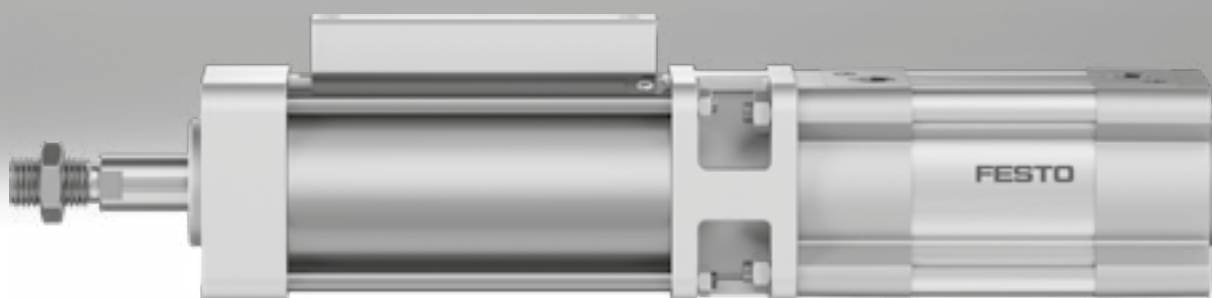


Cylinders with holding brake DFLL/G

FESTO



Characteristics

At a glance

Holding brakes are generally used to dynamically brake a movement or to prevent round rods of different lengths from starting up at any position. The double-acting cylinders with holding brake DFLL/G can brake or clamp the piston rod. During clamping, the piston rod is securely locked so that the

application of external force does not produce any relative motion. A rod can be locked at any position along the stroke, whether in the end positions or the intermediate positions. This provides protection in the event of a pressure failure and secures the piston rod

during intermediate stops for process operations.

- The clamping force is released when compressed air is supplied to the holding brake
- Static holding force up to 17000 N
- The cylinders with holding brake are based on ISO 15552 (previously

also VDMA 24562, ISO 6431, NF E49 003.1, UNI 10290)

Note

The cylinders with holding brake DFLL/G-...-S are a safety device as defined in the Machinery Directive 2006/42/EC and have been tested and certified to relevant standards. Additional information is available at www.festo.com/sp → Certificates.

The cylinders with holding brake DFLL/G-...-EX4-S are suitable for use in ATEX zones in "static holding" mode.

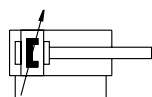
Possible safety functions:

- Holding function: retaining the piston rod by clamping with frictional locking
- Emergency braking function: stopping the movement of the piston rod by clamping with frictional locking

The safety functions are triggered by switching off the compressed air supply or by the failure of the compressed air supply.

Cushioning

[PPV] Pneumatic cushioning adjustable at both ends



- The drive is fitted with pneumatic end-position cushioning, which can be adapted by the operator for maximum performance according to the moved mass and speed.
- Very powerful

Corrosion protection

[R3] High corrosion protection



- Protects the drive against corrosion

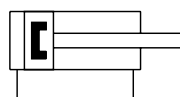
Certification

[S] Safety device

- To Machinery Directive 2006/42/EC

Position sensing

[A] Via proximity switch



- For monitoring the switching status of the holding brake

EU certification

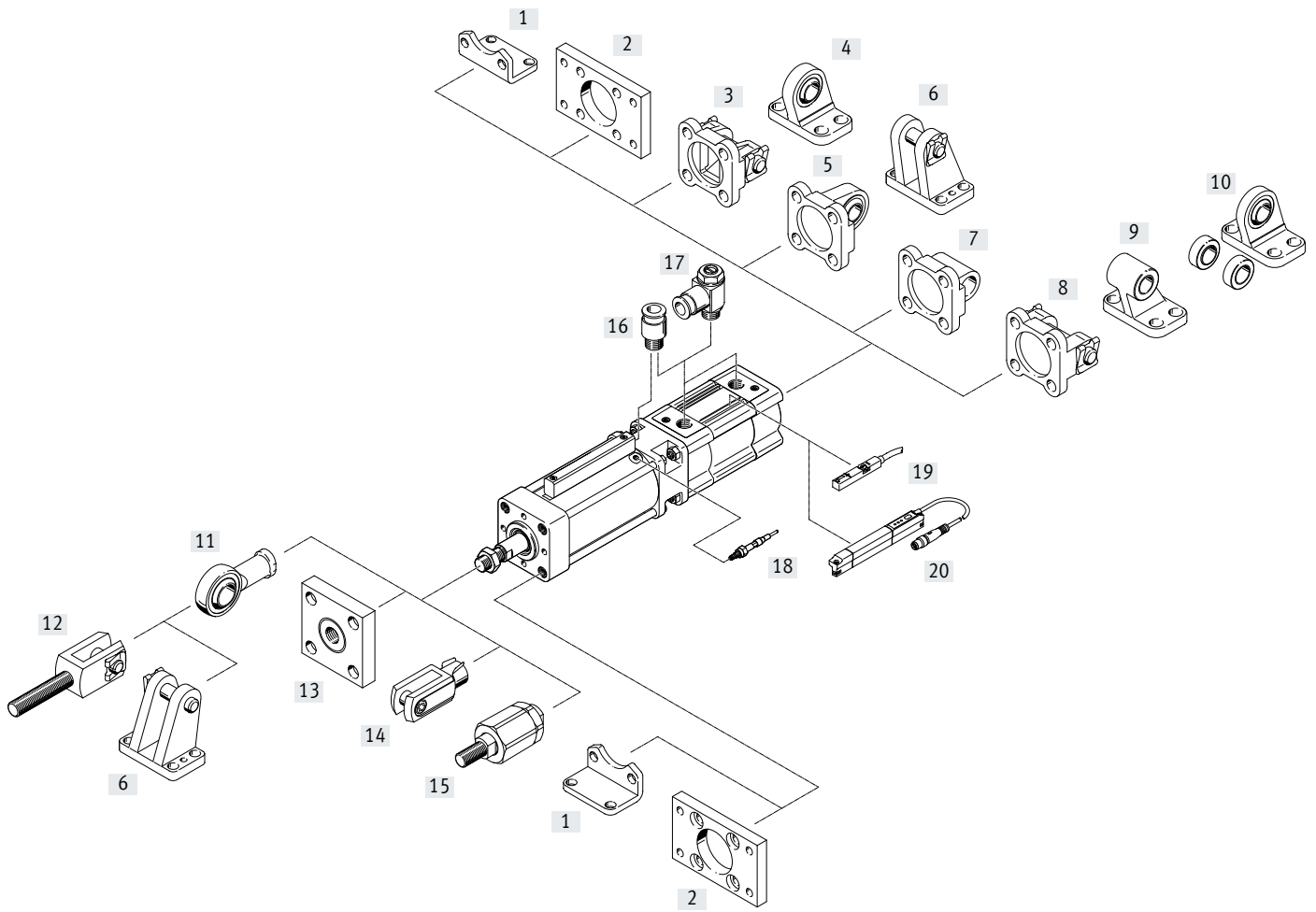
[EX4] II 2GD

- ATEX category for gas II 2G
- ATEX category for dust II 2D
- Type of ignition protection for gas Ex h IICT4 Gb
- Type of ignition protection for dust Ex h IICT120°C Db
- Explosion-proof ambient temperature $-20 \leq T_a \leq +60$

Type codes


001	Series		005	Position sensing	
DFLL	Cylinder with holding brake		A	For proximity sensor	
002	Piston diameter		006	Corrosion protection	
40	40			Standard	
63	63		R3	High corrosion protection	
100	100		007	EU certification	
003	Stroke			None	
...	10 ... 2000		EX4	II 2GD	
004	Cushioning		008	Certification	
PPV	Pneumatic cushioning, adjustable at both ends		S	Safety component to Machinery Directive 2006/42/EC	

Peripherals overview



Peripherals overview

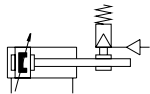
Accessories		
Type/order code	Description	→ Page/Internet
[1] Foot mounting HNC/CRHNC	For bearing or end caps	22
[2] Flange mounting FNC/CRFNG	<ul style="list-style-type: none"> For bearing or end caps Suitable for emergency stop applications/dynamic braking 	23
[3] Swivel flange SNC	For end caps	25
[4] Clevis foot LSNG	Weld-on, with spherical bearing	31
[5] Swivel flange SNCS/SNCS-...-R3	With spherical bearing for end caps	26
[6] Clevis foot LBG/LBG-...-R3	–	31
[7] Swivel flange SNCL	For end caps	27
[8] Swivel flange SNCB/SNCB-...-R3	For end caps	28
[9] Clevis foot LNG/CRLNG	–	31
[10] Clevis foot LSN	With spherical bearing	31
[11] Rod eye SGS/CRSGS	With spherical bearing	32
[12] Rod clevis SGA	With male thread	32
[13] Coupling piece KSG	For compensating radial deviations	32
[14] Rod clevis SG/CRSG	Permits a swivelling movement of the cylinder in one plane	32
[15] Self-aligning rod coupler FK, CRFK	For compensating radial and angular deviations	32
[16] Push-in fitting QS	For connecting compressed air tubing with standard O.D.	qs
[17] One-way flow control valve GRLA	For speed regulation	35
[18] Sensor kit DADG	<ul style="list-style-type: none"> Inductive sensor kit for status sensing of the clamping function Not included in scope of delivery 	33
[19] Proximity switch SMT-8M-A	<ul style="list-style-type: none"> For sensing the piston position Not included in scope of delivery 	34
Proximity switch SDBT-MS	<ul style="list-style-type: none"> For sensing the piston position Not included in scope of delivery 	34
[20] Position transmitter SDAT-MHS	<ul style="list-style-type: none"> Continuously senses the position of the piston Has an analogue output Not included in scope of delivery 	35



 **Note**

Only flange mounting FNC/CRFNG is permissible for emergency stop applications/dynamic braking.
Additional accessories for this application are available on request.

Data sheet

Function



-  - Diameter
40 ... 100 mm
-  - Stroke length
10 ... 2000 mm



General technical data			
Piston diameter	40	63	100
Design	Piston		
	Piston rod		
	Profile barrel		
Variants	Piston rod at one end		
Mode of operation	Double-acting		
Pneumatic connection			
Cylinder	G1/4	G3/8	G1/2
Holding brake	G1/8	G1/8	G3/8
Piston rod thread	M12x1.25	M16x1.5	M20x1.5
Piston rod end	Male thread		
Cushioning	Pneumatic cushioning adjustable at both ends		
Cushioning length [mm]	19	22	31
Position sensing	Via proximity switch		
Type of mounting	Via female thread		
	With accessories		
Type of clamping with active direction	At both ends		
	Clamping via spring force, released via compressed air		
Mounting position	Any		

Operating and environmental conditions			
Piston diameter	40	63	100
Cylinder			
Operating pressure [bar]	0.6 ... 8		
Holding brake			
Min. release pressure [bar]	3.8		
Max. permissible test pressure [bar]	8		
Operating medium	Compressed air to ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium	Operation with lubricated medium not possible		
Ambient temperature ¹⁾ [°C]	-20 ... +80		-10 ... +80
Corrosion resistance class CRC ²⁾			
[] Standard	1		
[R3] High corrosion protection	3		

1) Note operating range of proximity switches.

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

Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

Corrosion resistance class CRC 3 to Festo standard FN 940070

High corrosion stress. Outdoor exposure under moderate corrosive conditions. Externally visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment.

Data sheet

Safety characteristics		40	63	100
Piston diameter				
Conforms to standard	This product is based on ISO 15552 (previously also VDMA 24562, ISO 6431, NF E49 003.1, UNI 10290)			
Safety function	Holding and stopping a movement			
Performance Level (PL)	Stopping, holding, blocking a movement/category 1, Performance Level c			
Certification	German Technical Control Board (TÜV)			
Certificate issuing authority	German Technical Control Board (TÜV) CA 697			
CE marking (see declaration of conformity) ¹⁾	To EU Machinery Directive			
UKCA marking (see declaration of conformity) ¹⁾	To UK instructions for machines			

1) More information: www.festo.com/catalogue/dfc → Support/Downloads

ATEX		40	63	100
Piston diameter				
ATEX category for gas	II 2G			
Type of ignition protection for gas	Ex h IIC T4 Gb			
ATEX category for dust	II 2D			
Type of ignition protection for dust	Ex h IIIC T120°C Db			
Explosion-proof ambient temperature [°C]	-20 ≤ Ta ≤ +60			

Weight [g]		40	63	100
Piston diameter				
Basic weight with 0 mm stroke		2930	6185	19120
Additional weight per 10 mm stroke		37	62	101
Moving mass with 0 mm stroke		502	955	1940
Additional moving mass per 10 mm stroke		16	25	40

Forces [N]		40	63	100
Piston diameter				
Theoretical force at 6 bar, advancing		754	1870	4712
Theoretical force at 6 bar, retracting		633	1682	4418
Static holding force		1350	3300	8200



Note

The specified holding force refers to a static load. If this value is exceeded, slippage may occur. Dynamic forces occurring during operation must

not exceed the static holding force if slippage is to be avoided. The holding brake is backlash-free in the clamped condition when varying loads are applied to the piston rod.

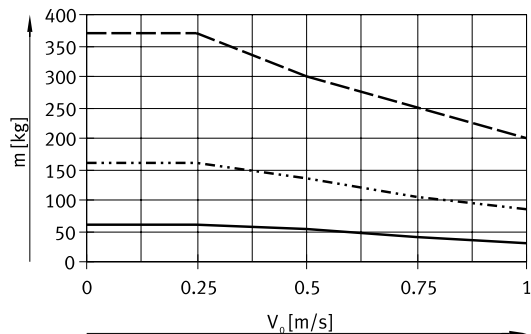
Lateral loads and bending moments on the piston rod can impair the function. (Make sure that the load on the piston rod is only in the direction of movement.)

Actuation:

The holding brake may only be released when the forces on the piston rod have reached equilibrium. Otherwise there is a risk of accidents due to the sudden movement of the piston rod. Blocking off the compressed air supply at both ends (e.g. with a 5/3-way valve) does not provide any safety.

Data sheet

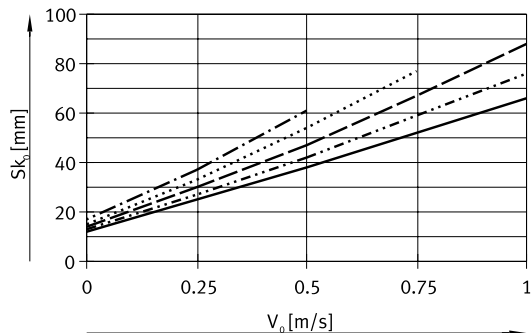
Load mass m as a function of piston speed v_0



- DFCL-100
- · - · - DFCL-63
- DFCL-40

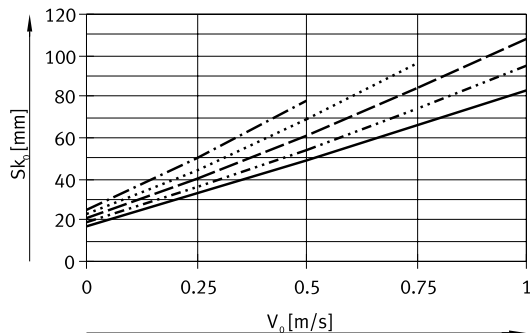
Stopping distance s_{k_0} as a function of piston speed v_0

∅ 40



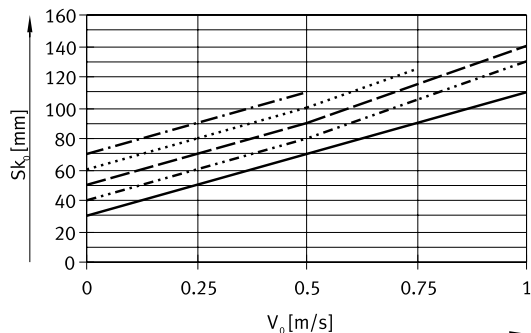
- 50 kg
- · - · - 40 kg
- 30 kg
- · - · - 20 kg
- 10 kg

∅ 63



- 125 kg
- · - · - 100 kg
- 75 kg
- · - · - 50 kg
- 25 kg

∅ 100



- 300 kg
- · - · - 250 kg
- 200 kg
- · - · - 150 kg
- 100 kg

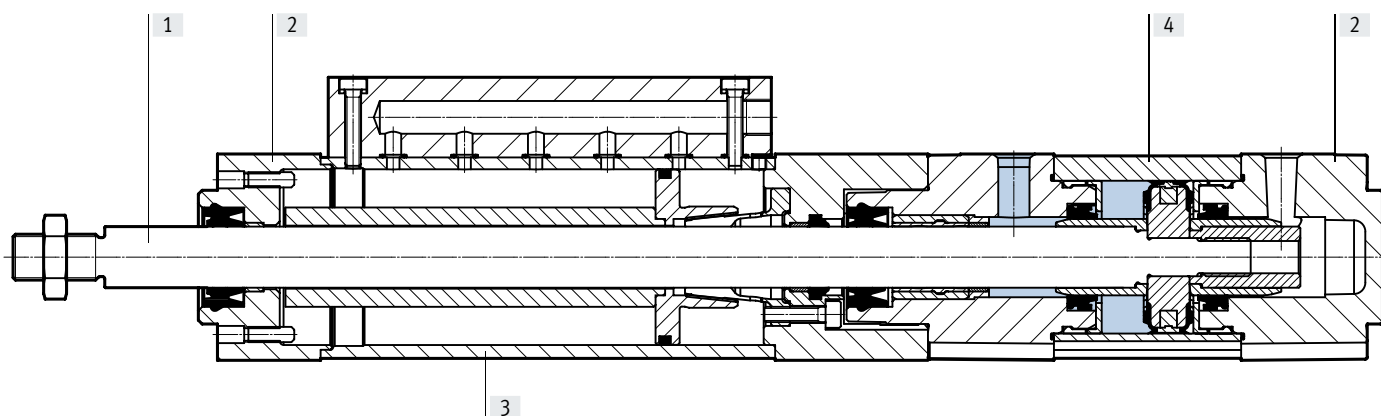
Note

All data in the graphs is intended exclusively for the purposes of preselection when configuring the emergency braking function and must be checked mathematically and in practice prior to commissioning. Additional information is available at www.festo.com/sp → User documentation.

Data sheet

Materials

Sectional view

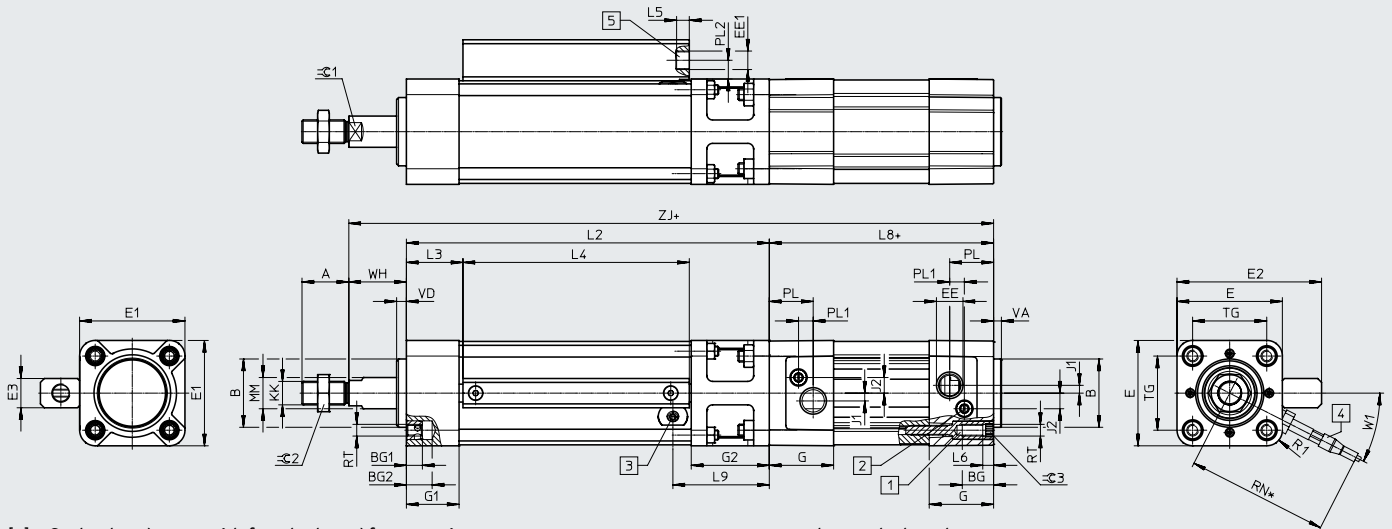


Cylinder with holding brake

[1]	Piston rod	Hard-chrome-plated steel
[2]	Cover	Die-cast aluminium
		Wrought aluminium alloy
[3]	Housing	
	DFLC-...	Steel
	DFLC-...-R3	High-alloy stainless steel
[4]	Cylinder barrel	
	DFLC-...	Smooth-anodised wrought aluminium alloy
	DFLC-...-R3	High-alloy stainless steel
-	Seals	NBR
		TPE-U(PU)
	PWIS conformity	VDMA24364-B2-L
	Note on materials	RoHS-compliant

Data sheet

Dimensions

Download CAD data → www.festo.com

- [1] Socket head screw with female thread for mounting components
- [2] Adjusting screw for adjustable end-position cushioning
- [3] Position for proximity switch (thread M6x0.75)
- [4] Sensor kit DADG-D-F8
- [5] Connection to release clamping function

+ = plus stroke length

* = installation space for sensor kit DADG-D-F8

Data sheet

∅	A	B	BG	BG1	BG2	E	E1	E2	E3	EE
[mm]	-0.5	∅ d11	min.			±0.8	+0.5	±1		
40	24	35	16	8	13.2	54	54	74.1	15	G1/4
63	32	45	16	9	14.8	78	75	98.1	15	G3/8
100	40	55	17	10	14.8	124	110	152.1	22	G1/2

∅	EE1	G	G1	G2	J1	J2	KK	L2	L3	L4
[mm]								±1		
40	G1/8	33	27	40	4	8	M12x1.25	186	29	116
63	G1/8	40.5	30	44	6.25	12.75	M16x1.5	210	38.4	122.5
100	G3/8	48	35	54	10	13.5	M20x1.5	255	47.1	148.5

∅	L5	L6	L8+	L9	MM	PL	PL1	PL2	R1	RN
[mm]			±0.4		∅					
40	6.5	5.5	105	49.4	16	22.5	7.5	9.6	R8	98
63	6.5	6	121	53.6	20	27.5	9	9.6	R10	100
100	8	-	138	65.3	25	31.5	7.5	13.6	R15	120

∅	RT	TG	VA	VD	W1	WH	Z]+	≡C1	≡C2	≡C3
[mm]		±0.3	-0.2	±0.2		+3.2/-1	+2.6/-0.4			
40	M6	38	4	5	27°	28.7	319.7	13	19	6
63	M8	56.5	4	5	20°	35.9	366.9	17	24	8
100	M10	89	4	5	20°	49.3	442.3	22	30	6

Ordering data – Modular product system

Ordering table						
Size	40	63	100	Conditions	Code	Enter code
Module no.	8073331	8073332	8073333			
Function	Cylinder with holding brake, double-acting				DFLC	DFLC
Piston diameter [mm]	40	63	100		-...	
Stroke [mm]	10 ... 2000				-...	
Cushioning	Pneumatic cushioning, adjustable at both ends				-PPV	-PPV
Position sensing	Via proximity switch				A	A
Corrosion protection	Standard					
	High corrosion protection				-R3	
EU certification	None					
	II 2GD				-EX4	
Certification	Safety device to Machinery Directive 2006/42/EC				-S	-S