



CERTIFIKAT

No. 0402-MID-48 97 01

CERTIFICATE OF EC TYPE EXAMINATION

Loadtronic 3

Issued to

AANDERAA DATA INSTRUMENTS AS, Nesttunbrekken 97, NO 5221 Bergen, Norway

In respect of

An electronic automatic catchweighing instrument.

Loadtronic 3 is an automatic and dynamic load weighing system for wheel loaders.

In accordance with

The Swedish Act on Metrology and Verification STAFS 2006:4 and STAFS 2006:10 dated 2006-08-21, transposing in the NB's country law the Directive 2004/22/EC of 31 March 2004 on measuring instruments (MID).

Applicable essential requirements

- Annex 1, Essential requirements
- Annex MI-006, Automatic weighing instruments

Harmonised standards and normative documents used

- OIML R51, edition 2006, Automatic catchweighing instruments

Further applied documents

- WELMEC 2.6, Guide for the testing of automatic catchweighing instruments (Issue X 8th draft October 2007)
- WELMEC 7.2, Software Guide (Issue 1)

Rated operating conditions

Measurand:	weight in bucket/shovel	Mechanic influence class:	M3
Accuracy class:	Y(b)	Climatic influence class:	-25°C - +50°C
Measurement range:	10e - 200e	Electromagnetic influence class:	E3

The weighing instrument may be of either single or multi-interval type.

Valid until


31th January, 2018.

The principal characteristics, approval conditions are set out in the appendix hereto, which forms part of the approval documents and consists of 4 pages. All the plans, schematic diagrams and documentations are recorded under reference files MTmP702831 and MTmP702831-2.

Borås 23th February 2009

**SP Technical Research Institute of Sweden
Certification**

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The instruments / measuring systems must correspond with the following specifications:

1 Design of the instrument

1.1 Construction

The weighing instrument consists of two pressure sensors, measuring the forces applied to the lifting arm system, indicating unit with control electronics. Furthermore there are three sensors in the system, two clinometers (one indicates the position of the lifting arms and one indicates the acceleration of the machine) and one position sensor (to signal when the lifting tool is retracted to weighing position).

1.2 Sensor

The weighing is performed when the bucket or other lifting equipment is raised in weighing position and when the bucket is used it is raised in fully retracted position. The weighing is performed dynamically.

Pressure sensor

Type	8253.84.23XX.XX.17.XX
Capacity	40 MPa (400 bar)
Manufacturer of sensor	Trafig AG, Männedorf, Switzerland

Other sensors

Type	
- acceleration sensor	SCA121T-D03
- angle sensor	SCA121T-D03
Manufacturer of sensor	VTI Technologies, Finland

1.3 Measurement value processing

Hardware

The weighing instrument consists of two pressure sensors, measuring the forces applied to the lifting arm system, indicating unit with control electronics. Furthermore there are three sensors in the system, two clinometers (one indicates the position of the lifting arms and one indicates the acceleration of the machine) and one position sensor (to signal when the lifting tool is retracted to weighing position).

Software

The validation of software was based on the essential requirements given in MID and WELMEC Guide 7.2. A report with number MTmP702831-02, dated 2007-12-13 was issued and is held by SP.

The software identification number, which is 1.xx (the xx is not concerning metrological functions) is shown on the display. The number of lifting tools should be evident from the software programme.

1.4 Indication of the measurement results

The control electronic unit may use different displays and interfaces. The control unit consists of a digital data processing unit.

1.5 Optional equipment and functions subject to MID requirements

- Manual zero-point setting every 2 hours
- dynamic setting function (configuration and calibration), only adjustable during set up

1.6 Technical documentation

The operating manual includes technical specifications and for example how to get access to the checksum. Dynamic settings is protected by a hardware switch.

1.7 Integrated equipment and functions not subject to MID

See operating manual.

2 Technical data

2.1 Rated operating conditions

Measurand

Any material within the measuring range, weight expressed in kg.

Measurement range

Maximum capacity,	$\text{Max} \leq e \cdot n$
Minimum capacity,	$\text{Min} \geq 10e$
Verification scale interval, class Y(b)	$e \geq 20 \text{ kg}$
Number of verification scale intervals, class Y(b),	$n \leq 200$

Accuracy class

Y(b)

Environments / influence quantities

Climatic:	-25 to +50°C
Mechanic:	class M3
Electromagnetic:	class E3

Durability period under rated operating conditions estimated by the manufacturer

Durability period estimated to be 36 months.

2.2 Other operating conditions

Not applicable.

3 Interfaces and compatibility conditions

The instrument may use the following protective interfaces for data communication:

- Printer (RS232, USB),
- USB interface,
- Reverse signal
- RS232 (cable/modem)
- RS485 (J1708)
- CAN (J1939) for external communication



4 Requirements on production, putting into use and utilisation

4.1 Requirements on production

No special requirements identified.

4.2 Requirements on putting into use

No special requirements.

4.3 Requirements for consistent utilisations

No special requirements identified.

5 Control of the measuring tasks of the instrument in use

No special measuring tasks are identified.

6 Security measures

6.1 Sealing

Interfaces

No sealing of interfaces is necessary

Indicator

No sealing of indicator is necessary

The switch, located in the indicator is found by opening the lower side of the main unit, is used to prevent unintentional changes, which destroys the verification of the system. It is not sealed. Every event which destroys the verification, is recorded in the event recorder.

Main unit is not sealed. The main card serial number is recorded in event recorder and in verification documents.

Note:

The program checksum shall be checked and noted.

Load cells / pressure sensors

The load cells/pressure sensors shall have a clearly visible serial number.

The serial number shall be marked on the descriptive plate

Descriptive plate

The descriptive plate (plates) shall be secured with sealing stickers unless the plate cannot be removed without being destroyed.

Bucket/shovel

The shovel shall be clearly and permanently marked with its number.

Sensors

The acceleration sensors and the angular sensors shall be sealed by wire.

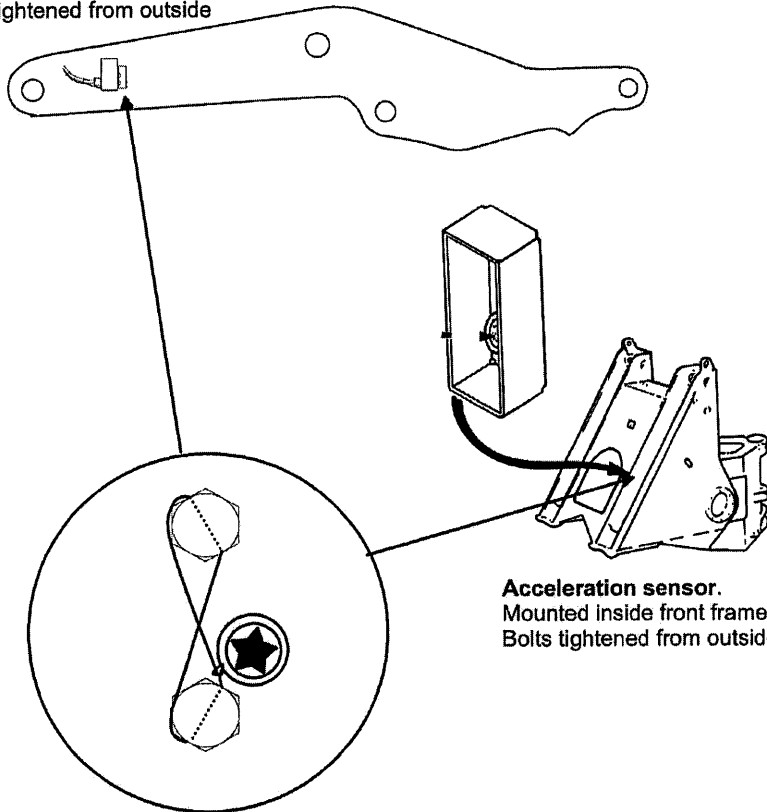
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Angle sensor

Mounted on bracket welded to lifting arm.
 Bolts tightened from outside



Acceleration sensor.
 Mounted inside front frame.
 Bolts tightened from outside.

Sealing is applied by thread through drilled hole in bolt heads.
 Sensors could not be removed without breaking the seal.

6.2 Data logger

The instrument has a Data storage device.

7 Labelling and inscriptions

7.1 Information to be borne by and to accompany the instrument

The descriptive plate mounted on the instrument shall contain the following information:


- name or identification mark of the manufacturer
- serial number and type designation
- number of EC type examination certificate
- accuracy class
- verification scale interval, e
- checksum
- maximum capacity, Max
- minimum capacity, Min
- temperature range
- electrical supply

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If different lifting tools with different Max capacity are used it should be evident from the descriptive plate


AANDERAA DATA INSTRUMENTS

Loadtronic 3

Version: 1. _ _
MID-006 / OIML R51 Class: Y(b)
Pattern Approval Certificate:
SPxxxx

d = e = _____ t
Max = _____ t
Min = _____ t

Equipment serial numbers
Main unit: _____
Pressure+: _____
Pressure-: _____

Software Checksums:
Program : _ _ _ _ _
Configuration : _ _ _ _ _
Calibration : _ _ _ _ _

Supply voltage: 18-36 VDC
Temperature: -25 / +50 deg.C
Max.work.pressure: 400 bar

7.2 Conformity marking in accordance to article 17

The instrument shall be marked in accordance to article 17 which e.g. describes the CE-marking together with M, year of marking and the notified body number.

7.3 Further inscriptions, if necessary

No further inscriptions considered necessary.