

Technical characteristics

Sinking equipment Machines for coal extraction and conveying

MINE PORTABLE CHAIN-AND-FLIGHT CONVEYOR КСД-28



The conveyor is designed for coal transportation from highly-production (3000-8000 t/day) stopes with the length of 200-350m, working out the seams with the thickness of 1,4-2,4m and advancing to the strike with dip angles of up to 30°, as well as to the dip or the rise with angles of up to 10°, in mines, including those that are hazardous by gas and dust.

The conveyor replaces the series-produced chain-and-flight conveyor СПИ273, which differs from it in the increased by 50% productivity, the use of a more powerful electric motor with two speeds and the increased by 2.3 times life of the pan line.

The conveyor is a transportation machine composed of drive units, transition sections, main and transitional pans, and a scraper-type tractive member.

The conveyor can operate as part of the following complexes: 2МКД90, 3МКД90, 2МКДД, 2КМТ, КМК700/800 with shearers and headers of the types РКУ13, ГШ500, РКУ10, 2ГШ68Б, 1ГШ68.

The conveyor design provides:

- work in both the right and left faces with the reassembly of individual assembly units in the mine;
- dismantling into transportable parts, allowing their delivery to the mine, assembly and disassembly in the longwall;
- adaptability to the longwall length changing due to changes in the number of pans and the length of the tractive member;
- possibility of mechanized coal loading at the pan line;
- smooth moving of the tractive member along the drive frames, transition sections, pan line;
- installation of the drive frames on the face-end supports or expansion devices;
- possibility of tractive members mounting on the drive frames when using chain feeding systems built into the shearer;
- safe connection and tension of the tractive member;
- reciprocal rotation of the conveyor pans in horizontal (20) and vertical (50) planes;
- drives protection against overload and jamming;
- possibility of dust suppression (irrigation) devices connection at the place of coal transshipment to the subsequent vehicle;
- possibility of connection of means of transport and conveyor drives;
- possibility of attachments fixation;
- possibility of chain sprockets replacement without the gearbox disconnection.

Drive units.

The drive units can be equipped with various types of gearboxes, allowing the installation of electric motors in both longitudinal and transversal directions towards to the pan line.

The gearbox design ensures the operation of the conveyor in both the right and left faces by reinstallation of the individual parts.

The gearbox is equipped with a mechanism for disconnecting from the electric motor, which increases safety during repairs.

The use of the planetary gearbox has significantly reduced the size and weight of the drives.

Gearbox operational life increased from 12000 to 25000 hours.

A new electric motor of increased power of 250 kW was used, it has two speeds: operating and flitting. The presence of flitting (1/3 of the operating) speed improves the conditions for starting the conveyor and its operation. Starting at low speed allows to triple the starting torque with the reduced current strength. Transition to operating speed is provided automatically.

The gearbox and electric motor are water cooled.

Seven-beam sprocket is detachable (for the possibility of its dismantling without disconnecting the drive). Unlike the analogues with welded structure, the sprocket has the monolithic structure, which made it possible to increase its strength characteristics.

The hydraulic chain tensioning mechanism, with control of the size of tension, is separated from the drive, which greatly simplifies the adjustment of tension and increases the operational safety.

Pan line.

The pan line consists of the main and transitional pans, connected to each other and transition sections by means of the special high-strength interlock of a new design.

The strength of the connection provides to take the tensile forces between the pans of 340t (2x170t).

The connections of the pans ensure their reciprocal rotation in the horizontal up to 1.2° and in the vertical up to 5° planes.

Scraper-type tractive member.

The tractive member is the endless belt consisting of two high-strength round-link chains in the center of the pan line with fastening to them scrapers every 1m.

In the tractive member, the caliber of the chain was increased from Ø26 to Ø30mm. The chain is made of a new high-strength steel grade with increased wear resistance of guaranteed chemical composition with the reduced content of harmful impurities. In addition, cold rolled calibrated bar was used for its manufacture instead of the hot rolled uncalibrated bar on the analogues.

The use of new material and the improvement of rolled properties increases the chain strength by 1.5 times.

The connecting links are made of the same steel grade as the chain. Unlike the analogues, a new design version with the stronger tooth is used.

Electrical equipment

The electrical equipment of the conveyor is designed for the use a supply voltage of 1140 V.

The conveyor control is interconnected with the general electrical circuit of the longwall set of equipment. A specially designed control station with control and diagnostic equipment based on microprocessor technology is supplied with the conveyor, which allows to quickly monitor the actual operating modes of the conveyor equipment providing the necessary protection, diagnostics, and indication of the failure causes. The two-speed electric motor ЭКВФ355L12/4, 85/250 kW, 500/1500 rpm, 1140 V, water-cooled, with posistor protection against overheating and is supplied by Pervomaysk Electromechanical Plant.

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Parameter name	Value
Productivity, t/min	18
Applicability according to the dip angle when advancing the face, degree:	
to the strike	30
to the dip	10
to the rise	10
Conveyor length, m	250
Number and arrangement of drive units, pcs.	two, single-sided
Nominal power of electric motors, kW	85/250
Motor type	asynchronous, two-speed ЭКВФ355L12/4, 1140V, 85/250 kW, 500/1500 rpm.
Number and arrangement of chains, pcs.	two, in the center
Chain type (caliber, pitch, strength class)	30x108-C
Chain center-to-center distance, mm	160
Height of the pan sidewall, mm	255
Pan sidewall length, mm	1500
Pan sidewall width, mm	800
Maximum breaking force of the pan line interlock, t	2x17 (340)
Tractive member traveling speed, m/s	
main (operating)	1,063
auxiliary (flitting)	0,354
Recourse, mln. t	3,0