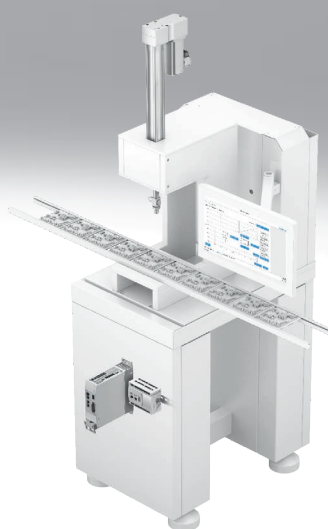# Servo press kits YJKP

FESTO

Key features

At a glance

The servo press kit and its associated application software can be used to respond quickly and flexibly to a range of press processes. It is a great alternative to complex and often oversized presses.

The software can be used for continuously monitoring parameters such as moments of force and displacement during joining and press-fitting processes.

Advantages:
- Pressing forces up to 17 kN (higher force ranges on request)
- Very high positioning and repetition accuracy
- Ideal price/performance ratio
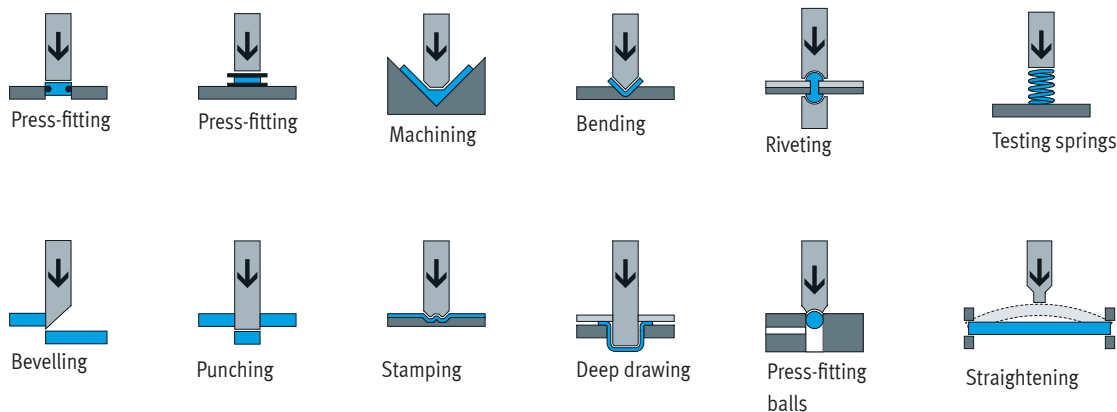- Easy integration into any application

Sample pressing device
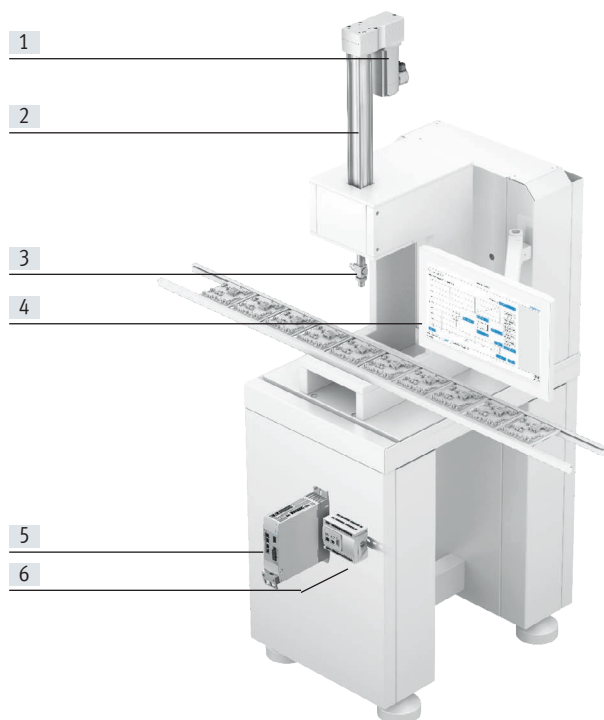
Individual components:
[1]   Servo motor
[2]   Electric cylinder
[3]   Force sensor (incl. inspection record)
[4]   Software package
[5]   Motor controller
[6]   Controller (incl. micro SD memory card)

Motor cable included in the scope of delivery.

Areas of application

Press-fitting

Press-fitting

Machining

Bending

Riveting

Testing springs

Bevelling

Punching

Stamping

Deep drawing

Press-fitting balls

Straightening

Key features

Modular application software for configuration, operation and visualisation

- The application is controlled via a web interface, which is also used for configuring the application-specific functions
- No programming skills are required to use the pre-installed, ready-to-use software
- The flexible web visualisation can be displayed on any system with a web browser, such as a touchscreen, PC, tablet or smartphone
- The program sequence itself is controlled by variables and digital control inputs, e.g. by the higher-order controller
- All recorded process data can be exchanged individually with the host system
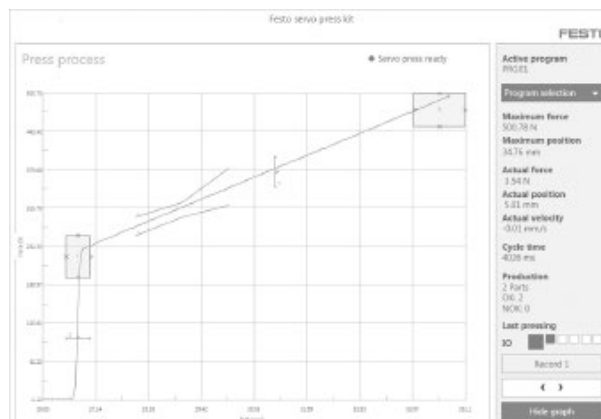
The following software functions are available

Commissioning	Writing a program	Operating	Diagnostics
• Configuring the hardware • Executing a homing run • Taring and adjusting the force sensor • Moving the press manually in "jog" mode • Configuring logging • Making fundamental system settings	• Managing programs • Defining press processes and parameterising and configuring them using the sequencer • Recording/loading reference curves • Configuring the threshold values/envelopes/windowing evaluation methods • Managing individual variables	• Selecting saved press programs • Recording and displaying reference curves • Allowing OK/NOK evaluation of pressed parts • Logging	• Process diagnostics • Sensing of various system parameters, system status and statistical values • Enabling the display of current data/statuses for the various interfaces, such as digital I/Os or data transferred by a host PLC.

Software functions	
Max. number of press programs	20 (expandable using variables)
Max. number of variables	100
Number of digital inputs for program control	
Software inputs	8 inputs/8 outputs
Hardware inputs	8 inputs/4 outputs
Max. possible measurements [1]	5
Max. number of measuring points [1]	200000
Number of envelopes [2]	5
Number of evaluation windows [2]	5
Number of threshold values [2]	5
Max. possible points per envelope	5 top/5 bottom
Evaluation results via	DIO/fieldbus/PC visualisation
Data export via	FTP, SMB, USB, SD

[1] Per program
[2] Per measurement

**Connection to the higher-order controller[1]**

Function	Programming software	Version	Communication	Hardware
Siemens Host FB	Step 7 TIA Portal	V14	Profinet IO	S7-300/S7-400, S7-1200/S7-1500
	Step 7 Classic	V5.5	Profinet IO	S7-300/S7-400
Allen Bradley Host FB	Studio 5000	V26.01	EtherNet/IP	CompactLogix 1769-L24ER-QB1B
OMRON Host FB	Sysmac Studio	V1.17	EtherNet/IP	NJ101-9000
Codesys Host FB	Codesys V3	V3.5.7 SP2	Modbus TCP	CPX-CEC-M1-V3
Mitsubishi Host FB	Melsec Studio GX Works 2	V1.551Z	Modbus TCP	Q03UDVCPU
Beckhoff Host FB	TwinCat 3	V12.0.21005.1	Modbus TCP	CX5130-0155

[1] The function blocks can be downloaded for free from the Support Portal.
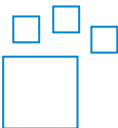
Key features

Ordering via the configurator

It is very easy to put together and order a wide range of servo press kits using the configurator.
The "Configuration", "Preassembly" and "Accessories" tabs are used to select the combinations and display them with the correct configuration.
CAD files and ePLAN macros are included.
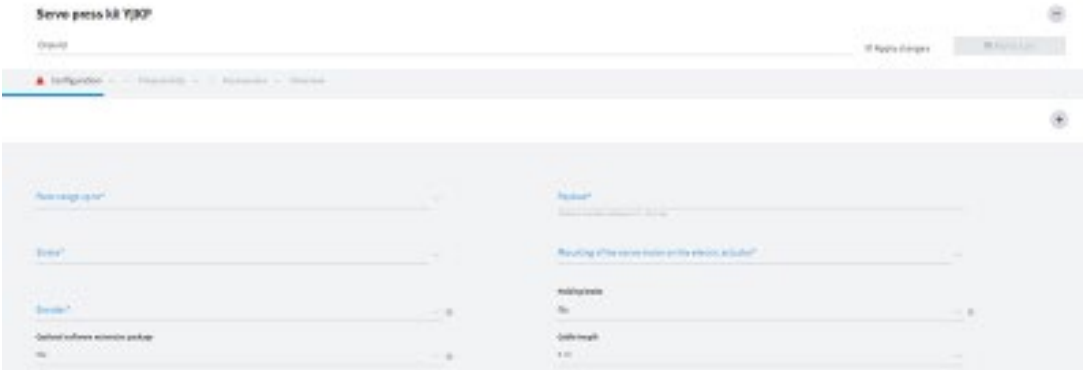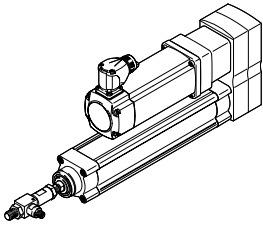

Ordering data – Product options

	Configurable product	Part no.	Type
	This product and all its product options can be ordered using the configurator.	**8077950**	**YJKP**

System components

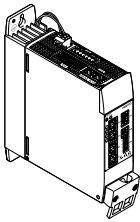**Included in the scope of delivery of the servo press kit**

Electric cylinder

- With force sensor
- Connecting cable to controller

Optionally with:

- Motors with absolute displacement encoder:
  – Single-turn
  – Multi-turn
- Motors with/without holding brake
- Axial or parallel motor attachment (pre-assembled if required)

Motor controller

- For servo motor

Control system
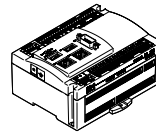
- With special software
- With connecting cable to the motor controller

Motor cable

- Pre-assembled cable

Connecting cable

- Screened cable for force sensor

Micro SD memory card

- 32 GB micro SD card for storing the created press programs and log files

Can be ordered as accessories

Guide unit

Profile mounting
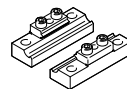
Flange mounting
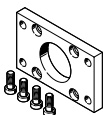
Clamping element

System components
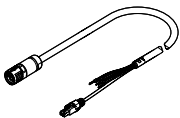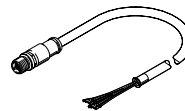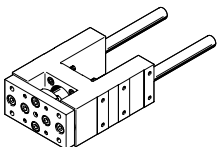
Possible combinations of kit and motor, depending on mounting position
Optionally pre-assembled

The electric cylinder, axial and parallel kit and servo motor are assembled in one application-specific module. This reduces the number of individual components to be managed. This module can be directly integrated in the system thanks to specific mechanical and electrical interfaces. After completion, a full performance test is performed. There is thus no need for the customer to carry out any assembly process.

With axial kit
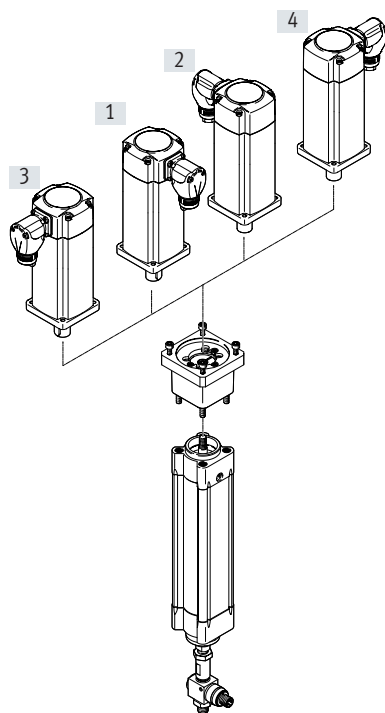
With parallel kit

Possible attachment variants
[1] Front
[2] Rear
[3] Left
[4] Right
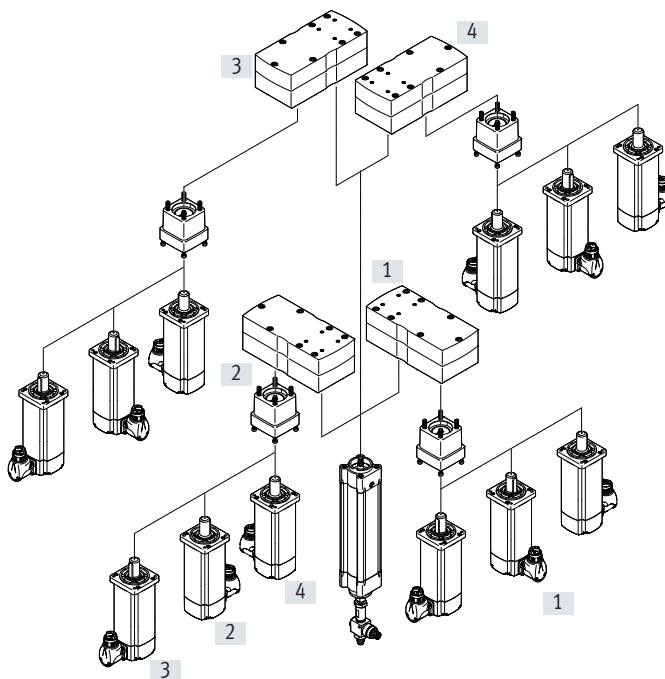
Advanced software package

The software package with selected functions makes it possible to adapt the servo press kit even more specifically to the application and the specific task, such as:
• Force control
• Step function with comparison operations
• OPC UA connection

Part no.	Type
8082745	GSAY-A4-F0-Z4-L-Y1

Available to purchase via the App World.

www.festo.com/appworld

Datasheet

Bus protocols

EtherNet/IP

Modbus

PROFINET

General technical data

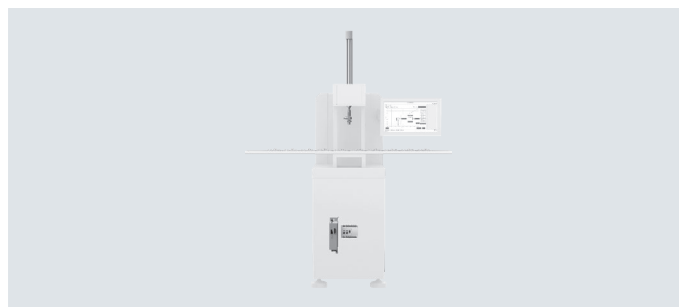| Force range up to	[kN]	0.8	1.5	4	7	12	17
Working stroke	[mm]	100, 200, 300, 400					
Pressing force[1]	[kN]	0.8	1.5	4	7	12	17
Max. payload[2]	[kg]	19.5	19.5	48	48	95	95
Max. feed speed	[mm/s]	250				160	
Acceleration							
For positioning phase	[m/s^2]	2					
For cushioning phase	[m/s^2]	2					
Repetition accuracy	[mm]	±0.01			±0.015	±0.01	
Scanning frequency of the force sensor	[Hz]	1000					
FS accuracy of the force measurement[3]	[%]	±0.25					
Parameterisation interface		Ethernet					
Fieldbus interface		Modbus TCP					
		EtherNet/IP					
		EtherNet TCP/IP					
		PROFINET IO					
Configuration via visualisation system		Force/displacement diagrams					
		Specification for good/defective parts					
		Visualisation					
Evaluation methods		Threshold value					
		Envelopes					
		Windowing					
Visualisation		At the customer's premises via a web browser					
Mounting position		Any					

1) Applications in combination with tensile forces on request
2) Caused by tool weight, for example
3) Related to the calibration range of the force sensor and/or the force measurement range of the software for the complete system. Example for YJKP with a force range of 0.8 kN: 0.25% x 1200 N

Technical data – Force sensor

Force range up to	[kN]	0.8	1.5	4	7	12	17
Force measuring range of software	[kN]	−0.2 … 1	−0.2 … 2	−0.5 … 4.5	−0.5 … 7.5	−1 … 13	−1 … 18
Max. overload	[kN]	1.5	3.75	11.25	15	30	37.5
Analogue output	[mA]	4 … 20					

> **Note**
>
> Transverse loads on the force sensor should be avoided as they may lead to false measurement results or damage the sensor.

Modbus®, PROFINET® and EtherNet/IP® are registered trademarks of the respective trademark holder in certain countries.

Datasheet

Electrical data							
Force range up to	[kN]	0.8	1.5	4	7	12	17

Motor controller				
Voltage input range	[V AC]	100 … 230 (−20%/+15%)	200 … 480 (−10%/+10%)	
Max. nominal input current	[A]	16.8	18	45
Nominal power	[VA]	700	2500	6000
Nominal voltage (logic)	[V DC]	24 ±20%		
Max. current consumption (logic)	[A]	0.5/2.3[1]	0.5/2.5[1]	

Control system		
Operating voltage	[V DC]	24
Current consumption	[mA]	200

Force sensor		
Operating voltage range	[V DC]	10 … 30

1) Max. current at full expansion, with two position encoders, brake output and all I/Os with max. specified loads connected.

Safety data	
Safety function to EN 61800-5-2	Safe torque off (STO)
	Safe stop 1 (SS1)
	Safe brake control (SBC)
Performance Level (PL) to EN ISO 13849-1	
Safe torque off (STO)	Category 4, Performance Level e
Safe brake control (SBC)	Category 3, Performance Level e
Safety integrity level (SIL) to EN 62061 and EN 61508	
Safe torque off (STO)	SIL 3/SILCL 3
Safe brake control (SBC)	SIL 3/SILCL 3
Certificate issuing authority and no.	German Technical Control Board (TÜV) Rheinland 01/205/5640.00/18
Proof test interval	
Safe torque off (STO)	Up to 20a
Safe brake control (SBC)	24 h
Diagnostic coverage	[%]	Up to 97
Safe failure fraction (SFF)	[%]	Up to 99
Hardware fault tolerance	1

Technical data – Encoder				
Measuring unit		Absolute, single-turn	Absolute, multi-turn	Absolute safety encoder, multi-turn
Operating voltage	[V DC]	5		
Operating voltage range	[V DC]	3.6 … 14		
Protocol		EnDat 2.2, digital channel only, max. switching frequency (CLOCK) ≤ 16 MHz		
Measuring principle		Inductive		
Position values per revolution				
For force range 0.8 kN/1.5 kN/4 kN		262144	524288	
For force range 7 kN/12 kN/17 kN		524288	524288	
Rotor position encoder resolution				
For force range 0.8 kN/1.5 kN/4 kN		18 bits	19 bits	
For force range 7 kN/12 kN/17 kN		19 bits	19 bits	
Revolutions		1	4096 revolutions, 12 bits	
System accuracy of angle measurement				
For force range 0.8 kN/1.5 kN	[arcsec]	−120 … 120		
For force range 4 kN	[arcsec]	−120 … 120		
For force range 7 kN/12 kN/17 kN	[arcsec]	−65 … 65		

Datasheet

Operating and environmental conditions		
Ambient temperature	[°C]	0 … 40
Storage temperature	[°C]	−10 … +60
Relative humidity	[%]	0 … 90
Degree of protection		IP20
Duty cycle	[%]	100
Note on materials		RoHS-compliant
LABS (PWIS) conformity		VDMA24364 zone III

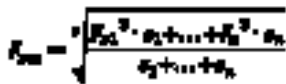| Weight [kg]						
Force range up to	0.8	1.5	4	7	12	17
Electric cylinder						
Basic weight with 0 mm stroke	0.78	1.24	1.98	3.16	7.39	11.12
Additional weight per 100 mm stroke	0.33	0.47	0.65	0.87	1.55	1.93
Kit						
Parallel kit	1.15	1.73	2.33	4.95	11.5	11.4
Axial kit	0.41	0.43	0.89	1.17	3.06	3.43
Motor						
Basic weight	1.53	1.91	3.29	5.5	26	26
Additional weight of brake	0.32	0.32	0.83	1.2	5.5	5.5
Force sensor						
Product weight	0.2	0.2	0.3	0.3	0.7	0.7
Motor controller						
Product weight	1.3	1.3	2.2	2.2	4.1	4.1
Control system						
Product weight	0.4	0.4	0.4	0.4	0.4	0.4

Datasheet

Service life

The service life of the servo press kit depends to a large extent on the lead screw of the cylinder.

To ensure that the balls of the ball screw drive can reliably realign, a stroke of at least 12.5 mm must be carried out at regular intervals (typically during the retracting phase, ideally after each pressing process).
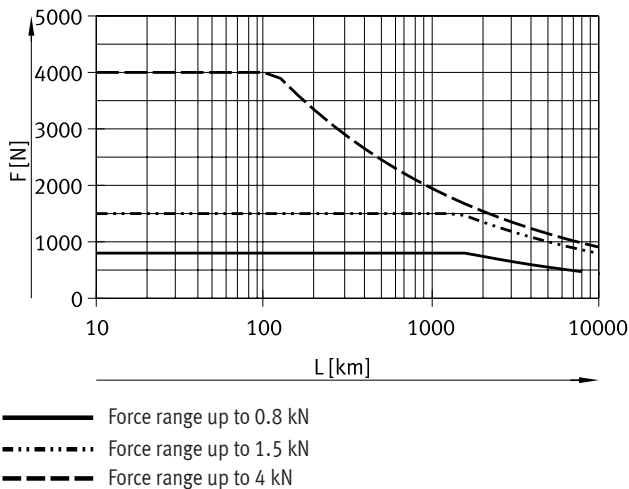
The service life ends after 10 million switching cycles or when the maximum running performance (L) has been reached.

The specifications for running performance (L) are based on experimentally determined and theoretically calculated data (at room temperature).

The running performance that can be achieved in practice can deviate considerably from the specified curves under different parameters (e.g. dirt, temperature).

$$F_{xm} = \sqrt{\frac{F_{x1}^3 \cdot s_1 + \ldots + F_{xn}^3 \cdot s_n}{s_1 + \ldots + s_n}}$$

$F_{x1/n}$ = Feed force of section
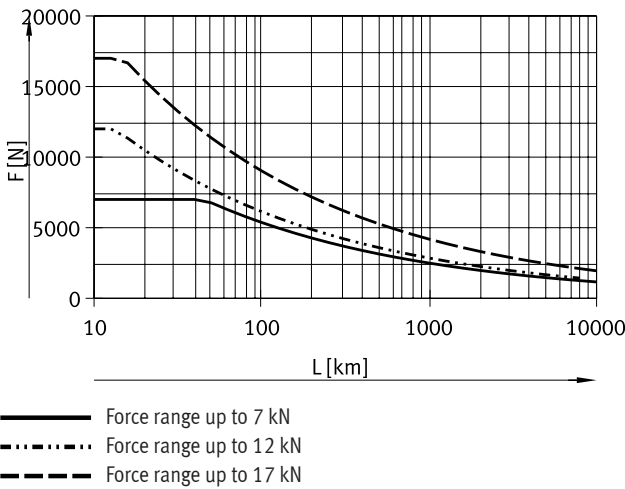$s_{1/n}$ = Part of movement cycle that is travel
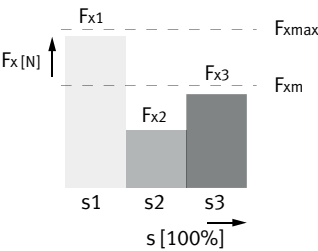
Mean feed force F_{xm} as a function of running performance L and room temperature

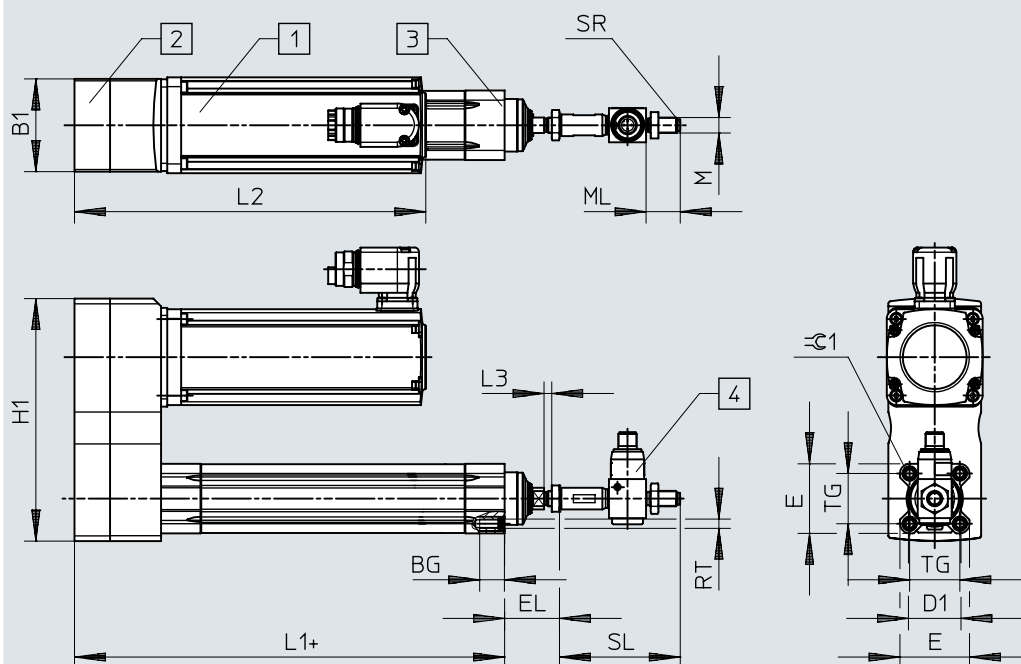| Force range up to 0.8/1.5/4	Force range up to 7/1 2/17

— Force range up to 0.8 kN
–·–·–· Force range up to 1.5 kN
– – – Force range up to 4 kN

— Force range up to 7 kN
–·–·–· Force range up to 12 kN
– – – Force range up to 17 kN

Datasheet

Dimensions
With parallel kit

[1] Servo motor
[2] Parallel kit
[3] Electric cylinder
[4] Force sensor

+ = plus stroke length

Force range up to [kN]	B1	BG min.	D1 Ø d11	E	EL[1]	H1	L1	L2
0.8	60	16	34	45$^{+0.5}$	35.5	157	178.5	223.3
1.5	70	16	39	54$^{+0.5}$	40.5	173.5	208.5	251.8
4	86	17	45	64$^{+0.5}$	49.5	188.5	234	285.4
7	110	17	52	75+0.5/−0.1	50	225	253	313.7
12	145	17	60	93+0.5/−0.1	61	348	303.5	490
17	145	17	70	110+0.5/−0.1	66	348	323.5	490

| Force range up to [kN]	L3	M	ML	RT	SL	SR	TG	⌀C1
0.8	5	M10x1.25	22	M6	78	60	32.5	6
1.5	5	M12x1.25	24	M6	81	60	38	6
4	5	M16x1.5	32	M8	107	100	46.5	8
7	5	M16x1.5	32	M8	107	100	56.5±0.5	8
12	5	M20x1.5	40	M10	140.5	150	72±0.5	6
17	5	M20x1.5	40	M10	140.5	150	89±0.5	6

1) With a spacing of 5 mm to the lock nut (in the retracted state)

Datasheet

Dimensions

With axial kit

Download CAD data → www.festo.com

[1] Servo motor
[2] Axial kit
[3] Electric cylinder
[4] Force sensor

+   = plus stroke length
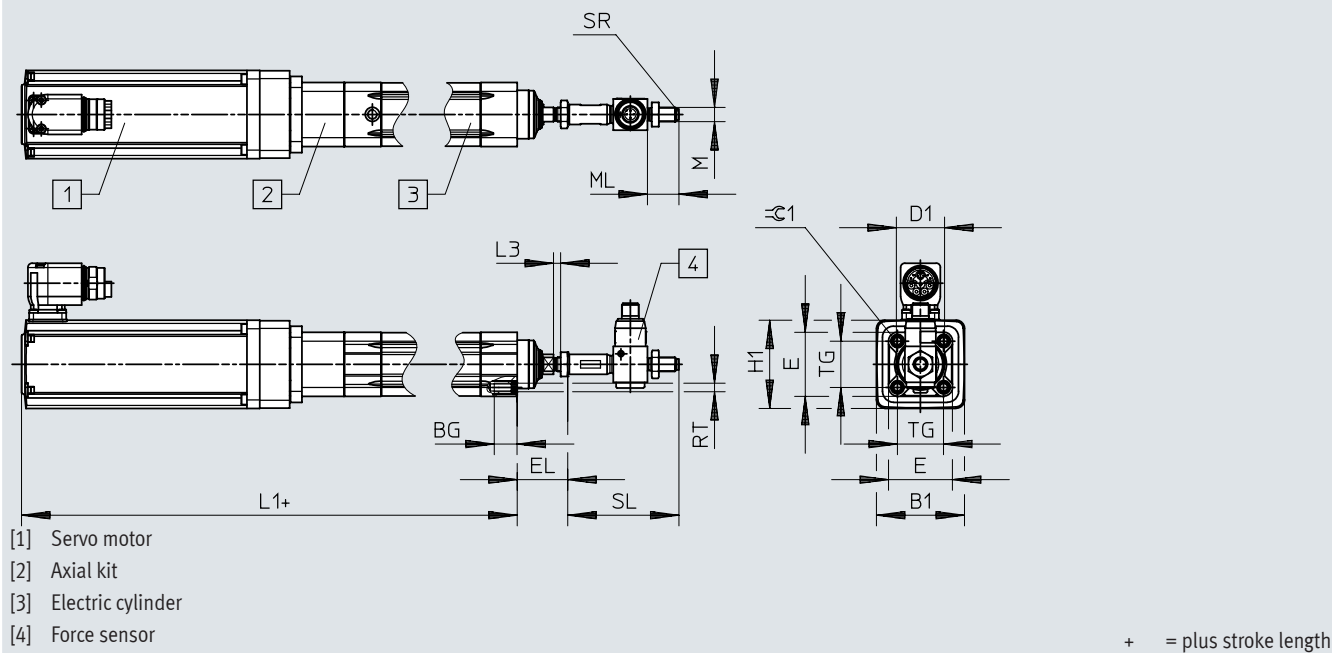
Force range up to [kN]	B1	BG min.	D1 Ø d11	E	EL[1]	H1	L1
0.8	62	16	34	$45^{+0.5}$	35.5	62	349.5
1.5	62	16	39	$54^{+0.5}$	40.5	62	391
4	82	17	45	$64^{+0.5}$	49.5	82	457.1
7	104	17	52	$75^{+0.5/-0.1}$	50	104	480.9
12	148	17	60	$93^{+0.5/-0.1}$	61	148	696.5
17	148	17	70	$110^{+0.5/-0.1}$	66	148	716.5

Force range up to [kN]	L3	M	ML	RT	SL	SR	TG	⌒1
0.8	5	M10x1.25	22	M6	78	60	32.5	6
1.5	5	M12x1.25	24	M6	81	60	38	6
4	5	M16x1.5	32	M8	107	100	46.5	8
7	5	M16x1.5	32	M8	107	100	56.5±0.5	8
12	5	M20x1.5	40	M10	140.5	150	72±0.5	6
17	5	M20x1.5	40	M10	140.5	150	89±0.5	6

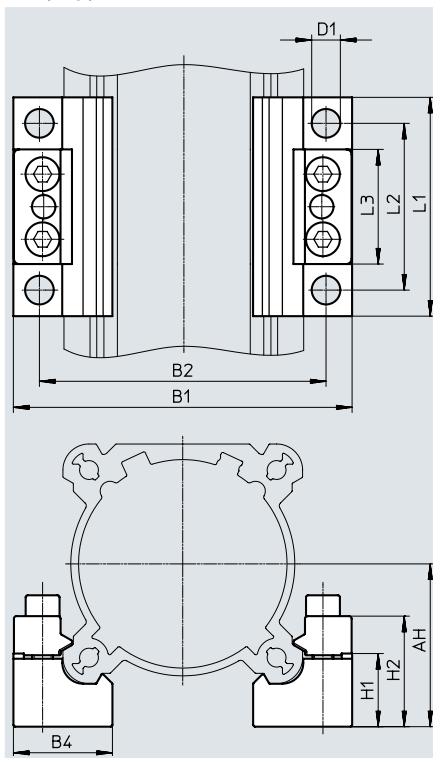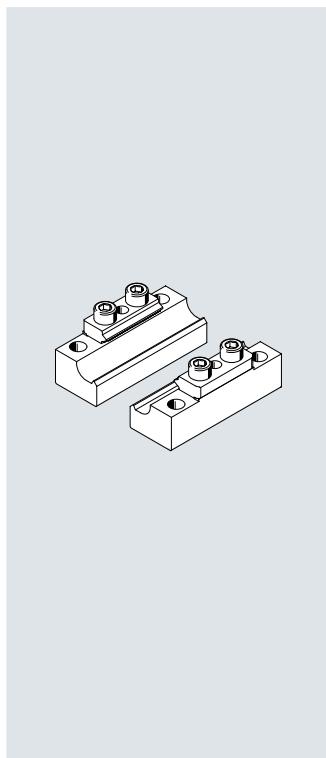1)   With a spacing of 5 mm to the lock nut (in the retracted state)
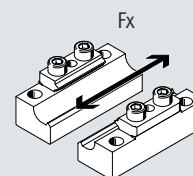
Accessories

Profile mounting EAHF

Material:
Plate: Anodised aluminium
Clamping piece: Coated steel

RoHS-compliant

- Note

Several profile mountings may have to be used depending on the pressing force.

Fx

Dimensions and ordering data

For force range up to [kN]	AH	B1	B2	B4	D1 ∅	H1	H2
0.8	32	76	60	26	9	16	23.6
1.5	36	84.5	68	26	9	16	23.6
4	44.5	94	81	30	9	22.8	30.4
7	50	105	92	30	9	22.8	30.4
12	62.5	130	110	38	11	28.1	42.5
17	71	147	127	38	11	28.1	42.5

For force range up to [kN]	L1	L2	L3	Weight [g]	Part no.	Type
0.8, 1.5	80	60	34	218	2838839	EAHF-V2-3 2/40-P
4, 7	80	60	41	340	1547781	EAHF-V2-5 0/63-P
12, 17	84	64	44	570	1547780	EAHF-V2-8 0/100-P

Number of profile mountings depending on the stroke

Force range	Max. possible force peak [N]	Transferable axial force Fx [kN]	Stroke [mm] 100	200	300	400
0.8	1.6	1.6	1	1	1	1
1.5	3.2	1.6	2	2	2	2
4	7.2	3.6	2	2	2	2
7	10.8	3.6	_1)	3	3	3
12	16	4	_1)	_1)	4	4
17	20	4	_1)	_1)	5	5

1) Mounting via profile mounting not possible as the required number cannot be attached to the profile.
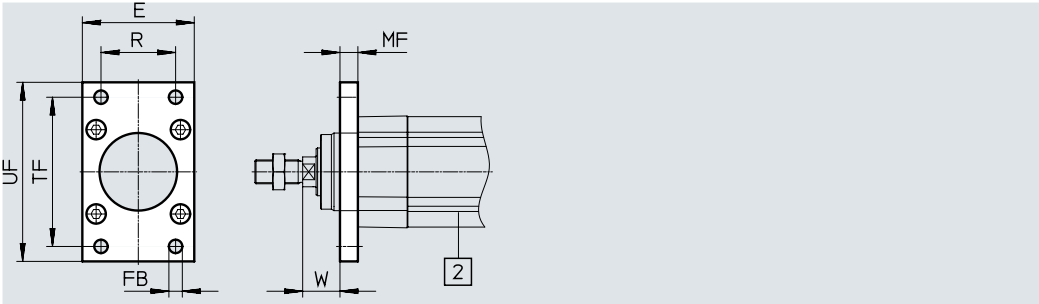
Accessories

Flange mounting EAHH

Material:
High-alloy stainless steel

RoHS-compliant
Free of copper and PTFE

Dimensions and ordering data

For force range up to [kN]	E	FB Ø H13	MF js14	R	TF	UF ±1	W
0.8	45	7	10	32	64	80	15.5
1.5	54	9	10	36	72	90	19.5
4	64	9	12	45	90	110	24.5
7	75	9	12	50	100	120	25
12	93	12	16	63	126	150	30
17	110	14	16	75	150	175	35

For force range up to [kN]	Max. load capacity [kN]	CRC[1]	Weight [g]	Part no.	Type
0.8	1	3	206	**2827587**	**EAHH-V2-32-R1**
1.5	3	3	275	**2827588**	**EAHH-V2-40-R1**
4	5	3	496	**2827589**	**EAHH-V2-50-R1**
7	7	3	633	**1502305**	**EAHH-V2-63-R1**
12	12	3	1360	**1502306**	**EAHH-V2-80-R1**
17	17	3	1880	**1502307**	**EAHH-V2-100-R1**

1) Corrosion resistance class CRC 3 to Festo standard FN 940070
High corrosion stress. Outdoor exposure under moderate corrosive conditions. External visible parts with primarily functional surface requirements that are in direct contact with a normal industrial environment.

Clamping element EADT
Material:
Polymer
RoHS-compliant
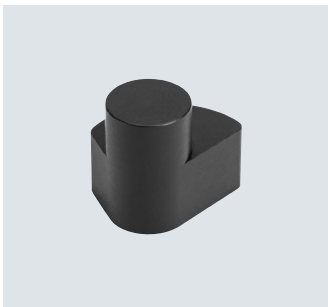
In conjunction with parallel kits, for setting the toothed belt pretension for force ranges 4, 7, 12 and 17 kN.
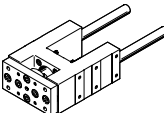
High toothed belt pretension forces can be generated with low torques at the clamping element.

Ordering data

Type	Weight [g]	Part no.	Type
EADT-E-U1-110	9	**1461069**	**EADT-E-U1-110**

Accessories

Ordering data – Guide units

Stroke [mm]	Part no.	Type		Stroke [mm]	Part no.	Type
For force range up to 0.8 kN				**For force range up to 1.5 kN**		
100	3038083	EAGF-V2-KF-32-170		100	3038089	EAGF-V2-KF-40-170
200	3038083	EAGF-V2-KF-32-270		200	3038089	EAGF-V2-KF-40-270
300	3038083	EAGF-V2-KF-32-370		300	3038089	EAGF-V2-KF-40-370
400	3038083	EAGF-V2-KF-32-470		400	3038089	EAGF-V2-KF-40-470
For force range up to 4 kN				**For force range up to 7 kN**		
100	3038094	EAGF-V2-KF-50-190		100	2608521	EAGF-V2-KF-63-190
200	3038094	EAGF-V2-KF-50-290		200	2608521	EAGF-V2-KF-63-290
300	3038094	EAGF-V2-KF-50-390		300	2608521	EAGF-V2-KF-63-390
400	3038094	EAGF-V2-KF-50-490		400	2608521	EAGF-V2-KF-63-490
For force range up to 12 kN				**For force range up to 17 kN**		
100	2608528	EAGF-V2-KF-80-220		100	2608532	EAGF-V2-KF-100-220
200	2608528	EAGF-V2-KF-80-320		200	2608532	EAGF-V2-KF-100-320
300	2608528	EAGF-V2-KF-80-420		300	2608532	EAGF-V2-KF-100-420
400	2608528	EAGF-V2-KF-80-520		400	2608532	EAGF-V2-KF-100-520