

Round Cylinders ESNU, Single-acting – Inch Series

FESTO



- Piston Ø 5/16" to 2-1/2"
- Stroke lengths up to 2"
- Single-acting, spring return
- Meets the highest requirements for running characteristics, service life and load carrying ability
- Extensive range of accessories

Product Range Overview							
Function	Type	Piston Ø [in]	Standard Stroke [in]	Variable Stroke ¹⁾ [in]	Force [lbf]	Variants	
						P	A
Single-acting, spring return	ESNU	5/16, 3/8, 1/2, 5/8, 3/4, 1	3/8, 1, 2	0.04 ... 2	0.6 ... 60.7	■	■
		1-1/4, 1-5/8, 2, 2-1/2	1/2, 1, 2	0.125 ... 2	12 ... 402	■	■

1) Reliable position sensing requires a minimum stroke of 0.4 inch.

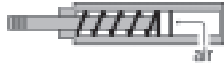
P Flexible cushioning at both ends A Magnet for position sensing

Round Cylinders ESNU – Inch Series (Sizes 5/16” to 1”)

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Technical Data

Single-acting, spring return



Ø - Diameter
5/16 ... 1 in

└ - Stroke length
0.04 ... 2 in



General Technical Data						
Piston Ø [in]	5/16	3/8	1/2	5/8	3/4	1
Pneumatic connection	10-32 UNF	10-32 UNF	10-32 UNF	10-32 UNF	1/8" NPT	1/8" NPT
Piston rod thread	6-32 UNF	6-32 UNF	10-32 UNF	10-32 UNF	5/16-24 UNF	3/8-24 UNF
Constructional design	Piston					
	Piston rod					
	Cylinder barrel					
Cushioning	Flexible cushioning rings at both ends (P)					
Magnet for position sensing ¹⁾	Optional					

1) Position sensing via magnetic proximity sensor (ordered separately, see accessories).

Operating Pressure [psi]						
Piston Ø [in]	5/16	3/8	1/2	5/8	3/4	1
Operating medium	Filtered compressed air, lubricated or unlubricated					
Operating pressure [psi]	22.1 ... 147.0	17.7 ... 147.0				

Ambient Conditions		
Ambient temperature ¹⁾ [°F]	-4 ... +176	
Corrosion resistance class CRC ²⁾	2	

1) Note operating range of proximity sensors

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Round Cylinders ESNU – Inch Series (Sizes 5/16" to 1")

Technical Data

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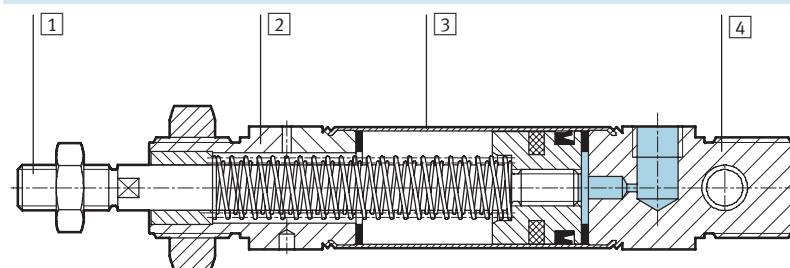
Forces [lbf] and Impact Energy [ft-lbf]						
Piston Ø [in]	5/16	3/8	1/2	5/8	3/4	1
Theoretical force at 90 psi, extending	5.4	9.2	13.7	24.1	38.0	60.7
Max. spring return force, 0.4 inch stroke	1.1	1.1	1.4	3.0	4.1	5.1
Max. spring return force, 1 inch stroke	0.9	0.9	1.2	2.7	3.7	4.8
Max. spring return force, 2 inch stroke	0.6	1.1	0.9	2.2	3.1	4.2
Max. impact energy at the end positions ¹⁾	0.02	0.04	0.05	0.11	0.15	0.22

1) The values are reduced by approx. 50% at 176 °F

Weights ESNU-... [oz]						
Piston Ø [in]	5/16	3/8	1/2	5/8	3/4	1
Product weight with 0 inch stroke	1.2	1.3	2.6	3.2	6.6	8.4
Additional weight per 1 inch stroke	0.20	0.25	0.36	0.41	0.64	0.99

Materials

Sectional view



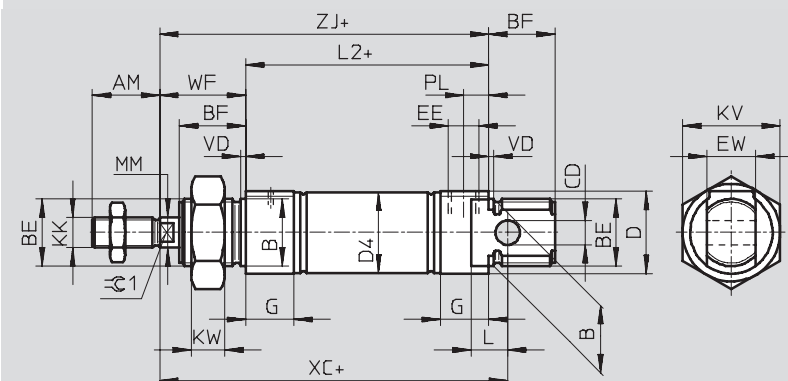
ESNU		
1	Piston rod	High-alloy stainless steel
2	Bearing cap	Wrought aluminum alloy
3	Cylinder barrel	High-alloy stainless steel
4	End cap	Wrought aluminum alloy
–	Seals	Polyurethane, nitrile rubber
–	Spring	Spring steel

Round Cylinders ESNU – Inch Series (Sizes 5/16" to 1")

Technical Data

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Dimensions – Basic Version



+ = plus stroke length

Ø [in]	AM	B Ø	BE	BF	CD Ø	D Ø	D4 Ø	EE	EW	G	KK	KV
5/16	0.5	0.5	M12x1.25	0.5	0.2	0.6	0.37	10-32 UNF	0.3	0.4	6-32 UNC	0.7
3/8							0.44					
1/2	0.6	0.6	M16x1.5	0.7	0.2	0.8	0.52		10-32 UNF		0.9	
5/8							0.68					
3/4	0.8	0.9	M22x1.5	0.8	0.3	1.1	0.84	1/8" NPT	0.6	0.6	5/16-24 UNF	1.3
1	0.9			0.9			1.04				3/8-24 UNF	

Ø	KW	L	L2	MM Ø	PL	VD	WF	XC	ZJ	≈C1
[in]										[mm]
5/16	0.2	0.2	1.8	0.2	0.2	0.1	0.6	2.5	2.4	–
3/8										
1/2	0.3	0.4	2.0	0.2			0.9	3.0	2.8	5
5/8			2.2					3.2	3.1	
3/4	0.4	0.5	2.7	0.3	8.2		0.9	3.7	3.6	7
1			2.74	0.4			1.1	4.1	3.8	9

Dimensions are in inches, unless otherwise noted.

Round Cylinders ESNU – Inch Series (Sizes 5/16" to 1")

Ordering Data

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M Mandatory Data				O Options
Function	Piston Ø	Stroke	Cushioning	Magnet for position sensing
ESNU	5/16 3/8 1/2 5/8 3/4 1	0.04 ... 2	P	A
ESNU	- 1	- 1	- P	- A

Ordering Table										
Size	5/16	3/8	1/2	5/8	3/4	1	Conditions	Code		Enter code
M Function	Standard cylinder, single-acting pushing							ESNU		ESNU
Piston Ø [in]	5/16	3/8	1/2	5/8	3/4	1		-...		
Stroke [in]	0.04 ... 2							-...		
Cushioning	Flexible cushioning rings at both ends							-P		-P
O Magnet for position sensing	For use with magnetic proximity sensor						1	-A		

1 Reliable position sensing requires a minimum stroke of 0.4 inch

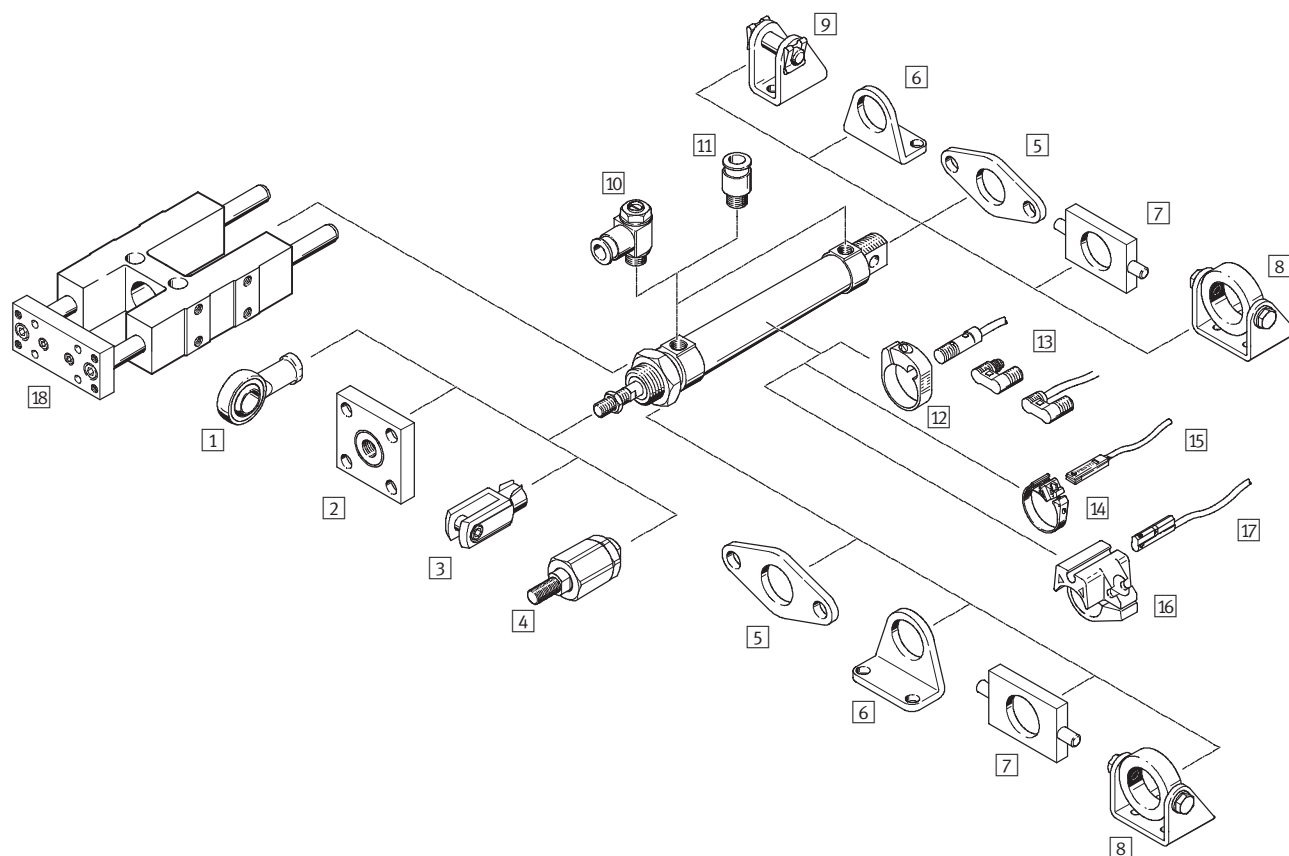
Transfer order code

ESNU	-		-		-	P	-	
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Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

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Mounting Attachments and Accessories			→ Page
1	Rod eye SGS		10
2	Coupling piece KSZ		10
3	Rod clevis SG		10
4	Self-aligning rod coupler FK		10
5	Flange mounting FBN		8
6	Foot mounting HBN		7
7	Swivel mounting WBN		9
8	Swivel mounting SBN		8
9	Clevis foot LBN		9
10	One-way flow control valve GRLA/GRLZ		11
11	Push-in fitting QS		11
12	Sensor mounting kit SMBR		12
13	Proximity switch SMEO/SMT0		12
14	Sensor mounting kit SMBR-8		13
15	Proximity switch SME/SMT-8		13
16	Sensor mounting kit SMBR-10		14
17	Proximity switch SME/SMT-10		14
18	Guide unit FEN		10

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

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Accessories

Foot Mounting HBN

Scope of delivery:

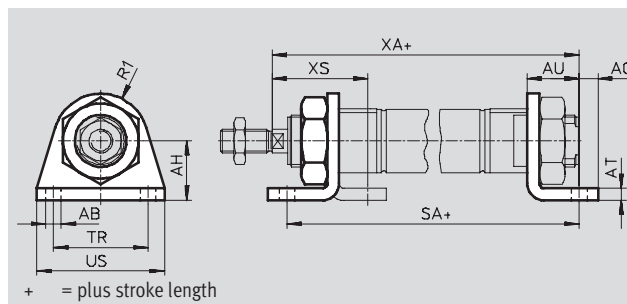
HBN-...x1: 1 foot

HBN-...x2: 2 feet and 1 nut

Material:

HBN: Galvanized steel

Free of copper, PTFE and silicone



Dimensions											
Ø	AB Ø	AH	AO	AT	AU	R1	SA	TR	US	XA	XS
[in]											
5/16, 3/8	0.18	0.6	0.2	0.1	0.4	0.4	2.7	1.0	1.4	2.9	0.9
1/2	0.22	0.8	0.2	0.2	0.6	0.5	3.1	1.3	1.7	3.4	1.3
5/8	0.22	0.8	0.2	0.2	0.6	0.5	3.3	1.3	1.7	3.6	1.3
3/4	0.26	1.0	0.3	0.2	0.7	0.8	4.0	1.6	2.1	4.3	1.4
1	0.26	1.0	0.3	0.2	0.7	0.8	4.08	1.6	2.1	4.51	1.6

Ordering Data				
Ø	Basic version			
[in]	CRC ¹⁾	Weight [oz]	Part No.	Type
5/16, 3/8	2	0.7	5123	HBN-8/10x1
	2	1.9	5124	HBN-8/10x2
1/2, 5/8	2	1.4	5125	HBN-12/16x1
	2	3.7	5126	HBN-12/16x2
3/4, 1	2	3.2	5127	HBN-20/25x1
	2	7.8	5128	HBN-20/25x2

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Dimensions are in inches, unless otherwise noted.

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

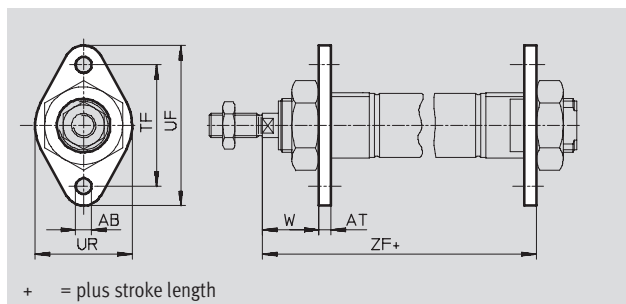
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Flange Mounting FBN

Material:

FBN: Galvanized steel

Free of copper, PTFE and silicone



Dimensions							
Ø	AB	AT	TF	UF	UR	W	ZF
[in]	Ø						
5/16, 3/8	0.2	0.1	1.2	2.6	1.0	0.5	2.6
1/2	0.2	0.2	1.6	2.1	1.2	0.7	3.0
5/8	0.2	0.2	1.6	2.1	1.2	0.7	3.2
3/4	0.3	0.2	2.0	2.6	1.6	0.7	3.8
1	0.3	0.2	2.0	2.6	1.6	0.9	4.0

Ordering Data				
Ø	Basic version			
[in]	CRC ¹⁾	Weight [g]	Part No.	Type
5/16, 3/8	2	0.4	5129	FBN-8/10
1/2, 5/8	2	0.9	5130	FBN-12/16
3/4, 1	2	1.6	5131	FBN-20/25

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Swivel Mounting SBN

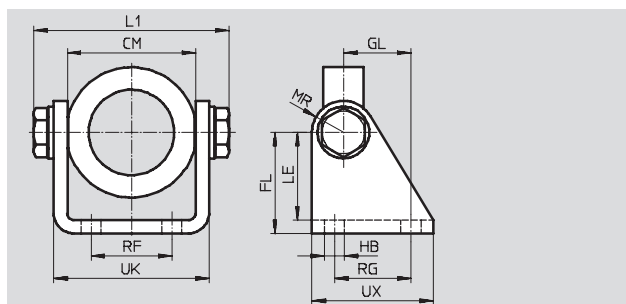
Material:

Mounting ring: Wrought aluminum alloy, anodized

Bearings: Bronze

Screws: Galvanized steel

Bracket: Steel



Dimensions and Ordering Data															
Ø	CM	FL	GL	HB	L1	LE	MR	RF	RG	UK	UX	CRC ¹⁾	Weight	Part No.	Type
[in]					max.								[oz]		
3/4, 1	1.5	1.4	0.8	0.3	2.4	1.2	0.5	0.8	0.9	1.81	1.6	2	7.1	539927	SBN-20/25

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Dimensions are in inches, unless otherwise noted.

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

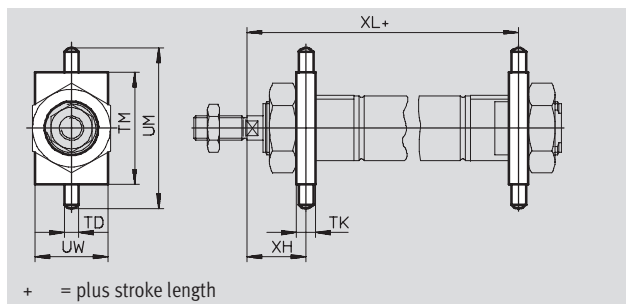
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Swivel Mounting WBN

Material:

Galvanized steel

Free of copper, PTFE and silicone



Dimensions and Ordering Data										
Ø	TD	TK	TM	UM	UW	XH	XL	CRC ¹⁾	Weight	Part No. Type
[in]	Ø								[oz]	
5/16, 3/8	0.2	0.2	1.0	1.5	0.8	0.5	2.6	2	0.7	8608 WBN-8/10
1/2	0.2	0.3	1.5	2.3	1.0	0.7	3.0	2	1.8	8609 WBN-12/16
5/8	0.2	0.3	1.5	2.3	1.0	0.7	3.2	2	1.8	8609 WBN-12/16
3/4	0.2	0.3	1.8	2.6	1.2	0.8	3.8	2	2.5	8610 WBN-20/25
1	0.2	0.3	1.8	2.6	1.2	0.9	4.0	2	2.5	8610 WBN-20/25

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

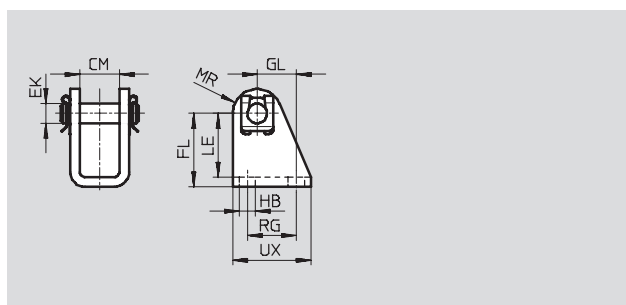
Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Clevis Foot LBN

Material:

LBN: Galvanized steel

Free of copper, PTFE and silicone



Dimensions									
For Ø	CM	EK	FL	GL	HB	LE	MR	RG	UX
[in]		Ø							
5/16, 3/8	0.32	0.2	0.9	0.54	0.17	0.85	0.2	0.49	0.8
1/2, 5/8	0.48	0.2	1.1	0.5	0.22	0.9	0.3	0.6	1.0
3/4, 1	0.63	0.3	1.2	0.6	0.26	1.0	0.4	0.8	1.3

Ordering Data				
Ø	Basic version			
[in]	CRC ¹⁾	Weight [oz]	Part No.	Type
5/16, 3/8	2	0.8	6057	LBN-8/10
1/2, 5/8	2	1.4	6058	LBN-12/16
3/4, 1	2	2.9	6059	LBN-20/25

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

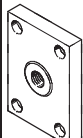
Dimensions are in inches, unless otherwise noted.

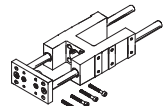
2008/02 – Subject to change – Round Cylinders ESNU

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

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Ordering Data – Piston Rod Attachments							
Designation	For Ø [in]	Part No.	Type	Designation	For Ø [in]	Part No.	Type
Rod eye SGS				Rod clevis SG			
	5/16	532693	SGS-6-32		5/16	11127	SG-6-32
	3/8				3/8		
	1/2	532694	SGS-10-32		1/2	546552	SG-10-32-B
	5/8				5/8		
	3/4	532695	SGS-5/16-24		3/4	546574	SG-5/16"-24-B
	1	532696	SGS-3/8-24		1	546540	SG-3/8"-24-B
Self-aligning rod coupler FK				Coupling piece KSZ			
	5/16	532702	FK-6-32		5/16, 3/8	–	
	3/8				1/2, 5/8		
	1/2	532703	FK-10-32		3/4		
	5/8				1	36129	KSZ-3/8-24-UNF
	3/4	532704	FK-5/16-24				
	1	532705	FK-3/8-24				

Ordering Data – Guide Units					
	For Ø [in]	Stroke [in]	With recirculating ball bearing guide		With plain bearing guide
			Part No.	Type	Part No. Type
	5/16, 3/8	up to 8	151730	FEN-5/16"-3/8"-...-KF	151720 FEN-5/16"-3/8"-...
	1/2, 5/8	up to 8	151731	FEN-1/2"-5/8"-...-KF	151721 FEN-1/2"-5/8"-...
	3/4	up to 10	151732	FEN-3/4"-...-KF	151722 FEN-3/4"-...
	1	up to 10	151733	FEN-1"-...-KF	151723 FEN-1"-...

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

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Ordering Data – One-way Flow Control Valves				
	Connection		Part No.	Type
	Thread	For tubing O.D.		
For exhaust air				
	10/32 UNF	5/32"	165008	GRLA-10-32-UNF-QS-5/32-U
		1/4"	192753	GRLA-10-32-UNF-QS-1/4-U
	1/8" NPT	5/32"	165009	GRLA-1/8-NPT-QS-5/32-U
		1/4"	165010	GRLA-1/8-NPT-QS-1/4-U
		3/16"	190941	GRLA-1/8-NPT-QS-3/16-U
		5/16"	165013	GRLA-1/8-NPT-QS-5/16-U
For supply air				
	10/32 UNF	—	151576	GRLZ-10-UNF-B
			151579	GRLZ-10-UNF-RS-B
		3/16"	151577	GRLZ-10-UNF-3/16-B
		1/4"	151578	GRLZ-10-UNF-1/4-B
	1/8" NPT	—	151561	GRLZ-1/8-NPT-B
			151564	GRLZ-1/8-NPT-RS-B
		1/4"	151562	GRLZ-1/8-NPT-1/4-B
		3/8"	151563	GRLZ-1/8-NPT-3/8-B

Ordering Data – Push-in Fittings QS				Technical Data → www.festo.com/catalog/QS	
	For tubing O.D. [in]	10/32 UNF		R1/8	
		Part No.	Type	Part No.	Type
With external hex					
	3/16	164851	QS-10-32-UNF-3/16-U	–	
	1/4	164850	QS-10-32-UNF-1/4-U	183741	QS-1/8-1/4-I-U-M
	5/16	–		183742	QS-1/8-5/16-I-U-M
With internal hex					
	1/8	–		533213	QS-H-1/8-1/8-U-M
	5/32	–		533214	QS-H-1/8-5/32-U-M
	3/16	–		533215	QS-H-1/8-3/16-U-M
	1/4	190687	QS-10-32-UNF-1/4-I-U	533216	QS-H-1/8-1/4-U-M
	5/16	–		533217	QS-H-1/8-5/16-U-M

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

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Ordering data – Proximity Switches for T-slot, Magneto-resistive							Technical data → www.festo.com/catalog/sm	
	Mounting	Switch output	Electrical connection		Cable length [ft]	Connection direction	Part No.	Type
			Cable	M8 plug				
NO contact								
	Via mounting kit	PNP	3-wire	–	8.2	In-line	152836	SMT0-4U-PS-K-LED-24
			–	3-pin	–	In-line	152742	SMT0-4U-PS-S-LED-24
		NPN	3-wire	–	8.2	In-line	152837	SMT0-4U-NS-K-LED-24
			–	3-pin	–	In-line	152743	SMT0-4U-NS-S-LED-24

Ordering data – Proximity Switches for T-slot, Magnetic Reed						Technical data → www.festo.com/catalog/sm	
	Mounting	Electrical connection		Cable length [ft]	Connection direction	Part No.	Type
		Cable	M8 plug				
NO contact							
	Via mounting kit	3-wire	–	8.2	In-line	36198	SME0-4U-K-LED-24
				16.4	In-line	175401	SME0-4U-K5-LED-24
		–	3-pin	–	In-line	151526	SME0-4U-S-LED-24-B

Ordering data – Proximity Switches for T-slot, Magnetic Reed, Corrosion Resistant						Technical data → www.festo.com/catalog/sm	
	Mounting	Electrical connection		Cable length [ft]	Connection direction	Part No.	Type
		Cable	M8 plug				
NO contact							
	Via mounting kit	3-wire	–	8.2	In-line	161775	CRSMEO-4-K-LED-24

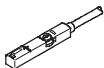
Ordering Data – Mounting Kit for Proximity Sensors SME0/SMT0/CRSMEO			
Designation	For Ø [in]	Part No.	Type
Mounting kit SMBR			
	5/16	19272	SMBR-8
	3/8	19273	SMBR-10
	1/2	19274	SMBR-12
	5/8	19275	SMBR-16
	3/4	19276	SMBR-20
	1	19277	SMBR-25

Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

FESTO

Ordering data – Proximity switches for T-slot, magneto-resistive					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	2.5	543867	SMT-8M-PS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543866	SMT-8M-PS-24V-K-0,3-M8D
			Plug M12x1, 3-pin	0.3	543869	SMT-8M-PS-24V-K-0,3-M12
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	Cable, 3-wire	2.5	543870	SMT-8M-NS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543871	SMT-8M-NS-24V-K-0,3-M8D
			Plug M8x1, 3-pin	0.3	175436	SMT-8-PS-K-LED-24-B
					175484	SMT-8-PS-S-LED-24-B
N/C contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7.5	543873	SMT-8M-PO-24V-K7,5-OE

Ordering data – Proximity switches for T-slot, magnetic reed					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Cable, 3-wire	2.5	543862	SME-8M-DS-24V-K-2,5-OE
				5.0	543863	SME-8M-DS-24V-K-5,0-OE
			Cable, 3-wire	2.5	543872	SME-8M-ZS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543861	SME-8M-DS-24V-K-0,3-M8D
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150857	SME-8-S-LED-24
N/C contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160251	SME-8-O-K-LED-24

Ordering Data – Mounting Kit for Proximity Sensors SME/SMT-8			
Designation	For Ø [in]	Part No.	Type
Mounting kit SMBR-8			
	5/16	175091	SMBR-8-8
	3/8	175092	SMBR-8-10
	1/2	175093	SMBR-8-12
	5/8	175094	SMBR-8-16
	3/4	175095	SMBR-8-20
	1	175096	SMBR-8-25

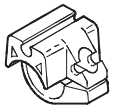
Round Cylinders DSNU/ESNU – Inch Series (Sizes 5/16" to 1")

Accessories

FESTO

Ordering data – Proximity switches for C-slot, magneto-resistive					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire, in-line	2.5	525915	SMT-10F-PS-24V-K2,5L-OE
			Plug M8x1, 3-pin, in-line	0.3	525916	SMT-10F-PS-24V-K0,3L-M8D
			Plug M8x1, 3-pin, lateral	0.3	526675	SMT-10F-PS-24V-K0,3Q-M8D
	Insertable in the slot lengthwise	PNP	Plug M8x1, 3-pin, in-line	0.3	173220	SMT-10-PS-SL-LED-24
			Cable, 3-wire, in-line	2.5	173218	SMT-10-PS-KL-LED-24

Ordering data – Proximity switches for C-slot, magnetic reed					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Plug M8x1, 3-pin, in-line	0.3	525914	SME-10F-DS-24V-K0,3L-M8D
			Cable, 3-wire, in-line	2.5	525913	SME-10F-DS-24V-K2,5L-OE
			Cable, 2-wire, in-line	2.5	526672	SME-10F-ZS-24V-K2,5L-OE
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	173212	SME-10-SL-LED-24
			Cable, 3-wire, in-line	2.5	173210	SME-10-KL-LED-24

Ordering Data – Mounting Kit for Proximity Sensors SME/SMT-10			
Designation	For Ø [in]	Part No.	Type
Mounting kit SMBR-10			
	5/16	175101	SMBR-10-8
	3/8	173227	SMBR-10-10
	1/2	175102	SMBR-10-12
	5/8	173228	SMBR-10-16
	3/4	175103	SMBR-10-20
	1	175104	SMBR-10-25

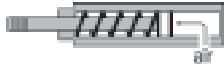
Ordering data – Connecting cables				Technical data → www.festo.com/catalog/nebu	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3
			5.0	541334	NEBU-M8G3-K-5-LE3
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541363	NEBU-M12G5-K-2.5-LE3
			5.0	541364	NEBU-M12G5-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5.0	541341	NEBU-M8W3-K-5-LE3
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541367	NEBU-M12W5-K-2.5-LE3
			5.0	541370	NEBU-M12W5-K-5-LE3

Round cylinders ESNU – Inch Series (Sizes 1-1/4” to 2-1/2”)

FESTO

Technical Data

Single-acting, Spring Return



Ø - Diameter
1-1/4 ... 2-1/2 inch

Stroke length
1/8 ... 2 inch



General Technical Data				
Piston Ø [in]	1-1/4	1-5/8	2	2-1/2
Pneumatic connection	1/8" NPT	1/4" NPT	1/4" NPT	3/8" NPT
Piston rod thread	3/8-24	1/2-20	5/8-18	5/8-18
Constructional design	Piston			
	Piston rod			
	Cylinder barrel			
Cushioning	Flexible cushioning rings at both ends (P)			
Magnet for position sensing ¹⁾	Optional			

1) Positioning sensing via magnetic proximity sensor (ordered separately, see accessories).

Operating Pressure [psi]				
Piston Ø	1-1/4	1-5/8	2	2-1/2
Operating medium	Filtered compressed air, lubricated or unlubricated			
Operating pressure [psi]	17.6 ... 150			

Ambient Conditions	
Ambient temperature ²⁾ [°F]	-4 ... +176
Corrosion resistance class CRC ³⁾	2

2) Note operating range of proximity sensors

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Round cylinders ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Technical Data

FESTO

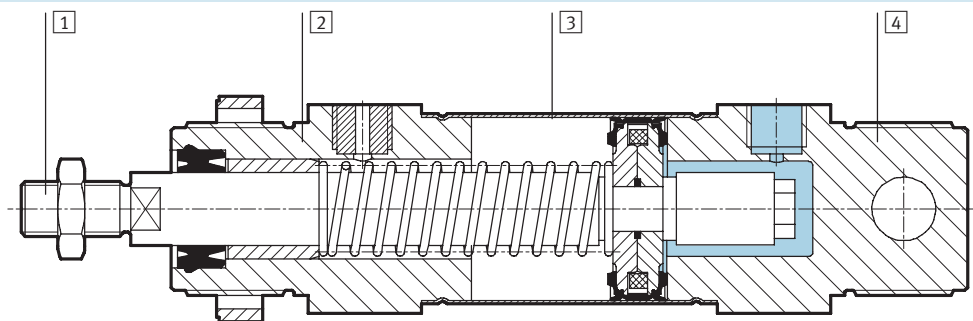
Forces [lbf] and Impact Energy [ft-lbf]				
Piston Ø [in]	1-1/4	1-5/8	2	2-1/2
Theoretical force at 90 psi, extending	94	150	247	402
Max. spring return force 3/8 inch stroke	12	17.7	16.7	16.7
Max. spring return force 1 inch stroke	12	17.7	16.7	16.7
Max. spring return force 2 inch stroke	12	17.7	16.7	16.7
Max. impact energy at the end positions ¹⁾	0.30	0.52	0.74	0.96

1) The values are reduced by approx. 50% at 176 °F

Weights ESNU-... [oz]				
Piston Ø [in]	1-1/4	1-5/8	2	2-1/2
Product weight with 0 inch stroke	13.1	23.3	38.3	51.0
Additional weight per 1 inch stroke	1.4	2.2	3.6	3.9

Materials

Sectional view



ESNU	
1	Piston rod
2	Bearing cap
3	Cylinder barrel
4	End cap
–	Seals
–	Spring

High-alloy steel

Wrought aluminum alloy

High-alloy stainless steel

Wrought aluminum alloy

Polyurethane, nitrile rubber

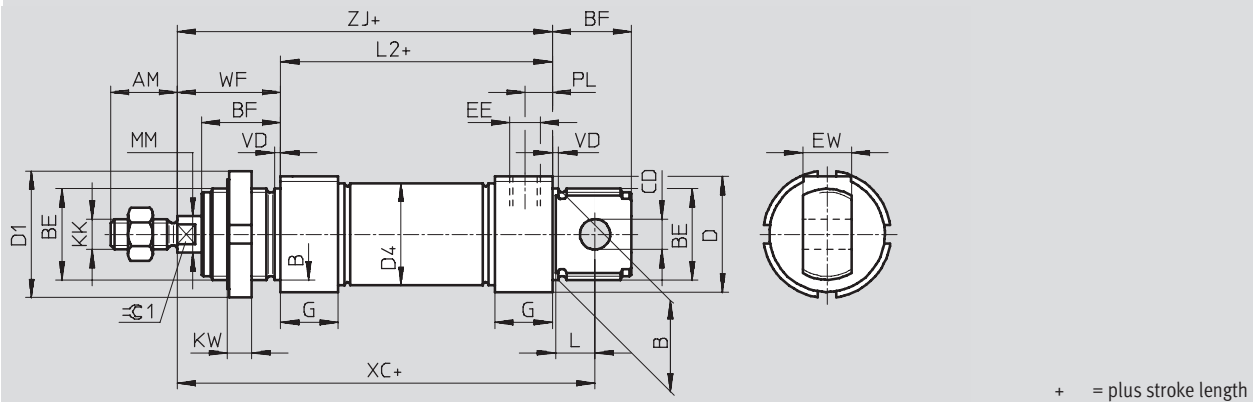
Spring steel

Round cylinders ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Technical Data

FESTO

Dimensions



Ø [in]	AM	B Ø	BE	BF	CD Ø	D Ø	D1 Ø	D4 Ø	EE	EW	G	KK
1-1/4	0.9	1.2	M30x1.5	1.0	0.4	1.5	1.7	1.3	1/8" NPT	0.6	0.7	M10x1.25
1-5/8	0.9	1.5	M38x1.5	1.2	0.5	1.8	2.0	1.6	1/4" NPT	0.7	1.0	M12x1.25
2	1.3	1.8	M45x1.5	1.3	0.6	2.2	2.4	2.1	3/8" NPT	0.8	1.1	M16x1.5
2-1/2						2.8		2.6				

Ø [in]	KW	L	L2	PL	MM Ø	VD	WF	XC	ZJ	≠C1 [mm]
1-1/4	0.3	0.5	2.7	0.4	0.5	0.1	1.3	4.6	4.1	10
1-5/8	0.4	0.6	3.3	0.5	0.6	0.1	1.5	5.5	4.9	13
2		0.6	3.4		0.8		1.7	5.8	5.1	17
2-1/2			3.7	0.5			1.8	6.1	5.5	

Dimensions are in inches, unless otherwise noted.

Round cylinders ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

FESTO

Ordering Data

M Mandatory Data				O Options
Function	Piston Ø	Stroke	Cushioning	Magnet for position sensing
ESNU	1 1/4 1 5/8 2 2 1/2	1/8 ... 2	P	A
ESNU	- 1 1/4	- 2	- P	- A

Ordering Table							
Size	1 1/4	1 5/8	2	2 1/2	Conditions	Code	Enter code
M Function	Single-acting round cylinder					ESNU	ESNU
Piston Ø [in]	1 1/4	1 5/8	2	2 1/2		-...	
Stroke [in]	1/8 ... 2					-...	
Cushioning	Flexible cushioning rings at both ends					-P	-P
O Magnet for position sensing	For use with magnetic proximity sensor				1	-A	

1 Reliable position sensing requires a minimum stroke length of 0.4 inch.

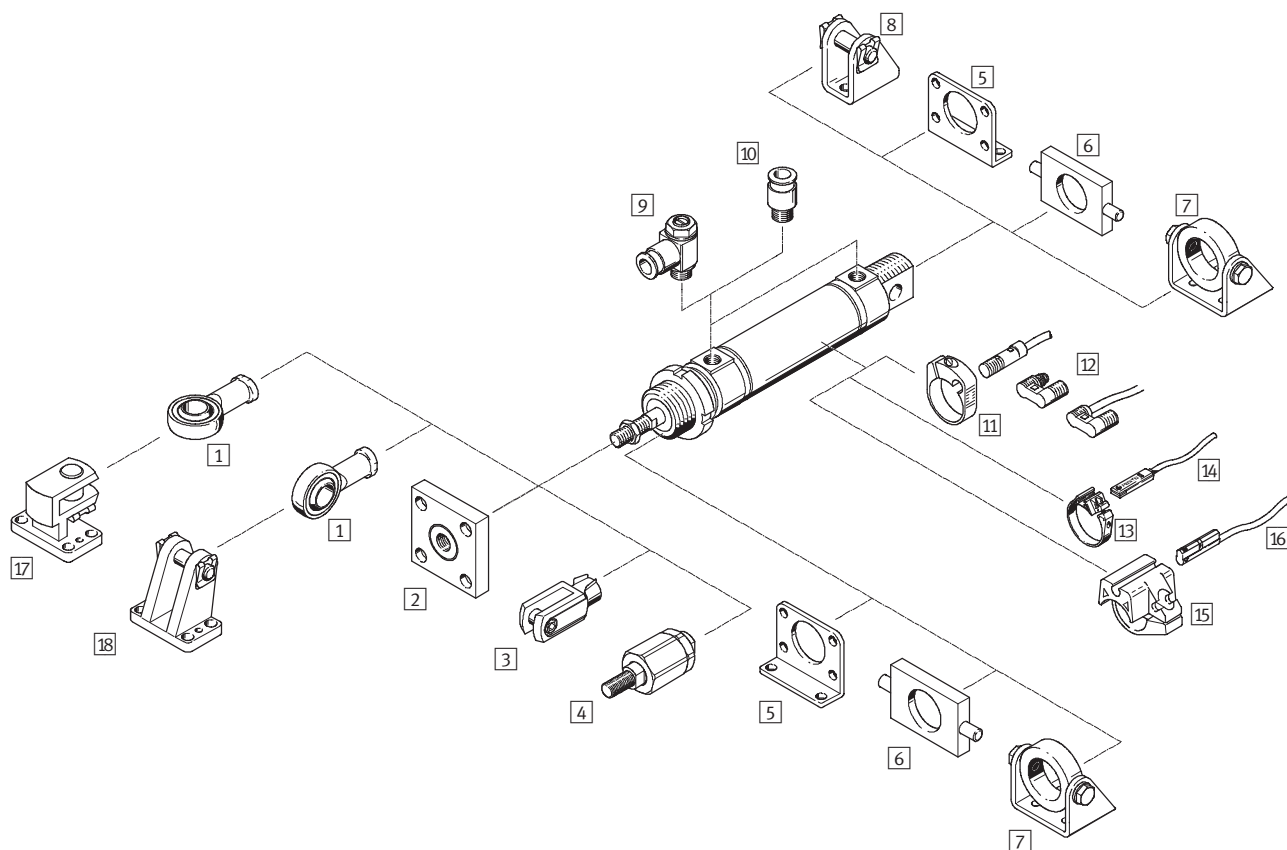
Transfer order code

ESNU	-		-		-	P	-	
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Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Accessories

FESTO



Mounting Attachments and Accessories		→ Page
1	Rod eye SGS/CRSGS	22
2	Coupling piece KSG/KSZ	22
3	Rod clevis SG/CRSG	22
4	Self-aligning rod coupler FK	22
5	Flange mounting FBN/CRFV	20
6	Swivel mounting WBN	21
7	Swivel mounting SBN	21
8	Clevis foot LBN/CRLBN	22
9	One-way flow control valve GRLA/GRLZ/CRGRLA	23
10	Push-in fitting QS	23
11	Sensor mounting kit CRSMBR	24
12	Proximity sensor SMEO/SMT0/CRSMEO-4	24
13	Sensor mounting kit SMBR-8	25
14	Proximity sensor SME/SMT-8	25
15	Sensor mounting kit SMBR-10	26
16	Proximity sensor SME/SMT-10	26
17	Clevis foot, lateral LQG	21
18	Clevis foot LBG	21

Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

FESTO

Accessories

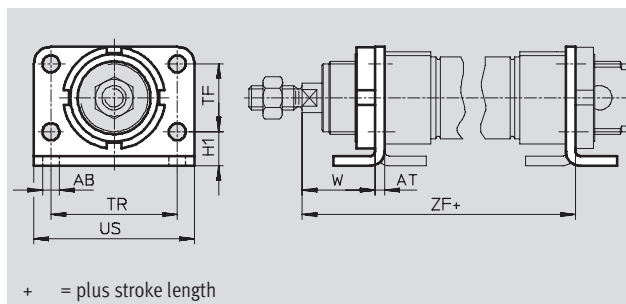
Flange Mounting FBN/CRFV

Material:

FBN: Galvanized steel

CRFV: High-alloy stainless steel

Free of copper, PTFE and silicone



Dimensions								
Ø	AB	AT	H1	TF	TR	US	W	ZF
[in]	Ø							
1-1/4	0.3	0.2	0.6	1.1	2.0	2.6	1.2	4.2
1-5/8	0.4	0.2	0.7	1.2	2.4	3.1	1.1	4.9
2	0.4	0.2	0.8	1.6	2.8	3.5	1.5	5.4
2-1/2	0.4	0.2	0.8	2.0	3.0	3.8	1.5	5.7

Ordering Data								
Ø	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [oz]	Part No.	Type	CRC ¹⁾	Weight [oz]	Part No.	Type
[in]								
1-1/4	2	3.6	195855	FBN-32	4	3.6	161858	CRFV-32
1-5/8	2	6.7	195856	FBN-40	4	6.7	161859	CRFV-40
2	2	10.2	195857	FBN-50	4	10.2	161860	CRFV-50
2-1/2	2	12.9	195858	FBN-63	4	12.9	161861	CRFV-63

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Corrosion resistance class 4 according to Festo standard 940 070

Components requiring higher corrosion resistance. Parts subjected to aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.

Dimensions are in inches, unless otherwise noted.

Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

FESTO

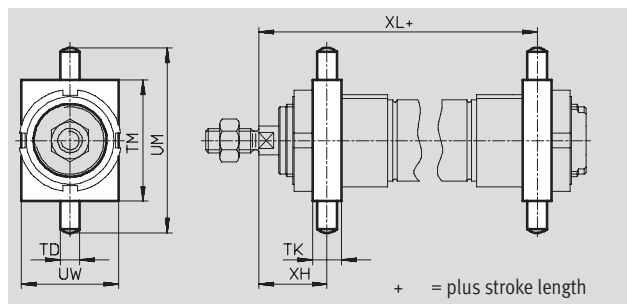
Accessories

Swivel Mounting WBN

Material:

Galvanized steel

Free of copper, PTFE and silicone



Dimensions and Ordering Data											
Ø	TD	TK	TM	UM	UW	XH	XL	CRC ¹⁾	Weight	Part No.	Type
[in]	Ø								[oz]		
1-1/4	0.3	0.5	2.0	3.0	1.6	1.1	4.3	2	4.6	195863	WBN-32
1-5/8	0.4	0.6	2.4	3.6	2.0	1.2	5.0	2	8.5	195864	WBN-40
2	0.5	0.8	3.1	4.6	2.6	1.3	5.5	2	21.5	195865	WBN-50/63
2-1/2	0.5	0.8	3.1	4.6	2.6	1.4	5.9	2	21.5	195865	WBN-50/63

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Swivel Mounting SBN

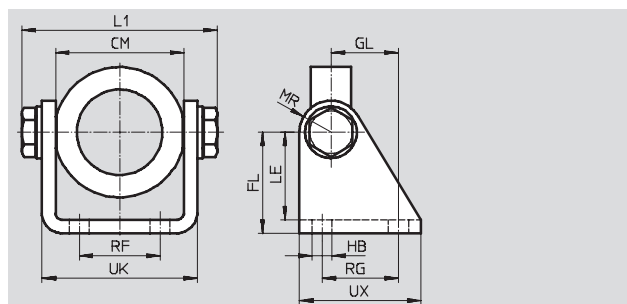
Material:

Mounting ring: Wrought aluminum alloy, anodized

Bearings: Bronze

Screws: Galvanized steel

Bracket: Steel



Dimensions and Ordering Data											
Ø	CM	FL	GL	HB	L1	LE	MR	RF	RG	UK	UX
[in]					max.						
1-1/4	1.8	1.6	1.1	0.4	2.8	1.4	0.5	1.1	1.2	2.2	2.0
1-5/8	2.2	1.8	1.2	0.4	3.5	1.5	0.6	1.4	1.3	2.7	2.1
2, 2-1/2	2.8	2.0	1.3	0.4	4.0	1.7	0.6	1.7	1.4	3.2	2.6

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents..

Ordering Data – Mounting Attachments							
Designation	For Ø [in]	Part No.	Type	Designation	For Ø [in]	Part No.	Type
Clevis Foot mounting LBG				Clevis Foot, right-angled LQG			
	1-1/4	31761	LBG-32		1-1/4	31768	LQG-32
	1-5/8	31762	LBG-40		1-5/8	31769	LQG-40
	2	31763	LBG-50		2	31770	LQG-50
	2-1/2	31764	LBG-63		2-1/2	31771	LQG-63

Dimensions are in inches, unless otherwise noted.

2008/02 – Subject to change – Round Cylinders ESNU

Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Accessories

FESTO

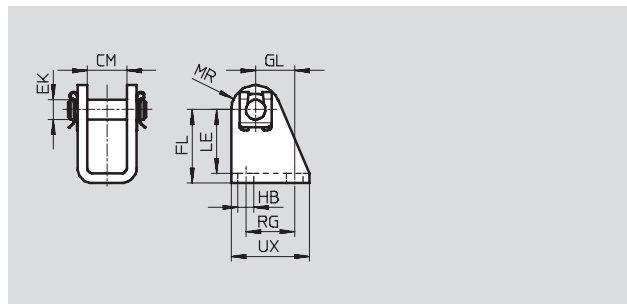
Clevis Foot LBN/CRLBN

Material:

LBN: Galvanized steel

CRLBN: High-alloy stainless steel

Free of copper, PTFE and silicone



Dimensions									
For Ø	CM	EK	FL	GL	HB	LE	MR	RG	UX
[in]		Ø							
1-1/4	0.6	0.4	1.4	0.7	0.3	1.2	0.4	0.9	1.4
1-5/8	0.7	0.5	1.6	1.0	0.4	1.4	0.5	1.2	1.8
2, 2-1/2	0.8	0.6	1.8	1.1	0.4	1.5	0.6	1.3	2.0

Ordering Data								
Ø	Basic version				High corrosion protection			
	CRC ¹⁾	Weight [oz]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type
[in]								
1-1/4	2	3.8	195860	LBN-32	4	3.8	195866	CRLBN-32
1-5/8	2	6.8	195861	LBN-40	4	6.5	195867	CRLBN-40
2, 2-1/2	2	10.7	195862	LBN-50/63	4	10.2	195868	CRLBN-50/63

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

Components with moderate corrosion resistance for use in normal industrial environments subjected to contact with coolants or lubricating agents.

Corrosion resistance class 4 according to Festo standard 940 070

Components requiring higher corrosion resistance. Parts subjected to aggressive media, e.g. food or chemical industry. These applications should be supported with special tests with the media if required.

Ordering Data – Piston Rod Attachments									
Designation	For Ø [in]	Part No.	Type		Designation	For Ø [in]	Part No.	Type	
Rod Eye SGS					Self-aligning rod coupler FK				
	1-1/4	532696	SGS-3/8-24			1-1/4	532705	FK-3/8-24	
	1-5/8	532697	SGS-1/2-20			1-5/8	532706	FK-1/2-20	
	2	532698	SGS-5/8-18			2	532707	FK-5/8-18	
	2-1/2					2-1/2			
Rod clevis SG					Coupling piece KSZ				
	1-1/4	13000030	SG-3/8"-24-B			1-1/4	36129	KSZ-3/8-24-UNF	
	1-5/8	13000469	SG-1/2-20-B			1-5/8	36130	KSZ-1/2-20-UNF	
	2	13000712	SG5/8-18			2	36131	KSZ-5/8-18-UNF	
	2-1/2					2-1/2			

Dimensions are in inches, unless otherwise noted.

Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Accessories

FESTO

Ordering Data – One-way Flow Control Valves				Technical Data ➔ www.festo.com/catalog/GRLA	
	Connection		Part No.	Type	
	Thread	For tubing O.D.			
For exhaust air					
	1/8" NPT	5/32"	165009	GRLA-1/8-NPT-QS-5/32-U	
		3/16"	190941	GRLA-1/8-NPT-QS-3/16-U	
		1/4"	165010	GRLA-1/8-NPT-QS-1/4-U	
		5/16"	165013	GRLA-1/8-NPT-QS-5/16-U	
	1/4" NPT	3/16"	190944	GRLA-1/4-NPT-QS-3/16-U	
		1/4"	165011	GRLA-1/4-NPT-QS-1/4-U	
		5/16"	165014	GRLA-1/4-NPT-QS-5/16-U	
		3/8"	190947	GRLA-1/4-NPT-QS-3/8-U	
	3/8" NPT	1/4"	165012	GRLA-3/8-NPT-QS-1/4-U	
		5/16"	165015	GRLA-3/8-NPT-QS-5/16-U	
		3/8"	190950	GRLA-3/8-NPT-QS-3/8-U	
		1/2"	190951	GRLA-3/8-NPT-QS-1/2-U	
	1/2" NPT	3/8"	190952	GRLA-1/2-NPT-QS-3/8-U	
		1/2"	190953	GRLA-1/2-NPT-QS-1/2-U	
For supply air					
	1/8" NPT	–	151561	GRLZ-1/8-NPT-B	
		–	151564	GRLZ-1/8-NPT-RS-B	
		1/4"	151562	GRLZ-1/8-NPT-1/4-B	

Ordering Data – Push-in Fittings QS						Technical Data → www.festo.com/catalog/QS			
	For tubing O.D. [in]	R1/8		R1/4		R3/8		R1/2	
		Part No.	Type	Part No.	Type	Part No.	Type	Part No.	Type
With external hex									
	1/4	183741	QS-1/8-1/4-I-U-M	192809	QS-1/4-1/4-I-U-M	–		–	
	5/16	183742	QS-1/8-5/16-I-U-M	183743	QS-1/4-5/16-I-U-M	183745	QS-3/8-5/16-I-U-M	–	
	3/8	–		183744	QS-1/4-3/8-I-U-M	183746	QS-3/8-3/8-I-U-M	183747	QS-1/2-3/8-I-U-M
	1/2	–		–		–		183748	QS-1/2-1/2-I-U-M
	–	–		–		–		–	
With internal hex									
	1/8	533213	QS-H-1/8-1/8-U-M	–		–		–	
	5/32	533214	QS-H-1/8-5/32-U-M	–		–		–	
	3/16	533215	QS-H-1/8-3/16-U-M	533218	QS-H-1/4-3/16-U-M	–		–	
	1/4	533216	QS-H-1/8-1/4-U-M	533219	QS-H-1/4-1/4-U-M	533222	QS-H-3/8-1/4-U-M	–	
	5/16	533217	QS-H-1/8-5/16-U-M	533220	QS-H-1/4-5/16-U-M	533223	QS-H-3/8-5/16-U-M	–	
	3/8	–		533221	QS-H-1/4-3/8-U-M	533224	QS-H-3/8-3/8-U-M	533226	QS-H-1/2-3/8-U-M
	1/2	–		–		533225	QS-H-3/8-1/2-U-M	533227	QS-H-1/2-1/2-U-M

Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Accessories

FESTO

Ordering data – Proximity Switches for T-slot, Magneto-resistive							Technical data → www.festo.com/catalog/sm	
	Mounting	Switch output	Electrical connection		Cable length [ft]	Connection direction	Part No.	Type
			Cable	M8 plug				
NO contact								
	Via mounting kit	PNP	3-wire	–	8.2	In-line	152836	SMT0-4U-PS-K-LED-24
			–	3-pin	–	In-line	152742	SMT0-4U-PS-S-LED-24
		NPN	3-wire	–	8.2	In-line	152837	SMT0-4U-NS-K-LED-24
			–	3-pin	–	In-line	152743	SMT0-4U-NS-S-LED-24

Ordering data – Proximity Switches for T-slot, Magnetic Reed						Technical data → www.festo.com/catalog/sm	
	Mounting	Electrical connection		Cable length [ft]	Connection direction	Part No.	Type
		Cable	M8 plug				
NO contact							
	Via mounting kit	3-wire	–	8.2	In-line	36198	SME0-4U-K-LED-24
				16.4	In-line	175401	SME0-4U-K5-LED-24
		–	3-pin	–	In-line	151526	SME0-4U-S-LED-24-B

Ordering data – Proximity Switches for T-slot, Magnetic Reed, Corrosion Resistant						Technical data → www.festo.com/catalog/sm	
	Mounting	Electrical connection		Cable length [ft]	Connection direction	Part No.	Type
		Cable	M8 plug				
NO contact							
	Via mounting kit	3-wire	–	8.2	In-line	161775	CRSMEO-4-K-LED-24

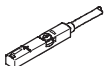
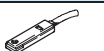
Ordering Data – Mounting Kit for Proximity Sensors SMEO/SMTO/CRSMEO			
Designation	For Ø [in]	Part No.	Type
Mounting kit CRSMBR, corrosion resistant			
	1-1/4	163888	CRSMBR-32
	1-5/8	163889	CRSMBR-40
	2	163890	CRSMBR-50
	2-1/2	163891	CRSMBR-63

Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Accessories

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Ordering data – Proximity switches for T-slot, magneto-resistive					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	2.5	543867	SMT-8M-PS-24V-K-2,5-OE
			Plug M8x1, 3-pin	0.3	543866	SMT-8M-PS-24V-K-0,3-M8D
			Plug M12x1, 3-pin	0.3	543869	SMT-8M-PS-24V-K-0,3-M12
		NPN	Cable, 3-wire	2.5	543870	SMT-8M-NS-24V-K-2,5-OE
	Insertable in the slot lengthwise, flush with the cylinder profile	PNP	Plug M8x1, 3-pin	0.3	543871	SMT-8M-NS-24V-K-0,3-M8D
			Cable, 3-wire	2.5	175436	SMT-8-PS-K-LED-24-B
			Plug M8x1, 3-pin	0.3	175484	SMT-8-PS-S-LED-24-B
N/C contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire	7.5	543873	SMT-8M-PO-24V-K7,5-OE

Ordering data – Proximity switches for T-slot, magnetic reed					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Cable, 3-wire	2.5	543862	SME-8M-DS-24V-K-2,5-OE
				5.0	543863	SME-8M-DS-24V-K-5,0-OE
			Plug M8x1, 3-pin	2.5	543872	SME-8M-ZS-24V-K-2,5-OE
				0.3	543861	SME-8M-DS-24V-K-0,3-M8D
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150855	SME-8-K-LED-24
			Plug M8x1, 3-pin	0.3	150857	SME-8-S-LED-24
N/C contact						
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160251	SME-8-O-K-LED-24

Ordering Data – Mounting Kit for Proximity Sensors SME/SMT-8					
Designation	For Ø [in]			Part No.	Type
Mounting kit SMBR-8					
	1-1/4			175097	SMBR-8-32
	1-5/8			175098	SMBR-8-40
	2			175099	SMBR-8-50
	2-1/2			175100	SMBR-8-63

Ordering data – Connecting cables				Technical data → www.festo.com/catalog/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
			5.0	541334	NEBU-M8G3-K-5-LE3
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541363	NEBU-M12G5-K-2.5-LE3
			5.0	541364	NEBU-M12G5-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5.0	541341	NEBU-M8W3-K-5-LE3
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541367	NEBU-M12W5-K-2.5-LE3
			5.0	541370	NEBU-M12W5-K-5-LE3

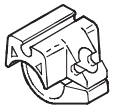
Round cylinders DSNU/ESNU – Inch Series (Sizes 1-1/4" to 2-1/2")

Accessories

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Ordering data – Proximity switches for C-slot, magneto-resistive					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	PNP	Cable, 3-wire, in-line	2.5	525915	SMT-10F-PS-24V-K2,5L-OE
			Plug M8x1, 3-pin, in-line	0.3	525916	SMT-10F-PS-24V-K0,3L-M8D
			Plug M8x1, 3-pin, lateral	0.3	526675	SMT-10F-PS-24V-K0,3Q-M8D
	Insertable in the slot lengthwise	PNP	Plug M8x1, 3-pin, in-line	0.3	173220	SMT-10-PS-SL-LED-24
			Cable, 3-wire, in-line	2.5	173218	SMT-10-PS-KL-LED-24

Ordering data – Proximity switches for C-slot, magnetic reed					Technical data → www.festo.com/catalog/sm	
	Type of mounting	Switch output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile	Contacting	Plug M8x1, 3-pin, in-line	0.3	525914	SME-10F-DS-24V-K0,3L-M8D
			Cable, 3-wire, in-line	2.5	525913	SME-10F-DS-24V-K2,5L-OE
			Cable, 2-wire, in-line	2.5	526672	SME-10F-ZS-24V-K2,5L-OE
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	173212	SME-10-SL-LED-24
			Cable, 3-wire, in-line	2.5	173210	SME-10-KL-LED-24

Ordering Data – Mounting Kit for Proximity Sensors SME/SMT-10			
Designation	For Ø [in]	Part No.	Type
Mounting kit SMBR-10			
	1-1/4	175105	SMBR-10-32
	1-5/8	175106	SMBR-10-40
	2	175107	SMBR-10-50
	2-1/2	175108	SMBR-10-63