



### Application

Winding machine B-4300/DC-8m/s is used to drive single-drum mine haulage in shafts of depth up to 1500 m.

The B-4300/DC-8m/s machine is an element of haulage used especially for sinking, snubbing, reinforcing or refitting of shafts. It can also be used in other shaft haulages. It is used for the following works:

- personnel transportation
- winning winding,
- materials haulage,
- shaft inspection and shaft related works.

### Design

Drum of the winding machine of diameter 4300 mm is driven from both sides by toothed gears driven with DC motors.

The main elements of the mechanical parts:

- drum,
- main shaft with two bearings,
- two toothed clutches,
- two main gears,
- two flexible clutches,
- LeBus lining,
- two driving motors,

- disk brake system together with control-supply hydraulic unit electrically controlled H-C MWM-4/VER.IID.

The main elements of the electrical parts:

- converter type driving system,
- control and adjustment systems,
- protection system,
- visualization and signalling system of operation statuses of individual machine assemblies.

The whole control, adjustment and protection systems are designed based on PLC controllers.

The braking system is equipped with UWDSO device [additional oil drainage forcing device] that provides additional route for oil drainage and produces pressure drop in the hydraulic system of the brake in order to ensure safe stopping of the haulage.

Rotors of driving motors and two non-reversing thyristor converters DCS800 are connected into a single main circuit of the winding machine. This method of connection provides 12-pulse impact on the supply network. Change of rotation direction of the winding machine takes place by changing the direction of current in the motors excitation windings. The described system allows operation using a single converter without limitation of lifting capacity with limitation of rate by half.

## Specifications

|                                  |   |                  |
|----------------------------------|---|------------------|
| machine type                     | B-4300/DC-8m/s  |                  |
| machine location                 | on horst  |                  |
| type of control                  | manual  |                  |
| operation modes                  | production;<br>materials haulage;<br>personnel transportation;<br>personal transportation;<br>inspections   |                  |
| travelling rate                  | 8 m/s for winning and materials;<br>6 m/s for personnel;<br>1 m/s for shaft inspection;<br>0 – 0.5 m/s; 0 – 1 m/s for inspection of carrying rope and sheave;<br>2 m/s for travel without controller;<br>0.5 m/s for transportation of materials under bucket |                  |
| acceleration / deceleration      | operation acceleration: 0.6 m/s <sup>2</sup> ;<br>operation deceleration: 0.8 m/s <sup>2</sup>  |                  |
| main power supply                | 3 – 30 kV   |                  |
| auxiliary power supply           | 500 V   |                  |
| drive                            | converter drive   |                  |
| motors manufacturer              | ABB   |                  |
| motors rating                    | type  | DMI 400R         |
|                                  | power   | $P_n = 1043$ kW  |
|                                  | main circuit current  | $I_n = 1459$ A   |
|                                  | main circuit voltage  | $U_n = 750$ V    |
|                                  | rotational speed  | $n_n = 1016$ rpm |
|                                  | excitation current  | $I_w = 55$ A     |
|                                  | excitation circuit voltage  | $U_w = 110$ V    |
| maximum static force in the rope | 240 kN  |                  |
| maximum rope breaking force      | 1900 kN   |                  |