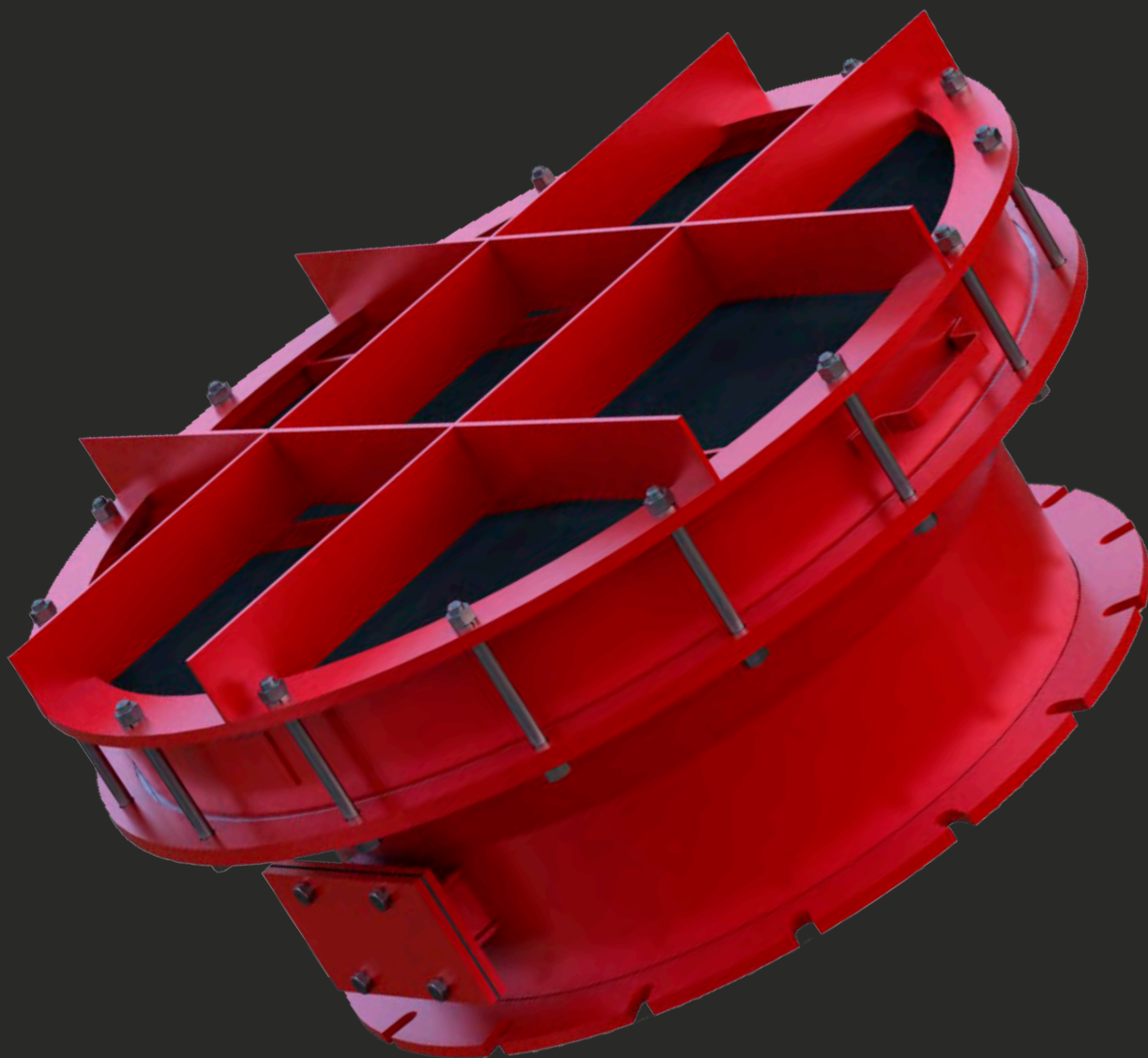


# PRODUCT CATALOG

TANK EQUIPMENT  
and FLAME ARRESTERS



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## **TANK EQUIPMENT**

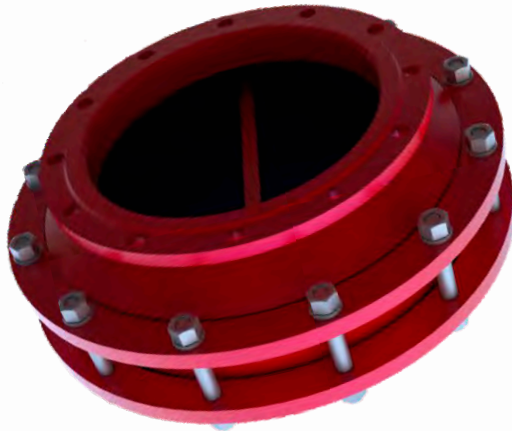
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# OP-1

## Communication Flame Arrester



### Field of application

Flame arrester is designed to extinguish the flames and air shock waves generated during fire or explosion of a gas-vapor mixture transported through the pipeline. A flame arrester can be equipped with pipelines through which gas-vapor-air mixture (GPVS) is transported to hazardous production facilities, including coal mines hazardous for gas and (or) dust. Flame arrester can be used on surface and underground gas extraction and degassing plants, as well as in degassing systems of mines with various parameters of the gas-vapor-air mixture transported through pipelines.

### Specifications

Characteristics	Value
Concentration of the hazardous substance in GPVS, % volume.	0 - 100
The concentration of dust in GPVS, grams / meter.	0 - 3000
Safe experimental maximum clearance for different groups of equipment for explosive gas environments, mm	I - 1,16 mm IIA - >0,9 mm IIB - 0,5-0,9 mm IIC - <0,5 mm
Time of preservation of working capacity at influence of a flame, not less, seconds.	3600
Maximum surface temperature: from the influence of the flame from the opposite side.	before 600 °C* before 150 °C*
The living section of the flame element, not less than %.	62,4
Standard size (conditional pass), mm.	50 - 1500
The overlap time (in the presence of flow cutoff), no more than seconds.	90 - automatic 120 - manual
The moisture content in the main fueling plant, not more, grams / m <sup>3</sup> .	590
The amount of moisture at the separator outlet (if any), grams / meter, not more.	0,05±0,01
Bandwidth, not more than, meter / hour.	Depending on the type, modification and size
Pressure drop, not more,% of pressure difference used equipment (fan, vacuum pump).	10
Dimensions and weight	Depending on the type, modification and size

## FLAME ARRESTER

\* - depends on the material and the protected environment.  
Main standard sizes, overall dimensions and mass of products.

Standard size		OP-40	OP-50	OP-80	OP-100	OP-150	OP-200	OP-250	OP-300	OP-350	OP-500
Conditional pass		40	50	80	100	150	200	250	300	350	500
Air flow resistance 118 Pa, m <sup>3</sup> /h		12	35	80	200	215	380	600	750	900	2950
Dimensions, mm	Dn	65	140	185	220	290	375	450	530	600	860
	H	100	80	80	250	260	270	240	300	440	500
Connecting dimensions, mm	D	-	140	185	205	262	315	370	435	485	644
	D1	-	110	150	170	225	280	335	395	445	600
	d	12	14	18	18	18	18	18	22	22	22
	n	2	4	4	4	4	4	4	6	6	8
Weight, kg		1	2,4	4,8	13,4	27	30	32	50	75	140

### System components

Delivery set of flame arrester depending on the modification

Name of components	Modification							
	1	2	3	4	5	6	7	8
Fire arrester OP-1	1	1	1	1	-	-	-	-
Fire arrester OP-1 in the shell	-	-	-	-	1	1	1	1
Separator of gas-steam-water mixture SGPVS	-	1	-	1	-	1	-	1
OTP flow cutter	-	-	1	1	-	-	1	1

### Principle of operation

In standby mode, the main fire pump then passes freely through the components of the flame arrester. Working mode occurs during ignition of a hazardous substance in the pipeline and flame "landing" on the flame-extinguishing OP-1 elements, fixed with temperature sensors.

In operation, reaching the flame-retarding elements of the OP-1, will stop. Overpressure is dumped into ambient atmosphere with safety devices installed on the pipeline.

In the OP-1 modification with a shell, the shell is covered with a fire barrier, separator SGPVS (if available) and OTP flow cutoff (if available).

### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-011-16320375-2016

# OP-1D

## Detonation Flame Arrester



### Field of application

Communication detonation flame arresters are dry-type fire arresters and are intended for installation on gas-oil pipelines and other technological equipment operating at pressures up to 4.0 Mpa (40 kgf / cm<sup>2</sup>), where there are hot mixtures that are prone to detonation burning and prevent the spread flame through the pipeline if it occurs. By the time of performance when exposed to the flame, flame arrester belongs to class II according to GOST R 53323-2009, the service life is not less than 10 minutes, at the place of installation - a communication one; as for a flame element, a cassette one.

The flame arrester is used in an explosive zone of class 0 in terms of frequency and duration of the presence of explosive gas mixture according to GOST R 51330.9-99 (IEC 60079-10-95), for explosive mixtures belonging to category II A according to safe experimental clearances (BEMP) and minimal igniting currents (MW) according to GOST R 51330.11-99 (IEC 60079-12-78), for explosive mixtures of gases and vapors, TK corpses according to auto-ignition temperature according to GOST R 51330.5-99 (IEC 60079-4-75).

In terms of resistance to environmental climatic factors, the arrester is manufactured in U, UHL, product placement category - 1 according to GOST 15150-69.

### Specifications

Characteristics		Value								
		OP-1D-32	OP-1D-50	OP-1D-100	OP-1D-150	OP-1D-200	OP-1D-250	OP-1D-300	OP-1D-500	OP-1D-600
Nominal pipe size, mm		32	50	100	150	200	250	300	500	600
Working pressure, Mpa (kg/cm <sup>2</sup> ), max		4,0 (40)								
Air flow resistance 118 Pa, m <sup>3</sup> /h, min		6	25	150	215	380	600	700	2950	3000
Dimensions, mm, max	diameter	160	180	330	390	445	550	635	995	995
	height	300	326	486	529	627	687	703	980	980
Connecting dimensions, mm	diameter of hole centers	100	125	190	250	320	385	450	670	795
	diameter holes	18		22	26	30	33		45	52
	number of holes	4		8		12		16	20	
Weight, kg, max		22	24	74	114	182	282	393	1180	1220

### System components

Flame arrester can be additionally equipped with counter flanges with gaskets, studs, washers and nuts. An additional set of parts can be installed on the product of its transportation.

### Principle of operation

The extinguishing effect of the flame arrester is based on the principle of heat extraction by the walls of the narrow channels of the cassette, formed by corrugated and flat tapes of stainless steel or aluminum. After triggering flame arrester its flame arresting element - the cassette must be replaced with a new one.

# OP-1Y

## Controlled Flame Arrester



### Field of application

Communication flame arrester with the possibility of monitoring and control of the OP-1Y is designed:

- to extinguish the flame and air shock wave generated by ignition or explosion gas-vapor mixture (hereinafter referred to as SPVS), transported through the pipeline;
- to monitor and control the OP-1Y.

OP-1Y can be equipped with pipelines, which are transported GPVS, at hazardous production facilities, including coal mines hazardous for gas and (or) dust.

OP-1Y can be used on surface and underground gas recovery units (GOU) and degassing installations (DU), as well as in the degassing systems of mines with various parameters of methane-air mixture (HPVS), transported through pipelines.

## Specifications

Characteristics	Value
Concentration of the hazardous substance in GPVS, % volume.	0 - 100
The concentration of dust in GPVS, grams / meter.	0 - 3000
Safe experimental maximum clearance for different groups of equipment for explosive gas environments, mm	I - 1,16mm IIA - >0,9 mm IIB - 0,5-0,9mm IIC - <0,5 mm
Time of preservation of working capacity at influence of a flame, not less, seconds.	3600
The living section of the flame element, not less than %.	62,4
Standard size (conditional pass), mm.	50 - 1500
Setting the temperature to form a trigger command, C (for OP-1Y)	57±0,5
The overlap time (in the presence of flow cutoff), no more than seconds.	90
The moisture content in the main fueling plant, not more, grams / m <sup>3</sup> .	590
The amount of moisture at the separator outlet (if any), grams / meter, not more.	0,05±0,01
Bandwidth, not more than, meter / hour.	Depending on the type
Pressure drop, not more,% of pressure difference used equipment (fan, vacuum pump).	10
Dimensions and weight	Depending on the type, modification and size

## System components

The composition of OP-1Y depends on the group of equipment for explosive gas environments and modifications. Availability and quantity components and components OP-1Y for II groups of equipment for explosive gas environments presented in the table.

Name of components	Modification			
	1	2	3	4
Fire arrester OP-1	1	1	1	1
OTP flow cut-off valve (with MOEF-630 actuator)	-	1	-	1
SGPVS gas-vapor-air separator	-	-	1	1
Pressure sensor METRAN 150	2	2	2	2
Temperature sensor METRAN 276	2	2	2	2
TM-5122 controller	1	1	1	1
The annunciator the security and fire combined "CORBU"	1	1	1	1
Control cabinet SHUZ-1-380	-	1	-	1

Availability and number of components and components OP-1Y for the first group of equipment for explosive gas environments are presented in the table.



## FLAME ARRESTER

Name of components	Modification							
	1	2	3	4	5	6	7	8
Fire arrester OP-1	1	1	1	1	1	1	1	1
OTP flow cutter (electrically operated PrimAR-800F)	-	1	-	1	-	1	-	1
Separator of gas-vapor-air mixture SGPVS	-	-	1	1	-	-	1	1
Pressure sensor MIDA-DIV-13P-Ex	2	2	2	2	-	-	-	-
Temperature sensor MNTL-RIVAS	2	2	2	2	-	-	-	-
The controller "ENIKOMP" TsAUK-2.3.1.1	1	1	1	1	-	-	-	-
Light and sound siren EV-4050-HOOTER/12	1	1	1	1	-	-	-	-
Power supply SHIP-S.0.0.03 + 12	1	1	1	1	-	-	-	-
Signal repeater PS 02	1	1	1	1	-	-	-	-
Box assembly CCFE-45BP in the layout: - interface relay RSB1A120jDS: - dividing plate NSYTRAP24: - screw terminal screw 2.5 mm <sup>2</sup> AB1VV235UBL: - screw terminal screw 2.5 mm <sup>2</sup> AB1VV235UHW:	1	1	1	1	-	-	-	-
The equipment of the operating efficiency of gas extraction installations and degassing systems "KRUG" consisting of: - Mine power source SHIP-S.0.0.03 + 12; - computing unit VB-04; - DTM temperature sensor; - signaling device SU-24.11-00.00.00 / 00; - pressure sensor SDD01; - signal repeater PS 02;	-	-	-	-	1	1	1	1

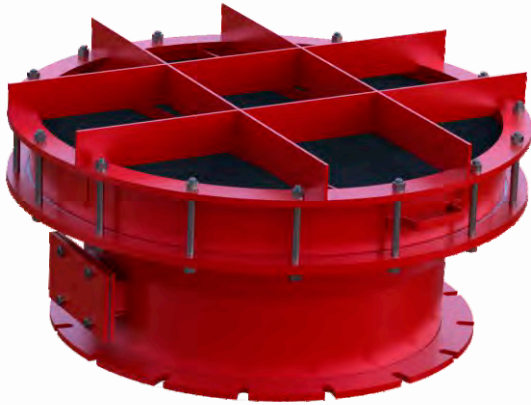
### Principle of operation

In the operating mode, the flame, having reached the flame-retarding elements of the OP-1, will stop. Sensors will detect a temperature increase. The signal goes to the controller. There is a sound and light alarm. Also from the signal from the controller turns on the actuator motor (electric drive) OTP.



# OP-2

## Cassette Terminal Flame Arrester



### Field of application

The flame arrester OP-2 is designed to protect people, pipelines and equipment from explosive damage, waves and striking elements. Flame arrester OP-2 is installed on the pipe of the protected pipeline or equipment. In certain cases, an explosive safety valve VPK can be mounted on the pipeline nozzle.

OP-2 flame arrester mounted on top of the valve MIC.

### Specifications

Characteristics	Value				
Nominal pipe size, mm	400	500	600	700	800
Height H, mm	440				
Diameter, D, mm	580	720	880	1020	1170
Hole spacing, Do, mm	488	595	695	785	885
Hole size b x h, mm	18x34				
Number of holes, n, pcs	12	16		20	
Center distance of the lugs Dp, mm	600	685	810	905	1005
Number of lugs, pcs	4			5	

A new generation of OP-2 end fire arresters has been developed taking into account the established requirements for this type of product.

### System components

The scope of delivery of the flame arrester includes:

- OP-2 assembly;
- Gasket;
- Operational documentation.

OP-2 can be installed without an explosive safety valve, for example, on the breathing nozzle.

### Principle of operation

In the operating mode in the presence of the VPK, to the OP-2, the integrity of the VPK membrane is violated, the flame reaches the flame-retarding OP-2 elements will stop. In the operating mode without the VPK, when the main fire pump is ignited, the flame, having reached the flame-retarding elements of the OP-2, will stop.

# KDM 150 P



## Mechanical Breather Valves

### Field of application

Mechanical breathe valves of the type KDM-150 with built-in flame arrester (hereinafter referred to as valves), designed to seal the gas space of tanks with light oil products and to regulate pressure in this space within the specified limits in order to reduce losses from the evaporation of petroleum products and reduce pollution.

Valves are components of tanks for petroleum products.

### Specifications

Characteristics		KDM 150/100	KDM 150/150	KDM 150/200	KDM 150/250
Nominal pipe size, mm		100	150	200	250
Working pressure, Pa (mm.wc), max		2000 (200)			
Working vacuum, Pa (mm.wc), max		250 (25)			
Trigger pressure, Pa (mm.wc), max		1350-1450 (135-145)			
Trigger vacuum, Pa (mm.wc), max		100-150 (10-15)			
Bandwidth, Pa (m <sup>3</sup> /h), max		150	200	220	250
Dimensions, mm, max	length	550	530	550	550
	width	450	470	450	450
	height	644	645	624	624
Connecting dimensions, mm	D	205	260	315	370
	D1	170	225	280	335
	d	18	18	18	18
	n, pcs	4	4	4	6
Weight, kg, max		32	36	38	40

### System components

The delivery set of the mechanical breather valve includes:

- Breathing valve KDM-150 - 1 pcs;
- instruction manual - 1 pcs;
- spacer - 1 pcs;

- pressure plate - 1 pcs;
- vacuum plate - 1 pcs;
- pressure plate suspension - 1 pcs;
- vacuum plate suspension - 1 pcs.

#### **Principle of operation**

When the "inhale" of the tank in the valve cavity creates a vacuum equal to the vacuum in the gas space of the tank. With the achievement of the calculated value of vacuum (vacuum of operation) in the valve cavity of the vacuum shutter plate open, giving the gas space of the tank with the atmosphere, ensuring the passage of air into the tank. With reducing the vacuum below the calculated value, the valve closes and the tank is sealed. When the expiration of the tank in the cavity of the valve body creates an excess pressure equal to the excess pressure in gas reservoir space. This pressure presses the plates of the vacuum closures to the saddles and acts on plate pressure shutter, seeking to raise it. If excess pressure in the valve body is exceeded opening pressure, the valve plate opens and gas is released from the tank to the atmosphere. After reducing excess pressure below the calculated value plate returns to its original position (gate closes).

#### **Warranty period of operation**

Warranty period of operation - 24 month.

#### **Product life**

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-006-16920375-2016

# KDM 200 K



## Mechanical Breather Valves

#### **Field of application**

Mechanical breather valves KDM-200 with built-in flame arrester (hereinafter referred to as valves), designed to seal the gas space of tanks with light oil products and to regulate pressure in this space within the specified limits in order to reduce losses from the evaporation of petroleum products and reduce pollution.

Valves are components of tanks for petroleum products.

## TANK EQUIPMENT

### Specifications

Characteristics	KDM - 200/100	KDM - 200/100	KDM - 200/100	KDM - 200/100	
Nominal pipe size, mm	100	150	200	250	
Working pressure, Pa (mm.wc), max	2000 (200)				
Working vacuum, Pa (mm. wc), max	250 (25)				
Trigger pressure, Pa (mm. wc), max	1350-1450 (135-145)				
Trigger vacuum, Pa (mm. wc), max	100-150 (10-15)				
Bandwidth, м3/h, max	150	200	220	250	
Dimensions, mm, max	height H	510	545	553	575
	diameter B	380	380	380	450
Connecting dimensions, mm	D	205	260	315	370
	D1	170	225	280	335
	d	18	18	18	18
	n, pcs	4	8	8	12
Weight, kg, max	31				

### System components

Are included in the package of delivery of the KDM:

- Breathing valve KDM-200 - 1 pcs;
- instruction manual - 1 pcs;
- spacer - 1 pcs;
- pressure plate - 1 pcs;
- vacuum plate - 1 pcs;
- pressure plate suspension - 1 pcs;
- vacuum plate suspension - 1 pcs.

### Principle of operation

When the "inhale" of the tank in the valve cavity creates a vacuum equal to the vacuum in the gas space of the tank. With the achievement of the calculated value of vacuum (vacuum of operation) in the valve cavity of the vacuum shutter plate open, giving the gas space of the tank with the atmosphere, ensuring the passage of air into the tank. With reducing the vacuum below the calculated value, the valve closes and the tank is sealed. When the expiration of the tank in the cavity of the valve body creates an excess pressure equal to the excess pressure in gas reservoir space. This pressure presses the plates of the vacuum closures to the saddles and acts on plate pressure shutter, seeking to raise it. If excess pressure in the valve body is exceeded opening pressure, the valve plate opens and gas is released from the tank to the atmosphere. After reducing excess pressure below the calculated value plate returns to its original position (gate closes).

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-006-16920375-2016

# KDS 1500 K, KDS 3000 K

## Combined Breather Valves



### Field of application

Combined breather valves with a built-in flame arrester (hereinafter referred to as valves), designed to seal the gas space of tanks with light oil products and to regulate pressure in this space within the specified limits in order to reduce losses from the evaporation of petroleum products and reduce pollution.

Valves are components of tanks for petroleum products.

### Specifications

Characteristics	KDS - 1500/150	KDS - 1500/200	KDS - 1500/250	KDS - 1500/350	KDS - 1500/500	
Nominal pipe size, mm	150	200	250	350	500	
Working pressure, Pa (mm.wc), max	2000 (200)					
Working vacuum, Pa (mm.wc), max	250 (25)					
Trigger pressure, Pa (mm.wc), max	1500-1600 (150-160)					
Trigger vacuum, Pa (mm.wc), max	100-150(10-15)					
Bandwidth, Pa (m <sup>3</sup> /h), max	450	750	1000	1300	1500	
Dimensions, mm, max	length/width	880/880				
	height	765				
Connecting dimensions, mm	D	260	315	370	485	640
	D1,	225	280	335	445	600
	d	18	18	18	22	22
	n, pcs	8	8	12	12	20
Weight, kg, max	75					

## TANK EQUIPMENT

The main parameters and dimensions of the KDS-3000 K

Characteristics	KDS - 3000/250	KDS - 3000/350	KDS - 3000/500	
Nominal pipe size, mm	250	350	500	
Working pressure, Pa (mm.wc), max	2000 (200)			
Working vacuum, Pa (mm.wc), max	250 (25)			
Trigger pressure, Pa (mm.wc), max	1500-1600 (150-160)			
Trigger vacuum, Pa (mm.wc), max	100-150(10-15)			
Bandwidth, Pa (m3/h), max	1100	2400	3000	
Dimensions, mm, max	length/width	1205/1205		
	height	1010		
Connecting dimensions, mm	D	370	485	640
	D1,	335	445	600
	d	18	22	22
	n, pcs	12	12	20
Weight, kg, max	145			

### System components

Are included in the package of delivery of the KDS:

- valve breather assembly, 1 pcs;
- vacuum plate assembly, 1 pcs (delivered by additional order);
- pressure plate assembly, 1 pcs (delivered by additional order);
- fluoroplastic film for a vacuum saddle of 1 kit;
- Fluoroplastic film for pressure seat, 1 kit;
- membrane fluoroplastic plates of vacuum and pressure, 1 kit;
- suspension of vacuum plates, 1 kit;
- suspension of pressure plates, 1 kit;
- spacer, 1 pcs;
- reflector disc assembly, 1 pcs. (delivered by additional order);
- manual, 1 pcs.

### Principle of operation

When the "inhale" of the reservoir in the valve cavity creates a vacuum equal to the vacuum in the gas space of the reservoir. Upon reaching the calculated value of vacuum (vacuum of operation) in the valve cavity, the plates of the vacuum valves open, informing the gas space of the tank with the atmosphere, ensuring the passage of air into the tank. When the vacuum is lower than the calculated value, the shutter closes and the reservoir becomes fluidized.

When the expiration of the tank in the cavity of the valve body creates an overpressure equal to the pressure in the gas space of the tank. This pressure presses the plates of the vacuum closures to the seats and acts on the pressure plate in an effort to raise it. When excess pressure in the valve body is exceeded, the pressure plate opens and gas is released from the tank to the atmosphere. After reducing the excess pressure below the calculated value, the plate returns to its original position (the shutter closes).

### Warranty period of operation

Warranty period of operation - 24 month.

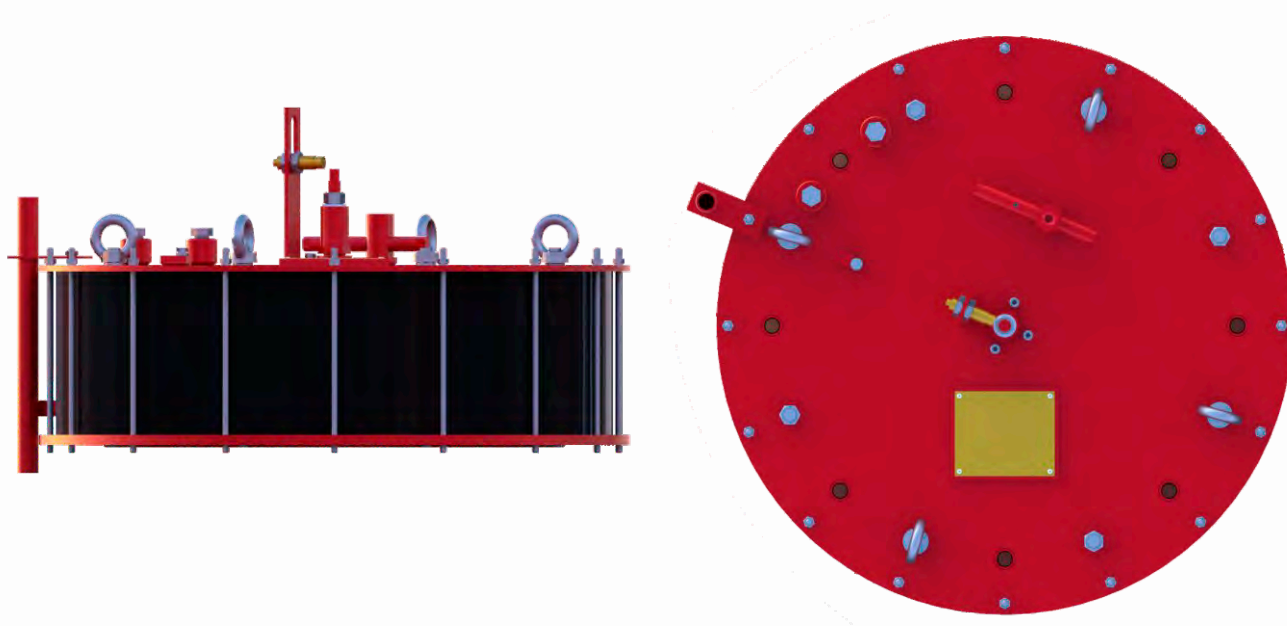
### Product life

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-006-16920375-2016

# VPKO

## Explosive Safety Valve with Flame Arrester



### Field of application

Explosion safety valve with flame arrester VPKO is designed to relieve pressure in the protected equipment, extinguishing of a flame and an air wave, formed at ignition or explosion of gas-vapor mixes inside the equipment.

### Specifications

	VPKO Characteristics							
	300	400	500	600	700	800	900	1000
Nominal pipe size, mm	300	400	500	600	700	800	900	1000
Drawdown pressure, kPa	25							
Working pressure, kPa	40							
Diameter D, mm	530	643	750	850	940	1040	1140	1240
Height with pointer H, mm	255	285	355	415	475	530	585	645
Hole spacing D2, mm	375	488	595	695	785	885	985	1085
Diameter holes, d, mm	18							
Number of holes, N, pcs	12		16			20		



## TANK EQUIPMENT

It is the ability of the valve to quickly close the outlet is its main advantage. It provides fast sealing of equipment and the lack of fresh air, which can lead to the formation of a new explosive mixture and repeated explosions in the protected equipment. Quick seal also increases the stopping time of the equipment, which is important in an emergency to make a decision or total absence of equipment stopping.

### **Values of the valve:**

- The presence of flaps (quick sealing of the protected equipment);
- The flame element (extinguishing the flame and reducing the blast wave);
- Radial location of the flame element (protection of direct visibility);
- Small valve dimensions (space saving);
- Low weight (ease of installation).

### **System components:**

- VPKO – 1 pcs;
- ZIP (pointer gasket, seat gasket, sensor gasket) is available on additional order;
- KOF (counter flange, gasket, fasteners) supplied by separate order;
- magnetic sensor of operating, pressure and temperature sensor are delivered by separate order;
- this operating manual;
- passport VPKO.00.000 PS;
- certificate of conformity;

### **Warranty:**

Appointed valve service life, years - 10  
(or before the first use to localize the flame);

Designated service life of the flame element, years - 10  
(or before the first use to localize the flame);

The average shelf life in the original packaging in the conditions of OZHZ according to GOST 15150, not more than, years - 3 (for components according to the relevant operational documentation).

After 2 years from the date of commissioning, the first localization of the flame or the replacement of the flame retardant element must be tested for the ability of the valve to localize the flame.

# OTR



## Disk Reflector

### Field of application

Disk reflectors OTR are designed to reduce the loss of oil and oil products from tanks when they are discharged by overpressure breathing valves.

### Specifications

Characteristics		Value				
		OTR-150	OTR-200	OTR-250	OTR-350	OTR-500
Nominal pipe size, mm		150	200	250	350	500
Dimensions, mm, max	length	560	661	774	973	1220
	width	468	611	814	1138	1450
	height	480	622	834	1164	1505
Weight, kg, max		5,7	7,95	11,1	16,5	24

### System components

Package Includes:

- Disk Reflector - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

Disk reflector is installed in the tank under the mounting pipe with a breather valve with a corresponding conditional passage. The disk reflector reduces the effect of forced convection during the evaporation of petroleum products from the surface of the tank, changing the direction of the air entering the tank from vertical to horizontal, so the intermixing of the vapor-air mixture occurs mainly in the layers adjacent to the roof of the tank.

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-005-16920375-2016

LZ



## Gauging Hatches

### Field of application

Gauging Hatches LZ are designed for measuring the level and sampling of petroleum products in tanks with oil and petroleum products. Gauging Hatches are components of tanks for petroleum products.

### Specifications

Characteristics		Value			
		LZ-50	LZ-80	LZ-100	LZ-150
Nominal pipe size, mm		50	80	100	150
length, mm, max		190	226	245	316
width, mm, max		140	185	205	260
height, mm, max		190	190	215	246
Connecting dimensions, mm	diameter of hole centers	110	150	170	225
	diameter holes	14	18	18	18
	number of holes	4	4	4	8
Weight, kg, max		1,2	2,7	2,5	4,1

### System components

Package Includes:

- Gauging Hatches - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

For the measurement of the level and sampling of petroleum products it is necessary to open the hatch. For this, the flywheel is unscrewed, the hinged bolt with the flywheel is retracted in one direction, and the lever with the lid in the other.

The hatch is mounted on the tank lid with a flange through the gasket.

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-007-16920375-2016



## Manhole Hatches

### Field of application

Manhole Hatches are designed for internal inspection, repair and cleaning of tanks for the storage and distribution of petroleum and petroleum products. Manhole Hatches are component parts of tanks for petroleum products.

### Specifications

Characteristics	Value			
	LL-600	LL-800	LL-600x900	LL-900x1200
Nominal pipe size, mm	600	800	-	-
Oval size, mm, max	-	-	600x900	900x1200
Outer diameter, mm	755	975	-	-
length, mm, max	-	-	1075	1375
width, mm, max	-	-	775	1075
height, mm, max	408	412	412	351
Reinforcing plate diameter, mm	1270	1650	-	-
Reinforcing plate size, mm	-	-	1270x1870	2000x2300
Weight, kg, max	208	362	322	475
Weight with rotator, kg, max	217	372	332	486

### System components

Package Includes:

- Light Hatches - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

The hatch is installed on the roof of the tank in the hole prepared in advance, after which the reinforcing flange is welded to the tank. As agreed with the customer, the hatches are manufactured with a turning mechanism

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-007-16920375-2016



## Light Hatches

### Field of application

Light hatches are intended for internal inspection and testing of tanks for oil and oil products before their repair.

Light hatches are components of tanks for petroleum products.

### Specifications

Characteristics	Value				
	LS-400	LS-500	LS-600	LS-800	LS-1000
Nominal pipe size, mm	400	500	600	800	1000
Outer diameter, mm	540	660	760	950	1150
Height, mm, max	380	450	450	500	500
Height with rotator, mm, max	570	700	700	750	750
Reinforcing plate diameter, mm	1000	1060	1060	1400	1500
Weight, kg, max	60	97	117	168	207
Weight with rotator, kg, max	69	106	128	180	218

### System components

Package Includes:

- Light Hatches - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

The hatch is installed on the roof of the tank in the hole prepared in advance, after which the reinforcing flange is welded to the tank.

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-007-16920375-2016

PV



## Vent Branch Pipe

### Field of application

Vent Branch Pipe are designed for ventilation and to prevent ingress of foreign objects inside. storage tanks for petroleum and petroleum products. PV are components of tanks for petroleum products.

### Specifications

Characteristics		Value									
		PV-50	PV-80	PV-100	PV-150	PV-200	PV-250	PV-300	PV-350	PV-500	PV-1000
Nominal pipe size, mm		50	80	100	150	200	250	300	350	500	1000
Dimensions, mm, max	length	130	180	200	250	400	470	530	620	810	1590
	width	130	180	200	250	400	470	530	620	810	1590
	height	213	236	250	290	530	590	690	780	1090	1838
Connecting dimensions, mm	flange diameter	140	185	205	260	315	370	435	485	640	1175
	diameter of hole centers	110	150	170	225	280	335	395	445	600	1120
	diameter holes	14	18					22			30
	number of holes	4			8			12		16	28
Weight, kg, max		3,5	5,2	6,2	9,1	16,9	23	30	39,2	67,8	207,8

### System components

Package Includes:

- Stripping Nozzle - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

Installation of the nozzle on the tank is made to the mounting flange of the tank through a gasket of oil and petrol resistant paronite with bolts

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 15 years.

The manufacturer guarantees compliance with the specification TU 3689-008-16920375-2016

# PZ, PZ1

## Stripping Nozzle



### Field of application

PZ are designed for stripping the bottoms of vertical cylindrical storage tanks. flooded oil. Two variants of connection of the cleaning-off nozzle with a tap are made: welded (PZ); and flange (PZ1). Stripping nozzles are components of tanks for petroleum products.

### Specifications

Characteristics		Value						
		PZ-80	PZ-100	PZ-150	PZ-200	PZ-250	PZ-300	
Nominal pipe size, mm		80	100	150	200	250	300	
Dimensions, mm, max	length	560	610	750	916	1050	1183	
	width	180	220	360	440	550	650	
	height	340	400	520	670	815	965	
Connecting dimensions, mm	flange diameter	185	205	260	315	370	435	
	diameter of hole centers	150	170	225	280	335	395	
	diameter holes	18					22	
	number of holes	4		8		12		
Weight, kg, max		12	16	30	48	90	123	

### System components

Package Includes:

- Stripping Nozzle - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

Installation of the PZ on the roof of the tank is made in a pre-prepared hole, after which the reinforcing lining is welded.

### Warranty period of operation

Warranty period of operation - 24 month.

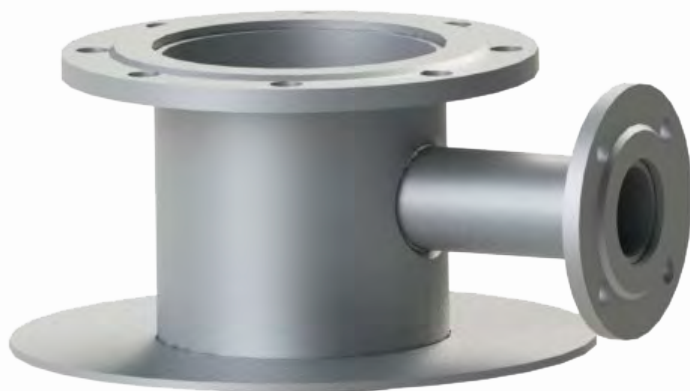
### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-008-16920375-2016

# PZL

## Gauging Hatch Nipple



### Field of application

PZL metering hatches nozzles are designed to install metering hatches and ventilation pipes on vertical and horizontal storage tanks for petroleum, petroleum products and chemical liquids.

### Specifications

Characteristics		Value	
		PZ-80	PZ-150
Nominal pipe size, mm		80	150
Dimensions, mm, max	length	290	365
	width	200	320
	height	180	180
Connecting dimensions, mm	flange diameter	185	260
	diameter of hole centers	150	225
	diameter holes	18	18
	number of holes	4	8
Weight, kg, max		6	10,5

### System components

Package Includes:

- Gauging Hatch Nipple - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

Installation of the PZL on the roof of the tank is made in a pre-prepared hole, after which the reinforcing lining is welded.

### Warranty period of operation

Warranty period of operation - 24 month.

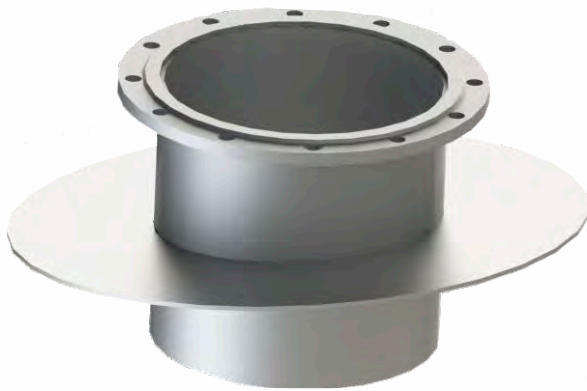
### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-008-16920375-2016



# PM



## Mount Nozzle

### Field of application

Mount Nozzle are designed to install the process equipment necessary for the operation of tanks and are installed on vertical and horizontal tanks for the storage of oil, petroleum products and chemical liquids

### Specifications

Characteristics		Value									
		PM-50	PM-80	PM-100	PM-150	PM-200	PM-250	PM-300	PM-350	PM-400	PM-500
Nominal pipe size, mm		50	80	100	150	200	250	300	350	400	500
Dimensions, mm, max	length	110	180	220	320	440	550	650	760	860	1060
	width	110	180	220	320	440	550	650	760	860	1060
	height	230	250	260	280	300	320	340	360	370	380
Connecting dimensions, mm	flange diameter	140	185	205	260	315	370	435	485	535	640
	diameter of hole centers	110	150	170	225	280	335	395	445	495	600
	diameter holes	14	18					22			30
	number of holes	4			8			12			16
Weight, kg, max		2,75	5,1	6,5	11	17	27,5	38	46	55	76

### System components

Package Includes:

- Mount Nozzle - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

installation of Mount Nozzle on the tank is made in a pre-prepared hole, after which the support ring is welded.

### Warranty period of operation

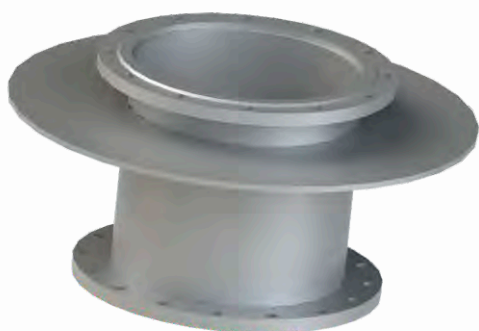
Warranty period of operation - 24 month.

### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-008-16920375-2016

# PPR



## Inlet - Distribution Nozzle

### Field of application

Inlet - Distribution Nozzle PPR designed to connect to them receiving and dispensing pipelines, flappers and other equipment of vertical cylindrical storage tanks for petroleum and petroleum products.

### Specifications

Characteristics			Value											
			PPR-50	PPR-80	PPR-100	PPR-150	PPR-200	PPR-250	PPR-300	PPR-350	PPR-400	PPR-500	PPR-600	PPR-700
Nominal pipe size, mm			50	80	100	150	200	250	300	350	400	500	600	700
Dimensions, mm, max	length	300					350	380			565	625	705	600
	width	220		260	320	440	550	650	760	860	1060	1260	1460	
	height	220		260	320	440	550	650	760	860	1060	1260	1460	
Connecting dimensions, mm	Stop Valves	flange diameter	160	195	215	280	335	390	440	500	580	710	840	910
		diameter of hole centers	125	160	180	240	295	350	400	460	525	650	770	840
		diameter holes	14	18				22			30	33	36	
		number of holes	4			8		12			16	20		24
	Tank Clap Valves	flange diameter	140	185	205	260	315	370	435	485	580	710	840	970
		diameter of hole centers	110	150	170	225	280	335	395	445	525	650	770	840
		diameter holes	14	18				22			30	33	36	
		number of holes	4			8		12			16	20		24
Weight, kg, max			6,6	10,5	13,2	20,4	30	48,6	61,8	88	152	267	375	410

### System components

Package Includes:

- Inlet-Distribution Nozzle - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

installation of PPR on the tank is made in a pre-prepared hole, after which the support ring is welded.

### Warranty period of operation

Warranty period of operation - 24 month.

### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-008-16920375-2016



## Meshes Filter

### Field of application

Meshes Filters are designed to pre-clean oil, petroleum products and other liquids from mechanical impurities. Meshes Filters are installed on technological pipelines of oil depots and gas stations

### Specifications

Characteristics		Value							
		FC-50	FC-80	FC-100	FC-150	FC-200	FC-250	FC-300	FC-500
Nominal pipe size, mm		50	80	100	150	200	250	300	500
Working pressure, Mpa (kg/cm <sup>2</sup> ), max		0,6(6); 1,6(16); 2,5 (25)							
Nominal filtration accuracy, mm		0,2; 0,4; 0,5; 0,6; 0,8; 1; 1,2; 1,6; 2; 4; 5; 6; 8; 10; 12							
Dimensions, mm, max	length	250	309	310	360	500	490	730	1280
	width	160	185	205	260	340	435	490	1075
	height	330	353	350	450	586	614	960	1100
Weight, kg, max		20	26	80	110	130	260	340	720

### System components

Package Includes:

- Meshes Filter - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

Meshes filter picks up and collects the mechanical particles contained in the stream. The degree of purification of the flow depends on the size of the cells in the mesh of the filter element.

### Warranty period of operation

Warranty period of operation - 24 month.

The manufacturer guarantees compliance with the specification TU 3689-008-16920375-2016

# HP



## Tank Clap Valves

### Field of application

Tank Clap Valves are designed to prevent the loss of oil and oil products from the tank in the event of a technological pipeline break or failure of locking devices placed on it. Tank Clap Valves are component parts of tanks for petroleum products.

### Specifications\*

Characteristics		Value								
		HP-80	HP-100	HP-150	HP-200	HP-250	HP-300	HP-400	HP-500	HP-600
Nominal pipe size, mm		80	100	150	200	250	300	400	500	600
Nominal pressure, Mpa (kg/cm <sup>2</sup> )		0,1 (1) - 0,6 (6)								
Dimensions, mm, max	length	200	232	300	385	460	522	707	801	928
	width	185	205	260	315	370	435	580	710	840
	height	162	200	264	342	412	450	704	677	737
Connecting dimensions, mm	Df	185	205	260	315	370	435	580	710	840
	Do	150	170	225	280	335	395	525	650	770
	do	18					22	30	33	36
	No	4		8		12		16	20	
Weight, kg, max		5	7	12	19	33	42	107	165	225

\* It is allowed in agreement with the customer to make Tank Clap Valves for other pressure and from another material.

### System components

Package Includes:

- Tank Clap Valves - 1 pcs;
- Manual - 1 pcs.

### Principle of operation

Valves are closed by gravity.

### Warranty period of operation

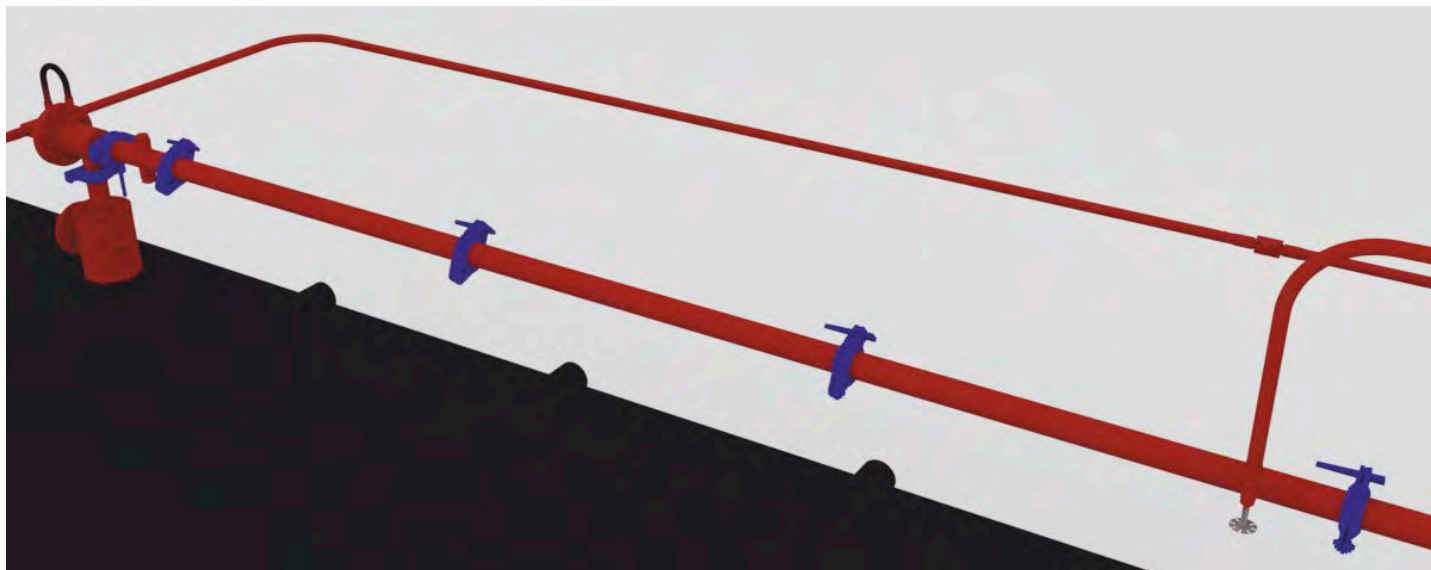
Warranty period of operation - 24 month.

### Product life

Product life - 10 years.

The manufacturer guarantees compliance with the specification TU 3689-009-16920375-2016

## Installation of automatic water fire extinguishing ARMA



### Field of application

Installation of automatic water fire extinguishing ARMA is designed to localize or extinguish and fire suppression at protected hazardous production facilities, including mines, hazardous for gas and (or) dust.

The main types of protected objects:

- cameras (structures, diesel-engine depot, VM warehouses);
- mine workings (curtains);
- preparatory workings (for supplying extinguishing agent into the wellbore space);
- belt conveyor, including the drive station, tension and end station, unloading station, linear part.

### Specifications

Characteristics	Value
Extinguishing agent	Water
Water pressure in the fire irrigation pipeline, Mpa, max	4,0; 6,3 (by request)
Water pressure at valve outlet, Mpa	
- min	0,6
- max	1,6
Valve tightness class, GOST R 54808-2011	«A»
Irrigation intensity for extinguishing a fire in chambers (buildings), l/sec*m2	0,12
Irrigation intensity for extinguishing burning surfaces (assembly line), min, l/sec*m2	0,1
Response temperature, C	57
Climatic performance, GOST 15150	YX/15
Reaction time, sec, max	3
Explosion protection marking of explosion proof equipment	PO Exia I X

**Advantages of ARMA:**

- The overlap of the entire cross section of generation. Due to the special design of the drencher line, the installation covers all the cross-section of generation in accordance with clause 489 of the «Federal norms and rules in the field of industrial safety safety in coal mines»;
- Easy to assemble. The assembly and disassembly of the ARMA components among themselves is carried out using a wedge yoke compounds;
- Due to the special design of the motive line ARMA, it works regardless of the direction of the flame, which allows you to detect a fire at an early stage;
- The use of a signaling device ensures the blocking of the operation of mechanisms on the protected object with a decrease in pressure in the fire pipeline and the transmission of information about the operation in dispatch center;
- Solenoid valve (if available) provides remote control ARMA;
- Crane manual start allows manual operation, if necessary, and verification.





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