- Gentle stopping without impact vibrations or noise
- Simple activation via valve terminal
- Single-acting or double-acting

Features

Special-function drives Stopper cylinders

5.2



Brief description

- Single-acting or double-acting
- Variants
 - Trunnion
 - Roller
 - Toggle lever
- Solenoid valves mounted directly to flange plate
- Fast and simple set-up of conveyor lines
- Workpiece carriers, pallets and packages weighing up to 300 kg can be safely stopped
- Gentle stopping without impact vibrations or noise with toggle lever version
- Simple activation via valve terminal (e.g. in combination with other cylinders at an assembly station)
- Flanged solenoid valve on individual stopper cylinders permits fast actuation even over long distances
- Space saving sensing with integrated proximity sensors

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Application options and versions



Trunnion version



Roller version

by means of piston rod spring return in the event of pressure failure

Highly effective, low noise level

Toggle lever version with integrated shock absorber facilitates precise and gentle stopping of the workpiece carrier





Features



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1. Sudden braking of the workpiece carrier via the piston rod.



2. The workpiece carrier is released by activating the cylinder. The control system must hold the piston down until the workpiece carrier has passed the stopper cylinder.



3. The piston rod then advances by means of spring force or compressed air. The next workpiece carrier can then be stopped.



2.

- 1. Sudden braking of the workpiece carrier via the piston rod.
- 2. The workpiece carrier is released by activating the cylinder.



3. The piston rod then advances by means of spring force or compressed air until the roller makes contact with the workpiece carrier. The workpiece carrier continues to move forward.



Technical data → 1 / 5.2-15

 After the workpiece carrier has passed, the piston rod advances to the end position. The next workpiece carrier can then be stopped.

Features



 Gentle stopping of heavy loads via a hydraulic shock absorber in the piston rod.



 The piston is extended by means of spring force or compressed air. The toggle lever tips back which prevents the workpiece carrier from being lifted.



2.

-

5.

- The toggle lever is latched into the retracted end position so that the workpiece carrier cannot be pushed back by the shock absorber.
 - 5.



- The workpiece carrier is released by means of compressed air, and the toggle lever is released simultaneously.
- X = STAF-32: 62.8 ... 63.4 mm STAF-50: 96.5 ... 99.5 mm STAF-80: 163 ... 166 mm

Technical data → 1 / 5.2-19

5.2



Protection against rotation: The guide rod always aligns the toggle lever precisely to the approaching workpiece carrier.



Integrated shock absorber: Absorbs impact energy and stops the workpiece carrier gently, and with low noise levels.

The impact energy can be adjusted using the regulating screw in the toggle lever.



Ь Ш г

The toggle lever is raised by

the next workpiece carrier.

means of spring force and stops

Detenting roller lever: The workpiece carrier cannot be pushed back by the shock absorber.



Locking mechanism for disabling the stopper function: The workpiece carrier is able to pass the holding point without activating the cylinder.

· 闄 - Note

Trunnion or roller type stopper cylinders can be mounted in any position.

Stopper cylinders with toggle lever must be mounted in the vertical, upright position.

Features

Mounting options for solenoid valves and valve functions

An MEH, MEBH, MOEH or MOEBH solenoid valve can be mounted on the stopper cylinder for quick, direct actuation of the cylinder. This type of actuation is only possible for stopper cylinders with flange mounting. The valve must be mounted on the flange

plate via a ZVA valve sub-base. The position of the piston rod when the solenoid valve is in the normal position depends upon the valve type and the position of the valve on the cylinder.

Application	Piston rod initial position	Required solenoid valve	Type of mounting for the solenoid valve with sub-base ZVA
	Single-acting		·
		Normally extended 173 125 MEH-3/2-5,0-B 172 999 MEBH-3/2-5,0-B	
		Normally retracted 173 429 MOEH-3/2-5,0-B 173 002 MOEBH-3/2-5,0-B	
	B2 ↓ ↓3 Double-acting	Normally extended 173 128 MEH-5/2-5,0-B 173 005 MEBH-5/2-5,0-B	
		Normally retracted 173 128 MEH-5/2-5,0-B	A A
		173 128 MEH-5/2-5,0-B 173 005 MEBH-5/2-5,0-B	

- Note

Cylinders are always supplied singleacting with spring. If a double-acting stopper cylinder is required, the filter nipple in the exhaust port must be removed. The exhaust port is then used as a supply port. Solenoid valves MEH, MEBH → Volume 2

Selection aid			
Complete the following three steps for quick and accurate selection of a suitable stopper cylinder:	 If gentle cushioning is required in your application in order to avoid vibration and shifting of the workpiece, and to reduce noise, use a stopper cylinder with toggle lever (graph 2). 	 Check to see whether or not the stopper cylinder covers the desired working range (see graph 1 and selection example). 	3. Check to see whether or not the installation dimensions for the selected cylinder fulfil your requirements.
Example			
A workpiece carrier and workpiece with a total weight of 200 kg moving at a speed of 17.5 m/min is to be stopped gently. The intersection of the horizontal and the vertical lines in graph 2 (impact load and impact	velocity respectively) is within the working range of the stopper cylinder (with toggle lever) STAF-80-40-P-A-K, i.e. this stopper cylinder fulfils the requirement and can be utilised. The maximum permissible kinetic	impact energy on the piston rod of stopper cylinders must not be exceeded. Mechanical failure of the cylinder may otherwise result. The values in the graph presuppose the use of a flexible buffer on the	workpiece carrier with a deformation capacity of 1 mm for trunnion and roller type stopper cylinders.

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Toggle lever version¹⁾

Graph 2:



1) Energy values apply at room temperature T = 20 $^{\circ}$ C

--Note Cushioning time is increased for partial loads

Stopper cylinders STA/STAF Product range overview

Function	Design	esign Type Piston Ø S		Stroke	Type of mounti Direct	ng With flange	Cushioning	Position sensing	→ Page
			[mm]	[mm]			Р	A	
Single	Basic version								
or doubl e-	A	Trunnion version	20	15	•	-	-	-	1 / 5.2-11
acting			32	20			-	-	
			50	30	•		•	-	
	(A)	Roller version	20	15		-			1 / 5.2-15
			32	20			-	-	
	FITE		50	30					
			80	30,40	-				
	A	Toggle lever version	32	20	-		-	-	1/5.2-19
		Version	50	30	_				
			80	40	-	-		-	

5.2

Special-function drives Stopper cylinders

Stopper cylinders STA/STAF Peripherals overview



Acce	Accessories								
		Brief description	→ Page						
1	Plug socket with cable KMEB	-	Volume 2						
2	3/2-way valve MEBH	For fast and direct actuation of the stopper cylinder	Volume 2						
3	Sub-base ZVA	For stopper cylinder with flange	1 / 5.2-22						
4	Proximity sensors SME/SMT-8F	Can be integrated in the cylinder profile barrel from above	1 / 5.2-24						
5	Proximity sensors SME/SMT-8	Can be integrated flush with the cylinder profile barrel	1 / 5.2-24						
6	Slot cover ABP	To protect the sensor cable and keep dirt out of the sensor slots	1 / 5.2-24						



Stopper cylinders STA/STAF, trunnion

Technical data

Function





Stroke length 15 ... 30 mm

General technical data

Pneumatic connection

Piston \varnothing

Stroke

Design

Cushioning

Position sensing

Type of mounting

Mounting position

Mode of operation

Protection against torsion

Ambient temperature¹⁾

Piston rod \varnothing

Operating pressure

Operating medium

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Note Contact with liquids must be avoided during use.

20

M5

_

15

12

10

Any

None

+5 ... +60

Non-adjustable

Via proximity sensor

Via through-holes Using female threads

STA

STAF

[mm]

[mm]

[bar]

[°C]



50	Special-function drives Stonner cylinders
G1⁄8	on dr
G1⁄8	inde inde
30	-fur
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	5.2

1) Note operating range of proximity sensors

Forces [N]							
Piston \varnothing	20	32	50				
Impact force	260	1,000	2,900				
Spring force	13 18	20 42	47 64				

32

G1⁄8

M5

20

20

Filtered compressed air, lubricated or unlubricated

Piston cylinder with spring return

Single-acting or double-acting

Impact force is the basis for the calculation of permissible impact energy. Depending upon the type of load to be stopped, it is advisable to use a flexible buffer to cushion the impact, reduce noise levels and to optimise impact energy.



→ = Direction of impact force

Stopper cylinders STA/STAF, trunnion Technical data



Stop	Stopper cylinder							
1	Piston rod	Stainless steel						
2	Flange	Die-cast aluminium						
3	Cylinder barrel	Anodised aluminium						
4	Springs	Spring steel						
5	Plug cap	Anodised aluminium						
-	Seals	Polyurethane						
-	Note on material	Free of copper, PTFE and silicone						

Stopper cylinders STA/STAF, trunnion Technical data



Ø	Stroke	D Ø	D1 Ø	D4	D5	E	F	F1	Н	H1	H2	L	L1	L2	Т	T1
[mm]	[mm]															
20	15	12	26	M5	M4	M5	8	45	53	64.5	15	36	22	37.5	4	18
32	20	20	38	M6	M5	G1⁄8	8	56.5	64.5	80.5	20	50	32	52	5	20

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Stopper cylinders STA/STAF, trunnion Technical data



Ordering data			
Piston \varnothing	Stroke	Direct mounting	Flange mounting
[mm]	[mm]	Part No. Type	Part No. Type
20	15	164 887 STA-20-15-P-A	
32	20	164 888 STA-32-20-P-A	164 890 STAF-32-20-P-A
50	30	164 889 STA-50-30-P-A	164 891 STAF-50-30-P-A

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Products 2004/2005 - Subject to change - 2004/10

Stopper cylinders STA/STAF, roller Technical data

Function



- **Ø** -Diameter 20 ... 80 mm
- Stroke length 15 ... 40 mm

٠Ť٠ www.festo.com/en/ Spare_parts_service

Note Contact with liquids must be avoided during use.



General technical data								
Piston \varnothing		20	32	50	80			
Pneumatic connection	STA	M5	G1⁄8	G1⁄8	-			
	STAF	-	M5	G1⁄8	G1⁄8			
Stroke	[mm]	15	20	30	30/40			
Piston rod \varnothing	[mm]	12	20	32	50			
Operating pressure	[bar]	10						
Operating medium		Filtered compressed air, lubri	cated or unlubricated					
Design		Piston cylinder with spring return						
Cushioning		Non-adjustable						
Position sensing		Via proximity sensor						
Type of mounting		Via through-holes						
		Using female threads						
Mounting position		Any						
Mode of operation		Single-acting or double-acting	Single-acting or double-acting					
Protection against torsion		Flat-sided piston rod	Flat-sided piston rod					
Ambient temperature ¹⁾	[°C]	+5 +60						

1) Note operating range of proximity sensors

Forces [N]					
Piston \varnothing	20	32	50	80	
Stroke	15	20	30	30	40
Impact force	170	830	2,300	14,600	13,300
Spring force	13 18	20 42	47 64	79 115	101 170

Impact force is the basis for the calculation of permissible impact energy. Depending upon the type of load to be stopped, it is advisable to use a flexible buffer to cushion the impact, reduce noise levels and to optimise impact energy.



 \rightarrow = Direction of impact force

Stopper cylinders STA/STAF, roller Technical data



5.2

Stop	Stopper cylinder							
1	Roller	Polymer						
2	Piston rod	Stainless steel						
3	Flange	Die-cast aluminium						
4	Cylinder barrel	Anodised aluminium						
5	Springs	Spring steel						
6	Plug cap	Anodised aluminium						
-	Seals	Polyurethane						
-	Note on material	Free of copper, PTFE and silicone						

Stopper cylinders STA/STAF, roller

Technical data



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Special-function drives Stopper cylinders

Stopper cylinders STA/STAF, roller Technical data



Ø	Stroke	В	B4	D Ø	D2 Ø	D3 Ø	D6	E1	F2	F3	F4	H3	H4	H5	H6
[mm]	[mm]			χ	Q	Ø									
32	20	8	4.5	20	11	6.6	M3	M5	8.5	14	7	6	38	20	16.5
50	30	10	4.5	32	15	9	M4	G1⁄8	9	17	8	6	50.5	30	18
80	30	- 18	4.5	50	18	11	M4	G1⁄8	11	17	4.5	10	63	30	22
	40							- / -					73	40	
Ø	Stroke	H9	H10	L	L2	L3	L4	L5	L6	L7	L9	L10	R1	T2	T3
[mm]	[mm]														
32	20	4	67.5	50	52	3.5	7.5	83	32	65	26	16.5	9	4	6.2
50	30	5	85	68	71	7	12	111	45	90	36	7	12.5	5	5
80	30	8	119	107	111	11	18	160	63	135	36	18.5	18	6	6
	40		129	107		11	10	100	0)	1))	50	10.5	10	5	Ŭ

Ordering data	rdering data								
Piston \varnothing	Stroke	Direct mounting	Flange mounting						
[mm]	[mm]	Part No. Type	Part No. Type						
20	15	164 883 STA-20-15-P-A-R							
32	20	164 884 STA-32-20-P-A-R	164 892 STAF-32-20-P-A-R						
50	30	164 885 STA-50-30-P-A-R	164 893 STAF-50-30-P-A-R						
80	30		164 886 STAF-80-30-P-A-R						
80	40		164 894 STAF-80-40-P-A-R						

Special-function drives Stopper cylinders

Stopper cylinders STA/STAF, toggle lever

Technical data

Function





- Stroke length 20 ... 40 mm

> www.festo.com/en/ Spare_parts_service

- Note
 Contact with liquids must be avoided during use.



General technical data							
Piston \varnothing		32	50	80			
Pneumatic connection		M5	G1⁄8	G1⁄8			
Stroke	[mm]	20	30	40			
Piston rod \varnothing	[mm]	20	32	50			
Operating pressure	[bar]	10					
Operating medium		Filtered compressed air, lubricated or unlubricated					
Design		Piston cylinder with spring return					
Cushioning		Non-adjustable					
Position sensing		Via proximity sensor					
Type of mounting		Via through-holes					
Mounting position		Vertical, upright					
Mode of operation		Single-acting or double-acting					
Protection against torsion		Guide rod					
Ambient temperature ¹⁾	[°C]	+5 +60					

1) Note operating range of proximity sensors

Forces [N]							
Piston \varnothing	32	50	80				
Impact force	480	1,200	6,400				
Spring force	20 42	47 64	101 170				

Impact force is the basis for the calculation of permissible impact energy. Depending upon the type of load to be stopped, it is advisable to use a flexible buffer to cushion the impact, reduce noise levels and to optimise impact energy.



 \rightarrow = Direction of impact force



Stopper cylinders STA/STAF, toggle lever



Stop	topper cylinder							
1	Piston rod	Stainless steel						
2	Flange	Die-cast aluminium						
3	Cylinder barrel	Anodised aluminium						
4	Springs	Spring steel						
5	Plug cap	Anodised aluminium						
-	Seals	Polyurethane						
-	Note on material	Free of copper, PTFE and silicone						

5.2

Stopper cylinders STA/STAF, toggle lever

Technical data



Ordering data	rdering data									
Piston \varnothing	Stroke	Direct mounting		Flange mounting						
[mm]	[mm]	Part No. Type		Part No. Type						
32	20			164 880 STAF-32-20-P-A-K						
50	30			164 881 STAF-50-30-P-A-K						
80	40			164 895 STAF-80-40-P-A-K						

Special-function drives Stopper cylinders

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Material:



Dimensions and ordering data

Dimension										
For \varnothing	B1	B2	В3	D1	CRC ¹⁾	Weight	Part No. Type			
[mm]						[g]				
32	56	18	20	G1⁄8	2	50	164 896 ZVA-1			
50/80	57.5	18	20	G1⁄8	2	52	164 897 ZVA-2			

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

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Special-function drives Stopper cylinders

5.2

Dimensions

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Special-function drives Stopper cylinders

5.2

Download CAD data → www.festo.com/en/engineering

Mounting dimensions for solenoid valves with sub-base ZVA on stopper cylinders -2 3-¥H ₩Þ⇒ 4 •• -3 Ξ -1 Ś -3 1 to the 4 -4 1 Solenoid can be repositioned by 180° 2 Solenoid rotated 180° (not as supplied)





- 3 Plug socket KME
- 4 Sub-base
- 5 Filter nipple with 3/2-way valves, sealing plug with 5/2-way valves

For Ø [mm]	L	L1	L2	L3	L4	L5	L6
32	55.5	88.5	18.5	51.5	59	35	72
50	65	79	28	42	73	36	71
80	48.5	95.5	11.5	58.5	98	39	68
For Ø [mm]	L7	L8	L9	H1	H2	H3	H4
32	35	72	42	74.5	33.5	48.5	59.5
50	34	73	52	77	31	31	57
80	31	76	71	79	29	53	56

Mounting

Via accessories

Ordering data - Proximity sensors for slot type 8, magneto-resistive

Switch

output

PNP

NPN

PNP

NPN

PNP

PNP

Electrical connection

Cables

3-wire

2-wire

3-wire

M8 plug

3-pin

_

Accessories

NO contact

ST F Via accessories <u>,</u>

			-	3-pin	-	0.3	175 484	SMT-8-PS-S-LED-24-B	
NC contact									
	Via accessories	PNP	3-wire	-	-	7.5	525 911	SMT-8F-PO-24V-K7,5-OE	• O ·

3-pin

_

M12 plug

Cable length Part No.

525 898

525 909

525 908

525 899

525 910

525 900

175 436

[m]

2.5

2.5

0.3

0.3

2.5

Туре

SMT-8F-PS-24V-K2,5-0E

SMT-8F-NS-24V-K2,5-OE

SMT-8F-ZS-24V-K2,5-OE

SMT-8F-PS-24V-K0,3-M8D

SMT-8F-NS-24V-K0,3-M8D

SMT-8F-PS-24V-K0,3-M12

SMT-8-PS-K-LED-24-B

Ordering da	ita – Proximity senso	ors for slot type 8, mag	gnetic reed			Technical data 🗲 1 / 10	.2-16
	Mounting	Electrical connection	1	Cable length	Part No.	Туре	
		Cables	M8 plug	[m]			
NO contact							
N	Via accessories	3-wire	-	2.5	525 895	SME-8F-DS-24V-K2,5-OE	• O ·
				5.0	525 897	SME-8F-DS-24V-K5,0-OE	·O·
		2-wire	-	2.5	525 907	SME-8F-ZS-24V-K2,5-0E	·O·
		-	3-pin	0.3	525 896	SME-8F-DS-24V-K0,3-M8D	·O·
Ń	Via accessories	3-wire	-	2.5	150 855	SME-8-K-LED-24	
		-	3-pin	0.3	150 857	SME-8-S-LED-24	
	•		•				
NC contact							
N	Via accessories	3-wire	-	7.5	525 906	SME-8F-DO-24V-K7,5-OE	۰O

Ordering data	– Plug sockets						Technical data 🗲 1 / 10.2-100	
	Mounting	Switch output		Connection	Cable length	Part No.	Туре	
		PNP	NPN		[m]			
Straight socket								
	M8 union nut		•	3-pin	2.5	159 420	SIM-M8-3GD-2,5-PU	
C. I.					5	159 421	SIM-M8-3GD-5-PU	
Angled plug so	ocket							
	M8 union nut			3-pin	2.5	159 422	SIM-M8-3WD-2,5-PU	
B		-			5	159 423	SIM-M8-3WD-5-PU	

Ordering data – Slot cover for slot type 8

ordering data	Side mig data – Side cover for side type o								
	Mounting	Length	Part No.	Туре					
		[m]							
	Insertable from	2x 0.5	151 680	ABP-5-S					
	above								

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Core Range

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Technical data → 1 / 10.2-13