# **FESTO**



## Key features

#### 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. Attaching a holding brake to a pneumatic cylinder allows the piston to be braked or clamped. During clamping, the round rod or 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 round rod or 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



#### Note

The holding brakes DACS-...-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  $\rightarrow$  Certificates.

The holding brakes DACS-...-S are suitable for use in ATEX zones in "static holding" mode.

Possible safety functions:

- · Holding function: retaining a round rod by clamping with frictional locking
- Emergency braking function: stopping the movement of a round 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.

#### Position sensing

[A] Via proximity switch

· For monitoring the switching status

#### Certification

[S] Safety device

• To Machinery Directive 2006/42/EC

#### **Corrosion protection**

[R3] High corrosion protection

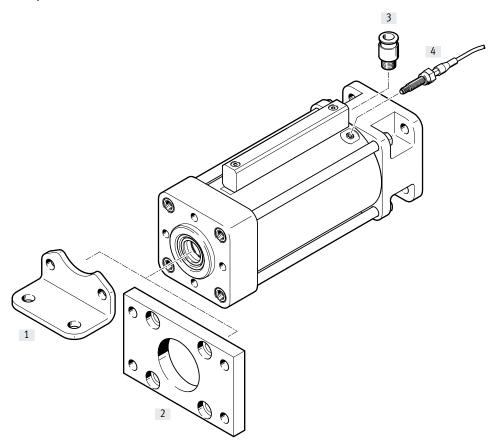
• Protects the holding brake against corrosion

## Type codes

001	Series
DACS	Holding brake
002	Piston rod diameter [mm]
16	16
20	20
25	25
40	40

003	Position sensing	
Α	For proximity sensor	
004	Corrosion protection	
	Standard	
R3	High corrosion protection	
005	Certification	
S	Safety component to Machinery Directive 2006/42/EC	

## Peripherals overview



Access	sories		
	Type/order code	Description	→ Page/Internet
[1]	Foot mounting HNG/HNC/CRHNC	For bearing cap	9
[2]	Flange mounting FNG/FNC/CRFNG	For bearing cap     Suitable for emergency stop applications/dynamic braking	10/11
[3]	Push-in fitting QS	For connecting tubing with standard outside diameters	qs
[4]	Sensor kit DADG	Inductive sensor kit for status sensing of the clamping function	12



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

## Data sheet



Diameter of the round rod to be clamped 16 ... 40 mm

- **=** - Force

1350 ... 17000 N



General technical data										
For round rod diameter	16	20	25	40						
Release connection	G1/8		G3/8							
Position sensing	Via proximity swit	Via proximity switch								
Type of mounting	Via female thread									
	With accessories									
Type of clamping with active direction	At both ends	t both ends								
	Clamping via spring force, released via compressed air									
Mounting position	Any									
Operating and environmental conditions										
For round rod diameter	16	20	25	40						

Operating and environmental cond	litions									
For round rod diameter		16	20	25	40					
Operating pressure	[bar]	3.8 8	3.8 8							
Min. release pressure	[bar]	3.8	3.8							
Max. permissible test pressure	st pressure [bar] 8									
Operating medium Compressed air to ISO 8573-1:2010 [7:4:4]										
Requirements on the round rod		•								
Tolerance		h7 f7	h7 f7							
Quality		At least HRC 60 o	At least HRC 60 or hard chromium-plated (minimum thickness 20 μm)							
		Surface roughnes	s max. 4 μm							
Lead-in chamfer		3 mm wide 15° c	3 mm wide 15° chamfer on the end of the round rod							
Ambient temperature <sup>1)</sup>	[°C]	-20 +80		-10 +80	-20 +80					
Corrosion resistance class CRC <sup>2)</sup>										
[] Standard		1	1							
[R3] High corrosion protection		3								

<sup>1)</sup> Note operating range of proximity switches.

Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind covers, 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. External visible parts with primarily functional surface requirements which are in direct contact with a normal industrial environment.

Safety data								
For round rod diameter	16	20	25	40				
Safety function	Holding and stopping a movement							
Performance Level (PL)	Stopping, holding, blocking a movement/category 1, Performance Level c							
Certification	German Technical Control Boar	d (TÜV)						
Certificate issuing authority	TÜV CA 697							
CE marking <sup>1)</sup> (see declaration of conformity)	To EU Machinery Directive							

<sup>1)</sup> For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp -> Certificates.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

<sup>2)</sup> Corrosion resistance class CRC 1 to Festo standard FN 940070

## Data sheet

Weights [g]					
For round rod diameter		16	20	25	40
Product weight	[g]	1483	3143	12832	34500
Forces [N]					
For round rod diameter		16	20	25	40
Static holding force		1350	3300	8200	17000



#### - Note

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

is to be avoided. The holding brake is backlash-free in the clamped condition when varying loads are applied to the round rod.

not exceed the static holding force if slippage Lateral loads and bending moments on the round rod can impair the function. (Make the direction of movement.)

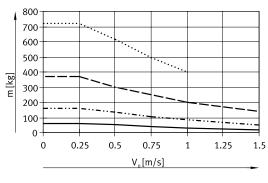
#### Actuation:

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

Materials										
For round rod diameter	16	20	25	40						
Spring	High-alloy steel	High-alloy steel								
Housing	Steel	Steel								
Clamping jaws	Tool steel	Tool steel								
Piston	Steel									
Seals	NBR									
	TPE-U(PU)									
Note on materials	RoHS-compliant									

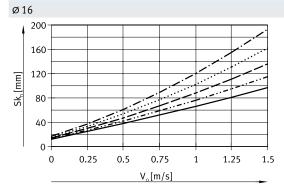
## Data sheet

#### Load mass m as a function of drive speed $v_0$

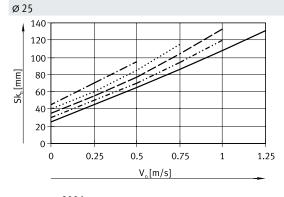


DACS-40
DACS-25
DACS-20
DACS-16

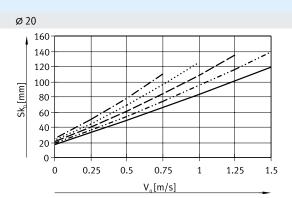
### Stopping distance $sk_0$ as a function of drive speed $v_0$



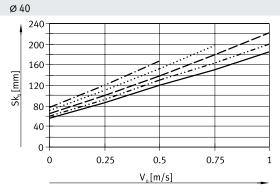












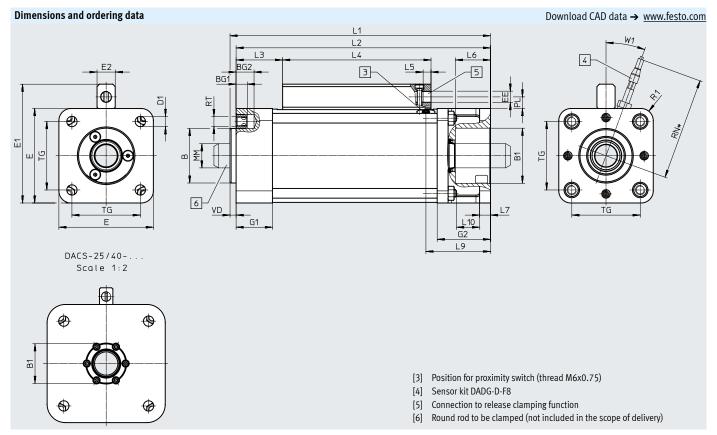




All data in the graphs is intended exclusively for the purposes of preselection when configuring the emergency braking function and must be checked mathematically and in practice prior to commissioning. Additional information is available at www.festo.com/sp 

User documentation.

## Data sheet



For round rod diameter	В	B1 <sup>1)</sup>	BG1	BG2	D1	E	E1	E2	EE	G1	G2	L1	L2	L3	L4	L5
[mm]	ø d11	ø ±0.1			Ø	±0.8	±1					±1.2	±1			
16	35	35.5	8	13.2	6.5	54	74.1	15	G1/8	27	40	191	186	29	116	6.5
10	35	35.5	8	13.2	6.5	54	74.1	15	G1/8	27	40	191	186	29	116	6.5
20	45	45.5	9	14.8	8.5	78	98.1	15	G1/8	30	44	215	210	38.4	122.5	6.5
20	45	45.5	9	14.8	8.5	78	98.1	15	G1/8	30	44	215	210	38.4	122.5	6.5
25	55	55.5	10	14.8	10.5	124	152.1	22	G3/8	35	54	260	255	47.1	148.5	8
23	55	55.5	10	14.8	10.5	124	152.1	22	G3/8	35	54	260	255	47.1	148.5	8
40	65	65.5	14	21	17	195	222.6	22	G3/8	48	80	305	298	67.2	143.5	8
40	65	65.5	14	21	17	195	222.6	22	G3/8	48	80	305	298	67.2	143.5	8

<sup>1)</sup> Not suitable as centring diameter

For round rod diameter	L6	L7	L9	L10	MM <sup>2)</sup> Ø	PL	R1	RN	RT	TG	VD	W1	Part no.	Туре
[mm]	+0.3				Q					±0.2	±0.2			
16	22	8	49.4	17+1	16	9.6	R8	98	M6	38	5	27°	8072770	DACS-16-A-S
16	22	8	49.4	17,1	16	9.6	R8	98	M6	38	5	27°	8072774	DACS-16-A-R3-S
20	29	9	53.6	18+1	20	9.6	R10	100	M 8	56.5	5	20°	8072771	DACS-20-A-S
20	29	9	53.6	18+1	20	9.6	R10	100	M 8	56.5	5	20°	8072775	DACS-20-A-R3-S
25	38.5	12	65.3	20+1.5	25	13.6	R15	120	M10	89	5	20°	8072772	DACS-25-A-S
25	38.5	12	65.3	20+1.5	25	13.6	R15	120	M10	89	5	20°	8072776	DACS-25-A-R3-S
40	61.5	16	95.5	34+1.5	40	13.6	R30	155	M16	140	7	20°	8072773	DACS-40-A-S
40	61.5	16	95.5	34+1.5	40	13.6	R30	155	M16	140	7	20°	8072777	DACS-40-A-R3-S

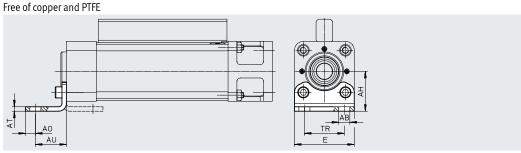
<sup>2)</sup> Round rod to be clamped: observe specifications (e.g. diameters, tolerances) in data sheet, p. 5

## Accessories

Foot mounting HNG/HNC/CRHNC Material:

HNG/HNC: galvanised steel CRHNC: high-alloy steel







#### Note

The foot mounting can also be fitted on the side of the end cap. Separate screws are required for this.

Dimensions and	Dimensions and ordering data												
For diameter	AB	AH	AO	AT	AU	E	TR						
	Ø												
[mm]													
16	10	36	9	4	28	54	36						
20	10	50	12.5	5	32	75	50						
25	14.5	71	17.5	6	41	110	75						

For diameter	Basic type				Corrosion-resistant				
	CRC <sup>1)</sup>	Weight	Part no.	Type <sup>2)</sup>	CRC <sup>1)</sup>	Weight	Part no.	Type <sup>2)</sup>	
[mm]		[g]				[g]			
16	2	193	174370	HNC-40	4	188	176938	CRHNC-40	
20	2	436	174372	HNC-63	4	424	176940	CRHNC-63	
25	2	1009	174374	HNC-100	4	990	176942	CRHNC-100	
40	2	3931	34476	HNG-160					

<sup>1)</sup> Corrosion resistance class CRC 2 to Festo standard FN 940070

Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment. 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, e.g. in the chemical or food industries. Such applications may need to be safeguarded by means of special testing (→ also FN 940082), using appropriate media.

2) Suitable for ATEX areas

## Accessories

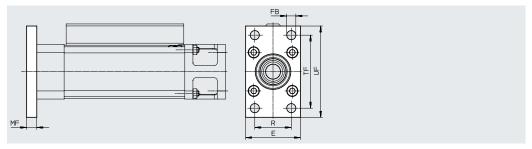
Flange mounting FNC/CRFNG

Suitable for emergency stop applications/

Material:

FNC: galvanised steel CRFNG: high-alloy steel Free of copper and PTFE RoHS-compliant





Dimensions and ordering data									
For diameter	E	FB	MF	R	TF	UF			
		Ø							
[mm]									
16	54	9	10	36	72	90			
20	75	9	12	50	100	120			
25	110	14	16	75	150	175			

For diameter	Basic type				Corrosion-resistant			
	CRC <sup>1)</sup>	Weight	Part no.	Type <sup>2)</sup>	CRC <sup>1)</sup>	Weight	Part no.	Type <sup>2)</sup>
[mm]		[g]				[g]		
16	1	291	174377	FNC-40	4	291	161847	CRFNG-40
20	1	679	174379	FNC-63	4	680	161849	CRFNG-63
20	1	0/9	117317	THE OF	1 7	1000		

<sup>1)</sup> 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 covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions). 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, e.g. in the chemical or food industries. Such applications may need to be safeguarded by means of special testing (> also FN 940082), using appropriate media.

<sup>2)</sup> Suitable for ATEX areas

## Accessories

Flange mounting FNG

Material:

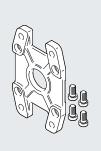
Painted spheroidal graphite cast iron

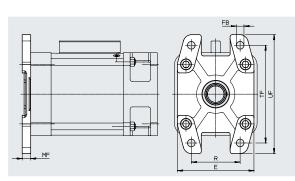
Suitable for

Free of copper and PTFE RoHS-compliant

emergency stop applications/

dynamic braking





Dimensions and ordering data										
For	E	FB	MF	R	TF	UF	CRC <sup>1)</sup>	Weight	Part no.	Type <sup>2)</sup>
diameter		Ø								
[mm]								[g]		
40	180	18	20	115	230	280	1	3550	34478	FNG-160

<sup>1)</sup> 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 covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

<sup>2)</sup> Suitable for ATEX areas

## Accessories

## Proximity switch DADG

General technical data							
For diameter	16; 20	25		40			
Size	M4						
Type of mounting	Screwed on	'					
Type of installation	Flush						
Housing material	Steel						
Cable sheath material	TPE-U(PUR)	TPE-U(PUR)					
Note on materials	Contains paint-wetting impairm	Contains paint-wetting impairment substances					
	RoHS-compliant						
Product weight [g]	26	30		32			
Conforms to standard	EN 60947-5-2						
Certification	RCM compliance mark	RCM compliance mark					
	c UL us (OL)	c UL us (OL)					
CE marking (see declaration of conformity)	To EU EMC Directive	To EU EMC Directive					
Degree of protection	IP67	IP67					

Operating and environmental condition	ons							
For diameter		16; 20	25	40				
Switching output		PNP						
Switching element function	-	N/O contact						
Electrical connection 1,		Cable						
connection type								
Electrical connection 1,		Open end						
connection technology								
Electrical connection 1,		3						
number of pins/wires								
Cable length	[m]	2						
Operating voltage range DC	[V]	10 30						
Max. switching frequency		5000 Hz						
Max. switching frequency DC		5000 Hz						
Max. output current	[mA]	100						
No-load supply current	[mA]	≤ 10						
Voltage drop	[V]	2						
Residual ripple	[%]	10						
Reverse polarity protection		For all electrical connections						
Short circuit current rating		Pulsed						
Rated operating distance	[mm]	0.6						
Assured operating distance	[mm]	0.64						
Reduction factors		Aluminium = 0.55						
		Stainless steel St 18/8 = 0.8						
		Copper = 0.5						
		Brass = 0.65						
		Steel St 37 = 1.0						
Repetition accuracy	[mm]	0.01						
Ambient temperature	[°C]	−25 +70						



Ordering data	Ordering data  Data sheets → Internet: dada						
	For diameter	Part no.	Туре				
	16; 20	8072857	DADG-D-F8-16/20				
The state of the s	25	8072858	DADG-D-F8-25				
	40	8072859	DADG-D-F8-40				