

One Source

CARICAMAT® 5X1 automatic truck loader



FLSMIDTH
VENTOMATIC

Automatic truck loading

The unique Ventomatic® CARICAMAT® automatic truck loading system was introduced in 1969. The large number of installations successfully performing all over the world confirms the optimal conceptual design of the CARICAMAT automatic truck loader.

The compact design and the flexibility of the equipment assures fast and smooth installation and commissioning either in new packing buildings or in existing structures, as replacement of manual loaders.

The truck loader palletises full bags directly onto truck platforms (with or without pallet). It operates with the widest possible typology of trucks (flat type with fixed or removable side and rear panels, dumper trucks, trucks with trailers etc...) always achieving the highest reliability and availability for this kind of application, specifically designed for working in the toughest climatic and working conditions.



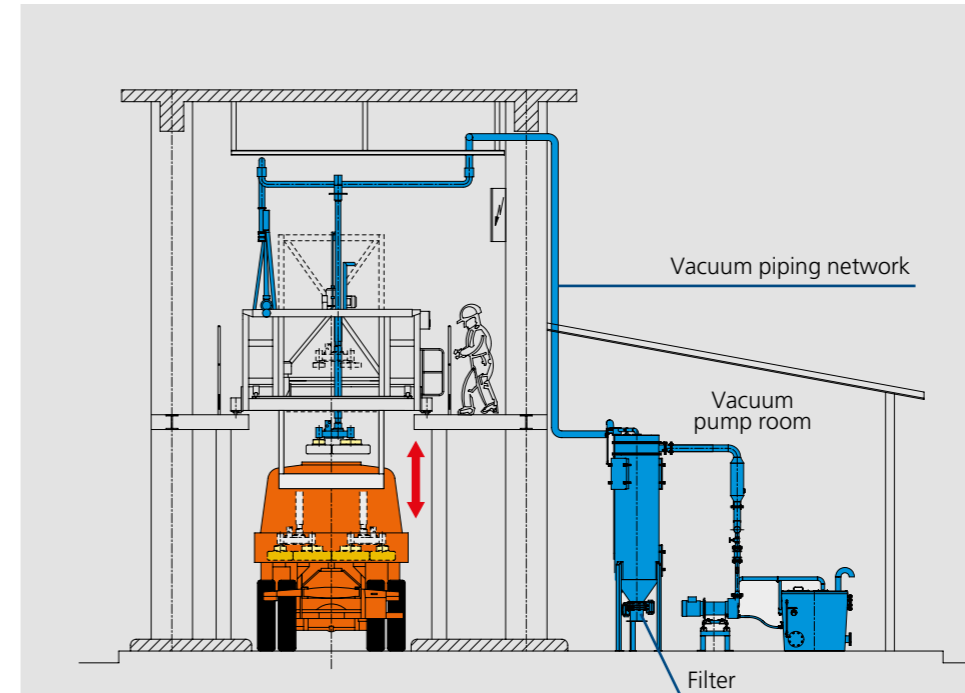
Loading head with 5x1 suction discs configuration.



One of the first truck loader (Year 1969)

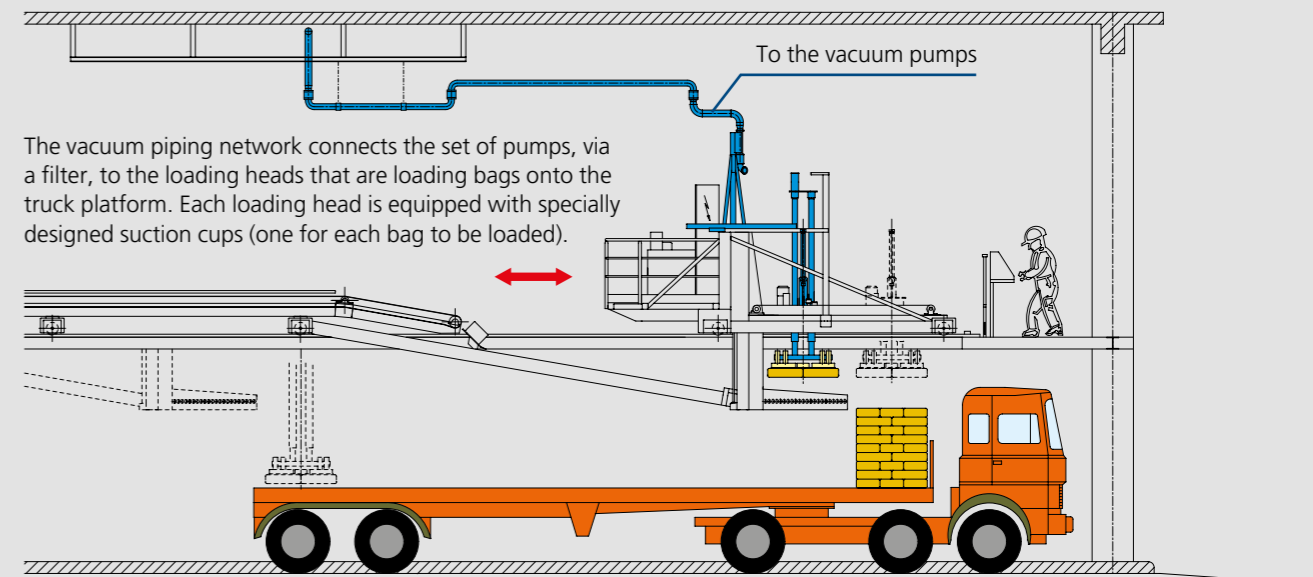
The patented suction disc system allows the loading of all kinds of paper and plastic bags onto all types of open top trucks and trailers. The high capacity (over 3000 bags/hour) combined with easy and fast positioning of the equipment (also in case the truck is not aligned into the loading bay) guarantees to the end-user a high overall capacity of the packing line, eliminating all the typical bottle necks of the traditional loading systems and reducing dramatically manpower required.

Vacuum system: working principles



The type of the vacuum pump could be:

- Liquid ring pump (with or without water cooling system);
- Dry vacuum pump.



The vacuum piping network connects the set of pumps, via a filter, to the loading heads that are loading bags onto the truck platform. Each loading head is equipped with specially designed suction cups (one for each bag to be loaded).

The exclusive design of the suction cups guarantees a gentle pressure over the entire surface of the bag, assuring a smooth handling. Furthermore the process of picking-up bags by suction cups will not extract cement from the bag itself.

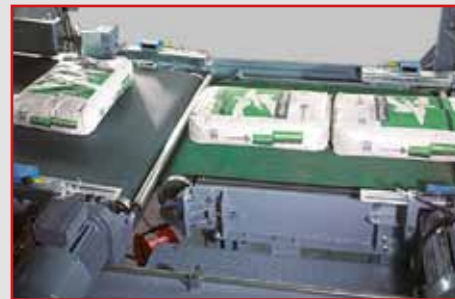
The vacuum system is surely the "heart" of the CARICAMAT® automatic truck loader and it is the main reason for the unique performance of the equipment. It is a proven technology which has been optimized over the years reaching nowadays a trouble-free status. The vacuum is generated by a set of pumps (the number and type of the units depends on the operational and climatic conditions) with always one unit in hot stand-by.

Working process



Phase 1 Bag turning device

Incoming bags are orientated according to the layer to be formed.



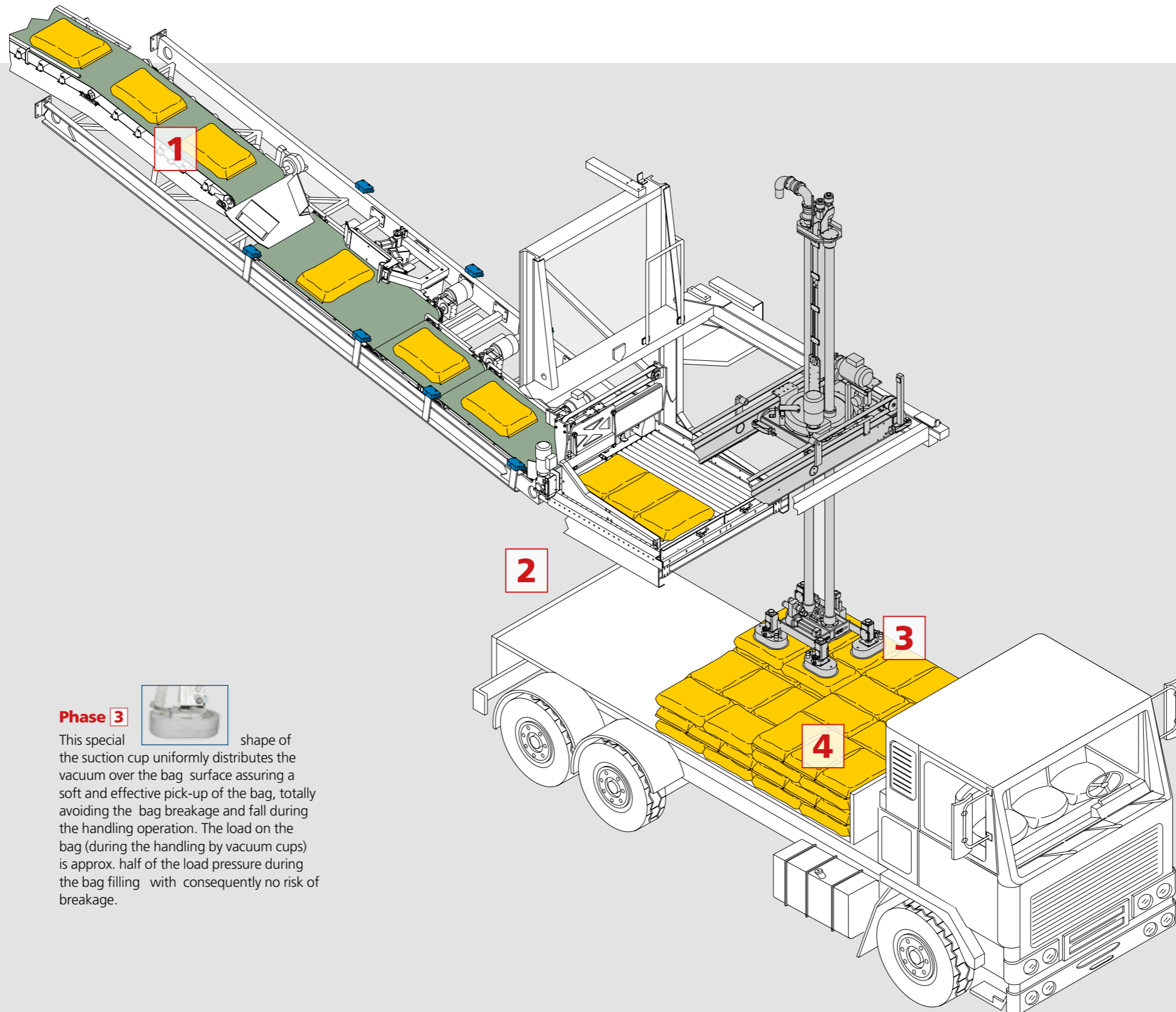
Phase 2 Semi-layer forming group

The bags are alternatively grouped in two part-layers:

- No. 2 - straight bags/layer



- No. 3 - 90° turned bags/layer



Phase 3



This special shape of the suction cup uniformly distributes the vacuum over the bag surface assuring a soft and effective pick-up of the bag, totally avoiding the bag breakage and fall during the handling operation. The load on the bag (during the handling by vacuum cups) is approx. half of the load pressure during the bag filling with consequently no risk of breakage.



Phase 4

The loading head picks up the bag layers and places them onto the truck platform. The bag layers are interlocked for ensuring stability to the stack.

Operator interface

The Operator panel is an IP65 Industrial Graphic Terminal. It displays the dynamic mimic of the automatic loader and provides both a clear and detailed overview and a close monitoring of all operations. Additionally, it is possible to have an on-board camera system connected to a pair of monitors installed close to the operator panel.

With a set of cameras and with the flexibility of the machine, the operator panels can be re-located in a remote control unit to allow an operator to control a multiple number of CARICAMAT® automatic truck loaders.

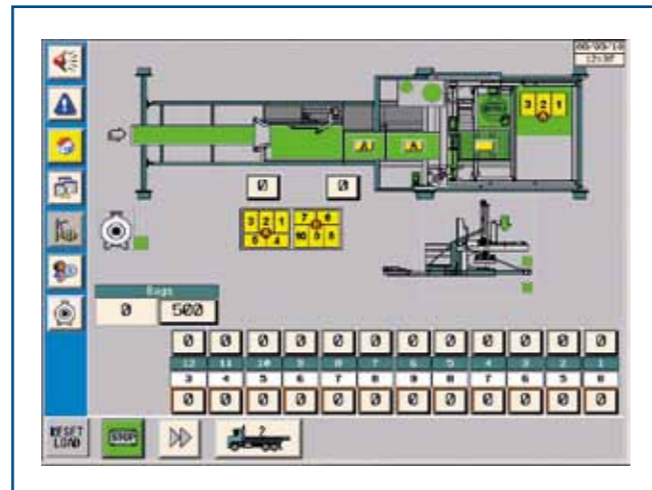
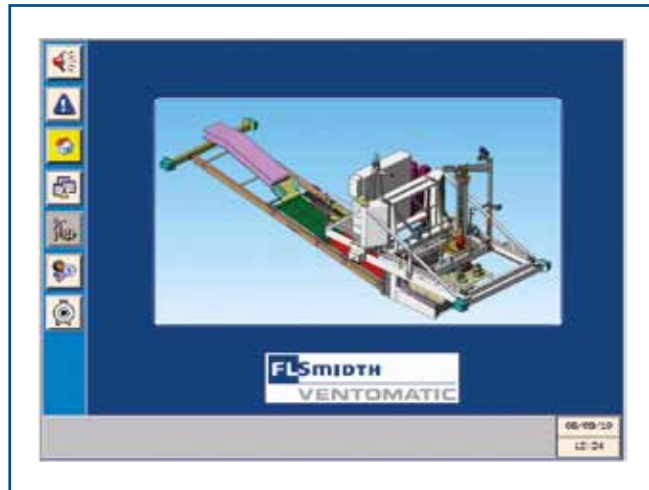
The setting of loading recipes, in accordance to the different type of trucks to be loaded, is easy and operator friendly. Among the main functions available, there is the possibility to change in "real time" the number of layers for each row of pallets and the number of rows per truck. The panel also provides alarm and warning lists for a proper trouble shooting and preventative maintenance. Several pages of the HMI operator panel are available for the control of the single actuator (i.e. motor and pneumatic-hydraulic cylinders) to allow the maintenance team to safely check and quickly test each single part of the machine.



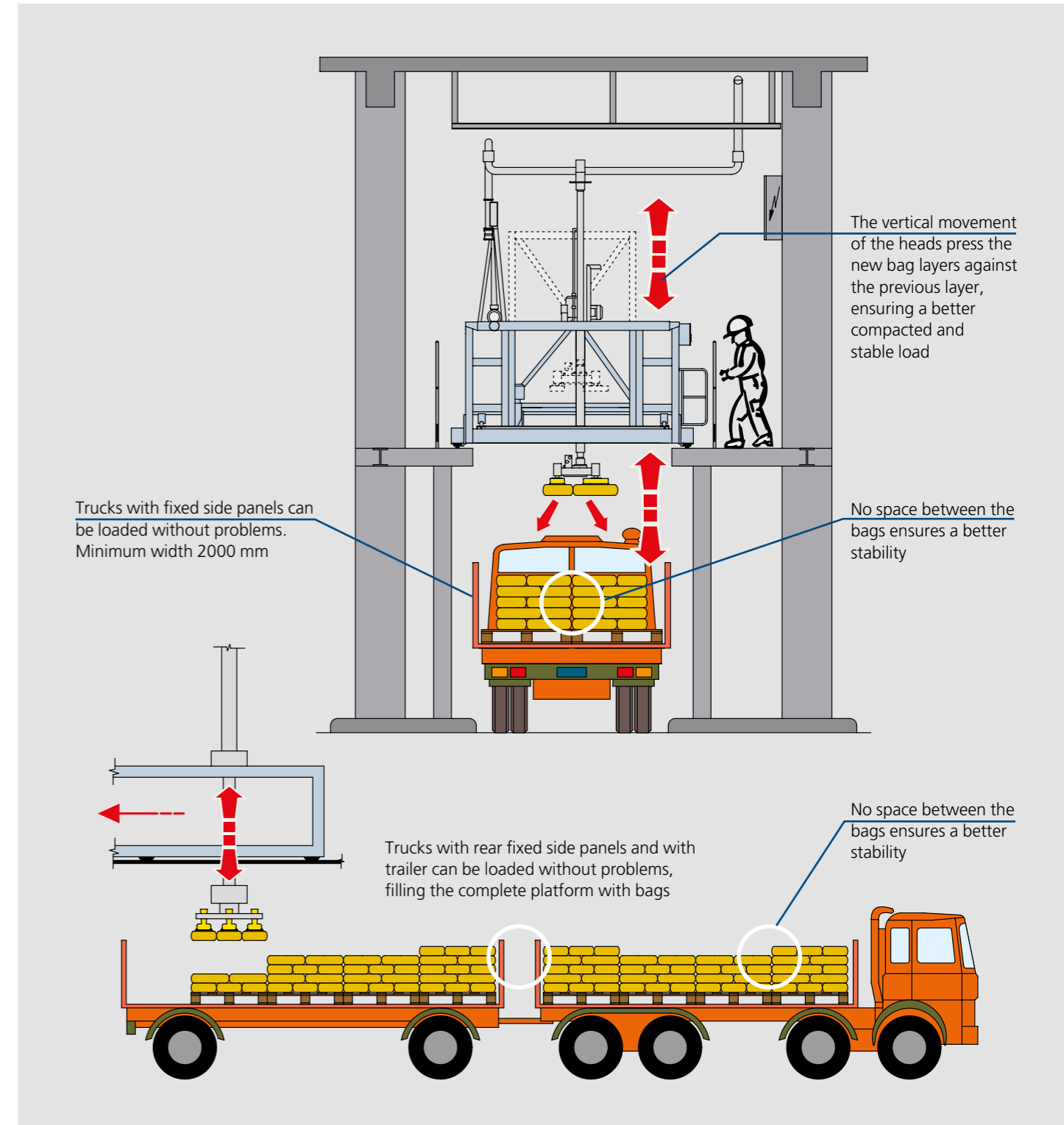
New operator panel



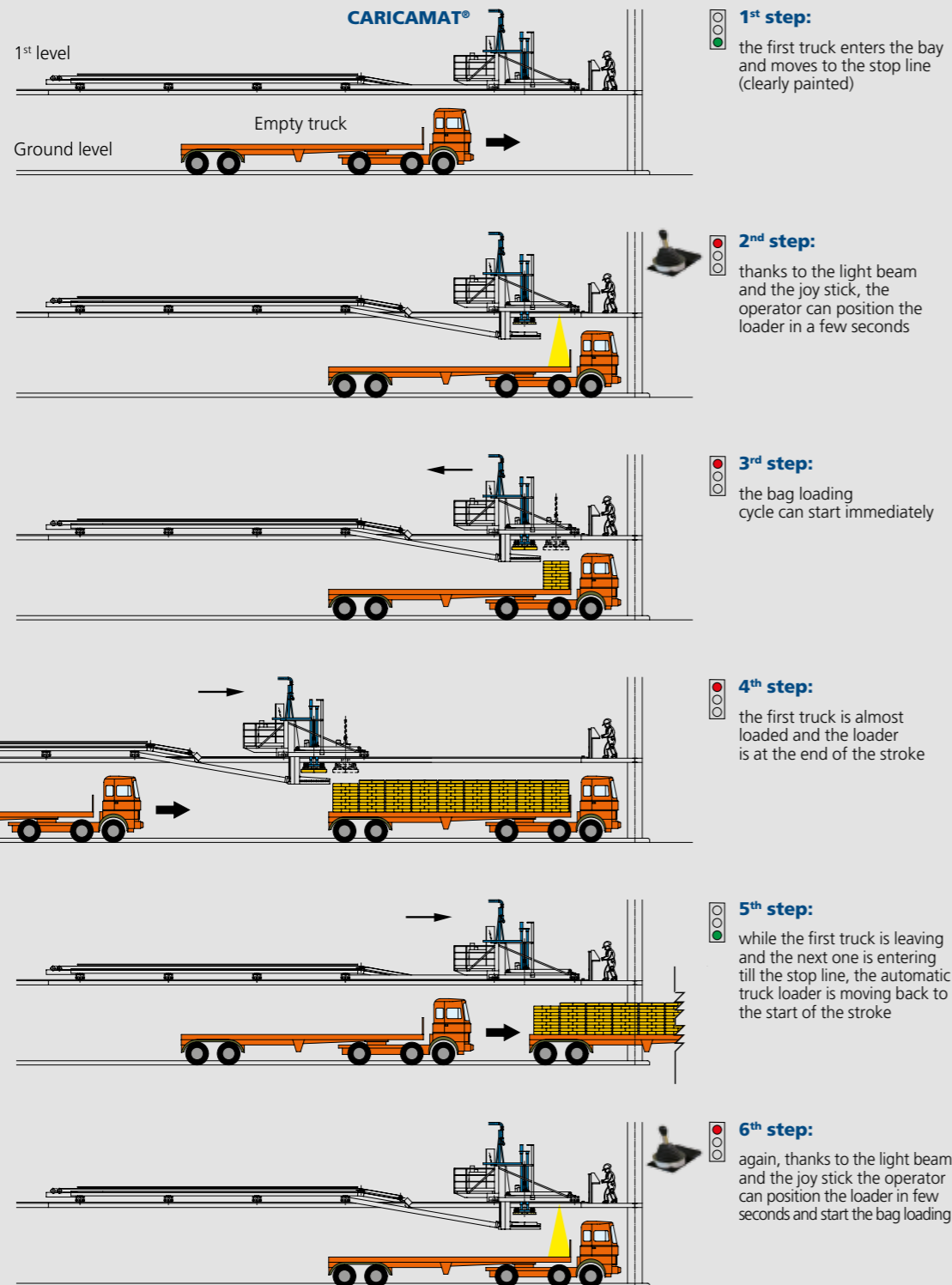
The positioning of the CARICAMAT automatic truck loader, done with the joystick, is fast and accurate, reducing the change-over time to a few seconds. The positioning can be set during the loading without interruption.



CARICAMAT® loading advantages



Truck loading sequence



Change-over time

The steps 4,5 and 6 in the previous page highlight the "change-over time" between trucks or in other words: the time required to re-start the bag loading cycle after the first truck is completely loaded.

More production with less investement

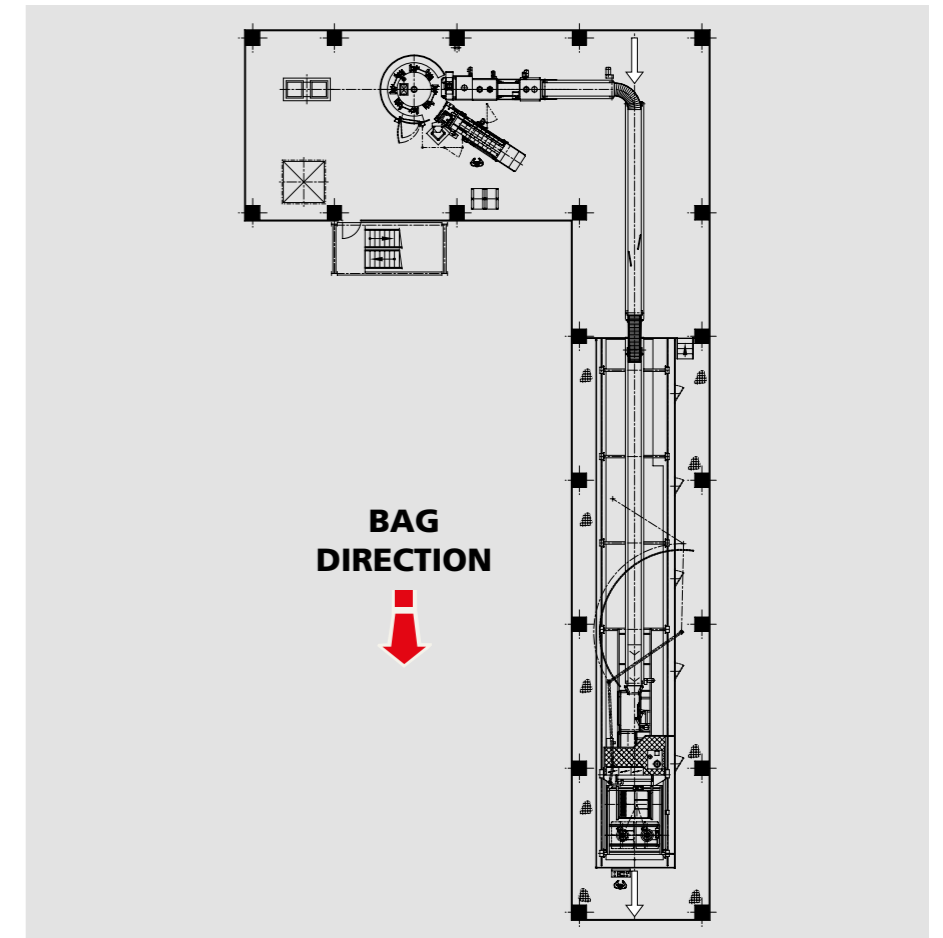
Ventomatic® solutions consists of one packer (typically a 8-spout rotary packer for 120 tons per hour), one automatic bag applicator and one **CARICAMAT® automatic truck loader** having an expected capacity of over 2400 bags/h for the whole line during loading time and with **fast** change-over between trucks. This is an efficient solution in terms of production and invested capital, assuring a good average production using only one loading bay.

The main advantages of the Ventomatic solution are:

- **Less equipment installed;**
- **Smaller building;**
- **Less man-power required;**
- **Less maintenance costs.**

Traditionally, in order to overcome the production stoppage due to this change-over time, the packer was always coupled with two loaders (manual or automatic) so that the production could be diverted to the

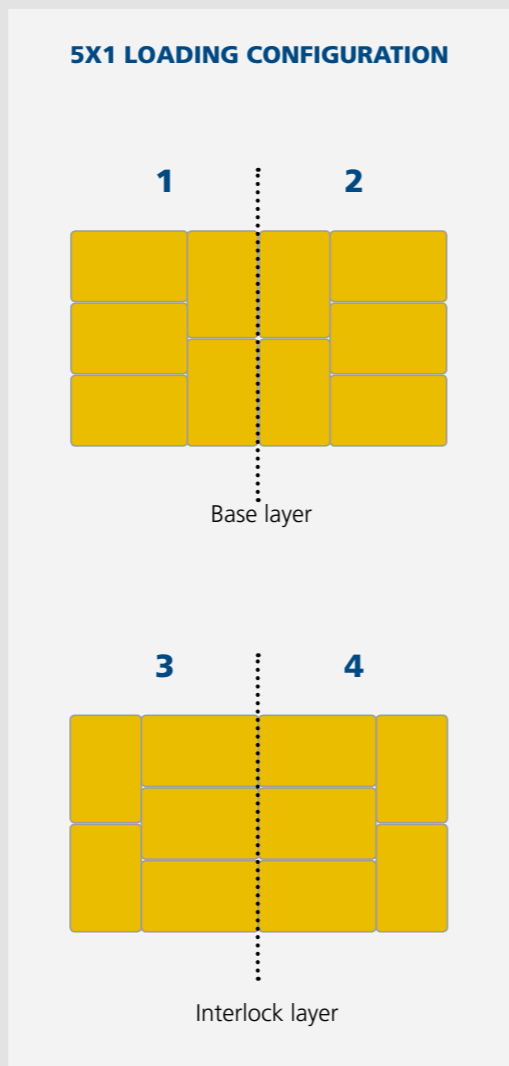
second loading bay after the truck in the first bay was fully loaded. This solution - two loaders per packer - could be necessary for countries where the limit load per truck, as average on the truck fleet, is between 10 and 20 tons.



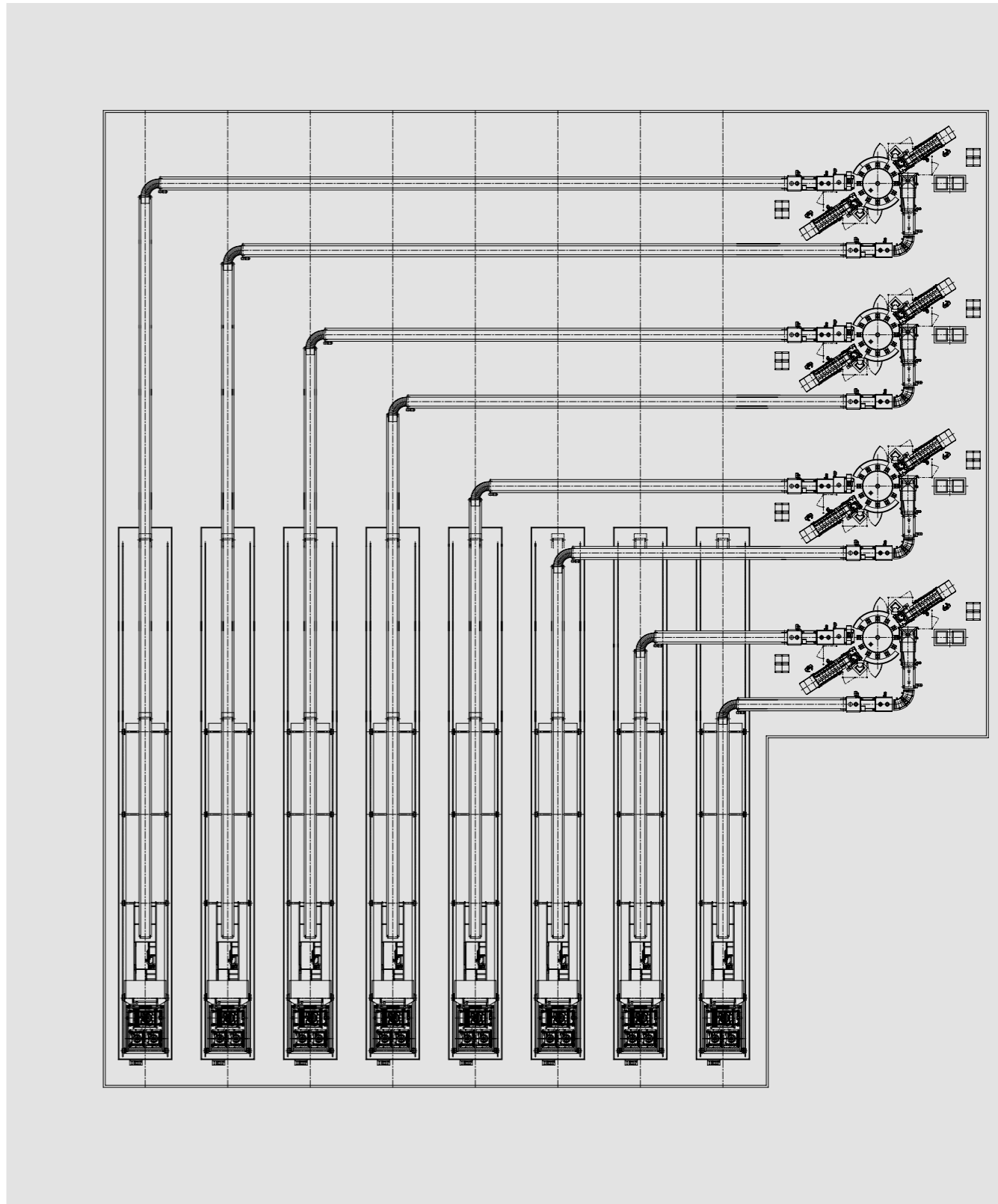
Number of bags to be loaded per truck	Capacity during loading (b/h)	Loading time (minutes)	Expected truck change-over time (minutes)	Actual loaded bags in one hour	Number of operators per shift (minimum)
400 (20 ton)	2400	10	1	2182	1
600 (30 ton)	2400	15	1	2250	1
800 (40 ton)	2400	20	1	2286	1

Important note: 1 minute of change-over is a conservative figure for the CARICAMAT automatic truck loader (typically it is less than 1 minute) but is a figure not possible to achieve for the other automatic loaders (mechanical) available on the market.

Typical bag layer configuration



Typical layout of multi-line plant





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