



GRIPPING SOLUTIONS

A BRIEF OVERVIEW OF THE PHD GRIPPER LINE

phd



ANGULAR

PARALLEL

UNIQUE SOLUTIONS

ELECTRIC

SPECIAL JAW

HARSH ENVIRONMENTS

GRIPPERIB07



SOLUTIONS FOR INDUSTRIAL AUTOMATION

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www.phdinc.com • phdinfo@phdinc.com



PHD 1957

50 YEARS

OF DEDICATION

Since 1957, our customers have trusted PHD to produce high quality, reliable products for their automation needs.

Since PHD's humble beginnings, PHD has been focused on creating innovative solutions for its customers. PHD was the first to bring these products to the market:

- **Grippers**
- **Small Bore Cylinders – Tom Thumb® Series**
- **Escapements**
- **Multi-Motion Actuators**
- **Rack and Pinion Rotaries**
- **Spline Style Non-Rotating Cylinders**
- **Actuators with Switches**

PHD makes continuous investments into its equipment, facilities, and employees:

- **State of the art tools, machining centers, and programming systems**
- **26 horizontal mills and 12 lathes focused on large quantity runs with extra capacity to meet spikes in demand**
- **6 mills and 7 lathes dedicated to short run made-to-order parts**
- **85,000 sq. ft. assembly facility designed around product flow**
- **Dedicated assembly stations to reduce setup time**
- **Large inventory of parts to meet delivery schedules and customer demand**
- **Employees trained in multiple positions, instilled with a focus on quality, and an average of 12 years of experience at PHD**
- **Engineers with backgrounds in mechanical, electrical, and industrial engineering**
- **Automated test equipment for 100% product testing**

These investments allow PHD to be the industry leader in delivery as well as being nimble enough to create specialized solutions to solve its customers' problems.

All employees of PHD believe in the philosophy of "Provide the customers what they want, when they want it."

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delivery, service, & support



DISTRIBUTOR SUPPORT

PHD, Inc. is a proud member of the MAC Distributor Network (MDN). The MAC Distributor Network is a customer focused network of global manufacturers and distributors providing worldwide sales and exceptional service. With partners located worldwide, we are equipped to provide you a wide variety of value-added support and ongoing assistance.



ENGINEERING SOFTWARE

PHD's engineering software provides powerful design and selection tools at your fingertips. The software eliminates risk and simplifies your design process and component selection, while offering significant time savings.



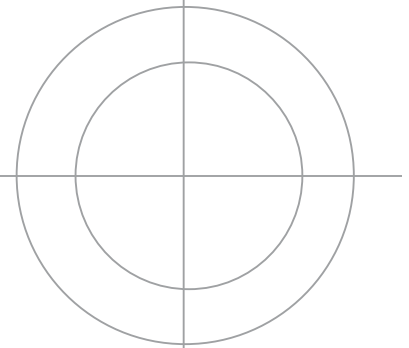
SUPERIOR DELIVERY

Nowhere in our industry is product delivery taken as seriously as it is at PHD. Even with the wide range of options offered on PHD products, shipping time in most cases is one to four working days. In today's fast-paced competitive markets, we understand the need for quick turnaround. With a track record of 98% on-time shipments, you can be assured of prompt delivery.

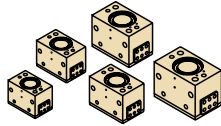


PHD UNLIMITED - UNIQUE SOLUTIONS™

Unique application designs require unique components. With over 50 years of experience, our PHD Unlimited team welcomes special requests for unique products, regardless of quantity or frequency of order. PHD is willing and able to develop drop-in replacement actuators for your toughest applications. Request quotes online at www.phdinc.com/unlimited.



PARALLEL GRIPPERS

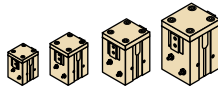


GRS

Low profile, high force
Rugged jaw support,
hardened jaws and
hardcoated bearing
surfaces

5 sizes

2 jaw travels each size

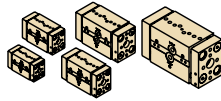


GRD

Very high grip force
to weight ratio for
efficient use of space
and power

Compact size

4 sizes



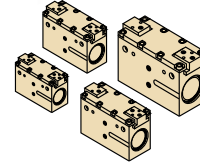
GRW

Jaws have large
tooling surfaces and
precision dowel holes
for accurate tooling
attachment

Large diameter
jaw guides allow
long tooling lengths
and high moment
capabilities and
reduce deflection

Dependable design

5 sizes

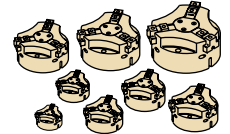


GRC

High grip force to
weight ratio

Available with locking
capability for retaining
the part upon loss
of removal of air
pressure

4 sizes



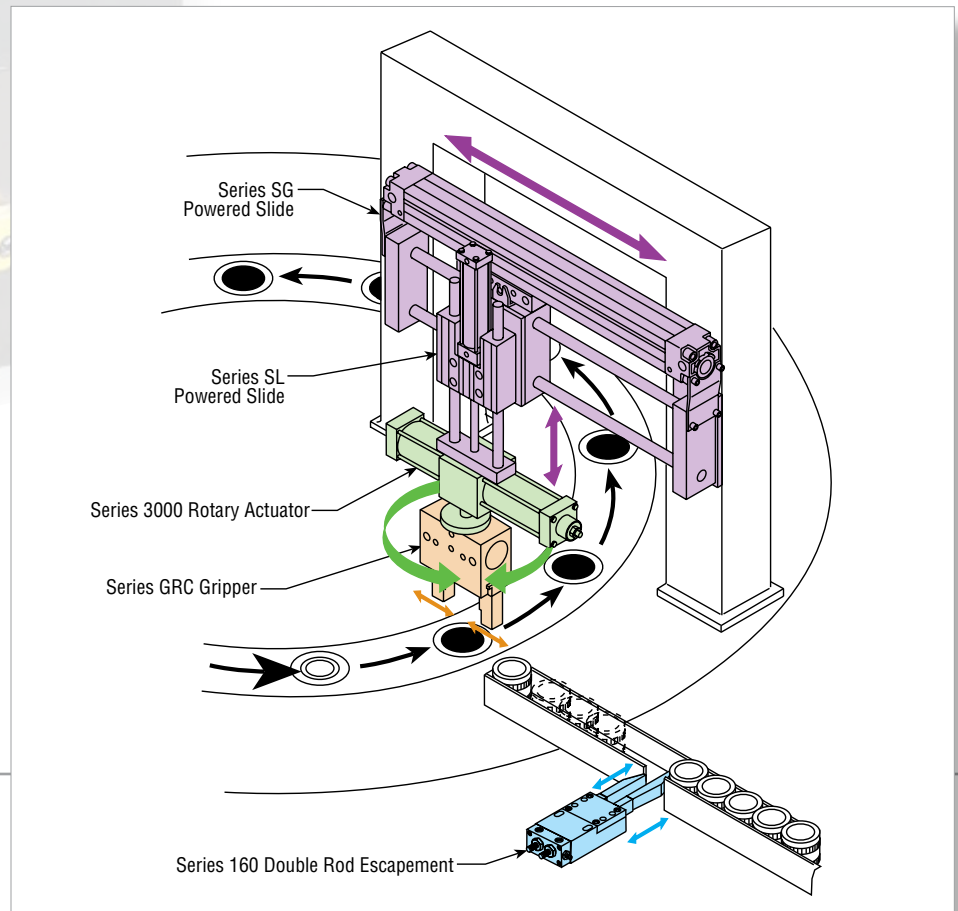
GRT

Three jaw design
provides self-centering
and maximum contact
between part and jaw
tooling

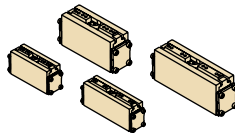
Ideal for high moment
applications

8 sizes

PHD powered slides, grippers, and multi-motion actuators are used in this multifunction system. This system automates the assembly and quality control of priming devices used in automotive airbag systems. PHD products perform part transfer, orientation, and clamping functions.



parallel



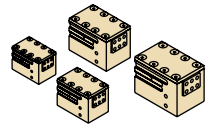
GRL

Parallel jaw motion simplifies jaw tooling design and is ideal for gripping parts of varying sizes

Narrow width, low profile, and long jaw travel

4 sizes

2 jaw travels each size



GRF

Low profile to fit limited space applications

Jaw covers help prevent contamination

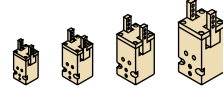
Rugged jaw support, hardened jaws, and hardcoated bearing surfaces ensure long life

4 sizes



Jaw Style 1

Jaw Style 2



190/191

Jaw Style 1

Compact size is ideal for handling small parts in confined areas

Units provide true parallel jaw travel for easy tooling design

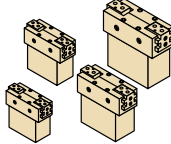
Jaw Style 2

Optional spring assist can be specified to obtain the maximum amount of gripping force

Mounting holes on one or three faces

4 sizes

2 jaw travels each size

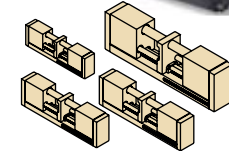


5300 Oval

Double acting for either internal or external gripper applications

Oval piston construction provides high grip force to weight ratio

4 sizes



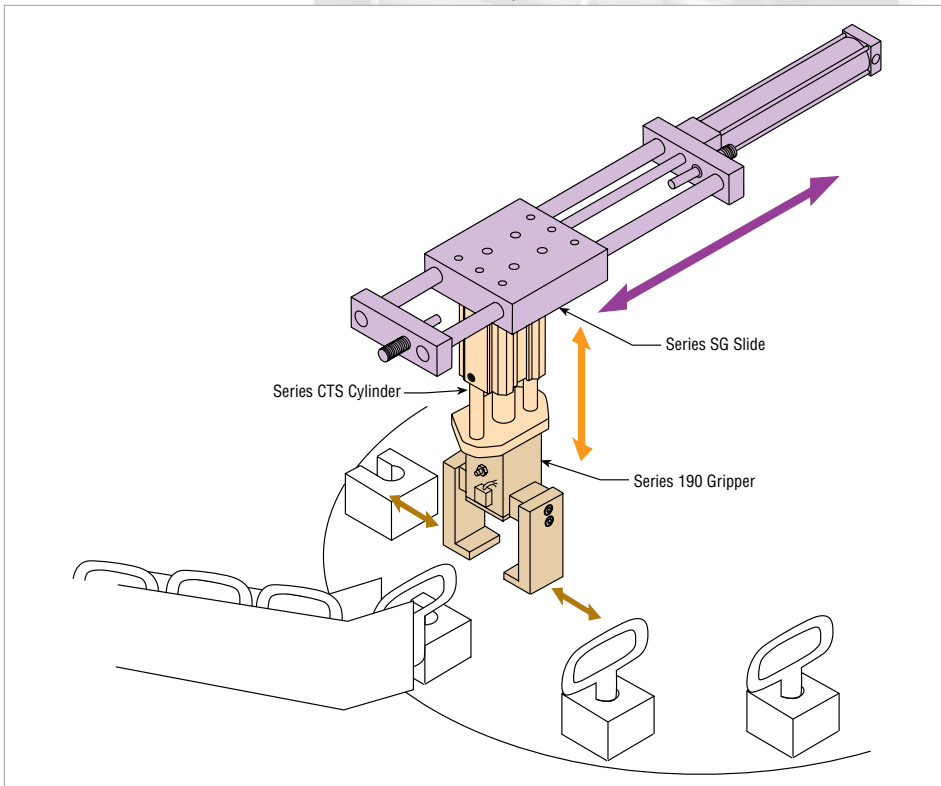
GRR

Ideal for high force and high jaw loads, moving heavy objects such as wheel rims can be done quickly

Narrow width and long jaw travel

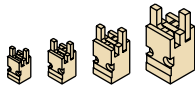
1 size

4 jaw travels

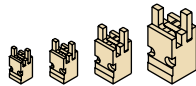


A PHD cylinder, gripper, and saddle powered slide provide cost effective automation for this assembly and pull test application. First the part is fed to the work platform using a Series CTS Guide Rod Cylinder as a light duty slide with a Series 190 Gripper affixed to the tool plate. Next, a saddle type slide and another Series CTS and 190 Gripper perform the final part assembly. The next stage of the application is a pull test to ensure proper part assembly. Finally the part is ejected into a completed parts bin.

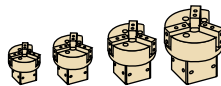
ANGULAR GRIPPERS



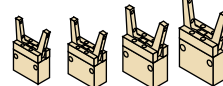
8400
Imperial
Compact size
Double acting for either internal or external applications
4 sizes



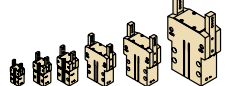
190
Metric
Compact size
Double acting for either internal or external applications
4 sizes



8600 3 Jaw
Double acting for either internal or external applications
4 sizes

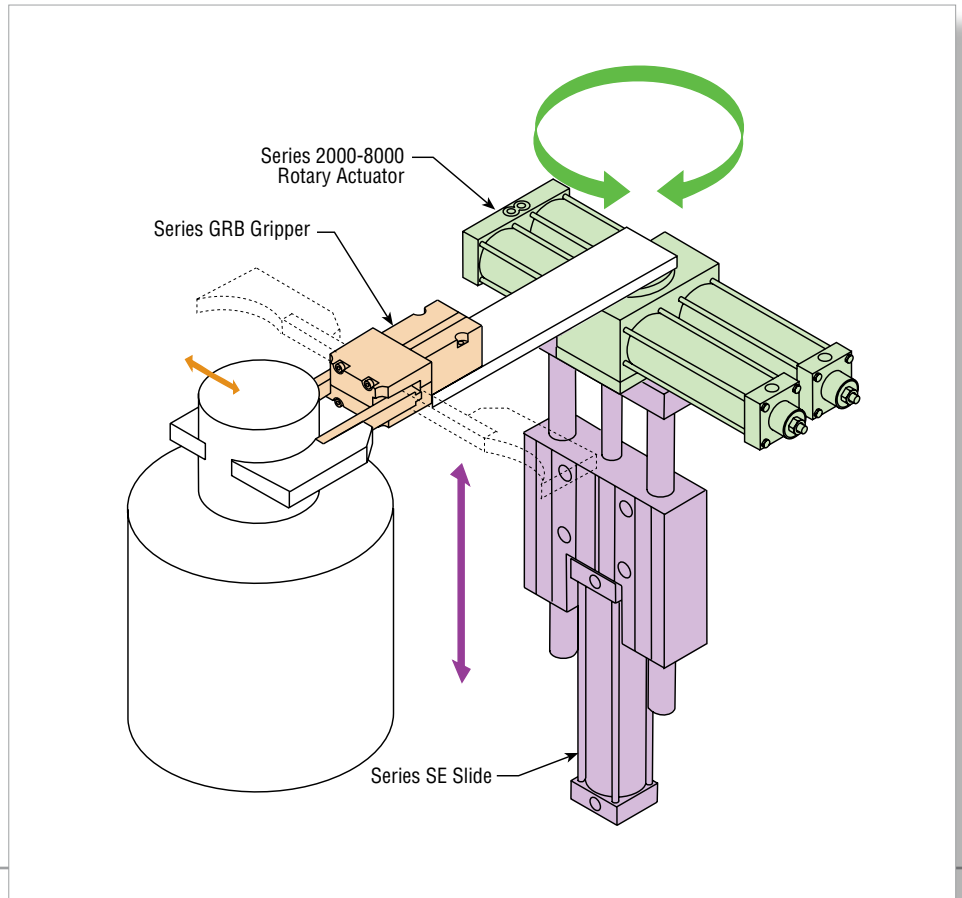
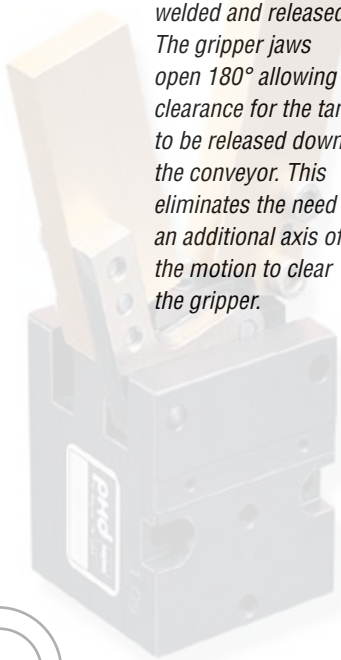


5300 Oval
Optional internal springs allow the unit to be used as a single acting gripper, for additional grip force, or for holding an object without air pressure
4 sizes

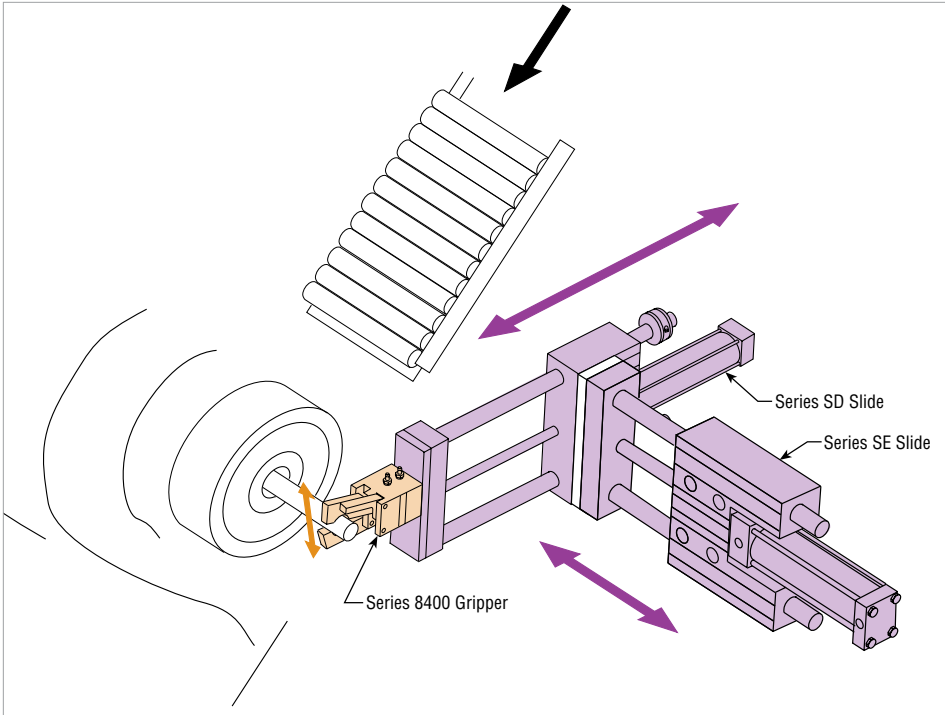


GRB
Three total jaw rotations are available 60°, 90°, and 180°
6 sizes

A PHD slide, rotary actuator, and gripper place and hold the shroud onto LP tanks. Once positioned, the shroud is spot welded and released. The gripper jaws open 180° allowing clearance for the tank to be released down the conveyor. This eliminates the need for an additional axis of the motion to clear the gripper.

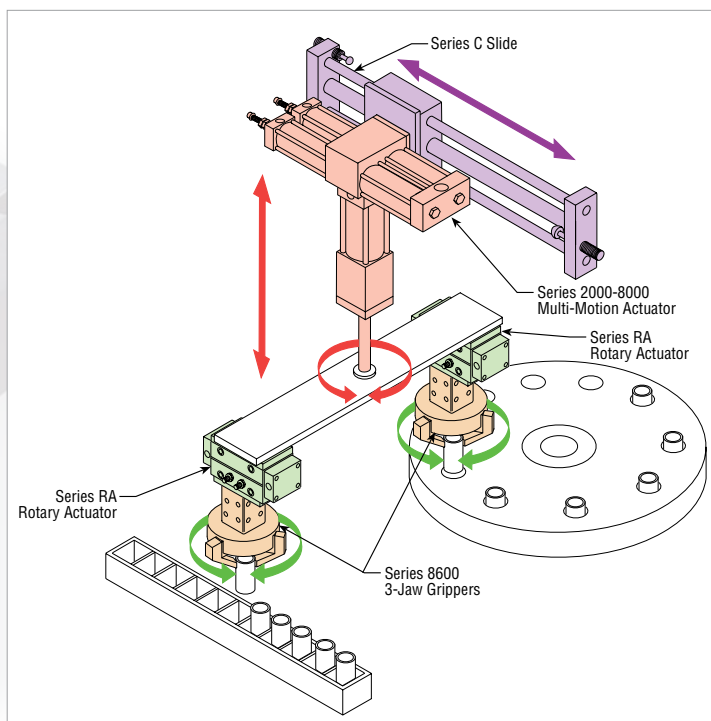


Angular



Less than one thousand dollars is invested in two PHD slides and gripper components, demonstrating a classic example of simple automation. The two slides are assembled in an X Y orientation with the gripper acting as the material handling device. The material is presented by an overhead track and placed into the spindle for several machining stations. Upon completion, the part is removed and placed into a drop chute.

Powered slides, rotary actuators, multi-motion actuators, and grippers are used in this custom built machine designed for the transfer of fittings onto and off of a round table multi-station machining work cell.





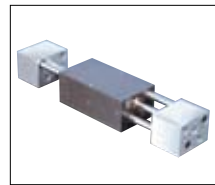
GRB with Special Lube
ML303143
CLASS 1
Unit with special high temperature non-toxic lubrication



Low Breakaway GRW
ML308186
CLASS 2
Special seals for 20 psi max breakaway



Position Feedback
ML306735
CLASS 3
Linear transducer for jaw position feedback
PHD LitStore
CP306735



GRW with Long Jaw Travel
ML301025
CLASS 4
Longer than standard jaw travel



Rod Gripper
ML308060
CLASS 5
Grips rods 4 mm Ø

REPLACEMENTS



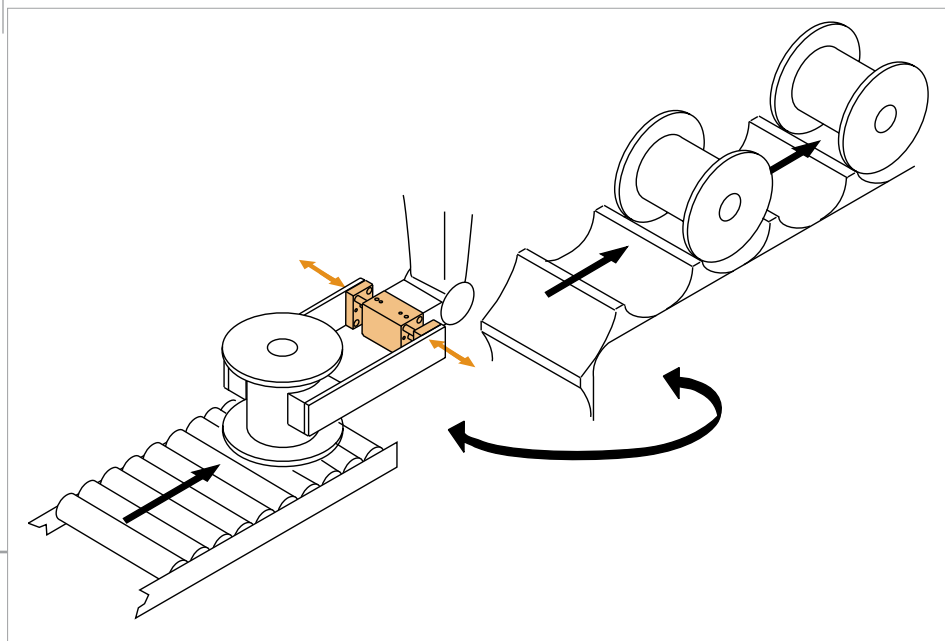
Three Position Gripper
ML308123
CLASS 5
Synchronized jaws
Replacement gripper



Robohand Replacement
ML307584
CLASS 5
Direct replacement for Robohand RA-10



Robohand Replacement
ML304302
CLASS 5
Direct replacement for Robohand RA-5



The long travel of this unique Series GRW Gripper can be used in numerous applications where longer travel is required, without a major increase in unit weight. One application grips an empty wire spool off one conveyor line, via a robotic arm, then reorients and places the spool on a new conveyor.

unique



Dual Jaw Gripper

ML305289

CLASS 5

2 sets of synchronized jaws

Each set of jaws are independently operated



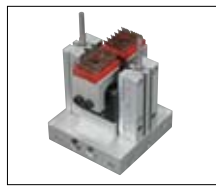
PET Angular Gripper

ML301141

CLASS 5

PET body and stainless steel jaws

PHD LitStore CP027



Carpet Gripper

ML305112

CLASS 4

Modular device - gripper/cylinder combination



Heavy Duty 3 Jaw Gripper

ML305843

CLASS 5

Large 3 jaw gripper
300 mm diametral travel

PHD LitStore
CP305843

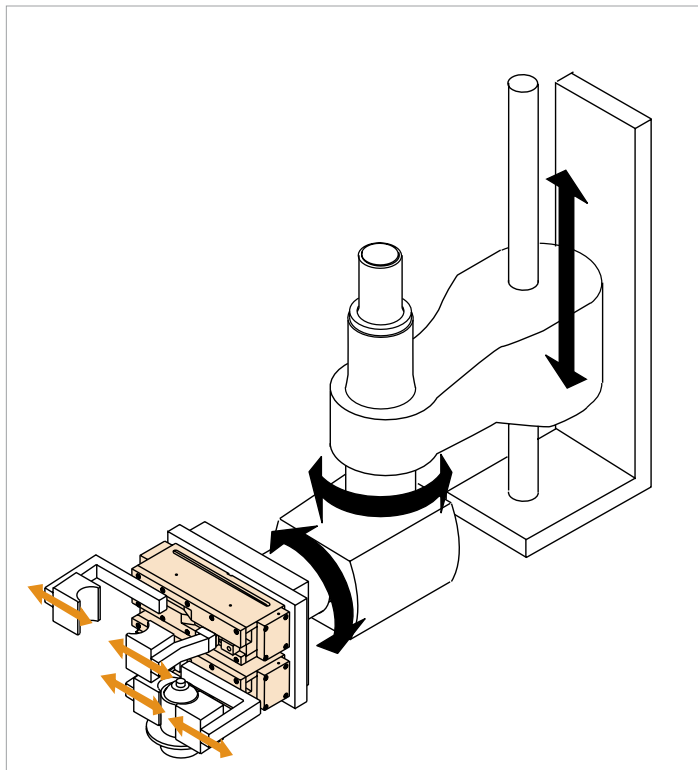


Stainless Steel/Plastic Gripper

ML302657

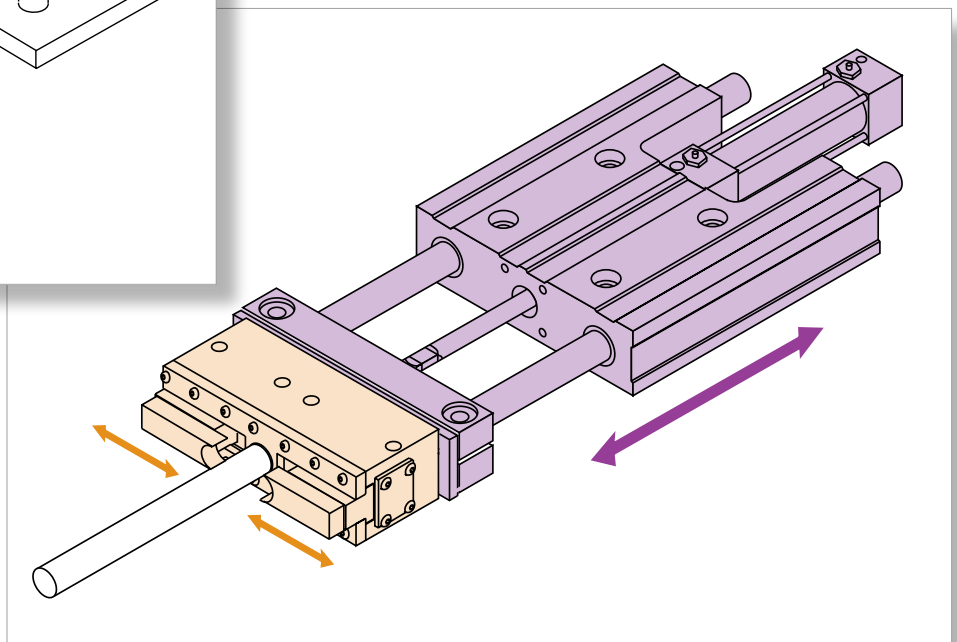
CLASS 4

PET plastic body & stainless steel jaws



Many pick and place applications use a gripper to pick the part and an external process to determine the correct location to place the part. Using position feedback PHD has created grippers that can pick the part as well as determine its required final location. These units may also be used for quick part inspection.

The gripper is designed to allow a tube to be extended through the body. When the gripper closes, the jaw tooling grasps the outer tube. As the slide retracts, the gripper skives the end of the tube.



other standard products

CLAMPS

The PHD Clamp Division

The Clamp Division has been a part of PHD's team since 1998. Our base product is the GRM Clamp which can be specialized in numerous ways, and that's just the beginning. We have also designed products ranging from number stamping clamps to heavy and light part lifters. But, what makes the Clamp Division unique is our commitment to providing the customer what they want, when they want it. Every Clamp Division product has been proposed by a customer and carefully designed around their needs. By meeting with the customer, we are able to quickly provide prototypes and beta models the customer can test on-site. Clamp Division engineers keep in contact with the customer throughout the entire process, making adjustments to the actuators as needed. Using this consultative approach allows the Clamp Division to create a product ahead of the competition that has a great need in the industry. It's proven success time and time again.



PLL Lite Lifter



PDG Disappearing Gage

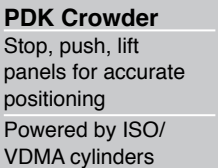


PNC Number Cruncher®

Stamp IDs into parts
High clamp force at 70 psi [4.8 bar]
Operates in less than .24 seconds
Eliminates part changing downtime

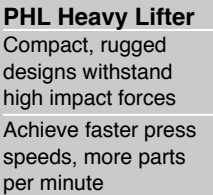


For more information, request the PHD Clamp Binder



PDK Crowder

Stop, push, lift panels for accurate positioning
Powered by ISO/VDMA cylinders



PHL Heavy Lifter

Compact, rugged designs withstand high impact forces
Achieve faster press speeds, more parts per minute



PS Reach & Pick

Powered with only one external valve
Clamp jaws stay open until slide is fully extended
Clamp can be spherically adjusted to match panel
Clamp jaws remain closed if pressure is lost



GRM - 12 jaw styles available

Standard, Flange, Needle nose, Hammerhead, Single Shovel, Double Shovel, Single Flat Shovel, Double Flat Shovel, Single Chisel, Double Chisel, Hook, and G Jaw
Sheet metal handling applications
Two sizes
Modular designed tips
Simple design, long life, high clamp force
Fully field-repairable



PA Swing Arm

Ideal for a wide variety of automated part holding and transfer applications



PB Swing Arm

Ideal for part holding and transfer welding applications



PLASTIC PACKAGING COMPONENTS

The PPC Group

This dedicated group of PHD is focused totally on the specific needs of the plastic packaging industry. We have a full line of automation components: from standard stretch rod, blow nozzle, and needle cylinders, preform/bottle eject slides, transfer arms to grippers, cylinders, and escapements. The possibilities are virtually endless.

If an application requires a modified component, our Plastic Packaging Components team is ready to help. We welcome special requests for unique products, regardless of quantity or frequency of order. PHD and your local MDN partner will work closely with you to find a solution to your application needs.



For more information, request the PPC Binder



BST Transfer Arms

Direct replacement
Significantly more rigid design than other transfer arms
Designed to operate over 20 million cycles



BCZ

Nozzle Cylinder
Direct replacement
Direct valve manifold provides quicker response with higher kinetic energy capacity



BCS Stretch Rod Cylinders

Direct replacement
Mounts into the same space and bolt patterns
Superior delivery
Longer life and reduces maintenance



Needle Cylinders

Direct replacement
Mounts into the same space and bolt patterns



- Provides significantly longer life and reduces maintenance and downtime
- Reduces "suckback," improves exhaust

We also have:

- Needle Cylinders
- Leak Test Cylinders
- Knock Out Cylinders
- Removal Cylinders & Grippers
- Labeling & Slide Knife Actuators
- Packaging & Palletizing
- Long Life Bushings & Bearings
- Cut Sheet Thermoforming
- Preform/Bottle Ejectors

other standard products



CYLINDERS • SLIDES

ROTARY ACTUATORS • ESCAPEMENTS

We have a full line of components: cylinders, escapements, grippers, slides, rotary actuators, clamps, multi-motion actuators, and proximity switches and sensors to provide the motion you require. With millions of component variations, we can help move, turn, slide, lift, grip, reach, rotate, and clamp almost anything to increase your productivity.

Our components are completely modular. Using either bolt direct units or transition plates, our actuators can be combined to create millions of application variations.

If an application requires a modified component, our PHD Unlimited team is ready to help. We welcome special requests for unique products, regardless of quantity or frequency of order. Ask for the Unique Solutions brochure for more information.

The products, supported by our strong commitment to delivery, service, and quality have made us a leader in the modular automation industry.



For more information, request the PHD Image Brochure



Series CV Cylinder

Conforms to ISO 6431 and VDMA 24562 specifications

Available in eight bore sizes



Series CRS Cylinder

Compact size is ideal for applications where length is critical

High force, long life, and short stroke lengths ranging from 1/4" to 7" [5 to 175 mm]



Tom Thumb® Cylinders

Known for their durability and versatility

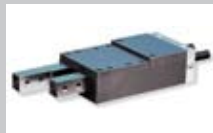
Multi-position, cleanroom, and non-rotating rod designs are available



Series LC Escapement

For separating and releasing parts being presented from systems

Large rod bearing area ensures high side load capacity and long life



Series 160 Escapement

Two fixtured, squared shafts with internally sequenced strokes work with your tooling to isolate a single part for continuation

Available with switches



Series SD Slide

Exceptional performance and low price

Available in a variety of sizes

Streamlined, thruster style with up to 28" of travel



Series SE Slide

Rugged, precise linear motion with minimum deflection

Offer many options, high performance and exceptional value



Series SFM Slide

Multiple midstops
Space saving rodless slide design

Lowest deflection and highest moment capacity combination in the industry



Series 1000-8000 Rotary Actuator

Larger series units are available for applications requiring 31,800 in-lb of torque
Rugged design



Series RCC Rotary Actuator

Low profile
High thrust loads
Low maintenance
Available in three sizes with standard rotations of 90° and 180°

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other standard products