

EVO TRAPPER

CÂNTAR FERROVIAR DINAMIC - CÂNTĂRIRE BOGHIU CU BOGHIU

Lungime platformă / Număr module	2.5m [inactiv] + 4.5m [activ] + 2.5m [inactiv] / 1
Metoda de cântărire	boghiu cu boghiu
Exactitate	static: OIML R76 class III dinamic: OIML R106 class 0,5
Diviziune	50kg
Capacitate de cântărire	60000kg
Domeniu de cântărire	1000..60000kg
Cântărire	Bi-direcțională
Viteza maximă a trenului în procesul de cântărire	8 km/h
Perioada de funcționare	continuă
Condiții de operare	Temperatură: Platformă: -40..+60°C Celule de cântărire: -40..+80°C Electronice: -10..+40°C
	Umiditate relativă (non-condens): 40..80%
Alimentare	220V±10%, 50Hz±2%
Putere	max. 750VA

CONFIGURAȚIA FURNITURII:

Lucrări de infrastructură C.F. pentru montaj +

Sistem de cântărire dinamică, complet asamblat și testat cu:

- celule electronice de cântărire
- cutie de conexiuni
- senzori de proximitate, inclusiv cablajele acestora
- cutie de interfață a senzorilor de proximitate
- dulap termostatat și protejat anti-efracție complet echipat cu: indicator digital de cântărire echipat cu MCU (Main Control Unit), interfață senzori de proximitate, software, interfață operator și imprimantă aliby virtuală
- transmisie radio la maxim 1km către DPR
- DPR (Data processing and reporting electronic device) PC (o singură stație PC pentru ambele cântare echipată cu două monitoare pentru fiecare cântar)
- manuale de operare ale tuturor componentelor în original, furnizate de producătorii UE (Germania) în limba engleză
- transport
- instalare și testare
- asigurare greutăți etalon, personal și verificare metrologică în conformitate cu legislația în vigoare

EXCLUDERI DIN FURNITURĂ

- alimentare cu energie electrică și împământare aferentă
- camera în care se instalează echipamentul DPR
- asigurare tren pentru testele metrologice

TERMEN DE LIVRARE ȘI PUNERE ÎN FUNCȚIUNE: 6 săptămâni.

TECHNICAL SPECIFICATION FOR FLINTAB EVO TRAPPER IN-MOTION RAILWAY WEIGHBRIDGE 60 tons capacity

1. GENERAL

The scope of supply covers an in-motion railway weighbridge, fully assembled, including interconnecting cables and electronic equipment.

The offered electronic weighing system is able to weigh railway waggons loaded with solid products, in-motion, coupled into a train sequence, pulled or pushed, in accordance with stipulated operating speed conditions.

The system performs high level robustness and reliability, complete elimination of mechanical maintenance, high precision of weight indication, maintenance requirements practically null, all of these due to the simple construction of assembly and to the distinct advantages of FLINTEC digital loadcells.

EVO TRAPPER surface rail weighbridge is installed directly on track ballast without any form of pit whatsoever. This involves the following advantages:

- No elaborate foundations required: no concrete castings.
- Low profile modular design.
- Weighbridge manufactured and assembled under controlled in-house conditions.
- Weighbridge in-house tested and calibrated.
- Modular design enables complete weighbridge to be delivered to site fully assembled and cabled ready for lowering onto normal railway infrastructure.
- All parts including loadcells are accessible from ground level (no maintenance required).
- Weighbeams supported only on the loadcells, no tie-rods or other force shunting devices required.

The site for installing this in-motion rail weighbridge has to meet the following technical requirements, in order to perform the best weighing features:

- Rectilinearity of both side rails of the weighbridge and the deviations of the upper surfaces of both rails should comply with our requirements.
- The route should have no curves or devices on 30 m length from each side of weighbridge.
- If the site is liable to flood, it will be provided a drainage system in order to prevent partially or totally the weighbridge flood.

For the weighbridge mounting, there are necessary the following preparatory works:

- Rails and sleepers are removed on a length equal to the weighbridge length.
- The track ballast is excavated (where appropriate) until the sand level is reached; the sand has to be clean (without impregnation of fuel oil, oils etc.); the track ballast should be remade according to railway regulations.
- Ballast is layed-out and settled in the above excavation and the weighbridge is rolled out over it.

FLINTAB electronic weighing systems are entirely without moving parts and are easy to calibrate according to OIML Regulations.

The system identifies automatically the waggons type, train direction, number of waggons, each waggon's speed, the start and the end of weighing process, all these data being acquired without any operator's assistance.

The standard railway engine is automatically identified without being weighted or recorded in the weighing reports.

The offered electronic weighing system has the weighing accuracy according to **OIML R106/1993 class 1** in-motion weighing regulations.

The system can perform also static weighing according to **OIML R76-1/1992 class III** weighing regulations.

NOTE: FLINTAB in-motion railway weighbridge do not require supplementary by-pass railway for trains which are not weighted.

2. SYSTEM DESCRIPTION

In-motion railway weighbridge consists of:

2.1 . The weighbridge

2.2. Waggon's identification electronic device

2.3. Electronic weighing equipment

2.4. Data processing and reporting electronic equipment

2.1. The weighbridge

FLINTAB EVO TRAPPER weighbridge consists of one single module. This module contains two weighbeam assemblies and four loadcells. Each weighbeam is supported by two loadcells, one at each end, and the two weighbeams are connected by a moment arm at the end of each weighbeam. This construction allows the beams to work independently without being exactly at the same level.

The load is transferred from the rail and rail support weighbeams to the loadcells via loading cups. This ensures that the load is applied correctly to the loadcells and also allow the thermal expansion in the weighbeam assemblies. The loadcells are **FLINTEC** type. Each loadcell is equipped with a shielded cable laid in a protected route inside the steel structure. The cables from the four loadcells are connected into a box mounted inside the weighbridge module.

NOTE: Comparing to the rigid structures mounted on a concrete foundation which impose that all the four supporting points to be at the same level, the advantage of **TRAPPER** surface mounted railways weighbridge is that the supporting points may not be at the same level, the beams working independently one to the other. That is the reason why the structure can be mounted directly on track ballast, the accuracy being not altered by the eventual ballast compression.

The weighbridge modules will be delivered to site fully assembled with the loadcells, cabled up and connected to the box.

2.2. Waggon's identification electronic device

Waggon's identification electronic device consists of four proximity sensors installed at each end of weighing module which perform:

- Axle directional counting.
- Train direction.
- Waggon's speed measurement over the weighbridge.
- Detection of opposite direction of waggon (in this case the weighbridge process is canceled).

The offered proximity sensors have national railway approvals in Austria and Germany.

Their main advantages are the following;

- Contact-free activation by the wheel max. 45mm in vertical direction proximity.
- Adjustment-free in the entire wear section of rail and wheel (max. 50mm).
- No weakening of rail through attachment of the sensor.
- Real-time response signal.
- Not influenced by radiotelephony.

- No temperature restrictions (-30..+60°C).
- Maintenance-free during long service life (750000h).
- Small dimensions.

To amplify the electronic signal transmitted by the sensors, they are connected to a buffer amplifier. The buffer amplifier's outputs are connected to the weighing system Main Control Unit (MCU).

2.3. Electronic weighing equipment

The electronic weighing equipment consists of:

- Digital weight indicator (DWI)
- Main Control Unit (MCU)
- Operator's interface
- Security printer

Digital weight indicator (DWI) is EC-type approved and is providing the control for the digital loadcells. The digital signal is displayed in kg units and transmitted to MCU unit.

DWI is provided with the possibility of zero tracking in order to compensate the deviations due to the mud accumulation on the weighbridge. This is automatically canceled while weighing.

MCU is a microcomputer which performs the weighing program and keeps in memory the weighing process parameters for the entire train.

MCU unit is equipped with all needed interfaces for DWI, printer, operator's interface and for communication with another network computer and inputs to communicate with the identification electronic device.

The panel view equipped with display and membrane-type keyboard is enabling bi-directional communication with the weighing process by entering a minimum amount of necessary weighing data (train ID, waggon ID, rail engine position) and is printing the weighing results.

Weighing and printing are automatically done so, there is no supervision required.

The security printer is connected to MCU and provides the weighing ticket with weighing date and time, waggon's ID, waggon weight, number of axles, waggon operating speed.

The electronic equipment will be installed into a control room to ensure it's proper functioning.

2.4. Data processing and reporting electronic device (DPR)

DPR is not affecting the weighing process, the weighing data, such as: each waggon's weight, entire train total weight, operational speed, train identification number, weighing date and time being automatically processed by the MCU independently from DPR.

It's role is to take-over the processed data from MCU and the specific data entered by an operator (such as: waggon serial number, product, supplier, customer, Bill of Lading, etc.).

Also, it is monitoring, processing and reporting the above mentioned data in the required client's customized form.

Data processing and reporting equipment consists of:

- PC computer (average market configuration) with licenced FLINTAB weighing software able to monitor and process the weighing data and all the data entered by the computer's operator (the specific data mentioned in the train Bill of Lading) and an EPSON LX-300 printer for the weighing documents.
- The computer can be located in the same control room with the MCU or at any other required location. The computer can be connected at a Local Area Network (LAN) in the required configuration and structure or by radio.

3. IN-MOTION WEIGHING

Let's consider a train which has to be weighted. The following data are entered from the operator's interface keyboard or from PC keyboard:

- Rail engine axles number (in the case of two rail engines, the axles number will be calculated accordingly)
- Number of waggons forming the train

In this moment, the MCU records that it will weigh a train defined by the entered data.

The system is now waiting: the duration is unlimited and can be cancelled only by operator's control.

Starting with the moment the first axle is passing over a proximity sensor, the weighing system will establish the train's direction on weighbridge and will automatically increment in MCU's memory the train number.

The system begins to count the axles, establishing the rail engine position in the train sequence (depending on the rail engine number). The system is automatically identifying the waggons type and is calculating their operating speed.

MCU automatically commands the start and the end of the weighing process. During an axle is passing over the weighbridge, the system will record a successive sequence of it's weighing data depending on the train operating speed. The weight value displayed is a statistically average value of the waggon weighing process.

If, by accident, the waggon is changing the sense, the weighing process of the entire train is cancelled.

The information about the weight values are taken from DWI and displayed on operator's interface connected to MCU unit. The weighing results are automatically printed on the security printer.

The obtained weighing data are transferred to the acquisition and data management computer at operator's request. The software provides the following:

- Is checking each waggon serial number and comparing it with the one already entered (based on the waggon sequence algorithm).
- Identifies of the same waggon, no matter its position and presence in the train, at the first and respectively the second weighing process, being quite important for net weight value.

NOTE: It is not necessary that the configuration of the train at the first weighing and second weighing should be identical. There are cases when only some waggons are weighted at the second weighing and their sequence in train configuration can be random. In this case, the software can precisely identify the weighted waggons.

- Calculating the difference between the registered net weight from the waggon Bill of Lading and the net real weight.
- Calculating the weight of products by shift or daily.
- Printing both operator's entered data and system calculated data to provide the weighing reports. These reports are customized on client's specific requirements.

4. TECHNICAL DATA

Number of modules	1
Weighbridge lengths	7.5m: 1.5m [inactive] + 4.5m [active] + 1.5m [inactive]
Weighing method	bogue by bogue
Accuracy	static: OIML R76 class III
Increment	50kg

Weighing capacity	60000kg
Weighing range	1000..60000kg
Load cells	RC3D-30t-C3 (IP 68)
Proximity sensors	Inductive (IP 67)
Connection box	IP 66
Weighing	Bi-directional
Train capacity	100 waggons
Maximum train speed during weighing	8 km/h
Functioning period	continuous: 24 hours per day, 7 days per week
Max. number of memorized trains	999
File for waggon data, product data, client data and customer/ supplier data	Unlimited
Operating conditions	Temperature range: Weighbridge: -40..+60°C Loadcells: -40..+80°C Electronics: -10..+40°C
	Relative humidity (non-condensing): 40..80%
Power supply	220 V \pm 10%, 50 Hz \pm 2%
Power drain	max. 750VA

5. FLINTAB supply:

Works to be done on existing rail at weighbridge's limit by AFER accredited subcontractor + In-motion pitless rail weighbridge as described before fully assembled and tested with:

- loadcells
- connection box
- track switches
- interconnecting track switch multi-core cable
- track switch interface box
- DWI digital weight indicator
- MCU control unit complete with software
- DPR PC and printer
- installation instructions and technical and operation manual
- transport on site
- technical assistance for fully commissioning and testing of systems
- providing the test waggons and test weights for legal-for-trade testing
- personnel for test weights handling
- the metrological approval of the in-motion weighing according to MID regulations

6. BUYER'S LIABILITIES

The following preparation have to be done before weighbridge installation and will be performed by the Client:

- power supply with earthing connection and earthing measurements
- arrangement of the weighing room for installation the weighing system electronic equipment, electrical and sanitary facilities, furniture, etc.
- providing a train in good functional conditions to be available for testing

7. DELIVERY TIME

The delivery time is 6 to 10 weeks from the date the contract is in force.

8. WARRANTY

The warranty period is 24 month for the whole weighing system.