Sales information for PHL/EGA long-stroke gripper

Superior Clamping and Gripping

SCHUNK®

Initial situation

Flexible. Precise. Powerful.

PHL Long-stroke Gripper

Gripper with large jaw stroke for large parts and / or a broad range of parts

Field of Application

Optimal standard solution for many fields of application. Universal application in clean and slightly dirty surroundings in machine building and plant building industry, assembly and handling as well as automotive industry.

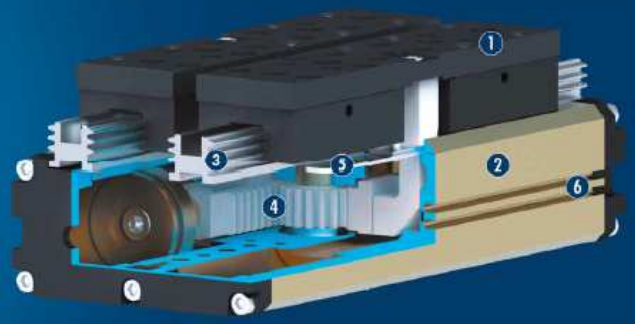
Advantages – Your benefit

- **Modular with two alternative guidances** for optimal adaption to your application
- **High maximum moments possible** suitable for using long gripper fingers
- **Double piston rack and pinion principle** for centric clamping
- **Fastening at one gripper side in two screw directions** for universal and flexible gripper assembly
- **Air supply via hose-free direct connection or screw connections** for flexible pressure supply in all automated systems
- **Comprehensive sensor accessory program** for versatile interrogation possibilities and control of stroke position
- **Stroke versions** for highest flexibility

Sizes	Weight	Gripping force	Stroke per jaw	Workpiece weight
Quantity: 5	1.38 .. 24.18 kg	390 .. 4630 N	30 .. 160 mm	1.95 .. 15.5 kg

Functional Description

With the application of pressure to the opposite pistons, the respective base jaw is moved by a driving pin on the piston. The synchronisation of the jaw stroke takes place based on the rack and pinion principle.

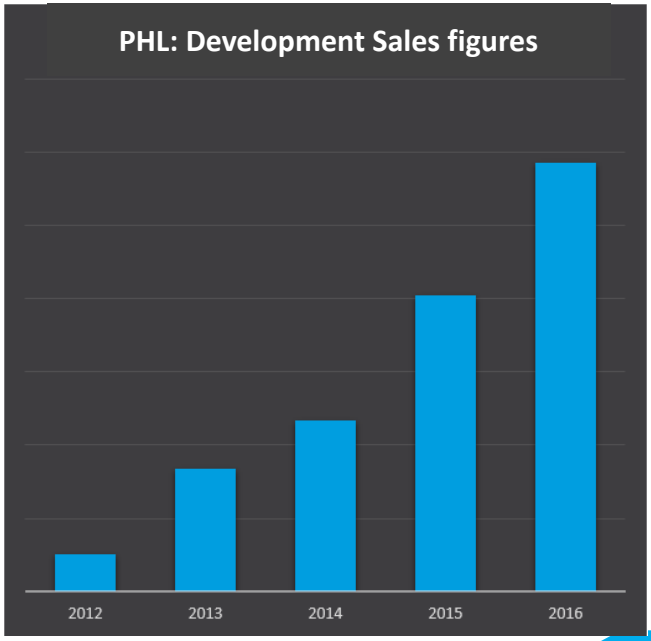


1. **Base jaw**
   for the connection of workpiece-specific gripper fingers
2. **Housing**
   Weight-optimized through application of high-strength aluminum alloy
3. **Multiple-tooth guidance**
   High-loadable base jaw guidance with minimum play for long fingers
4. **Kinematics**
   Pinion and rack principle for centric clamping, even at large strokes
5. **Dust cover**
   along the whole guidance length against coarse dirt
6. **Sensor system**
   Brackets for proximity switches and adjustable control cams in the housing

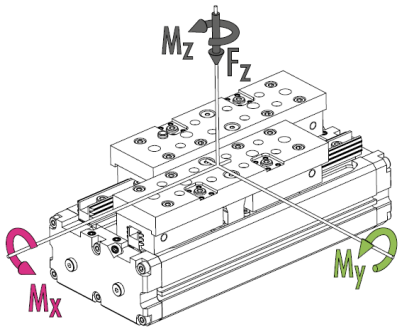
CAD data, operating manuals and other current product documents are available at **www.schunk.com**

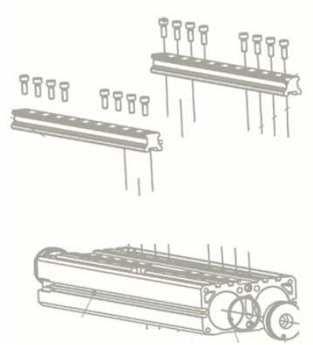
Initial situation

- The development of sales figures for the PHL is positive from year to year.
- The PHL sizes and stroke variants we have chosen has turned out to be correct.
- The PHL series is meanwhile established on the market as a modular long-stroke gripper and will continue to grow.



Initial situation





- However, there have been several complaints about PHL grippers due to loose guide rails as a result of stripped threads. (The screws used to hold the guide rails in the aluminum housing are relatively short.)
- Twice as many screws are used than in standard profiled rails.
- Applications within the catalog specifications (max. forces and moments) do not cause problems. The grippers were tested thoroughly and approved.
- **In customer applications, however, it sometimes happens that the PHL can withstand no overload situations or even crash runs** (as we have come to expect from PGN-plus etc.). The monorail design makes the guide especially susceptible to Mx moments.
- For your information: In 2016 there were 6 complaints (2 of which were justified)

Intermediate action Threaded bushes

In several cases, the problem was solved by using threaded bushes in the aluminum housing.

Advantage:

- Higher pull-out resistance compared with the standard version
- Easy to implement by reworking the standard housing

Disadvantage:

- Must be created as special gripper
- Expense of reworking
- Additional costs for material and assembly

Action:
High-strength aluminum

In search of alternatives an attempt was made to machine the housing of high-strength aluminum (instead of profiled material).

Advantage:

- Higher pull-out resistance than the standard version and even higher compared to threaded bushes
- About twice the screw-in length compared to the low-strength aluminum
- Manufacture of housing is cost neutral to profile + machining

Disadvantage:

- Special versions can no longer be manufactured at custom lengths, since drawn profile material is not used
- Housing is somewhat heavier than with drawn profile due to higher amount of material

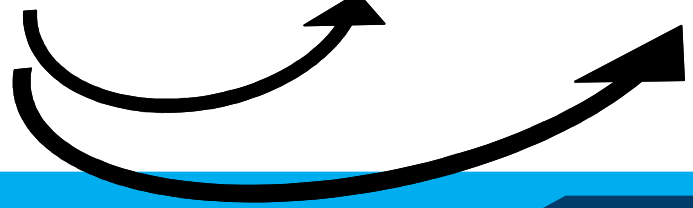
Comparison

The machined housing of high-strength aluminum achieved the best results by far (calculated and measured).

→ **All PHL and EGA housings will therefore be converted from profiled material to high-strength aluminum.**

	Low-strength aluminum	Threaded inserts	High-strength aluminum
1. Measuring result (N)	9,280	12,300	**16,800**
2. Measuring result (N)	8,920	11,450	**17,200**
3. Measuring result (N)	9,010	14,000	**15,600**
4. Measuring result (N)	-	-	**15,100**
Calculated value (N)	**8,000**	**11,000**	**15,000**

Status quo Ca. + 30 % Ca. + 90 %



Thread length

- It was also possible to further increase the thread length in the housing made of high-strength aluminum. This provides for additional strength!
- In other words the strength of the thread is doubled by implementing the two measures!
- Catalog specifications (especially the finger length and finger load Mx, My, Mz) remain unchanged and will not be increased. The increase in strength is intended only to increase the durability without changing the specifications.
- A further increase of the thread depth or additional threaded bushings in the high-strength aluminum do not further increase the strength.

Time schedule:
Planned conversion

- Size 25 will be converted first.
- Will be available in the high-strength version starting June 2017.
- The other sizes will be converted successively.
- During the transition period until the conversion, we will continue to offer the current PHL and EGA standard solution.
- They can continue to be sold without restrictions.

Price adjustment 2017

Regardless of the technical revision of the PHL series, a price adjustment is necessary for PHL and EGA.

This will be implemented as part of the general price adjustment at SCHUNK for 2017.

- Depending on the size and variant, there will be a price adjustment of up to +15% for PHL.
  - Average +9% for PHL 25, 32, 40
  - Average +4% for PHL 50, 63
- Depending on the size and variant, there will be a price adjustment of up to +9% for EGA.
  - Average 3% for EGA 25
  - Average +5% for EGA 40

PHL special versions

PHL - W

Implemented special versions

Fixed workpiece stop	Adjustable stroke
Pharmaceutical grease	
High-temperature grease	
Viton seal	
Without pinion	Jaws can be activated singly, half force
With clamping	Position memory
Additional wiper	Dirty environment
Larger stroke	
Single-side spring assembly	

PHL heavy-duty version

PHL - W