Holding brakes DACS

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 → 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

Corrosion protection

[R3] High corrosion protection

- Protects the holding brake against corrosion

Certification

[S] Safety device

- To Machinery Directive 2006/42/EC

Type codes

001	Series	
DACS	Holding brake	

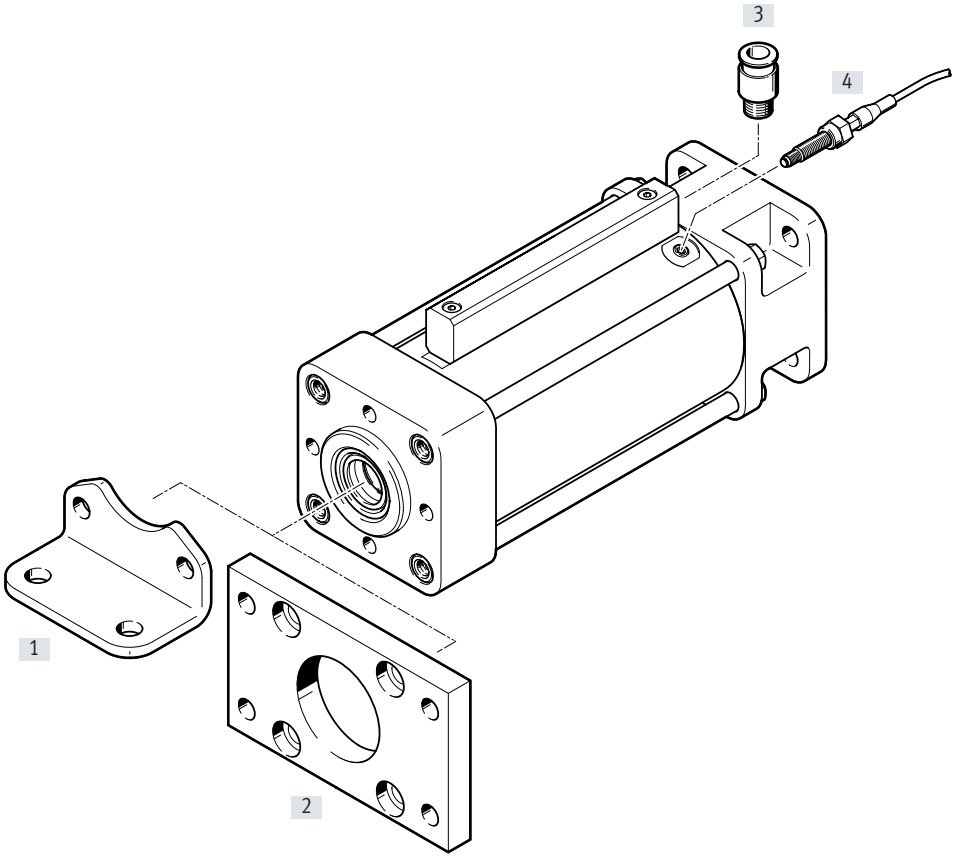
002	Piston rod diameter [mm]	
16	16	
20	20	
25	25	
40	40	

003	Position sensing	
A	For proximity sensor	

004	Corrosion protection	
	Standard	
R3	High corrosion protection	

005	Certification	
S	Safety component to Machinery Directive 2006/42/EC	

Peripherals overview



Accessories

	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

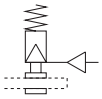
Note

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

Function



- 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 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					
For round rod diameter		16	20	25	40
Operating pressure	[bar]	3.8 ... 8			
Min. release pressure	[bar]	3.8			
Max. permissible test pressure	[bar]	8			
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]			
Requirements on the round rod					
Tolerance		h7 ... f7			
Quality		At least HRC 60 or hard chromium-plated (minimum thickness 20 µm)			
		Surface roughness max. 4 µm			
Lead-in chamfer		3 mm wide 15° chamfer on the end of the round rod			
Ambient temperature[1]	[°C]	–20 ... +80		–10 ... +80	–20 ... +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 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 Board (TÜV)			
Certificate issuing authority	TÜV CA 697			
CE marking[1] (see declaration of conformity)	To EU Machinery Directive			

1) 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.

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 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 round rod.

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

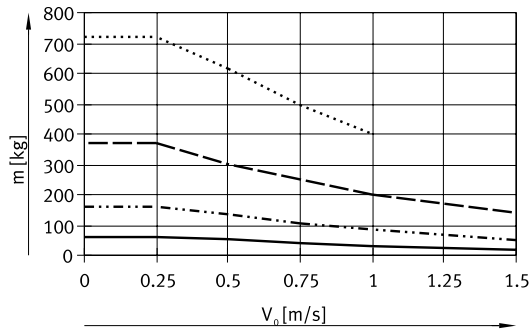
Actuation:
The holding brake may only be released when the forces on the round rod are in equilibrium. Otherwise there is a risk of accidents due to the sudden movement of the round rod. Blocking off the compressed air supply at both ends (e.g. with a 5/3-way valve) does not provide any safety.

Materials

Holding brakes	
Spring	High-alloy steel
Housing	
DACS-...	Steel
DACS-...-R3	High-alloy steel
Clamping jaws	Tool steel
Piston	Steel
Seals	NBR
	TPE-U(PU)
Note on materials	RoHS-compliant

Data sheet

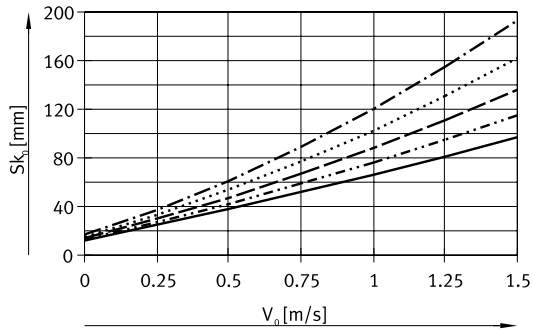
Load mass m as a function of drive speed v_0



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

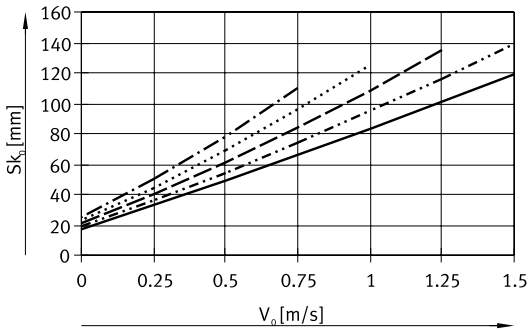
Stopping distance sk_0 as a function of drive speed v_0

Ø 16



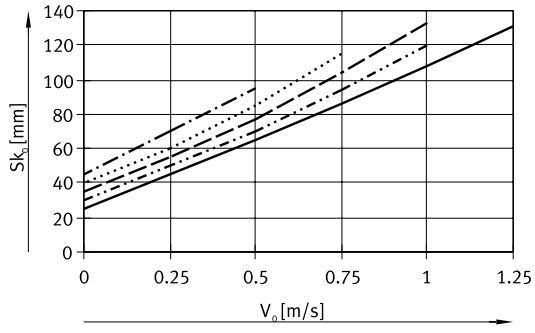
50 kg
40 kg
30 kg
20 kg
10 kg

Ø 20



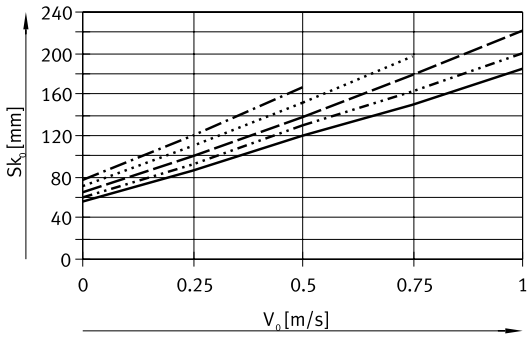
125 kg
100 kg
75 kg
50 kg
25 kg

Ø 25



300 kg
250 kg
200 kg
150 kg
100 kg

Ø 40



700 kg
600 kg
500 kg
400 kg
300 kg

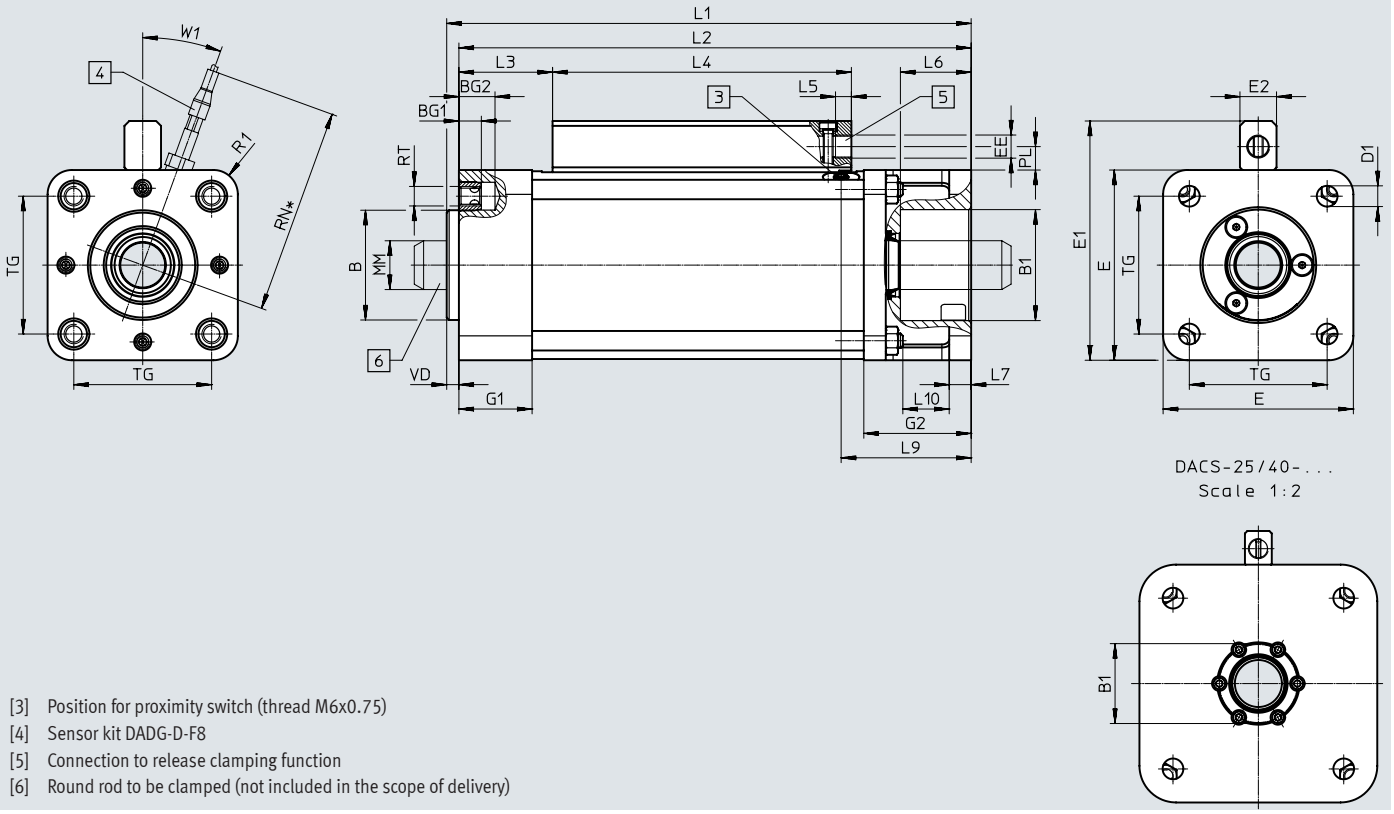
Note

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

Dimensions and ordering data

Download CAD data ➔ www.festo.com



[3] Position for proximity switch (thread M6x0.75)
[4] Sensor kit DADG-D-F8
[5] Connection to release clamping function
[6] Round rod to be clamped (not included in the scope of delivery)

For round rod diameter [mm]	B Ø d11	B1[1] Ø ±0.1	BG1	BG2	D1 Ø	E ±0.8	E1 ±1	E2	EE	G1	G2	L1 ±1.2	L2 ±1	L3	L4	L5
16	35	35.5	8	13.2	6.5	54	74.1	15	G1/8	27	40	191	186	29	116	6.5
	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
	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
	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
	65	65.5	14	21	17	195	222.6	22	G3/8	48	80	305	298	67.2	143.5	8

1) Not suitable as centring diameter

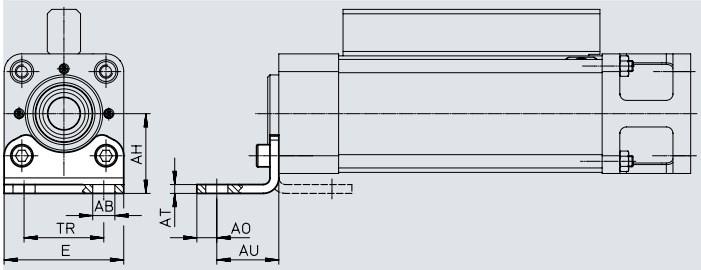
For round rod diameter [mm]	L6 +0.3	L7	L9	L10	MM[2] Ø	PL	R1	RN	RT	TG ±0.2	VD ±0.2	W1	Part no.	Type
16	22	8	49.4	17_{+1}	16	9.6	R8	98	M6	38	5	27°	**8072770**	**DACS-16-A-S**
	22	8	49.4	17_{+1}	16	9.6	R8	98	M6	38	5	27°	**8072774**	**DACS-16-A-R3-S**
20	29	9	53.6	18_{+1}	20	9.6	R10	100	M 8	56.5	5	20°	**8072771**	**DACS-20-A-S**
	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**
	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**
	61.5	16	95.5	$34_{+1.5}$	40	13.6	R30	155	M16	140	7	20°	**8072777**	**DACS-40-A-R3-S**

2) 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
Free of copper and PTFE



Note

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

Dimensions and ordering data

For diameter [mm]	AB Ø	AH	AO	AT	AU	E	TR
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
40	18.5	115	20	10	60	169	115

For diameter	Basic type				Corrosion-resistant			
[mm]	CRC[1]	Weight [g]	Part no.	Type[2]	CRC[1]	Weight [g]	Part no.	Type[2]
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**				

1) 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

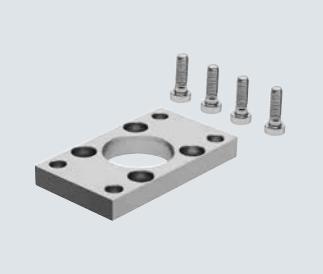
NEW

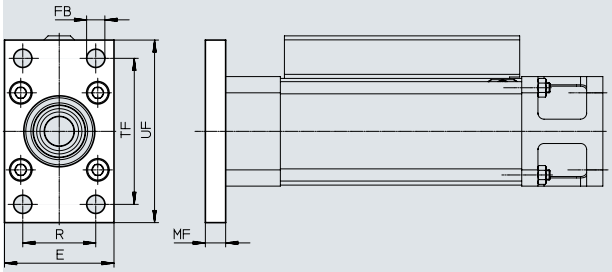
Accessories

Flange mounting
FNC/CRFNG

Suitable for
emergency stop applications/
dynamic braking

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





Dimensions and ordering data

For diameter [mm]	E	FB Ø	MF	R	TF	UF
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[1]	Weight [g]	Part no.	Type[2]	CRC[1]	Weight [g]	Part no.	Type[2]
[mm]								
16	1	291	**174377**	**FNC-40**	4	291	**161847**	**CRFNG-40**
20	1	679	**174379**	**FNC-63**	4	680	**161849**	**CRFNG-63**
25	1	2041	**174381**	**FNC-100**	4	2054	**161851**	**CRFNG-100**

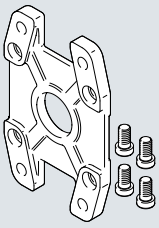
1) Corrosion resistance class CRC 1 to Festo standard FN 940070
Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
Corrosion resistance 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.
2) Suitable for ATEX areas

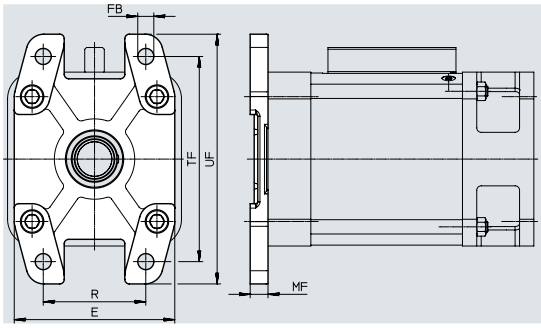
Accessories

Flange mounting FNG

Suitable for
emergency stop applications/
dynamic braking

Material:
Painted spheroidal graphite cast iron
Free of copper and PTFE
RoHS-compliant





Dimensions and ordering data

For diameter [mm]	E	FB ø	MF	R	TF	UF	CRC[1]	Weight [g]	Part no.	Type[2]
40	180	18	20	115	230	280	1	3550	**34478**	**FNG-160**

1) 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).
2) 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)		
Note on materials		Contains paint-wetting impairment substances		
		RoHS-compliant		
Product weight	[g]	26	30	32
Conforms to standard		EN 60947-5-2		
Certification		RCM compliance mark		
		c UL us (OL)		
CE marking (see declaration of conformity)		To EU EMC Directive		
Degree of protection		IP67		

Operating and environmental conditions

For diameter		16; 20	25	40
Switching output		PNP		
Switching element function		N/O contact		
Electrical connection 1, connection type		Cable		
Electrical connection 1, connection technology		Open end		
Electrical connection 1, number of pins/wires		3		
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

Data sheets → Internet: dadg

	For diameter	Part no.	Type
	16; 20	**8072857**	**DADG-D-F8-16/20**
	25	**8072858**	**DADG-D-F8-25**
	40	**8072859**	**DADG-D-F8-40**

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