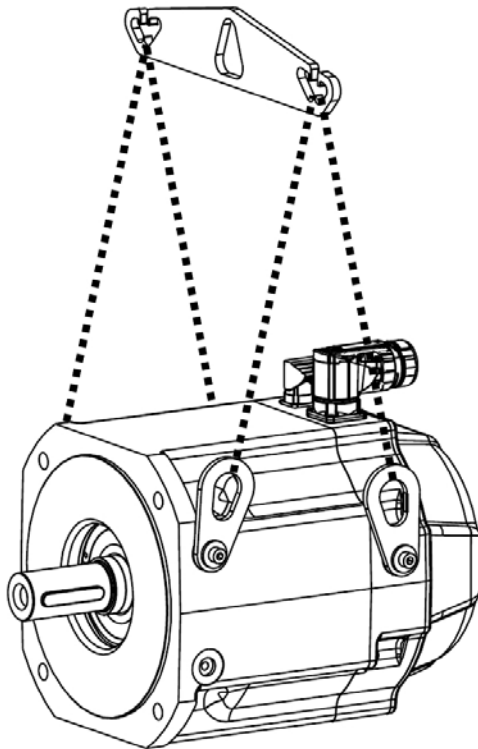


# SUSPENSION UNIT ZPMZ 120/292

## Instruction Manual



**Edition 07/2010**

Valid for revision of parts R-  
Original Document

<b>1</b>	<b>INTRODUCTORY INFORMATION.....</b>	<b>3</b>
	1.1 General.....	3
	1.2 Basic characteristics.....	3
	1.3 Explanation of type code (example).....	3
	Z = suspension.....	3
	1.4 Symbols used.....	3
<b>2</b>	<b>SAFETY PRECAUTIONS.....</b>	<b>4</b>
	2.1 Fundamental principle.....	4
	2.2 Definitions of terms.....	4
	2.3 Safety Instructions.....	4
	2.4 Use as directed.....	5
	2.5 Prohibited use.....	5
	2.6 Overview of residual risks.....	5
<b>3</b>	<b>DESCRIPTION OF THE SUSPENSION UNIT.....</b>	<b>6</b>
	3.1 Application.....	6
	3.2 Description.....	6
	3.2.1 The Beam.....	7
	3.3.2 Suspender ZMZ 60/8.....	8
	3.3 Technical specifications.....	10
	3.4 Markings.....	11
	3.5 Surface.....	11
<b>4</b>	<b>OPERATION.....</b>	<b>12</b>
	4.1 Safety Instructions.....	12
	4.2 Proper use of the Suspension Unit.....	12
<b>5</b>	<b>MAINTENANCE AND REPAIRS.....</b>	<b>12</b>
	5.1 Maintenance.....	12
	5.2 Repairs.....	12
<b>6</b>	<b>TESTING AND INSPECTION.....</b>	<b>13</b>
	6.1 Scope and content of testing.....	13
	6.2 Daily visual check.....	13
	6.3 Review inspection.....	13
	6.4 Functional test.....	13
	6.5 Load test.....	13
	6.6 Wear check.....	13
<b>7</b>	<b>WARRANTY CONDITIONS.....</b>	<b>14</b>
<b>8</b>	<b>DECLARATION OF CONFORMITY.....</b>	<b>14</b>

# 1 INTRODUCTORY INFORMATION

## 1.1 General

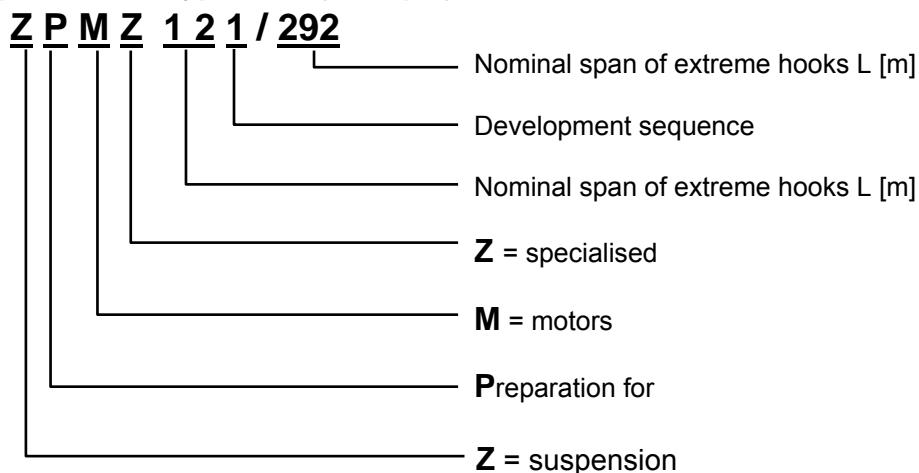
This Instruction Manual contains basic safety precautions to ensure the safe operation of the **Specialised Motor Suspension Unit ZPMZ 120/292** when handling AKM motors. It contains a technical description and requirements for control, operation, inspection testing, and maintenance.

Adherence to all the provisions contained in this Manual is a precondition for ensuring failure-free operation of the product and guarantee performance. All of the safety provisions have to be strictly observed in order to prevent accidents.




## 1.2 Basic characteristics

Specialised Motor Suspension Unit ZPMZ 120/292 (hereinafter, also Suspension Unit) is a gripping device designed for suspended handling of motors with a maximum weight of 120 kg and maximum nominal span of the gripping elements of 292 mm.

## 1.3 Explanation of type code (example)



## 1.4 Symbols used

Symbol	Indication
 <b>DANGER</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
<b>NOTICE</b>	Indicates situations which, if not avoided, could result in property damage.
<b>INFO</b>	This is not a safety symbol, it indicates important notes.

## 2 SAFETY PRECAUTIONS

### 2.1 Fundamental principle

**CAUTION** To ensure maximum security for operators, make yourselves deeply familiar with all the provision of this Instruction Manual prior to starting any work with the Suspension Unit (operating, testing, maintenance).

#### INFO

The Manufacturer declares with the Declaration of Conformity to the relevant ISO and EN standards that the product - Suspension Unit - conforms to the basic requirements on safety and occupational health protection.

#### INFO

To prevent the lug slipping out, each socket is fitted with a labyrinth approach gorge, positioned in a way that the lug cannot naturally slip out after any loosening. The Suspension Unit is fitted with a lifting capacity marking and its own weight on the label.

### 2.2 Definitions of terms

- **Dangerous work zone** - encompasses the area in (over) which the Suspension Unit travels when used in operation, including its immediate vicinity where persons in that area may be in danger (e.g., of fall of a wrongly gripped item). Nobody is allowed to linger in this zone.
- **User** - the legal entity responsible for the use of the Suspension Unit.
- **Operator - Slinger** - a person authorised and trained by the User for safe operation and use of the Suspension Unit. Operators are also persons authorised and trained for maintenance and testing of the Suspension Unit.

### 2.3 Safety Instructions

- **CAUTION** The Suspension Unit may only be used by a trained Operator (older than 18 years), deeply familiar with the Instruction Manual for the Suspension Unit, local operating conditions, and the particular work method, and conversant in communicating with the crane operator.
- The User of the Suspension Unit has to arrange training for the Operator. Prior to deploying the Suspension Unit in a particular workplace, the User has to make the Operator deeply familiar with local deployment conditions and any potential risks arising from the overall layout of the workplace, including defining the dangerous work zone for the Suspension Unit.
- operating the Suspension Unit, the Operator has to use gloves;
- while working, the Operator has to maintain a distance from the Suspension Unit of no less than 500 mm;

#### WARNING

## 2.4 Use as directed

- a) Operating the Suspension Unit, the Operator has to use gloves;
- b) While working, the Operator has to maintain a distance from the Suspension Unit of no less than 500 mm;
- c) The correct grip is checked after the motor is lifted a little: the grip has to be rigid and the motor position has to be natural;
- d) The motor has to be gripped over its centre of gravity in a way that the Suspension Unit Beam is horizontal, inclined at no more than 5°;
- e) The Suspender may only be stressed along the clamp plane, which is perpendicular to the connecting bolt axis;
- f) the Suspension Unit has to be put down on a bed (or in a rack), the height of which guarantees that the hooks do not rest on the floor and the Unit cannot fall and injure persons.

## 2.5 Prohibited use

- a) overloading the Suspension Unit, or lifting an motor with the Beam inclined at more than 5°;
- b) lifting loads that are of inappropriate shapes or not loose;
- c) suspending the Suspension Unit on a (lifting device) hook that is not fitted with a slip lock;
- d) using a Suspension Unit worn beyond the values shown in 6.6 below;
- e) putting down a Suspension Unit without securing it against tipping over, e.g., by bracing it up or placing it in a rack.

## 2.6 Overview of residual risks

Risk description	Solution description - required measures
<p><b>▲ WARNING</b>  <b>Risk of a load becoming loose and falling</b> due to the Suspension Unit slipping off the crane hook.</p>	<p><b>Alert to the necessity to check the functioning of the slip lock</b> on the crane hook; see Art. 2.4 and 4.2.</p>
<p><b>▲ WARNING</b>  <b>Risk of a load becoming loose</b> due to the motor being wrongly gripped.</p>	<p><b>Setting criteria for parameters</b> of a load that can be handled (motor) and process for checking correct gripping; see Art. 4.1 and 2.4.</p>
<p><b>▲ WARNING</b>  <b>Risk of the suspension bolt becoming loose</b> due to vibrations or incorrect mounting.</p>	<p><b>Setting criteria for parameters</b> bolt fastening torque 6 Nm and process for checking and <b>locking the bolt</b> using Loctite 243</p>
<p><b>▲ CAUTION</b>  <b>Possible Suspension Unit fall (tipping over)</b> if put down wrongly - may hurt the legs or feet of an Operator or a nearby person.</p>	<p><b>Alert to the necessity of securing the Suspension Unit against tipping over</b> when putting it down or placing it in a rack; see Art. 2.4, item (e).</p>

## 3 DESCRIPTION OF THE SUSPENSION UNIT

### 3.1 Application

The Suspension Unit is designed for suspended handling exclusively of motors (i.e., without attached units such as gearboxes, clutches, etc.) with a maximum weight of 120 kg and maximum nominal span of the extreme suspension hooks of 292 mm.

### 3.2 Description

Suspended Unit ZPMZ 120/292 consists of a Beam, suspended off the crane hook, two double-run chain suspenders and ZMZ 60/8 Suspenders, the number of which depends on the grip. The motor may be borne on two or four runs of the chain suspender.

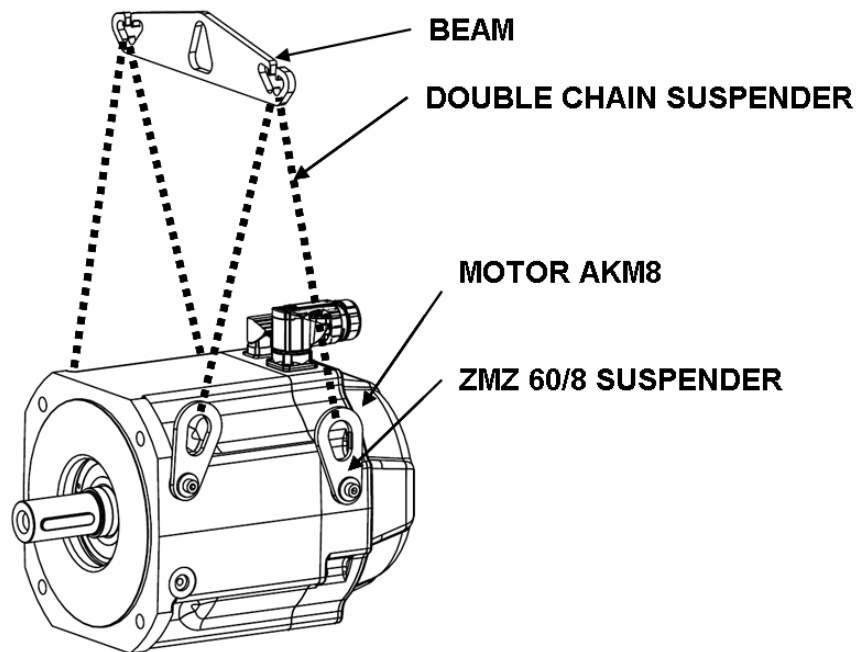


Fig. 1: Suspension Unit ZPMZ

### 3.2.1 The Beam

The Beam of the Suspension Unit is flat, single-wall with a flame-cut lug in the centre for suspending off the crane hook. Either end has two sockets for suspending the motor using a double-run chain suspender, while the lug of the chain suspender is inserted in each socket. To prevent the lug slipping out, each socket is fitted with a labyrinth approach gorge, positioned in a way that the lug cannot naturally slip out after any loosening.

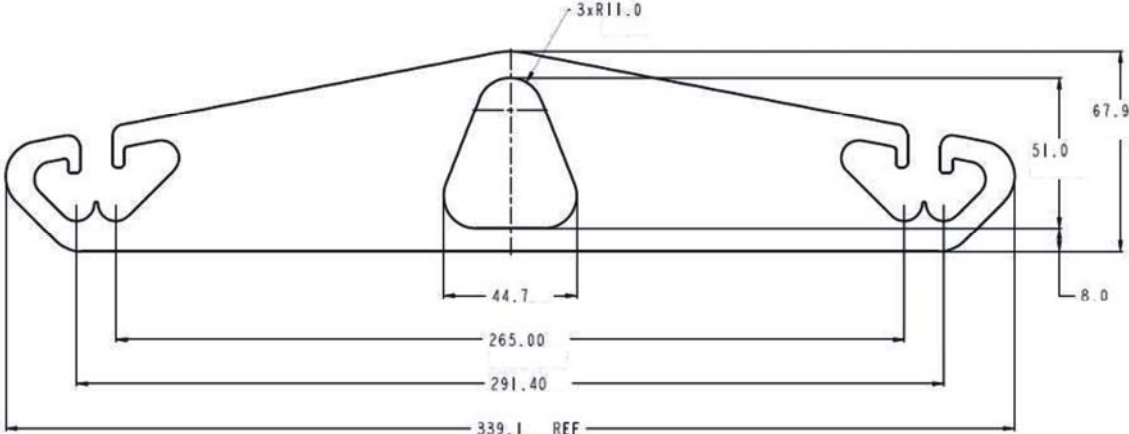


Fig. 2: Beam of Suspension Unit ZPMZ – layout (thickness 8mm)

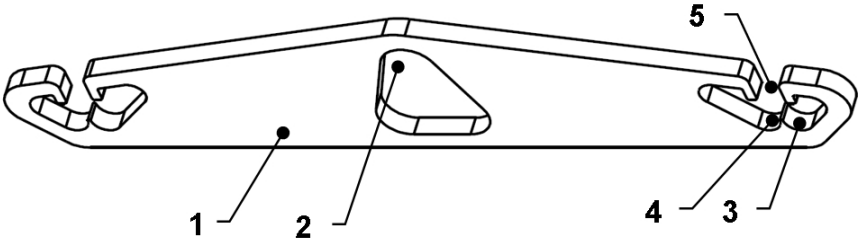
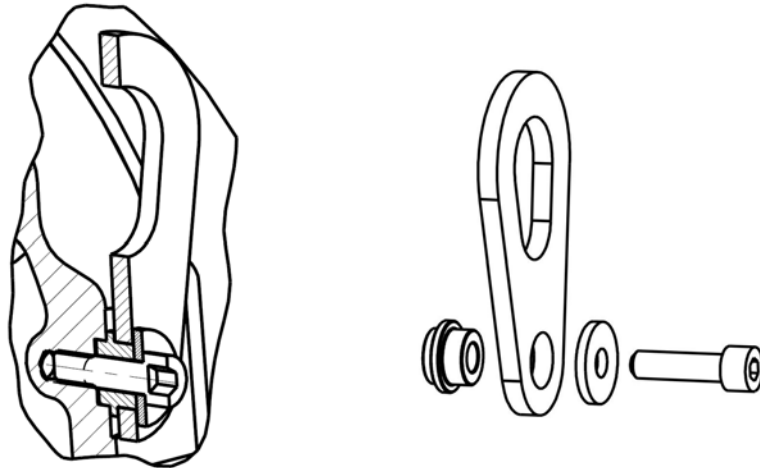


Fig. 3: Beam of Suspension Unit ZPMZ - description

- 1 - Beam load-bearing body;
- 2 - suspension lug for crane hook;
- 3 - outer socket for chain suspension lug;
- 4 - inner socket for chain suspension lug;
- 5 - labyrinth approach gorge.

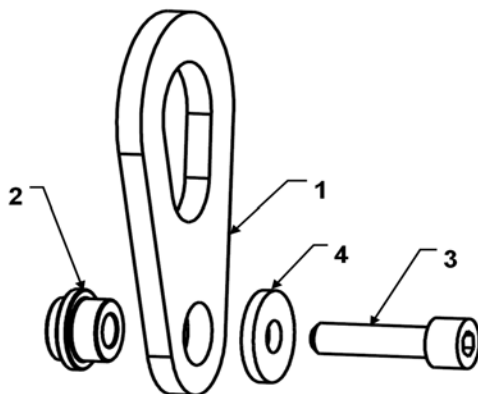
### 3.3.2 Suspender ZMZ 60/8

Specialised Motor Suspender ZMZ 60/8 is designed for suspended handling of motors with a maximum weight of 120 kg; the motor is gripped with two or four Suspenders.



**Fig. 4: Suspender ZMZ**

Each Suspender ZMZ 60/8 consists of an insert, a suspension clamp, and a connecting bolt with a washer. An motor may be borne by two or four Suspenders in a way that the suspension clamp lugs are hung using chain slings in a way that the chain sling may only pull at the suspension clamp along the clamp plane, i.e., a plane perpendicular to the bolt axis.



**Fig. 5: Suspender ZMZ - description**

- 1 - suspension clamp;
- 2 - insert;
- 3 - connecting bolt;
- 4 - washer.



Motor Suspender ZMZ 60/8 permits the safe suspension of an motor in any position that comes forward for handling, while observing the rule that the Suspender may only be loaded along the clamp plane, which is perpendicular to the connecting bolt axis; thus, the Beam always has to be used for suspension; see its layout in Fig. 3.

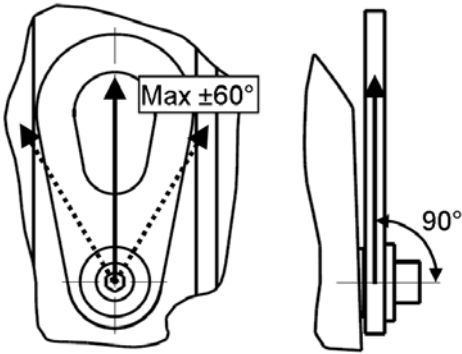


Fig. 6: Suspender ZMZ - load method

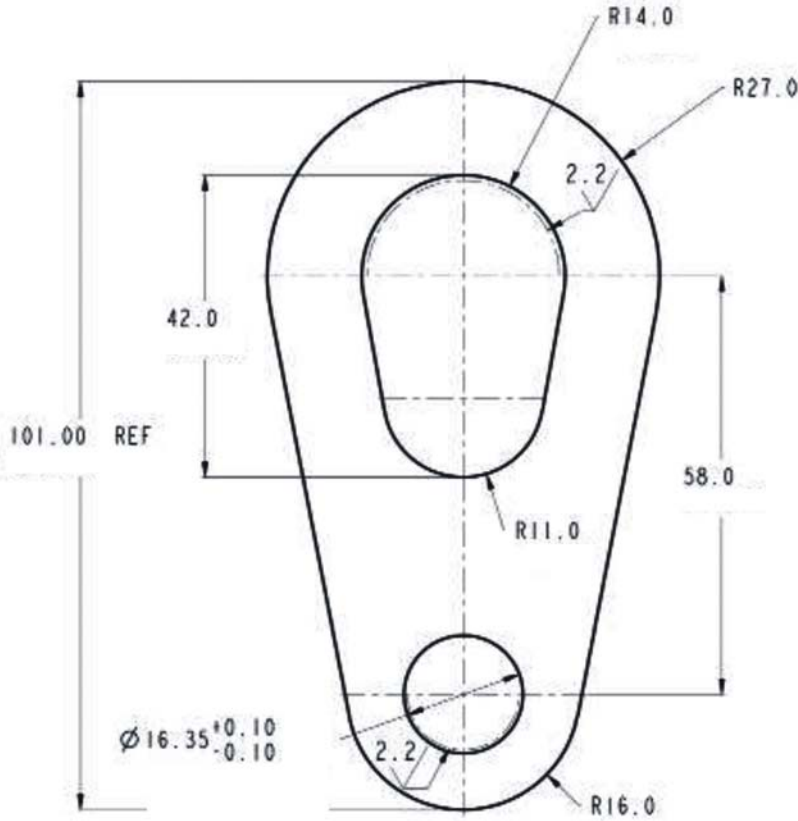


Fig. 7: Suspension clamp ZMZ – layout (thickness 6mm)

The motor is suspended off the Beam via the suspension clamp using double-run chain suspenders. The clamp is fastened to the motor with bolts that allow the clamp to rotate freely around the bolt axis. The motor may be suspended horizontally or vertically on two, three or four runs of the chain suspender.

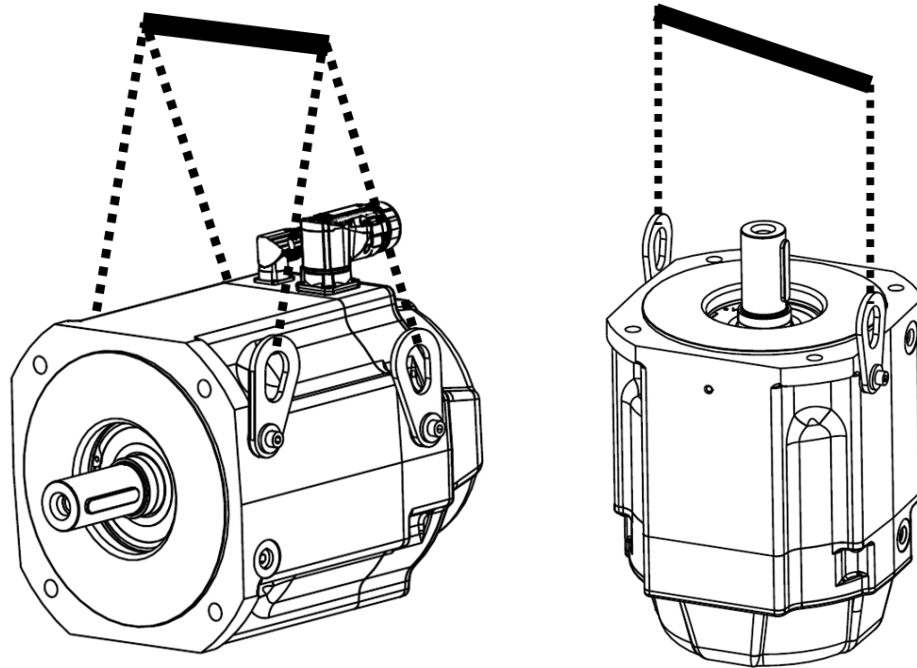


Fig. 8: ZPMZ - motor suspension methods

### 3.3 Technical specifications

Parameter	Dimension	Symbol	Value
Lifting capacity	kg	Q	120
Nominal span	mm	L	292
Lug width	mm	W	44.7
Lug height	mm	V	51
Weight	kg	G	
Number of cycles a year		Number of cycles a year	20,000
Average load		%	60

### 3.4 Markings

Markings on beam and suspension clamp

- manufacturing code: UNI-Exxnn-yyy  
xx ist the manufacturing number, nn is the charge number and yyy is the serial number within the charge.
- either side of the Beam and one side of the clamp has a lifting capacity mark:  
**WLL 120 kg**
- the CE conformity symbol can be found on one side:



Fig. 9 ZPMZ – Suspension Unit Beam – marking (Front and Rear)



Fig. 10 ZPMZ Suspension Clamp ZMZ – marking (Front and Rear)

### 3.5 Surface

- Suspension Unit Beam - zinc-coated
- Suspension Clamp ZMZ - zinc-coated

## 4 OPERATION

### 4.1 Safety Instructions

#### **⚠ CAUTION**

- The Suspension Unit may only be used by a trained Operator (older than 18 years), deeply familiar with the Instruction Manual for the Suspension Unit, local operating conditions, and the particular work method, and conversant in communicating with the crane operator.
- The User of the Suspension Unit has to arrange training for the Operator. Prior to deploying the Suspension Unit in a particular workplace, the User has to make the Operator deeply familiar with local deployment conditions and any potential risks arising from the overall layout of the workplace, including defining the dangerous work zone for the Suspension Unit.

#### **⚠ WARNING**

- operating the Suspension Unit, the Operator has to use gloves;
- while working, the Operator has to maintain a distance from the Suspension Unit of no less than 500 mm;

### 4.2 Proper use of the Suspension Unit

1. Attach the Suspension Unit Beam to the crane hook.
2. Guide the Suspension Unit with chain suspenders attached over the motor premounted suspension clamps and suspend the motor.
3. the motor has to be gripped over its centre of gravity in a way that the Suspension Unit Beam is horizontal, inclined at no more than 5°.
4. The Suspender may only be stressed along the clamp plane, which is perpendicular to the connecting bolt axis.
5. Lift the motor a little bit until it's free from the ground.
6. Check the correct grip, suspension clamps must not be twisted.
7. Move the motor to it's target position and put it down.
8. Remove the chains from the suspension clamps.
9. Put the Suspension Unit down on a bed (or in a rack), whose height guarantees that the hooks do not rest on the floor and the unit cannot fall and injure persons.

## 5 MAINTENANCE AND REPAIRS

### 5.1 Maintenance

Ensure that the testing/inspection is done according to section 6.

### 5.2 Repairs

Suspension Unit repairs have to be arranged with either the manufacturer or an authorised specialised company.

## 6 TESTING AND INSPECTION

### 6.1 Scope and content of testing

During its use, the Suspension Unit has to be inspected as follows:

- a) daily before the first use - visually as per 6.2;
- b) once every 12 months, a review inspection as per 6.3, and inspection of wear of functional parts as per 6.6.

### 6.2 Daily visual check

During the daily visual check, the operator shall check the overall Suspension Unit condition and whether any parts are damaged.

### 6.3 Review inspection

The following tasks are done during a review inspection, performed by the user's professional worker:

1. Visual check:
  - a. Suspension Unit completeness;
  - b. wear status;
  - c. condition of Suspension Unit surface finish as per 3.5 and markings as per 3.4;
2. A functional test as per 6.4;
3. A load test as per 6.5 is performed once every 4 years.

Following inspection and testing, an inspection report is made in the workplace operating journal.

### 6.4 Functional test

A functional test examines the balancing of the Suspension Unit and correct functioning of the hook slip locks (if hooks are installed).

### 6.5 Load test

During the load test, the Suspension Unit is loaded with a test load weighing 150% of the nominal lifting capacity; the test load has to be rigid and has to meet correct gripping requirements with its shape and grip points. It is lifted approx. 0.5 m high for 5 minutes; during that period, the beam must not suffer permanent deformities, which is measured with a template applied to the beam.

### 6.6 Wear check

The wear check of functional part inspects permanent deformities in rods and wear of gripping elements; if measured values exceed the limit values, the Suspension Unit has to be decommissioned and handed to an authorised specialised company for repair. If any crack in the load-bearing structure material is identified, the Suspension Unit has to be decommissioned immediately.

#### Wear limit values:

- ◆ deviation from beam straightness along both planes .... **5 mm / 500 mm**
- ◆ wear of load-bearing cross-sections in the excess of .... **10%**

## 7 WARRANTY CONDITIONS

The Manufacturer provides a warranty on the functioning of the Suspension Unit for a period of 24 months from the day of accepting the product at the manufacturing plant. For this warranty to be effective, the condition on demonstrable performance of review inspections under ISO 9927-1 has to be met.

The warranties do not cover:

- a) surface defects occurring during transport or storage of the Suspension Unit;
- b) defects occurring due to inexpert operation of the Suspension Unit or overloading it;
- c) products which have been modified by the user in any way.

Warranty cannot be asserted:

- a) if no recordings of the operation, operators and the inspections have been done.
- b) in case of wear, whereby this wear was caused by the operation at operating conditions others than described in the table in chapters 2.4 and 3.3 .

## 8 DECLARATION OF CONFORMITY

In the sense of EU Directive 2006/42/EC, the Manufacturer confirms that the rendering of the product conforms to all standards and related regulations in force and is in conformity with them.

An overview of relevant regulations and standards is shown in the following list.

EU Directive 2006/42/EC	On Assessing Conformity EC,
EN ISO 14121-1	Safety of machinery - Risk assessment principles;
EN ISO 12100-1	Safety of machinery. Basic concepts, Part 1: Basic terminology;
EN ISO 12100-2	Safety of machinery. Basic concepts, Part 2: Technical principles;
EN 349	Safety of machinery. Minimum gaps to avoid crushing of parts of the human body;
EN 13155	Cranes. Safety. Non-fixed load lifting attachments;
ISO 12 480-1	Cranes. Safe operation;
ISO 12 482-1	Cranes. Condition monitoring;
ISO 9927-1	Cranes. Inspection.

The Manufacturer issues an **EC Declaration of Conformity** for **Suspension Unit ZPMZ 120/292** and derived types. This Declaration along with the Technical Documentation is stored at the manufacturer. The client is issued a copy of this Declaration and this Instruction Manual.

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## **Service**

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If you are unaware of your local sales representative, please contact the Customer Support.

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