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THE OPERATING REGIME INFLUENCE UPON THE AEROSPACE PURPOSE LOW-SIZED PUMP TYPE CHOICE

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The low – consumed hydraulic systems (LCHS) with the working substance pump feed have already been found their large – scale and the wide application in the aerospace purpose energy complexes. They usually use the liquid coolants, having circulated in the LCHS pipelines in the flying vehicles with the heat – generating equipment, having situated in the untight chambers, for the heat large quantity transmission on the isolated radiant heating surface, or the heat removal (heat supply) from the high power sources. So, the following pumps types are being used in them: the scapular – centrifugal and the vortex ones, and also the friction – disk pumps. The above – indicated types are being permitted the high – circulating electric drives application by the general industrial measures, that it is being promoted the construction dimensions decrease in the radial – circular plane. Their miniaturization is being provided the calculating operating regimes concordance possibility with the system hydraulic characteristics. The D_2 rotor wheels outer diameter is not exceeded $50 \cdot 10^{-3}$ m, in the range of $n=(3...10) \cdot 10^3$ rpm.

The centrifugal pump type has a number of its advantages inside of the low – sized pumps group. The main ones from them are the following:

• The Work Resource.

The “Molniya” space vehicles (SV) have been become the first generation of the Soviet communications satellites. The temperature control system (TCS) in these SV has been carried out by the pump – circulation scheme. So, the preference has been given to the rotary gear pump at the pump type choice for the “Molniya” first model TCS (e.g. at the end of the 50 – es), by that time, it has been shown itself to a good advantage in the missiles steering engines composition. Thus, the TCS work resource of the first “Molniya” SV with the rotary gear pumps has been appeared to be inadmissibly low, in the process of its operations and the maintenance. Therefore, they have begun to employ the centrifugal pumps, having permitted to be increased the work resource up to several decades thousand hours in the all subsequent “Molnilyakh”.

• The Work Economy in the Regime Parameters Wide Range.

The low – sized centrifugal pumps with the $\varphi \leq 0.1$ discharge coefficient are being functioned with the efficiency acceptable level in the $n_s=40...200$ spe-

cific speed values range. This range is considerably narrower for the low – sized pumps another types. It is made up $n_s=10...30$ at the vortex pumps, and it is made up $n_s=30...40$ at the disk ones. The centrifugal pumps reasonable application field has been become dominating with the following number of revolutions increase up to $n=10,000$ rpm, for example, on the field of the temperature control (TC) LCHS needed regimes.

At the present day, the centrifugal low – sized pumps are the supercharger main type of the low – consumed hydraulic systems in the aviation and the space technology and the engineering, owing to better combination of the energy, the mass overall dimensions and the resource characteristics.

Let us consider the requirements to the centrifugal pump rotor wheel flowing form, having designed for the functioning in the temperature control LCHS with the following parameters: Δp_{hs} hydraulic resistance of the LCHS circulation tract is being changed in the range of $\Delta p_{hs}=(0.03...0.2)$ Mpa, and the \dot{V} working substance consumption is not exceeded $300 \cdot 10^{-6}$ m³/s. Thus, we shall find out the n_s specific speed, having regulated the D_1/D_2 ration of the scapular pumps rotor wheel, having accepted all these indicators, as the pump’s output parameters and, moreover, having taken into consideration, that the electric drives are being employed with the $\omega=(314...1047) \cdot c^{-1}$ angular frequency of the shaft revolution in the LCHS.

The n_s values bounds are being kept within the $n_s=40...80$ values range, having satisfied all the really possible combinations of the working substance combustion and the LCHS circulation tract hydraulic resistance. The $n_s \leq 80$ interval is meant, that the centrifugal pumps, having related to the low – speed class, are needed for the LCHS with the working substance active circulation.

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INTELLECTUAL EDUCATIONAL SYSTEM IN THE PROFESSIONAL TRAINING

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The existing system of education unable to provide the necessary level of professional training of information security specialists using basis types of educational and methodological provision, in the modern information society. This fact causes the need of elaboration and using of infocommunicational educational technologies, providing the formation of high competent information security specialists, using the institutes of intellectual educational systems at the educational process.