

## THE OPTIMUM SINGLE ROPE TENSION IS SETTING THE TONE

You do not have to be an expert to know how important the correct rope tension is in elevators.

Insufficiently adjusted ropes and excessive total weights result in undesirable and premature wear. Thanks to the new WeightWatcher rope load measuring system the rope adjustment and the weighing of car and counterweight become child's play. Due to the patented measuring principle the exact loads in each rope can be measured, within seconds, without the necessity of prior calibration with weights. The integrated rope adjustment wizard will guide you through the rope adjustment and logs each measurement in a report that can later be manipulated on the PC. This makes the WeightWatcher the optimum tool for your service to customers.

### Summary of the advantages:

- Time-saving rope tension adjustment through integrated wizard
- Rapid weight determination of car and counterweight
- Unnecessary wear of ropes and traction sheaves is avoided
- For rope diameters between 5 mm and 22 mm
- Memory for up to 100 measurements
- Big illuminated touch display and USB interface in series production

- Yes**, am interested in your product  
Mobile Rope Load Measurement
- I am also interested in your product:
  - Overload Control System Weight Watcher
  - measurement of ride quality according to ISO 18738 with LiftPC mobile Diagnosis
- Please contact us.

Company

Contact Name

Address

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Country

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## Mobile Rope Load Measurement

simple weight determination of car  
and counterweight

time saving rope tension setting

stores up to 100 measurements  
for documentation



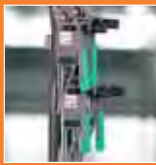
The mobile rope load sensors of the WeightWatcher system can be installed completely within seconds:



On each rope a load sensor is mounted. After fitting the sensor to the rope only the clamping lever is shifted.



Up to 12 sensors are simply plugged into the evaluation unit MSM12. This immediately indicates the total weight and the individual rope loads **without calibration with weights.**



Up to 100 rope load measurements can be stored in the internal memory of the MSM 12 ...



... in order to store them for the purpose of quality assurance in a data base or to file them as a document or print-out respectively:



## Prevent unnecessary wear of ropes and traction sheaves!

A particular highlight is the integrated adjustment wizard for optimum rope tension:

In this way the uniform rope adjustment becomes child's play: Within a few minutes the wizard will take you through the rope adjustment which has already been calculated for each rope by the evaluation unit.

The rope adjustment wizard presets an adjustment value in advance for each rope.



As soon as the user has adjusted a rope to the indicated target value ...



... the target value for the next rope is preset.



For the purpose of documentation the rope adjustment can be stored in the unit.



Even in the case of complicated suspension variants and many ropes the optimum rope adjustment becomes child's play taking up very little of your time.



## Evaluation unit MSM 12

### Standard type

Technical data evaluation unit MSM 12	
Power supply voltage	4 round cells, LR6 AA
Number of measuring channels	12
Bandwidth	30 Hz
Sampling frequency	100 Hz
L x W x H (mm)	190 x 138 x 46
Interface	USB 1.1

### Option Bluetooth

Technical data see standard type, in addition one Bluetooth interface	
Aerial	external with link
Bluetooth class	2
Max. wattage	2,5 mW

### Rope load sensors LSM



Technical Data	Sensor LSM 1	Sensor LSM 2
Rope diameter	6 – 16 mm	5 – 10 mm
Measuring range	0 – 500 kg	0 – 300 kg
Maximum load	1000 kg	600 kg
Breaking load	2000 kg	1200 kg
L x W x H (mm)	250 x 75 x 19	178 x 58 x 16
Connection cable length	0,8 m	0,8 m
Temperature range	0 °C – 70 °C	0 °C – 70 °C

### Load sensors LSM-XL

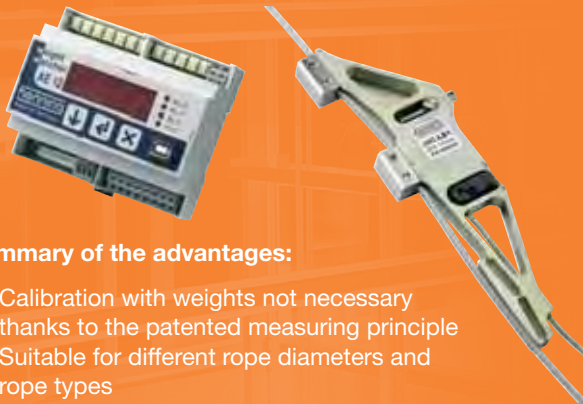
For special applications we offer the rope load sensor LSM-XL. This sensor is able to measure the load of ropes between 16 mm and 22 mm diameter. The matching evaluation unit also has 12 measuring channels and is of particularly rugged design.

**The Henning overload measuring system is designed according to a new measuring principle:**

On each rope a sensor is mounted, which no longer requires calibrating with the help of weights; the time-consuming use of weights has been dropped. Stock control will also be easier: One sensor type covers up to 11 different rope diameters.

A unique and amazing simple rope tension adjustment wizard is integrated into the software.

Within a few minutes a complete rope set can be adjusted in the best possible way. As a result of this permanent rope tension monitoring, undesired and unnecessary wear of the traction sheaves and ropes is reliably prevented.



**Summary of the advantages:**

- Calibration with weights not necessary thanks to the patented measuring principle
- Suitable for different rope diameters and rope types
- 4 programmable alarm relays
- Up to 12 rope sensors per evaluation unit
- Integrated slack rope alarm
- Permanent monitoring of the load distribution
- Equipped with USB interface and free PC software
- Software wizard for the adjustment of the optimum single rope tension to avoid unnecessary wear

- Yes**, am interested in your product  
Overload Control System Weight Watcher
- I am also interested in your product:
  - Mobile Rope Load measurement
  - measurement of ride quality according to ISO 18738 with LiftPC mobile Diagnosis
- Please contact us.

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Company

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# Overload Control System

no weights necessary for calibration  
(patented system)

suitable for use with different rope diameters and types

increased lifetime of ropes because of equal rope tension

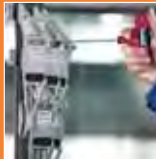
monitoring of rope tension and slack rope alarm

Option: CANOpen

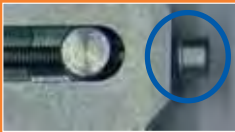


The WeightWatcher measuring instrument can be installed completely within a few minutes:

On each rope a load sensor is mounted. After fitting the sensor to the rope it is held in place by a single Allen screw.



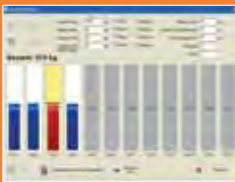
The flattened spring washer is an indication for the correct torque.



Up to 12 sensors are simply plugged into the evaluation unit AE 12. This immediately indicates the total weight and the individual rope loads **without calibration with weights.**



Using the display and the buttons of the instrument or with the free PC software the desired alarms are set.



**Finished!**

Now, the instrument indicates the alarms for up to 4 different load thresholds, slack rope states and individual rope load deviations.

**Prevent unnecessary wear of ropes and traction sheaves!**

The sophisticated PC software WeightWatcher can be downloaded free at <http://www.henning-gmbh.de>.

In this way the uniform rope adjustment becomes child's play: Within a few minutes an integrated rope adjustment wizard will take you through the individual rope adjustments as calculated by the software.

The rope adjustment wizard sets an adjustment value in advance for each rope.



As soon as the user has adjusted the rope to the indicated target value ...



... the display changes from red to green.



Even in the case of complicated suspension variants and many ropes the optimum rope adjustment becomes child's play, taking up very little of your time.

**Evaluation unit AE 12**

**Standard type**

Technical data evaluation unit AE 12	
Power supply voltage	12 V – 28 V DC
Power consumption	4 W
Fuse	1 A
Sampling frequency	100 Hz
HOLD input	12 V - 230 V AC/DC
Number of relay outputs	4
Number of measuring channels	12

**Analogue output option**

Technical data, see standard type, in addition one analogue output for the output of the total load	
Galvanically isolated	✓
Output voltage (resistive load > 500 Ω)	2–10 V
Output current (resistive load < 500 Ω)	4–20 mA

**CAN-Open option**

Technical data, see standard type, in addition one CAN interface	
Galvanically isolated	✓
Profile	CANOpen acc. to CiA-417

**Rope load sensors LS**



Sensor LS 1 for rope Ø 6-16 mm

Sensor LS 2 for rope Ø 5-10 mm

Technical Data	Sensor LS 1	Sensor LS 2
Rope diameter	6 – 16 mm	5 – 10 mm
Measuring range	0 – 500 kg	0 – 300 kg
Maximum load	1000 kg	600 kg
Breaking load	2000 kg	1200 kg
L x W x H (mm)	250 x 75 x 19	178 x 58 x 16
Connection cable length	2,5 m	2,5 m
Temperature range	0 °C – 70 °C	0 °C – 70 °C



Since the publication of EU directive 2002/91/EC, resource efficient operation has been the focus of building technology and management. Starting with the publication of directive VDI 4707 by VDI The Association Of German Engineers in March 2009 it has become topical for lifts as well. Especially as regards existing lifts it is common nowadays to label them as energy wasters. An important amount of energy is wasted by the cabin illumination.

LIGHTwatcher will enable you to have the cabin illumination simply switched off when not required. And that without any great installation effort, new wiring or adaptation to lift controls.

**Advantages at a glance:**

- Easy installation in the lighting branch-circuit
- Event-controlled light switch-off at a standstill
- Minimisation of standstill consumption according to VDI 4707
- Recognition of car and door movements by acceleration sensor system
- No need to mesh with the lift electronics
- Adjustable period of time to lapse after the latest travel until cabin lighting is switched off
- 3 inputs for optional sensors or control information
- 2 additional outputs for supplementary electric consumers

- Yes, I am interested in your product LIGHTwatcher**
- I am also interested in your product:
  - LED Cabin Lighting
- Please contact us

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City / Zip-Code

Country

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E-Mail

## Upgrading Energy Efficiency

# LIGHTwatcher

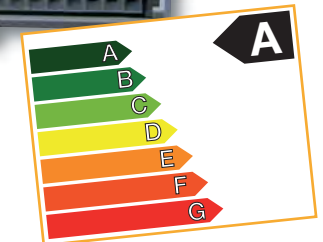
event-controlled cabin light switch-off at a standstill

quick and easy installation in the lighting branch-circuit

no communication with the lift control required



Flyer\_LIGHTWatcher\_eng\_2009-9



LIGHTwatcher will help you save energy costs and even benefit the environment, fully in the sense of VDI 4707.

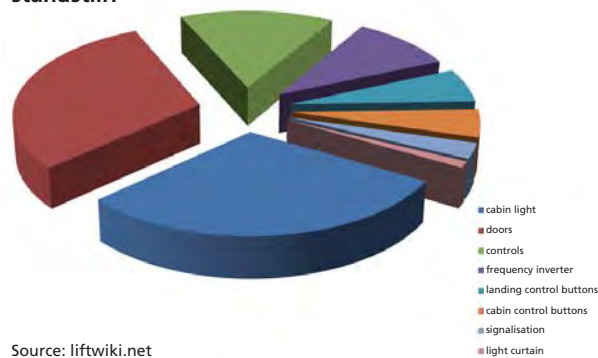


Especially existing lifts have scarcely been in the focus of energy efficiency ambitions. So their cabin illumination is on throughout.

More than 40% of the overall power consumption of lifts is wasted by stand-by functions.

One third of this energy is for cabin lighting.

**What shares in the energy consumption of a lift at a standstill?**



Source: liftwiki.net

Sample calculation:

Power consumption per year (cabin light being on throughout)	required (travel consumption)		wasted (standstill consumption)	
	Power (kWh)	Cost	Power (kWh)	Cost
fluorecent lamps (typical: 78 W)	31	7,44 €	647	155,28 €
halogen lamps (typical: 150 W)	60	14,40 €	1245	298,80 €
LEDs (typical: 9 W)	4	0,96 €	75	18,00 €

(Energy price assumption: 0,24 €/kWh)

## How it works

LIGHTwatcher is installed directly onto the car roof, where it can sense car movements by its three acceleration sensors. These sensors even recognize movements of the car door.

The cabin light is switched on each time a movement in the car is sensed. The switching threshold of the sensing of movements is to be adjusted directly at the LIGHTwatcher.

After the lapse of an adjustable time the light is switched off again, if no further car or door movements are sensed.

To install LIGHTwatcher, simply cut the lighting branch-circuit to place LIGHTwatcher in. Supplied with power by the lighting branch-circuit, it does not require any further wiring.

In addition to the cabin illumination, LIGHTwatcher can switch off another consumer. Moreover, it offers a third contact to switch on a consumer while in low power mode, like an emergency illumination for example.

For special applications, if in addition to the acceleration sensors other ones shall also activate the cabin light, there are three potential-free inputs available.

## LIGHTwatcher



Technical Data	
power supply voltage	230 V AC
power consumption	2 VA
relays	3
max. switching voltage	250 V AC
max. peak current	15 A
max. rated current	10 A
max. rated load (resistive)	2500 VA
max. rated load (ind.)	500 VA
min. switching load	0,3 W
additional inputs	3
control voltage	12 V - 230 V AC/DC
dimensions (L x W x H)	106 x 90 x 58 mm
time period, adjustable	1 min to 10 min

## The mobile performance and safety examination for the elevator



### Warranty

This description has been drawn up by **Henning GmbH** to the best of their knowledge. All technical statements have been carefully established and checked. They correspond to the state of the art. Changes and errors excepted.

Our application engineering advice – verbal and written – will support your work. It is regarded as an indication without obligation – to possible third party industrial property rights – and does not release you from your obligation to carry out appropriate testing of the products regarding their suitability for the intended application.

Product descriptions do not contain statements about the liability for possible damages. However, should a liability occur, it would be limited to the value of the goods supplied and used.

Suggestions and comments are welcomed.

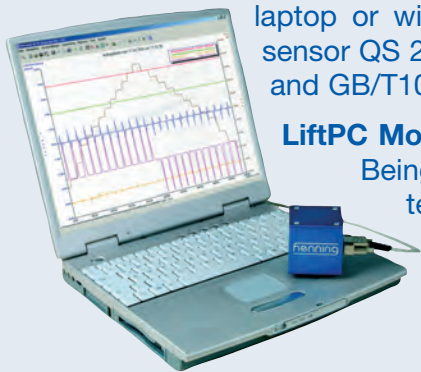


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## 1 The Lift Measuring System liftpc®

**LiftPC Mobile Diagnosis** is a powerful measuring system of modular structure for mobile and flexible measurement of performance and ride quality of lifts that can be used with any laptop or with our handheld terminal HT1 and connected 3D acceleration sensor QS 2.0. Performance data and ride quality of the lift to the ISO 18738 and GB/T10058-1997 standards can be precisely determined.



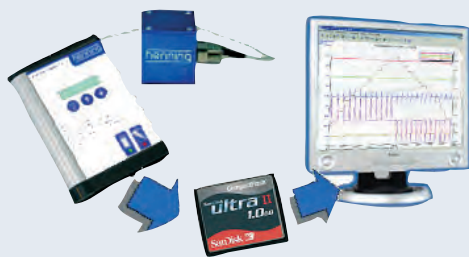
*Fig. 1: Acceleration Sensor QS 2 with a commercial notebook*

**LiftPC Mobile Diagnosis** can be used both for traction and hydraulic lifts. Being an open available system it is forward-looking with a guaranteed future as new developments can easily be implemented. In this way, **LiftPC Mobile Diagnosis** at any time represents the state of the art.

### Quick lift diagnosis

By means of the **LiftPC Mobile Diagnosis** Henning GmbH has created a modern diagnosis system which enables you for the first time to observe the lift ride quality and ride comfort during the ride, online on the screen of the laptop. Moreover, the data can immediately be evaluated and documented from which the maintenance condition monitoring and purposeful servicing may be obtained.

As an alternative, you may also carry out measurement travels without a laptop and use the hand-held terminal HT1 instead. The travel profiles are recorded by the hand-held terminal on a CompactFlash Memory Card. In this way the travel profile can then be evaluated at any time using a laptop or PC.



*Fig. 2: Hand-held terminal HT 1 with Sensor QS 2 and CompactFlash Card for data transport*

### Cost-efficient lift diagnosis

Objective measuring and evaluation instead of subjective inspection are the preconditions for forward-looking and cost-efficient maintenance and servicing of lift installations.

The diagnostic tool **LiftPC Mobile Diagnosis** provides an objective measurement of the acceleration and deceleration behaviour in all three axes, the impact and vibration movements resulting from the car and guide rails, door movements and evaluation of the lift quality to ISO 18738 and GB/T10058-1997.

The **LiftPC Mobile Diagnosis** of Henning GmbH offers optimum preconditions for the preparation of, commissioning of and acceptance testing, maintenance condition monitoring and servicing, for a purposeful response in the case of defects and complaints using a possible "before / after" comparison.

## 2 Versatile systems approach

The core system is made up from the newly developed 3D acceleration sensor QS 2 with associated evaluation software for measuring the performance data and the ride quality.

The scope of delivery with its basic facilities comprises, apart from the 3D acceleration sensor QS 2 and an USB connection cable, the corresponding evaluation software.

With modular expansion, e. g. with the hand-held terminal HT1, the noise module class 2, the rope load sensors or the database, the system can be expanded to an individually adapted total system for the lift diagnosis.

### 2.1 3D Acceleration Sensor QS 2

- Applicable to all lift types
- System-integrated measuring tools monitoring
- Bluetooth module and hand-held terminal connectivity
- USB connection 1.1
- Performs an electrical self check
- Shock-resistant up to 20,000 g
- Temperature-resistant from - 20 °C to + 60 °C
- Casing base with M6 thread
- Measuring range +/- 1.7 g in 3 axes
- Suitable for defined evaluation methods such as filtering, damping, peak evaluation and frequency analysis up to 1,000 Hz at a sampling rate up to 2,000 Hz



Fig 3: Acceleration sensor QS 2, detects the acceleration in all 3 directions in space

### 2.2 Noise Module Class 2

With this expansion module for noise measurement signals you are in a position to record the sound level progressions synchronized with the noise measurement to IEC 60651 and to carry out the evaluation to ISO 18738.



### 2.3 Hand-held Terminal HT1

Manual control element for the control of the 3D Acceleration Sensor QS 2.0 without notebook; storage on Compact-Flash™-Card with subsequent evaluation possibilities using a conventional laptop on the spot or a PC in your office.



## 2.4 Bluetooth Module

Acceleration measurements which would be unacceptable or poor can be carried out with this module using a Bluetooth radio link. Only the acceleration sensor and the Bluetooth module (independent voltage supply) are exposed to the accelerations. The user can follow the measurement on-line with their his evaluation PC within a range of up to 20 m.



## 2.5 Single rope load measurement module

The newly developed and patented single rope sensor detects tensions and loads in the suspensim ropes. In combination with a software module the user can not only determine car weights but also exactly correct differing rope load distributions using a rope tension adjustment wizard. As the software automatically calculates and indicates the required rope tension, each rope must only be adjusted once.



Fig. 5: control unit MSM 12 together with 1 rope load sensor LSM 1

## 2.6 Database module

Apart from the pure measuring data and the evaluations, the new database module of the **LiftPC Mobile Diagnosis** also acquires further design details of lifts and therefore, permits central statistical analyses in the form of tables and diagrams. In addition, by comparison with an statistical anonymous internet database, individual lifts can be compared with the average of all acquired lifts.

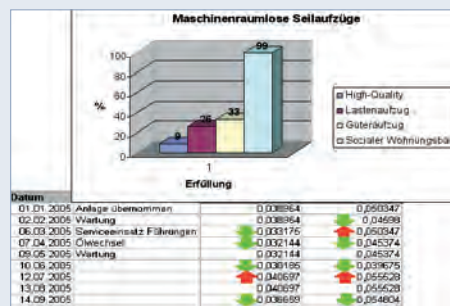


Fig. 5: Evaluation examples of the diagnosis database

## 3 The software functions

For each lift a project file is created in which the measured lift measurements are automatically stored and the evaluation parameters as well as the evaluated curves are saved. Under each project any number of lift movements or evaluations, can be stored. As the program operates in a project-oriented way, a newly measured lift travel is automatically assigned to the current project. It is possible to produce hard copies of all screen contents.

Thanks to the known Windows interface and a wizard leading the user through the measuring steps, the use of the program is quite simple.

The software is available in German, English, French and Chinese language versions.

## 3.1 Carrying out of a measurement

Under the menu item Measurement you will find all functions and parameters summarized that you require in order to carry out an lift diagnosis.

The measurements are displayed in a standard view. With ease, you are in a position to parameterize individual views on your own. These settings are permanently maintained. For example, you can determine which of the acceleration curves (of the X, Y and Z acceleration values) will be shown during the running measurement (all values not shown are still stored).

As soon as you start the measurement, the acceleration values are generated by the sensor and shown online as curves on the screen interface. This enables you to verify the live data. Evaluation functions, such as frequency analysis can also be carried out during the running measurement.

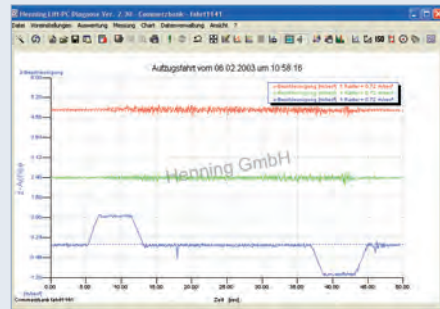


Fig. 6: View of the 3 acceleration curves directly after the measurement

## 3.2 Evaluation

All evaluation possibilities are found under the Evaluation menu and can be retrieved immediately after the measurement. The measurement data is filtered and the travel curves are calculated with regard to the actual acceleration values, speed and path, as well as jerk. Furthermore, the frequency spectra are determined and a comparison with the stored travel curves is also possible.

Further features such as, for example, the setting of parameters for the fine calibration and the low-pass and high-pass filters for the smoothing of curve shapes are also to be found under the Evaluation menu.

The evaluation of the measurements immediately shows irregularities in the sequence of motions; namely with the exact valuation according to ISO 18738 or GB/T10058-1997, also giving the exact distance values where they can be found.

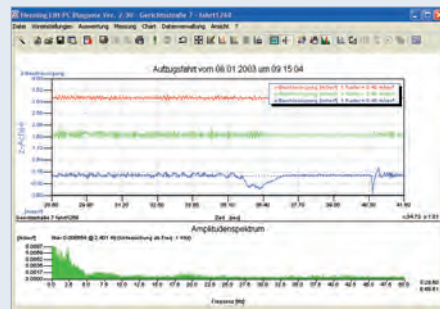


Fig. 7: Diagnosis measurement with simultaneous frequency analysis

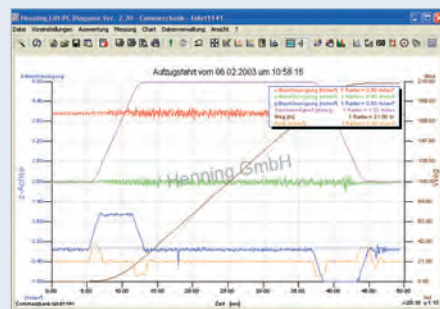


Fig.8: View of the evaluated lift travel now with the velocity curve (pink), path (brown) and jerk (orange)

### 3.3 Database and Report

The entire performance data and travel quality is automatically stored and in this way can be used for statistical evaluations. This objective data documents the quietness of running and the ride comfort and forms the basis for the establishment of quality certificates for the measured lifts. Immediately after the evaluation these so-called diagnosis reports exist as a document and for further archiving and can be output to a printer.

Further menu items permit the free choice of the representation parameters so that the general view can be designed as requested.



Fig. 9: Diagnosis report (detail) with all performance data and the quality parameters to ISO 18738

### 3.4 Diagnosis comparisons

Comparisons with other lifts or previous measurements of the same lift can be automatically generated by the program.

For the visual comparison the display is divided, so that the user can compare any details or total views of the two diagnosis movements with each other and can draw out the differences to the smallest detail by means of zooming.

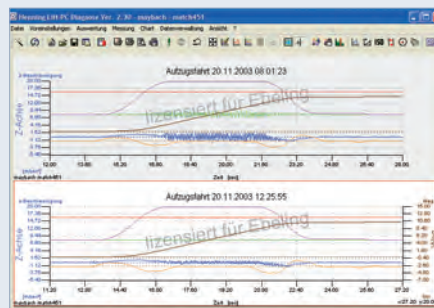


Fig. 10: Diagnosis comparison prior to the scheduled lift maintenance (upper half) and thereafter (lower half)

The comparison of the performance data and the quality parameters can be output in the form of a further diagnostic report in which all the results of the two lift diagnoses and the deviations between them are clearly represented.

On the right-hand side a comparison is shown. Here a diagnostic measurement with the **LiftPC Mobile Diagnosis** prior to routine maintenance is compared with a measurement made after the completion of the maintenance.

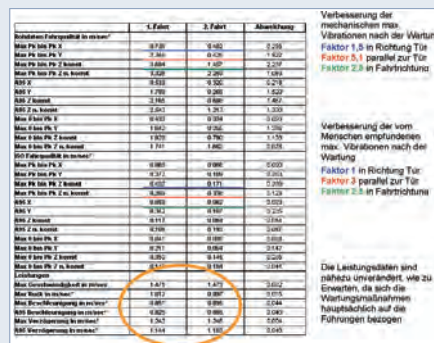


Fig. 11: Diagnosis report of the comparison measurement (see Fig. 10)

The curves already show significant differences. The associated diagnosis report not only shows the clearly improved ride quality after maintenance but by the parameters of the "raw data" also the clearly reduced mechanical influences to guides and car which enable a better utilization of the wear reserves.

## 4 Benefit and advantages

### 4.1 Safety and reliability

**LiftPC Mobile Diagnosis** is used as a transportable system for flexible performance and quality inspection and is designed to meet the increased demands on safety, reliability and ride comfort. Therefore, the requirements of the new standard ISO 18738 is met.

By means of objective measurement and evaluation, instead of subjective estimation, fault diagnosis is considerably improved. Possible defects are immediately detected and the necessary corrective measures can immediately be carried out and verified.

### 4.2 Cost reduction

**LiftPC Mobile Diagnosis** it is possible, for the first time, to carry out maintenance and servicing that can be planned and oriented towards the condition of the lift. When used regularly, changes can be detected in good time and malfunctions can be avoided. This results in a considerable increase in economic savings.

Verifications can immediately be carried out in the case of complaints and after repairs. Also problems in connection with new installations are detected in good time and can be dealt with immediately. This is of great advantage for the planning of commissioning and acceptance testing.

### 4.3 Universal application

The mobile system permits the highest possible flexibility in an extensive field of applications. It is applied both in the lift construction and service field and is used for the demonstration of performance to experts and inspectors.

**LiftPC Mobile Diagnosis** is equally suitable for traction and hydraulic lifts and is applicable for all types of lifts – independent of the make and year of construction.

Apart from the ride quality analysis to ISO 18738 the system also allows measurements of the drives, gears and bearings. With the aid of such measurements defects such as unbalances, faulty rollers as well as mechanical manufacturing and installation defects can be found and documented.

For the analysis of escalators and other dynamic systems further software modules are being developed. Thanks to the almost unlimited development capacity entirely new fields of application will be added.

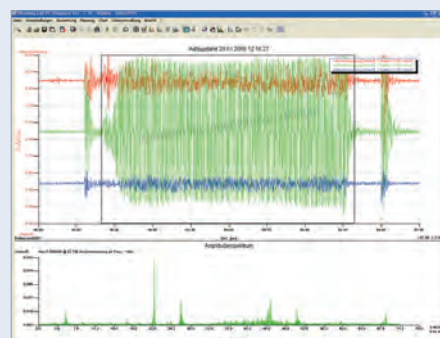


Fig. 12: Unbalance (clearly visible in the green curve shape) measured on the drive. In the lower third the associated frequency analysis is represented.

# lift<sup>pc</sup>® Mobile Diagnosis

**henning**  
MADE IN GERMANY

## Highlights

- world wide accepted
- ISO 18738 ride quality evaluation
- chinese GB/T 10058 - 1997 quality evaluation
- database module to govern data
- comparison of elevators
- vibration and sound measurement
- diagnostics of performance and quality



## technical data LiftPC mobile Diagnose

L x W x H (mm)	60 x 60 x 60
weight	300 g
fixation	thread M6x15 in bottom or clamp fastening
ports	1x USB 1.1 for connection to notebook/desktop 1x RJ12 for connection to Bluetoothmodule BM 1 (Art.-Nr.: 450 060) or Handterminal HT 1 (Art.-Nr.: 450 250)
measurement axes	X, Y, Z
measurement range X, Y	±1,7 g
measurement range Z	-0,7 g/+2,7 g
band width X, Y, Z	400 Hz
resolution X, Y, Z	64 µg
noise X, Y, Z	18 µg/√Hz
protection class	IP20
protection rating	SKIII (SELV)



# liftpc® Mobile Diagnosis



## For an inquiry, please fax or send this page to:

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**Fax: +49 2336 9298-10**

Further information can also be found at: [www.henning-gmbh.de](http://www.henning-gmbh.de)

- Yes**, I am interested in your new product **liftpc® Mobile Diagnosis**
- Please, send me an offer
- Please, give me a call without obligation to the following phone number:

\_\_\_\_\_

### My address:

_____	
Company	
_____	_____
Department, Function	Contact
_____	_____
Address	Street / ZIP
_____	_____
Country	Phone / Fax
_____	_____
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