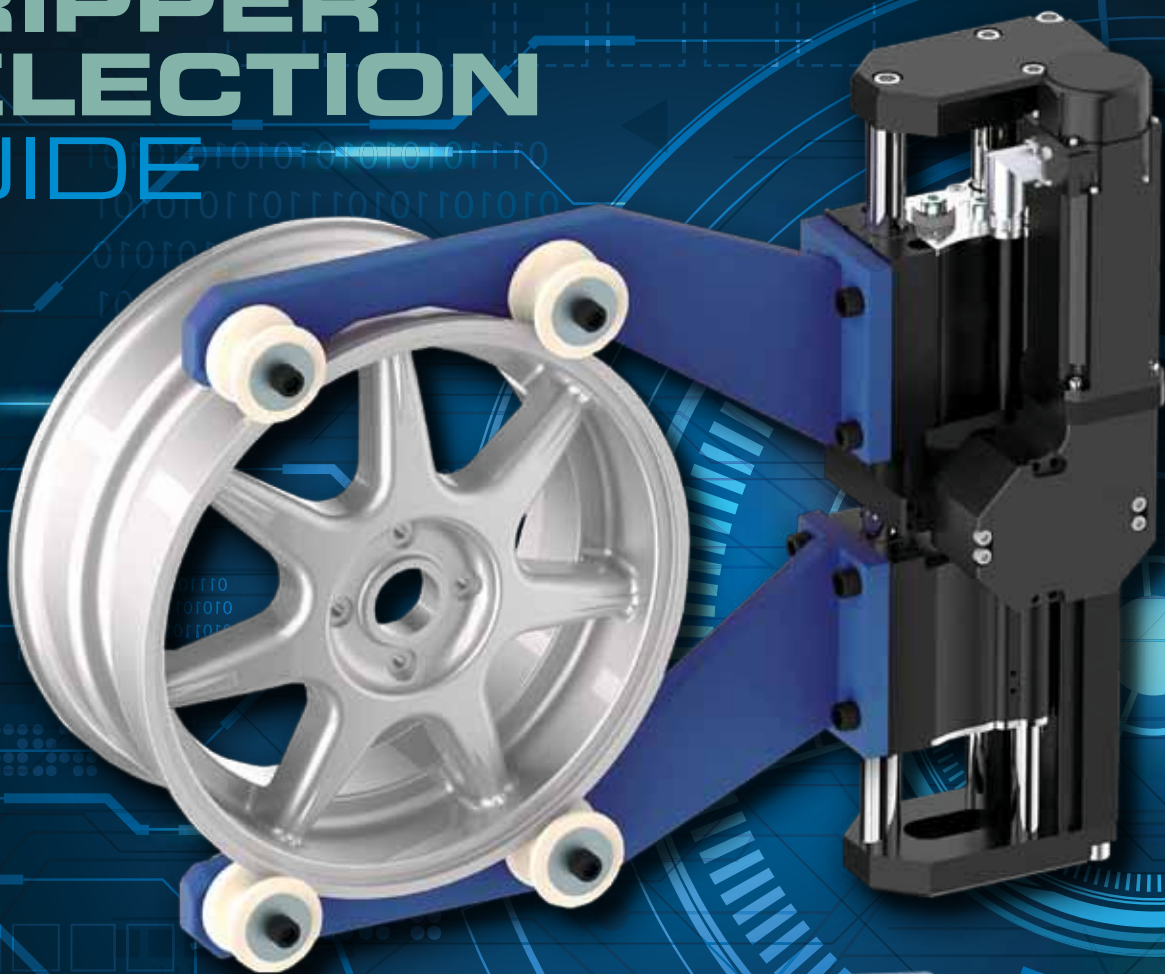


*The Right Gripper for Your Part*

# GRIPPER SELECTION GUIDE



- Robotic end effector solutions
- Angular and parallel, many sizes and options available
- For handling various sized parts
- Superior design and delivery

**ISO 9001  
REGISTERED**

Quality Management  
System Certified

GRIPB17



PHD is a member of the  
MAC Distributor Network

**phd**   
SOLUTIONS FOR INDUSTRIAL AUTOMATION

[www.phdinc.com](http://www.phdinc.com)

quality experience



Based in Fort Wayne, Indiana, PHD, Inc. is a leading manufacturer of pneumatic, hydraulic, and electric powered devices helping companies across all industries optimize automation and manufacturing processes. Our broad product portfolio, unique options, and made-to-order manufacturing processes set us apart in the industry.

### **STANDARD PRODUCTS**

Our full line of automation components provides flexibility, durability, and repeatability while welcoming the challenge of many different types of operating environments.

- Cylinders
- Escapements
- Grippers
- Linear Slides
- Rotary Actuators
- Clamps
- Multi-Motion Actuators
- Switches & Sensors

### **UNIQUE SOLUTIONS FOR UNIQUE NEEDS**

PHD has dedicated an engineering group, Unlimited Unique Solutions®, to exclusively meet unique requests by designing and building unique solutions based on specific requirements.

- Customer-driven solutions to meet application-specific needs
- PHD's database includes more than 35,000 existing unique designs
- With 100,000 quotes in the database, most quotes are sent the same day
- Unique solutions are often delivered faster than a competitor's standard product
- No minimum of quantity or frequency of order required

Because of our wide variety of actuators, options, and accessories, nearly every standard PHD unit is manufactured to order. Our factory capabilities allow us to modify standard products within our everyday processes, and producing a unique solution is simple and fast.

### **DELIVERY & SUPPORT**

We provide fast delivery to reduce your inventory costs and keep your production schedule on track. Choosing and designing a solution for your specific industrial automation needs has never been easier or faster.

- Local and worldwide distributor support
- Powerful engineering software and web tools simplify and save design time
- Factory-trained application and industry specialists ensure a cost-effective and field-proven solution

**REBUILD  
REPAIR  
RECYCLE**

- PHD's Rebuild Program refurbishes existing PHD grippers with new wear items.
- Rebuilt grippers offer same PHD quality, but for minimal cost
- Rebuilt grippers are placed back into service, reducing total cost and saving valuable components from scrap.
- Rebuilt grippers receive 12 month "like new" warranty.

See page 4.

Let us handle the sizing and get you the right actuators and **CAD** models you need.



## TABLE OF CONTENTS

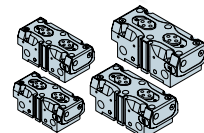
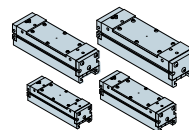
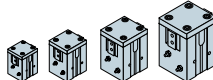
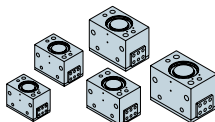
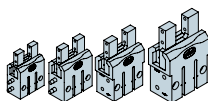
Parallel Grippers	4 & 5
Angular Grippers	6
Electric Parallel Grippers	7
Clamps	8 & 9
Unique Grippers	10 & 11
Other PHD products	12





# PARALLEL GRIPPERS

parallel



## GRA

**Grip Force:**  
2.55 to 27.7 lb  
[11 to 123 N]

**Nominal Jaw Travel:**  
0.158 to 0.512 in  
[4 to 13 mm]

Compact, flexible design for large moment capacities and longer tooling

Fully supported hardened steel jaws for long life, minimal wear and high moment capability

Robust construction

## GRS

**Grip Force:**  
68 to 289 lb  
[302 to 1287 N]

**Nominal Jaw Travel:**  
0.177 to 1.732 in  
[4.5 to 44 mm]

Low profile, high force

Rugged jaw support, hardened jaws and hardcoated bearing surfaces

2 jaw travels each size

## GRD

**Grip Force:**  
33 to 91 lb  
[147 to 406 N]

**Nominal Jaw Travel:**  
0.187 to 0.699 in  
[4.75 to 17.75 mm]

High grip force to weight ratio

Two body styles

Spring assist on open or close

Compact size

10 million cycles

## GRH

**Grip Force:**  
12 to 75 lb  
[53 to 334 N]

**Nominal Jaw Travel:**  
1.969 to 4.921 in  
[50 to 125 mm]

Corrosion-resistant and robust construction

Dual bore provides higher total grip force

Extended support guide system with wide slot jaws minimizes tooling deflection

Low breakaway allows for gripping of delicate parts

## GRK

**Grip Force:**  
86 to 805 lb  
[383 to 3581 N]

**Nominal Jaw Travel:**  
0.256 to 1.024 in  
[6.5 to 26 mm]

Low profile, high grip force

Exceptional gripping forces and high moment capabilities

High precision movement maintained

Ultra-rigid, wear-compensating, jaw guidance system

Long or short jaw travels each size

# REBUILD REPAIR RECYCLE

Before:  
After normal service life this GRH Gripper was rebuilt and returned to service.

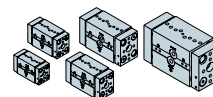
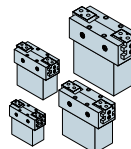
**12 Month  
"Like New" Warranty**



After

## How does the program work?

- PHD's Rebuild Program refurbishes your existing PHD grippers with all new wear items.
- Rebuilt grippers offer the same PHD quality that you're used to, but for minimal cost versus purchasing a new gripper.
- Rebuilt grippers are placed back into service, thus reducing your total cost and saving valuable components from scrap.
- All PHD factory rebuilt grippers receive a 12 month "like new" warranty.



## 5300 Oval

**Grip Force:**  
128 to 980 lb  
[570 to 4356 N]

**Nominal Jaw Travel:**  
0.62 to 1.80 in  
[15.8 to 45.8 mm]

Double acting for either internal or external gripper applications

Oval piston provides high grip force to weight ratio

## GRW

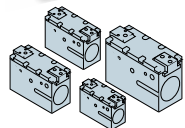
**Grip Force:**  
36 to 429 lb  
[160 to 1908 N]

**Nominal Jaw Travel:**  
0.79 to 4.61 in  
[20 to 117 mm]

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



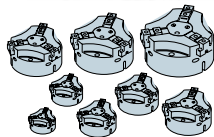
## GRC

**Grip Force:**  
96 to 870 lb  
[427 to 3870 N]

**Nominal Jaw Travel:**  
1.00 to 3.07 in  
[25.5 to 78 mm]

High grip force to weight ratio

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



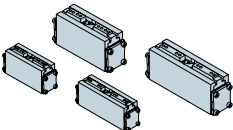
## GRT

**Grip Force:**  
44 to 1452 lb  
[196 to 6459 N]

**Nominal Jaw Travel:**  
0.236 to 1.575 in  
[6 to 40 mm]

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

Ideal for high moment applications



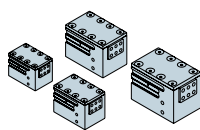
## GRL

**Grip Force:**  
28 to 41 lb  
[124 to 182 N]

**Nominal Jaw Travel:**  
0.28 to 1.02 in  
[7 to 26 mm]

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

Narrow width, low profile, and long jaw travel



## GRF

**Grip Force:**  
30 to 85 lb  
[135 to 378 N]

**Nominal Jaw Travel:**  
0.177 to 0.512 in  
[4.5 to 13 mm]

Low profile to fit limited space applications

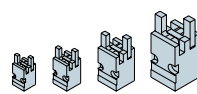
Jaw covers help prevent contamination

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



Jaw Style 1

Jaw Style 2



## 190/191

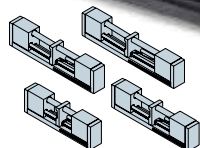
**Grip Force:**  
3.2 to 42.6 lb  
[14 to 190 N]

**Nominal Jaw Travel:**  
0.157 to 0.866 in  
[4 to 22 mm]

Compact size is ideal for handling small parts in confined areas

Units provide true parallel jaw travel for easy tooling design

Optional spring assist can be specified to obtain maximum amount of gripping force  
2 jaw styles



## GRR

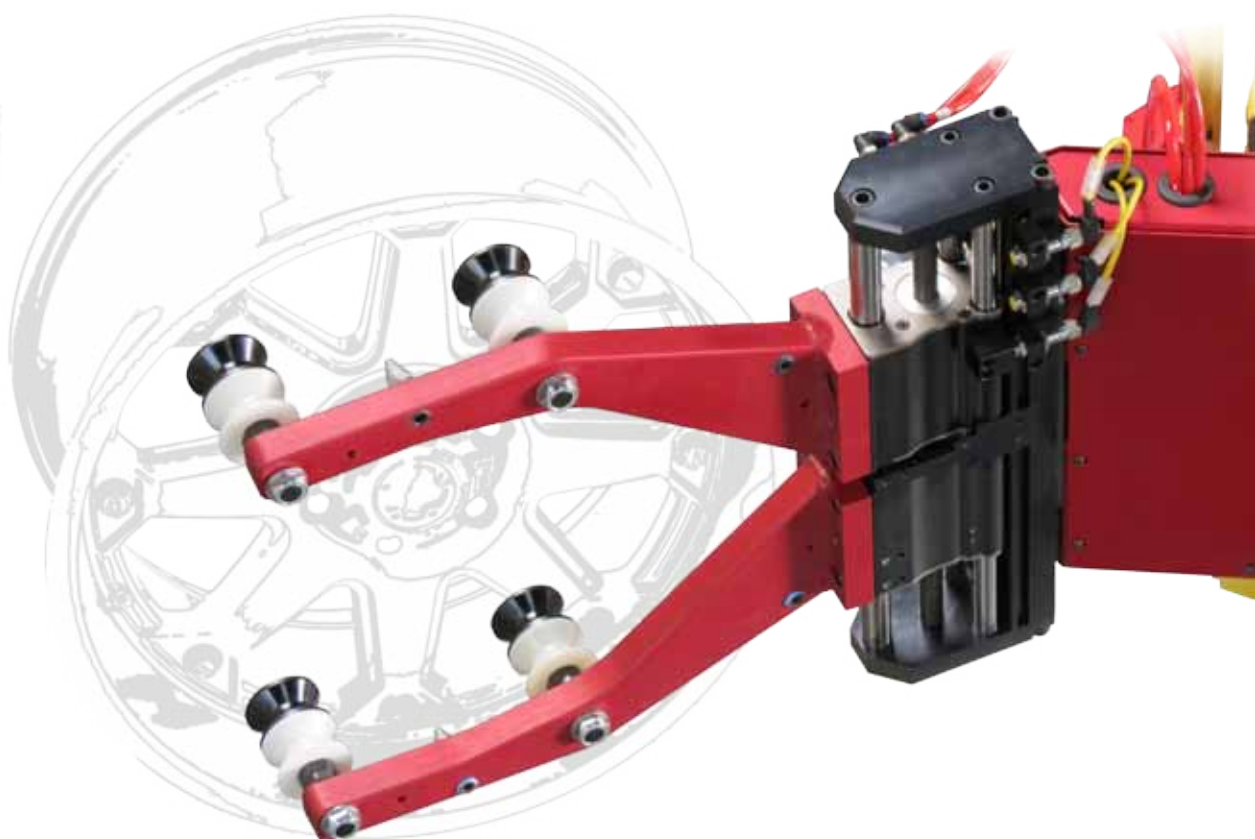
**Grip Force:**  
704 lb  
[3131 N]

**Nominal Jaw Travel:**  
5.906 to 13.780 in  
[150 to 350 mm]

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

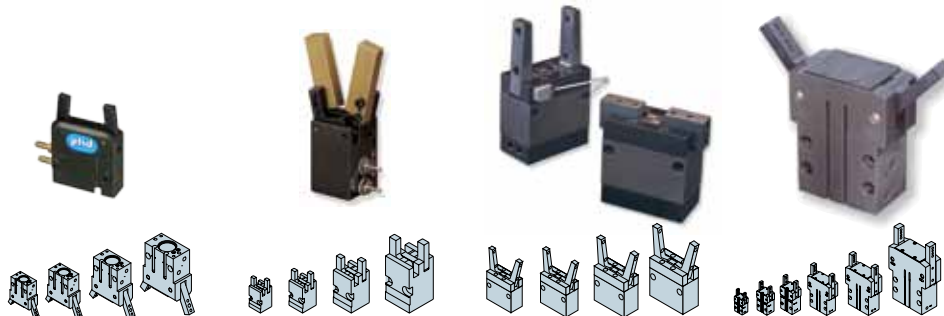
Available as electric (page 7)





# ANGULAR GRIPPERS

angular



## GRV

**Grip Force:**  
2.0 to 28 lb  
[10 to 159 N]

**Minimum Distance:**  
0.322 to 0.594 in  
[8.2 to 15.1 mm]

Compact, flexible design provides large moment capacities and long tooling lengths

Robust construction ensures long operating life

Double acting for use in both internal and external gripping applications

## 8400

**Grip Force:**  
11.7 to 81 lb  
[52 to 359 N]

**Minimum Distance:**  
0.200 to 0.62 in  
[5.1 to 16 mm]

Imperial

Compact size

Double acting for either internal or external applications

## 5300 Oval

**Grip Force:**  
201 to 2167 lb  
[894 to 9639 N]

**Minimum Distance:**  
0.81 to 1.68 in  
[21 to 43 mm]

Optional internal springs allow unit to be used as single acting gripper, for additional grip force, or for holding object without air pressure

## GRB

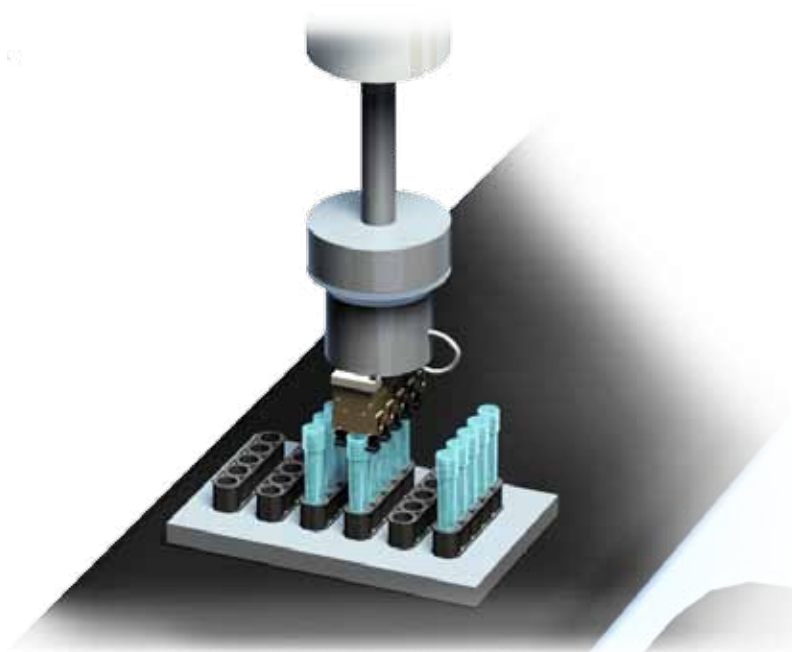
**Grip Force:**  
13 to 549 lb  
[57 to 2443 N]

**Minimum Distance:**  
0.44 to 1.90 in  
[11.3 to 48.3 mm]

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

Potentially eliminates need for additional axis in some applications

**NOTE:** Gripping force is at the corresponding minimum distance (from the jaw pivot) at 87 psi [6 bar] (pneumatic). Optional spring assist can increase the gripping force or be a safety device on the Series 5300.

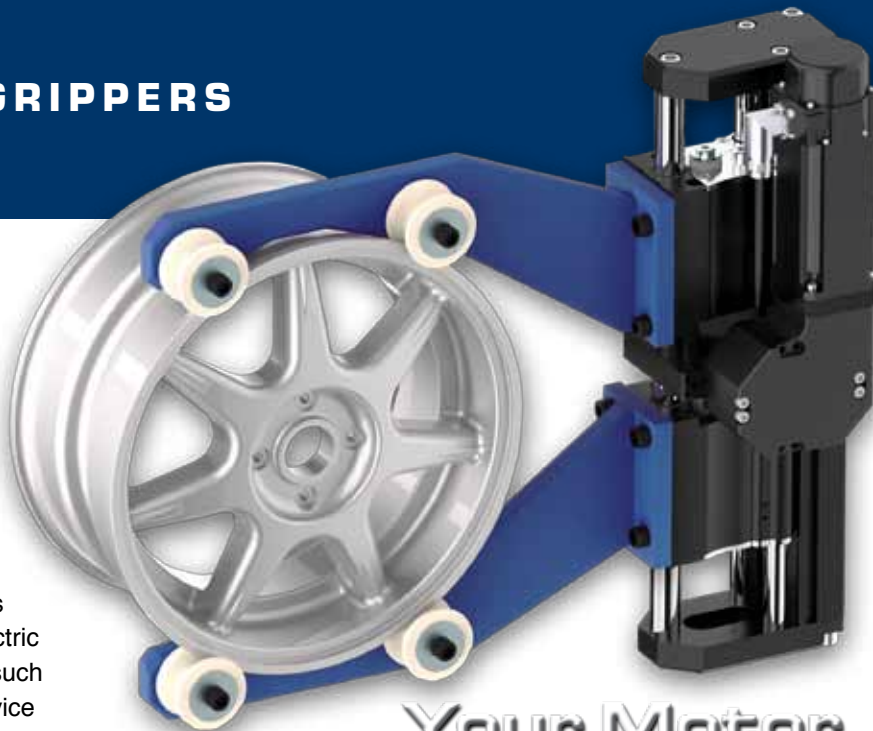


For a complete PHD gripper and product engineering catalog, go to [phdinc.com/resources/inforequest/](http://phdinc.com/resources/inforequest/)



## PHD Electric Grippers as Robotic End Effectors

With the advent of electric actuation, there are now more robotic processes than ever used around the world. Electric components offer attractive features such as precise programmable control, device portability, increased application flexibility without the need for compressors, line maintenance, or required routing, and clean actuation for sanitary environments. PHD plays an active role in the robotic industry. Our electric end effectors on robotic arms, such as the Series EGRT grippers, are specifically designed as a robotic arm peripheral.



**Your Motor,  
Your Way**



### EGRR HIGH CAPACITY PARALLEL GRIPPER

**Grip Force:** 809 lb [3600 N]

**Nominal Jaw Travel:** 5.906 to 13.780 in [150 to 350 mm]

*Your Motor, Your Way* motor and control flexibility

High grip force and large moment capacity

Rugged construction for demanding industrial environments

Robust rack and pinion jaw drive

Motor speed reducer and motor can be easily repositioned in the field

Available as pneumatic

**Contact PHD with your specific  
electric gripper needs at  
[phdplus.phdinc.com](http://phdplus.phdinc.com)**



### POLYMER GRIPPER

For medical industry applications



### LONG TRAVEL GRIPPER

Enclosed, long jaw travel electric gripper



### EGRT

Electric 3 jaw gripper for round parts





## PHD Clamps

PHD Clamps have been a customer-specific line since their first design in 1998. The 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. Every clamp 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. Our engineers keep in contact with the customer throughout the entire process, making adjustments to the actuators as needed. Using this consultative approach allows PHD to create a product ahead of the competition that has a great need in the industry. It's proven success time and time again.

**Contact PHD with  
your specific clamp needs  
at 1-800-624-8511**



Most clamps are fully field-repairable or can be returned to PHD for rebuild.

**REBUILD  
REPAIR  
RECYCLE**



For more information,  
request the PHD Clamp Binder.



### GRM - 13 jaw styles available

**Grip Force:**  
225 to 500 lb  
[1000 to 2224 N]

**Maximum External Load:**  
450 lb [2002 N]

Standard, Flange, Needlenose, Hammerhead, Single Shovel, Double Shovel, Single Flat Shovel, Double Flat Shovel, Single Chisel, Double Chisel, Hook, G Jaw, and Drop Jaw

Sheet metal handling applications

Modular designed tips

Simple design, long life, high clamp force

Fully field-repairable



### GRM1

**Grip Force:**  
225 [1000 N]

**Maximum External Load:**  
300 lb [1334 N]

Fully field-repairable

2 jaw styles

Standard and flange

Sheet metal handling requiring compact design

Modular designed tips for various thicknesses

Simple design, long life

Ideal for robotic and end effector applications

Compact envelope size, lightweight and strong



## Pin Clamps



### PLC

**Grip Force:**  
223 lb  
[991 N]

Used to locate and clamp part through hole or slot

Ideal for part clamping in weld areas

Enclosed finger design keeps weld slag out

Full compliment of standard and special pin sizes available



### PLK & PLKD

**Grip Force:**  
223 lb  
[991 N]

Ideal for part holding and positioning in weld areas

Enclosed finger design keeps weld slag out

## Swing Arm Clamps



### PA

**Grip Force:**  
46 to 378 lb  
[204 to 1682 N]

Rotates clamp arm into position before clamping with linear motion

Ideal for part holding or transfer, Series PA features simple design and compact size for low weight, long life, and high clamp force



### PB/PC

**Grip Force:**  
51 to 223 lb  
[226 to 992 N]

Rotates clamp arm into position before clamping with linear motion

Ideal for part holding or transfer, Series PB/PC features simple design and compact size for low weight, long life, and high clamp force

## Toggle Clamps



### PEC

**Clamp Torque:**  
125 to 900 in-lb  
[14 to 102 Nm]

Superior part holding for assembly and welding applications

Clamps and locks over last six degrees of rotation



## PNC Number Cruncher®

**Total Clamp Force:**  
9000 to 15000 lb  
[40 to 60 kN]

Stamp IDs into parts

High clamp force at 70 psi [4.8 bar]

Operates in less than .24 seconds

Eliminates part changing downtime



## PNC66 Number Cruncher®

**Total Clamp Force:**  
48330 lb at 87 psi  
[215 kN at 6 bar]

Utilizes industry-proven PNC cam mechanism on a larger scale

Provides cost effective solution for identification stamping, staking, and crimping



## PFC Frame Clamp

**Total Clamp Force:**  
7200 to 11250 lb  
[32027 to 50040 N]

Securely holds heavy parts in place

Power window of .150 in [3.8 mm]

Wide jaw space allows to clamp part closer to tooling surface



**Series PLK has 324,000 pin configurations for optimum application flexibility.**



## phd *Unlimited*<sup>®</sup> UNIQUE SOLUTIONS

### UNIQUE SOLUTIONS ARE OUR SPECIALTY

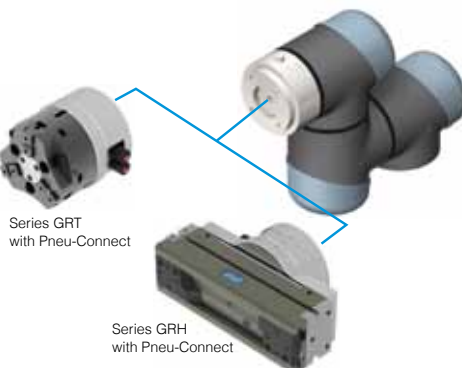
Nearly every standard unit PHD makes is manufactured to order. That's because PHD has such a wide variety of actuators, options and accessories available. PHD has the capabilities built into our factory systems to modify products within our everyday processes. Because of our flexibility, creating Unique Solutions<sup>®</sup> is simple for PHD.

We have dedicated assembly cells, machining centers, and many engineers to design and build unique solutions for our customers. With over 34,000 unique designs and over 100,000 quotes already in our database, we can provide most quotes within eight working hours. We have the systems in place to provide the best delivery in the industry.

## phd PNEUCONNECT<sup>™</sup>

Seamless Integration to collaborative robots

Built in MAC<sup>®</sup> bullet valves  
Connects directly to tool port on robot arm  
Simplified pneumatic gripping solutions  
Contact PHD for further assistance



Series GRT  
with Pneu-Connect

Series GRH  
with Pneu-Connect



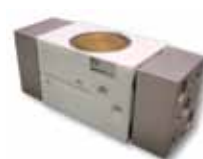
#### Position Feedback

ML306735  
Linear transducer for jaw position feedback



#### Heavy Duty 3 Jaw Gripper

ML305843  
Large 3 jaw gripper  
300 mm diametral travel



#### Stainless Steel Plastic Gripper

ML302657  
PET plastic body & stainless steel jaws



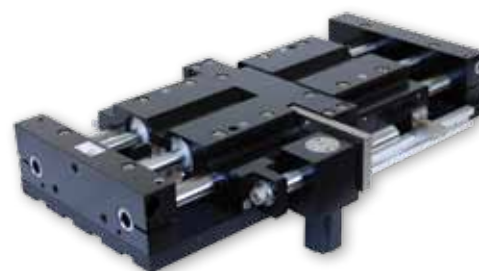
#### Hydraulic Steel Gripper

ML221538  
Hydraulically driven  
Manifold ported for simplified plumbing  
Long jaw travel and compact package  
Can be repaired in field for extended life and value  
Steel body and jaw covers with corrosion resistant plating.



#### CNC Quick Change Gripper

ML306580  
Single acting hydraulic gripper, operates using pressurized coolant through the machine's spindle  
Mounting to fit CNC tool holder



#### GRPL/GRPA

Compact design  
High grip force  
Large moment capacities with low overall height  
Long jaw travel



## 4 Jaw Long Travel Gripper

ML304667  
4 jaw synchronized gripper  
25 mm travel per jaw



## Series GRB Fixed Jaw Gripper

ML308635  
Series GRB11-2-20 x 180 gripper  
Fixed jaw  
Rated for 500°F  
Unique color jaws



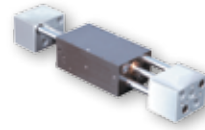
## Rod Gripper

ML308060  
Grips rods 4 mm Ø



## GRB with Special Lube

ML303143  
Unit with special high temperature non-toxic lubrication



## GRW with Long Jaw Travel

ML301025  
Longer than standard jaw travel



## Lightweight Gripper

ML310665  
GRW size 16 design  
PET body and aluminum jaws for lighter weight  
Longer than normal travel



## Mono Gripper

ML219177  
Long jaw travel  
Spring assist closed  
One fixed jaw to maintain accurate registration on gripped parts



## Dual Jaw Gripper

ML305289  
2 sets of synchronized jaws  
Each set of jaws are independently operated



## PET Angular Gripper

ML301141  
PET body and stainless steel jaws



## Three Position Synchronized Rail Gripper

ML219177  
Ground rail delivers high precision with minimal deflection  
12 mm bore with 1:1 power to jaw force output  
Jaws are synchronized via common pinion  
Jaw positions at closed 0.00", 1.00", and 2.67"  
Intermediate jaw position repeatable to  $\pm .005$ "  
Air centered intermediate position for use with pressure centered valve-requires only two air lines!



## Glass Tong Head Gripper

ML315988  
Handles hot glass containers  
Adjustable opening design available



## 3 Jaw Gripper

ML315982  
Automotive rim picker



## Micro Gripper

ML315874  
Semiconductor Industry  
Pneumatic and vacuum operated with spring assist



## Low Breakaway GRW

ML308186  
Special seals for 20 psi max breakaway



## Three Position Gripper

ML308123  
Synchronized jaws  
Replacement gripper



## Robohand Replacement

ML307584  
Direct replacement for Robohand RA-10



## Robohand Replacement

ML304302  
Direct replacement for Robohand RA-5



## ML310165 Double Series GRS Gripper

2 Grippers in one body



## Angular Gripper

ML315687  
Direct replacement for competitor unit



## 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  
overview 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 NFPA versatility

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



### Series LC Single Rod Escapement

For separating and releasing parts being presented from systems

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



### Series 160 Double Rod 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 Thruster 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 Saddle Slide

Multiple midstops

Space saving rodless slide design

Lowest deflection and highest moment capacity combination in the industry

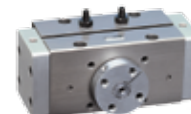


### Series RIS Rotary Actuator

Eliminates external air lines

Hollow pinion manifold

Available in 3 sizes with single and dual bore styles



### Series RA Rotary Actuator

Retains zero backlash

5 sizes and 6 standard rotations

Oversize sealed ball bearings, large pinion shafts for heavy load stability and high load stopping ability

PHD, Inc.  
9009 Clubridge Drive  
P.O. Box 9070, Fort Wayne, Indiana 46899 U.S.A.  
Phone (260) 747-6151 • Fax (260) 747-6754  
[www.phdinc.com](http://www.phdinc.com) • [phdinfo@phdinc.com](mailto:phdinfo@phdinc.com)

PHDinEurope GmbH  
Zum Carl-Alexander-Park 6  
52499 Baesweiler, Germany  
Tel. +49 (0)2401-619 77 0 • Fax. +49 (0)2401-619 77 99  
[www.phdinc.com](http://www.phdinc.com) • [info@PHDinEurope.de](mailto:info@PHDinEurope.de)