Parallel grippers HGPLE, sturdy with long stroke, electric

FESTO

New
Size 14/25-80

Parallel grippers HGPLE, sturdy with long stroke, electric

Key features

At a glance

With free, speed-controlled selection of the gripping positions, flexible access is no longer a problem with the parallel gripper HGPLE. Its long stroke means it can be used with workpieces of different sizes. The option to adjust the gripping force makes the HGPLE ideal for soft or very delicate workpieces. It also grips large and heavy workpieces reliably.

Economical

- A "pre-holding" position enables the HGPLE to stop its gripper fingers just short of the workpiece, thus reducing access times to an absolute minimum. Even when the size of the workpiece requires the entire stroke, the HGPLE still offers impressively short opening and closing times of 0.6 s.
- The installation complexity is minimal as only one cable is required (from the controller to the gripper).

Sturdy

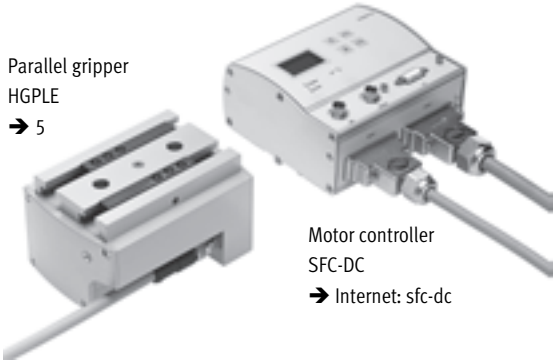
The T-slot gives the HGPLE very high torque resistance as well as very high precision.

Flexible

It is actuated on-site using the tried and tested motor controller SFC-DC.

Everything from a single source

Parallel gripper
HGPLE
➔ 5



Motor controller
SFC-DC
➔ Internet: sfc-dc

The parallel gripper and motor controller SFC form one unit.

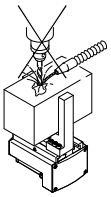
- Thanks to IP54 degree of protection, the SFC can be mounted close to the HGPLE, either:
  - via central supports or
  - via H-rail
- The motor controller SFC is available with or without control panel
- Easy actuation via:
  - PROFIBUS
  - CANopen
  - DeviceNet

Parameterisation possible via:

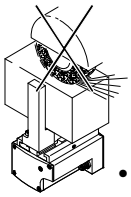
- Control panel:
  - Suitable for easy positioning sequences
- FCT (Festo Configuration Tool) configuration package:
  - Parameterisation via RS 232 interface
  - Windows-based PC user interface, Festo Configuration Tool
  - Tool is included in scope of delivery

Note

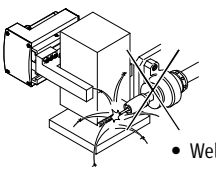
These grippers are not suitable for the following or similar applications:



- Aggressive media
- Machining



- Grinding dust



- Welding spatter

PROFIBUS®, DeviceNet®, CANopen® is a registered trademark of its respective trademark holder in certain countries.

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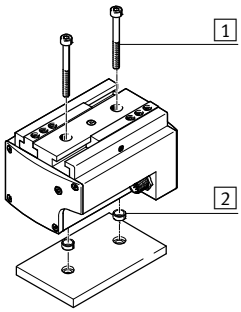
Key features and peripherals overview

Mounting options

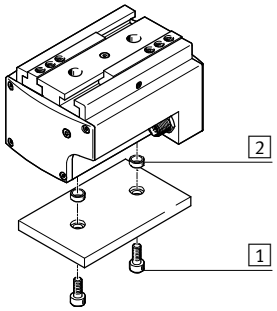
Direct mounting

From above



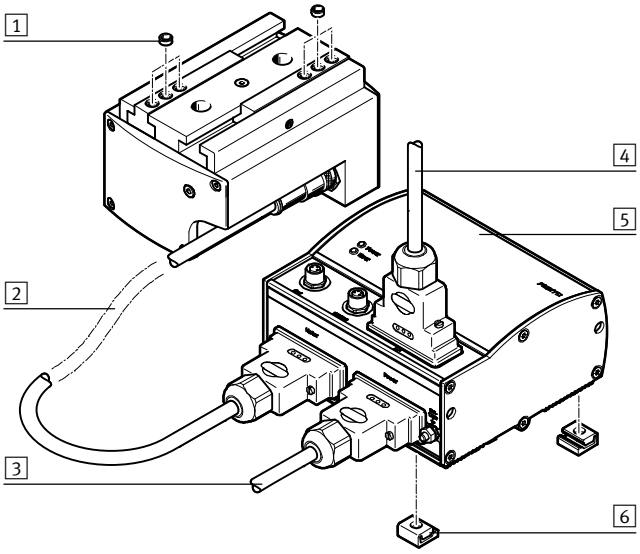
1 Mounting screws
2 Centring sleeves

From underneath

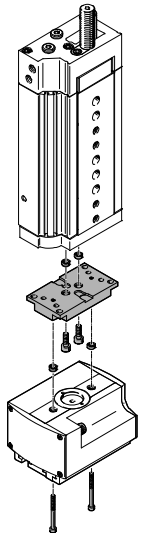


1 Mounting screws
2 Centring sleeves

Peripherals overview



System product for handling and assembly technology



Accessories

	Type	Description	➔ Page/Internet
1	Centring sleeve ZBH	For centring attachments	11
2	Motor cable KMTR	Connecting cable between motor and motor controller	sfc-dc
3	Supply cable KPWR	Power supply cable; load and logic power supplies are separate	sfc-dc
4	Plug connector FBS, FBA	For fieldbus interface	sfc-dc
5	Motor controller SFC	For parameterising and positioning the parallel gripper	sfc-dc
6	Central support MUP	– For mounting the motor controller – Motor controller can also be mounted on an H-rail	sfc-dc
–	Gripper jaw blank BUB-HGPL	Unmachined part specially matched to the gripper jaws for custom fabrication of gripper fingers	11

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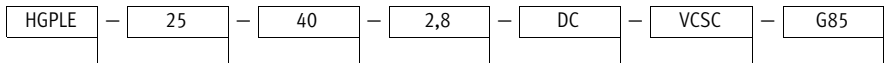
Type codes



Type	
HGPLE	Parallel gripper

Size

Stroke [mm] per gripper jaw

Spindle pitch	
2,8	2.8 mm
3,1	3.1 mm

Motor type	
DC	DC motor

Nominal voltage/plug connector type	
VCSC	24 V

Gear reduction	
G85	85:1
G96	96:1

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Technical data

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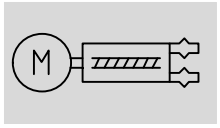
Function



Size
14 and 25 mm

Stroke
30 ... 80 mm

General technical data						
Size		14		25		
Stroke		30	60	40	80	
Design		Worm gear unit with integrated displacement encoder				
		Rack and pinion				
Guidance		Plain-bearing guide with T-slot				
Mode of operation		Double-acting				
Gripper function		Parallel				
Number of gripper jaws		2				
Stroke per gripper jaw, adjustable	[mm]	0 ... 30	0 ... 60	0 ... 40	0 ... 80	
Max. load per gripper finger[1]	[g]	150	150	500	500	
Repetition accuracy[2]	[mm]	≤ 0.05				
Max. interchangeability	[mm]	≤ 0.2				
Reversing backlash[3]	[mm]	≤ 0.35				
Rotational symmetry	[mm]	≤ 0.2				
Max. gripper jaw backlash	[mm]	≤ 0.05				
Max. gripper jaw angular backlash	[°]	≤ 0.2				
Homing		Negative fixed stop block				
		Positive fixed stop block				
Position sensing		Via integrated angular displacement encoder				
Type of mounting		Via through-holes and centring sleeves				
		Via female thread and centring sleeves				
Electrical connection		12-pin				
		M12x1				
		Plug connector				
Mounting position		Any				
Product weight	[g]	520	700	1680	2030	

1) Applies to unthrottled operation
2) End-position drift under constant operating conditions with 100 consecutive strokes in the direction of movement of the gripper jaws
3) In new condition

Electrical data for motor		
Motor type		DC servo motor
Nominal operating voltage	[V DC]	24

Operating and environmental conditions		
Ambient temperature	[°C]	5 ... 40
Degree of protection		IP40
Noise level	[db (A)]	≤60
CE mark (see declaration of conformity)[1]		To EU EMC Directive
Corrosion resistance class CRC[2]		2

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
2) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

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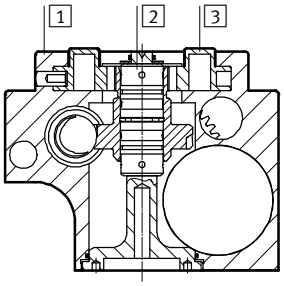
Technical data

Materials

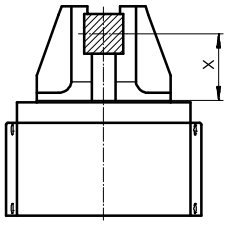
Sectional view



Parallel gripper		
1	Housing	Wrought aluminium alloy, hard-anodised
2	Bearing	Rolled steel
3	Gripper jaw	Hardened steel
–	Note on materials	Free of copper and PTFE
		RoHS-compliant

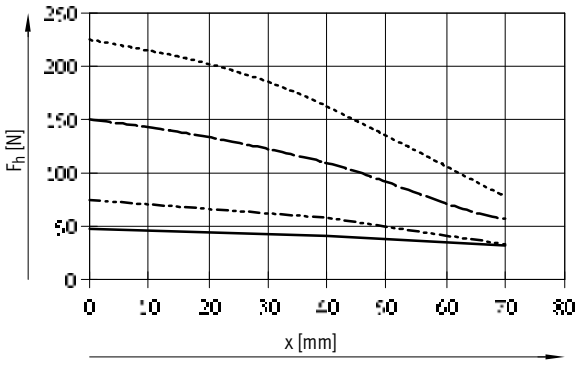
Gripping force F_h per gripper jaw as a function of travel speed v and lever arm x

The gripping forces as a function of travel speed and lever arm can be determined using following graphs.

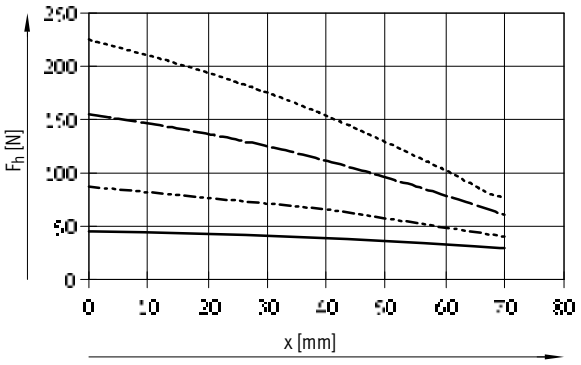


HGPLE-14

Opening



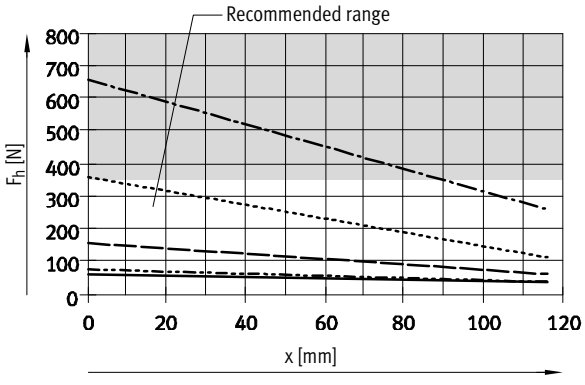
Closing



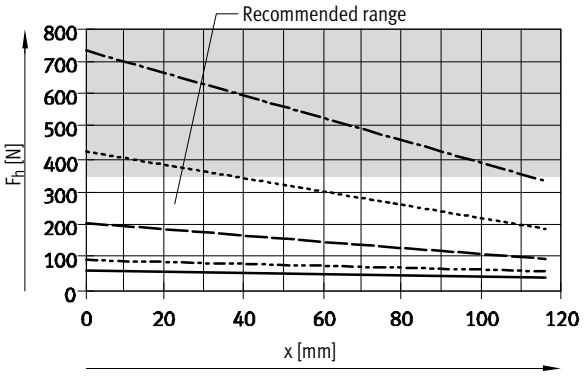
v = 2 mm/s
v = 10 mm/s
v = 20 mm/s
v = 30 mm/s

HGPLE-25

Opening



Closing



v = 2 mm/s
v = 10 mm/s
v = 20 mm/s
v = 40 mm/s
v = 60 mm/s

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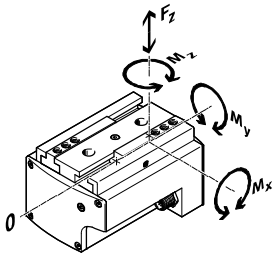
Technical data

Total gripping force F with a lever arm X = 20 mm

Travel speed v	[mm/s]	2	5	10	20	30	40	60
HGPLE-14								
Opening	[N]	92	93	149	300	450	–	–
Closing	[N]	88	104	173	305	445	–	–
HGPLE-25								
Opening	[N]	120	120	148	293	–	652	1150
Closing	[N]	121	120	176	376	–	771	1300

Characteristic load values at the gripper jaws

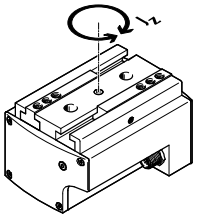


The indicated permissible forces and torques apply to a single gripper jaw. They include the lever arm, additional applied loads due to the workpiece or external gripper fingers and acceleration forces occurring during movement.

The zero co-ordinate line (gripper jaw guide groove) must be taken into consideration for the calculation of torques.

Size		14		25	
Stroke		30	60	40	80
Max. permissible force F_z	[N]	500	500	1500	1500
Max. permissible torque M_x	[Nm]	25	35	100	140
Max. permissible torque M_y	[Nm]	25	35	60	90
Max. permissible torque M_z	[Nm]	25	35	70	100

Mass moment of inertia [kgcm²]

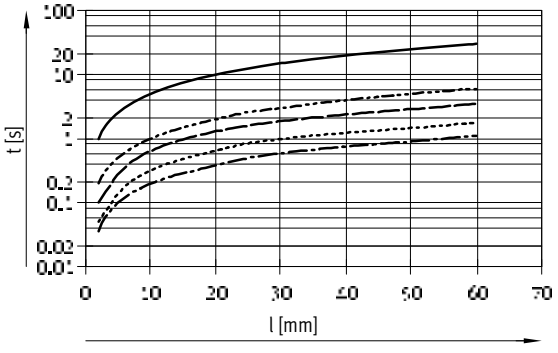


Under the following conditions:
- The reference point is the central axis
- Without external gripper fingers
- In a load-free state

Size		14		25	
Stroke		30	60	40	80
Mass moment of inertia Jz	[kgcm²]	4.24	11.64	28.32	72.72

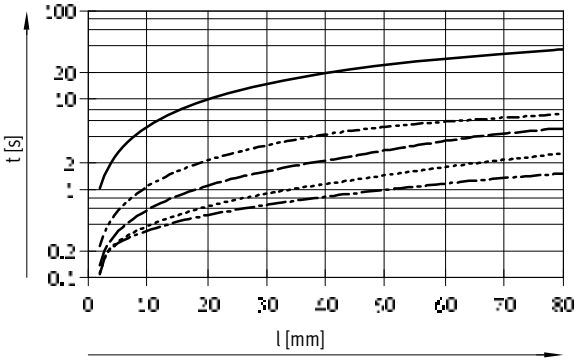
Positioning time t as a function of stroke per gripper jaw l and travel speed v

HGPLE-14



v = 2 mm/s
v = 10 mm/s
v = 20 mm/s
v = 40 mm/s
v = 55 mm/s

HGPLE-25



v = 2 mm/s
v = 10 mm/s
v = 20 mm/s
v = 40 mm/s
v = 65 mm/s

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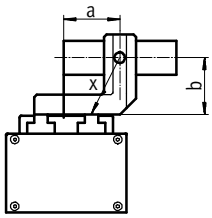
Gripping force F_h per gripper jaw as a function of lever arm x and eccentricity a and b

The following formula must be used to calculate the lever arm x with eccentric gripping:



$x = \sqrt{a^2 + b^2}$

The gripping force F_h can then be read from the graphs (➔ 6) using the calculated value x.

Calculation example

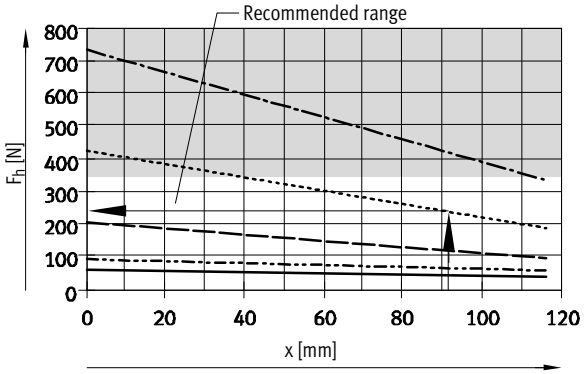
Given:
Distance a = 60 mm
Distance b = 70 mm
To be found:
The gripping force at 40 mm/s with a HGPLE-25-40, used as an external gripper

Approach:
Calculating the lever arm x

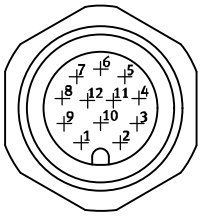
$x = \sqrt{60^2 + 70^2}$

x = 92 mm

The graph (➔ 6) gives a value for the gripping force F_h of approx. 245 N.



Pin allocation of plug connector



M12 plug connector		
Pin	Port	Function
1	Motor +	Motor conductor
2	Motor –	Motor conductor
3	A	Encoder signal RS 485
4	A/	Encoder signal RS 485
5	B	Encoder signal RS 485
6	B/	Encoder signal RS 485
7	I	Encoder signal RS 485
8	I/	Encoder signal RS 485
9	+5 V DC	Signal supply
10	0V	Signal ground
11	–	Preassigned
12	–	Preassigned

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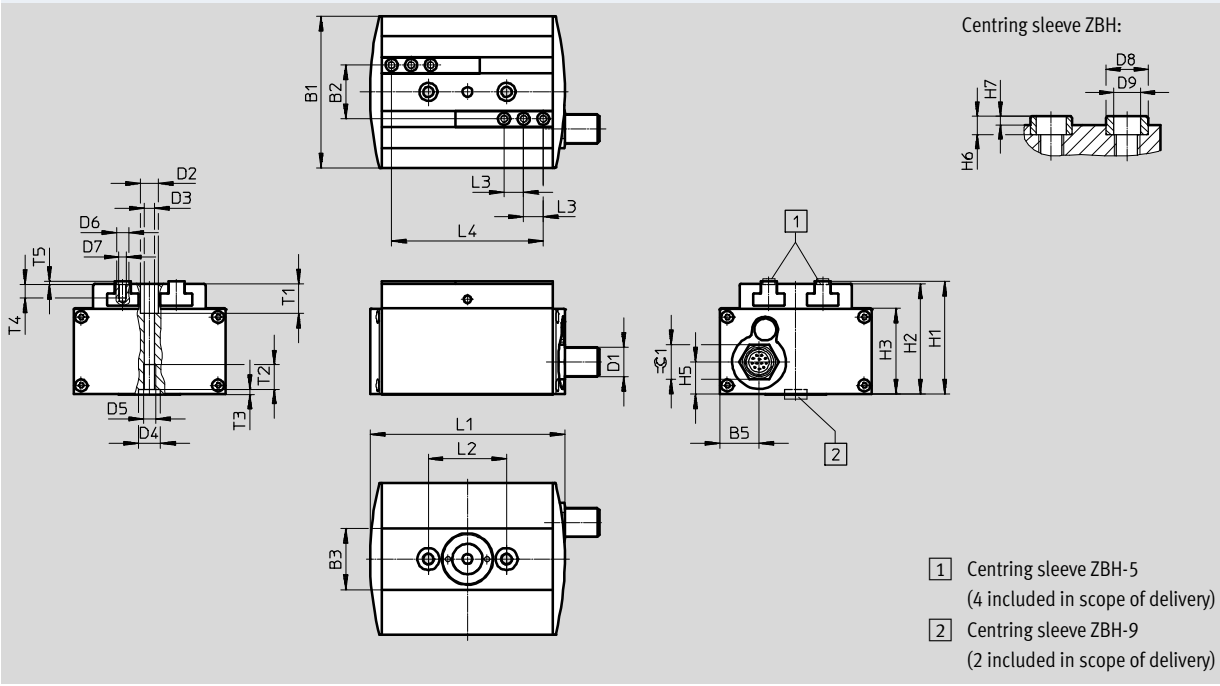
Dimensions Download CAD data ➔ **www.festo.com**

HGPLE-14



1 Centring sleeve ZBH-5
(4 included in scope of delivery)
2 Centring sleeve ZBH-9
(2 included in scope of delivery)

Type	B1 ±0.05	B2 ±0.01	B3 ±1	B5	D1	D2 ∅ H13	D3 ∅	D4 ∅ H8	D5	D6 ∅ H8	D7
HGPLE-14-30	62	22	25	16	M12x1	7.4	4.2	9	M5	5	M3
HGPLE-14-60											

Type	D8[4] ∅ h7	D9[4] ∅	H1 ±0.1	H2	H3	H5	H6[4] −0.2	H7[4] −0.3	L1 ±0.3	L2[1]	L3[1]
HGPLE-14-30	5/7	3.2/6.4	46.2	45.2	35.2	13.1	2.4/4	1.1/1.9	79.6	32	8
HGPLE-14-60									139.6		

Type	L4		T1	T2	T3	T4	T5	⫧
	max.[2]	min.[3]	+0.2	min.	+0.1	min.	+0.1	
HGPLE-14-30	62	2	12	10	2.1	5.5	1.3	14
HGPLE-14-60	122	2						

1) Tolerance for centring hole ±0.02 mm
Tolerance for thread ±0.1 mm
2) Gripper open
3) Gripper closed
4) On the gripper jaw/on the gripper

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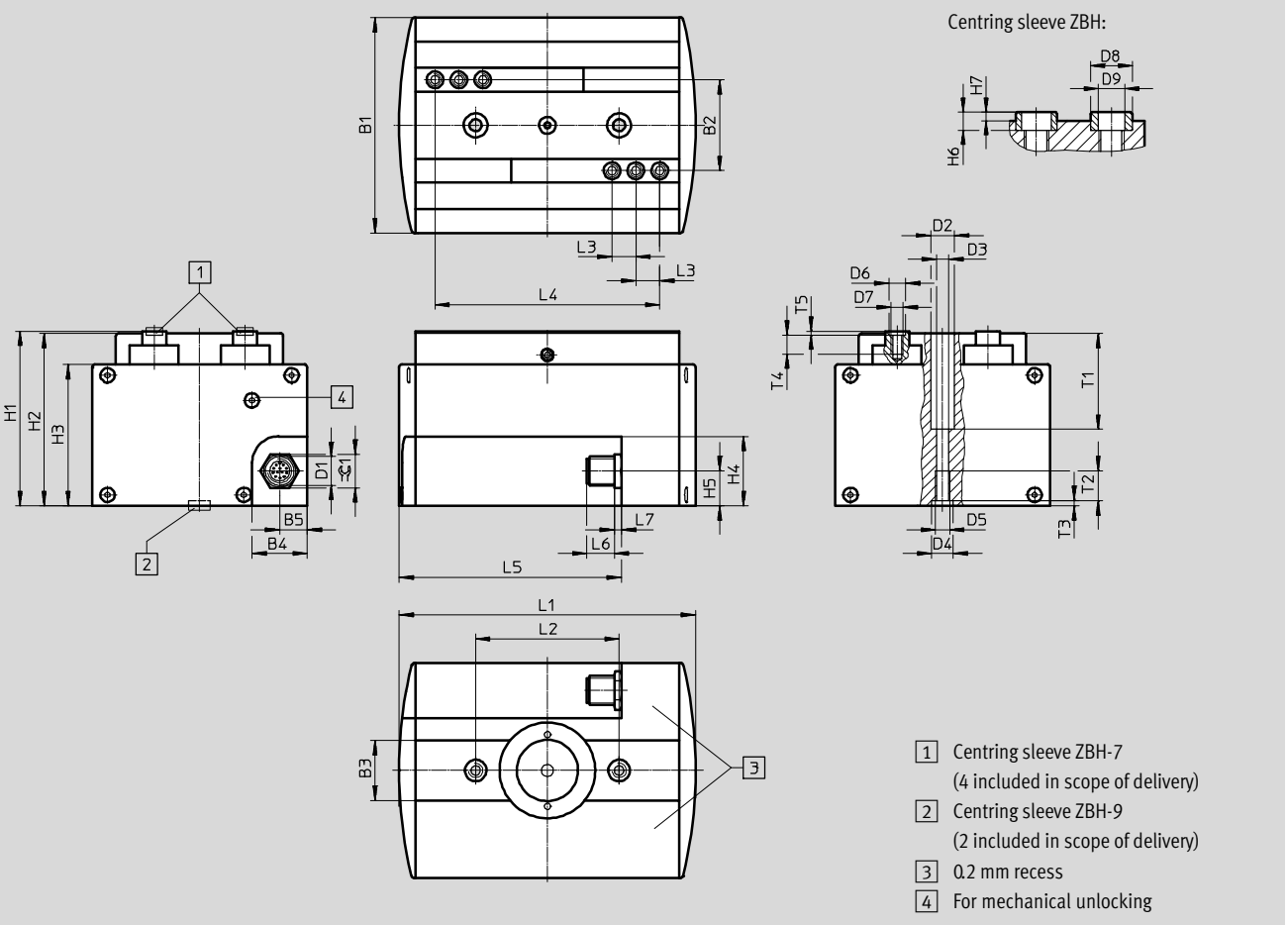
Dimensions Download CAD data ➔ **www.festo.com**

HGPLE-25



Type	B1	B2	B3	B4	B5	D1	D2	D3	D4	D5	D6	D7
	±0.05	±0.01	±1				∅ H13	∅ +0.1	∅ H8		∅ H8	
HGPLE-25-40	90	38	25	23	11.5	M12x1	10	5.1	9	M6	7	M5
HGPLE-25-80												

Type	D8[4]	D9[4]	H1	H2	H3	H4	H5	H6[4]	H7[4]	L1	L2[1]	L3[1]
	∅ h7	∅	±0.1					−0.2	−0.3	±0.3		
HGPLE-25-40	7/9	5.3/6.4	73	72	59	29	14.5	3/4	1.4/1.9	124	60	10
HGPLE-25-80										204		

Type	L4		L5	L6	L7	T1	T2	T3	T4	T5	⫷
	max.[2]	min.[3]				+0.2	min.	+0.1	min.	+0.1	
HGPLE-25-40	94	14	93	11.5	3	40	12.5	2.1	8	1.6	14
HGPLE-25-80	174	14	133								

1) Tolerance for centring hole ±0.02 mm
Tolerance for thread ±0.1 mm
2) Gripper open
3) Gripper closed
4) On the gripper jaw/on the gripper

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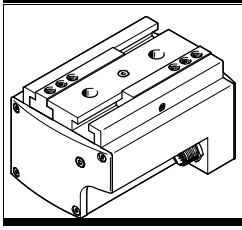
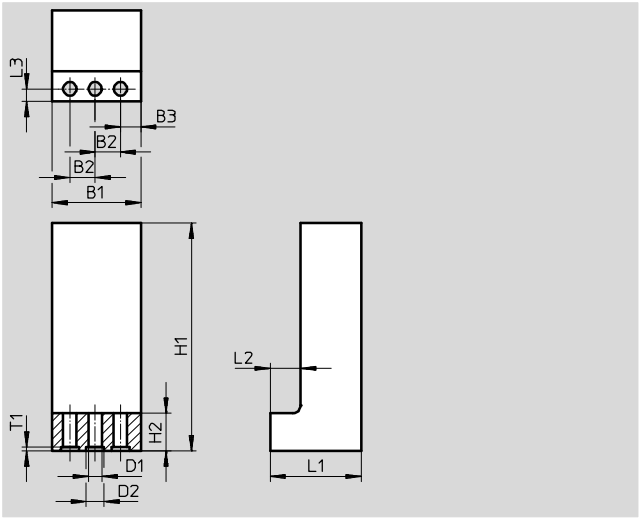
Ordering data

	Part No.	Type
	**2342434**	**HGPLE-14-30-3,1-DC-VCSC-G96**
	2342435	**HGPLE-14-60-3,1-DC-VCSC-G96**
	555563	**HGPLE-25-40-2,8-DC-VCSC-G85**
	2342436	**HGPLE-25-80-2,8-DC-VCSC-G85**

Accessories

Gripper jaw blank BUB-HGPL
(2 included in delivery)

Materials:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant



Dimensions and ordering data

For size	B1 +0.1	B2 +0.02	B3	D1 ∅ +0.1	D2 ∅ H8	H1 +0.1	H2
14	25	8	4	3.2	5	80	11
25	35	10	8	5.3	7	120	15

For size	L1 +0.1	L2 +0.1	L3 +0.1	T1 +0.1	Weight per blank [g]	Part No.	Type
14	20.5	8	3.3	1.3	75	**537316**	**BUB-HGPL-14**
25	36	12	5	1.6	295	**537317**	**BUB-HGPL-25**

Ordering data – Centring sleeve

	For size	Part No.	Type	PU[1]
For the gripper jaws			Technical data ➔ Internet: zbh	
	14	**189652**	**ZBH-5**	10
	25	**186717**	**ZBH-7**	
For the gripper			Technical data ➔ Internet: zbh	
	14, 25	**150927**	**ZBH-9**	10

1) Packaging unit

Parallel grippers HGPLE, sturdy with long stroke, electric

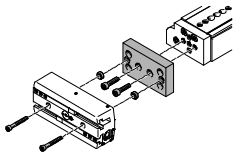
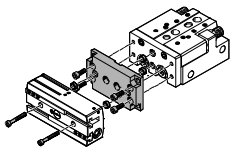
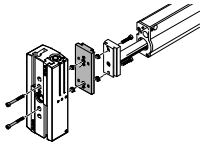
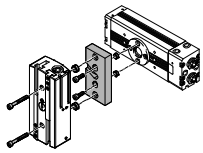
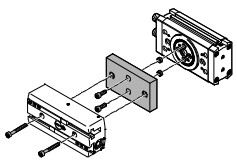
Accessories

Adapter kit
DHAA, HAPG

Materials:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

Note
The kit includes the individual mounting interface as well as the necessary mounting material.

Permissible drive/gripper combinations with adapter kit — Download CAD data ➔ **www.festo.com**

Combination	Drive Size	Gripper Size	Mounting option		Adapter kit CRC[1]	Part No.	Type
DGSL/HGPLE	DGSL	HGPLE			DHAA/HAPG		
	16	14	■	■	2	**2519367**	**DHAA-G-G6-16-B17-14**
	20, 25	14	■	■		**2515219**	**DHAA-G-G6-20-B17-14**
	25	25	■	■		**539274**	**HAPG-90**
SLT/HGPLE	SLT	HGPLE			DHAA		
	16	14	■	–	2	**2531838**	**DHAA-G-G3-16-B17-14**
	20	14	■	–		**2516304**	**DHAA-G-G3-20-B17-14**
	25	14	■	–		**2516252**	**DHAA-G-G3-25-B17-14**
	25	25	■	–		**8033603**	**DHAA-G-G3-25-B17-25**
HMP/HGPLE	HMP	HGPLE			HAPG		
	20, 25	25	–	■	2	**539887**	**HAPG-92**
DRQD/HGPLE							
	DRQD	HGPLE			DHAA/HAPG		
	16, 20	14	■	■	2	**2534351**	**DHAA-G-Q5-16-B17-14**
	25, 32	25	■	■		**537311**	**HAPG-SD2-29**
	DRQD-E422	HGPL			DHAA/HAPG		
	16, 20	14	■	■	2	**2512383**	**DHAA-G-Q5-16-B17-14-E**
	25, 32	25	■	■		**544645**	**HAPG-SD2-46**
DRRD/HGPLE	DRRD	HGPLE			DHAA		
	16	14	■	■	2	**8034057**	**DHAA-G-Q11-16-B17-14**
	20	14	■	■		**8034058**	**DHAA-G-Q11-20-B17-14**
	25	14	■	■		**3122168**	**DHAA-G-Q11-25-B17-14**
	25	25	■	■		**8033607**	**DHAA-G-Q11-25-B17-25**
	32	25	■	■		**8033608**	**DHAA-G-Q11-32-B17-25**
	35	25	■	■		**8033609**	**DHAA-G-Q11-35-B17-25**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Parallel grippers HGPLE, sturdy with long stroke, electric

Accessories

FESTO

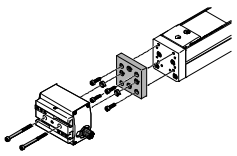
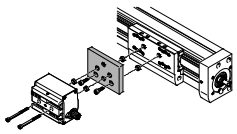
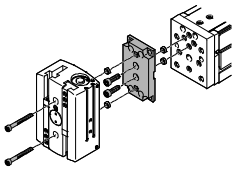
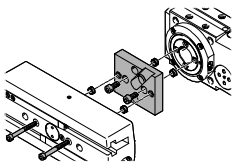
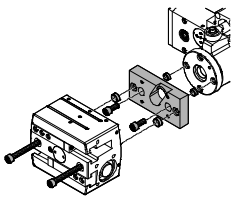
Adapter kit
DHAA, HAPG

Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant

Note
The kit includes the individual mounting interface as well as the necessary mounting material.

Permissible drive/gripper combinations with adapter kit

Download CAD data ➔ **www.festo.com**

Combination	Drive	Gripper	Mounting option		Adapter kit		
	Size	Size			CRC[1]	Part No.	Type
DGEA/HGPLE	DGEA	HGPLE			DHAA		
	25	14	■	■	2	**2786045**	**DHAA-G-E2-25-B17-14**
	40	14	■	■		**2806354**	**DHAA-G-E2-40-B17-14**
EGC/HGPLE	EGC	HGPLE			DHAA		
	70	14	■	■	2	**2808960**	**DHAA-G-E7-70-B17-14**
	80	14	■	■		**2810619**	**DHAA-G-E7-80-B17-14**
	120	25	■	■		**8033604**	**DHAA-G-E7-120-B17-25**
	185	25	■	■		**8033605**	**DHAA-G-E7-185-B17-25**
EGSL/HGPLE	EGSL	HGPLE			DHAA		
	45, 55	14	■	■	2	**2519367**	**DHAA-G-G6-16-B17-14**
	75	14	■	■		**2515219**	**DHAA-G-G6-20-B17-14**
ERMB/HGPLE	ERMB	HGPLE			DHAA		
	20	14	■	■	2	**2807590**	**DHAA-G-R1-20-B17-14**
	25	14	■	■		**2812698**	**DHAA-G-R1-25-B17-14**
	32	25	■	■		**8033606**	**DHAA-G-R1-32-B17-25**
EHMB/HGPLE	EHMB	HGPLE			HAPG		
	20	25	■	■	2	**537311**	**HAPG-SD2-29**

1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

Product Range and Company Overview

A Complete Suite and Company Overview

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.

Custom Automation Components
Complete custom engineered solutions

Custom Control Cabinets
Comprehensive engineering support and on-site services

Complete Systems
Shipment, stocking and storage services

The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.

Electromechanical
Electromechanical actuators, motors, controllers & drivers

Pneumatics
Pneumatic linear and rotary actuators, valves, and air supply

PLCs and I/O Devices
PLC's, operator interfaces, sensors and I/O devices

Supporting Advanced Automation... As No One Else Can!
Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 16,000 employees in 60 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

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Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

To meet this commitment, we strive to ensure a consistent, integrated, and systematic approach to management that will meet or exceed the requirements of the ISO 9001 standard for Quality Management and the ISO 14001 standard for Environmental Management.

9001:CERTCS-16248-2006-AQ-ESN-TGA
ISO 9001
ISO 14001
DNV
Certified Company
14001:CERTCS-16248A-2006-AQ-ESN-TGA

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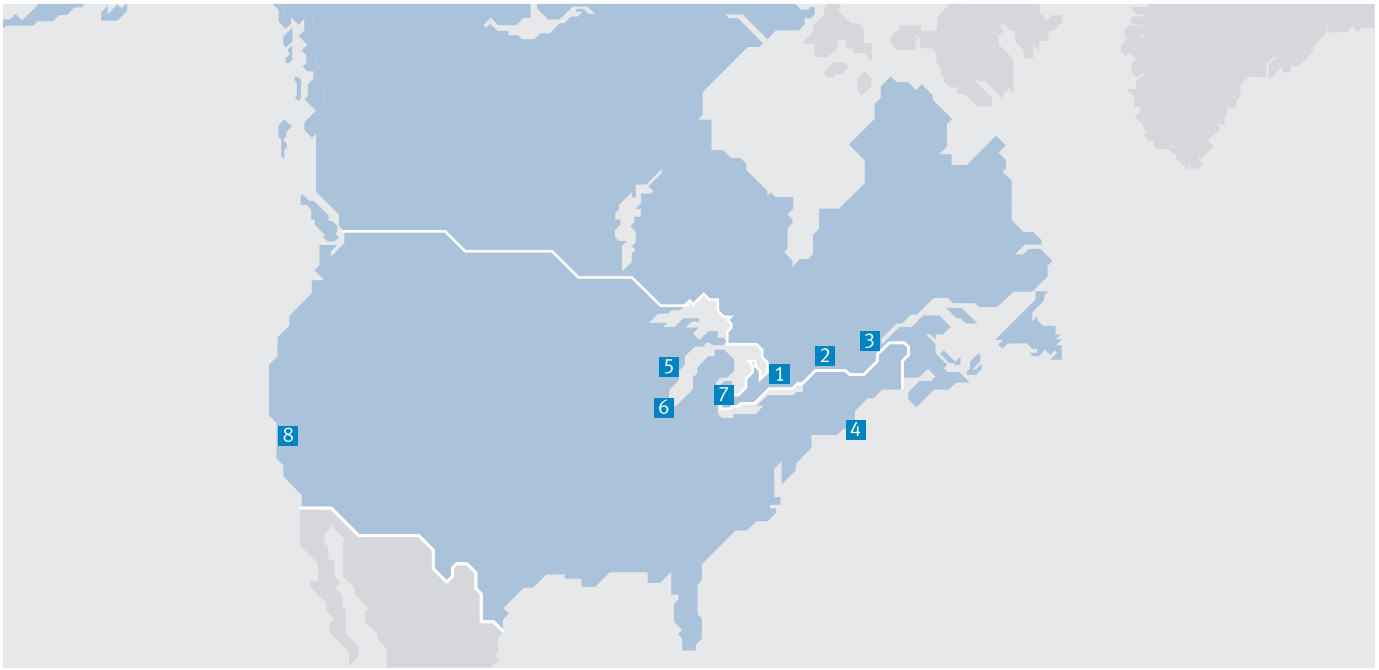

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