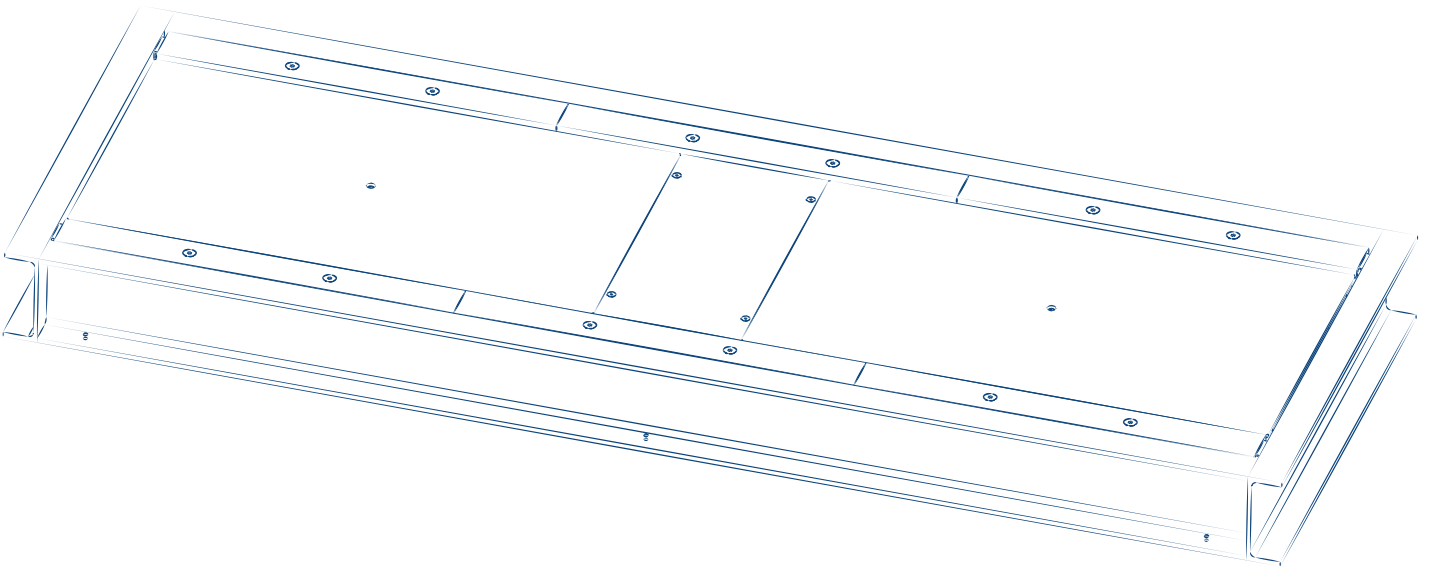


RWS

USER MANUAL

ENGLISH



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Dear Customer,

We thank you for choosing products made by Dini Argeo, and kindly invite you to carefully read the contents of this manual prior to carrying out any installation, use or maintenance operation on the system you have purchased.

Utmost attention was paid when drafting this manual; however, we appreciate anyone pointing out to us any unintentional errors or inaccuracies.



This publication, or any part of it, cannot be reproduced without the MANUFACTURER's written authorisation.

Description and intended use

“RWS” is an axle weigher designed to be installed flush with the road surface; it represents the ideal solution for weighing multi-axle vehicles, in both static and dynamic mode, with the possibility to discriminate between the total weight, the net weight of the material being transported and individual axle weights that would highlight any overloaded axles.

The “RWS” axle weigher can be used in all industrial, agricultural and commercial sectors, due to its load-bearing structure made of IPE beams in reinforced steel and the sturdy platform made of very thick slip-resistant chequered plate, that ensures extreme stiffness and precision with all kinds of motor vehicles.

Designed and built with extremely high quality materials, the “RWS” is an effective solution in terms of economic savings and occupied space.

Forward

The rules, prescriptions, prohibitions and warnings contained in this manual are aimed at drawing the attention of the installer and of the user to information or procedures needed for:

- Operating under conditions of safety.
- Extending the service life of the system.
- Maintaining the accuracy of the weighing operations over time.
- Avoiding any damage to the “RWS” axle weigher.
- Optimising the work to be done, taking into account metrology and safety standards in force in the country of use.

Therefore:

- Prior to carrying out any operation, the technicians and operators assigned to the installation, use and maintenance of the “RWS” axle weigher are required to read the following instructions and strictly comply with them when executing any operation.
- Make sure this manual is always available where the machine is used.

In the manual, for simplicity purposes, the “RWS” axle weigher is identified with the abbreviation “RWS”.

General safety rules

Before, during and after the commissioning of the weighing system, the user is required to make sure that:

- All of the manufacturer's prescriptions contained in this manual are complied with:
- All regulations in force in the country where the system is used on the subject of “*safety and accident prevention*” and of “*metrology*”.

General warnings

- Strictly comply with all prescriptions concerning the installation, operation and location of use of the system.
- Do not position vehicles or loads that exceed the rated capacity of the axle weigher.
- Do not allow unauthorised personnel to work on the axle weigher or on any device connected to it.

The “RWS” must only be used as a weighing system, therefore any other improper use or use other than the ones indicated in this manual shall relieve the Manufacturer from any and all responsibility in case of damages caused to people or property.

Organisational measures of the user company

The end user is required to comply with the following indications and prescriptions:

- Entrust the execution of operations such as installation, commissioning, maintenance and repairs to specialised personnel only, who must have read and understood this manual.
- Arrange for all the safety signs and protections as required by the regulations in force on the subject of workplace safety.
- Prevent access to the operating/weighing area by unauthorised personnel.
- All wiring of the weighing system must be carried out in compliance with applicable standards in the area and in the installation environment.
- System safety is entrusted firsthand to the operator authorised to use the “RWS”.
- The “RWS” must be considered as a weighing scale for all intended purposes, and as such it must be used as a weighing instrument only, avoiding any accidental collisions and overloads.
- Use original spare parts only.
- In case you detect any irregularities while using the weigher, IMMEDIATELY stop any operation in progress and prevent its use by others.
- Improper but reasonably foreseeable use by untrained individuals entails an unacceptable residual risk.



The installation engineer must ensure that all safety regulations in force in the country of use are applied, also making sure that the system is used in compliance with the manufacturer's intended use.

- *The installation engineer must avoid any situation that may be dangerous for the user and for the people present in the workplace.*
- *Any attempt to tamper with or modify the system by the user or by unauthorised personnel, as well as any improper use or use other than the indicated in this manual, shall relieve the manufacturer from any and all responsibility in case of damages to people or property and also cause the warranty to be forfeited.*

Indications and prohibitions pertaining to the “rws” axle weigher

For optimal installation and use of the system, the company personnel is required to comply with the following indications and prescriptions:

- The “RWS” must be used exclusively for the intended purposes.
- It is strictly FORBIDDEN to exceed the rated capacity of the system.
- It is strictly FORBIDDEN to travel over the weigher at a speed of more than 5 km/h.
- The “RWS” is not part of the road surface, consequently it must be used only during the weighing of vehicles in static or dynamic mode with a transit speed lower than or equal to 5 km/h.
- It is crucial to prohibit the passage of undesired vehicles by means of barriers, guard rails or other solutions.
- Make sure the system is properly levelled and that all its parts have been correctly installed.
- All weighings must be carried out by centrally positioning the load on the weighing platform as it traverses.
- Avoid sudden acceleration or braking of the vehicle on the platform during the weighing process.
- Do not drag any load across the weighbridge platform that is not on pneumatic tyres.
- Do not weld, drill or carry out changes to the structure, unless duly authorised by the manufacturer; any damages to or tampering with the structure shall cause the warranty to be forfeited.
- Periodically check the intactness of all parts of the system.
- Do not install the cables of the “RWS” in proximity of high and/or medium voltage conductive cables; this may cause interference with regards to weight display. It is recommended to arrange for protected containment specifically intended to house the platform cables.
- Do not walk on, crush or expose to sources of heat the shielded cables used to connect the system.
- The indicator must be positioned so as to allow the operator to see the weight display and the platform at the same time; if this is not possible, use mirrors or video cameras as an alternative. Prior to using the axle weigher, carefully read the information contained in this manual.
- Avoid all contact between the platform and aggressive substances which may not be compatible with the materials used to make the platform itself.

Information and prohibitions for safe operation

To ensure optimal safety conditions for the user and to any personnel standing nearby, the following indications must be complied with:

- Entrust the execution of activities such as installation, commissioning, maintenance and repairs to specialised personnel only, who must have read and understood this manual.
- The axle weigher **MUST NOT** be used to weigh radioactive goods or moving material.
- **NO** changes or modifications can be made to the system.
- **DO NOT** use industrial chemical products or solvents to clean the system.
- **DO NOT** install the “RWS” in areas classified at risk of explosion (except for specific models bearing the Ex mark).
- Do not subject the module and all the components of the weighing system to high stress in addition to the compression strength.
- Make sure that none of the load cells are partially or fully raised during the weighing phase.
- Prevent any corrosive materials or liquid from falling on the weighing surface, on the hatches or on any other exposed surface.
- In case of weighing of loads without wheels, it is **FORBIDDEN** to tow or drag them onto the platform.
- Do not remove the earthing connections of the system for any reason.
- Generally speaking, all maintenance, repair or cleaning operations must be carried out with the machine stopped and cut off from power supply sources (mains, battery), by specialised personnel exclusively.

Environmental conditions for proper installation

- Identify the place best suited for installation of the “RWS”, making sure that there is enough space for the safe movement of the vehicles to be weighed.
- The installation area must be large enough for proper positioning of the weighing module and all its components.
- The installation area must allow protection of the cable connecting the weighing module, the junction box, the load cells and the weight indicator, by means of metal raceways buried underground.
- The installation area must be linear, flat and duly levelled for a length equal to twice the length of the longest vehicle to be weighed.
- The installation area must not be subject to flooding.
- DO NOT install the system near strong magnetic or electrical fields.
- In particularly hot and sunny environments, protect the “RWS” against constant exposure to the sun’s rays, arranging for appropriate shading systems. To obtain optimal weighing performance, the load cells must operate at a temperature falling within the range specified by the manufacturer.
- Protect the axle weigher against high humidity , vapours, liquids or dust.
- If the area of installation is humid or wet, the installation must be carried out so as to avoid any accumulation or stagnation of water and/or debris underneath the structure.

Moreover, the choice of a suitable location where to install and use the “RWS” must take into account the following conditions:

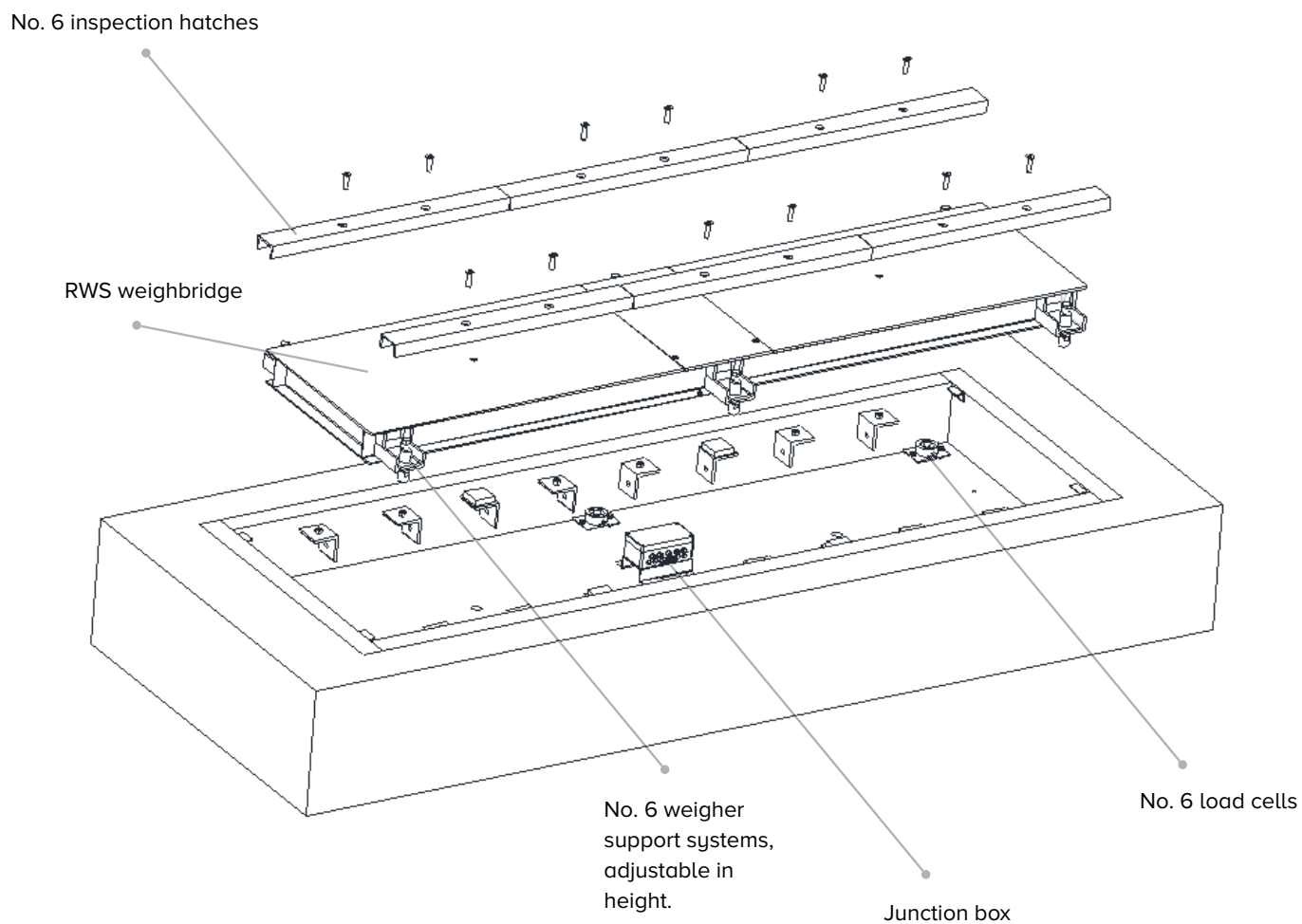
- The support surface must be flat and levelled.
- The floor hardness must be at least 100kg/cm².
- Absence of aggressive vapours or dust.
- Moderate temperature and humidity (do not expose to sources of heat).

Glossary of indications and prescriptions

As a consequence of the aforementioned prescriptions and indications, DINI ARGEO srl considers itself relieved from any responsibility in case of improper use of the system, such as, for example:


- Improper use of the system or use by unauthorised personnel.
- Use contrary to specific standards.
- Incorrect installation.
- Defective power supply.
- Serious shortcomings in terms of maintenance.
- Unauthorised changes or operations.
- Use of non-original spare parts or spare parts not specific for the model.
- Full or partial non-compliance with the instructions contained in this manual.
- Exceptional events.

Main components



Technical characteristics of the weighing system

GENERAL CHARACTERISTICS

- Total weight: 746kg.
- Weight of the weighing platform: 300kg.
- Total capacity of the system: 30t 
- Varnishing with bi-component epoxy coating.
- Load-bearing structure consisting of IPE beams made of reinforced steel.
- Sturdy and thick slip-resistant loading platform made of sheet metal.
- Anti-corrosion treatment and high-resistance paint.
- 6 inspection hatches for maintenance/adjustment of the load cells.
- 1 central inspection hatch for maintenance of the load cells connections and of the junction box.



*RWS is designed to weigh axles of up to 20t with a vehicle transit speed of no more than 5 km/h, detecting overloads of up to 30t for no more than 1% of the total number of weighings.
The percentage value indicated may therefore be reduced in installations where the transit speed of the vehicles (5 km/h) is not permitted or where transit is not limited to the vehicles to be weighed.
A higher percentage of overloads, transit at uncontrolled speeds, as well as the use of the platform not reserved for weighing operations, can lead to a reduction in the life of the platform and compromise its operation.*

LOAD CELLS

- Model: compression
- Material: STAINLESS STEEL
- Degree of protection IP68
- Maximum allowed supply voltage 15 VDC
- Maximum number of load cell divisions: nLC = 3000 (C3).
- Sensitivity 2mV/V +/-0.5%.
- Input resistance 750 +/-10 Ω.
- Output resistance: 700 +/- 5Ω.
- Operating temperature range: -10°C/+40°C.
- Cable colours.

Colour coding of the cell cable:

Colour	Meaning
Red	POWER SUPPLY +
Black	POWER SUPPLY -
Green	SIGNAL +
White	SIGNAL -
-	- SCREEN

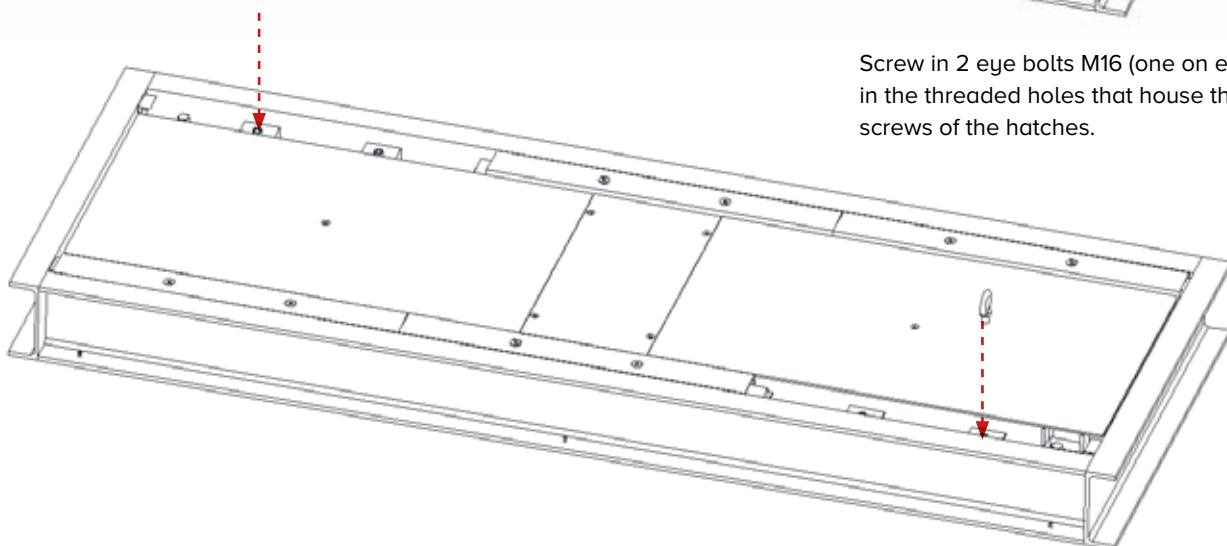
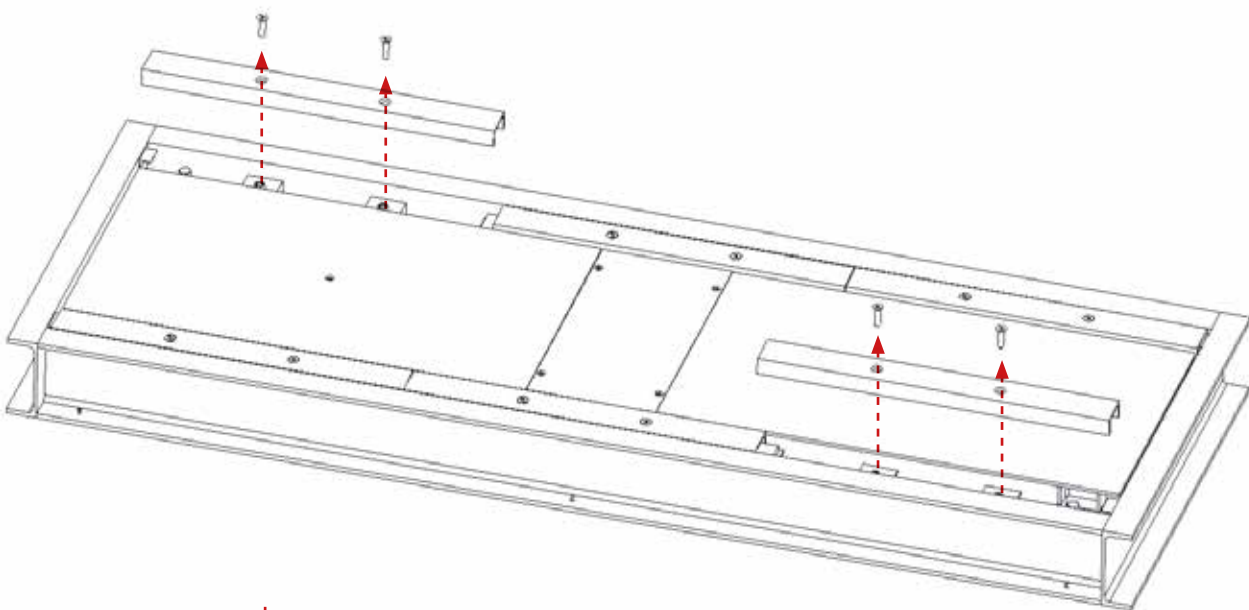
JUNCTION BOX

- Enclosure made of reinforced polyester
- Degree of protection IP68
- Maximum input voltage: 24VDC.
- Surge protect the system, electrical discharges and interferences.

Rules for proper transport and handling

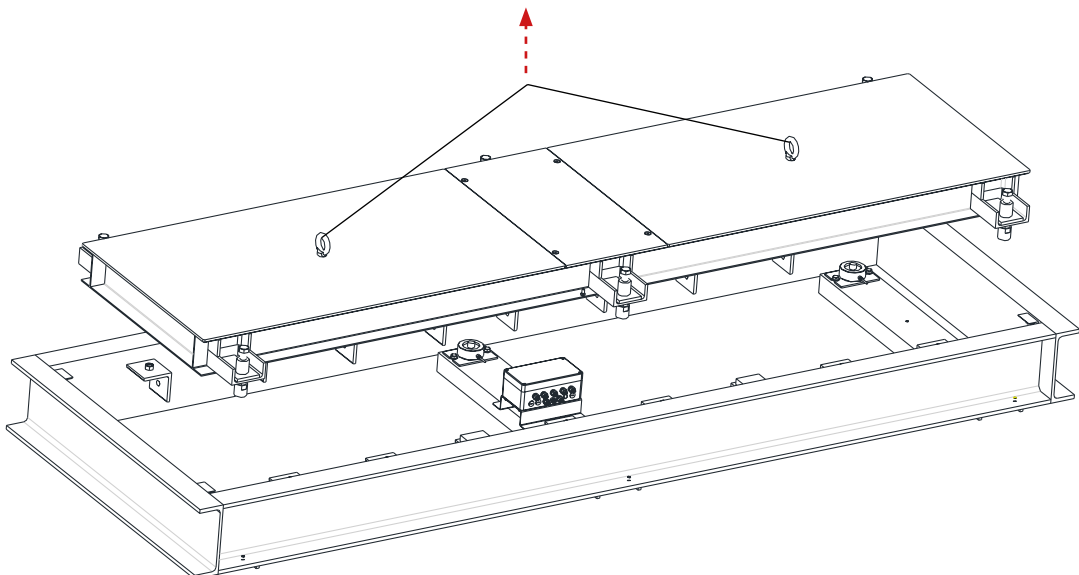
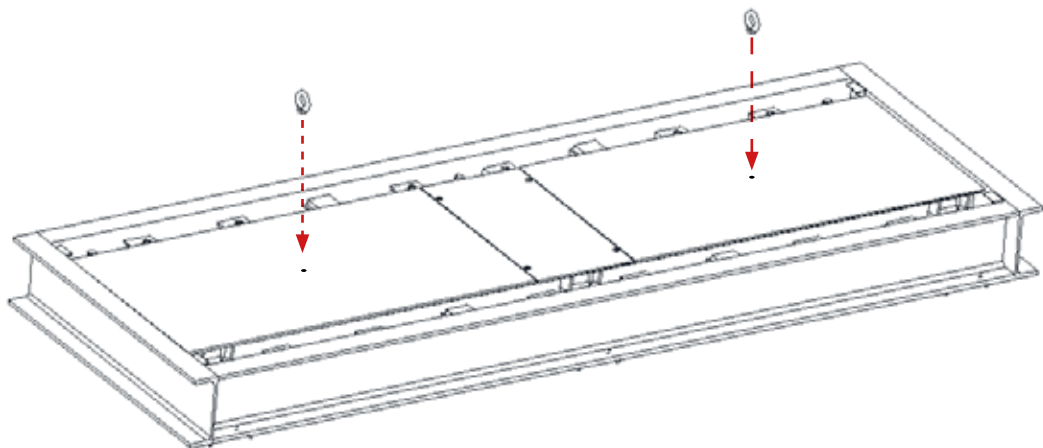
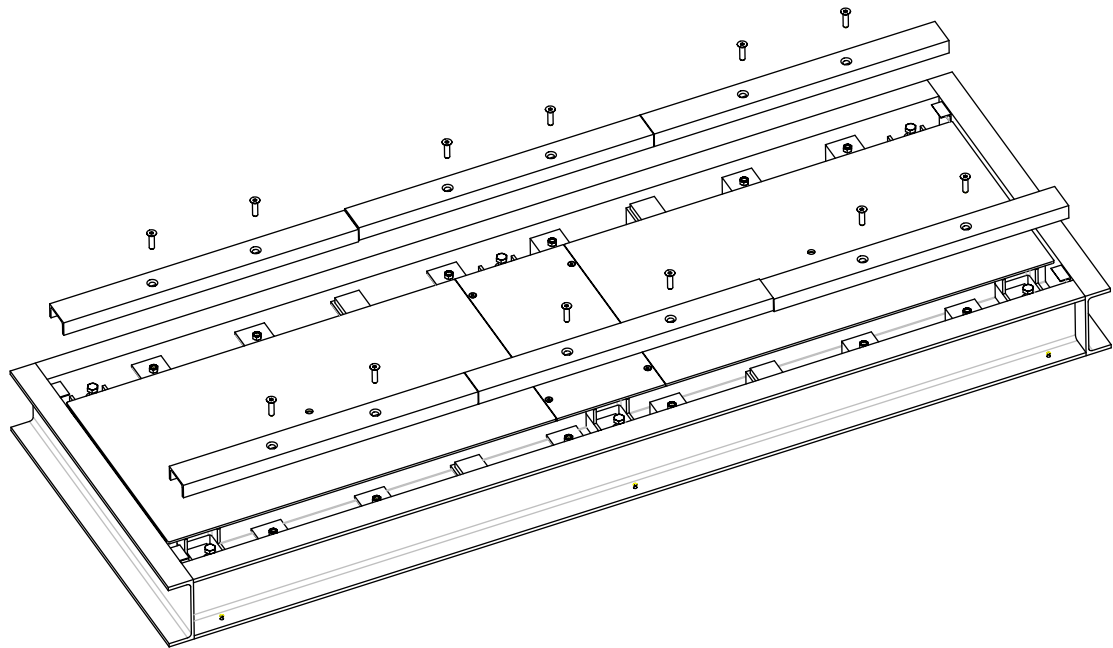
- Prior to handling the RWS in any way, make sure that there are no people, animals or objects inside the manoeuvring area.
- The packing, transport and handling phases must be carried out with special care, avoiding collisions and overloads.
- Use cranes, bridge cranes or forklift trucks with suitable lifting capacity.
- Make sure you have a full view of the handling manoeuvre from the driver's seat.
- Use type-approved ropes, hooks and chains, with appropriate capacity and length and suited to the handling of suspended loads.
- When transporting the "RWS", you need to prevent the system components from being crushed both on top and at the sides by any external bodies; therefore, refrain from stacking materials if the weight of which exceeds the maximum capacity of the platform, so as to avoid overloading the system.
- The handling procedure of the "RWS" requires special attention in order to avoid collisions or falls that may cause damage to people, animals and/or property or jeopardise proper system operation.
- During all movements, carefully check the stability of the load; avoid load oscillations during the movements and keep the load as low as possible.
- It is recommended that a lift plan is created with the risk assessment and method statement prior to lifting. Lifting should be carried out by an appointed person and banksman.

Handling



Screw in 2 eye bolts M16 (one on each side) in the threaded holes that house the fixing screws of the hatches.

Removal of loading platform



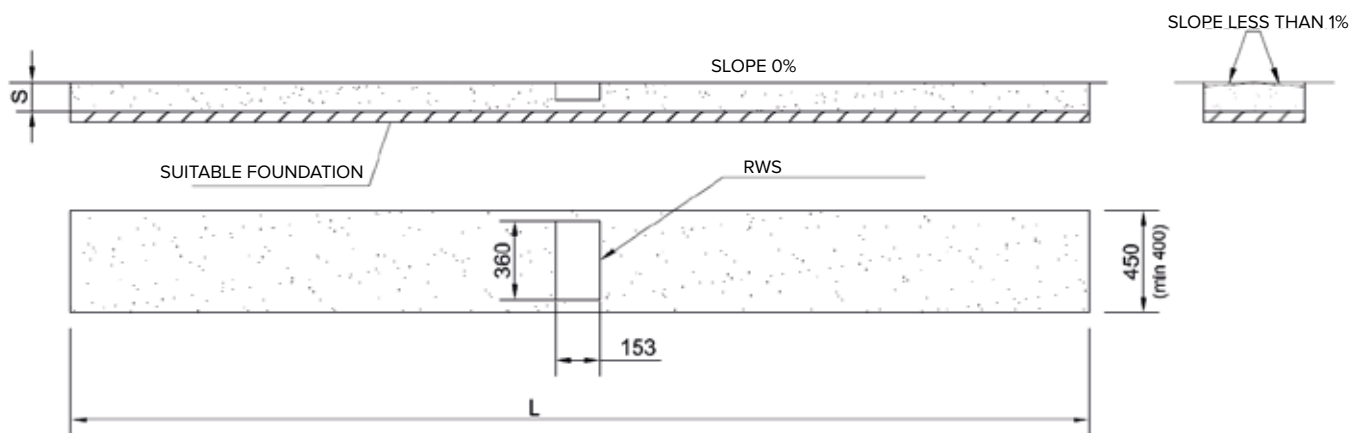
INSTALLATION

For optimal weigher installation, you are required to carefully read, in addition to this manual, the following complementary documents:

- Guide for building the weighing lane.
- Technical installation drawing of the pit frame.
- Practical installation guide of the pit frame.

To obtain high accuracy weighing (up to 1%), or for type-approved systems in relation to third parties, a well-levelled “weighing lane” must be built, so as to allow proper distribution of the loads during the transit of vehicles to be weighed.

Below please find the main measurements and slopes to be complied with:



Example of cement spread foundation laying

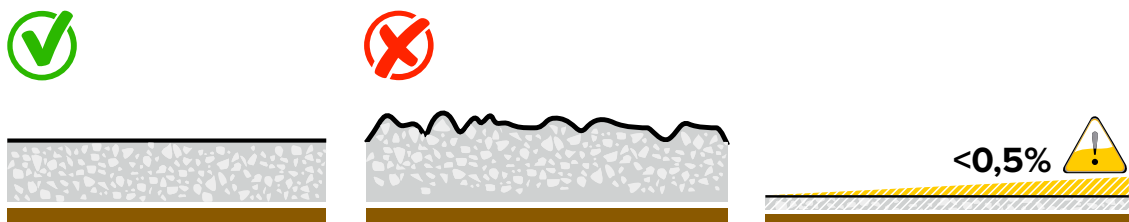
Tips for optimal system installation

Choose a weighing location that is large enough so that vehicles can carry out their manoeuvres easily and safely.

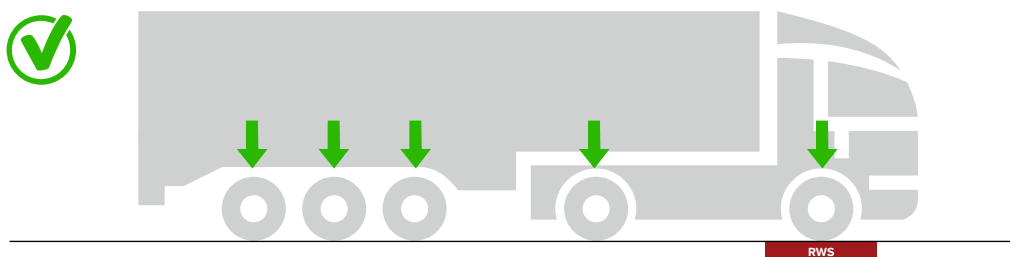
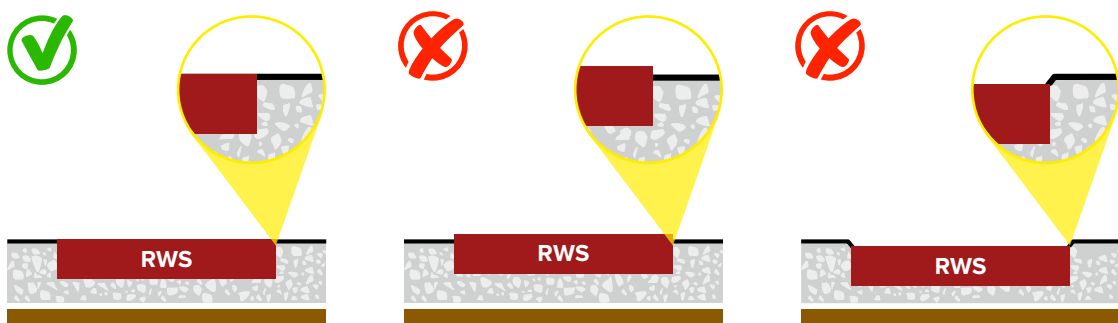
- Choose flat and well-levelled surfaces, with slope equal to 0% (optimal condition, a must for type-approved systems) or less than 0,5%, twice as long as the longest vehicle to be weighed; flat but insufficiently long surfaces may have a negative effect on the weighing accuracy.
- Privilege use on hard surfaces, cement or asphalt, with hardness of at least 100 kg/cm² (usual value for reinforced cement).
- The bottom underneath the weighing area must be able to withstand, with no sagging, concentrated loads equal to at least 1.5 times the maximum capacity of the purchased RWS weigher.
- Privilege environments where the temperature is included between 10° and +40°C.
- It is recommended to set up a special area using guard-rails or other solutions that force the driver to travel at a slow and constant speed. Where possible, install access barriers to prevent transit when the system is not being used.

MOREOVER

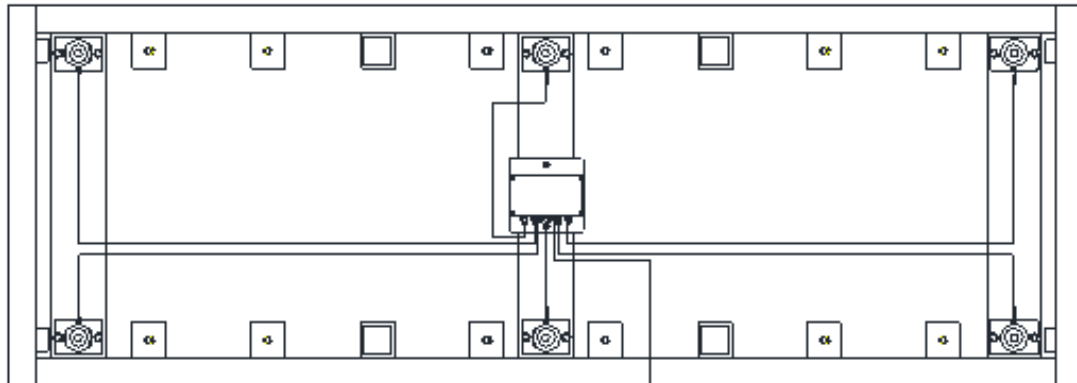
- Avoid roads full of potholes or uneven surfaces.
- Avoid areas at risk of flooding.
- Avoid areas with regular traffic: "RWS" is not designed to carry out the function of a road, consequently it must be used only at the time of the weighing, complying the conditions of use specified by the manufacturer.



- Avoid all steps, at both the entrance and exit areas, the weighing surface must be perfectly flush with the floor.



Connecting the junction box to the indicator



Colour	Meaning
Red	POWER SUPPLY +
Black	POWER SUPPLY -
Green	SIGNAL +
White	SIGNAL -
-	- SCREEN



Earthing

For proper operation of the "RWS", the installer must carefully connect the weigher to the earth leakage line.

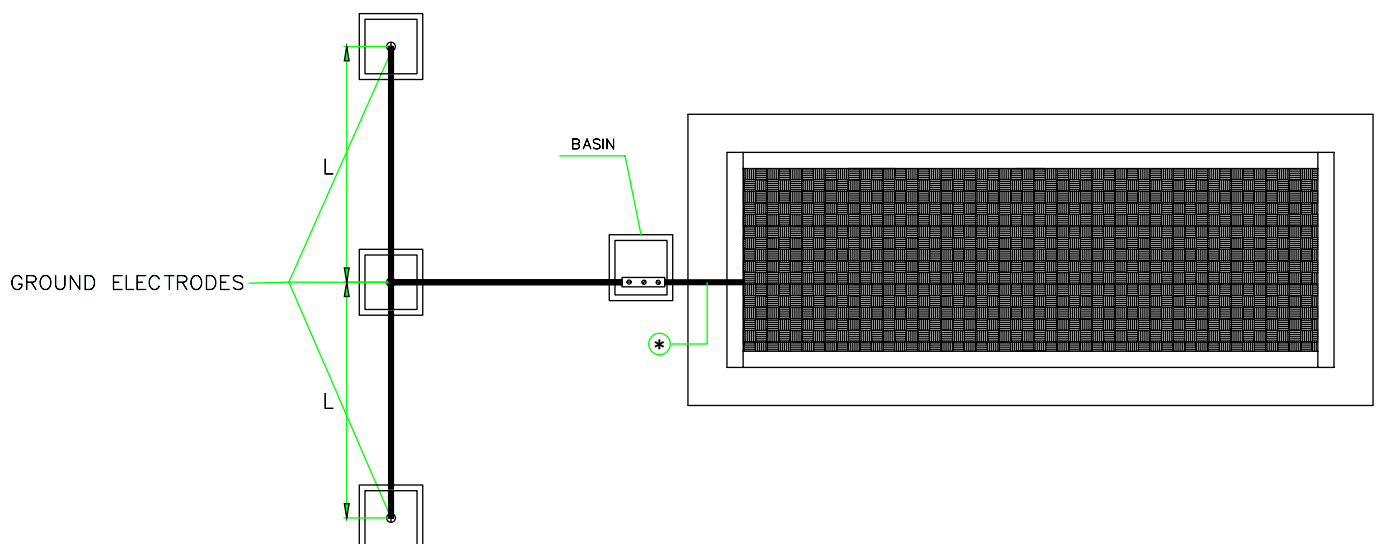
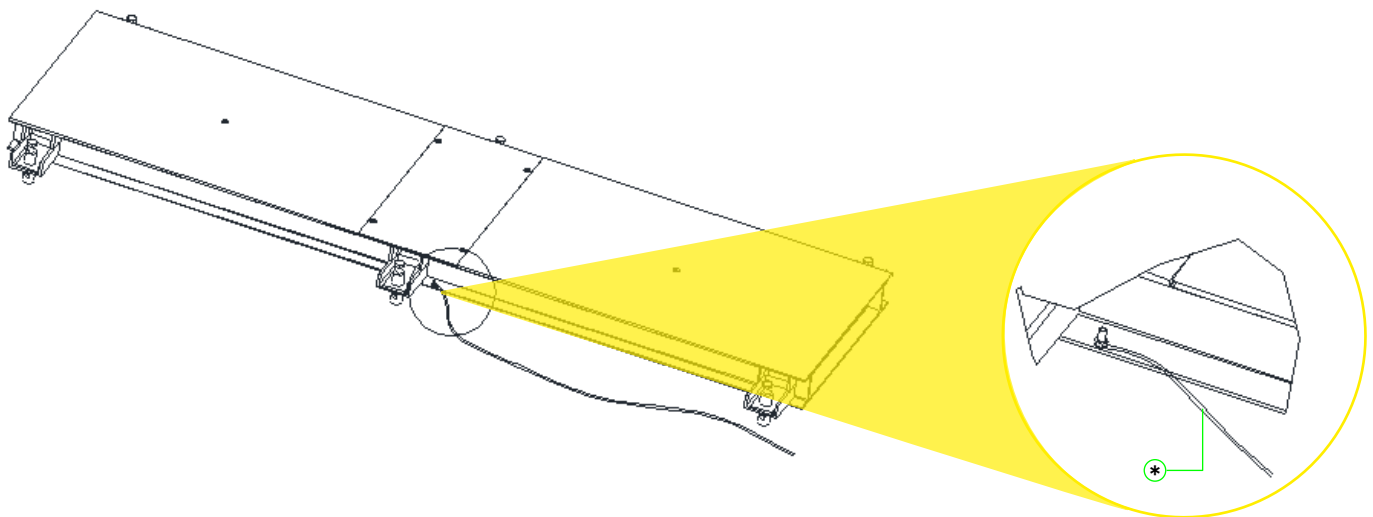
All leakage interconnections that make up the weigher (weighing surface, junction box and load cells) are carried out in series by the manufacturer, through cables with section 16 mm².

The series interconnections must not be tampered with or removed for any reason, under penalty of forfeiture of the product warranty.

The installer must connect the earth leakage point of the weigher to the dedicated earth plate, using a copper wire with section of at least 50 mm².



The earth bond must be dedicated to the weigher only.

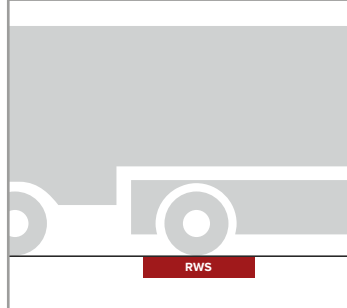


Static axle weighing

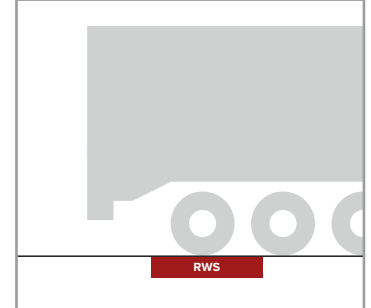
1. Get on the "RWS" with the first axle to be weighed, shift into first gear, turn off the engine and take your foot off the brake.



2. Repeat this operation for all the vehicle axles.



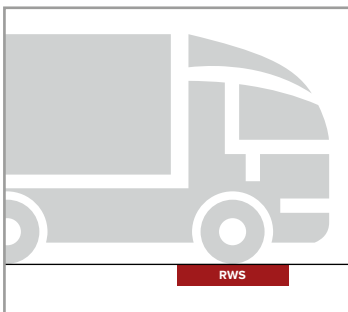
3.



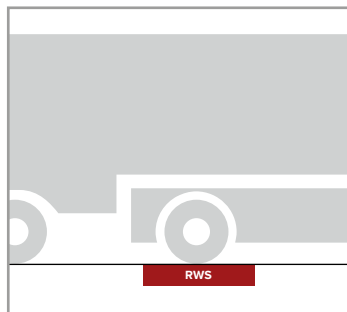
If the weighing lane has not been installed level and an even surface, the weighing results may vary based on the direction of travel.

Dynamic axle weighing

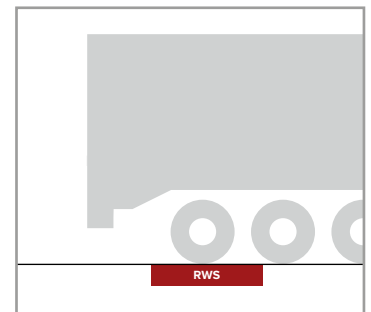
1. Get on the "RWS" slowly (speed \leq 5km/h), at a constant speed, avoiding any acceleration or braking.



2.



3.



- If the weighing lane has not been installed level and an even surface, the weighing results may vary based on the direction of travel.*
- Speeds that exceed 5km/h may have a negative effect on the weighing accuracy and even damage the system.*

Functions of the weight indicator

For a description of the weighing operations, please refer to the manual of the electronic terminal delivered with the instrument.

Maintenance and repairs

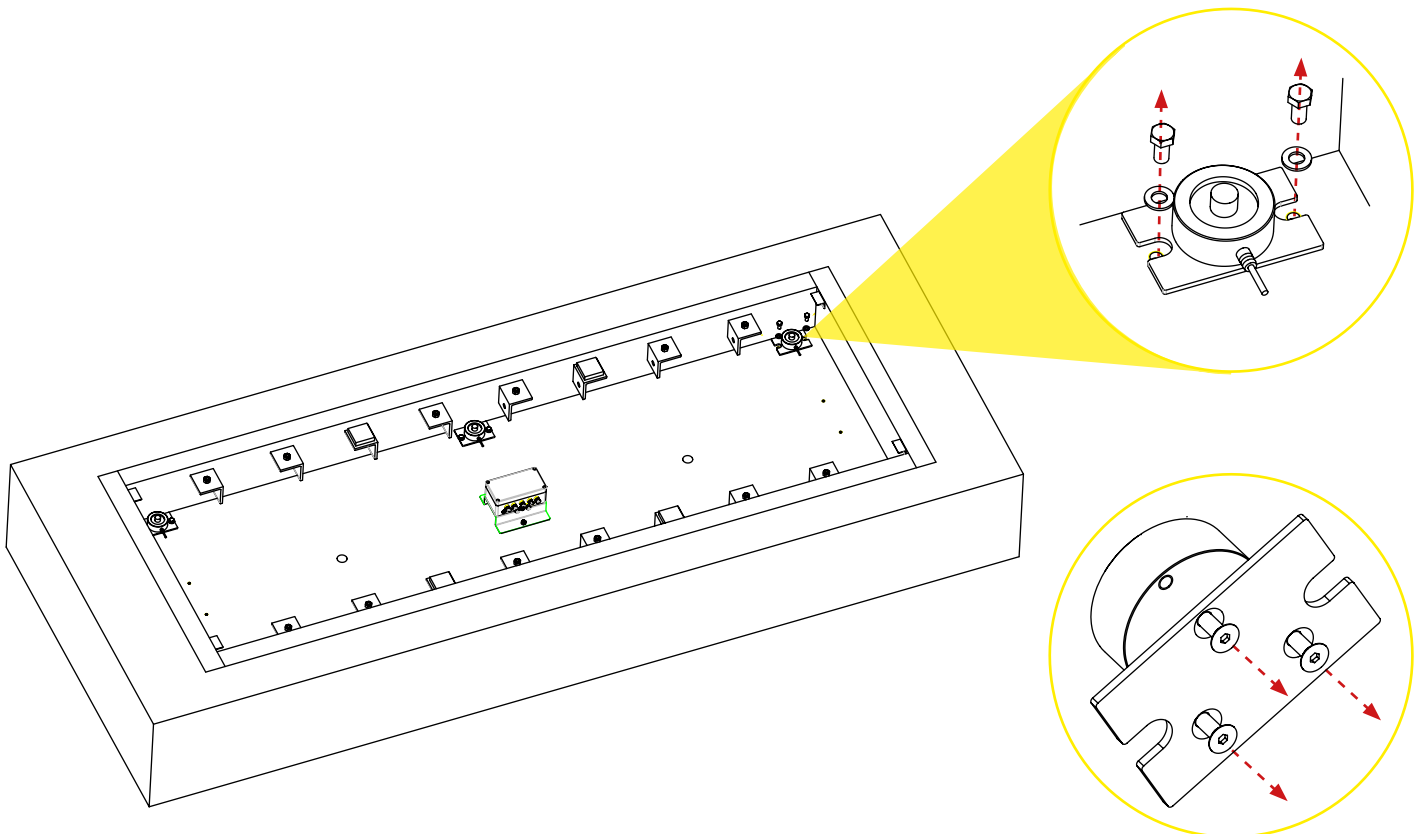
- All routine maintenance, checks and general lubrication jobs must be carried out by specialised personnel with the machine stopped and disconnected from the energy supplies (power and other kinds).
- “Specialised personnel” means personnel who, due to their training and professional experience, have been expressly authorised by the “System Safety Manager” to install, use and carry out maintenance on the instrument.
- Prior to working on the platform, it is mandatory to cut out power to the electronic terminal.
- Do not perform any welding on the platform.

Routine maintenance

- Keep the platform clean using regular cleaning products (do not use SOLVENTS or ACIDS).
- Keep the pit underneath the weigher clean, periodically removing any debris and mud that may have accumulated.
- Periodically clean the rainwater drains.
- Periodically clean any manholes that provide access to the connections (if present).
- Periodically grease the pushers of the load cells.

Maintenance of load cells

- It is recommended to periodically grease the pushers of the load cells, keeping the friction points well lubricated.
- In case of extraordinary maintenance for the replacement of a load cell, proceed as follows:
 1. Switch off the main weight indicator and unplug the weigher.
 2. Remove the loading surface (see page 11).
 3. Locate the load cell to be replaced.
 4. Unscrew the bolts of the load cell fixing plate.
 5. Unscrew the blocking grub screws located under the load cell.



In case of malfunction

In the case of any malfunction or fault of the RWS, prevent access to it by vehicles and any type of use of the weigher until the fault has been fixed by specialised technical personnel.

Do this if the platform:

- a) Shows signs of damage.
- b) Stops working.
- c) Has been overloaded beyond the allowed limits.

Using the RWS under faulty or malfunctioning conditions may irreparably jeopardise its proper operation.

Warranty

The warranty lasts for TWO YEARS from the delivery date of the instrument, and consists in the free coverage of labour and spare parts for INSTRUMENTS RETURNED CARRIAGE PAID to the SELLER's facilities and in case of faults NOT ascribable to the Customer (e.g., improper use) or to the transport.

If, for any reason, the job is requested (or is needed) at the place of use, the Customer shall be charged with the costs for the technician's services, including travel times and expenses and, if need be, room and board.

If the instrument is shipped by way of courier, the shipping costs (to and from) shall be charged to the Customer.

The WARRANTY IS FORFEITED in case of faults caused by jobs carried out by unauthorised personnel or by connections to equipment installed by others or for incorrect connection to the mains.

The company EXCLUDES any compensation for damages, direct or indirect, caused to the Customer by full or partial malfunction of the sold instruments or systems, even if they occur during the warranty period.



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