

Technical News

Bulletin

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860 Servo Pusher

with Pocket Air Fingers and Versa-Cam Software



Introduction

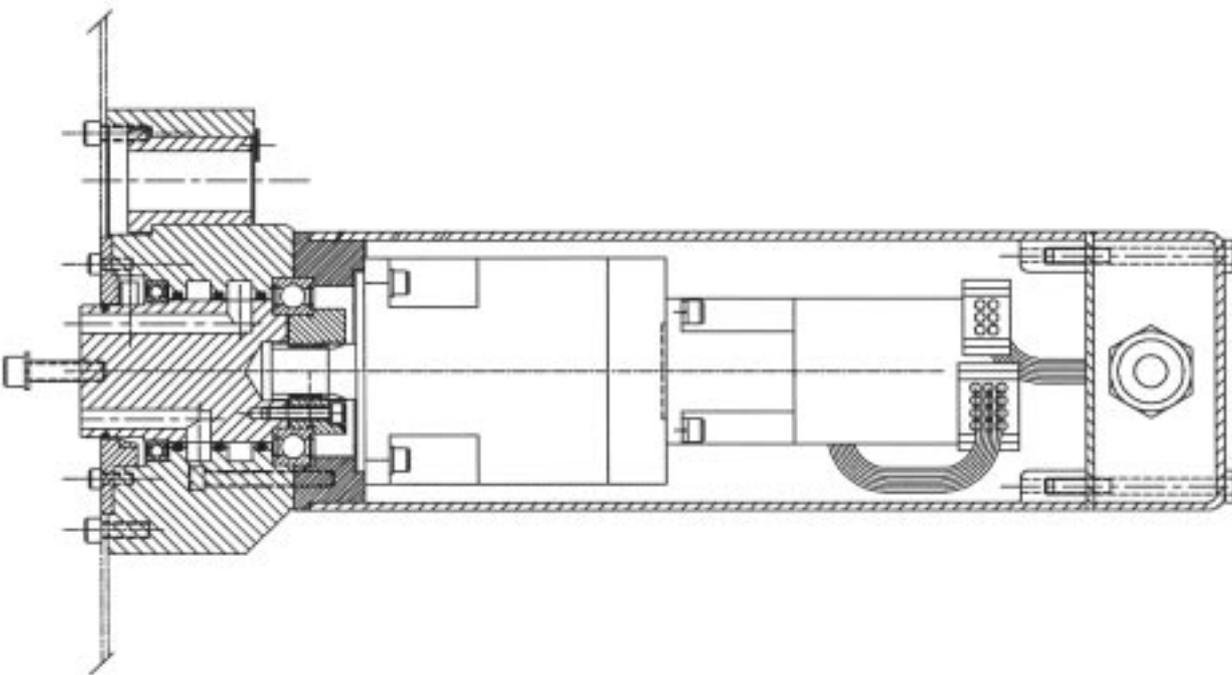
The Emhart 860 Pusher transfers glass containers from an IS (Individual Section) Machine to a high-speed conveyor belt. The 860 Servo Pusher is an electronically controlled pneumatic and servo-driven mechanism. The AC brushless servomotor provides the rotational motion of the pusher. An air valve controls the extending and retracting of the pusher cylinder and fingers. When the servo rotary motion and pneumatic extend and retract motion are combined, you have consistent and stable placement of containers on a high-speed production conveyor belt.

The 860 Pushers are designed to be integrated with the Emhart Pocket Air Finger option. The patented Pocket Air Finger system applies a stabilizing force through the pusher finger on hot glass containers while moving them from the deadplate to the conveyor. The pocket finger air operates independently from the pusher extend and retract function. This lets the operator configure the pusher system for optimum handling across the ware range.

860 Rotary Motion

The heart of the 860 Pusher is an AC brushless servomotor with a 50:1 gear reduction unit. The high-resolution mechanism provides the precise placement of glass containers on the moving conveyor belt. The AC brushless motor has direct feedback from a 1000 tick/motor revolution encoder that is mounted within the motor assembly. The motion resolution of .01 degrees provides quick, reliable feedback to the amplifier module.

This feedback not only allows for precise operation, but permits jam conditions to be detected quickly, preventing mechanism damage. The sealed bearings and self-contained gearbox do not require constant lubrication. This makes the rotary mechanism a maintenance free assembly. The simpler mechanism design permits both left and right hand applications to be run on the same rotary mechanism.



Controls

The 860 control system is designed to work on 220 volts AC, single phase, 10 amp, 50/60 hertz.

The 860 Pusher control can be integrated into Emhart's T-600 VLAN Forming Controls. This configuration provides user-friendly system configuration at the least cost to the customer. For customers that simply want to enhance their existing production line with an 860 Pusher system, the 860 Pusher controls can be configured in a stand-alone control cabinet. The stand-alone configuration permits the 860 controls to replace earlier version pusher systems as well as be applied to convert a competitor's pusher products.

Versa-Cam

Emhart's Versa-Cam software provides a convenient method to develop or alter custom electronic pusher cams. The software is offered as an option to the 860 Pusher product.

The Versa-Cam feature allows the experienced bottle maker to customize the ware handling cam profile. This allows the pushing process to be optimized for any particular container. Each individual 860 Pusher can have a different software loaded cam profile. The customer can select the optimum cam profile and "load" this cam profile to all other sections while the machine/conveyor/pushers are operating.

Improvements Over Earlier Models

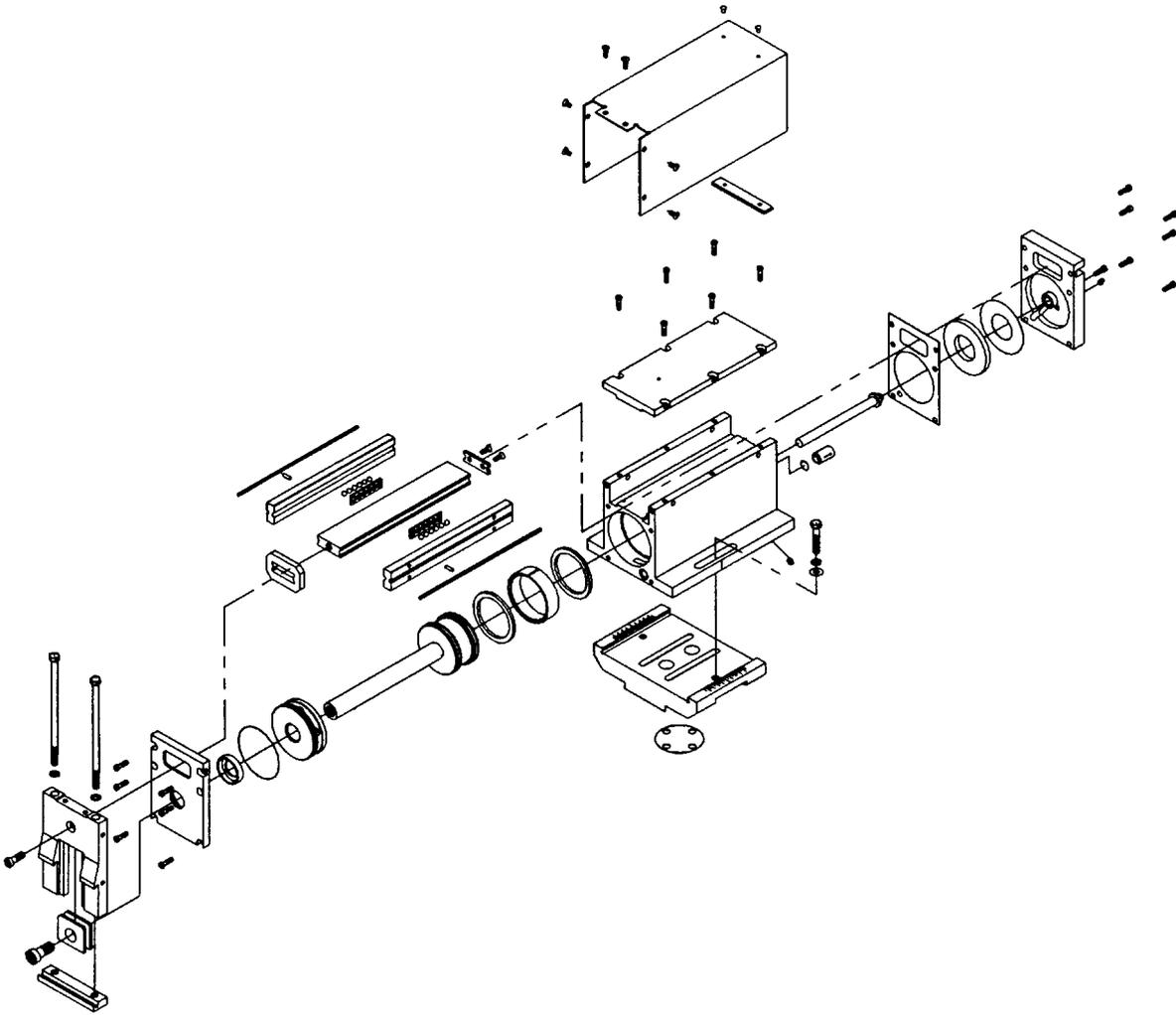
The 860 Pusher includes many significant improvements over the previous Emhart electronic pushers and competitively offered products.

A much simpler mechanism design results in smoother operation and greater reliability.

The new motor is precise, powerful, and smaller than previous motors. With the optional Versa-Cam, pusher parameters can be user definable, and if desired, a different pusher cam can be run on each machine section. The home and retract position for each pusher is programmable. Jam conditions are sensed electronically, preventing mechanism damage and boosting productivity. The rotary actuator mechanism is simpler and no longer requires continuous separate lubrication. Both right and left hand applications are possible with the new universal design of the mechanism.

When equipped with Pocket Air Fingers, the new design provides better performance at a lower cost than previous electronic models. Ware handling improvements help reduce ware defects and ware loss due to fallen or stuck ware. Smooth transfer permits closer spacing on the conveyor which, in turn, allows a slower belt speed operation. Ware handling is often the limiting factor in increasing I.S. Machine speed.

Cost/benefit analysis shows that even on existing pusher units, the retrofitting of Pocket Air Fingers will reduce ware loss and improve handling characteristics. Except in unusual cases the Pocket Air Finger assembly should be ordered on all new 860 Pusher units.



Upper Cylinder

The upper cylinder provides the extend and retract force for the pusher fingers as well as porting for the Pocket Air Finger operation. The speed and timing of the cylinder extend and retract are individually adjustable. This allows the optimum setup to be easily obtained. Emhart offers a variety of upper cylinders (4¹/₄" , 4³/₄" , 5") each in a variety of configurations. The flexible mounting system in combination with cylinder configurations makes it easy to configure a pusher mechanism for the customer's applications. The upper cylinder is a very low maintenance item designed to run consistently and predictably over its entire life.

Pusher Fingers

Emhart's pusher fingers have been designed with flexible and quick configuration in mind. Emhart's conventional fingers and Pocket Air Fingers offer a wide variety of finger configurations. The Pocket Air Fingers offer superior ware handling for tall containers. Pocket Air Fingers direct jets of air behind the containers, creating a partial vacuum. The partial vacuum pulls the container into the pocket and holds it there while the container is transferred to the conveyor belt. The pocket airflow and on/off timing are independently adjustable. These independent adjustments allow the operator to fine-tune the ware handling process.



Standard Emhart Pocket Air Fingers

Mold Spacing	EF 4 1/4" & 5 1/2" F 6 1/4" AIS	Belt Advance	Maximum Ware Size (MM)	Pusher Finger Spacing	Finger Height
3" TG	—	10 1/2"	1 3/8" (35)	3 1/2"	2 9/16"
3" TG	—	10 1/2"	1 3/8" (35)	3 1/2"	1 1/2"
3" TG	—	10 1/2"	1 3/4" (45)	3 1/4"	2 9/16"
3" TG	—	9"	2" (51)	3"	2 9/16"
4 1/4" DG	—	7 7/8"	2 7/8"	3 15/16"	2 9/16"
4 1/4" DG	—	10 1/2"	3 1/4" (83)	5 1/4"	2 9/16"
4 1/4" DG	—	11 13/16"	2 5/8" (67)	3 7/8"	2 9/16"
4 1/4" DG	—	13 1/8"	3" (76)	4 3/8"	2 9/16"
5" DG	—	7"	2 3/8" (60)	3 1/2"	2 9/16"
5" DG	—	8 3/4"	3 1/4" (83)	4 3/8"	2 9/16"
5" DG	—	10 1/2"	4" (102)	5 1/4"	2 9/16"
5" DG	—	10 1/2"	3 1/4" (83)	5 1/4"	2 9/16"
5 1/2" DG	—	10 1/2"	4 1/4" (108)	5 1/4"	2 9/16"
6 1/4" DG	—	10 1/2"	4 7/16" (113)	5 1/4"	2 9/16"
6 1/4" DG	—	13 1/8"	5" (127)	6 9/16"	2 9/16"

Benefits of Using the 860 Pushers

- Higher percent pack
- Reduced "down & stuck ware"
- Smoother operation
- Electronically sensed jam condition to prevent pusher damage
- Reduced inventories of spare parts due to universal mechanism for left or right hand operation
- Independent pocket air/upper cylinder controls
- Universal finger design handles round and non-round containers
- Easy diagnostics
- Fully integrated into VLAN Forming Control
- Can be configured to interface with other forming control systems

The improvements in the 860 Pushers provide economical and reliable ware handling for glass containers. Emhart's 860 Pusher with Pocket Air Fingers and Versa-Cam Software sets a new standard in ware handling.