

**Pick & Place**



## Pick & Place

Pick & place - ideally suited for workpieces weighing up to 10 kg and applications where the handling unit needs to be retracted from the working area.

### Pick & Place

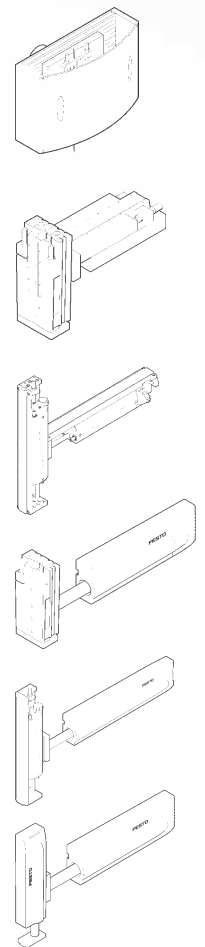
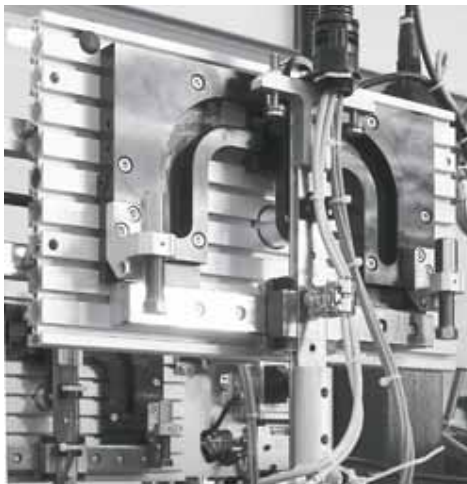
#### Using the example of feeding units in a welding station

##### The task:

A system for automatic feeding and welding of axes into formed parts for CD/DVD drives for use in cars, needs to provide high cycle rates, short strokes and high precision.

##### The solution:

The system comprises four stations: feeding; assembly, welding and measuring. Four HSP handling modules ensure short cycle times for equipping and feeding of parts to the final inspection units. This system offers a further advantage in addition to the short cycle times: The stroke adjustment facility means that the handling module can be quickly adapted to a variety of uses.



## Pick & Place – System matrix

### Two-dimensional systems

The system matrix provides you with condensed information regarding the most important parameters for quick selection of your system. Reference to the corresponding page, guides you to standard solutions and individual components.

A standard solution means

- Complete bill of materials with exploded view
- Quick project planning
- Reliable data, accuracy, travel time

#### Workpiece load

With a standard front end (semi-rotary drive and gripper or gripper only), the workpiece load can serve as a basis for the approximate selection of a handling/positioning system.

#### Working load

The working load is a decisive factor in the precise selection of a standard handling system.

The working load of a handling/positioning system is the sum of the loads of the following parts:

- Function units (semi-rotary drives and grippers)
- Adapter plates
- Gripper fingers
- Workpiece

Pick & Place					
Drive system	P	E	P	SP	P
Moving loads					
Max. working load	0 ... 1.6 kg		0 ... 3 kg		0 ... 3 kg
Workpiece load	0 ... 0.1 kg		0 ... 0.5 kg		0 ... 2 kg
Stroke range					
Y-axis (horizontal)					
[mm]	52 ... 170		0 ... 200		0 ... 200
Z-axis (vertical)					
[mm]	20 ... 70		0 ... 200		0 ... 200
Intermediate positions					
Y	–	any	–	any	1
Z	–	any	–	any	1
Repetition accuracy					
Y [mm]	±0.01		0.02		±0.05
Z [mm]	±0.01		0.02		±0.05
Standard examples					
Type	HSP-AP	HSP-AE	SLT/SLT	SLTE/SLTE	HMPL/HMPL
Page					

Pick & Place							
Drive system	P	SP	LAC	P	LAC	P	LAC
Moving loads							
Max. working load	0 ... 6 kg			0 ... 6 kg		0 ... 10 kg	
Workpiece load	0 ... 1 kg			0 ... 3 kg		0 ... 5 kg	
Stroke range							
Y-axis (horizontal)							
[mm]	0 ... 400			0 ... 400		0 ... 400	
Z-axis (vertical)							
[mm]	0 ... 200		0 ... 150		0 ... 200		0 ... 400
Intermediate positions							
Y	1		any	1		any	1
Z	–	any	–	1		1	
Repetition accuracy							
Y [mm]	0.02			0.02		0.02	
Z [mm]	0.02		0.05		0.02		0.01
Standard examples							
Type	HM.../SLT(E)			HM.../HMPL		HM.../HMP	
Page							

#### H Note

- P Pneumatic
- E Electrical (Servo motor)
- PS Servo-pneumatic
- SP Spindle axis, electrical
- ZR Toothed belt axis, electrical
- LAC Linear motor

# Pick & Place

## Handling module HSP-AP, HSP-AE

The combination of a semi-rotary drive and a slotted guide system produces a compact unit with extremely short cycle times for a complete pick & place cycle.

**HSP-AP:**  
pneumatic semi-rotary drive  
**HSP-AE:**  
drive with servo motor

### Attributes of the handling system

- Pneumatic or electrical
- Compact design
- Extremely short cycle times
- Low-cost
- For working loads up to 1.6 kg
- Stroke adjustment along Y- and Z-axes
- Wait positions possible (AP)
- Freely positionable (AE)
- No planning costs

### Sample application

Handling of small parts with short travel distances

### Other attributes of the system

- Precision through metallic end position stops and sturdy design
- Ultra-simple installation as the HSP handling module is supplied fully pre-assembled
- Operational and process reliability through safe tubing and cable routing

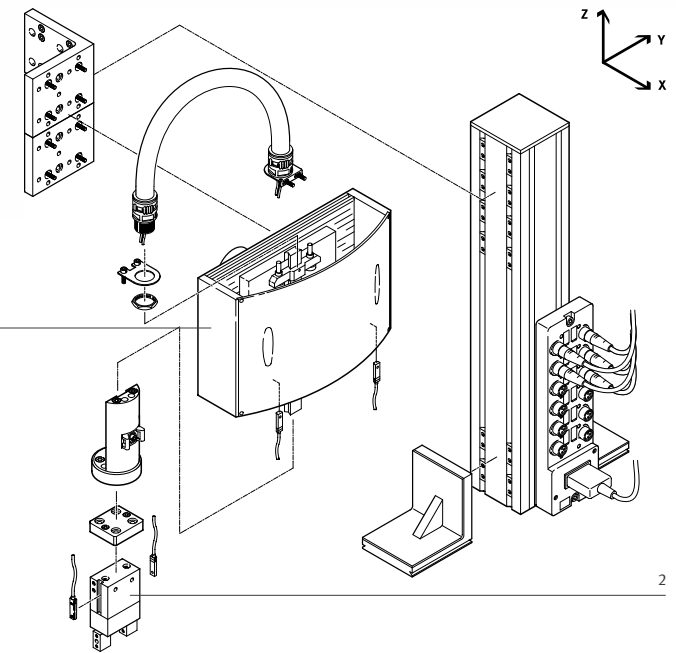


### General technical data

Size	HSP-12	HSP-16	HSP-25
Working load*	0 ... 0.7 kg	0 ... 1.2 kg	0 ... 1.6 kg
Stroke range			
Y-direction	52 ... 68 mm	90 ... 110 mm	130 ... 170 mm
Z-direction	20 ... 30 mm	35 ... 50 mm	50 ... 70 mm
Wait positions HSP-AP	2		
Wait position HSP-AE	any		
Repetition accuracy in the end position			
Y-direction	±0.01 mm	±0.01 mm	±0.02 mm
Z-direction	±0.01 mm	±0.01 mm	±0.02 mm
Minimum cycle time	0.6 s	0.8 s	1.0 s

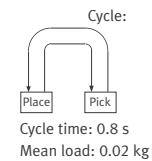
\*The working load is the total weight on the Z-axis (workpiece, gripper, semi-rotary drive, adapter plates)

- 1 Handling module HSP
- 2 Parallel gripper HGP

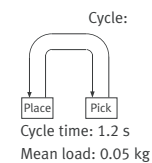


1

**Solution example A:**  
HSP-12-AP-SD  
HGP-10 (Gripper)

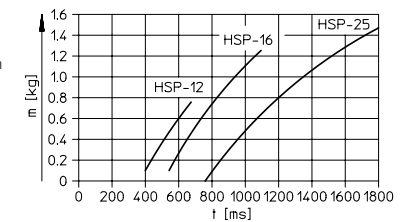


**Solution example B:**  
HSP-16-AP  
HGP-16 (Gripper)



### Working load m as a function of the cycle time t

The cycle time t is the time taken for the HSP to move from one end position to the other and back again. The working load m is the load attached to the vertical guide rail (e.g. adapter, gripper, semi-rotary drive and workpiece).



# Pick & Place

## Compact pick & place SLT/SLT, SLTE/SLTE

For working loads up to 3 kg and an extremely rigid gantry design: the combination of two mini-slides.

**Pneumatic solution: SLT**  
High dynamic characteristics using the pneumatic mini slide

**Electrical solution: SLTE**  
Free positioning capability using the electrical mini slide

**Attributes of the handling system**

- Compact design
- Range of stroke lengths
- Very short cycle times (SLT)
- Various cushioning variants (SLT)
- Freely positionable (SLTE)

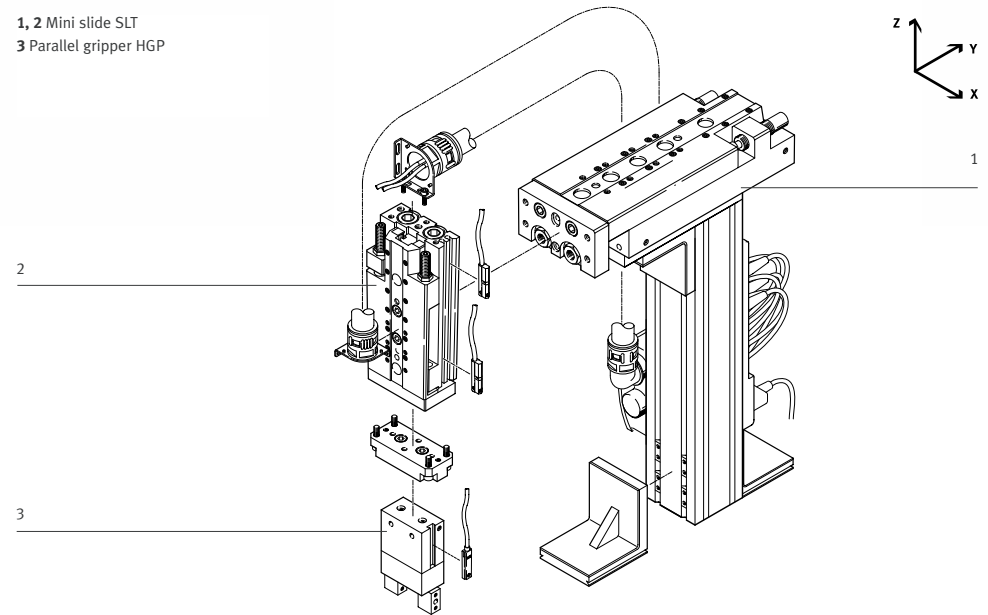
**Sample application**  
Precision handling of small parts with short travel distances.

**Other attributes of the system**

- Reliability and precision through high mechanical rigidity
- Operational and process reliability through safe routing of tubing and cables in protective conduit
- Flexibility through the variety of solutions offered by the modular handling system
- User friendliness through straightforward assembly and installation, even during servicing



- 1, 2 Mini slide SLT
- 3 Parallel gripper HGP

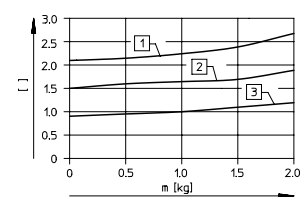


System type				
Working load		1 kg	2 kg	3 kg
Y-axis				
SLT, SLTE	Size	16	20	25
	Max. stroke	150	200	200
	Drive system	pneumatic, electric		pneumatic
	Options	shock absorber, adjustable cushioning, fixed cushioning		
Z-axis				
SLT, SLTE	Size	10	16	20
	Max. stroke	80	150	200
	Drive system	pneumatic, electric		pneumatic
	Options	shock absorber, adjustable cushioning, fixed cushioning, freely positionable (SLTE)		
Basic and installation components				

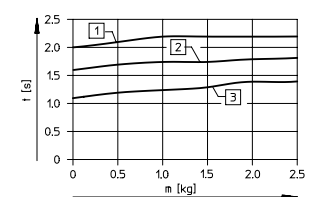
**Working load m as a function of the cycle time t**

Combination of Y/Z-axis

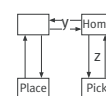
SLT-16/SLT-10



SLT-20/SLT-16



Cycle:



Stroke along Y-/Z-axis

- 1 150 mm/80 mm
- 2 100 mm/50 mm
- 3 50 mm/30 mm

Stroke along Y-/Z-axis

- 1 150 mm/100 mm
- 2 150 mm/80 mm
- 3 80 mm/50 mm

# Pick & Place

## Compact pick & place HMPL/HMPL

With additional functions for working loads up to 3 kg: the combination of two linear modules HMPL.

### Attributes of the handling system

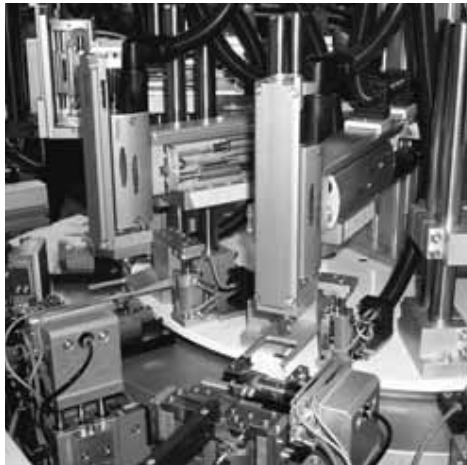
- Lightweight components
- Narrow front end area
- Very short cycle times
- Additional functions:
  - Intermediate position with travel capability possible along Y- and Z-axes
  - Clamping cartridge possible along Y- and Z- axes
- Highly dynamic vertical return stroke

### Sample application

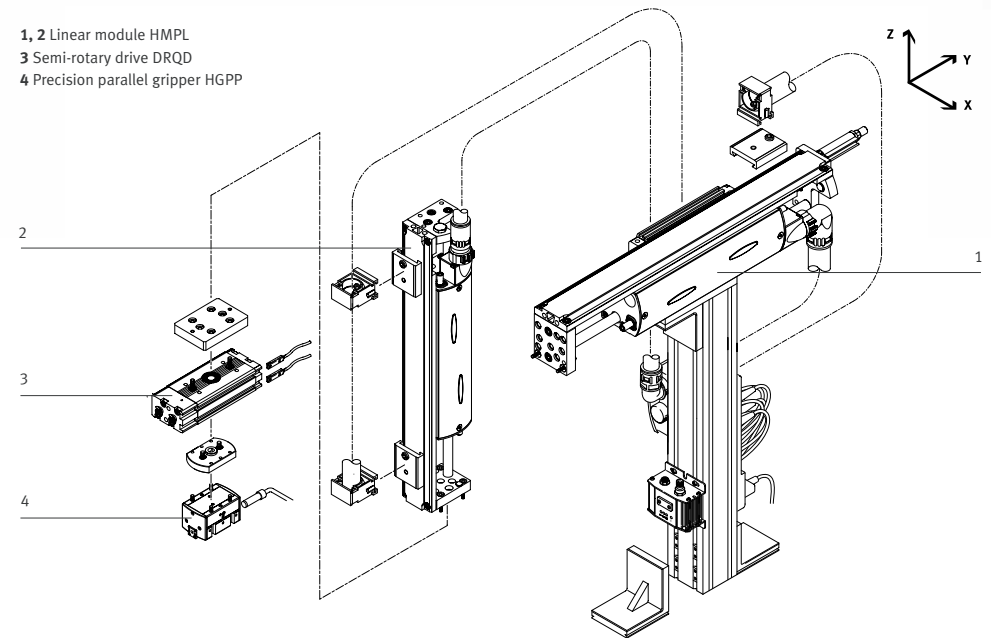
Precision handling of small parts with short travel distances and with intermediate position

### Other attributes of the system

- Reliability and precision through high mechanical rigidity
- Operational and process reliability through routing of tubing and cables in protective conduit
- Flexibility through the variety of solutions offered by the modular handling system
- User friendliness through straight-forward assembly and installation, even during servicing



- 1, 2 Linear module HMPL
- 3 Semi-rotary drive DRQD
- 4 Precision parallel gripper HGPP

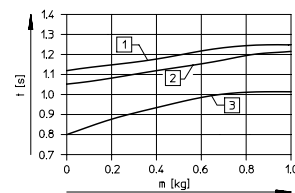


System type				
Working load		1 kg	2 kg	3 kg
Y-axis				
HMPL	Size	16	20	
	Max. stroke	160	200	
	drive system	pneumatic		
	Options	intermediate position, clamping cartridge		
Z-axis				
HMPL	Size	12	16	20
	Max. stroke	100	160	200
	Drive system	pneumatic		
	Options	intermediate position, clamping cartridge		
Basic and installation components				

### Working load m as a function of the cycle time t

Combination of Y/Z-axis

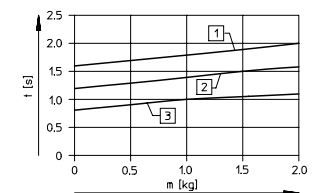
HMPL-16/HMPL-12



Stroke along Y-/Z-axis

- 1 100 mm/50 mm
- 2 80 mm/50 mm
- 3 50 mm/30 mm

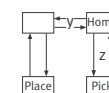
HMPL-20/HMPL-16



Stroke along Y-/Z-axis

- 1 200 mm/160 mm
- 2 100 mm/100 mm
- 3 50 mm/50 mm

Cycle:



# Pick & Place

## Mid-sized pick & place HMP/SLT, HME/SLTE

For horizontal strokes up to 400 mm and working loads up to 6 kg: the combination of a linear module and a mini slide.

**Pneumatic solutions:**  
HMP, SLT

**Electrical solutions:**  
HME (linear motor),  
SLTE (spindle axis)

### Attributes of the handling system

- High rigidity and precision, even with long strokes
- Additional functions:
  - Intermediate position possible along Y-axis
  - Clamping cartridge possible along Y-axis
- Free positioning capability along the Z axis (SLTE) and Y axis (HME)

### Sample application

Feeding and palletising of workpieces using long Y strokes and short Z strokes.



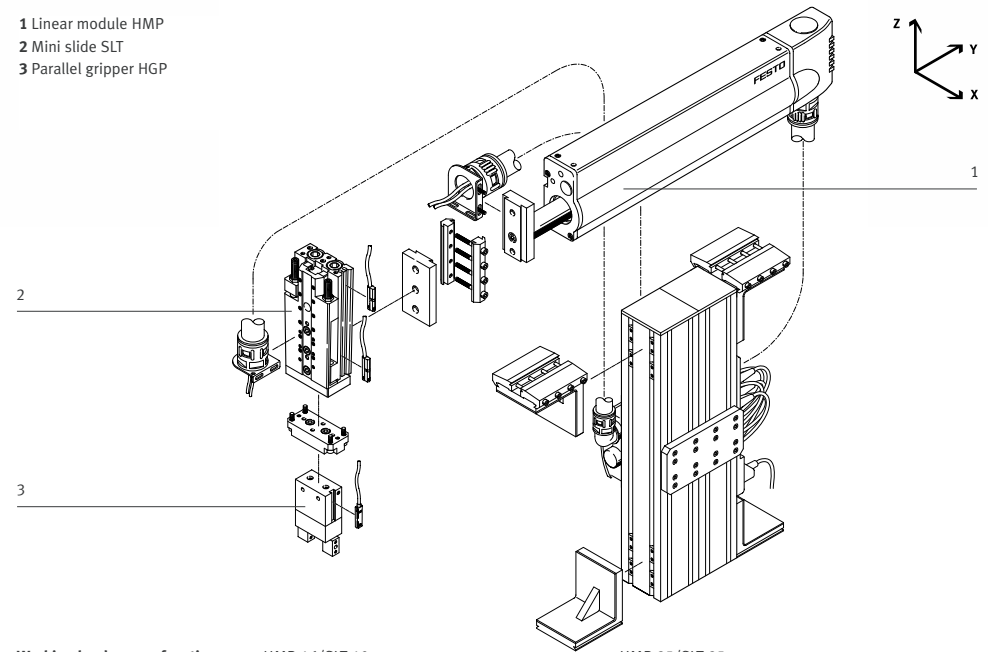
### Other attributes of the system

- Reliability and precision through high mechanical rigidity
- Operational and process reliability through routing of tubing and cables in protective conduit
- Flexibility through the variety of solutions offered by the modular handling system
- User friendliness through easy assembly and installation, even during servicing

System type				
Working load		2 kg	4 kg	6 kg
Y-axis				
HMP, HME*	Size	16	16 (20)	20 (25)
	Max. stroke	320	320 (400)	400
	Drive system	pneumatic, electric		
	Options	intermediate position, clamping cartridge, larger HMP for a greater dynamic response and longer strokes		
Z-axis				
SLT, SLTE	Size	16	20	25
	Max. stroke	150	200	200
	Drive system	pneumatic, electric		
	Options	shock absorber, adjustable cushioning, fixed cushioning		
Basic and installation components				

\* HME: Size 16 and 25

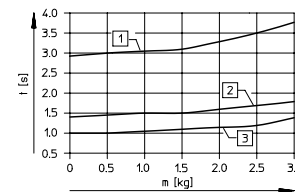
- 1 Linear module HMP
- 2 Mini slide SLT
- 3 Parallel gripper HGP



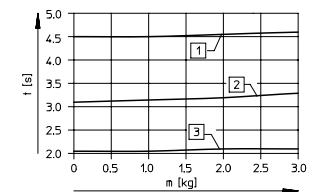
### Working load m as a function of the cycle time t

Combination of Y/Z-axis

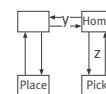
HMP-16/SLT-10



HMP-25/SLT-25



Cycle:



Stroke along Y-/Z-axis

- 1 320 mm/150 mm
- 2 150 mm/80 mm
- 3 100 mm/50 mm

Stroke along Y-/Z-axis

- 1 400 mm/200 mm
- 2 250 mm/150 mm
- 3 150 mm/100 mm



# Pick & Place

## Mid-sized pick & place HMP/HMPL, HME/HMPL

With optional additional functions for horizontal strokes up to 400 mm and working loads up to 6 kg: the combination of the sturdy linear module HMP and the lightweight linear module HMPL.

**Pneumatic horizontal axis:** HMP  
**Electrical horizontal axis:** HME

### Attributes of the handling system

- High rigidity and precision, even with long strokes
- Pneumatic or electrical linear module for Y stroke
- Additional functions:
  - Intermediate position possible along the Y axis
  - Clamping cartridge possible along Y and Z axes
- Narrow front end area
- Highly dynamic response, particularly with vertical stroke

### Sample application

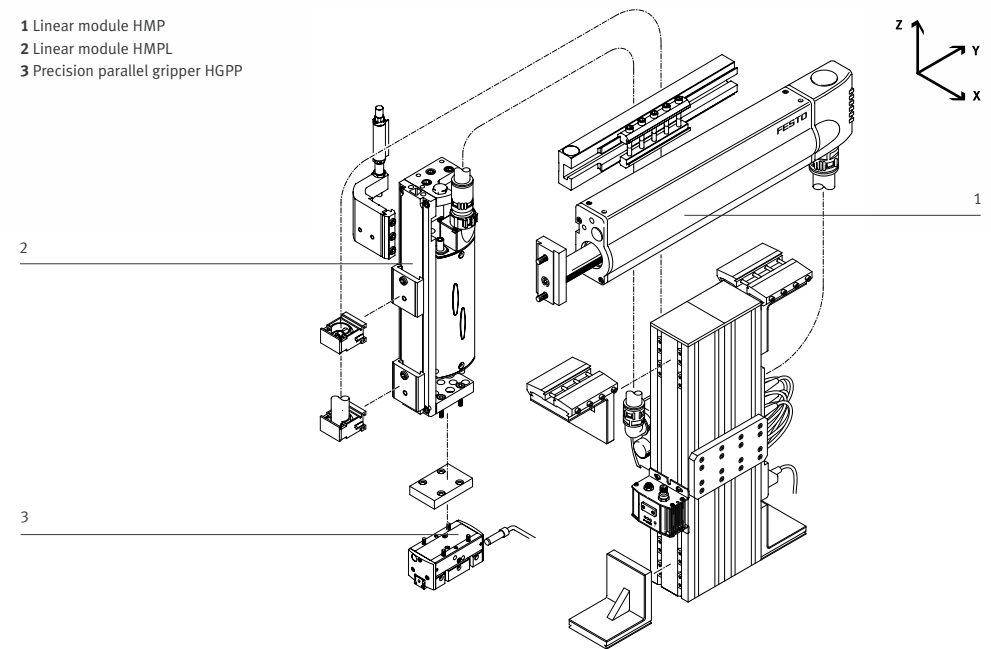
Feeding and palletising of workpieces; ideal with long Y strokes and short Z strokes

### Other attributes of the system

- Reliability and precision through high mechanical rigidity
- Operational and process reliability through routing of tubing and cables in protective conduit
- Flexibility through the variety of solutions offered by the modular handling system
- User friendliness through easy assembly and installation, even during servicing



- 1 Linear module HMP
- 2 Linear module HMPL
- 3 Precision parallel gripper HGPP



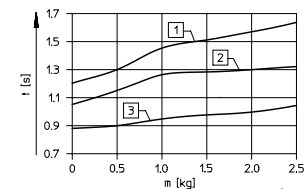
System type				
Working load		2 kg	4 kg	6 kg
Y-axis				
HMP, HME*	Size	16	16	20
	Max. stroke	320	320	400
	Drive system	pneumatic, electric		
	Options	intermediate position, clamping cartridge, larger HMP for a greater dynamic response and longer strokes, freely positionable (HME)		
Z-axis				
HMPL	Size	16	20	20
	Max. stroke	160	200	200
	Drive system	pneumatic		
	Options	intermediate position, clamping cartridge		
Basic and installation components				

\* HME: Size 16 and 25

### Working load m as a function of the cycle time t

Combination of Y/Z-axis

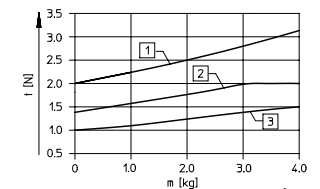
HMP-16/HMPL-16



Stroke along Y-/Z-axis

- 1 150 mm/50 mm
- 2 100 mm/50 mm
- 3 50 mm/30 mm

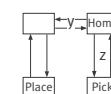
HMP-16/HMPL-20



Stroke along Y-/Z-axis

- 1 320 mm/200 mm
- 2 200 mm/100 mm
- 3 100 mm/50 mm

Cycle:



# Pick & Place

## Large pick & place HMP/HMP, HME/HMP

For horizontal and vertical strokes up to 400 mm, working loads up to 10 kg and additional functions: the combination of two sturdy linear modules.

**Pneumatic horizontal axis:** HMP  
**Electrical horizontal axis:** HME

### Attributes of the handling system

- High rigidity and precision, even with long strokes
- Very high load-carrying capacity thanks to high-quality guides
- Additional functions:
  - Intermediate position possible
  - Clamping cartridge and electrical interface possible along both axes
- Highly dynamic response with working loads up to 6 kg
- Freely positionable Y stroke when using HME-25

### Sample application

Feeding and palletising of heavy workpieces using long Y strokes and short Z strokes

### Other attributes of the system

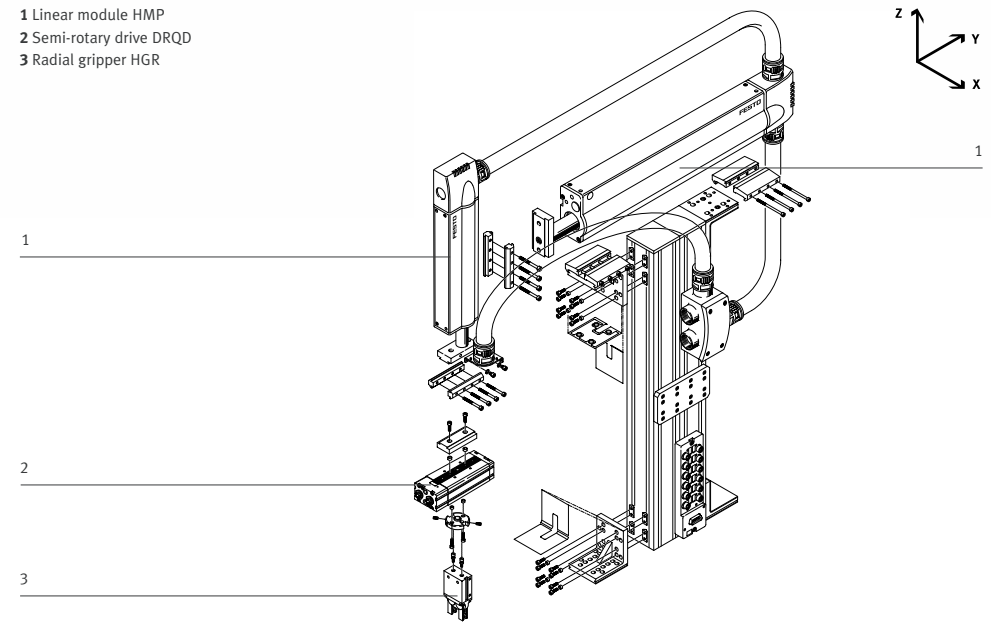
- Reliability and precision through high mechanical rigidity
- DUO system structure for particularly high loads
- Operational and process reliability through routing of tubing and cables in protective conduit
- Flexibility through the variety of solutions offered by the modular handling system
- User friendliness through straightforward assembly and installation, even during servicing



System type				
Working load		4 kg	6 kg	10 kg
Y-axis				
HMP, HME*	Size	20 (25)	25 (32)	32
	Max. stroke	400	400	400
	Drive system	pneumatic, electric		
	Options	intermediate position, clamping cartridge		
Z-axis				
HMP	Size	16	20	25
	Max. stroke	320	400	400
	Drive system	pneumatic		
	Options	intermediate position, clamping cartridge		
Basic and installation components				

\* HME: Size 16 and 25

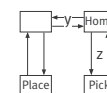
- 1 Linear module HMP
- 2 Semi-rotary drive DRQD
- 3 Radial gripper HGR



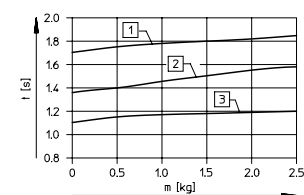
### Working load m as a function of the cycle time t

Combination of Y/Z-axis

Cycle:



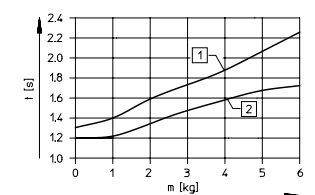
HMP-20/HMP-16



Stroke along Y-/Z-axis

- 1 320 mm/50 mm
- 2 200 mm/40 mm
- 3 100 mm/30 mm

HMP-25/HMP-20

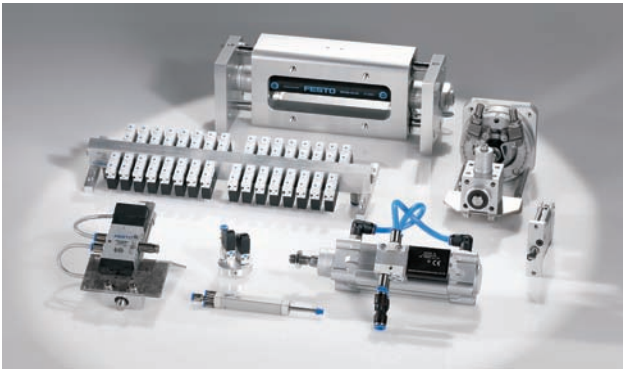


Stroke along Y-/Z-axis

- 1 400 mm/400 mm
- 2 400 mm/200 mm

## Product Range and Company Overview

### Custom Automation Components



### Custom Control Cabinets



### Complete Systems



### Complete Automation Solutions

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

### Electromechanical



### Pneumatics



### PLCs and I/O Devices



### Comprehensive Line of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo can support the most complex automation requirements.

### 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 11,500 employees in 56 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.

# Festo North America

## United States

### Customer Resource Center

502 Earth City Expressway, Suite 125  
Earth City, MO 63045

For ordering assistance,  
or to find your nearest Festo Distributor,  
Call: 1.800.99.FESTO  
Fax: 1.800.96.FESTO  
Email: customer.service@us.festo.com

For technical support,  
Call: 1.866.GO.FESTO  
Fax: 1.800.96.FESTO  
Email: product.support@us.festo.com

### Headquarters

Festo Corporation  
395 Moreland Road  
P.O. Box 18023  
Hauppauge, NY 11788  
www.festo.com/usa

### Sales Offices

#### Appleton

North 922 Tower View Drive, Suite N  
Greenville, WI 54942

#### Boston

120 Presidential Way, Suite 330  
Woburn, MA 01801

#### Chicago

1441 East Business Center Drive  
Mt. Prospect, IL 60056

#### Dallas

1825 Lakeway Drive, Suite 600  
Lewisville, TX 75057

#### Detroit – Automotive Engineering Center

2601 Cambridge Court, Suite 320  
Auburn Hills, MI 48326

#### New York

395 Moreland Road  
Hauppauge, NY 11788

#### Silicon Valley

4935 Southfront Road, Suite F  
Livermore, CA 94550

### Design and Manufacturing Operations



East: 395 Moreland Road, Hauppauge, NY 11788



Central: 1441 East Business Center Drive, Mt. Prospect, IL 60056



West: 4935 Southfront Road, Suite F, Livermore, CA 94550

## Mexico

### Headquarters

Festo Pneumatic, S.A.  
Av. Ceylán 3  
Col. Tequesquahuac  
54020 Tlalnepantla  
Edo. de México  
Call: 011 52 [55] 53 21 66 00  
Fax: 011 52 [55] 53 21 66 65  
Email: festo.mexico@mx.festo.com  
www.festo.com/mx



## Canada

### Headquarters

Festo Inc.  
5300 Explorer Drive  
Mississauga, Ontario L4W 5G4  
Call: 1.905.624.9000  
Fax: 1.905.624.9001  
Email: info\_ca@ca.festo.com  
www.festo.com/ca



## Festo Worldwide

Argentina Australia Austria Belarus Belgium Brazil Bulgaria Canada Chile China  
Colombia Croatia Czech Republic Denmark Estonia Finland France Germany Great Britain  
Greece Hong Kong Hungary India Indonesia Iran Ireland Israel Italy Japan Latvia  
Lithuania Malaysia Mexico Netherlands New Zealand Norway Peru Philippines Poland  
Romania Russia Serbia Singapore Slovakia Slovenia South Africa South Korea Spain  
Sweden Switzerland Taiwan Thailand Turkey Ukraine United States Venezuela

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