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## **1. Purpose**

Aerosol and gas valve ZAGhp-1,0 77181.00000 TY is intended for emergency gas-dynamic overlap of process pipelines, filled with dangerously explosive gas-dust-air mixture, with the aim of localization and suppression of the arisen explosion in the pipeline and in the volume of process equipment, adjacent to it.

The overlap and suppression of explosion is carried out by flow of fire extinguishing (inhibiting burning) aerosol, generated by the valve, of high kinetic energy directed toward the front of the impending explosion.

## **2. Design of the valve**

The valve consist of a case, in which a dual-mode charge of aerosol generating agent is placed: the leading charge with weight 0.2 kg (burning time 0.2 s) and the main charge with weight 0.9 kg (burning time 4 s).

The electric igniter carries out the activation at the command of the control system. The efflux of fire extinguishing aerosol after the opening of the membrane occurs through a supersonic nozzle, at a rate of up to 1000 m / s. The valve communicates with a pipeline through a gas pipe-adapter.

The valve is fixed at the pipeline by worm clamps, making it easy to replace the triggered ones by the new.

## **3. Operation mechanism of the valve**

The activation of the valve occurs at the command of the control system from the sensor - explosion indicator. Aerosol flow due to high kinetic energy stops and destroys a wave of cold gas-dust-air mixture of heightened pressure, preceding the front of the explosion, and the front of explosion itself.

Aerosol jet energy at 10 times exceeds the energy of the front of gas-dust-air mixture explosion for pipeline with a diameter of 0.3 m.

Fire extinguishing aerosol, after the destruction of the front of the explosion, fills the pipeline and technological volume, adjacent to it, which prevents the possibility of the repeated explosion.

Mixture of burning products, unburned gas-dust-air mixture and aerosol

are displaced through the revealed explosion discharging aperture.

#### 4. Advantages

Aerosol and gas valve has significant advantages compared with the used mechanical devices of explosions localization, the principle of which is a complete block of the pipeline.

The valve has lower inertia, the lack of an abrupt pressure increase, dangerous for the pipeline, due to superposition of the reflected and oncoming waves of gas-dust-air mixture at the sudden mechanical overlap of the pipeline; winning weight, size and cost characteristics; simplicity of design; there is no need for maintenance during the whole operation period; the possibility of installing the pipeline of any type and the need for a power source of small capacity.

#### 5. Specifications

№	Name	Value
1	The inertia, no more, s	0,1
2	Equivalent overlapped diameter, m	from 0,1 to 0,3
3	Profile of overlapped pipeline	any
4	The effect of explosion there is suppression in the adjacent volume	
5	Protected adjacent volume, m <sup>3</sup>	10
6	The power supply voltage, V	12-36
7	Current consumption, no less, A	0,4
8	The required electrical power to run, kW	0,02
9	Weight, kg	7
10	Dimensions:	
	length	500
	width	120
	height (in the flanges)	150

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