

**DETERMINATION OF THE "DICTATING" SPRINKLER IN THE RING
HYDRAULIC DISTRIBUTION NETWORKS OF WATER EXTINGUISHING UNITS
WITH AN ARBITRARY TOPOLOGY**

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The hydraulic calculation of an automatic water (foam) fire extinguishing system with a ring-shaped supply of fire extinguishing agent (EA) should be started with the determination of the "dictating" sprinkler (DS), which is in the "worst conditions" in terms of ensuring the admissible pressure and intensity of the EA supply. For design schemes in which the branches of the distribution network are the same, the "dictating" is the sprinkler, as a rule, equally distant from the point of entry of the supply pipeline.

If the branches that are connected to the ring pipeline of the distribution network have different topology, then the choice of the DS, and accordingly the "dictating" branch, cannot be determined explicitly from the geometric parameters of the distribution network, and the solution proposed in [1] must be performed by the method of sequential single approximations. A method for the analytical determination of the choice of DS is proposed.

To determine the "dictating" sprinkler, the following algorithm is proposed:

1) The pressure at point B is defined as:

$$H_B = H_A + \frac{l_{A-B} \cdot (L \cdot Q_{A-B})^2}{k_{1A-B}} \quad (1)$$

Since the minimum value of the pressure at point B will be subject to the condition $L = 0$, the pressure at point B will be equal to the pressure at point A.

2) According to the method described in [2], the parameters of branch B are determined.

If the conditions are met

$$H_{\min} \leq H_{0B} \leq H_{\max} \text{ и } Q_{0B} \geq Q_{0A}, \quad (2)$$

then the sprinkler with the 0_A index is "dictating" in relation to the sprinkler with the 0_B index and a similar calculation is carried out for the D branch.

If conditions (2) are not met, then the sprinkler with the 0_B index will "dictate" in relation to the sprinkler with the 0_A index and then it is necessary to carry out similar calculations from the right of point B. The calculation is considered complete when condition (2) is met on both sides of the tested sprinkler.

ЛІТЕРАТУРА

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