



SLOVENSKI STANDARD
SIST EN 500-4:2007/kprA1:2008
01-december-2008

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

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

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

Ta slovenski standard je istoveten z: EN 500-4:2006/prA1

ICS:

93.080.10 Gradnja cest Road construction

SIST EN 500-4:2007/kprA1:2008 en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
EN 500-4:2006

prA1

August 2008

ICS 93.080.10

English Version

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

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

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

This draft amendment is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 151.

This draft amendment A1, if approved, will modify the European Standard EN 500-4:2006. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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Foreword

This document (EN 500-4:2006/prA2:2008) has been prepared by Technical Committee CEN/TC 151 “Construction equipment and building material machines — Safety”, the secretariat of which is held by DIN.

This document is currently submitted to the Unique Acceptance Procedure.

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(s).

For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.

EN 500-4:2006/prA2:2008 (E)**1 Modification to the Foreword**

Replace the 5th paragraph with the following:

"For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document."

2 Modification to Clause 2, Normative references

Add the following reference:

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

Delete all full stops.

3 Modification to 3.1.2, pedestrian-controlled roller

Replace "Annex B" with "Annex A".

4 Modification to 5.5.4.1, Infrared remote control

Replace "Annex B" with "Annex A".

5 Modification to 5.7.3.1, Braking systems for rollers with ride-on operators

Delete after the 3^d indent the following sentence:

"Service and secondary brake systems shall work independently of each other according to A.1.5.4."

Last indent:

Replace "A.1.2.4" with "EN ISO 3450".

Last but one sentence:

Replace "Annex A" with "EN ISO 3450".

6 Modification to 5.11.1, Noise measurement of pedestrian-controlled machines

Indent:

Replace "Annex C" with "Annex B".

7 Modification to 5.11.2, Noise measurement of rollers for ride-on operation

Indent:

Replace "Annex E" with "Annex D".

8 Modification to 5.11.3, Vibration measurement of pedestrian-controlled machines

Indent:

Replace "Annex D" with "Annex C".

9 Modification to 7.2, Instruction handbook

Last indent:

Add in the brackets after "permissible slope" ", tipping angle".

10 Deletion of Annex A

Delete Annex A in its entirety.

11 Modification to Annex B, Remote infrared controls for rollers with attending operator (will become new Annex A)

Update all cross references in new Annex A to read as follows: "

Annex A

(normative)

Remote infrared controls for rollers with attending operator

A.1 General

This annex will be replaced by a relevant B-Standard when available.

A.2 Scope

This annex deals with the mode of construction and components of remote infrared controls which ensure the safe operation of rollers with attending operator.

A.3 Terms and definitions

For the purposes of this annex, the following terms and definitions apply.

A.3.1

remote control

portable transmitter and a receiver permanently mounted on the roller

A.3.2

transmitter

steering element with the necessary controls for issuing commands and the transmission element including the part for modulation

A.3.3

receiver

receiving element including the part for demodulation, the evaluation unit as well as the command-output element

A.3.4

safety distance

minimum distance between the roller and operating personnel necessary to prevent injury

A.4 Safety requirements and measures

A.4.1 All travel movements shall be switched off automatically by the receiver if:

- a) the maximum range exceeds 20 m;
- b) the distance of the machine to the operator is closer than 2 m;
- c) a break in communications between the remote controls and machinery lasting longer than 3 s occurs;
- d) the power supply to the transmitter or receiver is interrupted;
- e) the travel controls are released.

NOTE If there is an insufficient state of charge concerning the battery of the transmitter, this state should be indicated (e.g. acoustically or optically) before the function of the equipment is affected in any way (e.g. alteration of the transmission of control commands).

A.4.2 When a return of power occurs after a power cut affecting the transmitter or receiver, the roller shall not automatically start to move.

A.4.3 Transmitters and receivers shall be assigned to each other, e.g. on the basis of a code.

NOTE Measures should be taken to ensure that interference with the process of wireless transmission due to external signals or a combination of several remote control systems with the same transmission frequency does not cause hazardous movements.

A.4.4 No hazardous movements shall be caused on connection of transmitter or receiver to a power source.

A.4.5 Remote controls shall be constructed to be capable of withstanding any operation stresses and external influences which may reasonably be expected.

Operating stresses are, for example:

- actuation frequencies;
- electrical load.

External influences are, for example:

- continuous vibration, impacts, shocks;
- dampness;
- external optical, magnetic, electromagnetic, electrostatic fields;
- extraneous light, e.g. interrupted alternating illumination caused by pulsating light sources or gas-discharge lamps;
- solar influence;
- ambient temperatures;
- interference in power supply as well as variations in voltage and frequency;
- effects on connecting cables, linking components of the receiver and the control system of the roller, which are located in separate casings, due to which a short circuit of any two conductors of such cables or an interruption of a conductor could be caused which could in turn could lead to a cancellation of the cut-out.

A.4.6 The beam angle of the transmission element shall not exceed 60°.

NOTE It is intended that this measure limits the possibility of a command being unintentionally issued due to reflecting walls or obstacles.

A.4.7 The number of the transmitted commands shall be higher than the executed commands because of data safety.

A.4.8 Due to safety requirements the steering telegrams shall consist of several independent telegrams.

A.4.9 The remote control shall be realised by stateful dependent logic.

EN 500-4:2006/prA2:2008 (E)**A.5 Components and equipment**

A.5.1 Switching equipment with an automatic reset shall be provided on the drive system. It shall not be possible to restart the machine unintentionally if the roller stops due to the release of such switching equipment.

A.5.2 The controls for the drive system shall be designed in such a way that, when the roller is working, the controls can be actuated from the operator's station to give the desired effect.

It shall also be possible to operate the controls safely while wearing protective gloves.

A.5.3 If programming is used in the process of transmitting commands in conjunction with the remote controls, it shall only be possible to alter the programme with a special tool.

A.5.4 The power supply of the receiver shall have its own separate fuses.

A.5.5 Insulation and current-carrying of peripheral conductors and cables for power supply, receiving elements and actuators shall correspond with EN 60204-1. The current carrying of conductors on printed boards in remote controls shall be laid out for a maximum temperature increase of 10 °C.

A.5.6 The requirements laid down in EN 60664 shall apply to the measurement of safety distances.

A.5.7 The remote control shall bear legibly and indelibly the following minimum information:

- name and address of the manufacturer;
- type;
- year of manufacture;
- product identification number.

The description of type shall clearly indicate the relationship between transmitter and receiver.

The following message shall be legibly and durably shown on the transmitter (either by text or by an appropriate pictogram):

CLEAN THE TRANSMITTER ELEMENTS BEFORE USE

A.5.8 The safety-related parts of the control system of remote infrared controllers shall be in accordance with category 2 of EN 954-1:1996 (corresponds to IEC 61508, SIL 1).

A.5.9 Remote-control units shall be supplied with operating instructions containing all technical and safety information required for utilising the controls in accordance with the regulations, e.g.:

- data on performance and operating limits;
- instructions on actuation;
- a description of the actuation equipment;
- the instruction handbook shall contain information regarding the assigned operator's location, and it shall specify if the actuation of controls from the operator's place/station which is on the opposite side does not correspond with the intended/expected direction of the roller movement;
- instructions concerning safe operation (changing the battery, cleaning, reflections, encoding etc.);
- instructions on action in the event of the occurrence of faults;

- instructions in accordance with A.5.2 and accompanying note;
- the minimum distance between machine and operator shall be 2 m."

12 Modification to Annex C, Noise test code for hand-guided and remote-controlled vibratory ground compaction machines (will become new Annex B)

Add the following two sub-clauses: "

B.2.5 Sound pressure spectrum at a single microphone position on the measurement surface

If required, sound pressure spectra can be registered at microphone number 10 in accordance with 8.7 of EN ISO 3744:1995.

B.2.6 Sound pressure level as a function of time

If required, the sound pressure level can be recorded as a function of time at microphone position 10 in accordance with EN ISO 3744:1995."

replace the text and title of B.3.5 with the following: "

B.3.5 Sound pressure spectrum at the operator's position

For the emission sound pressure level at the work station in accordance with EN ISO 11201 (microphone position 14, right ear, see Figures B.1 and B.2)."

add at the end of the title of B.3.6 "at the operator's position",

replace "10 and 14" with "10" in B.3.6

and update all cross references in new Annex B to read as follows: "