

# **SLOVENSKI STANDARD**

## **SIST EN 500-4:2011**

**01-julij-2011**

**Nadomešča:**

**SIST EN 500-4:2007/kprA2:2010**

**SIST EN 500-4:2007+A1:2009**

---

**Premični stroji za gradnjo cest - Varnost - 4. del: Posebne zahteve za stroje za kompaktiranje tal**

Mobile road construction machinery - Safety - Part 4: Specific requirements for compaction machines

**iTeh STANDARD PREVIEW**  
(standards.itteh.ai)  
Bewegliche Straßenbaumaschinen - Sicherheit - Teil 4: Besondere Anforderungen an Verdichtungsmaschinen

[SIST EN 500-4:2011](https://standards.itteh.ai/catalog/standards/sist/730cch34-b78d-4a2a-8ad9-e80e03c1119b/sist-en-500-4-2011)  
<https://standards.itteh.ai/catalog/standards/sist/730cch34-b78d-4a2a-8ad9-e80e03c1119b/sist-en-500-4-2011>  
Machines mobiles pour la construction de routes - Sécurité - Partie 4: Prescriptions spécifiques pour compacteurs

**Ta slovenski standard je istoveten z: EN 500-4:2011**

---

**ICS:**

93.080.10      Gradnja cest

Road construction

**SIST EN 500-4:2011**

**en,fr**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 500-4:2011

<https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9-e80e03c11f9b/sist-en-500-4-2011>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 500-4**

February 2011

ICS 93.080.10

Supersedes EN 500-4:2006+A1:2009

English Version

**Mobile road construction machinery - Safety - Part 4: Specific  
requirements for compaction machines**

Machines mobiles pour la construction de routes - Sécurité  
- Partie 4: Prescriptions spécifiques pour compacteurs

Bewegliche Straßenbaumaschinen - Sicherheit - Teil 4:  
Besondere Anforderungen an Verdichtungsmaschinen

This European Standard was approved by CEN on 9 January 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN 500-4:2011](https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9-e80e03c11f9b/sist-en-500-4-2011)

<https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9-e80e03c11f9b/sist-en-500-4-2011>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

# Contents

Page

Foreword.....	6
Introduction .....	8
1 Scope .....	8
2 Normative references .....	8
3 Terms and definitions .....	9
4 List of significant hazards .....	11
5 Safety requirements and/or protective measures .....	11
5.1 Lighting, signalling and marking lights and reflex-reflector devices.....	11
5.2 Operation and handling .....	11
5.2.1 Retrieval transportation and towing .....	11
5.2.2 Pedestrian-controlled rollers .....	11
5.3 Operator's station .....	13
5.4 Operator's seat.....	13
5.5 Controls and indicators .....	13
5.5.1 General.....	13
5.5.2 Travel control of pedestrian-controlled machines with handle bar .....	13
5.5.3 Controls for towed machines .....	13
5.5.4 Remote control of pedestrian-controlled rollers .....	13
5.6 Starting .....	14
5.7 Stopping .....	14
5.7.1 General.....	14
5.7.2 Stopping device .....	14
5.7.3 Braking systems .....	14
5.8 Access system to operator's station and to maintenance points .....	15
5.9 Roll-over protective structure (ROPS).....	15
5.10 Noise and vibration.....	16
5.10.1 Noise measurement of vibratory plates and vibratory rammers .....	16
5.10.2 Noise measurement of rollers .....	16
5.10.3 Vibration measurement of hand-guided machines .....	16
6 Verification of safety requirements and/or protective measures .....	17
7 Information for the user .....	17
7.1 Warning signals and devices .....	17
7.2 Instruction handbook .....	17
7.3 Marking .....	18
Annex A (normative) Remote infrared controls for rollers with attending operator .....	19
A.1 General.....	19
A.2 Scope .....	19
A.3 Terms and definitions .....	19
A.4 Safety requirements and measures .....	19
A.5 Components and equipment .....	21
Annex B (normative) Noise-test-code for vibratory plates and vibratory rammers .....	23
B.1 Scope .....	23
B.2 Determination of the A-weighted sound power level .....	23
B.2.1 General.....	23
B.2.2 Measurement surface .....	24
B.2.3 Test procedure .....	28
B.2.4 Repetition of the test and calculation of the sound power level .....	28

B.3	Determination of the A-weighted emission sound pressure level at the operator's position.....	29
B.3.1	General .....	29
B.3.2	Operator's position .....	29
B.3.3	Test procedure.....	29
B.3.4	Repetition of the test and calculation of the emission sound pressure level.....	29
B.3.5	Determination of emission sound pressure spectra .....	29
B.3.6	Sound pressure level as a function of time .....	29
B.4	Installation and mounting conditions .....	30
B.4.1	General .....	30
B.4.2	Design of the test surface.....	30
B.4.3	Design of the test site .....	31
B.5	Operating conditions .....	33
B.6	Uncertainty .....	33
B.7	Information to be recorded.....	33
B.8	Information to be reported.....	34
B.9	Declaration and verification of noise emission values .....	35
Annex C	(normative) Measurement of the hand-arm vibration of hand-guided vibratory ground compaction machines.....	36
C.1	General .....	36
C.2	Terminology .....	36
C.3	Quantities to be measured .....	36
C.3.1	R.m.s. value of the weighted acceleration .....	36
C.3.2	Frequency analysis .....	36
C.3.3	Time records .....	37
C.3.4	Other quantities to be measured .....	37
C.4	Measuring equipment.....	37
C.4.1	Requirements for the acceleration transducers .....	37
C.4.2	Fastening of the acceleration transducers .....	37
C.4.3	Frequency weighting filter.....	37
C.4.4	R.m.s. detector.....	37
C.4.5	Calibration .....	37
C.5	Measurement direction and measurement location.....	38
C.5.1	Measurement direction .....	38
C.5.2	Measurement location.....	40
C.6	Specification of working procedure .....	40
C.6.1	Operator.....	40
C.6.2	Other quantities to be determined (forces).....	40
C.6.3	Operating conditions .....	40
C.6.4	Requirements for the test site.....	40
C.6.5	Measurement procedure.....	41
C.7	Test report.....	41
C.7.1	Reference .....	41
C.7.2	Description of the object to be measured.....	41
C.7.3	List of measuring equipment .....	41
C.7.4	Fastening of the acceleration transducers .....	41
C.7.5	Operating conditions .....	41
C.7.6	Further specifications .....	41
C.7.7	Results.....	42
C.8	Report of results.....	42
C.9	Measurement uncertainty .....	42
Annex D	(normative) Noise test code for vibratory rollers.....	43
D.1	Scope .....	43
D.2	Determination of the A-weighted sound power level .....	43
D.2.1	General .....	43
D.2.2	Measurement surface.....	43
D.2.3	Positioning of the machine.....	45
D.2.4	Repetition of the test.....	49

## EN 500-4:2011 (E)

<b>D.3</b>	<b>Determination of the A-weighted emission sound pressure level at the operators positions for vibratory rollers.....</b>	<b>49</b>
D.3.1	General.....	49
D.3.2	Operator's positions.....	49
D.3.3	Enclosed operator's positions .....	49
D.3.4	Quantities to be determined .....	49
D.3.5	Microphone position(s) .....	49
D.3.6	Test procedure .....	49
D.3.7	Repetition of the test .....	50
<b>D.4</b>	<b>Test conditions .....</b>	<b>50</b>
D.4.1	Installation and mounting conditions.....	50
D.4.2	Operating conditions.....	50
<b>D.5</b>	<b>Uncertainty .....</b>	<b>50</b>
<b>D.6</b>	<b>Information to be recorded .....</b>	<b>51</b>
<b>D.7</b>	<b>Information to be reported.....</b>	<b>51</b>
<b>D.8</b>	<b>Declaration and verification of noise emission values.....</b>	<b>52</b>
<b>Annex E</b>	<b>(normative) Noise test code for non-vibrating rollers .....</b>	<b>53</b>
E.1	Scope .....	53
<b>E.2</b>	<b>Determination of the A-weighted sound power level.....</b>	<b>53</b>
E.2.1	General.....	53
E.2.2	Measurement surface.....	53
E.2.3	Positioning of the machine.....	55
E.2.4	Repetition of the test .....	56
<b>E.3</b>	<b>Determination of the A-weighted emission sound pressure level at operator's positions for non-vibrating rollers .....</b>	<b>56</b>
E.3.1	General.....	56
E.3.2	Operators positions.....	56
E.3.3	Enclosed operator's positions .....	56
E.3.4	Quantities to be determined .....	56
E.3.5	Microphone position(s) .....	56
E.3.6	Test procedure .....	56
E.3.7	Repetition of the test .....	57
<b>E.4</b>	<b>Test conditions .....</b>	<b>57</b>
E.4.1	Installation and mounting conditions.....	57
E.4.2	Operating conditions.....	57
<b>E.5</b>	<b>Uncertainty .....</b>	<b>57</b>
<b>E.6</b>	<b>Information to be recorded .....</b>	<b>58</b>
<b>E.7</b>	<b>Information to be reported.....</b>	<b>58</b>
<b>E.8</b>	<b>Declaration and verification of noise emission values.....</b>	<b>59</b>
<b>Annex ZA</b>	<b>(informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC .....</b>	<b>60</b>
<b>Bibliography</b>	<b>.....</b>	<b>61</b>

## Figures

Figure 1 — Vertical swinging of single-drum walk-behind rollers .....	12
Figure 2 — Position of the stopping device at pedestrian-controlled rollers .....	13
Figure 3 — Minimum clearance of lower limbs at access to the operator's station on machines with articulated steering .....	15
Figure 4 — Deflection-limiting volume, front view, side view.....	16
Figure 5 — Warning decal .....	17

Figure B.1 — Arrangement of test positions for hand-guided vibratory plates and hand-guided vibratory rammers .....	25
Figure B.2 — Arrangement of test positions for remote controlled vibratory plates.....	27
Figure B.3 — Grading-size diagram of the material to be compacted (gravel).....	31
Figure B.4 — Test site and arrangement with test track .....	32
Figure C.1 — Directions of measurement and examples for attachment of the acceleration transducer.....	39
Figure C.2 — Arrangement of the coupling device on the drawbar .....	40
Figure D.1 — Basic length $L$ .....	44
Figure D.2 — Arrangement of test positions for ride-on vibratory rollers .....	45
Figure D.3 — Arrangement of test positions for hand-guided vibratory rollers .....	46
Figure D.4 — Arrangement of test positions for remote controlled vibratory rollers .....	47
Figure D.5 — Arrangement of test positions for towed vibratory rollers.....	48
Figure E.1 — Basic length $L$ .....	54
Figure E.2 — Microphone positions .....	55

**STANDARD PREVIEW**  
**(standards.iteh.ai)**

## Tables

Table B.1 — Coordinates of microphones .....	28
Table B.2 — Operating conditions .....	33
Table B.3 — Uncertainties applicable to gravel course .....	33
Table D.2 — Uncertainties applicable to cushion mounted machines.....	50
Table E.1 — Coordinates of microphone positions .....	54
Table E.2 — Uncertainties.....	57

## Foreword

This document (EN 500-4:2011) has been prepared by Technical Committee CEN/TC 151 Building material construction machinery and equipment — Safety”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

This document supersedes EN 500-4:2006+A1:2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive.

For relationship with EU Directive, see informative Annex ZA which is an integral part of this document.

The following changes have been introduced during the revision of EN 500-4:2006+A1:2009:

- exclusion of machines for seated ride-on operated rollers with a drum width less than nominal 0,8 m;
- addition of warnings and instructions regarding use of machines with a drum width less than nominal 1 m;
- vibrating rollers, irrespective whether they are intended for ride-on operation, pedestrian- or remote-controlled are measured on a cushion/elastic underlay;
- non-vibrating rollers, irrespective whether they are intended for ride-on operation, pedestrian- or remote-controlled are measured on a rigid reflecting plane without load and engine operating at nominal power-output;
- vibratory rammers are measured on the gravel-track;
- vibratory plates are measured on the gravel-track;
- for pragmatic reasons the deletion of explosion rammers and non-vibrating towed rollers/equipment is suggested ancillary, because today explosion-rammers cannot be found in the market any longer and non-vibrating towed rollers/equipment represent a passive attachment without any power-source and a function based on static-load only.

EN 500 “Mobile road construction machinery — Safety” comprise the following parts:

- Part 1: Common requirements;
- Part 2: Specific requirements for road-milling machines;
- Part 3: Specific requirements for soil-stabilising machines and recycling machines;
- Part 4: Specific requirements for compaction machines;
- Part 6: Specific requirements for paver-finishers.



According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 500-4:2011

<https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9-e80e03c11f9b/sist-en-500-4-2011>

## Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this European Standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

## 1 Scope

This part of EN 500 specifies the safety requirements for compaction machines as defined in Clause 3 and deals with all significant hazards, hazardous situations and events relevant to compaction machines, when they are used as intended and under conditions of misuse which are reasonably foreseeable.

This document specifies additional requirements to and/or exceptions from EN 500-1 "Common requirements".

This part of EN 500 is not applicable for seated ride-on operated rollers with a drum width less than nominal 0,8 m.

ITeH STANDARD PREVIEW  
(standards.iteh.ai)

## 2 Normative references

[SIST EN 500-4:2011](https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9-)

<https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9->

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 500-1:2006+A1:2009, *Mobile road construction machinery — Safety — Part 1: Common requirements*

EN 954-1:1996, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60664 (all parts), *Insulation coordination for equipment within low-voltage systems*

EN ISO 3164:2008, *Earth-moving machinery — Laboratory evaluations of protective structures — Specifications for deflection-limiting volume (ISO 3164:1995)*

EN ISO 3450:2008, *Earth-moving machinery — Braking systems of rubber-tyred machines — Systems and performance requirements and test procedures (ISO 3450:1996)*

EN ISO 3471:2008, *Earth-moving machinery — Roll-over protective structures — Laboratory tests and performance requirements (ISO 3471:2008)*

EN ISO 3744:2010 *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 6683:2008, *Earth-moving machinery — Seat belts and seat belt anchorages — Performance requirements and tests (ISO 6683:2005)*

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 20643:2008, *Mechanical vibration — Hand-held and hand-guided machinery — Principles for evaluation of vibration emission (ISO 20643:2005)*

ISO 17063:2003, *Earth-moving machinery — Braking systems of pedestrian-controlled machines — Performance requirements and test procedures*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

#### 3.1

##### **compaction machine**

machine which compacts materials, e.g. rock fills, soil or asphalt surfacing, through a rolling, tamping, percussive or vibrating action of the working tool or a combination of the latter. It may be self-propelled, towed or carried as attachment to a carrying machine. A compaction machine may be controlled by direct control of an operator in physical contact with the machine (seated or standing on the machine, or walking behind operating the controls directly mounted on the machine), or indirect control without physical contact of an operator with the machine (remote controlled by wire or wireless in accordance with Annex A)

NOTE ISO 8811:2000; Clause 4 provides a methodology for a further sub-classification of vibratory and non-vibrating rollers.

Compaction machines are subdivided as follows:

#### 3.1.1

##### **vibratory roller**

self-propelled or towed compaction machine with one or more metallic cylindrical bodies (drums), rubber tyres or a combination of the latter

NOTE The compaction of materials is performed through a rolling and directional oscillating action of the working tool.

#### 3.1.1.1

##### **vibratory roller for ride-on operations**

self-propelled and direct controlled machine as defined in 3.1.1, where a seated or standing operator rides on the machine present at a machine integrated operator's station

#### 3.1.1.1.1

##### **vibratory single-drum roller**

self-propelled and direct controlled compaction machine as defined in 3.1.1.1 with one vibrating metallic cylindrical body (drum) and two rubber tyres

#### 3.1.1.1.2

##### **vibratory tandem roller**

self-propelled and direct controlled compaction machine as defined in 3.1.1.1 with one metallic cylindrical body (drum) in the front and one in the rear

NOTE The drums can be split.

**EN 500-4:2011 (E)****3.1.1.1.3****vibratory combined roller**

self-propelled and direct controlled compaction machine as defined in 3.1.1.1 with one or more metallic cylindrical body (drum) and more than two rubber tyres

**3.1.1.1.4****vibratory three-wheel roller**

self-propelled and direct controlled compaction machine as defined in 3.1.1.1 with one metallic body (drum) in the front (or rear) and two in the rear (or front)

NOTE The drums can be split.

**3.1.1.2****vibratory pedestrian controlled roller**

self-propelled and by walking operator directly controlled or attending operator indirectly controlled machine as defined in 3.1.1

**3.1.1.3****vibratory towed roller**

towed and indirectly controlled machine as defined in 3.1.1 with one or more metallic cylindrical bodies (drums) or rubber tyres which do not possess an independent drive system and where the operator's station is located at the towing unit

**3.1.2****non-vibrating roller**

self-propelled or towed compaction machine with one or more metallic cylindrical bodies (drums), rubber tyres or a combination of the latter

NOTE The compaction of materials is performed through a rolling action of the working tool.

**3.1.2.1****pneumatic-tyre roller**

self-propelled compaction machine as defined in 3.1.2 with three or more tyres in the front and the rear

**3.1.2.2****static towed roller**

towed machine as defined in 3.1.2 with one or more metallic cylindrical bodies (drums) or rubber tyres which do neither possess an independent drive system nor an independent vibration system and where the operator's station is located at the towing unit

**3.1.3****vibratory plate**

compaction machine with mainly flat base-plate which is transposed into vibration and moving into a predominantly horizontal direction by directional oscillation

NOTE 1 The compaction of materials is performed through an oscillating action of the working tool.

NOTE 2 ISO 19433:2008 provides a methodology for a further sub-classification of vibratory plates.

**3.1.4****vibratory rammer**

compaction machine with mainly a flat foot-plate (shoe), which is made to move in a predominantly vertical direction by displacement

NOTE The compaction of materials is performed through a percussive or a tamping action of the working tool or a combination of the latter.

**3.2****braking system**

system affecting all machine components between the operator and the wheels and drums, which effects the machine stopping and holding (see EN ISO 3450:2008 for further definition)

**4 List of significant hazards**

EN 500-1:2006+A1:2009, Annex F shall apply.

**5 Safety requirements and/or protective measures****5.1 Lighting, signalling and marking lights and reflex-reflector devices**

EN 500-1:2006+A1:2009, 5.2 shall apply.

**5.2 Operation and handling****5.2.1 Retrieval transportation and towing**

EN 500-1:2006+A1:2009, 5.3.2 shall apply.

**5.2.2 Pedestrian-controlled rollers****5.2.2.1 General**

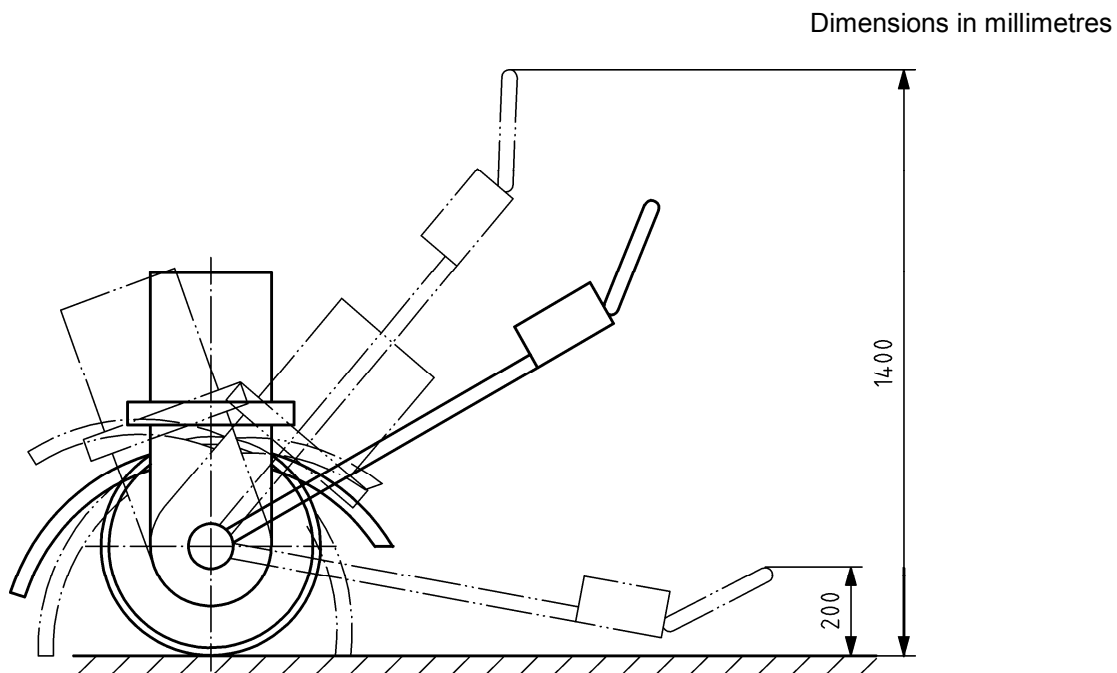
EN 500-1:2006+A1:2009, 5.3.3 shall apply with the following addition:

**5.2.2.2 Handle bar**

To prevent dangerous vertical swinging of the steering element (handle bar) of the single-drum pedestrian-controlled rollers, movement of the handle in the vertical direction shall be not less than 0,2 m and not more than 1,4 m above the ground (see Figure 1).

ITEH STANDARD PREVIEW  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/7d0ccb34-b78d-4a2a-8ed9-e80e03c11f9b/sist-en-500-4-2011>



**Figure 1 — Vertical swinging of single-drum walk-behind rollers**

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

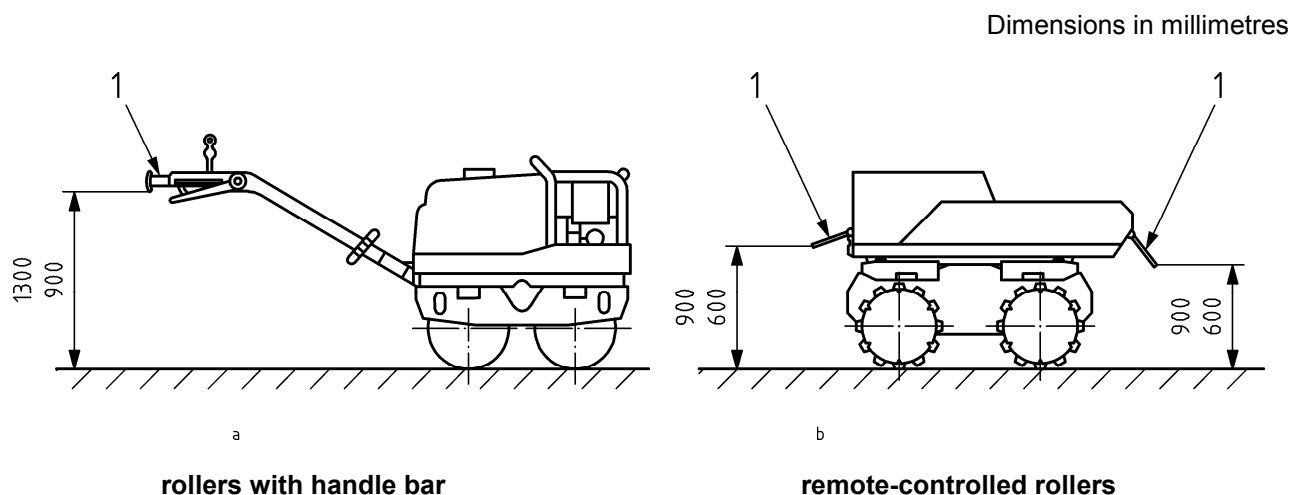
#### 5.2.2.3 Stopping device against crushing

Pedestrian-controlled rollers shall be provided with a stopping device against crushing which is designed to prevent the operator from being trapped between the machine and an obstacle.

The device shall be so designed in a way to stop the machine in a distance that is less than the total operating range of the device.

This device shall have an effective operating force not exceeding 230 N.

The device shall be positioned according to Figure 2.



## Key

1 stopping device

**Figure 2 — Position of the stopping device at pedestrian-controlled rollers**

### 5.3 Operator's station

EN 500-1:2006+A1:2009, 5.4.1 shall apply with the following addition:

- if the operator's position is offset from the space envelope width centreline, then the internal distance from the seat centreline to the side of the enclosure shall not be less than 295 mm.

## 5.4 Operator's seat

EN 500-1:2006+A1:2009, 5.5 shall apply.

## 5.5 Controls and indicators

### 5.5.1 General

EN 500-1:2006+A1:2009, 5.6 shall apply with the following addition:

### 5.5.2 Travel control of pedestrian-controlled machines with handle bar

The machine-travel control of pedestrian-controlled rollers shall be of the hold-to-run type.

### 5.5.3 Controls for towed machines

For towed vibratory-rollers, it shall be possible to control the on/off operate of the vibration from the operator's station on the towing unit.

#### 5.5.4 Remote control of pedestrian-controlled rollers

#### 5.5.4.1 Infrared remote control

Infrared remote-controlled pedestrian-controlled rollers shall conform to Annex A.