

2. Swiftsort

2.1 General Description

The Swiftsort Rotary Unscrambler is fully automatic and designed to orientate and place many different types of plastic containers onto a conveyor system.

The machine supplies containers to a conveyor system by means of container starwheels. The rate at which containers leave the unscrambler is dependent on the speed at which the starwheels are rotating, and also the size of the container. Generally, the smaller the container, the higher the supply rate. This is due to the fact that the large starwheel can contain more small container pockets than large container pockets.

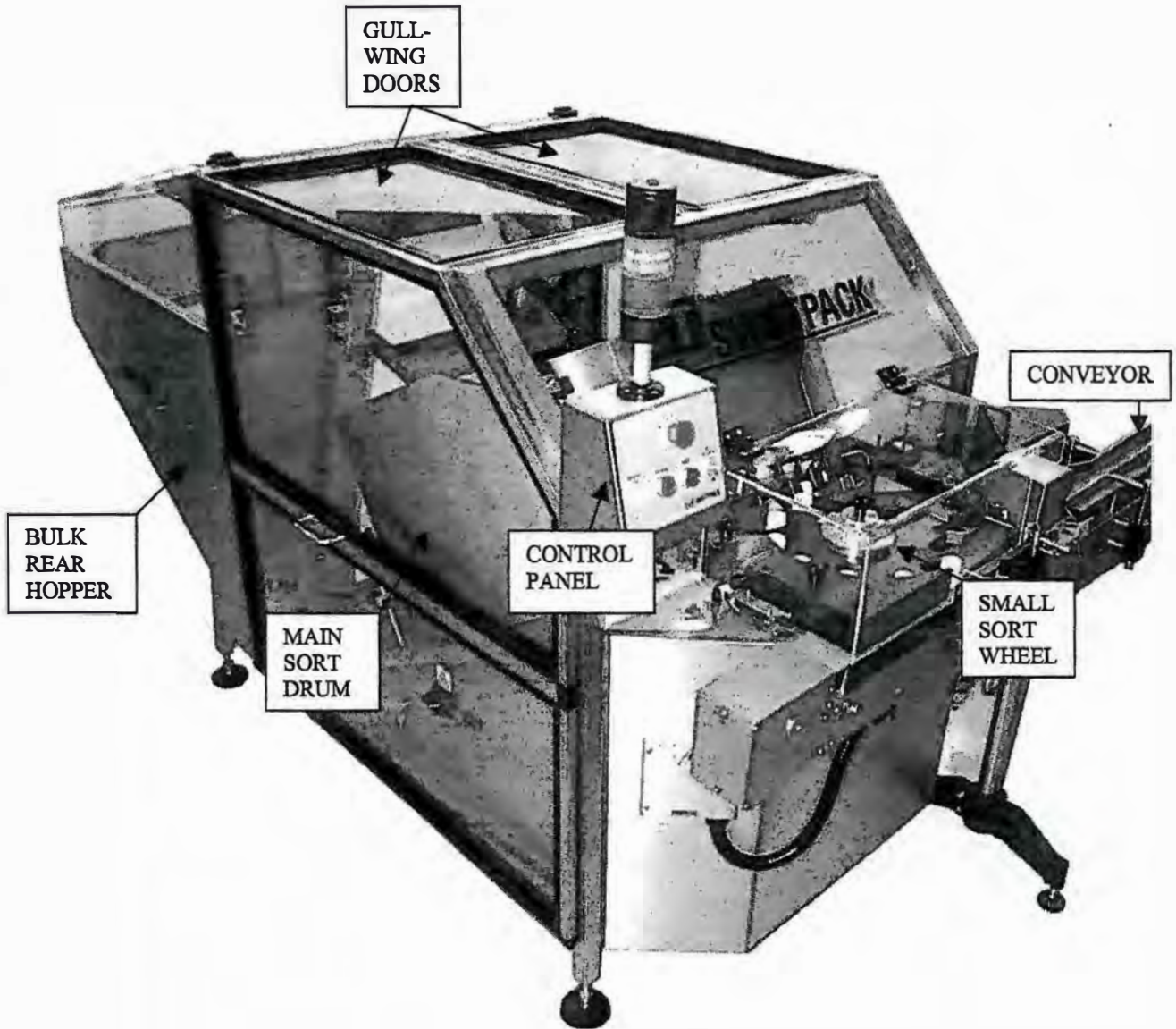
Containers are held in a large bulk hopper at the rear of the machine. The containers are then delivered to the main sort area by means of a flighted belt elevator. The feed of containers by the flighted belt is controlled by a sensor that detects the level of containers in the main sort area.

A sensor fitted to the outfeed conveyor controls the unscrambler. When the conveyor needs containers the unscrambler will run until the conveyor sensor is satisfied, the unscrambler will now pause until the conveyor sensor calls for containers again.

Between the outfeed of the unscrambler and the conveyor is an inverting cage. Containers pass through the cage and are inverted. While inverted, the containers are blown with de-ionised air before being re-inverted and released onto the conveyor.

SECTION 2 - General Description.

Swiftsort General Arrangement.



2. Desiccant Inserter

2.1 General Description

The Swiftpack Desiccant Inserter is fully automatic and designed to orientate and place barrel type desiccants into containers being carried on a conveyor system.

Randomly oriented barrel desiccants are supplied to the tooled vibratory bowl at the rear of the machine.

These randomly oriented barrel desiccants are driven around and up the tooling of the bowl by the vibrating action of the bowl. The desiccants will only feed in one direction either along the vertical axis or along the radius (depending on the size and shape of the desiccant, usually along the longest dimension).

Any doubles or incorrectly oriented desiccants are forced off the tooling back to the bottom of the vibratory bowl to be re-oriented.

Desiccants exit the bowl into a chute which holds the desiccants in an oriented queue.

The chute has a sensor attached which controls the switching on and off of the vibratory bowl (i.e. When the sensor is uncovered, the vibratory bowl will run. When the sensor becomes covered, the vibratory bowl will stop).

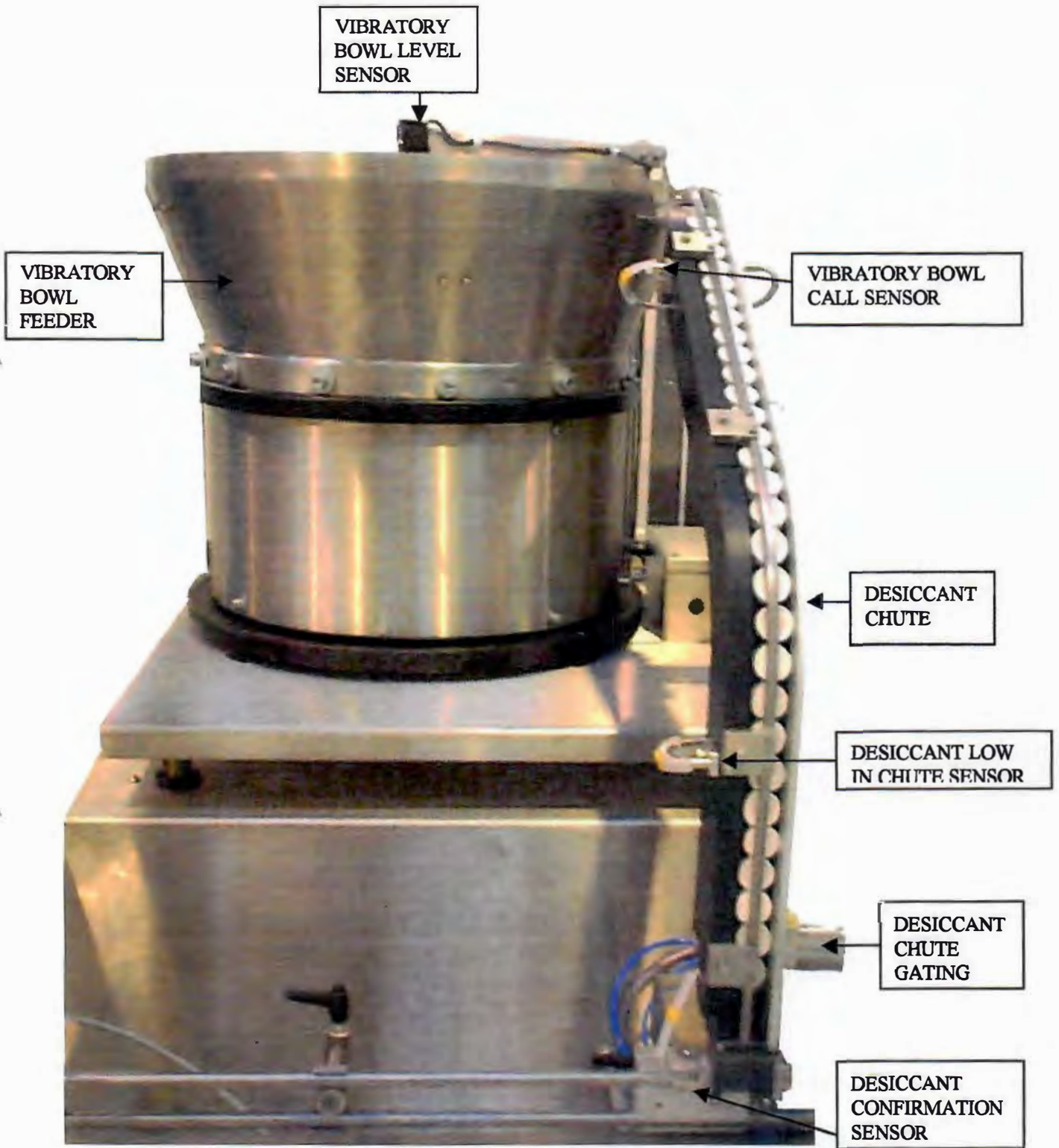
On the lower section of the chute there is another sensor which will pause the machine if insufficient desiccants are supplied to the chute. This ensures the correct placement of desiccants into the containers.

Desiccants are released from the chute via a gating system situated at the bottom of the desiccant chute. This operates by holding the queue back with the top gate then releasing the lower gate to allow the first desiccant in the queue to free fall into the container. The lower gate is then returned and the upper gate releases the queue, ready to start the cycle again.

Between the lower gate and the container neck, another sensor is positioned to confirm that a desiccant is actually released when supposed to. If a desiccant is not seen by this sensor, the machine will stop and hold the un-filled container.

Containers are controlled by a finger gating system to position, hold and release the containers on the conveyor beneath the desiccant chute.

Desiccant Inserter General Arrangement.



2. Swiftpack

2.1. General Description

The Swiftpack Tablet Counter consists of individual mechanical, pneumatic and electrical subsystems which together form an integrated tablet, capsule and container counting and filling process. All the major components and process steps of this equipment and their functions are described below.

Product is fed into the stainless steel bulk hoppers of the Swiftpacks. The bulk hoppers meter product flow onto the rear vibrator trays of the Swiftpacks via adjustable hopper gates. The flat rear vibrator tray is used to feed the product down onto individual tracks on the second vibrator or "preweigh" tray. Preweight is a system that utilizes a linearly variable differential transformer coupled with a depth probe. As product is fed onto the preweigh tray, which is spring loaded, the additional weight causes a shift in position of the probe depth. A tolerance (hysteresis) level is added and subtracted from this value to give a high/switch off and low/switch on value which is compared with the output from the preweigh probe. If the preweigh depth goes below the low threshold the rear vibrator is turned on, if it goes above the high threshold the rear vibrator is turned off.

Product is now fed onto the front vibrator tray. The front vibrator trays continue to feed and additionally separate the product. These front vibrator trays are used to ensure:

- a constant speed of feed
- elimination of doubles
- product does not "bounce" when it leaves the end of the trays to enter the sensor tubes.

Note: *There are differences in product shape, size, surface texture, density, weight and moisture content. Any one or a combination of these properties can cause changes in feed rates. Therefore the three sets of vibrator feed trays can be altered via the control panel while the machine is in operation.*

Care should be taken to ensure the product is controlled when it leaves the end of the front trays to ensure product separation and to eliminate product bounce both of which will affect counting accuracy.

Adjustment of both sets of vibrators should be made to ensure that the front vibrator trays are filled correctly (product can be touching).

General Description cont'd

Product now enters the sensor block assemblies. The product "free falls" passing a series of electronic infra-red sensors. Each sensor is controlled via a sensor emitter and receiver circuit board which collects data on the time (Msecs) required for a particular tablet/capsule to pass the sensor "beam". This data is compared with previously stored information on product size (measured in time (Msecs)). Once measured, the counter can determine the difference between a single falling tablet and two tablets falling together.

Pre-count gates are now used to separate a "known count" and allow the machine to continue while the finished "known count" or last container to be filled is gated.

After leaving the pre-count gates, the product continues to "free fall" into the discharge chutes. The discharge chute dividers help to eliminate product "spinning" or bouncing and minimizes the time required to funnel product into the containers. Vibrating nozzles have been fitted to these machines to facilitate the discharge of the product by reducing the chance of product "bridging" and "jamming" in the discharge nozzle.

The Swiftpacks indicate that the filling cycle has completed by sending a signal to the inline finger indexing system, which indexes the containers when the signal is received.

When the Swiftpack detects a possible overcount, it will react in accordance with pre-set options. The first option is that the Swiftpack will do nothing. The second option is that the Swiftpack will stop filling, display an error message, and send an "All-Stop" signal to the indexing system. Option three activates a reject station, if installed. Setting the desired option is detailed in the Swiftpack instruction manual.

Note: *The Swiftpack only reacts to detected overcounts*. Undetected overcounts are still a statistical possibility. That is, it is statistically possible that two tablets could fall past an individual sensor assembly if the vibration rate of the first tray is excessive, or if the programming of the tablet/capsule size is incorrect and/or the product feed rate is not controlled. However, the tablets would have to pass the sensor assembly together and not exceed the maximum dark time programmed. (Statistical probability: approximately 1 tablet in 10,000). The system does not recognize a detected undercount as this is theoretically not possible under normal operating conditions. However, undetected undercounts are possible if the programming of the Swiftpack is incorrect, or product loss occurs after counting. The system does not receive any information regarding undercounts and therefore does not react.*

** Detected overcounts are a condition where two tablets/capsules fall past a sensor and exceed the maximum dark time and one of these tablets/capsules is the last tablet/capsule of a count. (i.e. 100th tablet of a 100 count container) and the other tablet/capsule is the first tablet of the next count (i.e. the 1st of 100 count).*

The Swiftpack is unable to separate these two tablets and therefore signals an overcount.

ELECTRONIC COUNTERS: SWIFTVISION II RANGE



TECHNOLOGY, ACCESSIBILITY, COUNTING AND ACCURACY ALL IN ONE.

The Swiftvision counter range can be configured for any product or container requirement. Count speed and accuracy are optimized through the unique auto balanced feeding system, which prevents surges and ensures a constant flow of the product to the count head, independent of the hopper level. The counters are available in Single, Twin and Duplex versions.



THE AUTOBALANCE FEEDING SYSTEM IS A UNIQUE FEATURE OF OUR COUNTERS AND ASSURES AN OPTIMUM PRODUCT CONTROL.

SWIFTVISION II

	PRODUCTION (SUBJECT TO TRIAL CONFIRMATION)	CONTAINER DIAMETER RANGE	CONTAINER HEIGHT RANGE
SWIFTVISION II (SINGLE HEAD)	Up to 60 bpm or 6,000 tablets per minute*	25 mm to 100 mm	40 mm to 200 mm
SWIFTVISION II (DUPLEX)	Up to 80 bpm or 8,000 tablets per minute*	25 mm to 100 mm	40 mm to 200 mm
SWIFTVISION II (TWIN)	Up to 120 bpm or 10,000 tablets per minute*	25 mm to 100 mm	40 mm to 200 mm
SWIFTVISION II (TWIN DUPLEX)	Up to 150 bpm or 12,000 tablets per minute*	25 mm to 100 mm	40 mm to 200 mm

*Depending upon product and container size and shape

ANCILLARY EQUIPMENT: UNSCRAMBLER, BOTTLE BLOWER

WE PROVIDE A WIDE RANGE OF ANCILLARY EQUIPMENT TO COMPLEMENT OUR COUNTING MACHINES AND TO ENHANCE PRODUCTIVITY.



ROTARY UNSCRAMBLER

Rotary series have been designed to handle a wide range of plastic bottles and are available in three different sizes according to production output. Large storage hopper, automatic container queue control at outfeed, compactness and fast changeovers are some of the many distinguishing features.

PRODUCTION SPEED	BOTTLE DIAMETER	BOTTLE HEIGHT
Up to 180 bpm*	25 mm to 100 mm	40 mm to 200 mm

*Depending upon model, product and container size and shape



A300 LINEAR UNSCRAMBLER

High speed bottle unscrambling solution featuring a unique orientation device to stand bottles upright onto a conveyor. Small footprint, belt and hook operation, very few or no change parts and fast changeovers. Suitable not only for pharmaceutical but also for the personal care industry.

PRODUCTION SPEED	BOTTLE DIAMETER	BOTTLE HEIGHT
Up to 240 bpm*	25 mm to 100 mm	30 mm to 180 mm

*Depending upon product and container size and shape

COMPLETE SOLUTIONS



Individual counters or complete lines are available to cater to the customer's specific production requirement.

The constant collaboration of IMA R&D with customers has made it possible to develop optional devices and other ancillary equipment applications aimed at maximizing the efficiency and increase quality standards, such as:

- Camera
- Cappers
- Coding systems
- Containment
- Cottoners
- Induction sealers
- Labellers
- Printing unit
- Retorquer
- Specific equipment supplied by third parties

IMA Safe handles all stages of line integration, including coordination, project management and the related activities for final fulfillment of the project such as factory acceptance tests, validation service, training and inspections. In addition to engineering activities, IMA Safe also offers testing rooms for count tests with customers for particularly awkward shaped products.

ONLY ONE SUPPLIER FOR YOUR HIGHLY EFFICIENT COUNTING LINES.

COMPLETE LINE SOLUTION

