Superior Clamping and Gripping

Product data sheet

Long-stroke gripper PHL 32

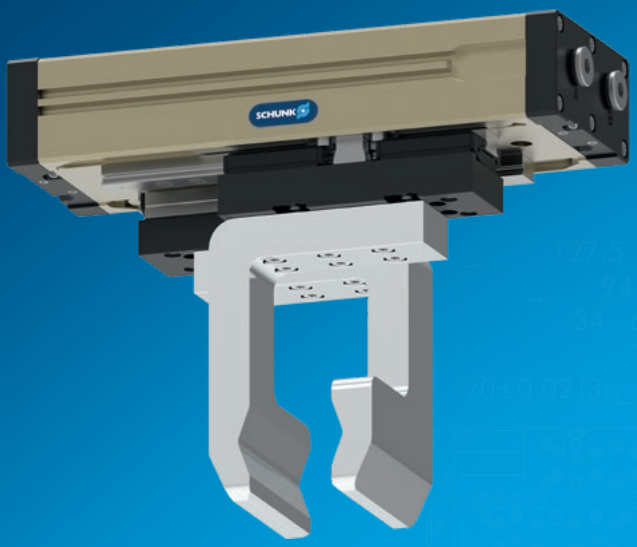
Flexible. Precise. Powerful.

Long-stroke gripper PHL

2-finger parallel gripper with long jaw stroke for large parts and/or a broad range of parts

Field of application

Optimum 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 benefits

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

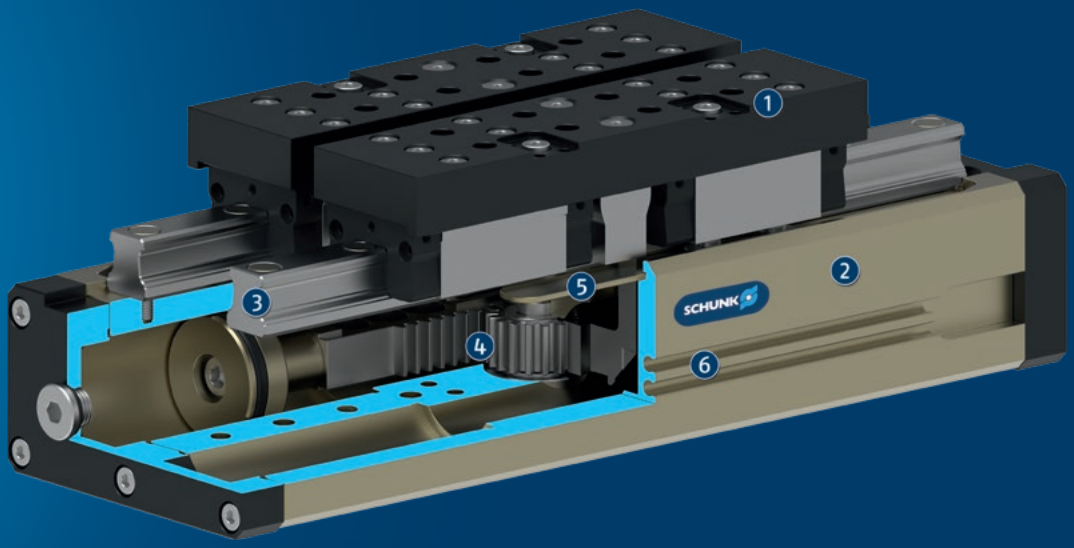
Comprehensive sensor accessory program for versatile querying possibilities and stroke position monitoring

Stroke versions for highest flexibility

Sizes	Weight	Gripping force	Stroke per jaw	Workpiece weight
Quantity: 5	1.64 .. 26.47 kg	500 .. 4630 N	30 .. 160 mm	2.5 .. 15.5 kg

Functional description

By pressure actuation of the opposing piston, the base jaws are guided by a carrier on the piston, and are set in motion. The synchronization of the jaw stroke is done with a rack and pinion principle.



① **Base jaw**
for the connection of workpiece-specific gripper fingers

② **Housing**
is weight-optimized due to the use of high-strength aluminum alloy

③ **Roller guide**
highly loadable, nearly backlash-free base jaw guidance for long finger lenghts

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

General notes about the series

Operating principle: Double piston rack and pinion principle

Housing material: Aluminum (extruded profile)

Base jaw material: Aluminum alloy, anodized

Actuation: pneumatic, with filtered compressed air as per ISO 8573-1:2010 [7:4:4].

Warranty: 24 months

Scope of delivery: Gripper in the ordered variant, accessory kit (centering sleeves, O-rings for direct connection/detailed contents see operating manual) and safety information. Product-specific instructions can be downloaded at schunk.com/downloads-manuals.

Gripping force maintenance: possible by using the version with mechanical gripping force maintenance or pressure maintenance valve SDV-P

Gripping force: is the arithmetic sum of the individual force applied to each jaw at distance P (see illustration).

Finger length: is measured from the reference surface as the distance P in direction to the main axis.
The maximum permissible finger length applies until the nominal operating pressure is achieved. With higher pressures, the finger length must be reduced proportionally to the nominal operating pressure.

Repeat accuracy: is defined as a distribution of the end Position for 100 consecutive strokes.

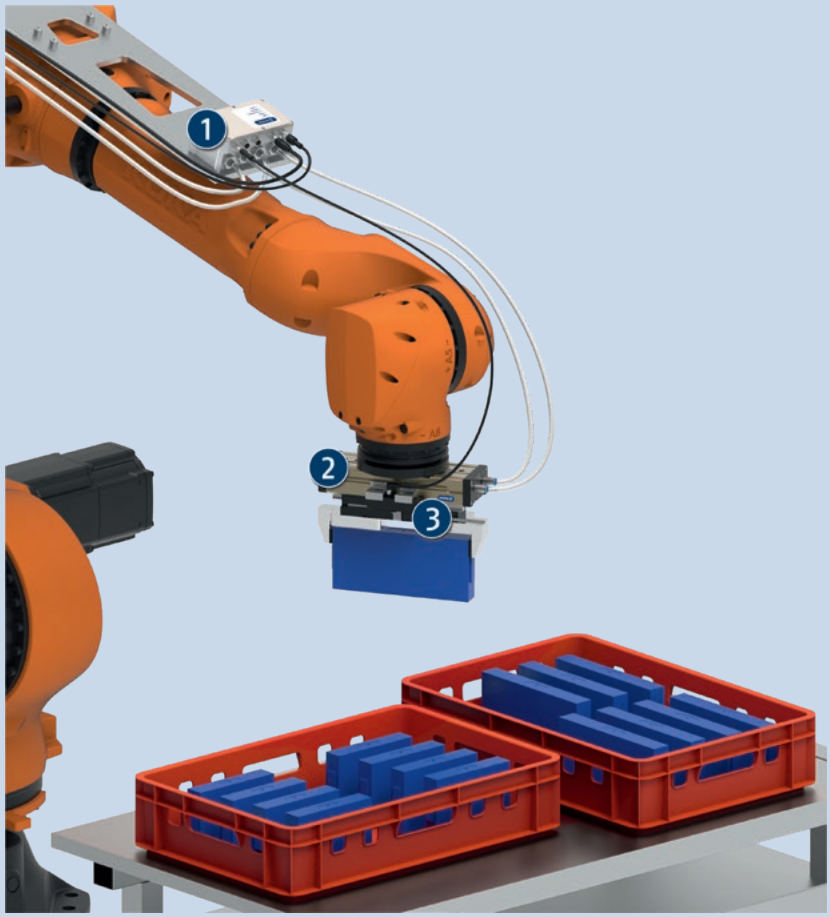
Workpiece weight: is calculated for force-fit gripping with a coefficient of static friction of 0.1 and a safety factor of 2 against workpiece slippage at acceleration due to gravity g. For form-fit or capture gripping, there are significantly higher permissible workpiece weights.

Closing and opening times: are movement times of the base jaws only, without application-specific gripper fingers. Valve switching times, hose fill times, or PLC reaction times are not included, and are to be considered when cycle times are calculated.

Application example

Flexible and cycle-time-optimized handling of prismatic battery cells during the assembly of battery modules. The PHL long-stroke gripper handles cell formats of various dimensions. By using the PPD pneumatic positioning unit, the gripper fingers can be pre-positioned cell-specifically to save cycle time and avoid collisions in narrow deposit positions when opening the gripper fingers.

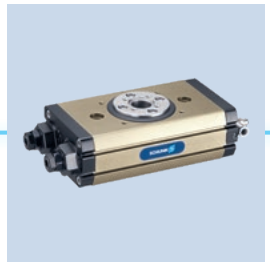
1. Pneumatic positioning device PPD
2. 2-finger long-stroke gripper PHL
3. Inductive analog position sensor BIP



SCHUNK offers more ...

The following components make the product even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.

Quick change system



Universal swivel unit

Pressure maintenance valve

Universal intermediate jaw

Inductive proximity switch

Magnetic switches

Finger blank

Jaw quick-change system

ⓘ For more information on these products can be found on the following product pages or at schunk.com.

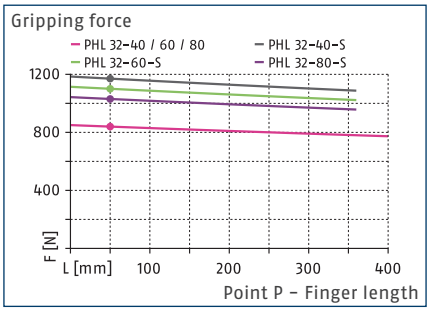
Options and special information

Mechanical gripping force maintenance: ensures a minimum gripping force in the event of a pressure loss This acts as the closing force in the S version. The design of the top jaws means that they can also be used as an opening force.
Additional stroke versions: available in three stroke variants as standard
Additional versions: Various options can be combined with each other. Numerous additional options are also available – just tell us what your task is!
Food-grade lubrication: The product contains food-compliant lubricants as standard. The requirements of standard EN 1672-2:2020 are not fully met. The relevant NSF certificates are available at https://info.nsf.org/USDA/Listings.asp using the lubricant information in the operating manual. Components such as rolling bearings, linear guides, or shock absorbers are not provided with food-compliant lubricants.

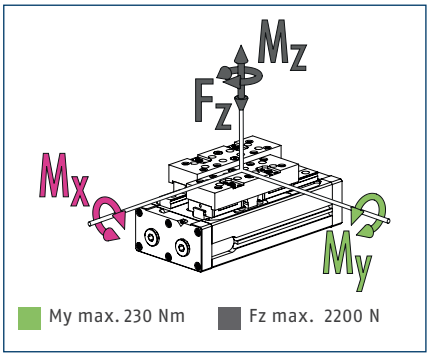
PHL 32

Long-stroke gripper

Gripping force



Dimensions and maximum loads

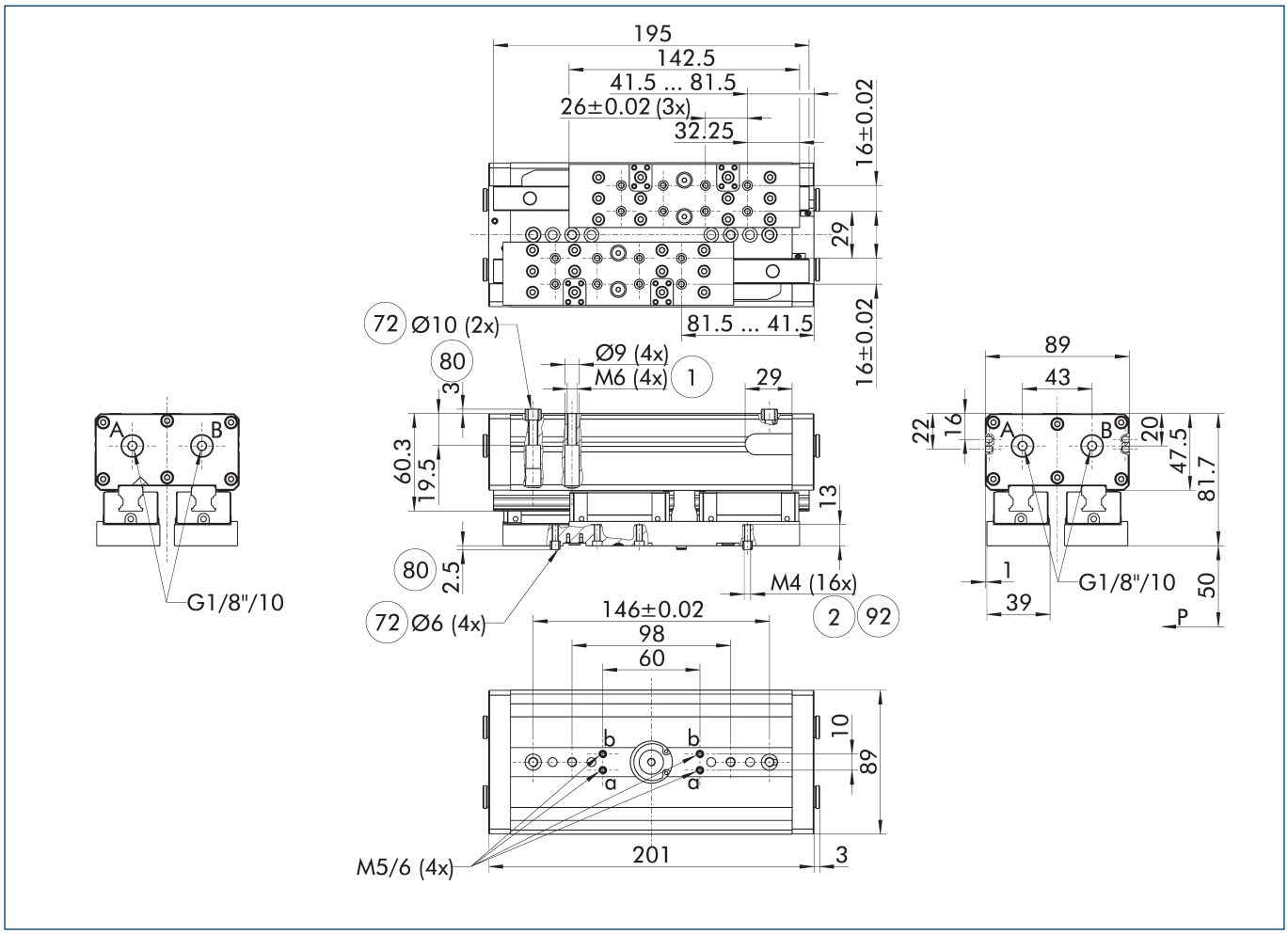


ⓘ The indicated torques and forces are static values, apply for each base jaw, and may occur simultaneously.

Technical data

Description		PHL 32-040	PHL 32-040-S	PHL 32-060	PHL 32-060-S	PHL 32-080	PHL 32-080-S
ID		1462553	1462558	1462560	1462562	1462563	1462565
Stroke per jaw	[mm]	40	40	60	60	80	80
Closing/opening force	[N]	840/840	1170/-	840/840	1100/-	840/840	1030/-
Min. spring force	[N]		330		260		190
Weight	[kg]	3.5	3.92	4.03	4.47	4.6	5.04
Recommended workpiece weight	[kg]	4.2	4.2	4.2	4.2	4.2	4.2
Cylinder volume per double stroke	[cm³]	161	309	227	375	292	440
Min./nom./max. operating pressure	[bar]	2/6/8	4/6/6.5	2/6/8	4/6/6.5	2/6/8	4/6/6.5
Closing/opening time	[s]	0.19/0.19	0.2/0.39	0.26/0.26	0.27/0.52	0.32/0.32	0.34/0.65
Max. permissible finger length	[mm]	400	360	400	360	400	360
Max. permissible weight per finger	[kg]	2.5	2.5	2.5	2.5	2.5	2.5
IP protection class		41	41	41	41	41	41
Min./max. ambient temperature	[°C]	5/90	5/90	5/90	5/90	5/90	5/90
Repeat accuracy	[mm]	0.02	0.02	0.02	0.02	0.02	0.02
Moments Mx max./Mz max.	[Nm]	50/58	50/58	58/63	58/63	67/71	67/71

Main view



The drawing shows the gripper in the basic version with closed jaws, without dimensional consideration of the options described below.

ⓘ The SDV-P pressure maintenance valve can be used as a gripping force maintenance device (see catalog section on accessories).

A, a Main / direct connection, gripper opening

B, b Main / direct connection, gripper closing

(1) Gripper connection

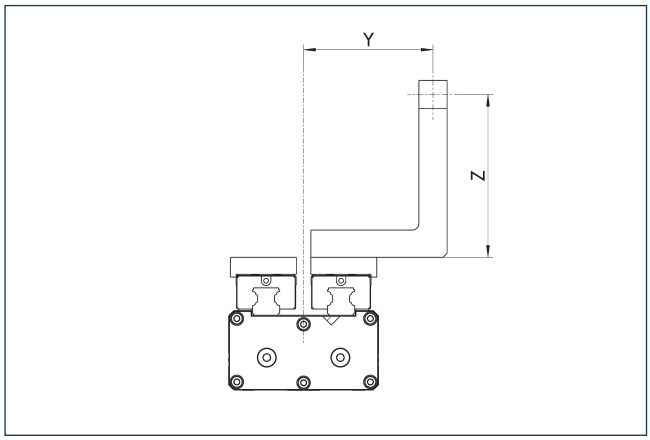
(2) Finger connection

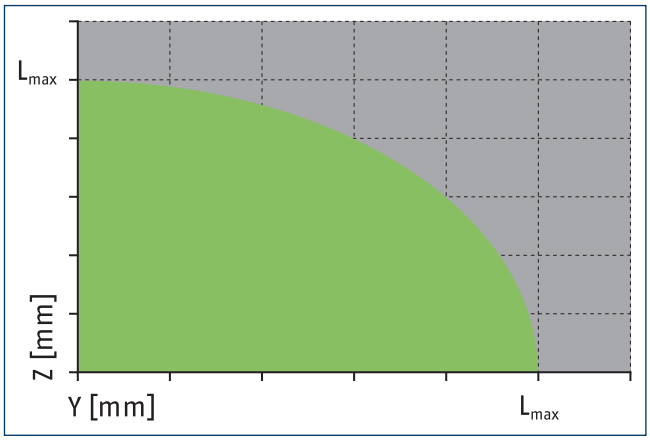
(72) Fit for centering sleeves

(80) Depth of the centering sleeve hole in the counter part

(92) Min. six screws per base jaw

Maximum permitted finger projection





Permitted range

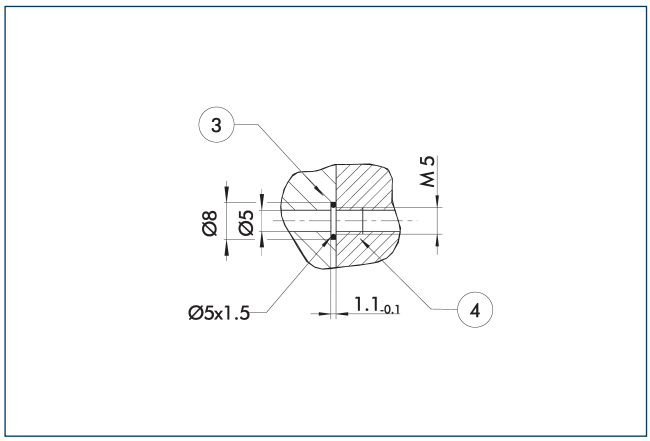
Inadmissible range

L^{max} is equivalent to the maximum permitted finger length, see the technical data table.

PHL 32

Long-stroke gripper

Hose-free direct connection M5

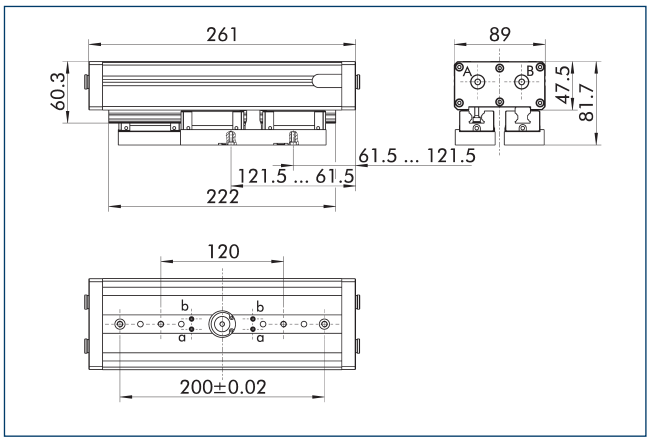


(3) Adapter

(4) Grippers

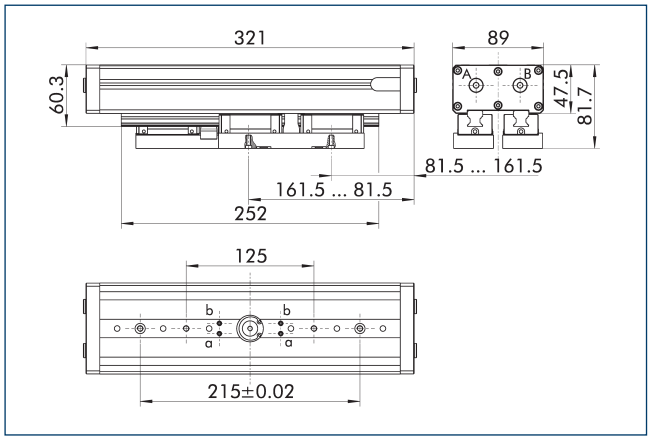
The direct connection is used for supplying compressed air without hoses. Instead, the pressure medium is fed through bore-holes in the mounting plate.

Stroke version PHL 32-060



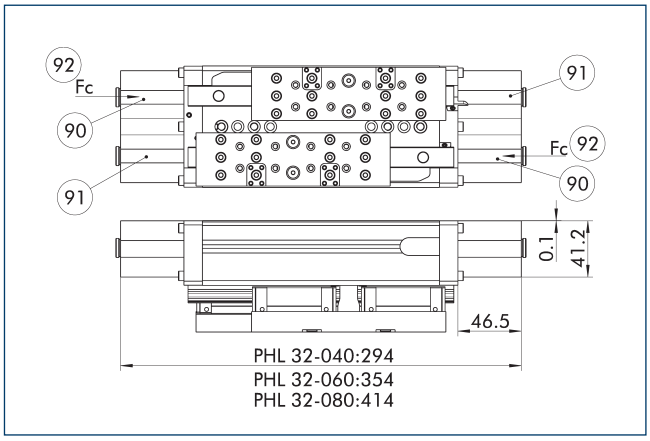
The drawing shows changes in dimensions of the version with a different stroke compared to the version shown in the main view.

Stroke version PHL 32-080



The drawing shows changes in dimensions of the version with a different stroke compared to the version shown in the main view.

Gripping force maintenance S



(90) Piston chamber with spring

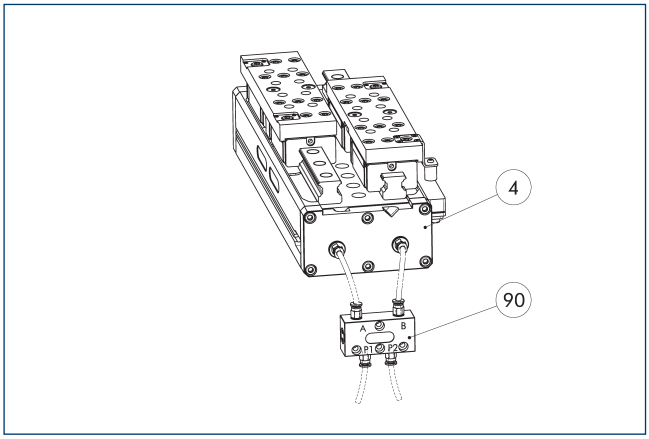
(91) Piston chamber without spring

(92) Direction of force of the pressure springs

The mechanical gripping force maintenance ensures a minimum clamping force in the event of a pressure drop. This acts as the closing force in the S variant. The design of the top jaws means that they can also be used as an opening force. Besides this, the gripping force maintenance can be used to increase the gripping force.

ⓘ The gripper is shown in the basic position, closed by springs.

SDV-P pressure maintenance valve



(4) Grippers

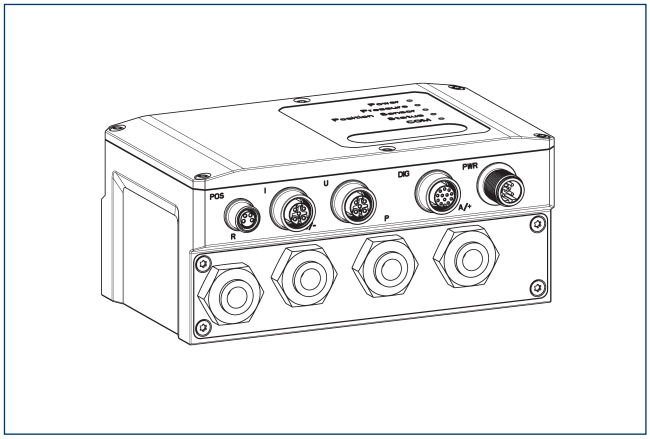
(90) SDV-P pressure maintenance valve

The SDV-P pressure maintenance valve ensures in emergency STOP situations that the pressure in the piston chamber of pneumatic gripper, swivel, linear, and quick-change modules is temporarily maintained.

Description	ID	Recommended hose diameter
		[mm]
Pressure maintenance valve		
SDV-P 04	0403130	6
SDV-P 07	0403131	8
Pressure maintenance valve with air bleed screw		
SDV-P 04-E	0300120	6
SDV-P 07-E	0300121	8

ⓘ In order to achieve the specified closing and opening time for each gripper variant, the recommended hose diameter must be used. The direct allocation of the respective variant of the gripper for the respective SDV-P can be found at schunk.com.

Pneumatic positioning device PPD

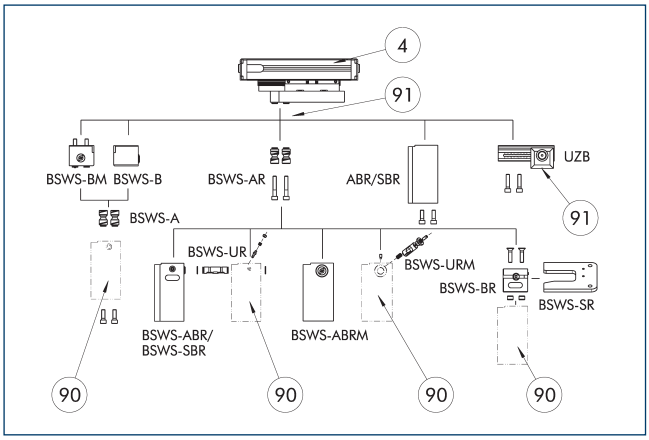


The PPD allows flexibility in all applications with pneumatic grippers through free positioning, gripping force and speed adjustment.

Description	ID	
Pneumatic positioning device		
PPD 20-IOL	1540700	
Adapter		
A GGN0804-1204-A	1540691	
IO-Link connection cable		
KA GGN1205-1212-IOL-00100-A	1540697	
Voltage supply connection cable - cable track compatible		
KA GLN12B05-LK-01000-A	1540660	
Cable extension		
KV GGN0804-IO-00150-A	1540662	
KV GGN0804-IO-00300-A	1540663	
Assembly set		
Assembly set PPD	1540705	

ⓘ In addition to the PPD, a position sensor (SCHUNK IO-Link sensor or analog sensor (4...20 mA)) is required.

Intermediate jaw interface



(4) Grippers

(90) Customized gripper fingers

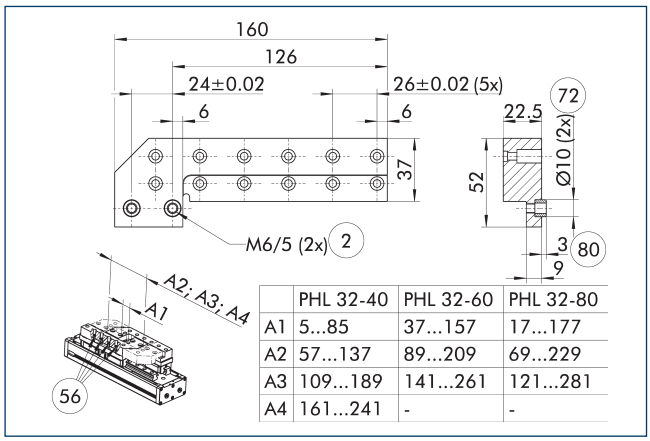
(91) Uniform screw connection pattern

By using the intermediate jaw, you have the possibility of directly connecting a wide range of accessories directly. This includes jaw quick-change systems, finger blanks, and universal intermediate jaws.

PHL 32

Long-stroke gripper

Intermediate jaw ZBA PHL 32-125



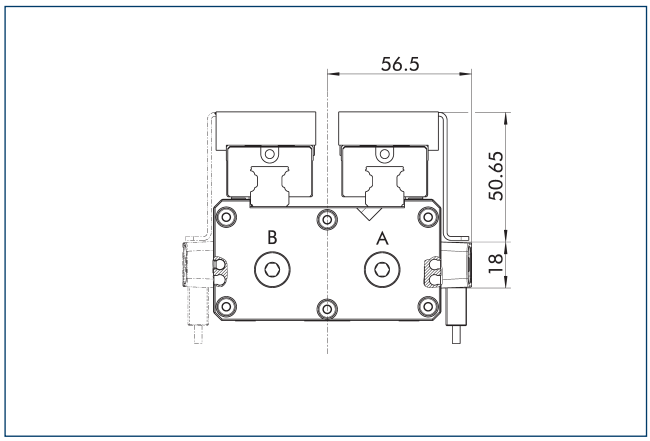
	PHL 32-40	PHL 32-60	PHL 32-80
A1	5...85	37...157	17...177
A2	57...137	89...209	69...229
A3	109...189	141...261	121...281
A4	161...241	-	-

(2) Finger connection
(56) Included in the scope of delivery
(72) Fit for centering sleeves
(80) Depth of the centering sleeve hole in the counter part

Optionally intermediate jaws can be used, enabling direct connection and alignment of top jaws and various standard accessories in Z-direction.

Description	ID	Material	Finger interface	Scope of delivery
Intermediate jaw				
ZBA-PHL 32-125	0308149	Steel	PGN-plus 125	2

Attachment kit for proximity switch IN 80

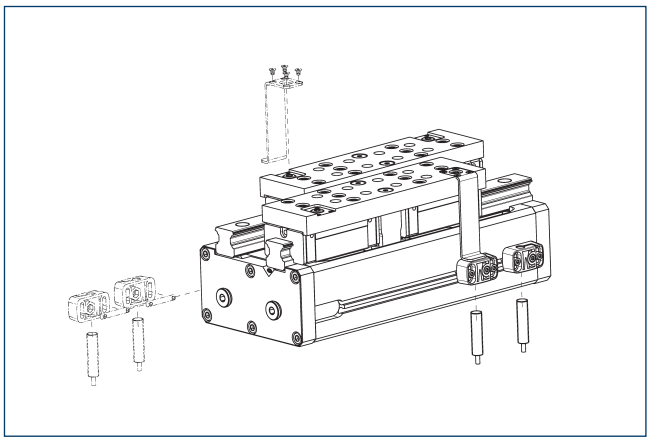


End position monitoring can be mounted with an attachment kit.

Description	ID	
Attachment kit for proximity switch		
AS-PHL 32-IN80	1485806	

ⓘ This attachment kit needs to be ordered optionally as an accessory.

IN 80 inductive proximity switches

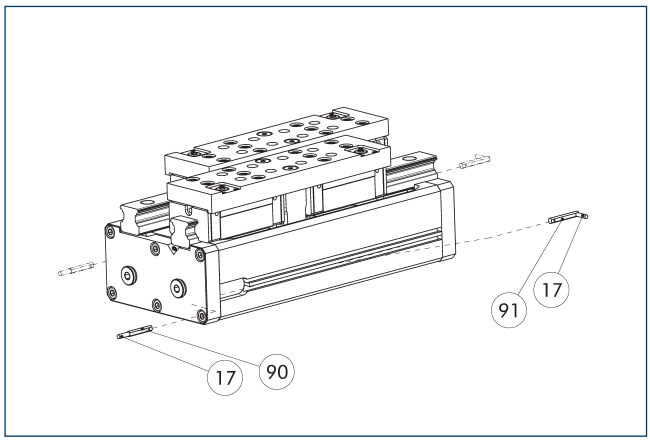


End position monitoring can be mounted with an attachment kit.

Description	ID	Often combined
Attachment kit for proximity switch		
AS-PHL 32-IN80	1485806	
Inductive proximity switch		
IN 80-S-M12	0301578	
IN 80-S-M8	0301478	●
INK 80-S	0301550	

ⓘ Two sensors (closer/S) are required for each unit and extension cables are available as an option. This attachment kit needs to be ordered optionally as an accessory. For sensor cables, note the minimum permissible bending radii. These are generally 35 mm.

Electronic magnetic switch MMS



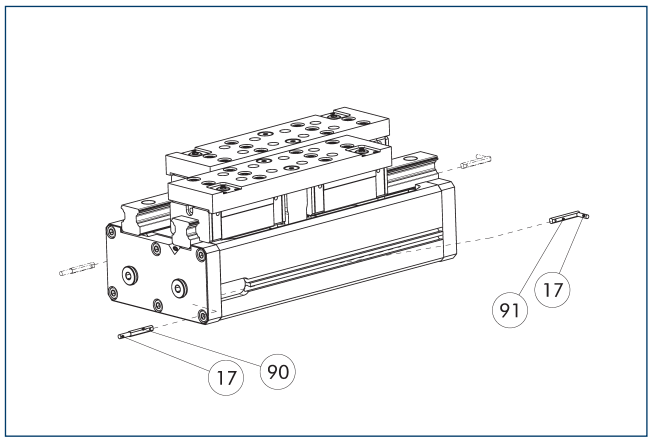
(17) Cable outlet
(91) Sensor MMS 22...-SA
(90) MMS 22 sensor

End position monitoring for mounting in the C-slot.

Description	ID	Often combined
Electronic magnetic switch		
MMS 22-S-M8-PNP	0301032	●
MMSK 22-S-PNP	0301034	
Electronic magnetic switches with lateral cable outlet		
MMS 22-S-M8-PNP-SA	0301042	●
MMSK 22-S-PNP-SA	0301044	
Connection cables		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
Clip for connector/socket		
CLI-M8	0301463	
Cable extension		
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
Sensor distributor		
V2-M8	0301775	●
V4-M8	0301746	
V8-M8	0301751	

ⓘ Two sensors are required per unit for monitoring two positions. On option, extension cables and sensor distributors are available. Additional product variants of the sensor, and further information and technical data can be found in the catalog chapter sensor system.

Programmable magnetic switch MMS 22-PI1



(17) Cable outlet
(91) Sensor MMS 22 ..-PI1-...-SA
(90) Sensor MMS 22 PI1-...

Position monitoring with one programmable position per sensor and integrated electronic system in the sensor. Can be programmed using MT magnetic teaching tool (included in the scope of delivery, ID 0301030) or ST plug teaching tool (optional). End position monitoring for mounting in the C-slot. If the ST plug teaching tools are listed in the table provided, teaching is only possible with the ST teaching tools.

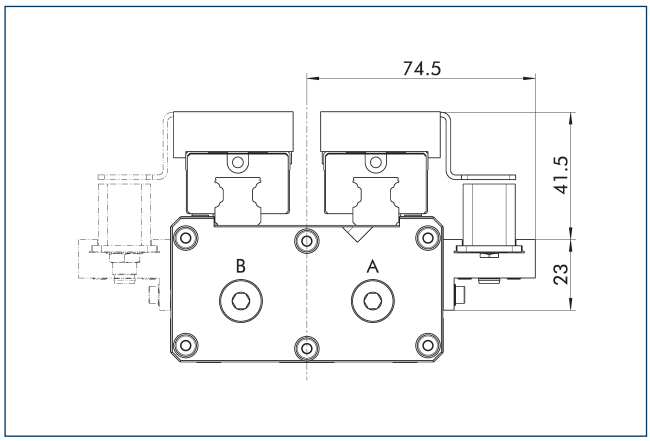
Description	ID	Often combined
Programmable magnetic switch		
MMS 22-PI1-S-M8-PNP	0301160	●
MMSK 22-PI1-S-PNP	0301162	
Programmable magnetic switch with lateral cable outlet		
MMS 22-PI1-S-M8-PNP-SA	0301166	●
MMSK 22-PI1-S-PNP-SA	0301168	
Programmable magnetic switch with stainless steel housing		
MMS 22-PI1-S-M8-PNP-HD	0301110	●
MMSK 22-PI1-S-PNP-HD	0301112	

ⓘ Two sensors are required per unit for monitoring two positions. On option, extension cables and sensor distributors are available. Additional product variants of the sensor, and further information and technical data can be found in the catalog chapter sensor system.

PHL 32

Long-stroke gripper

Attachment kit for inductive analog position sensor

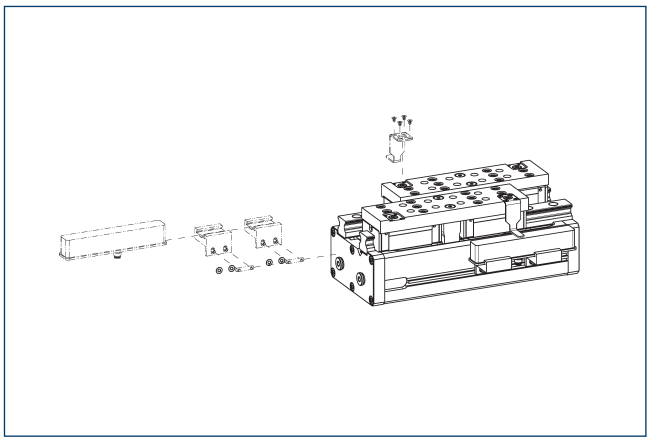


The attachment kit includes switching cam, brackets and mounting screws. The position sensor must be ordered separately.

Description	ID	
Attachment kit for position sensor		
AS-BIP-PHL 32	1538505	

ⓘ This attachment kit needs to be ordered optionally as an accessory.

Inductive analog position sensor



Position sensor mountable via attachment kit

Description	ID	
Attachment kit for position sensor		
AS-BIP-PHL 32	1538505	
Inductive analog position sensor		
BIP 048	1561246	
BIP 070	1561247	
BIP 103	1561248	
Cable extension		
KV GGN0804-I0-00150-A	1540662	
KV GGN0804-I0-00300-A	1540663	

ⓘ The measuring length of the sensor must be selected according to the gripper stroke. The direct allocation of the respective variant of the gripper for the respective position sensor can be found at schunk.com.

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