

Typ : RWS-Ex-RPW-2100-Exi (ATEX)

For weighing system types:
RAVAS-2100 EXi – RAVAS-2100L EXi – ProLine 2100 EXi

Weighing handpallet trucks



- Even full stainless steel versions are available

Operating instructions

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1 Symbols



Warning!

This symbol indicates advice which, if ignored, puts your health or the ability of the device or devices to function at risk.



Note:

This symbol indicates important additional information, tips and recommendations.

2 Safety instructions

The most important safety instructions are summarised in this chapter. It is intended to supplement the relevant regulations which must be studied by the personnel responsible.

When working in hazardous areas, the safety of personnel and plant depends on complying with all relevant safety regulations. Assembly and maintenance staff working on installations therefore have a particular responsibility. They require precise knowledge of the applicable standards and regulations.



As user, please observe:

- *National safety and accident prevention regulations.*
- *National installation regulations (e.g. IEC 60079-14)*
- *Generally recognised technical regulations.*
- *Safety guidelines and information in these operating instructions as well as the enclosed mechanical assembly drawings, wiring diagrams and operating instructions of the subassembly devices.*
- *Characteristic values and rated operating conditions on the rating and data plates.*
- *Additional instruction plates / labels on the devices.*
- *That any damage can invalidate the Ex-protection.*

Use the devices in **accordance with the regulations** and for their intended purpose (see “Function” on page 2). Incorrect and impermissible use or non-compliance with these instructions invalidates our warranty provision. No changes to the devices and components impairing their explosion protection are permitted.

3 Conformity to standards

The devices comply with the following standards and directives:

- Directive 94/9/EG;
EN 60079-0: 2009
EN 60079-7: 2007
EN 60079-11: 2012
EN 60079-18: 2009
EN 60079-31: 2009



The devices are approved for use in hazardous area Zones 1, 2, 21 and 22.

4 Function

This operating manual describes the following device:
- Palettrucks with weighing system RWS-Ex-RPW-2100-Exi
For functionality indicator, see manual (page 9)

5 Technical data



Please consult the manufacturer if operating conditions are non-standard.

Additional technical data can be obtained upon request.

5.1 Ex protection RWS-Ex-RPW-2100-Exi

EG-type research certificate:	DEKRA 13ATEX0044
Explosion protection, device group and category	 II 2G Ex ib IIB T4 Gb of  II 2D Ex ib IIIC T135°C Db
May be used in temperature range:	-10°C...+40°C

Tabel 5-1: Ex protection data

5.2 Electrical data

Supply by battery type BU-2100-Exi (certificate DEKRA 13ATEX0043)

The battery may only be recharged outside the hazardous area. The charging instructions, stipulated in the battery-manual must be observed.

6 Arrangement

6.1 Dimensions

See appendix A 3.

7 Opening and closing of the enclosure



*Only open the enclosure to change battery type BU-2100-Exi.
After the battery is connected the housing has to be closed.*



The battery can't be changed in areas which contain flammable dust.

8 Commissioning



Before commissioning, ensure that the device is not damaged.

The power supply to the system takes place through an exchangeable battery pack. With a completely charged battery pack the total weighing time is about 100 hours

When the voltage level of the battery is running low, the display will show "LO-BA". When the battery is completely empty, the weighing system switches off.

When charging, it is necessary to charge the battery for at least 6 hours. This will prevent loss of battery capacity.

If you use the system in shift work, it is recommended to purchase a supplementary battery pack. By means of a special clasp system, the battery can be removed and replaced easily

Remark: Exchanging the battery can be done inside the EX-zone!

The battery can be charged on the adapter supplied with the charger. When the charger is connected to 220 Vac, the red light is on. When the battery is charging, the yellow LED on the charger is lit. When the LED turns off, the battery is charged and can be used. After a while the yellow LED will start blinking. The blinking will slow down after some time. This shows that the charger is keeping the battery fully charged. It is not possible to overload the battery.

Warning: Charging the battery has to be done outside the EX-zone!

9 Maintenance and servicing



Please pay attention to the national regulations applicable in the country of deployment!

Maintenance, repair and servicing work on the devices must only be performed by personnel who are both authorised and suitably trained for this purpose.

To prevent defects in the system, perform maintenance work regularly. The intervals between inspections should however not exceed a maximum of three years.

Maintenance and calibration may only be executed in a safe area.

Main guideline:

- *Because the steering wheels are mounted in the front, pulling of the pallet truck is preferred above pushing it.*
- *When the lifting mechanism is not used, it should be kept in the neutral, middle position. This prolongs the life span of the sealings. .*
- *The bearings of the wheels and the pivoting points of the levelling bar of the loading wheels must be cleansed and greased regularly.*
- *The oil containers must be checked every six months.*

An antistatic protection screen is available for polluted environments. Please contact your supplier.

9.1 Inspection intervals

Consider the following conditions when determining the inspection interval:

- The ambient conditions:
 - Set-up in the open

- Degree of wind, rain and sunlight exposure
- The operating conditions:
 - Duty cycle of the system
 - Operator errors
- Manufacturer information in the technical documentation:
 - Mechanical and electrical service life

9.2 Inspection content

Perform the inspections as determined by the local requirements. The inspections include visual examinations, general checks and detailed inspections.



If defects which affect explosion protection are discovered during inspections, then the equipment is to be taken out of service until the defect is remedied.

9.3 Inspections/maintenance checklist

Date:	Name:	Yes	No	Action performed
Date last inspection				
General inspection				
Are the wires in the terminal blocks clamped properly?				
Are the permissible temperature specifications (in accordance with EN 50014) complied with?				
Are seals, cable glands and cable entries free of damage?				
Inspecting the outer condition of enclosures				
Are the enclosures free of ruptures, holes, bumps, material brittleness or corrosion spots?				
Inspecting the condition of cable glands				
Are the threaded joints tightened properly?				
Is the sealing within the threaded joint in satisfactory condition?				
Inspecting the condition of windows:				
Are the windows intact? a)				
Inspecting the condition of the wheels				
Are the wheels in satisfactory condition?				
Inspection of the interiors				
Are the interior spaces of the devices in flawless condition?				
Are the electrical points of contact in flawless condition?				
Is the mechanical attachment of the battery intact?				
Do the electrical contact points make contact properly?				
Calibration:				
Is the device within the tolerances as stated by the manufacturer?				
Recommended interval: once a year				
Inspection of the age and condition				
Is the device still within the electrical or mechanical service life as specified by the manufacturer?				
Inspecting the device prior to operating				
Is the device intact?				
Has the device been checked that no extraneous particles are present within?				
Is the battery connection performed correctly?				
Do cable entries and stopping plugs sit correctly?				
Are all unused openings sealed with certified sealing elements?				

Table 9-1: Maintenance checklist

10 Accessories and spare parts



Use only original accessories and spare parts from electromach b.v.. Use of another company's accessories and spare parts invalidates the warranty of electromach b.v..

11 Transportation and storage

Transport and storage are only permissible in the original packaging.

12 Disposal

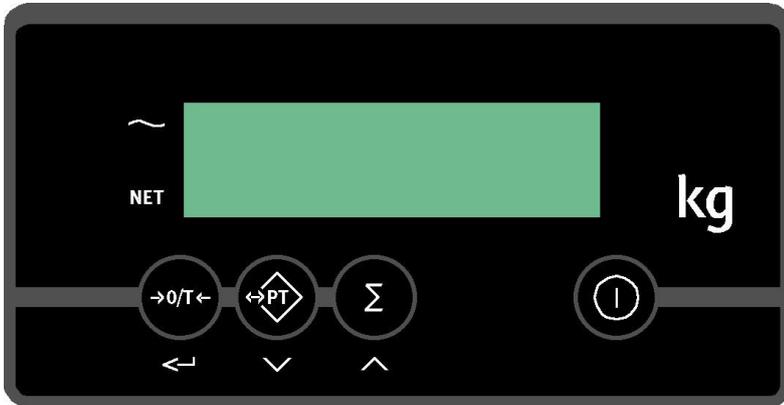


Please observe the national waste-disposal regulations.

Should you require the operating instructions in one of the other European Community languages, please feel free to contact your electromach representative.

13 INDICATOR MANUAL

13.1 TOUCHSCREEN DISPLAY



Frontview indicator

THE DISPLAY

The 3 bars in the display indicate:

-  ◀ The weighing system (including load) is stable
-  The display weight is negative
- NET** ◀ The display shows the net weight

DISPLAY MESSAGES

The "-" sign in the display occurs. The display might show one of the following messages:

- HELP 1 The weighing system is in overload.
- HELP 2 A negative weight will be tared.
- HELP 3 There is a negative sign from the loadindicator on the AD converter / the system is not level.
- HELP 4 (Manually) the entered tare weight is too high. Push the ⇄PT button again to erase the message and enter a lower tare weight.
- HELP 5 The memory is full.
- HELP 7 The sign from the loadindicator on the AD converter is too high
- LO-BA The level of the battery (indicator) is too low. The battery needs to be charged.

The Touch panel

Each key has a company- or entering function.

	Company function	Entering function
	Zero setting and automatic tare	Confirm and segment left
		
	Tare entry	Lower value of the flashing segment
		
	Totalising	Raise value of the flashing segment
		
	On / off	clear

IMPORTANT

Pushing a key will only be accepted when the system is stable (and the sign "load stable" flashes). This means that all functions will only be performed when the weight is stable.

WARNING

If the weighed load is higher than the maximum, the sign: "HELP1" shows. To prevent damage to the indicator or the loadcells, the load has to be removed as fast as possible.

LEVELSWITCH

When the system is approved the display shows only show a "—" message when the system is not level. The system has to be placed horizontal. Afterwards the weight will be shown.

13.2 INDICATOR OPTIONS

13.2.1. MULTIRANGE

The graduation of the indicator depends on the weighed load:

- from 0 till 200 kg the weight will be displayed in 0,2 kg graduation steps;
- from 200 till 500 kg will be displayed in 0,5 kg graduation steps;
- from 500 till 2000 kg the weight will be displayed in 1 kg. steps.

Because of the weight dependable graduation smaller weights will be weighed with an increased accuracy. After taring the weight, smaller weights can be totalized or deducted with the graduation which belongs to the smaller weight.

If the weight changes the graduation also changes. Per example: if the weight with an original weight of 650 kg. is removed from the scale, the display will change to 0,5 kg. steps when the weight reaches 500 kg.

13.2.2. BEFORE WEIGHING: ZERO CORRECTION

Before each weighing you have to check if the system is unloaded. The indicator contains an automatic zero correction. This means that small deviations from the zero-point will be corrected automatically. If the indicator doesn't determine the zero-point automatically you have to perform the zero correction manually using the →0/T← button.

13.2.3. GROSS WEIGHING

After lifting the load the display shows the gross value of the weighed weight.

13.2.4. NET WEIGHING: TARING PUSH BUTTON

The indicator offers the possibility to set the tare weights to zero automatically, this way it's possible to determine extra loaded or unloaded weight. After taring the graduation starts again from the smallest graduation.

- Enter load
- Pushing →0/T← button.
 - ❑ The indicator is set to zero.
 - ❑ The indicator 'NET'" indicates that the tare weight is active.
- Remove or change the net weight
 - ❑ The display shows the net weight of the weighed weight.
 - ❑ When removing weight the value is negative.
- By performing the zero correction while there is no weight on the system, it returns to the standard weighing mode.

13.2.5. NET WEIGHT: MANUAL TARE-ENTRY

The tare weight can be entered at every moment, while the system is loaded or unloaded. For a higher accuracy it's possible to enter a tare weight with a smaller graduation, regardless the weight and graduation of the indicator. A tare weight which is bigger then MAX1 of the weighing system won't be accepted by the indicator. MAX1 is the weight in the first range, standard 200 kg. (see 3.1). If a bigger value is entered, the display shows "HELP4". When you press the button □PT, the HELP sign disappears.

- Push ⇄PT button.
 - ❑ The last tare weight will be shown..
 - ❑ The right segment flashes.
- If you want to use the actual tare weight, push the ENTER (↵) button for 3 seconds.

Or

- Push ⇄PT button
- Push value up ^ or down v until the flashing segment has the wished value.
- Push the ENTER (↵) button for adjusting the next segment.
- Repeat these actions until the requested tare weight is shown on the display.
- If you want to activate the tare weight but not save is, push the ENTER (↵) button for 3 seconds to confirm the value.
 - ❑ Tare weight is activated.
 - ❑ The bar "NET" shows.
 - ❑ If the system is loaded, the net weight shows on the display.
 - ❑ If the system is unloaded, the display shows the entered tare weight as a negative.
 - ❑ If the system is unloaded, the display shows the Net weight in the display.
 - ❑ The entered value remains active until the system will be shut down, a new tare weight will be entered, a new load will be tare (see 2.4) or by putting the tare value to zero:
- The weighing system is loaded: push the □PT button for 2 seconds. The tare value is set to zero and the system returns to the standard weighing mode.

Or

- The weighing system is unloaded: push the *0/T* button. The tare value will be set to zero and the system returns to the standard weighing mode.

- To activate *and* save tare weight, push ENTER (↵) at each segment.
 - ❑ The tare weight is activated and will be saved.
 - ❑ The bar "NET" shows.
 - ❑ If the system is loaded, the net weight shows on the display.
 - ❑ If the system is unloaded, the display shows the entered tare weight as a negative.The entered value remains active until the system will be shut down, a new tare weight will be entered, a new load will be tare (see 2.4) or by putting the tare value to zero:
The weighing system is loaded: push the □PT button for 2 seconds. The tare value is set to zero and the system returns to the standard weighing mode.

Or

- The weighing system is unloaded: push the *0/T* button. The tare value will be set to zero and the system returns to the standard weighing mode.

13.2.6. TOTALIZING

The indicator offers the possibility to totalize the weighing's and display the total weight. If a tare weight is active, the Net weight will be summed up automatically.

- Load the system with the weight which has to be summed up.
- Push Σ button to add the weighed weight to the total weight.
 - * The value of the display will be placed in the memory and totalized.

- * The display shows the sequence number afterwards (number of weightings) and the (sub) total.
- * If a printer is fitted on the system, the showed value will be printed at the same time.
- * After a couple of seconds the system returns to the weighing mode automatically.

Or

- Push Σ for three seconds to show the actual weight without totalizing.
 - * The display shows the sequence number afterwards (number of weightings) and the (sub) total in the memory.
 - * After a couple of seconds the system returns to the weighing mode automatically.
- During showing the total weight the memory can be erased by briefly pushing the Σ button.
 - * If a printer is fitted on the system, a print of the total weight will be made.
 - * The display shows the sequence number 00 and the total as 0.0 kg.
 - * The system returns to the weighing mode automatically.

13.2.7. PRINTING (OPTIONAL)

If a printer is fitted on the system, a print of the actual weighing values can be made.

- Push the Σ button.
 - * A print-out will be made. The weight will be stored and totalized in the memory (see 2.6).
- Unload the system to 0 when a new printout will be made before the new print-out is made.

On the print-out the gross weight will be indicated by letters "B/G" and a net weight with the letter "N". A entered tare weight will also be printed and indicated with "PT". The total weight will be indicated with the letter "TOT".

Example print-out	01	B/G	6.8	kg
	02	B/G	158.2	kg
	03	N	426.5	kg
	04	N	1200.0	kg
	<u>04</u>	<u>PT</u>	<u>150.0</u>	<u>kg</u>
	04	TOT	1791.5	kg

Please note: the printer has to be placed in an explosion-proof environment

APPENDIX A1 EC-Declaration of conformity ATEX Richtlijn



ELECTROMACH member of the R.STAHL Technology Group

EG-Conformiteitsverklaring

EG-Konformitätserklärung
 EC-Declaration of Conformity
 Déclaration de Conformité CE

Electromach bv , Jan Tinbergenstraat 193, 7559 SP Hengelo, Nederland

Verklaard op eigen verantwoording, erklart in alleiniger Verantwortung, declares in its sole responsibility, declare sous sa seule responsabilité

Dat het product: Dass das Produkt: That the product: Que le produit:	Niet-automatisch weeginstrument Nicht-automatische Waage Non-automatic weighing instrument Instrument de pesage non-automatique
Type, Typ, type, type :	Type RWS-Ex, *** - BX Type RWS-Ex, *** - 2100-Exi
Voldoet aan de eisen van de volgende Richtlijnen en normen Mit den Anforderungen der folgende Richtlinien und Normen übereinstimmt Is in conformity with the requirements of the following directives and standards Est conforme aux exigences des directives et des normes suivantes	
Richtlijn Richtlinie Directive Directive	Normen Normen Standards Normes
94/9/EEG : ATEX Richtlijn 94/9/EG : ATEX Richtlinie 94/9/EC : ATEX Directive 94/9/CE : Directive ATEX	EN 60079-0: 2009 EN 60079-7: 2007 EN 60079-11: 2012 EN 60079-18: 2009 EN 60079-31: 2009
Markering, Kennzeichnung, marking, marquage :	II 2 G Ex ib IIB T4 Gb 0158 II 2 D Ex ib IIIC T135°C Db
EG-Certificaat van Overeenstemming : EG-Baumusterprüfbescheinigung : EC Type Examination Certificate : Attestation d'examen CE de type :	Dekra 13 ATEX 0044 DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem, Nederland

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2006/42/EEG : Machine Richtlijn 2006/42/EG : Maschinen-Richtlinie 2006/42/EC : Machinery Directive 2006/42/CE : Directive Machines	

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APPENDIX A2 EC-Type examination certificate DEKRA 13ATEX0044



CERTIFICATE

(1) EC-Type Examination

(2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **DEKRA 13ATEX0044** Issue Number: **3**

(4) Equipment: **Weighing System Type RWS-Ex**

(5) Manufacturer: **Electromach B.V.,
Member of the R. STAHL Technology Group**

(6) Address: **Jan Tinbergenstraat 193, 7559 SP Hengelo,
The Netherlands**

(7) This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the directive.

The examination and test results are recorded in confidential test report number 215604600.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 60079-0 : 2009
EN 60079-18 : 2009**

**EN 60079-7 : 2007
EN 60079-31 : 2009**

EN 60079-11 : 2012

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:



**II 2G Ex ib IIB T4 Gb or
II 2G Ex ib IIC T4 Gb or
II 2D Ex ib IIC T135 °C Db or
II 2 (2) G Ex e ib mb IIC T4 Gb or
II 2 (2) D Ex ib tb IIC T125 °C Db**

This certificate is issued on 3 April 2014 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

T. Pijpker
Certification Manager

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(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate DEKRA 13ATEX0044** Issue No. 3

(15) **Description**

The Weighing System Type RWS-Ex consists of a battery supplied intrinsically safe weighing Unit mounted on or used with an approved forklift, pallet car or weighing platform. The load weight is sensed by loadcells located in the forks or the platform. The weight is displayed by an indicator. The system enables the operator to determine the weight of the transported load.

The components of the system are separately approved and marked. The application depends on their approval code and safety specifications.

The following table lists the Weighing System model code, the applicable type(s) of protection, the ambient temperature range, the electrical data and the options:

Weighing System	Approval code/ type of protection	Ambient temperature range	Electrical data and options
RWS-Ex, Model BTA226x	II 2G Ex ib IIC T4 Gb or II 2D Ex ib IIIC T135 °C Db	-10 °C to +40 °C	See drawing 5020-RWS-Ex/BTA226x
RWS-Ex, Model ***-IT3000Ex	II 2 (2) G Ex e ib mb IIC T4 Gb or II 2 (2) D Ex ib tb IIIC T125 °C Db	-10 °C to +40 °C	See drawing 5020-RWS-Ex/IT3000 Ex
RWS-Ex, Model ***-2100-Exi Model ***-BX	II 2G Ex ib IIB T4 Gb or II 2D Ex ib IIIC T135 °C Db	-10 °C to +40 °C	See drawing 5020-32-RWS-Ex-***- 2100-Exi

The system can optionally be provided with a level switch Model RELS-001-Exi that is connected to the Weighing Unit.

Installation instructions

The instructions provided with the equipment shall be followed in detail to assure safe operation.

(16) **Test Report**

No. 215604600.

(17) **Special conditions for safe use**

None.

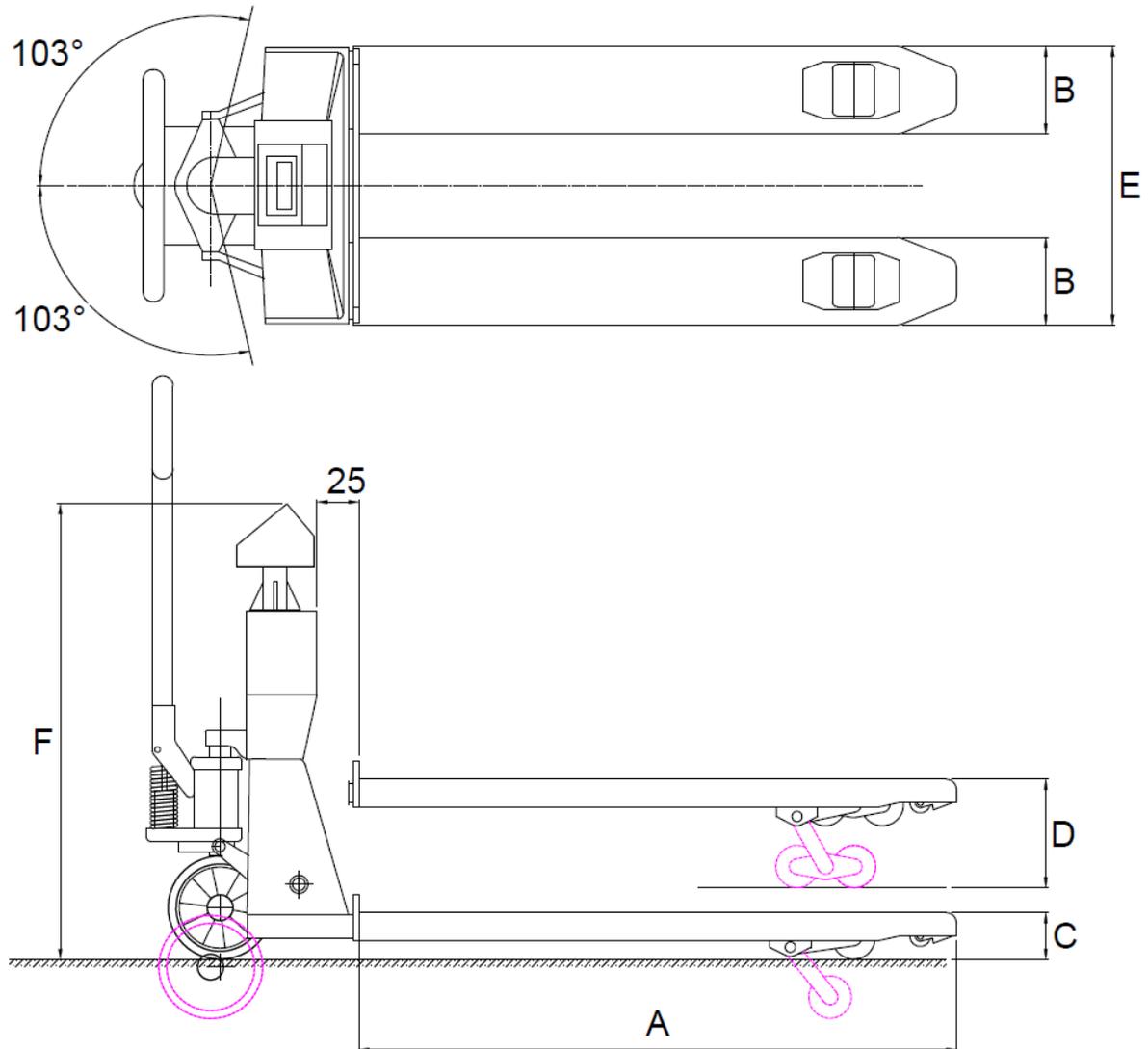
(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 215604600.

Appendix A3 Dimensions



This drawing is a standard version as an example. The actual release might vary depending on the options and pallet truck

DIMENSIONS in mm		
A	Fork length	1150
B	Fork width	170-180 *
C	Minimum fork height	87-90 *
D	Maximum fork height	200-210 *
	Lifting height	110-120 *
E	Width over forks	540-555 *
F	Height to top indicator	945-1125 *

*: Depending on type of pallet and selected options

Appendix A4 EC-Type examination certificate DEKRA 13ATEX0043

CERTIFICATE

(1) EC-Type Examination

(2) **Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **DEKRA 13ATEX0043** Issue Number: **1**

(4) Equipment: **Welghing Unit Type RWI-2100-ExI**

(5) Manufacturer: **Electromach B.V., Member of the R. STAHL Technology Group**

(6) Address: **Jan Tinbergenstraat 193, 7559 SP Hengelo, The Netherlands**

(7) This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the directive.

The examination and test results are recorded in confidential test report number 215604800-1.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2009

EN 60079-11 : 2012

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:



**II 2G Ex ib IIB T4 Gb or
II 2D Ex ib IIIC T135 °C Db**

This certificate is issued on 3 April 2014 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

T. Pijpker
Certification Manager

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(13) **SCHEDULE**

(14) **to EC-Type Examination Certificate DEKRA 13ATEX0043**

Issue No. 1

(15) **Description**

The Weighing Unit Type RWI-2100-Exi consists of an indicator supplied from a battery displaying the weight measured by loadcells.

The unit can optionally be provided with a separate data connection board for communication with the indicator with RS232 communication via an external 4 pin connector.

Ambient temperature range -10°C to +40°C

The indicated maximum temperature T 135 °C at the surface of the enclosure is referred to the maximum ambient temperature.

Electrical data

Supply input (CON2, terminals 1, 2 and 3):
only for connection to battery unit type BU-2100-Exi.

RS232 Input/Output (DIN connector, terminals 2, 3 and 4):
in type of protection intrinsic safety Ex ia IIB, only for connection to certified intrinsically safe circuits, with following maximum values (per channel):
 $U_i = 9,3 \text{ V}$, $I_i = 30 \text{ mA}$, $P_i = 0,15 \text{ W}$, $C_i = 20,3 \text{ }\mu\text{F}$, $L_i = 250 \text{ }\mu\text{H}$.

Installation instructions

The instructions provided with the equipment shall be followed in detail to assure safe operation.

(16) **Test Report**

No. 215604600-1.

(17) **Special conditions for safe use**

None.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. 215604600-1.