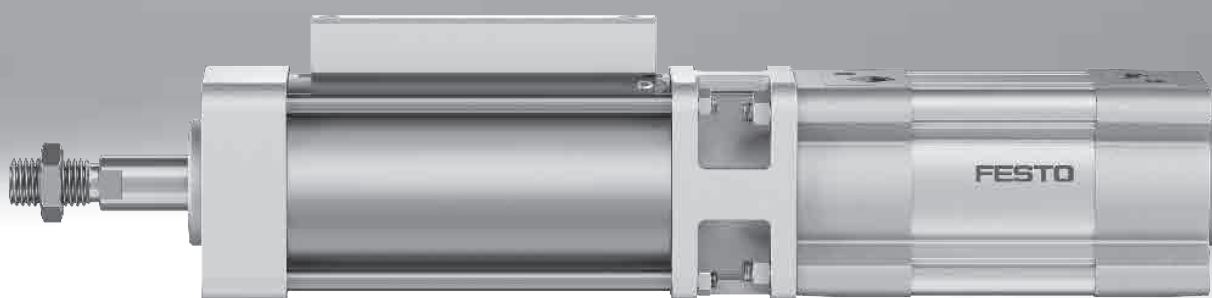


Cylinders with holding brake DFCL/G

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 DFCL/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 DFCL/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 DFCL/G-...-EX4-S are suitable for use in ATEX zones in "static holding" mode.

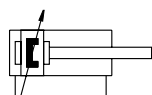
Possible safety functions:

- 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

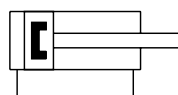
Certification

[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	
DFLC	Cylinder with holding brake	

002	Piston diameter	
40	40	
63	63	
100	100	

003	Stroke	
...	10 ... 2000	

004	Cushioning	
PPV	Pneumatic cushioning, adjustable at both ends	

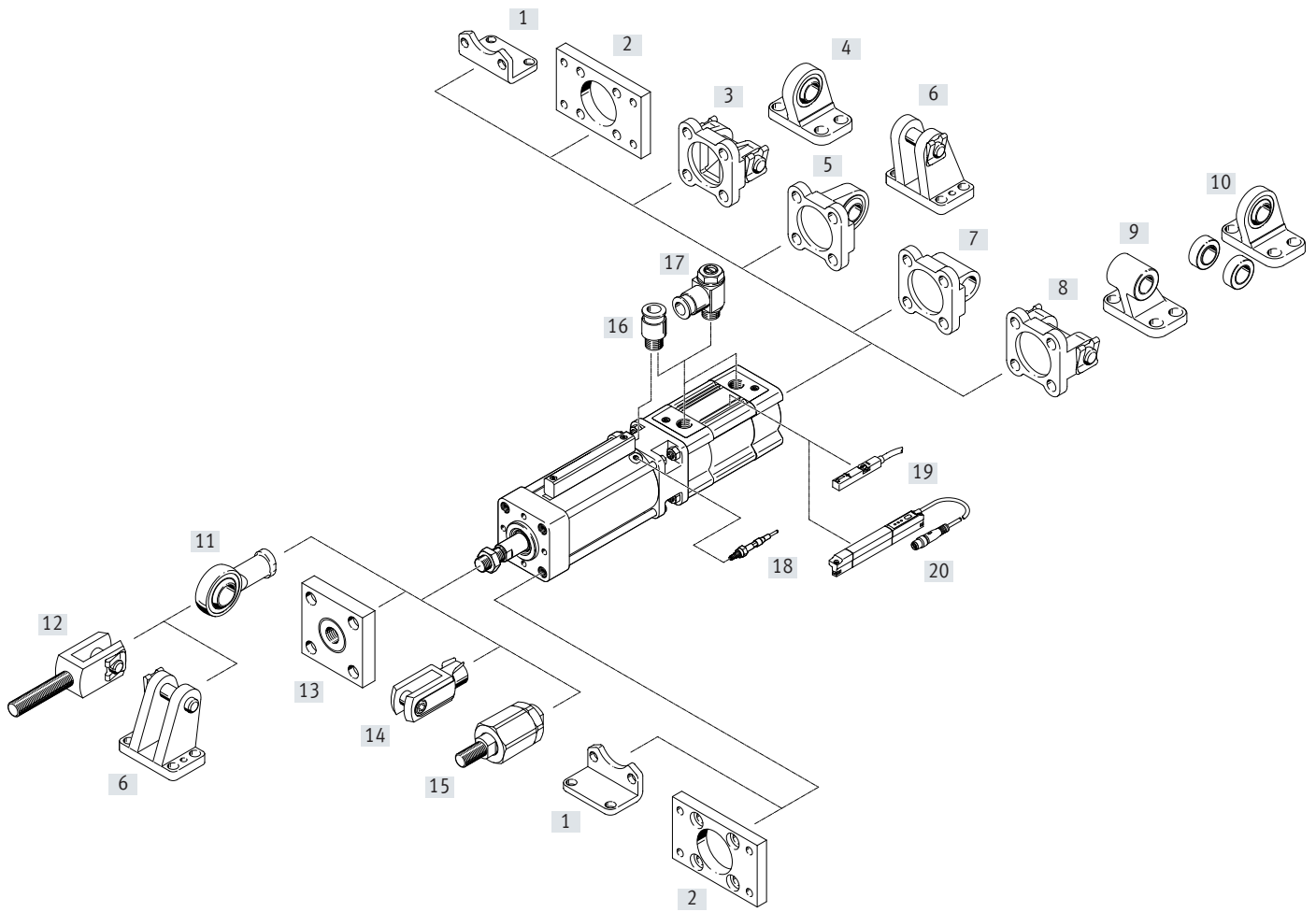
005	Position sensing	
A	For proximity sensor	

006	Corrosion protection	
	Standard	
R3	High corrosion protection	

007	EU certification	
	None	
EX4	II 2GD	

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

Peripherals overview



Peripherals overview

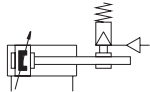
Accessories		
Type/order code	Description	→ Page/Internet
[1] Foot mounting HNC/CRHNC	For bearing or end caps	22
[2] Flange mounting FNC/CRFNG	<ul style="list-style-type: none"> For bearing or end caps Suitable for emergency stop applications/dynamic braking 	23
[3] Swivel flange SNC	For end caps	25
[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.

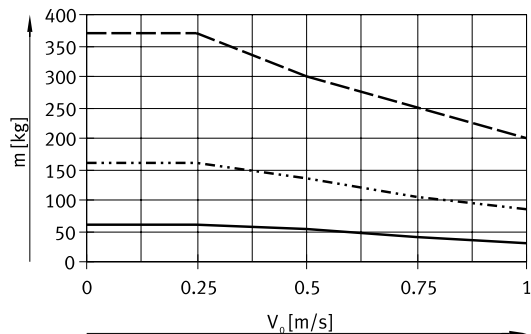
Lateral loads and bending moments on the piston rod can impair the function. (Make sure that the load on the piston rod is only in the direction of movement.)

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

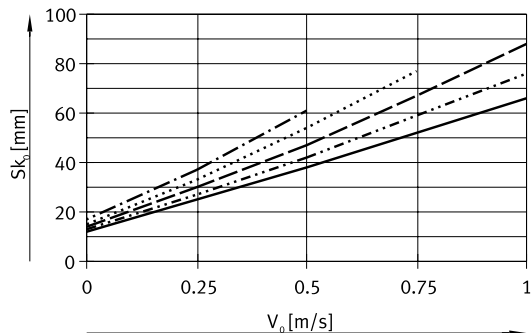
Load mass m as a function of piston speed v_0



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

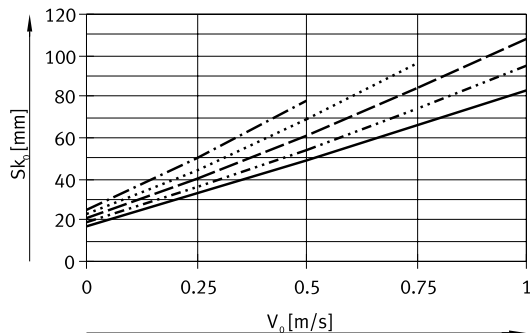
Stopping distance s_{k_0} as a function of piston speed v_0

∅ 40



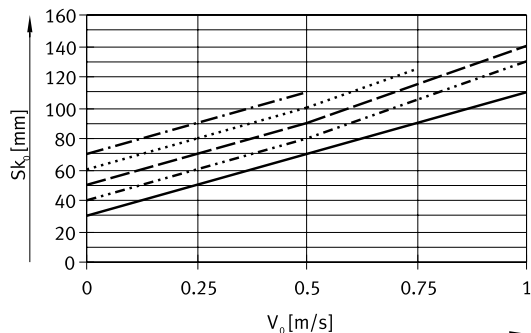
- 50 kg
- · - · - 40 kg
- 30 kg
- · - · - 20 kg
- 10 kg

∅ 63



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

∅ 100



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

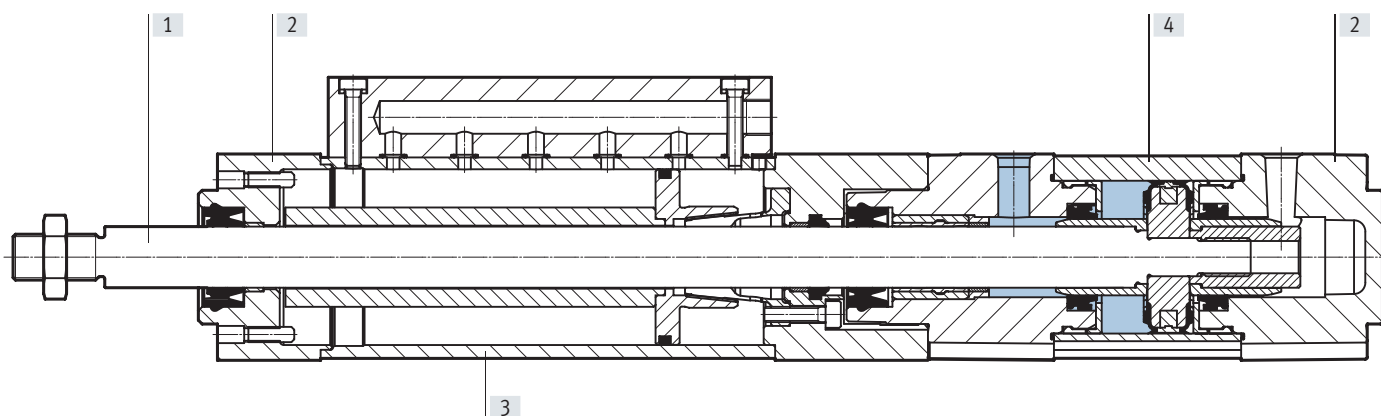
Note

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

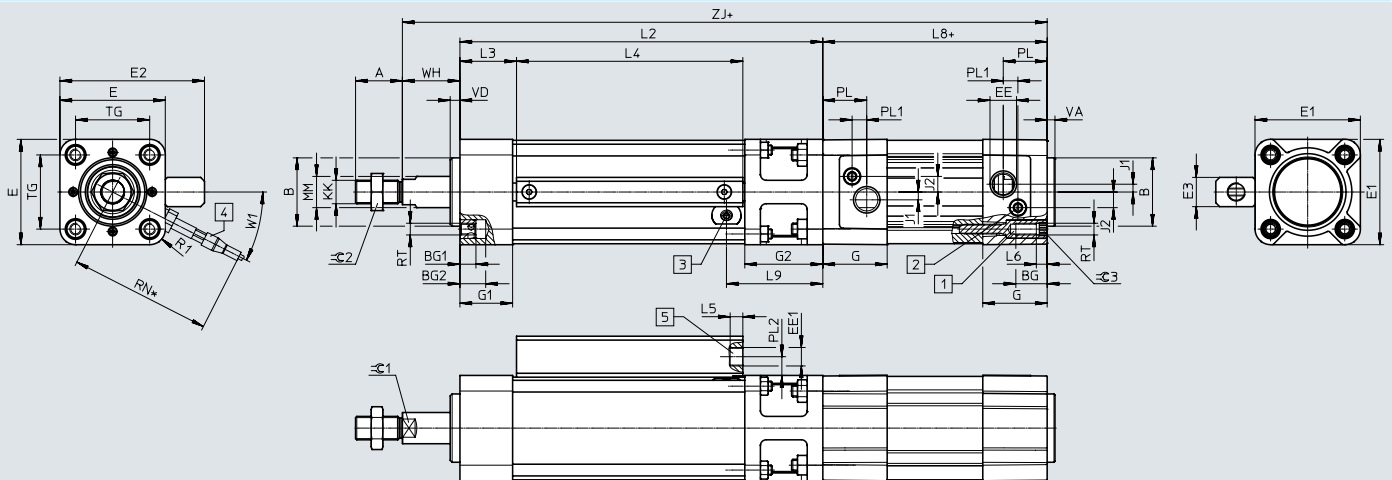


Cylinder with holding brake

[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

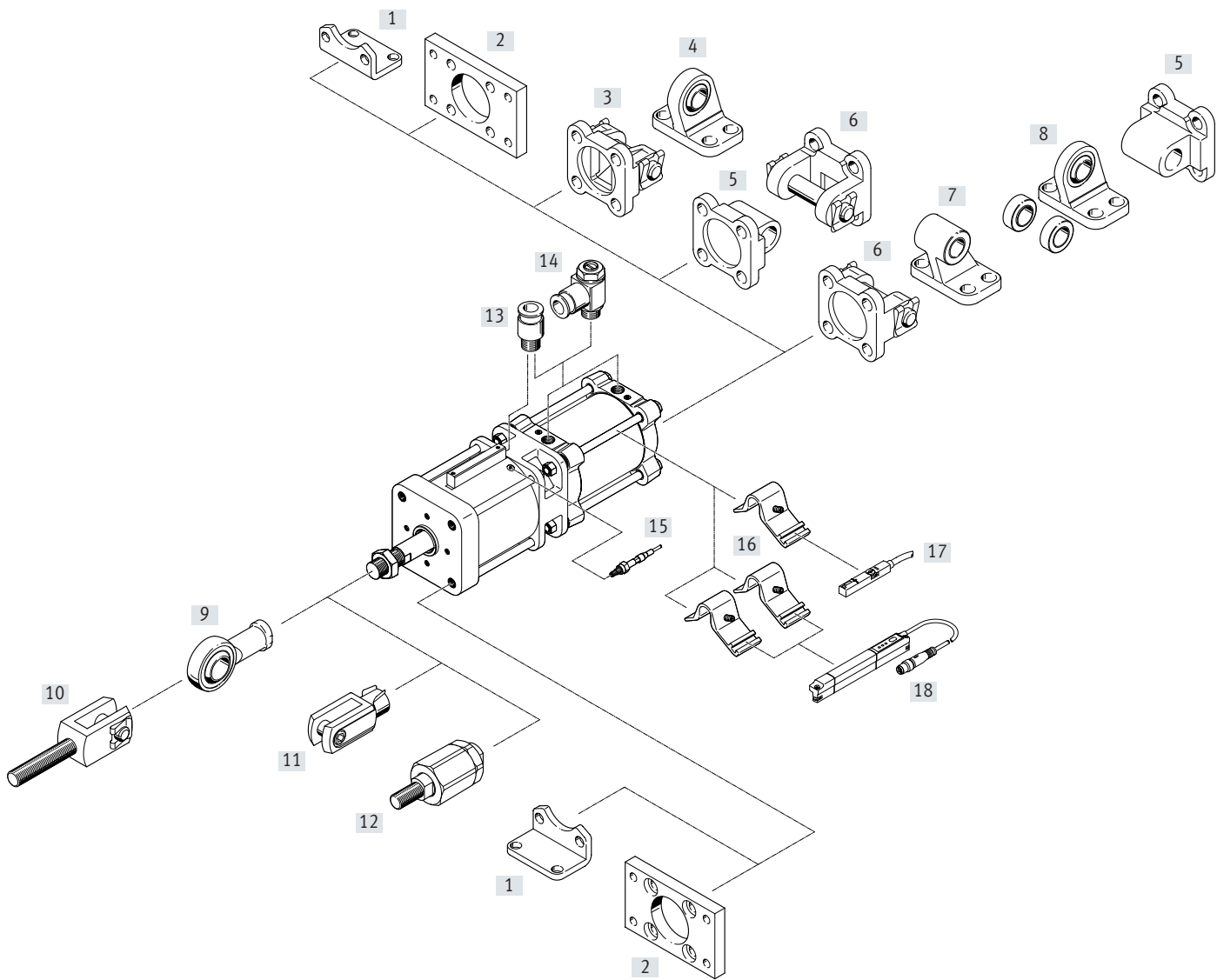
Ordering table						
Size	40	63	100	Conditions	Code	Enter code
Module no.	8073331	8073332	8073333			
Function	Cylinder with holding brake, double-acting				DFLC	DFLC
Piston diameter [mm]	40	63	100		-...	
Stroke [mm]	10 ... 2000				-...	
Cushioning	Pneumatic cushioning, adjustable at both ends				-PPV	-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

Type codes

001	Series	
DFLG	Cylinder with holding brake	
002	Piston diameter	
160	160	
003	Stroke	
...	10 ... 2000	
004	Cushioning	
PPV	Pneumatic cushioning, adjustable at both ends	


005	Position sensing	
A	For proximity sensor	
006	Corrosion protection	
	Standard	
R3	High corrosion protection	
007	EU certification	
	None	
EX4	II 2GD	
008	Certification	
S	Safety component to Machinery Directive 2006/42/EC	

Peripherals overview



Peripherals overview

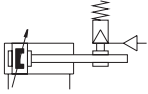
Accessories		
Type/order code	Description	→ Page/Internet
[1] Foot mounting HNG	For bearing and end caps, corresponds to MS1 to ISO 15552	22
[2] Flange mounting FNG	<ul style="list-style-type: none"> For bearing or end caps, corresponds to MF1/MF2 to ISO 15552 Suitable for emergency stop applications/dynamic braking 	24
[3] Swivel flange SNG	For end caps	29
[4] Clevis foot LSNG	With spherical bearing	31
[5] Swivel flange SNGL	For end caps, corresponds to MP2 to ISO 15552	29
[6] Swivel flange SNGB	For end caps, corresponds to MP2 to ISO 15552	30
[7] Clevis foot LN	For swivel flange SNGB	31
[8] Clevis foot LSN	With spherical bearing	31
[9] Rod eye SGS	With spherical bearing	32
[10] Rod clevis SGA	Suitable for spherical mounting of cylinders in conjunction with rod eye SGS	32
[11] Rod clevis SG	Permits a swivelling movement of the cylinder in one plane	32
[12] Self-aligning rod coupler FK	For compensating radial and angular deviations	32
[13] Push-in fitting QS	For connecting compressed air tubing with standard O.D.	qs
[14] One-way flow control valve GRLA	For speed regulation	35
[15] 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
[16] Sensor mounting DASP	For proximity switch SME-8M-A and position transmitter SDAT-MHS	35
[17] Proximity switch SMT-8M-A	<ul style="list-style-type: none"> For sensing the piston position Can be integrated in the cylinder profile barrel Not included in scope of delivery 	34
Proximity switch SDBT-MS	<ul style="list-style-type: none"> For sensing the piston position Can be integrated in the cylinder profile barrel Not included in scope of delivery 	34
[18] Position transmitter SDAT-MHS	<ul style="list-style-type: none"> Continuously senses the position of the piston Has an analogue output Can be integrated in the cylinder profile barrel 2 sensor mountings DASP are required for mounting Not included in scope of delivery 	35



 **Note**

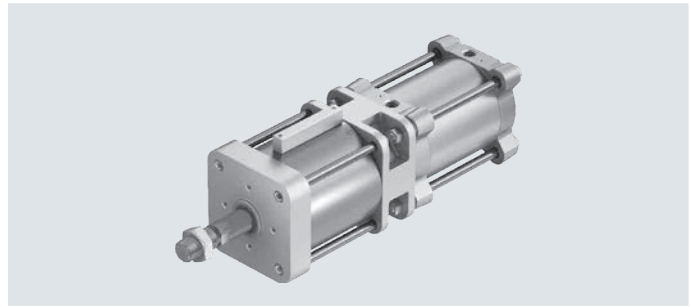
Only flange mounting FNG is permissible for emergency stop applications/dynamic braking.
Additional accessories for this application are available on request.

Data sheet

Function



-  - Diameter
160 mm
-  - Stroke length
10 ... 2000 mm



General technical data	
Piston diameter	160
Design	Piston
	Piston rod
	Profile barrel
Variants	Piston rod at one end
Mode of operation	Double-acting
Pneumatic connection	
Cylinder	G3/4
Holding brake	G3/8
Piston rod thread	M36x2
Piston rod end	Male thread
Cushioning	Pneumatic cushioning adjustable at both ends
Cushioning length [mm]	48
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	160
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
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	
Piston diameter	160
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/dfhg → Support/Downloads

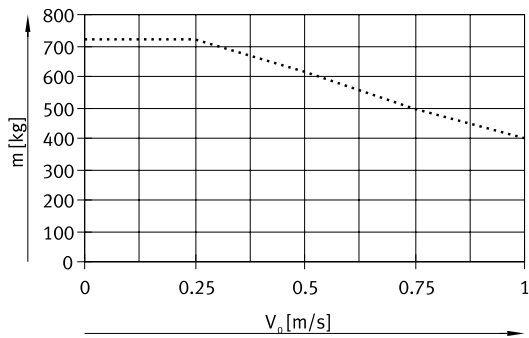
ATEX	
Piston diameter	160
ATEX category for gas	II 2G
Type of ignition protection for gas	Ex h IIC T4 Gb
ATEX category for dust	II 2D
Type of ignition protection for dust	Ex h IIIC T120°C Db
Explosion-proof ambient temperature [°C]	-20 ≤ Ta ≤ +60

Weight [g]	
Piston diameter	160
Basic weight with 0 mm stroke	49660
Additional weight per 10 mm stroke	208
Moving mass with 0 mm stroke	7085
Additional moving mass per 10 mm stroke	97

Forces [N]	
Piston diameter	160
Theoretical force at 6 bar, advancing	12064
Theoretical force at 6 bar, retracting	11310
Static holding force	17000

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

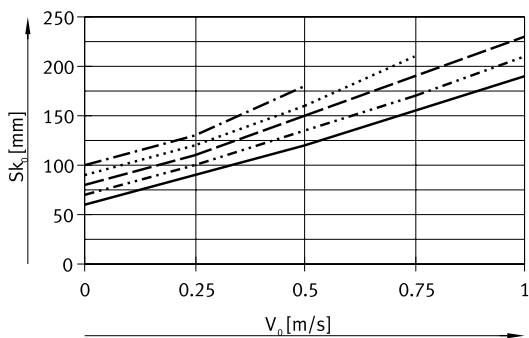
Data sheet

Load mass m as a function of piston speed v_0 


..... DFLG-160

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

∅ 160



- · - · 700 kg
- 600 kg
- - - 500 kg
- · · · 400 kg
- 300 kg

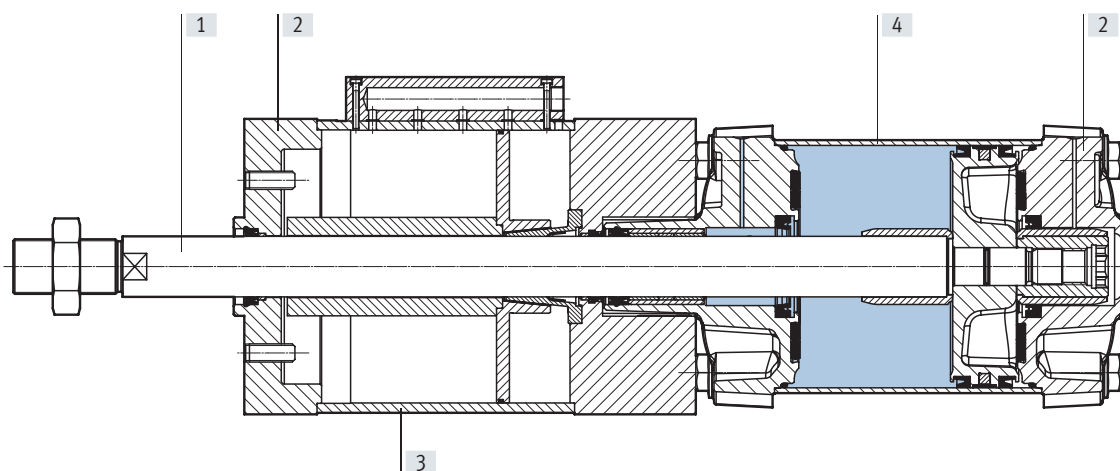
 **Note**

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

Materials

Sectional view



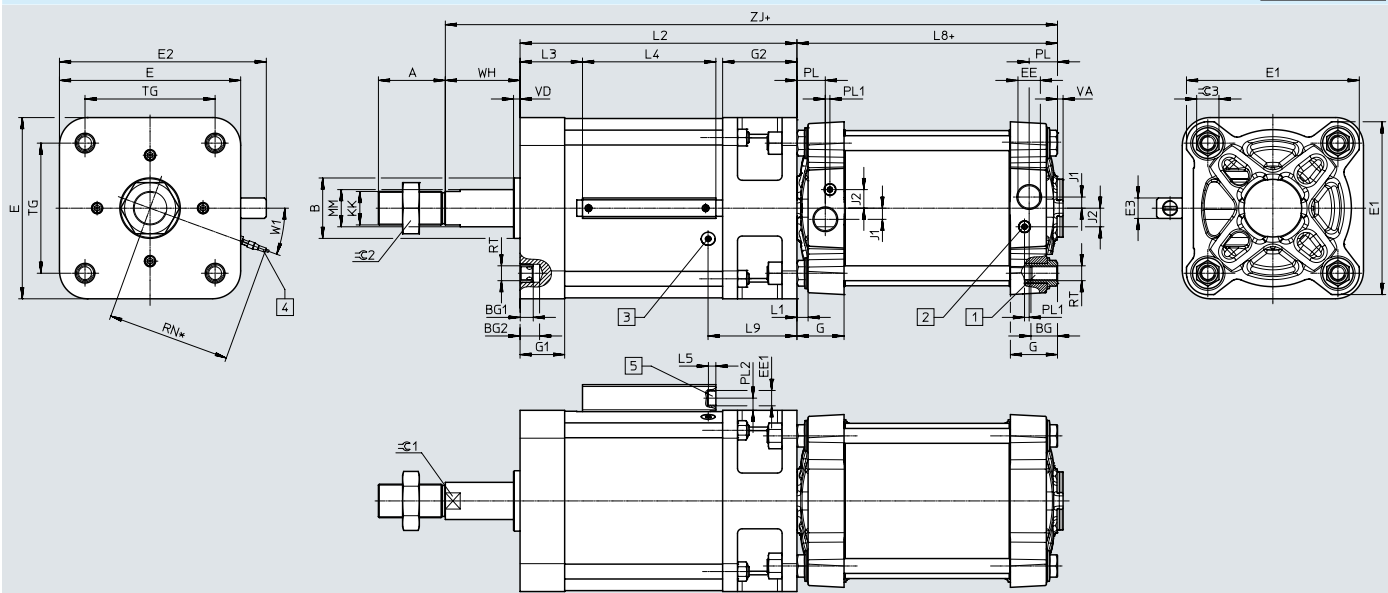
Cylinder with holding brake

[1] Piston rod	Hard-chrome-plated steel
[2] Cover	Die-cast aluminium
	Wrought aluminium alloy
[3] Housing	
DFLG-...	Steel
DFLG-...-R3	High-alloy stainless steel
[4] Cylinder barrel	
DFLG-...	Smooth-anodised wrought aluminium alloy
DFLG-...-R3	High-alloy stainless steel hochlegierter Stahl, rostfrei
- 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

∅	A	B	BG	BG1	BG2	E	E1	E2	E3	EE
[mm]	-0.5	∅ d11	min.			±0.8	±0.9	±1		
160	72	65	24	14	21	195	186	222.6	22	G3/4
∅	EE1	G	G1	G2	J1	J2	KK	L1	L2	L3
[mm]									±1	
160	G3/8	50.7	48	80	12	20	M36x2	12	298	67.2
∅	L4	L5	L8+	L9	MM	PL	PL1	PL2	R	RN
[mm]			±1		∅					
160	143.5	8	180	95.5	40	31	5	13.1	R30	155
∅	RT	TG	VA	VD	W1	WH	ZJ+	∅C1	∅C2	∅C3
[mm]		±1.1	-1	±0.2		+2.3/-2.3	+2.3/-2.3			
160	M16	140	6	7	20°	80	558	36	55	24

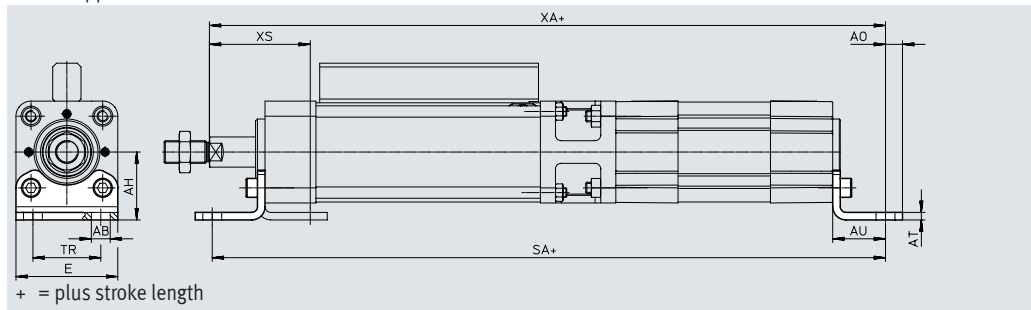
Ordering data – Modular product system

Ordering table		Conditions	Code	Enter code
Size	160			
Module no.	8073334			
Function	Cylinder with holding brake, double-acting		DFLG	DFLG
Piston diameter [mm]	160		-160	-160
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

Accessories

Foot mounting HNC/CRHNC
for DFLC

Material:
HNC: galvanised steel
CRHNC: high-alloy steel
Free of copper and PTFE



Dimensions and ordering data

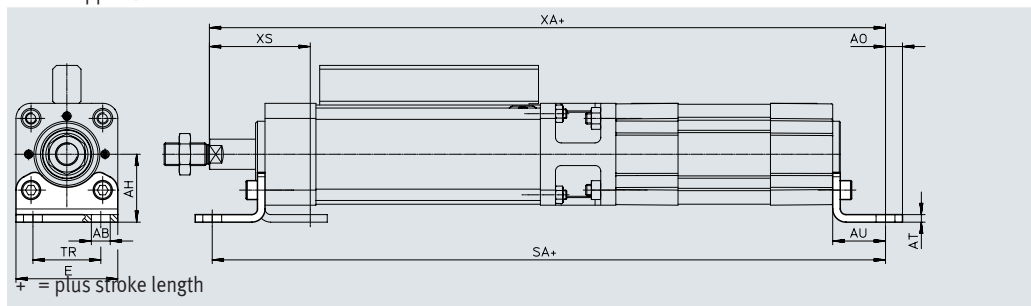
For diam.	AB ∅	AH	AO	AT	AU	E	SA	TR	XA	XS
[mm]										
40	10	36	9	4	28	54	347	36	347.7	56.7
63	10	50	12.5	5	32	75	395	50	398.9	67.9
100	14.5	71	17.5	6	41	110	475	75	483.3	90.3

For diam.	Basic type				Corrosion-resistant			
	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾
40	2	193	174370	HNC-40	4	188	176938	CRHNC-40
63	2	436	174372	HNC-63	4	424	176940	CRHNC-63
100	2	1009	174374	HNC-100	4	990	176942	CRHNC-100

- 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 special tests (→ also FN 940082), using appropriate media.
- 2) Suitable for ATEX

Foot mounting HNG
for DFLG

Material:
Galvanised steel
Free of copper and PTFE



Dimensions and ordering data

For diam.	AB ∅	AH	AO	AT	AU	E	SA	TR	XA	XS	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾
[mm]														
160	18.5	115	20	10	60	169	598	115	618	140	2	3931	34476	HNG-160

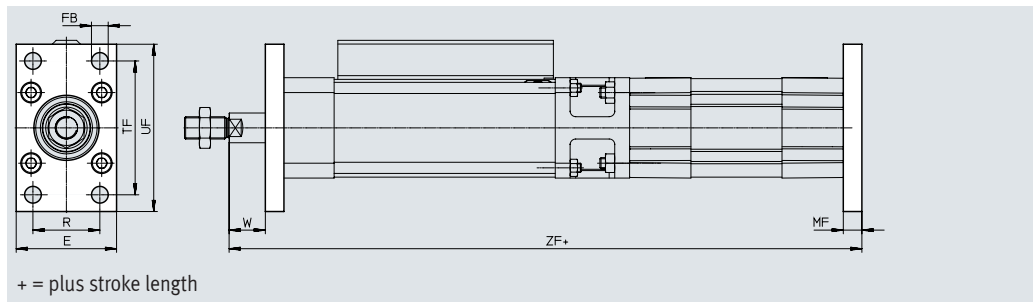
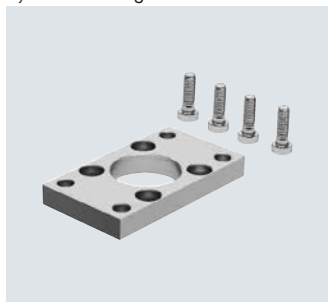
- 1) Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation can occur. External visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment.
- 2) Suitable for ATEX

Accessories

Flange mounting FNC/CRFNG for DFLL

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 diam.	E	FB ∅ H13	MF	R	TF	UF	W	ZF
[mm]								
40	54	9	10	36	72	90	18.7	329.7
63	75	9	12	50	100	120	23.9	378.9
100	110	14	16	75	150	175	33.3	458.3

For diam.	Basic type				Corrosion-resistant			
	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾
40	1	291	174377	FNC-40	4	291	161847	CRFNG-40
63	1	679	174379	FNC-63	4	680	161849	CRFNG-63
100	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 coverings, 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 special tests
 (→ also FN 940082), using appropriate media.

2) Suitable for ATEX

Accessories

Flange mounting FNG

for DFLG

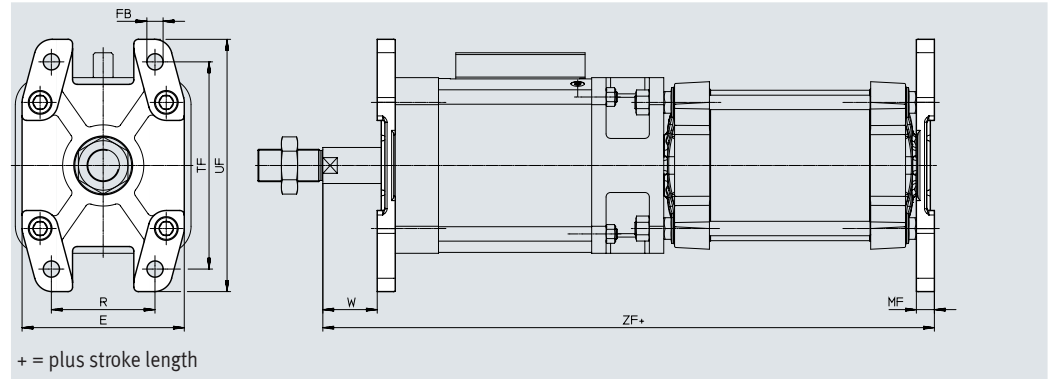
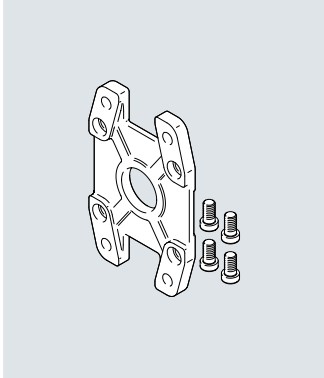
Suitable for
emergency stop applications/
dynamic braking

Material:

Painted spheroidal graphite cast iron

Free of copper and PTFE

RoHS-compliant

**Dimensions and ordering data**

For diam.	E	FB ∅ H13	MF	R	TF	UF	W	ZF	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾
160	180	18	20	115	230	280	60	578	1	3550	34478	FNG-160

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

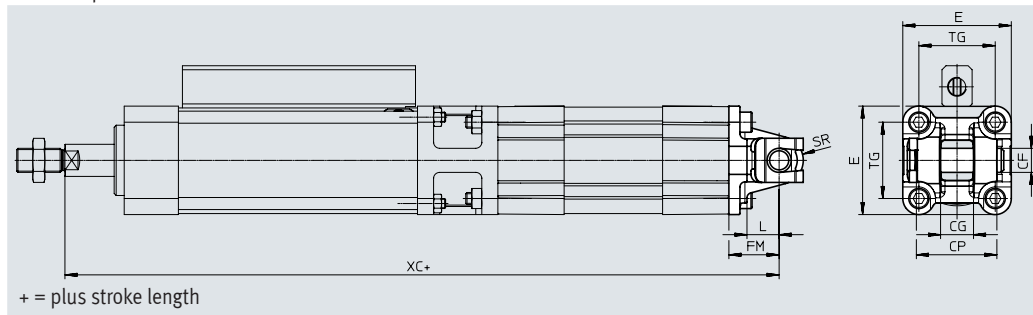
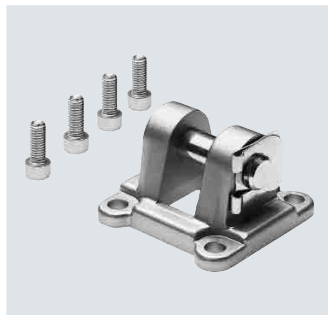
Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

2) Suitable for ATEX

Accessories

Swivel flange SNC for DFCL

Material:
Die-cast aluminium
Free of copper and PTFE
RoHS-compliant



Dimensions and ordering data

For diam.	CF ∅	CG	CP	E	FM	L	SR
[mm]	E7/h9	H14	h14		±0.2		
40	12	16	40	54 _{-0.5}	25	16	12
63	16	21	51	75 _{-0.6}	32	21	16
100	20	25	75	110 _{+0.3/-0.8}	41	27	20

For diam.	TG	XC	CRC ¹⁾	Weight [g]	Part no.	Type ²⁾
[mm]						
40	38	344.7	1	140	174384	SNC-40
63	56.5	398.9	1	331	174386	SNC-63
100	89	483.3	1	865	174388	SNC-100

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

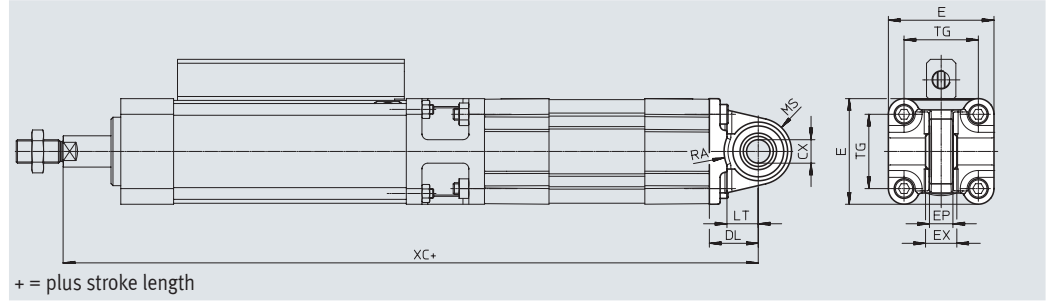
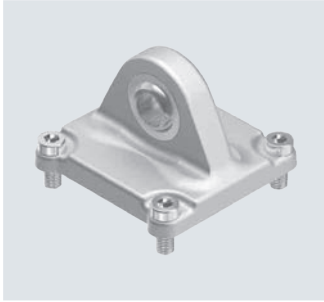
Low corrosion stress. Dry internal application or transport and storage protection. Also applies to parts behind coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

2) Suitable for ATEX

Accessories

Swivel flange
SNCS/SNCS-...-R3
for DF/LC

Material:
SNCS 40: die-cast aluminium
SNCS 63 ... 100:
Wrought aluminium alloy
SNCS-...-R3 100:
Wrought aluminium alloy with protective coating
RoHS-compliant



+ = plus stroke length

Dimensions and ordering data

For diam. [mm]	CX		DL ±0.2	E		EP ±0.2
	[CRSNCS]	[SNCS-...-R3]		[CRSNCS]	[SNCS-...-R3]	
40	12 _{+0.015}	12 _{+0.018/-0.04}	25	54 _{-0.5}	54 _{-0.5}	12
63	16 _{+0.015}	16 _{+0.018/-0.14}	32	74.5 _{±0.5}	75 _{-0.6}	15
100	20 _{-0.018}	20 _{+0.021/-0.04}	41	109 _{+1/-0.7}	109 _{+1/-0.7}	18

Dimensions and ordering data

For diam. [mm]	EX	LT	MS		RA			TG	XC
			[CRSNCS]	[SNCS-...-R3]	[CRSNCS]	[SNCS-...-R3]	[CRSNCS]		
40	16	16	17 _{+0.5}	17 _{+0.5}	17.5	17.5	38	344.7	
63	21	21	23 _{-0.5}	22 _{+0.5}	23	23	56.5	398.9	
100	25	27	30 _{+0.5}	30 _{+0.5}	95	100	89	483.3	

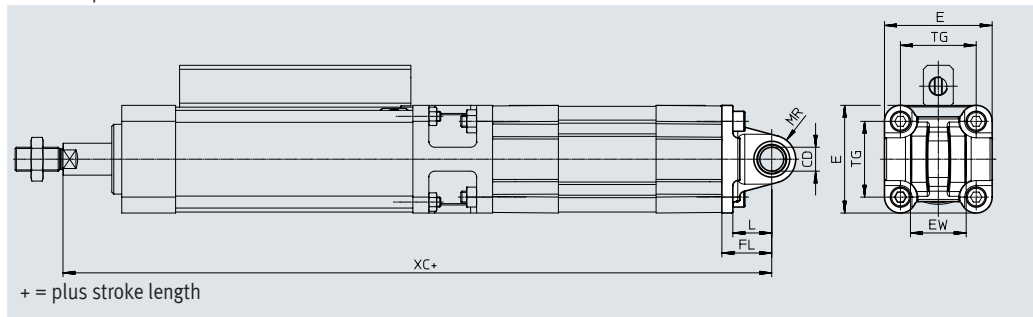
For diam. [mm]	Basic type				High corrosion protection			
	CRC ¹⁾	Weight [g]	Part no.	Type	CRC ¹⁾	Weight [g]	Part no.	Type
40	1	122	174398	SNCS-40	4	239	2895921	CRSNCS-40
63	2	281	174400	SNCS-63	4	576	2895923	CRSNCS-63
100	2	683	174402	SNCS-100	3	684	2895925	SNCS-100-R3

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 coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
 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 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.
 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 special tests
 (→ also FN 940082), using appropriate media.

Accessories

Swivel flange SNCL for DFCL

Material:
Die-cast aluminium
Free of copper and PTFE
RoHS-compliant



Dimensions and ordering data

For diam.	CD ∅	E	EW	FL	L	MR
[mm]	H10		-0.2 -0.6	±0.2		
40	12	54 _{-0.5}	28	25	16	12
63	16	75 _{-0.6}	40	32	21	16
100	60	41	27	20	89	483.3

For diam.	TG	XC	CRC ¹⁾	Weight [g]	Part no.	Type
40	38	344.7	1	95	174405	SNCL-40
63	56.5	398.9	1	225	174407	SNCL-63
100	89	483.3	1	606	174409	SNCL-100

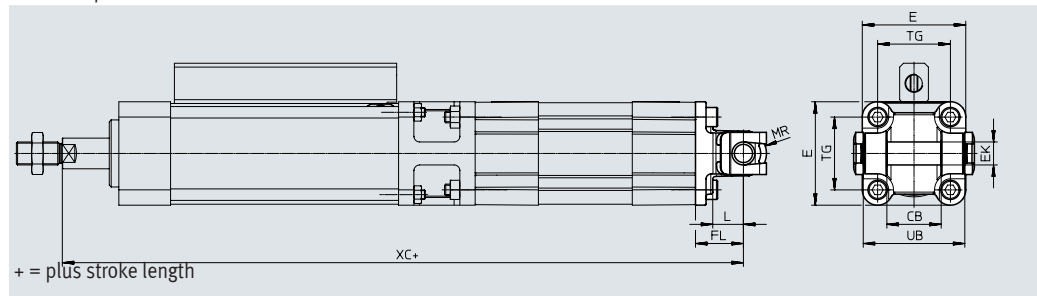
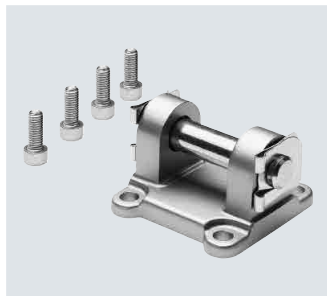
1) Corrosion resistance class CRC 1 to Festo standard FN 940070

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

Accessories

Swivel flange
SNCB/SNCB-...-R3
 for DFCL

Material:
 SNCB: die-cast aluminium
 SNCB-...-R3: die-cast aluminium with protective coating
 Free of copper and PTFE
 RoHS-compliant

**Dimensions and ordering data**

For diam.	CB	E	EK ∅	FL	L	MR	TG	UB	XC
[mm]	H14		H10/e8	±0.2		-0.5		h14	
40	28	54 _{-0.5}	12	25	16	12	38	52	344.7
63	40	75 _{-0.6}	16	32	21	16	56.5	70	398.9
100	60	110 _{+0.3/-0.8}	20	41	27	20	89	110	483.3

For diam. [mm]	Basic type				R3 – High corrosion protection			
	CRC ¹⁾	Weight [g]	Part no.	Type	CRC ¹⁾	Weight [g]	Part no.	Type
40	1	155	174391	SNCB-40	3	151	176945	SNCB-40-R3
63	1	375	174393	SNCB-63	3	371	176947	SNCB-63-R3
100	1	1035	174395	SNCB-100	3	986	176949	SNCB-100-R3

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 coverings, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

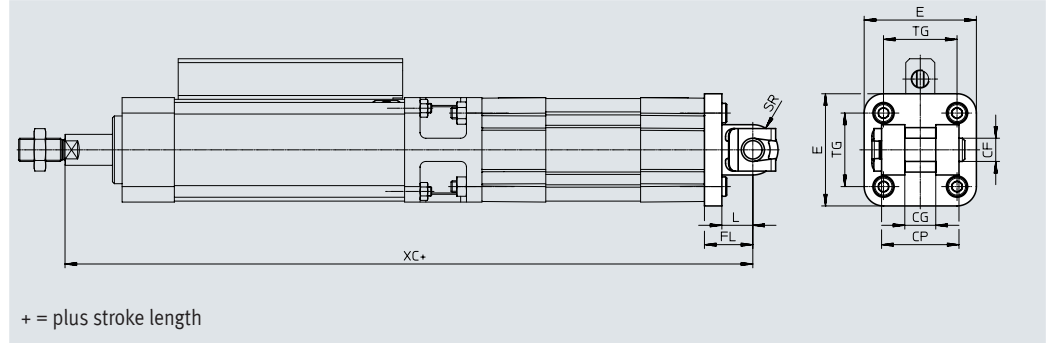
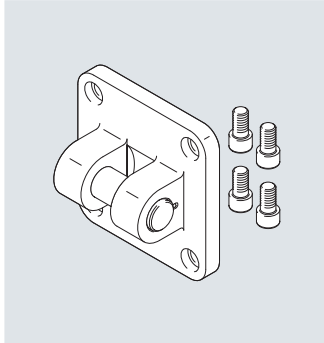
Corrosion resistance class CRC 3 to Festo standard FN 940070

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.

Accessories

Swivel flange SNG
for DFLG

Material:
Die-cast aluminium
Free of copper and PTFE
RoHS-compliant



+ = plus stroke length

Dimensions and ordering data

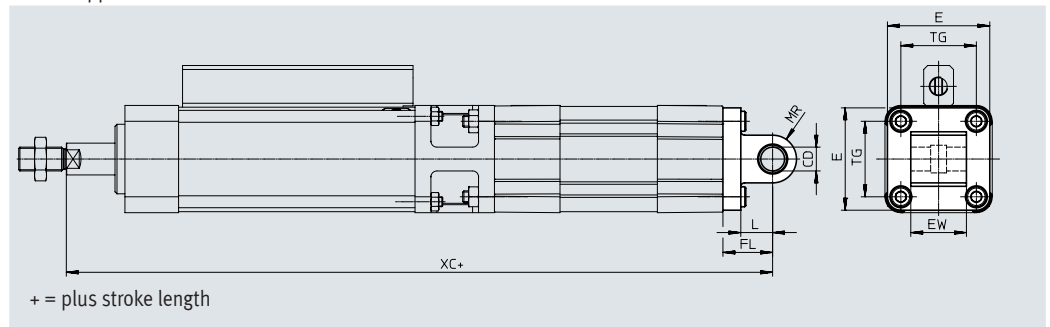
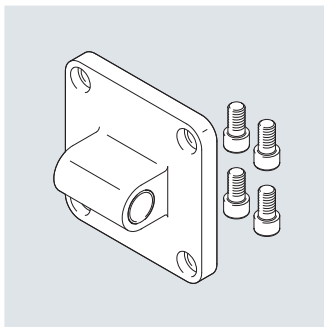
For diam.	CF	CG	CP	E	FL	L	SR	TG	XC	CRC ¹⁾	Weight	Part no.	Type
[mm]	F7/h9	H14	d12	max.	±0.2		max.				[g]		
160	35	43	122	186	55	35	32	140 _{+0.3}	613	2	3577	152597	SNG-160

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.

Swivel flange SNGL
for DFLG

Material:
Die-cast aluminium
Free of copper and PTFE



+ = plus stroke length

Dimensions and ordering data

For diam.	CD	EW	E	FL	L	MR	TG	XC	CRC ¹⁾	Weight	Part no.	Type
[mm]	∅ H9		±0.5	±0.2						[g]		
160	30	90 _{-0.5/-1.2}	179.5	55	35	25	140	613	2	2358	151534	SNGL-160

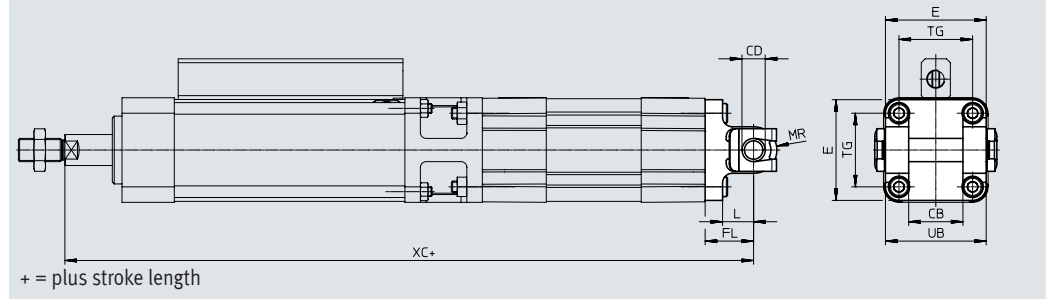
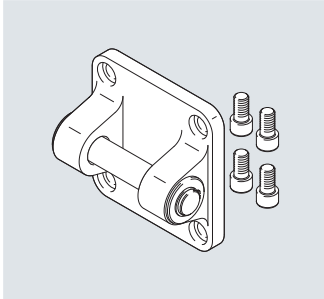
1) Corrosion resistance class CRC 2 to Festo standard FN 940070

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.

Accessories

Swivel flange SNGB
for DFLG

Material:
Die-cast aluminium
Free of copper and PTFE
RoHS-compliant





Dimensions and ordering data

For diam.	CB	CD ∅	E	FL	L	MR	TG	UB	XC	CRC ¹⁾	Weight [g]	Part no.	Type
[mm]	H14	E10	±0.5	±0.2				h14					
160	90	30	179.5	55	35	25	140 _{±0.3}	170	613	2	3445	34547	SNGB-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.

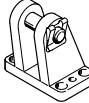
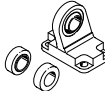
Accessories

Ordering data – Mounting attachments

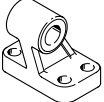
Designation	For diam.	Part no.	Type
Clevis foot LN/LNG			
	40	33891	LNG-40
	63	33893	LNG-63
	100	33895	LNG-100
	160	9037	LN-160
Clevis foot LSNG			
	40	31741	LSNG-40
	63	31743	LSNG-63
	100	31745	LSNG-100
	160	152599	LSNG-160

1) Suitable for ATEX

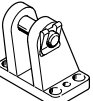
Data sheets → Internet: clevis foot

Designation	For diam.	Part no.	Type
Clevis foot LBG ¹⁾ for DFCL			
	40	31762	LBG-40
	63	31764	LBG-63
	100	31766	LBG-100
Clevis foot LSN			
	40	5562	LSN-40
	63	5564	LSN-63
	100	5566	LSN-100
	160	6988	LSN-160

Ordering data – Mounting components, corrosion-resistant

Designation	For diam.	Part no.	Type
Clevis foot CRLNG for DFCL			
	40	161841	CRLNG-40
	63	161843	CRLNG-63
	100	161845	CRLNG-100


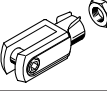
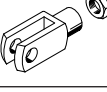
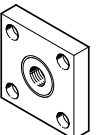
Ordering data – Mounting components, high corrosion protection

Designation	For diam.	Part no.	Type ¹⁾
Clevis foot LBG-R3 for DFCL			
	40	2078792	LBG-40-R3
	63	2078795	LBG-63-R3
	100	2078799	LBG-100-R3

1) Suitable for ATEX

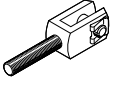
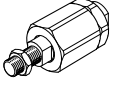
Accessories

Ordering data – Piston rod attachments

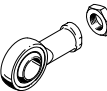
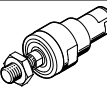
Designation	For diam.	Part no.	Type
Rod eye SGS			
	40	9262	SGS-M12x1.25
	63	9263	SGS-M16x1.5
	100	9264	SGS-M20x1.5
	160	10775	SGS-M36x2
Rod clevis SG¹⁾			
	40	6145	SG-M12x1.25
	63	6146	SG-M16x1.5
	100	6147	SG-M20x1.5
	160	9581	SG-M36x2
Coupling piece KSG¹⁾ for DFLC			
	40	32964	KSG-M12x1.25
	63	32965	KSG-M16x1.5
	100	32966	KSG-M20x1.5

1) Suitable for ATEX

Data sheets → Internet: piston rod attachment

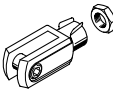
Designation	For diam.	Part no.	Type
Rod clevis SGA¹⁾			
	40	10767	SGA-M12x1.25
	63	10768	SGA-M16x1.5
	100	10769	SGA-M20x1.5
	160	10771	SGA-M36x2
Self-aligning rod coupler FK¹⁾			
	40	6141	FK-M12x1.25
	63	6142	FK-M16x1.5
	100	6143	FK-M20x1.5
	160	10746	FK-M36x2

Ordering data – Piston-rod attachments, corrosion-resistant

Designation	For diam.	Part no.	Type
Rod eye CRSGS for DFLC			
	40	195583	CRSGS-M12x1.25
	63	195584	CRSGS-M16x1.5
	100	195585	CRSGS-M20x1.5
Self-aligning rod coupler CRFK¹⁾ for DFLC			
	40	2305779	CRFK-M12x1.25
	63	2490673	CRFK-M16x1.5
	100	2545677	CRFK-M20x1.5

1) Suitable for ATEX

Data sheets → Internet: piston rod attachment

Designation	For diam.	Part no.	Type
Rod clevis CRSG¹⁾ for DFLC			
	40	13570	CRSG-M12x1.25
	63	13571	CRSG-M16x1.5
	100	13572	CRSG-M20x1.5

Accessories


Proximity switches DADG

General technical data			
For diam.	40; 63	100	160
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 diam.	40; 63	100	160
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		

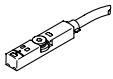
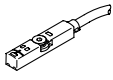
Ordering data

Data sheets → Internet: dadg

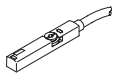
	For diam.	Part no.	Type
	40; 63	8072857	DADG-D-F8-16/20
	100	8072858	DADG-D-F8-25
	160	8072859	DADG-D-F8-40

Accessories



Ordering data – Proximity switches for T-slot, magneto-resistive Data sheets → 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 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
		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 cylinder profile, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7.5-OE

Ordering data – Proximity switches for T-slot, NAMUR Data sheets → Internet: sdbt

	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part no.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	NAMUR	Cable, 2-wire	5	579071	SDBT-MS-20NL-ZN-E-5-LE-EX6
				10	579072	SDBT-MS-20NL-ZN-E-10-LE-EX6

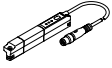
Ordering data – Connecting cables Data sheets → Internet: nebu


	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3
			5	541334	NEBU-M8G3-K-5-LE3
	Angled socket, M8x1, 4-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5	541341	NEBU-M8W3-K-5-LE3

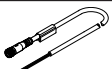

Accessories

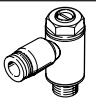
Position transmitter

The position transmitter continuously senses the position of the piston.
It has an analogue output with an output signal in proportion to the piston position.

Ordering data – Position transmitter for T-slot							Data sheets → Internet: sdat
	Position measuring range	Analogue output [mA]	Type of mounting	Electrical connection	Cable length [m]	Part no.	Type
	0 ... 50	4 ... 20	Insertable in the slot from above	Plug M8x1, 4-pin, in-line	0.3	1531265	SDAT-MHS-M50-1L-SA-E-0.3-M8
	0 ... 80					1531266	SDAT-MHS-M80-1L-SA-E-0.3-M8
	0 ... 100					1531267	SDAT-MHS-M100-1L-SA-E-0.3-M8
	0 ... 125					1531268	SDAT-MHS-M125-1L-SA-E-0.3-M8
	0 ... 160					1531269	SDAT-MHS-M160-1L-SA-E-0.3-M8

Ordering data – Sensor bracket for proximity switch SMT-8M and position transmitter SMAT-8M for DFLG					Data sheets → Internet: dasp
	For diam.	Materials	Part no.	Type	
	160	Rail: anodised wrought aluminium alloy Screws: high-alloy stainless steel	1553813	DASP-M4-160-A	

Ordering data – Connecting cables						Data sheets → Internet: nebu
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part no.	Type	
	Straight socket, M8x1, 4-pin	Cable, open end, 4-wire	2.5	541342	NEBU-M8G4-K-2.5-LE4	
			5	541343	NEBU-M8G4-K-5-LE4	
	Angled socket, M8x1, 4-pin	Cable, open end, 4-wire	2.5	541344	NEBU-M8W4-K-2.5-LE4	
			5	541345	NEBU-M8W4-K-5-LE4	

Ordering data – One-way flow control valves					Data sheets → Internet: grla
	Connection	Material	Part no.	Type	
	Thread	For tubing O.D.			
	G1/8	4	Metal version	193143	GRLA-1/8-QS-4-D
		6		193144	GRLA-1/8-QS-6-D
		8		193145	GRLA-1/8-QS-8-D
	G1/4	6		193146	GRLA-1/4-QS-6-D
		8		193147	GRLA-1/4-QS-8-D
		10		193148	GRLA-1/4QS-10-D
	G3/8	6		193149	GRLA-3/8-QS-6-D
		8		193150	GRLA-3/8-QS-8-D
		10		193151	GRLA-3/8-QS-10-D
	G1/2	12		193152	GRLA-1/2-QS-12-D

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