ELECTROHYDRAULIC CONTROL AND SUPPLY SYSTEM H-C MWM-4/VER.II

Application

The electrohydraulic control and supply system H-C MWM-4/VER.II provides hydraulic control of pneumatically released disk brake of a winding machine. The systems allows for the control of winding machine disk brake actuators used to its mechanic braking. Because it is possible to generate two different braking torques i.e. safety braking and / or variable braking torque, it can be applied in most of shaft mining winders.

System design

The electrohydraulic control and supply system H-C MWM-4/VER.II is constructed of the following basic elements:

- two ide1ntical independent hydraulic units LA and LB (in version H-C MWM-4/VER.IID there is a single unit with two pumping assemblies),
- hydralic switch LP (not present in version H-C MWM-4/VER.IID),
- electrical equipment cabinets L1 and L2,
- set of control and measurements elements arranged on hydraulic actuators and braking posts as well as near them.

The hydraulic unit is made in a form of steel cage housing individual components:

- oil tan together with sensors, oil heaters, which is equipped with a pumping assembly equipped with axial-piston pump of variable delivery,
- hydraulic units equipped with control and supply elements,
- hydraulic piston accumulator,
- by-pass filtering and cooling system together with oil purity control in the tank.

Main features of the system

The systems allows:

- manoeuvring braking – in manual and automatic control, in remote start-up mode and after emergency stop using a drive,
- safety braking – using one of two independent values of braking torque of safety braking, selected according to value and direction of overweight motion and / or controlled value of braking moment in order to execute fixed delay during safety braking,
- advanced approximation of actuator callipers in case of winning with skip,
- performing functional test of the hydraulic unit,
- performing a test of settings of residual pressure,
- performing static brake test,
- testing the brake actuator hysteresis together with runs recording,
- testing the oil tank purity class in the tank,
- by-pass cooling and filtration of oil in the tank,
- performing circulation hydraulic network with two-sided actuators supply,
- performing any trials and tests from the level of device visualization.

Conditions of work and application parameters

Electrohydraulic brake control system H-C MWM-4/VER.II meets the requirements of the Decision of the Minister of Economy 1) of 20 December 2005 on essential requirements put before safety machines and elements, 2) introducing Directive 98/37/EC (Journal of Laws 05.259.2170).

supply voltage	500V AC 50 Hz, 230 V AC 50 Hz with UPS
ambient temperature	5 ÷ 40°C
working liquid	hydraulic oil – grade HL-P from 46 to 68
declared corrected level of acoustic pressure A	L< 85 dB
maximum total working volume of oil in the supplied brake actuators	approx. 1000 cm^3

Specifications

oil tank volume	approx. 250 dm^3
hydraulic pump	axial – piston of variable delivery
pump delivery	0 ÷16.3 cm^3/rotation
maximum working pressure	20 MPa
electrical motor of main pump	three-phase induction, 7.5 kW, 500 V, 50 Hz, 1450 rpm
electrical motor of pump of oil and air cooler	three-phase induction, 1.1 kW, 500 V, 50 Hz, 950 rpm
accuracy oil filtration in the tank	5 µm
panel heater	2x1.14 kW 500V
range of admissible oil working temperatures	30 ÷ 60°C
total weight of the system without oil (1 hydraulic unit, 2 electrical cabinets)	approx. 3000 kg
overall dimensions (LA+LP+LB)	width: ≈ 4500 mm; depth: ≈ 1400 mm; height: ≈ 1600 mm
total weight of H-C MWM-4/VER.IID system without oil (1 hydraulic unit, 2 electrical cabinets)	approx. 1800 kg
overall dimensions of version H-C MWM-4/VER.IID (LA)	width: ≈ 1800 mm; depth: ≈ 1100 mm; height: ≈ 1600 mm
hydraulic connections	25 s

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