FILLING & RELATED PROCESS IMPROVEMENTS

INCREASE PRODUCTION • REDUCE MAINTENANCE • REDUCE DOWNTIME • REDUCE SCRAP

DEPALLETIZING SOLUTION
FILLER CYLINDERS
VOLUMETRIC PUMP
CAM FOLLOWER WHEELS
EJECT SLIDE
CASE TURNING SOLUTIONS
We understand your unique requirements

Focused on the specific needs of the plastic packaging industry, PHD has worked with a wide range of continuous extrusion OEMs and user accounts to produce a variety of improved solutions for the industry.

Our components are the actuators of choice. Designed for long life, PHD products keep your blow molding lines running while increasing productivity and reducing downtime and scrap.

We also offer the added benefit of our rebuild program which refurbishes your existing PHD components, enabling even longer service life and savings.

See page 15 for more information.

To request more literature, visit www.phdinc.com/resources/inforequest/

Easy Drop-in
With longer life, reduced maintenance, and reduced downtime

We offer a wide variety of direct replacement components. Our drop-in components save you money by reducing costly production downtime and maintenance costs.

Many of our components provide up to twice the life of the original unit. This means longer run time for higher production and higher profits.

Superior Delivery
FASTER delivery than competitor

Excellent delivery saves you money by getting you back to business faster.

Unique Solutions

PHD offers a variety of components already designed to fit unique requirements. If your application requires a modified component from outside our large database of designs, our team is ready to help. We welcome special requests, regardless of quantity or frequency of order. See page 15.

Special Requirements

Rebuild Program
Return to Service

Our products can be rebuilt and put back in service for continued savings. Plus you will receive a "like new" warranty. See page 14 for more information.
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Slip Sheet Gripper Assembly

15 Different Combinations Available

MAJOR BENEFITS

• Modular assembly consisting of a GRM Clamp, an SBx Slide, and one transition plate
• The combination of clamp and slide is a robust design, providing long life
• The clamp provides a wide opening so slip sheets are not missed and a positive lock in the last six degrees of travel to firmly hold the slip sheet even when air pressure is removed
• The slide provides a rugged and rigid support mechanism utilizing two bushings and stout guide shafts for maximum load carrying capability
• Modular design for quick installation and easy maintenance
• Increased production and reduced maintenance costs are achieved
• Factory rebuild available which features a new part warranty from date of rebuild
• Local/Worldwide MDN network sales, service, and support
• PHD’s over 60 years of pneumatic actuator experience

Uses Series GRM Clamp
More compact design is lighter weight and for tight work areas

PHD has developed many combinations of slip sheet grippers based on application requirements.

<table>
<thead>
<tr>
<th>ML NUMBER</th>
<th>CLAMP</th>
<th>SLIDE</th>
<th>STROKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>314235</td>
<td>GRM2TN-2-30-30</td>
<td>SBH114x3-AE</td>
<td>3 in</td>
</tr>
<tr>
<td>310760</td>
<td>GRM2TS-2-30SDB-30SDB</td>
<td>SBH114x3-AE</td>
<td>3 in</td>
</tr>
<tr>
<td>310000</td>
<td>GRM2TN-2-15-15 (C4323)</td>
<td>SBL120x1</td>
<td>1 in</td>
</tr>
<tr>
<td>309633</td>
<td>GRM2TN-6-22-22</td>
<td>SBL520x25-J3</td>
<td>25 mm</td>
</tr>
<tr>
<td>307794</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x1</td>
<td>1 in</td>
</tr>
<tr>
<td>310477</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x1</td>
<td>1 in</td>
</tr>
<tr>
<td>310477</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x1</td>
<td>2 in</td>
</tr>
<tr>
<td>310412</td>
<td>GRM2TN-2-22-22</td>
<td>SBH120x2-AE</td>
<td>2 in</td>
</tr>
<tr>
<td>310136</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x2</td>
<td>2 in</td>
</tr>
<tr>
<td>310570</td>
<td>GRM2TH-2-15SDB-00 (C5034)</td>
<td>ML310567 (SBL120x2 side ported)</td>
<td>2 in</td>
</tr>
<tr>
<td>310600</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x2</td>
<td>2 in</td>
</tr>
<tr>
<td>309940</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x3</td>
<td>3 in</td>
</tr>
<tr>
<td>309126</td>
<td>GRM2TN-2-22-22</td>
<td>SBL120x3-AE</td>
<td>3 in</td>
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<tr>
<td>309841</td>
<td>GRM2TN-6-22-22</td>
<td>ML309843 (SBH520x100)</td>
<td>100 mm</td>
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<tr>
<td>309419</td>
<td>GRM2TN-2-22-22</td>
<td>SBH125x1</td>
<td>1 in</td>
</tr>
<tr>
<td>309260</td>
<td>GRM2TN-2-22-22</td>
<td>SBH132x6</td>
<td>6 in</td>
</tr>
</tbody>
</table>

All dimensions are reference only unless specifically tolerated.
ML310760 (with Series GRM1 Clamp)

All dimensions are reference only unless specifically tolerated.

www.phdinc.com • (800) 624-8511
DIMENSIONS: SLIP SHEET GRIPPER ASSEMBLY

ML314235 (with Series GRM1 Clamp)

ML307794 (with Series GRM2 Clamp)

All dimensions are reference only unless specifically tolerated.

www.phdinc.com  •  (800) 624-8511
Machine Lift Cylinder

ML314023 - ‘K’ Style spare component

MAJOR BENEFITS

- Used on ‘K’ Style volumetric filler machines
- Direct replacement for the previous OEM-supplied Norgren SPC/050198/25
- 40 mm bore x 25 mm stroke
- Food grade seals
- Stainless construction
- Tested for millions of cycles
- Hygienic design for washdown

All dimensions are reference only unless specifically tolerated.
### Major Benefits

- Reliable, field-tested design provides consistent performance.
- Replaces failure-prone diaphragm with simple piston design for superior operation.
- Round design more hygienic/cleaner, for easy washdown.
- Passivated stainless steel for food and beverage industry.
- Spare component for certain ‘K’ Style filler valves requires no modifications to implement this product.
- Lubricant free.
- Food grade seals.

### 2 Position Filler Cylinder

**ML312828 - ‘K’ Style 55 mm Bolt Spacing**

**ML313378 - ‘K’ Style 60 mm Bolt Spacing**

### Specifications

<table>
<thead>
<tr>
<th></th>
<th>ML312828</th>
<th>ML313378</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>0.414 in [10.5]</td>
<td>0.430 in [10.9]</td>
</tr>
<tr>
<td>Bore</td>
<td>1 in [25.4]</td>
<td>1-1/4 in [31.8]</td>
</tr>
<tr>
<td>Components</td>
<td>300 Series Stainless Steel</td>
<td>300 Series Stainless Steel</td>
</tr>
<tr>
<td>Piston Seal</td>
<td>Fluoroelastomer</td>
<td>Fluoroelastomer</td>
</tr>
<tr>
<td>Bushing</td>
<td>Composite</td>
<td>Composite</td>
</tr>
<tr>
<td>Cap Seal</td>
<td>PTFE</td>
<td>PTFE</td>
</tr>
</tbody>
</table>

### Notes:

1. Dimensions in [ ] are mm.
2. Unit features:
   - 1.000 [25.4] Bore
   - Stroke = 0.414 ±0.020 [10.5 ±0.5
3. This unit uses no lubrication.

All dimensions are reference only unless specifically tolerated.

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Series FCB Filler Cylinder

ML314051 - 'K' Style 45 40152 and 45 40156
ML314569 - 'K' Style 45 40150
ML314570 - 'K' Style 45 40155 and 45 40153

MAJOR BENEFITS

- Reliable, field-tested design provides consistent performance
- Replaces failure-prone diaphragm with simple piston design for superior operation
- Round design more hygienic/cleaner, for easy washdown
- Passivated stainless steel for food and beverage industry
- Spare component for certain 'K' Style filler valves requires no modifications to implement this product
- Lubricant free
- Food grade seals
- Reduced air volume for additional savings

All dimensions are reference only unless specifically toleranced.
Specialized Filling Application

Volumetric Pump

ML302807

MAJOR BENEFITS

- 303 Stainless steel body, piston rod, adjustment screws, sand fasteners
- Adjustable screw for volume adjustment
- Additional Buna-N quad seal for added sealing and protection
- Compact design
- Many other volumes and configurations available. Contact PHD for more information.

<table>
<thead>
<tr>
<th>SPECIFICATIONS</th>
<th>VOLUMETRIC PUMP</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIT WEIGHT</td>
<td>1 lb [454 g]</td>
</tr>
<tr>
<td>BORE SIZE</td>
<td>1 in [25.4 mm]</td>
</tr>
<tr>
<td>MINIMUM AIR PRESSURE</td>
<td>10 psi [0.7 bar]</td>
</tr>
<tr>
<td>MAXIMUM AIR PRESSURE</td>
<td>150 psi [10.3 bar]</td>
</tr>
<tr>
<td>TOTAL STROKE</td>
<td>.66 in [16.8 mm]</td>
</tr>
<tr>
<td>MAX. OPERATING TEMPERATURE</td>
<td>200°F [93°C]</td>
</tr>
<tr>
<td>DISPLACEMENT (AIR)</td>
<td>.553 in³ [9.06 mL]</td>
</tr>
<tr>
<td>DISPLACEMENT (PUMP)</td>
<td>.292 in³ [4.785 mL]</td>
</tr>
</tbody>
</table>

2X 1/8-27 NPT FLUID PORTS - CUSTOMER TO PROVIDE/INSTALL CHECK VALVES - ONE TO FREE FLOW IN AND ONE TO FREE FLOW OUT.

EXTEND PORT (SUPPLY AIR PRESSURE HERE TO PUMP FLUID OUT OF PUMP)

RETRACT PORT (SUPPLY AIR PRESSURE HERE TO DRAW FLUID INTO PUMP)

STROKE ADJUSTMENT (IT CAN TAKE THE STROKE TO ZERO)

NOTE COMMUNICATION HOLES LOCATION IN DETERMINING LOCATION OF AIR PORTS

All dimensions are reference only unless specifically toleranced.
Cam Follower Wheels

MAJOR BENEFITS

• Provides longer life than OEM product (up to 8 times in some instances)
• Competitive price point
• Can be produced in several materials to fit specific application requirements
• Can be produced in any size to fit a machine
• Can be designed for cappers, fillers, etc.
• Global availability and support

APPLICATION

On rotary machines, cams are used to drive containers, fill heads, and capping heads into position. Cam follower wheels roll on the cams to actuate the different processes.
Eject Slide

ML309590

Can be used to replace units provided by TapTone®, Filtec®, and others

MAJOR BENEFITS

- Provides rapid repeatable ejection function due to MAC valve design and PHD cylinder.
- High kinetic energy capacity
- Eject slide uses proven PHD thruster slide technology
- Provides faster delivery times than OEM product
- In many cases lower cost solution than OEM product
- Intended for high speed part rejection
- Other sizes available to meet application requirements

All dimensions are reference only unless specifically toleranced.
Overhead Case Turner

MAJOR BENEFITS

• Bolt-in replacement slide design
• PHD slides are field repairable, saving the customer additional cost.
• Standard SD/SE delivery times of one to four days
• Standard repair parts available
• Longer life than OEM product

Side Case Turner

Replacement for High Speed Case Palletizer
CVAS2V32x3-DB-TEE

MAJOR BENEFITS

• More robust pillow block mounting provides stronger pivot point.
• Spherical bearing allows for misalignment for increased durability.
• ISO/VDMA interchange for easy mounting (metric unit)
• Imperial unit provides simplified integration in imperial facilities.
• PTFE wear ring provides piston support and enhances durability.
• Built-in shock pads are standard, absorbing impact energy and eliminating metal to metal contact
• Increased piston seal retention for higher speed applications
• Cylinders, including port and cushion controls, are easily repairable, maximizing your investment.
Rebuild Program

Return your old units for rebuilding

Get a 12 Month “Like New” Warranty

Plastic Packaging Components such as Stretching Cylinders, Transfer Arms, Blow Nozzles, Filler Cylinders, Slip Sheet Grippers, and Eject Slides are rebuildable.

REBUILD IT YOURSELF OR ALLOW PHD?

PHD’s rebuild program can save your facility training, additional work load, possible tool requirements, and facility space to perform the rebuilds. In addition, you will receive a 12 month “like new” warranty.

PHD’s Rebuild Program refurbishes your existing PHD products with all new wear items.

Rebuilt units offer the same PHD quality that you’re used to, but for a fraction of the cost of a new unit, reducing your total cost of ownership.

Rebuilt units are placed back into service, thus reducing your total cost and saving valuable components from scrap.

All PHD factory rebuilt units receive a 12 month “like new” warranty.

Before:

After: This stretching cylinder was rebuilt and returned to service.
PHD Unlimited Unique Solutions® designs and manufactures units to meet the special requirements of our customers. We welcome and encourage requests for specialized products, regardless of quantity or frequency of order. Our solutions range from one-time-only units to high quantity requirements. With over 30,000 designs and over 100,000 quotes already in our database, we can provide most quotes within eight working hours.

When it comes to delivery, PHD is the best. Give us a call or go online and see how we can become your engineering partner.

**Capabilities**

- Most quotes delivered within eight working hours
- Dedicated application assistance
- 24 hours a day, 7 days a week service
- Fast delivery and competitive pricing
- Separate unique solutions engineering and manufacturing areas dedicated to our customers, ensuring prompt quotes and dependable delivery
- Over 30,000 unique solutions provided and over 100,000 quotes in our database

**Quotes Online**

- Available 24 hours a day, 7 days a week
- Enter and edit order prior to contact information
- Submit your quote and an MDN representative will contact you with a quote
- No minimum quantities are required
- CAD files available prior to ordering
- Geared towards short-run requests
- All units receive an “ML” number when ordered. This number, along with all specifications, is kept on permanent record at PHD for future reference and reorders.

www.phdinc.com/unlimited/quote

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**Angular Bottle Gripper ML313267**
Drop-in Festo replacement
Longer life than OEM product
Does not damage bottle preforms
Minimal jaw play
Switch slots offer flush mounting
Dowel holes on hardened steel jaws offer precise tooling location
Hardcoated aluminum body

**Parallel Preform Gripper ML312135**
Drop-in Festo replacement
Longer life than OEM product
Does not damage bottle preforms
Minimal jaw play
Switch slots offer flush mounting
Dowel holes on hardened steel jaws offer precise tooling location
Hardcoated aluminum body

**Filler Cylinder Can/Football Styles**
Drop-in component for “K” Style filler valves - Requires no modification to implement
Long life
Easy rebuild
Available with or without non-rotating feature
Reliable, field-tested design provides consistent performance, reducing under and over fills

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To request a free brochure, visit
www.phdinc.com/resources/inforequest/
OTHER SOLUTIONS

‘S’ STYLE

BCS Stretching Cylinders
‘S’ Style Series1, Series2 and Universal spare components
X27 PHD check valve option

BST1 Transfer Arm
‘S’ Style Series1 spare component
Significantly more robust and precise than other transfer arms
Designed to operate over 20 million cycles

BST Transfer Arm Preferential Head

BST2 Transfer Arm
‘S’ Style Series2 spare component
Vertical height adjustment eliminates need for shims
Designed to operate over 20 million cycles

Preform/ Bottle Eject Slide
‘S’ Style Series2 spare component
Consistently more robust and precise than other transfer arms
Designed to operate over 20 million cycles

Significantly more robust and precise than other transfer arms
Designed to operate over 20 million cycles

‘K’ STYLE

BCZ Nozzle Cylinders
‘S’ Style Series2 and Universal spare components
Valve manifold assembled to cylinder available as standard

BST1 Transfer Arm Preferential Head

BST2 Transfer Arm
‘S’ Style Series2 spare component
Vertical height adjustment eliminates need for shims
Designed to operate over 20 million cycles

Preform/ Bottle Eject Slide
‘S’ Style Series2 spare component
Consistently more robust and precise than other transfer arms
Designed to operate over 20 million cycles

Significantly more robust and precise than other transfer arms
Designed to operate over 20 million cycles

To request more literature, visit www.phdinc.com/resources/inforequest/

Eject Cylinders
ML309880 and ML310656
‘K’ Style spare component
Provides rapid repeatable ejection function due to MAC valve design and PHD cylinder.
High kinetic energy capacity
Provides faster delivery times than OEM product
In many cases lower cost solution than OEM product
Intended for high speed part rejection

‘K’ Style Series2 and Universal spare components
Simplified pneumatic system

Transfer Arm Head
ML311628
‘K’ Style spare component

To request more literature, visit www.phdinc.com/resources/inforequest/

ISO 9001 REGISTERED
Quality Management System Certified