protection of persons against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment by fire-fighting in buildings and production facilities of different application at an ambient tem

- ① A full-face mask PTS "OBZOR"-S with a shock-proof glass part of improved shape provides a field of view over 85% and does not create distortions.
- ② A lung-governed oxygen admission valve with threaded connection maintains uniform overpressure in the under-mask frontage space under various respiratory loads.

- ③ A cylinder valve has a strengthened design and high operational reliability. The design is provided with an indicator and safety device designed for cylinder protection from damage due to uncontrolled increase of pressure in it.

- ④ A high-capacity reduction gear does not require service adjustment and ensures improved respiratory parameters under various loads. a high-flow safety valve automatically releases the pressure in the apparatus in case of emergency situation.

A self-centering spring-loaded reduction gear clutch considerably simplifies coupling with the cylinder valve.





⑤ An original suspension system with heat- and fire-resistant belts and ergonomically shaped back-piece with due account for anatomic features of a person equipped with a chest strap, wide soft shoulder and waist pads to focus the unit's weight on the hips, significantly reduce the load on the back and ensure maximum user comfort.

It is possible to fix the lung-governed oxygen admission valve on the waist belt while waiting for the application or in transit.

⑥ A multi-purpose attachment system suitable for all types of cylinders is notable for simple and reliable fixation.

⑦ A life-saving appliance of hooded type with overpressure and constant air flow is designed in such a way that it can be put on as easily as possible irrespective of the face shape and head size.



⑧ A quick-coupling adapter used for connection of the life-saving appliance provides connection of any life-saving appliance with a unified connector.

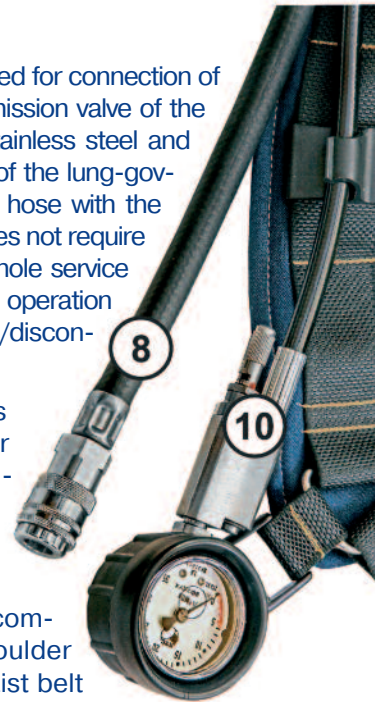
## PTS "Profi-A"



⑨ A quick-coupling adapter used for connection of the lung-governed oxygen admission valve of the main face-piece is made of stainless steel and provides a reliable connection of the lung-governed oxygen admission valve hose with the reduction gear. The adapter does not require any maintenance during the whole service life period and has an assigned operation time over 15 000 connection/disconnection cycles.

⑩ The signalling device is automatic and is notable for the original design, high quality and reliable operation. The pressure gauge has an accuracy class 1.6.

⑪ Newly designed buckles combined with an efficient shoulder straps fit technology and waist belt tension in two movements provide convenient and quick apparatus putting on and off.



**PTS "Profi-A" breathing apparatus with compressed air** ("Arctic") is designed on the basis of the apparatus PTS "Profi-M" and rated for the use at an ambient air temperature of minus 50 to +60 °C and relative air humidity up to 98%.

The distinctive features of the breathing apparatus PTS "Profi-A" ensuring operability at extremely low temperatures are:

- the hoses and adapter of the lung-governed oxygen admission valve are made of silicone and have outer covers enabling to maintain their elasticity at low temperatures;
- all sealing elements are made of frost-resistant materials;
- silicone valves and perfect ventilation system protect the full-face mask glass piece from fogging when used at a temperature of minus 50°C



## PTS "PROFI"-MT

"PROFI"-MT



A mobile receive and transmit station (MRTS)

**"PROFI"-MT breathing apparatus** is a modification of a mass produced apparatus "PROFI"-M.

**The operation of the breathing apparatus "Profi"-MT together with the "Rescuer beacon" kit** ensures the performance of the following functions:

- measurement and indication of the air pressure value in the cylinder (bar) and transmission of this information to the MRTS;
- calculation and indication of the remaining protective power time (min) and transmission of this information to the MRTS;
- automatic "Alert" signal generation in case the fire-fighter or the rescue worker does not move and transmission of this information to the MRTS;
- the "Alert" mode can be manually actuated by pressing the keys on the RB, herewith the signal is also transmitted to the MRTS;
- in the "Alert" mode, the RB generates sound and light announcement;



Rescuer beacon (RB)



- the RB generates a sound signal "All to the exit" when the corresponding signal is received from the MRTS.
- When used without the "Rescuer beacon" kit, the "Profi"-MT apparatus operates as a usual breathing apparatus of the "Profi"-M type.



## PTS "AVIA"



**PTS "Avia" breathing apparatus with compressed air** for civil aviation services is designed for personal respiratory and vision protection when performing search and rescue operations in civil aviation, as well as during fire-fighting on aviation equipment and at the air complex production facilities at a temperature of minus 40 to +60 °C.

The apparatus is a self-contained tank breathing device with compressed air in the cylinder with an operating pressure of 29.4 MPa and overpressure under the face-piece providing additional protection system when working in highly toxic environments. The apparatus does not change its technical parameters after staying in the environment with a temperature of +200 °C for 60 s and withstands an open flame with a temperature of +850 °C for 5 s.

The apparatus are available in various options differing in packaging arrangement: different number of cylinders, ability to connect the life-saving device.

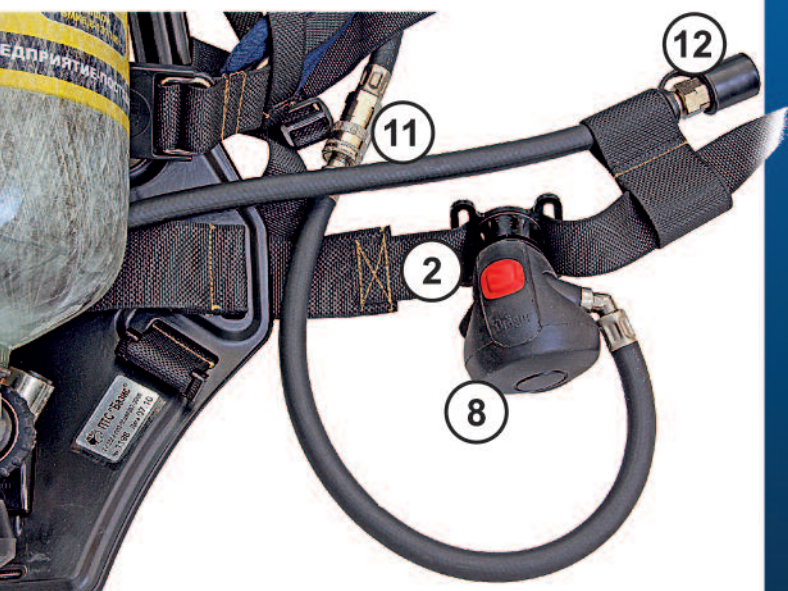
| Apparatus model | Number of cylinders, pcs. | Cylinder capacity, l | Service time, at least | Overall dimensions, mm | Weight, kg |
|-----------------|---------------------------|----------------------|------------------------|------------------------|------------|
| PTS "Avia"-140E | 1                         | 4,0                  | 35                     | 650x280x200            | 7,6        |
| PTS "Avia"-240E | 2                         |                      | 70                     | 650x290x200            | 11,0       |
| PTS "Avia"-140M | 1                         |                      | 35                     | 650x280x200            | 8,5        |
| PTS "Avia"-240E | 2                         |                      | 70                     | 650x290x200            | 12,8       |

\* - условное время защитного действия при легочной вентиляции 30 дм³/мин и температуре окружающей среды +25°C

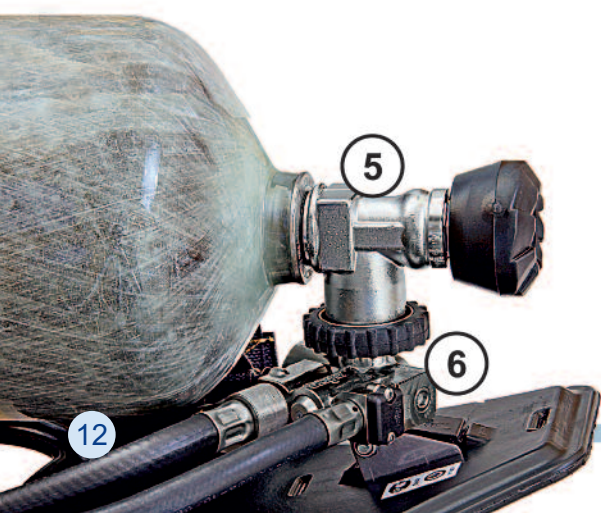


## PTS "Basis"

**PTS "Basis" breathing apparatus with compressed air** is designed for respiratory and vision protection of persons against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment by fire-fighting in buildings, structures and production facilities of different application at an ambient temperature of minus 40 to +60 °C.



The apparatus does not change its technical parameters after staying in the environment with a temperature of +200 °C for 60 s and withstands an open flame with a temperature of +850 °C for 5 s.



① An original suspension system with heat- and fire-resistant belts and ergonomically shaped back-piece with due account for anatomic features of a person equipped with a chest strap, wide soft shoulder and waist pads to focus the unit's weight on the hips, significantly reduce the load on the back and ensure maximum user comfort.

② It is possible to fix the lung-governed oxygen admission valve on the waist belt while waiting for the application or in transit.

③ A multi-purpose attachment system suitable for all types of cylinders is notable for simple and reliable fixation.

④ Newly designed buckles combined with an efficient shoulder straps fit technology and waist belt tension in two movements provide convenient and quick apparatus putting on and off.

⑤ A cylinder valve has a strengthened design and high operational reliability. The design is provided with an indicator and safety device designed for cylinder protection from damage due to uncontrolled increase of pressure in it.

⑥ A high-capacity balanced first-stage reduction gear can be used with an operating pressure of 200 or 300 bar and has a small, but solid casing. It does not require service adjustment.

⑦ The signalling device is notable for the space-saving design and high reliability. A rubber coating reliably prevents the pressure gauge and the whistle from strokes and dirt.





⑧ A light-weight lung-governed oxygen admission valve with a plug-in connection is notable for high performance and maintains uniform overpressure in the under-mask frontage space under various respiratory loads.

⑨ A full-face mask "Panorama Nova Standard" is a classic example of a full-face respirator and is ideal in terms of wearer's comfort and respiration. A dual-disk shutter ensures complete and extremely comfortable fit. A glass piece giving an excellent view does not get fogged thanks to a complex ventilation system, and a talk-back diaphragm made of stainless steel enables communication.

⑩ A life-saving appliance of hooded type with overpressure and constant air flow is designed in such a way that it can be put on as easily as possible irrespective of the face shape and head size.

⑪ A quick-coupling adapter used for connection of the lung-governed oxygen admission valve of the main face-piece is made of stainless steel and provides a reliable connection of the lung-governed oxygen admission valve hose with the reduction gear. The adapter does not require any maintenance during the whole service life period and has an assigned operation time over 15 000 connection/disconnection cycles.

⑫ A quick-coupling adapter used for connection of the life-saving appliance provides connection of any life-saving appliance with a unified connector.





## PTS "Fairwater-Mini"



**PTS "Fairwater-mini" Emergency Breathing Device** is a self-contained tank breathing apparatus with compressed air in the cylinder and overpressure under the face-piece and can be used on river and marine ships for personal respiratory and vision protection against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment when exiting the compartment with a dangerous atmosphere.

Unlike oxygen units, the apparatus can be used in machine rooms.

A conducted complex of climatic, resource and physiological tests has showed a high degree of the apparatus reliability and safety.

operation at an ambient temperature of minus 40 to +60°C and relative humidity up to 98%.

Durable heat-resistant and water-repellent suspension system is adjusted for any user's height providing a safe and comfortable fit.

A lung-governed oxygen admission valve with overpressure is actuated with the first inhale. The presence of overpressure under the face-piece provides additional protection system when working in highly toxic environments.

The apparatus is produced under the technical supervision of the Russian Maritime Register of Shipping.



## PTS "Fairwater"



**PTS "Fairwater"** is a breathing apparatus with compressed air designed for river and sea fleet and complies with the IC SOLAS-74 requirements and the International Code for Fire-fighting Systems. It is intended for respiratory and vision protection of persons against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment by rescue and fire-fighting operations at the facilities supervised by the Russian Maritime and River Register of Shipping, at an ambient temperature of minus 40 to +60 °C and is capable of staying in the environment with a temperature of +200 °C for 60 s.

The apparatus combines:

- uniform overpressure in the under-mask frontage space under various respiratory loads;
- little breathing resistance at the maximum air flow;
- convenient arrangement of control and signalling devices.

The apparatus is available in two options: with one cylinder with a capacity of 6 litres and two cylinders with a capacity of 4 litres each.

The operating pressure in the cylinder is 19.6 MPa (200 kg/cm<sup>2</sup>).

| Apparatus model      | Number of cylinders, pcs. | Cylinder capacity, l | Relative URV, minutes, min. | Overall dimensions, mm | Weight, kg, max. |
|----------------------|---------------------------|----------------------|-----------------------------|------------------------|------------------|
| PTS "Fairwater"-160E | 1                         | 6,0                  | 40                          | 660x320x230            | 12,8             |
| PTS "Fairwater"-240E | 2                         | 4,0                  | 53                          | 630x320x220            | 17,0             |



## "Extremal-PRO"



**"Extremal-PRO" Special-Purpose Self-Rescuer** is designed for personal respiratory and vision protection against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment and is used by the personnel maintaining residential buildings (hotels, camping places, motels, dormitories, boarding schools, homes for the elderly and the disabled, orphanages and other buildings except dwelling houses) and responsible for people's evacuation out of the premises in case of fire (accident).

"Extremal-PRO" Self-Rescuer can also operate as a self-contained breathing apparatus with a short protection power time (25 minutes).

The self-rescuer includes a full-face mask equipped with a talk-back device. A bright transporting bag makes the self-rescuer noticeable in low light and poor visibility. The bag cover is marked with icons containing application rules clearly explaining how to quickly put on and actuate the self-rescuer understandable even for a naive user.

The self-rescuer "Extremal-PRO" retains its protective properties at an ambient temperature of minus 40 to +60 °C, as well as under short-term exposure to a temperature of +200°C for 60 s.

"Extremal-PRO" Self-Rescuer requires minimum maintenance.

|                                                                |            |
|----------------------------------------------------------------|------------|
| Operating conditions, °C                                       | -40...+60  |
| Protection power time*, minutes, min.                          | 25         |
| Cylinder capacity, l                                           | 3          |
| Operating pressure in the cylinder, MPa (kgs/cm <sup>2</sup> ) | 29,4 (300) |
| Weight, kg, max.                                               | 5,8        |
| Service life, years                                            | 10         |



## "Extremal"



**"Extremal" Self-Contained General-Purpose Self-Rescuer** is designed for personal respiratory and vision protection against harmful impact of the unsuitable for breathing, toxic and smoke-filled gas environment and is used by the people self-dependently evacuating from the premises in case of fire (accident).

The self-rescuer includes a hood made of heat- and fire-resistant materials. A bright transporting bag makes the self-rescuer noticeable in low light and poor visibility. The bag cover is marked with icons containing application rules clearly explaining how to quickly put on and actuate the self-rescuer understandable even for a naive user.

The self-rescuer "Extremal" is the most effective for the use by the people with a neck size over 30 cm and older than 12 years.

The self-rescuer "Extremal" requires minimum maintenance.

|                                                                   |               |
|-------------------------------------------------------------------|---------------|
| Operating conditions, °C                                          | 0...+60       |
| Protection power time, minutes, min.                              | 15            |
| Cylinder capacity, l                                              | 2             |
| Operating pressure in the cylinder, MPa<br>(kgs/cm <sup>2</sup> ) | 29,4<br>(300) |
| Weight, kg, max.                                                  | 5,0           |
| Service life, years                                               | 10            |



## "Module"



**"Module" Mobile Cylinder Compressed Air Supply System** is designed for the compressed air supply necessary for person's breathing in the toxic and smoke-filled gas environment during technological, repair and rescue operations at the oil, chemical and gas complex facilities, as well as in the metal-processing industry and by the utility services in the hard-to-reach places where it is impossible to use an ordinary breathing apparatus.

The system is available in a wheeled option that includes two or four cylinders with a capacity of 6.8 l, and in a portable option ("Module"240M-H) with two cylinders with a capacity of 4 l.

Two users can be simultaneously connected to the system. The "Module" option is equipped with the control and warning devices. "Module" is used together with the hose breathing apparatus PTS "Reserve", as well as with other breathing apparatus, such as PTS "Rescuer" and PTS "Profi" equipped with a euro connector to connect the life-saving appliance. "Module" can be used for air supply required for ventilation of the protective self-contained suits. The optional equipment may include additional coil with the oil- and gasoline-resistant and antistatic hoses, extension hoses, various adapting and switching devices, etc.



| Apparatus model | Number of cylinders, pcs. | Cylinder capacity, l | Relative URV, minutes, min. | Overall dimensions, mm | Weight, kg, max. |
|-----------------|---------------------------|----------------------|-----------------------------|------------------------|------------------|
| "Module" 240E-H | 2                         | 4,0                  | 72                          | 900x500x200            | 17,0             |
| "Module" 268A-K |                           | 6,8                  | 120                         | 1450x550x600           | 60,0             |
| "Module" 268E-K |                           |                      |                             |                        | 54,0             |
| "Module" 468E-K | 4                         |                      | 240                         | 1450x550x800           | 65,0             |



## "Module-M"

**"Module" Mobile Cylinder System** is intended for storage, transportation and supply of the compressed air to ensure person's breathing in the toxic and smoke-filled gas environment and is used at an ambient temperature of minus 40 to +60 °C. Up to five users can be simultaneously connected to the system.

The "Module-M" system is equipped with:

- two 50-litre cylinders made of metal composites with an operating pressure of 29.4 MPa;
  - two reduction gears mounted on the trolley panel ensuring a reduced pressure of 0.6...0.9 MPa;
  - coil with extension antistatic hose (50 m);
  - signalling device with pressure gauge to control pressure in the cylinders;
  - distributor for connection of four users in the form of tank with an inlet connector and slots.
- The distributor capacity serves as a receiver ensuring normal breathing for simultaneously connected users;

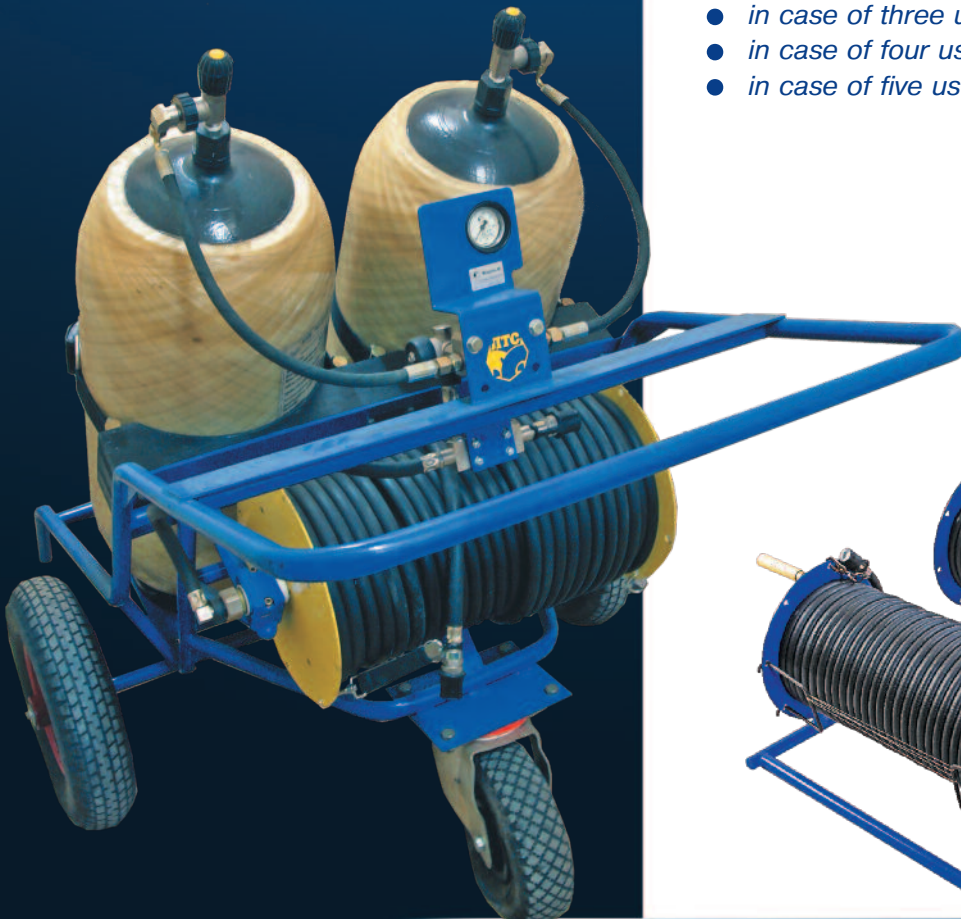
- one-shot socket mounted on the distribution collector of the trolley panel enables connection for the fifth user accompanying the trolley, in case of necessity.

The mobile system equipment is mounted on the trolley made of welded metal frame on three inflatable wheels. The trolley design enables reliable fixation of the cylinders, and the wheels arrangement ensures system stability, good flotation ability, manoeuvrability and ease of movement.

The mobile system is equipped with portable drums with hoses enabling simultaneous work of four users within 15 metres from the distributor location. The drum design enables the hose fixation at an established length and perform quick and easy automatic return to the initial position.

The protection power time in case of pulmonary ventilation of 30 dm<sup>3</sup>/min, not less than:

- in case of two users - 7.5 h
- in case of three users - 5.0 h
- in case of four users - 3.7 h
- in case of five users - 3.0 h





## PTS "Reserve"

**PTS "Reserve" Hose Breathing Apparatus** PTS "Reserve" Hose Breathing Apparatus provides the user with complete independence from the environment. The apparatus provides full respiratory and vision protection of a person working in the area with a high content of toxic gas or with a low content of oxygen (less than 17 vol.%) in the temperature range from minus 40 to + 60°C.

The apparatus can be used:

- independently as a breathing apparatus with a short protection power time;
- together with the mobile compressed air supply system "Module".

Durable heat-resistant and water-repellent suspension system is adjusted for any user's height providing a safe and comfortable fit. A lung-governed oxygen admission valve is actuated with the first inhale. The presence of overpressure under the face-piece provides additional protection system when working in highly toxic environments.

| Apparatus model  | Cylinder capacity, l | Relative URV, minutes, min. | Overall dimensions, mm | Weight, kg, max. |
|------------------|----------------------|-----------------------------|------------------------|------------------|
| PTS "Reserve"-20 | 2,0                  | 18                          | 780x410x200            | 5,0              |
| PTS "Reserve"-30 | 3,0                  | 27                          | 780x620x200            | 5,5              |





# PTS "RESCUER" (SPASATEL) – FIREFIGHTERS (RESCUERS) RESCUE SYSTEM



**PTS "Rescuer"** is a rescue system designed to assist firefighters (rescuers) in emergency when there is no opportunity to self-rescue.

The firefighter (rescuer), which is blocked and lost bearing or which is suffering disaster in an unusable for breathing environment, is in a great danger, and, as a rule, he cannot cope with such a situation without outside help. In such an emergency, if the firefighter shares his apparatus with a friend, the consumption increases twice that endangers both firefighters (rescuers) and leaves in doubt the outcome of rescue operation.

Therefore, to save the life of the firefighter (rescuer) it is necessary to use special equipment, which has not only a large air reserve, but is also equipped with a tool to help the victim.

PTS "Rescuer" features

1. Cylinder with the capacity of 10 liters (4.4 kg) and working pressure of 29.4 MPa provides the protective action time for at least 45 minutes for two men in parallel engagement with lungs ventilation rate of 30 L/min.

2. High-performance reducer and hose with two connectors ensures operation of two men at the same time.

3. Hood type lifesaving appliance with excess pressure and constant air flow, special extension hose for different applications, auxiliary demand regulator with plug connector and adapter for masks with threaded connection M45 x 3.

4. Well-rounded bag, which prevents catch hooking of miscellaneous parts, made of wear-resistant and waterproof fabric with the density of 1060 g/m<sup>2</sup>, and has reflective signal stripes.

At the ends, it is equipped with a belt for dragging and a strap for carrying with durable carabines attached. It has also half-volume pockets with tools for firefighter releasing.





### **PTS "Obzor"-Mr Full-Face Mask**

The mask body made of elastic rubber provides convenient fit and comfort by prolonged wearing and at the same time ensures reliable sealing, perfectly adhering to any face contour and head shape.

A glass-piece geometry combined with a reliable mask fit provide a wide field of vision and absence of distortions. Efficient ventilation system eliminates glass-piece fogging. It is equipped with two exhale valves and a speech diaphragm to transmit audio information with the help of voice.



## "Panorama Nova" Full-Face Mask

It is a classic example of a full-face respirator and is ideal in terms of wearer's comfort and respiration.

A dual-disk shutter ensures complete and extremely comfortable fit. A glass piece giving an excellent view does not get fogged thanks to a complex ventilation system, and a talk-back diaphragm made of stainless steel enables communication.

It is produced in various modifications enabling to cover almost the whole range of requirements: the body made of rubber or silicone; the glass-piece made of polycarbonate or triplex.



## PTS "Obzor"-K Full-face mask

This mask is specially designed for the use with the breathing apparatus with compressed air with a closed breathing cycle. It has all advantages of the full-face mask PTS "Obzor"-M. A distinctive feature is that the mask body and under-mask body are made of silicone.

The mask is available in three options:

- with polycarbonate panoramic glass;
- with triplex panoramic glass;
- with polycarbonate panoramic glass and the device allowing to clear the glass from fogging ("windscreen wiper").

It is equipped with two speech diaphragms to transmit audio information with the help of voice with preservation of normal speech intelligibility.





## Breathing apparatus control system "SKAD"

**"SKAD" Breathing Apparatus Control System** is designed for testing the apparatus with compressed air of various types, as well as their face-pieces to comply with the requirements stipulated in the breathing apparatus operation manuals and in the "Instructions for the gas and smoke protection service of the State Fire Service of the Russian Ministry of Interior Affairs".

The system is designed for use in stationary conditions at checkpoints and bases of the gas and smoke protection service (GSPS), as well as part of the GSPS cars equipment.

The system allows to perform the following tests:

- air vacuum gauge pressure whereby the lung-governed oxygen admission valve is actuated;

- air overpressure values generated by the lung-governed oxygen admission valve;
- overpressure values in the under-mask space of the face-piece by the zero air flow;
- air pressure value whereby the exhale valve of the face-piece opens;
- reduced pressure values, safety valve opening pressure and reduction gear valve hermeticity values;
- hermeticity of the breathing apparatus air supply system;
- hermeticity of the face-piece by the vacuum gauge pressure;
- hermeticity of the life-saving appliance by the vacuum gauge pressure;
- air vacuum gauge pressure values whereby the lung-governed oxygen admission valve of the life-saving appliance is opened without overpressure under the face-piece.

The system is equipped with adapters and inflatable dummy head to connect all types of breathing apparatus and their face-pieces of domestic and foreign manufacture certified for the use within the Russian territory.





# Test System "Expert-700"

**"Expert-700" Test System** is designed for testing the self-contained pressure suits (suits of TASK, RZK type, etc.) used for protection of the Russian Federation Ministry of Civil Defence and Emergency Response staff during rescue operations. The system allows to check the hermeticity of:

- self-contained pressure suit;
- overpressure valves.

Air supply to fill in the pressure suit is conducted from the breathing apparatus adapted and from the high pressure cylinder, for which purpose the system is equipped with an adapter and reduction gear.

The system contains:

- pressure vacuum gauge;
- reduced pressure gauge;
- stopwatch;
- adapters set;
- pumps to check the valves hermeticity.

The system is mounted in a convenient portable case.



|                                                         |              |
|---------------------------------------------------------|--------------|
| Value of the pressure supplied to the system, MPa, max. | 1.0          |
| Pressure vacuum gauge measurements range, Pa            | -1200...2800 |
| Weight, kg                                              | 7,6          |
| Overall dimensions, mm                                  | 420x225x220  |



## PTS "OXI-TEST" Control System



Ensures the fulfilment of the following functions:

- hermeticity test of the air supply system (both in excess and vacuum) with or without mask;
- measurements of the continuous oxygen supply value;
- pressure measurement of the lung-governed oxygen admission valve actuation;
- pressure measurement of the excess pressure valve opening;
- measurement of the auxiliary oxygen supply value;
- measurement of reduced pressure and safety valve opening pressure.

## Dummy Head



**Inflatable Dummy Head** for dynamic tests of breathing apparatus and their face-pieces:

- provision of compatibility with all face-pieces of the breathing apparatus of domestic and foreign manufacture certified for the use within the Russian territory;
- the dummy inflation can be performed from the air supply system of the breathing apparatus;
- besides the pressure measuring line in the under-mask space there is the breathing line (of a large diameter) allowing to connect the artificial lung respirator to the dummy. It enables the performance of all dynamic tests of breathing apparatus and their face-pieces stipulated by GOST R 53255-2009.



## PTS "Test kit"

**PTS "Test kit"** is designed for testing the air quality fed into the breathing apparatus cylinders by the compression units or high-pressure air supply systems, and can be applied everywhere where compressed air is used for breathing (on the GSPS bases, in mines, rescue services, at the oil and gas enterprises, as well as in chemical industry and services armed with breathing apparatus for diving, etc.).

PTS "Test kit" is supplied to the subdivisions of the Russian Federation Ministry of Civil Defence and Emergency Response.

The device is available in two options:

- option 4 intended for measuring contents of the following substances in the compressed air:

- carbon monoxide (CO);
- carbon dioxide (CO<sub>2</sub>);
- oils;
- water vapor (H<sub>2</sub>O).

- option 5 (for diving services) to measure the nitrous gases content (NO<sub>x</sub>), besides the listed ones.

The check can be performed for all substances simultaneously or separately for each of the listed ones, and the procedure takes max. 5 minutes. To operate the device, one does not need to be specially trained. The device operation principle is based on the color change of the indicator layer when the test air passes through the tube. The air flow passing through the indicator tubes is regulated automatically and does not depend on the reduction gear inlet pressure which eliminates measurement errors and inaccuracies.

PTS "Test kit" is connected to the air supply systems without the use of special tools, requires no configuration, is reliable and convenient in operation and easy in maintenance. The device complete set includes: a set of indicator tubes, reduction gear with pressure gauge, collector, device to open the tubes and two adapters to connect the reduction gear to the compressed air sources at a pressure of 20 or 30 MPa, stopwatch and maintenance documentation. All components of the device are placed in a carrying case, ready to use.

Performance 4



Performance 5



|                                                   |             |
|---------------------------------------------------|-------------|
| Maximum pressure at the reduction gear inlet, MPa | 30,0        |
| Dimensions of the carrying case, mm               | 390x130x340 |
| Weight, kg, max.                                  | 4,0         |
| Service life, years, min.                         | 10          |



## Cylinder Valves VOA6 series



### VOA6GAI003 or VOA6GAI004

Operating environment: breathing air

Operating pressure: 29.4 MPa (300 kgs/cm<sup>2</sup>)

Thread for connection to the compressor: G 5/8"

Thread for connection to the cylinder: W19.2 or

M18x1.5

Valve body: high-strength brass, chrome-plated

Flywheel: heat- and fire-resistant durable material tolerant to high loads, cuts and ruptures



### VOA6GAI001 or VOA6GAI002

Operating environment: breathing air

Operating pressure: 29.4 MPa (300 kgs/cm<sup>2</sup>)

Thread for connection to the compressor: G 5/8"

Thread for connection to the cylinder: W19.2 or

M18x1.5

Valve body: high-strength brass, chrome-plated

Flywheel: heat- and fire-resistant durable material tolerant to high loads, cuts and ruptures

Indicator: enables to control the presence and the value of the compressed air in the cylinder

Safety device: protects the cylinder against damages due to pressure increase in it, e.g. when heated or improper filling.



## Metal composite cylinders

METAL COMPOSITE CYLINDERS are intended for storage and transportation of compressed air and used in breathing apparatus.

Cylinders are multilayer containers, the inner shells (liners) of which are made of stainless steel and the pressure shells are made of composite material.

Thanks to modern technology, the cylinders combine optimal weight, high reliability and safety.

Designated service life of the cylinders:

- BMK series – 15 years,
- RBMK series – 11 years.

Frequency of technical examination - 5 years.

Cylinders are certified and have the appropriate permissions for use.



| Cylinder type   | Volume, l | Operating pressure, MPa | Diameter, mm | Length, mm | Filler thread size | Weight, kg, max. |
|-----------------|-----------|-------------------------|--------------|------------|--------------------|------------------|
| RBMK 10-165-300 | 10,0      | 29,4                    | 182          | 545        | M18x1,5            | 4,6              |
| BMK 6,8-139-300 | 6,8       | 29,4                    | 154          | 520        | M18x1,5            | 3,6              |
| BK-7-300C       | 6,8       | 29,4                    | 145          | 555        | W19,2              | 5,5              |
| RBMK 4-100-300  | 4,0       | 29,4                    | 111          | 564        | M18x1,5            | 2,2              |
| BK-4-300C       | 4,0       | 29,4                    | 112          | 545        | W19,2              | 3,6              |
| RBMK 3-100-300  | 3,0       | 29,4                    | 111          | 430        | W19,2              | 1,7              |
| BK-3-300C       | 3,0       | 29,4                    | 112          | 420        | W19,2              | 2,8              |
| BMK-2,5-125-250 | 2,5       | 25,0                    | 135          | 264        | M18x1,5            | 1,2              |
| RBMK 2-100-300  | 2,0       | 29,4                    | 111          | 302        | W19,2              | 1,2              |
| BK-2-300C       | 2,0       | 29,4                    | 112          | 305        | W19,2              | 2,1              |



## Steel cylinders



### STEEL CYLINDERS

are intended for storage and transportation of compressed air and used in breathing apparatus.

Cylinders are made of seamless stainless steel tubes with a special anti-corrosive surface finish. Fully computerized production of the manufacturing plant provides high consumer characteristics of the cylinders, and strict quality control (ISO 9001 certificate) - reliability in operation.

Service life - 25 years!

The allowable number of filling cycles - 12,500.

Frequency of technical examination - 5 years.

Cylinders are certified and have the appropriate permissions for use.

| Cylinder type | Volume, l | Operating pressure, MPa | Diameter, mm | Length, mm | Filler thread size | Weight, kg, max. | Manufacture    |
|---------------|-----------|-------------------------|--------------|------------|--------------------|------------------|----------------|
| R-EXTRA-5     | 6,8       | 29,4                    | 141          | 585        | W19,2              | 8,7              | Austria        |
| LA4-0518      | 6,0       | 19,6                    | 140          | 525        | M18x1,5            | 6,9              | Czech Republic |
| LA4-0356      | 4,0       | 19,6                    | 115          | 500        | M18x1,5            | 5,0              | Czech Republic |
| LA4-0580      | 2,0       | 29,4                    | 100          | 370        | W19,2              | 3,7              | Czech Republic |

## Protective covers for cylinders



- Cylinder protective cover made of canvas
- Cylinder protective cover made of fire retardant fabric
- Cylinder protective cover made of fire retardant fabric (Nomex)
- Cylinder protective cover made of canvas with two pockets
- Cylinder protective cover made of fire retardant fabric with two pockets



# PTS "VECTOR" COMPRESSORS AND SPECIAL EQUIPMENT





## Compressors PTS "VECTOR"-105 PTS "VECTOR"-120

This is a series of compact and portable compressors which are designed to fill breathing apparatus cylinders with compressed air.

One cylinder can be filled as well.

According to GOST R 53263-2009 requirements.

Compressed air quality corresponds to EN12021.

Working pressure: 30.0 MPa.

Efficiency: 105 and 120 L/min.

### Design features:

- compressor unit of three-compression stages provides continuous operation and stable service performance;
- increased volume of the unit oil sump lengthens service life of all mechanical friction pairs;
- effective cooling system prevents compressor unit overheating due to using enhanced cooling surfaces and an effective fan;

Drive: 1-phase electrical (2.2 и 3.0 kW 220V),  
3-phase electrical (3.0 kW 380V),  
4-stroke gasoline (5.5 kW).

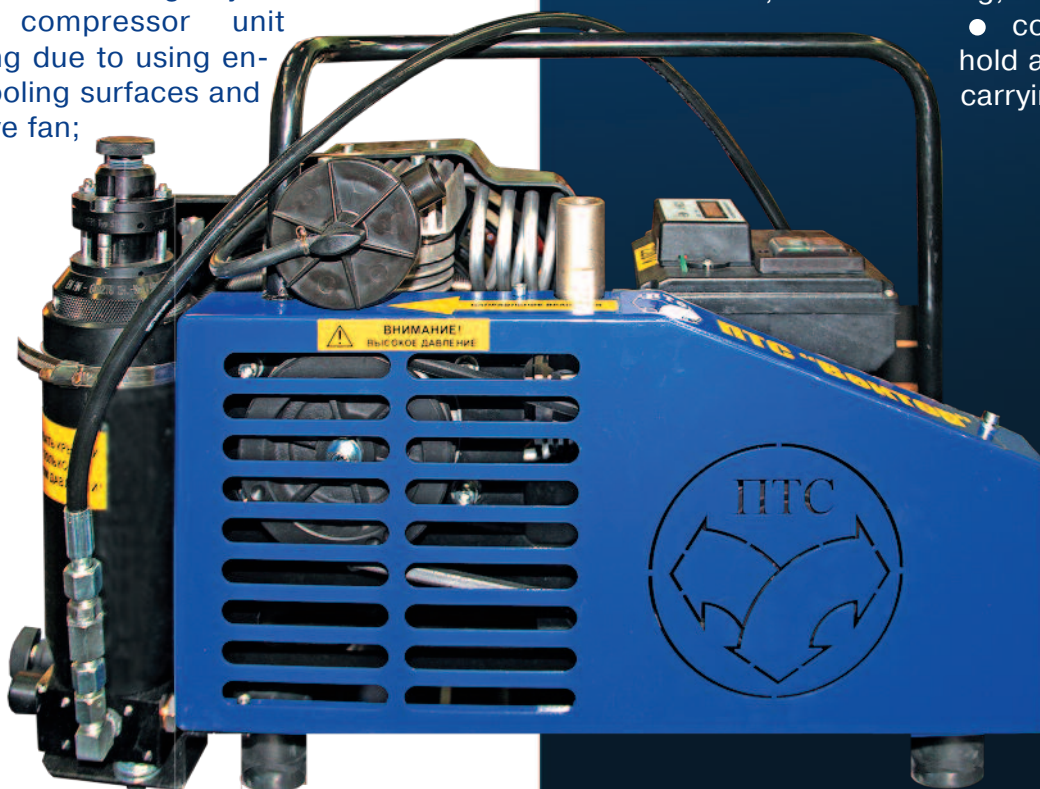
Overall dimensions (LxWxH), no more than:

- with an electric drive: 681x490x412mm
- with a gasoline drive: 800x600x400mm

|                                                       |          |
|-------------------------------------------------------|----------|
| Final pressure valve, MPa                             | 33,8 ± 2 |
| Temperature mode, °C                                  | +5...40  |
| Max. altitude above sea level, m                      | 1500     |
| Max. inclination angle, deg.                          | 5        |
| Compressor unit stage number                          | 3        |
| Filtering system                                      | PTS-21   |
| Condensate removal                                    | manual   |
| Volume of cleaned air, m <sup>3</sup> , no worse than | 108      |
| Electric protection class                             | IP 54    |
| Motor rotation number, min <sup>-1</sup>              | 3000     |
| Unit weight, kg, no more than                         | 60       |
| Service term, years                                   | 10       |

- increased resource of the filtering system
- of compressed air (up to 108 m<sup>3</sup>);
- light frame with a rigid base decreases drive vibration and provides easy access to compressor elements, when servicing;

- convenient hand-hold allows compressor carrying by one person.





## Compressors PTS "VECTOR"-210 PTS "VECTOR"-265

This is a series of compact and portable compressors which are designed to fill breathing apparatus cylinders with compressed air.

According to GOST R 53263-2009 requirements.

Compressed air quantity corresponds to EN12021.

Working pressure: 30.0 MPa.

Efficiency: 210 and 265 L/min.

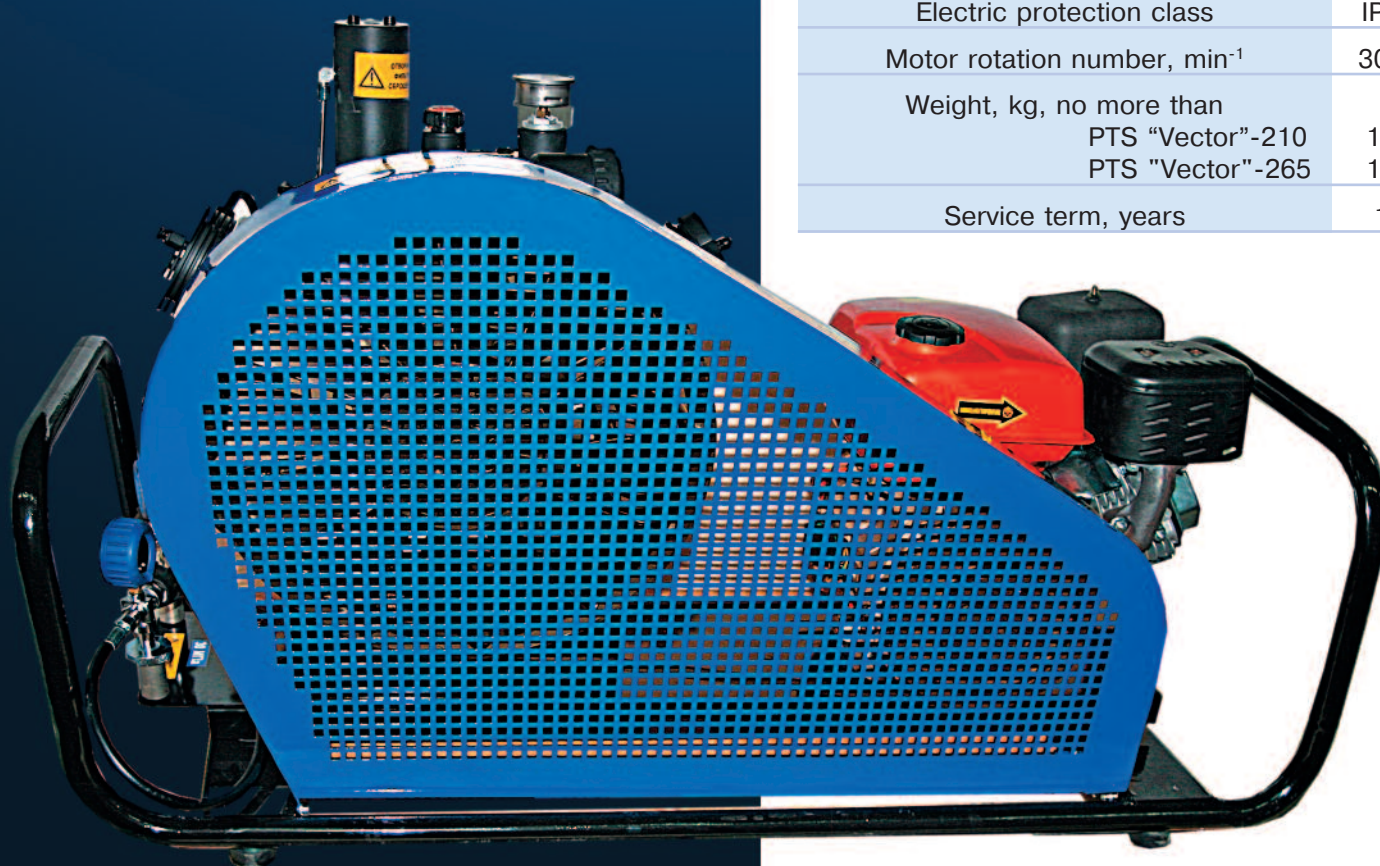
Simultaneous filling of two cylinders.

Drive: 3-phase electrical (4.0 kW),  
4-stroke gasoline (5.5 kW).

Overall dimensions (LxWxH), no more than:

- with an electric drive: 1205x500x892mm
- with a gasoline drive: 1337x500x750mm

|                                          |          |
|------------------------------------------|----------|
| Final pressure valve, MPa                | 33,8 ± 2 |
| Temperature mode, °C                     | +5...40  |
| Max. altitude above sea level, m         | 1500     |
| Max. inclination angle, deg.             | 5        |
| Compressor unit stage number             | 3        |
| Filtering system                         | PTS-31   |
| Condensate removal                       | manual   |
| Volume of cleaned air, n³, no worse than | 327      |
| Electric protection class                | IP54     |
| Motor rotation number, min <sup>-1</sup> | 3000     |
| Weight, kg, no more than                 |          |
| PTS "Vector"-210                         | 110      |
| PTS "Vector"-265                         | 130      |
| Service term, years                      | 10       |





## Compressor PTS "VECTOR"-330

This is an immovable professional compressor unit of capacity no worse than 330 L/min:

- control systems are located on the front panel:

- working pressure - 30.0 MPa
- electric motor 380V/50Hz, 7.5 kW;
- super tough frame;
- simultaneous filling of up to 4 cylinders;
- electronic system of automatic disconnection, when pressure reaches 32.0 MPa
- double system of drying and filtering air;
- condensate automatic discharge into a tank with a filter-silencer;
- light indication of a filter-cartridge condition;
- motor overheat protection system;
- work hour counter;
- oil level indicator;
- "emergency stop" button;
- compressor protection system of incorrect electric supply connection (phase control relay)

Overall dimensions - 670x900x885mm. According to GOST R 53263-2009 requirements.

Compressed air quantity corresponds to EN12021.

|                                          |          |
|------------------------------------------|----------|
| Final pressure valve, MPa                | 33,8 ± 2 |
| Temperature mode, °C                     | +5...40  |
| Max. altitude above sea level, m         | 1500     |
| Max. inclination angle, deg.             | 5        |
| Compressor unit stage number             | 3        |
| Filtering system                         | PTS-41   |
| Condensate removal                       | autom.   |
| Volume of cleaned air, n³, no worse than | 850      |
| Electric protection class                | IP54     |
| Motor rotation number, min <sup>-1</sup> | 3000     |
| Unit weight, kg, no more than            | 180      |
| Service term, years                      | 10       |

*The compressor might be equipped with filling hoses at the request.*





## Portable compressor PTS "VECTOR"-330P

High-pressure compressor unit PTS "VECTOR"-330P is portable professional compressor with a productivity rate of at least 330 l / min and working pressure of 30.0 MPa; electric motor with the power of 7.5 kW, 380V / 50Hz.

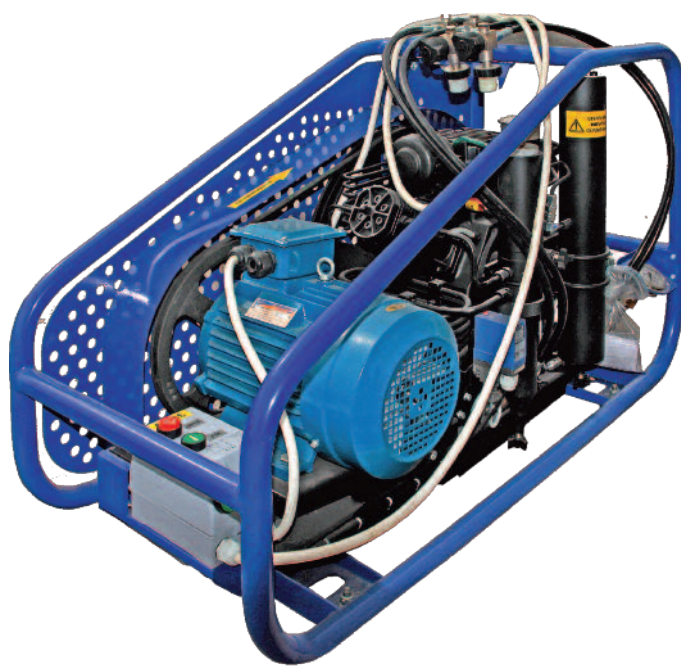
PTS "VECTOR"-330P combines three important properties:

- quality – the compressor has a large service life;
- reliability – the compressor has a heavy-duty frame for damage protection;
- usability – the compressor has easy access to elements and features mobility during transportation.

Distinctive features of the compressor unit:

- 4 cylinders simultaneous charging;
- electronic system for compressor automatic shut-down when the pressure value reached 32.5 MPa;
- possibility to preset pressure for the safety valve opening at a final pressure of 33.8 MPa;
- air drying and filtration;
- automatic belt tension;
- motor overheating protection system;
- service hour meter;
- oil level indicator;
- soft operation owing to inherent electric motor suspension;
- pressure relay shutoff button to check the safety valve triggering;
- compressor unit weight: at most 150 kg;
- dimensions: 1080 x 510 x 735 mm.

|                                                  |          |
|--------------------------------------------------|----------|
| Final pressure valve, MPa                        | 33,8 ± 2 |
| Temperature conditions, °C                       | +5...40  |
| Max. height above sea level, m                   | 1500     |
| Max. tilt angle, deg                             | 5        |
| Number of stages of the compressor unit          | 3        |
| Filtering system                                 | PTS-31   |
| Condensate removal                               | manual   |
| Clean air volume, m <sup>3</sup> , not less than | 327      |
| Electrical protection class                      | IP54     |
| Engine speed, min <sup>-1</sup>                  | 3000     |
| Weight, kg, at most:                             |          |
| PTS "Vector" -210                                | 110      |
| PTS "Vector" -265                                | 130      |
| Service life, years                              | 10       |





## Compressor PTS "VECTOR" - S-500

S Series professional stationary compressor units with the capacity of 500 dm<sup>3</sup> / min designed for operating pressure of 45 MPa. High-pressure air compressor designed for filling the breathing apparatus cylinders with compressed air up to a pressure of 45 MPa or to 30 MPa with bypass from the receiver through a reduction gear (optional receiver up to 200 liters). The compressed air quality meets the requirements of EN12021.

The compressor unit is available both in fixed and mobile version for placement on the vehicle.

The compressor unit intended for general industrial purposes for filling cylinders with compressed air or nitrogen..



Motor drive type: three-phase asynchronous (11 kW or 15 kW).

Design features:

- electronic system automatically switches off the compressor at a pressure of  $45.2 \pm 0.1$  MPa;
- all compression stages equipped with pressure and temperature sensors;
- removable control panel designed for filling cylinders in a convenient location, which is remote or isolated from the compressor (optional extension cable and tubes or high-pressure hoses of required length);
- the sound and light alarm warns the operator of a deviation from pressure norm and temperature of the compression stage, and will shut down the compressor in case of pressure deviation from the norm and oil level in the lubrication system;
- soft starter not only protects the motor from overloading and overheating at start, but also protects the entire power grid from power surges and phase imbalance;
- automatic condensate discharge;
- automatic control system of filter-cartridge state with the light indication brought to the front panel;
- drive belt tension system;
- motor thermal protection against overload;

|                                                  |               |
|--------------------------------------------------|---------------|
| Final pressure valve, MPa                        | 46,2±0,8      |
| Temperature conditions, °C                       | +5...40       |
| Max. height above sea level, m                   | 1500          |
| Max. tilt angle, deg                             | 5             |
| Number of stages of the compressor unit          | 4             |
| Condensate removal                               | automatic     |
| Clean air volume, m <sup>3</sup> , not less than | 2400          |
| Dimensions, mm                                   | 1330x1548x800 |
| Weight, kg, at most:                             | 450           |
| Service life, years                              | 10            |



## Compressors PTS "VECTOR"-600 PTS "VECTOR"-700

This is series of immovable professional compressor units of capacity 600 and 700 L/min and working pressure of 30.0 MPa.

Drive type: 3-phase asynchronous with a cage rotor (15 and 18.5 kW).

According to GOST 53263-2009 requirements.

Compressed air quantity corresponds to EN12021.

Structural details:

- 5-door noise suppressing body provides an easy access to all compressor aggregates;
- electronic system of automatic disconnection, when pressure reaches 32.0 MPa
- all compression stages are equipped with pressure/temperature sensors;
- emergency light and sound signalization warns an operator about deviations from standards of pressure, temperature of compression stages, pressure/level of oil in the lubrication system, and it will switch off compressor
- compression unit is equipped with a detachable control panel, which is designed to control the unit, refill its cylinders in a convenient place distanced from the compressor (it is necessary to additionally order an extension cable and high pressure tubes of required length);
- slow starter not only protects a motor against overloads (when starting and overheating), but also it protects the entire grid against voltage surges;

- condensate automatic discharge;
- automatic system controlling a filter-cartridge condition with light indication is arranged on the frontal panel;
- system of adjusting driving belt tension;
- overall dimensions - 1595x800x1800mm.



|                                          |          |
|------------------------------------------|----------|
| Final pressure valve, MPa                | 33,8 ± 2 |
| Temperature mode, °C                     | +5...40  |
| Compressor unit stage number             | 4        |
| Filtering system                         | PTS-81   |
| Condensate removal                       | autom.   |
| Volume of cleaned air, n³, no worse than | 1700     |
| Electric protection class                | IP54     |
| Unit weight, kg, no more than            | 470      |
| Service term, years                      | 10       |

## Oxygen Booster Pump PTS "Vector-Oxy"

This is designed to additionally pump ultra-pure oxygen from the initial pressure of 50...150 bar to the working pressure of 220 bar.

Compressed air drive. Oxygen compression is based on the principle of pneumo-multiplier. A piston of big area and low air pressure, having transmitted force to a small area piston, creates higher pressure of oxygen. Pressure ratio is determined by ratio of piston areas.

A pump construction provides its operation on oxygen compression without using lubrication.

Bodies of the pump and pneumatic equipment are made of stainless steel.

Control is done by means of 24 V solenoid valve.

Power supply is arranged from the grid of ~220 V

Light indication of the working process.

Automatic disconnection, when oxygen final pressure is reached

|                                                                                                                              |              |
|------------------------------------------------------------------------------------------------------------------------------|--------------|
| Air pressure at inlet, bar                                                                                                   | from 1 to 10 |
| Suction pressure, min, bar                                                                                                   | 2            |
| Suction pressure, max, bar                                                                                                   | 5            |
| Oxygen outlet pressure, bar                                                                                                  | 220          |
| Piston stroke frequency, min <sup>-1</sup>                                                                                   | 110          |
| Compression coefficient                                                                                                      | 1/90         |
| Overall dimensions, mm                                                                                                       | 1080x830x570 |
| Weight (no more than), kg                                                                                                    | 70           |
| Quantity of inlets to supply oxygen                                                                                          | 2            |
| Quantity of cylinders filled simultaneously                                                                                  | 4            |
| Air consumption for 1 liter of oxygen (at suction), L                                                                        | 26           |
| Time of filling one 2-liter cylinder (at pressure of supplying oxygen 150 bar and air pressure of 10 bar), no more than, min | 1,5          |
| Time of filling one 2-liter cylinder (at pressure of supplying oxygen 50 bar and air pressure of 10 bar), no more than, min  | 4,8          |





## A unit for Hydraulic Testing PTS "CYCLONE" cylinders PTS "CYCLONE"- 450

The unit is designed for simultaneous testing 2-4 steel / metal-composite cylinders of 2-12 liter volume. Cylinders of bigger sizes can be tested too, but outside the box.

The unit consists of a control panel, testing box for steel cylinders and a module of cubic dilation for metal-composite cylinders.

Water circulation mode is closed one; purification is done by inbuilt filters with visual control of contamination degree.

|                                 |      |
|---------------------------------|------|
| Normal power supply, V          | 220  |
| Auxiliary power supply, V       | 12   |
| Max. air pressure at inlet, MPa | 1,0  |
| Max. working pressure, MPa      | 45,0 |
| Max. air consumption, L/min     | 320  |
| Capacity, kW, no more than      | 0,4  |





## PTS "BREEZE" drying equipment

Designed to dry working clothes and equipment, special suits and outfits of fire fighters and rescuers.

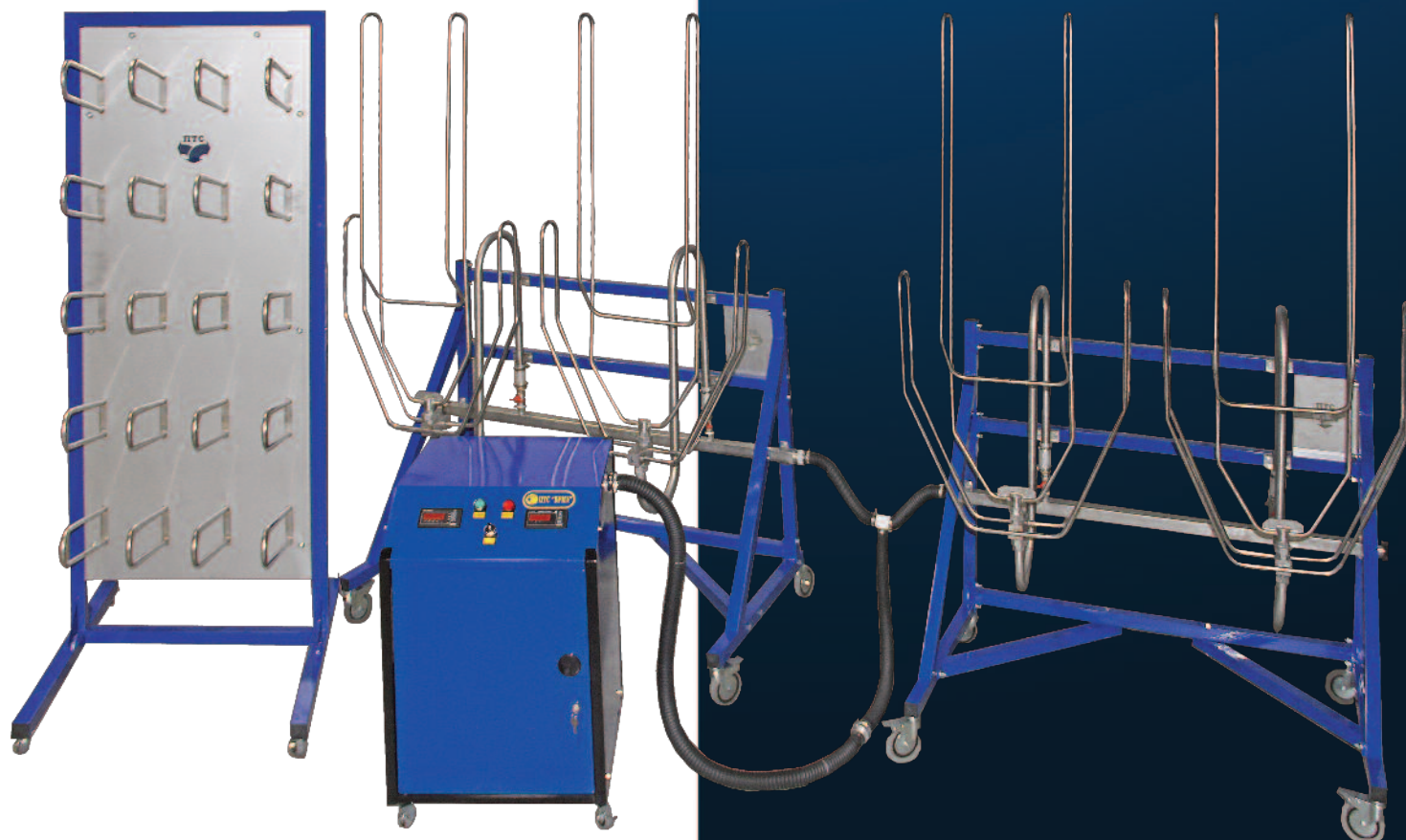
It allows to quickly and nicely dry clothes by supplying preheated air through stainless steel tubes and nozzles located on hangers to an object of drying.

The main element is the unit of supplying air PTS "Breeze".

Its operation does not require additional exhaust ventilation and allows installing the unit in the room with general ventilation standard system.

The equipment is characterized by low noise level and low energy consumption: 220V - 1600 W.

All elements are made of stainless steel and might be assembled either for wall immovable application or portable application as well





SPECIAL  
PROTECTIVE  
CLOTHING



## PP-M Fire-Fighting Cloak



PP-M fire-fighting cloak designed for equipment managerial personnel of administrations and major units of State Fire Service of RF Ministry of Interior, who perform management of major fires extinguishing, in particular, chiefs of firefighting Headquarters, who for a long time exposed to hazardous fire factors (high temperatures, high intensity heat flows and eventual flame ejaculation), as well as adverse climatic influences (wind, rain, low temperatures up to - 50 °C).

It is created utilizing the baseline design of BOP-I-M firefighter's combat clothing and equipment and BOP-I-C-50 combat clothing of firefighters for Northern regions of the country.

The set includes:

- elongated jacket of flame retardant fabric with high-efficient signal elements and fluorescent lettering on the back: "MES of Russia";
- conventional jacket lining with high-efficient water-resistant barrier (waterproofing capacity is more than 2000 mm of water column.);
- auxiliary lining with high-efficient insulating layer;
- waistcoat made of natural fur (sheepskin) with elongated back-piece covering the loins.

### Main parameters and specifications

|                                                                                                            |          |
|------------------------------------------------------------------------------------------------------------|----------|
| Resistance to ambient temperature up to +300 °C, s, no less than                                           | 300      |
| Resistance to heat flow<br>5 kW/m <sup>2</sup> , s, no less than<br>40 kW/m <sup>2</sup> , s, no less than | 240<br>5 |
| Resistance to contact with solid surfaces heated up to 400 °C, s, not less than                            | 7        |
| Resistance to open flame, s, no less than                                                                  | 15       |
| Weight, kg, no more than                                                                                   | 8        |



## BOP-I-A, BOP-I-B General Service Uniform

BOP-I-A, BOP-I-B (TU 8570-004-46840277-00) with II 006-2012 protects personnel of fire departments from hazard environment factors that arise during rescue operations associated with fire extinguishing, as well as from adverse climatic effects.

BOP-I-A and BOP-I-B are suits for application in climatic regions with ambient temperature from  $-40^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .

The number of produced height sizes: 6 (3 sizes of 2 heights each).

Distinctive features of the design:

- BOP-I-A jacket with karabinier clips; wing collar, set-in hood; breast pocket for walkie-talkie; set-in sleeves with elbow pads and knitted wristbands; clamp band for adjusting the jacket volume on the waist line; removable lining consisting of moisture and thermal barrier layers; signal strip with the width of at least 50 mm.

- BOP-I-B jacket differs by the absence of clamp band for adjusting the jacket volume and pocket for walkie-talkie; it has another arrangement of signal strips.

BCS-I-A designed for commanding staff;

BCS-I-B designed for the rank and file.



| Item name        | Item size | Human height |
|------------------|-----------|--------------|
| BOP-I-A, BOP-I-B | I         | 170-176      |
| BOP-I-A, BOP-I-B | II        | 182-188      |

## BOP-I-M General Service Uniform



### General Service Uniform (TY 8570-004-46840277-00) with ИИ (Change Notice) 006-2012

According to GOST R 53264-2009 Fire Engineering. Fire Fighters Special Protective Clothing. General Technical Requirements. Test Methods.

General service uniform is a modern personal protective equipment, developed on the basis of experience of use of domestic and imported 'fire-entry suits'.

Clothing protects personnel of firefighting divisions against high temperatures, heat flows of high intensity and possible flame ejaculations when working in extreme situations that arise when extinguishing the fire, performing reconnaissance and rescue of people.

Clothing also protects against adverse climatic effects: wind, precipitations, low temperatures (up to  $-40^{\circ}\text{C}$ ) and is available in several versions in the form of structural and unified series (SUS).

The versions differ in the type of central fastener ('zipper' or 'clasp', length of jacket, width and version of trousers (including overalls), availability of removable cape, leather knee and elbow pads, kind and number of pockets.

Number of available size ranges is 6 (3 sizes of 2 lengths each).

Design features: upper material is flame and heat resistant fabric of polyaramide fibers with water-resistant proofing and high strength (tensile strength shall be no less than 1000 N); fully waterproof design due to use of effective impervious barrier (flame and heat resistant rubberized fabric); improved ergonomics; compatibility with all kinds of fire-technical equipment and breathing apparatus.

#### MAIN FEATURES AND CHARACTERISTICS

|                                                                                                                      |          |
|----------------------------------------------------------------------------------------------------------------------|----------|
| Resistance to ambient temperature up to $+300^{\circ}\text{C}$ , s, no less than                                     | 300      |
| Resistance to heat flow<br>5 $\text{kW}/\text{m}^2$ , s, no less than<br>40 $\text{kW}/\text{m}^2$ , s, no less than | 240<br>5 |
| Resistance to contact with solid surfaces<br>heated up to $400^{\circ}\text{C}$ , s, not less than                   | 7        |
| Resistance to open flame, s, no less than                                                                            | 15       |
| Weight, kg, no more than                                                                                             | 5        |



# BOP-I-SPAS

## General Service Uniform for Fire Fighters and Rescuers

**БОП-1-СПАС General Service Uniform for Fire Fighters and Rescuers (TU 8570-004-46840277-00) with II 006-2012 According to GOST R 53264-2009 Fire Engineering. Fire Fighters Special Protective Clothing. General Technical Requirements. Test Methods.**

БОП-СПАС general service uniform for fire fighters and rescuers protects personnel of firefighting divisions against high temperatures, heat flows of high intensity and adverse climatic effects: wind, precipitations, low temperatures (up to  $-40^{\circ}\text{C}$ ) when working in extreme situations that arise when extinguishing the fire, performing reconnaissance and rescue of people, at road traffic accidents.

БОП-1-СПАС combines high-quality materials and modern design solutions considering the work specify of fire fighters and rescuers.

Firefighting uniform БОП-1-СПАС is a jacket and overalls with heat insulating undercoat that are produced in 3 versions that have the same design of upper part made of 3 different materials but are differed in way of connection to undercoat: version No 1 and No 2 have removable undercoat, version No 3 has unremovable undercoat.

Short-cut jacket with central zip fastener includes the following design elements: moisture proof flap, stand-up and turn-down collar, set-in pocket for radio station, belt loops for lantern, two side capacious patch pockets with flaps and holes for water drainage; lifesaving device available at the back for emergency evacuation of the injured rescuer; sleeves with gussets, elbow pads.

Overalls with zipper fastener, belt loops, cuts in side seam at hip level for easy access to undersuit space, side capacious pockets with flaps and holes for water drainage; inseam butterfly; spacing knee area, knee pads; down inseam reinforcement pad and rear heel cutout.

Reinforcing elements are made of split leather (version No 1) and AKAZSHEO™ fabric on the basis of para-aramid fibers (versions No 2 and No 3).

To increase the information content БОП-1-СПАС has retroreflective tape of width 70mm.

Number of available size ranges is 6 (3 sizes of 2 lengths each).

Features of upper material:

**Version No1:** Upper material is of polyaramid fibers of dark blue color. Surface density:  $200 \text{ g/m}^2$ . Tear resistance, not less than: 100 N. Tensile strength, not less than: 1000 N.

**Version No 2:** Upper Material is Advance, flame and heat resistant fabric of dark blue color of para- and meta-aramid fibers. Antistatic. Surface density:  $200 \text{ g/m}^2$ . Tear resistance, not less than: 140 N. Tensile strength, not less than: 2000 N.

**Version No 3:** Millenia Light™ - flame and heat resistant fabric of yellow color of para-aramid fibers (Kevlar) and PBO (polyparaphenylene benzobisoxazole). It is ultra-light protective fabric due to surface density of  $180 \text{ g/m}^2$ . It has better resistance to attrition, high temperature, chemical resistance, abrasion and cuts than similar materials. Tear resistance, not less than: 200 N. Tensile strength, no less than: 2000 N.



### MAIN FEATURES AND CHARACTERISTICS

|                                                                                                 |      |
|-------------------------------------------------------------------------------------------------|------|
| Resistance to ambient temperature up to $+300^{\circ}\text{C}$ , s, not less than               | 300  |
| Resistance to heat flow                                                                         |      |
| 5 $\text{kW/m}^2$ , s, not less than                                                            | 240  |
| 40 $\text{kW/m}^2$ , s, not less than                                                           | 5    |
| Resistance to contact with solid surfaces heated up to $400^{\circ}\text{C}$ , s, not less than | 7    |
| Resistance to open flame, s, no less than                                                       | 15   |
| Weight, kg, not more than                                                                       |      |
| Version No 1                                                                                    | 4.60 |
| Version No 2                                                                                    | 4.10 |
| Version No 3                                                                                    | 3.65 |

## BOP-I-C-50 General Service Uniform for Northern regions



BOP-I-C-50 general service uniform for Northern regions is modern means of individual protection (TU 8570-009-46840277-00).

It complies with GOST R 53264-2009 "Fire-fighting equipment. Firefighter special protective clothing. General technical requirements. Test methods."

In the design of BOP-I-C-50 general service uniform used the following modern materials and components:

- fire and heat-resistant heavy duty fabric of aramid fibers, such as NOMEX® with waterproof impregnation,
- high-efficiency waterproof protective barrier,
- high-performance signal elements,
- reliable fittings.

General service uniform protects personnel of fire departments from high temperatures, high intensity heat flows and eventual flame emissions in extreme situations that arise during extinguishing fires, carrying out reconnaissance and rescue people. General service uniform also protects from adverse climatic influences (wind, rain, low temperatures up to - 65 °C) and can be used in climatic regions of Russia with moderately cold, cold, and very cold climates. A set of BOP-I-C-50 protects from water, among other things, from surfactant additives, mild acids, and alkalis; it has antistatic properties as well.

Two types of general service uniform are available:

- BOP-I-C-50-A - for commanding staff,
- BOP-I-C-50-B - for rank and file.

Option A – with signal strips.

General service uniform (BOP) scope of delivery:

Jacket with 2 removable insulating linings, waterproof layer and fur collar, trousers with removable water and heat insulator, waistcoat (heat-resistant), mittens: exterior of split leather with reinforcement straps and cuffs, internal – heat-resistant and waterproof with cuffs.

The number of produced height sizes: 6 (3 sizes of 2 heights each h).

General service uniform (BOP) distinctive features: top stuff – fire and heat-resistant fabric with waterproof impregnation and high strength aramid fibers, such as NOMEX® (breaking load of not less than 1000 N), a fully waterproof design through the use of effective impervious barrier, improved ergonomics, compatibility with all kinds of firefighting equipment and breathing apparatus.



## TSN Heat Protection Exposure Cover

TSN cape provides protection from thermal exposure (open fire, heat flows, and contact with heated surfaces). It is intended for safe evacuation of people from buildings and premises during a fire.

The cape is essentially adjustable in size cloak with a hood, cut-outs for hands, and quick unsnapping hook and loop fastener. It can be used in a set with escape apparatus for the protection of respiratory organs. The cape is made of special metalized flame-resistant fabric with a high-grade infrared radiation reflection.

### Main parameters and specifications

|                                                            |                |
|------------------------------------------------------------|----------------|
| Resistance to open flame, sec, at least                    | 300            |
| coefficient of infrared radiation attenuation, %, at least | 70             |
| Weigh, kg, at most                                         | 7              |
| Dimensions in the folded state, mm, at most                | 240 x 360 x 25 |
| The time of untrained person dressing, sec, at most        | 5              |



## SLZ-L Set of local protective means



**SLZ-L Set of Fire Fighters Local Protective Means (TU 8570-049-38996367-2008).**

**The set is a light version according to GOST R 53264-2009**

SLZ-L set of local protective means for fire fighters against high heat influences provides additional heat protection to the most vulnerable body parts: face, head, neck, arms and legs, as well as breathing apparatus of fire fighter when working close to flames and incandescent material.

It is used in urban areas instead of fire proximity set in restricted spaces (cellars, saunas, attics, tunnels, etc.).

Set includes: a cape with a hood, window and hold for breathing apparatus; gloves (palm part is reinforced with natural leather); boot covers.

Design features: increased area of protected body parts; improved ergonomics; panoramic heat-resistant heat reflective glass of window.

The suit is put on over general service uniform and any type of breathing apparatus.

### MAIN FEATURES AND CHARACTERISTICS

|                                                                                 |     |
|---------------------------------------------------------------------------------|-----|
| Resistance to heat flow 10 kW/m <sup>2</sup> , s, not less than                 | 480 |
| Resistance to temperature +300 °C, s, not less than                             | 480 |
| Resistance to contact with solid surfaces heated up to 400 °C, s, not less than | 15  |
| Attenuation coefficient of infrared radiation, %, not less than                 | 70  |
| Resistance to open flame, s, not less than                                      | 20  |
| Weight, kg, not more than                                                       | 4   |



## TOK-200-25-P/T Fire Proximity suit for Fire Fighters

### TOK-200-25-P/T Fire Proximity Set.

The set is a light heavy version according to GOST R 53264-2009, TU 8570-007-46840277-00

TOK-200-25-P/T Fire proximity suit is designed for protection of personnel of firefighting divisions against high heat influences (intensive heat radiation, high environmental temperatures, short-time contact with open fire) and also environmental hazards. It also protects against adverse climatic effects: low temperatures, wind, precipitations.

The suit is put on over general service uniform and any type of breathing apparatus used in fire protection.

For design modern materials and components are used: flame and heat resistant, heat reflective and metallized materials with high reflective index, heat resistant, heat reflective and panoramic optical elements (glass) of window, reliable accessories.

Number of available size ranges is 2 (medium and large).

Set includes: a jacket with a hood, window and hold for breathing apparatus, pants, vamp boot covers, gloves with heat insulating liners, packing bag.



### MAIN FEATURES AND CHARACTERISTICS

|                                                                                 |     |
|---------------------------------------------------------------------------------|-----|
| Resistance to heat flow                                                         |     |
| 25 kW/m <sup>2</sup> , s, not less than                                         | 120 |
| 18 kW/m <sup>2</sup> , s, not less than                                         | 600 |
| 10 kW/m <sup>2</sup> , s, not less than                                         | 900 |
| Resistance to temperature +300 °C, s, not less than                             | 600 |
| Resistance to open flame, s, not less than                                      | 20  |
| Resistance to contact with solid surfaces heated up to 400 °C, s, not less than | 15  |
| Donning time (without help of assistant), s, no more than                       | 80  |
| Weight, kg, not more than                                                       | 10  |

## TOK-200 "Gazovik" ("Plamia") ("The flame")



**TOK-200 "Gazovik"** ("Plamia") is intended to protect fire-fighters from exposure to thermal radiation, high temperature, short contact with open fire, environmental hazards arising during the liquidation of oil fires and oil products; oil and gas fountains.

The set is made of special materials with heat-resistant and heat-reflecting properties. It refers to light heavy-weight type of execution according to GOST R 53264-2009.

The set includes:

- heat-reflecting suit (trousers and jacket with a hood);
- heat-reflecting outer protection of hands and feet (cuffs, shoe covers);
- internal heat-protective union suit;
- internal protection of hands and feet (gloves, ankle boots).

The set is available in three height sizes:

- size 1 (96-100), height (158-164);
- size 2 (104-108), height (170-176);
- size 3 (112-118), height (182-188).

Union suit is the element of inner heat protection.

Maximum time of dressing with the help of assistant: 5 min.

Maximum time of respiratory tract independent freeing – 20 sec.

Protective properties according to GOST 12.4.103 – Ti, To, Vp.

Life cycle, at least: 10 hours.

Weight: 15.5 kg.



## TK-800-40-T Heat Protective Set

**TK-800-40-T (TCK-2004) Heat Protective Set, TU 8570-008-46840277-00.**

**The set is a heavy version according to GOST R 53264-2009**

Heat protective set is specially designed for protection of personnel of firefighting divisions against high heat influences (intensive heat radiation, high environmental temperatures, short-time contact with open fire) that arise when extinguishing the large-scale and complex fires at the gas and oil producing and oil refining enterprises.

Suit allows working quickly and effectively close to inflamed areas of high bulk temperature and conduct rescue work.

High protective properties of suit are ensured due to use of modern materials and components in design: flame and heat resistant, heat reflective and metallized materials with high reflective index, high-performance heat-resistant insulator, heat resistant, heat reflective and panoramic optical elements (glass) of window, reliable accessories.

Suit is put on over any type of breathing apparatus. Number of available size ranges is 9 (3 sizes of 3 lengths each).



### MAIN FEATURES AND CHARACTERISTICS

|                                                                                 |     |
|---------------------------------------------------------------------------------|-----|
| Resistance to heat flow                                                         |     |
| 40 kW/m <sup>2</sup> , s, not less than                                         | 120 |
| 25 kW/m <sup>2</sup> , s, not less than                                         | 240 |
| 18 kW/m <sup>2</sup> , s, not less than                                         | 960 |
| Resistance to temperature +300 °C, s, not less than                             | 960 |
| Resistance to temperature +800 °C, s, not less than                             | 20  |
| Resistance to contact with solid surfaces heated up to 400 °C, s, not less than | 15  |
| Resistance to open flame, s, not less than                                      | 30  |
| Attenuation coefficient of infrared radiation, %, not less than                 | 70  |
| Donning time (without help of assistant), s, not more than                      | 80  |
| Weight, kg, not more than                                                       | 16  |

# PULSAR

## Lightweight Hostile Environment Protection Outfit



**Lightweight hostile environment protection outfit Pulsar.**  
**TU 8570-052-38996367-2011**

Pulsar outfit is designed for protection of personnel of Emergency Rescue and State Fire Services of RF Ministry of Interior from dangerous and harmful factors of environment during support operations such as danger area security cordoning, decontamination and disinfection of gassed insulating suits after their exposure to danger areas, also from unfavorable climatic factor effects.

Lightweight hostile environment protection outfit «Pulsar» is designed in three variants using special materials:

- Pulsar-1 is made of material with high non-combustibility and oil-and-petrol resistance.
- Pulsar-2 is made of material with resistance against chemicals including chemical warfare agents (CWA) and rocket fuel components (RFC).
- Pulsar-Universal is made of special polymeric material which combines non-combustibility and oil-and-petrol resistance, high resistance against chemicals including CWA and RFC and also resistance to heat flux effects.

### BASIC PARAMETERS

| Parameter                                                                        | Pulsar-1  | Pulsar-2  | Pulsar-Universal |
|----------------------------------------------------------------------------------|-----------|-----------|------------------|
| Resistance to contact with solid surfaces heated up to +400°C, sec, no less than | 5         | 5         | 5                |
| Infrared attenuation coefficient, %, no less than                                |           |           |                  |
| Operating temperature range, °C                                                  | -30...+40 | -40...+40 | 50               |
| Weight, kg, no more than                                                         | 2,8       | 3,1       | 3,5              |

### CHEMICAL RESISTANCE OF Pulsar OUTFITS TO HOSTILE ENVIRONMENTS

| Hostile environment                                                | Pulsar-1 | Pulsar-2 | Pulsar-Universal |
|--------------------------------------------------------------------|----------|----------|------------------|
| <u>Chemically hostile liquids</u>                                  |          |          |                  |
| Caustic soda NaOH (40% aqueous)                                    | 30       | 60       | 90               |
| Sulphuric acid H <sub>2</sub> SO <sub>4</sub> (50% aqueous)        | 30       | 60       | 120              |
| Nitric acid HNO <sub>3</sub> (50% aqueous)                         | 30       | 60       | 120              |
| Hydrochloric acid HCl (30% aqueous)                                | 30       | 60       | 120              |
| Ammonia NH <sub>4</sub> OH (25% aqueous)                           | -        | 10       | 10               |
| Unsymmetrical dimethylhydrazine, number of usage, no less than     | -        | 5        | 7                |
| <u>Physically hostile liquids</u>                                  |          |          |                  |
| 1,2 ethylene dichloride                                            | 10       | 10       | 120              |
| Benzene                                                            | 10       | 10       | 120              |
| Acetic acid CH <sub>3</sub> COOH (70% aqueous)                     | 10       | 10       | 20               |
| Petroleum and petroleum products                                   | 20       | 5        | 120              |
| <u>Chemically hostile gases</u>                                    |          |          |                  |
| Ammonia NH <sub>4</sub> OH (saturated vapor)                       | 10       | 60       | 60               |
| Gaseous chlorine (70 mg/l)                                         | 10       | 60       | 60               |
| <u>Physiologically active substances</u>                           |          |          |                  |
| β,β'-dichlorodiethyl sulphide, 1,0 g/m <sup>2</sup> , no less than | -        | 60       | 90               |



**TASK Chemical-Resistant and Heat-Protective Suit of Special Polymeric Materials. TU 8570-025-46840277-2003 with II 005-2011. According to GOST R 53264-2009**

TASK is a sealed insulating suit with impact-resistant panoramic window of polycarbonate.

Breathing apparatus with compressed air is worn under a suit. There is a convenient sealed connection for removable protective boots and gloves.

It is designed to protect the personnel of firefighting and emergency rescue services of the Ministry of Emergency Situations of Russia against aggressive environments, high heat influences and adverse climatic conditions that arise when extinguishing the fire, performing reconnaissance and rescue of people, in case of accidents on chemically hazardous objects.

#### TECHNICAL CHARACTERISTICS

| Environmental temperature | Work time. min |
|---------------------------|----------------|
| From -40 °C to +40 °C     | 30             |
| From +40 °C to +100 °C    | 20             |
| From +100 °C to +150 °C   | 3              |

**SPECIAL REQUIREMENTS:** Resistance of TACK suit upper material to aggressive environment

#### AGGRESSIVE ENVIRONMENT

Time of protective effect in case of contact with aggressive environment, no less than, min, at temperature C°, inclusive

-40...40°C 40...100°C 100...150°C

##### 1. Chemically aggressive liquids

|                                                                                            |    |    |   |
|--------------------------------------------------------------------------------------------|----|----|---|
| Aqueous sodium hydroxide solution (NaOH) with mass fraction of 50%                         | 90 | 30 | 5 |
| Aqueous sulfuric acid solution (H <sub>2</sub> SO <sub>4</sub> ) with mass fraction of 50% |    |    |   |
| Aqueous nitric acid solution (HNO <sub>3</sub> ) with mass fraction of 50%                 |    |    |   |
| Aqueous hydrochloric acid solution (HCl) with mass fraction of 30%                         |    |    |   |

##### 2. Physically aggressive liquids

|                                                                               |    |        |   |
|-------------------------------------------------------------------------------|----|--------|---|
| 1,2 dichloroethane                                                            | 20 | 10/20* | - |
| Benzene                                                                       |    |        |   |
| Aqueous acetic acid solution (CH <sub>3</sub> COOH) with mass fraction of 70% |    |        |   |
| Oil and petroleum products                                                    |    |        |   |

##### 3. Chemically aggressive gases

|                             |    |    |   |
|-----------------------------|----|----|---|
| Ammonia (NH <sub>3</sub> )  | 60 | 30 | 5 |
| Chlorine (Cl <sub>2</sub> ) |    |    |   |

\* - effect with saturated vapor concentration

#### BASIC PARAMETERS

|                                                                              |    |
|------------------------------------------------------------------------------|----|
| Donning time (without help of assistant), s, no more than                    | 3  |
| Time for putting-off without help till respiratory tract release, s, no more | 20 |
| Weight, kg, no more than                                                     | 11 |

## TASK Chemical-Resistant and Heat-Protective suit



#### DELIVERY SET:

- insulating outer suit with a hood, window, hold for breathing apparatus, rubber gloves and boots;
- internal heat-insulating overall;
- internal heat-insulating hood with protective helmet;
- hygienic underwear (optional);
- special cutting resistant gloves (optional).

# TASK-T Heat-Corrosion Resistant Heat-Reflective suit



## DELIVERY SET:

- insulating external suit with hood, viewport, compartment for a breathing apparatus, rubber gloves and boots, shoe covers and gauntlets;
- internal heat-insulating one-piece suit;
- internal heat-insulating hood with a protective helmet;
- crest;
- hygienic clothes;
- special cutting-resistant gloves (at customer's option).

## TASK-T Heat-Corrosion Resistant Heat-Reflective Suit of Special Polymeric Materials.

TU 8570-025-46840277-2003 with II 005-2011. According to GOST R 53264-2009

The insulated-type hermetic suit is designed on the basis of the Heat-Corrosion Resistant Suit made of special polymeric TACK materials.

The suit protects against the more wide range of corrosive environments, including propellant components and chemical warfare agents, as well as high-intensity heat flows (up to 14 kW/m<sup>2</sup>).

It is made to protect the personnel of fire-fighting and rescue services of MES of Russia in extinguishing serious and complex fires, conducting a reconnaissance and rescuing people in case of accidents at chemically dangerous facilities.

The suit is equipped with a special hermetic zipper with a protective valve of the material of the environmental suit.

### TECHNICAL CHARACTERISTICS

| Environmental temperature | Work time, min |
|---------------------------|----------------|
| From -40 °C to +40 °C     | 30             |
| From +40 °C to +100 °C    | 20             |
| From +100 °C to +150 °C   | 3              |

### CORROSIVE ENVIRONMENTS

Protective action time when in contact with an corrosive environment, at least, min., at the temperature of, °C, including

-40...40°C 40...100°C 100...150°C

#### 1. Chemically aggressive liquids

|                                                                                            |    |    |   |
|--------------------------------------------------------------------------------------------|----|----|---|
| Aqueous sodium hydroxide solution (NaOH) with mass fraction of 50%                         |    |    |   |
| Aqueous sulfuric acid solution (H <sub>2</sub> SO <sub>4</sub> ) with mass fraction of 50% |    |    |   |
| Aqueous nitric acid solution (HNO <sub>3</sub> ) with mass fraction of 50%                 | 90 | 30 | 5 |
| Aqueous hydrochloric acid solution (HCl) with mass fraction of 30%                         |    |    |   |
| Propellant components                                                                      | 90 | -  | - |

Resistance to pouring with fuel oxidizers At least 3 times

#### 2. Physically aggressive liquids

|                                                                               |    |        |   |
|-------------------------------------------------------------------------------|----|--------|---|
| 1,2 dichloroethane                                                            |    |        |   |
| Benzene                                                                       |    |        |   |
| Aqueous acetic acid solution (CH <sub>3</sub> COOH) with mass fraction of 70% | 20 | 10/20* | - |
| Oil and petroleum products                                                    |    |        |   |

#### 3. Chemically aggressive gases

|                             |    |    |   |
|-----------------------------|----|----|---|
| Ammonia (NH <sub>3</sub> )  | 60 | 30 | 5 |
| Chlorine (Cl <sub>2</sub> ) |    |    |   |

#### 4. Physiologically active substances

|                         |    |    |   |
|-------------------------|----|----|---|
| Chemical warfare agents | 90 | 30 | 5 |
|-------------------------|----|----|---|

### MAIN FEATURES AND CHARACTERISTICS

|                                                                                            |    |
|--------------------------------------------------------------------------------------------|----|
| Suiting-up time (with the help of one assistant), min., no more than                       | 3  |
| Time to take off independently until the respiratory tract is released, sec., no more than | 20 |
| Weight, kg, no more than                                                                   | 11 |



**Heat-corrosion resistant suit of special polymeric materials TASK-V with the combined compressed air supply from a breathing apparatus and from an external source. TU 8570-025-46840277-2003 with ИИ 005-2011. According to GOST R 53264-2009**

The insulated-type hermetic suit, created on the TACK basis, is designed for conducting reconnaissance and rescuing works for longer periods in zones of corrosive environments due to the ability of the built-in vent valve to switch to external supply sources.

The vent valve provides:

- increase of the user's work time by connecting an external source of compressed air without breaking the leak tightness of the suit;
- user convenience due to the work from an external source of compressed air at the open valve of the cylinder of the breathing apparatus;
- continuity of supply of the breathing mixture to the user due to the fully automatic switch to optimal modes of operation;
- user comfort due to the organization of the system of ventilation of PPE with a cool air during the operation from an external source.

#### Specification:

| Ambient temperature     | Work time. min |
|-------------------------|----------------|
| From -40 °C to +40 °C   | 30             |
| From +40 °C to +100 °C  | 20             |
| From +100 °C to +150 °C | 3              |

#### CORROSIVE ENVIRONMENTS

Protective action time when in contact with an corrosive environment, at least, min., at the temperature of, C°, including

-40...40°C 40...100°C 100...150°C

##### 1. Chemically aggressive liquids

|                                                                                            |                  |    |   |
|--------------------------------------------------------------------------------------------|------------------|----|---|
| Aqueous sodium hydroxide solution (NaOH) with mass fraction of 50%                         | 90               | 30 | 5 |
| Aqueous sulfuric acid solution (H <sub>2</sub> SO <sub>4</sub> ) with mass fraction of 50% |                  |    |   |
| Aqueous nitric acid solution (HNO <sub>3</sub> ) with mass fraction of 50%                 |                  |    |   |
| Aqueous hydrochloric acid solution (HCl) with mass fraction of 30%                         |                  |    |   |
| Propellant components                                                                      | 90               | -  | - |
| Resistance to pouring with fuel oxidizers                                                  | At least 3 times |    |   |

##### 2. Physically aggressive liquids

|                                                                               |    |        |   |
|-------------------------------------------------------------------------------|----|--------|---|
| 1,2 dichloroethane                                                            | 20 | 10/20* | - |
| Benzene                                                                       |    |        |   |
| Aqueous acetic acid solution (CH <sub>3</sub> COOH) with mass fraction of 70% |    |        |   |
| Oil and petroleum products                                                    |    |        |   |

##### 3. Chemically aggressive gases

|                             |    |    |   |
|-----------------------------|----|----|---|
| Ammonia (NH <sub>3</sub> )  | 60 | 30 | 5 |
| Chlorine (Cl <sub>2</sub> ) |    |    |   |

#### MAIN FEATURES AND CHARACTERISTICS

|                                                                                            |    |
|--------------------------------------------------------------------------------------------|----|
| Suiting-up time (with the help of one assistant), min., no more than                       | 3  |
| Time to take off independently until the respiratory tract is released, sec., no more than | 20 |
| Weight, kg, no more than                                                                   | 11 |

## Heat-Corrosion Resistant suit TASK-V



#### DELIVERY SET:

- insulating external suit with hood, viewport, compartment for a breathing apparatus, rubber gloves and boots;
- internal heat-insulating one-piece suit;
- internal heat-insulating hood with a protective helmet;
- vent valve;
- hygienic clothes;
- special cutting-resistant gloves (at customer's option).

# TASK-MT Light-Weight Heat-Corrosion Resistant Heat-Reflective suit



## DELIVERY SET:

- external one-piece suit with a hood (sealing over the face part), rubber gloves and boots;
- internal heat-insulating one-piece suit, hygienic clothes;
- protective cloak with viewport and compartment for cylinders of a breathing apparatus with compressed air (delivered at customer's option), cuffs and shoe covers;
- special cutting-resistant gloves (at customer's option)

Weight of one set, kg, no more than .....9

**TASK-MT Light-weight heat-corrosion resistant heat-reflective suit of special polymeric materials. TU 8570-025-46840277-2003 with II 005-2011. According to GOST P 53264-2009**

TACK-MT suit is designed to protect the personnel of fire-fighting and rescue services of MES (Ministry of Emergency Situations) of Russia in case of fires or accidents, when conducting reconnaissance and preventive works at chemically dangerous facilities, as well as civil and military vessels for different purposes and with different power units.

The breathing apparatus with compressed air is put on over the suit, and that allows increasing the work time due to the available ability to replace cylinders quickly.

The close-fitting suit does not constrain the freedom of movement and allows overcoming the hatches and manholes with a diameter of from 600 mm.

The heat-reflective material provides protection against the effect of heat flows up to 14 kW/m<sup>2</sup> (at least 180 sec.).

The available face seal allows using an individual full-face mask.

The great length of the hermetic zipper, which is vertically located at the front of the suit, allows the user to put on and take off the suit without too much effort and assistance.

The available protective cloak provides protection of the mask and breathing apparatus against chemically corrosive environments and heat flows.

## Specification:

| Ambient temperature     | Work time. min |
|-------------------------|----------------|
| From -40 °C to +40 °C   | 30             |
| From +40 °C to +100 °C  | 20             |
| From +100 °C to +150 °C | 3              |

## CORROSIVE ENVIRONMENTS

Protective action time when in contact with an corrosive environment, at least, min., at the temperature of, °C, including

-40...40°C 40...100°C 100...150°C

### 1. Chemically aggressive liquids

|                                                                                            |    |    |   |
|--------------------------------------------------------------------------------------------|----|----|---|
| Aqueous sodium hydroxide solution (NaOH) with mass fraction of 50%                         | 90 | 30 | 5 |
| Aqueous sulfuric acid solution (H <sub>2</sub> SO <sub>4</sub> ) with mass fraction of 50% |    |    |   |
| Aqueous nitric acid solution (HNO <sub>3</sub> ) with mass fraction of 50%                 |    |    |   |
| Aqueous hydrochloric acid solution (HCl) with mass fraction of 30%                         |    |    |   |
| Propellant components                                                                      | 90 | -  | - |

Resistance to pouring with fuel oxidizers At least 3 times

### 2. Physically aggressive liquids

|                                                                               |    |        |   |
|-------------------------------------------------------------------------------|----|--------|---|
| 1,2 dichloroethane                                                            | 20 | 10/20* | - |
| Benzene                                                                       |    |        |   |
| Aqueous acetic acid solution (CH <sub>3</sub> COOH) with mass fraction of 70% |    |        |   |
| Oil and petroleum products                                                    |    |        |   |

### 3. Chemically aggressive gases

|                             |    |    |   |
|-----------------------------|----|----|---|
| Ammonia (NH <sub>3</sub> )  | 60 | 30 | 5 |
| Chlorine (Cl <sub>2</sub> ) |    |    |   |

### 4. Physiologically active substances

|                         |    |    |   |
|-------------------------|----|----|---|
| Chemical warfare agents | 90 | 30 | 5 |
|-------------------------|----|----|---|



**TASK-M Light-Weight Heat-Corrosion Resistant Suit. TU 8570-025-46840277-2003 with II 005-2011.**  
According to GOST R 53264-2009

It is designed to protect the personnel of fire-fighting and rescue services of MES of Russia in case of fires or accidents, when conducting reconnaissance and preventive works at chemically dangerous facilities, as well as civil and military vessels for different purposes and with different power units.

The breathing apparatus with compressed air is put on over the suit, and that allows increasing the work time due to the available ability to replace cylinders quickly.

The close-fitting suit does not constrain the freedom of movement and allows overcoming the hatches and manholes with a diameter down to 600 mm.

The strong tight connections of changeable gloves and boots ensure the safe operation.

The available face seal allows using an individual full-face mask.

The great length of the hermetic zipper, which is vertically located at the front of the suit, allows the user to put on and take off the suit without too much effort and assistance.

The available protective cloak provides protection of the face mask and breathing apparatus against chemically corrosive environments.

**Specification:**

| Ambient temperature     | Work time. min |
|-------------------------|----------------|
| From -40 °C to +40 °C   | 30             |
| From +40 °C to +100 °C  | 20             |
| From +100 °C to +150 °C | 3              |

**CORROSIVE ENVIRONMENTS**

Protective action time when in contact with an corrosive environment, at least, min., at the temperature of, C°, including

-40...40°C 40...100°C 100...150°C

**1. Chemically aggressive liquids**

|                                                                                            |    |    |   |
|--------------------------------------------------------------------------------------------|----|----|---|
| Aqueous sodium hydroxide solution (NaOH) with mass fraction of 50%                         | 90 | 30 | 5 |
| Aqueous sulfuric acid solution (H <sub>2</sub> SO <sub>4</sub> ) with mass fraction of 50% |    |    |   |
| Aqueous nitric acid solution (HNO <sub>3</sub> ) with mass fraction of 50%                 |    |    |   |
| Aqueous hydrochloric acid solution (HCl) with mass fraction of 30%                         |    |    |   |

**2. Physically aggressive liquids**

|                                                                               |    |        |   |
|-------------------------------------------------------------------------------|----|--------|---|
| 1,2 dichloroethane                                                            | 20 | 10/20* | - |
| Benzene                                                                       |    |        |   |
| Aqueous acetic acid solution (CH <sub>3</sub> COOH) with mass fraction of 70% |    |        |   |
| Oil and petroleum products                                                    |    |        |   |

**3. Chemically aggressive gases**

|                             |    |    |   |
|-----------------------------|----|----|---|
| Ammonia (NH <sub>3</sub> )  | 60 | 30 | 5 |
| Chlorine (Cl <sub>2</sub> ) |    |    |   |

## TASK-M Light-Weight Heat-Corrosion Resistant Chemical-Protective suit



**DELIVERY SET:**

- external one-piece suit with a hood (sealing over the face part), rubber gloves and boots;
- internal heat-insulating one-piece suit, hygienic clothes;
- protective cloak with viewport and compartment for cylinders of a breathing apparatus with compressed air, protective gloves, special cutting-resistant gloves (at customer's option).

Weight of one set, kg, no more than .....9

# RZK Firefighters Raidation Protection outfit


**DELIVERY SET:**

- insulating suit with a hood, a visor, a breathing apparatus compartment, gloves and boots;
- heat and radiation protective overalls;
- protective hood;
- radiation protective: bib overalls, cape, shorts, insoles and boots;
- hygienic underwear;
- special cut-resistant gloves (optional).

**RZK Radiation Protection Outfit. TU 8570-047-38996367-2004 with II 005-2011. According to GOST R 53264-2009.**

The outfit is designed for integrated personal human protection during fire-fighting and salvage and rescue operations in combined beta- and gamma-radiation areas, including cases of fire and accidents at nuclear reactors.

The outfit is designed for protection against external beta- and partial gamma-radiation, high temperature, heat fluxes, radioactive gas and aerosol incorporation through respiratory and alimentary tracts, also against radioactive contamination of skin and mucous membranes.

P3K outfit allows to eliminate the subtotal radiation burn and to reduce the effects of penetrating radiation upon organs and tissues considering their varied radiation sensitivity, which enhances lifesaving chances during an uncontrolled overexposure and increases the duration of stay in a controlled radiation area.

The duration of personnel stay in a high combined gamma-radiation area depends on the equivalent dose rate and must be based on the dose limits specified by the Radiation Safety Standards NRB-99 for group A.

**Specification:**

| Ambient temperature     | Work time. min |
|-------------------------|----------------|
| From -40 °C to +40 °C   | 30             |
| From +40 °C to +100 °C  | 20             |
| From +100 °C to +150 °C | 3              |

|                                                                                                            |     |
|------------------------------------------------------------------------------------------------------------|-----|
| Beta-radiation attenuation factor for energy under 2 MeV (source Sr90), no less than                       | 150 |
| External gamma-radiation attenuation factor for energy of 122 KeV (source Co <sup>57</sup> ), no less than | 5,5 |

**MAIN PARAMETERS AND SPECIFICATIONS**

|                                                                            |    |
|----------------------------------------------------------------------------|----|
| Donning time (assisted by one person), min., no more than                  | 3  |
| Unassisted doffing time until respiratory tract release, sec, no more than | 20 |
| Outfit weight, kg, no more than                                            | 25 |



**RZK-M Mobile Radiation Protective Outfit. TU 8570-047-38996367-2004 with II 005-2011. According to GOST R 53264-2009**

The outfit is designed for integrated personal human protection during salvage and rescue operations in combined beta- and gamma-radiation areas, especially in small space areas with thick walls, particularly at nuclear-powered civil and war ships.

The compressed air breathing apparatus is to be donned over the suit, which allows increasing the working time thanks to the quick cylinder change possibility.

The closely fitted suit does not encumber mobility and allows getting through hatches and passageways of a diameter more than 600 mm.

Presence of a facial seal allows using of a personal full face mask.

#### Specification:

| Ambient temperature                                                                                        | Work time. min |
|------------------------------------------------------------------------------------------------------------|----------------|
| From -40 °C to +40 °C                                                                                      | 30             |
| From +40 °C to +100 °C                                                                                     | 15             |
| From +100 °C to +150 °C                                                                                    | 3              |
| Beta-radiation attenuation factor for energy under 2 MeV (source Sr90), no less than                       | 150            |
| External gamma-radiation attenuation factor for energy of 122 KeV (source Co <sup>57</sup> ), no less than | 5,5            |

## RZK-M Mobile Radiation Protective outfit



#### DELIVERY SET:

- external suit with rubber gloves and boots;
- heat protective inner suit;
- radiation protective: cape, shorts, vest, insoles;
- hygienic water-absorbing underwear;
- special cut-resistant gloves (optional).

Outfit weight, kg, no more than .....18

# RZK-F Radiation and Fire Protec- tion outfit for Firefighters



## DELIVERY SET:

- external insulating suit with a hood, a visor, a breathing apparatus compartment, rubber gloves and boots, overboots and gauntlets;
- heat protective hood;
- crest;
- heat and radiation protective overalls;
- radiation protective: cape, bib overalls, shorts, insoles and boots;
- hygienic underwear;
- special cut-resistant gloves (optional).

**RZK-F Radiation and Fire Protection Outfit for Firefighters. TU 8570-025-46840277-2003 with II 005-2011. According to GOST R 53264-2009**

The outfit is designed for integrated personal human protection during fire-fighting and salvage and rescue operations in combined beta- and gamma-radiation areas, including cases of fire and accidents at nuclear reactors.

The outfit is designed for protection against external beta- and partial gamma-radiation, high temperature, heat fluxes, radioactive gas and aerosol incorporation through respiratory and alimentary tracts, also against radioactive contamination of skin and mucous membranes.

It allows to eliminate the subtotal radiation burn and to reduce the effects of penetrating radiation upon organs and tissues considering their varied radiation sensitivity, which enhances lifesaving chances during an uncontrolled overexposure and increases the duration of stay in a controlled radiation area.

It protects from a wide range of hostile environments, including propellant fuel and chemical warfare agents, also heat fluxes of high intensity up to 14 kW/m<sup>2</sup> (for no less than 180 sec).

The duration of personnel stay in a high combined gamma-radiation area depends on the equivalent dose rate and must be based on the dose limits specified by the Radiation Safety Standards NRB-99 for group A.

## Specification:

| Ambient temperature     | Work time. min |
|-------------------------|----------------|
| From -40 °C to +40 °C   | 20             |
| From +40 °C to +100 °C  | 15             |
| From +100 °C to +150 °C | 3              |

|                                                                                                            |     |
|------------------------------------------------------------------------------------------------------------|-----|
| Beta-radiation attenuation factor for energy under 2 MeV (source Sr <sup>90</sup> ), no less than          | 150 |
| External gamma-radiation attenuation factor for energy of 122 KeV (source Co <sup>57</sup> ), no less than | 5,5 |

## MAIN PARAMETERS AND SPECIFICATIONS

|                                                                            |    |
|----------------------------------------------------------------------------|----|
| Donning time (assisted by one person), min., no more than                  | 3  |
| Unassisted doffing time until respiratory tract release, sec, no more than | 20 |
| Outfit weight, kg, no more than                                            | 25 |



**P3K-MT Mobile Radiation and Fire Protection Outfit. TU 8570-025-46840277-2003 with II 005-2011. According to GOST R 53264-2009**

The outfit is designed for integrated personal human protection during fire-fighting and salvage and rescue operations in combined beta- and gamma-radiation areas, especially in small space areas.

The outfit is designed for protection against external beta- and partial gamma-radiation, high temperature, heat fluxes, radioactive gas and aerosol incorporation through respiratory and alimentary tracts, also against radioactive contamination of skin and mucous membranes.

The compressed air breathing apparatus is to be donned over the suit, which allows increasing the working time thanks to the quick cylinder change possibility.

Fire protective material provides the suit with protection against the effects of heat fluxes up to 14 kW/m<sup>2</sup> (for no less than 180 sec).

The closely fitted suit does not encumber mobility and allows getting through hatches and passageways of a diameter more than 600 mm.

Presence of a facial seal allows using of a personal full face mask.

Presence of a protective cover, overboots, gauntlets provides the mask and breathing apparatus with protection against chemically hostile environments and heat fluxes.

#### Specification:

| Ambient temperature     | Work time. min |
|-------------------------|----------------|
| From -40 °C to +40 °C   | 20             |
| From +40 °C to +100 °C  | 15             |
| From +100 °C to +150 °C | 3              |

|                                                                                                            |     |
|------------------------------------------------------------------------------------------------------------|-----|
| Beta-radiation attenuation factor for energy under 2 MeV (source Sr <sup>90</sup> ), no less than          | 150 |
| External gamma-radiation attenuation factor for energy of 122 KeV (source Co <sup>57</sup> ), no less than | 5,5 |

#### MAIN PARAMETERS AND SPECIFICATIONS

|                                                                            |    |
|----------------------------------------------------------------------------|----|
| Donning time (assisted by one person), min., no more than                  | 3  |
| Unassisted doffing time until respiratory tract release, sec, no more than | 20 |
| Outfit weight, kg, no more than                                            | 18 |

## RZK-MT Mobile Radiation and Fire Protection outfit



#### DELIVERY SET:

- external insulating suit with a hood, a visor, a breathing apparatus compartment, rubber gloves and boots, overboots and gauntlets;
- heat protective hood;
- crest;
- heat and radiation protective overalls;
- radiation protective: cape, bib overalls, shorts, insoles and boots;
- hygienic underwear;
- special cut-resistant gloves (optional).

# STALKER-PRO-M

## Heat and Hostile Environment Protection Insulating suit



**Heat and hostile environment protection suit of special polymeric materials. TU 8570-053-38996367-2010 with II 001-2011**

New model range of insulating suits Сталкер-ПРО and Сталкер-ПРО-М, developed by PTS open joint-stock company in co-operation with "Trelleborg Protective Products AB" company.

Comes in 2 types: one-piece (CABA placed inside the suit) and open (CABA placed outside the suit), variant "M".

One-piece type insulating suit Сталкер-ПРО is easily donned over general service uniform.

The material is polyamide fabric double-coated with chloroprene rubber and internally laminated with plastic sheeting. The color is blue (or anthracite for special application).

The seams are pressure-sealed with a band on the inside and on the outside.

The zipper is gasproof.

The gloves are made of butyl rubber, fastened with a ring system to make their replacement possible.

The boots are made of polyvinyl chloride, 100% oil-and-petrol resistant and acid-base resistant, steel-capped, with steel insoles, heat-retardant, fastened with a ring system to make their replacement possible.

Panoramic visor of Сталкер-ПРО suit is made of chemical- and impact-resistant polyvinyl chloride.

Over-pressure relief valves are automatic, need no check with special equipment, are protected with covers.

Resistance to open flame effects for no less than 5 seconds.

Resistance to contact with solid surfaces heated up to +400 °C – for no less than 5 seconds.

Product weight: Сталкер-ПРО – 11 kg,

Сталкер-ПРО-М – 8 kg.

Sizes L, XL, XXL.

Optional delivery of special cut-resistant gloves.

### HOSTILE ENVIRONMENTS

**Time of protection during the contact with the hostile environment, no less than, min, with C° temperature, including**

-40...-40°C 40...100°C 100...150°C

#### 1. Chemically hostile liquids

|                                                                             |                 |    |   |
|-----------------------------------------------------------------------------|-----------------|----|---|
| Aqueous caustic soda (NaOH), 50% of total mass                              |                 |    |   |
| Aqueous sulphuric acid (H <sub>2</sub> SO <sub>4</sub> ), 50% of total mass | 90              | 30 | 5 |
| Aqueous nitric acid (HNO <sub>3</sub> ), 50% of total mass                  |                 |    |   |
| Aqueous hydrochloric acid (HCl), 50% of total mass                          |                 |    |   |
| Rocket fuel components (RFC)                                                | 90              | -  | - |
| Resistance to fuel oxidant poured over                                      | 3 times minimum |    |   |

#### 2. Physically hostile liquids

|                                                               |    |        |   |
|---------------------------------------------------------------|----|--------|---|
| 1,2 ethylene dichloride                                       |    |        |   |
| Benzene                                                       |    |        |   |
| Aqueous acetic acid (CH <sub>3</sub> COOH), 70% of total mass | 20 | 10/20* | - |
| Petroleum and petroleum products                              |    |        |   |

#### 3. Chemically hostile gases

|                             |    |    |   |
|-----------------------------|----|----|---|
| Ammonia (NH <sub>3</sub> )  | 60 | 30 | 5 |
| Chlorine (Cl <sub>2</sub> ) |    |    |   |



**Hostile environment protection suit of special polymeric materials. TU 8570-054-38996367-2010 with II 001-2011**

New model range of insulating suits "Сталкер" and "Сталкер-M", developed by PTS open joint-stock company in cooperation with "Trelleborg Protective Products AB" company.

Comes in 2 types: one-piece (CABA placed inside the suit) and open (CABA placed outside the suit), variant "M".

The suit material is polyamide fabric with external polyvinyl chloride cover, sharp yellow color.

The seams are welded.

The zipper is gasproof.

The gloves are made of butyl rubber, fastened with a ring system to make their replacement possible.

The boots are made of polyvinyl chloride, 100% oil-and-petrol resistant and acid-base resistant, steel-capped, with steel insoles, heat-retardant, fastened with a ring system to make their replacement possible.

Panoramic visor (of the one-piece type suit) is made of soft polyvinyl chloride.

Over-pressure relief valves are automatic, need no check with special equipment, are protected with covers.

Operating temperature range from -40 °C to +40 °C.

Product weight: Сталкер – 8 kg., Сталкер-M – 7 kg.

Sizes – 3 (L, XL, XXL).

Optional delivery of special cut-resistant gloves.

#### Chemical resistance of the suit to hostile environments

Time of resistance of material to hostile environment effects with substance flow 0,1 µg/cm/min, temperature of 20-230 °C, min

|                                  |     |
|----------------------------------|-----|
| Gaseous ammonia                  | 300 |
| Aqueous caustic soda, 40%        | 480 |
| Aqueous hydrochloric acid, 37%   | 170 |
| Petroleum products (diesel fuel) | 220 |
| Ethylene glycol                  | 480 |
| Phenol                           | 480 |
| Formaldehyde                     | 480 |
| Aqueous sulphuric acid, 50%      | 480 |
| Aqueous ammonia, 25%             | 20  |
| Glacial acetic acid              | 25  |

## STALKER-M Hostile Environment Protection Insulating suit

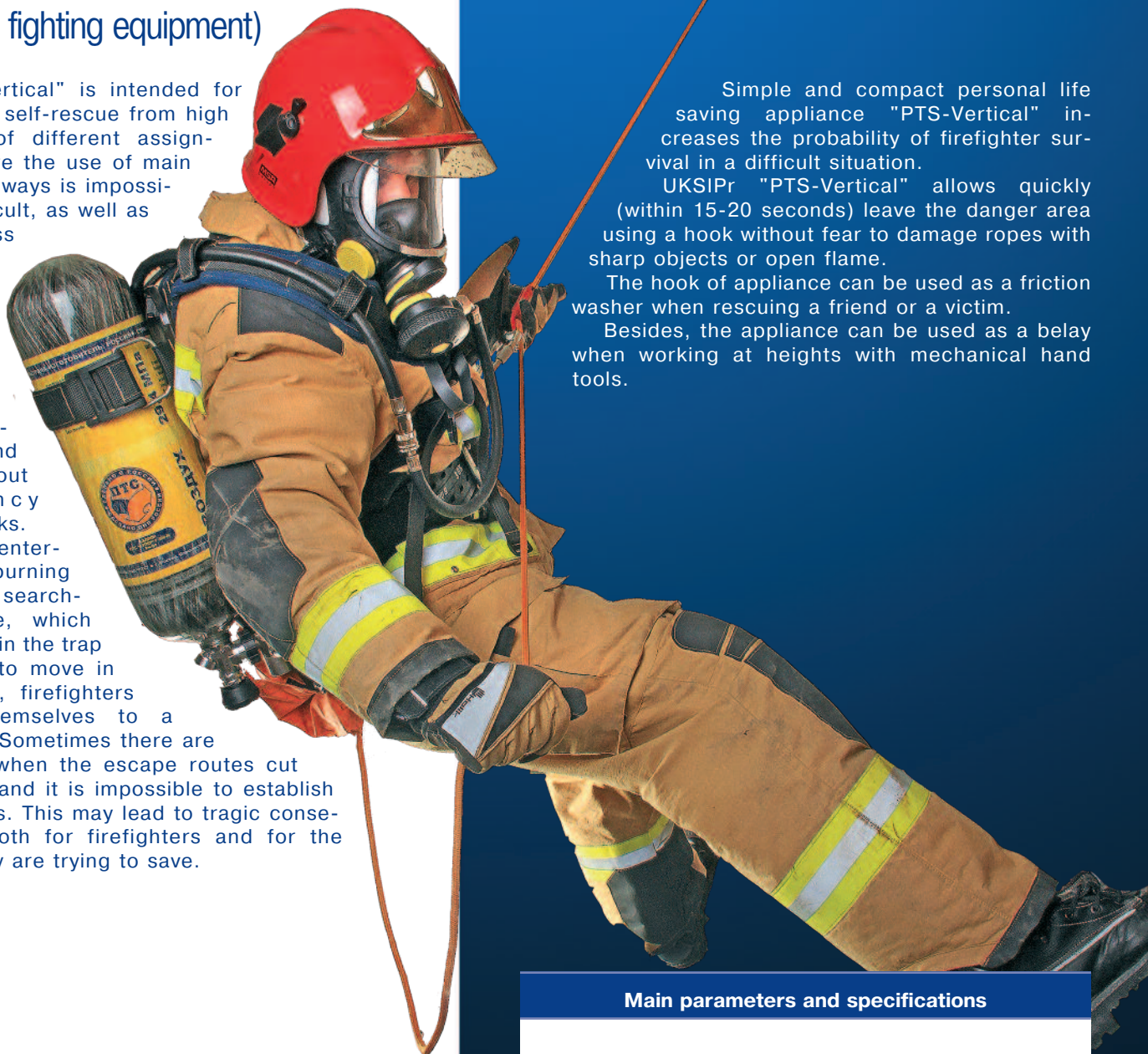


## "PTS-Vertical"

(Individual rope-descending manual fire-fighting equipment)

"PTS-Vertical" is intended for firefighters self-rescue from high buildings of different assignment, where the use of main evacuation ways is impossible or difficult, as well as to address other operational and tactical tasks during combat operations of fire extinguishing and carrying out emergency rescue works.

When entering the burning building in searching people, which are caught in the trap or unable to move in the smoke, firefighters expose themselves to a great risk. Sometimes there are situations when the escape routes cut off by fire and it is impossible to establish lifting gears. This may lead to tragic consequences both for firefighters and for the people they are trying to save.



Simple and compact personal life saving appliance "PTS-Vertical" increases the probability of firefighter survival in a difficult situation.

UKSIPr "PTS-Vertical" allows quickly (within 15-20 seconds) leave the danger area using a hook without fear to damage ropes with sharp objects or open flame.

The hook of appliance can be used as a friction washer when rescuing a friend or a victim.

Besides, the appliance can be used as a belay when working at heights with mechanical hand tools.

### Main parameters and specifications

|                                                          |                |
|----------------------------------------------------------|----------------|
| RThe weight of a descending man, kg                      | from 40 to 200 |
| The length of heat-resistant rescue rope (VTS), at least | 15             |
| VTS diameter, mm                                         | 7.5-9          |
| Dimensions in a bag (W x L x H) mm, at most              | 260 x 200 x 55 |
| Weigh, kg, at most                                       | 1.40           |
| Service life, cycles                                     | 100            |
| Arresting device service life, cycles                    | 500            |



# MOBILE AND STA- TIONARY TRAINING FACILITIES AND RANGES





## PTS 'GROT' Training Facility



The **PTS "GROT" Mobile Training Gallery** is intended for training firefighting and rescue services to use personal protective equipment (breathing apparatus) under conditions, simulating a smoked up ambient atmosphere, fire and other emergency situations. PTS "GROT" allows the trainees to improve their skills:

- in orientating in smoked up premises (atmosphere unsuitable for breathing);
- in withstanding hard ambient conditions during firefighting activities and rescue operations (noise, confined spaces, etc.);
- in carrying out prospecting operations (find and get an injured person out from a smoked up premises) and other missions.

The PTS "GROT" shall be in use in steady-state conditions only.

The mobile training gallery PTS "GROT" is based on a trailer and comprises:

- the orientation module (including the roof of the trailer - an additional training area);
- the exercise room;
- the control room (equipped with the first aid set).

**The Exercise Room.** During the training, a blood pressure and pulse of each participant is supervised by the Cardio Control System (CCS). The information can be displayed and saved on a computer, allowing to track behaviour and adaptation of every trainee.

The room temperature is set within the range of +20... 40°C ( $\pm 2^{\circ}\text{C}$ ) from the control room.

The exercise room can be fitted out with all kinds of training equipment (each is continuously controlled and monitored from the control room):

- horizontal treadmill;
- ergometer;
- endless ladder, etc.

To monitor the exercises, there is a watch window (by





the size 1x1m) in the wall separating the exercise room from the control room.

The obligatory condition of exercises is the strict observance of periodicity and sequence.

**The Orientation Module.** The aim of the orientation module is a formation of psychological readiness of trainees for actions in extreme situations. During trainings, they improve their professional skills, study to apply correctly their knowledge in practice.

Trainings are as much as possible approached to real conditions of firefighting and rescue work which includes danger, risk, long maximal physical and emotional loadings. All this allows to achieve from trainees a full pressure, mental faculties and will.

The orientation module is equipped with:

- labyrinth (path orientation);
- smoke generator;
- communication system;
- video monitoring and a path-tracking (tracing) system;
- special audio effect system;
- ventilation system.

The labyrinth is designed in three levels, allowing to creep, walk and climb. The following imitating objects are applied to carry out trainings in a labyrinth:

- hatches and narrow manholes of various configurations;
- an inclined site with gradually varying height;
- automatic self-closing "doors & windows" (operate from the control room);
- inclined and vertical ladders;



- a pipe for movement through;
- a dummy.

The labyrinth has three entries-exits which are used for various routes of movement. A special installed smoke generator is used to create a smoke. A smoke does not cause a poisoning or burns in case of the user's presence without respiratory protection inside the labyrinth.

The monitoring of training and site is carried out by video surveillance and path-tracking systems from the control room. The display indicates the exact position of each firefighter inside the labyrinth.

The instructor is able to issue verbal instructions and to receive reply by the communication system. The special audio effect system creates an additional psychological loading on trainees, allowing to simulate:

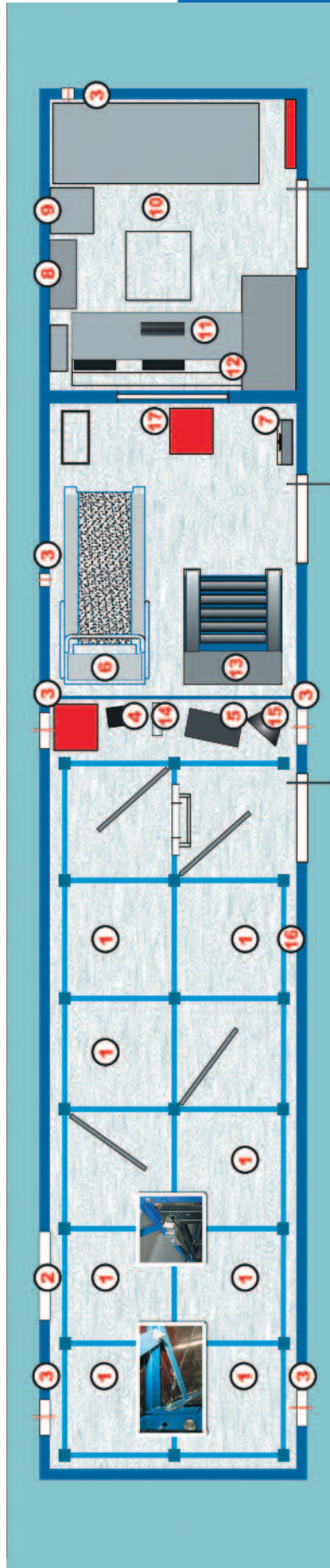
- construction collapse;
- explosions; noise leaving the pipeline under pressure of gas;
- shouts of "victim", etc.

The forced-air and exhaust ventilation system is used to remove a smoke from the orientation module.

**The Control Room.** The control room enables the instructor to monitor the training, to conduct the trainees through the labyrinth, to issue verbal instructions and to receive reply by communication system, etc. The training can be video recorded for further analysis.

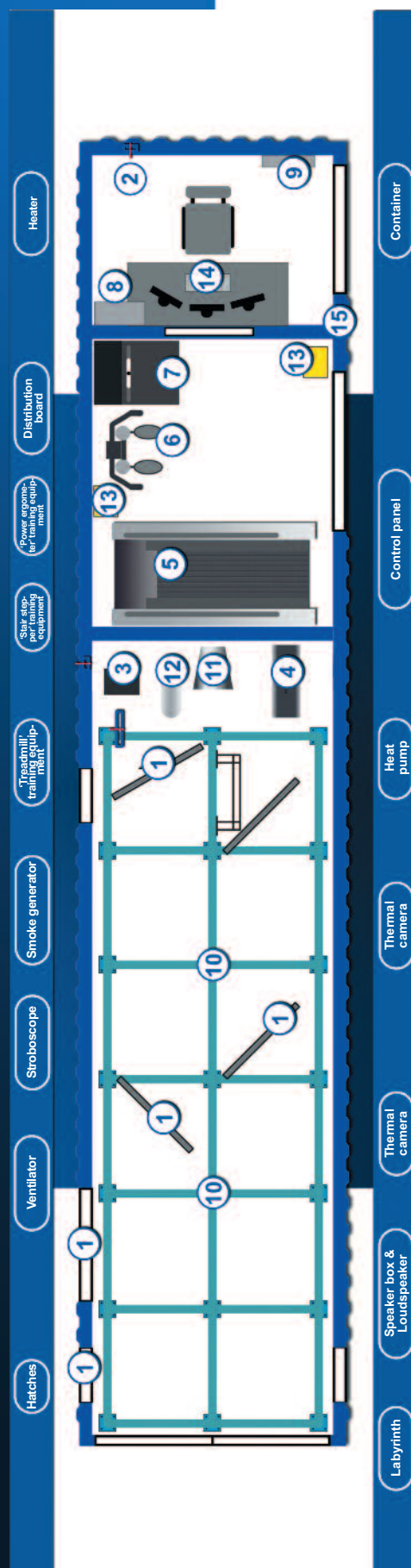
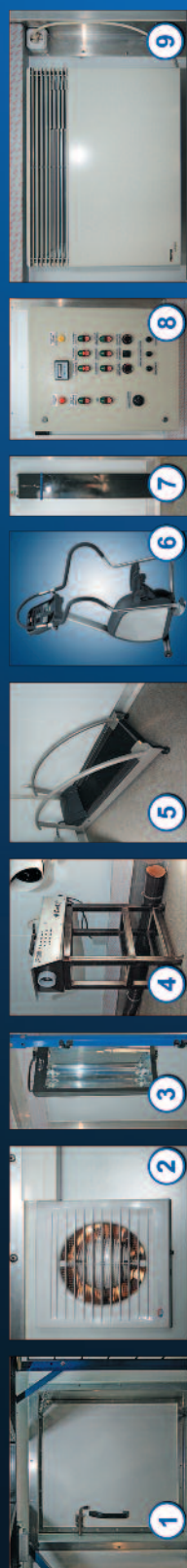
The control room is also equipped with the first aid set. In an emergency, the instructor is able to shut down all special effects, activate ventilation to clear up the smoke, turn the lights up, open the doors.

## PTS 'GROT' Smoke and Heat Training Facility





PTS 'Grot' Scheme of stationary smoke and heat training facility



## PTS 'LAVA' - mobile gas-fired training simulator



**This mobile gas-fired training simulator** has been designed to prepare all kind of professionals who engaged in firefighting and rescue activities for dealing with real-life fire operations in hazardous areas and emergency situations while assuring the highest safety standards.

PTS «LAVA» enables to teach trainees how to assess the risks posed by different types of fire and how to tackle the fire itself.

The simulator helps to improve the professional skills such as:

- orientating in smoked up premises;
- withstanding hard ambient conditions during firefighting activities and rescue operations (noise, confined spaces, etc.);
- carrying out prospecting operations (find and get an injured person out from a smoked up premises) and others.

It also provides a range of entry options to enable various realistic scenarios to be simulated, for example, go downstairs from a roof, climb through a hatch or fight the fire from outside through the doors.

PTS «LAVA» is based on a trailer and comprises:

- three exercise rooms: orientation area, industrial zone, residential area, of which last two are fire rooms,
- a passageway between fire rooms for additional training options
- the roof of the trailer as an additional training area,
- and the control room.

**The Orientation area** also known as 'the labyrinth' allows to build up psychological readiness of



trainees to withstand real-life scenarios such as poor visibility and enclosed space.

The labyrinth consists of sections, hatches and narrow manholes of various configurations.

**The Industrial zone** provides a practice of fire extinguishing in an efficient manner at the industrial projects. It features three fire seats: "Gas bottle fire", "Flange fire", "Spiral staircase fire" as well as an electric switchboard cabinet to simulate switching off the mains supply, a water-supply with fire-cock and a smoke tender unit.

**The Residential area** allows simulate many different scenarios to give trainees the best possible real-life fire and rescue operations in living accommodation. This fire room including a passageway have three fire seats: "Bed Fire", "TV Fire", "Hot Fire Door" and a flashover simulator as well as a smoke extractor.

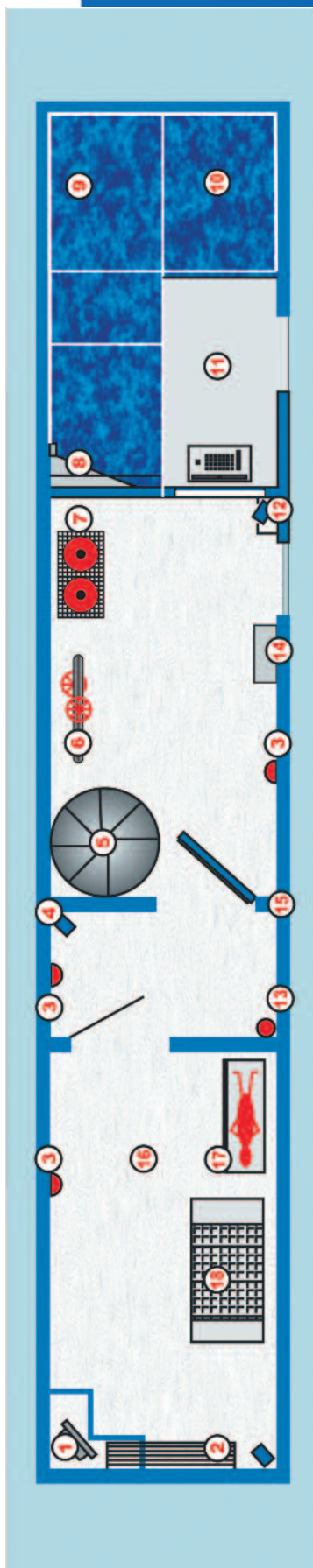
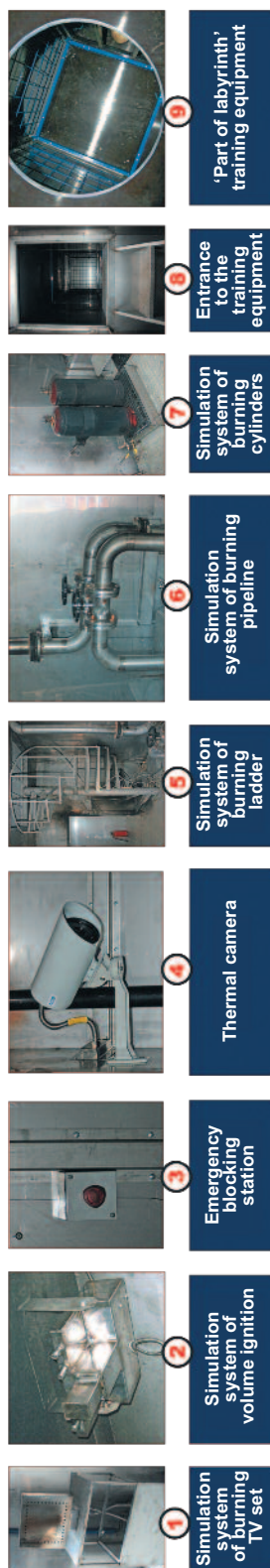
**The control room** enables the instructor to monitor and to control the training, to issue verbal instructions and to receive reply by the communication

system. The training can be recorded by heat-resistant video cameras for further analysis. During the training, a blood pressure and pulse of each participant is also supervised by the Cardio Control System (CCS) from the control room. After training it is possible to define the used quantity of extinguishing agent which allows in real conditions to carry out fire extinguishing with minimal consumption.

In case of emergency, the training process can be stopped by pushing an emergency stop button either in the control room (by instructor) or in all three exercise rooms (by trainee). The training also stops automatically when gas concentration or temperature limiting values are exceeded. These important values are controlled by integrated sensors in all exercise rooms. When emergency alarm is activated the following procedure is triggered simultaneously and automatically: alarm sounds, lights turn on, all fire simulators and gas flow shut off completely and exhaust ventilation begins.

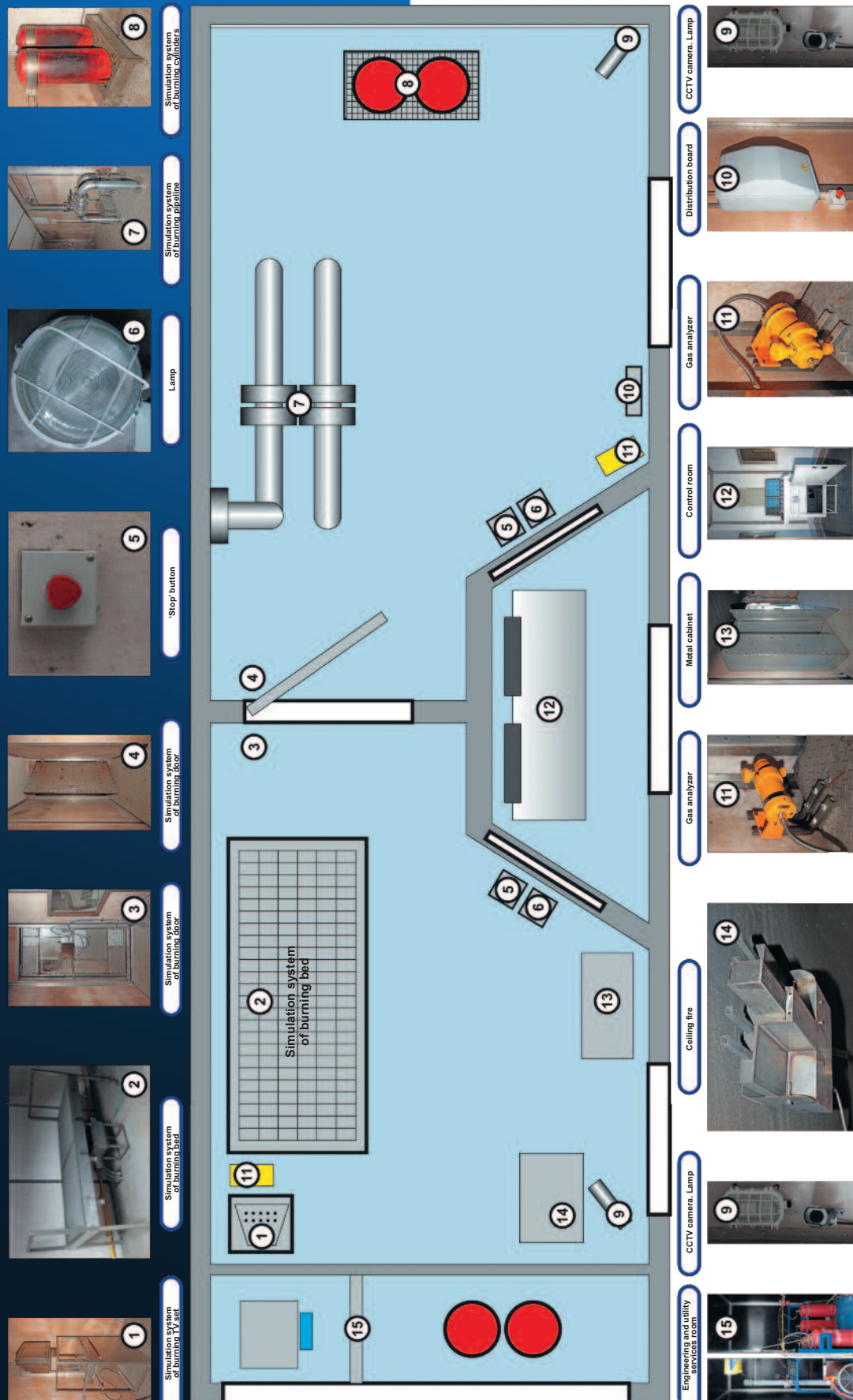


PTS 'LAVA' Scheme of mobile fire range





PTS 'LAVA' Scheme of stationary fire range





## “Fire-House”



**“Fire-House” Automated Educational and Instructional Fire Facility** (Fiery House) is designed for practical training of smoke divers (rescuers) to work with different types of personal protective equipment in a smoked up ambient atmosphere, being exposed to fire and high temperatures and practice firefighting tactics and rescuing people.

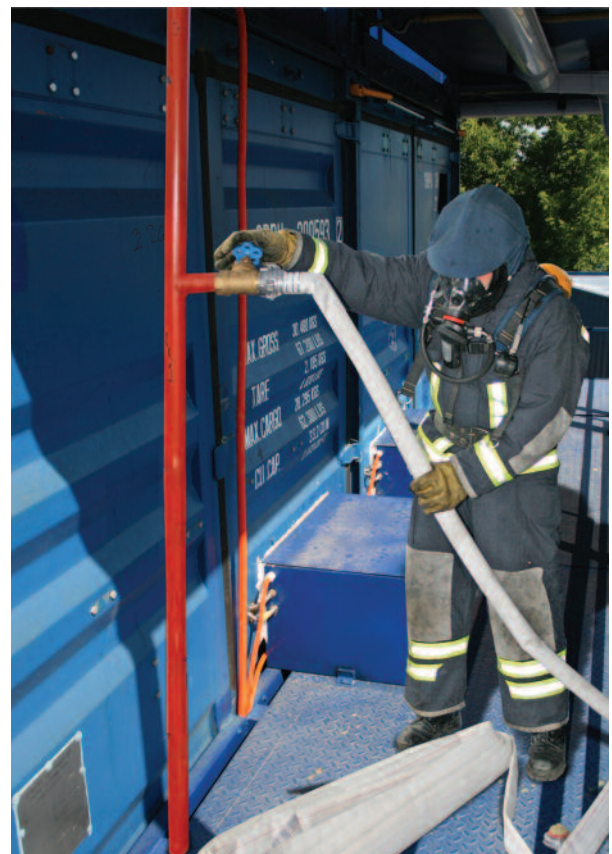
This is the end product that does not require any additional options and financial expenses, accordingly.





The complex includes 8 block-modules:

- Control module and medical supervision station
- Classroom
- “Industrial area” module.
- “Collector-cellar” module
- “Apartment and roof” module
- Heating module
- Pump room and wastewater treatment facilities
- Gas storage facility.



## “UTMK” Educational and Training Simulating Facility

**“UTMK” Educational and Training Simulating Facility** is designed to develop skills of using new facilities and firefighting technologies, as well as to train firefighters to work in extremely severe and aggressive conditions.



The facility consists of:

- control block-module, consisting of the console compartment with a classroom for constant monitoring of the training progress, maintenance of voice communication, as well as management of all systems and equipment industry;
- technical systems block-module, consisting of the heating systems and water supply compartment and flammable substance storage and distribution compartment;
- orientation block-module for training firemen's endurance and stamina in confined spaces and challenging obstacles;





- transportation of hazardous chemical substances block-module, intended for practical training of firefighters to work with hazardous chemical substances using leakage simulators;
- transport emergency containment block-module, consisting of two simulators: railway tank and car tank simulators.

- fire block-module designed for practical training of fire fighters' to work with different types of personal protective equipment in a smoked up ambient atmosphere, being exposed to fire and high temperatures and practice firefighting tactics;
- chlorine emergency containment block-module, which allows to simulate several typical chlorine emergencies;
- refrigeration unit emergency containment block-module, a model of the manufacturing room with equipment, which allows to simulate several typical accidents dealing with gas and liquid freon leaks;



## PTS “UGOLEK” Training Fire Facility



This facility is designed for firefighters and rescuers to have training exercises under the conditions of fire hazards (smoke, heat, open flame, heat radiation), which are simulated by burning solid fuel in the furnace.

The design of the fire facility allows for conducting exercises under reproducible and controllable conditions, their safety ensured by the means of controlling gas flow in a complex with the help of extinguishing agents.

PTS “Ugolek” (Ember) is mounted inside shipping containers; it includes training, technical and console compartments.



## PTS “PROMETHEY” Mobile Training Fire Facility

**PTS “Prometey”** (Prometheus) is a mobile facility (fire bath) of modular design, which can be equipped with different fire-simulating modules, depending on the training requirements.

Various scenarios of fires are simulated by burning propane under constant supervision.

PTS “Prometey” is designed to develop skills of using fire extinguishers before the arrival of fire brigade.

Modes of module control: manual or automatic.

Main Features:

- mobility and ease of use;
- environmentally friendly owing to the use of propane gas;
- can be deployed almost anywhere;
- has different fire simulation scenarios;
- is used with all types of hand-held extinguishers, from compressed air foam to powder and carbon dioxide ones;
- easy to maintain due to modern modular design;
- requires low maintenance and training expenses.



Burning Oil



Monitor



Wastepaper Basket



Electric Motor

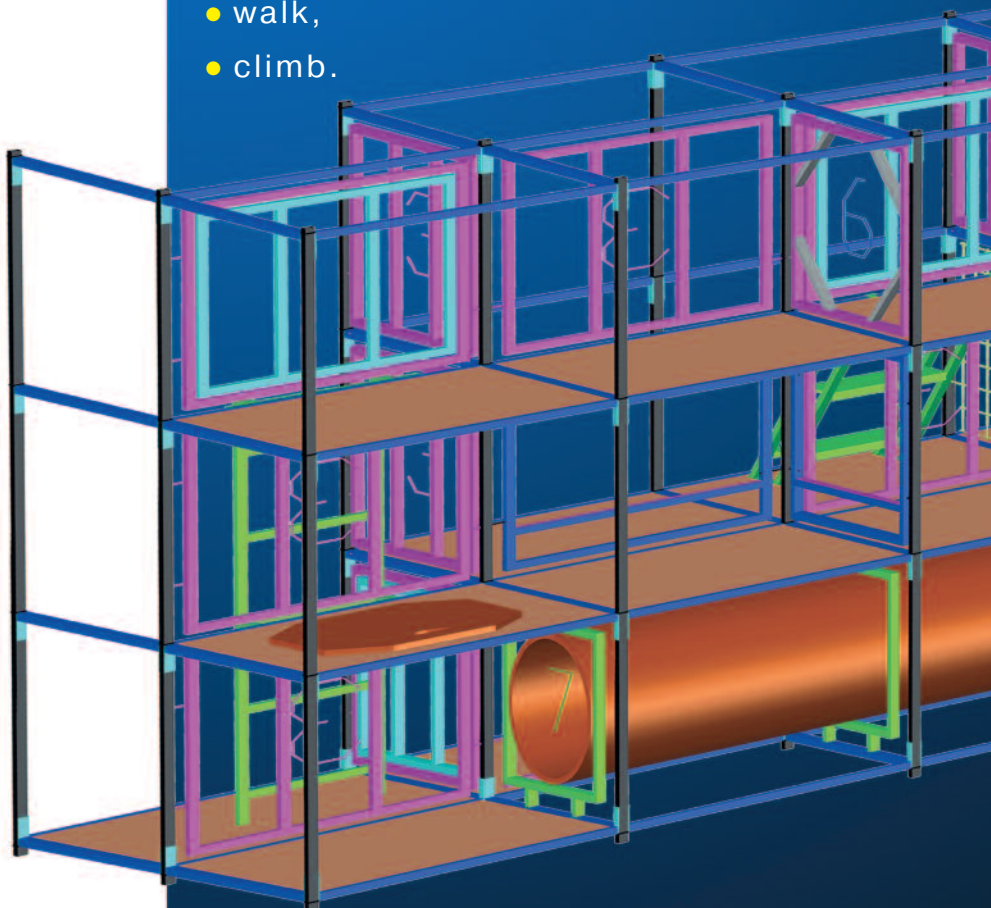
Electricity Closet



## Training Equipment for Training Facilities and Range

**“Labirint” Orientation Training Equipment** designed in three height levels allows you to:

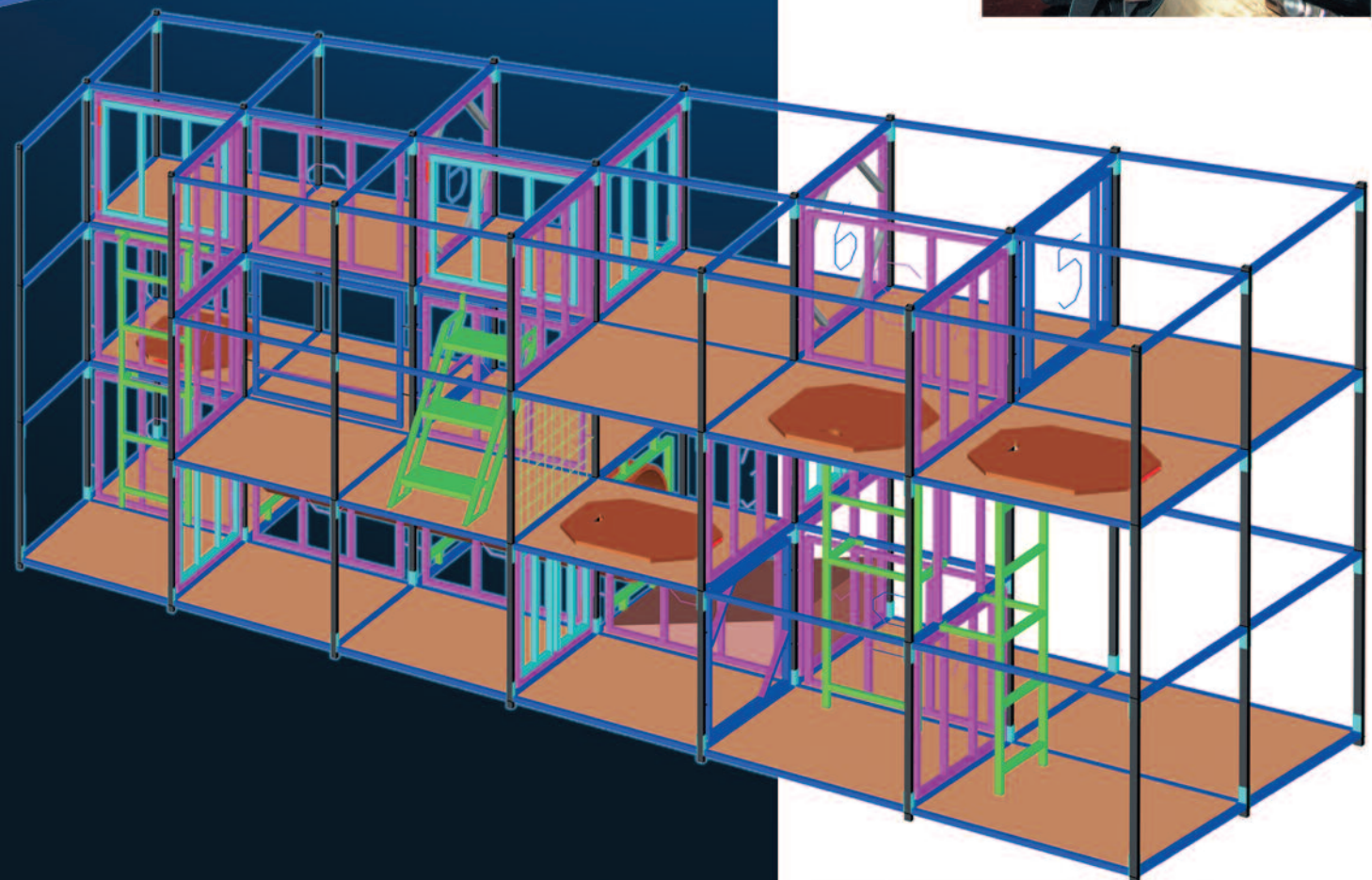
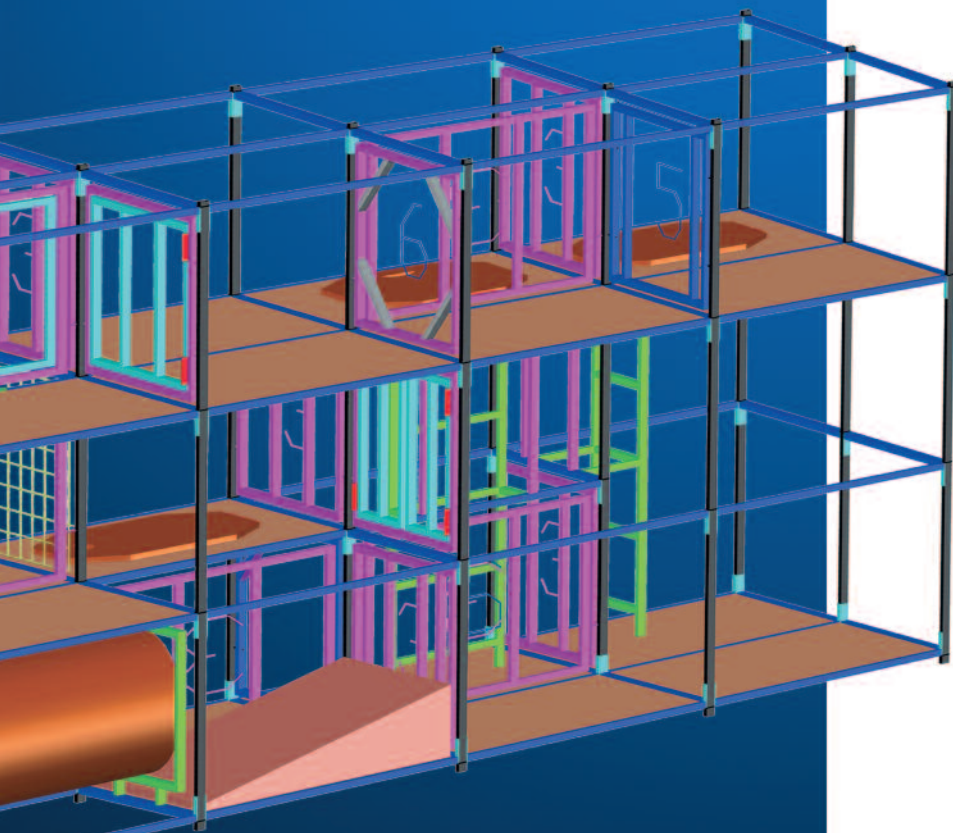
- crawl,
- walk,
- climb.



In order to try out certain exercises in the course of training the following simulation objects are applied in the labyrinth:

- hatches and narrow manholes of different configurations;
- slope areas with a gradually varying height;
- self-closing doors and windows (controlled from the operator panel);
- slope and vertical ladders;
- pipe for crawl passing;
- dummy.



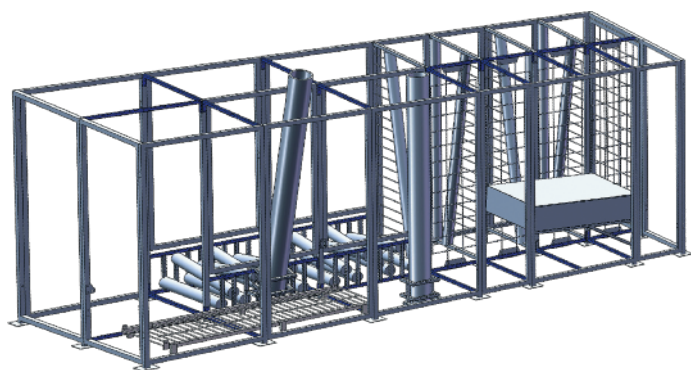




**“Uzkyi Laz’” (Crawlway) Simulation System** is a construction with a varying angle of joints’ slope, which ensures the effectiveness of the training process in accordance with modern requirements for training specialists.

Joints of the simulation systems:

- Vertical module with a ladder;
- Horizontal module;
- Sloping module with a ladder.



**“Zavaly” (Debris) Training Equipment** is represented by a range of obstacles that allows for practicing skills of orientation, passing crawlways and obstacles and rescuing a man using a special tool. Moreover, with the help of rocking floors and crashing of pipe segments included in the construction of this training equipment, firefighters develop their vestibular apparatus, agility, alertness and quick response.

Elements of the training equipment:

- crashing constructions;
- rocking floor;
- crawlways;
- simulation system of a crashed concrete floor panel;
- simulation system of a rough surface;
- simulation system of a locked metal door;
- simulation system of a metal lattice.



**“Rezervuar”** (Reservoir) **Training Equipment** is designed for preparing professionals to conduct rescue operations and save people from the tanks and special containers using respiratory protective equipment and special protective clothing.

The training equipment contains the following elements:

- three cupola-shaped elements with a window opening and two partitions;
- two hatches;
- two external ladders;
- two internal ladders;
- platform;
- handrail.

Size: 3707x2000x2690 mm



The training complex **PTS “Nautilus”** is designed for practicing skills in the use of technical means and elimination of consequences of accidents involving gas and liquid leaking rail tank cars and tank trucks.



## Fire training modules



**Burning Ladder Simulation System** is a spiral ladder with handrails, consisting of 12 steps. Six lower steps are evenly spaced with fixed burners. Steps ignition happens consequently, in a certain period of time.

Flame intensity is regulated by the gas volume supplied to the burners.

In order to control fire extinguishing the simulation system is equipped with sensors



**Burning Door Simulation System** ("Burning Door") consists of a door frame, door and a handle. Burners are fixed in the door frame and the door.

If the door is closed, it is heated from the inside.

When the door is opened, it is ignited together with the door frame, simulating the effect of reverse thrust. When the door is closed, the flame goes out.

In order to control fire extinguishing the simulation system is equipped with sensors.





**Burning Bed Simulation System** ("Burning Bed") consists of a steel net bed one hundred and sixty-by-ninety cm.

Fixed on a horizontal bed surface burners create a low flame that gradually increases and covers the entire surface of the bed.

The simulation system is equipped with sensors to control fire extinguishing.



**Burning TV Set Simulation System** ("Burning TV Set") is represented by a monitor with fixed burners mounted on the nightstand.

The simulation system is equipped with sensors to control fire extinguishing.





### **Cableways Simulation System** (“Burning Cable Tray”)



It is designed for fire simulation in cableways and tunnels. It is made of heavily alloyed metal and fixed on a wall. Temperature sensors are fixed on the working floor.

### **Oil Spill Simulation System** (“Fire Bath”)



It is represented by a netted fire module with fixed burners producing flame over the surface and maintaining it on the given level of combustion.

### **Volume Ignition Simulation System** (“Ceiling Fire”)



It simulates the ignition of gas-air mixture and is located at the end of the living area.

Compared to other simulation systems this one has a stronger psychological impact on trainees and makes it possible to train the skills of extinguishing the similar combustion.



**Roof Ignition Simulation System** (“Burning Roof”) is represented by a fire module at an angle. As a rule, it is installed on the roof of the training complex, aslope to the edge.



**Burning Kitchen Entresol Simulation System** (“Burning Kitchen”) and Burning Stove Simulation System (“Burning Stove”) are designed for practicing fire extinguishing in kitchens. As a rule, not only faulty gas stoves, electric kettles and fryers burn on their own, but they also ignite boxes and kitchen entresols located above them. The simulation system is represented by fire modules with fixed burners and temperature sensors.





**“Zadvizhka” (Gate Valve) Training Equipment** is designed for training specialists to conduct emergency and recovery operations in the petrochemical, chemical and gas enterprises, in the metallurgical industry and community facilities, as well as Russian Ministry of Emergency Situations divisions.



**Burning Cylinders Simulation System** (“Burning Cylinders”) consists of two vertical cylinders.

Both cylinders are heated from the bottom and inside.

In order to control fire extinguishing the simulation system is equipped with sensors.



## Simulators general function

**Endless Ladder training equipment** is designed for practicing climbing stairs in the heat zone.

It is a general-purpose training machine that makes it possible for trainees to get controlled, predetermined and variable physical load, defined remotely from the operator panel.

**Power Ergometer training equipment** is designed so that trainees get traction load in the heat zone. It is a general-purpose training machine that makes it possible for trainees to get controlled, predetermined and variable physical load, defined remotely from the operator panel.

With the help of the rope roller, the training equipment provides for loading 25 kg clear of and on ground.

**Treadmill training equipment** is designed for walking (running) exercises in the heat zone. It is a general-purpose training machine that makes it possible for trainees to obtain controlled, predetermined and variable physical activity, defined remotely from the operator panel.





## Traning simulation system

**Burning Pipeline Simulation System** ("Burning Pipelines") consists of two pipelines with clamping shoulders and stop valve:

Pipeline 1

bottom pipeline gas leak,

Pipeline 2

top gas pipeline leak

Fire is extinguished by turning the stop valve.

In order to control fire extinguishing the simulation system is equipped with sensors.

**Gas Leak Simulation Training Equipment** is designed for training specialists to eliminate leaks from gas pipe lines during emergency and recovery operations in the petrochemical, chemical and gas enterprises, in the metallurgical industry and community facilities, as well as the State Fire Service of Ministry of Emergency Situations of Russian Federation divisions.

The stand has no analogues in Russia, possesses a number of advantages and ensures the effectiveness of the training process in accordance with modern requirements for training specialists.

**"MITya" Simulation Dummy for Training** is designed for practicing search and rescue operations in the emergency area. In comparison with other popular analogues dummy possesses a number of advantages and ensures the effectiveness of the training process in accordance with modern requirements for training specialists.

Dummy weight is 50 kg.



## Console Compartment

**Console Compartment** is a space for a chief instructor. There is a control panel designed for the complete control over the training process:

- training equipment and simulation systems control;
- video recording of training activities for their further analysis;
- constant control over physiological data (heart rate and blood pressure);
- console compartment also provides data on the amount of extinguishing material spent which is convenient for reducing costs on fire extinguishing.

In case of emergency, all data are transferred to the control board, causing fire alarm system to start out, which blocks operation of all special effects and training machines, disables feeding of gas to the fire simulation systems and involves the ventilation and lighting system in the training compartments.







**Medical Supervision Station** is designed for control of the trainees' physical condition and rapid delivery of pre-hospital medical care in case of emergency.

Health control station consists of a couch, first aid kits and a stand-poster on how to provide first aid.

**Training Room** is equipped with computers, visual aids and stands with information about self-contained breathing apparatus, rules on their usage and maintenance, methods of calculating work parameters in the unbreathable environment. It is designed for training and performance rating of smoke divers.





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