

ALTA

VERTICAL TRANSPORT

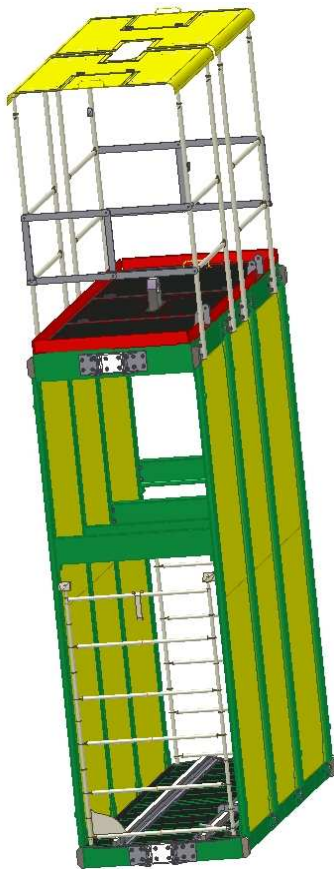
TRANSPORT VESSELS – WINDING CAGES

Utilization:

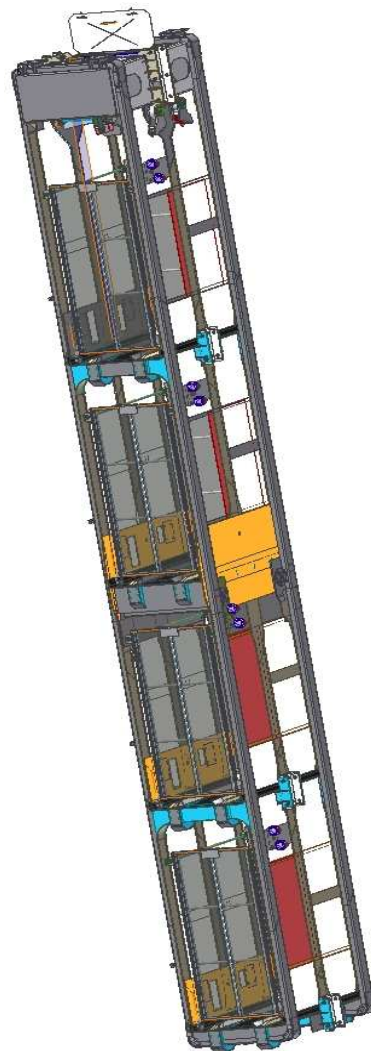
Winding cages serve for transportation of raw ore, persons and material in pits and staple pits of coal and ore mines. According to the utilization and design they are divided in

- cages of emergency transport appliances
- staple pit cages
- 2-floors up to 4-floors winding cages

Staple Pit Cage



4-Floors Divided Cage



Description:

Cages of Emergency Transport Appliances

may be stationary and mobile. The smallest mobile cage of a circular profile without guiding is delivered as a part of the mobile emergency transport appliance. The stationary cages are either permanently suspended or they are suspended in the operation status before their use. In the pit profile they are then guided either with the shaft guide or with the guide and the winding unit rope. These cages either have their own stationary winding machine or they are used with a mobile machine.

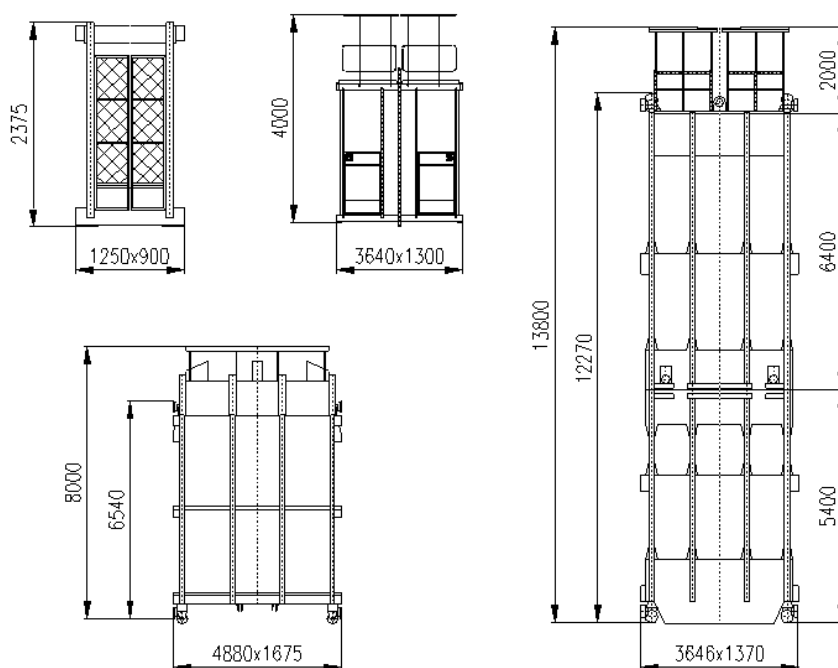
The cages without guiding have a cylindrical shape with tapered portions. The guided cages are usually of rectangular profile. Their construction consists of a supporting frame equipped with a floor-plate, roof, rope suspension, side covers and the entry door. The dimensions are modified according to the operated pit profile.

Staple Pit Cages

are cages for transportation of persons and material in staple pits to the mine floors that are inaccessible via the main pits. These are mainly one-floor cages for single-acting transportation with a counter-weight, purposefully designed for transportation of machinery equipment used on the given mine floor. Concerning parameters they are operated for lower carrying capacity (for two boogies), lower speed and with the cage sliding guiding on wooden guides. The suspension is performed with one rope or with four ropes. The design is classical – supporting frame, rope suspension, cage guiding, floor, roof, side covers and the front door that is either solid or a slat one. The floor is equipped with rails for boogies, the roof is equipped with a suspension rail bearing element and on the top surface there is a guard-rail with a roof.

Winding Cages,

that are operated in down-cast air shafts or in up-cast air shafts are mainly designed as two-floors up to four-floors cages and may be delivered either as one part or divided for easier installation in the pit. For raw ore or material transportation they are mainly designed for two wagons type JDV in tandem on one floor. The cage suspension is mainly performed with one winding rope. The cage is designed as a weldment – supporting frame with a head and floor plate, stationary or sliding floor plates of further floors, solid side sheet covering. The head is equipped with the ropes suspensions, clamp device and stationary cage guiding on the shaft guides. On the head is installed the wheel guiding, shelter sheet enclosure and the guard-rail with the roof. The floors are equipped with rails and stopping device for boogies, eventually with a beam for the rope groove or for the freight transportation, holders and door for transportation of persons. In the case of the winding machine with the friction wheel the floor plate is appended with the compensatory rope suspensions. On the bottom part is the cage wheel guiding and fix shaft guides.



Technical Parameters:

The cages are manufactured as spare parts for the existing mine equipment in operation or as new ones with innovated parameters according to the customer's request. Their dimensions are modified according to the given pit profile, their design answers to the given technical parameters: utilization, weight capacity, suspension of the winding (eventually compensatory) rope/s and further equipment.

Safety:

The cages determined for the mining industry shall with their design and safety answer to the requirements of the Public Notices No. 22/1989 Coll. and No. 415/2003 Coll. of ČBÚ (Czech Mining Office Board).

Delivery:

The cages are delivered according to their design either completely mounted or divided for the transportation and assembly, with a protective coating, functionary surfaces are preserved with preserving oil.

The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer's Certificate, material certificates, Test Reports.

Assembly:

The assembly of the cages shall be only performed by experienced and trained staff authorized for such work by the company leadership. The assembly shall run under the technical supervision, before starting the equipment operation it is necessary to carry out a test run according to the company leadership determination.

Guarantee:

The product is given a guarantee of 18 months as from the date of the operation start, however maximum 24 months after the delivery. If the instructions in the Operation Manual are not followed the guarantee of the product is left aside. The recommended service life-time is 10 years.

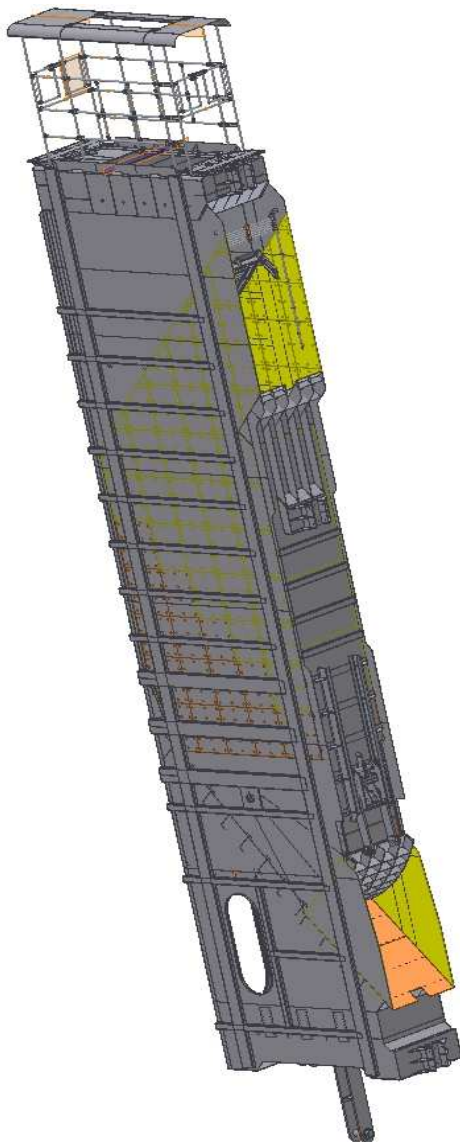


TRANSPORT VESSELS – SKIPS

Utilization:

Skips are solid vessels of box design serving for direct transportation of raw ore.

Picture of a skip:



Technical Parameters:

Skips are manufactured as spare parts for existing mining equipment in operation or as new ones with innovated parameters according to the customer's request. Their dimensions are modified according to the given pit profile, their design answers to the given technical parameters: effective weight capacity, suspension of the winding (eventually compensatory) rope/s and further equipment, etc.

Transported volume /m3/	12 to 21
Transported weight	according to raw ore density
Mining speed	16 to 20 m/s
Wheel guiding	spring-loaded

Description:

The skip of the whole-welded design consists of the head, vessel and base. The head is formed by a solid frame with holes for the ropes suspension and followed with the skeleton longitudinal carrier rods. The head fronts are equipped with fixed shaft guides, above them there are solid consoles for installation of the spring-loaded wheel guiding. The upper part bordered with shelter sheet forms a floor for inspections and maintenance work. The vessel consists of a frame structure made of longitudinal carrier rods, covered with sheet and enforced with crossbars. On the face of the upper part there is a charging hole, in the bottom part there is an inclined slip and a discharge hole closed with a guillotine or segment turning shutter. The inclined slip and its sides is covered with wiping sheet, above the shutter there is a relieving roof. On the face of the middle part there are middle fix shaft guides. Under the slip there is a closed space for transportation of persons equipped with a door. The base is formed by a compact frame where the longitudinal carrier rods are ended. On the faces of the bottom part there are consoles for wheel guiding and fix shaft guides, in the middle part there are beams for anchoring the lower compensatory ropes suspensions.

The skip equipment consists of: winding ropes cross suspensions with hinges, spring-loaded wheel guiding of the heavy type, removable guard-rail with the roof, lower compensatory ropes suspensions with hinges.

Safety:

The skips determined for the mining industry shall with their design answer to the safety requirements of the Public Notices No. 22/1989 Coll. and No. 415/2003 Coll. of ČBÚ (Czech Mining Office Board).

Delivery:

Skips are delivered with a protective coating, the functionary surfaces are preserved with preserving oil. Such skip equipment as the wheel guiding, guard-rails, shelter and gates are delivered separately.

The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer's Certificate, material certificates, Test Reports.

Assembly:

The assembly of the skip shall be only performed by experienced and trained staff authorized for such work by the company leadership. The assembly shall run under the technical supervision, before starting the equipment operation it is necessary to carry out a test run according to the company leadership determination.

Guarantee:

The product is given a guarantee of 18 months as from the date of the operation start, however maximum 24 months after the delivery. If the instructions in the Operation Manual are not followed the guarantee of the product is left aside. The recommended service life-time is 10 years.

TRANSPORT VESSELS EQUIPMENT FOR LONG MATERIAL TRANSPORTATION

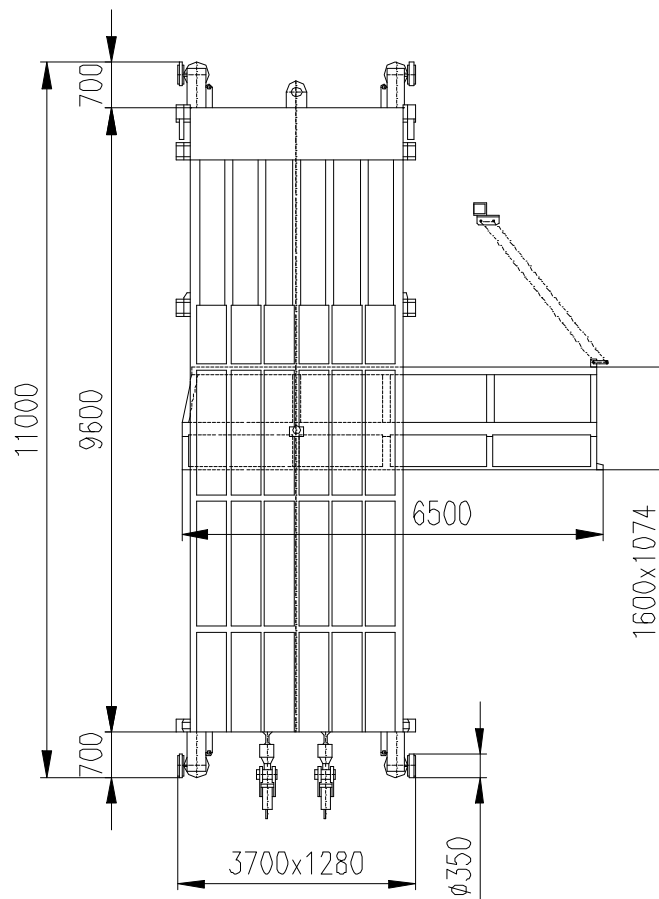
Utilization:

The equipment serves for the transportation of long materials in containers to mines. The containers may be placed in the cage or suspended under the cage. Material is transported in wagons from exterior to the place of use in the mine without trans-loading.

The container permanently suspended in the cage is used by the winding equipment exclusively serving for material transportation, eventually by the single-acting winding equipment where it is possible to use the special cage with a container instead of the balancing counter-weight. The container cage may also contain one upper floor for transportation of persons.

The container suspended under the cage is used in the cases when regular capacity of material transportation is not requested. The container is then suspended under the cage only in the case of its utilization.

Picture of a Container in a Cage with the Main Dimensions



Description:

The equipment consists of the container cage, container and tipping equipment. The cage consists of the head, transport floor, carrying tow-bars and base. The head is a welded cabinet beam with the winding rope suspension, clamping device, fix shaft guides and the wheel guiding above them. The transport floor with a solid floor-plate is designed for a tandem of two bogies. According to the container tipping kinematics design the cage is either equipped with a hinge anchoring or with a curving rail for the container guiding. The base is of a frame structure covered with a floor plate and equipped with rails for eventual transportation of the wagons. On the fronts there are fix shaft guides and consoles for wheel guiding. In the middle there are suspensions for eventual lower compensatory ropes. The container itself is a weldment of frame structure and in a bottom part it is equipped with profiles for the wheels of the transport wagon and for its position blocking. On the bottom side there is a solid front plate with a soft lining for supporting of the long material transported in the vertical position. The tipping is performed with solid tow bars or ropes suspended on the pit bank and floors structure. Another version of a container in the cage is a container type equipped with guiding pulleys and it runs in the cage in a curving guiding. This cage usually contains its own drive for the container retraction.

Container for Long Material transportation Suspended under the Cage

Is basically of the same construction as the previous type. Before the material loading it is suspended in a special anchor and collar mounted under the winding cage. The container tipping equipment on the pit bank and on the floors is formed by rope suspensions.

Function:

The container permanently suspended in the cage – after the container cage arrives to a mine floor the container in the cage is unblocked and it is suspended on the tipping equipment. The container is slowly turned from the vertical position to the horizontal one. After the handling is finished the bridges are tilt to the shorter side, the wagon with material is unblocked and it is pulled out from the container. The vice-versa handling brings the container to the horizontal position again and when it is blocked in the cage, the new transport cycle can start.

The container controlled by an air winch in the head of the cage is switched on after the connection to the air source and it is lifted with help of a pulley cable transmission. The front driving wheels of the container are guided by the curve in the cage, the back wheels are traveling on the rail in the cage and the pit bank or on the floor.

The container suspended under the cage shall be in the cases of utilization at first suspended in special hinges. Its handling is the same as for the above stated case.

Technical Parameters:

Cage	dimensions are given by the mining pit profile and the container length
Container	for the wagon and material in the length of 6 m
Load	2 – 3 t

Safety:

The equipment shall with its design answer to the safety requirements of the Public Notices No. 22/1989 Coll. and No. 415/2003 Coll. of ČBÚ (Czech Mining Office Board).

Delivery:

The equipment is delivered with a protective coating, the functionary surfaces are preserved with preserving oil. Further cage equipment as the wheel guiding, guard-rails, shelter etc. are delivered separately.

The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer's Certificate, material certificates, Test Reports.

Assembly:

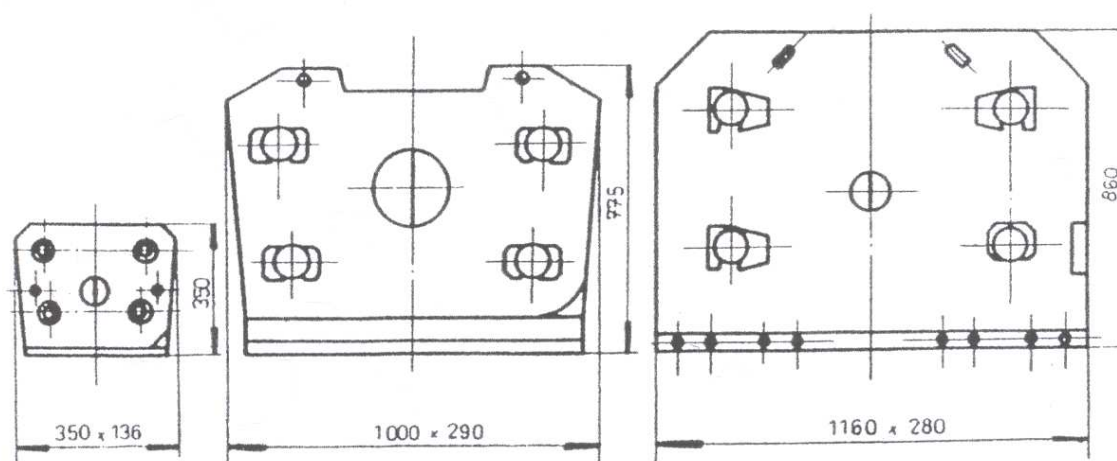
The assembly shall be only performed by experienced and trained staff authorized for such work by the company leadership. The assembly shall run under the technical supervision, before starting the equipment operation it is necessary to carry out a test run and the function tests according to the company leadership determination.

ANCHORING CLAMPS FOR THE ROPES OF CIRCULAR PROFILE

Utilization:

Anchoring clamps for the ropes of circular profile are used for the winding ropes and the compensatory ropes handling by their replacement or shortening or by the rope thimbles replacement.

Picture with assembly dimensions



Technical Parameters:

clamp	KL 6/30	KL 20/60	KL 50/80
Rope anchoring diameter	14 – 30 mm	20 – 60 mm	60 – 80 mm
Rated safe working load	60 kN	200 kN	500 kN
Weight	56 kg	695 kg	935 kg

Description:

The main function elements are clamp wedges with replacement shoes for various rope diameters. The wedges move on supporting pulleys laid in anti-friction bearings. The supporting pulleys axles are fixed to the carrying frame of the clamp and are supported by the front tilting plate. The tilting of the plate enables to put the clamps on the rope. Moving of the clamp wedges from and to the working position is performed by a catch driver that is lifted or dropped down with a hand-levers via lifting bars. In the upper position, i.e. by the maximum open shoes, the clamp wedges are locked with a spring blocking device.

Function:

The clamps are mostly used in the pit bank where they are slipped over the rope after the folding slide-board uncovering with a hand-lever. After the slide-board resetting the wedges are moved with the hand-lever to the working position in which they weigh heavily on the rope. The clamping setting is reached with the rope weight itself. When the work with the rope is over the procedure runs vice-versa.

Safety:

The clamps determined for the mining industry shall with their design answer to the safety requirements of the Public Notices No. 22/1989 Coll. and No. 415/2003 Coll. of ČBÚ (Czech Mining Office Board).

Delivery:

The clamps are delivered with a protective coating, functionary surfaces are preserved with preserving oil. The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer's Certificate, material certificates, Test Reports.

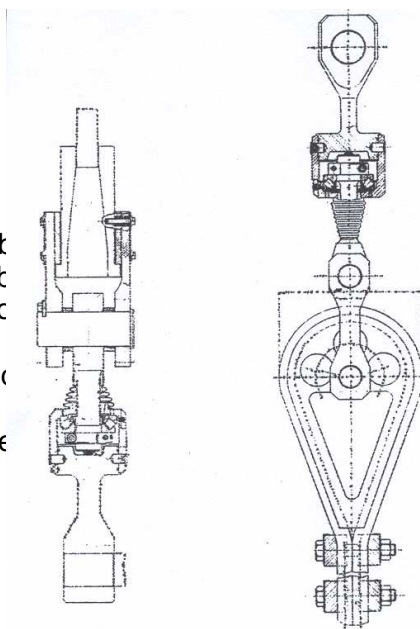
SUSPENSIONS FOR THE COMPENSATORY ROPES OF CIRCULAR PROFILE

Utilization:

The suspension is used for gripping the compensatory rope of circular profile to the transport vessel or also for the counter-weight. It enables the rope working rotation and its continuous shortening in the thimble.

Technical Description:

The swivel suspension enables rotation of the compensatory rope of circular profile during the working cycle. It consists of a swivel with a spherical-roller bearing and the rope thimble that is for the load capacity of 4 tonnes formed to a point crossing frog with rope nips. For higher load capacities the rope thimble consists of the encapsulated end-piece on one side and the wedge thimble type ASEA on the other side. The interconnection of the swivel and the thimble including the gripping to the transport vessel is performed with hinges.



Technical Parameters:

Turning Suspension Load Capacity	up to 4 t	up to 8 t	up to 16 t	up to 24 t
Compensatory Rope Diameter	25-37,5 mm	40-53 mm	56-63 mm	67-70 mm
Suspension with Encapsulated End-Piece				
Maximum Width	360 mm	D 254 mm	D 297 mm	D 297 mm
Length	1226 mm	1160 mm	1360 mm	1360 mm
Maximum Weight	109 kg	189 kg	325 kg	325 kg
Suspension with the Wedge Thimble Type				
Max. Turning Diameter		A 120 kN	A 160 kN	
Length		515 mm	515 mm	
Weight		1830 mm	2220 mm	
		432 kg	514 kg	

Delivery:

The suspension is delivered completely assembled with a protective coating, functional surfaces are preserved with preserving oil.

The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer's Certificate, material certificates, Test Reports.

Safety:

The suspensions determined for the mining industry shall with their design answer to the safety requirements of the Public Notices No. 22/1989 Coll. and No. 415/2003 Coll. of ČBÚ (Czech Mining Office Board).

Assembly:

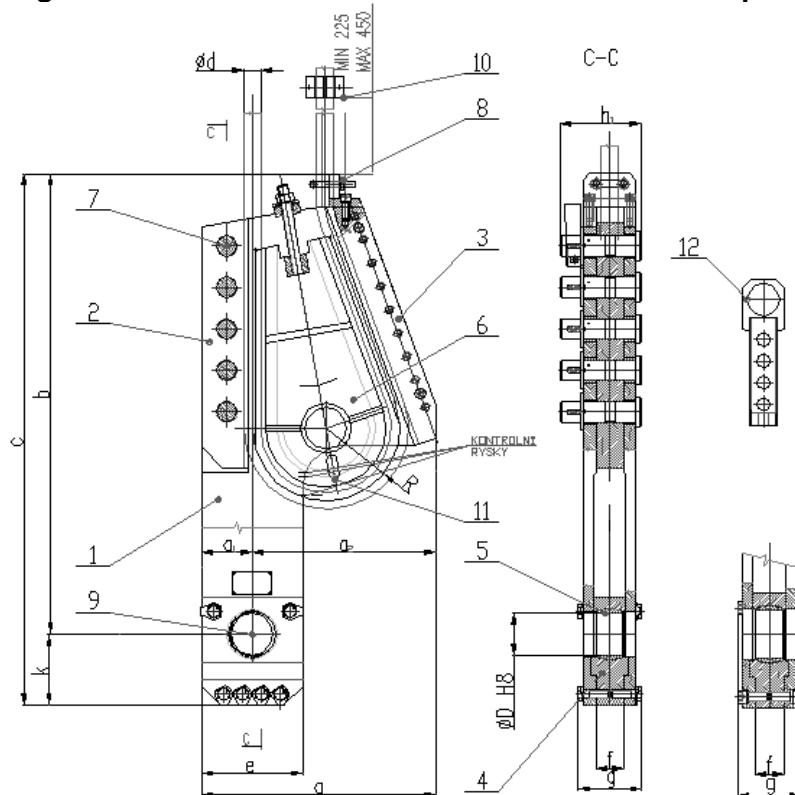
The assembly shall be only performed by experienced and trained staff authorized for such work by the company leadership. The assembly shall run under the technical supervision, before starting the equipment operation it is necessary to carry out a test run according to the company leadership determination.

WEDGE THIMBLE OF WINDING ROPES - Type AD

Utilization:

The wedge thimble is designed for the transport-vessel suspension of a more-ropes winding machine and after the loading capacity reanalysis this basic type may also be used for a single-rope winding machine. It is suitable as replacement of the existing thimbles type Schönfeld or Droste, that is why it is manufactured in the size line of these thimbles.

Assembly drawing with main dimensions and essential items description:



- 1 side frame
- 2 bar No. 1 – with hinges
- 3 bar No. 2 – slotted bar
- 4 bar No. 3
- 5 hinged bushing
- 6 heart with locking
- 7 bar hinge with locking pin
- 8 rope-end clamping
- 9 hinge pin with locking
- 10 control bracket
- 11 drift wedge
- 12 assembly jig

Indicator lines: 1- nominal rope diameter
 2- limit heart setting
 3- heart touch-down on the bars

NOTE: rope diameter d and the hole D for the hinge are made according to the customer's assignment, the width g may be modified for countersink screws

Function:

The rope is clutched in the self-locking wedge between the bars and the heart. After the rope setting into the clutch the heart position is assured with female screws and the control bracket is fixed.

Technical parameters

as well as the thimbles dimensions are given in the enclosed table (orientation values only).

Description:

The new technical solution under the type marking AD consists in the combination of the design execution of the carrier slot and the side frame hinges of the product that leads to a higher quality of the machinery manufacturing of the product – a more accurate production connected with a steadier distribution of the loading forces to the thimble carrying parts. The individual main parts are stated in the picture: the side frame (1) is the basic carrying part, where the clutching load is transferred on one side via the bar (2) and hinges, and on the other side via

the bar (3) with the slot. The bar (4) transfers the carrying force from the hinge pin (9) via hinged bushing (5) on the side frame (1) via the slot as well. The hinges (7) are locked with wedges, the heart (6) is locked with a screw through a disc spring and the bars (3 and 4) are fixed in the side frame with screws bonded with plied saddles – by the other modification the bar (4) is fixed with countersink screws. The rope is conducted out from the thimble by the end clamping (8) with the specified control bracket (10). The heart is shot out from the clutch with the drift wedge (11). The product is marked with a label and indicator lines.

Safety:

The product complies to the Public Notice No. 22/1989 Coll. of ČBÚ (Czech Mining Office Board) and especially to the Public Notice No. 415/2003 Coll., § 39

– Thimble:

- Security as min. 7-tuple than maximum static load specified for more-ropes winding machines (for utilization by single-rope winding machines with specified safety 10-tuple, it is necessary to recalculate the basic type load by a coefficient 0,7 or to order a “tailored” thimble);
- Security against the rope removal from the wedge thimble clutch as minimum 1,2-tuple;
- The rope end above the latest bracket as minimum 150 mm;
- Minimum R of the rope bend on the thimble not less than 4-tuple of the rated rope diameter;
- The main parts of the thimble are marked with the identical registration number;
- The thimble carrier parts have a material certificate;
- The thimble is provided with a special surface treatment except of the working parts;
- The thimble is accompanied with the heart drift wedge;
- The thimble is marked with indicator lines (the basic line must be between the lines 1 and 2 on the side frame) and the production label with the data: manufacturer, type, load capacity, production date, rope and hinge pin diameter, user’s registration number
- Each product shall be tested: (the sample for the testing shall be delivered by the customer)
- Testing load by 25% higher than permitted static load;
- Minimum testing period is 20 minutes;
- After the test, the carrier parts shall be dismantled and checked;
- The Test Report is an integral part of the Quality Certificate of the product;
- If requested, manufacturer performs non-destructive test as per § 64 (4) of the Public Notice No. 415/2003 Coll.

Delivery:

The products is delivered with a protective surface zinc coating and painting; working surfaces are protected with preserving oil. The product is accompanied by 2 pc of the heart drift wedges; a set of 4 thimbles is delivered with the assembly jig. The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer’s Certificate, material certificates, Test Reports and static calculation. If ordered it is also possible to deliver the hinge pins (9) with locking.

Assembly:

The assembly shall be performed only by experienced and trained workers authorized for this work by the organization leadership. The rope end in the thimble must be surface-ungreased with technical benzine, the thimble-contact surface must also be clean – free of painting and rusting, ungreased. After the rope end lacing through the thimble the heart is inserted in the rope eye and the heart is tucked in the contact with the rope. After the rope clutching the thimble is strong, the heart position is locked with screw nuts. The overhanging part of the rope shall be bandaged, fastened in a clamp in the upper part of the thimble and deflected so that the ropes do not touch. The control bracket is fastened on the rope, it shall be placed by 5-10-tuple of the rated rope diameter above the thimble. The distance between the thimble and the bracket shall be measured and carried to the Book on the Rope Ride. The thimble for the mounting must be completely assembled; it is necessary to check the hinges and screws tightening. The hinge pin (9) shall be locked after the mounting with a safety pin.

Guarantee:

The product is given a guarantee of 18 months as from the date of the operation start, however maximum 24 months after the delivery. If the instructions in the Operation Manual are not followed the guarantee of the product is left aside. The recommended service life-time is 10 years.

Others:

After the agreement with the manufacturer the product may be modified according to the customer’s requirement.



WEDGE THIMBLE Type AD

Table of sizes, informative dimensions, drawing numbers

Thimble dimension	0	1	2	3	4	5	6	7	8
Load capacity kN	25	40	55	100	150	220	300	400	*
Weight kg	20	33	65	149	250	300	514	825	
Ropes range d	16	16-20	20-25	26-35	36-40	40-45	50-60	63-70	*
a	230	267	352	456	530	555	850	974	
a1					110	120			
a2					420	435			
b	388	450	550	735	1040	1110	1270	1410	
c	443	520	630	850	1200	1280	1450	1650	
e	95	110	156	180	220	240	320	400	
f	31	32	38	44	65	65	72	70	
g	55	72	92	104	145	152/140	148	160	
h	83	97	125	150	172	191	220	242	
k					160	170			
Slot R					0,6d	0,6d			
Hinge D max					100	110			*

Thimble type: **AD 0/25 AD 1/37 AD 2/55 AD 3/100 AD 4/150 AD 5/220 AD 6/300 AD 7/400 AD ***
 AD * atypical delivery according to the customer's requirement

The general and group order number of the drawing related to the type

3726 - 000 100 200 300 400 500 600 700 800

is later completed by the manufacturer with his internal three-figures-code according to the product specification.

In your Purchase Order kindly state: number of pieces, thimble name, type, size/load capacity, drawing number, rope diameter **d**, hinge pin **D** and width **g**

Purchase Order Example: 4 pc Wedge Thimble AD 5/220, Drwng No. 3726-500

for the rope diameter 40 mm, hinge pin diameter 100 mm, width 152 mm

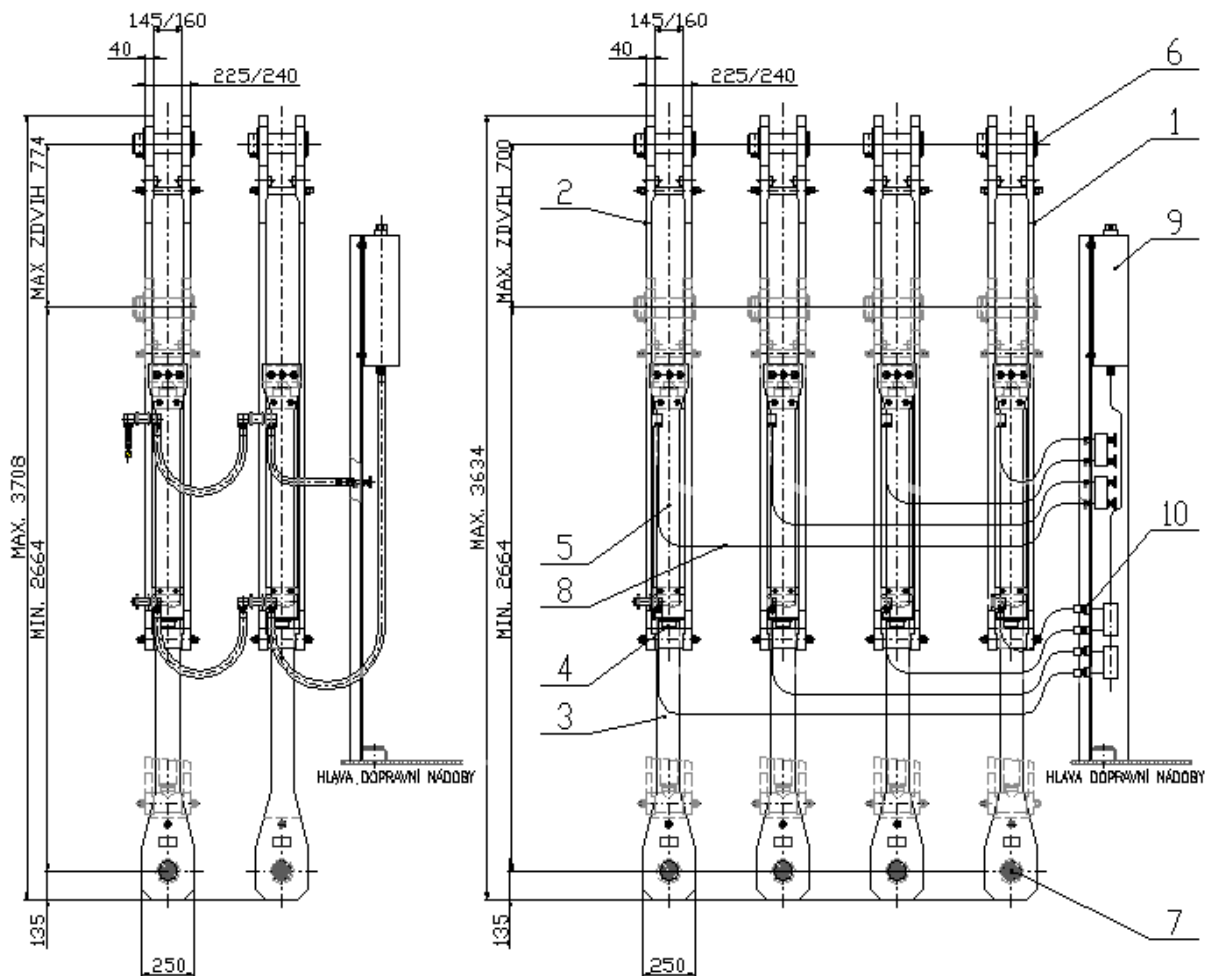
HYDRAULIC TENSILE COMPENSATOR

Type : HV 4 four-ropes – HV 2 two-ropes

Utilization:

Hydraulic tensile compensator serves for the rope tensile balancing by more-ropes winding machines equipped with a friction disc that are rising by the operation from various ropes prolongation, from their tolerance stiffness or from different diameters of the rope-slots of the friction disc. The winding plant is delivered together with a complete relevant compensator set according to the ropes number with hydraulic interconnection of cylinders, valves, pressure gauge and the hydraulic oil supply bin.

Hydraulic Compensators Composition



HV2

HV4

Legend :

1 - complete compensator cylinder, 2 - upper side-frame, 3 - bottom side-frame,
 4 - spherical bearing, 5 - working hydraulic cylinder, 6 - upper hinge pin, 7 - bottom hinge pin,
 8 - hydraulic interconnection, 9 - hydraulic oil supply bin, 10 - carrying console



Technical Characteristics:

type	marking	HV 2	HV 4
ropes number	pc	2	4
load capacity	kN	300	750
working cylinders diameter	mm	80	125
working pressure/testing	MPa	12 / 32	15 / 32
hydraulic oil	marking	HM 32	HM 32
working stroke	mm	774	700
min. length between hinges	mm	2664	2500
max. length between hinges	mm	3438	3200
hinges diameter	mm	90	100
width between the side-frames	mm	145	145 (160)
hydraulic oil supply bin	liter	20	25
cylinders spacing (according to ropes spacing)	mm	550	400
dimensions – see the drawing			
general drawing number		3040-000	3051-000

Function:

Balancing of the rope tensile consists in the principle of equal pressures in cylinders (given by load), their hydraulic interconnection by the possibility of different strokes of individual cylinders, which answers to different lengths of re-winded ropes. Tensile equalization is enabled until the stroke utilization, then the rope in the thimble must be shortened.

Description:

The operation compensator set consists of the same number of cylinders (1) like winding ropes. The cylinder (1) consists of two upper side-frames (2) and two bottom ones (3), equipped on one side with a head with an eye for hinge pins (6, 7) and on the other side with a screwed spherical bearing (4) with a working hydraulic cylinder (5) between them. The individual cylinders (5) are hydraulically interconnected (8), with hoses, screws, distribution cubes, control-valves set, pressure gauge and the hydraulic oil supply bin (9) placed together with the valves and cubes on the carrying console (10).

Safety:

The product answers to the requirements of the Public Notices No. 22/1989 Coll. and No. 415/2003 Coll. of ČBÚ (Czech Mining Office Board); the safety of mechanical carrying parts of the compensator is minimum 7-tuple against the type static load.

Delivery:

The Hydraulic Tensile Compensator set is delivered dismounted as independent complete parts and interconnection. The steel structure has a protective coating. The product is accompanied by one set of spare parts for the working cylinder sealing. The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts, Manufacturer's Certificate, material certificates, Test Reports and static calculation.

Assembly, Adjustment, Maintenance:

Basic mounting and function test is performed by the manufacturer. The assembly shall be only performed by experienced and trained staff authorized for such work by the company leadership following the technical documentation of the manufacturer.

Transport, Storage:

The product is dispatched EXW manufacturer's residence. Storage is recommended under roof in dry ambient with temperature over 5°C.

Guarantee:

The product is given a guarantee of 18 months as from the date of the operation start, however maximum 24 months after the delivery. If the instructions in the Operation Manual are not followed the guarantee of the product is left aside. The recommended service life-time is 10 years.

Others:

After the agreement with the Manufacturer the product may be modified according to the customer's requirement. According to an agreement the Manufacturer performs service work.

Placing an Order:

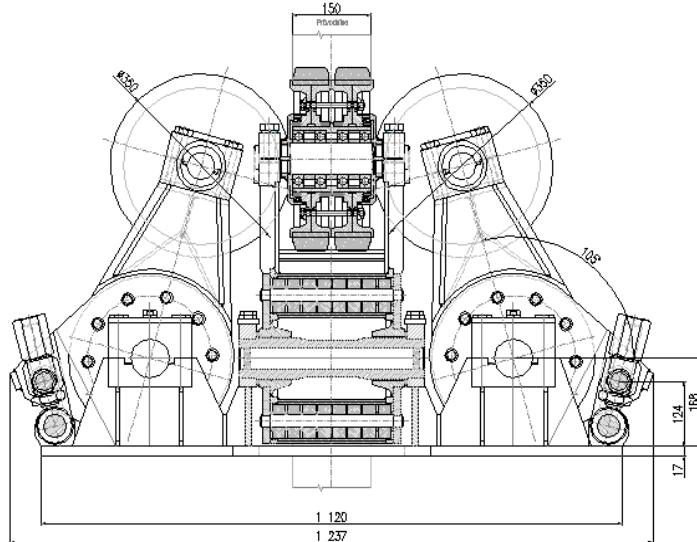
In your Purchase Order kindly state: number of pieces, name and type, drawing number

Purchase Order Example: 4 pc Hydraulic Tensile Compensator HV 4, Drwng No. 3051-000

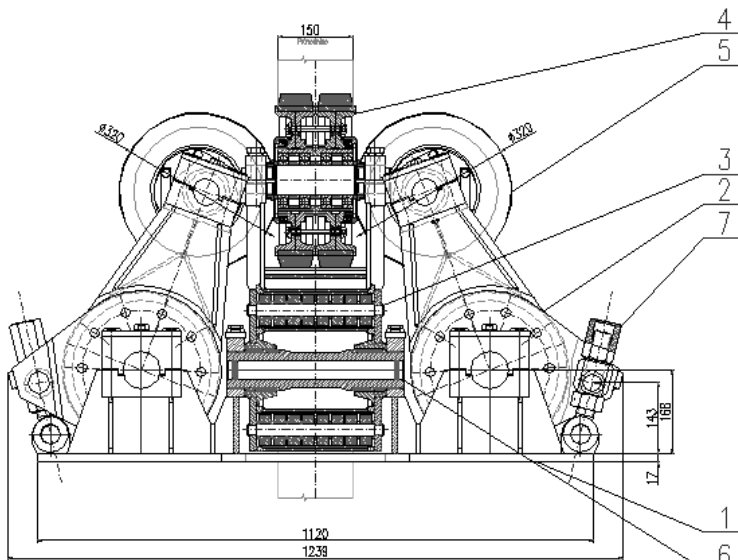
SPRING-LOADED WHEEL GUIDING KVO 40 SE P1, P2

Utilization:

The spring-loaded wheel guiding KVO 40 SE serves for the rolling guiding of transport vessels – skips – on the steel guide rails. It is innovation of the existing wheel guiding of the types KVO 350 and KVO 40. It is manufactured in two versions – P1 and P2, which differ in the execution of the side wheels.



KVO 40 SE P1



KVO 40 SE P2

Legend:

1 - baseplate, 2 - side arm, 3 - front arm, 4 - front axle, 5 - side wheel, 6 - tubular axis, 7 - adjustment

Function:

Dynamic impulses called during the run by asperity of the guide rails traction are eliminated with resistance and hysteresis of the rubber rings bunch. The flexible fixation of these forces fundamentally reduces impacts of dynamic impulses on the transport vessel construction and on the working pit equipment. The operation spring-loading follows the fractional characteristics of rubber springs; the characteristics can be modified by the composition of the springs according to needs. The springs hysteresis assures attenuation of the spring-loading counter-motion. After the clearance between the guide rail and the transport vessel is exhausted the transport vessel fixed-guides sit down on the guide rail.



Technical characteristics:

	Version:	P1	P2
Max. total operation weight of the guided vessel			up to 45 t
Max. total speed of the vessel			16 m/s
Guiding rails dimensions			steel 150 x 150 mm
Guiding wheels dimensions (front / side)		Ø350 / Ø350 mm	Ø350 / Ø320 mm
Wheels thrust setting		with a screw	with a screw / eccentric
Max. guiding wheel stroke in horizontal level			15 mm
Recommended guiding wheel setting to the guide rails			on touch
Maximum resistance force			40 kN
Dimensions (width x depth x height) acc. the drawing		1237x622x595 mm	1239x630x595 mm
Assembly bolts			12 x M 20
Weight		app. 560 kg	app. 570 kg

Description:

For the transport vessel equipment there are necessary four sets of the wheel guiding placed on the faces of the upper and bottom part of the skip vessel.

The set is formed by three independent mounted units assembled on a baseplate – two swing spring-loaded arms with wheels for side guiding and one swing spring-loaded arm with an axle for front guiding. The spring-loaded arms have the same design. They consist of 2 side frames as fix-parts carrying rods for rubber rings. The side frames are placed through self-lubricating sliding bushings on a tubular axis, that is reposed in split casings welded on the baseplate. The side frame are indented in the back part for the passage through the corner guiding and they are connected with a crossbeam forming together with a screw and nuts a thrust setting construction. The swing spring-loaded part of the arm consists of a drum with forks. In the concentric tubes of the drum there are placed the outside parts of the rubber rings. The forks welded on the drum coat bear the split casings for inserting the guiding wheel axes.

The face axle contains two rings with a rubber back-cloth. The discs reposed on ball bearings are fixed on the axis with KM nuts. The axis is reposed in split casings locked with a slot against turning.

The side wheel P1 consists of a replaceable ring with a rubber back-cloth placed in split discs on ball bearings. The axis is reposed in split casings of the arm.

The side wheel P2 consists of a replaceable rubber tire inserted in a two-part screw-disc placed on cone-bearings on the eccentric axis. One side of the axis is reposed in the tapered socket, the other one is reposed in the split casing.

The baseplate is equipped with the casings for the fixation of the swing arms tubular axes with twelve mounting holes for the assembly bolts M 20. The bolts heads of the casings upper parts are locked with a common safety-catch.

Delivery:

The set is delivered assembled on a palette. The product is supplied with a protective coating; working surfaces are protected with preserving oil. The delivery of four sets is by the version P2 accompanied by 1 pc nut wrench OK 90/36.

The integral part of the delivery is the accompanying documentation: the assembly drawing, Operation Manual, the list of spare parts and the Manufacturer's Certificate.

Assembly:

The set is mounted on the transport vessel with 12 bolts and locked with counter-nuts. The assembly of the spring-loaded arm is performed by the tubular hinge fixation in a baseplate casings. The assembly of the wheels with axes is performed by their fixation to the casings of the spring-loaded arms.

Adjustment, Maintenance

is performed according to the Operation Manual delivered together with the product. If not decide in another way the wheels are adjusted on touch to the guide rail either with an adjustment screw or with a wheel axis eccentric and locking with nuts.

Guarantee:

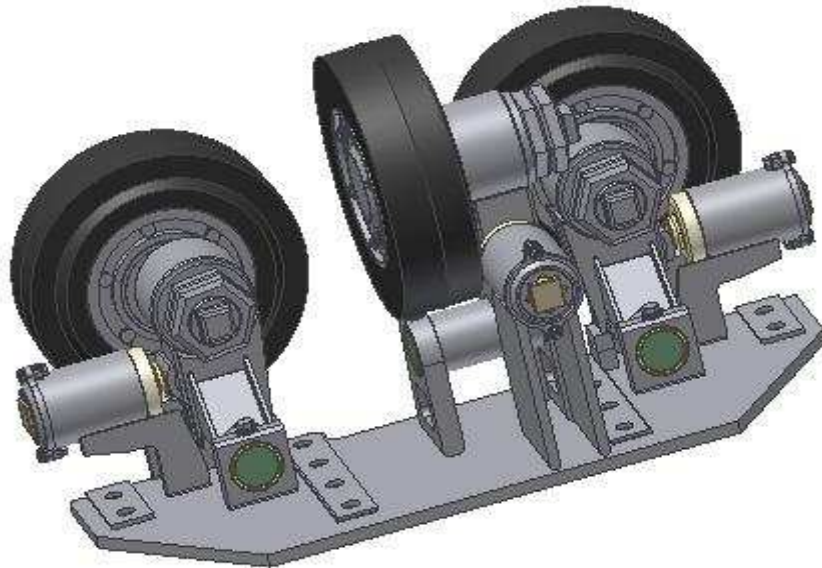
The product is given a guarantee of 18 months as from the date of the operation start, however maximum 24 months after the delivery. If the instructions in the Operation Manual are not followed the guarantee of the product is left aside.

Others:

After the agreement with the Manufacturer the product may be modified according to the customer's requirement.

Safety:

The products comply to the requirements of the Public Notice No. 22/1989 Coll. of ČBÚ (Czech Mining Office Board), the rubber wheels are delivered with the flame resistance certificate.



Function:

Dynamic impulses called during the run by asperity of the guide rails traction are eliminated with resistance and hysteresis of disc springs. The flexible fixation of these forces fundamentally reduces impacts of dynamic impulses on the transport vessel construction and on the working pit equipment. The guiding wheel is during the run in a forced touch with the guiding rail, the swinging of levers with wheels takes places in the swing-hinge reposed in casings on the baseplate. The resistance with the linear fractional characteristics is provided by a bunch of preloaded disc springs; the resistance characteristics may be modified according to need by the springs composition. After the clearance between the guide rail and the transport vessel is exhausted the transport vessel fixed-guides sit down on the guide rail which avoids eventual extreme impulses on the wheel guiding. After the guiding wheel rubber tire wearing there is performed an adjustment of its new position on touch by turning of the wheel eccentric hinge and locking with a nut pair.

The type P2 is a lite version constructed of high-strength materials.

The type P4 is designed for a wheel couple mounting on the face because of a better passage especially through the large holding holes of the guiding rails.

The Type P5 is a beaded version for higher horizontal impulses.

Description:

There are four sets mounted on a cage. The sets P2 and P3 contain one front and two side spring-loaded wheels, the set P4 has an axle mounted on a face lever. The supporting mounting element is the baseplate with casings welded on for one face and two side swing levers, holders of disc springs bunches and the holes for assembly bolts with counter-nuts. The swing levers are weldments containing a body for the guiding wheel cone hinge gripping, the side frames with a support for the disc springs strut and the supporting tube with bearing bushings for the hinge reposed in the baseplate casings. The mounting set is accompanied with three sets of disc springs in a closed and tight holder, spring struts, adjusting screws, their locks, safety-pins, and three complete full-rubber wheels with safety nuts reposed on a pair of cone bearings on the eccentric hinge with a taper edge. The axle by the version P4 is on a common axis reposed in split casings of the face swing lever. The beaded version P5 has got reinforced structure and a swinging levers hinges. On request, the central hinges lubrication from one spot is possible.

Mounting:

The set KVO 320 SE answers with its dimensional characteristics of the baseplate and mounting holes to the identical type of the unsprung wheel guiding Type KVN 32 that can be replaced by this new type without any additional modifications of the head and the transport vessel base. The set is mounted on the transport vessel with ten bolts and locked with counter-nuts. The guiding wheel is mounted by inserting the eccentric cone hinge in the swinging lever bushing and locking with a nut pair.

Adjustment, Maintenance

is performed according to the Operation Manual delivered together with the product. The integral part is the Spare Parts List.

Guarantee:

The product is given a guarantee of 12 months as from the date of the operation start, however maximum 18 months after the delivery. If the instructions in the Operation Manual are not followed the guarantee of the product is left aside.

Safety:

The products comply to the requirements of the Public Notice No. 22/1989 Coll. of ČBÚ (Czech Mining Office Board), the rubber wheels are delivered with the flame resistance certificate.

Others:

After the agreement with the Manufacturer the product may be modified according to the customer's requirement. This concerns modification according to different guiding rail dimensions, load, additional reinforcement, surface treatment etc.

