One Source

GIROMAT® EVO rotary packer

FLSmidth
VENTOMATIC

Rotary packer family

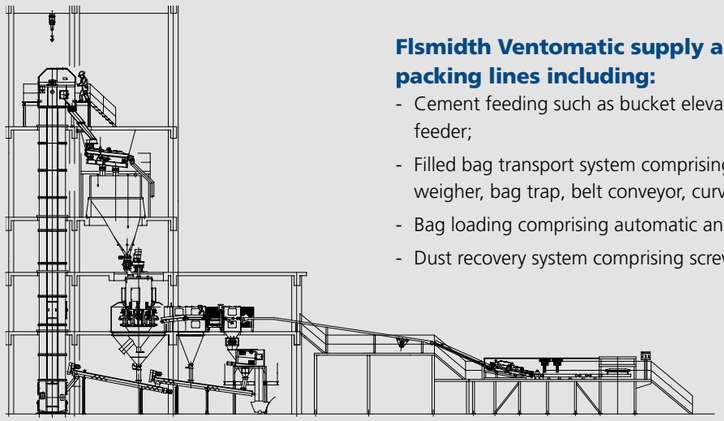
FLSmidth Ventomatic Spa is located nearby the historical town of Bergamo (North-East of Milan, Italy), where are concentrated all of its activities, from R&D to production and assembly. Here our company started the production of packing equipment in 1957. Since then FLSmidth Ventomatic Spa has been recognised for its innovative design and for the originality of the solutions it has proposed to the industry.

FLSmidth Ventomatic Spa was the first manufacturer to develop a microprocessor-based controller for filling and weighing units on packers and the first to introduce the electronic rotary packer in an industry that up until than had only known packers with mechanical weighing system.

The latest and most successful step in the continuous path of innovation is represented by the new GIROMAT® EVO rotary packer generation that distinguishes itself in the market for the very compact and modular design with very high flexibility and expandability, thanks to the modular integration between mechanical parts and electronic control.

GIROMAT EVO rotary packers are specially designed and developed for handling many types of building materials, with a wide range of configurations such as:

- Various impeller design;
- Bag clamping device for glued and stitched bags and suitable for various bag construction material;
- Quick discharge system;
- Bag sealing system on board (ultrasonic technology).



FIsmidth Ventomatic supply and control complete packing lines including:

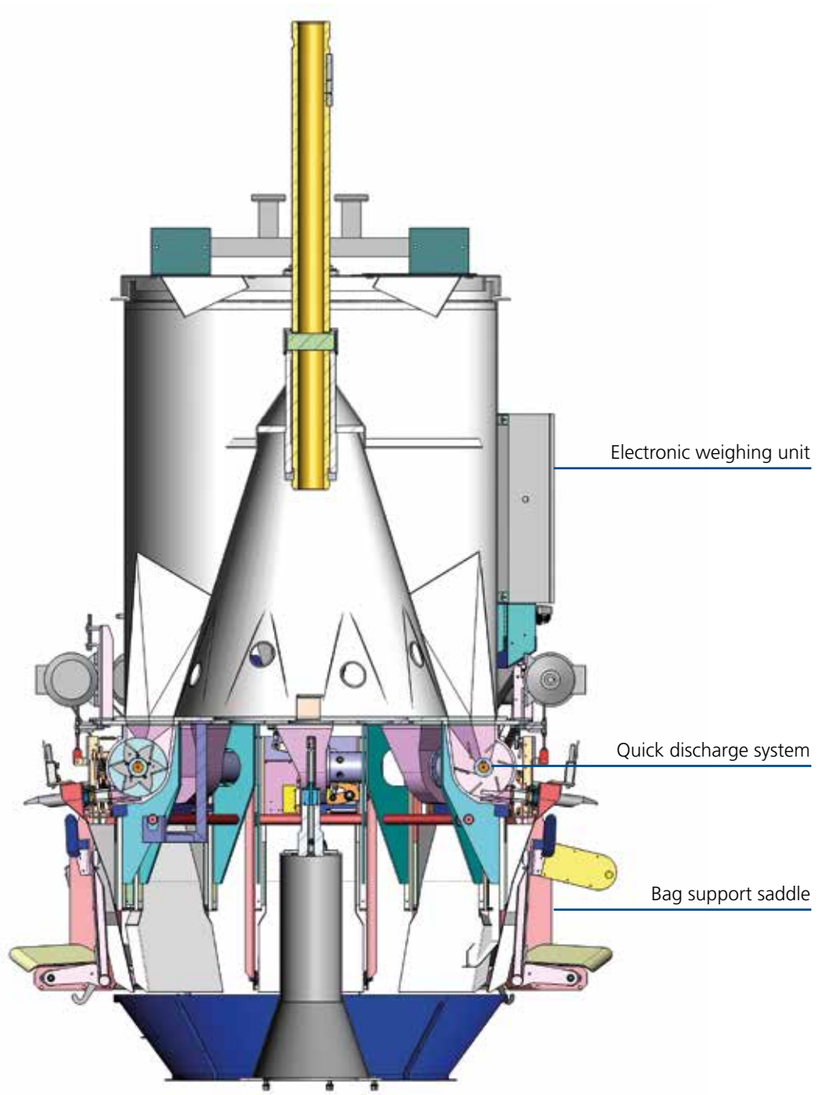
- Cement feeding such as bucket elevator, vibrating screen and vane feeder;
- Filled bag transport system comprising bag cleaning, electronic check weigher, bag trap, belt conveyor, curves, bag diverters;
- Bag loading comprising automatic and manual truck loaders, palletisers;
- Dust recovery system comprising screw conveyors, bag filters, hoppers.

EVO: Electronic Versatile Open-ended

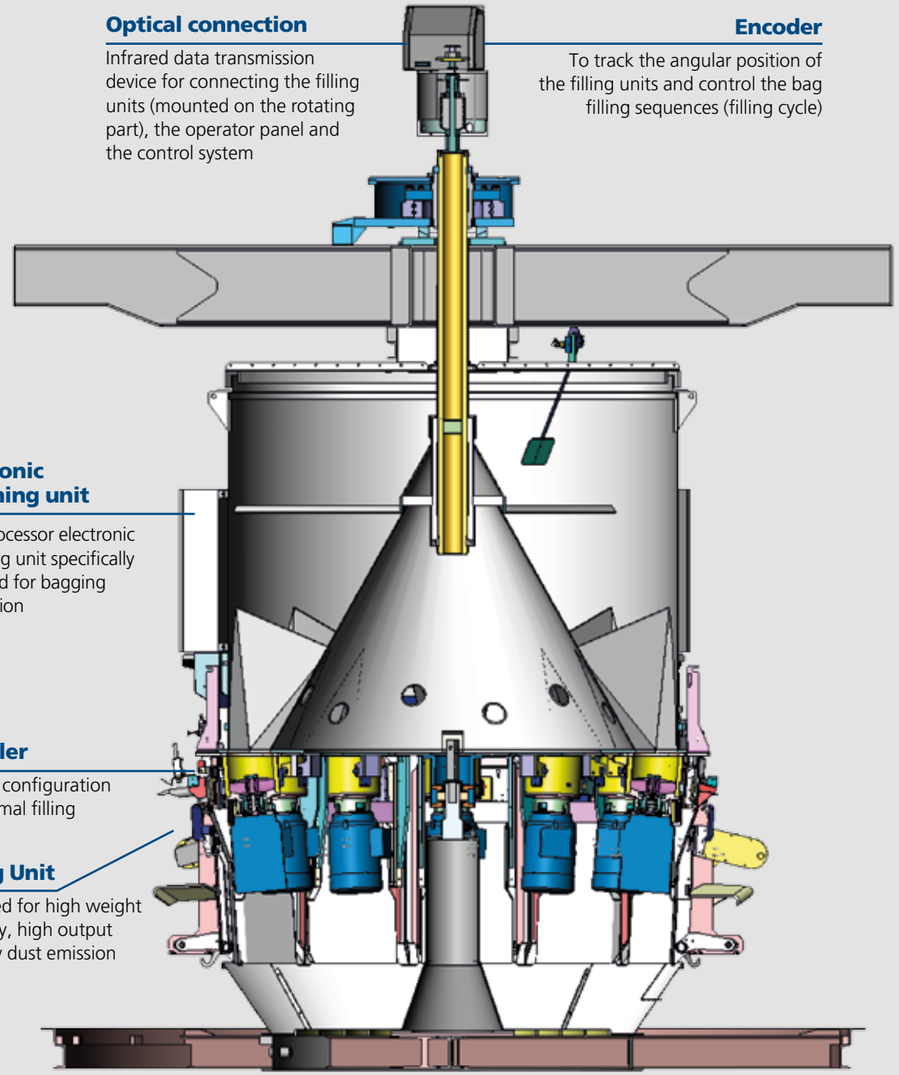
Electronic
The packer is equipped with the last generation of electronic weighing units, EWU (OIML approved), encoder and optical connection.

Versatile
Available for wide-range of bag types, sizes and for manual or automatic adjustment.

Open-ended
Suitable either for cement material or drymix, gypsum and other powdery products and expandable in capacity.



Main features



Optical connection

Infrared data transmission device for connecting the filling units (mounted on the rotating part), the operator panel and the control system

Encoder

To track the angular position of the filling units and control the bag filling sequences (filling cycle)

Electronic weighing unit

Multiprocessor electronic weighing unit specifically designed for bagging application

Impeller

Vertical configuration for optimal filling

Filling Unit

Designed for high weight accuracy, high output and low dust emission

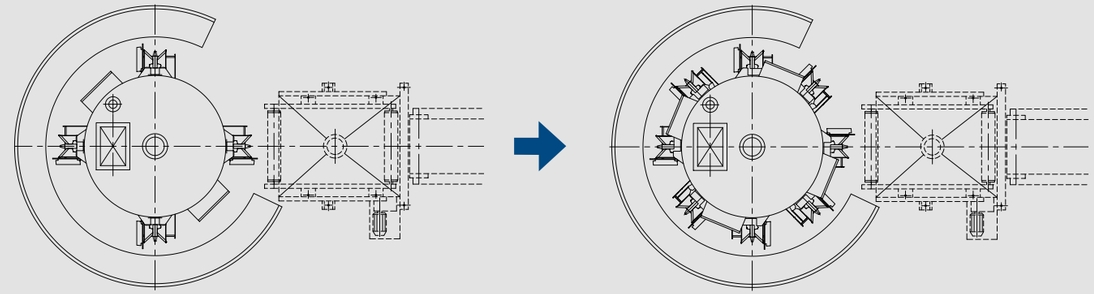
Modularity and flexibility

A FLSmidth Ventomatic® packer is composed of a number of pre-assembled modules, which are prepared and tested before delivering. These modules are quickly and easily mounted on the central tank of the packer during the erection. The numbered pneumatic connector plugs and electric rapid connectors avoid the possibility of mistakes.

If required and in order to minimise the initial investment, it is possible to put the packer in service with a reduced number of bag filling units. In case of future growth in production demand, additional filling units can be easily added on.

Example

4-spout packer (supplied with the tank for 8 spouts) which can be expanded with up to four additional filling units without modifying main pneumatic, electric plants and control system.



Standard capacity table (bags per hour)

		min.	max.*			min.	max.*			min.	max.*
3	50 kg	900	990	4	50 kg	1200	1320	6	50 kg	1800	1980
	40 kg	960	1035		40 kg	1280	1380		40 kg	1920	2070
	35 kg	990	1050		35 kg	1320	1400		35 kg	1980	2100
	25 kg	1080	1125		25 kg	1440	1500		25 kg	2160	2250
8	50 kg	2400	2640	9	50 kg	2700	2970	10	50 kg	3000	3300
	40 kg	2560	2760		40 kg	2880	3105		40 kg	3200	3450
	35 kg	2640	2800		35 kg	2970	3150		35 kg	3300	3500
	25 kg	2880	3000		25 kg	3240	3375		25 kg	3600	3750
12	50 kg	3600	3960	14	50 kg	4200	4620	16	50 kg	4800	5280
	40 kg	3840	4140		40 kg	4480	4830		40 kg	5120	5520
	35 kg	3960	4200		35 kg	4620	4900		35 kg	5280	5600
	25 kg	4320	4500		25 kg	5040	5250		25 kg	5760	6000

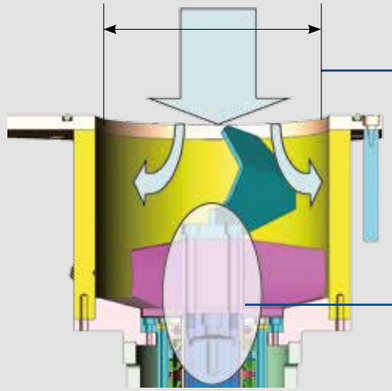
** Depending on the characteristic of the product.*

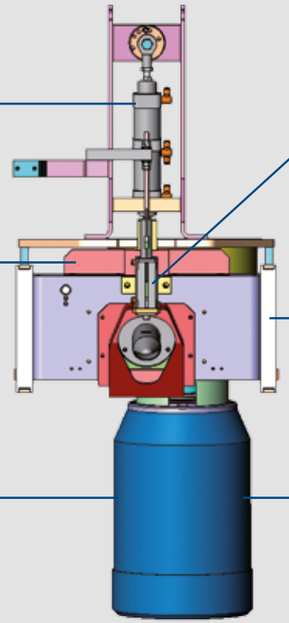
Vertical shaft impeller

Process

Since many years Ventomatic successfully introduced the bagging technology with the vertical shaft impeller. The product feed flow follows the direction of the impeller shaft, the blade design minimises the internal turbulence and the product is completely centrifuged. The result is an optimal deaeration of the product itself and a minimum kinetic energy dispersion which means high filling performance.

The performance of the vertical shaft impeller is optimal with cement and similar products assuring the best output to kW power ratio.

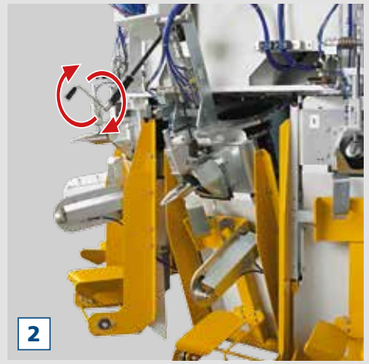


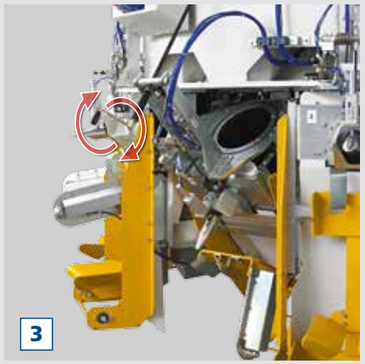


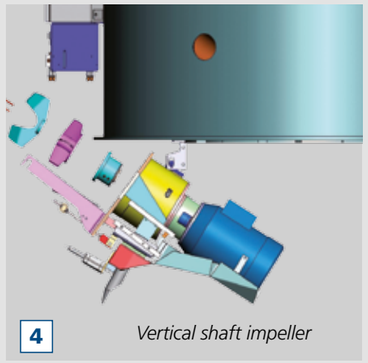
Maintenance

- Simple and compact design;
- Easy to be disassembled for inspection;
- Less components (minimun number of actuators and wearing parts installed);
- Less spare parts consumption;
- Lower power consumption.

Example of filling unit inspection for the vertical shaft impeller







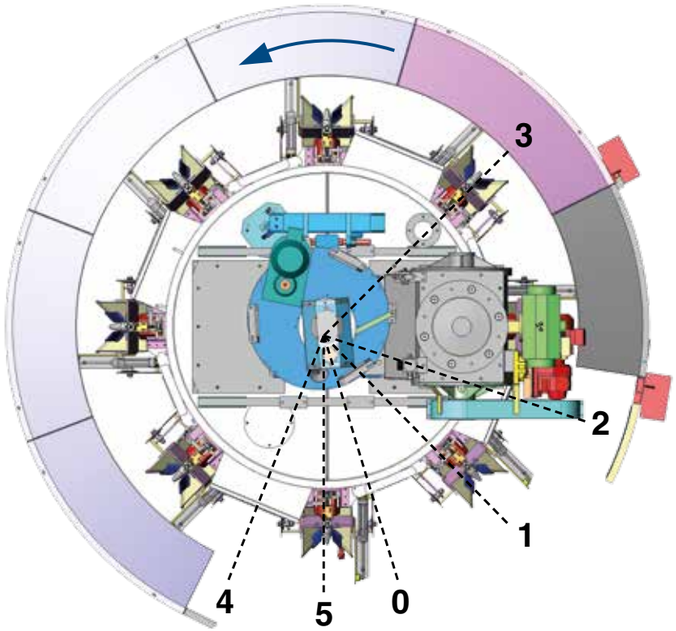
Vertical shaft impeller

A special tool is provided to be connected to the filling unit (**fig. 1**). By turning the tool, the filling unit tilts until the impeller is cleared from the packer body (**fig. 2, fig. 3**).
The impeller and the shaft sealing are designed for easy access and disassembling from the motor shaft (**fig. 4**).
The motor shaft has a high insulation and protection level thanks to a grease barrier that does not request periodical re-filling: the grease retention is ensured by a labyrinth system and sliding scrapers.

Encoder and optical connection

The sequence of the bag filling operations is defined by the peripheral location of the bag on the packer during the filling cycle: empty bag application location, tare location, bag disharge location, etc. During the rotation and according to its location, the filling unit receives the relevant commands. These points, on bag location, are normally determinated by a complicated system of microswitches, solenoid valves, pneumatic cylinders etc., all mounted on the external perimeter of the packer.

FLSmidth Ventomatic® packers, however, fulfil the same operations with an encoder mounted on the top of the rotating shaft of the packer. It continuously tracks the angular position of the packer and, via a field-bus connection, the information is sent to the filling units that react accordingly.



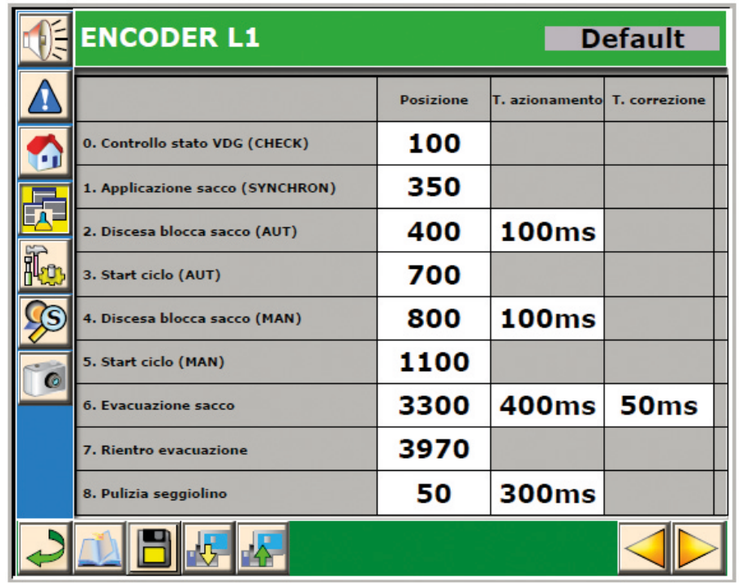
Legend
0) Control Status (ALARM)
1) Bag application
2) Tare
3) Not filled bag removing position
4) Bag Evacuation
5) Saddle Return

Optical connection

The encoder tracking system significantly simplifies the packer and offers shorter and easier erection and tuning and eliminates sources of possible malfunctioning.

Encoder

The positions for each of the filling operations is quickly and accurately set on the operator panel, eliminating the need to physically position externally mounted mechanical devices on the packer. Specific sequences of the filling cycle (and their positions) can be set in relation to type of product, empty bag size, etc.



	Posizione	T. azionamento	T. correzione
0. Controllo stato VDG (CHECK)	100		
1. Applicazione sacco (SYNCHRON)	350		
2. Discesa blocca sacco (AUT)	400	100ms	
3. Start ciclo (AUT)	700		
4. Discesa blocca sacco (MAN)	800	100ms	
5. Start ciclo (MAN)	1100		
6. Evacuazione sacco	3300	400ms	50ms
7. Rientro evacuazione	3970		
8. Pulizia seggiolino	50	300ms	

VENTODIGIT™ Electronic Weighing Unit

FLSmidth Ventomatic Spa has been a pioneeer in manufacturing electronic packers since 1980 and with the VENTODIGIT has achieved the objective of introducing a new modular electronic unit.

The modules are:
- The CPU for each packer;
- The analogic for each filling unit;
- The I/O digital, applied for each filling; unit or depending on the configuration.

The new weighing unit is based on the huge experience gained from our packer installations worldwide. All the filling units of one packer are controlled by only one CPU.

On request, the unit can be equipped with a weighing unit with display to control every filling spout.

HW platform

The completely redesigned HW platform includes the following main new features:
- Powerful microprocessor permits high-speed response and very accurate control of the dynamic weighing process;
- Separate weighing module, equipped with sigma-delta technology A/D converter with a double post digital filter action;
- Possibility of installing optional modules, i.e. analog I/O, additional digital I/O,etc for covering special applications.

Packing functions

- Check correct empty bag application;
- Bag breakage detection;
- Filling unit aeration (start/stop);
- Automatic bag support saddle levelling system;

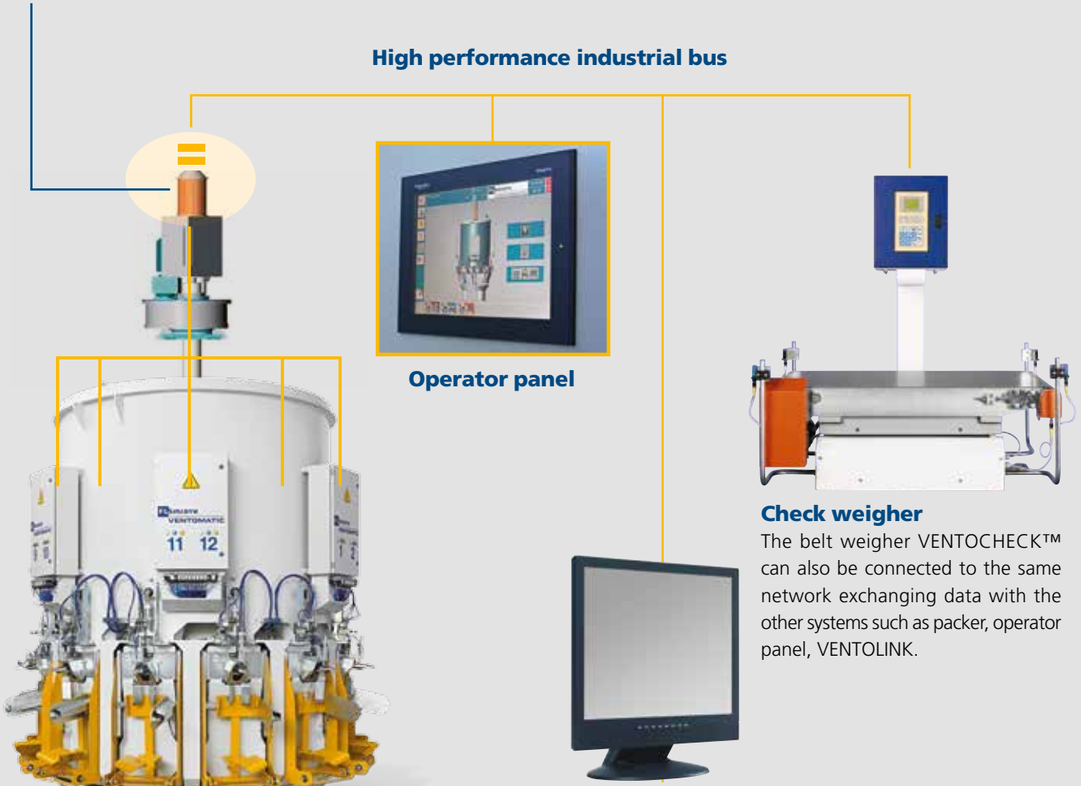
Weighing functions

- Automatic taring;
- Zero setting;
- Coarse and fine flow;
- Filling parameters self adjusting;
- Filling time control;
- Dynamic filling cycle optimisation;
- Set-point correction feed back from the check weigher (in option).
- Rapid product emptying control;
- Continuous bag discharge adjustment according to rotation speed, bag sizes and product conditions.

Network

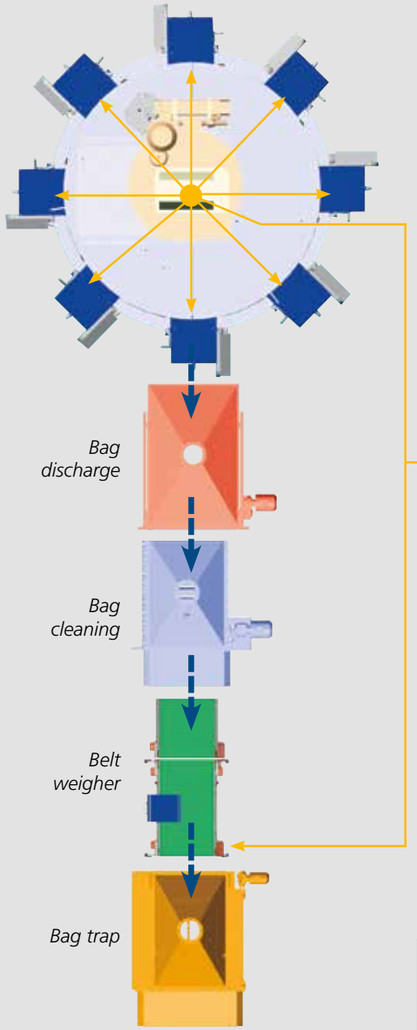
All filling units on the rotary packer are connected to a data network CANBUS. Through the unique FLSmidth Ventomatic® optical connection system, all the weighing units are also connected to the absolute (encoder for tracking their angular position) and to the operator panel. The operator panel, and the remote control system VENTOLINK™, receive in real time the complete status of each bag filling unit and also its weighing performance. Furthermore, all filling units can be completely programmed from the operator panel.

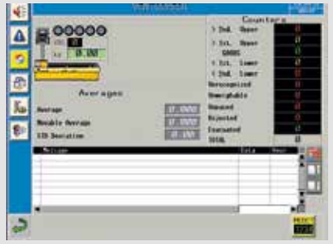
An infra-red optical communication system specially developed for high speed data communication in heavy industrial environments. It is 100% dust proof and not sensitive to any kind of vibrations or EMC noise. Furthermore, there is no mechanical wear.



Execution with VENTOCHECK™ belt check weigher

The belt weigher can be directly connected, without using external master or other additional device, to the packer operator panel and then to all the filling units on board.





A real-time monitor and basic production statistic page of the belt check weigher is always available on the operator panel display.

Operator panel

VENTOCHECK belt check weigher completes the packing process and improves the overall control by providing the following main functions:

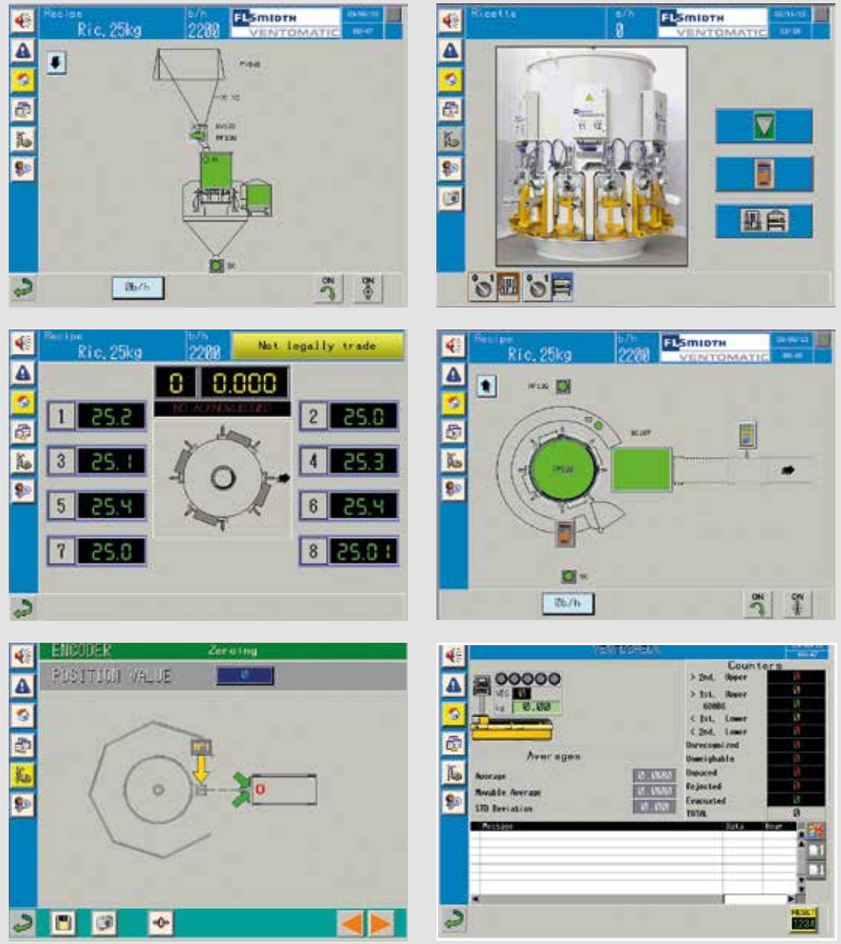
- Sorting of broken bags, underweight and overweight bags;
- Providing overall production data;
- Monitoring each bag single filling unit performance on the packer;
- Adjusting automatically the set-point of each filling unit on the packer (correction "spout-by-spout") see "Important Note";
- Disabling automatically a filling unit in case of malfunction or mechanical problems.

Important note

The packer is able to achieve the target weight performance without necessarily using the feedback from the belt weigher.

Operator panel

The achievement of greater flexibility and higher level of automation requires an operator panel quite different to the conventional pushbutton desk. The HMI (Human Machine Interface) is an IP65 industrial graphic terminal designed for industrial use and dusty environments which thanks to a dynamic mimic of the packing line, provides a clear and detailed overview and monitoring of all the main equipment.
The overall feeding and packing processes monitored with the possibility to adjust/optimise the performance through specific pages of the HMI (protected by different password levels) such as adjusting timers, variables and abilitations of the PLC program. Furthermore, all alarms and warnings are recorded, facilitating troubleshooting and supporting preventive maintenance planning.



All the main operations such as start/stop of the line, change of product and bag size, emptying and cleaning of the line, are completely automatic and programmable.

VENTOLINK™
Data collection and statistical system

The new VENTOLINK™ data acquisition and statistical system for Ventomatic® packing lines runs on Microsoft Windows.

The VENTOLINK™ purpose is focused on monitoring packing plant performance in terms of bag weight precision, bag produced number, quality of bag produced collecting and analyzing data from the packers and VENTOCHECK™ belt checkweighers.
The system can manage, store and display data up to 5 packing sistem with, single or double discharge.
Data can be analyzed with many views such as: packer, single filling spout, belt checkweigher and time frame: hour, shift, day and others.

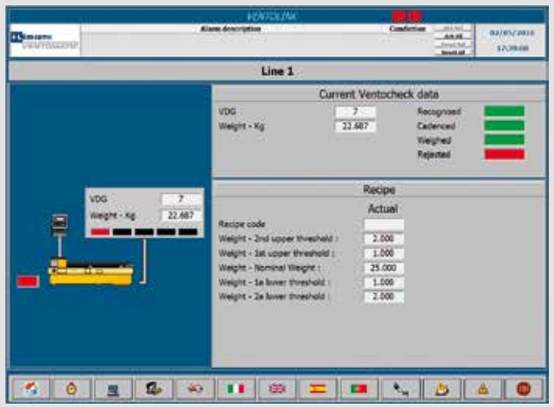
All data are stored in a SQL database and can be exported to Access, Excel or other formats according to ODBC standards.

The system includes:

- Run time supervision of the packing line showing equipment status and info.
- Shift setting module; customizable according to the production unit organization.
- Statistical module.

Run time supervision:

It displays the current status either of the complete line or of each machines. The user can get data and relevant information from field like actual throughput and weights and display recipes main parameters or settings.



Shift setting

User can set up to three different shifts for each day of the week with different recipes.

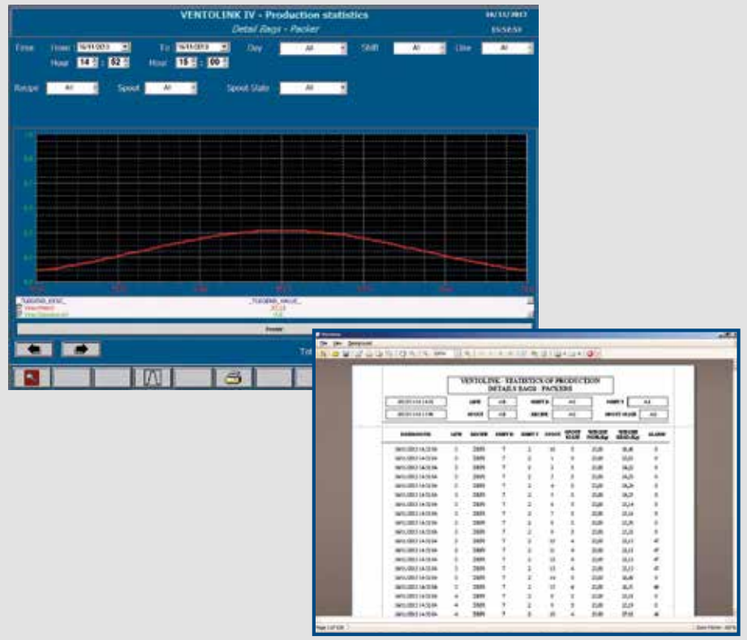
Statistical module

This module allows user to get relevant information (i.e. mean weight, standard deviation, shift statistcs etc..) about packing process.

Statistical module is basically structured in tables which can be arranged as per user needs.

The module manages the data and defines query for data file as follows:

- Day/shift database (relevant data for each filled bag are available);
- Last year historical database, the system makes available hourly triggered compounded data;
- Previous years historical database (preceding the last one), the system monthly stores and displays triggered and compounded data;
- View the Gaussian weight data of the stored compounded data;
- Print or save on files of all reports.



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