



“REMASZ”[®] Sp. z o.o.

41-708 Ruda Śląska
ul. Pawła 6
tel. +48 32 244-35-
remasz@remasz.com

Tax ID (NIP) 627-274-10-73
Regon: 3611332282
+48 518 518 211
KRS: 0000550711

Information sheet

Hydraulic coiler, ZMBD type





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1. General description

The ZMBD type hydraulic coiler is a hydraulic drive device intended for unrolling and rolling conveyor belts. Unrolling and winding of power cables and lines is also permitted.

Devices used to power the coiler must be compatible in terms of connections and specification of the power supply of the hydraulic system, be provided with an emergency stop system and a system controlling functional parameters.

The coiler may be used in underground mines, in methane fields, in mining longwalls of “a”, “b” and “c” classes in terms of methane explosion hazards and of classes A and B of coal dust explosion hazard

Use of the coiler other than that specified above, shall be considered as unintended use. In such cases, the manufacturer shall not be liable for any damage caused by such use.

The ZMBD type hydraulic coiler is an integral and inseparable part of the Z1 transport system and is delivered fully assembled by the manufacturer. Assembly or disassembly of the ZMBD type hydraulic coiler with the Z1 transport system may be undertaken by an authorised service only, with an approval of the manufacturer.

2. Technical specifications

No.	Details	Unit	APP
1	load capacity	kg	4000
2	minimum force at the coiler drum	kN	15
3	maximum speed of the winding drum	rpm	36
4	maximum travel speed of the system	m/s	2.0
5	coiler width	mm	800 ÷ 1450
6	coiler length	mm	2200 ÷ 2600
7	belt or cable drum width	mm	900 ÷ 1400
8	cable drum internal service	mm	450 ÷ 640
9	maximum belt length wound onto the drum	m	200
10	permitted supply pressure	bar	190
11	required capacity of the supply system	l/min	26
12	hydraulic agent		HLP, HFC
13	attachment hitch pin diameter	mm	40
14	ZBMD type hydraulic coiler unit weight, including the Z1 transport system	kg	1650 ÷ 1750
15	maximum attached pulling / pushing force	kN	120



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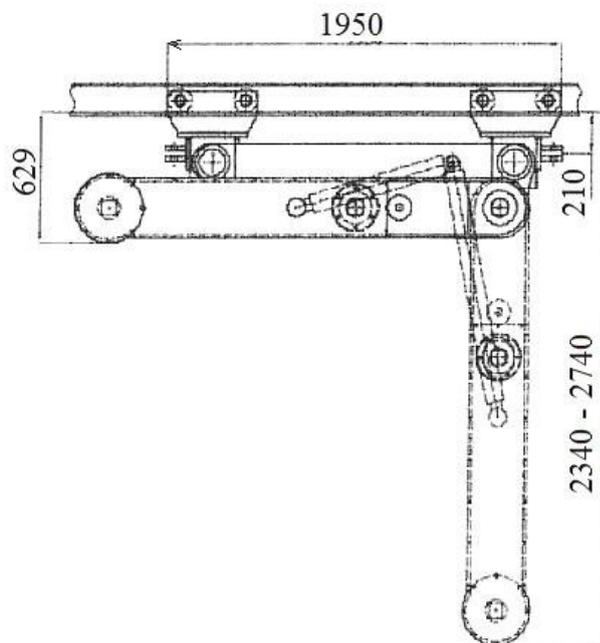
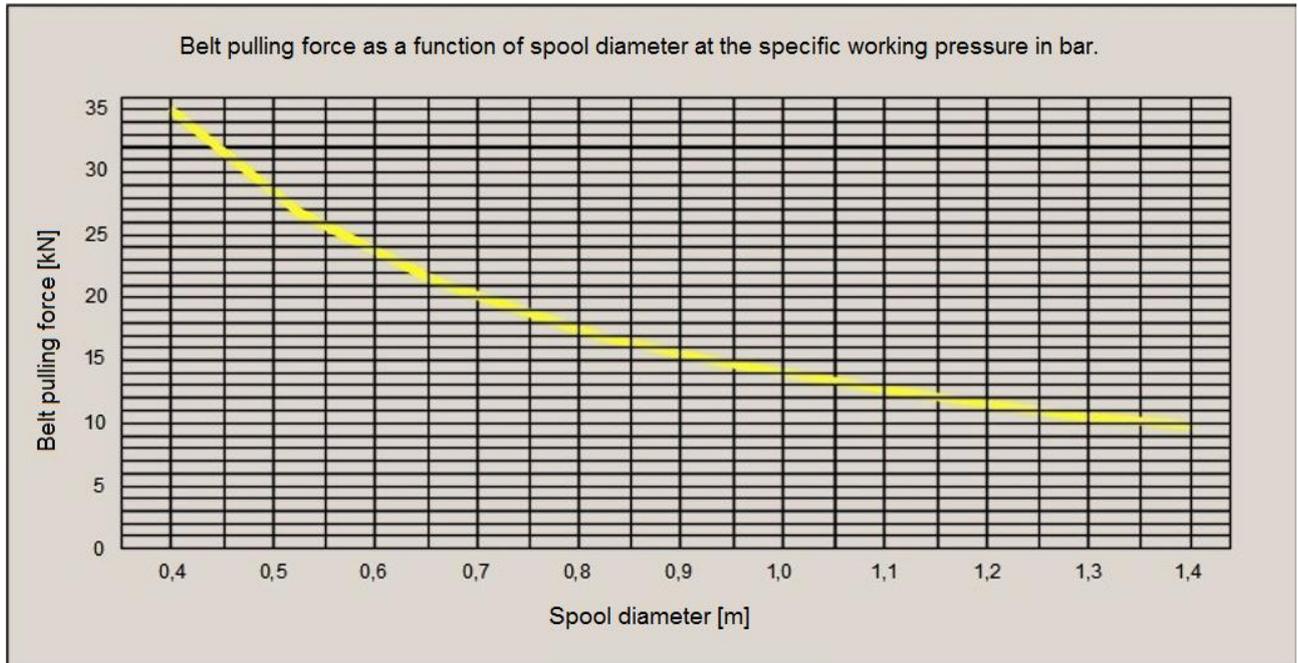


Fig. 2. Coiler dimensions with the arm lowered



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3. Conditions of use

The hydraulic coiler may be used under the following conditions:

- a) The ZMBD type hydraulic coiler is an integral part of the Z1 transport system.
- b) the driven rail shall be characterised by:
 - rail profil I 155, I 140 (acc. DIN) or equivalent,
 - the height profile of the bottom rail connector does not exceed 40 mm;
 - the maximum rail connector bend angle along the route $\pm 6^\circ$ vertically;
 - the maximum rail connector bend angle along the route $\pm 2^\circ$ horizontally;
 - curvature in the horizontal plane $R \geq 4$ m;
 - curvature in the vertical plane $R \geq 8$ m;
 - rail connector load capacity in the suspension direction 40 kN;
- c) the ravel speed shall not exceed 2.0 m/s;
- d) the maximum route inclination shall not exceed 30° ;
- e) the coiler shall be operated by persons trained by the manufacturer and who have read the user manual.

4. Scope of delivery

The delivery includes:

- A complete hydraulic coiler,
- The original copy of the user manual,
- The warranty card and the Quality Control acceptance certificate,
- EC/EU Declarations of conformity.
- Annex: Operation and maintenance documentation, Z1 type transport system

5. Device design

The hydraulic coiler (Fig. 3) is built out of the following units:

1. type Z1 transport system (item 1),
2. lowered arms (item 2, 3),
3. a transverse beam (item 4),
4. an arm protracting hydraulic actuator (item 5),
5. arm raising hydraulic actuators (item 6),
6. a hydraulic actuator executing rotation of the load bearing frame, installed under the bearing axle (item 7),
7. type MK04 hydraulic actuators (item 8),
8. drive dice of the drum (item 9)
9. attachment hitches (item 10),
10. guiding roller arms (item 11),

Lowered arms with gearboxes installed inside (items 2 and 3) are attached to the load bearing frame of the transport system (item 1). Drive dice (item 9) are installed at arm ends, which rotate the belt drum or the cable drum. The arms are lowered or raised using hydraulic actuators (item 6) attached to the arm at one end and to the traverse beam (item 4) at the other end. Hydraulic actuators (item 8) and arm protracting actuators (item 5) are also attached to the arms. Hydraulic motors are connected through the drive dice of the drum, placed in the middle of gears using roller chains (Galla).



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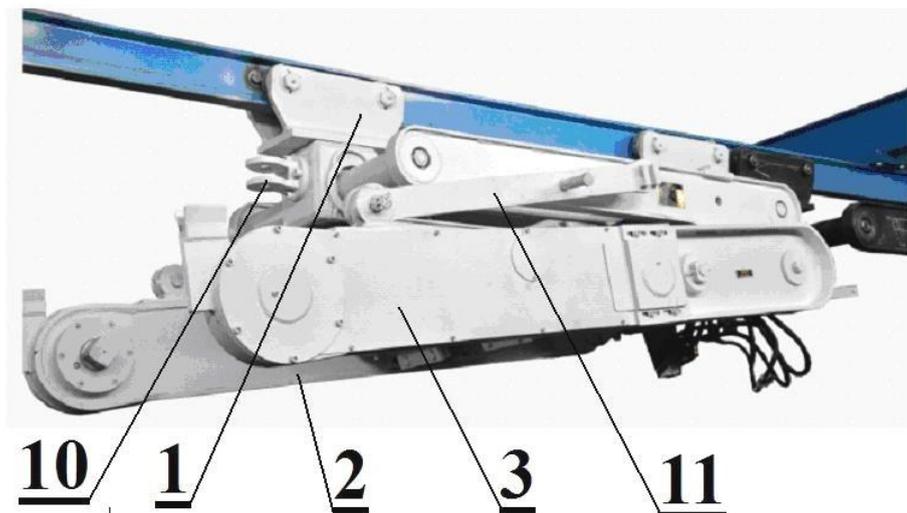
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Arms of the roller (item 11) guiding the coiled roller belt onto the belt drum (item 11) are attached to the lowered arms. The hydraulic coiler is connected to the power supply and transporting unit using a tie installed in the attachment hitch (item 10). The hydraulic coiler is controlled using control boxes /Fig. 5/ connected to the hydraulic system.

The Z1 type transport system (Fig. 4) includes two load bearing carriages installed on a driven rail (Fig. 1). The load bearing frame (item 2) is suspended on the load bearing carriages using bearing axles (item 3). The connection between the axles and the carriages is mobile, enabling traversing horizontal and vertical arcs of the driven rail. The axle (item 4) is installed in the bottom part, on one side of the frame, with the lowered arms installed on both ends of the axle. A hydraulic actuator enabling the load bearing frame of the unit to be rotated is installed above the load bearing axle located above the axle used to install the lowered arms.

The hydraulic system of the coiler is supplied through hydraulic lines (supply and return lines) connected to the controller. The hydraulic line for actuators intended for lifting and transverse motion is protected using independent hydraulic locks. Coiler motors are provided with automatic brakes. Depending on which of the controller levers /Fig. 5/ is moved, pressure is supplied to the arm lifting/lowering actuators, the distance changing actuator or the coiler drum drive hydraulic motors.

The hydraulic coiler may be supplied from the hydraulic system of any tractor or an individual pump unit. Devices used to power the coiler must be compatible in terms of connections and specification of the power supply of the hydraulic system, be provided with an emergency stop system and a system controlling functional parameters.

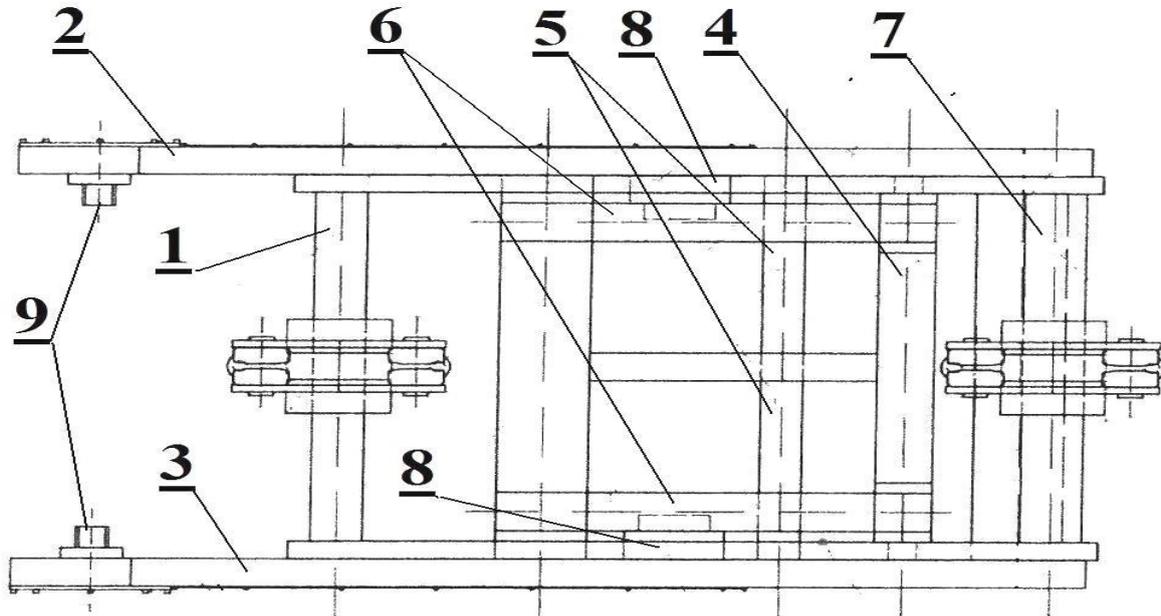




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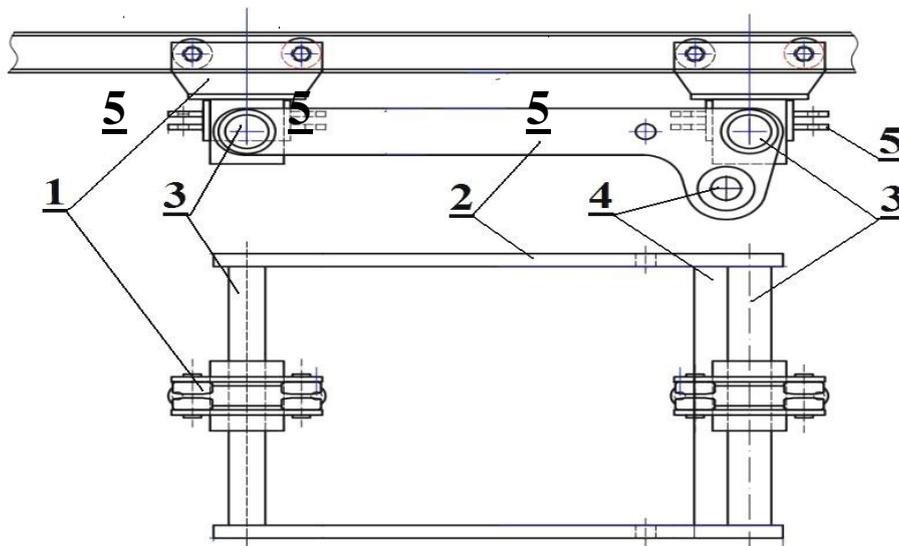
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1.- Z1 transport system, 2.- lowered arm 3.- lowered arm, 4.- transverse beam, 5.- arm protracting hydraulic actuators, 6.- arm lifting hydraulic actuators, 7.- hydraulic actuator rotating the load bearing frame installed under the load bearing frame, 8.- type MK04 hydraulic motor, 9.- drive dice of the drum, 10.- attachment hitches, 11.- arm of the guiding roller.

Fig. 3. Hydraulic coiler



1.- load bearing carriage, 2.- load bearing frame, 3.- load bearing axle, 4.- axle on which the lowered arms are installed, 5.- attachment hitches,

Fig. 4. Type Z1 transport system



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Fig. 7. Belt winding onto the drum

6. Cable/wire winding onto the drum

The coiler may be used to wind cables or wires onto dedicated cable drums /Fig. 8/, to do this:

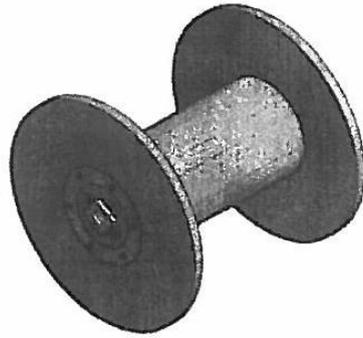
1. Move the coiler in front of the cable/wire to be wound onto the dedicated drum.
2. Stop and fix the hydraulic coiler on the driven rail.
3. Lower and separate the coiler arms using the controller levers.
4. Place the dedicated drum onto the drive dice of the lowered arms.
5. Move the arms close to each other, locking the dedicated drum onto which the cable/wire will be wound between them.
6. Place the dedicated drum against the cable/wire (rotating the load bearing frame).
7. Disconnect the power supply to the cable/wire and release the cable/wire from its attachment.
8. Attach the cable/wire to the dedicated drum.
9. Start winding the cable/wire onto the dedicated drum.
10. Once the entire cable/wire is wound onto the dedicated drum, place the drum on the transport platform with the cable/wire on the platform or place on a foot.
11. Move the lowered arms apart and lift them.
12. Move the coiler to its storage position or to a new working location.



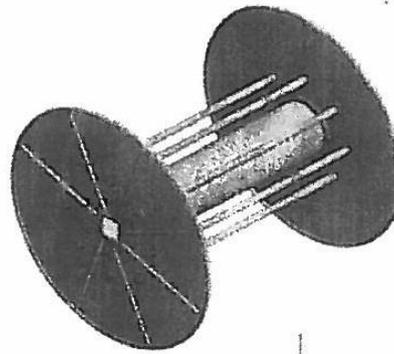
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Wooden cable spool



Metal cable spool
(adjustable inner diameter)

Fig. 8. Dedicated drums for winding and unwinding cables/wires

The minimum drum diameter should be adapted for the purpose of cable/wire winding onto the drum, according to the minimum bending radius of the cable/wire specified in the catalogue of the cable/wire manufacturer.

During cable/wire winding onto the drum note if the winding force acting on the drum, overcoming friction present during cable/wire motion, does not exceed the maximum permitted force tensioning the cable/wire, specified in the catalogue of the cable/wire manufacturer. If this force is exceeded, the cable/wire being wound up will be torn.

7. Hydraulic coiler repairs

Hydraulic coiler repairs may be performed by the user within the scope of spare part replacement. It is prohibited to use parts and units of other manufacturers or homemade parts during repairs. If the coiler loses operational parameters specified in this manual, perform an overhaul. The overhaul includes repairs or replacement of worn units and parts, restoring the original technical condition of the winder. Overhauls of the hydraulic winder may be performed only by the manufacturer or by repair stations authorised by the manufacturer.



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