

WHAT LIKE AN ELECTRIC DRIVE SHOULD BE: FROM TOMSK POINT OF VIEW

(argumentative material of SME “Tomsk Electronic Company” Ltd.

according to the subject of the article by V. A. Judin)

It is a fact, that there is a problem of monopoly in the market of electric drives of check, stop and control valves in Russia. No doubt, the market needs more compact and sophisticated electric drives. But it also should be noted, that now Tomsk enterprises solely (Tomsk Electric drives Plant, “Sibirsky mashinostroitel” Ltd., SME “Tomsk Electronic Company” Ltd.) produce full range of sophisticated electric drives with total amount about 5000 per year.

In order to control the valve, the electric drives include electric control modules, detecting the torque output of the electric drive according to its internal parameters and tracing the status of the valve operating device. This allows rejecting the torque-control clutches and terminal switches. The noncontact position sensors allow to control with high accuracy and reliability position of the shut-off valves. Electric drives designed on the basis of this principle shut the valves with the provided preset torque by using the torque control group in the control loop.

We agree completely with the author, that the APCS should be “relieved”. Electric drives should take the functions of intelligent control. Our company has been producing the explosion-proof and intelligent electric drives RemTEC with the range of torque outputs from 50 to 10000 Nm within last 5 years. Our electric drives provide adjustable speed range of output link minimum 10 and ensure the smooth start and stop of the valve operating device. The control, diagnostics and adjustment of electric drives can be carried out both by remote control via infra red channel at the distance up to 0,75 m, and CAN-bus (allowing up to 32 electric drives) at the distance up to 1 km from the electric drive.

In order to improve technical parameters of the electric drives we would like to use noncontact direct-current drive (ac electronic motor). It facilitates the electric drive circuit, increases starting torque ratio, reduces weight and dimensions.

In order to solve problems of the mechanical part of the intelligent electric drive we chose patented gear model with intermediate rollers, which is different from the currently produced models, characterized by the author as “expensive”. The gear operating principle is also based on the bearing boxes principle, that is, the sliding friction in the gearing is replaced by resistance to rolling. As to the gear bearing box, no doubt, the rollers take essential part in rendering torsion torque. The lack of sliding friction in the gearing is, however, doubtful, as it reduces the gear efficiency coefficient. The compactness of the gear bearing box surpasses the gears with intermediate rollers by 5-10 %. On the one hand, the participation of all rollers in the rendering torsion torque provides for the load uniformity, on the other hand, it increases the amount of sliding friction surfaces. Sliding friction in the gear bearing box appears when the velocity attitudes of the roller and input/output elements do not coincide. That is the reason, why our company uses the modification with intermediate rollers, updated according to the new principle, taking into consideration the detected faults. Moreover, our gear design is more processable than the gear bearing box design.

Our company views further development of the electric drive devices for the pipeline valves as to optimize electric drives configuration by applying complex approach to the development of electric motor, gear, control module and software.

This approach reduces the electric drive costs, increases its reliability and provides competitiveness.