

Stopper cylinders DFSP

FESTO



Stopper cylinders DFSP

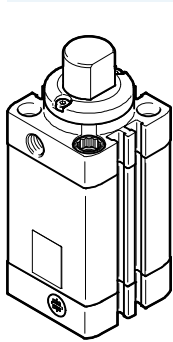
Key features

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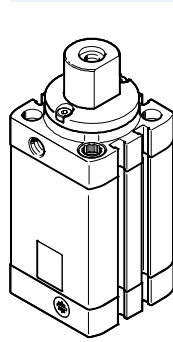
At a glance

- Versions:
 - Trunnion
 - Trunnion with female thread
 - Roller
- Single-acting, pulling
- Double-acting with spring, pulling
- Double-acting without spring
- With or without protection against rotation
- Compact design
- Sensor slots on 3 sides
- Long service life owing to very good cushioning characteristics and sturdy piston rod guide
- Fast and simple set-up of conveyors
- Workpiece carriers, pallets and packages weighing up to 90 kg can be safely stopped
- Space-saving sensing via integrated proximity sensors

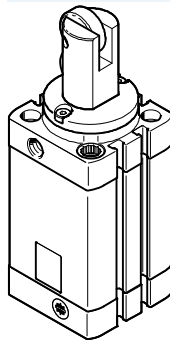
Trunnion version with/without protection against rotation



Trunnion version with female thread and with/without protection against rotation

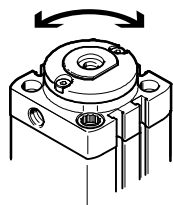


Roller version with protection against rotation



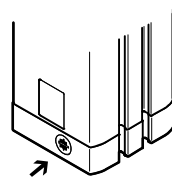
Protection against rotation

The anti-rotation ring can be rotated by 90° by loosening the screws. The compressed air can thus be connected from all 4 sides, independent of the direction of impact.



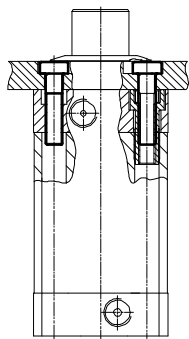
Single-acting cylinders with spring DFSP-...-P

In the DFSP-...-P variant, the cylinder can be operated as a double-acting cylinder by removing the filter nipple in the end cap.

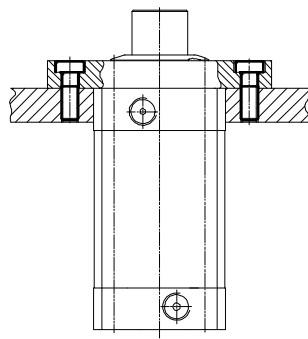


Mounting options

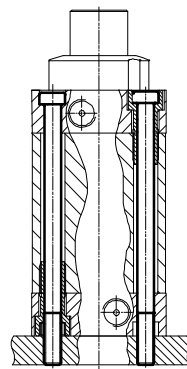
1 Direct mounting on the bearing cap



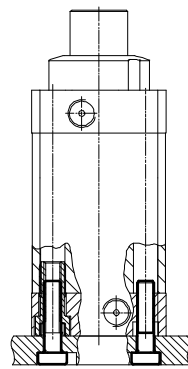
2 Direct mounting via flange mounting DAMF-F7 on the bearing cap



3 Through-hole mounting



4 Direct mounting on the end cap



-  - Note

All technical data refer to mounting options 1 and 2. The values can be

significantly lower for the other mounting options.

Adhere to minimum screw-in depths
→ page 12

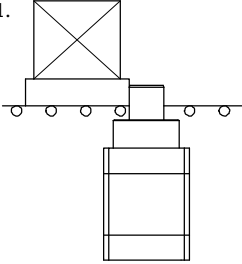
Stopper cylinders DFSP

Key features

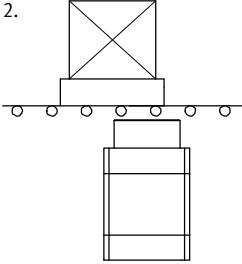
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Functional sequence

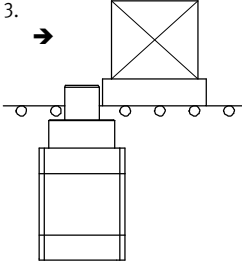
Trunnion version

- 

1.

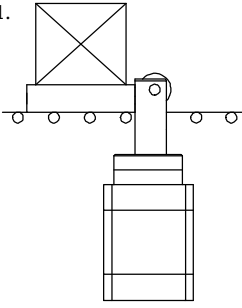


2.

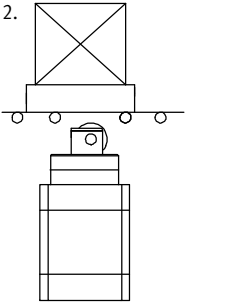


3.
1. Sudden braking of the conveyed good via the piston rod.
 2. The conveyed good is released by actuating the cylinder. The control system must hold the piston down until the conveyed good has passed the stopper cylinder.
 3. The piston rod then advances by means of spring force or compressed air. The next conveyed good can then be stopped.

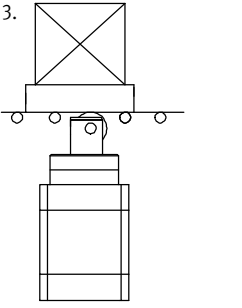
Roller version

- 

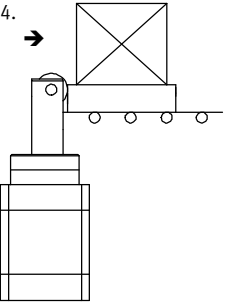
1.



2.



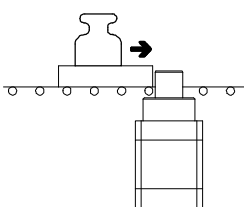
3.



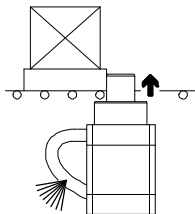
4.
1. Sudden braking of the conveyed good via the piston rod.
 2. The conveyed good is released by actuating the cylinder.
 3. The piston rod then advances by means of spring force until the roller makes contact with the conveyed good. The conveyed goods continues to move forward.
 4. After the conveyed goods has passed, the piston rod advances to its end position. The next conveyed good can then be stopped.

Application options and versions

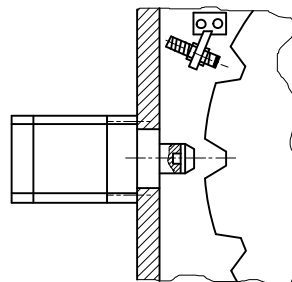
Stopping large loads



Security



Safe stopping in the event of emergency off or pressure failure is guaranteed as a result of advancing the piston rod using spring force (single-acting/double-acting with spring).

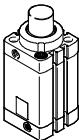
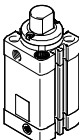
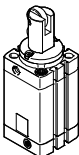
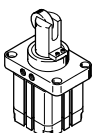
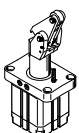
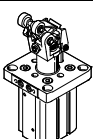


High lateral forces on the piston rod are possible, e.g. as a result of latching or holding loads.

Stopper cylinders DFSP

Product range overview

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Function	Version	Type	Piston Ø	Stroke	Permissible impact force ¹⁾ [N]	Type of mounting		→ Page/ Internet
			[mm]	[mm]		Direct	Via flange	
Stopper cylinders DFSP								
Single-acting, pulling or double-acting	Trunnion							
		DFSP-...-S DFSP-...-F	16	5 ... 15	880	■	■	5
			20	5 ... 20	1370	■	■	
			32	5 ... 25	3270	■	■	
			40	5 ... 30	5540	■	■	
			50	5 ... 30	6280	■	■	
	Trunnion with protection against rotation							
		DFSP-Q-...-S DFSP-Q-...-F	16	5 ... 15	880	■	■	5
			20	5 ... 20	1100	■	■	
			32	5 ... 25	3270	■	■	
			40	5 ... 30	5540	■	■	
			50	5 ... 30	6280	■	■	
	Roller with protection against rotation							
		DFSP-Q-...-R	16	10, 15	710	■	■	5
			20	10, 15, 20	840	■	■	
			32	15, 20, 25	2670	■	■	
			40	20, 25, 30	4500	■	■	
			50	20, 25, 30	5000	■	■	
Stopper cylinders STAF								
Single-acting, pulling or double-acting	Roller							
		STAF-...-P-A-R	80	30, 40	14600	–	■	sta
	Toggle lever							
		STAF-...-P-A-K	32	20	480	–	■	sta
Stopper cylinders DFST								
Single-acting, pulling or double-acting	Toggle lever							
		DFST-...-	50	30	3000	–	■	dfst
			63	30	5000			
			80	40	6000			

1) On the advanced piston rod

Stopper cylinders DFSP

Type codes and peripherals overview

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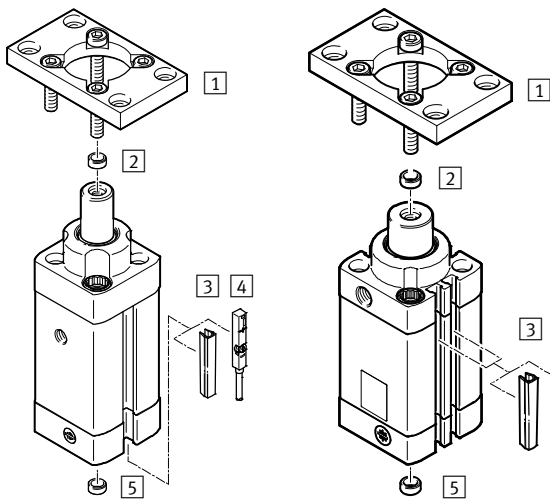
Type codes

		DFSP	–		–	20	–	15	–		S	–	P	A
Type														
Single-acting or double-acting														
DFSP	Stopper cylinder													
Protection against rotation														
Q	With protection against rotation													
Piston Ø [mm]														
Stroke [mm]														
Function														
–	Double-acting with spring, pulling													
D	Double-acting without spring													
P	Single-acting, pulling													
Piston rod version														
S	Standard (trunnion)													
F	Trunnion with female thread													
R	With roller													
Cushioning														
P	Elastic cushioning rings/plates at both ends													
Position sensing														
A	Via proximity sensor													

Peripherals overview

DFSP-16/20

DFSP-32/40/50



Accessories		
	Description	→ Page/ Internet
1	Flange mounting DAMF-F7	Mounting option via flange plate 20
2	Centring sleeve ZBH	For the precise fitting on the piston rod with female thread 21
3	Slot cover ABP	For protecting against contamination 21
4	Proximity sensor SME/SMT-8	Can be integrated into profile slot 21
5	Centring sleeve ZBH	For the precise fitting of the stopper cylinder 21

Stopper cylinders DFSP

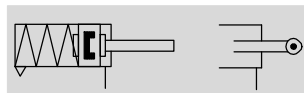
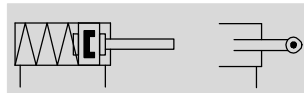
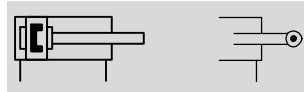
Technical data

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Feature

Trunnion

Roller



Diameter
16 ... 50 mm



Stroke length
5 ... 30 mm



General technical data					
Piston Ø	16	20	32	40	50
Pneumatic connection	M5	M5	G1/8	G1/8	G1/8
Stroke [mm]	5 ... 15	5 ... 20	5 ... 25	5 ... 30	5 ... 30
Max. cycle rate [Hz]	5				
Design	Piston				
	Piston rod				
	Piston rod with roller				
	Profile barrel				
	Non-rotating				
Mode of operation	Double-acting with spring, pulling				
	Double-acting without spring				
	Single-acting, pulling				
Cushioning	Elastic cushioning rings/plates at both ends				
Type of mounting	With through-hole				
	With female thread				
	Via accessories				
Position sensing	Via proximity sensor				
Mounting position	Any				

Operating and environmental conditions						
Piston Ø	16	20	32	40	50	
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]					
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)					
Min. operating pressure						
Without spring [bar]	1					
With spring [bar]	2.8	1.6	1.2	1.2		1.2
With max. lateral force [bar]	➔ page 10					
Max. operating pressure [bar]	10					
Ambient temperature ¹⁾ [°C]	-10 ... +80					
Corrosion resistance class CRC ²⁾	2					

1) Note operating range of proximity sensors.

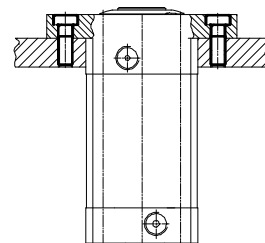
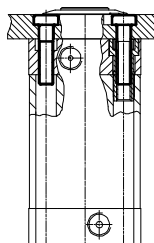
2) Corrosion resistance class 2 according to Festo standard 940 070

Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

- Note

All technical data refer to the mounting options (→ right). The values can be significantly lower for the other

mounting options. Adhere to minimum screw-in depths → page 12



Stopper cylinders DFSP

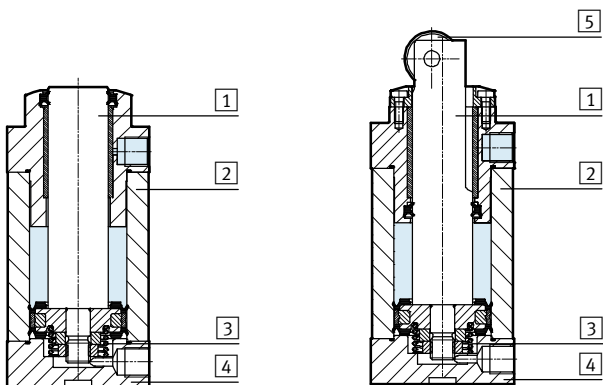
Technical data

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Effective force and impact energy						
Piston Ø		16	20	32	40	50
Effective force at 6 bar, advancing						
DFSP-...	[N]	107	171	438	683	1064
DFSP-...-D	[N]	121	188	483	754	1178
Effective force at 6 bar, retracting						
DFSP-...	[N]	74	121	294	459	696
Max. impact energy of the cylinder in the end positions						
DFSP-...	[J]	0.1	0.15	0.4	0.7	1.0

Materials

Sectional view



Stopper cylinder		
1	Piston rod	High-alloy stainless steel
2	Profile barrel	Wrought aluminium alloy, hard-anodised
3	Spring	Spring steel
4	Cap	Anodised wrought aluminium alloy
5	Roller	Galvanised steel
–	Flange screws	High-alloy stainless steel
	Seals	TPE-U(PU)
	Anti-rotation ring	POM
	Note on materials	RoHS-compliant

Stopper cylinders DFSP

Technical data

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Weight [g]					
Piston Ø	16	20	32	40	50
Product weight					
With 0 mm stroke					
DFSP-...-S	113	189	409	633	948
DFSP-...-F	112	188	406	626	941
DFSP-Q-...-S	111	185	402	628	937
DFSP-Q-...-F	110	184	399	621	930
DFSP-Q-...-R	113	188	419	666	1007
Additional weight per 10 mm stroke					
DFSP-...-S	16.1	24.7	45.5	68.4	99.5
DFSP-...-F					
DFSP-Q-...-S					
DFSP-Q-...-F	15.6	23.7	43.7	65.8	94.9
DFSP-Q-...-R					
Moving mass					
With 0 mm stroke					
DFSP-...-S	30	50	156	263	436
DFSP-...-F	29	50	153	257	429
DFSP-Q-...-S	29	49	155	261	430
DFSP-Q-...-F	29	49	152	254	424
DFSP-Q-...-R	31	52	171	299	501
Additional weight per 10 mm stroke					
DFSP-...-S	6.3	9.0	25.1	39.3	64.3
DFSP-...-F					
DFSP-Q-...-S					
DFSP-Q-...-F	5.7	8.1	23.3	36.6	59.7
DFSP-Q-...-R					
Spring					
	1.3	1.4	3.5	6.4	10.6

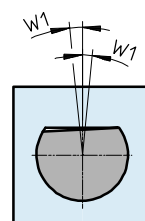
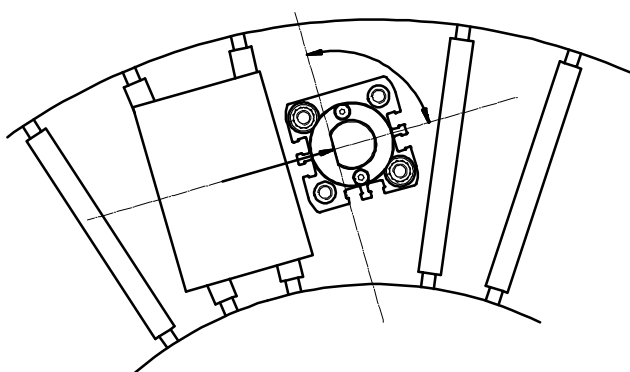
Stopper cylinder with protection against rotation

For the DFSP-Q-... (with anti-rotation ring), the alignment and direction of movement of the workpiece carrier must be exactly vertical with respect to the flat impact surface of the piston

rod. Conveyed goods approaching at an angle reduce the service life of the cylinder and can lead to breakage of the anti-rotation ring.

The anti-rotation ring can be rotated by 90° into the desired position.

The compressed air can thus be connected from all 4 sides, independent of the direction of impact.



Piston Ø	16	20	32	40	50
Permissible torque on the piston rod [Nm]	1	1.5	2.5	2.5	3.5
Permissible torsional backlash W1 in new condition [°]	±5	±4	±4	±4	±3

Stopper cylinders DFSP

Technical data

FESTO

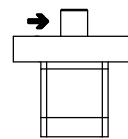
Permissible impact force on the advanced piston rod

"Impact force" refers to the maximum of a force-time progression (not known in detail) during the impact or cushioning phase of the moving mass. This acts perpendicularly to the axis of motion of the piston rod. If the flexible

components are considered as linear springs, a permissible impact energy can be calculated from the permissible impact force, which helps in the selection of the correct stopper. The stopper must not operate under this

force.

Depending upon the type of load to be stopped, it is advisable to provide a flexible buffer to cushion the impact, reduce noise levels and to optimise the impact energy.



→ = Direction of impact force

Piston Ø		16	20	32	40	50
DFSP-...	[N]	880	1370	3270	5540	6280
DFSP-Q-...	[N]	880	1100	3270	5540	6280
DFSP-Q-...-R	[N]	710	840	2670	4500	5000

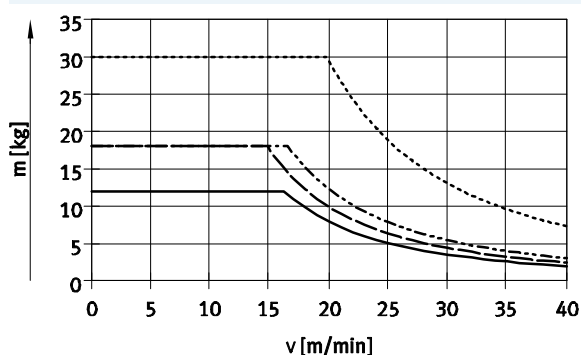
Permissible load m as a function of conveyor speed v

A prerequisite for the values in the graphs is an elastic buffer on the workpiece carrier with a deformation path of 1 mm.

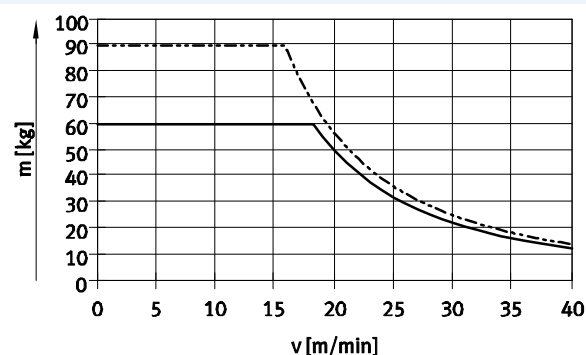
For a smaller deformation path, the impact force is reduced.

Note
Selection aid → page 22

DFSP-... / DFSP-Q-... – with trunnion

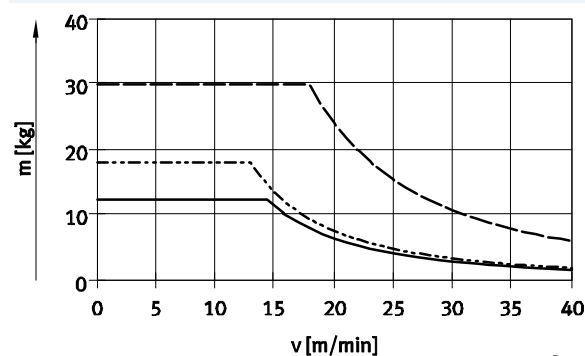


— DFSP-16/DFSP-Q-16
- - - DFSP-20
- · - DFSP-Q-20
- · - DFSP-32/DFSP-Q-32

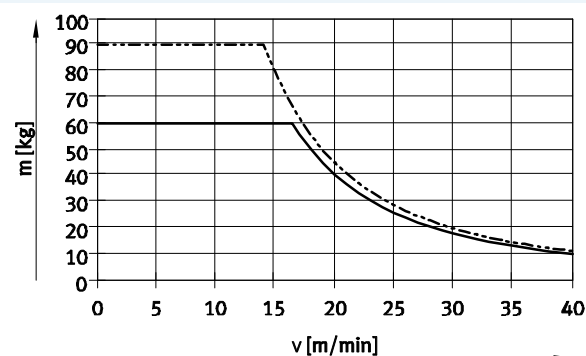


— DFSP-40/DFSP-Q-40
- - - DFSP-50/DFSP-Q-50

DFSP-Q-...-R – with roller



— DFSP-Q-16-R
- - - DFSP-Q-20-R
- · - DFSP-Q-32-R



— DFSP-Q-40-R
- - - DFSP-Q-50-R

Stopper cylinders DFSP

Technical data

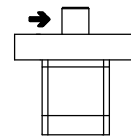
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Permissible lateral force F on the advanced piston rod during switching operation

The "permissible lateral force during switching operation" refers to the force which is still applied perpendicularly to the direction of movement of the piston rod even after the end of

the impact or braking process, e.g. as a result of belts that are still running or the downhill force of a steep raceway. The force has a static effect. The

stopper must operate under this force. To ensure the function of the cylinder, a minimum pressure must be applied
→ page 6



→ = Direction of lateral force

Piston Ø		16	20	32	40	50
DFSP-...	[N]	130	210	570	950	1500
DFSP-Q-...	[N]	130	210	570	950	1500
DFSP-Q-...-R	[N]	100	160	420	750	1200

Permissible lateral force F during the switching operation as a function of the pressure p

In order to overcome the bearing friction, sufficient compressed air must be applied when switching under pressure.

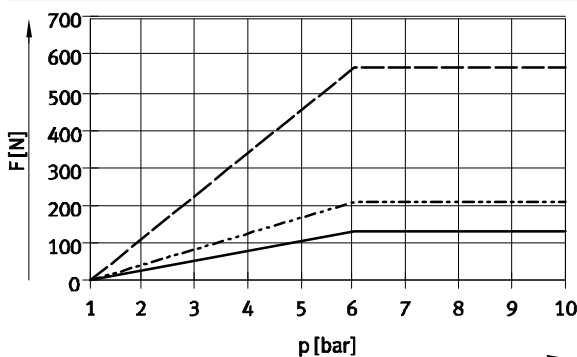
If the compressed air is below 6 bar, the following graphs and the minimum operating pressure should be observed.



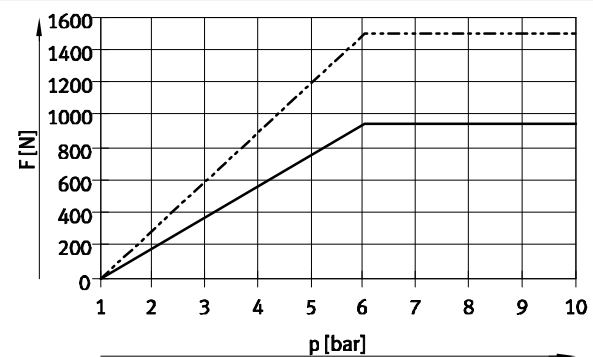
Note

Selection aid → page 22

DFSP-... / DFSP-Q-... – with trunnion

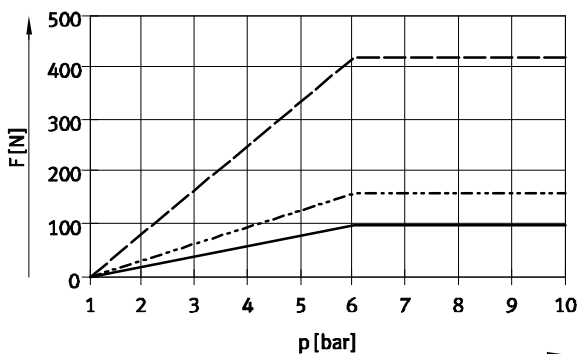


— DFSP-16
- - - DFSP-20
- - - DFSP-32

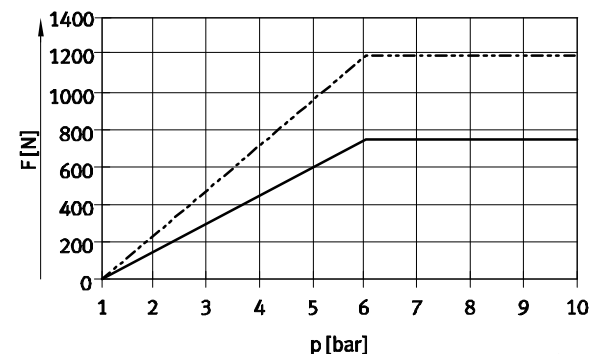


— DFSP-40
- - - DFSP-50

DFSP-Q-...-R – with roller



— DFSP-Q-16-R
- - - DFSP-Q-20-R
- - - DFSP-Q-32-R



— DFSP-Q-40-R
- - - DFSP-Q-50-R

Stopper cylinders DFSP

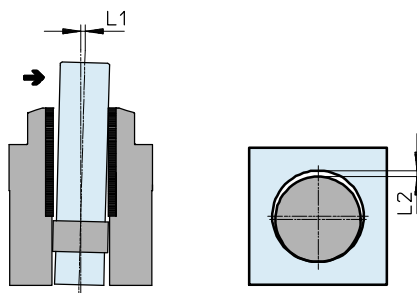
Technical data

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Bearing clearance of the piston rod when subjected to lateral force F

The specifications are valid for the following conditions:

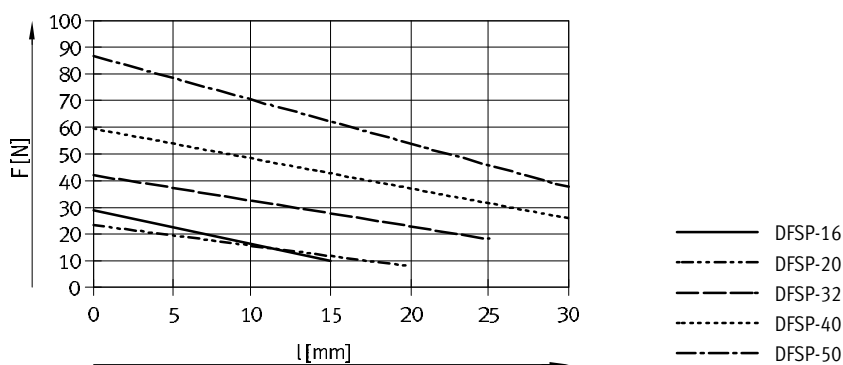
- In new condition
- Without compressed air
- Max. lateral force
- Advanced piston rod



Piston Ø		16	20	32	40	50
Dimension L1						
DFSP-...	[mm]	±0.2	±0.25	±0.25	±0.3	±0.3
DFSP-Q-...	[mm]	±0.25	±0.3	±0.3	±0.3	±0.35
Dimension L2						
Absolute bearing clearance	[mm]	±0.1	±0.12	±0.14	±0.14	±0.17

Spring return force F as a function of stroke l

- For single-acting cylinders, the effective force is reduced compared to the theoretical force by the values for frictional and spring force
- The frictional force must be smaller than the spring force
- The friction depends on the mounting position and the type of load involved
- Single-acting cylinders should as far as possible be operated without lateral forces when advancing (spring force).



Stopper cylinders DFSP

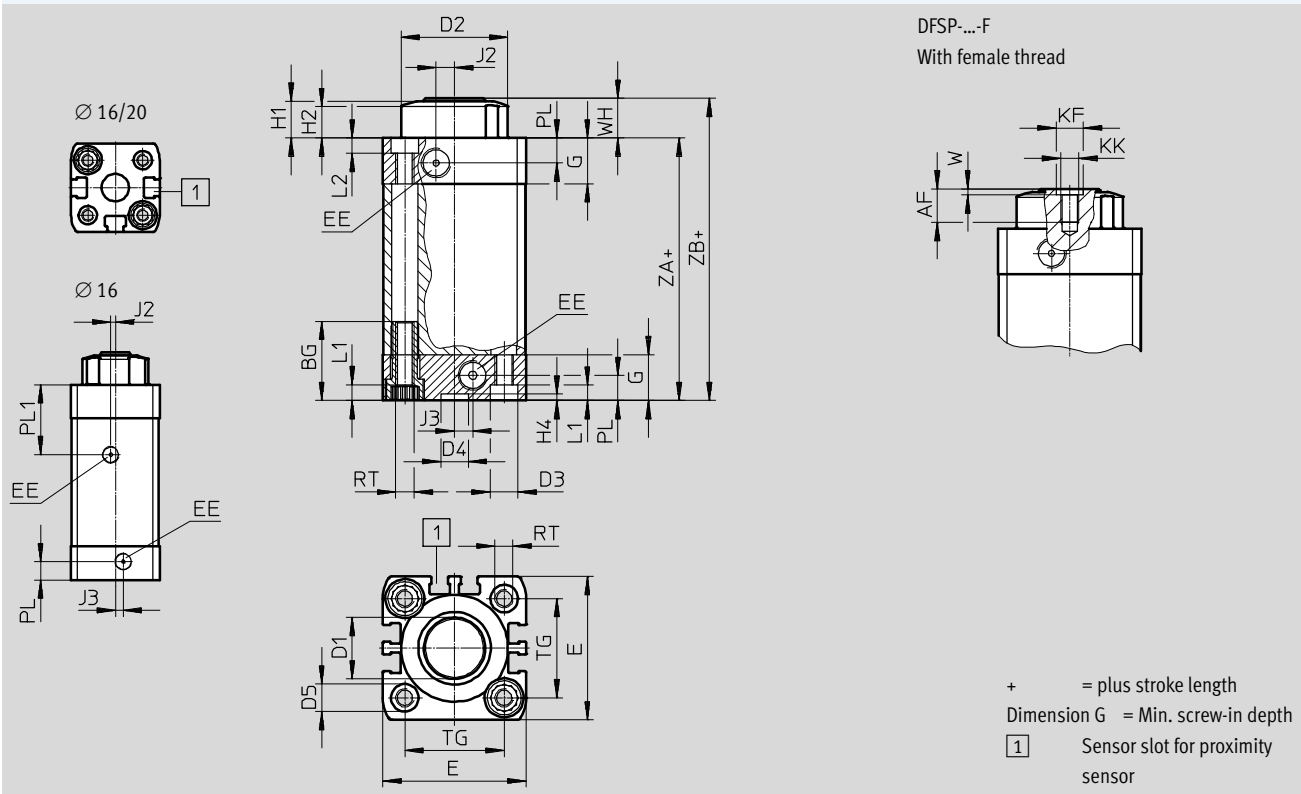
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

DFSP-... – with trunnion



Ø	AF	BG	D1	D2	D3	D4	D5	E	EE	G	H1	H2	H4	J2
[mm]	min.	min.	Ø	Ø f8	Ø F9	Ø H9	Ø F9	+0.3			±0.3	±0.3	+0.1	
16	6	17	10	21.5	6	9	6	29	M5	11	9.5	8.4	2.1	1.5
20	6	19.5	12	25	9	9	7.5	35.5	M5	12	9.5	8.4	2.1	4
32	11	26	20	35	9	9	9	47	G1/8	15	12	10.5	2.1	6
40	14.5	26	25	43	9	9	9	54.5	G1/8	15	12.5	10.5	2.1	8
50	14.5	27	32	51	12	12	10.5	65.5	G1/8	15	14.5	12.5	2.6	10

Ø	J3	KF	KK	L1	L2	PL	PL1	RT	TG	W	WH	ZA	ZB
[mm]		Ø H7		+0.2	+0.2	+0.2	±0.4		±0.2	+0.1	±0.7	±0.3	±0.7
16	2.6	5	M3	3.5	3	6	23	M4	18	1.2	10.5	49	59.5
20	2.6	5	M3	5	4	6	–	M5	22	1.2	10.5	53.5	64
32	6	9	M6	5	5	8.2	–	M6	32.5	2	13	61	74
40	8	12	M8	5	5	8.2	–	M6	38	2.5	13.5	66.5	80
50	8	12	M8	5	4.2	8.2	–	M8	46.5	2.5	15.5	65.5	81

Stopper cylinders DFSP

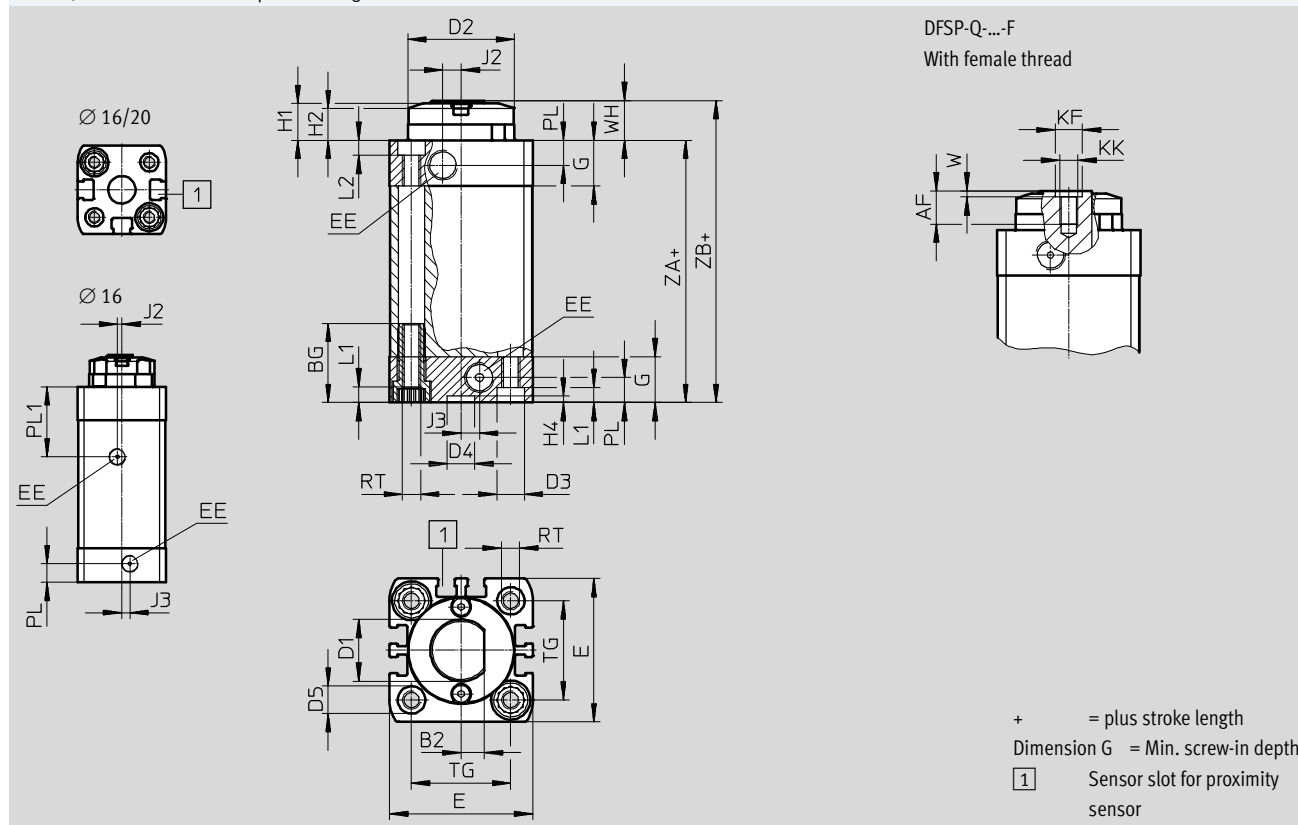
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

DFSP-Q-... – with trunnion and protection against rotation



Ø	AF	B2	BG	D1	D2	D3	D4	D5	E	EE	G	H1	H2	H4
[mm]	min.	-0.15	min.	Ø	Ø f8	Ø F9	Ø H9	Ø F9	+0.3			±0.3	±0.3	+0.1
16	6	3.5	17	10	21.5	6	9	6	29	M5	11	9.5	8.4	2.1
20	6	4	19.5	12	25	9	9	7.5	35.5	M5	12	9.5	8.4	2.1
32	11	7.5	26	20	35	9	9	9	47	G1/8	15	12	10.5	2.1
40	14.5	9.5	26	25	43	9	9	9	54.5	G1/8	15	12.5	10.5	2.1
50	14.5	12	27	32	51	12	12	10.5	65.5	G1/8	15	14.5	12.5	2.6

Ø	J2	J3	KF	KK	L1	L2	PL	PL1	RT	TG	W	WH	ZA	ZB
[mm]			Ø H7		+0.2	+0.2	+0.2	±0.4		±0.2	+0.1	±0.7	±0.3	±0.7
16	1.5	2.6	5	M3	3.5	3	6	23	M4	18	1.2	10.5	49	59.5
20	4	2.6	5	M3	5	4	6	–	M5	22	1.2	10.5	53.5	64
32	6	6	9	M6	5	5	8.2	–	M6	32.5	2	13	61	74
40	8	8	12	M8	5	5	8.2	–	M6	38	2.5	13.5	66.5	80
50	10	8	12	M8	5	4.2	8.2	–	M8	46.5	2.5	15.5	65.5	81

Stopper cylinders DFSP

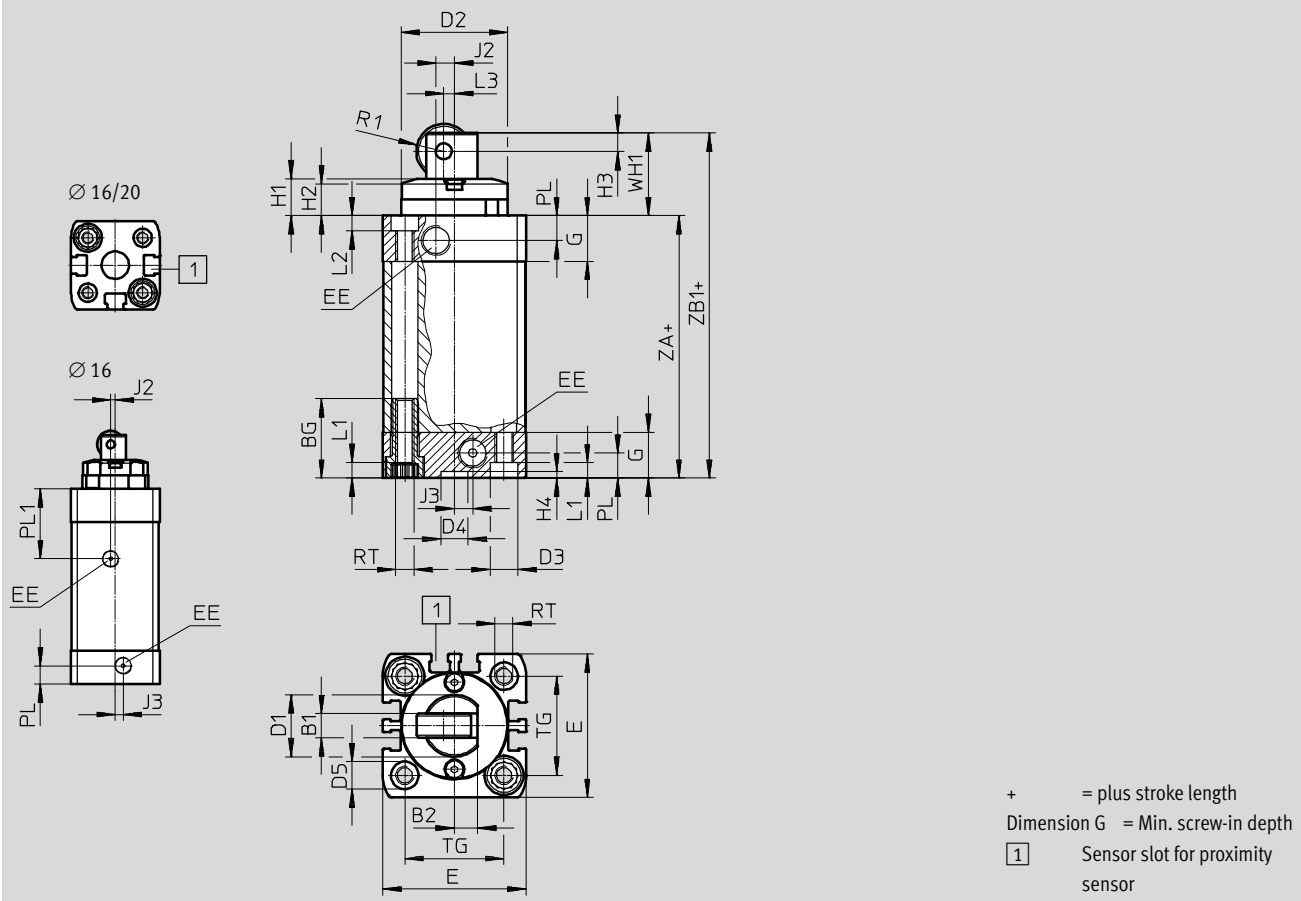
Technical data

FESTO

Dimensions

Download CAD data → www.festo.com

DFSP-Q-...-R – with roller and protection against rotation



Ø	B1	B2	BG	D1	D2	D3	D4	D5	E	EE	G	H1	H2	H3
[mm]	-0.2	-0.15	min.	Ø	Ø f8	Ø F9	Ø H9	Ø F9	+0.3			±0.3	±0.3	
16	3.5	3.5	17	10	21.5	6	9	6	29	M5	11	9.5	8.4	3
20	4	4	19.5	12	25	9	9	7.5	35.5	M5	12	9.5	8.4	3
32	8	7.5	26	20	35	9	9	9	47	G1/8	15	12	10.5	6
40	8	9.5	26	25	43	9	9	9	54.5	G1/8	15	12.5	10.5	7
50	10	12	27	32	51	12	12	10.5	65.5	G1/8	15	14.5	12.5	7.5

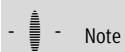
Ø	H4	J2	J3	L1	L2	L3	PL	PL1	R1	RT	TG	WH1	ZA	ZB1
[mm]	+0.1			+0.2	+0.2		+0.2	±0.4			±0.2	±0.7	±0.3	±0.7
16	2.1	1.5	2.6	3.5	3	1.5	6	23	4.5	M4	18	17.5	49	66.5
20	2.1	4	2.6	5	4	2	6	–	5	M5	22	17.5	53.5	71
32	2.1	6	6	5	5	3.5	8.2	–	9	M6	32.5	27	61	88
40	2.1	8	8	5	5	5	8.2	–	11	M6	38	30.5	66.5	97
50	2.6	10	8	5	4.2	7	8.2	–	12.5	M8	46.5	34.5	65.5	100

Stopper cylinders DFSP

Technical data

FESTO

Ordering data								
Stroke	Piston rod version			Function			Protection against rotation	Part no. Type
[mm]	With trunnion	With trunnion and female thread	With roller	Double-acting with spring, pulling	Double-acting without spring	Single-acting, pulling	With protection against rotation	
Piston Ø 16								
10	■			■				576056 DFSP-16-10-S-PA
	■				■			576058 DFSP-16-10-DS-PA
	■					■		576060 DFSP-16-10-PS-PA
		■		■				576062 DFSP-16-10-F-PA
		■			■			576064 DFSP-16-10-DF-PA
		■				■		576066 DFSP-16-10-PF-PA
		■			■		■	576068 DFSP-Q-16-10-DF-PA
			■			■	■	576070 DFSP-Q-16-10-PR-PA
15	■			■				576057 DFSP-16-15-S-PA
	■				■			576059 DFSP-16-15-DS-PA
	■					■		576061 DFSP-16-15-PS-PA
		■		■				576063 DFSP-16-15-F-PA
		■			■			576065 DFSP-16-15-DF-PA
		■				■		576067 DFSP-16-15-PF-PA
		■			■		■	576069 DFSP-Q-16-15-DF-PA
			■			■	■	576071 DFSP-Q-16-15-PR-PA
Piston Ø 20								
10	■			■				576072 DFSP-20-10-S-PA
	■				■			576075 DFSP-20-10-DS-PA
	■					■		576078 DFSP-20-10-PS-PA
		■		■				576081 DFSP-20-10-F-PA
		■			■			576084 DFSP-20-10-DF-PA
		■				■		576087 DFSP-20-10-PF-PA
		■			■		■	576090 DFSP-Q-20-10-DF-PA
			■			■	■	576093 DFSP-Q-20-10-PR-PA
15	■			■				576073 DFSP-20-15-S-PA
	■				■			576076 DFSP-20-15-DS-PA
	■					■		576079 DFSP-20-15-PS-PA
		■		■				576082 DFSP-20-15-F-PA
		■			■			576085 DFSP-20-15-DF-PA
		■				■		576088 DFSP-20-15-PF-PA
		■			■		■	576091 DFSP-Q-20-15-DF-PA
			■			■	■	576094 DFSP-Q-20-15-PR-PA
20	■			■				576074 DFSP-20-20-S-PA
	■				■			576077 DFSP-20-20-DS-PA
	■					■		576080 DFSP-20-20-PS-PA
		■		■				576083 DFSP-20-20-F-PA
		■			■			576086 DFSP-20-20-DF-PA
		■				■		576089 DFSP-20-20-PF-PA
		■			■		■	576092 DFSP-Q-20-20-DF-PA
			■			■	■	576095 DFSP-Q-20-20-PR-PA



Additional variants → page 19

Stopper cylinders DFSP

Technical data

FESTO

Ordering data								
Stroke	Piston rod version			Function			Protection against rotation	Part no. Type
[mm]	With trunnion	With trunnion and female thread	With roller	Double-acting with spring, pulling	Double-acting without spring	Single-acting, pulling	With protection against rotation	
Piston $\varnothing$ 32								
15	■			■				576096 DFSP-32-15-S-PA
	■				■			576099 DFSP-32-15-DS-PA
	■					■		576102 DFSP-32-15-PS-PA
		■		■				576105 DFSP-32-15-F-PA
		■			■			576108 DFSP-32-15-DF-PA
		■				■		576111 DFSP-32-15-PF-PA
		■			■		■	576114 DFSP-Q-32-15-DF-PA
			■			■	■	576117 DFSP-Q-32-15-PR-PA
20	■			■				576097 DFSP-32-20-S-PA
	■				■			576100 DFSP-32-20-DS-PA
	■					■		576103 DFSP-32-20-PS-PA
		■		■				576106 DFSP-32-20-F-PA
		■			■			576109 DFSP-32-20-DF-PA
		■				■		576112 DFSP-32-20-PF-PA
		■			■		■	576115 DFSP-Q-32-20-DF-PA
			■			■	■	576118 DFSP-Q-32-20-PR-PA
25	■			■				576098 DFSP-32-25-S-PA
	■				■			576101 DFSP-32-25-DS-PA
	■					■		576104 DFSP-32-25-PS-PA
		■		■				576107 DFSP-32-25-F-PA
		■			■			576110 DFSP-32-25-DF-PA
		■				■		576113 DFSP-32-25-PF-PA
		■			■		■	576116 DFSP-Q-32-25-DF-PA
			■			■	■	576119 DFSP-Q-32-25-PR-PA

-  - Note

Additional variants → page 19

Stopper cylinders DFSP

Technical data

FESTO

Ordering data								
Stroke	Piston rod version			Function			Protection against rotation	Part no. Type
[mm]	With trunnion	With trunnion and female thread	With roller	Double-acting with spring, pulling	Double-acting without spring	Single-acting, pulling	With protection against rotation	
Piston $\varnothing$ 40								
20	■			■				576120 DFSP-40-20-S-PA
	■				■			576123 DFSP-40-20-DS-PA
	■					■		576126 DFSP-40-20-PS-PA
		■		■				576129 DFSP-40-20-F-PA
		■			■			576132 DFSP-40-20-DF-PA
		■				■		576135 DFSP-40-20-PF-PA
		■			■		■	576138 DFSP-Q-40-20-DF-PA
			■			■	■	576141 DFSP-Q-40-20-PR-PA
25	■			■				576121 DFSP-40-25-S-PA
	■				■			576124 DFSP-40-25-DS-PA
	■					■		576127 DFSP-40-25-PS-PA
		■		■				576130 DFSP-40-25-F-PA
		■			■			576133 DFSP-40-25-DF-PA
		■				■		576136 DFSP-40-25-PF-PA
		■			■		■	576139 DFSP-Q-40-25-DF-PA
			■			■	■	576142 DFSP-Q-40-25-PR-PA
30	■			■				576122 DFSP-40-30-S-PA
	■				■			576125 DFSP-40-30-DS-PA
	■					■		576128 DFSP-40-30-PS-PA
		■		■				576131 DFSP-40-30-F-PA
		■			■			576134 DFSP-40-30-DF-PA
		■				■		576137 DFSP-40-30-PF-PA
		■			■		■	576140 DFSP-Q-40-30-DF-PA
			■			■	■	576143 DFSP-Q-40-30-PR-PA

-  - Note

Additional variants → page 19

Stopper cylinders DFSP

Technical data

FESTO

Ordering data								
Stroke	Piston rod version			Function			Protection against rotation	Part no. Type
[mm]	With trunnion	With trunnion and female thread	With roller	Double-acting with spring, pulling	Double-acting without spring	Single-acting, pulling	With protection against rotation	
Piston $\varnothing$ 50								
20	■			■				576144 DFSP-50-20-S-PA
	■				■			576147 DFSP-50-20-DS-PA
	■					■		576150 DFSP-50-20-PS-PA
		■		■				576153 DFSP-50-20-F-PA
		■			■			576156 DFSP-50-20-DF-PA
		■				■		576159 DFSP-50-20-PF-PA
		■			■		■	576162 DFSP-Q-50-20-DF-PA
			■			■	■	576165 DFSP-Q-50-20-PR-PA
25	■			■				576145 DFSP-50-25-S-PA
	■				■			576148 DFSP-50-25-DS-PA
	■					■		576151 DFSP-50-25-PS-PA
		■		■				576154 DFSP-50-25-F-PA
		■			■			576157 DFSP-50-25-DF-PA
		■				■		576160 DFSP-50-25-PF-PA
		■			■		■	576163 DFSP-Q-50-25-DF-PA
			■			■	■	576166 DFSP-Q-50-25-PR-PA
30	■			■				576146 DFSP-50-30-S-PA
	■				■			576149 DFSP-50-30-DS-PA
	■					■		576152 DFSP-50-30-PS-PA
		■		■				576155 DFSP-50-30-F-PA
		■			■			576158 DFSP-50-30-DF-PA
		■				■		576161 DFSP-50-30-PF-PA
		■			■		■	576164 DFSP-Q-50-30-DF-PA
			■			■	■	576167 DFSP-Q-50-30-PR-PA

-  - Note
Additional variants → page 19

Stopper cylinders DFSP

Ordering data – Modular product

FESTO

Ordering table								
Size	16	20	32	40	50	Condi- tions	Code	Entry code
[M] Module No.	575166	575167	575168	575169	575170			
Function	Stopper cylinder						DFSP	DFSP
[O] Protection against rotation	None							
	With protection against rotation						-Q	
[M] Piston Ø [mm]	16	20	32	40	50		-...	
Stroke [mm]	10, 15	10, 15, 20	15, 20, 25	20, 25, 30	20, 25, 30		-...	
	5 ... 15	5 ... 20	5 ... 25	5 ... 30	5 ... 30			
[O] Function	Double-acting with spring, pulling							
	Double-acting without spring						-D	
	Single-acting with spring, pulling						-P	
[M] Piston rod version	Standard						S	
	With female thread						F	
	With roller					[1]	R	
Cushioning	Elastic cushioning rings/plates at both ends						-P	P
Position sensing	Via proximity sensor						A	A

- [1]** R Only with 10, 15, 20, 25, 30 mm stroke
Only with protection against rotation Q

- [M]** Mandatory data
[O] Options

Transfer order code

DFSP - - - - - **P** **A**

Stopper cylinders DFSP

Accessories

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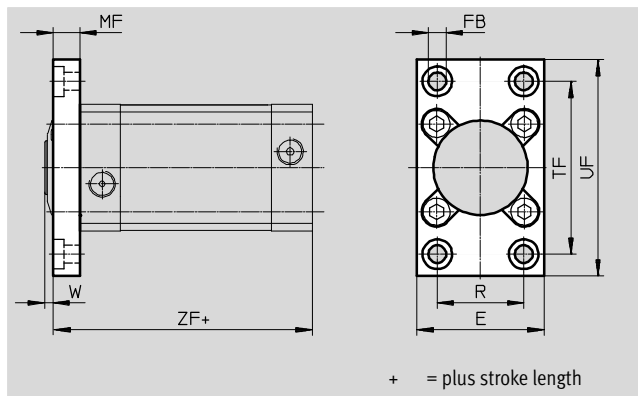
Flange mounting DAMF-F7

Materials:

Galvanised steel

Free of copper and PTFE

RoHS-compliant



Dimensions and ordering data								
For Ø	E	FB	MF	R	TF	UF	W	ZF
[mm]		Ø	±0.2	±0.1	±0.1		±0.9	±0.5
16	29	5.5	8	17	43	55	2.5	57
20	35.5	5.5	8	22	56	70	2.5	61.5
32	47	6.6	10	32	64	80	3	71
40	54.5	6.6	10	36	72	90	3.5	76.5
50	65	9	12	45	90	110	3.5	77.5

For Ø	Screws ¹⁾ (4x)	Tightening torque	Weight	Part no.	Type
[mm]		[Nm]			
16	DIN 912-M4x16-8.8	2.5	69	1405169	DAMF-F7-16
20	DIN 6912-M5x20-8.8	4.8	119	1405193	DAMF-F7-20
32	DIN 6912-M6x25-8.8	8	212	1405211	DAMF-F7-32
40	DIN 6912-M6x25-10.9	11	263	1405218	DAMF-F7-40
50	DIN 6912-M8x25-8.8	15	449	1405225	DAMF-F7-50

1) The screws are included in the scope of delivery of the flange mounting.

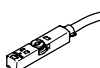
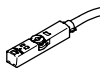
Stopper cylinders DFSP

Accessories

FESTO

Ordering data – Centring sleeves					
	For Ø	Description	Part no.	Type	PU ¹⁾
	16, 20	For the precise fitting on the piston rod with female thread	189652	ZBH-5	10
	32		150927	ZBH-9	
	40, 50		189653	ZBH-12	
	16, 20, 32, 40	For the precise fitting of the stopper cylinder to the end cap	150927	ZBH-9	
	50		189653	ZBH-12	

1) Packaging unit

Ordering data – Proximity sensor for T-slot, magneto-resistive					Technical data → Internet: smt	
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Insertable in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	2.5	574335	SMT-8M-A-PS-24V-E-2,5-OE
			Plug M8x1, 3-pin	0.3	574334	SMT-8M-A-PS-24V-E-0,3-M8D
			Plug M12x1, 3-pin	0.3	574337	SMT-8M-A-PS-24V-E-0,3-M12
		NPN	Cable, 3-wire	2.5	574338	SMT-8M-A-NS-24V-E-2,5-OE
			Plug M8x1, 3-pin	0.3	574339	SMT-8M-A-NS-24V-E-0,3-M8D
N/C contact						
	Insertable in the slot from above, flush with the cylinder profile, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7,5-OE

Ordering data – Proximity sensors for T-slot, magnetic reed					Technical data → Internet: sme	
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Insertable in the slot from above, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	543 862	SME-8M-DS-24V-K-2,5-OE
				5.0	543 863	SME-8M-DS-24V-K-5,0-OE
			Cable, 2-wire	2.5	543 872	SME-8M-ZS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543 861	SME-8M-DS-24V-K-0,3-M8D
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150 855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150 857	SME-8-S-LED-24
N/C contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160 251	SME-8-O-K-LED-24

Ordering data – Connecting cables					Technical data → Internet: nebu	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type	
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 333	NEBU-M8G3-K-2.5-LE3	
			5	541 334	NEBU-M8G3-K-5-LE3	
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541 338	NEBU-M8W3-K-2.5-LE3	
			5	541 341	NEBU-M8W3-K-5-LE3	

Ordering data – Slot cover for T-slot					Part no.	Type
	Mounting	Length [m]				
	Inserted from above	2x 0.5			151680	ABP-5-S

Stopper cylinders DFSP

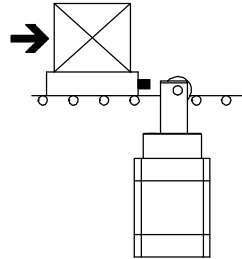
Technical data

FESTO

Selection aid

Stopping a pallet

The stopper cylinder is used to brake an individual pallet.



Example

Given:

Friction factor $\mu = 0.1$

Conveyor speed $v = 15 \text{ m/min}$

Pallet with workpiece $m = 40 \text{ kg}$

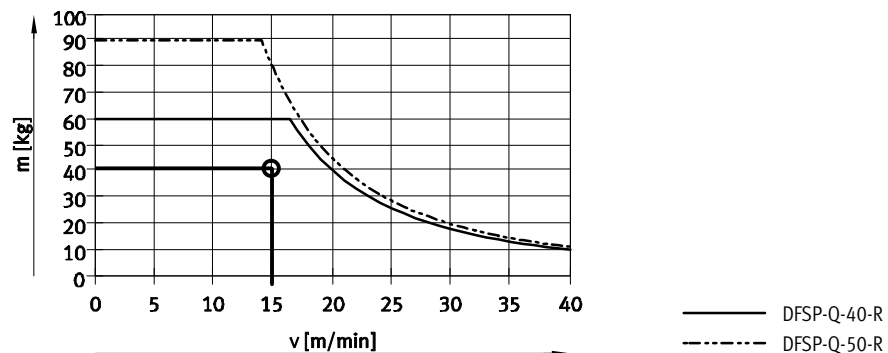
Operating pressure $p = 6 \text{ bar}$

Spring travel of the pallet buffer $s_F = 1 \text{ mm}$

Selection: stopper cylinders DFSP-Q-40-...-R

1. Checking the permissible load

The maximum permissible load at a conveyor speed of 15 m/min is 60 kg . This means that the total permissible load for the pallet and the workpiece is 40 kg .



2. Checking the permissible lateral force during the switching operation

Lateral force $F_Q = \text{frictional force}$

F_{Friction}

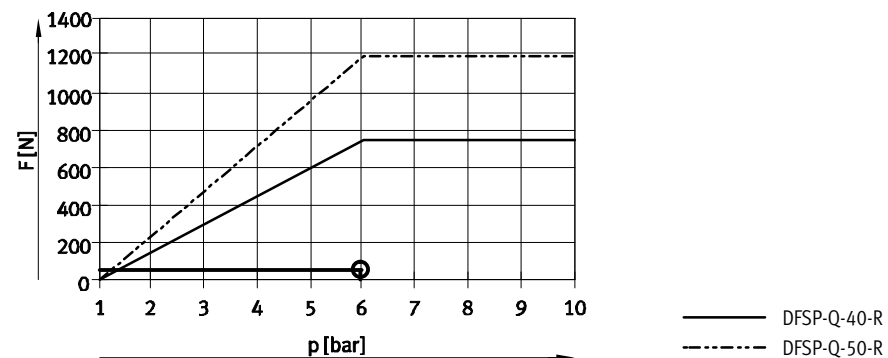
$F_{\text{Friction}} = \mu \times m \times g$

$= 0.1 \times 40 \text{ kg} \times 9.81 \text{ m/s}^2$

$= \text{approx. } 40 \text{ N}$

The maximum permissible lateral force at an operating pressure of 6 bar is 750 N .

This means that a lateral force of 40 N is permissible.



Stopper cylinders DFSP

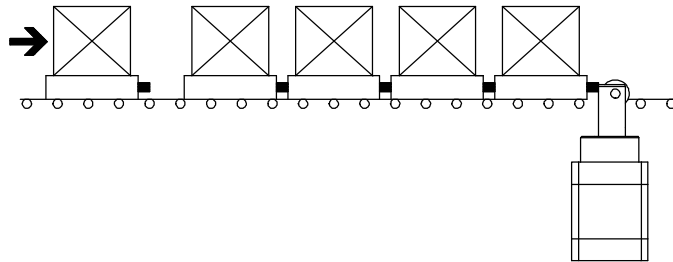
Technical data

FESTO

Selection aid

Stopping or separating several pallets

The stopper cylinder is used to separate pallets. Further pallets accumulate behind the pallets already resting against the stopper cylinder. It is therefore vital that a buffer is mounted between the pallets (e.g. elastomer elements).



Example

Given:

Friction factor $\mu = 0.1$

Conveyor speed $v = 15 \text{ m/min}$

Pallet with workpiece $m = 40 \text{ kg}$

Operating pressure $p = 6 \text{ bar}$

Maximum number of pallets accumulating simultaneously $n_{\text{Group}} = 1$

Maximum number of all queued pallets $n_{\text{Queue}} = 5$

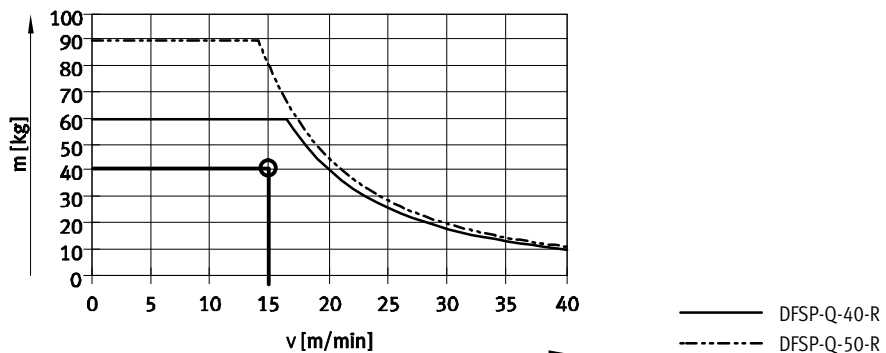
Maximum number of all advancing pallets $n_{\text{Queue-1}} = 4$

Spring travel of the pallet buffer $s_F = 1 \text{ mm}$

Selection: stopper cylinders DFSP-Q-40-...-R

1. Checking the permissible load of the first pallet

The maximum permissible load at a conveyor speed of 15 m/min is 60 kg. This means that a total load of 40 kg for the pallet and the workpiece is permissible.



2a. Calculation of the maximum permissible impact force when pallets accumulate behind a pallet resting against the stopper cylinder

For DFSP-Q-40-...-R, the maximum permissible impact force is 4,500 N. This means that with a total force of 2,700 N, the number of pallets is permissible.

Impact force calculation:

$$F_{\text{Impact}} = \frac{(n_{\text{Group}} \times m) \times v^2}{s_F} = \frac{(1 \times 40 \text{ kg}) \times (15 \text{ m}/60 \text{ s})^2}{0,001 \text{ m}} = \text{ca. } 2500 \text{ N}$$

Frictional force:

$$F_{\text{Friction}} = \mu \times (n_{\text{Queue}} \times m) \times g = 0,1 \times (5 \times 40 \text{ kg}) \times 9,81 \text{ m/s}^2 = \text{ca. } 200 \text{ N}$$

Max. total force:

$$F_{\text{total}} = F_{\text{Impact}} + F_{\text{Friction}} = 2500 \text{ N} + 200 \text{ N} = 2700 \text{ N}$$

Stopper cylinders DFSP

Technical data

FESTO

Selection aid

2b. Checking the permissible lateral force during the switching operation

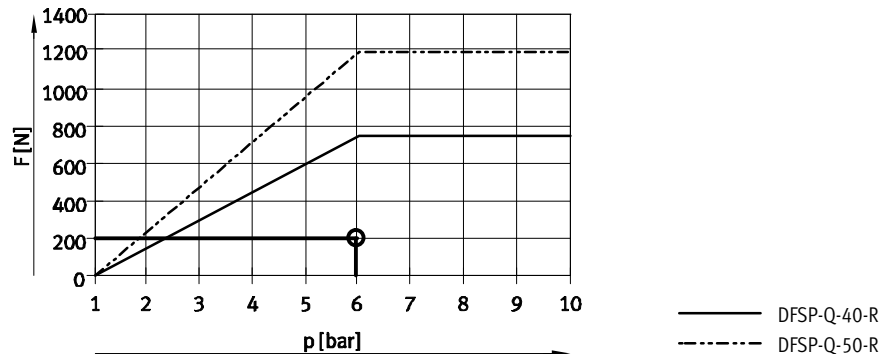
Lateral force F_Q = frictional force

F_{Friction}

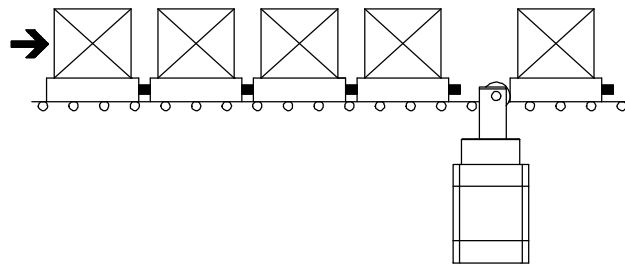
$F_{\text{Friction}} = 200 \text{ N}$

The maximum permissible lateral force at an operating pressure of 6 bar is 750 N.

This means that a lateral force of 200 N is permissible.

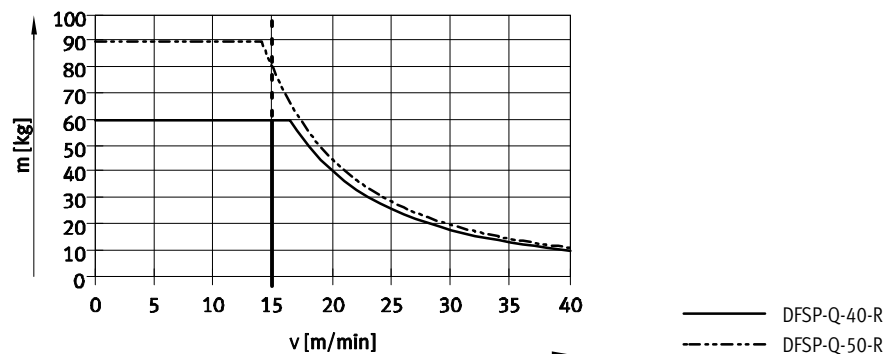


3. Separating and advancing the pallets



For the DFSP-Q-40-...-R, the maximum permissible load at a conveyor speed of 15 m/min is 60 kg.

The total load of the 4 pallets advancing on the stopper cylinder is 160 kg. The next largest stopper cylinder is therefore not permissible for this application as a max. of 80 kg at a speed of 15 m/min is permissible here.



Max. total load:

$$m_{\text{total}} = n_{\text{Queue}-1} \times m = 4 \times 40\text{kg} = 160\text{kg}$$

Result

When using stopper cylinders DFSP-Q-50-...-R, max. 2 advancing pallets may accumulate simultaneously.

Max. total load:

$$m_{\text{total}} = n_{\text{Queue}-1} \times m = 2 \times 40\text{kg} = 80\text{kg}$$