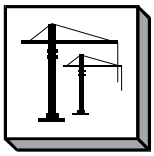
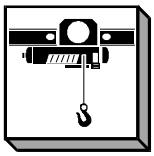
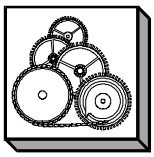
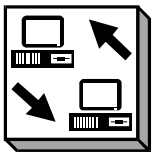
HBC – Radio Control

Radio Receiver FSE 514









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1 Description

The FSE 514 radio receiver is designed for the wireless reception of command instructions for controlling light-weight industrial cranes and small hoists.

The FSE 514 radio receiver can receive and process up to 14 control commands.

A non-interchangeable system address ensures the functional safety of the radio control system when operating cranes or machines, This feature is particularly important when several cranes or machines are in use, for example in halls and shops. The system address is exclusively allocated to each HBC radio transmitter and its respective receiver.
It is not possible to activate crane or machine functions using a radio control system allocated to another crane or machine.

The radio receiver has general telecommunications approvals. It is not necessary to have or to apply for a license to operate the receiver and the respective transmitter. The radio receiver broadcasts in either a 30 cm or 70 cm bandwidth. The receiver is equipped with < 5 mW or < 10 mW transmitting power.

Operating the radio receiver and transmitter using a different frequency range requires the approval of the competent regulative authorities for telecommunications.

High-quality radio technology pursuant to the guidelines laid down by the German Regulative Authorities for Telecommunications and Postal Services and the Regulations For The Prevention of Accidents combined with perfected microprocessor technology guarantees the highest degree of operative safety, service quality and serviceable life.

1.1 Unpacking and Examining the Consignment

When unpacking your radio control system ensure that the contents of the consignment correspond with the specification on the delivery note.
As a rule, the complete radio control system 514 consists of the following parts and components :

- 1 transmitter
- 1 transmitter carrying set
- 2 rechargeable transmitter batteries
- 1 battery charger
- 1 transmitter operating instructions

- 1 FSE 514 radio receiver with
- 4 rubber vibration dampers including hardware
- 1 receiver operating instructions
  ("Installation, Commissioning and Operating Instructions")

To ensure that the radio control system arrives intact, HBC-radiomatic GmbH packs its systems in reusable packaging material.
We recommend storing all packaging materials in a safe place in case of later use.

1.1.1 Transport Insurance

When unpacking your radio control system check for possible transport damage !

Deliveries ex works Crailsheim are insured against transport damage. Should any part or component arrive damaged contact the carrier immediately (postal services, courier, parcel service, forwarding agent), register complaint and have the damage inspected and recorded. After having the reason for complaint recorded, assign the claim to the manufacturer. You will find the necessary insurance forms together with the consignment documents.

Note:
Failure to adhere to these instructions may render the transport insurance coverage invalid.

2 Safety Instructions

2.1 Pictographs

The following pictographs will be used throughout the present operating instructions :

indicates shock hazard

Contacting components under voltage may lead to death. Housing marked with this symbol may only be opened by qualified electricians after having disconnected the device from the mains supply (supply voltage, operating voltage or input terminal voltage).

indicates safety relevant passages

You will find this pictograph as an indicator for occupational safety measures. The neglecting of such measures poses a serious hazard.
Always observe the instructions and be particularly attentive and careful.
Avoid any situations that could at any time be a danger to persons or machines.

indicates important information or instructions

This symbol brings your attention to important information or instructions on how to secure a long serviceable life of the radio control system.
Pay attention to the comments and instructions given. Ignoring the information provided may permanently impair the reliability and operability of the equipment.

2.2 General Safety Instructions

Radio controls facilitate and increase the operating efficiency of cranes and machines. Nevertheless, the operator must thoroughly understand and be in a position to properly use a radio control system !

- Read the Operating Instructions Manual carefully and thoroughly before working with the transmitter for the first time !
- The operator undertakes to strictly adhere to the instructions and proceedings described in this manual, as well as to follow the general rules and regulations for worker safety and accident prevention. Ignoring any such instructions or regulations could pose a fatal threat to the operator or others.
- Keep this manual on location and readily available at all times !
- Only authorized and properly trained personnel may operate the radio control system (transmitter **and** receiver).
- Anyone who is under the influence of drugs, alcohol or medication that has a detrimental effect on a person's reactions may at no time commission, operate, maintain or repair the transmitter.
- Before switching the transmitter on ensure that no-one is or can be endangered by the initiated operation.
- With the first signs of any malfunction related to the operative safety and reliability of the device the operator must immediately shut down or not activate the radio receiver. For the purpose of the present manual "shut down" implies :
  - switching OFF the transmitter
  - storing the transmitter in a safe place and ensuring no unauthorized access
  - de-energizing the receiver
- Defects must be repaired and objects of interference must be removed immediately !
- A defective radio receiver may only be repaired by qualified and competent personnel. Use only original HBC spare parts. The use of any other spares will render the technical inspectorate approval invalid as well as substantially impede operative safety.
- Observe all periodical tests and inspections that are required by law or recommended in the present operating instructions !
- When using the radio receiver always observe the regulations and instructions stipulated in the authoritative worker safety and accident prevention regulations !
  - The radio receiver has been manufactured in accordance with the regulations and guidelines stipulated in the German Trade Association's "Safety and Accident Prevention Regulations for Operating Cranes by Radio Controls" (VBG 9) and pr EN 12077-1.
  - The radio receiver has been tested and approved in accordance with EMC guidelines and complies with the authoritative standards for emitted interference and interference immunity.

2.3 Safety Instructions for Installation and Operation

- Before mounting, installing and commissioning the radio receiver, read the operating instructions for the radio transmitter thoroughly.
- Use the transmitter cautiously and properly. In particular when using a transmitter to radio control a machine or crane for the first time.
- Connect the radio receiver to the correct line voltage only (refer to chapter 6 "Technical Data" and nameplate) !

Warning – shock hazard!

- Only skilled and qualified persons may connect the radio receiver to the mains supply in accordance with the enclosed output wiring instructions.
- Various components within the radio receiver housing conduct electricity. Contact to these components as well as to mains voltage is hazardous !
- Only connect the radio receiver to machines or cranes that are designed for radio controls.
- Prior to welding the crane or machine disconnect the connection cable to the crane or machine. Switch off the radio control system as well as the crane or machine.

- In case of an emergency or any disturbances within the working range of the crane or machine, switch the transmitter OFF immediately by the emergency STOP pushbutton. If necessary, disconnect the radio receiver from the mains supply. Should the transmitter or receiver show signs of technical failure or breakdown, disconnect the radio control system immediately !
- Switch the transmitter OFF during breaks and after finishing work to avoid any misoperation of crane or machine by unintended activation of the operator controls.
  - These precautions are particularly important whenever changing your position or climbing over an obstacle.
- Never leave an activated transmitter unattended. The operator undertakes to follow and comply with the authoritative regulations for worker safety and accident prevention.

2.4 FCC-Regulatory Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada.

Operation is subject to the following two conditions:

1) this device may not cause harmful interference, and
2) this device must accept any interference received, including interference that may cause undesired operation

WARNING:

Changes or modifications made to this equipment not expressly approved by HBC-radiomatic GmbH may void the FCC authorization to operate this equipment.

RF EXPOSURE NOTICE:

The radiated output power of the FSE 514 is far below the FCC radio frequency exposure limits. Nevertheless, the FSE 514 shall be used in such a manner that the potential for human contact during normal operation is minimized.

3 Installation and Mains Connection

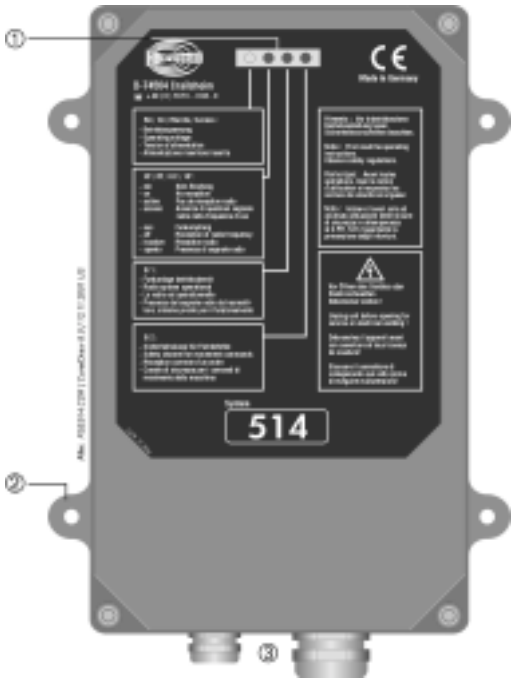
Warning – shock hazard!

- Only skilled and qualified persons may connect the radio receiver to the mains supply.
- Mains connection must be performed in accordance with the enclosed output wiring instructions. Take technical data into due consideration !
- Various components within the radio receiver housing conduct electricity. Contact to these components as well as to mains voltage is hazardous !

The radio receiver FSE 514 is to be mounted using the rubber vibration dampers (included). The rubber vibration dampers are to be screwed to the mounting loops on the upper and lower edge of the receiver ℑ.

The radio receiver is connected to the crane or machine electronics through the heavy-threaded compression gland ℜ.

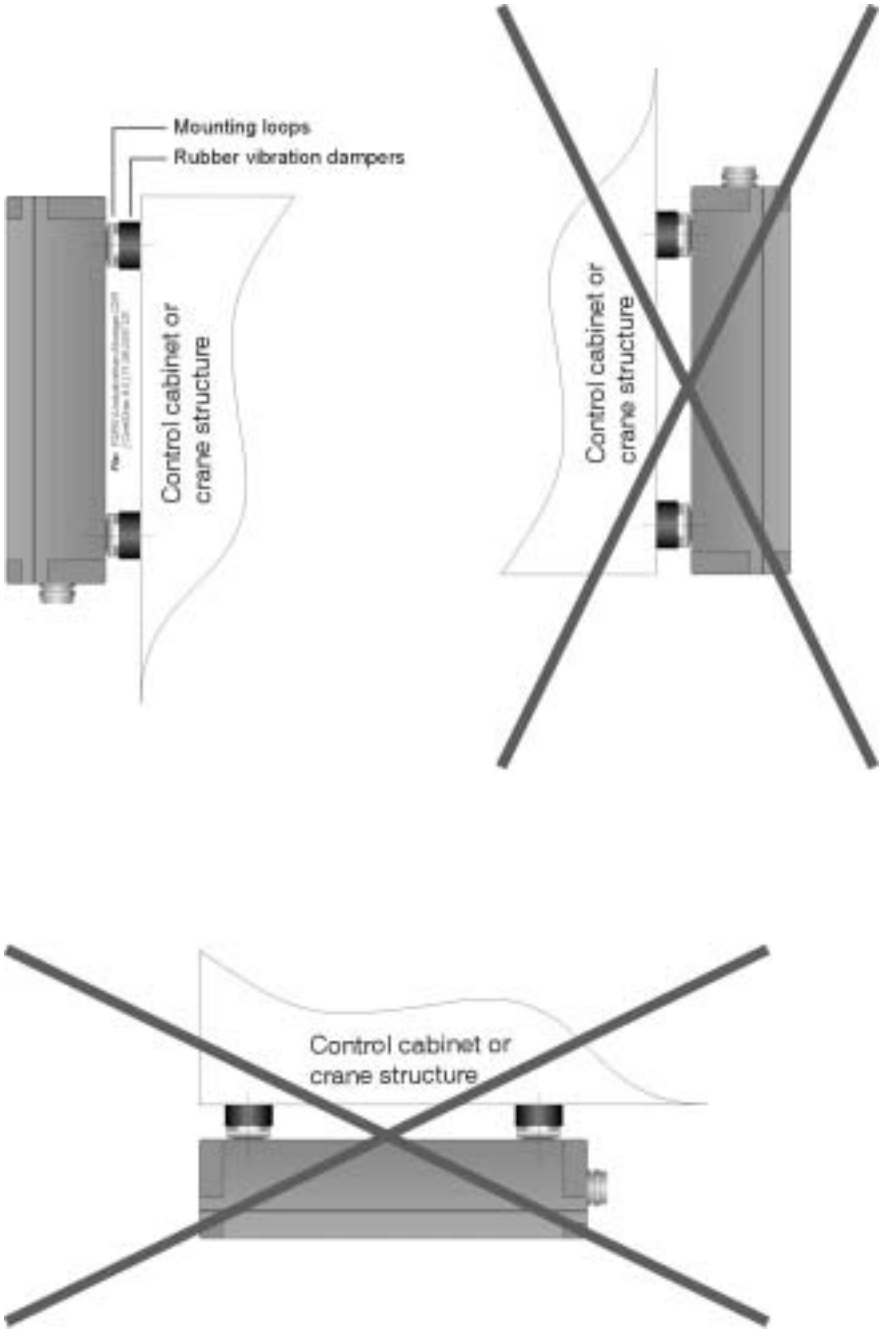
The radio receiver lid may be removed for commissioning the system.



Note:

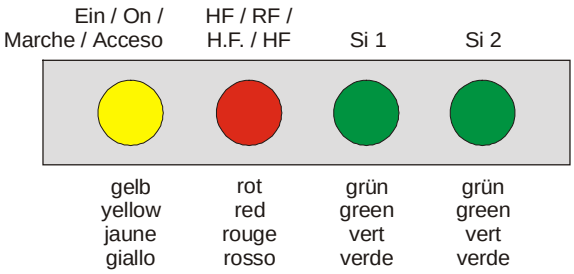
– To avoid damaging components, the commissioning of the radio control system should only be carried out by skilled and qualified personnel with expert knowledge of electronic components (confer section 2.3 for further information).
– Before activating the radio control system, study the description and instructions for using the radio status panel ℵ.

Proper Installation of the FSE 514 Radio Receiver



3.1 Radio Status Panel

The control display with LEDs indicating the operating state of the radio system is located behind the inspection window of the receiver cover lid.



The LEDs have the following significance :

Ein / On / Marche / Acceso (yellow) is illuminated as soon as operating voltage is present at the receiver, i.e. the connection to the electronic of the crane or machine is established and operating voltage (12 V) is present.

HF / RF / H.F. / HF (red) is illuminated whenever the transmitter is switched OFF. It will be extinguished the very moment a signal is received by the receiver on its radio frequency.

Note :

– Should the "HF/RF/H.F./HF" LED be extinguished while the transmitter is switched OFF, then this indicates that the radio channel is also utilized by another transmitter.
– In the case of a switching OFF of the electronic system as a result of radio interference it is recommended for you to also switch OFF your transmitter and monitor if the "HF/RF/H.F./HF" LED is extinguished nevertheless.
  Exception :
  With radio systems that are equipped with a frequency selector function (optional), the "HF/RF/H.F./HF" LED will either extinguish or flash. This indicates that the receiver is searching (scanning) the stored frequencies available for its specific transmitter.

SI 1 (green) is flashing approx. twice per second when the transmitter is switched OFF. During this time, the safety circuit will be checked.
The "SI 1" LED permanently illuminates after the transmitter is switched ON, i.e. the receiver has identified its specific transmitter on the basis of the common message address (code). Safety circuit SI 1 is enabled.

SI 2 (green) refers to the internal safety circuit SI 2, responsible for a double switching OFF of the move commands whenever the control station is in the OFF (ZERO) position, i.e. "SI 2" will not be illuminated.
It is not until one or several drive commands (e.g. turn, trolley traveling, lifting gear or crane traveling) are input that the "SI 2" LED may be illuminated !

3.2 Automatic HOLD Function Settings (Eltako)

The automatic HOLD function of relay K12 can be activated or deactivated (latched/unlatched) with switches S2 and S3 on the relay board.
For example, the relay can be used together with the "Light" function (remote control circuit).

- The automatic HOLD function is activated (latched) when switches **S2 und S3** are set to position **II**.

- The automatic HOLD function is deactivated (unlatched) when switches **S2 und S3** are set to position **I**.

4 Fault Correction

Note:
Check the functions using the cabin or cable controls first !

Problem	Possible Cause	Remedy
The transmitter is operating properly, however the crane does not carry out the control commands.	– The receiver is not connected to the mains supply. – There is no radio contact between transmitter and receiver. – The command "crane ON" has not been activated.	– Check the mains cable leading to the receiver. – Check the fuses in the receiver housing. – Check receiver functions using the LEDs in the indicator lamp panel on the receiver.
Some command statements are not carried out.	– The receiver is defective. – The connection between crane / machine and receiver is faulty.	– Ensure that the connection cable is securely fastened. – If necessary, call a service engineer or technician.

5 Maintenance

The radio receiver is virtually maintenance-free. However, the following points should be taken into consideration :

- Never use a high-pressure cleaner or steam jet cleaner to "clean" the receiver.
- Whenever welding the crane or machine:
  - Switch OFF the radio control system.
  - Switch OFF the crane or machine.
  - Disconnect receiver connection cable.

  Failure to observe these precautions will cause severe damage to the radio control system.

Note:

In the event of any problems with the radio control system, contact your local distributor or HBC-radiomatic GmbH.

5.1 In The Event of a Fault

Warning:

Never operate a crane or machine with a faulty or defective radio control system.

- Never try to repair the radio receiver electronics! Opening the transmitter housing terminates the manufacturer guarantee.
  - Send any defective or faulty equipment to your local distributor or to the manufacturer. They are experts and have the necessary know-how and OEM spare parts.
  - Always send transmitter **and** receiver and enclose a detailed description of the problem.
  - Do not forget to enclose your address and telephone number so that we can get in touch with you quickly if necessary.
- To avoid damage during transport, use the original packing supplied with the transmitter and receiver, otherwise pack securely. Send the consignment to your distributor or to the following address :

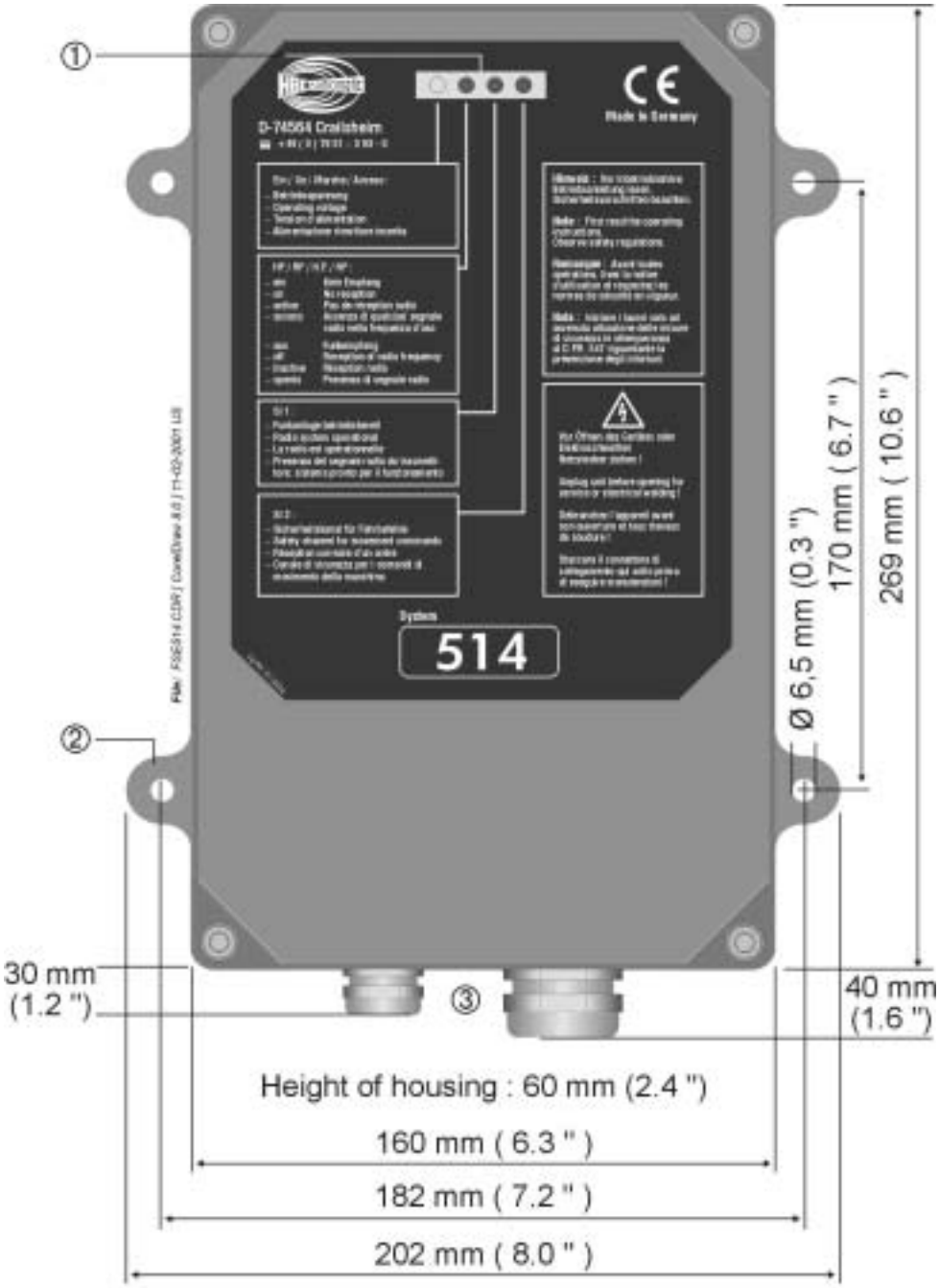
  HBC-radiomatic GmbH
  Haller Strasse 49 – 53
  74564 Crailsheim
  Germany
- Should you chose to deliver a defective radio control system personally to your distributor or our factory, please call and arrange an appointment.

  HBC-radiomatic GmbH
  – Customer Services / Repair Service –
  Tel.: +49 (0) 79 51 – 3 93 – 800

6 Technical Data

General Technical Data	
System	514
Max. number of control commands	14
Unique system addresses	over 65,000 combinations
Command output	relays 250 V / 2 A
Output wiring	none (standard)
Operating voltage range	100 V - 240 V ; 50 / 60 Hz
Connection	heavy-thread compression gland
Operating temperature range	–20°C to +55°C
Housing material	plastic compound (PA6 GF30)
Housing color	orange
Dimensions	202 x 269 x 60 mm (8.0 x 10.6 x 2.4 ")
Weight	approx. 1.3 kg (2.8 lb.)
Protection class	IP 55
RF Specific Technical Data (TC690)	
Frequency	902,125 to 927,875 MHz
Number of channels	103
Channel separation	250 kHz
Type of modulation	115KF1D
RF sensitivity	better than –95dBm @ BER=10^{-3}
RF power	92,9dBµV/m
RF antenna	internal

6.1 Dimensions of the FSE 514 Radio Receiver



① Control LEDs
② Mounting loop
③ Heavy-thread compression gland

7 Certificates and Approvals

EC Declaration of the Manufacturer and of Conformity

according to EC Directives for Machinery 98/37/EG , Appendix II B

We,

HBC-radiomatic GmbH
Haller Strasse 49-53 • 74564 Crailsheim • GERMANY

hereby certify that the following products

CE

Radio Control Transmitter	**orbit, vector, patrol, micron, eco, spectrum, geo**
Radio Control Receiver	**505, 514, 707, 716, 717, 722, 735, 770, 808**

correspond to the following EC guidelines

98/37/EG	Directives for machinery
.....	(altered by 91/263/EWG, 92/31/EWG, 93/68/EWG)
73/23/EWG	Directives for low voltages (altered by 93/68/EWG)
1999/5/EG	Radio and Telecommunications Terminal Equipment Act
.....	(FTEG)

In particular, the tests executed were based on the following harmonized standards

EN 300 220	EMC - emission
EN 300 683	EMC – immunity
EN 954-1:1996	Safety of machinery;
.....	Safety relevant parts of controls
EN 60529	Degree of protection provided by enclosure (IP)
IEC 68	Mechanical strength
prEN 50178	Climatic tests
DIN V VDE 0801 appendix 1 ...	Principles for computers in safety-related systems

and on the following national technical standards :

ZH 1/547:1976	Directives for radio controls of cranes
ZH 1/295:1995	Safety regulations for wireless control facilities

Note : **The commissioning of the machine on which this part of the machine was installed is prohibited until it has been established that the machine corresponds to the 98/37/EG Directives.**

Authorized by :	
Name, first name:	Brendel, Wolfgang
Position in the company :	General Manager
Location and date :	Crailsheim, November 23, 2001
Authentic signature :	