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Loading and transshipment automation in modern bulk material and goods handling plants

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Loading and transshipment automation in modern bulk material and goods handling plants

Crane scales simplify handling processes and networking solutions, allowing the user to optimise the proficiency of operations.

Increased rationalisation pressure and rising growth rates in goods traffic place heavy demands on the efficiency of logistics concepts. In steel producing and trading companies, material well as in the field of transshipment (e.g. ports), material flows have to be acquired and optimised with regard to time and cost. This is ensured by the combined use of top quality weighing systems, smart automation systems and networking solutions. Depending on the goods to be handled, different measuring and weighing systems are used. The following list gives examples of static and continuous weighing and monitoring systems, which also form part of the Schenck Process product range:

- Legal-for-trade belt scales and weigh belts for mass flow monitoring and loading/unloading of transit vehicles and ships.
- Solids flow meters for legal-for-trade loading of trucks, train wagons and ships.
- Road weigh bridges for acquisition of incoming and outgoing vehicles.
- Static and dynamic railroad weighing systems for legal-for-trade acquisition of single wagon and train total weights.
- Weighing systems for big-bag and liquid filling, as well as discharge stations.
- Crane scales during in-plant transit and dispatch and shipping areas (e.g. in the steel trade).



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Many goods and materials, such as containers, bulk goods and steel bars are handled by crane, and many of the handling operations require that the weight of the load be determined quickly. Measuring the weight of goods during transportation thus combines many advantages.

Some of the key advantages of using Schenck Process crane scales include:

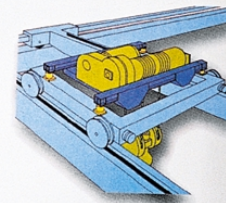
- Savings in time and cost, due to accurate weight measurement during a lifting operation.
- Minimal space requirements – as the scale is installed in the crane, allowing the floor space, which is otherwise required by a stationary type of scale, to be used for other purposes.
- Fast loading and unloading/simple and safe operation, thanks to the automatic weighing system and straightforward operation.
- High level of availability and accuracy, with all Schenck products legal-for-trade.
- Modular electronic design and passive measuring elements, with accuracy better than +/- 0.1 percent.
- Robust and maintenance-free – all components for the load receptor (load cells and mounting hardware) are free of maintenance, even under the most severe of operating conditions.
- All Schenck Process scales are operated by means of load cells or sensors and a modular, electronic data processing (EDP)-compatible weight meter, the user-friendly Disomat.
- Weighing data can be transmitted to printers, secondary displays or to EDP systems.
- As well as boasting displaying and recording devices, Disomat can be arranged either travelling with the crane or stationary, for instance in a ground station.
- The commissioning and operation of the scale are extremely easy.
- The acquisition of incorrect weigh data is avoided.

Schenck Process crane scales guarantee trouble-free installation in all types of cranes – even those constructed for special applications. They reliably operate as legal-for-trade scales as well as in-plant control scales. Many years of experience and the know-how gained in hundreds of different applications mean that Schenck Process can offer optimal technical and economical solutions to any crane weighing problem. In the following section, the main methods of installation are presented.

Methods of installation

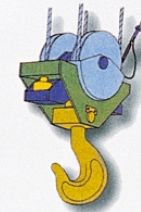
With respect to design for legal-for-trade, in-plant control, and non-legal-for-trade crane scales, the following main methods of installation are possible:

1. Dual-frame trolley installation



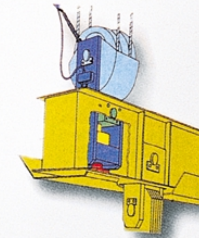
This method of installation should be used whenever possible on all new crane systems. Three or four load cells are positively mounted between the trolley frame and a weighing frame in conjunction with load cell mounting hardware and are restrained against lateral displacement.

2. Hook block installation



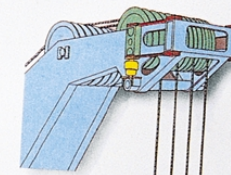
This method of installation is particularly suited for retrofitting existing crane systems using a hook block, especially when installation of load cells in the trolley is no longer possible. As a rule, the hook block is designed as a weighing block, but there is also the possibility of suspending a crane hook weigher from the load hook of the existing hook block. Between one and four load cells are fitted to newly manufactured hook blocks.

3. Spreader beam installation



This method of installation is particularly suited to use with cranes in which the load is attached to the spreader beam. Between two and four load cells are fitted between rope sheaves and the spreader beam in conjunction with measuring elements.

4. Rope Pull Weighers



In rope pull weighers, two load cells are fitted to the head sheave station in conjunction with load cell mounting hardware at

the fixed or moving boom spring parallel guides.

For crane scales not requiring the possibility of a number of load receptors.

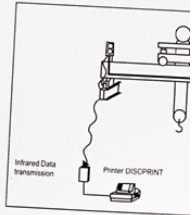
The arrangement of electrical scale is explained here using:

1. Cabin-controlled Crane

The arrangement of the electrical scale is explained here using:

- Weight meter
- Printer
- Large-size digital display

2. Floor-controlled Crane



The arrangement of the electrical scale is explained here using:

- Weight meter
- Large size digital display
- Pendant
- Infra red transmission
- Printing

Production factor 'information'

Demands on the quality of weighing go along with improvements in the production chain. Modern logistical concepts aim at the optimum internal information acquisition and processing, the automation of acquisition, processing and movements. The principal demands are:

- Avoidance of multiple entry of data and administrative expenditures.
- Provision of database structures: safety and consistency.
- Consistent access to handling data departments (issuing of material balance).
- Automated load-out processes (systems, single-handed collection, etc.) and handling areas.
- Fully automated issuing of transit of transaction data.
- Providing evidence in the disposal of transaction data.
- Data transmission for the integration and storage sites into the central system.

Smart crane scales, in combination with modern production systems, help to achieve substantial cost savings in the production chain. Over many years, Schenck Process has gained the know-how in hundreds of different applications, which means that Schenck Process can offer optimal technical and economical solutions to any crane weighing problem, as well as to any other issues relating to automation in the logistical process.

the fixed or moving boom and restrained with the use of plate spring parallel guides.

For crane scales not required to meet a high accuracy, there exists the possibility of a number of additional methods of installation of the load receptor.

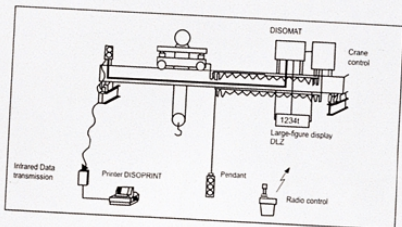
The arrangement of electrical components in an electronic crane scale is explained here using two typical examples:

1. Cabin-controlled Crane

The arrangement of the electrical devices:

- Weight meter
- Printer
- Large-size digital display

2. Floor-controlled Crane



The arrangement of the electrical devices:

- Weight meter
- Large size digital display
- Pendant
- Infra red transmission
- Printing

Production factor 'information'

Demands on the quality of weighing, feeding and screening systems go along with improvements in the production factor 'information'. Modern logistical concepts aim at the optimisation of resources in internal and external information acquisition and processing. An important starting point is the automation of acquisition, processing and recording of material movements. The principal demands on automatic bulk solids handling are:

- Avoidance of multiple entry of identical data to curb error sources and administrative expenditures.
- Provision of database structures and networks for maximal data safety and consistency.
- Consistent access to handling data and histories for administrative departments (issuing of material balances, invoicing, SAP connection).
- Automated load-out processes (identification and dialogue systems, single-handed collection, etc.) for staff reduction in shipping and handling areas.
- Fully automated issuing of transit and delivery notes and storage of transaction data.
- Providing evidence in the disposal area.
- Data transmission for the integration of decentralised production and storage sites into the central administration.

Smart crane scales, in combination with modern networking solutions, help to achieve substantial cost savings through an optimisation of the logistics chain. Over many years, Schenck Process has gained the experience and the know-how in hundreds of different applications to be able to offer optimal technical and economical solutions to any crane weighing problem, as well as to any other issues related to weighing, feeding, screening and automation in the logistical process. ■

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