



# EC type Examination Certificate

**0402-MID-51 65 02**

## Issued to

Structab AB, Slottsmöllan 14B, 302 31 HALMSTAD, Sweden

## In respect of (type of instrument)

Taximeter MegTax 350 and MegTax 310

## In accordance with

The Measuring Instruments Regulations STAFS 2006:4 and The Regulations and Guidelines concerning Taximeters STAFS 2006:11 dated 2006-07-21, implementing in the NB's country law the Directive 2004/22/EC of 31 March 2004 on measuring instruments (MID).

## Harmonised standards and normative documents used

OIML R21 Taximeters Metrological and technical requirements, test procedures and test report format (applied partly)

## Further applied documents

WELMEC 7.2, Software Guide (Issue 3)

OIML D 11 Edition 2004 (E), General requirements for electronic measuring instruments

Information regarding applied environmental testing is evident from clause 9 of the appendix.

## Rated operating conditions

Measurand:	Time and or distance	Mechanic environment class:	M3
Measurement range:	Maximum 6 digits on the display (corresponding to the fare to be paid)	Electromagnetic environment class:	E3
Accuracy:	- Time elapsed: $\pm 0,1$ % - Distance travelled: $\pm 0,2$ % - Calculation of the fare: $\pm 0,1$ % - Measuring range: 1 000-100 000 pulses/km	Climatic environment:	-25 to +55 °C Condensing Closed (installed in a car)

## Miscellaneous

Valid until June 3, 2019. This certificate is the sixth edition with this number and replaces the earlier edition dated February 13, 2012.

*The principal characteristics, approval conditions are set out in the appendix hereto, which forms part of the approval documents and consists of 9 pages. All the plans, schematic diagrams and documentations are recorded under reference files ELe P804595, PX03215, PX11908, PX17328, PX20944 and 5P05553.*

2015-10-30

**SP Technical Research Institute of Sweden  
Certification - Notified Body No. 0402**

Lennart Aronsson  
Product Certification Manager

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Certification Officer



Certificate issue 6, dated 2015-10-30

## SP Technical Research Institute of Sweden

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

### 1 Design of the instrument

#### 1.1 Construction

##### Product names

MegTax 350 consists of

MTME350 (Central processor unit with display)

MTKB300 (Connecting box)

MTPR200 (Printer) can be connected to the system, but is not a requirement according to directive 2004/22/EC.

MegTax 310 (MT 310) consists of

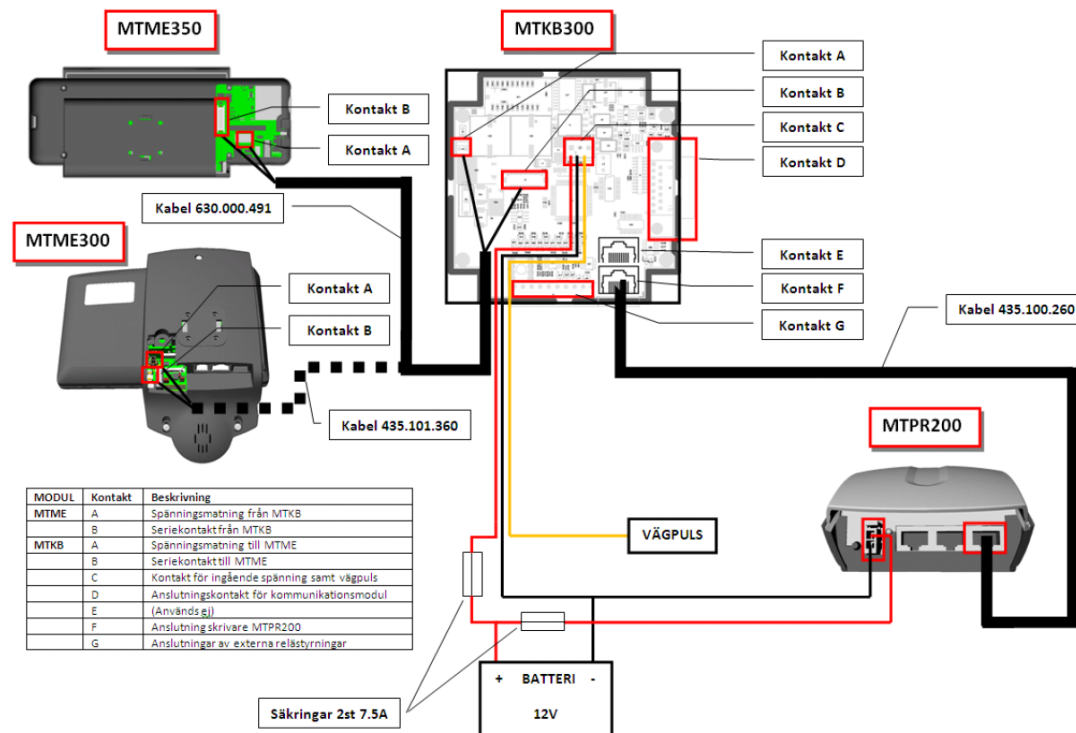
MTME300 (Central processor unit with display)

MTKB300 (Connecting box)

MTPR200 (Printer) can be connected to the system, but is not a requirement according to directive 2004/22/EC.

##### Measuring system description

The taximeter is designed to measure time and receive information to calculate distance. Time is measured by its internal real time clock and distance is calculated by the number of pulses received from the pulse generator of the car (Vägpuls) in relation to the given pulse constant. The supply voltage is taken from the battery of the vehicle. For connections see the schematic picture below.



Picture 1: Taximeter connections (instead of MTME350, MTME300 can be used)

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Picture 2: Central Processor Unit with display MTME350



Picture 3: Central Processor Unit with display MTME300



Picture 4: Connection box MTKB300



Picture 5: Printer MTPR200

## Supply voltage

Taximeter and printer: 10-18 V

## Connection to pulse generator of the vehicle

The pulse from the pulse generator of the car is to fulfil the following the requirements according to the manufacturer:

The pulse input can be of the following types: Open-collector, Push-pull or Sinus.  
The pulse interval is 1000 ....100000 pulses/km

State	Sensor type	Recommended value for pulses/km
0	Manual adjustment	Manual adjustment
1	Sinus	Up to 18000
2	Sinus	Between 18000 and 100000
3	Push-pull	Up to 18000

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State	Sensor type	Recommended value for pulses/km
4	Push-pull	Between 18000 and 100000
5	Open-collector (1kΩ pull-up)	Up to 18000
6	Open-collector (1kΩ pull-up)	Between 18000 and 100000
7	Open-collector (10kΩ pull-up)	Up to 18000
8	Open-collector (10kΩ pull-up)	Between 18000 and 100000
9	Open-collector (100kΩ pull-up)	Up to 18000
10	Open-collector (100kΩ pull-up)	Between 18000 and 100000

**Table 1:** Connection to pulse generator of the vehicle.

State number 0 is only to be used if recommended directly from the manufacturer.

The signal is never to exceed the supply voltage of the taximeter or be below -6V.

At Sinus type AC-pulses with an amplitude down to and including 200mV will be detected. At Push-pull and Open-collector the low level must be lower than 1V and the high level must be higher than 2V.

### 1.2 Software

The validation of software was based on the essential requirements given in MID and WELMEC Guide 7.2. A report with number P804595-02, dated April 15, 2009 was issued and is held by SP. Supplementary evaluation was carried out in accordance with report PX11908-04.

#### Software version

The following program versions are approved:

Type of program	Program version with checksum in brackets
Taximeter program MegTax 350	01.02B(21f2)
	02.01C(76c9)
	03.01B(4251)
	04.01A (dd1f)
Taximeter program MegTax 310	01.02B(1cf3)
	02.01C(7e7c)
	03.01B(2cd8)
	04.01A (88bf)

**Table 2:** Program versions where the values (hexadecimal) in brackets are the checksums.

The software identification numbers are to be interpreted in the following way:

*Example:*

Complete program version: 01.02B(21f2)

- 01 is the main version and is changed at bigger changes
- 02 is the part version and is changed at smaller changes
- B is the bug fix version
- (21f2) is the checksum



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The software identification number and the checksum can be seen in the following way: choose MENY, RAPPORTER, VERSIONER, and TAXAMETERVERSION.

Alternatively if a printer is connected the number and the checksum can be read by making a "Taxameterkontroll"\* choose MENY, RAPPORTER and TAXAMETERKONTROLL or press the PK button and choose TAXAMETERKONTROLL.

- \* The mode "Taxameterkontroll" is a print-out intended for the police or other authority in order to check e.g. the totalisers, the date of securing and the tariff values.

### 1.3 Components included for electronic function

The following documentation is stating the components

Product	Documentation	Revision	Note
Megtax 350	UB 2008:27	F	
MT310	UB 2010:46	D	
MT310	UB 2010:83	B	Change of hardware
Megtax 350	UR 2011:51	A	Change of hardware

*Table 3: Documentations that stating the components.*

### 1.4 Optional equipment and functions subject to MID requirements

None identified

### 1.5 Technical documentation

For market surveillance the construction, software and included components are described in 1.1, 1.2 and 1.3.

### 1.6 Integrated equipment and functions not subject to MID

Software to fulfil national requirements, to communicate with booking central or card reader must not influence the accuracy of measurements such that the maximum permissible error is exceeded or the required functions are changed.

## 2 Technical data

### 2.1 Rated operating conditions

#### Measurand

Time and or distance.

#### Measurement range

*Total Memory:*

Total distance:  $420 \cdot 10^6$  km

Total distance in taxi traffic (driver logged in):  $420 \cdot 10^6$  km

Number of hirings:  $420 \cdot 10^6$  km

Total amount of money:  $21 \cdot 10^6$  monetary units

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Total amount of supplementary charge:  $21 \cdot 10^6$  monetary units

*Total Memory for taximeters with programversion 04.01A with checksums (dd1f) and (88bf):*

Total distance:  $1,8 \cdot 10^{18}$  km

Total distance in taxi traffic (driver logged in):  $1,8 \cdot 10^{18}$  km

Number of hirings:  $4200 \cdot 10^6$  km

Total amount of money:  $92 \cdot 10^{15}$  monetary units

Total amount of supplementary charge:  $92 \cdot 10^{15}$  monetary units

The limitation is the maximum fare that can be displayed. The amount is limited to five digits e.g. SEK 99 999.

### Accuracy

- Time elapsed:  $\pm 0,1 \%$
- Distance travelled:  $\pm 0,2 \%$
- Calculation of the fare:  $\pm 0,1 \%$
- Pulse range: 1000-100 000 pulses/km

### Environments classes / influence quantities

Mechanic:	class M3
Electromagnetic:	class E3
Ambient temperature limits:	-25°C to +55°C
Humidity:	condensing
Location:	closed (inside a car)

### 2.2 Other operating conditions

Not applicable.

### 3 Interfaces and compatibility conditions

See clause 1.1

### 4 Requirements on production, putting into use and utilisation

The requirements of the installation manual are to be followed when installed in a car and put into use.

#### 4.1 Requirements on production

No special requirements identified.

#### 4.2 Requirements on putting into use

The taximeter must be adapted to the vehicle.

#### 4.3 Requirements for consistent utilisations

No special requirements identified.

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### 5 Control of the measuring tasks of the instrument in use

#### 5.1 Documentation of the procedure

The procedure to control the accuracy after installation in a car is described in the user's manual.

#### 5.2 Special equipment or software, if applicable

A stop watch or other time measure equipment is needed.

#### 5.3 Calibration-/adjustment procedure

The taximeter can be controlled after installation in a car in the following way.

#### ***Accuracy of distance measurement***

To check the accuracy of distance measurement the following procedure is to be followed:

Choose "Anpassningskontroll" (MENY, RAPPORTER, ANPASSNINGSKONTROLL). Press "OK" when the verified distance starts and press "OK" again when 1000m is passed. The taximeter is showing the pulse constant, the number of pulses received when driving the distance and the deviation. If a printer is connected a print-out will be given. The speed is required to be at least 20km/h during the complete distance.

Use a verified distance of 1000m to carry out the control.

To change the taximeter constant the sealing must be broken and using "SERVICEMENY" in accordance with the installation manual.

#### ***Accuracy of time measurement***

To check the accuracy of the time measurement the following procedure is to be followed: Choose "Tidmätning" (MENY, RAPPORTER, TIDMÄTNING). Start by pressing "OK" and start a calibrated stop watch at the same time. Wait at least 60 min. Stop both stop watch and taximeter counting "OK" at the same time. Start time, stop time and measured time are shown on the display. If a printer is connected, a print-out will be given.

Use a calibrated stop watch to carry out the control.

### 6 Security measures

#### 6.1 Sealing

The taximeter is sealed according to page 7 and 8.

MTKB300 (connection box) is to be fastened to the vehicle by four screws. Cables for supply voltage and pulses are connected inside the connection box. When the connection box has been fastened to the vehicle the lid of the box is sealed with a screw (electronic sealing when the lid is pressed down) and a sealing wire through the screw.

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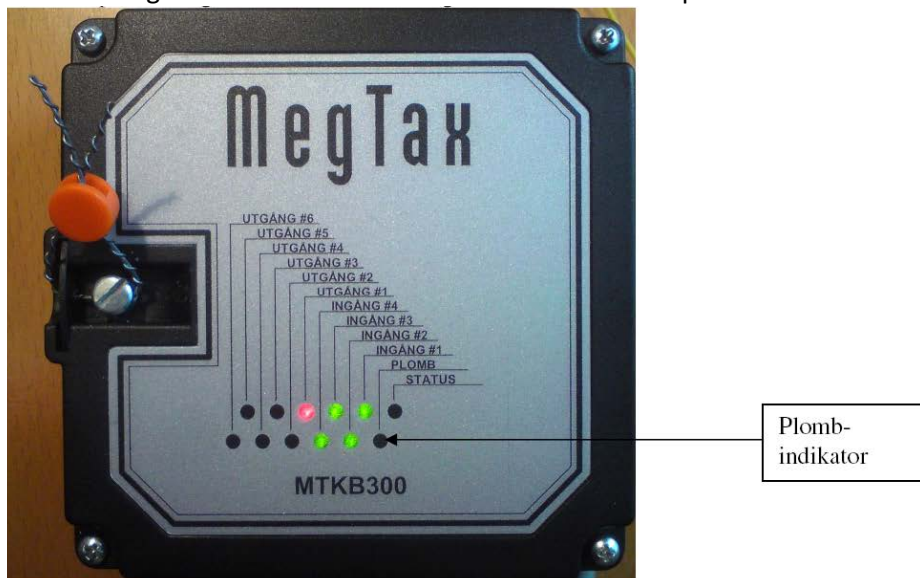
The display and CPU MTME350 or MTME300 is electronically sealed to MTKB300 in the way that if the lid of the display and CPU part is opened the sealing is shown as broken on the display as well as on the connection box. If the lid of the connection box is opened the sealing will also be shown to be broken.

The status of the electronic sealing is shown by the diodes of MTKB by a period of 5s in the following way:

Number of twinkles (during 5s)	Meaning
1	The system is sealed
2	The electronic sealing has not been reset after being broken
3	The sealing of MTME300/350 is broken
4	The sealing of MTKB300 is broken
5	The sealing of both MTME300/350 and MTKB300 are broken

**Table 4:** Status of the electronic sealing.

If the sealing has been broken the lid of MTKB must be opened and then sealed again.



**Picture 6:** Mechanical sealing (indicator regarding electronic sealing marked)

### 6.2 Data logger

The totalisers are stored in memory of FRAM type.

Change of program version will be stored in “Versionshistorik” (MENY, RAPPORTER, VERSIONER, VERSIONSHISTORIK).

Change of taximeter constant “Txm.konst historic” can be seen by choosing MENY, RAPPORTER, TXM.KONST. HISTORIK.



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Dates of sealing “Plomberingshistorik” can be seen by choosing MENY, RAPPORTER, PLOMBERINGSHISTORIK.

Alternatively the date and time of the last electronic sealing can be read by “Taxi-identitet” (MENY, RAPPORTER, TAXI-IDENTITET).

### 7 Labelling and inscriptions

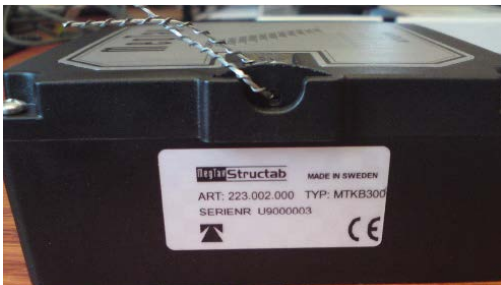
#### 7.1 Information to be borne by the instrument

The marking on the instrument shall contain the following information:

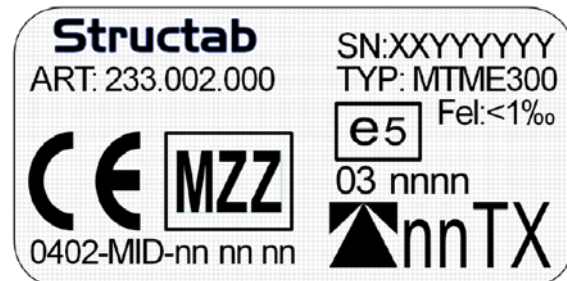
- the name of the manufacturer
- the serial number
- the designation or type name (according to “Product names” Appendix page 1)
- the EC-type examination certificate number, MID SC 51 65 02
- the accuracy class
- markings regarding other approvals
- marking regarding additional devices not being covered by MID



Picture 7 and 8: Placement of marking on MTME350 (to the left) and MTME300 (to the right)



Picture 9: Placement of marking on MTKB300



Picture 10: Information to be given on the marking. nn nn is to be replaced by the approval number TnnTX is national Swedish marking



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### 7.2 Conformity marking in accordance to MID article 17

7 The instrument shall be marked in accordance to MID 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

Further inscriptions e.g. e-marking and national markings are necessary, but are not connected to this directive.

## 8 Manuals

The following manuals are to accompany the different systems in the official language of the country of use (the manufacturer is responsible for the translation of approved documents).

<i>Program version (check sum)</i>	<i>Title of manual</i>	<i>Product</i>	<i>Version number</i>	<i>Date</i>	<i>Language of examined version</i>
01.02B(21f2)	Manual MegTax MTME350 Taxameter	MegTax 350	1.0	090320	Swedish
01.02B(1cf3)	Manual MegTax 310	MegTax 310	1.1	101011	Swedish
02.01C(7e7c)	Manual MegTax 310	MegTax 310	-	110414	Swedish
02.01C(76c9)	Manual MegTax 350	MegTax 350	PA16	111116	Swedish
03.01B(4251)	Manual MegTax 350	MegTax 350	PA18	111223	Swedish
03.01B(2cd8)	Manual MegTax 310	MegTax 310	PA9	120209	Swedish

**Table 5:** List of manuals.

For installation purposes the manual "MegTax Servicemanual 310/350" revision 2.2 dated 2010/10/12 (examined in Swedish version) is to be followed for program version 01.02B, revision 2.4 dated 2011/04/14 is to be followed for program version 02.01C and revision 4.0 dated 2015-08-12 is to be followed for program version 04.01A.

## 9 Applied environmental testing

### **Vibration**

IEC 68-2-64 revision 1, test Fh (this is a higher severity than Class M3 in accordance with OIML D11):

10-20 Hz: 0,05 g<sup>2</sup>/Hz

20-500Hz: -3 dB/octave

Testing was carried out in three mutually perpendicular axes for 0.5 hours in each direction and the taximeter was connected to power during testing.

### **Dry Heat**

OIML D11 with testing according to IEC 60068-2-2 test Bd, but with the duration 16h and the highest temperature +70°C.

The test object was connected to power during the test.

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### **Cyclic damp heat/Cold**

Testing of cold and damp heat was carried out in accordance with the climate sequence of IEC 60068-2-61.

First one cycle damp heat was carried out according to IEC 60068-2-30 edition 2 revision 1. test Db. temperature: +55 °C. The taximeter was not connected to power during testing.

After recovery in controlled atmosphere during 1 h ±5 min cold test according to IEC 60068-2-2 edition 5 revision 2 test Ab at -40 °C during 16 h was carried out.

After finalisation of the cold test 5 cycles of damp heat was carried out according to IEC 60068-2-30. edition 2. revision 1. test Db. +55 °C. The taximeter was not powered during testing.

### **Emission**

EN 55022:2006, /A1:2007 class B

### **Immunity**

OIML D11 12.2 Electrostatic discharged according to IEC61000-4-2, level 3

OIML D11 12.1.1/1 and 12.1.1/2 Radiated RF immunity according to IEC61000-4-3, level 3

OIML D11 12.1.1 Injected RF immunity according to IEC61000-4-6, level 3

OIML D11 14.2.1 Voltage variation according to ISO16750-2

OIML D11 14.2.2 Automotive voltage transient immunity according to ISO 7637-2, level 4 pulses 1, 2a, 2b, 3a, 3b, 4, 5

OIML D11 14.2.3 Automotive voltage transient immunity ISO 7637-3, level 4