

Servo press kits YJKP



Servo press kits YJKP

Characteristics

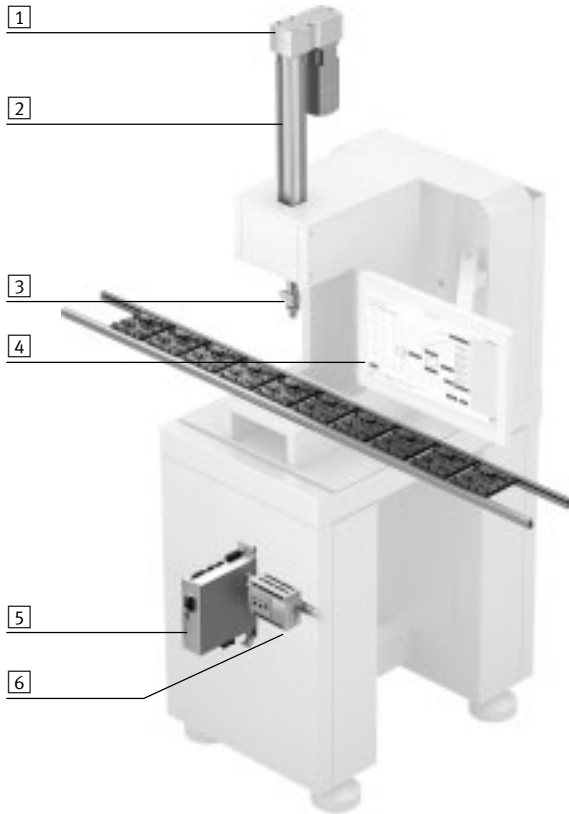
At a glance

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 continuous monitoring of parameters such as moments of force and displacement during joining and press-fitting processes.

Advantages :

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

Sample pressing device

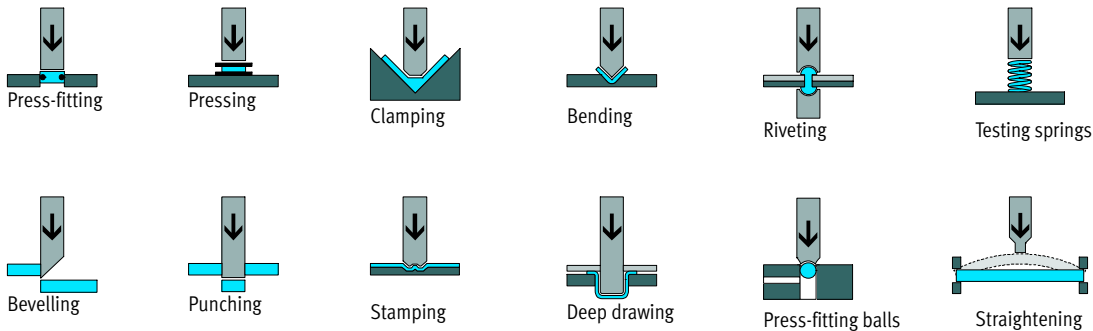


Individual components:

- 1 Servo motor
- 2 Electric drive
- 3 Force sensor (including inspection record)
- 4 Software package
- 5 Motor controller
- 6 Controller (including micro SD memory card)

Motor/encoder cables are included in the scope of delivery.

Areas of application

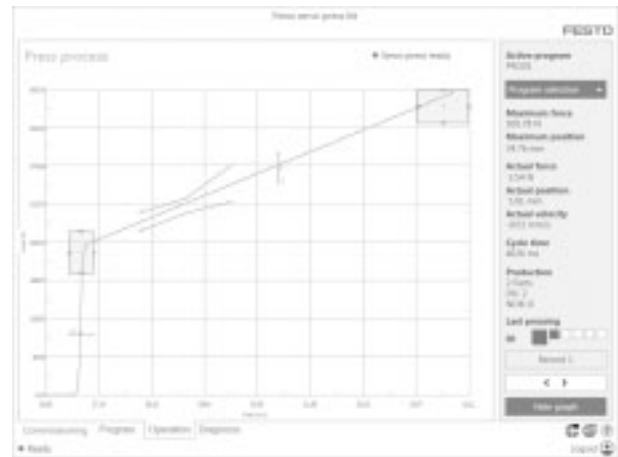


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Characteristics

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
- A non-platform-specific software display allows visualisation on all kinds of human-machine interfaces (HMIs) with a web browser, such as touchscreens, PCs, iPads, mobile phones, etc.
- 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 interchanged individually with the host system
- 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



The following software functions are available

Commissioning

- Configuring the hardware
- Executing a homing run
- Taring and adjust the force sensor
- Moving the press manually in “jog” mode
- Configuring logging
- Making fundamental system settings

Writing a programme

- 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

Operation

- Selecting saved press programs
 - Recording and displaying reference curves
 - Allowing OK/NOK evaluation of pressed parts
 - Logging
- The interfaces enable the GUI (graphical user interface), the PLC and the host to be selected and defined.

Diagnostics

- Process diagnostics
- Sensing of various system parameters, system status and statistical values
- Enabling 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

1) Per program

2) Per measurement

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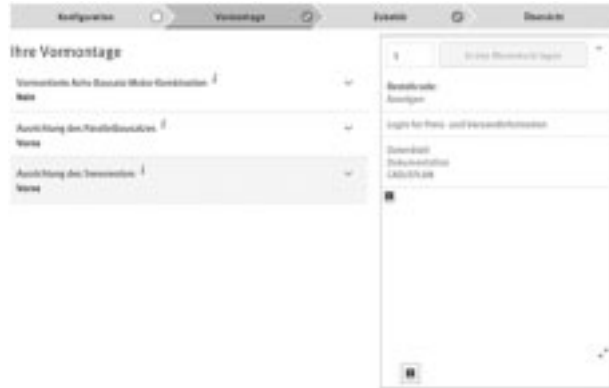


Ordering using the configurator

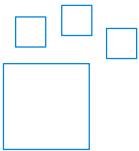
It is very easy to put together and order a wide range of servo press kits using the configurator.

The “Configuration”, “Preassembly” and “Accessories” tabs are used to select the combinations and display them with the correct configuration.

CAD files and ePLAN macros included.



Ordering data – Product options



Configurable product
This product and all its product options can be ordered using the configurator.

The configurator can be found under
Products on the DVD or
→ www.festo.com/catalogue/...

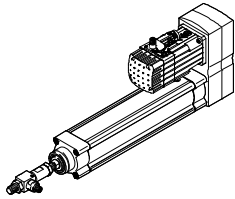
Part No. Type code
8077950 **YJKP**

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System components

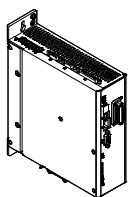
Included in the scope of delivery of the servo press kit

Electric drive



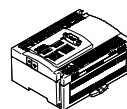
- With force sensor
- Connecting cable to controller (cable lengths of 5, 10, 15 m)
- Optionally with:
 - Motors with absolute displacement encoder:
 - Singleturn
 - Multiturn
 - Motors with/without holding brake
 - Axial or parallel motor attachment (preassembled if required)

Motor controller



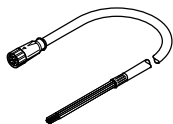
- For servo motor

Controller



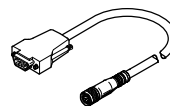
- With special software
- With connecting cable to motor controller

Motor cable



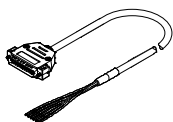
- Pre-assembled cable

Encoder cable



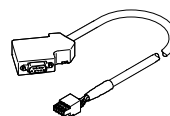
- Pre-assembled cable

Connecting cable



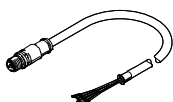
- Preassembled cable for commissioning the controller

Connecting cable



- Preassembled cable for CANopen interface

Connecting cable



- Screened cable for force sensor

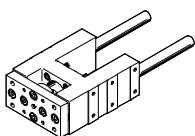
Micro SD memory card



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

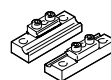
Can be ordered as accessories

Guide unit



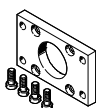
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Profile mounting



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Flange mounting



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Clamping element



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System components

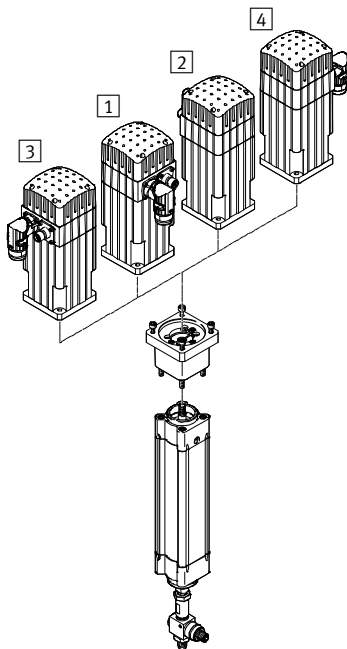


Possible combinations of kit and motor, depending on mounting position

Optionally preassembled

The electric drive, 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 defined 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.

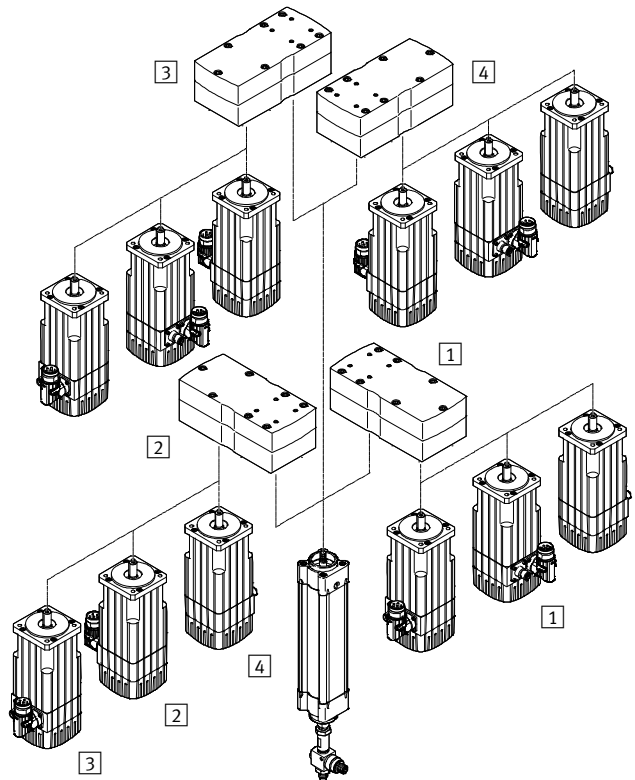
With axial kit



Possible attachment variants

- 1 Front
- 2 Rear
- 3 Left
- 4 Right

With parallel kit



Advanced software package

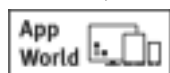
For even more individual adaptation to the application and for specific tasks.

With selected features at an attractive price, e.g.:

- Force control
- Advanced sequencer
- OPC-UA connection

Part No. Type code
8082745 GSAY-A4-F0-Z4-L-Y1

Available to purchase via the App World.



www.festo.com/appworld



Servo press kits YJKP

Technical data

FESTO

Bus protocols



General technical data							
Force range up to	[kN]	0.8	1.5	4	7	12	17
Protection against torsion/guide		With plain-bearing guide					
Working stroke	[mm]	100, 200, 300, 400					
Pressing force	[kN]	0.8	1.5	4	7	12	17
Max. payload ¹⁾	[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					
Accuracy FS of the force measurement ²⁾	[%]	±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 method		Threshold value					
		Envelopes					
		Window technique					
Visualisation		At the customer's premises via a web browser					
Mounting position		Any					

1) Caused by tool weight, for example

2) Related to the calibration range of the force sensor or the force measurement range of the software for the overall 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

The accuracy of the force measurement is influenced by the following properties of the force sensor:

- Accuracy
- Calibration range
- Nominal signal range
- Overload range

Lateral forces on the force sensor should be avoided as they may lead to false measurement results or damage the sensor.

Modbus®, PROFINET®, EtherNet/IP® is a registered trademark of its respective trademark holder in certain countries.

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Technical data

Electrical data							
Force range up to	[kN]	0.8	1.5	4	7	12	17
Motor controller							
Input voltage range	[V AC]	100 ... 230 ±10 %			3x 230 ... 480 ±10 %		
Max. nominal input current	[A]	3		6	5.5		11
Nominal power	[VA]	500		1000	3000		6000
Controller							
Operating voltage	[V DC]	24					
Current consumption	[mA]	200					
Force sensor							
Operating voltage range	[V DC]	10 ... 30					

Safety characteristics of the motor controller	
Safety function to EN 61800-5-2	Safe torque off (STO)
Performance Level (PL) to EN ISO 13849-1	Category 4, Performance Level e
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 3
Certificate issuing authority	TÜV 01/205/5262.01/14
Proof test interval	20a
Diagnostic coverage	[%] 97
Safe failure fraction (SFF)	[%] 99.2
Hardware fault tolerance	1

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	Contains paint-wetting impairment substances
	RoHS-compliant

Weight [kg]							
Force range up to		0.8	1.5	4	7	12	17
Electric drive							
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		1.05	2.45	4.99	4.95	11.9	11.8
Axial kit		0.26	0.41	1.14	1.17	2.92	3.46
Motor							
Basic weight		1.6	2.1	4.8	6.9	16.2	16.2
Additional weight of brake		0.1	0.2	0.5	0.6	0.8	0.8
Force sensor							
Product weight		0.2	0.2	0.3	0.3	0.7	0.7
Motor controller							
Product weight		2.1	2.1	2.2	3.8	3.8	3.8
Controller							
Product weight		0.4	0.4	0.4	0.4	0.4	0.4

Servo press kits YJKP

Technical data

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 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).

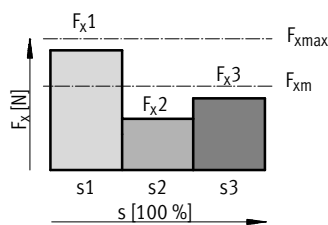
Calculation of the mean feed force F_{xm}

$$F_{xm} = \sqrt[3]{\frac{F_{x1}^3 \times s_1 + \dots + F_{xn}^3 \times s_n}{s_1 + \dots + s_n}}$$

F_{xm} = Mean feed force

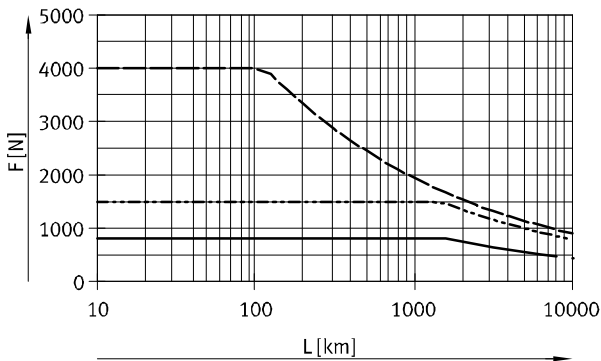
$F_{x1/n}$ = Feed force of section

$s_{1/n}$ = Part of movement cycle that is travel



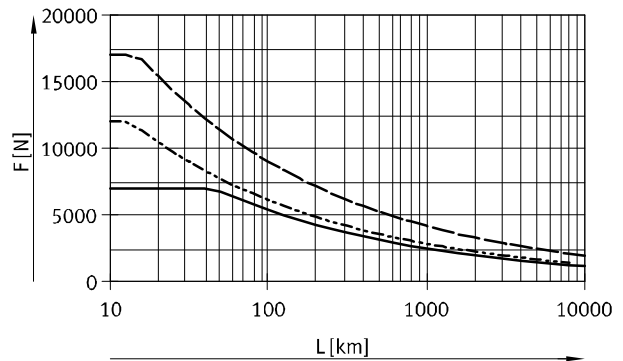
Mean feed force F_{xm} as a function of running performance L and room temperature

Force range up to 0.8/1.5/4



- Force range up to 0.8 kN
- - - Force range up to 1.5 kN
- · - Force range up to 4 kN

Force range up to 7/12/17



- Force range up to 7 kN
- - - Force range up to 12 kN
- · - Force range up to 17 kN

Servo press kits YJKP

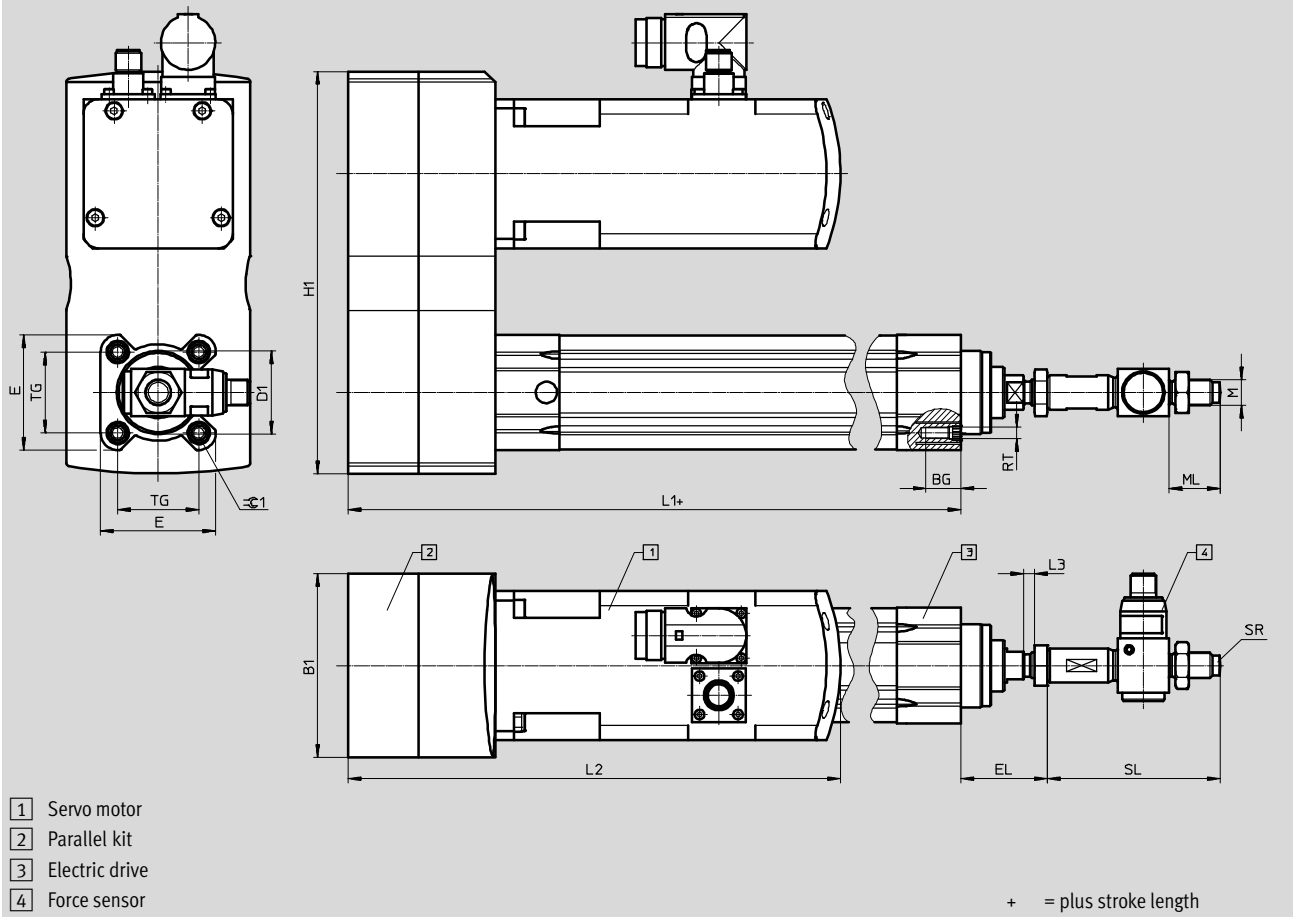
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

With parallel kit



Force range up to [kN]	B1	BG Min.	D1 ∅ d11	E	EL ¹⁾	H1	L1	L2
0.8	60	16	34	45 ^{+0.5}	35.5	157	178.5	220.4
1.5	86	16	39	54 ^{+0.5}	40.5	188.5	213	230.8
4	110	17	45	64 ^{+0.5}	49.5	225	245	274.3
7	110	17	52	75 ^{+0.5/-0.1}	50	225	253	325.3
12	145	17	60	93 ^{+0.5/-0.1}	61	348	303.5	385
17	145	17	70	110 ^{+0.5/-0.1}	66	348	323.5	385

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)

Servo press kits YJKP

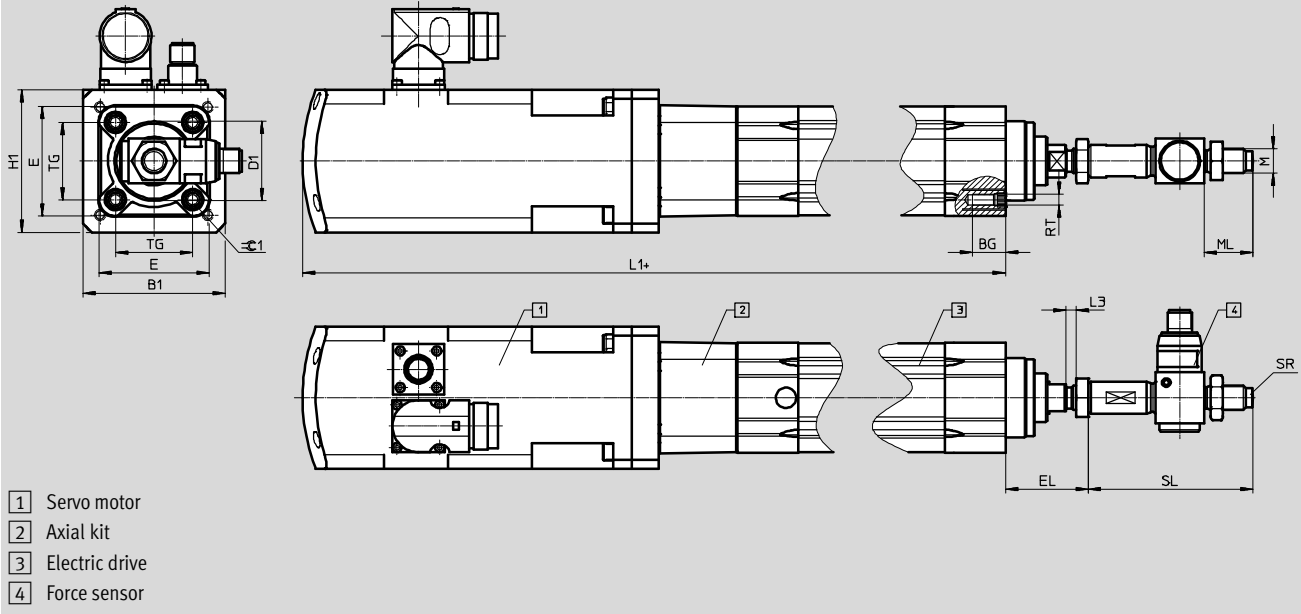
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

With axial kit



Force range up to [kN]	B1	BG Min.	D1 ∅ d11	E	EL ¹⁾	H1	L1
0.8	55	16	34	45 ^{+0.5}	35.5	55	336.1
1.5	70	16	39	54 ^{+0.5}	40.5	70	357.8
4	100	17	45	64 ^{+0.5}	49.5	100	439.3
7	100	17	52	75 ^{+0.5/-0.1}	50	100	492.5
12	140	17	60	93 ^{+0.5/-0.1}	61	140	591.5
17	140	17	70	110 ^{+0.5/-0.1}	66	140	619

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)

Servo press kits YJKP

Accessories



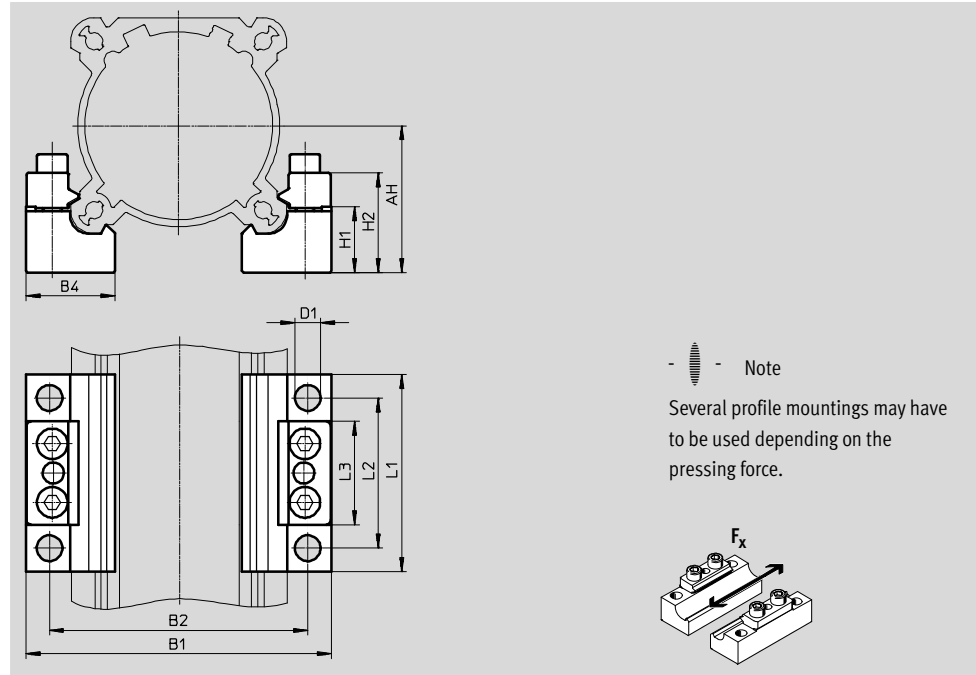
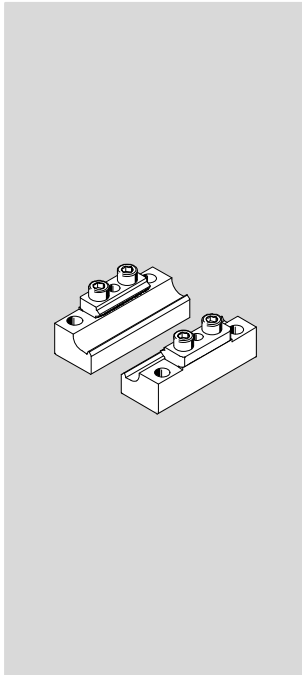
Profile mounting EAHF

Materials:

RoHS-compliant

Plate: Anodised aluminium

Clamping piece: Coated steel



Dimensions and ordering data							
For force range up to	AH	B1	B2	B4	D1 ∅	H1	H2
[kN]							
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	L1	L2	L3	Weight	Part No.	Type code
[kN]				[g]		
0.8, 1.5	80	60	34	218	2838839	EAHF-V2-32/40-P
4, 7	80	60	41	340	1547781	EAHF-V2-50/63-P
12, 17	84	64	44	570	1547780	EAHF-V2-80/100-P

Number of profile mountings as a function of stroke						
Force range	Max. possible force peak	Transferable axial force F_x	Stroke [mm]			
			100	200	300	400
	[N]	[kN]				
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.

Servo press kits YJKP

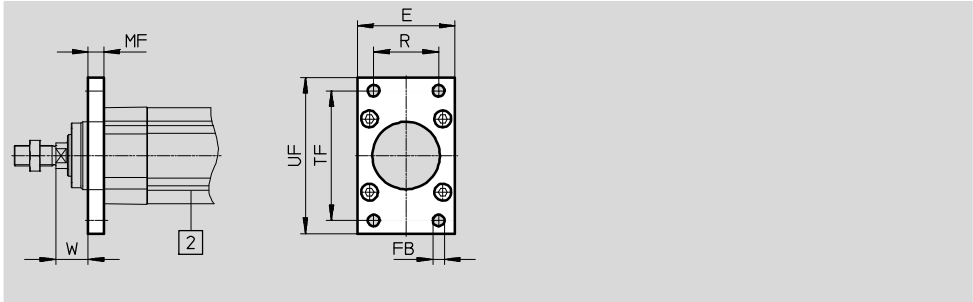
Accessories

FESTO

Flange mounting EAHH

Materials:
High-alloy stainless steel

RoHS-compliant
Free of copper and PTFE



Dimensions and ordering data

For force range up to [kN]	E	FB ∅ 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 carrying ability [kN]	CRC ¹⁾	Weight [g]	Part No.	Type code
0.8	1	4	206	2827587	EAHH-V2-32-R1
1.5	3	4	275	2827588	EAHH-V2-40-R1
4	5	4	496	2827589	EAHH-V2-50-R1
7	7	4	633	1502305	EAHH-V2-63-R1
12	12	4	1360	1502306	EAHH-V2-80-R1
17	17	4	1880	1502307	EAHH-V2-100-R1

1) Corrosion resistance class CRC 4 to Festo standard FN 940070

Particularly high corrosion stress. Outdoor exposure under extreme corrosive conditions. Parts exposed to aggressive media, for instance in the chemical or food industries. These applications may need to be supported by special tests (→ also FN 940082) using appropriate media.

Clamping element EADT

Materials:
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.

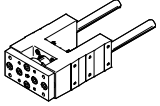
Ordering data

Type code	Weight [g]	Part No.	Type code
EADT-E-U1-110	9	1461069	EADT-E-U1-110

Servo press kits YJKP

Accessories

FESTO

Ordering data – Guide units				Technical data → Internet: eagf		
	Stroke [mm]	Part No.	Type code	Stroke [mm]	Part No.	Type code
	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