

Parallel kinematic system EXPT, tripod

FESTO



Key features

At a glance

The high-speed handling unit with robot functionality for free movement in three dimensions provides precision in movement and positioning as well as a high dynamic response of up to 150 picks/min.

The highly rigid mechanical design and low moving mass make the parallel delta kinematic system with toothed belt axes up to three times as fast as comparable Cartesian systems.

Three double rods keep the front unit horizontal at all times. The axes and servo motors do not move with the unit.

The parallel kinematic system is suitable for handling loads of up to max. 5 kg.

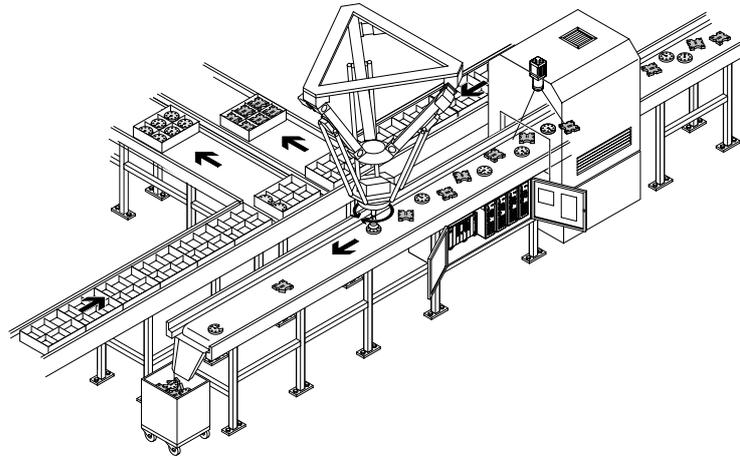
Typical applications include:

- Pick&Place of small parts
- Gluing
- Labelling
- Palletising
- Sorting
- Grouping
- Repositioning and separating

Comparison between parallel kinematic and Cartesian systems

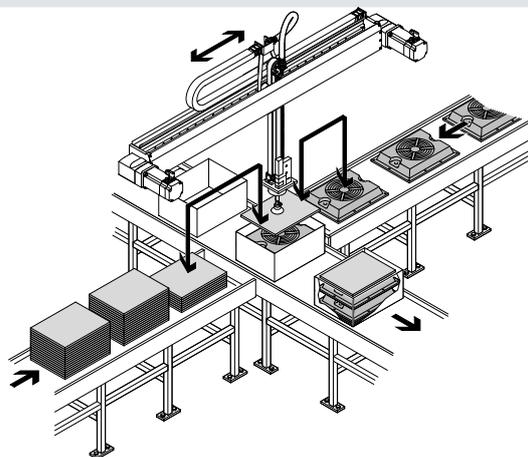
Parallel kinematic system

- Low moving mass – ideal for demanding requirements on dynamic response in three dimensions
- High path accuracy with a range of path profiles, even for highly dynamic operation
- Four sizes with a working space diameter of up to 1200 mm



Cartesian system

- Axes build on one another; the first axis carries all the subsequent axes
- High moving mass, therefore much lower dynamic response
- Rectangular, scalable working space
- Based on standard components
- Flexible designs



Characteristics

The technology in detail

Parallel kinematic system

- | | |
|--|---|
| [1] Mounting frame | [7] Angle kit → Page 27 |
| [2] Mounting bracket for toothed belt axis | [8] Protective conduit → Page 27 |
| [3] Motor | [9] Toothed belt axis |
| [4] Connection block | [10] Tubing holder → Page 27 |
| [5] Pair of rods | [11] Front unit for mounting a gripper, etc.
→ Page 18 |
| [6] Interface housing | |



Front unit

→ Page 18

The front unit can optionally be ordered via the modular product system. It includes a gear motor that enables rotary movement (fourth axis) and is available in two sizes.

The front unit can also be chosen with or without rotary through-feed, for vacuum or excess pressure.

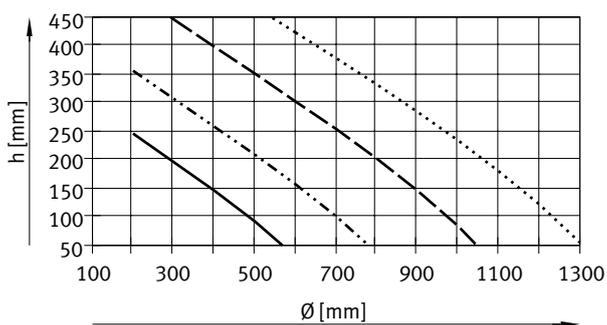
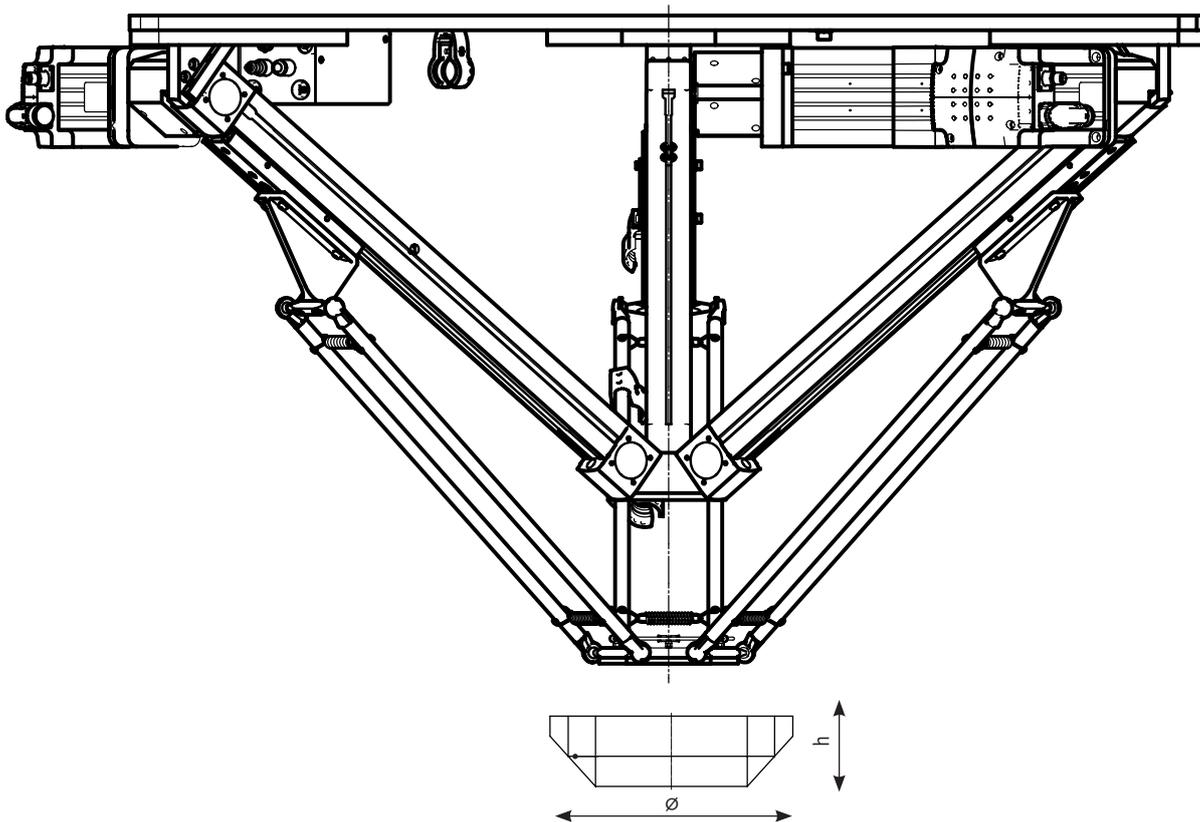
A range of grippers can be attached to it → Page 28



Characteristics

Available working space

There are four sizes available with different working space diameters.
 In simplified terms, the possible working space can be described using the shape of a cylinder (→ drawing).
 The larger the working space required, the smaller its diameter (→ graph).



— EXPT-95
 EXPT-120

Characteristics

Motor attachment variants

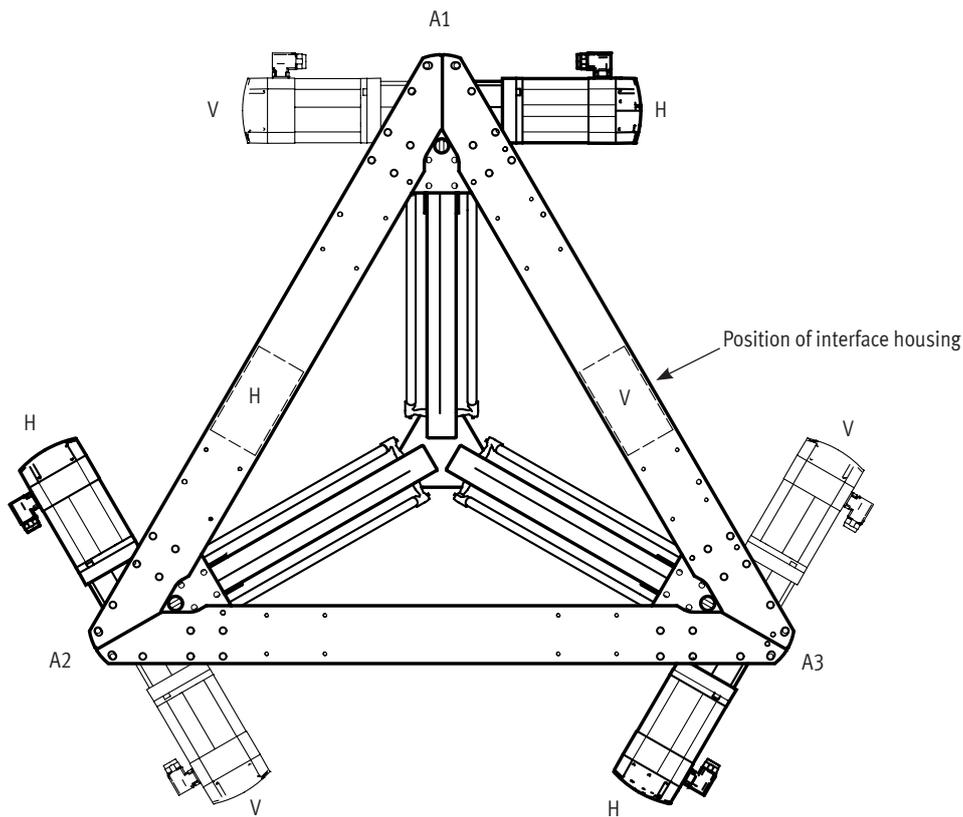
The attachment position of the motors can be individually configured via the modular product system (→ Page 24).

The standard motor attachment position corresponds to code HHH (cf. illustration below). This means: A1/A2/A3 rear.

If a motor is to be attached on the front, a 'V' must be specified in the order code for the respective axis.

The position of the interface housing depends on the position of the motor (V or H) on axis A1.

Code	Description
HHH	A1/A2/A3 rear
HHV	A3 front; A1/A2 rear
HVH	A2 front; A1/A3 rear
HVV	A2/A3 front; A1 rear
VHH	A1 front; A2/A3 rear
VHV	A1/A3 front; A2 rear
VVH	A1/A2 front; A3 rear
VVV	A1/A2/A3 front



Characteristics

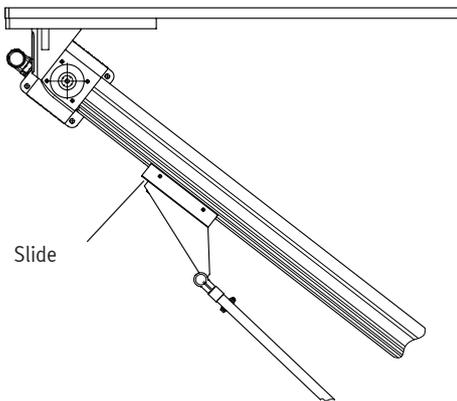
Protection against particles for size 95 and 120

Installation type: protected version (P8)

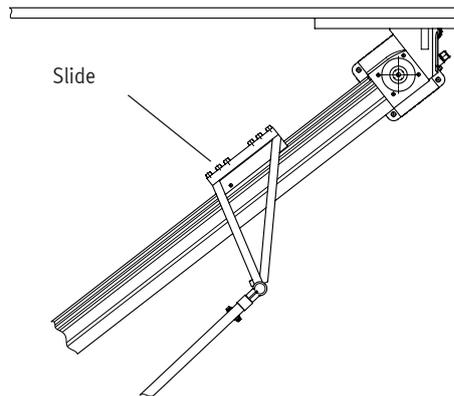
Abrasion on the toothed belt can lead to loose particles falling into the working space in the basic design.

If the variant EXPT-...-P8 (→ page 24) is selected, the axes are turned during installation (slide on top). A cover kit EASC-E10 (→ page 27) can be additionally ordered as a separate accessory and fitted; this prevents particles from entering the working space. They slide downwards into the troughs and collect in the cover (see below).

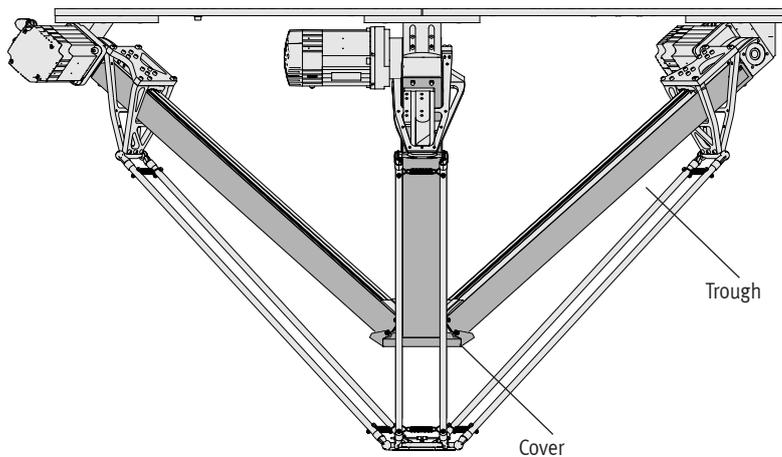
Standard



Protected version (P8)

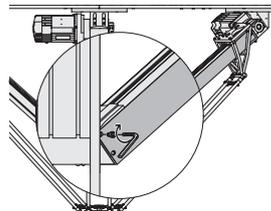
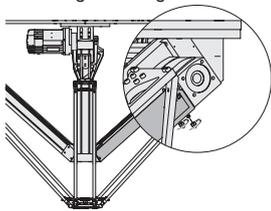


Protected version (characteristic P8 in the modular product system) with cover kit EASC-E10 (ordered separately as an accessory)

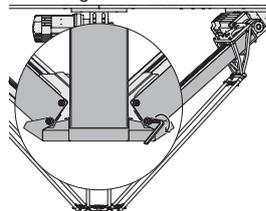


Easy mounting of the covering kit EASC-E10

Mounting the troughs



Mounting the cover



Type codes

001	Series	
EXPT	Parallel kinematic system	

002	Working space	
95	950 mm	
120	1200 mm	

003	Drive	
E1	DGE-25	
E4	EGC-80	

004	Attachment components	
T0	None	
T1	Rotary drive, size 8	
T2	Rotary drive, size 8 with pn. rotary feed-through	
T3	Rotary drive, size 11	
T4	Rotary drive, size 11 with pn. rotary feed-through	

005	Motor attachment position	
HHH	A1/A2/A3 rear	
HHV	A3 front, A1/A2 rear	
HVH	A2 front, A1/A3 rear	
HVV	A2/A3 front, A1 rear	
VHH	A1 front, A2/A3 rear	
VHV	A1/A3 front, A2 rear	
VVH	A1/A2 front, A3 rear	
VVV	A1/A2/A3 front	

006	Protection against particles	
	Standard	
P8	Protected version	

007	Cable length	
	None	
5K	5 m	
10K	10 m	
15K	15 m	

008	Presetting	
	Standard	
S	With calibration	

009	Document language	
DE	German	
EN	English	
ES	Spanish	
FR	French	
IT	Italian	
RU	Russian	
ZH	Chinese	

Peripherals overview

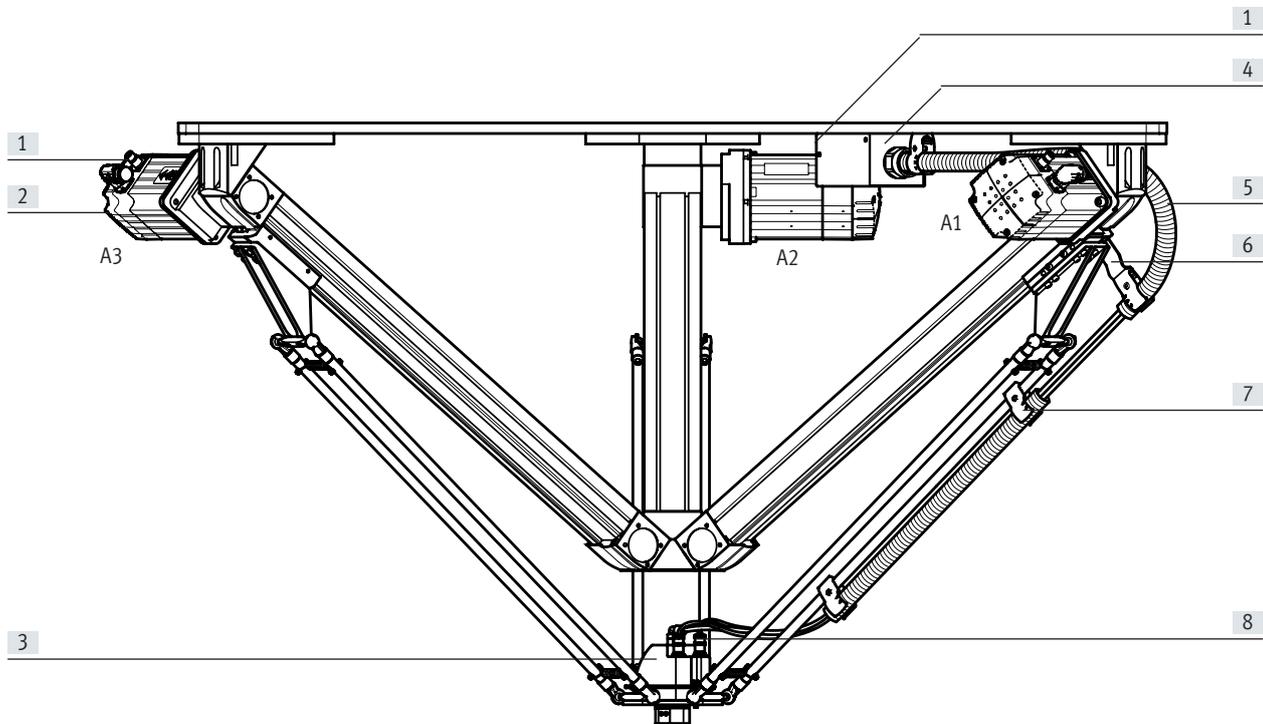
Variant examples

Order code: EXPT-...-E4-T2-HHH-...

E4: Drive: EGC-80

T2: Attachment component: rotary drive, size 8 with pneumatic air supply through-feed

HHH: Motor attachment position: A1/A2/A3 rear



Order code: EXPT-...-E4-T0-HVV-P8-... with cover kit EASC-E10-...

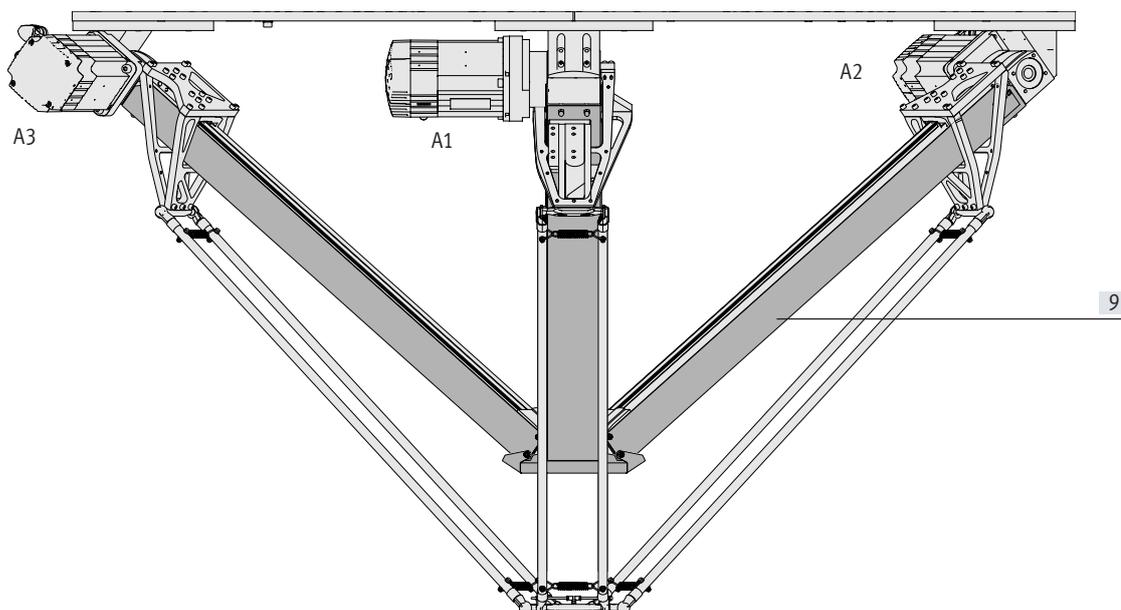
E4: Drive: EGC-80

T0: Attachment component: no rotary drive

HVV: Motor attachment position: A1 rear, A2/A3 front

P8: Protection against particles: protected version

Cover kit EASC-E10 must be ordered separately as an accessory.



Peripherals overview

Attachments and accessories		
Type	Description	→ Page/Internet
[1] Connecting cable 5K, 10K, 15K	All required connecting cables/compressed air tubing are included loose as part of the delivery. The required cable length can be selected in the modular product system (none, 5 m, 10 m or 15 m)	26
[2] Servo motor HHH, HHV, ...	The attachment position of the motors can be defined via the modular product system (HHH ... WV). Homing is not required thanks to a multi-turn rotary encoder	-
[3] Front unit T0, T1, T2, ...	Choose from: <ul style="list-style-type: none"> • Front unit without rotary drive (T0) • Front unit with rotary drive (T1 to T4) 	-
[4] Interface housing	Serves as the interface between the parallel kinematic system and the control cabinet to supply the front unit	-
[5] Protective conduit MKG	Is pre-assembled for all variants (T0 to T4), on axis A1	27
[6] Angle kit EAHM-E10	Is pre-assembled for all variants (T0 to T4), on axis A1. If required, further angle kits can be ordered as accessories	27
[7] Tubing holder EAHM-E10-TH	Is pre-assembled for all variants (T0 to T4), on axis A1. If required, further tubing holders can be ordered as accessories	27
[8] Front unit installation	The cables that supply the front unit are already installed between the front unit and the interface housing	-
[9] Cover kit EADC-E10	Protects the working space against contamination by particles. The kit must be fitted by the customer	27

Data sheet

Size
95, 120

 www.festo.com



General technical data			
Size		95	120
Design	Parallel kinematic system		
Motor type	Servo motor		
Mounting position	Horizontal		
Working space			
Nominal diameter	[mm]	950	1200
Nominal height	[mm]	100	100
Max. acceleration ¹⁾	[m/s ²]	110	
Max. speed ¹⁾	[m/s]	7	
Max. pick rate ¹⁾²⁾	[picks/min]	150	
Repetition accuracy	[mm]	±0.1	
Positioning accuracy ³⁾	[mm]	±0.5	
Track precision ³⁾⁴⁾	[mm]	±0.5	
Rated load ⁵⁾			
With min. dynamic response	[kg]	5	
With max. dynamic response	[kg]	1	
Base weight	[kg]	61.5	66

- 1) When used in combination with motor controller CMMF-AS-C5-3A.
- 2) In the 12° cycle.
- 3) Only with calibrated system (order code S).
- 4) At a speed of ≤0.3 m/s.
- 5) Rated load = tool load (accessories attached to the front unit) + payload

Max. process force in Z direction			
Size		95	120
With working space diameter	[mm]	0	0
Process force	[N]	1000	850
With working space diameter ⁶⁾	[mm]	237.5	300
Process force	[N]	750	750

- 6) The specified values correspond to 25% of the nominal diameter.

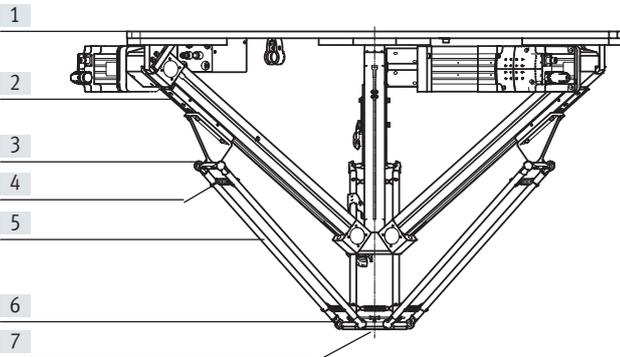
Operating and environmental conditions			
Ambient temperature	[°C]	0 ... +40	
Storage temperature	[°C]	-10 ... +60	
Operating pressure for rod loss detection	[bar]	2 ... 8	
Duty cycle ⁷⁾	[%]	100	
Corrosion resistance CRC ⁸⁾		2	

- 7) When used in combination with motor controller CMMF-AS-C5-3A.
- 8) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Data sheet

Materials

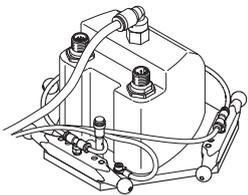
Sectional view



Parallel kinematic system

[1]	Mounting frame	Wrought aluminium alloy
[2]	Toothed belt axis DGE/EGC	→ Internet: dge, egc
[3]	Ball stud	Wrought aluminium alloy
[4]	Tension spring	High-alloy stainless steel
[5]	Pair of rods	Plastic, carbon-fibre reinforced
[6]	Ball cup	Polyamide
	Ball	Ceramic
[7]	Front unit	Wrought aluminium alloy
-	Note on materials	Contains paint-wetting impairment substances Free of copper and PTFE

Rod loss detection

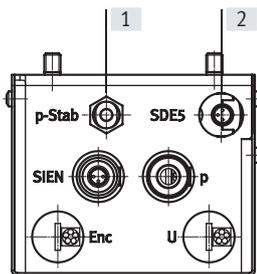


The rod loss detection feature detects detached rods and initiates an emergency stop.

This is realised using permanent compressed air monitoring (pressure switch integrated in the interface housing on the frame)

This is done by pressurising the ball cup connections of the front unit with compressed air at 2 bar (rel.).

Connections on the interface housing:



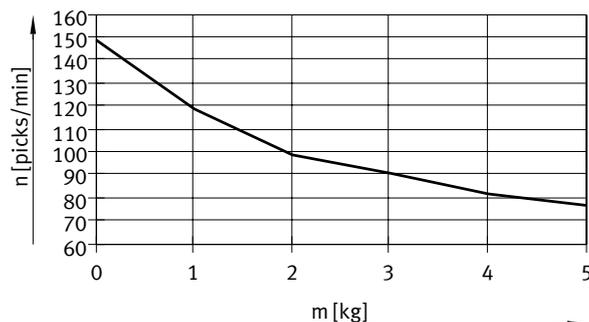
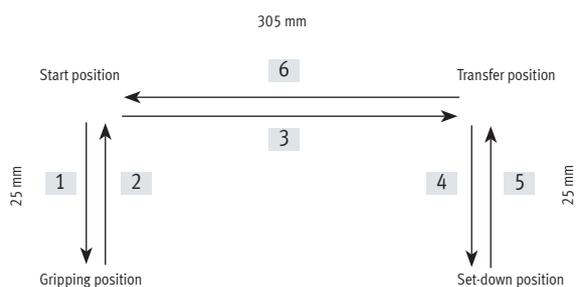
[1] Compressed air supply for rod loss detection.
The compressed air is adjusted to 2 bar in the interface housing.

[2] Pressure sensor for monitoring rod loss detection.
Connecting cable
→ Page 26

Pick rate as a function of rated load

The characteristic values for dynamic response are determined in so-called 12" cycles. The graph below shows the maximum number of possible cycles as a function of rated load. It is based on an accuracy of ± 0.5 mm.

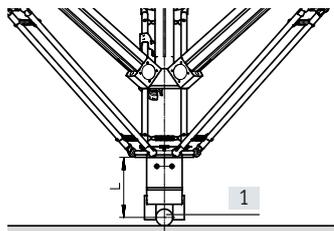
One 12" cycle means:
[1] To the gripping position
[2] To the start position
[3] To the transfer position
[4] To the set-down position
[5] To the transfer position
[6] To the start position



n = cycles per minute
M = rated load

Data sheet

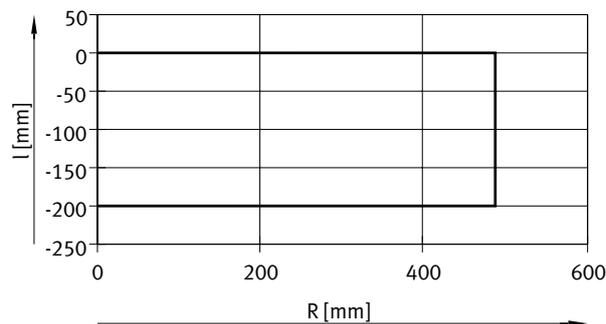
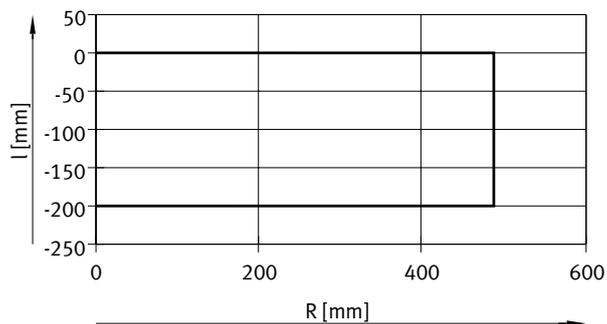
Max. acceleration a as a function of the position in the working space R and distance l , from the centre of gravity of the rated load m to the front unit



EXPT-95

Rated load of 0.1 kg

Rated load of 0.5 kg

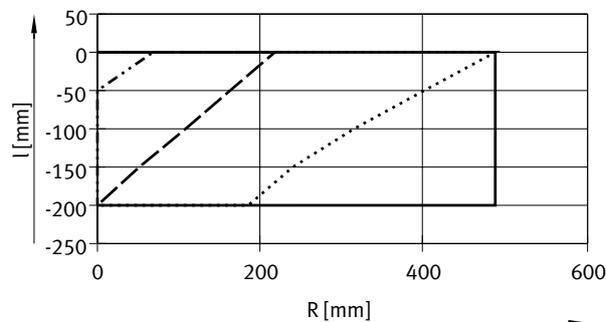
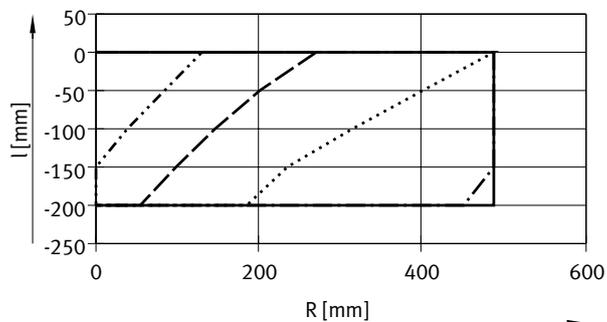


— $a = 0 \dots 100$ m/s²

— $a = 0 \dots 100$ m/s²

Rated load of 1 kg

Rated load of 1.5 kg

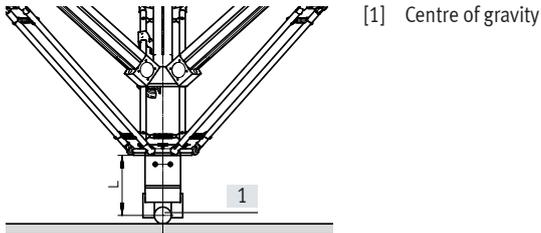


— $a = 0 \dots 60$ m/s²
 - - - $a = 100$ m/s²
 - - - $a = 90$ m/s²
 $a = 80$ m/s²
 - · - · $a = 70$ m/s²

— $a = 0 \dots 50$ m/s²
 - - - $a = 80$ m/s²
 - - - $a = 70$ m/s²
 $a = 60$ m/s²

Data sheet

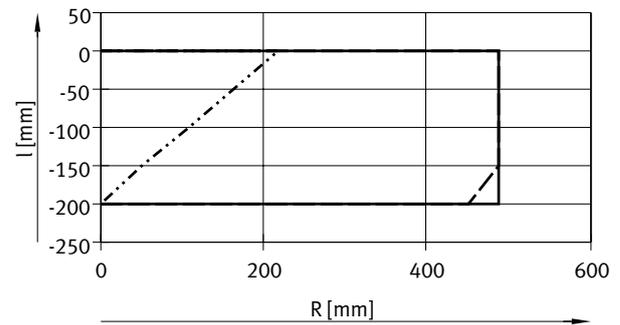
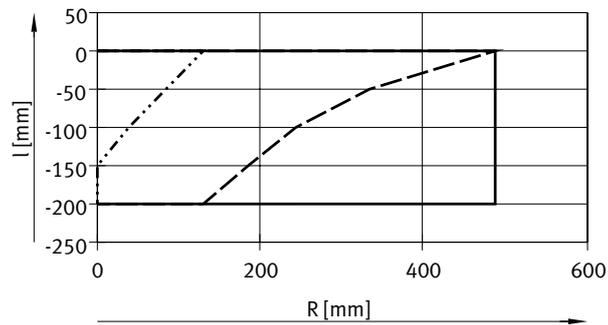
Max. acceleration a as a function of the position in the working space R and distance l , from the centre of gravity of the rated load m to the front unit



EXPT-95

Rated load of 2 kg

Rated load of 3 kg

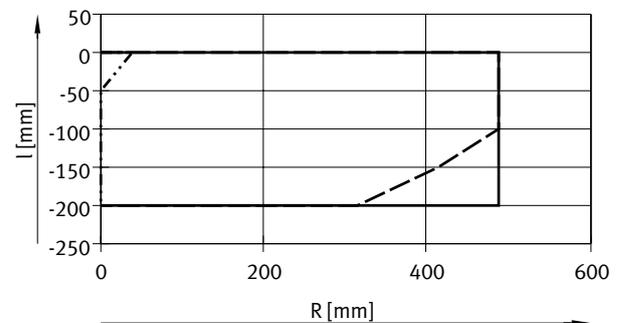
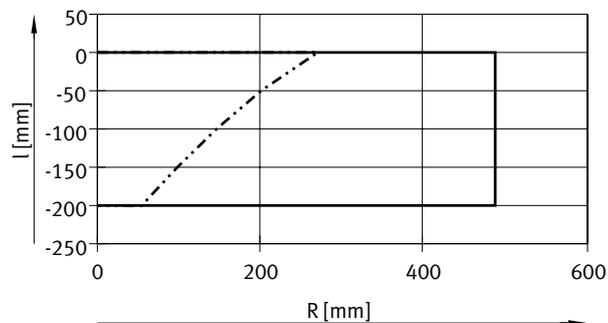


— $a = 0 \dots 40$ m/s²
 $a = 60$ m/s²
 - - - $a = 50$ m/s²

— $a = 0 \dots 20$ m/s²
 $a = 40$ m/s²
 - - - $a = 30$ m/s²

Rated load of 4 kg

Rated load of 5 kg

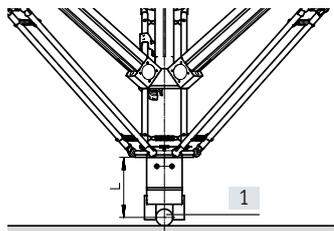


— $a = 0 \dots 20$ m/s²
 $a = 30$ m/s²

— $a = 0 \dots 10$ m/s²
 $a = 30$ m/s²
 - - - $a = 20$ m/s²

Data sheet

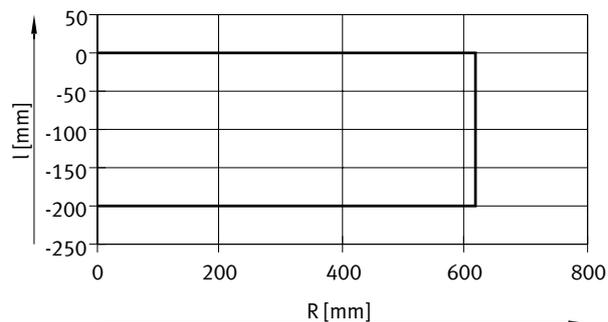
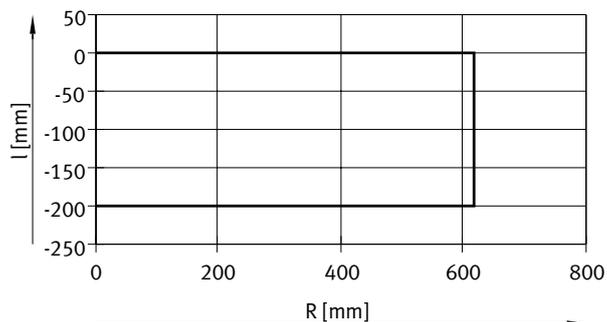
Max. acceleration a as a function of the position in the working space R and distance l , from the centre of gravity of the rated load m to the front unit



EXPT-120

Rated load of 0.1 kg

Rated load of 0.5 kg

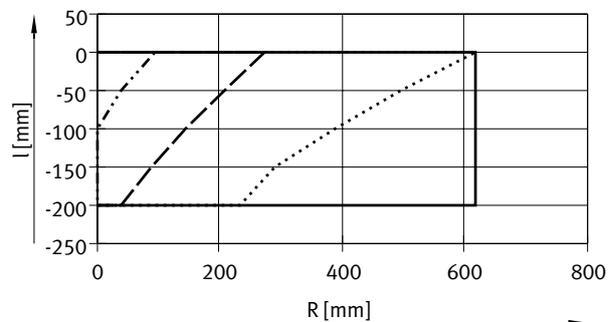
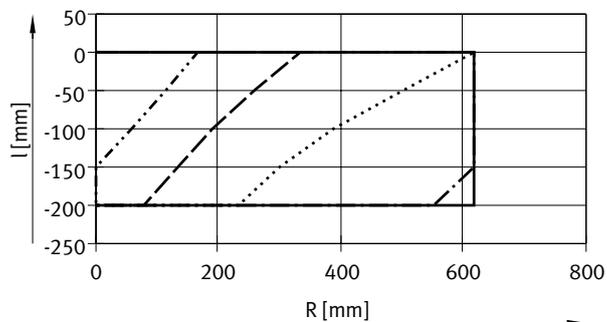


— $a = 0 \dots 100 \text{ m/s}^2$

— $a = 0 \dots 100 \text{ m/s}^2$

Rated load of 1 kg

Rated load of 1.5 kg

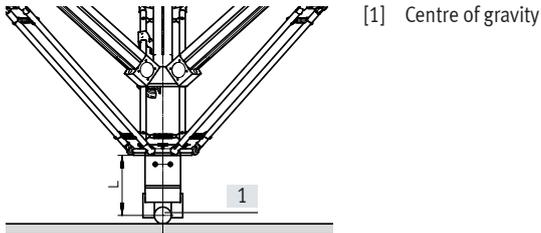


— $a = 0 \dots 60 \text{ m/s}^2$
 $a = 100 \text{ m/s}^2$
 - - - $a = 90 \text{ m/s}^2$
 $a = 80 \text{ m/s}^2$
 - · - · - $a = 70 \text{ m/s}^2$

— $a = 0 \dots 50 \text{ m/s}^2$
 $a = 80 \text{ m/s}^2$
 - - - $a = 70 \text{ m/s}^2$
 - · - · - $a = 60 \text{ m/s}^2$

Data sheet

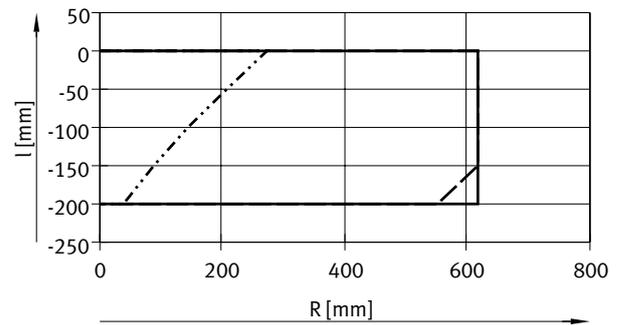
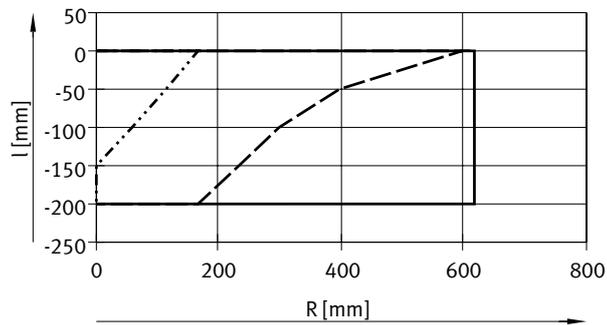
Max. acceleration a as a function of the position in the working space R and distance l , from the centre of gravity of the rated load m to the front unit



EXPT-120

Rated load of 2 kg

Rated load of 3 kg

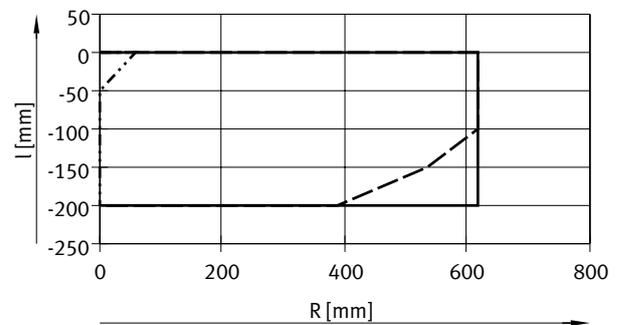
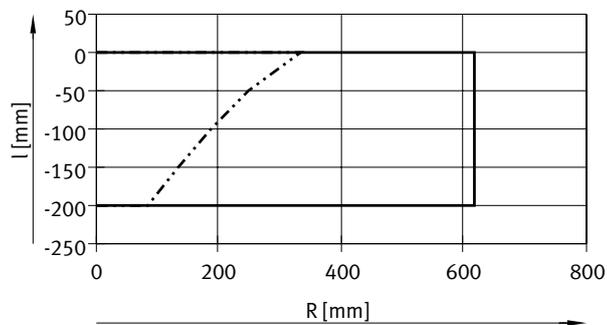


— $a = 0 \dots 40$ m/s²
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 - - - $a = 50$ m/s²

— $a = 0 \dots 20$ m/s²
 $a = 40$ m/s²
 - - - $a = 30$ m/s²

Rated load of 4 kg

Rated load of 5 kg



— $a = 0 \dots 20$ m/s²
 $a = 30$ m/s²

— $a = 0 \dots 10$ m/s²
 $a = 30$ m/s²
 - - - $a = 20$ m/s²

Data sheet

Requirements for the base frame

The positioning and path accuracy depends to a large extent on the design of the base frame.

The following influences must therefore be taken into consideration:

- Rigidity of the base frame
- Mass of the base frame
- Mass of the parallel kinematic system

With a maximum dynamic response of the axes, the following forces are exerted on the corner brackets of the mounting frame and therefore on the mounting in the base frame.

- Start-up frequency caused by dynamic operation of the parallel kinematic system
 - Cycles per minute
 - Dynamic settings for acceleration and jerk

Maximum forces occur if two axes accelerate in the opposite direction to the third and result in horizontal movement of the rated load.

The base frame must be designed so that the maximum forces that can occur as a result of the parallel kinematic system can be absorbed with the necessary degree of certainty.

The guide value for the first natural frequency is specified to be at least 16 Hz for the complete system.

Size		95	120
Vertical force	[N]	±325	±475
Horizontal force	[N]	±200	±215

Mounting options on the base frame

The parallel kinematic system must always be mounted in the area of the corner brackets of the mounting frame. Ensure that the corner bracket area has a torsionally rigid, flat bearing surface.

The bearing surface must meet the following minimum requirements in order to achieve the positioning accuracy:

- Flatness = 0.05 mm
- Parallelism = 0.5 mm

Since the distance between the slots is 40 mm in the 80x80 profile, the drilled holes in the corner brackets have been positioned so that the profile can be mounted in various positions.

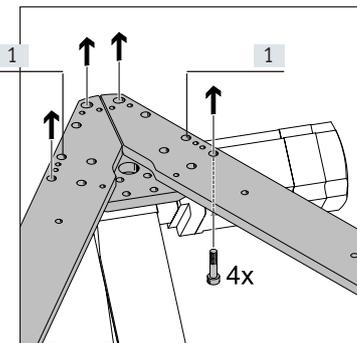
Since the homing settings of the corresponding axis are lost when the motor is dismantled, it is recommended to use mounting holes that do not require the motor to be removed.

The drilled holes [1] are not accessible, depending on the attachment position of the motor.

Direct mounting via screws

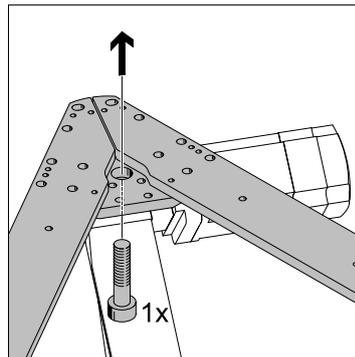
Screws M8x...

Via at least 4 screws (M8) per corner bracket directly on the base frame. These 4 screws should be placed as far apart as possible to ensure a torsionally rigid connection.



Screws M20x...

Via 1 screw (M20) per corner bracket directly on the base frame. There is a central drilled hole on each bracket for this purpose.



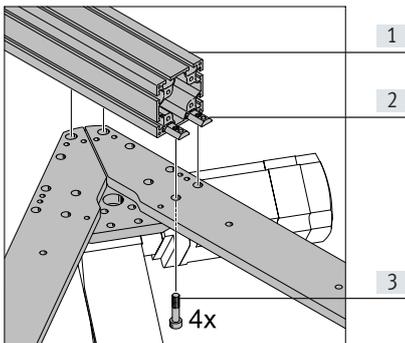
Data sheet

Mounting options on the base frame

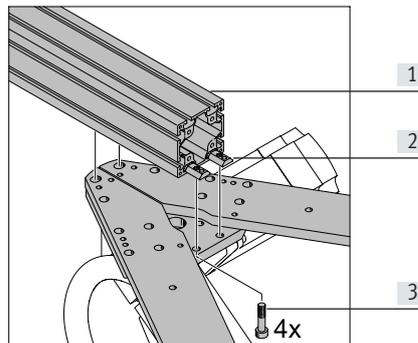
Mounting via slot nuts – parallel to the mounting frame

- | | |
|---------------------------------------|----------------------------|
| [1] Profile
(e.g. HMBS-8 0/80) | [3] Screws
(e.g. M8x35) |
| [2] Slot nut
(e.g. NST-HMV-8-2-M8) | |

Example 1



Example 2



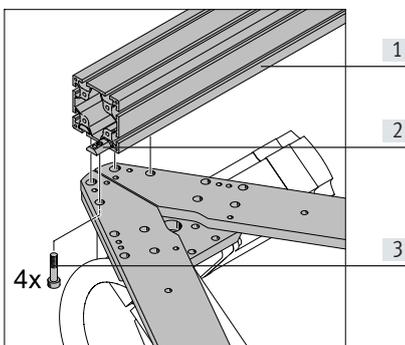
Mounting via slot nuts – at right angles to the mounting frame

- | | |
|---------------------------------------|----------------------------|
| [1] Profile
(e.g. HMBS-8 0/80) | [3] Screws
(e.g. M8x35) |
| [2] Slot nut
(e.g. NST-HMV-8-2-M8) | [4] Bracket |

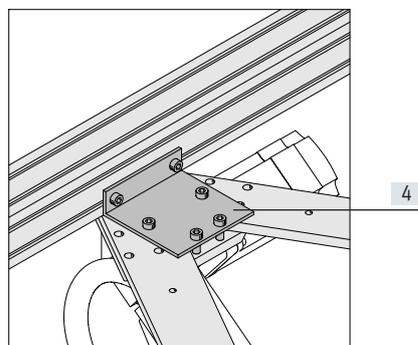
The additional brackets in the following examples are required in order to increase the torsional rigidity and the bearing surface.

Example 1

Mounting the profile

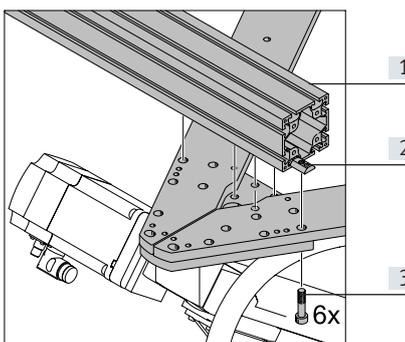


Mounting the bracket

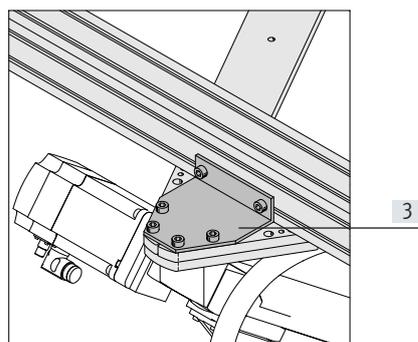


Example 2

Mounting the profile



Mounting the bracket



Data sheet

Technical data – Front unit

EXPT-...-T...



Mechanical data

Type	EXPT-...-			
	T1	T2	T3	T4
Design	Electromechanical rotary module			
	–	With rotary through-feed	–	With rotary through-feed
Motor type	Servo motor			
Size	8	8	11	11
Rotation angle	Infinite			
Pneumatic connection	–	G1/8	–	G1/8
Nominal width [mm]	–	4	–	4
Standard nominal flow rate [l/min]	–	350	–	350
Gear ratio	30:1			
Repetition accuracy [°]	±0.01			
Max. output speed [rpm]	200			
Nominal torque [Nm]	0.75	0.75	1.8	1.8
Peak torque [Nm]	1.8	1.8	4.5	4.5
Max. axial force [N]	200	200	300	300
Max. pull-out torque, static [Nm]	15	15	40	40
Perm. mass moment of inertia of load [kgm ²]	0.0026	0.0026	0.006	0.006
Mounting position	Any			
Load mass for EXPT [g]	640	690	850	900

Electrical data

Type	EXPT-...-			
	T1	T2	T3	T4
Nominal voltage [V AC]	230			
Nominal current [A]	0.31	0.31	0.74	0.74
Peak current [A]	0.61	0.61	1.5	1.5
Nominal power [W]	9.2	9.2	22.1	22.1
Duty cycle [%]	100			
Measuring system ¹⁾	Encoder			

1) Homing required

Operating and environmental conditions

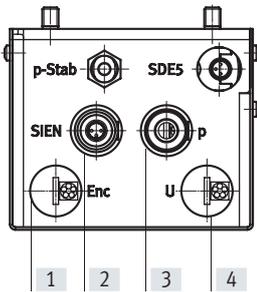
Type	EXPT-...-			
	T1	T2	T3	T4
Operating pressure [bar]	–	–0.9 ... +10	–	–0.9 ... +10
Ambient temperature [°C]	0 ... 40			
Degree of protection	IP40			
Note on materials	RoHS-compliant			
Corrosion resistance CRC ¹⁾	2			

1) Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.

Data sheet

Connections on the interface housing:



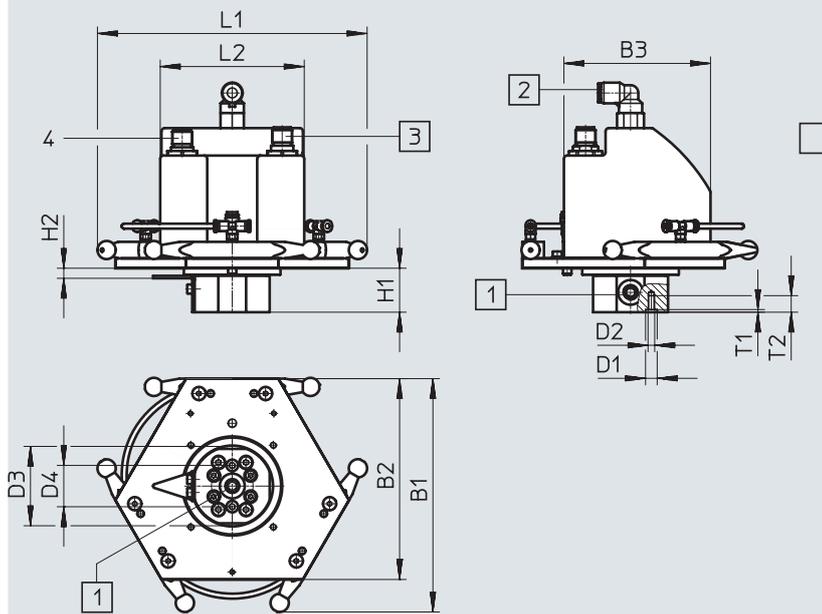
Connection for:

- [1] Encoder cable → Page 26
- [2] Rotary motion sensing → Page 26
- [3] Supply port for pneumatic rotary through-feed
- [4] Motor cable → Page 26

Dimensions

Download CAD data → www.festo.com

Front unit



- [1] Supply port outlet
- [2] Supply port for rotary through-feed
- [3] Connection for motor cable
- [4] Connection for encoder cable

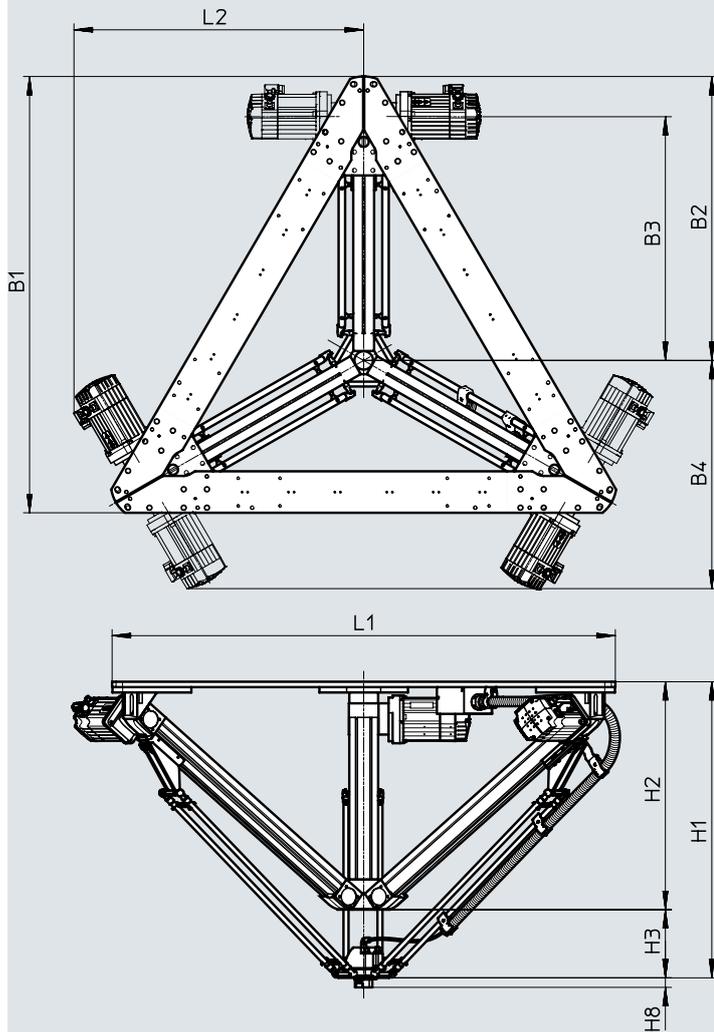
Type	B1	B2	B3	D1 ∅ H7	D2	D3 ∅	D4 ∅	H1	H2 +1	L1	L2	T1	T2
EXPT...	141	122	88	7	M4	48	25	27	6	162	86	1.6	10

Data sheet

Dimensions

Download CAD data → www.festo.com

Parallel kinematic system



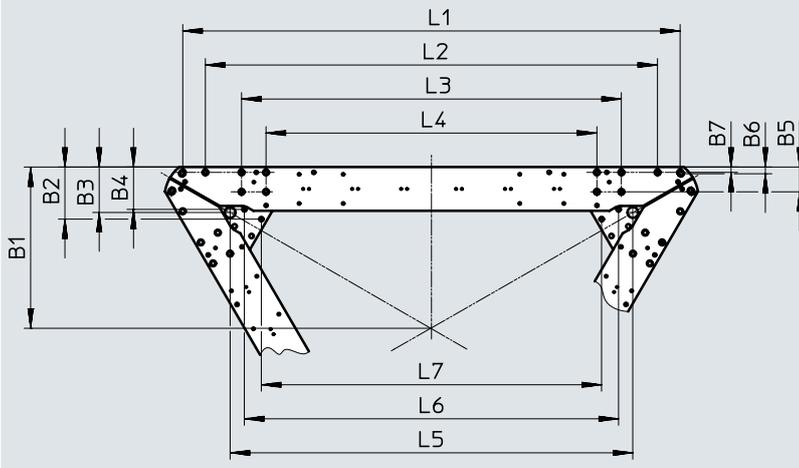
Type	B1	B2	B3	B4	H1	H2	H3	L1	L2
EXPT-95	1213	794	705	626	827	636	191	1394	803
EXPT-120	1355	888	800	672	944	710	234	1558	885

Data sheet

Dimensions

Download CAD data → www.festo.com

Mounting holes on the mounting frame



Type	B1	B2	B3	B4	B5	B6	B7
EXPT-95	419.3	107.2	93.5	87.2	51	12.3	11
EXPT-120	466.6	107.2	93.5	87.2	51	12.3	11

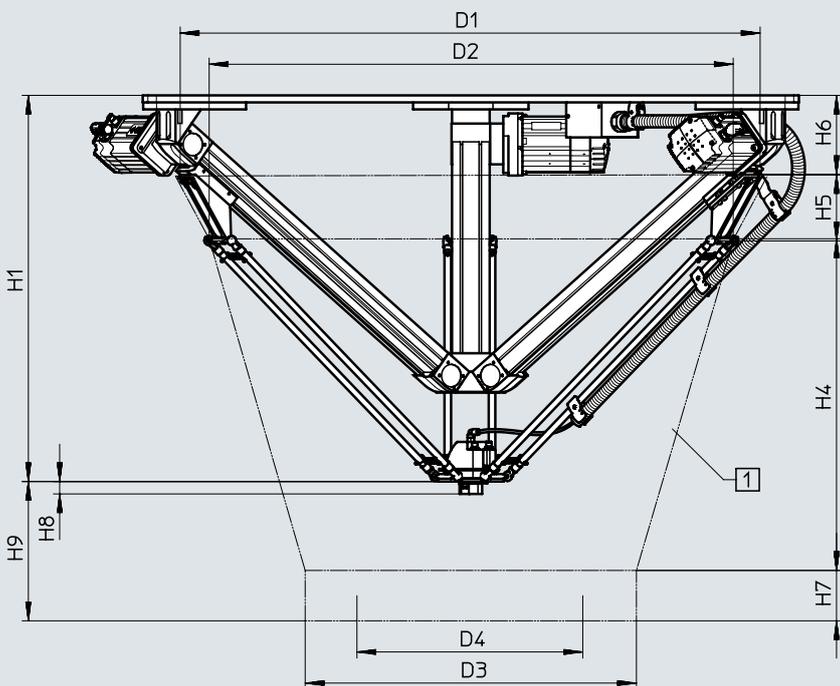
Type	L1	L2	L3	L4	L5	L6	L7
EXPT-95	1323.7	1229.7	1082.1	982.1	1128.7	1070.6	1001.3
EXPT-120	1487.5	1393.5	1245.9	1145.9	1292.5	1234.4	1165.1

Data sheet

Dimensions

Download CAD data → www.festo.com

Interference contour within the nominal operating area



- [1] Interference contour
- D3 Diameter of interference contour
- D4 Diameter of nominal operating area
- H7 Height of nominal operating area
- H9 Distance from bottom edge of gripper plate to base of nominal operating area

The distance specification for the working space refers to the bottom edge of the gripper plate. With the variants T1 to T4, the working space is extended downwards by the dimension H8. The same applies to attached gripper systems, where the reference point is always shifted by the height of the gripper system. Additional dimensions for laying the motor cables and tubing are not taken into account in the interference contour.

Type	D1 ±5	D2 ±5	D3 ±5	D4	H1	H4	H5
EXPT-95	1400	1260	1120	950	827	760	141
EXPT-120	1590	1440	1370	1200	944	907	141

Type	H6	H7	H8			H9
			EXPT...T0	EXPT...T1/T2	EXPT...T3/T4	
EXPT-95	170	100	0	27	28.5	357
EXPT-120	170	100	0	27	28.5	397

Ordering data – Modular product system

Ordering table					
Size	95	120	Conditions	Code	Enter code
Module no.	569799	569800			
Product type	EXPT series T			EXPT	EXPT
Working space	[mm]	950	-	-95	
	[mm]		1200	-120	
Drive	EGC-80			-E4	-E4
Attachment components	EXPT series T			-T0	
	Rotary drive, size 8			-T1	
	Rotary drive, size 8 with pneum. air supply through-feed			-T2	
	Rotary drive, size 11			-T3	
	Rotary drive, size 11 with pneum. air supply through-feed			-T4	
Motor attachment position	A1/A2/A3 rear			-HHH	
	A3 front, A1/A2 rear			-HHV	
	A2 front, A1/A3 rear			-HVH	
	A2/A3 front, A1 rear			-HVV	
	A1 front, A2/A3 rear			-VHH	
	A1/A3 front, A2 rear			-VHV	
	A1/A2 front, A3 rear			-VVH	
	A1/A2/A3 front			-VVV	
Protection against particles	Standard				
	Protected version			-P8	

Allocation table	
Parallel kinematic system EXPT	Motor controller CMMP (→ Page 26)
EXPT-...-T0-...	3x CMMP-AS-C5-3A
EXPT-...-T0-...	3x CMMP-AS-C5-3A
EXPT-...-T1 to T4-...	3x CMMP-AS-C5-3A, 1x CMMP-AS-C2-3A
EXPT-...-T1 to T4-...	3x CMMP-AS-C5-3A, 1x CMMP-AS-C2-3A

 **Note**
 Motor controllers must be ordered separately as accessories
 → page 26.
 Open-loop control system on request.

Ordering data – Modular product system

Ordering table					
Size	95	120	Conditions	Code	Enter code
Cable length	None				
	5 m		[1]	-5K	
	10 m		[1]	-10K	
	15 m			-15K	
Presetting	Standard				
	With calibration			-S	
Document language	German			-DE	
	English			-EN	
	Spanish			-ES	
	French			-FR	
	Italian			-IT	
	Russian			-RU	
	Chinese			-ZH	

[1] The motor and encoder cables for the rotary drive (attachment components) are always 15 m long, regardless of the specification in the modular product system.

**Note**

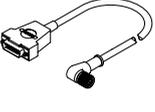
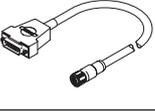
To order a parallel kinematic system, please get in touch with your local Festo contact.

The parallel kinematic system may only be commissioned by a specially trained technician (robotics specialist).

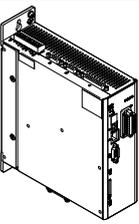
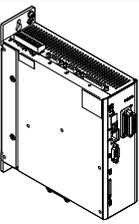
The following knowledge is required:

- Specialist knowledge of robotics and CODESYS
- Knowledge of handling motor controllers CMMP
- Knowledge of handling parallel kinematic systems

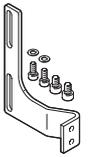
Accessories

Ordering data			
	Cable length [m]	Part no.	Type
Connection from the motor for the axis to the motor controller			
	Motor cable NEBM		
	5	550310	NEBM-M23G8-E-5-Q9N-LE8
	10	550311	NEBM-M23G8-E-10-Q9N-LE8
	15	550312	NEBM-M23G8-E-15-Q9N-LE8
	X length ¹⁾	550313	NEBM-M23G8-E-...-Q9N-LE8
	Encoder cable NEBM		
	5	550318	NEBM-M12W8-E-5-N-S1G15
	10	550319	NEBM-M12W8-E-10-N-S1G15
	15	550320	NEBM-M12W8-E-15-N-S1G15
	X length ¹⁾	550321	NEBM-M12W8-E-...-N-S1G15
Connection from the interface housing to the motor controller			
	Motor cable NEBM		
	15	571907	NEBM-M12G4-RS-15-N-LE4
	Encoder cable NEBM		
	15	571915	NEBM-M12G12-RS-15-N-S1G15
Connecting cable NEBU for rod loss detection or reference sensor of the rotary drive			
	5	541334	NEBU-M8G3-K-5-LE3
	10	541332	NEBU-M8G3-K-10-LE3
	15	575986	NEBU-M8G3-K-15-LE3

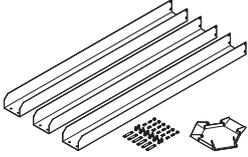
1) Max. 25 m

Ordering data – Motor controller						
	For size	Output voltage	Nominal output current	Nominal power	Part no.	Type
		[V AC]	[A]	[VA]		
	For parallel kinematic system					
	45 ... 120	3x 0 ... 270	5	1000	1622902	CMMP-AS-C5-3A-M0
	For attachment component					
	45 ... 120	3x 0 ... 270	2.5	500	1622901	CMMP-AS-C2-3A-M0

Accessories

Ordering data				
	For size	Description	Part no.	Type
Protective conduit MKG				
	95, 120	2 m are required per axis	3156318	MKG-23-PG-29-B
Tubing holder EAHM				
	95, 120	For mounting the protective conduit	3506553	EAHM-E10-TH-W29
Angle kit EAHM				
	95, 120	For mounting the tubing holder on the connection block	2075203	EAHM-E10-AK
			2075842	EAHM-E10-AK-P8 ¹⁾

1) In combination with the variant EXPT...-P8

Ordering data				
	For size	Description	Part no.	Type
Cover kit EASC-E10				
	95	<ul style="list-style-type: none"> Protects the working space against contamination by particles Can only be fitted in conjunction with the variant EXPT...-P8 	3790894	EASC-E10-95
	120		3790896	EASC-E10-120
Adapter kit EAHA				
	95, 120	For suction gripper ESG- (holder size 2)	1574224	EAHA-R2-M12P
		For suction gripper ESG- (holder size 3 and 4)	1574227	EAHA-R2-M14P

Accessories

Adapter kit
DHAA, HAPG

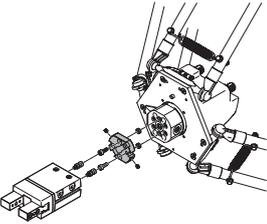
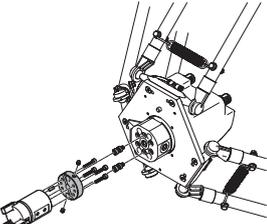
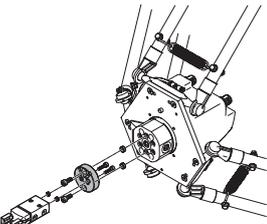
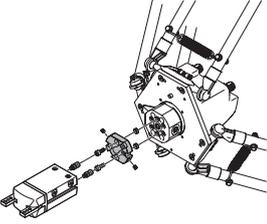
Material:
Wrought aluminium alloy
Free of copper and PTFE
RoHS-compliant



Note

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

Download CAD data → www.festo.com

Gripper combinations with adapter kit			
Gripper	Size	Adapter kit	
		Part no.	Type
Parallel gripper			
	DHPS, standard		
	6	187566	HAPG-SD2-12
	10	184477	HAPG-SD2-1
	16	184478	HAPG-SD2-2
	HGPT-B, sturdy		
	16	564958	DHAA-G-Q5-12-B8-16
	20	564955	DHAA-G-Q5-16-B8-20
	25	537181	HAPG-SD2-25
	HGPL, sturdy with long stroke		
	14-40, 14-60, 14-80	537310	HAPG-SD2-31
	HGPD, leak-proof		
	16	564958	DHAA-G-Q5-12-B8-16
20	564955	DHAA-G-Q5-16-B8-20	
25	537181	HAPG-SD2-25	
Three-point gripper			
	DHDS, standard		
	16	187567	HAPG-SD2-13
	HGDT, sturdy		
25	542439	HAPG-SD2-32	
Radial gripper			
	DHRS, standard		
	10	187566	HAPG-SD2-12
	16	184477	HAPG-SD2-1
	25	184478	HAPG-SD2-2
	HGRT, sturdy		
16	1273999	DHAA-G-Q5-16-B11-16	
Angle gripper			
	DHWS, standard		
	10	187566	HAPG-SD2-12
	16	184477	HAPG-SD2-1
	25	184478	HAPG-SD2-2

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