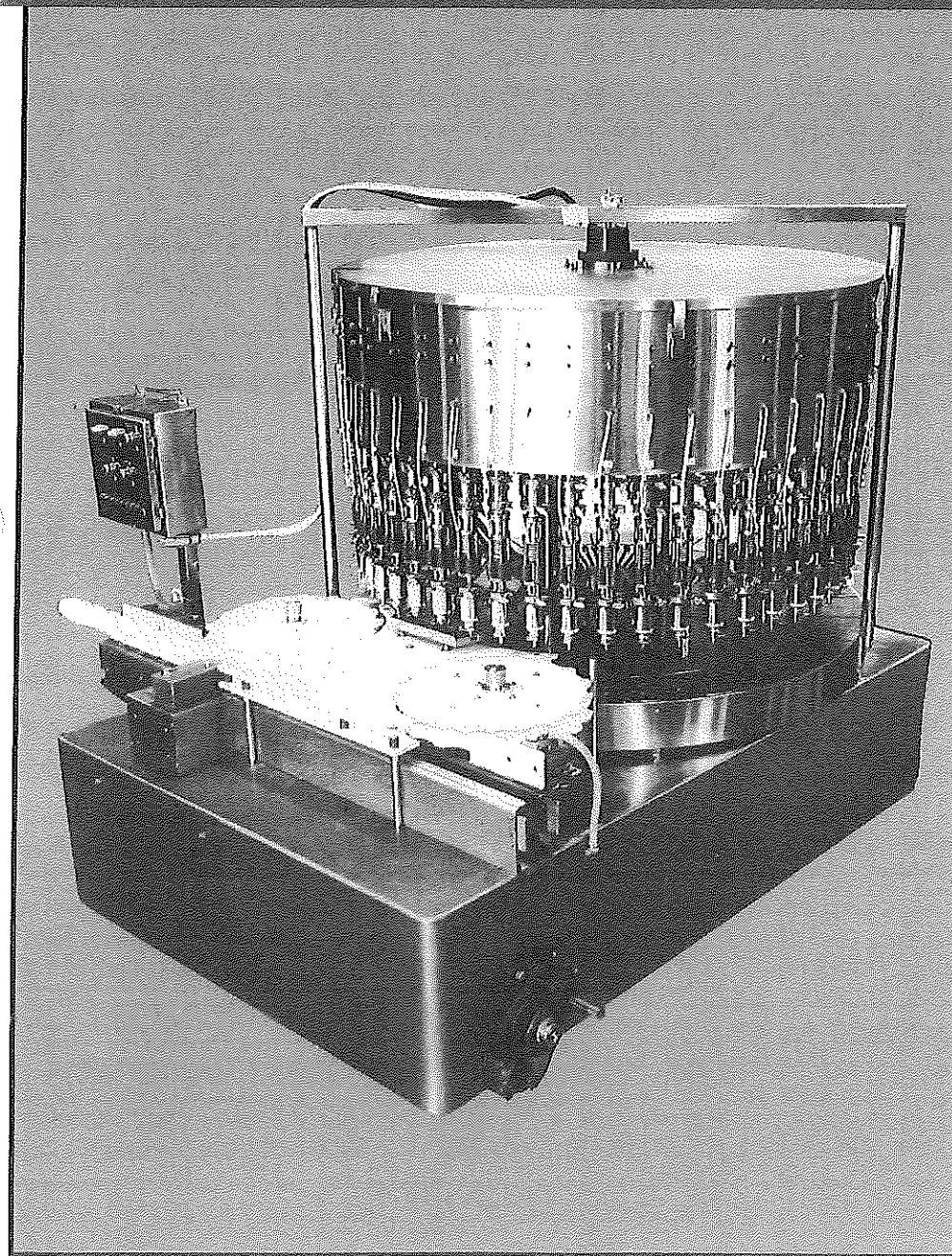


# Weigh Filler

U.S. Pat. N. 4,582,102

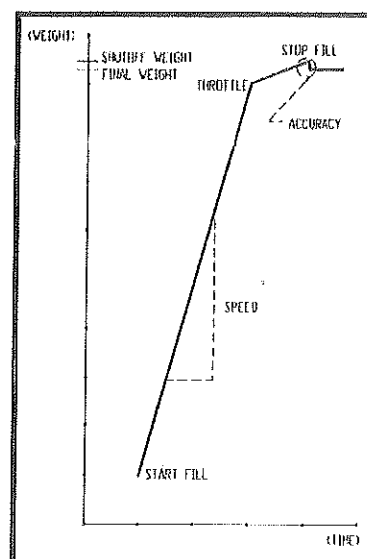


## WEIGH SCALE FILLING BACKGROUND

The first U. S. Bottlers WEIGH SCALE FILLER was built in 1981. This represented a culmination of design concepts for liquid fillers built by U.S. Bottlers over the past 75 years. Since then, dozens of rotary WEIGH SCALE FILLERS have been built and installed. This extremely accurate weight-sensing filler is built for non-circulating sanitary filling processes. Rotary machines with 8 heads up to 54 heads have been built for products as diversified as pharmaceutical medications to automobile lubricants. The WEIGH SCALE FILLER represents the most advanced filling technology available today in the world. It is modularly designed for ease of maintenance and operation. If your operating plant and product controls demand this type of sophistication, a U.S. Bottlers' WEIGH FILLER should be your machine.

**Designed for speed** and accuracy, a WEIGH SCALE FILLER is shown above with an all stainless steel construction and a clean-in-place liquid system.

**The graph** at right depicts the filling concept. The fill begins with a high speed liquid flow and then throttles to a slower flow to reduce the tendency toward turbulence, and to increase final fill accuracy at shutoff.



## FEATURES

### BOTTLE HANDLING

Bottle handling parts consist of standard hardware typically used on all U. S. Bottlers' filling, cleaning, and capping equipment. The bottles enter the machine from a feed screw that separates the containers for transfer into the center guide and infeed star assembly. These containers are then located on the individual station load cell tables. When speed requirements dictate, bottle locating devices are used to prevent the containers from shifting on the table during the filler process. Each filling valve cycle is individually controlled without the filling tube nozzle or other hardware touching the bottle opening during the filling process. This atmospheric fill allows for easy clean-up of the equipment, controlled sanitation of the container, and the ability to fill extremely viscous products in plastic, glass, and metal containers. Under certain conditions, the machine can be designed so that the valve remains fixed above the container throughout the machine rotation eliminating the need for filling nozzles..

### USER FRIENDLY OPERATOR CONTROL

The WEIGH SCALE FILLER operator control panel is a pressure sensitive, monochrome input screen housed in a NEMA-4X enclosure. This Opti-Touch screen uses menu-driven prompts for operator input. The operator merely needs to respond to questions and touch the appropriately highlighted areas of the screen for entering fill data. This monitor allows changes in fill weights to be sent to individual heads or to the entire machine during machine rotation. Data can be retrieved for evaluation just as easily. An option exists to provide a signal should a valve not reach the target weight. Customers can use this signal to then track the container and have it removed from the line either automatically or by the line operator.

### BATCH AND STRING DATA COLLECTION

The Opti-Touch screen has the ability to display string data during the filling process, but the WEIGH SCALE FILLER is extremely versatile in its ability to work with additional computers. Specifically, a batch data computer and/or a string data collection operator/maintenance computer can be added to the electronics of the WEIGH SCALE FILLER. The operator computer can be used for storing an infinite number of product filling parameters for those customers who fill a variety of products.

This computer can download the filling information to the machine as well as retrieve filling parameters to update filler memory for a particular product. The batch data computer can be wired in parallel with the Opti-Touch screen for management use. Management can follow the filling process over the course of a run or as long as the machine remains on-line with the computer. Other customers have used such a computer to install an input-output device for bottle rejection, as well as the ability to signal other equipment on the line when certain conditions have arisen at the filler.

### FLEXIBILITY

WEIGH SCALE FILLERS currently fill containers with product weighing as little as two ounces up to five gallons. Machines run from ten bottles per minute to over 600 bottles per minute depending on size. They range from 8 heads to 54 heads and fill containers in various heights, shapes, materials, and weights. These machines can fill chunky, pulpy, foamy, viscous, and water-like products.

### ELECTRONICS

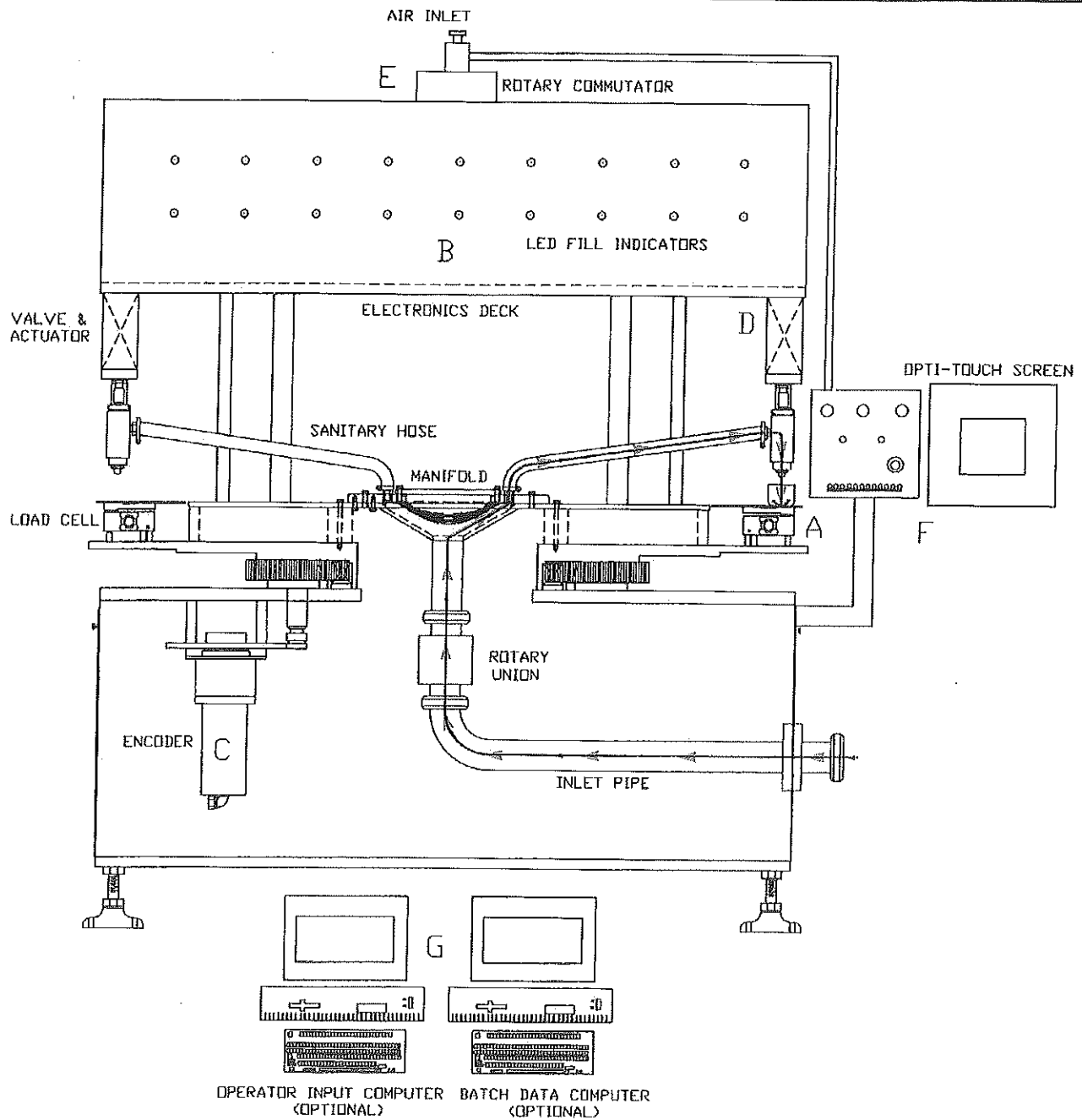
The commutator and the electronic circuit boards for each station are housed in the watertight electronic deck located well above the liquid level line. Individual LEDs on the electronic deck skin indicate the status of the valve via an electronic signal from the station boards. Station boards are connected to the Opti-Touch screen housed in its watertight enclosure at the operator level. All major components within this electronic system are designed, built, and supported by U. S. Bottlers and the software for the entire system has been custom designed by U. S. Bottlers. Special customer software requirements can be addressed by the U.S. Bottler's software engineers.

### VALVE CONFIGURATIONS

The WEIGH SCALE FILLER liquid system uses a variety of valve designs to meet each customer's unique needs. Three basic valve designs have been developed.

- A standard down stroking valve assembly for free flowing liquids.
- An upstroking cam action valve that is typically used for heavy products that tend to drip when the filling cycle has ended. (The upstroke in essence produces a vacuum which holds the product from falling out of the end of the nozzle.)
- The CIP-style valve which incorporates valve filling above the container without the need for valve stem cam action. This valve has been designed with the appropriate "O" ring seals and high polish required in the dairy and pharmaceutical industries. The valve assembly does not need to be dismantled during clean-up and the entire liquid system is constructed to meet the stringent requirements of the dairy industry. Some customers have found that the clean-up savings on this machine have justified the purchase of several U. S. Bottlers' WEIGH SCALE FILLERS for their particular applications. In general, all the valves are designed around a two stage process for initial filling at a high flow rate to achieve cycle speed and then throttling to a slower flow rate to assist in maintaining accuracy. This throttling process allows the computer study at the end of the filling cycle to respond to shut off signals with less variation from cycle to cycle. Products that tend to foam are also handled better during slow flow rate shutdowns.

## DESIGN DETAIL

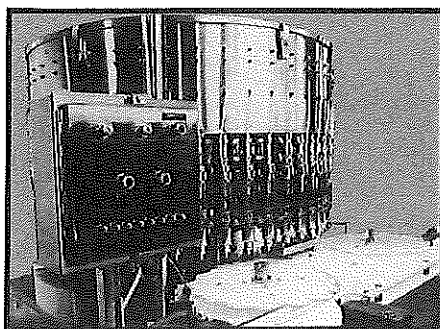


### FILLING DESIGN

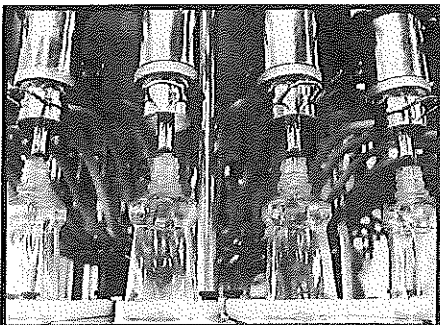
The sketch above shows the configuration of a typical WEIGH SCALE FILLER. The liquid system is designed for simplicity and ease of cleanup. Product is supplied at the tri-clamp connection on the inlet pipe at the filler cabinet base. Liquid flows from the inlet pipe to the rotary union and up to the distribution manifold. From here, the liquid flows into sanitary hosing into each filling valve assembly. When a bottle is detected at a load cell (A), a signal is sent to the electronic deck (B). When the proper angular position occurs as determined by the encoder (C), a signal is sent to a valve actuator (D). This allows the valve to open for full flow and, upon reaching a designated value as detected by the load cell, the valve will throttle to a second stage slow fill to reduce turbulence and incoming product pressure. The throttle value is defined by the operator as dictated by the product and filling process. If necessary, it may be eliminated altogether. Electrical data achieved during the filling process is sent and received through the rotary commutator (E) to the operator station (F). At the Opti/Touch user-friendly menu-driven screens, the operator can input and receive data for adjusting fill weights and detecting changes for overall accuracy. Operator input and batch computers are available as options (G) for use in string data collection, batch run reporting, input/output signal devices, and other useful concepts that are uniquely defined for the customer using the technology available within the WEIGH SCALE FILLER family.

## CAPABILITIES AND OPTIONS

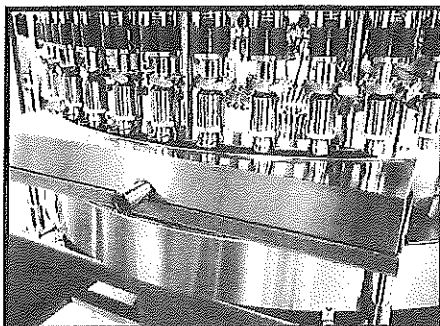
- SANITARY LIQUID SYSTEM
- ALL 316 S. S. LIQUID PARTS
- USER FRIENDLY
- HIGH SPEEDS
- ACCURACY
- EASY CLEANUP (CIP)
- HARD TO FILL PRODUCTS (FOAMY, PULPY, CHUNKY, VISCOUS, WATERLIKE)
- REAL GRAM REPORTING
- BATCH REPORTS
- AUTO-DELTA CORRECTION
- GLOBAL/INDIVIDUAL DELTAS
- % THROTTLE ADJUSTMENT
- STATION INHIBIT
- SECURITY CODE LOCKOUT
- VALVE CHANGE LOG
- REJECT SIGNALS
- RS 232 PORTS (2)
- MODULAR DESIGNS
- NO CONTAINER, NO FILL
- TECHNICAL BACKUP
- TRAINING COURSES/MATERIALS
- CUSTOM SOFTWARE
- FULL DIAGNOSTICS



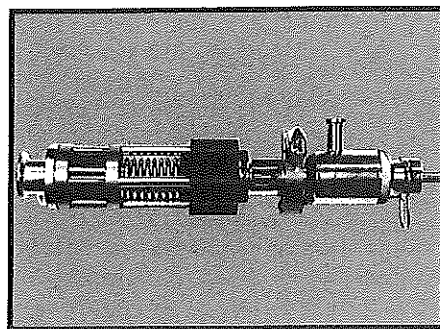
**All Stainless Steel** construction is available.



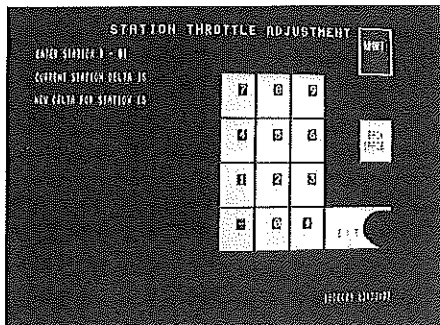
**Container contact** with the valve is eliminated in weigh filling.



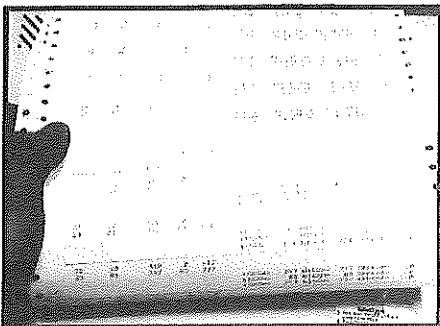
**Clean-up is simple** with a removable tray in the rear of the machine.



**Solid valve** design makes for an accurate and long-lasting machine.



**User friendly** controls make fill adjustments easy.



**Statistical printouts** are generated with operator and batch software.

### TECHNICAL TRAINING

In order to facilitate the installation of the USB **WEIGH FILLER** at your plant, we request that your technical staff take our classes at the manufacturing plant to familiarize themselves with the operation and capabilities of this machine.

### INFORMATION

Should you desire additional information concerning this machine or any U.S. Bottler's equipment, your interest will be best served by sending us a complete set of containers with the products to be filled. We can then determine your exact requirements, make the proper

recommendations, and quote accordingly. Our sales and engineering departments offer this service without any obligation on your part. Samples should be sent to the main office in Charlotte, N.C.



# Bottlers Machinery Company

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