

Linear/swivel clamp CLR

FESTO



- Swivelling and clamping via integrated guide
- Swivel direction freely selectable and subsequently adjustable
- Compact
- Versatile
- Easy to maintain



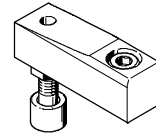
Linear/swivel clamp CLR

Key features

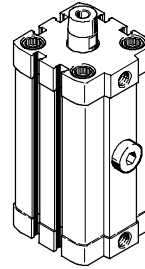
Functional description

The CLR linear/swivel clamp is used for all types of clamping. Through the combination of the linear and swivel motion of the piston rod, it is possible to insert and remove workpieces even

beyond the clamping range. Here it is possible to choose between swivelling to the right or left, while the CLR also boasts a linear stroke as of $\varnothing 32$.



Clamping finger set:
Can be ordered as an accessory



Optimal range

- Simple mechanical system
- Robust design
- Long service life
- Low initial, assembly and maintenance expenditure

Versatile

- Subsequently adjustable swivel direction
- Compact dimensions for the tightest installation spaces

Easy to assemble

- The port pattern corresponds to ISO 21 287, meaning that foot and flange mountings from the standard accessories range can be used.
- Female threads in the bearing and end cap enable simple assembly of the cylinder either directly or using mounting accessories.

Practical

- Clamping finger sets including slip-on rubber cap to protect sensitive surfaces are available as accessories.
- Clamping finger can be freely adjusted across a full 360°
- Can be repaired with wearing parts kit

Swivel direction



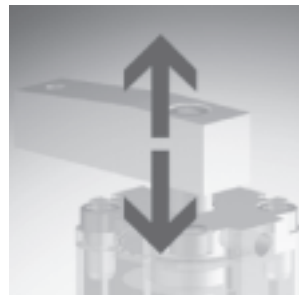
Swivel motion to right

Viewed from above the piston rod side with the piston rod retracted. Clockwise swivel direction.



Swivel motion to left

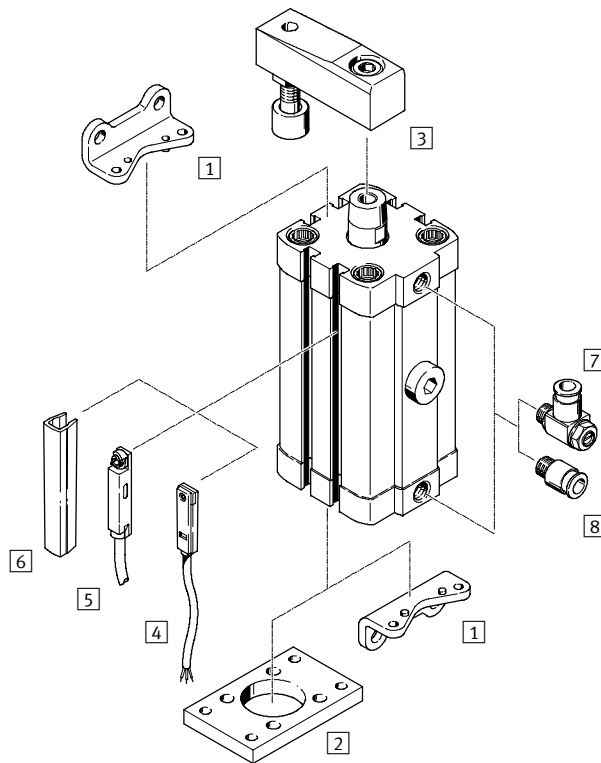
Viewed from above the piston rod side with the piston rod retracted. Anti-clockwise swivel direction.



Linear motion

Linear/swivel clamp CLR

Peripherals overview



Mounting attachments and accessories		
	Brief description	→ Page
1	Foot mounting HNA	1 / 5.5-12
2	Flange mounting FNC	1 / 5.5-12
3	Clamping finger set	1 / 5.5-14
4	Proximity sensors SME/SMT-8	1 / 5.5-15
5	Proximity sensors SME/SMT-8F	1 / 5.5-15
6	Slot cover ABP-5-S	1 / 5.5-15
7	One-way flow control valve GRLA/GRLZ	1 / 5.5-14
8	Push-in/threaded fitting QS	Volume 3

Linear/swivel clamp CLR

Type code

CLR - 12 - 10 - R - P - A

Type

Double-acting	
CLR	Linear/swivel clamp

Piston Ø [mm]

Clamping stroke [mm]

Swivel direction

R	Swivel motion to right
L	Swivel motion to left
G	Linear motion

Cushioning

P	Non-adjustable at either end
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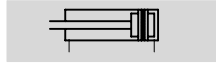
Position sensing


A	Via proximity sensor
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Linear/swivel clamp CLR

Technical data

Function



 Diameter
12 ... 63 mm

 Stroke length
10, 20, 50 mm

 [www.festo.com/en/
Spare_parts_service](http://www.festo.com/en/Spare_parts_service)



General technical data																		
Piston Ø	12	16	20	25	32	40	50	63										
Pneumatic connection	M5	M5	M5	M5	G1/8	G1/8	G1/8	G1/8										
Piston-rod end, female thread	M3	M4	M6	M6	M8	M8	M10	M10										
Operating medium	Filtered compressed air, lubricated or unlubricated																	
Design	Piston																	
	Piston rod																	
	Cylinder barrel																	
Cushioning	Non-adjustable at either end																	
Position sensing	Via proximity sensor																	
Type of mounting	Via through-holes																	
	Direct																	
	Via accessories																	
Mounting position	Any																	
Clamping stroke ¹⁾	[mm]	10	20	10	20	10	20	10	20	10	20	10	20	20	50	20	50	
Total stroke ²⁾	[mm]	19	29	20	30	22	32	23	33	28	38	28	38	41	71	43	73	
Swivel direction		Swivel to right, swivel to left									Swivel to right, swivel to left, plus linear motion							
Swivel angle	[°]	90 ±1																

- 1) The clamping stroke corresponds to the linear stroke which effects clamping.
2) The total stroke comprises the clamping stroke and the swivel stroke.

Operating pressure [bar]								
Piston Ø	12	16	20	25	32	40	50	63
Piston rods at one end	2 ... 10							

Ambient conditions	
Variant	Basic version
Ambient temperature ¹⁾	[°C] -10 ... +80
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 requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Linear/swivel clamp CLR

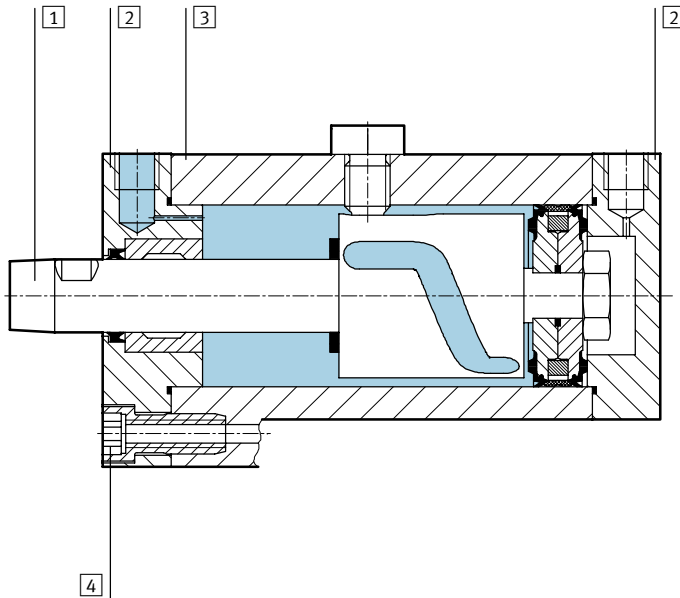
Technical data

Forces [N] without clamping finger (FS) and clamping screw								
Piston Ø	12	16	20	25	32	40	50	63
Theoretical force at 6 bar, retracting	51	90	121	227	362	633	990	1,682

Forces [N] with clamping finger (FS) and clamping screw, 5 mm before stroke end					
Piston -Ø		12	20	32	50
Effective clamping force	2 bar	12	35	111	271
	4 bar	23	73	216	508
	6 bar	34	109	313	716

Materials

Sectional view



Linear/swivel clamp	
1	Piston rod High-alloy steel
2	Bearing and end caps Coated aluminium
3	Cylinder barrel Smooth anodised aluminium
4	Flange screws Galvanised steel
-	Static seals Nitrile rubber

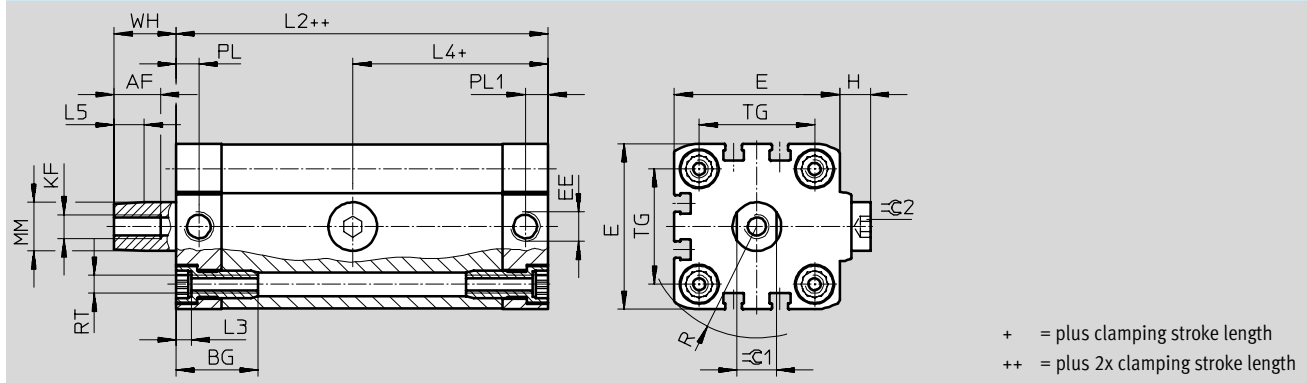
Weights [g]									
Piston Ø		12	16	20	25	32	40	50	63
Product weight at stroke	10 mm	135	160	335	395	685	880	-	-
	20 mm	160	190	385	455	765	985	1,650	2,100
	50 mm	-	-	-	-	-	-	2,115	2,635

Linear/swivel clamp CLR

Technical data

Dimensions Download CAD data → www.festo.com/en/engineering


Piston Ø 12 ... 63



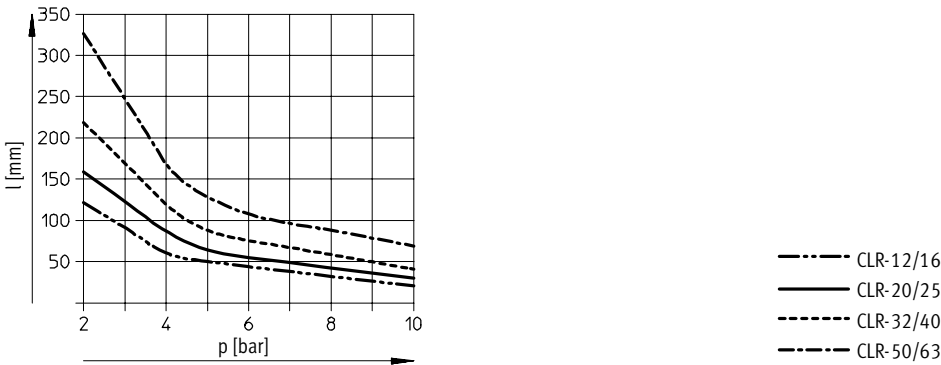
Ø	AF	BG	E	EE	H	KF	L2	L3	L4	L5	MM Ø	PL	PL1	R	RT	TG	WH	≙C1	≙C2	
[mm]																				
12	10	17	27.5	M5	3.25	M3	60.6	3.5	21.8	4.9	6	6	15.1	18.2	M4	16	10.9	5	3	
16	12		29			M4	62.5		23.5		8	6.5	15	19.3		18		7		
20	15	19.5	35.5	M5	4.75	M6	79.5	5	43.8	7.4	12	6	6	23.7	M5	22	16.4	10	5	
25			39.5				82.5		45.8					26.3		26				
32		27	G1/8	47	M8	8.9	M8	101	5	53.05	9.9	16	7.5	7.5	31.5	M6	32.5	20.4	13	6
40				54.5				102.5		54.3					36.7		38			
50	65.5			117.5				58.8		44.3					46.5					
63			75.5		14.2	M10	124.5		60.8	10.3	20			51.5	M8	56.5	20.8	17	8	

Linear/swivel clamp CLR

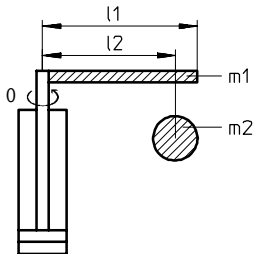
Technical data

 **Note**
 No calculations are required when using the Festo clamping finger set. The accessory is co-ordinated with the cylinder and can be operated unthrottled at the maximum permissible pressure. When constructing the clamping finger in-house the following values must be checked and calculations performed.

Maximum permissible clamping arm length l depending on the operating pressure p




Maximum permissible mass moment of inertia J_0



m_1 = mass of the clamping finger
 l_1 = length of the clamping finger
 m_2 = mass of the screw
 l_2 = center distance between screw and piston rod

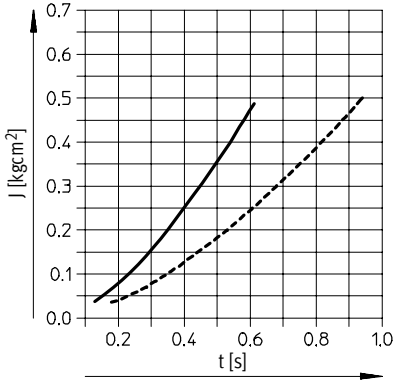
Maximum permissible mass moment of inertia: $J_0 = \frac{m_1 \times l_1^2}{3} + m_2 \times l_2^2$

 **Note**
 The permissible mass moment of inertia at the piston rod depends on the cylinder's speed. To simplify, the moment can be calculated using this formula. For calculation purposes, the software program "mass moments of inertia" is also available on the electronic catalogue.

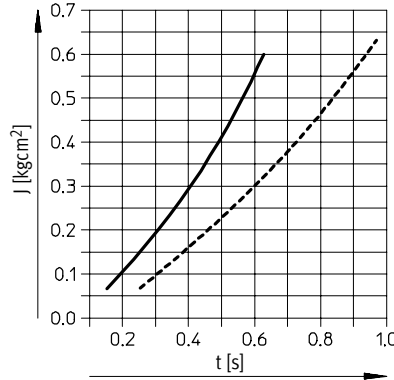
Linear/swivel clamp CLR

Technical data

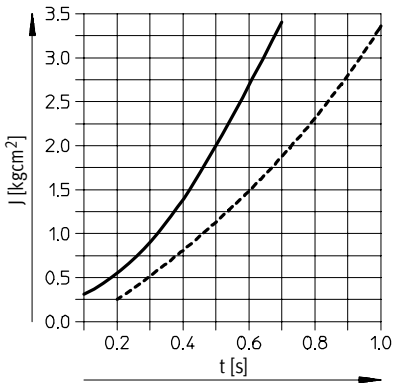
Mass moment of inertia J as a function of the time t required for the single stroke



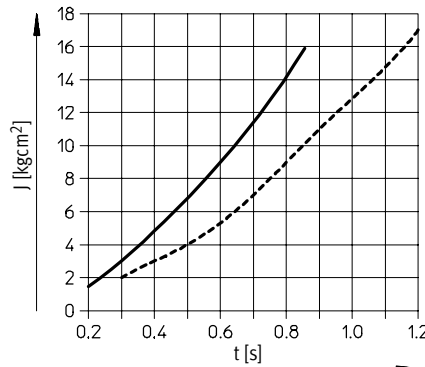
— CLR-12-10
- - - CLR-12-20



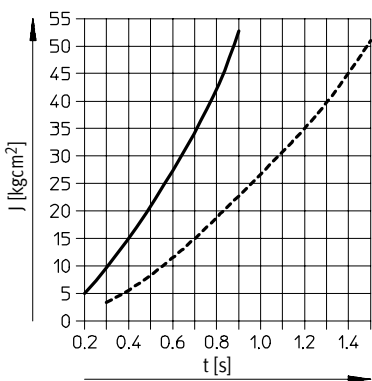
— CLR-16-10
- - - CLR-16-20



— CLR-20/25-10
- - - CLR-20/25-20




— CLR-32/40-10
- - - CLR-32/40-20




— CLR-50/63-10
- - - CLR-50/63-20

Linear/swivel clamp CLR

Technical data


Ordering data – Right-hand swivel direction				
Type	Piston Ø [mm]	Stroke [mm]	Part No.	Type
	12	10	535 431	CLR-12-10-R-P-A
		20	535 433	CLR-12-20-R-P-A
	16	10	535 435	CLR-16-10-R-P-A
		20	535 437	CLR-16-20-R-P-A
	20	10	535 439	CLR-20-10-R-P-A
		20	535 441	CLR-20-20-R-P-A
	25	10	535 443	CLR-25-10-R-P-A
		20	535 445	CLR-25-20-R-P-A
	32	10	535 447	CLR-32-10-R-P-A
		20	535 450	CLR-32-20-R-P-A
	40	10	535 453	CLR-40-10-R-P-A
		20	535 456	CLR-40-20-R-P-A
	50	20	535 459	CLR-50-20-R-P-A
		50	535 462	CLR-50-50-R-P-A
	63	20	535 465	CLR-63-20-R-P-A
		50	535 468	CLR-63-50-R-P-A

Ordering data – Left-hand swivel direction				
Type	Piston Ø [mm]	Stroke [mm]	Part No.	Type
	12	10	535 432	CLR-12-10-L-P-A
		20	535 434	CLR-12-20-L-P-A
	16	10	535 436	CLR-16-10-L-P-A
		20	535 438	CLR-16-20-L-P-A
	20	10	535 440	CLR-20-10-L-P-A
		20	535 442	CLR-20-20-L-P-A
	25	10	535 444	CLR-25-10-L-P-A
		20	535 446	CLR-25-20-L-P-A
	32	10	535 448	CLR-32-10-L-P-A
		20	535 451	CLR-32-20-L-P-A
	40	10	535 454	CLR-40-10-L-P-A
		20	535 457	CLR-40-20-L-P-A
	50	20	535 460	CLR-50-20-L-P-A
		50	535 463	CLR-50-50-L-P-A
	63	20	535 466	CLR-63-20-L-P-A
		50	535 469	CLR-63-50-L-P-A

Special-function drives
Power clamps
5.5

Linear/swivel clamp CLR

Technical data

Ordering data – Linear motion			
Type	Piston Ø [mm]	Stroke [mm]	Part No. Type
	32	10	535 449 CLR-32-10-G-P-A
		20	535 452 CLR-32-20-G-P-A
	40	10	535 455 CLR-40-10-G-P-A
		20	535 458 CLR-40-20-G-P-A
	50	20	535 461 CLR-50-20-G-P-A
		50	535 464 CLR-50-50-G-P-A
	63	20	535 467 CLR-63-20-G-P-A
		50	535 470 CLR-63-50-G-P-A

Linear/swivel clamp CLR

Accessories



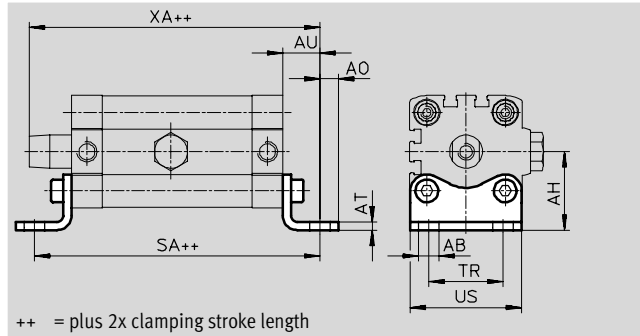
Foot mounting HNA

Material:

HNA: Galvanised steel

HNA-...-R3: Steel with protective coating

Free of copper, PTFE and silicone



Dimensions and ordering data										
For Ø	AB Ø H14	AH	AO	AT	AU	SA	TR	US	XA	
12	5.8	21	5	3	13	86.6	16	26	84.5	
16		22	4.75			88.5	18	27.5	86.4	
20	7	27	6.25	4	16	111.5	22	34.5	111.9	
25		29				7	114.5	26	38.5	114.9
32	10	33.5	8	5	21	133	32	46	137.4	
40		38				9	138.5	36	54	140.9
50		45				8	159.5	45	64	159.7
63		50				166.9	50	75	166.7	

Dimensions and ordering data									
For Ø	Basic version				Variant R3 – high corrosion protection				
	CRC ¹⁾	Weight [g]	Part No.	Type	CRC ¹⁾	Weight [g]	Part No.	Type	
12	2	25	537 237	HNA-12	3	25	537 252	HNA-12-R3	☉
16	2	30	537 238	HNA-16	3	30	537 253	HNA-16-R3	☉
20	2	50	537 239	HNA-20	3	50	537 254	HNA-20-R3	☉
25	2	55	537 240	HNA-25	3	55	537 255	HNA-25-R3	☉
32	2	70	537 241	HNA-32	3	70	537 256	HNA-32-R3	☉
40	2	90	537 242	HNA-40	3	90	537 257	HNA-40-R3	☉
50	2	160	537 243	HNA-50	3	160	537 258	HNA-50-R3	☉
63	2	180	537 244	HNA-63	3	180	537 259	HNA-63-R3	☉

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

Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Corrosion resistance class 3 according to Festo standard 940 070

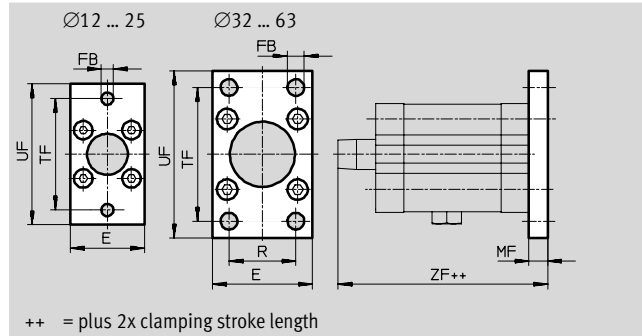
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

Linear/swivel clamp CLR

Accessories

Flange mounting FNC

Material:
Galvanised steel
Free of copper, PTFE and silicone



Dimensions and ordering data										
For Ø	E	FB Ø H13	MF	R	TF	UF	ZF	CRC ¹⁾	Part No.	Type
12	28	5.5	8	-	40	50	79.5	2	537 245	FNC-12
16	29				43	55	81.4	2	537 246	FNC-16
20	36				55	70	103.9	2	537 247	FNC-20
25	40	6.6	8	-	60	76	106.9	2	537 248	FNC-25
32	45				64	80	131.4	2	174 376	FNC-32
40	54	9	10	32	72	90	132.9	2	174 377	FNC-40
50	65				45	90	110	150.7	2	174 378
63	75		12	50	100	120	157.7	2	174 379	FNC-63

1) Corrosion resistance class 2 according to Festo standard 940 070
Components requiring moderate corrosion resistance. Externally visible parts with primarily decorative surface requirements which are in direct contact with a surrounding industrial atmosphere or media such as cooling or lubricating agents.

 Core Range

Linear/swivel clamp CLR

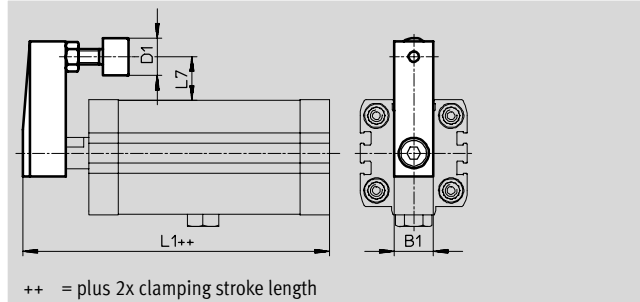
Accessories





Clamping finger set CLR-...-FS

Materials:

- Clamp arm: anodised aluminium
- Fixing screw, clamping screw, lock nut: galvanised steel
- Protective cap: neoprene





















∅ [mm]	B1	D1 ∅	L1	L7	Part No.	Type
12	10	11	77.6	11.8	535 551	CLR-12-FS
16	11		80.5	12.25	535 552	CLR-16-FS
20	16	15	105.5	17.5	535 553	CLR-20-FS
25			108.5	15.5	535 553	CLR-25-FS
32	20	19	134.5	25.75	535 554	CLR-32-FS
40			136	22	535 554	CLR-40-FS
50	25	24	154.3	32.5	535 555	CLR-50-FS
63			161.3	27.5	535 555	CLR-63-FS





Ordering data – One-way flow control valves				Technical data → Volume 2				
	Connection		Material	Part No.	Type			
	Thread	For tubing OD						
For exhaust air								
	M5	3	Metal design	193 137	GRLA-M5-QS-3-D			
		4		193 138	GRLA-M5-QS-4-D			
		6		193 139	GRLA-M5-QS-6-D			
	G1/8	3		193 142	GRLA-1/8-QS-3-D			
		4		193 143	GRLA-1/8-QS-4-D			
		6		193 144	GRLA-1/8-QS-6-D			
		8		193 145	GRLA-1/8-QS-8-D			
		For supply air						
				M5	3	Metal design	193 153	GR LZ-M5-QS-3-D
4	193 154		GR LZ-M5-QS-4-D					
6	193 155		GR LZ-M5-QS-6-D					
G1/8	3		193 156	GR LZ-1/8-QS-3-D				
	4		193 157	GR LZ-1/8-QS-4-D				
	6		193 158	GR LZ-1/8-QS-6-D				
	8		193 159	GR LZ-1/8-QS-8-D				

Linear/swivel clamp CLR

Accessories

Ordering data – Proximity sensors for slot type 8, magneto-resistive							Technical data → 1 / 10.2-13	
	Mounting	Switch output	Electrical connection			Cable length [m]	Part No.	Type
			Cables	M8 plug	M12 plug			
NO contact								
	Insertable from above	PNP	3-wire	–	–	2.5	525 898	SMT-8F-PS-24V-K2,5-OE 
		NPN					525 909	SMT-8F-NS-24V-K2,5-OE 
		–	2-wire	–	–	2.5	525 908	SMT-8F-ZS-24V-K2,5-OE 
		PNP	–	3-pin	–	0.3	525 899	SMT-8F-PS-24V-K0,3-M8D 
		NPN					525 910	SMT-8F-NS-24V-K0,3-M8D 
		PNP	–	–	3-pin	0.3	525 900	SMT-8F-PS-24V-K0,3-M12 
	Insertable, flush with the cylinder profile	PNP	3-wire	–	–	2.5	175 436	SMT-8-PS-K-LED-24-B
		–	3-pin	–	0.3	175 484	SMT-8-PS-S-LED-24-B	
NC contact								
	Insertable from above	PNP	3-wire	–	–	7.5	525 911	SMT-8F-PO-24V-K7,5-OE 

Ordering data – Proximity sensors for slot type 8, magnetic reed							Technical data → 1 / 10.2-16	
	Mounting	Electrical connection		Cable length [m]	Part No.	Type		
		Cables	M8 plug					
NO contact								
	Insertable from above	3-wire	–	2.5	525 895	SME-8F-DS-24V-K2,5-OE 		
				5.0	525 897	SME-8F-DS-24V-K5,0-OE 		
		2-wire	–	2.5	525 907	SME-8F-ZS-24V-K2,5-OE 		
		–	3-pin	0.3	525 896	SME-8F-DS-24V-K0,3-M8D 		
	Insertable, flush with the cylinder profile	3-wire	–	2.5	150 855	SME-8-K-LED-24		
		–	3-pin	0.3	150 857	SME-8-S-LED-24		
NC contact								
	Insertable from above	3-wire	–	7.5	525 906	SME-8F-DO-24V-K7,5-OE 		

Ordering data – Plug sockets							Technical data → 1 / 10.2-100	
	Mounting	Switch output		Connection	Cable length [m]	Part No.	Type	
		PNP	NPN					
Straight socket								
	M8 union nut	■	■	3-pin	2.5	159 420	SIM-M8-3GD-2,5-PU	
					5	159 421	SIM-M8-3GD-5-PU	
	M12 union nut	■	■	3-pin	2.5	159 428	SIM-M12-3GD-2,5-PU	
					5	159 429	SIM-M12-3GD-5-PU	
Angled plug socket								
	M8 union nut	■	■	3-pin	2.5	159 422	SIM-M8-3WD-2,5-PU	
					5	159 423	SIM-M8-3WD-5-PU	
	M12 union nut	■	■	3-pin	2.5	159 430	SIM-M12-3WD-2,5-PU	
					5	159 431	SIM-M12-3WD-5-PU	

Ordering data – Slot cover for slot type 8				
	Mounting	Length [m]	Part No.	Type
	Insertable from above	2x 0.5	151 680	ABP-5-S

 Core Range