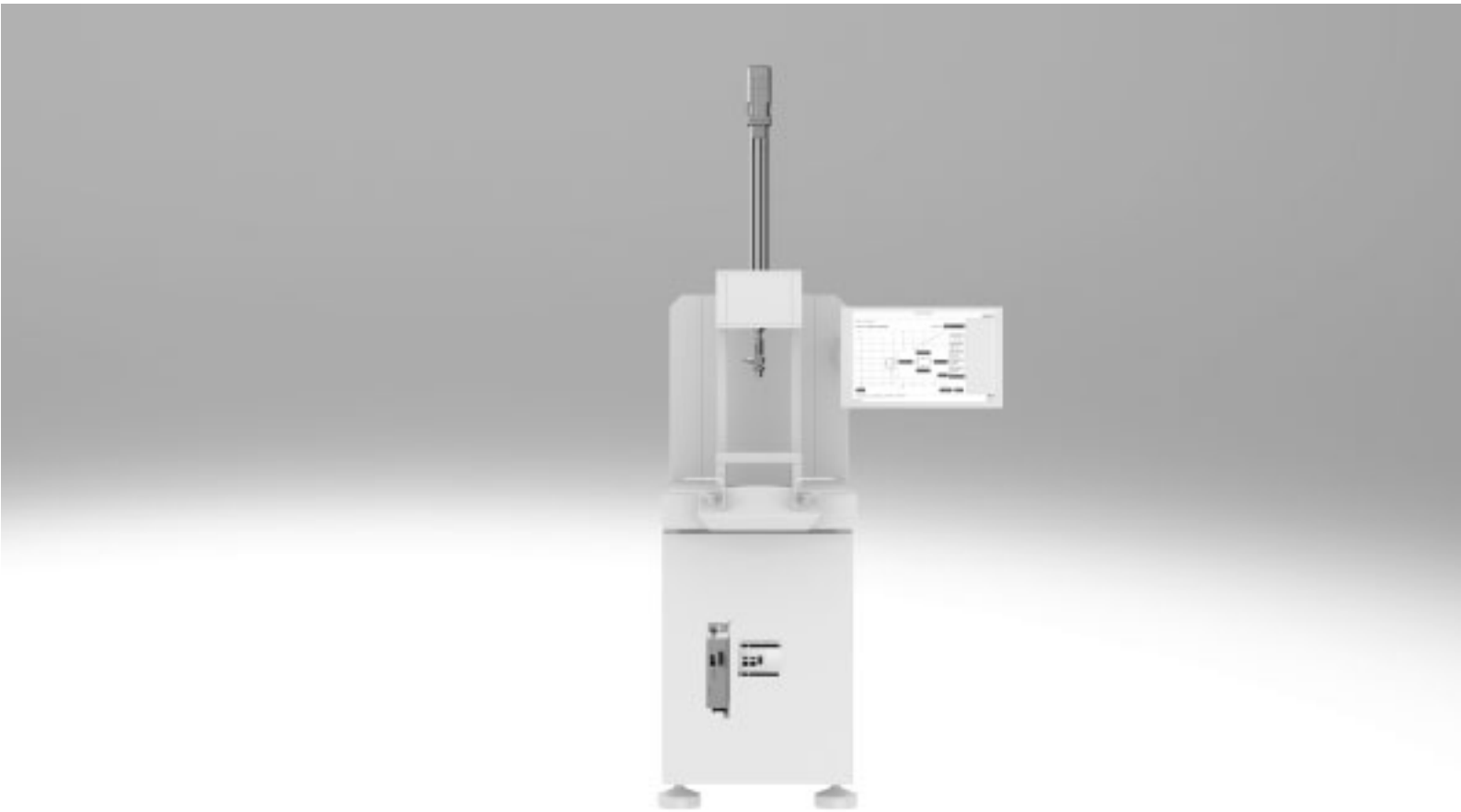
Servo press kits YJKP

FESTO



Servo press kits YJKP

Key features

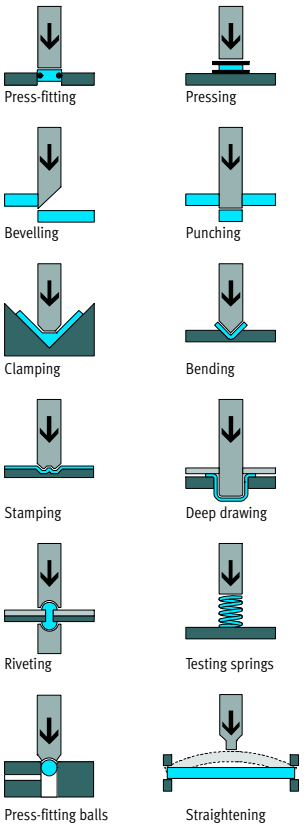
At a glance

The servo press kit and its associated software can be used to respond quickly to a range of press processes. It offers the ideal alternative to complex and often oversized presses.

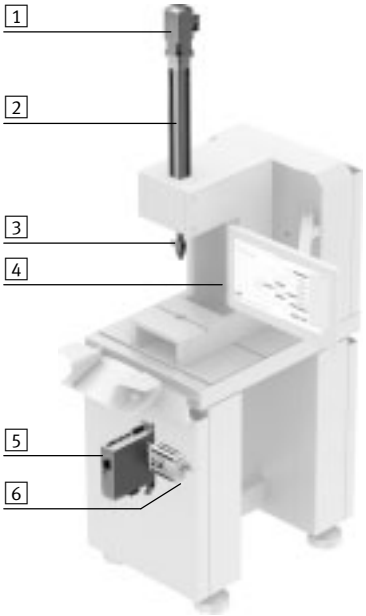
The software can be used to monitor parameters such as force, displacement and torque or angles during joining, press-fitting, swivelling and rotation processes in real time.

Advantages:

- Pressing forces of up to 17 kN
- Very high positioning and repetition accuracy
- Ideal price/performance ratio
- Easy integration into any application



Example pressing device



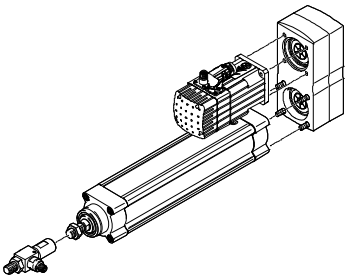
Individual components:

1 Servo motor
2 Electric cylinder
3 Force sensor
4 Software package
5 Motor controller
6 Controller

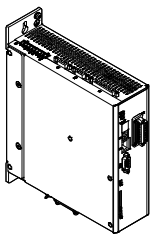
Connecting cables included in the scope of delivery.

Everything from a single source

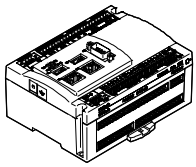
Electric cylinder with force sensor, connecting cable for control, and with either axial or parallel motor mounting[1)]



Motor controller[1)]

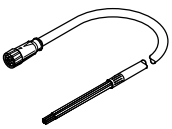


Controller with special software and connecting cable to the motor controller[1)]

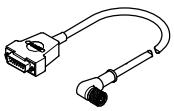


Memory card[1)]

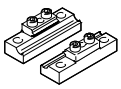
Motor cable[1)]



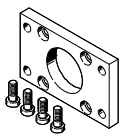
Encoder cable[1)]



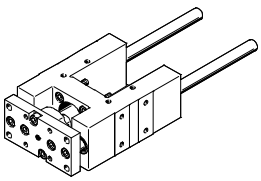
Profile mounting



Flange mounting



Guide unit

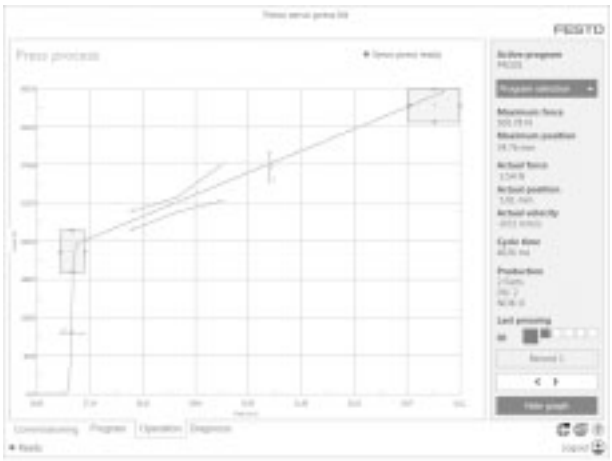


1) Included in the scope of delivery of the servo press kit.

Servo press kits YJKP

Key features

Modular software for configuration, operation and visualisation



The application is controlled via a WebVisu, which is also used for programming the application-specific functions. The pre-installed, ready-to-use software on the controller means that users do not need any knowledge of programming. Intuitive operation ensures user-friendly parameterisation of the press application. The modular press software is based on libraries which reflect state-of-the-art software architecture. A non-platform-specific software display allows visualisation on all kinds of human-machine interfaces (HMIs) with a web browser function, such as touchscreens, PCs, iPads, mobile phones, etc. The application is controlled by variables, e.g. by the higher-order controller. All recorded process data can be interchanged individually with the host system.

Software functions

1 Commissioning

All kinds of functions can be used during "Commissioning", e.g. hardware configuration, carrying out homing, calibrating the force sensor, moving the press manually by "jogging", carrying out logging configuration or entering basic system settings.

2 Writing a program

Program management is carried out using the "Program" function. This is also where the press sequence is defined and parameterised or configured by the sequencer; reference curves are recorded/loaded; the evaluation processes "Threshold values", "Envelope curves" and "Window technique" are configured; and individual variables are managed.

3 Operation

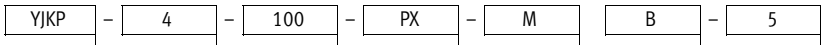
The function "Operation" allows the user to select a stored press program, record and display reference curves, evaluate pressed parts as "OK" or defective and carry out logging. The “Interfaces” enable the GUI (graphical user interface), the PLC and the host to be selected and defined.

4 Diagnostics

With the "Diagnostic" function, users/installation technicians can carry out process diagnostics, interrogate various system parameters, system statuses and statistical values and manage error handling. "User management" allows the user to make various individual settings.

Servo press kits YJKP

Type codes



Pressing	
YJKP	Servo press kit

Pressing force	
0.8	Up to 0.8 kN
1.5	Up to 1.5 kN
4	Up to 4 kN
7	Up to 7 kN
12	Up to 12 kN
17	Up to 17 kN

Stroke	
100	100 mm
200	200 mm
300	300 mm
400	400 mm

Motor attachment position	
AX	Axial
PX	Parallel

Measuring unit	
M	Absolute encoder, multi-turn
S	Absolute encoder, single-turn

Brake	
–	None
B	With brake

Line length	
5	5 m
10	10 m
15	15 m

Servo press kits YJKP

Technical data

Fieldbus interfaces

General technical data							
Type		YJKP-					
		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. working load[1]	[kg]	19.5	19.5	48	48	95	95
Max. feed speed	[mm/s]	250				160	
Acceleration							
For positioning operation	[m/s²]	2					
For cushioning phase	[m/s²]	2					
Repetition accuracy	[mm]	±0.01			±0.015	±0.01	
Scanning frequency of 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					
Configuration via visualisation system		Force/displacement diagrams					
		Default for good/bad parts					
		Visualisation					
Evaluation method		Threshold value					
		Envelope curves					
		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 pressing force of the complete system. Example for YJKP-0.8: 0.25% x 800 N

Servo press kits YJKP

Technical data

Technical data – Force sensor							
Type		YJKP-					
		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.

Electrical data							
Type		YJKP-					
		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]	100					
Force sensor							
Operating voltage range	[V DC]	10 … 30					

Safety data of 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

Servo press kits YJKP

Technical data

Operating and environmental conditions		
Ambient temperature	[°C]	0 ... 40
Storage temperature	[°C]	–10 ... +60
Relative air humidity	[%]	0 ... 90
Degree of protection		IP20
Duty cycle	[%]	100
Note on materials		Contains paint-wetting impairment substances
		RoHS compliant

Weight [kg]						
Type	YJKP-					
	0.8	1.5	4	7	12	17
Electric cylinders						
Basic weight with 0 mm stroke	0.78	1.24	1.98	3.16	7.39	7.39
Additional weight per 100 mm stroke	0.33	0.47	0.65	0.87	1.55	1.55
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

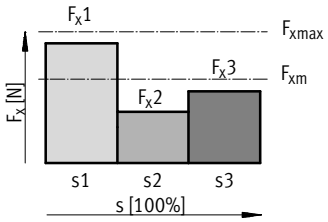
The service life of the servo press kit depends to a large extent on the lead screw of the cylinder.
To ensure that the balls of the ball screw can reliably realign, a stroke of at least 12.5 mm must be carried out at regular intervals (typically during the retracting phase, ideally after each pressing process).
The service life ends after 10 million switching cycles or when the maximum running performance (L) is 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}

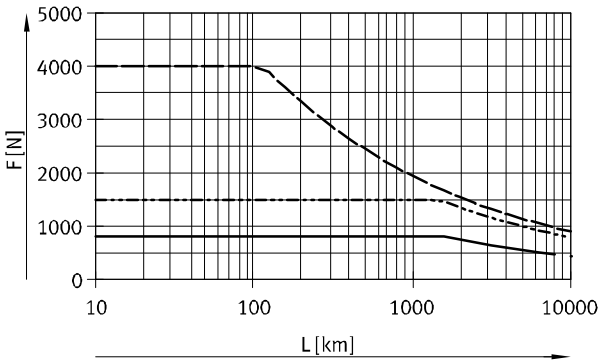
$$F_{xm} = \sqrt[3]{\frac{F_{x1}^{3} \times s_1 + \ldots + F_n^{3} \times s_n}{s_1 + \ldots + s_n}}$$

F_{xm} = Mean feed force
$F_{x1/n}$ = Feed force of section
$s_{1/n}$ = Share of motion cycle that is travel



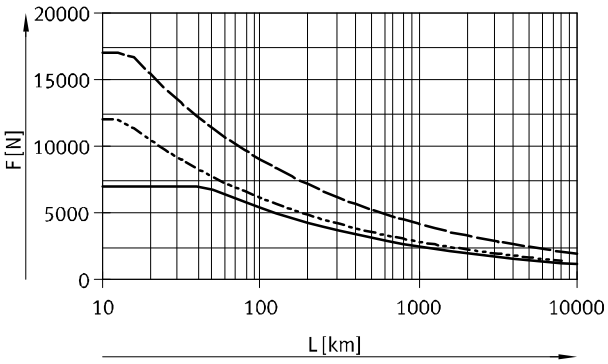
Mean feed force F_{xm} as a function of running performance L and room temperature

YJKP-0.8 / YJKP-1.5 / YJKP-4



YJKP-0.8
YJKP-1.5
YJKP-4

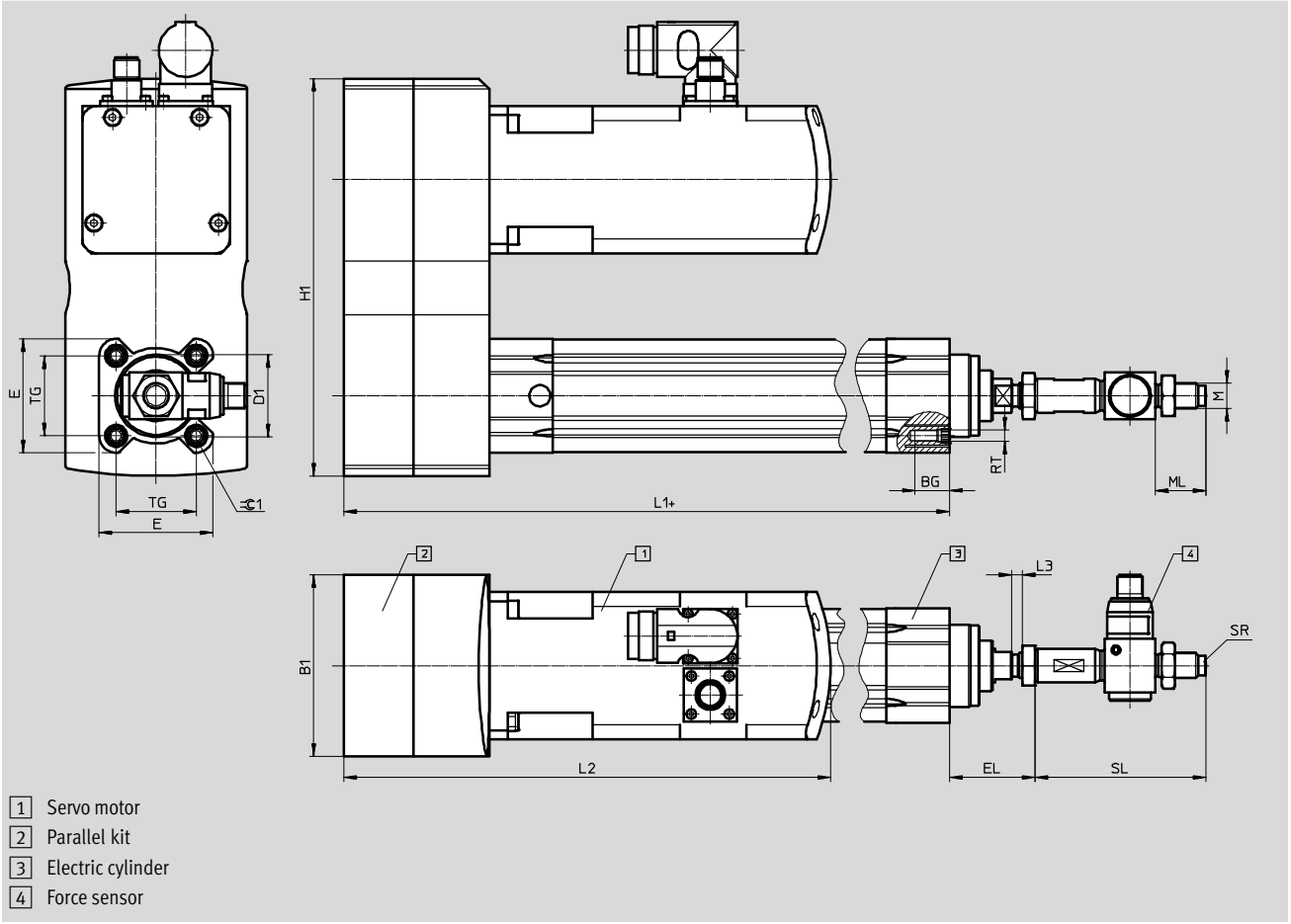
YJKP-7 / YJKP-12 / YJKP-17



YJKP-7
YJKP-12
YJKP-17

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

With parallel kit



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

Type	B1	BG Min.	D1 ∅	E	EL[1)]	H1	L1	L2
YJKP-0.8	60	16	34	$45^{+0.5}$	35.5	157	178.5	220.4
YJKP-1.5	86	16	39	$54^{+0.5}$	40.5	188.5	213	230.8
YJKP-4	110	17	45	$64^{+0.5}$	49.5	225	245	274.3
YJKP-7	110	17	52	$75^{+0.5/-0.1}$	50	225	253	325.3
YJKP-12	140	17	60	$93^{+0.5/-0.1}$	61	348	303.5	385
YJKP-17	140	17	70	$110^{+0.5/-0.1}$	66	348	323.5	385

Type	L3	M	ML	RT	SL	SR	TG	⫩C1
YJKP-0.8	5	M10x1.25	22	M6	78	60	32.5	6
YJKP-1.5	5	M12x1.25	24	M6	81	60	38	6
YJKP-4	5	M16x1.5	32	M8	107	100	46.5	8
YJKP-7	5	M16x1.5	32	M8	107	100	$56.5^{\pm 0.5}$	8
YJKP-12	5	M20x1.5	40	M10	140.5	150	$72^{\pm 0.5}$	6
YJKP-17	5	M20x1.5	40	M10	140.5	150	$89^{\pm 0.5}$	6

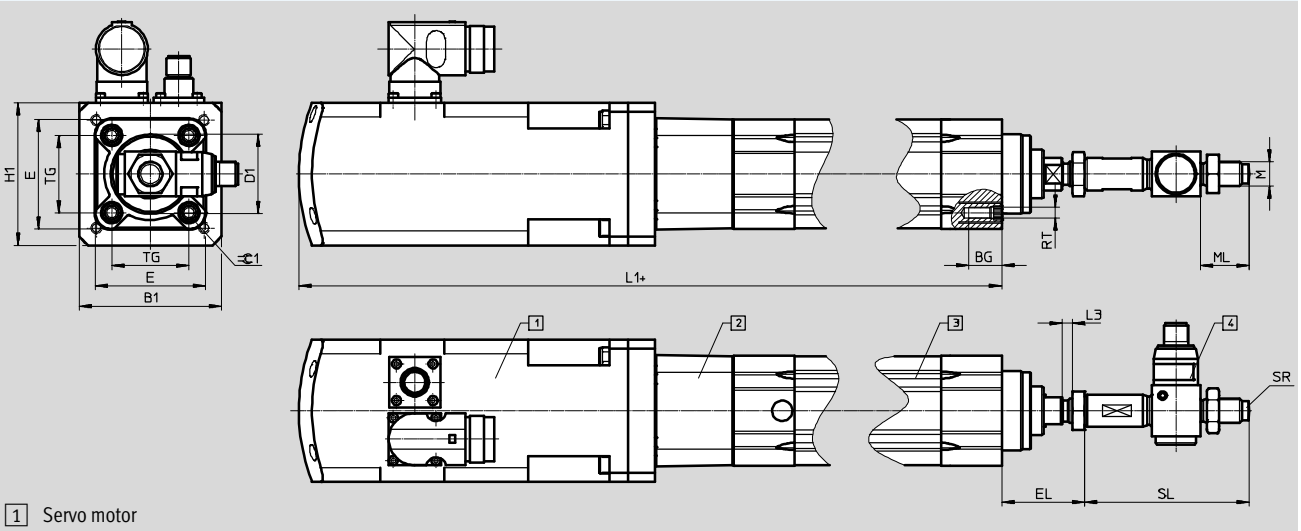
1) With a spacing of 5 mm to the lock nut (in the retracted state)

Servo press kits YJKP

Technical data

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

With axial kit



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

Type	B1	BG Min.	D1 ∅	E	EL[1)]	H1	L1
YJKP-0.8	55	16	34	$45^{+0.5}$	35.5	55	336.1
YJKP-1.5	70	16	39	$54^{+0.5}$	40.5	70	357.8
YJKP-4	100	17	45	$64^{+0.5}$	49.5	100	439.3
YJKP-7	100	17	52	$75^{+0.5/-0.1}$	50	100	492.5
YJKP-12	140	17	60	$93^{+0.5/-0.1}$	61	140	581.5
YJKP-17	140	17	70	$110^{+0.5/-0.1}$	66	140	619

Type	L3	M	ML	RT	SL	SR	TG	⊂1
YJKP-0.8	5	M10x1.25	22	M6	78	60	32.5	6
YJKP-1.5	5	M12x1.25	24	M6	81	60	38	6
YJKP-4	5	M16x1.5	32	M8	107	100	46.5	8
YJKP-7	5	M16x1.5	32	M8	107	100	$56.5^{\pm 0.5}$	8
YJKP-12	5	M20x1.5	40	M10	140.5	150	$72^{\pm 0.5}$	6
YJKP-17	5	M20x1.5	40	M10	140.5	150	$89^{\pm 0.5}$	6

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

Servo press kits YJKP

Ordering data – Modular product system

Ordering table

			Condi-tions	Code		Entry code
M	Module no.	**8058596**				
	Pressing	YJKP		**YJKP**		YJKP
	Pressing force	Up to 0.8 kN		**-0.8**		
		Up to 1.5 kN		**-1.5**		
		Up to 4 kN		**-4**		
		Up to 7 kN		**-7**		
		Up to 12 kN		**-12**		
		Up to 17 kN		**-17**		
	Stroke	100 mm		**-100**		
		200 mm		**-200**		
		300 mm		**-300**		
		400 mm		**-400**		
	Motor attachment position	Axial		**-AX**		
		Parallel		**-PX**		
	Measuring unit	Absolute encoder, multi-turn		**-M**		
		Absolute encoder, single-turn		**-S**		
O	Brake	None				
		With brake		**B**		
M	Cable length	5 m		**-5**		
		10 m		**-10**		
		15 m		**-15**		

M Mandatory data
O Options

Transfer order code

	YJKP	–		–		–		–			–

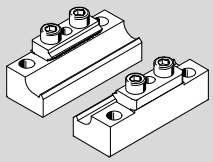
Servo press kits YJKP

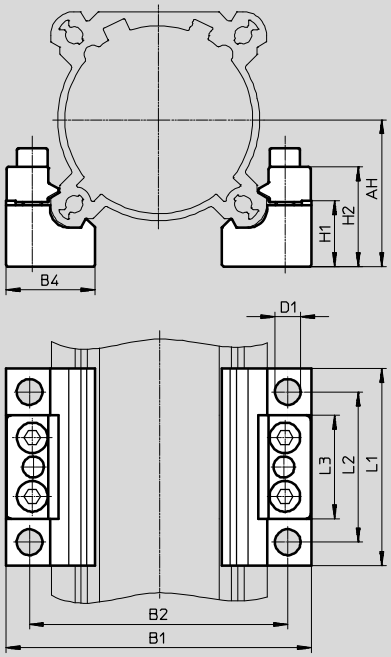
Accessories

Profile mounting EAHF for electric cylinder

Materials:
Plate: Anodised aluminium
Clamping piece: Coated steel

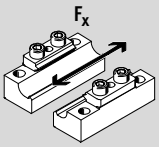
RoHS compliant





Note

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



Dimensions and ordering data

For type	AH	B1	B2	B4	D1 ∅	H1	H2	L1	L2	L3
YJKP-0.8	32	76	60	26	9	16	23.6	80	60	34
YJKP-1.5	36	84.5	68	26	9	16	23.6	80	60	34
YJKP-4	44.5	94	81	30	9	22.8	30.4	80	60	41
YJKP-7	50	105	92	30	9	22.8	30.4	80	60	41
YJKP-12	62.5	130	110	38	11	28.1	42.5	84	64	44
YJKP-17	71	147	127	38	11	28.1	42.5	84	64	44

For type	Transferable axial force F_x [kN]	Weight [g]	Part No.	Type
YJKP-0.8, YJKP-1.5	1.6	218	**2838839**	**EAHF-V2-32/40-P**
YJKP-4, YJKP-7	3.6	340	**1547781**	**EAHF-V2-50/63-P**
YJKP-12, YJKP-17	4.0	570	**1547780**	**EAHF-V2-80/100-P**

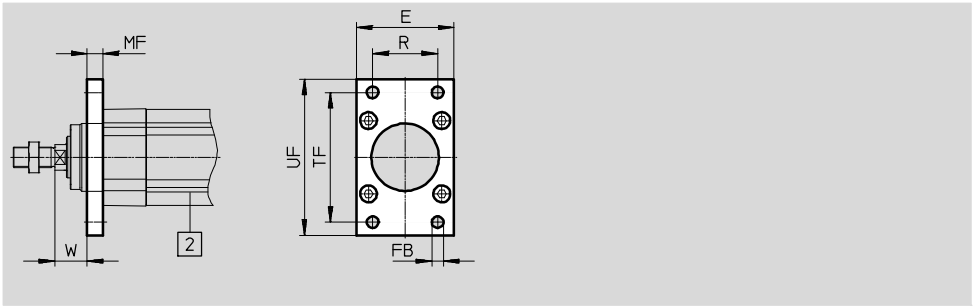
Servo press kits YJKP

Accessories

Flange mounting EAHH

Materials:
High-alloy stainless steel

RoHS compliant
Free of copper and PTFE



Dimensions and ordering data

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

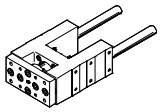
For type	Max. load carrying ability	ESBF-...-R3			
		CRC[1)]	Weight	Part No.	Type
[mm]	[kN]		[g]		
YJKP-0.8	1	4	206	**2827587**	**EAHH-V2-32-R1**
YJKP-1.5	3	4	275	**2827588**	**EAHH-V2-40-R1**
YJKP-4	5	4	496	**2827589**	**EAHH-V2-50-R1**
YJKP-7	7	4	633	**1502305**	**EAHH-V2-63-R1**
YJKP-12	12	4	1360	**1502306**	**EAHH-V2-80-R1**
YJKP-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.

Servo press kits YJKP

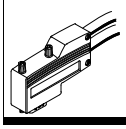
Accessories

Ordering data – Guide units — Technical data ➔ Internet: eagf

	Stroke [mm]	Part No.	Type		Stroke [mm]	Part No.	Type
	For YJKP-0.8				For YJKP-1.5		
	100	**2782818**	**EAGF-V2-KF-32-200**		100	**2782976**	**EAGF-V2-KF-40-200**
	200	**2782885**	**EAGF-V2-KF-32-320**		200	**2783047**	**EAGF-V2-KF-40-320**
	300	**2782923**	**EAGF-V2-KF-32-400**		300	**2783080**	**EAGF-V2-KF-40-400**
	400	**3038083**	**EAGF-V2-KF-32-[1)]**		400	**3038089**	**EAGF-V2-KF-40-[1)]**
	For YJKP-4				For YJKP-7		
	100	**2784152**	**EAGF-V2-KF-50-200**		100	**1725843**	**EAGF-V2-KF-63-200**
	200	**2784164**	**EAGF-V2-KF-50-320**		200	**1725844**	**EAGF-V2-KF-63-320**
	300	**2784184**	**EAGF-V2-KF-50-400**		300	**1725845**	**EAGF-V2-KF-63-400**
	400	**3038094**	**EAGF-V2-KF-50-[1)]**		400	**2608521**	**EAGF-V2-KF-63-[1)]**
	For YJKP-12				For YJKP-17		
	100	**1725848**	**EAGF-V2-KF-80-320**		100	**1725852**	**EAGF-V2-KF-100-320**
	200	**1725849**	**EAGF-V2-KF-80-400**		200	**1725853**	**EAGF-V2-KF-100-400**
	300	**2608528**	**EAGF-V2-KF-80-[1)]**		300	**2608532**	**EAGF-V2-KF-100-[1)]**
	400[2)]	**2608528**	**EAGF-V2-KF-80-[1)]**		400[2)]	**2608532**	**EAGF-V2-KF-100-[1)]**

1) Max. configurable stroke = 500 mm
2) In conjunction with a guide unit stroke = 500 mm, the maximum possible stroke of the servo press kit is 380 mm

Ordering data

	Description	Part No.	Type
Plug connector			
	For CANopen interface	**533783**	**FBS-SUB-9-WS-CO-K**