Electric Drives and Controls | Hydraulics | Linear Motion and Assembly Technologies | Pneumatics | Service

Rexroth
Bosch Group

Pneumatic Automation Products

(Pages from SC-Master1 catalog)

The Drive & Control Company

Rexroth
Bosch Group

Easy-2-Combine

Series GSU

Series MSC

Series MSF

Series ZSC

Series GPC-E

Series RCM

Series GSP

Series MSN

Series RAP

Series RAN

Series RWT

Series GPC

Series TWC

Series NCT

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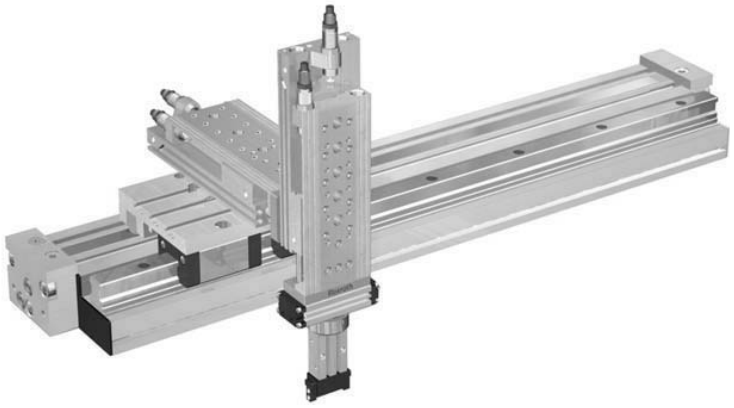
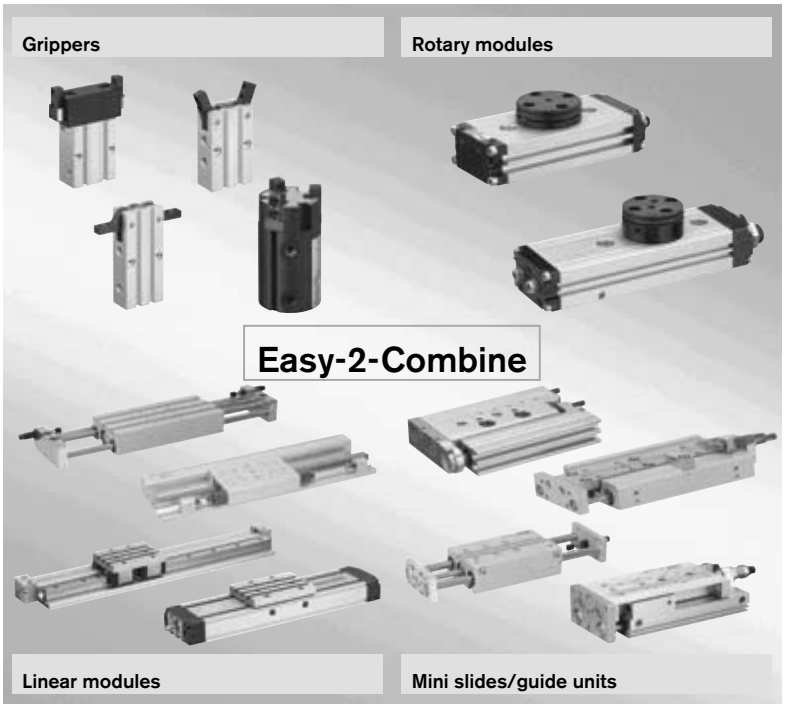
Easy-2-Combine System from Rexroth – Systematically Simple to Combine

The benefits of coordination
Modularity and ease in assembling the individual components are key factors, particularly when it comes to standardized applications requiring a large degree of flexibility for adaptations. The philosophy of Easy-2-Combine is to provide the right, coordinated products for linear movements, rotary movements and gripping functions. The components are intelligent, technically sophisticated and of premium quality. And that means for the future: even more Easy-2-Combine! As Rexroth expands the special handling technology product range, the move towards directly combinable components will continue to make adapter plates more and more redundant. "Easy to combine" – a principle which pays off.





Integrated economic efficiency:
- Less engineering time
- Reduced assembly costs
- High flexibility in assembly
- Optimum compatibility
- Modular design
- Wide product spectrum

Dependability by design:
- Standardized interfaces (uniform mounting dimensions, thread and centering sleeve sizes)
- Direct mounting (via connection plates, bolts and/or groove nuts)
- Comprehensive connection kits as accessories
- Interlocking, force-fit connection without extra work
- High-load and low-wear guides

Easy-2-Combine distinguishes between three general application types:
1. Pick & place:
   pneumatic (Z-/Y-axis)
2. Linear gantry:
   pneumatic (Z-axis)
   electric/pneumatic (Y-axis)
3. Area gantry:
   pneumatic (Z-axis)
   electric/pneumatic (Y-/X-axis)

Guided shuttle unit, series GSU

Double acting, magnetic piston, stroke length adjustment with shock absorbers

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Technical Data

Ambient temperature range		0 °C to +60 °C (+32 °F to +140 °F)
Working pressure		Min. 1.5 bar (19 psi), max. 8 bar (116 psi)
Medium		Compressed air, lubricated or non-lubricated
Material	Cylinder body	Anodized aluminum
	End covers	Anodized aluminum
	Outer seal band	Stainless steel
	Guide rail	Steel

Technical Information
The GSU is a combination of a rodless cylinder and a guide rail with 2 carriers.
The guide rail size is chosen to provide a very rigid unit for high load capacity.
Stroke length adjustment is made by 2 shock absorbers included with the unit.
The stroke length can be adjusted over the GSU's whole length.
Easy-2-Combine. The upper mounting surface has an interface to Easy-2-Combine meaning that other products from Rexroth can be directly assembled on the GSU.

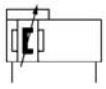
Application area

Carrier of a second axis as basic movement in multi axis system.
Carrier of a work piece between 2 stations, e.g. a loading station and an assembly or machining station.
Rodless cylinder applications with demands for stroke length adjustment.

Technical Information

Piston diameter	[mm]	16	25
Theoretical piston force	[N]	120	295
	(lbf)	26.98	66.32
Max. velocity	[m/s]	1,5	1,5
	(ft/s)	4.92	4.92
Max. cushioning energy E_{max}	[Nm]	2,3	3,3
	(in.lbs)	20.36	29.21
Guide rail size		BRL 15 Miniature	BRL 15 Standard

Part no.: GSU including 2 shock absorbers



Piston dia.	16	Weight [kg] (lbs.)	25	Weight [kg] (lbs.)
Connection ports	M 5		G1/8	
Stroke				
200	**R402000986**	1,78 (3.92)	**R402000995**	3,21 (7.08)
300	**R402000987**	2,09 (4.61)	**R402000996**	3,73 (8.22)
400	**R402000988**	2,40 (5.29)	**R402000997**	4,25 (9.37)
500	**R402000989**	2,71 (5.97)	**R402000998**	4,77 (10.52)
600	**R402000990**	3,02 (6.66)	**R402000999**	5,29 (11.66)
700	**R402000991**	3,33 (7.34)	**R402001000**	5,81 (12.81)
800	**R402000992**	3,64 (8.03)	**R402001001**	6,33 (13.96)
900	–	–	**R402001002**	6,85 (15.10)
1000	–	–	**R402001003**	7,37 (16.25)

Guided shuttle unit, series GSU

Double acting, magnetic piston, stroke length adjustment with shock absorbers

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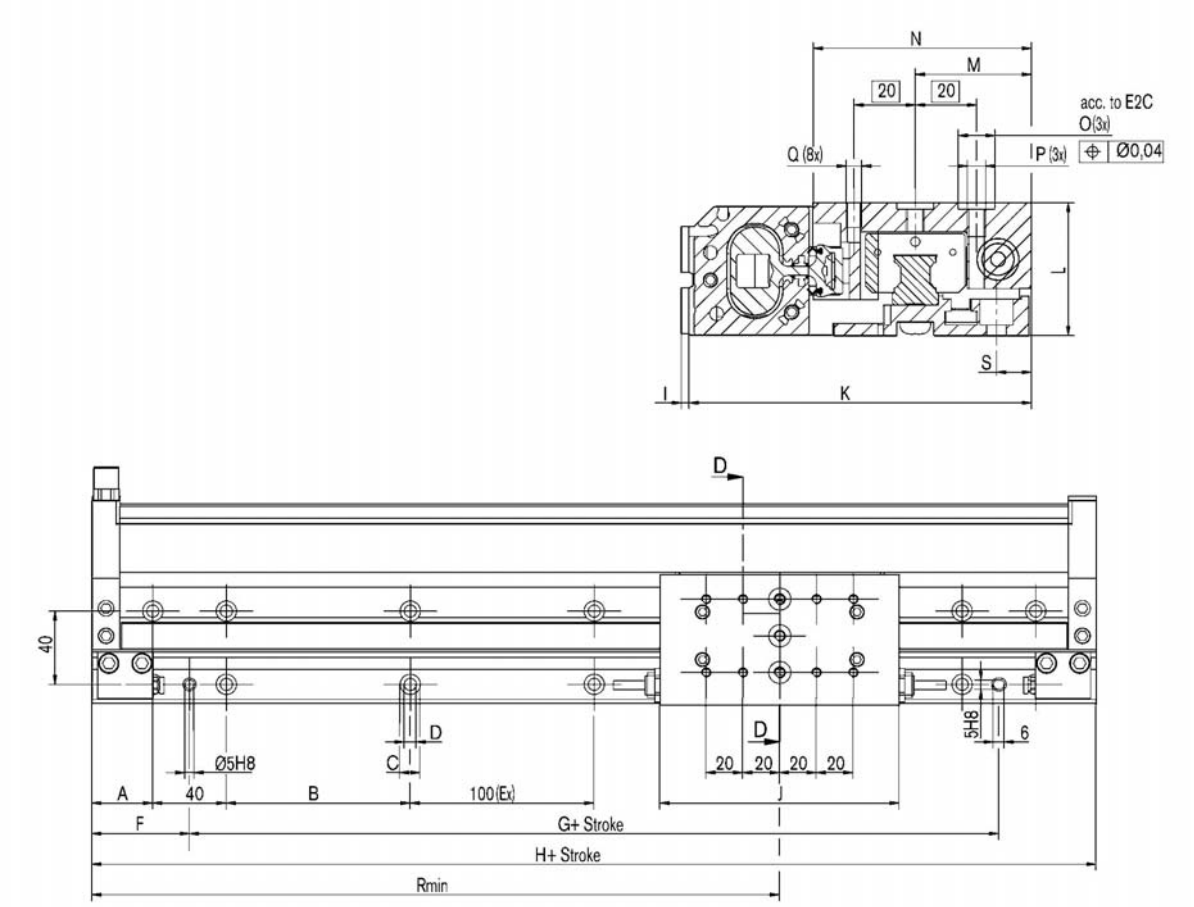
CAD files, free download from the Internet.



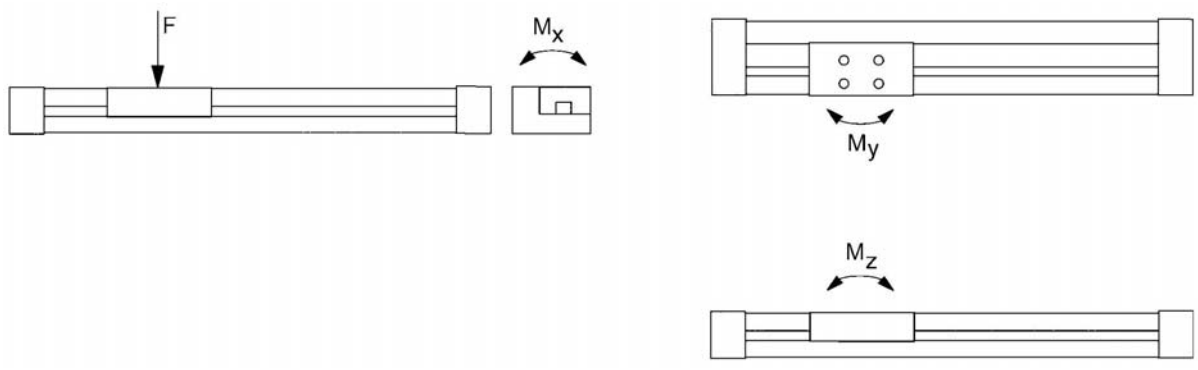
Port sizes: 16 mm M 5, 25 mm G 1/8.

Cylinder	A	B	C	D	F	G	H	I	J	K	L	M	N	O	P	Q	Rmin	S
GSU 16	25	92	Ø9,5	Ø5,5	45	124	214	3,6	110	99	29	33,5	69	Ø9 H8x2,1$^{+0,2}$	M5x9	M4x8	107	7,5
GSU 25	33	100	Ø11	Ø6,6	53	140	246	2,5	130	111,65	43,5	37,85	71,5	Ø12 H8x2,1$^{+0,2}$	M6x9	M5x8	123	11,35

Cylinder	Stroke								
	200	300	400	500	600	700	800	900	1000
GSU 16/25 (Ex)	1	2	3	4	5	6	7	8	9

Allowed forces and moments. Static situation

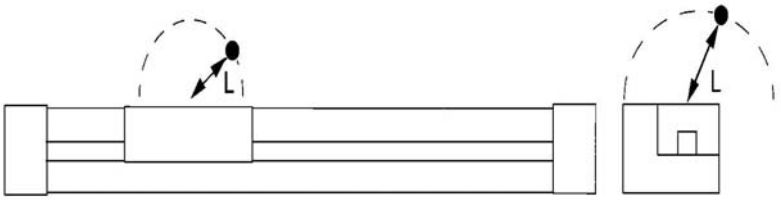
Max allowed forces and moments effecting the guide rail.
Note! Cushioning capacity and dynamic forces when reaching the end positions reduces the pay-load capacity. See separate diagrams below!

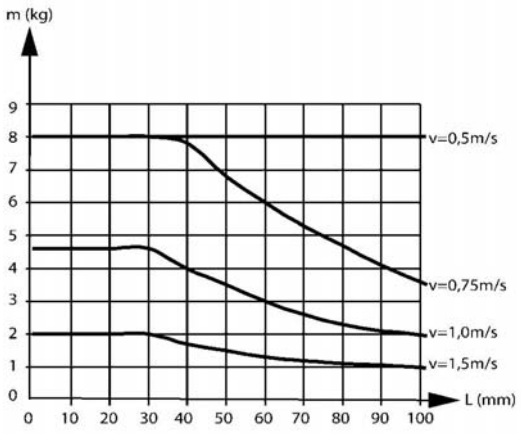


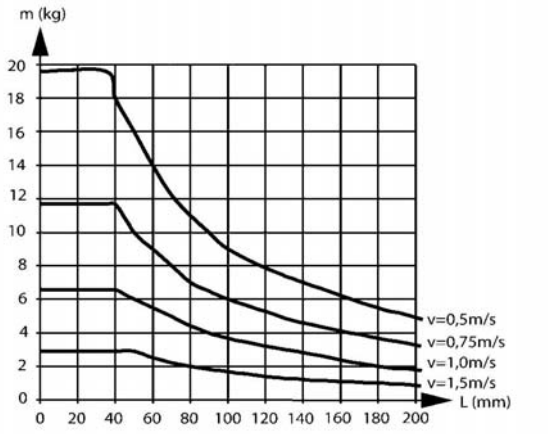
Size dia.	Static situation			
	F [N] (lbf)	Mx [Nm] (ft.lbs.)	Mz [Nm] (ft.lbs.)	My [Nm] (ft.lbs.)
16	1500 (337)	20 (14.8)	40 (29.5)	40 (29.5)
25	2500 (562)	55 (40.6)	65 (47.9)	65 (47.9)

Allowed pay-load with respect to center of mass on pay-load and velocity. Dynamic situation.

When the end positions are reached, the acceleration creates high moments affecting the unit. It is therefore important not to exceed the values in the diagrams below.
L is the distance between center of mounting plate and center of mass for built-on equipment.







Guided shuttle unit, series GSU

Double acting, magnetic piston, stroke length adjustment with shock absorbers

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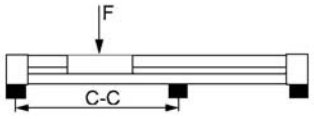
Support of mounting surface. Deflection from different loads.

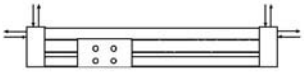
	16 mm dia.			25 mm dia.		
F [N] (lbf)/C-C [mm]	**100**	**200**	**300**	**100**	**200**	**300**
500 (112)	0,01	0,10	0,32	0,001	0,08	0,25
1000 (225)	0,02	0,20	0,65	0,002	0,15	0,50
1500 (337)	–	–	–	0,003	0,23	0,75
2000 (450)	–	–	–	0,004	0,30	0,98



Air connections and adjusting the velocity

It is possible to use one or the other end cover for connecting pressure for both cylinder directions.

It is recommended always to adjust the velocity to a minimum in respect to the necessary cycle time.
This is to optimize the life time of the GSU and also on the built on equipment.



Recommended flow control valves

GSU size	Connection port	Code no. Flow control valve
16	M 5	**0 821 200 191**
25	G 1/8	**0 821 200 193**

Shock absorber specifications

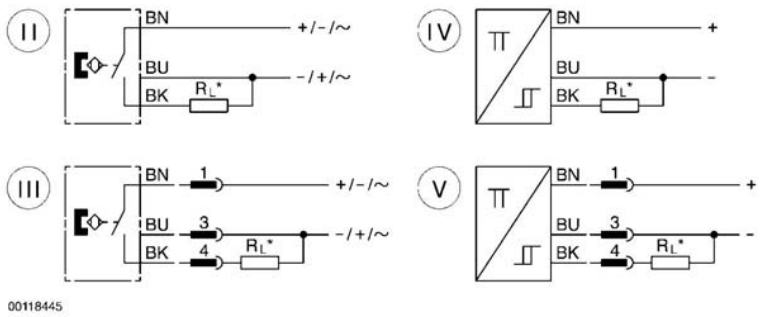
GSU size	Code no. Shock absorber as spare part	Outer thread	Max E / stroke [Nm] (ft.lbs.)	Max E / hour [Nm] (ft.lbs.)
16	**0 821 005 022**	M12	2,3 (1.7)	28000 (20653)
25	**0 821 005 031**	M14	3,3 (2.4)	34000 (25078)

Kit to secure end position when switching shock absorbers

GSU size	Part no.
16	**R402001207**
25	**R402001208**

The kit consists of 2 stop-sleeves and 2 stop-screws.
The sleeve replaces the lock nut for the shock absorber.

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

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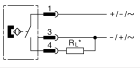
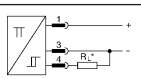
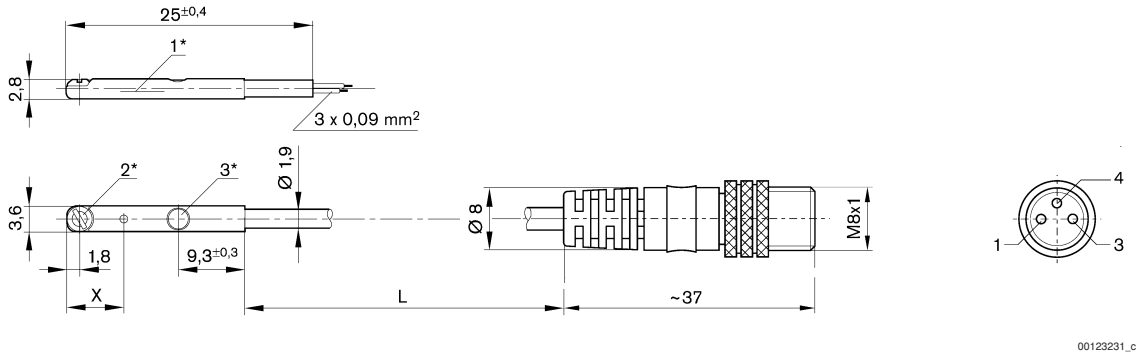
Ambient temperature min. / max.	-25°C / +75°C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	-	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions



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1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

Mini slides compact, MSC series
MSC

Rexroth
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Technical Data

Operating mode		Double-acting with two drive cylinders
Operating temperature range		0 °C to +50 °C (32 °F to +122 °F)
Cushioning		Elastomer (MSC-...-...-SE) Hydraulic (MSC-...-...-SH)
Medium		Compressed air, lubricated or oil-free
Lubrication		maintenance-free
Material	Housing	Aluminum (anodized)
	Slide	Aluminum (anodized)
	Front plate	High-strength aluminum (anodized)
	Piston rod	Steel
	Ball bearing	Hardened steel
	Seals	NBR+PU

Application area
Suitable for precise applications in handling technology
Versatile mounting options on further handling components (grippers, rotary modules...)
Centering elements included in scope of delivery

Technical information

			MSC – 8	MSC – 12	MSC – 16	MSC – 20	MSC – 25
Piston Ø	–	[mm]	2 x 8	2 x 12	2 x 16	2 x 20	2 x 25
Equivalent piston Ø	–	[mm]	11	17	22	28	35
Connection thread	–		M 5	M 5	M 5	G 1/8	G 1/8
Operating pressure	–	[bar] (psi)	1,5 - 10 (22 - 145)	1 - 10 (15 - 145)	1 - 10 (15 - 145)	1 - 10 (15 - 145)	1 - 10 (15 - 145)
Theoretical useful force (6 bar) (87 psi)	Thrust [N]	[N] (lbf.)	60 (13.488)	136 (30.573)	241 (54.177)	377 (84.750)	589 (132.407)
	Retraction force [N]	[N] (lbf.)	52 (11.690)	102 (22.930)	181 (40.689)	283 (63.618)	496 (111.501)
Speed	Outward stroke [m/s]	[m/s] (ft/s)	0,8 (2.62)	0,8 (2.62)	0,8 (2.62)	0,8 (2.62)	0,8 (2.62)
	Retraction stroke [m/s]	[m/s] (ft/s)	0,8 (2.62)	0,8 (2.62)	0,8 (2.62)	0,8 (2.62)	0,8 (2.62)
Cushioning	Elastomer [Nm]	[Nm] (in.lbs.)	0,1 (0.89)	0,2 (1.77)	0,3 (2.66)	0,4 (3.54)	0,5 (4.43)
	Hydraulic [Nm/Stroke]	[Nm] (in.lbs.)	0,85 (7.52)	2,70 (23.90)	2,70 (23.90)	7,00 (61.95)	15,00 (132.76)
	Hydraulic	[Nm/h]	2500	9000	9000	20000	39000
Max. additional moving mass	Elastomer	[kg] (lbs.)	1,1 (2.425)	1,8 (3.968)	4,3 (9.480)	4,3 (9.480)	5,7 (12.566)
	Hydraulic	[kg] (lbs.)	1,5 (3.307)	2,8 (6.173)	8,9 (19.621)	8,9 (19.621)	17,0 (37.478)
Stroke-limiting range per end position	... 100	[mm]	5	9	11	12	12
	from 100	[mm]	–	–	10	10	10

Part no. for MSC–...–...–SE elastically cushioning

Stroke	MSC – 8	MSC – 12	MSC – 16	MSC – 20	MSC – 25
10	**0 821 406 300**	**0 821 406 306**	**0 821 406 313**	**0 821 406 322**	**0 821 406 332**
20	**0 821 406 301**	**0 821 406 307**	**0 821 406 314**	**0 821 406 323**	**0 821 406 333**
30	**0 821 406 302**	**0 821 406 308**	**0 821 406 315**	**0 821 406 324**	**0 821 406 334**
40	**0 821 406 303**	**0 821 406 309**	**0 821 406 316**	**0 821 406 325**	**0 821 406 335**
50	**0 821 406 304**	**0 821 406 310**	**0 821 406 317**	**0 821 406 326**	**0 821 406 336**
80	**0 821 406 305**	**0 821 406 311**	**0 821 406 318**	**0 821 406 327**	**0 821 406 337**
100	–	**0 821 406 312**	**0 821 406 319**	**0 821 406 328**	**0 821 406 338**
125	–	–	**0 821 406 320**	**0 821 406 329**	**0 821 406 339**
150	–	–	**0 821 406 321**	**0 821 406 330**	**0 821 406 340**
200	–	–	–	**0 821 406 331**	**0 821 406 341**

Part no. for MSC–...–...–SH hydraulically cushioning

Stroke	MSC – 8	MSC – 12	MSC – 16	MSC – 20	MSC – 25
20	**0 821 406 343**	–	–	–	–
30	**0 821 406 344**	**0 821 406 350**	**0 821 406 357**	**0 821 406 366**	**0 821 406 376**
40	**0 821 406 345**	**0 821 406 351**	**0 821 406 358**	**0 821 406 367**	**0 821 406 377**
50	**0 821 406 346**	**0 821 406 352**	**0 821 406 359**	**0 821 406 368**	**0 821 406 378**
80	**0 821 406 347**	**0 821 406 353**	**0 821 406 360**	**0 821 406 369**	**0 821 406 379**
100	–	**0 821 406 354**	**0 821 406 361**	**0 821 406 370**	**0 821 406 380**
125	–	–	**0 821 406 362**	**0 821 406 371**	**0 821 406 381**
150	–	–	**0 821 406 363**	**0 821 406 372**	**0 821 406 382**
200	–	–	–	**0 821 406 373**	**0 821 406 383**

Drive weight for nominal stroke [g]

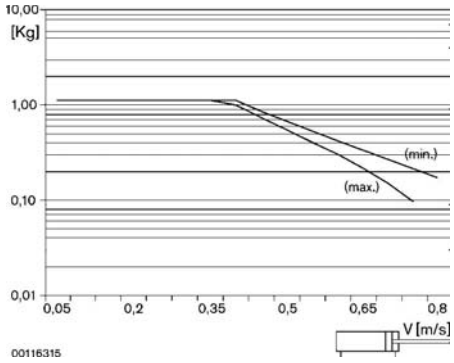
Stroke [mm]	MSC – 8	MSC – 12	MSC – 16	MSC – 20	MSC – 25
10	300	590	810	1360	2320
20	290	570	785	1415	2260
30	315	555	760	1375	2220
40	340	590	815	1450	2380
50	405	670	1285	1610	2635
80	555	915	1365	2100	3285
100	–	990	1940	2230	3560
125	–	–	1940	3015	4750
150	–	–	2075	3360	5370
200	–	–	–	4120	6455

Moving mass for nominal stroke [g]

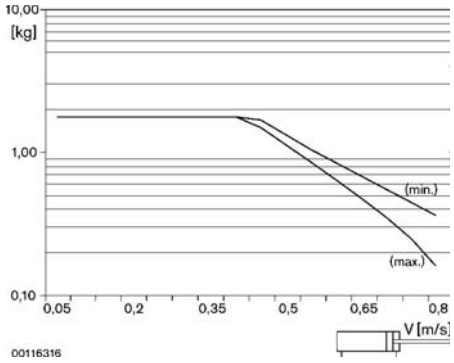
Stroke [mm]	MSC – 8	MSC – 12	MSC – 16	MSC – 20	MSC – 25
10	140	255	375	655	1000
20	140	255	375	655	1000
30	155	260	375	655	1000
40	165	280	400	690	1100
50	195	315	450	765	1225
80	265	403	615	985	1450
100	–	460	650	1035	1625
125	–	–	725	1200	1885
150	–	–	765	1290	2085
200	–	–	–	1540	2445

Max. additionally moving mass with elastic cushioning (min. stroke, max. stroke)

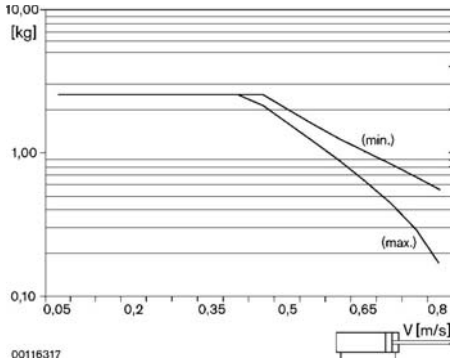
MSC - 8 -...- SE



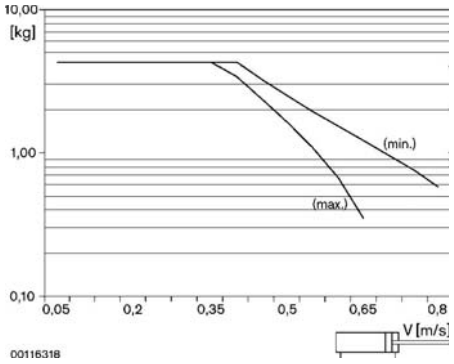
MSC - 12 -...- SE



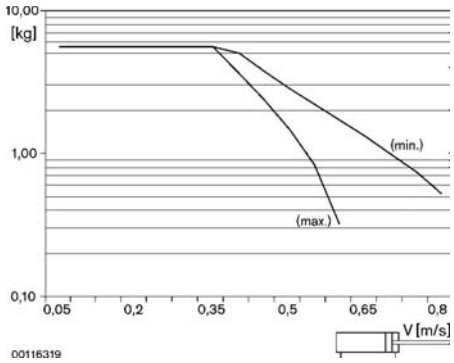
MSC - 16 -...- SE



MSC - 20 -...- SE

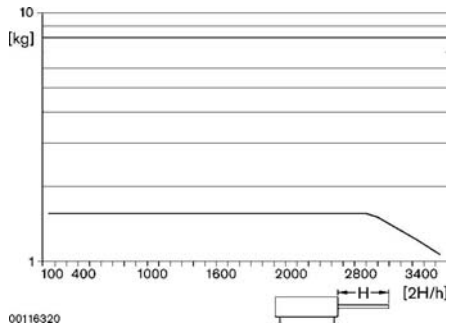


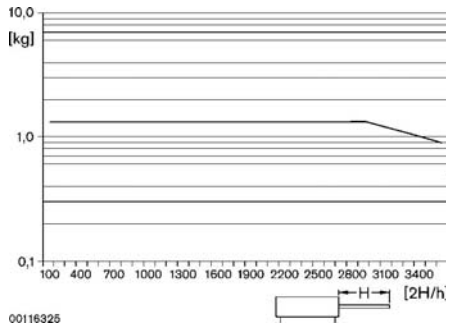
MSC - 25 -...- SE



Max. additionally moving mass with hydraulic cushioning (min. stroke, max. stroke)

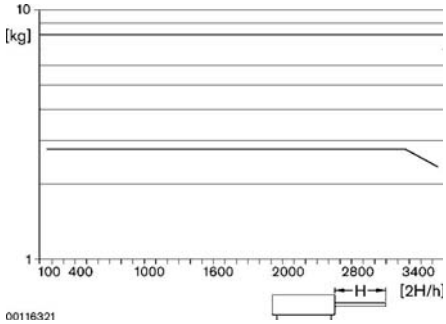
MSC - 8 -...- SH	
horizontal	vertical



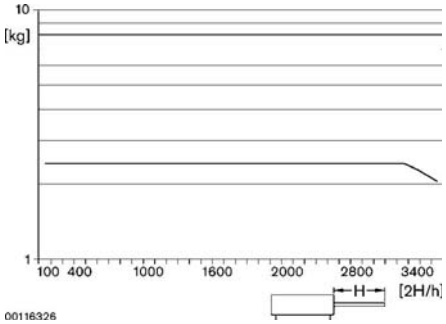


MSC - 12 -...- SH

horizontal

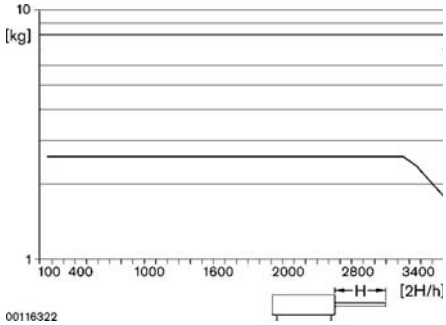


vertical

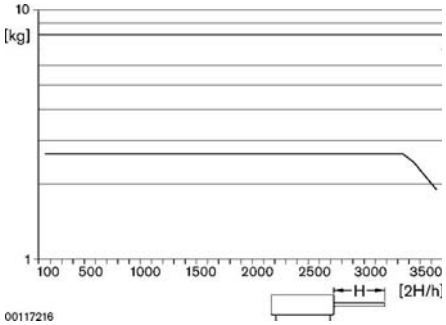


MSC - 16 -...- SH

horizontal

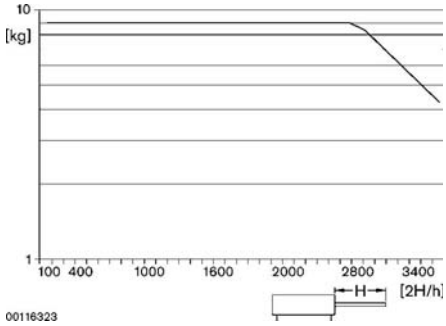


vertical

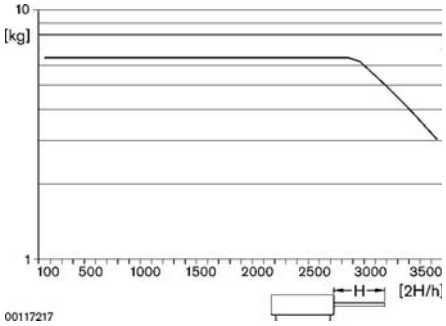


MSC - 20 -...- SH

horizontal

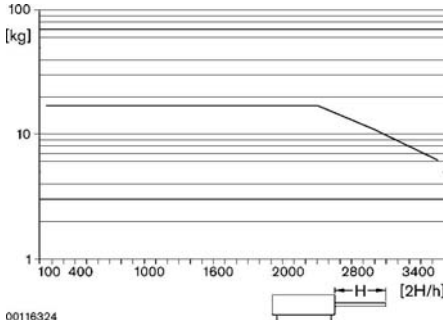


vertical

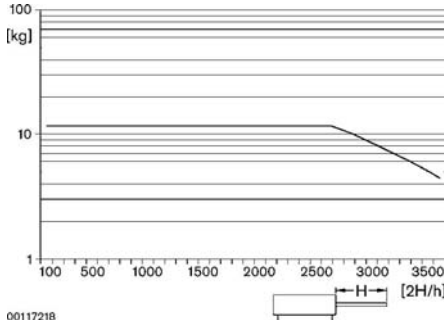


MSC - 25 -...- SH

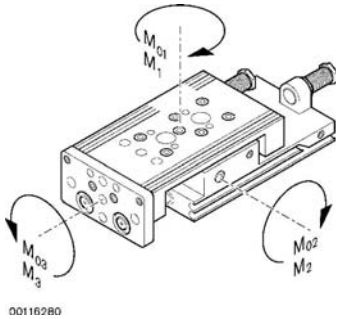
horizontal



vertical

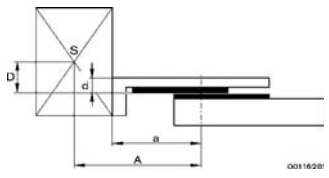


Permissible loads

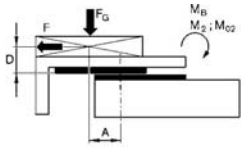


Type	Stroke	Correction factor a	Correction factor d	Maximum permissible torque [Nm] static			Maximum permissible torque [Nm] dynamic		
	[mm]	[mm]	[mm]	M 01	M 02	M 03	M 1	M 2	M 3
MSC – 8	10	44	14	7	7	7	1,9	1,9	1,1
	20	49		7	7	7	1,9	1,9	1,1
	30	59		7	7	7	1,9	1,9	1,1
	40	69		7	7	7	1,9	1,9	1,1
	50	84		13	13	9	2,9	2,9	1,3
	80	124		25	25	13	3,8	3,8	1,3
MSC – 12	10	53	16	14	14	20	4,4	4,4	4,2
	20	58		14	14	20	4,4	4,4	4,2
	30	63		14	14	20	4,4	4,4	4,2
	40	73		14	14	20	4,4	4,4	4,2
	50	85		19	19	13	5,6	5,6	4,6
	80	123		32	32	33	8,2	8,2	5,2
	100	143		32	32	33	8,2	8,2	5,2
MSC – 16	10	55	15	25	25	35	6,6	6,6	6,5
	20	60		25	25	35	6,6	6,6	6,5
	30	65		25	25	35	6,6	6,6	6,5
	40	75		25	25	35	6,6	6,6	6,5
	50	87		29	29	38	7,6	7,6	7,0
	80	125		58	58	74	12,8	12,8	8,7
	100	145		58	58	74	12,8	12,8	8,7
	125	198		118	118	88	31,2	31,2	15,2
	150	223		119	119	88	31,2	31,2	15,2
MSC – 20	10	60	19	57	57	87	12,0	12,0	9,6
	20	65		57	57	87	12,0	12,0	9,6
	30	70		57	57	87	12,0	12,0	9,6
	40	80		57	57	87	12,0	12,0	9,6
	50	92		65	65	93	13,3	13,3	10,0
	80	130		99	99	116	19,0	19,0	11,7
	100	150		99	99	116	19,0	19,0	11,7
	125	200		136	136	126	40,6	40,6	19,0
	150	233		152	152	126	45,4	45,4	19,0
	200	295		179	179	126	53,4	53,4	19,0
MSC – 25	10	66	24	90	90	100	19,5	19,5	22,9
	20	71		90	90	100	19,5	19,5	22,9
	30	76		90	90	100	19,5	19,5	22,9
	40	86		90	90	100	19,5	19,5	22,9
	50	98		90	90	100	13,0	13,0	15,3
	80	136		129	129	110	20,8	20,8	18,8
	100	156		129	129	110	20,8	20,8	18,8
	125	202		180	180	145	44,1	44,1	20,4
	150	235		201	201	145	49,2	49,2	20,4
	200	297		236	236	145	57,8	57,8	20,4

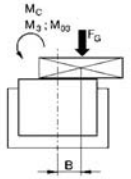
correction factor (a, d)



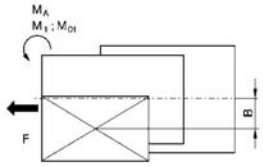
Horizontal application



stat.	$M_{B0} = F_G \cdot A + F \cdot D$
dyn.	$M_B = F_G \cdot A$



stat.	$M_{C0} = F_G \cdot B$
dyn.	$M_C = F_G \cdot B$

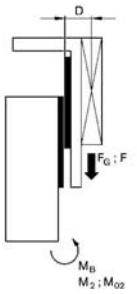


stat.	$M_{A0} = F \cdot B$
dyn.	$M_A = 0$

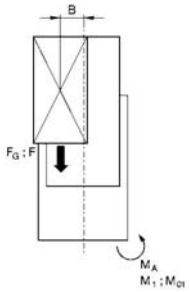
dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$
stat.	$\frac{M_{A0}}{M_{01}} + \frac{M_{B0}}{M_{02}} + \frac{M_{C0}}{M_{03}} \leq 1$

00116296

Vertical application



stat.	$M_{B0} = (F_G + F) \cdot D$
dyn.	$M_B = F_G \cdot D$



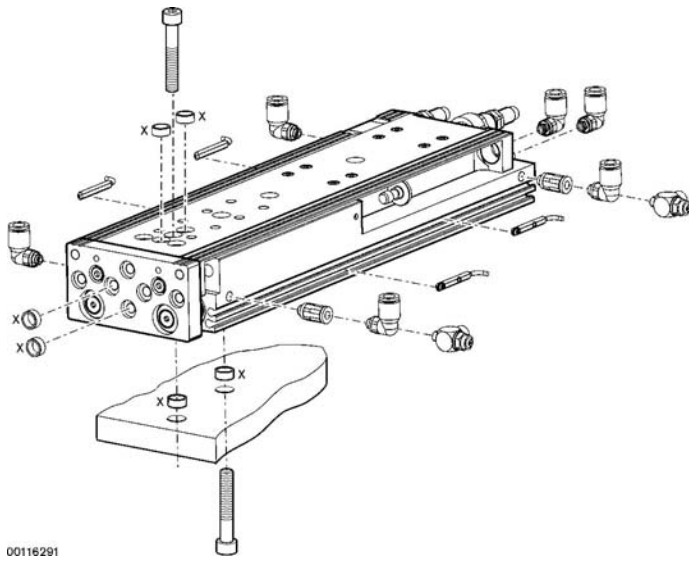
stat.	$M_{A0} = (F_G + F) \cdot B$
dyn.	$M_A = F_G \cdot B$

dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$
stat.	$\frac{M_{A0}}{M_{01}} + \frac{M_{B0}}{M_{02}} \leq 1$

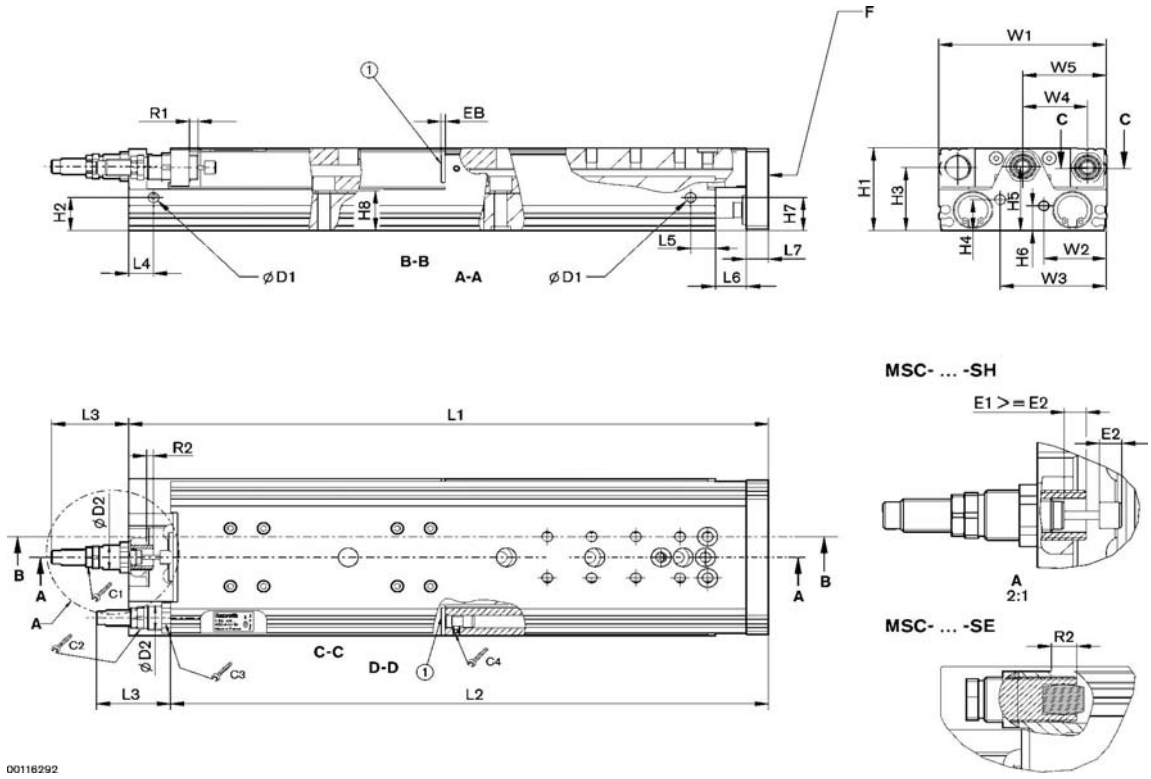
00116297

F = m * a = deceleration force [N]
FG = m * g = force due to weight [N]
The decelerations occurring in the stroke end position depend on traversing speed and moving mass.

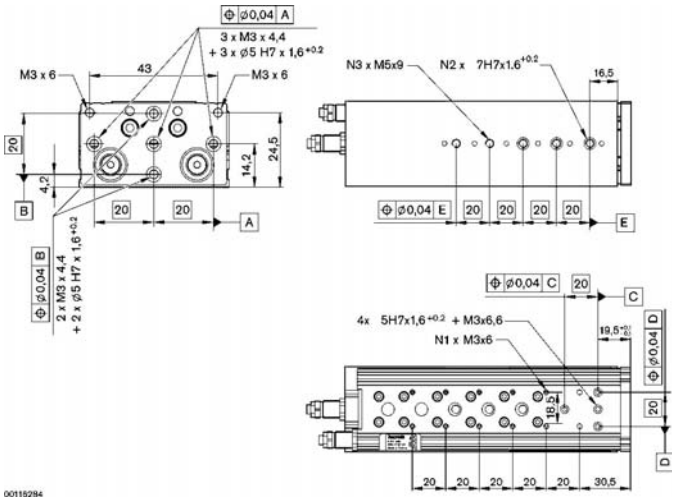
MSC 8 – 25 basic data (all sizes)



x = 4 centering rings in scope of delivery (2 x front plate/slide, 2 x housing)



MSC – 08

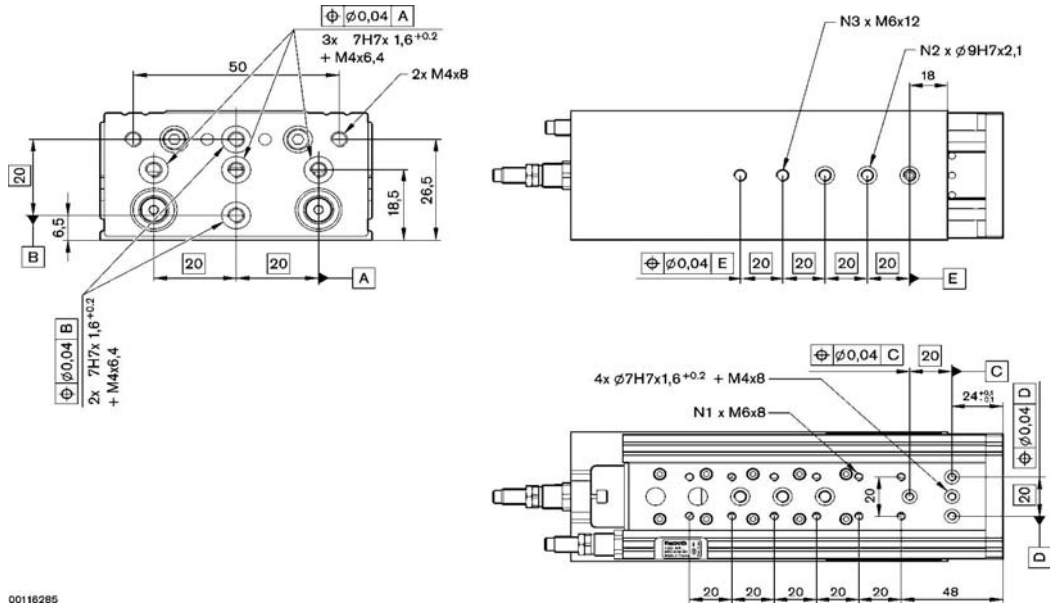


Stroke	N 1	N 2	N 3	L1	L2
10	4	2	2	81	73,5
20	4	2	2	81	73,5
30	4	2	2	91	83,5
40	6	2	2	101	93,5
50	8	3	3	121	113,5
80	12	3	5	171	163,5

	C 1	C 2	C 3	C 4
SW	8	10	12	1,5
MD [Nm]	1,4	–	7	0,4

										MSC-SH	MSC-SE										
Ø D 1	Ø D 2	H 1	H 2	H 3	H 4	H 5	H 6	H 7	H 8	L 3	L 3	L 4	L 5	L 6	L 7	R 1	R 2	W 1	W 2	W 3	W 4	W 5
M5	M10x1	28	9,6	20,4	7	19	5,5	9,6	9,5	24 max	15 max	9,8	12,4	2	6	0...5	0...5	50	19,2	30,5	18	25

MSC – 12

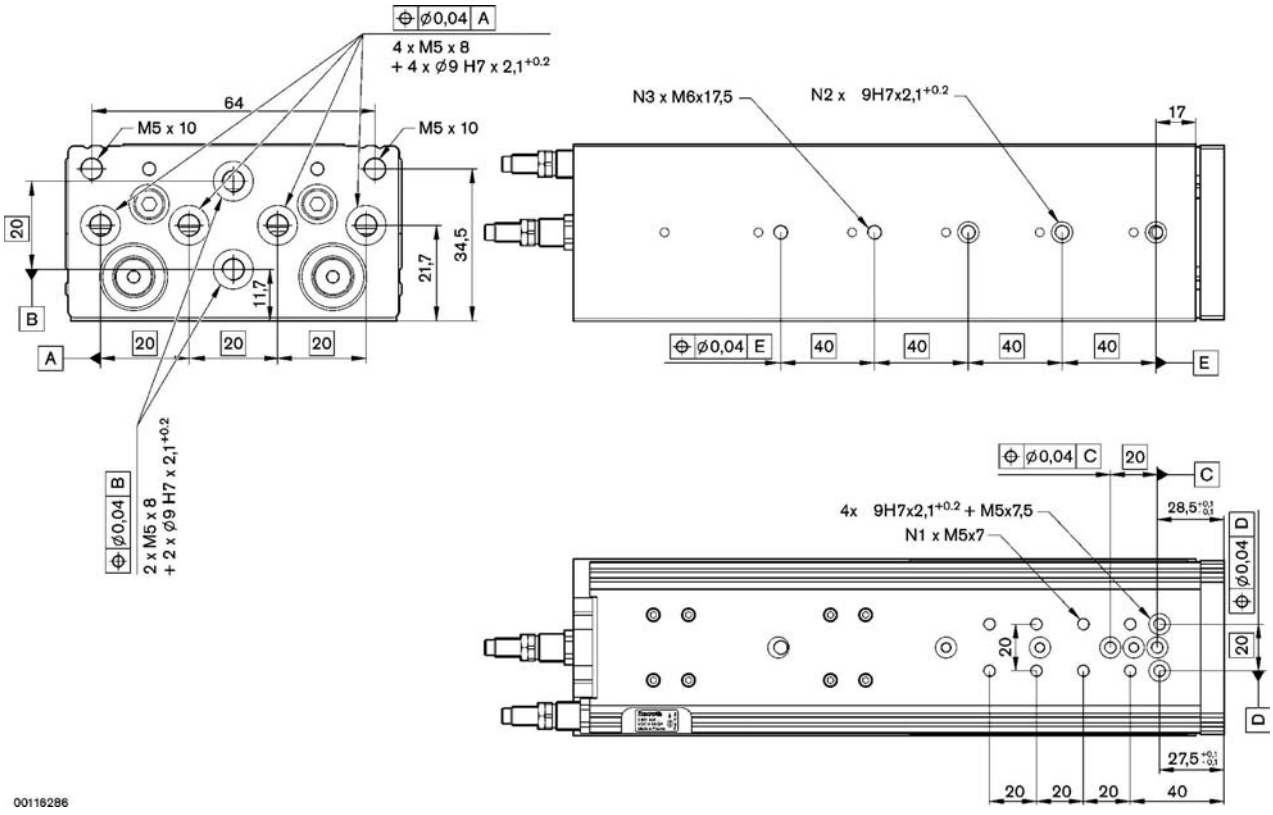


Stroke	N 1	N 2	N 3	L1	L2
10,20,30	4	2	2	99	88,5
40	4	2	2	109	98,5
50	6	3	3	124	113,5
80	10	3	5	170	159,5
100	12	3	5	190	179,5

	C 1	C 2	C 3	C 4
SW	11	11	14	15
MD [Nm]	1,4	–	20	0,4

										MSC-SH	MSC-SE										
Ø D 1	Ø D 2	H 1	H 2	H 3	H 4	H 5	H 6	H 7	H 8	L 3	L 3	L 4	L 5	L 6	L 7	R 1	R 2	W 1	W 2	W 3	W 4	W 5
M 5	M12x1	34	11	25,5	9	24,5	7	20	12,6	40 max	19 max	12	13	2	8	0...9	0...9	66	25	40	24,5	33

MSC – 16



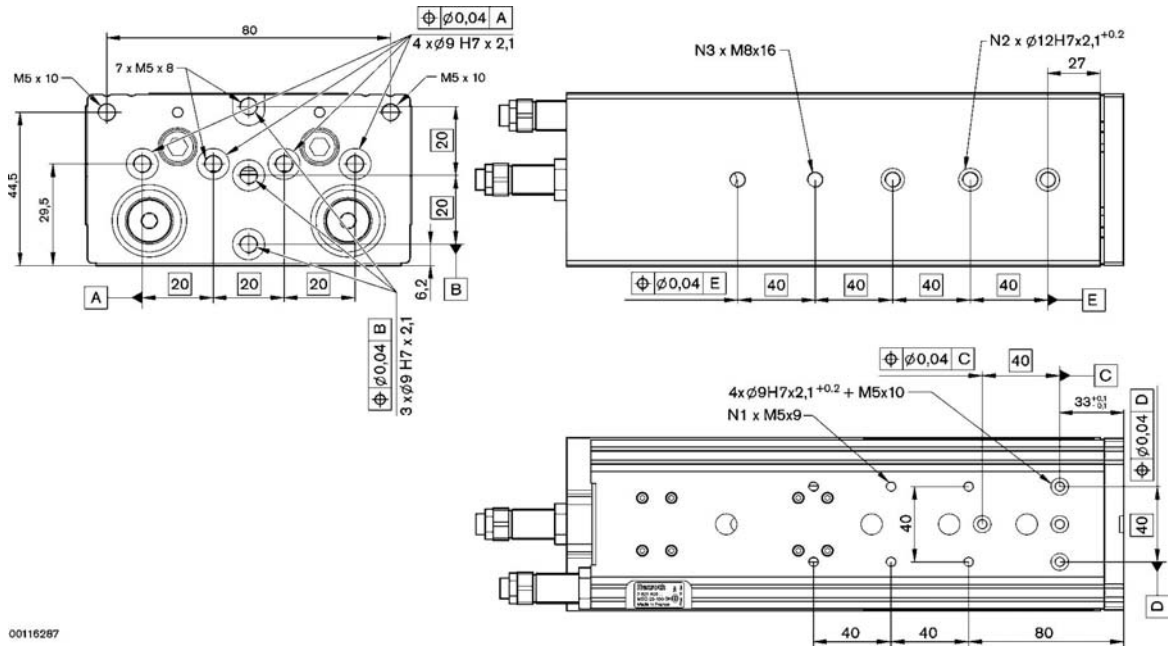
Stroke	N 1	N 2	N 3	L1	L2
10	2	2	2	102	90,5
20	2	2	2	102	90,5
30	2	2	2	102	90,5
40	2	2	2	112	100,5
50	2	2	2	127	115,5
80	3	3	3	173	161,5
100	3	3	3	193	181,5
125	4	3	5	282	270
150	4	3	5	307	295

	C 1	C 2	C 3	C 4
SW	11	11	14	1,5
MD [Nm]	1,4	–	20	0,4

										MSC-SH	MSC-SE
Ø D 1	Ø D 2	H 1	H 2	H 3	H 4	H 5	H 6	H 7	H 8	L 3	L 3
M 5	M12x1	40	16	30,5	15	31	12,2	16	19,3	41max	20max

L 4	L 5	L 6	L 7	R 1	R 2	W 1	W 2	W 3	W 4	W 5
11,2	11,2	2	10	≤ 100-0...11 ≥ 100-0...10	0...11	76	28,3	48	29	38

MSC – 20



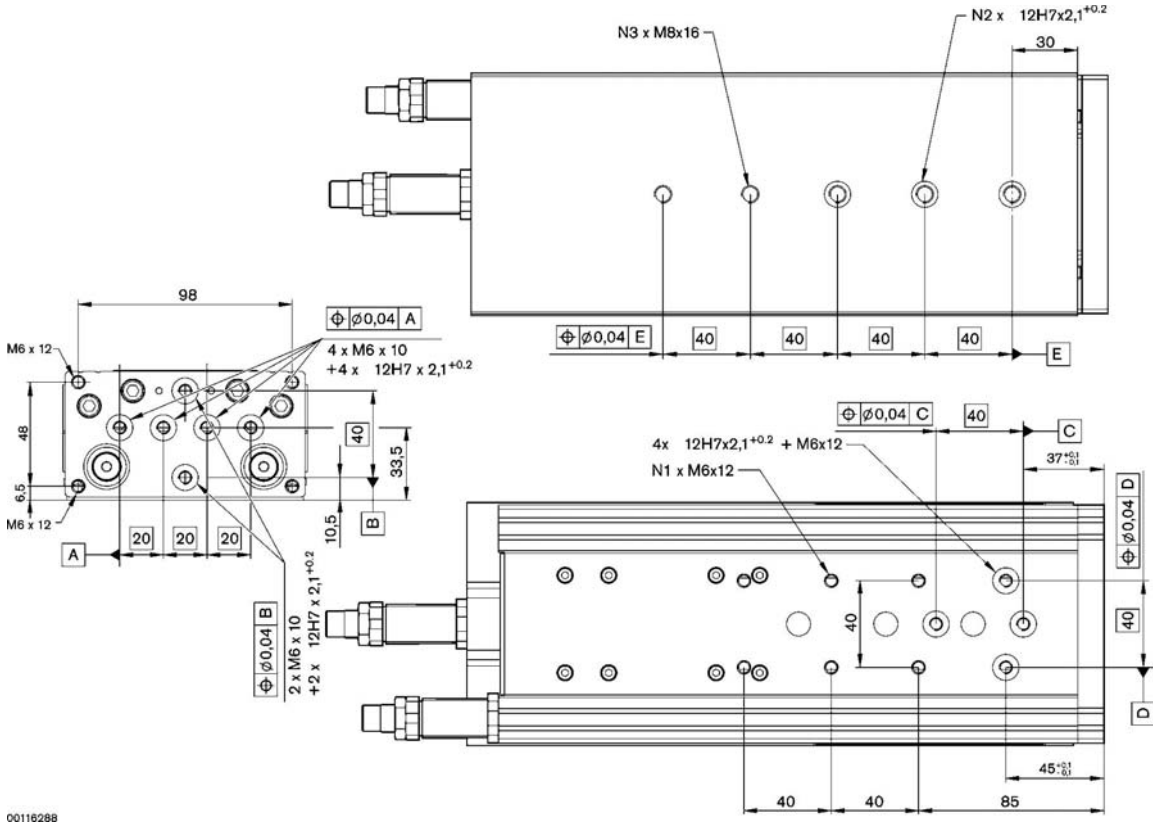
Stroke	N 1	N 2	N 3	L1	L2
10	2	2	2	113	100,5
20	2	2	2	113	100,5
30	2	2	2	113	100,5
40	2	2	2	123	110,5
50	2	2	2	138	125,5
80	4	3	3	183	170,5
100	4	3	3	203	190,5
125	6	3	5	288	275
150	6	3	5	328	315
200	6	3	6	403	390

	C 1	C 2	C 3	C 4
SW	14	17	19	2,5
MD [Nm]	5,2	–	20	3

										MSC-SH	MSC-SE
Ø D 1	Ø D 2	H 1	H 2	H 3	H 4	H 5	H 6	H 7	H 8	L 3	L 3
G1/8	M16x1,5	50	19	37,5	15	38	12,2	19	24	49max	31max

L 4	L 5	L 6	L 7	R 1	R 2	W 1	W 2	W 3	W 4	W 5
12	12	2	10	≤ 100-0...15 ≥ 100-0...10	0...15	92	37	55	36	46

MSC – 25



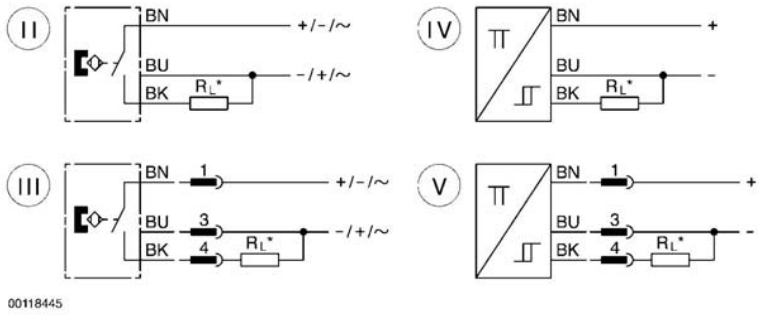
Stroke	N 1	N 2	N 3	L1	L2
10	2	2	2	126,5	111,6
20	2	2	2	126,5	111,6
30	2	2	2	126,5	111,6
40	2	2	2	136,5	121,6
50	4	2	2	149,5	134,6
80	4	3	3	195,5	180,6
100	4	3	3	215,5	200,6
125	4	3	5	295,5	268,6
150	6	3	5	332,5	317,6
200	6	3	7	407,5	392,6

	C 1	C 2	C 3	C 4
SW	17	20	22	2,5
MD [Nm]	13,6	–	20	3

										MSC-SH	MSC-SE
Ø D1	Ø D2	H 1	H 2	H 3	H 4	H 5	H 6	H 7	H 8	L 3	L 3
G 1/8	M18x1,5	60	22	44,5	16	46,5	12	22	28	72 (max.)	35 (max.)

L 4	L 5	L 6	L 7	R 1	R 2	W 1	W 2	W 3	W 4	W 5
18	18	2	12	≤ 100-0...15 ≥ 100-0...10	0...15	112	45	67	43,5	56

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

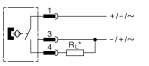
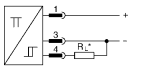
General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

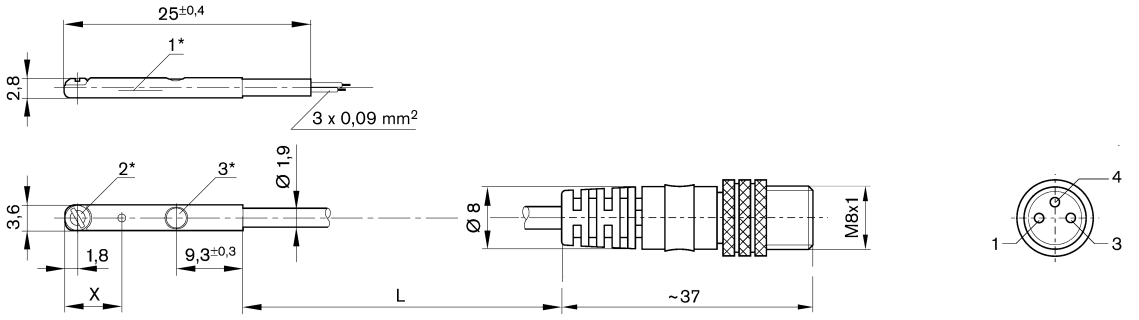
00118444_c

Ambient temperature min. / max.	-25°C / +75°C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	-	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions

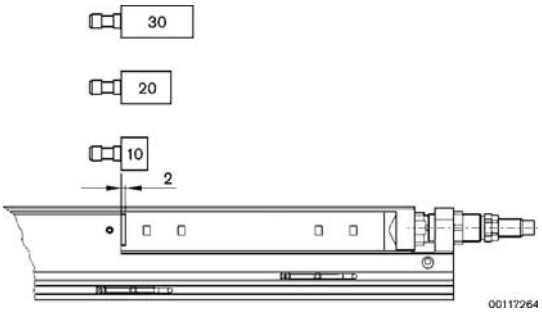


00123231_c

1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

▲★ Stroke limit bolts

Type	Stroke [mm]	Stroke reduction 10 mm	20 mm	30 mm
MSC - 8	20 – 80	**7472D00616**	–	–
MSC - 12	30 – 100	**7472D00616**	**7472D00626**	–
MSC - 16	30 – 150	**7472D00620**	**7472D00619**	–
MSC - 20	30	**7472D00623**	**7472D00622**	–
	40 – 200	**7472D00623**	**7472D00622**	**7472D00625**
MSC - 25	30	**7472D00623**	**7472D00622**	–
	40 – 200	**7472D00623**	**7472D00622**	**7472D00625**



▲★ Centering ring

▲★

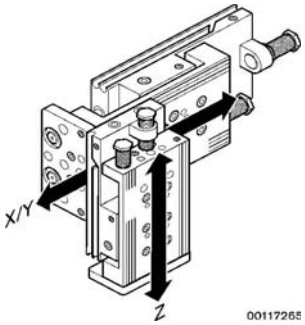
		per Pack	Part no.
	5	6	**R412000669**
	7	6	**R412000668**
	9	6	**R412000670**
	12	6	**R412000671**
	5 – 7	6	**R412004030**
	5 – 9	6	**R412004032**
	7 – 9	6	**R412004033**
	9 – 12	6	**R412004034**

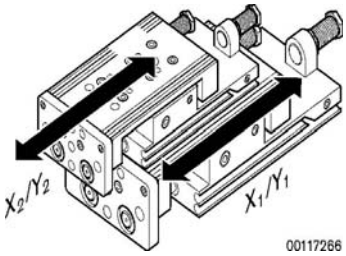
▲ Shock absorber

▲

	Type	Part no.
	MSC - 8	**R402000753**
	MSC - 12	**R402000758**
	MSC - 16	**R402000758**
	MSC - 20	**R402000759**
	MSC - 25	**R402000760**

Combination options, table mounting

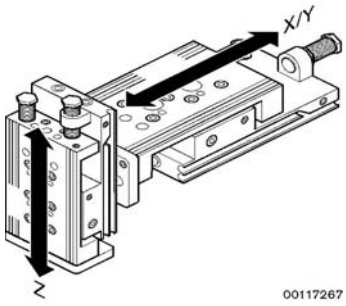


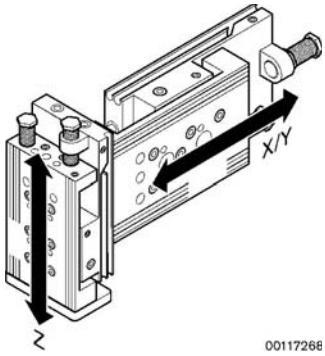


X / Y	Z			
	MSC 8	MSC 12	MSC 16	MSC 20
MSC 12	Screw M4 x 16 to ISO 4762 Centering ring 7mm*			
MSC 16		Screw M5 x 20 to ISO 4762 Centering ring 9mm*		
MSC 20			Screw M5 x 30 to ISO 4762 Centering ring 9mm*	
MSC 25				Screw M6 x 35 to ISO 4762 Centering ring 12mm*

* Centering elements included in scope of delivery

Combination options, front mounting





X / Y	Z			
	MSC 8	MSC 12	MSC 16	MSC 20
MSC 12	Screw M4 x 18 to ISO 4762 Centering ring 7mm*			
MSC 16		Screw M5 x 20 to ISO 4762 Centering ring 9mm*		
MSC 20			Screw M5 x 30 to ISO 4762 Centering ring 9mm*	
MSC 25				Screw M6 x 35 to ISO 4762 Centering ring 12mm*

* Centering elements included in scope of delivery

Mini slides flat, MSF series
MSF

Rexroth
Bosch Group

★

Technical Data

Operating mode		Double-acting type
Operating temperature range		0 °C to +50 °C (32 °F to +122 °F)
Cushioning		Elastomer (MSF-...-...-SE)
Medium		Compressed air, lubricated or oil-free
Lubrication		Maintenance-free
Material	Housing	Aluminum (anodized)
	Slide	Aluminum (anodized)
	Front plate	High-strength aluminum (anodized)
	Piston rod	Steel
	Ball bearing	Hardened steel
	Seals	NBR+PU (NBR+Polyurethane)

Application area

Suitable for precise applications in handling technology
Versatile mounting options on further handling components (grippers, rotary modules...)
Centering elements included in scope of delivery

Technical information

			MSF – 8	MSF – 12	MSF – 16
Piston diameter	–	[mm]	8	12	16
Connection thread	–		M 5	M 5	M 5
Operating pressure	–	[bar] (psi)	**1,5 - 10 (22 - 145)**	1 - 10 (15 - 145)	1 - 10 (15 - 145)
Theoretical useful force (6 bar) (87 psi)	Thrust force	[N] (lbf.)	30 (7)	68 (15)	120 (30)
	Retraction force	[N] (lbf.)	23 (5)	51 (11)	90 (20)
Speed	Outward stroke	[m/s] (ft/s)	0,8 (2.262)	0,8 (2.262)	0,8 (2.262)
	Retraction stroke	[m/s] (ft/s)	0,8 (2.262)	0,8 (2.262)	0,8 (2.262)
Cushioning	Elastomer	[Nm] (in.lbs.)	0,05 (0.44)	0,07 (0.62)	0,15 (1.33)
Max. additional moving mass	Elastomer	[kg] (lbs.)	0,3 (0.661)	0,5 (1.102)	0,9 (1.984)
Stroke-limiting range per end position		[mm]	0 - 10	0 - 10	0 - 10

Part no. for MSF–...–...–SE elastically cushioning

Stroke	MSF – 8	MSF – 12	MSF – 16
10	**0821406400**	**0821406403**	**0821406408**
20	**0821406401**	**0821406404**	**0821406409**
30	**0821406402**	**0821406405**	**0821406410**
40	–	**0821406406**	**0821406411**
50	–	**0821406407**	**0821406412**
80	–	–	**0821406413**

Drive weight for nominal stroke [kg] (lbs.)

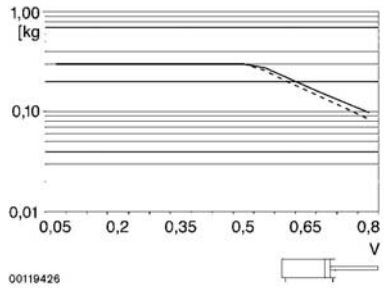
Stroke [mm]	MSF – 8	MSF – 12	MSF – 16
10	0,120 (0.265)	0,190 (0.419)	0,370 (0.816)
20	0,130 (0.287)	0,220 (0.485)	0,380 (0.838)
30	0,150 (0.331)	0,240 (0.529)	0,410 (0.904)
40	–	0,290 (0.639)	0,430 (0.948)
50	–	0,310 (0.683)	0,490 (1.080)
80	–	–	0,700 (1.543)

Moving mass for nominal stroke [kg] (lbs.)

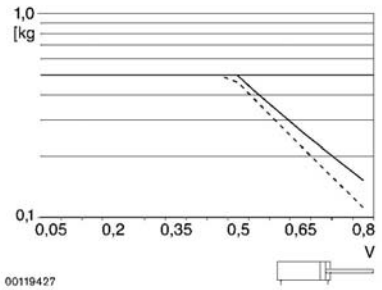
Stroke [mm]	MSC – 8	MSC – 12	MSC – 16
10	0,060 (0.132)	0,070 (0.154)	0,162 (0.375)
20	0,070 (0.154)	0,080 (0.176)	0,167 (0.368)
30	0,074 (0.163)	0,086 (0.190)	0,180 (0.397)
40	–	0,102 (0.225)	0,183 (0.403)
50	–	0,107 (0.236)	0,213 (0.470)
80	–	–	0,295 (0.650)

Max. additionally moving mass with elastic cushioning (min. stroke, max. stroke)

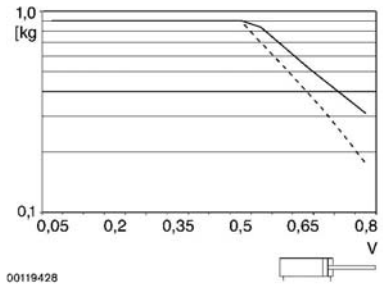
MSF - 8 -...- SE



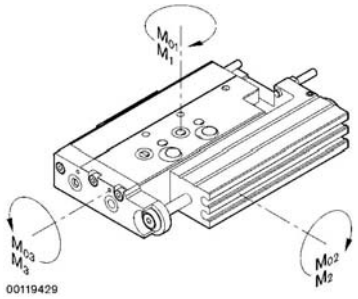
MSF - 12 -...- SE



MSF - 16 -...- SE

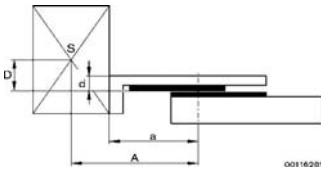


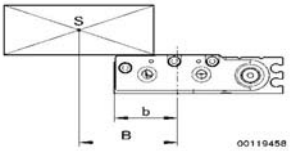
Permissible loads



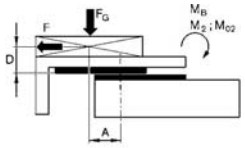
Type	Stroke	Correction factor			Maximum permissible torque [Nm] (in.lbs.)					
		a	d	b	Static			Dynamic		
	[mm]	[mm]	[mm]	[mm]	M 01	M 02	M 03	M 1	M 2	M 3
MSF – 8	10	36	8	15	2,4 (21.24)	2,4 (21.24)	2,3 (20.36)	0,5 (4.43)	0,8 (7.08)	0,6 (5.31)
	20	48			3,3 (29.21)	3,3 (29.21)	3,2 (28.32)	1,2 (10.62)	1,2 (10.62)	0,7 (6.20)
	30	56			3,3 (29.21)	3,3 (29.21)	3,2 (28.32)	1,2 (10.62)	1,2 (10.62)	0,7 (6.20)
MSF – 12	10	43	9,6	17,5	7 (62)	7 (62)	7 (62)	1,9 (16.82)	1,9 (16.82)	1,1 (9.74)
	20	53			7 (62)	7 (62)	7 (62)	1,8 (15.93)	1,9 (16.82)	1,1 (9.74)
	30	63			7 (62)	7 (62)	7 (62)	1,9 (16.82)	1,9 (16.82)	1,1 (9.74)
	40	78			13 (115)	13 (115)	9 (80)	2,9 (25.67)	2,9 (25.67)	1,3 (11.51)
	50	87			13 (115)	13 (115)	9 (80)	2,9 (25.67)	2,9 (25.67)	1,3 (11.51)
MSF – 16	10	50	12,5	23,5	14 (124)	14 (124)	20 (177)	4,4 (38.94)	4,4 (38.94)	4,2 (37.17)
	20	56			14 (124)	14 (124)	20 (177)	4,4 (38.94)	4,4 (38.94)	4,2 (37.17)
	30	66			14 (124)	14 (124)	20 (177)	4,4 (38.94)	4,4 (38.94)	4,2 (37.17)
	40	76			14 (124)	14 (124)	20 (177)	4,4 (38.94)	4,4 (38.94)	4,2 (37.17)
	50	88			19 (168)	19 (168)	19 (168)	5,6 (49.56)	5,6 (49.56)	4,6 (40.71)
	80	127			32 (283)	33 (292)	33 (292)	8,2 (72.58)	8,2 (72.58)	5,2 (46.02)

Correction factor (a, d, b)

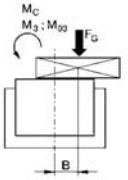




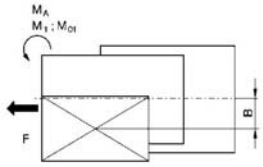
Horizontal application



stat.	$M_{B0} = F_G \cdot A + F \cdot D$
dyn.	$M_B = F_G \cdot A$



stat.	$M_{CO} = F_G \cdot B$
dyn.	$M_C = F_G \cdot B$

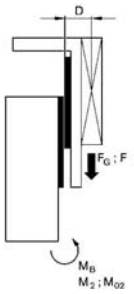


stat.	$M_{A0} = F \cdot B$
dyn.	$M_A = 0$

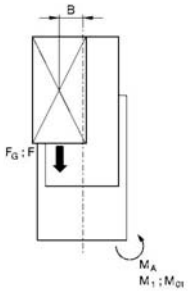
dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$
stat.	$\frac{M_{A0}}{M_{01}} + \frac{M_{B0}}{M_{02}} + \frac{M_{C0}}{M_{03}} \leq 1$

D0116096

Vertical application



stat.	$M_{B0} = (F_G + F) \cdot D$
dyn.	$M_B = F_G \cdot D$

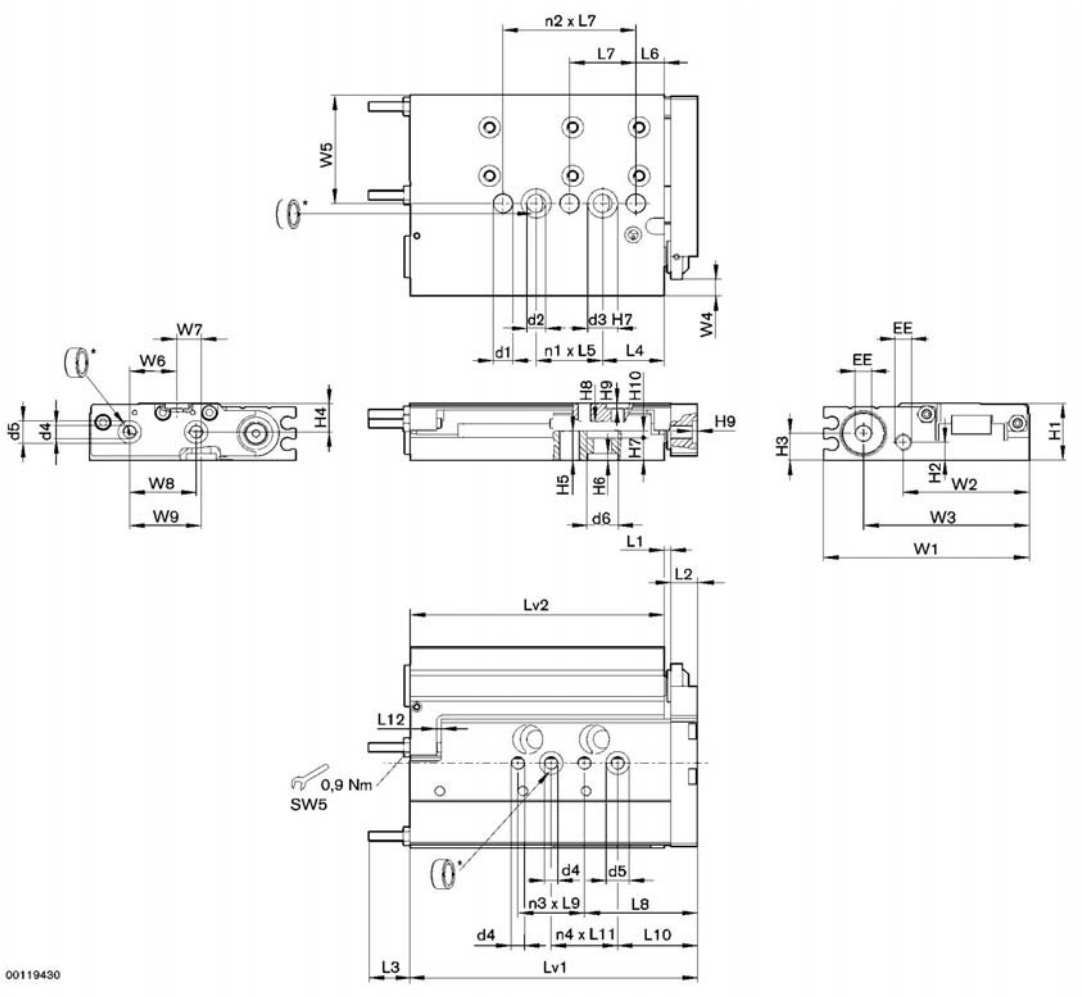


stat.	$M_{AO} = (F_G + F) \cdot B$
dyn.	$M_A = F_G \cdot B$

dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$
stat.	$\frac{M_{A0}}{M_{01}} + \frac{M_{B0}}{M_{02}} \leq 1$

D0116097

F = m * a = deceleration force [N]
FG = m * g = force due to weight [N]
The decelerations occurring in the stroke end position depend on traversing speed and moving mass.



	Ø d1	Ø d2	Ø d3	Ø d4	Ø d5	Ø d6	EE	H1 ±0,1	H2	H3	H4 ±0,1	H5 max.	H6 ±0,2	H7	H8 max.	H9 ±0,2	H10	L1*	L2
MSF - 8	M5	4,7	7	M3	M7	7,5	M5	14	5,1	6,5	7,5	7,5	1,6	4,3	5	1,6	4	2	6
MSF - 12	M6	5,6	9	M4	M7	9,5	M5	17,5	5,5	8,25	8,8	9	2,1	6,9	6,1	1,6	5	2	8
MSF - 16	M6	5,6	9	M5	M7	9,5	M5	21	5,5	10	12,2	10,5	2,1	6,9	7,6	2,1	5	2	10

	L3	L4	L5	L6	L7	L8	L9	L10 ±0,1	L11	L12	W1	W2	W3	W4	W5	W6 ±0,06	W7	W8 ±0,02	W9
MSF - 8	12,5	12	20	4,5	20	30	20	20	20	0-10	53	32,5	43	3,8	28	12,7	6,8	20	19,5
MSF - 12	12,5	18,5	20	8,5	20	34	20	20	20	0-10	62	38	50	5	33,5	14,2	7,3	20	21,5
MSF - 16	12	21,5	20	11,5	20	36	20	25,5	20	0-10	76,5	48,7	62,5	5,5	44	19,5	8	20	27,5

MSF - 08

Stroke	Lv1*	Lv2	n1	n2	n3	n4
10	59	50,5	1	1	0	1
20	69	60,5	1	2	1	1
30	79	70,5	1	2	1	1

* ~+1,5 mm with elastic cushioning

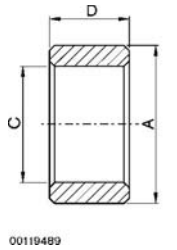
MSF - 12

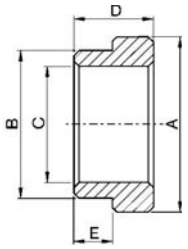
Hub	Lv1	Lv2	n1	n2	n3	n4
10	67	56,5	1	1	0	1
20	77	66,5	1	1	1	1
30	87	76,5	1	2	1	1
40	106	95,5	2	2	1	1
50	115	104,5	2	2	1	1

MSF - 16

Hub	Lv1	Lv2	n1	n2	n3	n4
10	78	65,5	1	1	1	1
20	81	68,5	1	2	1	1
30	91	78,5	2	2	1	1
40	100	87,5	2	2	1	1
50	115	102,5	3	3	1	1
80	162	149,5	4	4	1	1

▲★ Centering ring

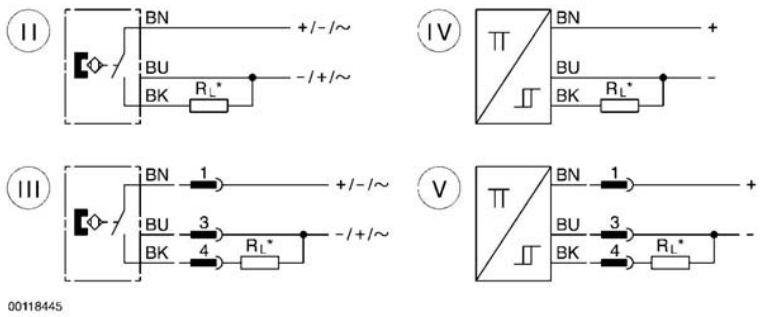




▲★

	A f7	B e7	C ±0,1	D ±0,2	E –0,1	per Pack	Part no.
	5	5	–	3,4	3	–	6	**R412000669**
	7	7	–	5,5	3	–	6	**R412000668**
	9	9	–	6,6	4	–	6	**R412000670**
	12	12	–	9,0	4	–	6	**R412000671**
	5 – 7	7	5	3,4	3	1,5	6	**R412004030**
	5 – 9	9	5	3,4	3,5	1,5	6	**R412004032**
	7 – 9	9	7	5,5	3,5	1,5	6	**R412004033**
	9 – 12	12	9	6,6	4,0	2	6	**R412004034**

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

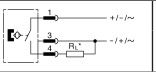
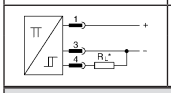
General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

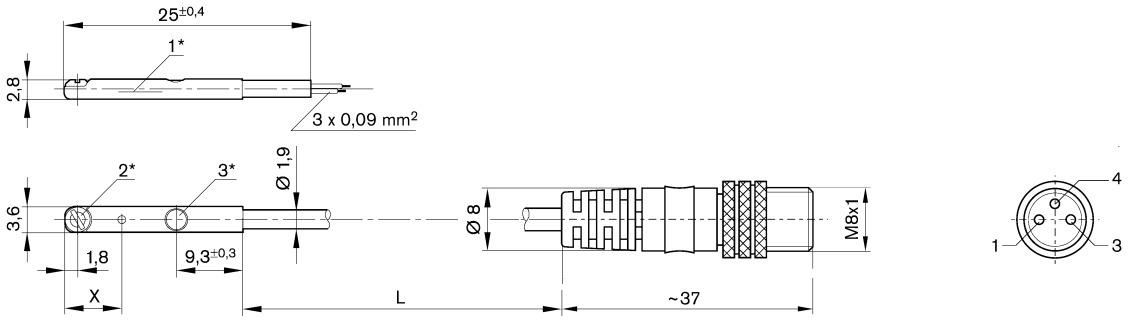
00118444_c

Ambient temperature min. / max.	-25 °C / +75 °C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	-	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions



00123231_c

1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

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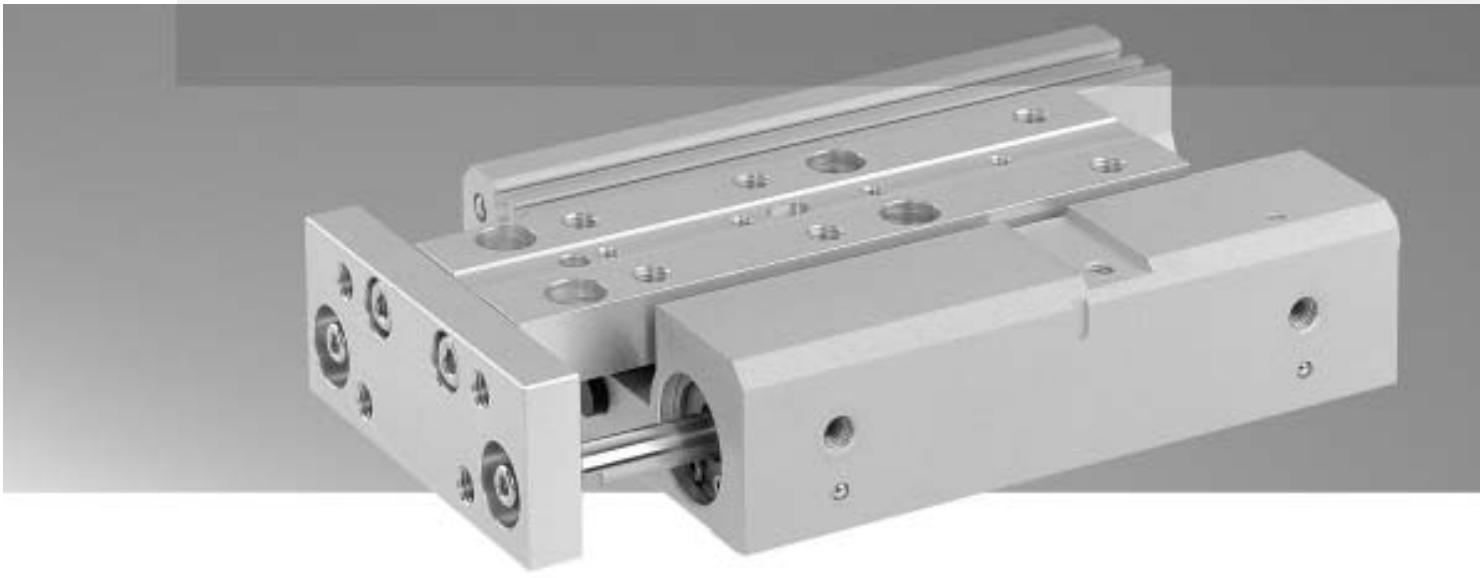
ZSC – Pneumatic Mini Slide Unit

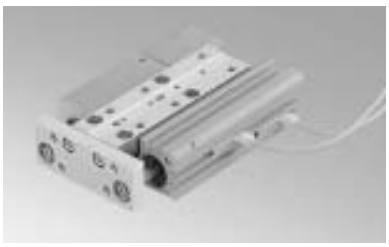
The ZSC Series is specially designed for vertical applications. The unique placement of the ball rail system between the twin piston rods results in a very flat, low-mount guide.



The advantages are:

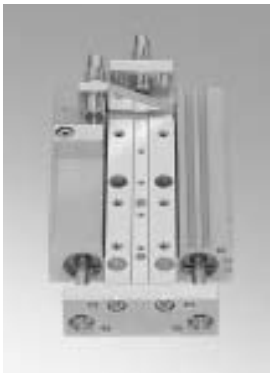
- Double-acting type
- High parallelism between rail system and twin piston rods.
- Multiple mount options on front and top, simplifying machine design.
- Flexible, lightweight design combined with precision movement enabling use in dynamic applications.
- Options include stroke adjustment, improving machine-setting capabilities.
- Available in bore sizes 2 x 6 to 2 x 25 mm and strokes up to 4" [100 mm].

Top and front mounting possibilities.



Magnetic sensors as accessories.

35% lower profile and 35% less weight than conventional double rod slide units.



Stroke adjustment at both ends, with shock absorbers and rubber stops as accessories.

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Technical Data

Operating type		Double-acting type
Operating pressure range		1.5–7 bar (22 to 102 psi)
Proof pressure		10.5 bar
Operating temperature range		0 °C to +60 °C / 32° to 140°F
Stroke repeatability*		±0.002 in. (±0.05 mm)
Cushioning	Standard	Rubber bumper
	Option	Shock absorber, metal stop and rubber stop
Operating speed range		0.16 to 1.64 ft/s (0.05 to 0.5 m/s)
Medium		Compressed air, lubricated or non-lubricated
Lubrication	Cylinder	Not required. If required use turbine oil class 1 (ISO VG32) or equivalent.
	Guide	Not required. If required use lithium based grease.

* In case of shock absorber with stroke adjusting.

Material	Body	Aluminum alloy (anodized)
	Guide	Stainless steel
	Piston	Aluminum alloy (anti rust)

Application area

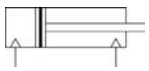
Suitable for all applications where a z-axis movement is needed.

Technical information

Type		ZSC6	ZSC10	ZSC16	ZSC20	ZSC25
Bore size [mm]		2 x 6	2 x 10	2 x 16	2 x 20	2 x 25
Maximum allowable load mass lb. [kg]		14.77 [6.7]	36.60 [16.6]	50.49 [22.9]	91.93 [41.7]	139.77 [63.4]
Stroke adjusting range* [mm]	Rubber stop pull side	–5–0	–5–0	–5–0	–5–0	–5–0
	Rubber stop push side	–12–0	–11–0	–14–0	–13–0	–17–0
	Shock absorber pull side	–	–5–0	–11–0	–10–0	–7–0
	Shock absorber push side	–	–11–0	–19–0	–18–0	–17–0
Parallelism during stroke in. [mm]	[1]	0.004 [0.1]	0.004 [0.1]	0.004 [0.1]	0.004 [0.1]	0.004 [0.1]
	[2]	0.008 [0.2]	0.008 [0.2]	0.008 [0.2]	0.008 [0.2]	0.008 [0.2]
Port size		M5x0.8	M5x0.8	M5x0.8	G 1/8	G 1/8

[1]) Stroke lengths: ZSC6 up to 40 mm, ZSC10 up to 50 mm, ZSC16, ZSC20, ZSC25 up to 80 mm.
[2]) Stroke lengths: ZSC6; 50 mm and longer. ZSC10; 60 mm and longer. ZSC16, ZSC20, ZSC25; 90 mm and 100 mm.

Code no.

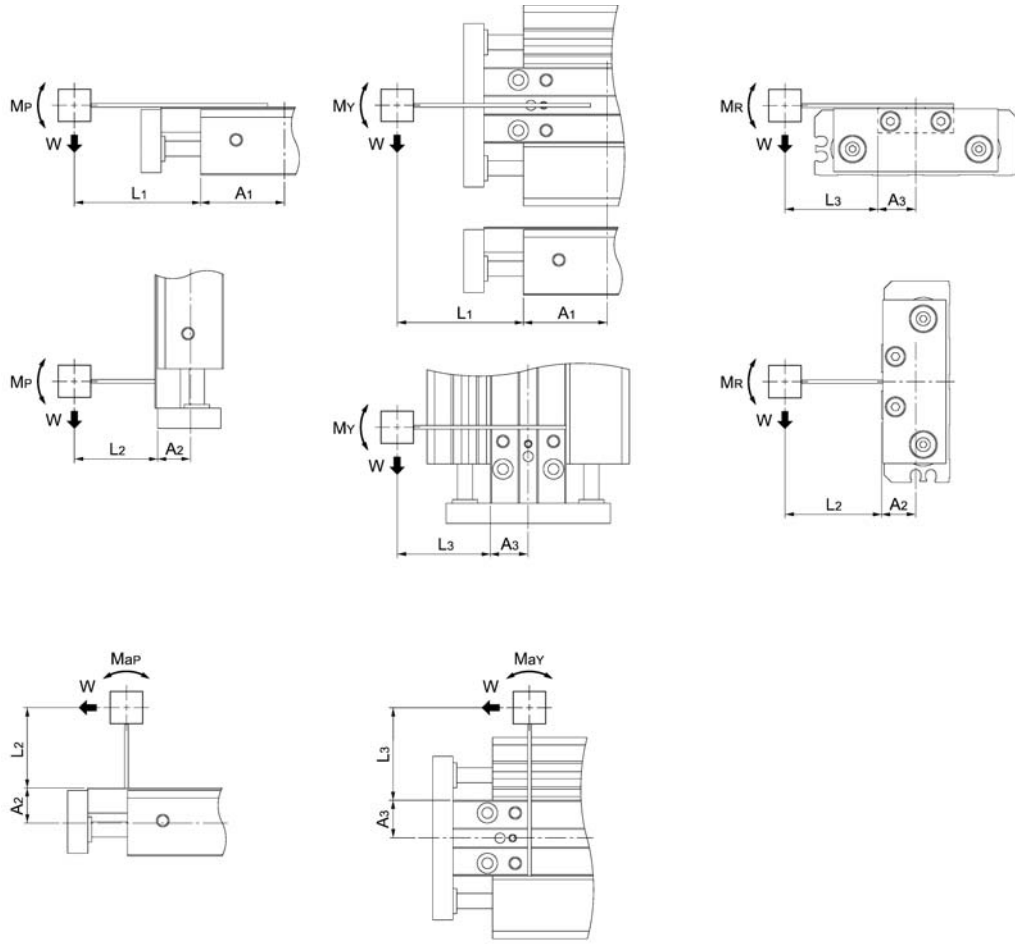


Piston dia.	2 x 6	2 x 10	2 x 16	2 x 20	2 x 25
Stroke					
10	**2 650 113 000**	**2 650 113 120**	**2 650 113 280**	**2 650 113 440**	**2 650 113 600**
20	**2 650 113 010**	**2 650 113 130**	**2 650 113 290**	**2 650 113 450**	**2 650 113 610**
30	**2 650 113 020**	**2 650 113 140**	**2 650 113 300**	**2 650 113 460**	**2 650 113 620**
40	**2 650 113 030**	**2 650 113 150**	**2 650 113 310**	**2 650 113 470**	**2 650 113 630**
50	**2 650 113 040**	**2 650 113 160**	**2 650 113 320**	**2 650 113 480**	**2 650 113 640**
60	**2 650 113 050**	**2 650 113 170**	**2 650 113 330**	**2 650 113 490**	**2 650 113 650**
70	**2 650 113 060**	**2 650 113 180**	**2 650 113 340**	**2 650 113 500**	**2 650 113 660**
80	–	**2 650 113 190**	**2 650 113 350**	**2 650 113 510**	**2 650 113 670**
90	–	**2 650 113 200**	**2 650 113 360**	**2 650 113 520**	**2 650 113 680**
100	–	**2 650 113 210**	**2 650 113 370**	**2 650 113 530**	**2 650 113 690**

Body mass (weight)

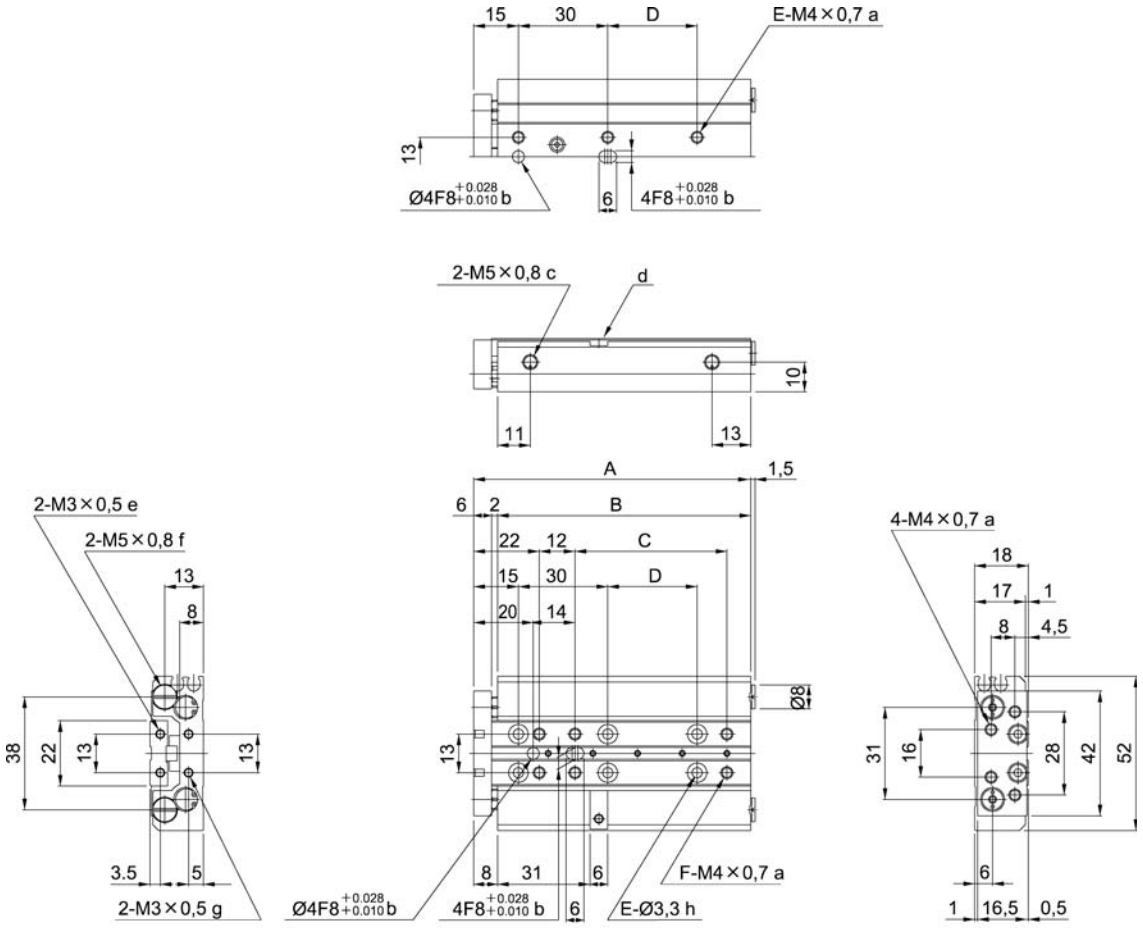
Piston dia. [mm]	Zero stroke mass lb. [kg]	Add. mass per 10 mm stroke lb. [kg]
6	0.19 [0.085]	0.04 [0.020]
10	0.37 [0.170]	0.06 [0.029]
16	0.71 [0.323]	0.09 [0.043]
20	1.27 [0.577]	0.15 [0.067]
25	2.15 [0.973]	0.21 [0.094]

Allowed forces and moments



Technical Data	Designation	Unit	ZSC6	ZSC10	ZSC16	ZSC20	ZSC25
Max. cushioning energy Max. cushioning energy with shock absorber	Ea Ea	in.lbs.[J] in.lbs.[J]	0.159 [0.018] –	0.487 [0.055] 5.851 [1.0]	0.974 [0.110] 25.668 [2.9]	1.416 [0.160] 34.519 [3.9]	2.124 [0.240] 52.221 [5.9]
Max. load	W max.	lbs. [kg]	14.77 [6.7]	36.60 [16.6]	50.49 [22.9]	91.49 [41.5]	139.77 [63.4]
Dimensions	A1 A2 A3	in. [mm] in. [mm] in. [mm]	0.79 [20.0] 0.45[11.5] 0.43[11.0]	1.02 [26.0] 0.59 [15.0] 0.49 [12.5]	1.30 [33.0] 0.73 [18.5] 0.59 [15.0]	1.50 [38.0] 0.89 [22.5] 0.71 [18.0]	1.85 [47.0] 1.08 [27.5] 0.87 [22.0]
Max. moment	MaP MaY MaR	in.lbs. [Nm] in.lbs. [Nm] in.lbs. [Nm]	14.06 [1.59] 4.69 [0.53] 5.92 [0.67]	17.77 [2.01] 14.15 [1.60] 17.77 [2.01]	54.56 [6.17] 43.68 [4.94] 54.56 [6.17]	72.78 [8.23] 58.28 [6.59] 72.78 [8.23]	90.99 [10.29] 72.78 [8.23] 90.99 [10.29]

ZSC 6



a	b	c	d	e	f	g	h
Depth 6	Depth 4	Connection port	Stroke adjust-ment fitting*	Depth 4,5	Port with plug	Depth 5,5	M 3 holes 10 from top

* Not for stroke length 10 mm.

Stroke	A	B	C	D	E No. of holes	F
10	53	45	–	–	4	4
20	63	55	21	–	4	6
30	73	65	31	–	4	6
40	83	75	41	–	4	6
(50)*	93	85	51	30	6	6
(60)*	103	95	61	30	6	6
(70)*	113	105	71	30	6	6

*Available on request.

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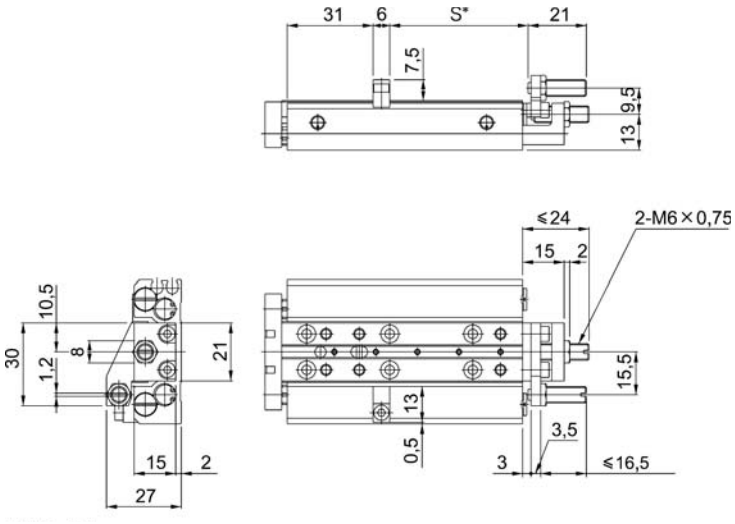
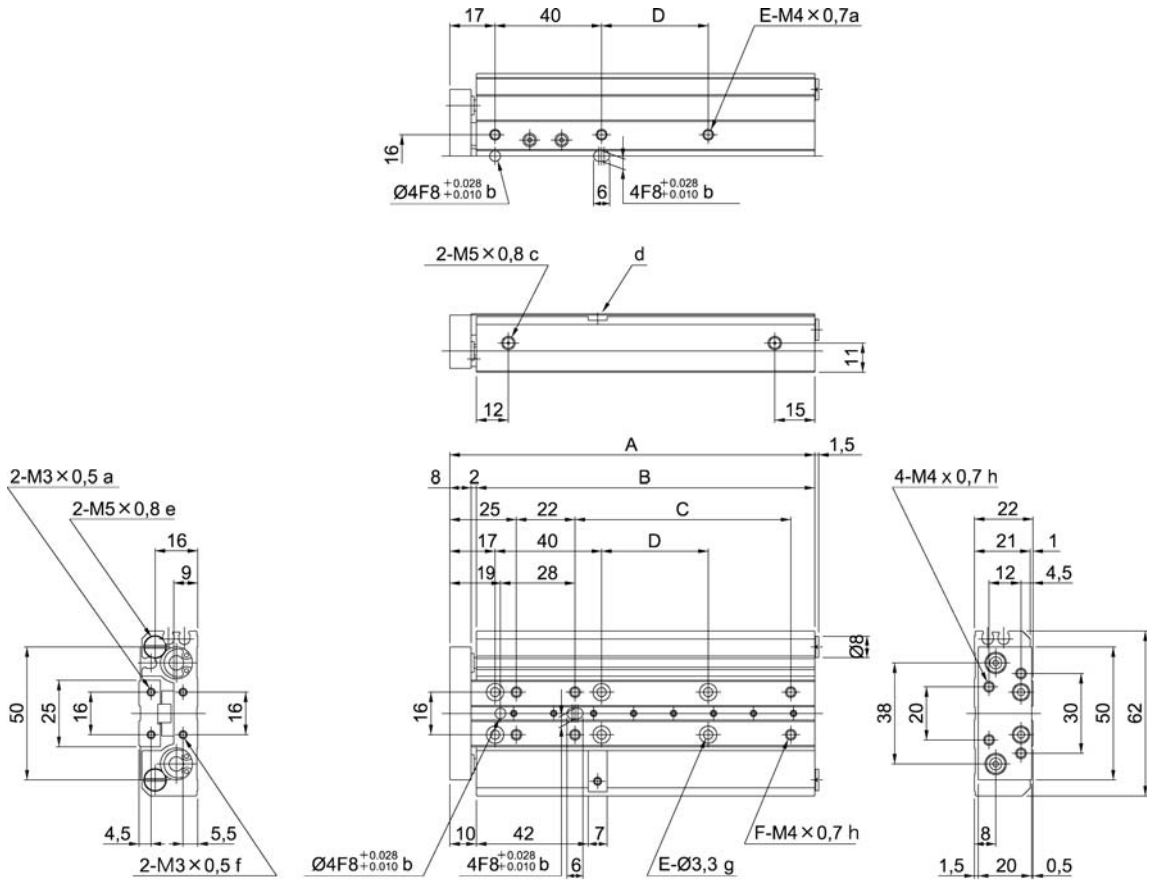
ZSC 6 with shock absorber



S* = Stroke

ZSC 10



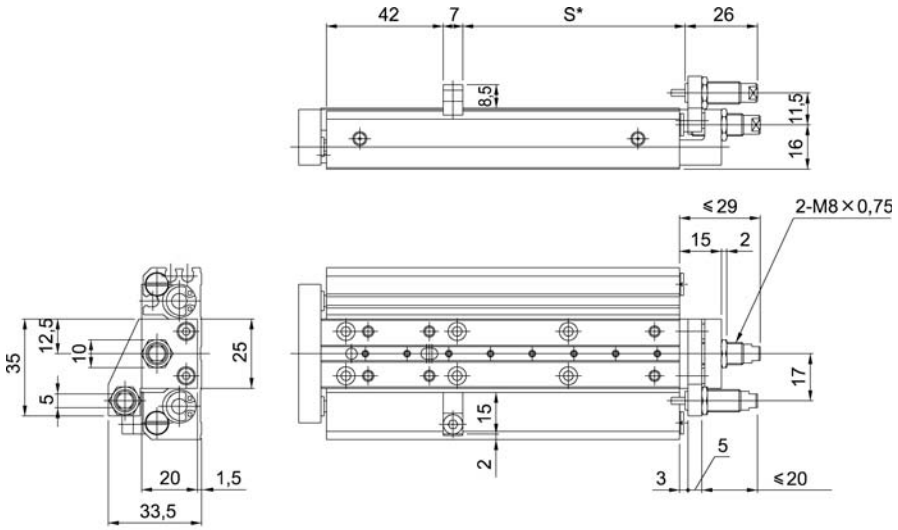
a	b	c	d	e	f	g	h
Depth 6	Depth 4	Connection port	Stroke adjust-ment fitting*	Port with plug	Depth 7	M 3 holes 13 from top	Depth 8

* Not for stroke length 10 mm.

Stroke	A	B	C	D	E No. of holes	F
10	67	57	–	–	4	4
20	77	67	21	–	4	6
30	87	77	31	–	4	6
40	97	87	41	–	4	6
50	107	97	51	–	4	6
(60)*	117	107	61	40	6	6
(70)*	113	105	71	30	6	6
(80)*	137	127	81	40	6	6
(90)*	147	137	91	40	6	6
(100)*	157	147	101	40	6	6

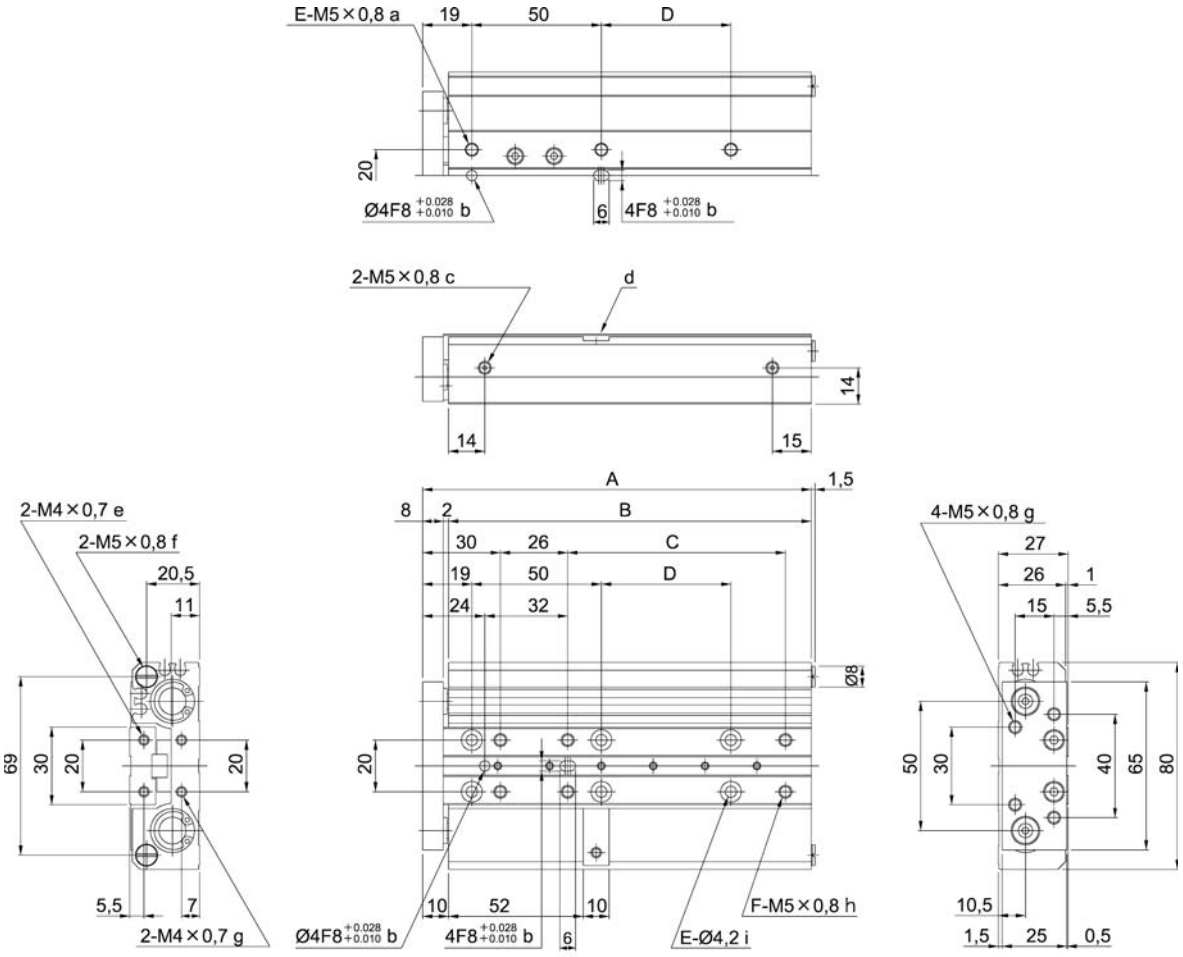
* Available on request.

ZSC 10 with shock absorber



S* = Stroke

ZSC 16



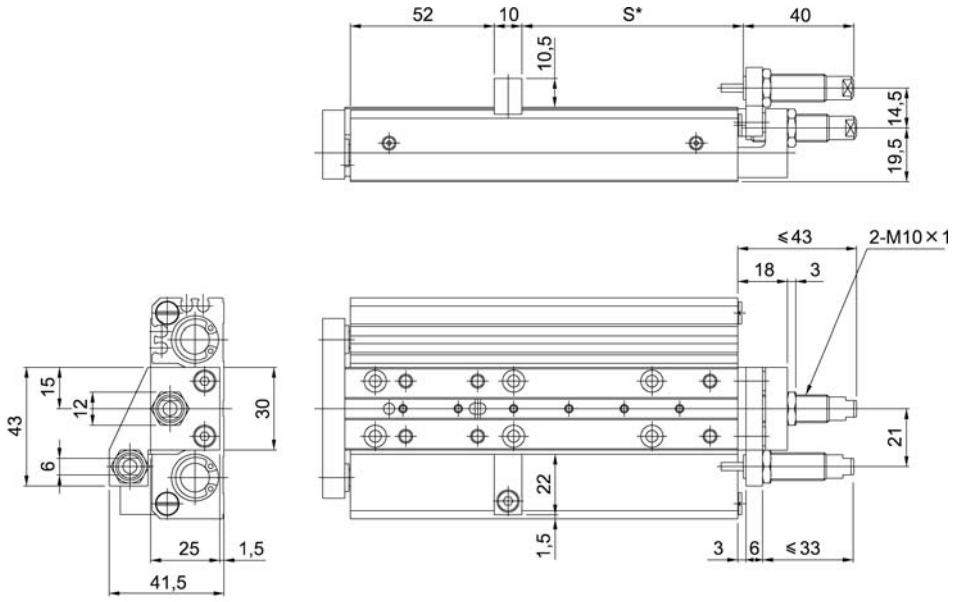
a	b	c	d	e	f	g	h	i
Depth 7	Depth 4	Connection port	Stroke adjustment fitting*	Depth 6,5	Port with plug	Depth 8	Depth 10	M 4 holes 16 from top

* Not for stroke length 10 mm.

Stroke	A	B	C	D	E No. of holes	F
10	80	70	–	–	4	4
20	90	80	24	–	4	6
30	100	90	34	–	4	6
40	110	100	44	–	4	6
50	120	110	54	–	4	6
(60)*	130	120	64	–	4	6
(70)*	140	130	74	50	6	6
(80)*	150	140	84	50	6	6
(90)*	160	150	94	50	6	6
(100)*	170	160	104	50	6	6

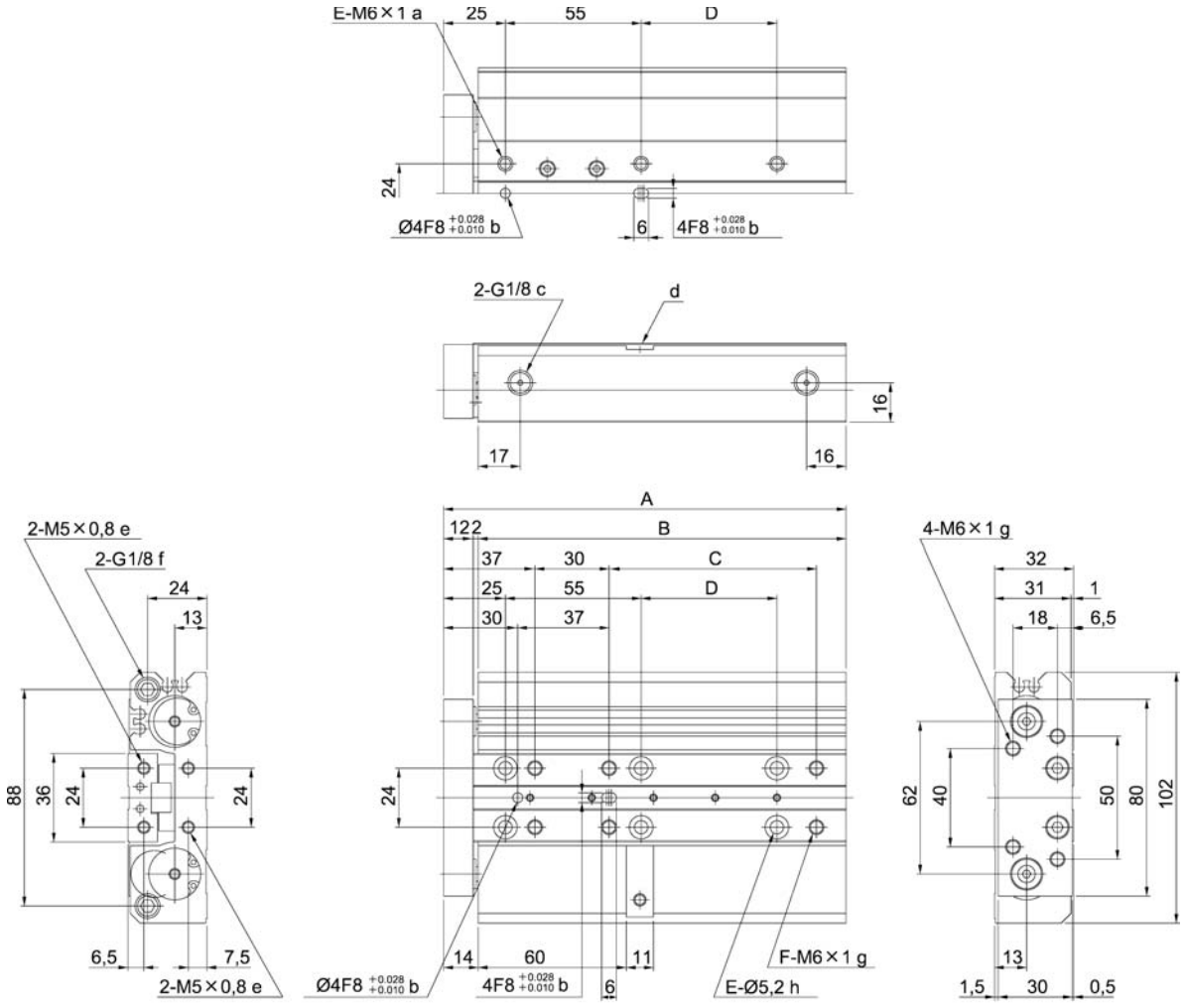
* Available on request.

ZSC 16 with shock absorber



S* = Stroke

ZSC 20



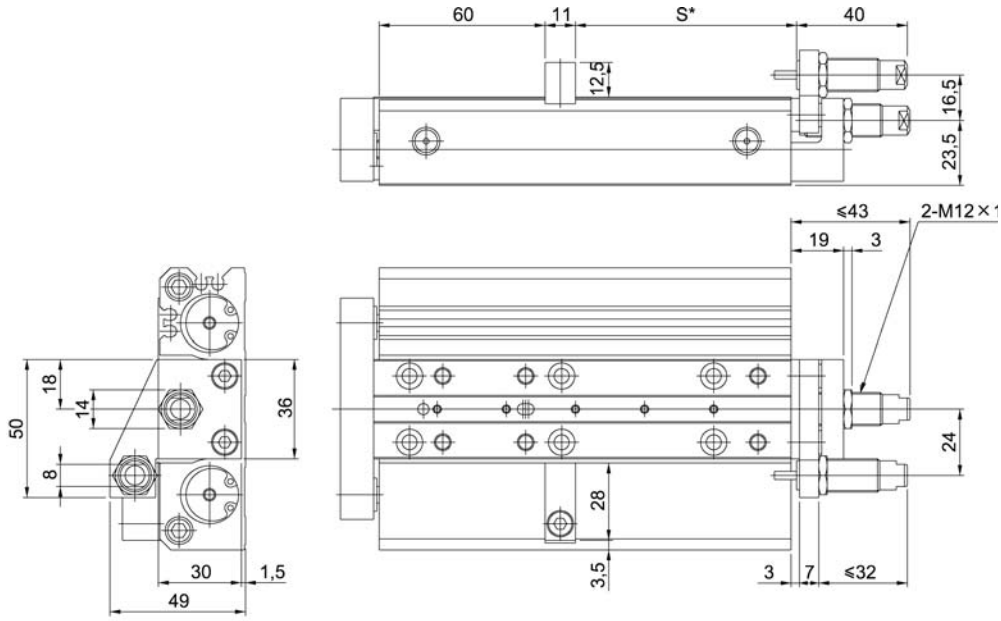
a	b	c	d	e	f	g	h
Depth 9	Depth 4	Connection port	Stroke adjust-ment fitting*	Depth 8	Port with plug	Depth 12	M 5 holes 19 from top

* Not for stroke length 10 mm.

Stroke	A	B	C	D	E No. of holes	F
10	93	79	–	–	4	4
20	103	89	24	–	4	6
30	113	99	34	–	4	6
40	123	109	44	–	4	6
50	133	119	54	–	4	6
(60)*	143	129	64	–	4	6
(70)*	153	139	74	–	4	6
80	163	149	84	55	6	6
(90)*	173	159	94	55	6	6
(100)*	183	169	104	55	6	6

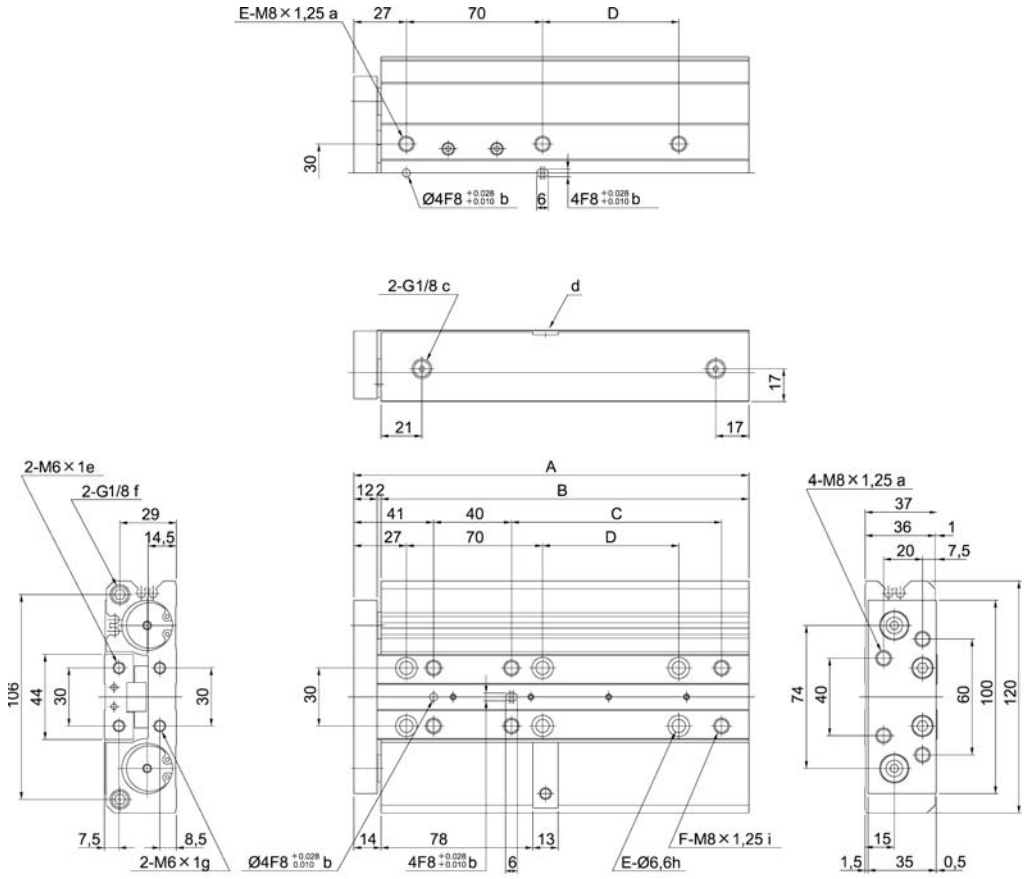
* Available on request.

ZSC 20 with shock absorber



S* = Stroke

ZSC 25



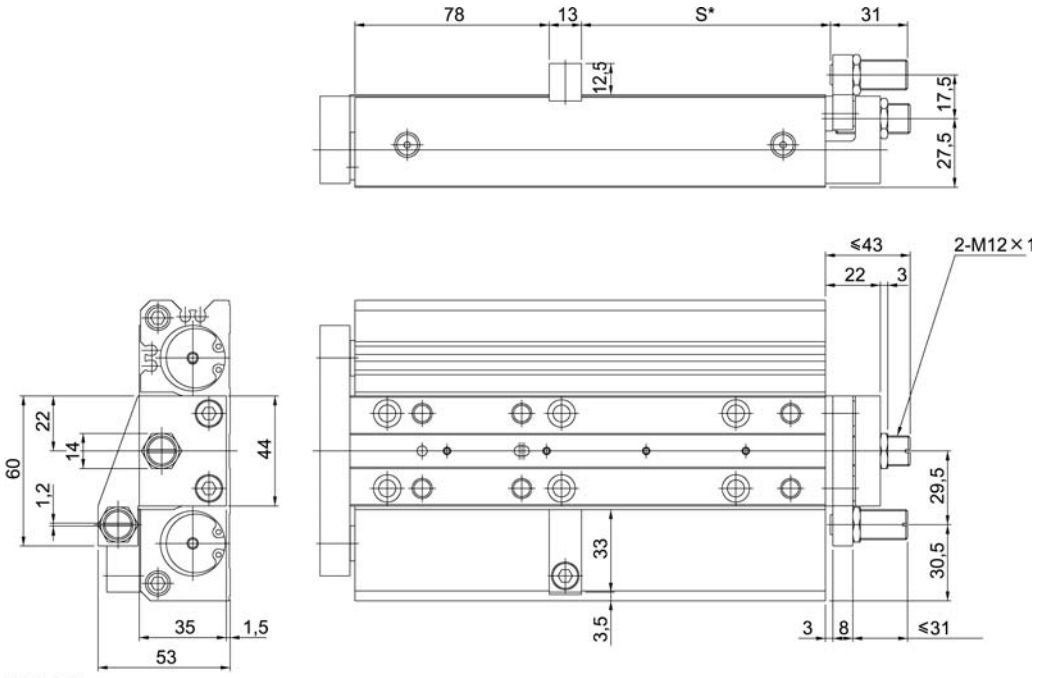
a	b	c	d	e	f	g	h	i
Depth 12	Depth 4	Connection port	Stroke adjustment fitting*	Depth 9	Port with plug	Depth 10	Depth 15	M 6 holes 22,5 from top

* Not for stroke length 10 mm.

Stroke	A	B	C	D	E No. of holes	F
10	113	99	–	–	4	4
20	123	109	28	–	4	6
30	133	119	38	–	4	6
40	143	129	48	–	4	6
50	153	139	58	–	4	6
(60)*	163	149	68	–	4	6
(70)*	173	159	78	–	4	6
80	183	169	88	–	4	6
(90)*	193	179	98	70	6	6
(100)*	203	189	108	70	6	6

* Available on request.

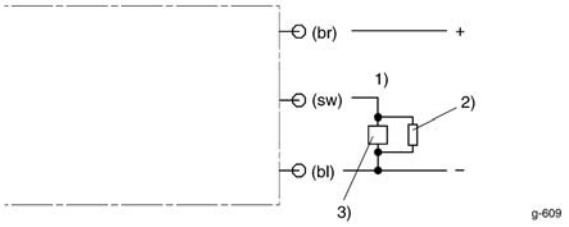
ZSC 25 with rubber stop



Magnetic sensor

Switch type	Solid-state sensor
Output type	Sourcing (PNP), Sinking (NPN)
Cable	Black Polyurethane (PUR) jacket, PVC insulation
Electrical connection	M 8 socket coupling, or cable
Ambient temperature	–10 °C to +70 °C / 14° to 158°F
Operating voltage (DC), Umax	5–28 V DC
Switching current	Max. 50 mA
Current consumption at 24 V DC	Max. 9 mA
Leakage current	Max. 0,01 mA
LED indicator	Provided, green
Voltage drop at 25 mA	Max. 1,2 mA
Enclosure protection class	IP 67 (NEMA 6), fully insulated

Electric circuit with LED, 3-wires

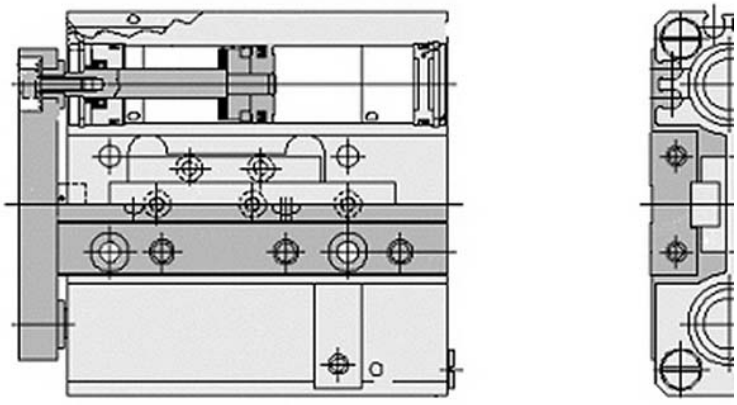


br=brown
sw=black
bl=blue

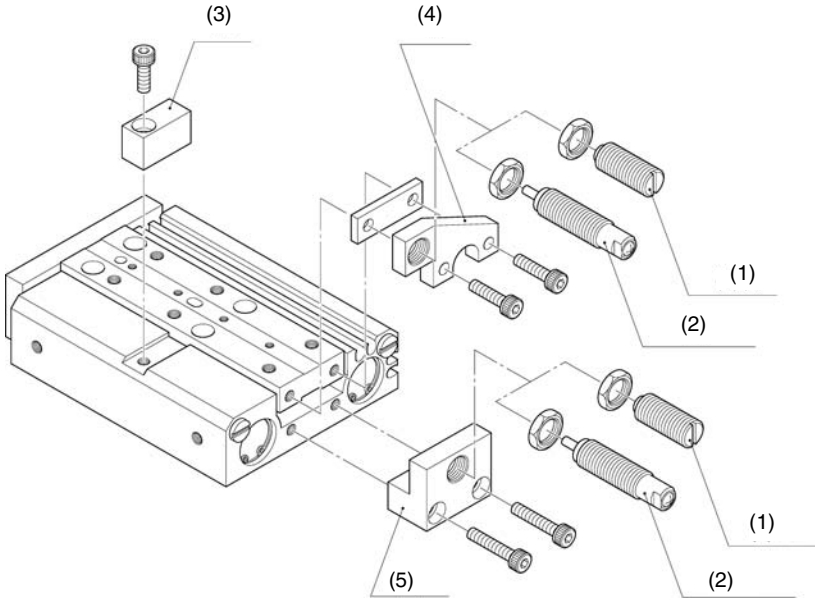
1) Output
2) Protection circuit
3) Load

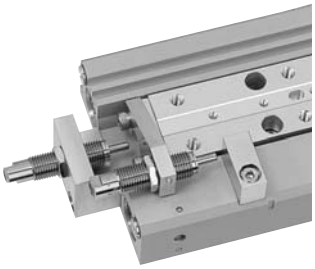
Type	Cable length ft. [m]	Weight lbs. [kg]	Code no.
Cable with PNP	0.5 [0.15]	0.13 [0.006]	**2 650 122 040**
Cable with PNP	9.8 [3.0]	0.64 [0.029]	**2 650 122 050**
Cable with NPN	9.8 [3.0]	0.64 [0.029]	**2 650 122 081**
Also available:			
Cable, reed	9.8 [3.0]	0.64 [0.029]	**2 650 122 051**
Cable, reed-vertical	9.8 [3.0]	0.64 [0.029]	**2 650 122 052**

See Sensors/Electrical Accessories in last section of catalog for connector cables.



Shock absorbers and stops





Code No.

Piston dia.	2 x 6	2 x 10	2 x 16	2 x 20	2 x 25
Rubber stop (1)	**2 650 113 080**	**2 650 113 230**	**2 650 113 390**	**2 650 113 550**	**2 650 113 710**
Shock absorber (2)	–	**2 650 113 240**	**2 650 113 400**	**2 650 113 560**	**2 650 113 720**
Mountings for adjustment in both ends (3), (4) and (5)*	**2 650 113 090**	**2 650 113 250**	**2 650 113 410**	**2 650 113 570**	**2 650 113 730**
Mountings for adjustment in outer end (3) and (4)*	**2 650 113 100**	**2 650 113 260**	**2 650 113 420**	**2 650 113 580**	**2 650 113 740**
Mountings for adjustment in inner end (3) and (5)	**2 650 113 110**	**2 650 113 270**	**2 650 113 430**	**2 650 113 590**	**2 650 113 750**

* Cannot be used for 10 mm stroke.

Shock absorber specifications

Item	2 650 113 240	2 650 113 400	2 650 113 560	2 650 113 720
Applicable cylinder	ZSC10	ZSC16	ZSC20	ZSC25
Maximum absorption in. lbs. [J]	8.85 [1.0]	25.67 [2.9]	34.52 [3.9]	52.22 [5.9]
Absorbing stroke in. [mm]	0.20 [5]	0.31 [8]	0.31 [8]	0.31 [8]
Maximum impact speed ft/s [m/s]	3.28 [1]	3.28 [1]	3.28 [1]	3.28 [1]
Maximum frequency [cycle/min]	60	30	30	30
Spring return force lbf [N]	0.88 [3.9]	1.46 [6.5]	1.46 [6.5]	1.46 [6.5]
Operating temperature range °F [°C]	32-140 [0–60]	32-140 [0–60]	32-140 [0–60]	32-140 [0–60]
Angle variation [°]	Max. 1	Max. 3	Max. 3	Max. 3
Mass lbs. [kg]	0.02 [0.007]	0.04 [0.020]	0.06 [0.028]	0.06 [0.028]

Guide Cylinder, Series GPC-E and GPC-ST

Series GPC-E, Ø 12–20 mm, double acting,
magnetic piston, stroke length adjustment

Rexroth
Bosch Group

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Technical Data

Ambient temperature range		0 °C to +65 °C (+32 °F to +149 °F)
Working pressure	Ø 12–20 mm	Min. 1.3 bar (19 psi), max. 8 bar (116 psi)
Medium		Compressed air, lubricated or non-lubricated
Material	Piston rod	Stainless steel
	Guide rods SB	Stainless steel
	Guide rods BB	Corrosion resistant steel, hardened
	Barrel	Anodized aluminum
	Scrapers	PUR
	Front plate	Steel, galvanized
	Rear plate	Anodized aluminum

Technical information
The guide cylinder is equipped with 2 rigid guide rods supported by slide bearings (SB) or ball bearings (BB).
The stroke length can be adjusted with hydraulic shock absorbers. Standard for +stroke and accessory for –stroke.
Both types have scrapers on the guide rods.
For corrosive environment we recommend the version SB (guide rods in stainless steel).

Application area

For precise movements with high side load capacity.
The guide cylinder can be used as:
– Carrier of a second axis. The next smaller cylinder fits directly on the front plate of a bigger cylinder.
– Carrier of grippers or suction cups in material handling applications.
– Carrier of tools like automatic screw drivers.
– Carrier of work-piece.
– Applications with demands for stroke length adjusting.

Technical information

Piston diameter		[mm]	12	16	20
Theoretical piston force	push stroke	[N] (lbf)	67 (15.1)	120 (27)	180 (40.5)
at 6 bar (87 psi)	pull stroke	[N] (lbf)	50 (11.2)	100 (22.5)	140 (31.5)
Max. velocity		[m/s]	0,5	0,5	0,5
		(ft/s)	(1.6)	(1.6)	(1.6)
Max. cushioning energy E_{max}		[Nm] (in.lbs)	0,1 (0.885)	0,11 (0.974)	0,15 (1.328)

Part no.: GPC-E with slide bearing, SB

Piston Ø	12	16	20
Stroke			
25	**0822060407**	**0822061407**	**0822062407**
50	**0822060404**	**0822061404**	**0822062404**
75	**0822060405**	**0822061405**	**0822062405**
100	**0822060406**	**0822061406**	**0822062406**
125	**0822060424**	**0822061424**	**0822062424**
150	**0822060429**	**0822061429**	**0822062429**

Part no.: GPC-E with ball bearing, BB

Piston Ø	12	16	20
Stroke			
25	**0822060507**	**0822061507**	**0822062507**
50	**0822060504**	**0822061504**	**0822062504**
75	**0822060505**	**0822061505**	**0822062505**
100	**0822060506**	**0822061506**	**0822062506**
125	**0822060524**	**0822061524**	**0822062524**
150	**0822060529**	**0822061529**	**0822062529**

For GPC-E, use Series ST6 sensors

Guide Cylinder, Series GPC-E and GPC-ST

Series GPC-E, Ø 12-20 mm, double acting,
magnetic piston, stroke length adjustment

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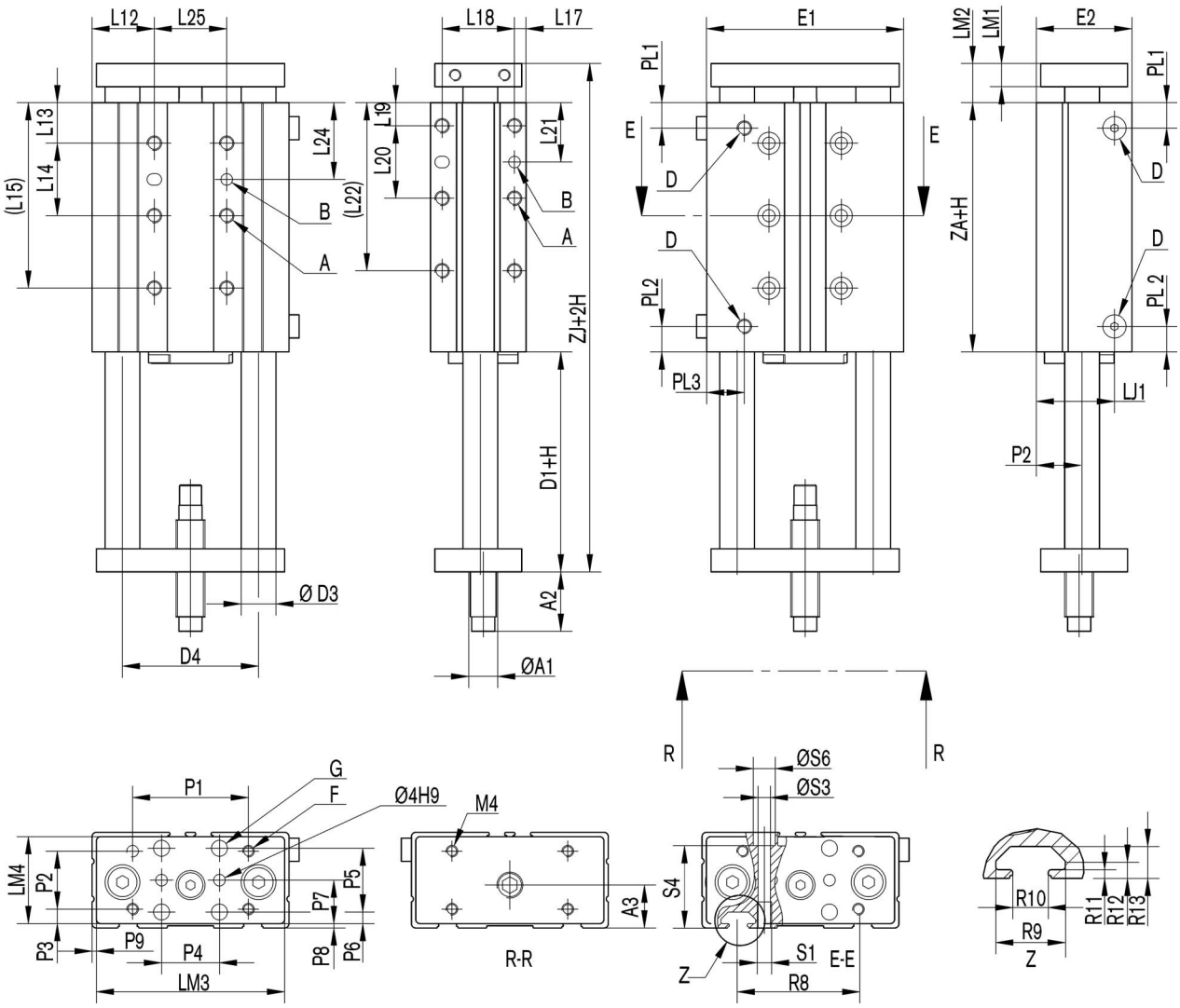
Piston Ø	Type	Total weight [kg] (lbs) Stroke					
		25	50	75	100	125	150
12	BB	0,43 (0.95)	0,58 (1.28)	0,70 (1.54)	0,82 (1.81)	0,95 (2.09)	1,07 (2.36)
	SB	0,49 (1.08)	0,64 (1.41)	0,78 (1.72)	0,93 (2.05)	1,07 (2.36)	1,22 (2.69)
16	BB	0,57 (1.26)	0,76 (1.68)	0,91 (2.01)	1,07 (2.36)	1,23 (2.71)	1,38 (3.04)
	SB	0,64 (1.41)	0,84 (1.85)	1,02 (2.25)	1,19 (2.62)	1,38 (3.04)	1,55 (3.42)
20	BB	0,72 (1.59)	0,95 (2.09)	1,12 (2.47)	1,31 (2.89)	1,50 (3.31)	1,69 (3.73)
	SB	0,79 (1.74)	1,02 (2.25)	1,23 (2.71)	1,44 (3.17)	1,66 (3.66)	1,86 (4.1)

BB = Ball bearing, SB = Slide bearing.



+H = stroke
(L15), (L22) = only on the longer stroke cylinders.

CAD files, free download from the Internet.

To simplify your engineering design we can support 2D - and 3D CAD files for this product. The CAD files can be found under:
www.boschrexroth.com - select: Pneumatics - select: Interactive Designer - select: CAD files - select: GPC-E - select specific product number - select: 2D or 3D files.
Available format: 2D; dxf, 3D; Pro/E and STEP.

Outer dimensions

Piston Ø	E1	E2	D2	D3 SB	D3 BB	D4	LM1	LM2
12	58	30,5	14,5	10	8	40	8	12,7
16	68	33	15,8	12	10	47	8	13,5
20	80	36	16,5	12	10	54	10	15,5

Overall length

Piston Ø	ZJ	ZA	D1
12	65,7	34,4	18,6
16	75,3	36	25,8
20	78,3	36	26,8

Connection ports

Piston Ø	D	LJ1	PL1	PL2	PL3
12	M5	24,8	8,5	8,5	11,5
16	M5	27,0	8,8	8,8	13
20	M5	26,5	10	10	15

Mounting holes Top / Bottom / Side

Piston Ø	A*	B*	L12	L13	L14	(L15) Stroke 50-150	L17	L18	L19
12	M5x8	4H7x4	19	14,5	22	58,5	4	22	8
16	M5x8	4H7x4	21,5	14,0	25	64	4	25	8
20	M6x10	4H7x4	25	15,0	24	63	4,5	24	8

* Dimension x Depth

Mounting holes Top / Bottom / Side

Piston Ø Stroke	L20	L21	(L22) Stroke 50-150	L24	L25	S1*	S3	S4	S6
12	20	18	48	25,5	20	M5x8	4,2	20	7,6
16	25	20,5	58	26,5	25	M5x8	4,2	28,5	7,6
20	30	23	68	27	30	M6x10	5,2	30,5	9,5

* Dimension x Depth

Mounting holes T-groove

Piston Ø	R8	R9	R10	R11	R12	R13
12	–	–	–	–	–	–
16	43	12	6,15	1,5	1,5	5,5
20	50	12	6,15	1,5	1,5	5,5

* Dimension x Depth

Mounting holes Front Plate

Piston Ø	LM3	LM4	P1	P2	P3	P4	P5	P6	P7	P8	P9	G	F
12	55	27	40	20	3,5	20	–	–	–	1,5	1,5	–	M4
16	65	30	40	20	5	20	22	4	15	1,5	1,5	5,5	M4
20	77	33	50	25	4	25	25	4	16,5	1,5	1,5	5,5	M5

Stroke adjustment dimensions (rear)

Piston Ø	A1	A2 min.	A2 max.	Adjustment length	A3
12	8	5	19	14	13,5
16	10	5	29	24	14,8
20	10	5	28	23	18,5

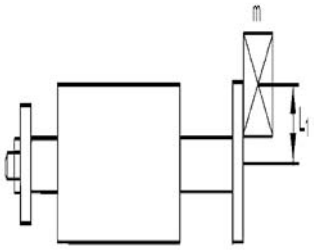
Weight of moving parts [kg] (lbs) (guide rods, front plate, piston and piston rod)

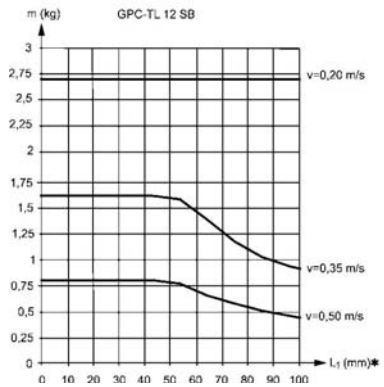
Piston Ø	Type	Stroke					
		25	50	75	100	125	150
12	BB	0,25 (0.55)	0,29 (0.64)	0,33 (0.73)	0,37 (0.82)	0,41 (0.91)	0,45 (0.99)
	SB	0,32 (0.71)	0,39 (0.86)	0,45 (0.99)	0,51(1.12)	0,57 (1.26)	0,64 (1.41)
16	BB	0,37 (0.82)	0,43 (0.95)	0,49 (1.08)	0,55 (1.21)	0,61 (1.34)	0,67 (1.48)
	SB	0,47 (1.04)	0,56 (1.23)	0,65 (1.43)	0,74 (1.63)	0,83 (1.83)	0,92 (2.03)
20	BB	0,47 (1.04)	0,53 (1.17)	0,59 (1.3)	0,65 (1.43)	0,71 (1.57)	0,77 (1.7)
	SB	0,57 (1.26)	0,66 (1.46)	0,75 (1.65)	0,84 (1.85)	0,93 (2.05)	1,02 (2.25)

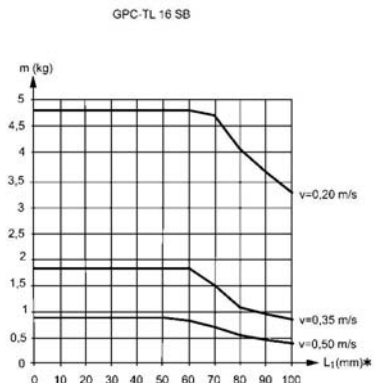
BB = Ball bearing, SB = Slide bearing.

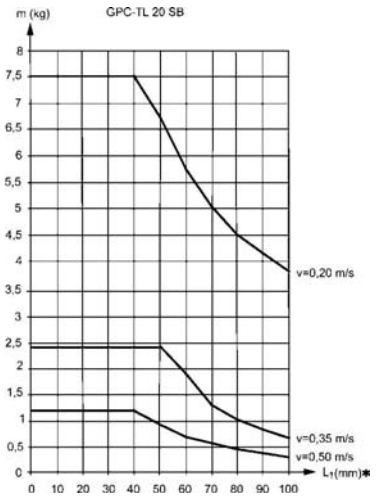
Allowed dynamic load [kg] (lbs)with respect of center of mass [mm] and velocity [m/s]

Load attached to carrier plate.
The diagrams show max allowed load in respect of distance from cylinder center and velocity of the movement.
In the horizontal part of the curves the cushioning capacity of the cylinder is limiting the load.
In the decreasing part of the curves the bearings are limiting the load.
The recommendation is to run the cycles in as low velocity as possible. The velocity can be controlled with flow control valve 0821200191 from the Rexroth range.









Guide Cylinder, Series GPC-E and GPC-ST

Series GPC-E, Ø 12–20 mm, double acting,
magnetic piston, stroke length adjustment

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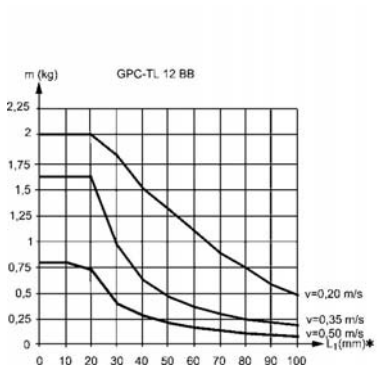
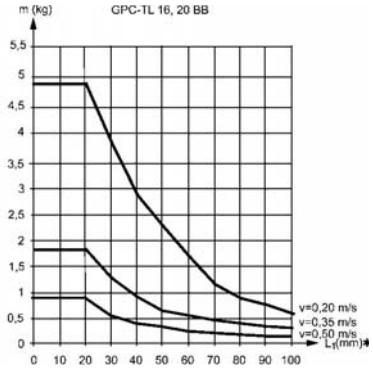
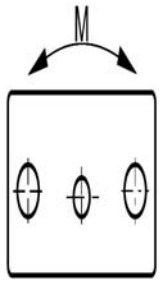




Max. moment M (Nm) (in.lbs)

Piston Ø	Type	10	20	25	30	40	50	75	100	125	150
12	BB	0,38 (3.36)	0,34 (3.01)	0,32 (2.83)	0,3 (2.66)	0,46 (4.07)	0,44 (3.89)	0,4 (3.54)	0,38 (3.36)	0,36 (3.14)	0,34 (3.01)
	SB	0,56 (4.96)	0,48 (4.25)	0,46 (4.07)	0,42 (3.72)	0,62 (5.49)	0,56 (4.96)	0,44 (3.89)	0,38 (3.36)	0,32 (2.83)	0,26 (2.30)
16	BB	0,63 (5.58)	0,56 (4.96)	0,54 (4.78)	0,52 (4.60)	1,36 (12.03)	1,32 (11.68)	1,2 (10.62)	1,13 (10.0)	1,03 (9.12)	0,94 (8.32)
	SB	1,48 (13.10)	1,32 (11.68)	1,25 (11.06)	1,2 (10.62)	1,72 (15.22)	1,57 (13.90)	1,29 (11.42)	1,15 (10.17)	0,99 (8.76)	0,82 (7.26)
20	BB	0,73 (6.46)	0,65 (5.75)	0,62 (5.49)	0,59 (5.22)	1,57 (13.90)	1,51 (13.37)	1,38 (12.21)	1,3 (11.51)	1,19 (10.53)	1,08 (9.56)
	SB	1,7 (15.05)	1,51 (13.37)	1,43 (12.66)	1,38 (12.21)	1,97 (17.44)	1,81 (16.02)	1,49 (13.19)	1,32 (11.68)	1,13 (10.00)	0,95 (8.41)

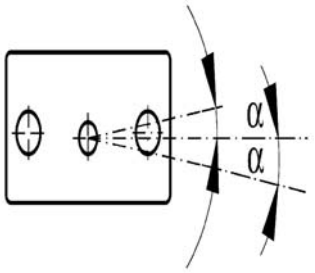
BB = Ball bearing, SB = Slide bearing.



Distortion / Play (°)

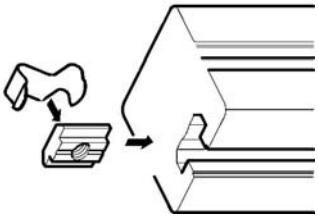
α°	Piston dia. 12	Piston dia. 16	Piston dia. 20
α° SB	0,09	0,09	0,07
α° BB	0,08	0,08	0,07

Torsion play (α) for slide bearing guide (SB) and ball bearing guide (BB) (retracted, without load).



T-groove nut

Thread	GPC size 16 - 25 GPC-TL size 16 - 25 GPC-E size 16, 20 GPC-ST size 12, 20	GPC size, 32–50	GPC size, 63
M 4	**3842523229**	**3842514932**	–
M 5	**3842523231**	**3842514934**	**3842242109**
M6	–	**3842514936**	**3842242111**
M8	–	**3842514938**	**3842242113**
Spring	**3842523223**	**3842519315**	**3842519316**



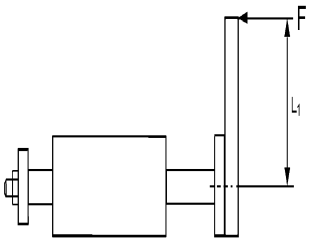
* Package of 10 pcs.

Piston rod deflection at stroke 50 mm and a side load of 10 N (2.25 lbf)

	Piston dia. 12	Piston dia. 16	Piston dia. 20
A [mm] SB	0,11	0,11	0,11
A [mm] BB	0,10	0,08	0,08

Allowed lever arm length [mm] with moment created by the cylinder force at 6 bar (87 psi)

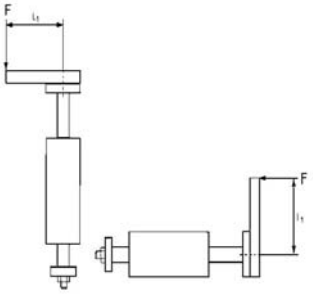
Static situation.
The lever arm meets a stop before the cylinder stroke ends. The cylinder force and the lever arm creates a moment effecting the bearings



Piston Ø	Type	Theoretical cylinder force at 6 bar (87 psi) [N] (lbf)	Max arm length L1 [mm]
12	BB	67 (15.1)	115
	SB	67(15.1)	290
16	BB	120 (27)	80
	SB	120 (27)	215
20	BB	180 (40.5)	55
	SB	180 (40.5)	140

Allowed lever arm length [mm] when cylinder is used as a pusher/lifter. Dynamic situation

Dynamic situation. The load is not attached to the front plate of the cylinder. To get a correct performance from the cylinder, the following values should not be exceeded.

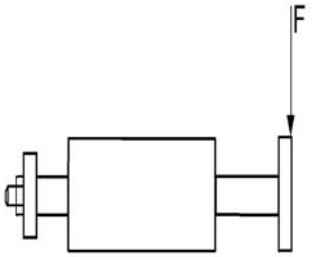


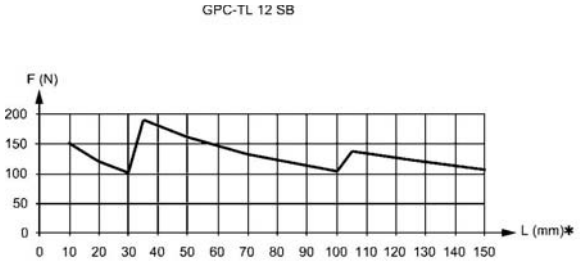
Piston Ø	Type	Theoretical cylinder force at 6 bar (87 psi) [N] (lbf)	Horizontal situation max force [N] (lbf)	Vertical situation max force [N] (lbf)	Max arm length L1
12	BB	67 (15.1)	23 (5.17)	23 (5.17)	100
12	SB	67 (15.1)	23 (5.17)	23 (5.17)	250
16	BB	120 (27)	40 (8.99)	40 (8.99)	75
16	SB	120 (27)	40 (8.99)	40 (8.99)	200
20	SB	180 (40.5)	65 (14.6)	65 (14.6)	50
20	BB	180 (40.5)	65 (14.6)	65 (14.6)	125

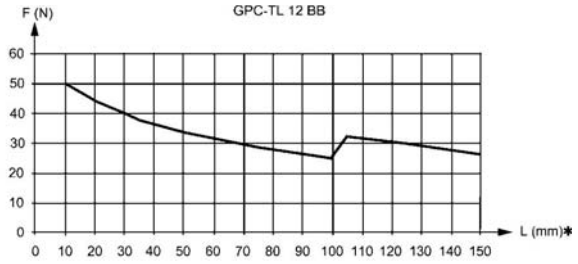
Note! If load is attached to the lever arm when the cylinder reaches its end position, additional F will occur. Depending on the cylinder velocity, this will be 10 to 40 times the original F!

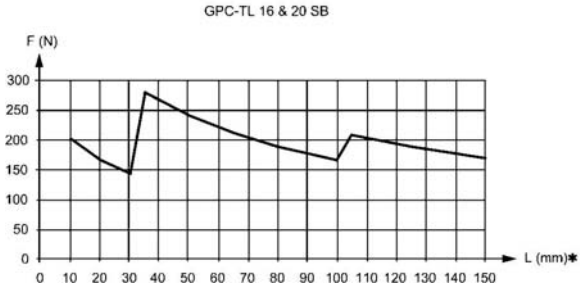
Allowed static side force in out-position [N] (lbf)

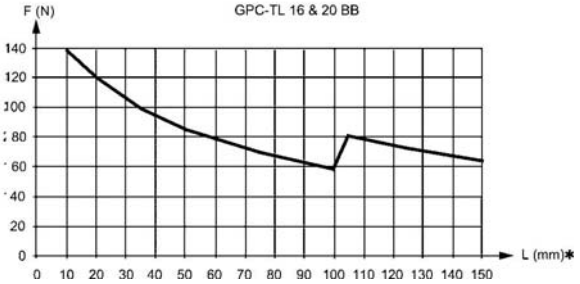
The diagrams show the maximum allowed static force for different stroke lengths, L, depending on max permissible load on bearings.
For example if an additional force is used for drilling, labelling etc. of an object carried by the GPC-TL.
No movement of the cylinder is allowed in this situation.





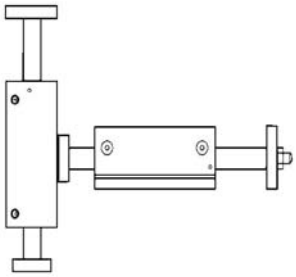






GPC combinations

The GPC-E can be directly mounted on the front plate of next bigger standard GPC or GPC-E in radial direction.

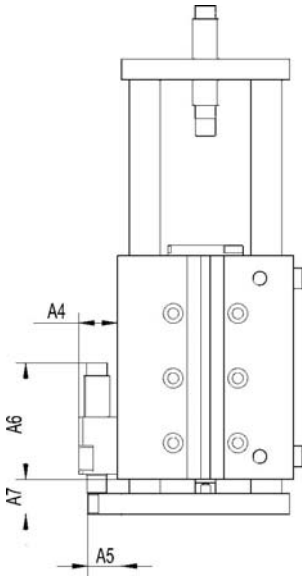


Combination radial direction (2)

Combination Screws	GPC 12 on GPC 16 MC6S M5x15	GPC 16 on GPC 20 MC6S M5x15	GPC 20 on GPC 25 MC6S M6x15

Stroke length adjustment, return stroke

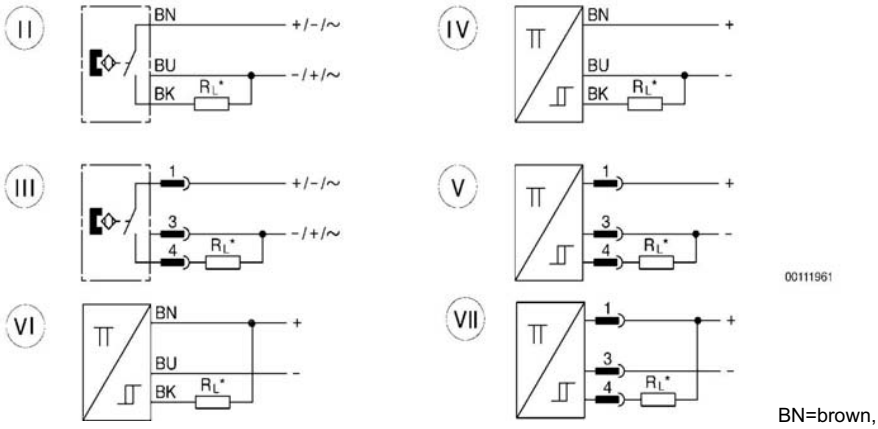
Size	Complete kit	shock absorbers as spare
GPC 12	**R402000134**	**0821005002**
GPC 16	**R402000135**	**0821005013**
GPC 20	**R402000136**	**0821005013**

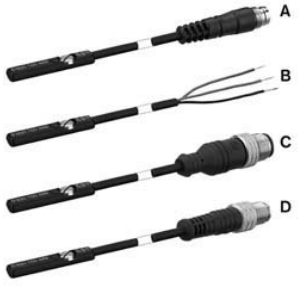


Stroke adjustment dimensions (front, accessory)

Piston Ø	A4	A5	A6 min.	A6 max.	A7 min.	A7 max.	Adjustment length
12	13	13	21	29	13	25	12
16	15	13	24	45	13,5	43,5	30
20	15	13	26	44	15,5	45,5	30

▲★ **Cylinder switch Series ST6, electrically (Reed contact) and electronic (contactless)**





BN=brown, BK=black, BU=blue

Style	Contact type	Symbol	Cable length(m) Material	Connector	Ambient temperature range	Operating voltage	Switching current max. (A)	Part no.
B	Reed	II (3-wire)	3 PUR	-	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100629
B	Reed	II (3-wire)	5 PUR	-	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100630
B	Reed	II (3-wire)	10 PUR	-	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	R412004575
A	Reed	III (3-wire)	0.3 PUR	M8 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100488
C	Reed	III (3-wire)	0.3 PUR	M12 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100432
D	Reed	III (3-wire)	0.3 PUR	M8 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100434
D	Reed	III (3-wire)	0.5 PUR	M8 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100436
B	contactless PNP	IV (3-wire)	3 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100631
B	contactless PNP	IV (3-wire)	5 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100632
B	contactless PNP	IV (3-wire)	10 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	R412004576
A	contactless PNP	V (3-wire)	0.3 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100489
C	contactless PNP	V (3-wire)	0.3 PUR	M12 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100433
D	contactless PNP	V (3-wire)	0.3 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100435
D	contactless PNP	V (3-wire)	0.3 PVC	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	R412004762
D	contactless PNP	V (3-wire)	0.5 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100437
B	contactless NPN	(3-wire)	3 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100633
B	contactless NPN	(3-wire)	5 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100634
A	contactless NPN	(3-wire)	0.3 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100430
C	contactless NPN	(3-wire)	0.3 PUR	M12 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100431

A = Plug-in connection M8 x 1; B = Cable connection; C = Plug-in connection M12x1; D = Plug-in conn M8 x 1 w/knurled screw

Guide Cylinder, Series GPC-E and GPC-ST

Series GPC-ST, Ø 12 and 20 mm, double acting,
magnetic piston, stroke length adjustment

Rexroth
Bosch Group

★

Technical Data

Ambient temperature range		0 °C to +65 °C (+32 °F to +149 °F)
Working pressure	Ø 12–20 mm	Min. 1.3 bar (19 psi), max. 8 bar (116 psi)
Medium		Compressed air, lubricated or non-lubricated
Material	Piston rod	Stainless steel
	Guide rods BB	Corrosion resistant steel, hardened
	Barrel	Anodized aluminum
	Scrapers	PUR
	Rear plate	Steel, galvanized

Technical information
The guide cylinder is equipped with 2 rigid guide rods supported by ball bearings (BB).
The ball bearing bushings are equiped with scrapers for the guide rods.
The stroke length is adjusted with hydraulic shock absorbers.
The mounting surface on top of the unit has interface to other automation products like the Minislide MSC without any additional adapter plates and the interface to other GPC-cylinders with a simple adapter kit. This is named the E2C-system (Easy to combine).

Application area

The end plates are mounted in the machine frame and the body is the moving part.
For precise movements with high load capacity.
The guide cylinder can be used as:
– Carrier of a second axis.
– Carrier of a work-piece between two stations.
– Applications with demands for stroke length adjusting.

Technical information

Piston diameter		[mm]	12	20
Theoretical piston force	push stroke	[N] (lbf)	67 (15.1)	180 (40.5)
at 6 bar (87 psi)	pull stroke	[N] (lbf)	50 (11.2)	140 (31.5)
Max. velocity		[m/s]	0,5	0,5
		(ft/s)	(1.6)	(1.6)
Max. cushioning energy E_{max}		[Nm] (in.lbs)	0,8	2,8

Part no.: GPC-ST with ball bearing (BB) including 2 shock absorbers

Piston Ø	12	20
Connection ports	M5	M5
Stroke		
35	R402000243	R402000249
50	R402000244	R402000250
75	R402000245	R402000251
100	R402000246	R402000252
125	R402000247	R402000253
150	R402000248	R402000254

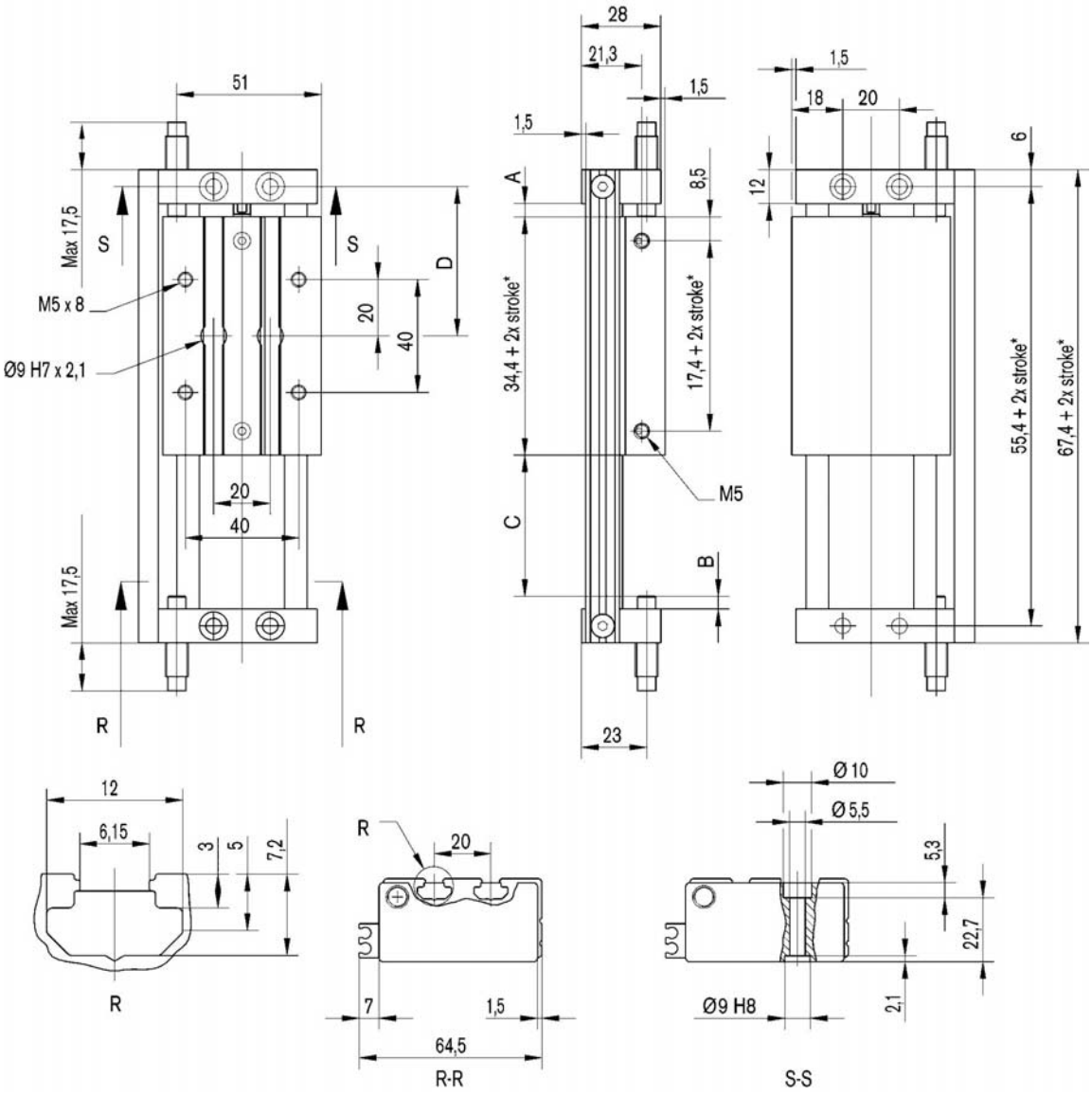
Piston Ø	Type	Total weight [kg] (lbs) Stroke					
		35	50	75	100	125	150
12	BB	0,43 (0.95)	0,58 (1.28)	0,70 (1.54)	0,82 (1.81)	0,95 (2.09)	1,07 (2.36)
20	BB	0,72 (1.59)	0,95 (1.59)	1,12 (2.47)	1,31 (2.89)	1,50 (3.31)	1,69 (3.73)

CAD files, free download from the Internet.

To simplify your engineering design we can support 2D - and 3D CAD files for this product. The CAD files can be found under:
www.boschrexroth.com - select: Pneumatics - select: Interactive Designer - select: CAD files - select: GPC-ST - select specific product number - select: 2D - or 3D files.
Available format: 2D; dxf, 3D; Pro/E and STEP.

For GPC-E, use Series ST6 sensors

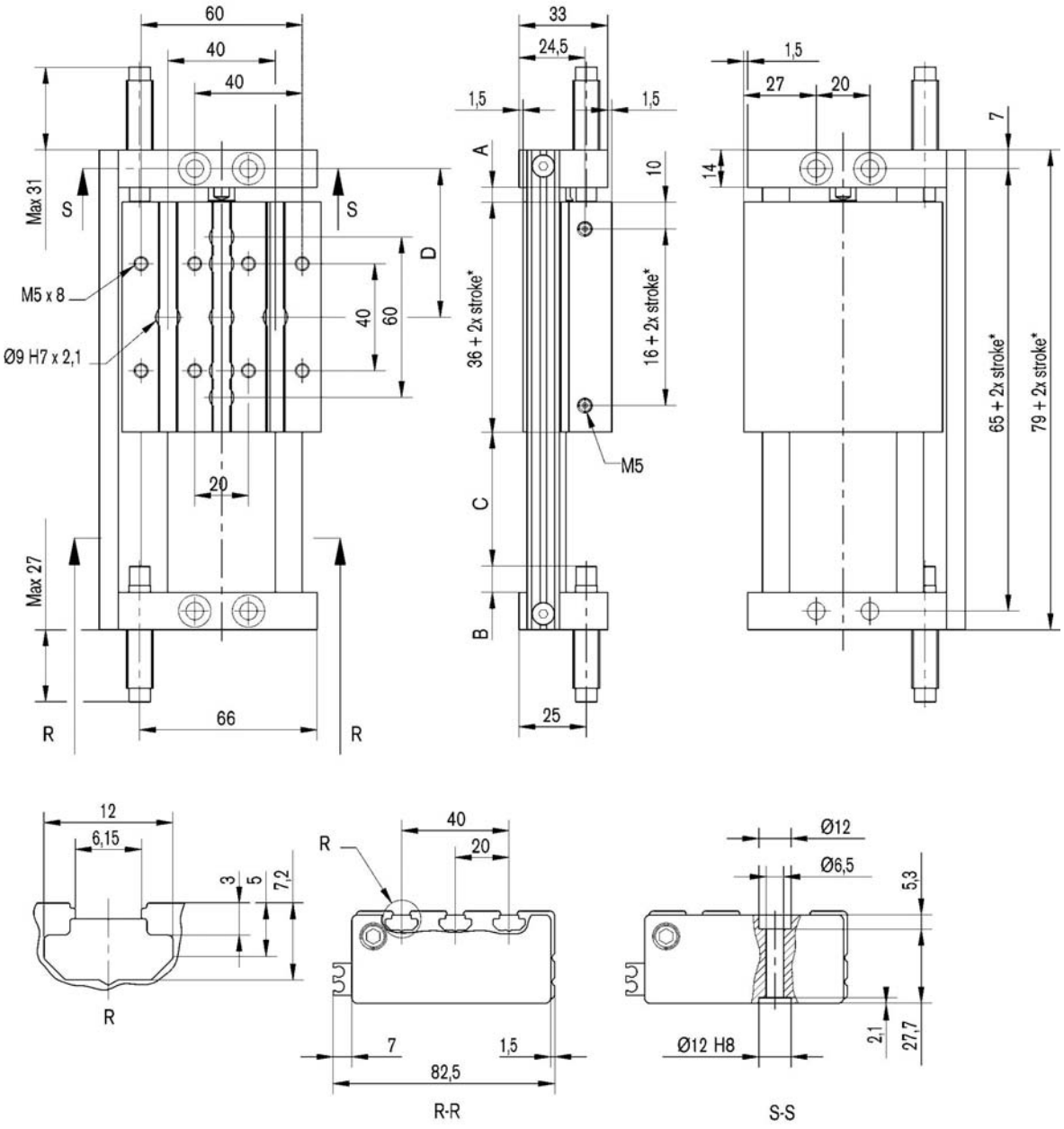
Ø 12



* stroke length

Amin	Amax	Bmin	Bmax	Cmin	Cmax	Dmin	Dmax
4,7	24,7	4,2	24,2	Stroke - 40	Stroke	25 + 0,5 x stroke*	48 + 0,5 x stroke*

Ø 20



* stroke length

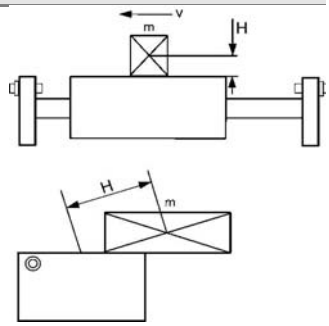
Amin	Amax	Bmin	Bmax	Cmin	Cmax	Dmin	Dmax
5,5	35,5	9,5	35,5	Stroke* - 56	Stroke*	30,5 + 0,5 x stroke*	60,5 + 0,5 x stroke*

Allowed dynamic load [kg] (lbs)with respect of center of mass [mm] and velocity [m/s]

Max dynamic load with respect to velocity and distance to center of load.
The load creates a high moment on the unit when reaching the end positions.
It is therefore necessary not to exceed the limitations showed below.

Following parameters must be considered: velocity, distance to center of mass and size of GPC-ST.
When multiplying the mass m[kg] with the distance H [mm] the result must not exceed the values below.
Example: A load of 2,3 kg shall be mounted with L 52 mm on a GPC-ST dia 20 stroke 50.

m x H; 2,3 x 52 = 120. From the table below we can see that this is ok for a velocity of 0,3 m/s.

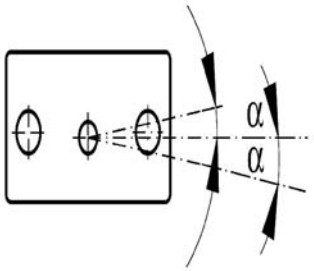


GPC-ST dia 12 m[kg] x H [mm]				
	Velocity [m/s]			
Stroke	**0,2**	**0,3**	**0,4**	**0,5**
35	155	75	60	50
50	225	100	90	60
75	310	160	110	85
100	350	170	130	105
125	450	250	180	140
150	600	300	200	160

GPC-ST dia 20 m[kg] x L[mm]				
	Velocity [m/s]			
Stroke	**0,2**	**0,3**	**0,4**	**0,5**
35	195	95	75	95
50	28	125	110	75
75	390	200	140	110
100	440	210	160	130
125	560	310	225	175
150	750	375	250	200

Distortion / Play (°)

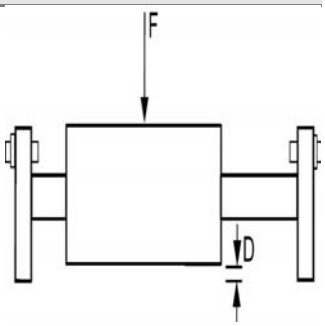
α°	Piston dia. 12	Piston dia. 20
α° BB	0,08	0,07



Torsion play (α) for the ball bearing guide (BB).

Static situation. Max allowed force and deflection at various forces

Piston Ø Max static force F [N] Deflection at max force (mm) Stroke	12 170	20 260
35	0,02	0,01
50	0,02	0,02
75	0,05	0,04
100	0,09	0,07
125	0,15	0,12
150	0,23	0,19

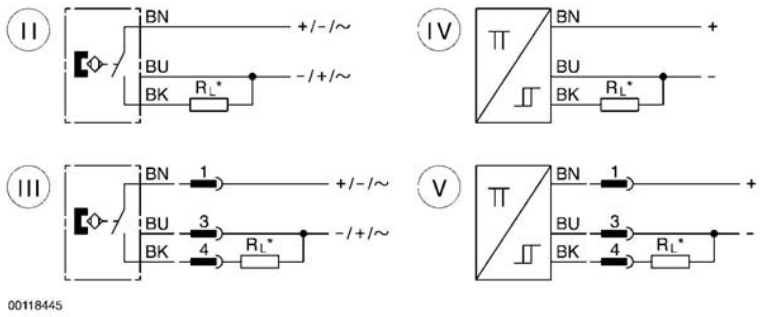


The deflection for different forces is linear.
Example with a force of 50 N on a diameter 12 stroke 100 mm, the deflection is 50/170 x 0,09 = 0,026 mm.

Shock absorbers

GPC-ST size	Part no.	Outer thread	Max E / stroke
12	**0821005002**	M8x1	0,8 Nm
20	**0821005013**	M10x1	2,8 Nm

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

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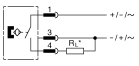
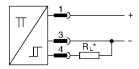
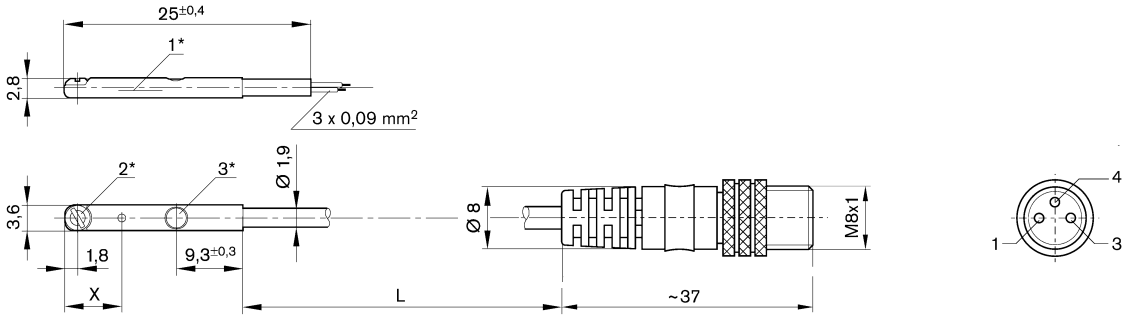
Ambient temperature min. / max.	-25°C / +75°C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	-	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions



00123231_c

1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

Rotary compact module, Series RCM

with elastic/hydraulic shock absorbers, Ø 6–25

Rexroth
Bosch Group

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Technical Data

Type		Double-acting drive with double piston Power transmission and synchronization through rack and pinion
Angle of rotation		90°/180°
Working pressure, max.		2 – 8 bar (58–116 psi)
Thermal application range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or oil-free (10 µm)
Installation position		any
Materials	Housing	Aluminum anodized
	Seals	NBR
	Rotary flange	Hardened steel
	Pinion	Hardened steel
	Rack	Hardened steel
	Ball bearing	Hardened steel

Application area

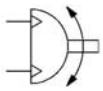
Suitable for handling technology applications where maximum torque combined with minimum construction size is required.
The drives feature especially accurate and high-load rotary flange bearings.
Sensor slots integrated on both sides permit versatile inquiry options.
Centering elements included in scope of delivery.

Technical information

Type			RCM–6	RCM–8	RCM–12	RCM–16	RCM–20	RCM–25
Piston Ø		[mm]	6	8	12	16	20	25
Connection thread			M 3	M 3	M 5	M 5	M 5	M 5
Theoretical torque *	(6 bar) (87 psi)	[Nm] (in.lbs.)	0,17 (1.50)	0,33 (2.92)	0,95 (8.41)	1,7 (15.05)	3,0 (26.55)	6,5 (57.53)
Setting range per end position	0 ° 90 ° 180 °	[°] [°] [°]	-6 / 20 70 / 96 160 / 186	-6 / 20 70 / 96 160 / 186	-6 / 20 70 / 96 160 / 186	-6 / 20 70 / 96 160 / 186	-6 / 20 70 / 96 160 / 186	-6 / 20 70 / 96 160 / 186
Repeatability	elastic hydraulic	[°] [°]	0,2 –	0,2 –	0,2 0,05	0,2 0,05	0,2 0,05	0,2 0,05
Max. app. torque moment of inertia	elastic hydraulic	[kg cm²] (lb.in²) [kg cm²] (lb.in²)	0,10 (0.03) –	0,25 (0.09) –	0,70 (0.24) 10 (3.42)	1,60 (0.55) 80 (27.34)	3,20 (1.09) 180 (61.51)	6,30 (2.15) 450 (153.77)
min. swivel times (1x180°)	elastic hydraulic	[s] [s]	0,12 –	0,16 –	0,15 0,30	0,20 0,32	0,25 0,48	0,25 0,75
Max. perm. axiales bearing load Max. perm. radiales bearing load		[N] (lbf.) [N] (lbf.)	170 (38.22) 170 (38.22)	280 (62.94) 300 (67.44)	330 (74.18) 360 (80.93)	490 (110.15) 580 (130.38)	620 (139.38) 780 (175.34)	1160 (260.77) 1480 (332.70)
Torque cylinder weight	elastic hydraulic	[kg] (lbs.) [kg] (lbs.)	0,13 (0.29) –	0,18 (0.40) –	0,42 (0.93) 0,46 (1.01)	0,70 (1.54) 0,77 (1.70)	0,91 (2.01) 0,96 (2.12)	1,73 (3.81) 1,85 (4.08)

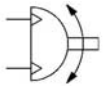
* Note: Due to the design principle, a reduced theoretical torque acts in the end position.

Part no. for RCM-...-SE elastically cushioning



Angle of rotation	RCM-6	RCM-8	RCM-12	RCM-16	RCM-20
90°	**R412000357**	**R412000359**	**R412000361**	**R412000363**	**R412000365**
180°	**R412000358**	**R412000360**	**R412000362**	**R412000364**	**R412000366**
Angle of rotation	**RCM-25**				
90°	**R412000367**				
180°	**R412000368**				

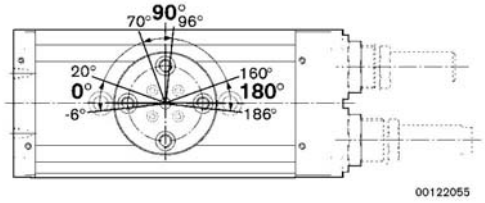
Part no. for RCM-...-SH hydraulically cushioning



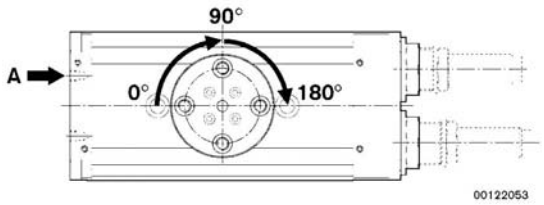
Angle of rotation	RCM-6	RCM-8	RCM-12	RCM-16	RCM-20
90°	–	–	**R412000369**	**R412000371**	**R412000373**
180°	–	–	**R412000370**	**R412000372**	**R412000374**
Angle of rotation	**RCM-25**				
90°	**R412000375**				
180°	**R412000376**				

Use ST4 Sensors located in Sensors/Electrical Accessories section.

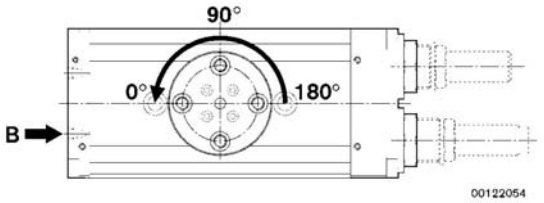
Setting range for end position 0° / 90° / 180°



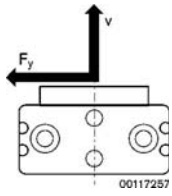
Movement into end position 90° / 180°



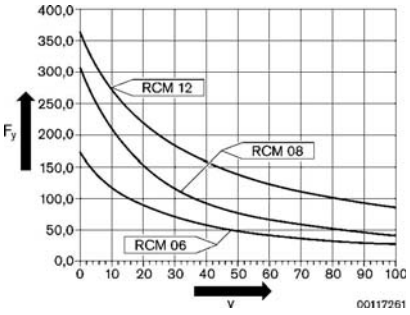
Movement into end position 0°



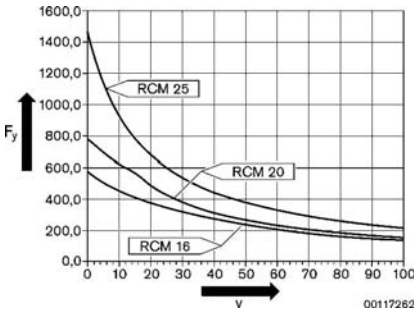
Max. permissible radial force Fy [N] as a function of v [mm]



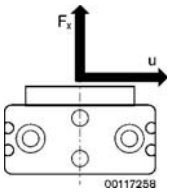
RCM 6 – 12



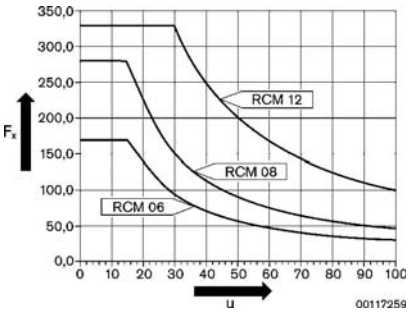
RCM 16 – 25



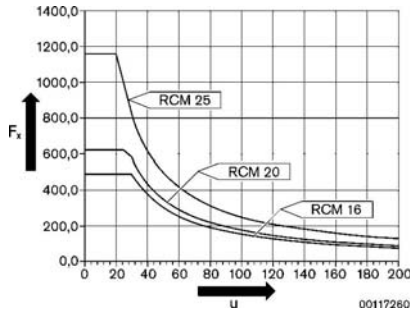
Max. permissible axial force Fx [N] as a function of u [mm]



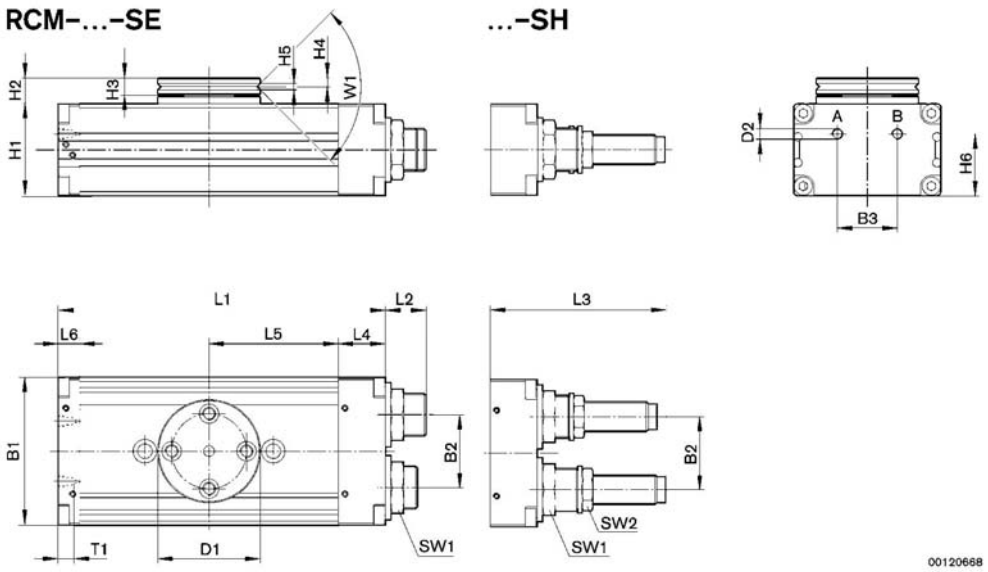
RCM 6 – 12



RCM 16 – 25



RCM-6/.../-25

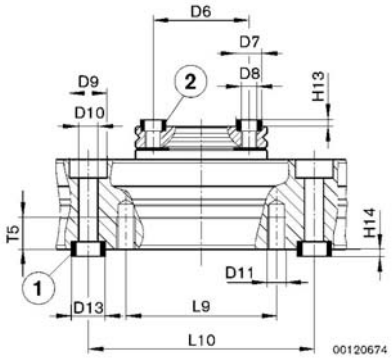


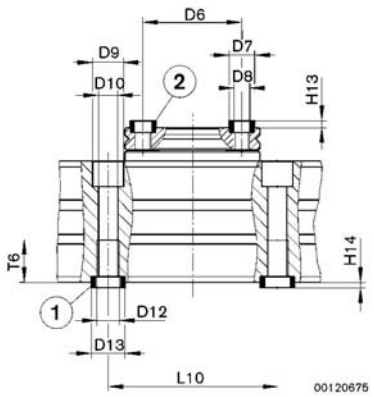
	B1	B2	B3	Ø D1	Ø D2	H1	H2	H3	H4	H5	H6
RCM–06	31	13,6	11,6	26	M 3	17	7,5	5	2,4	2	12,9
RCM–08	35	15	13	28	M 3	18	8	5	2,4	2	14
RCM–12	43	18	18	35	M 5	24	10,5	6	2,9	2,5	18
RCM–16	52	24	20	40	M 5	32	10	7	3,3	2,5	21
RCM–20	58	30	20	42	M 5	37	11	7	3,3	3	26
RCM–25	69	34	28	48	M 5	43	12	8	4	3	29

	L1	L2	L3	L4	L5	L6	SW1	SW2	T1	W1
RCM–06	71	8,5	–	7	28,5	7	8	–	3	90 °
RCM–08	77	8,5	–	7	31,5	7	10	–	3	90 °
RCM–12	103	11,5	29,5	14	40	9	15	11	4	90 °
RCM–16	108	14,5	58	18	40	10	19	13	4	90 °
RCM–20	114	12	37,5	19	43	9	19	15	4	90 °
RCM–25	153	15,5	52	22	60,5	10	23	17	4	90 °

Mounting and assembly

RCM-06/-12	RCM-08/-16/-20/-25





1) Centering sleeve, included in scope of delivery
2) Centering sleeve

	Ø D6 ± 0,02	Ø D7 f7	Ø D8	Ø D9	Ø D10	Ø D11	Ø D12	Ø D13 f7	H13 +0,2	H14 +0,2	L9	L10 ± 0,02	T5	T6
RCM–06	18	5	M 3	6	3,3	M 4	–	5	1,6	1,6	20	40	7	–
RCM–08	20	5	M 3	7,5	4,2	–	M 5	7	1,6	1,6	–	40	–	9,1
RCM–12	25	7	M 4	10	5,1	M 5	–	9	1,6	2,1	40	60	8,5	–
RCM–16	30	7	M 5	10	5,0	–	M 6	9	1,6	2,1	–	60	–	11,1
RCM–20	30	7	M 5	11	6,8	–	M 8	12	1,6	2,1	–	60	–	15,1
RCM–25	35	9	M 6	11	6,8	–	M 8	12	2,1	2,1	–	60	–	15,1

Rotary compact module, Series RCM

with elastic/hydraulic shock absorbers and air channel, Ø 8–25

Rexroth
Bosch Group

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Technical Data

Type		Double-acting with two drive cylinders Power transmission and synchronization
through		Rack and pinion
Rotation angle		90°/180°
Working pressure, max.		4 – 8 bar (58–116 psi)
Temperature range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or oil-free (10 µm)
Installation position		any
Materials	Housing	Aluminum anodized
	Seals	NBR (Nitrile Butadiene Rubber)
	Rotary flange	Hardened steel
	Pinion	Hardened steel
	Rack	Hardened steel
	Ball bearing	Hardened steel

Application area

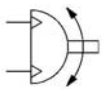
Suitable for handling technology applications where maximum torque combined with minimum construction size is required.
The drives feature especially accurate and high-load rotary flange bearings.
Sensor slots integrated on both sides permit versatile inquiry options.
Integrated air duct.
Energy loss in the rotary table.
Centering elements included in scope of delivery.

Technical information

Type			RCM–8	RCM–12	RCM–16	RCM–20	RCM–25
Piston Ø		[mm]	8	12	16	20	25
Connection thread			M 3	M 5	M 5	M 5	M 5
Air feed-through			2	2	4	4	4
Theoretical torque *	(6 bar) (87 psi)	[Nm] (in.lbs.)	0,33 (2.92)	0,95 (8.41)	1,7 (15.05)	3,0 (26.55)	6,5 (57.53)
Setting range per end position	0 ° 90 ° 180 °	[°] [°] [°]	-6 / 20 70 / 96 160 /186	-6 / 20 70 / 96 160 /186	-6 / 20 70 / 96 160 /186	-6 / 20 70 / 96 160 /186	-6 / 20 70 / 96 160 /186
Repeatability	elastic hydraulic	[°] [°]	0,2 –	0,2 0,05	0,2 0,05	0,2 0,05	0,2 0,05
Max. app. torque moment of inertia	elastic hydraulic	[kg cm²] (lb.in²) [kg cm²] (lb.in²)	0,25 (0.09) –	0,70 (0.24) 10 (3.42)	1,60 (0.55) 80 (27.34)	3,20 (1.09) 180 (61.51)	6,30 (2.15) 450 (153.77)
min. swivel times (1x180°)	elastic hydraulic	[s] [s]	0,28 –	0,28 0,30	0,25 0,32	0,30 0,48	0,30 0,75
Max. perm.axiales bearing load Max. perm. radiales bearing load		[N] (lbf.) [N] (lbf.)	280 (62.94) 210 (154.90)	330 (74.18) 290 (213.90)	490 (110.15) 400 (295.04)	620 (139.38) 560 (413.06)	1160 (260.77) 700 (157.36)
Torque cylinder weight	elastic hydraulic	[kg] (lbs.) [kg] (lbs.)	0,19 (0.42) –	0,46 (1.01) 0,50 (1.10)	0,76 (1.68) 0,84 (1.85)	0,99 (2.18) 1,04 (2.29)	1,83 (4.03) 1,95 (4.30)

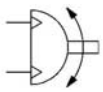
* Note: Due to the design principle, a reduced theoretical torque acts in the end position.

Part no. for RCM-...-SE-AP elastically cushioning



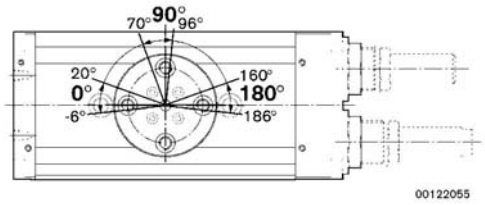
Rotation angle [°]	RCM-8	RCM-12	RCM-16	RCM-20	RCM-25
90°	**R412000377**	**R412000379**	**R412000381**	**R412000383**	**R412000385**
180°	**R412000378**	**R412000380**	**R412000382**	**R412000384**	**R412000386**

Part no. for RCM-...-SH-AP hydraulically cushioning

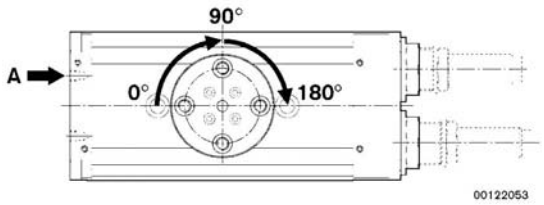


Rotation angle [°]	RCM-8	RCM-12	RCM-16	RCM-20	RCM-25
90°	–	**R412000387**	**R412000389**	**R412000391**	**R412000393**
180°	–	**R412000388**	**R412000390**	**R412000392**	**R412000394**

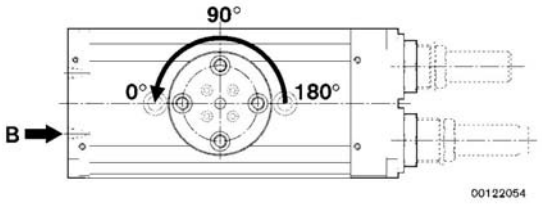
Setting range for end position 0° / 90° / 180°



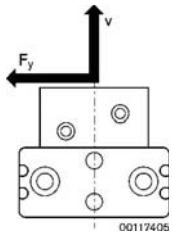
Movement into end position 90° / 180°



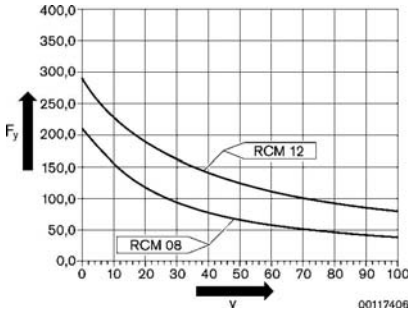
Movement into end position 0°



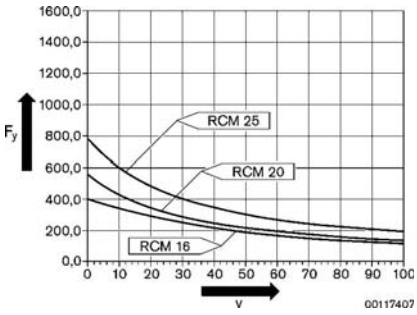
Max. permissible radial force Fy [N] as a function of v [mm]



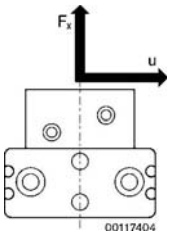
RCM 8 – 12



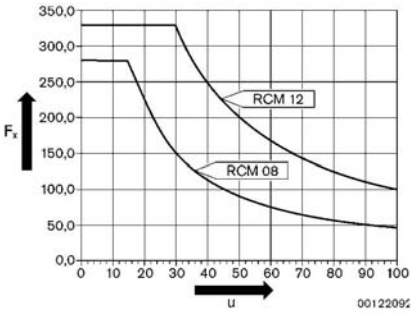
RCM 16 – 25



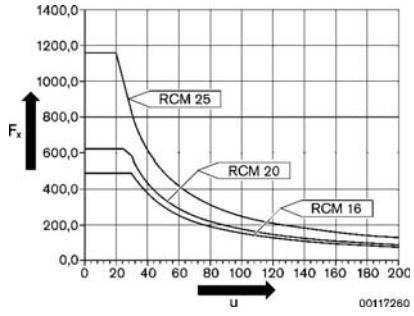
Max. permissible axial force Fx [N] as a function of u [mm]



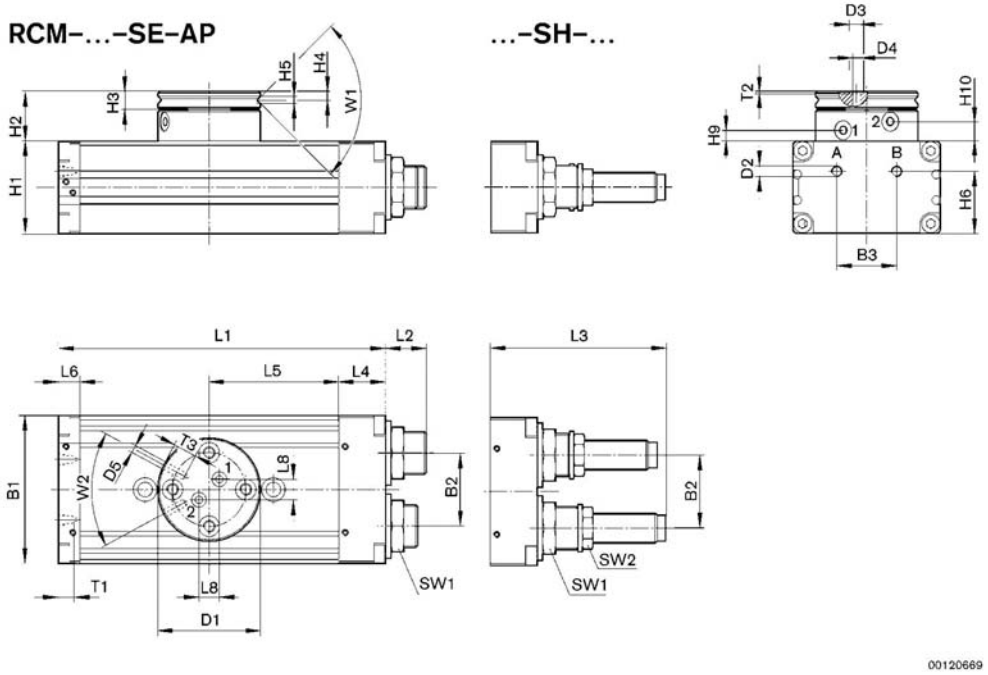
RCM 8 – 12



RCM 16 – 25



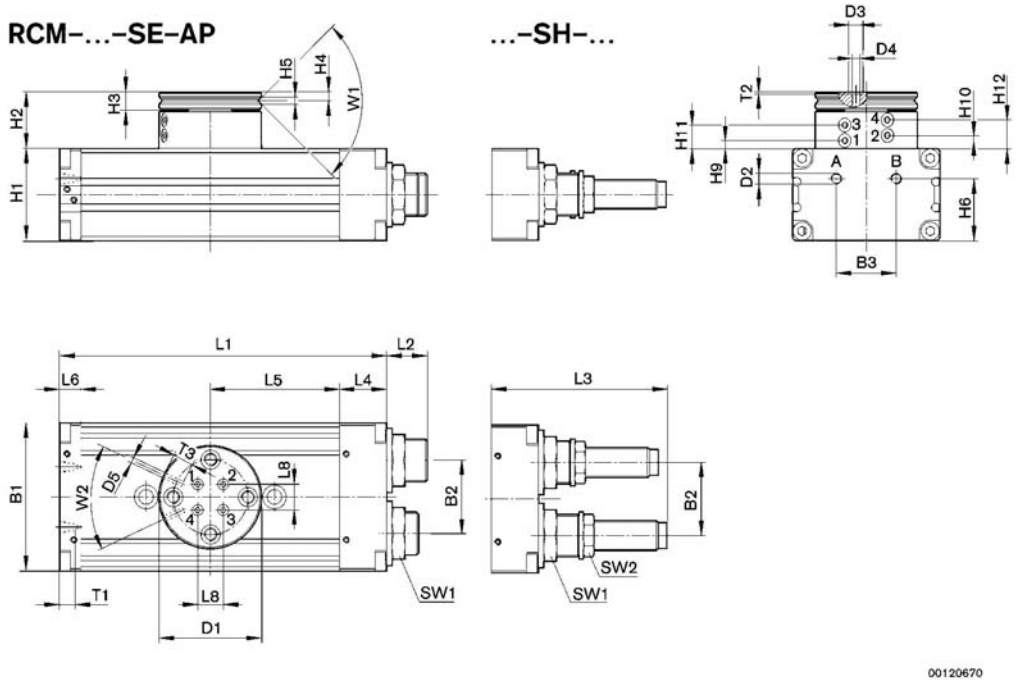
RCM-8/-12



	B1	B2	B3	Ø D1	Ø D2	Ø D3	Ø D4	Ø D5	H1	H2	H3	H4	H5	H6	H9 ±0,2	H10 ±0,2
RCM–08	35	15	13	28	M 3	3	1,5	M 3	18	16,5	5	2,4	2	14	4,3	7,2
RCM–12	43	18	18	35	M 5	5	2,5	M 3	24	17	6	2,9	2,5	18	3,8	6,7

	L1	L2	L3	L4	L5	L6	L8	SW1	SW2	T1	T2	T3	W1	W2
RCM–08	77	8,5	–	7	31,5	7	4	10	–	3	0,35	4	90 °	30 °
RCM–12	103	11,5	29,5	14	40	9	7	15	11	4	0,7	4	90 °	28 °

RCM-16/.../-25

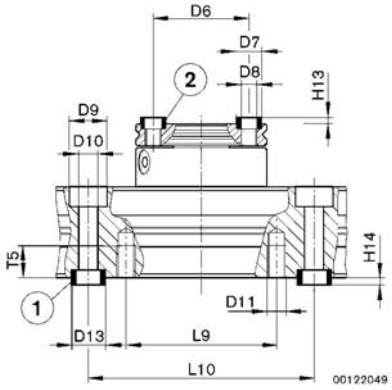


	B1	B2	B3	Ø D1	Ø D2	Ø D3	Ø D4	Ø D5	H1	H2	H3	H4	H5	H6	H9 ±0,2	H10 ±0,2
RCM–16	52	24	20	40	M 5	5	2,5	M 3	32	25,5	7	3,3	2,5	21	3,9	6,5
RCM–20	58	30	20	42	M 5	5	2,5	M 3	37	26	7	3,3	3	26	4,4	7
RCM–25	69	34	28	48	M 5	5	2,5	M 3	43	26,5	8	4	3	29	3,9	6,5

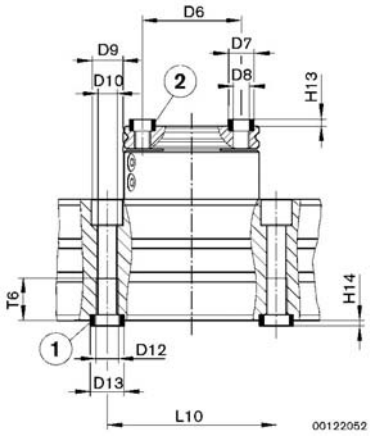
	H11 ±0,2	H12 ±0,2	L1	L2	L3	L4	L5	L6	L8	SW1	SW2	T1	T2	T3	W1	W2
RCM–16	11,1	13,7	108	14,5	58	18	40	10	6	19	13	4	0,7	4	90 °	25 °
RCM–20	11,6	14,2	114	12	37,5	19	43	9	10	19	15	4	0,7	4	90 °	25 °
RCM–25	11,1	13,7	153	15,5	52	22	60,5	10	12	23	17	4	0,7	4	90 °	25 °

Mounting and assembly

RCM-12



RCM-8/-16/-20/-25



1) Centering sleeve, included in scope of delivery
2) Centering sleeve

	Ø D6 ± 0,02	Ø D7 f7	Ø D8	Ø D9	Ø D10	Ø D11	Ø D12	Ø D13 f7	H13 +0,2	H14 +0,2	L9	L10 ± 0,02	T5	T6
RCM–08	20	5	M 3	7,5	4,2	–	M 5	7	1,6	1,6	–	40	–	9,1
RCM–12	25	7	M 4	10	5,1	M 5	–	9	1,6	2,1	40	60	8,5	–
RCM–16	30	7	M 5	10	5,0	–	M 6	9	1,6	2,1	–	60	–	11,1
RCM–20	30	7	M 5	11	6,8	–	M 8	12	1,6	2,1	–	60	–	15,1
RCM–25	35	9	M 6	11	6,8	–	M 8	12	2,1	2,1	–	60	–	15,1

Rotary compact module, Series RCM

with elastic/hydraulic shock absorbers and intermediate position, Ø 12–25

Rexroth
Bosch Group

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Technical Data

Type		Double-acting drive with double piston Power transmission and synchronization through rack and pinion
Angle of rotation		90°/180°
Working pressure, max.		2 – 8 bar (58–116 psi)
Thermal application range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or oil-free (10 µm)
Installation position		any
Materials	Housing	Aluminum anodized
	Seals	NBR
	Rotary flange	Hardened steel
	Pinion	Hardened steel
	Rack	Hardened steel
	Ball bearing	Hardened steel

Application area

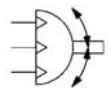
Suitable for handling technology applications where maximum torque combined with minimum construction size is required.
The drives feature especially accurate and high-load rotary flange bearings.
Sensor slots integrated on both sides permit versatile inquiry options.
Centering elements included in scope of delivery.
The integrated pneumatic intermediate position makes it possible to approach three positions without play.

Technical information

Type			RCM–12	RCM–16	RCM–20	RCM–25
Piston Ø		[mm]	12	16	20	25
Connection thread			M5	M 5	M 5	M 5
Theoretical torque *	(6 bar) (87 psi)	[Nm] (in.lbs.)	0,95 (8.41)	1,7 (15.05)	3 (26.55)	6,5 (57.53)
Setting range per end position	0 ° 90 ° 180 °	[°] [°] [°]	-6 / 45 45 / 135 135 /186	-6 / 45 45 / 135 135 /186	-6 / 45 45 / 135 135 /186	-6 / 45 45 / 135 135 /186
Repeatability	elastic hydraulic	[°] [°]	0,2 0,05	0,2 0,05	0,2 0,05	0,2 0,05
Max. app. torque moment of inertia	elastic hydraulic	[kg cm²] (lb.in²) [kg cm²] (lb.in²)	0,7 (0.24) 10 (3.42)	1,6 (0.55) 80 (27.34)	3,2 (1.09) 180 (61.51)	6,3 (2.15) 450 (153.77)
min. swivel times (1x180°)	elastic hydraulic	[s] [s]	0,28 0,3	0,25 0,32	0,3 0,48	0,3 0,75
Max. perm.axiales bearing load Max. perm. radiales bearing load		[N] (lbf.) [N] (lbf.)	330 (74.18) 360 (80.93)	490 (110.15) 580 (130.38)	620 (139.38) 780 (175.34)	1160 (260.77) 1480 (332.70)
Torque cylinder weight	elastic hydraulic	[kg] (lbs.) [kg] (lbs.)	0,48 (1.06) 0,5 (1.10)	0,79 (1.74) 0,823 (1.81)	1,12 (2.47) 1,18 (2.60)	2,1 (4.63) 2,23 (4.92)

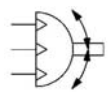
* Note: Due to the design principle, a reduced theoretical torque acts in the end position.

Part no. for RCM-...-SE-IP elastically cushioning



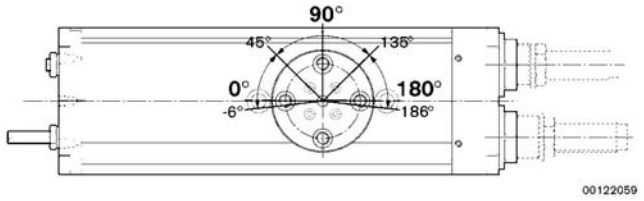
Rotation angle [°]	RCM-12	RCM-16	RCM-20	RCM-25
180°	R412000395	R412000396	R412000397	R412000398

Part no. forRCM-...-SH-IP hydraulically cushioning

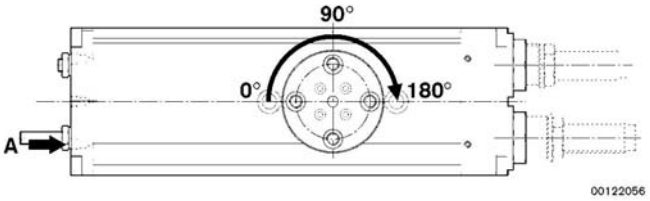


Rotation angle [°]	RCM-12	RCM-16	RCM-20	RCM-25
180°	R412000399	R412000400	R412000401	R412000402

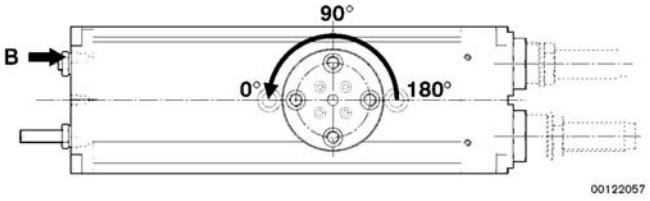
Setting range for end position 0° / 180° and intermediate position 90°



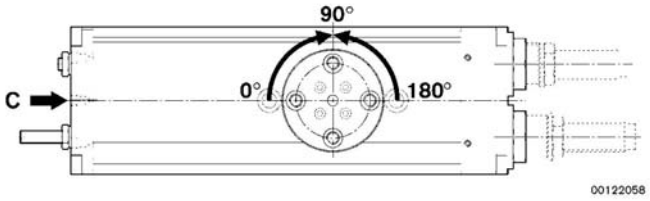
Movement into end position 180°



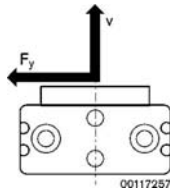
Movement into end position 0°



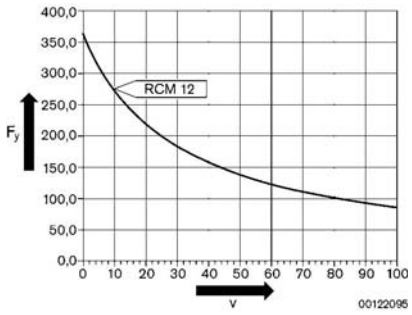
Movement into intermediate position 90°



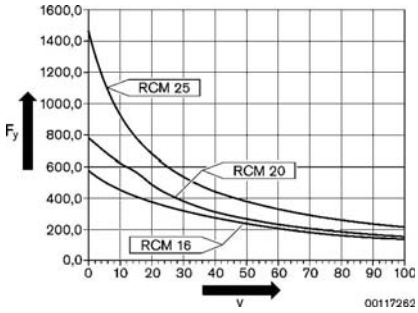
Max. permissible radial force Fy [N] as a function of v [mm]



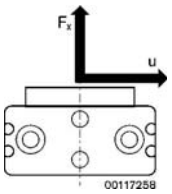
RCM 12



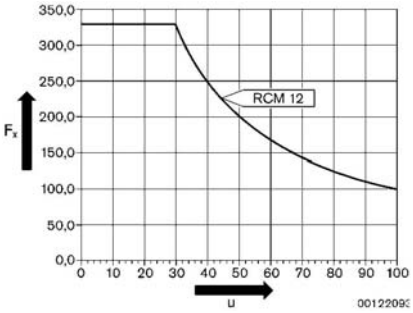
RCM 16 – 25



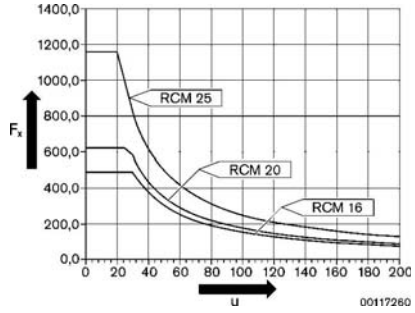
Max. permissible axial force Fx [N] as a function of u [mm]



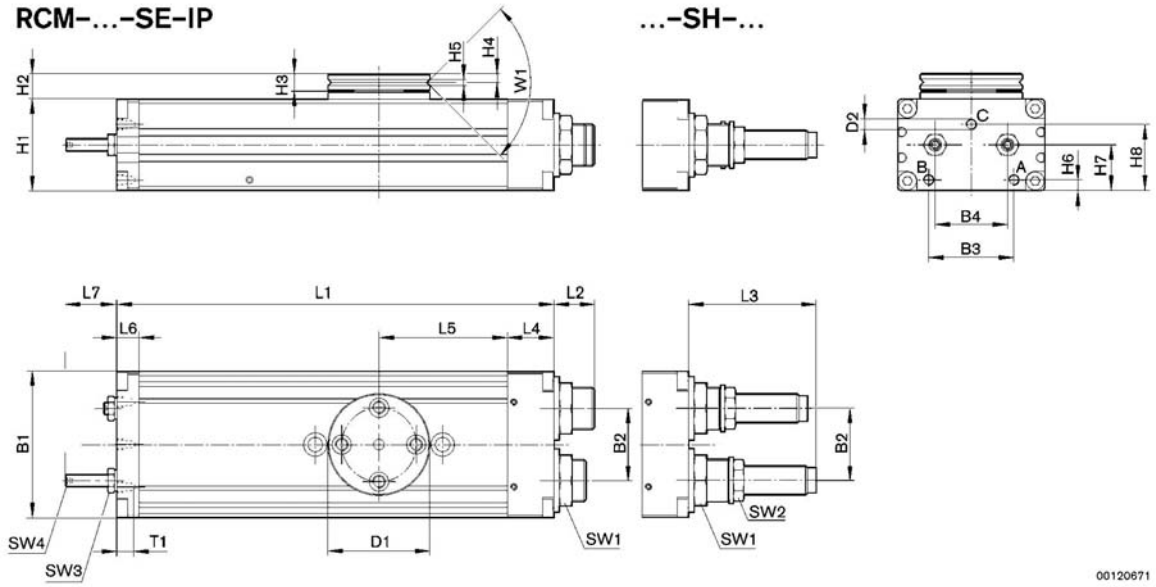
RCM 12



RCM 16 – 25



RCM-12/.../-25

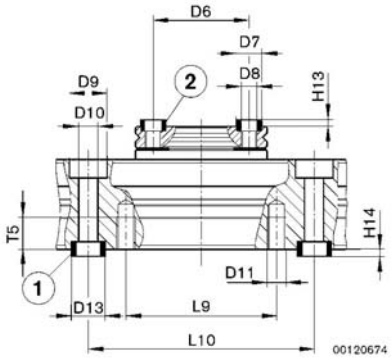


	B1	B2	B3	B4	Ø D1	Ø D2	H1	H2	H3	H4	H5	H6	H7	H8
RCM–12	43	18	24	18	35	M 5	24	10,5	6	2,9	2,5	3,7	12,5	18,1
RCM–16	52	24	29	24	40	M 5	32	10	7	3,3	2,5	5	16	21,1
RCM–20	58	30	30	30	42	M 5	37	11	7	3,3	3	5,5	19	27,1
RCM–25	69	34	40	34	48	M 5	43	12	8	4	3	5	21,5	31,1

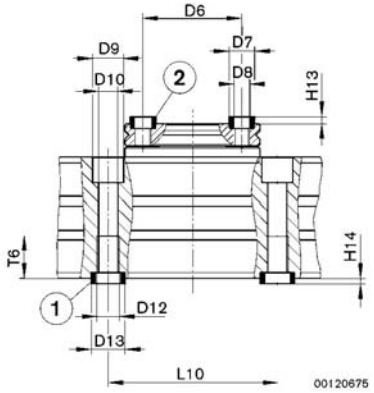
	L1	L2	L3	L4	L5	L6	L7	SW1	SW2	SW3	SW4	T1	W1
RCM–12	103	12,5	33,5	14	40	9	17	15	11	7	2	4	90 °
RCM–16	108	15	34	18	40	10	17	19	13	7	2	4	90 °
RCM–20	114	15	48,5	19	43	9	22	19	15	8	2,5	4	90 °
RCM–25	153	19	60	22	60,5	10	24	23	17	10	3	4	90 °

Mounting and assembly

RCM-12



RCM-16/-20/-25



1) Centering sleeve, included in scope of delivery
2) Centering sleeve

	Ø D6 ± 0,02	Ø D7 f7	Ø D8	Ø D9	Ø D10	Ø D11	Ø D12	Ø D13 f7	H13 +0,2	H14 +0,2	L9	L10 ± 0,02	T5	T6
RCM–12	25	7	M 4	10	5,1	M 5	–	9	1,6	2,1	40	60	8,5	–
RCM–16	30	7	M 5	10	5,0	–	M 6	9	1,6	2,1	–	60	–	11,1
RCM–20	30	7	M 5	11	6,8	–	M 8	12	1,6	2,1	–	60	–	15,1
RCM–25	35	9	M 6	11	6,8	–	M 8	12	2,1	2,1	–	60	–	15,1

Rotary compact module, Series RCM

with elastic/hydraulic shock absorbers, air channel, and intermediate position, Ø 12–25

Rexroth
Bosch Group

★

Technical Data

Type		Double-acting with two drive cylinders Power transmission and synchronization
through		Rack and pinion
Rotation angle		90°/180°
Working pressure, max.		4 – 8 bar (58–116 psi)
Temperature range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or oil-free (10 µm)
Installation position		any
Materials	Housing	Aluminum anodized
	Seals	NBR
	Rotary flange	Hardened steel
	Pinion	Hardened steel
	Rack	Hardened steel
	Ball bearing	Hardened steel

Application area

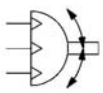
Suitable for handling technology applications where maximum torque combined with minimum construction size is required.
The drives feature especially accurate and high-load rotary flange bearings.
Sensor slots integrated on both sides permit versatile inquiry options.
Integrated air duct.
Energy loss in the rotary table.
Centering elements included in scope of delivery.
The integrated pneumatic intermediate position makes it possible to approach three positions without play.

Technical information

Typ			RCM–12	RCM–16	RCM–20	RCM–25
Piston Ø		[mm]	12	16	20	25
Connection thread			M5	M 5	M 5	M 5
Air feed-through			2	4	4	4
Theoretical torque *	(6 bar) (87 psi)	[Nm] (in.lbs.)	0,95 (8.41)	1,7 (15.05)	3 (26.55)	6,5 (57.53)
Setting range per end position	0 ° 90 ° 180 °	[°] [°] [°]	-6 / 45 45 / 135 135 /186	-6 / 45 45 / 135 135 /186	-6 / 45 45 / 135 135 /186	-6 / 45 45 / 135 135 /186
Repeatability	elastic hydraulic	[°] [°]	0,2 0,05	0,2 0,05	0,2 0,05	0,2 0,05
Max. app. torque moment of inertia	elastic hydraulic	[kg cm²] (lb.in²) [kg cm²] (lb.in²)	0,7 (0.24) 10 (3.42)	1,6 (0.55) 80 (27.34)	3,2 (1.09) 180 (61.51)	6,3 (2.15) 450 (153.77)
min. swivel times (1x180°)	elastic hydraulic	[s] [s]	0,28 0,3	0,25 0,32	0,3 0,48	0,3 0,75
Max. perm.axiales bearing load Max. perm. radiales bearing load		[N] (lbf.) [N] (lbf.)	330 (74.18) 290 (65.19)	490 (110.15) 400 (89.92)	620 (139.38) 560 (125.89)	1160 (260.77) 700 (157.36)
Torque cylinder weight	elastic hydraulic	[kg] (lbs.) [kg] (lbs.)	0,52 (1.15) 0,56 (1.24)	0,85 (1.85) 0,93 (2.05)	1,2 (2.65) 1,25 (2.76)	2,2 (4.85) 2,33 (5.14)

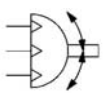
* Note: Due to the design principle, a reduced theoretical torque acts in the end position.

Part no. for RCM-...-SE-AP-IP elastically cushioning



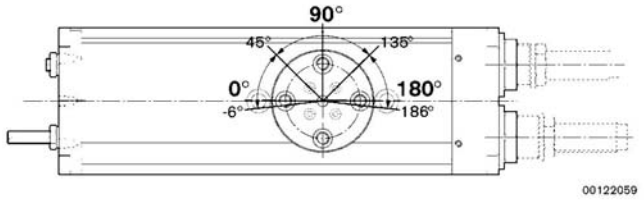
Rotation angle [°]	RCM-12	RCM-16	RCM-20	RCM-25
180°	R412000403	R412000404	R412000405	R412000406

Part no. for RCM-...-SH-AP-IP hydraulically cushioning

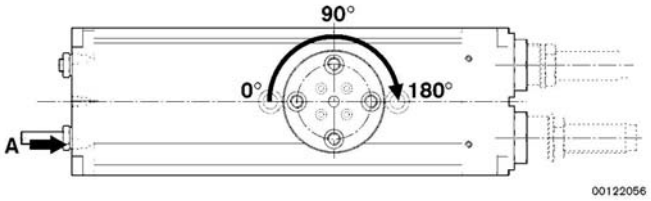


Rotation angle [°]	RCM-12	RCM-16	RCM-20	RCM-25
180°	R412000407	R412000408	R412000409	R412000410

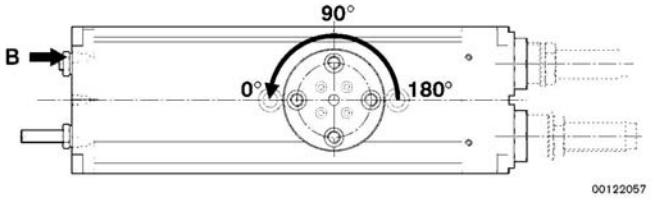
Setting range for end position 0° / 180° and intermediate position 90°



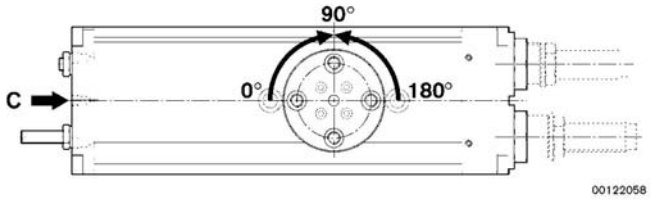
Movement into end position 180°



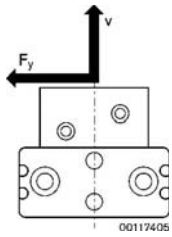
Movement into end position 0°



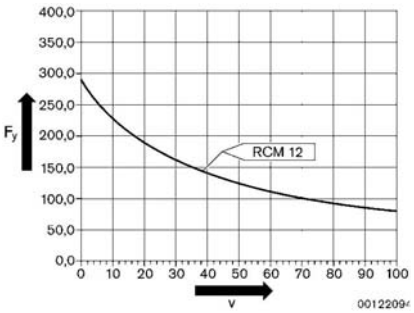
Movement into intermediate position 90°



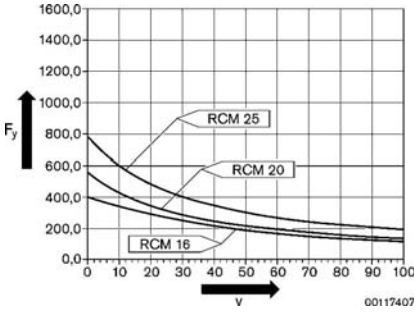
Max. permissible radial force Fy [N] as a function of v [mm]



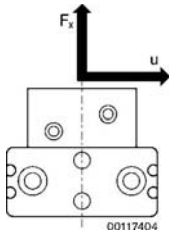
RCM 12



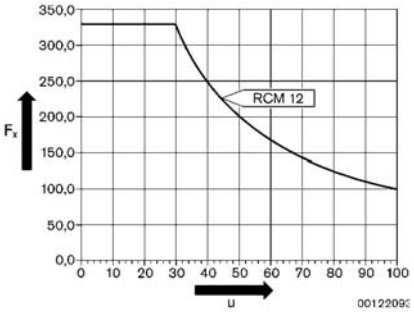
RCM 16 – 25



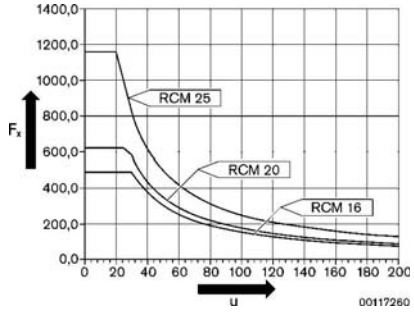
Max. permissible axial force Fx [N] as a function of u [mm]



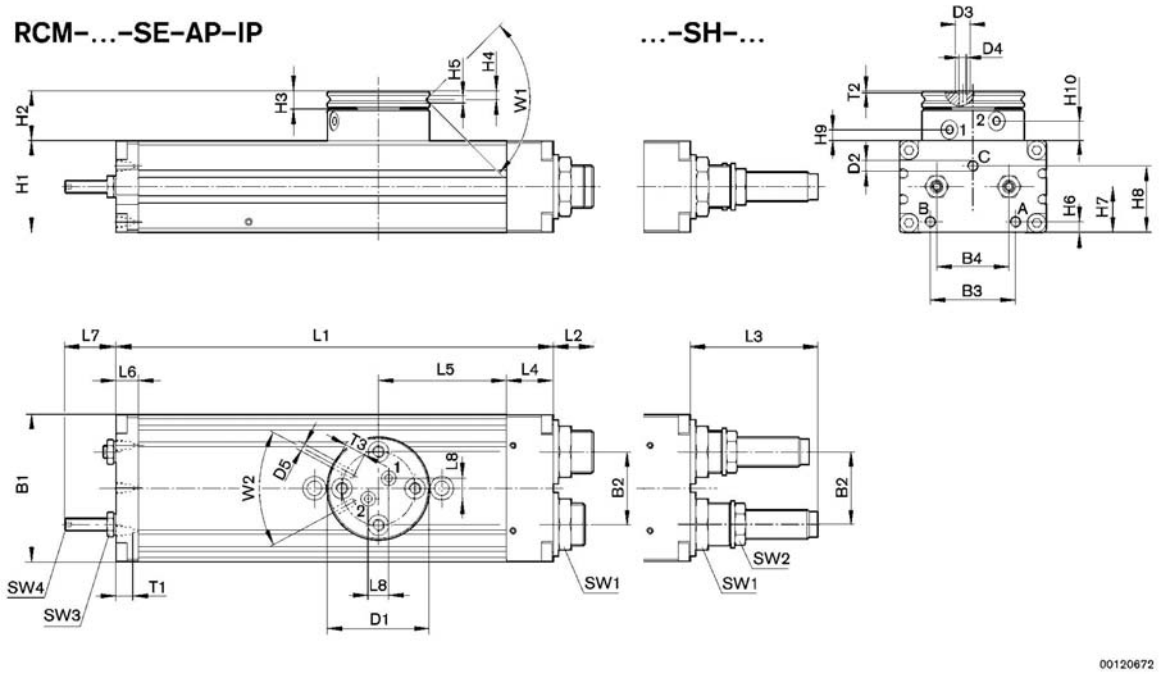
RCM 12



RCM 16 – 25



RCM-12



	B1	B2	B3	B4	Ø D1	Ø D2	Ø D3	Ø D4	Ø D5	H1	H2	H3	H4	H5	H6	H7	H8	H9 ±0,2	H10 ±0,2
RCM–12	43	18	24	18	35	M 5	5	2,5	M 3	24	17	6	2,9	2,5	3,7	12,5	18,1	3,8	6,7

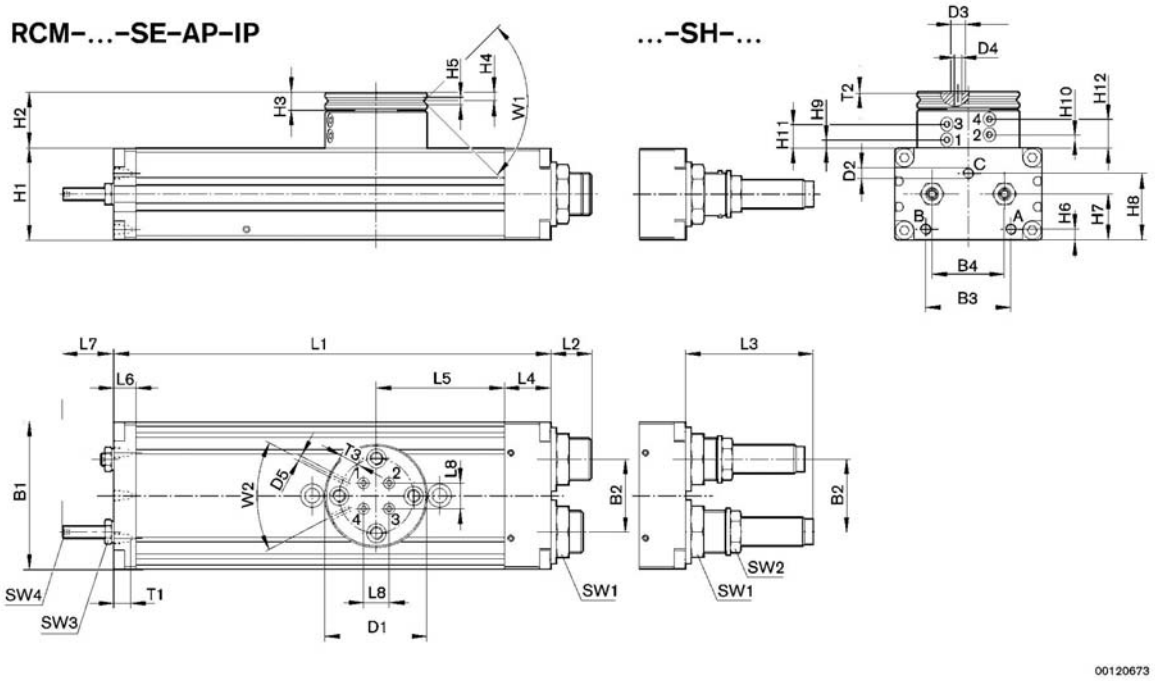
	L1	L2	L3	L4	L5	L6	L7	L8	SW1	SW2	SW3	SW4	T1	T2	T3	W1	W2
RCM–12	103	12,5	33,5	14	40	9	17	7	15	11	7	2	4	0,7	4	90 °	28 °

Rotary compact module, Series RCM

with elastic/hydraulic shock absorbers, air channel, and intermediate position,
Ø 12–25

Rexroth
Bosch Group

RCM-16/.../-25



	B1	B2	B3	B4	Ø D1	Ø D2	Ø D3	Ø D4	Ø D5	H1	H2	H3	H4	H5	H6	H7	H8	H9 ±0,2	H10 ±0,2
RCM–16	52	24	29	24	40	M 5	5	2,5	M 3	32	25,5	7	3,3	2,5	5	16	21,1	3,9	6,5
RCM–20	58	30	30	30	42	M 5	5	2,5	M 3	37	26	7	3,3	3	5,5	19	27,1	4,4	7
RCM–25	69	34	40	34	48	M 5	5	2,5	M 3	43	26,5	8	4	3	5	21,5	31,1	3,9	6,5

	H11 ±0,2	H12 ±0,2	L1	L2	L3	L4	L5	L6	L7	L8	SW1	SW2	SW3	SW4	T1	T2	T3	W1	W2
RCM–16	11,1	13,7	108	15	34	18	40	10	17	6	19	13	7	2	4	0,7	4	90 °	25 °
RCM–20	11,6	14,2	114	15	48,5	19	43	9	22	10	19	15	8	2,5	4	0,7	4	90 °	25 °
RCM–25	11,1	13,7	153	19	60	22	60,5	10	24	12	23	17	10	3	4	0,7	4	90 °	25 °

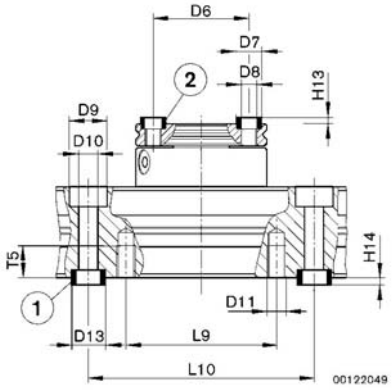
Rotary compact module, Series RCM

with elastic/hydraulic shock absorbers, air channel, and intermediate position,
Ø 12–25

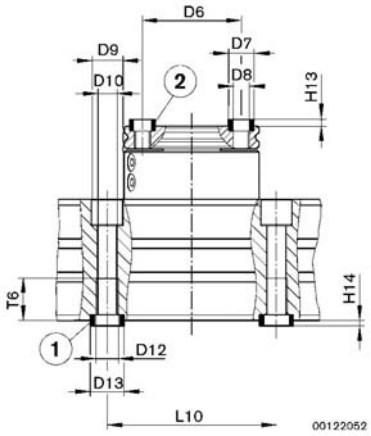
Rexroth
Bosch Group

Mounting and assembly

RCM-12



RCM-16/-20/-25



1) Centering sleeve, included in scope of delivery
2) Centering sleeve

	Ø D6 ± 0,02	Ø D7 f7	Ø D8	Ø D9	Ø D10	Ø D11	Ø D12	Ø D13 f7	H13 +0,2	H14 +0,2	L9	L10 ± 0,02	T5	T6
RCM–12	25	7	M 4	10	5,1	M 5	–	9	1,6	2,1	40	60	8,5	–
RCM–16	30	7	M 5	10	5,0	–	M 6	9	1,6	2,1	–	60	–	11,1
RCM–20	30	7	M 5	11	6,8	–	M 8	12	1,6	2,1	–	60	–	15,1
RCM–25	35	9	M 6	11	6,8	–	M 8	12	2,1	2,1	–	60	–	15,1

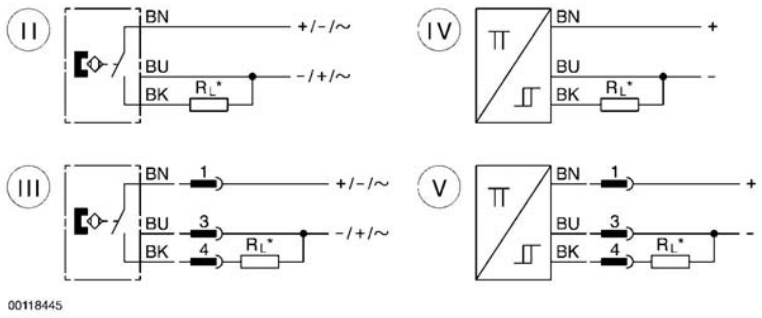
Locating ring

Accessories

Symbol	Ø D [mm]	per Pack	Part no.
	5	6	**R412000669**
	7	6	**R412000668**
	9	6	**R412000670**
	12	6	**R412000671**
	5 – 7	6	**R412004030**
	5 – 9	6	**R412004032**
	7 – 9	6	**R412004033**
	9 – 12	6	**R412004034**

LE* = Delivery unit

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

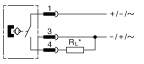
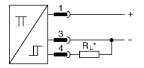
General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

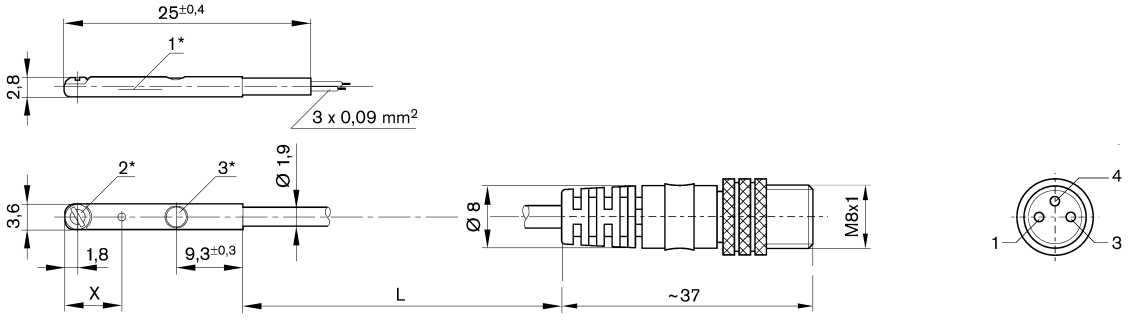
00118444_c

Ambient temperature min. / max.	-25 °C / +75 °C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	-	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions



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1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

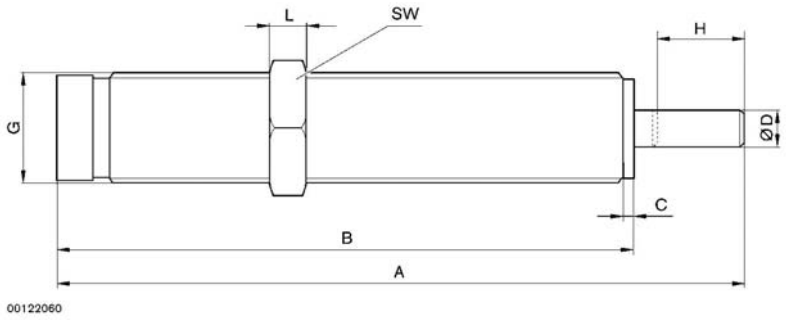
Shock absorber, Series SA2-RC

Ambient temperature range		0 °C to +65 °C (+32 °F to +149 °F)
Working medium		Oil
Materials	Piston rod	Hardened, stainless steel
	Cylinder body	Steel, black oxide
	Installation position	Any

Performance and Code No.

Symbol	Type	H [mm]	Absorption Energy W/H [Nm=J] (in.lbs)	Absorption Energy W/h [J/h] (in.lbs/h)	Effective mass min. [kg] (lbs.)	Effective mass max. [kg] (lbs.)	Impact speed v max. [m/s]	Return spr. Force min. [N] (lbf.)	Return spr. Force max. [N] (lbf.)	Weight [g] (oz.)	Code No.
	SA2 - RC	6,0	4 (35.40)	14400 (127450)	2,8 (6.17)	70 (154.32)	1,7	2,5 (0.56)	6 (1.35)	10 (0.353)	**R412004751**
		6,0	9 (79.66)	21000 (185865)	6,0 (13.23)	280 (617.29)	1,8	3,5 (0.79)	8 (1.80)	20 (0.706)	**R412004752**
		8,5	16 (141.61)	30000 (265521)	17 (37.48)	512 (1128.76)	1,4	3,5 (0.79)	7 (1.57)	35 (1.235)	**R412004753**
		12,0	31 (274.37)	50000 (442535)	136 (299.83)	1550 (3417.13)	–	6,0 (1.35)	19 (4.27)	60 (2.116)	**R412004754**

H = Stroke



	G	A	B	C	Ø D	H	L	SW
R412004751	M8x1	53	44	2,5	2,5	6	3	11
R412004752	M10x1	58,5	49,5	2,5	3	6	3	13
R412004753	M12x1	76	65	2,5	4	8,5	4	14
R412004754	M14x1,5	95	78	–	4,8	12	5	17

Grippers - Series GSP

Rexroth
Bosch Group

Products

★ Series GSP-P
2-Finger, parallel gripper

See page 5.90

★ Series GSP-A
2-finger, angle gripper 40°

See page 5.97

★ Series GSP-R
2-fingers, radial gripper 180°

See page 5.103

★ Series GSP-Z
3-finger, centric gripper

See page 5.107

Accessories

★ Locating rings

See page 5.110

★ Cylinder switch series ST4

See page 5.111

Gripper standard

Series GSP-P
2-Finger, parallel gripper

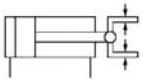
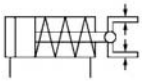
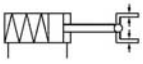
Rexroth
Bosch Group

★

Technical Data

Type		2-fingers, parallel gripper
Operating pressure range, double-acting		2 – 8 bar (29 – 87 psi) (GSP-P-...)
with gripp. force safety	pressureless open	4,5 – 6,5 bar (62-94 psi) (GSP-P- ...-NO)
with gripp. force safety	pressureless closed	4,5 – 6,5 bar (62-94 psi) (GSP-P- ...-NO)
Repeatability*		± 0,02 mm
Lubrication		endurance lubrication
Ambient temperature range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or non-lubricated
Materials	Housing	Aluminum, anodized
	Guide housing	Aluminium, hard anodized
	Function parts	Steel, hardened
	Seals	NBR+PU (NBR + Polyurethane)

Performance and Code No.

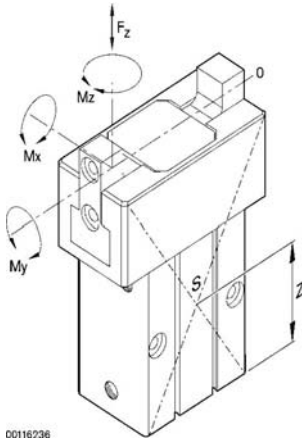
Symbol	Type	Eff. gripping force min (6 bar) (87 psi) [N] (lbf)		Gripping force secured by spring	Stroke/Finger [mm]	Weight [kg] (lbs)	Part no.
		O.D. gripping	I.D. gripping				
	GSP-P-08	13 (2.922)	18		2	0,04 (0.088)	**R412000411**
	GSP-P-10	29 (6.519)	35		3	0,07 (0.154)	**R412000414**
	GSP-P-16	60 (13.488)	69		5	0,16 (0.353)	**R412000417**
	GSP-P-20	120 (26.976)	140		6	0,25 (0.551)	**R412000420**
	GSP-P-25	190 (42.712)	219		8	0,48 (1.058)	**R412000423**
	GSP-P-40	420 (94.416)	464		13	1,56 (3.439)	**R412000426**
	GSP-P-08-NC	16–19 (3.60–4.27)	–	3–6	2	0,04 (0.088)	**R412000412**
	GSP-P-10-NC	37–42 (8.32–9.44)	–	8–13	3	0,07 (0.154)	**R412000415**
	GSP-P-16-NC	80–95 (17.98–21.36)	–	18–30	5	0,16 (0.353)	**R412000418**
	GSP-P-20-NC	140–170 (31.47–38.22)	–	30–58	6	0,25 (0.551)	**R412000421**
	GSP-P-25-NC	230–270 (51.70–60.70)	–	55–90	8	0,48 (1.058)	**R412000424**
	GSP-P-40-NC	535–635 (120.3–142.8)	–	120–205	13	1,57 (3.461)	**R412000427**
	GSP-P-08-NO	–	16–19	3–6	2	0,04 (0.088)	**R412000413**
	GSP-P-10-NO	–	37–42	8–13	3	0,07 (0.154)	**R412000416**
	GSP-P-16-NO	–	80–95	18–30	5	0,16 (0.353)	**R412000419**
	GSP-P-20-NO	–	140–170	30–58	6	0,25 (0.551)	**R412000422**
	GSP-P-25-NO	–	230–270	55–90	8	0,48 (1.058)	**R412000425**
	GSP-P-40-NO	–	535–635	120–205	13	1,57 (3.461)	**R412000428**

Type	Mass moment of inertia** [kgcm²](lb.in²)	max. perm. finger length*** [mm]	rec. workpiece weight [kg](lbs)	Closing time (6 bar)(87 psi) [s]				Opening time (6 bar)(87 psi) [s]			
				GSP-P-...	GSP-P-... -NO	GSP-P-... -NC	without pressure	GSP-P-...	GSP-P-... -NO	GSP-P-... -NC	without pressure
GSP-P-08	0,02 (0.007)	20	0,13 (0.29)	0,02	0,03	0,01	0,15	0,02	0,01	0,03	0,15
GSP-P-10	0,07 (0.024)	25	0,29 (0.64)	0,03	0,05	0,02	0,20	0,03	0,02	0,05	0,20
GSP-P-16	0,31 (0.106)	32	0,70 (1.54)	0,05	0,08	0,04	0,35	0,05	0,04	0,08	0,35
GSP-P-20	0,63 (0.215)	40	1,20 (2,65)	0,07	0,10	0,06	0,40	0,07	0,06	0,10	0,40
GSP-P-25	1,85 (0.632)	50	1,90 (4.19)	0,10	0,12	0,08	0,50	0,10	0,08	0,12	0,50
GSP-P-40	14,1 (4.818)	64	4,10 (9.04)	0,15	0,18	0,12	0,60	0,15	0,12	0,18	0,60

** referring to center line of gripper
***measured from top edge of housing

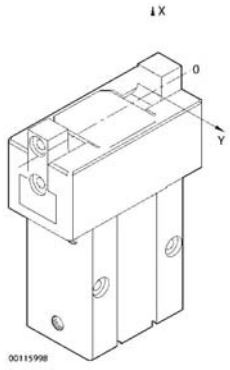
→ Use ST4 Sensors located in Sensors/Electrical Accessories section.

Max. permissible forces and torques on gripper



Type	FZ [N](lbf)	MX [Nm](in.lbs)	MY [Nm](in.lbs)	MZ [Nm](in.lbs)	Z [mm]
GSP-P-08	120 (26.98)	1,3 (11.51)	1,0 (8.85)	0,25 (2.21)	21,5
GSP-P-10	140 (31.47)	2,0 (17.70)	1,5 (13.28)	0,5 (4.43)	34,9
GSP-P-16	200 (44.96)	3,3 (29.21)	1,5 (13.28)	1,0 (8.85)	37,9
GSP-P-20	250 (56.20)	5,5 (48.68)	5,0 (44.25)	2,5 (22.13)	41,4
GSP-P-25	450 (101.16)	9,0 (79.66)	9,0 (79.66)	6,0 (53.10)	47,7
GSP-P-40	800 (179.84)	18,0 (159.31)	18,0 (159.31)	13,0 (115.06)	57,6

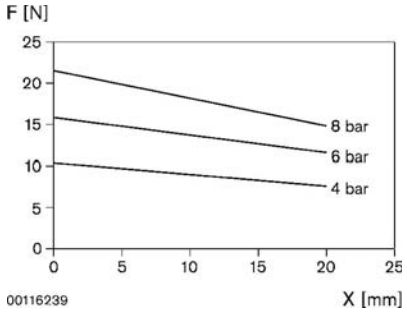
Permissible gripping range



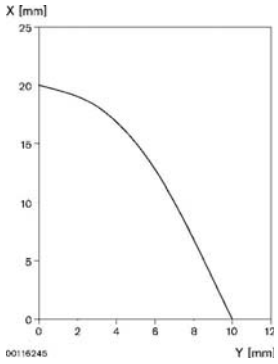
X = clamping height
Y = clamping width

GSP-P-08

gripping force

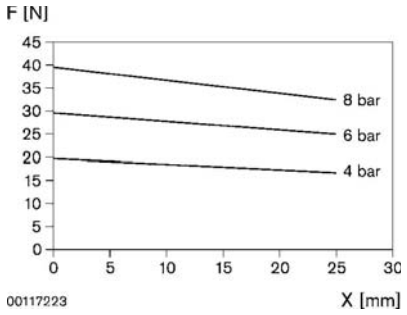


gripping range

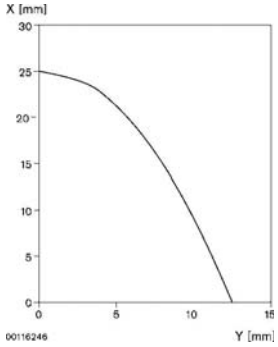


GSP-P-10

gripping force

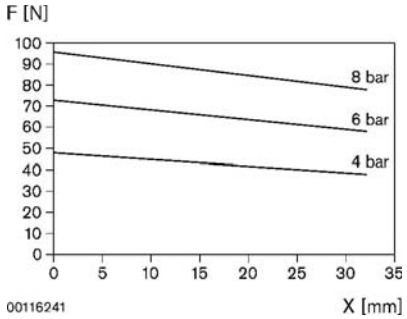


gripping range

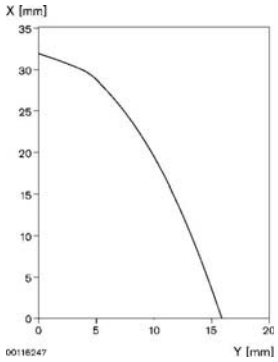


GSP-P-16

gripping force

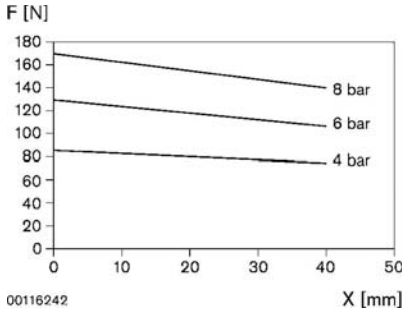


gripping range

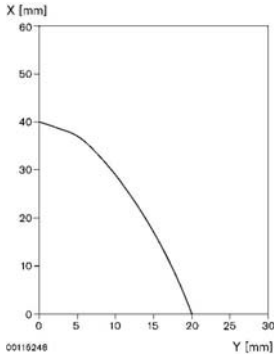


GSP-P-20

gripping force

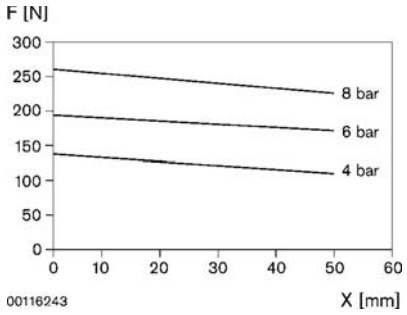


gripping range

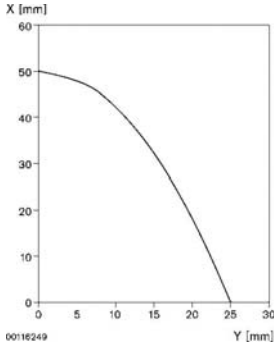


GSP-P-25

gripping force

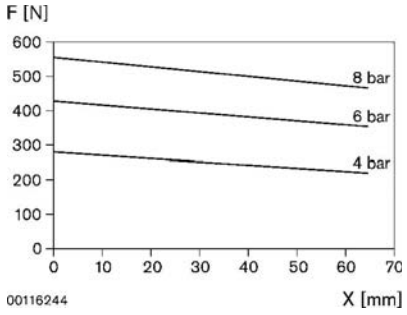


gripping range

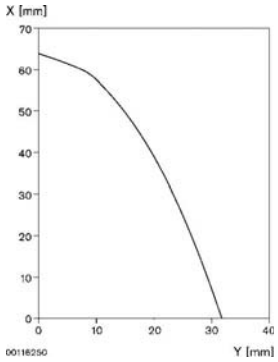


GSP-P-40

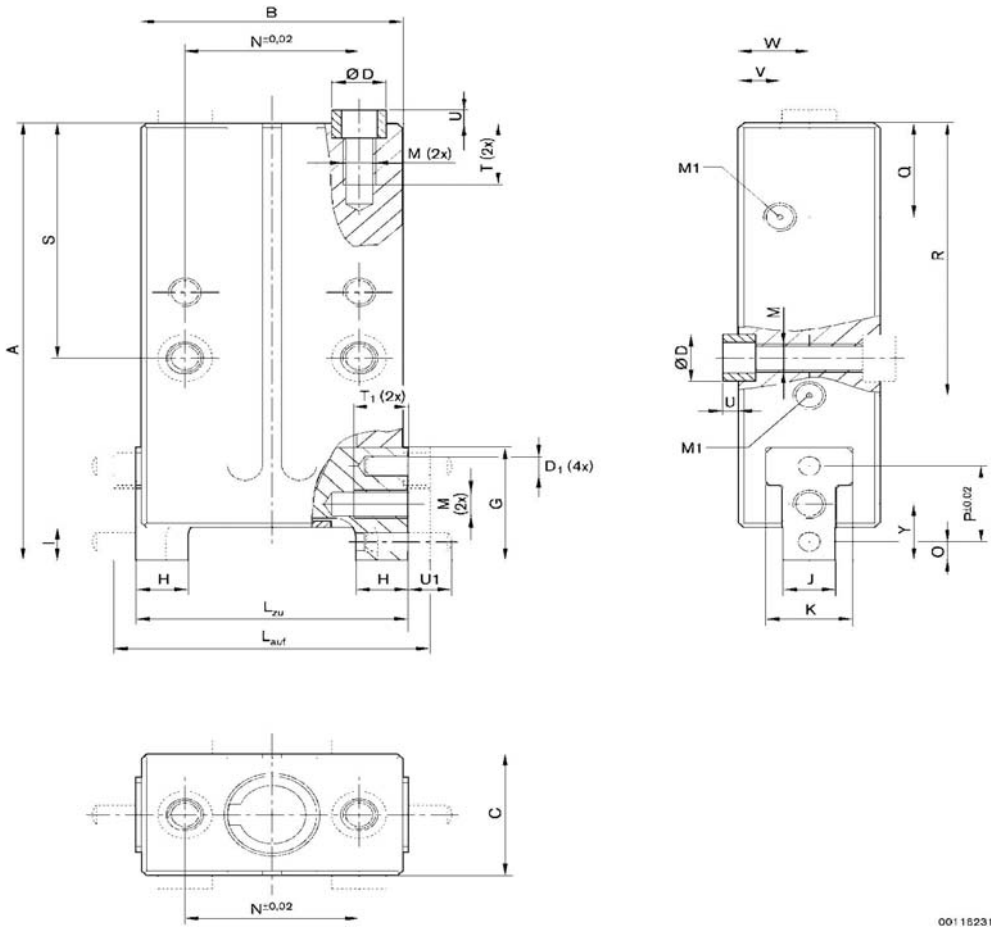
gripping force



gripping range



GSP-P-08



L1 = Gripper open
L2 = Gripper closed

EE1 = Close gripper air connection
EE2 = Open gripper air connection

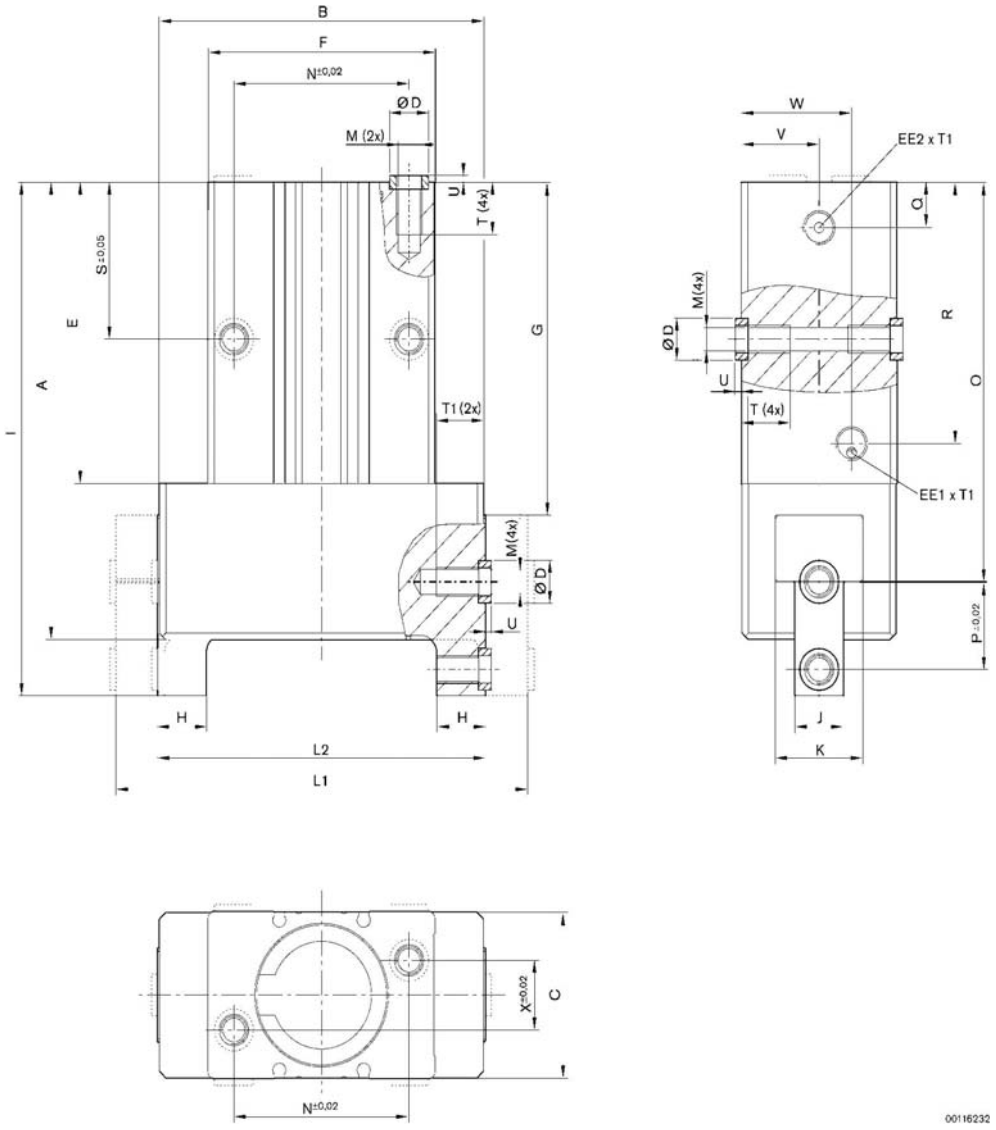
Type	A	B	C	D	D1	EE1	EE2	G	H	I	J	K	L1	L2	M
GSP-P-08	43	24	13	Ø5 f7	Ø2 m6	M3	M3	34,5	4,8	46,5	4,8	8	29	25	M3

Type	N	O	P	Q	R	S	T	T1	U	U1	V	W	Y
GSP-P-08	16	36,5	8	10	29	25	6,6	5	1,4	4	3,8	6,5	4

Gripper standard
Series GSP-P
2-Finger, parallel gripper

Rexroth
Bosch Group

GSP-P-10-...-40



L1 = Gripper open
L2 = Gripper closed

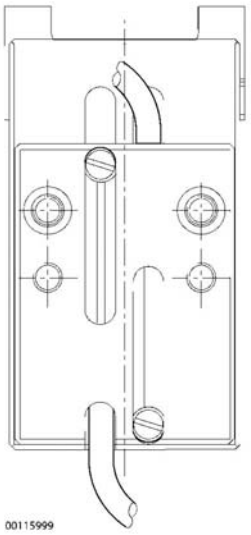
EE1 = Close gripper air connection
EE2 = Open gripper air connection

Type	A	B	C	D	E	EE1	EE2	F	G	H	I	J	K	L1	L2	M
GSP-P-10	56	32	16	Ø5 f7	41	M3	M3	28	44	6	61	6	10	39	33	M3
GSP-P-16	68	46	20	Ø5 f7	47	M5	M5	36	51	7	74,5	7	12	57	47	M5
GSP-P-20	79	50	24	Ø7 f7	53,5	M5	M5	42	58,5	8	87	8	14	63	51	M5
GSP-P-25	95	64	30	Ø7 f7	63	M5	M5	50	69	10	106	10	17	81	65	M5
GSP-P-40	131	100	48	Ø12 f7	86,5	G1/8	G1/8	70	95,5	15	147	15	27	127	101	G1/8

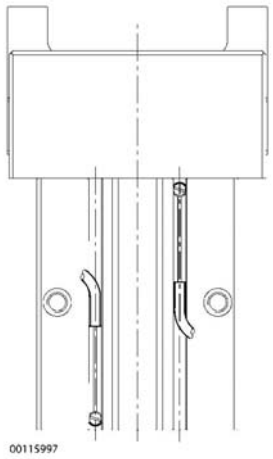
Type	N	O	P	Q	R	S	T	T1	T2	U	V	W	X
GSP-P-10	20	52	6	11,5	32	21	7	4	–	1,6	5,3	11,2	–
GSP-P-16	28	61,5	10	11	41	24	7	5	–	1,6	5,5	14,5	–
GSP-P-20	32	70,5	12	11	46	27	8	6	–	1,6	6,5	17,5	–
GSP-P-25	40	85,5	16	11	55	32	11,5	6	–	1,6	9	21	–
GSP-P-40	54	114,5	25	13	75	45	15,0	6	–	2,1	24	34	20

Cylinder switches

GSP-P-08



GSP-P-10...- 40



Gripper standard

Series GSP-A
2-finger, angle gripper 40°

Rexroth
Bosch Group

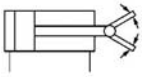
★

Technical Data

Type		2-fingers, anglular gripper
Operating pressure range, double-acting		2 – 8 bar (29 - 116 psi)
Opening angle		40° (per finger 20°)
Repeatability*		± 0,02 mm
Lubrication		endurance lubrication
Ambient temperature range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or oil-free
Materials	Housing	Aluminum, anodized
	Function parts	Aluminum, hard anodized
	Seals	NBR + PU (NBR + Polyurethane)

* After 100 consecutive strokes worst case.
Centering elements included in scope of delivery

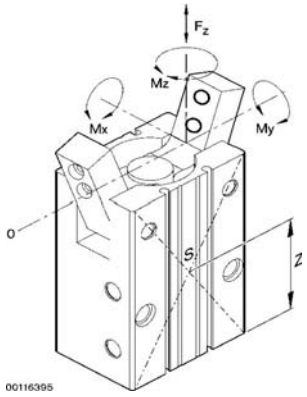
Performance and code no.

Symbol	Type	eff. Gripping moment min (6 bar) [Nm] (87 psi) [in.lbs]	Weight [kg](lbs)	Part no.
	GSP-A-10	0,11 (0.97)	0,06 (0.132)	**R412000448**
	GSP-A-16	0,36 (3.19)	0,08 (0.176)	**R412000450**
	GSP-A-25	1,45 (12.83)	0,26 (0.573)	**R412000452**
	GSP-A-32	2,70 (23.90)	0,48 (1.058)	**R412000454**
	GSP-A-40	4,27 (37.79)	0,83 (1.830)	**R412000456**

Type	Mass moment of inertia* [kgcm²](lbs.in²)	max. perm. finger length*** [mm]	max. perm. block attachment weight [kg] (lbs)	max. perm. mass moment of inertia/block attachment** [kgcm²](lbs.in²)	Closing time (6 bar)(87 psi) [s]	Opening time (6 bar)(87 psi) [s]
GSP-A-10	0,04 (0.014)	25	0,04 (0.088)	0,03 (0.010)	0,03	0,03
GSP-A-16	0,14 (0.048)	32	0,05 (0.110)	0,70 (0.239)	0,02	0,02
GSP-A-25	0,83 (0.284)	50	0,10 (0.220)	3,20 (1.093)	0,03	0,03
GSP-A-32	2,20 (0.752)	62	0,13 (0.287)	5,70 (1.948)	0,05	0,04
GSP-A-40	5,35 (1.828)	80	0,22 (0.485)	13,00 (4.442)	0,06	0,06

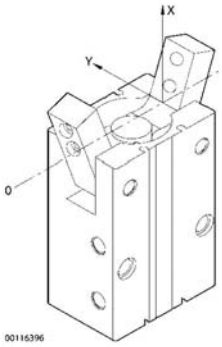
* referring to longitudinal axis of gripper
** measured from top edge of housing
*** referring to center of swivel pin

Max. permissible forces and torques on gripper



Type	FZ	MX	MY	MZ	Z
	[N] (lbf)	[Nm](in.lbs)	[Nm](in.lbs)	[Nm](in.lbs)	[mm]
GSP-A-10	18 (4.05)	0,2 (1.77)	0,4 (3.54)	0,3 (2.66)	25,1
GSP-A-16	35 (7.87)	0,5 (4.43)	1,2 (10.62)	1,0 (8.85)	30,7
GSP-A-25	58 (13.04)	1,5 (13.28)	3,0 (26.55)	2,4 (21.24)	40,8
GSP-A-32	80 (17.98)	2,5 (22.13)	4,8 (42.48)	5,6 (49.56)	49,2
GSP-A-40	130 (29.22)	4,0 (35.40)	7,0 (61.95)	5,6 (49.56)	57,1

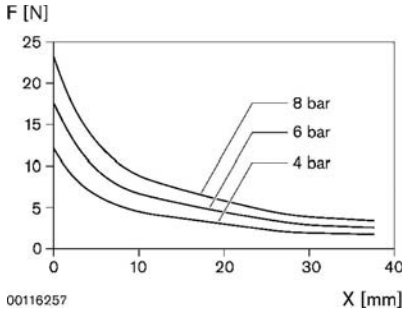
Permissible gripping range



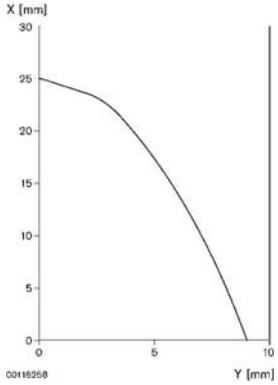
X = clamping height
Y = clamping width

GSP-A-10

gripping force

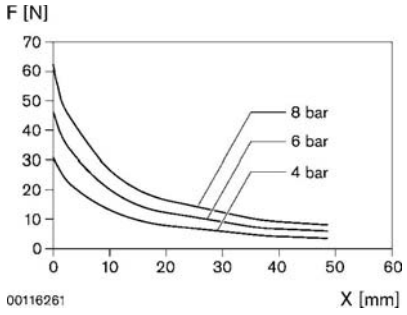


gripping range

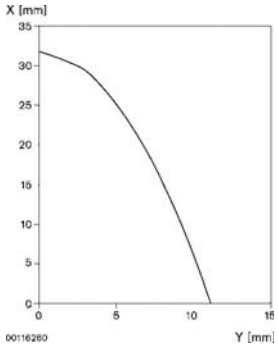


GSP-A-16

gripping force

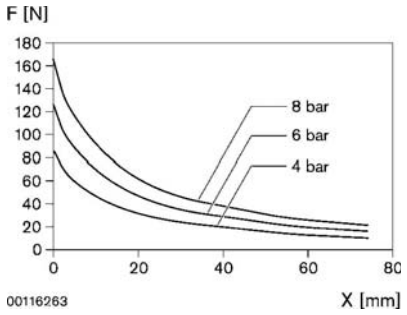


gripping range

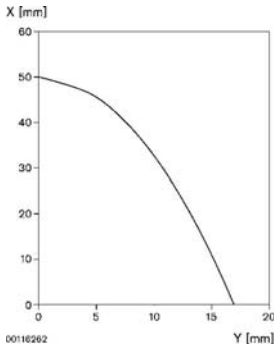


GSP-A-25

gripping force

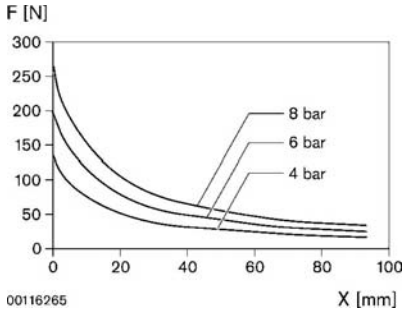


gripping range

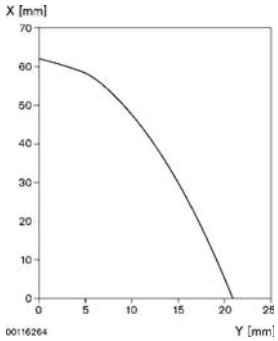


GSP-A-32

gripping force

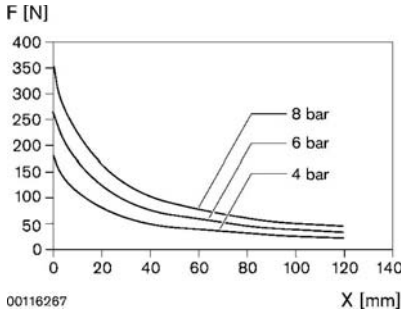


gripping range

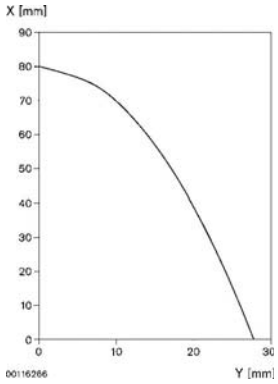


GSP-A-40

gripping force



gripping range

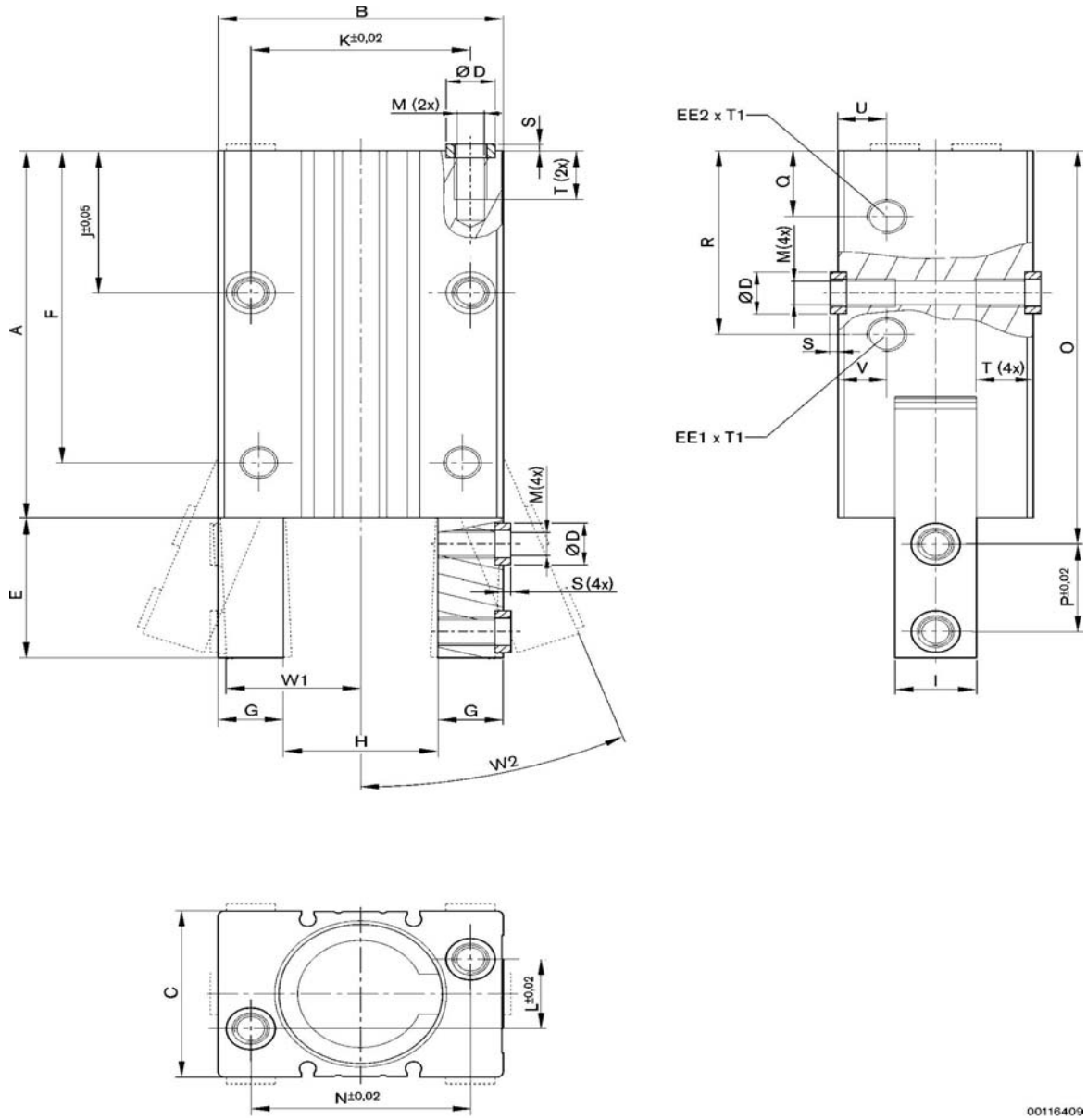


Gripper standard

Series GSP-A
2-finger, angle gripper 40°

Rexroth
Bosch Group

GSP-A-10/-16/-25/-32/-40



L1 = Gripper open
L2 = Gripper closed

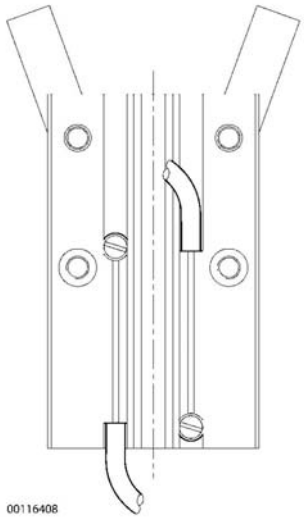
EE1 = Close gripper air connection
EE2 = Open gripper air connection

Type	A	B	C	D	E	EE1	EE2	F	G	H	I	J	K	L
GSP-A-10	47	28	16	Ø5 f7	12	M5	M5	41,2	6	15	6,5	24	20	0
GSP-A-16	56	36	20	Ø5 f7	16	M5	M5	48,2	8	20	9	26	28	0
GSP-A-25	74	50	24	Ø7 f7	25	M5	M5	62,5	11	28	13	32	40	0
GSP-A-32	91	60	38	Ø9 f7	32	G1/8	G1/8	77,3	13	34	16	38	40	20
GSP-A-40	106	70	48	Ø12 f7	40	G1/8	G1/8	90	16	38	20	41	54	20

Type	M	N	O	P	Q	R	S	T	T1	U	V	W1	W2
GSP-A-10	M3	20	50	6	12,5	29	1,6	6,6	5	8	8	2°	20°
GSP-A-16	M3	28	59	10	12,5	33	1,6	6,6	5	7	7	2°	20°
GSP-A-25	M5	40	78,5	16	13,5	39	1,6	9,6	5	8	8	2°	20°
GSP-A-32	M6	40	97	20	16	49	2,1	11,1	6	19	19	2°	20°
GSP-A-40	M8	54	113,5	25	17	53	2,1	14,1	6	12	12	2°	20°

Cylinder switches

GSP-A-10...-40



Gripper standard

Series GSP-R
2-fingers, radial gripper 180°

Rexroth
Bosch Group

★

Technical Data

Type		2-fingers, radial gripper
Operating pressure range, double-acting		2 – 8 bar (29 – 116 psi)
Opening angle		180° (per finger 90°)
Repeatability*		± 0,05 mm
Lubrication		endurance lubrication
Ambient temperature range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or non-lubricated
Materials	Housing	Aluminum, anodized
	Function parts	Steel, hardened
	Seals	NBR + PU (NBR + Polyurethane)

* After 100 consecutive strokes worst case
Centering elements included in scope of delivery

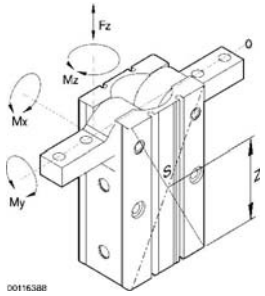
Performance and code no.

Symbol	Type	eff. Gripping moment min (6 bar) [Nm] (87 psi) (in.lbs.)	Weight [kg] (lbs)	Part no.
	GSP-R-10	0,15 (1.33)	0,08 (0.022)	**R412000438**
	GSP-R-16	0,45 (3.98)	0,15 (0.331)	**R412000440**
	GSP-R-25	2,00 (17.70)	0,40 (0.882)	**R412000442**
	GSP-R-32	4,00 (35.40)	0,72 (1.587)	**R412000444**
	GSP-R-40	6,00 (53.10)	1,21 (2.668)	**R412000446**

Type	Mass moment of inertia* [kgcm²](lb.in²)	max. perm. finger length** [mm]	max. perm. block attachment weight [kg] (lbs)	max. perm. mass moment of inertia/block attachment*** [kgcm²](lb.in²)	Closing time (6 bar)(87 psi) [s]	Opening time (6 bar) (87 psi) [s]
GSP-R-10	0,07 (0.024)	25	0,07 (0.154)	0,01 (0.003)	0,07	0,06
GSP-R-16	0,22 (0.075)	32	0,10 (0.220)	0,40 (0.137)	0,07	0,06
GSP-R-25	1,28 (0.438)	50	0,30 (0.661)	2,50 (0.854)	0,10	0,09
GSP-R-32	3,42 (1.169)	62	0,50 (1.102)	4,00 (1.367)	0,11	0,12
GSP-R-40	7,98 (2.727)	80	0,80 (1.764)	8,00 (2.734)	0,23	0,18

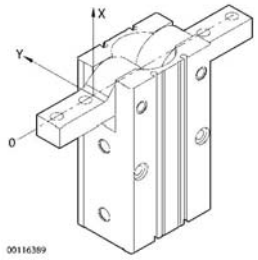
* referring to center line of gripper
** measured from top edge of housing
*** referring to center of swivel pin

Max. permissible forces and torques on gripper



Type	FZ [N] (lbf)	MX [Nm] (in.lbs)	MY [Nm] (in.lbs)	MZ [Nm] (in.lbs)	Z [mm]
GSP-R-10	18 (4.05)	0,3 (2.66)	0,5 (4.43)	0,5 (4.43)	34,0
GSP-R-16	35 (7.87)	0,7 (6.20)	1,5 (13.28)	1,1 (9.74)	40,8
GSP-R-25	58 (13.04)	1,8 (15.93)	3,7 (32.75)	2,5 (22.13)	55,8
GSP-R-32	80 (17.98)	2,8 (24.78)	5,5 (48.68)	3,9 (34.52)	66,1
GSP-R-40	130 (29.22)	4,5 (39.83)	8,0 (70.81)	6,0 (53.10)	74,5

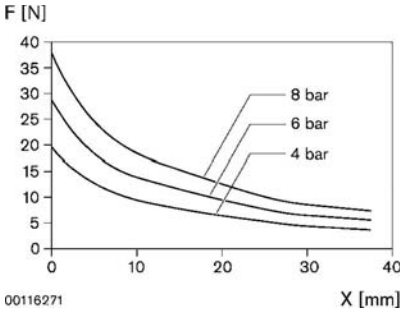
Permissible gripping range



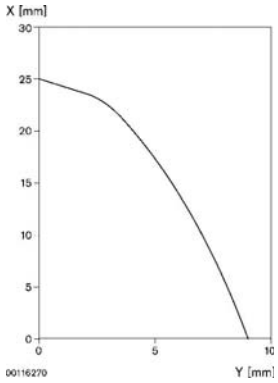
X = clamping height
Y = clamping width

GSP-R-10

gripping force

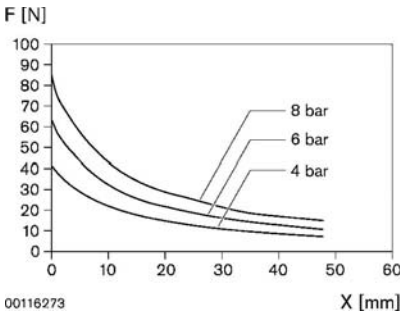


gripping range

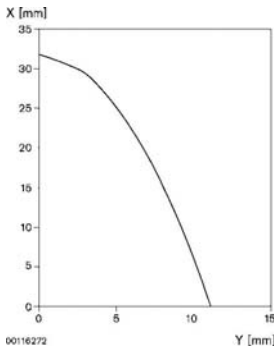


GSP-R-16

gripping force

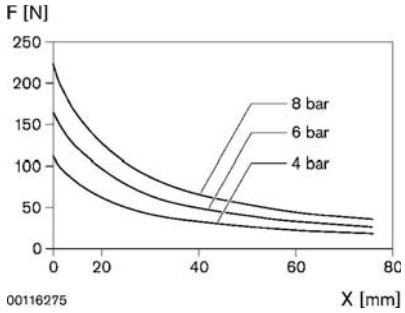


gripping range

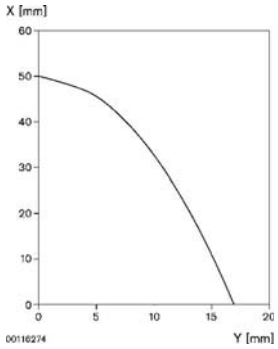


GSP-R-25

gripping force

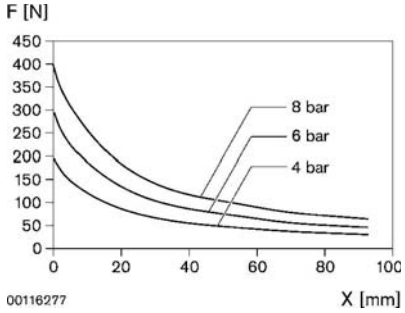


gripping range

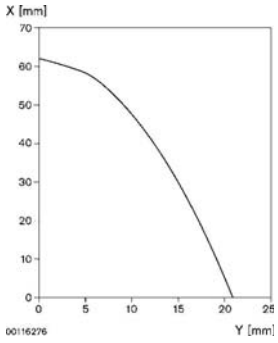


GSP-R-32

gripping force

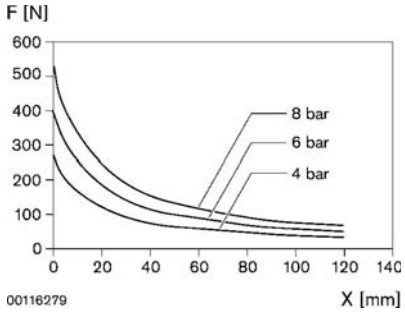


gripping range

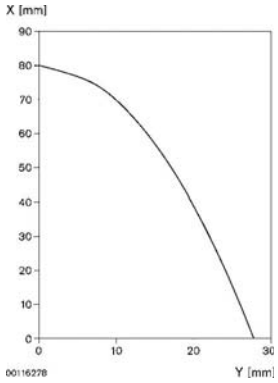


GSP-R-40

gripping force



gripping range

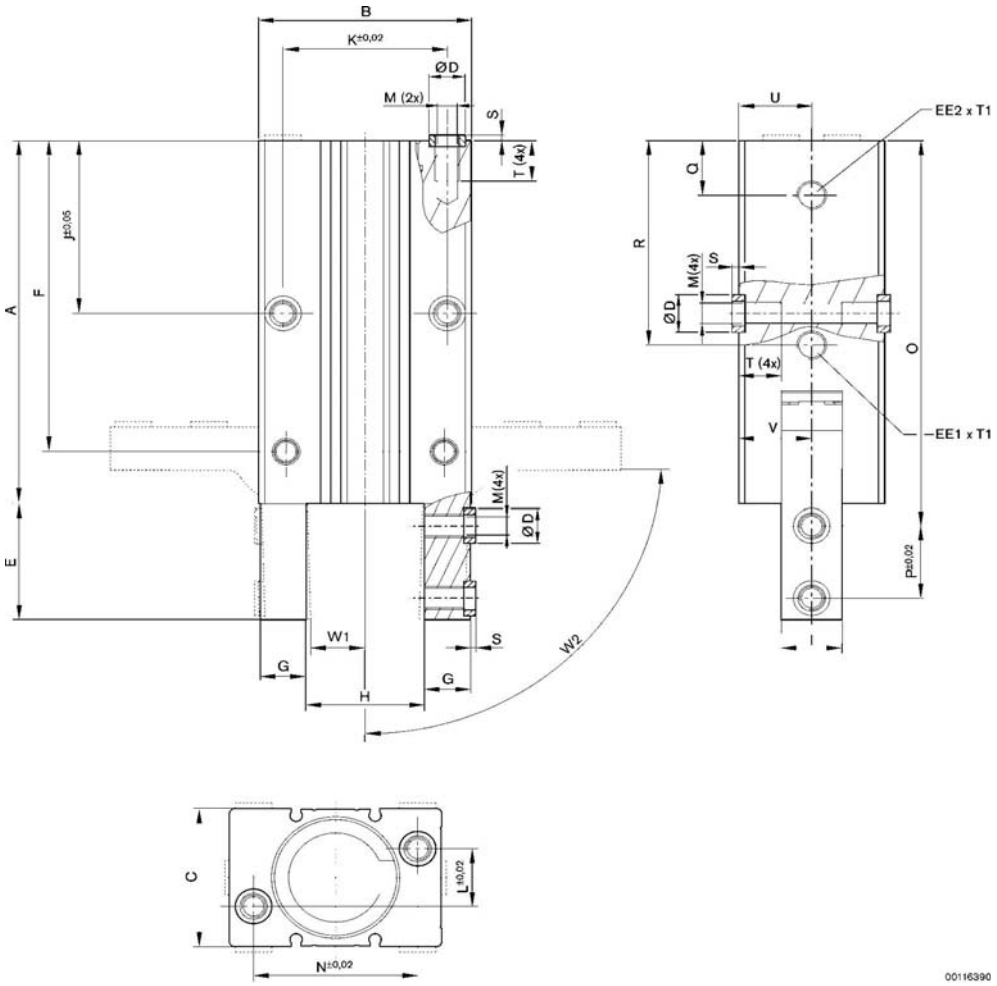


Gripper standard

Series GSP-R
2-fingers, radial gripper 180°

Rexroth
Bosch Group

GSP-R-10/-16/-25/-32/-40



L1 = Gripper open
L2 = Gripper closed

EE1 = Close gripper air connection
EE2 = Open gripper air connection

Type	A	B	C	D	E	EE1	EE2	F	G	H	I	J	K
GSP-R-10	63	28	16	Ø5 H7	12	M5	M5	54,3	5	17	6,5	30,5	20
GSP-R-16	71	36	20	Ø5 H7	16	M5	M5	61,1	7,5	20	9	36	28
GSP-R-25	94,5	50	30	Ø7 H7	25	M5	M5	80,5	10	29	13	46,5	40
GSP-R-32	112,5	60	38	Ø9 H7	32	G1/8	G1/8	95,6	12,5	34	16	54	40
GSP-R-40	126	70	48	Ø12 H7	40	G1/8	G1/8	108	15	39	20	60	54

Type	L	M	N	O	P	Q	R	S	T	T1	U	V	W1	W2
GSP-R-10	0	M3	20	66	6	12,5	36,5	1,6	6,6	5	8	8	0°	90°
GSP-R-16	0	M3	28	74	10	12,5	42	1,6	6,6	5	7	7	0°	90°
GSP-R-25	0	M5	40	99	16	12,5	53	1,6	9,6	5	8	8	0°	90°
GSP-R-32	20	M6	40	118,5	20	16	64	2,1	11,1	6	19	19	0°	90°
GSP-R-40	20	M8	54	133,5	25	17	71	2,1	14,1	6	24	24	0°	90°

Gripper standard

Series GSP-Z
3-finger, centric gripper

Rexroth
Bosch Group

★

Technical Data

Type		3-fingers, centric gripper
Operating pressure range, double-acting		2 – 8 bar (29 – 116 psi)
Repeatability*		± 0,02 mm
Lubrication		endurance lubrication
Ambient temperature range		+5 °C to +60 °C (+41 °F to +140 °F)
Medium		Compressed air, lubricated or non-lubricated
Materials	Body	Aluminum, hard anodized
	Function parts	Steel, hardened
	Sealing	NBR + PU (NBR + Polyurethane)

* After 100 consecutive strokes worst case.
Centering elements included in scope of delivery

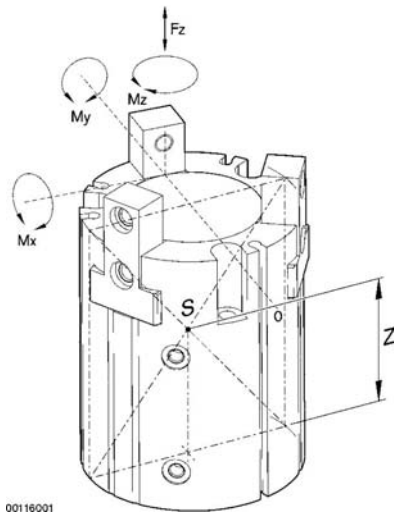
Performance and code no.

Symbol	Type	eff. Gripping force min (6 bar)(87 psi) [N] (lbf)		Stroke/finger [mm]	Weight [kg] (lbs)	Part no.
		O.D. gripping	I.D. gripping			
	GSP-Z-16	40 (9.0)	48 (10.8)	3	0,09 (0.198)	**R412000429**
	GSP-Z-32	150 (33.7)	180 (40.5)	4	0,33 (0.728)	**R412000432**
	GSP-Z-50	350 (78.7)	440 (98.9)	7	0,97 (2.138)	**R412000435**

Type	Mass moment of inertia* [kgcm²](lb.in²)	rec. workpiece weight [kg](lbs)	max. perm. Finger length** [mm]	Closing time (6 bar)(87 psi) [s]	Opening time (6 bar)(87 psi) [s]
GSP-Z-16	0,11 (0.038)	0,60 (1.3)	30	0,02	0,02
GSP-Z-32	0,97 (0.331)	2,25 (5.0)	60	0,02	0,02
GSP-Z-50	6,29 (2.149)	5,70 (12.6)	80	0,05	0,05

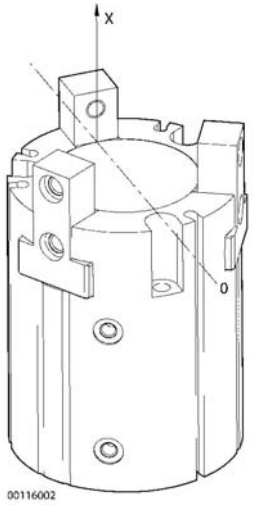
* referring to center line of gripper
** measured from top edge of housing

Max. permissible forces and torques on gripper



Type	FZ [N](lbf)	MX [Nm](in.lbs)	MY [Nm](in.lbs)	MZ [Nm](in.lbs)	Z [mm]
GSP-Z-16	100 (22.5)	1,8 (15.9)	0,5 (4.4)	1,4 (12.4)	29,9
GSP-Z-32	120 (27.0)	4,5 (39.8)	1,2 (10.6)	2,0 (17.7)	38,8
GSP-Z-50	160 (36.0)	11 (97.4)	2,7 (23.9)	3,0 (26.6)	56,2

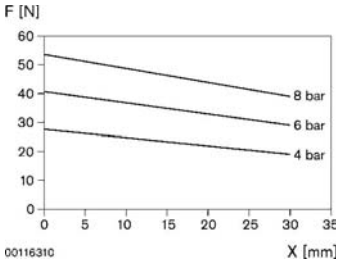
Permissible gripping range



X = clamping height

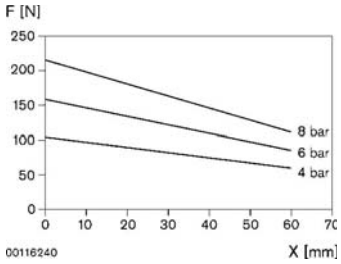
GSP-Z-16

gripping force



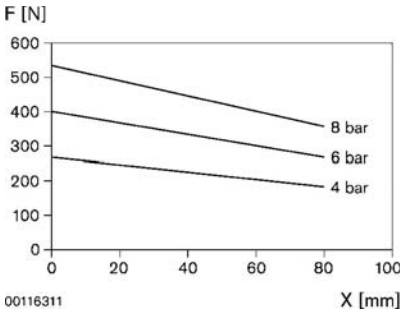
GSP-Z-32

gripping force



GSP-Z-50

gripping force

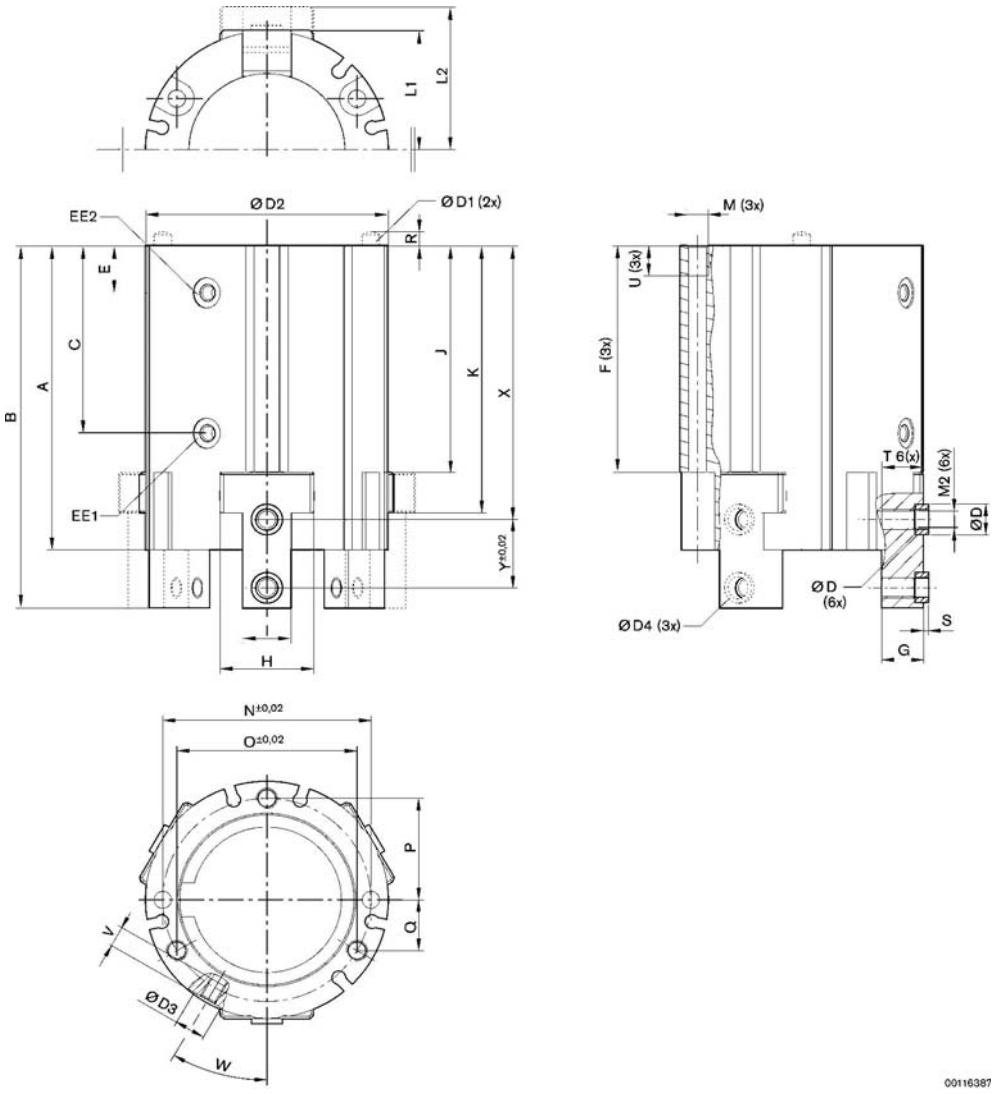


Gripper standard

Series GSP-Z
3-finger, centric gripper

Rexroth
Bosch Group

GSP-Z-16/-32/-50



L1 = Gripper open
L2 = Gripper closed

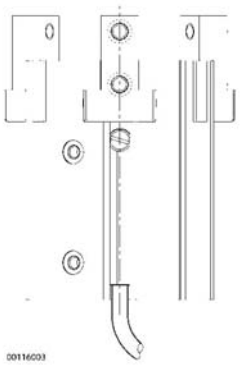
EE1 = Close gripper air connection
EE2 = Open gripper air connection

Type	A	B	C	D	D1	D2	D3	D4	E	EE1	EE2	F	G	H	I	J
GSP-Z-16	52	57	30,5	Ø5 f7	Ø3 m6	Ø30	Ø9	Ø6	6,5	M5	M5	39,5	6	10	6	40
GSP-Z-32	65	75,5	40	Ø7 f7	Ø4 m6	Ø48	Ø9	Ø8	10	M5	M5	49	8,5	17	10	49,5
GSP-Z-50	90	107	55,5	Ø9 f7	Ø5 m6	Ø70	Ø9	Ø10	14	M5	M5	67	12	27	14	67

Type	K	L1	L2	M	M2	N	O	P	Q	R	S	T	U	V	W	X	Y
GSP-Z-16	45	15	18	M4	M3	25	19,9	11,5	5,75	3	1,6	6	6,5	4,2	30°	47,5	6
GSP-Z-32	58,5	24	28	M5	M5	40	34,6	20	10	5	1,6	8,5	7,5	4,5	30°	59	12
GSP-Z-50	79	35	42	M6	M6	60	52	30	15	4	2,1	12	9	6	30°	81	20

Cylinder switches

GSP-Z-16...-50



Use ST4 Sensors located in Sensors/Electrical Accessories (last section in catalog).

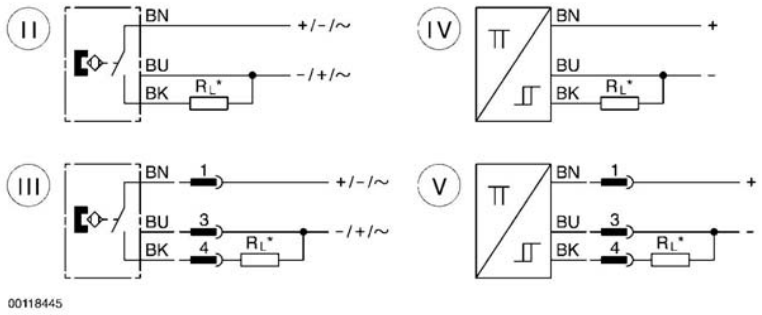
★ Locating ring

★ Accessories

Symbol	Ø D [mm]	LE*	Part no.
	5	6	**R412000669**
	7	6	**R412000668**
	9	6	**R412000670**
	12	6	**R412000671**
	5 – 7	6	**R412004030**
	5 – 9	6	**R412004032**
	7 – 9	6	**R412004033**
	9 – 12	6	**R412004034**

LE* = Delivery unit

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (– 13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

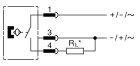
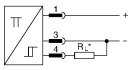
General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

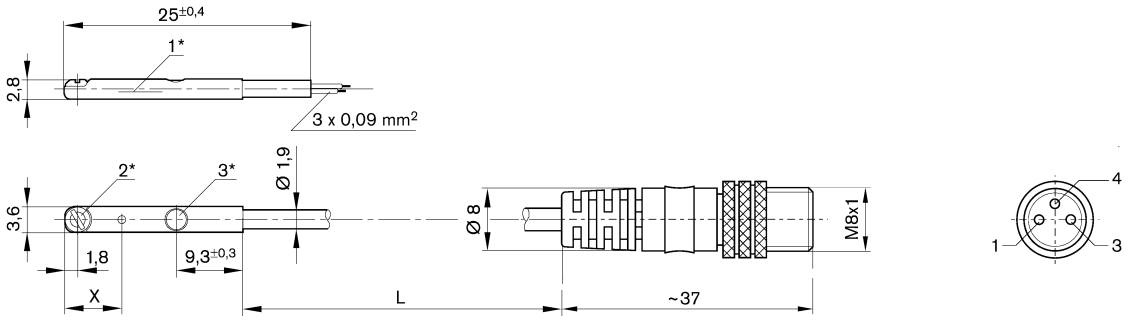
00118444_c

Ambient temperature min. / max.	-25 °C / +75 °C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	-	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions



00123231_c

1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

☐ **Products**

☐ ★ **Combination:**
RCM rotary module
with GSP standard gripper

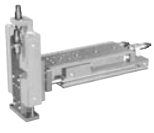
See page 5.115

☐ ★ **Combination:**
GPC-E guide unit
with GSP standard gripper

See page 5.125

☐ ★ **Combination:**
MSC mini slide
with ZSC mini slide

See page 5.130



☐ ★ **Combination:**
GPC-ST guide unit
with MSC mini slide

See page 5.138

☐ ★ **Combination:**
GSU slide unit
with ZSC mini slide

See page 5.142

☐ ★ **Combination:**
MSC mini slide
with GSP standard gripper

See page 5.119

☐ ★ **Combination:**
MSC mini slide
with RCM rotary module

See page 5.127

☐ ★ **Combination:**
MSC mini slide
with GPC-E guide unit

See page 5.134

☐ ★ **Combination:**
GPC-ST guide unit
with GPC-E guide unit

See page 5.139

☐ ★ **Combination:**
GSU slide unit
with GPC-E guide unit

See page 5.144

☐ ★ **Combination:**
MSC mini slide
with MSC mini slide

See page 5.128

☐ ★ **Combination:**
GPC-E guide unit
with GPC-E guide unit

See page 5.137

☐ ★ **Combination:**
GSU slide unit
with MSC mini slide

See page 5.141

☐ ★ **Combination:**
RMC-HE RexMover
with MSC mini slide

See page 5.146

Products

★ Combination:
RMC-HE RexMover with GPC-E guide unit

See page 5.147

★ Combination:
CKK/CKR Compact module with MSC mini slide

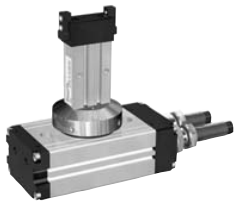
See page 5.149

★

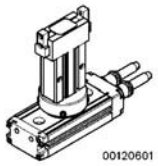
Technical Data

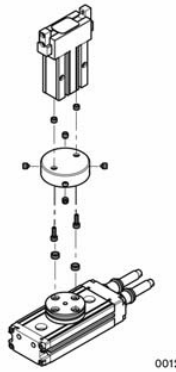
Materials for "connection kit"

Connecting plate	Aluminium, anodized
Screws (ISO 4762)	Steel, galvanized
Centering sleeves	Steel, stainless
Threaded pins (DIN 914)	Steel, blackened

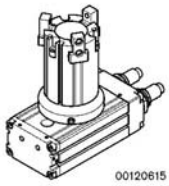


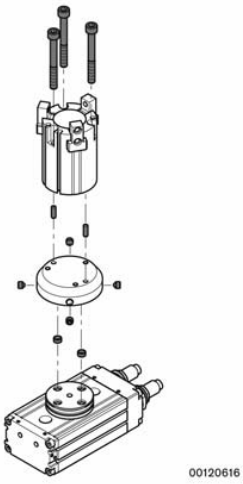
Flange mounting: GSP-A / -P / -R





Flange mounting: GSP-Z



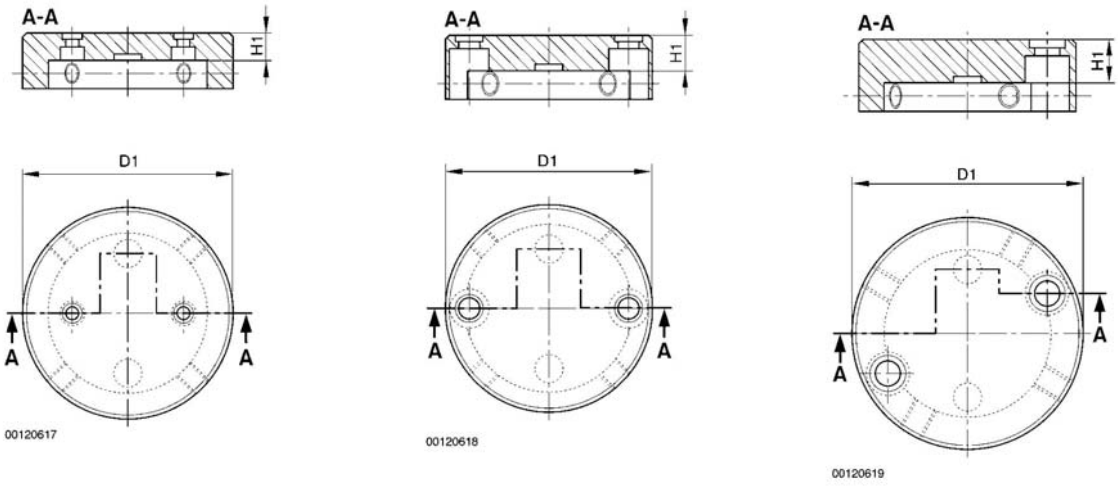


Part no.: Flange mounting

Type	RCM-06	RCM-08	RCM-12	RCM-16	RCM-20	RCM-25
GSP-A-10		CK1-RO-82 **R412000196**	CK1-RO-83 **R412000197**			
GSP-A-16			CK1-RO-84 **R412000198**	CK1-RO-85 **R412000199**		
GSP-A-25				CK1-RO-104 **R412004055**	CK1-RO-88 **R412000202**	
GSP-A-32					CK1-RO-90 **R412000204**	CK1-RO-91 **R412000206**
GSP-P-08	CK1-RO-80 **R412000192**	CK1-RO-81 **R412000195**				
GSP-P-10		CK1-RO-82 **R412000196**	CK1-RO-83 **R412000197**			
GSP-P-16			CK1-RO-84 **R412000198**	CK1-RO-85 **R412000199**		
GSP-P-20				CK1-RO-86 **R412000200**	CK1-RO-87 **R412000201**	
GSP-P-25					CK1-RO-88 **R412000202**	CK1-RO-89 **R412000203**
GSP-R-10		CK1-RO-82 **R412000196**	CK1-RO-83 **R412000197**			
GSP-R-16			CK1-RO-84 **R412000198**	CK1-RO-85 **R412000199**		
GSP-R-25				CK1-RO-104 **R412004055**	CK1-RO-88 **R412000202**	
GSP-R-32					CK1-RO-90 **R412000204**	CK1-RO-91 **R412000206**
GSP-Z-16				CK1-RO-96 **R412000212**	CK1-RO-97 **R412000213**	
GSP-Z-32					CK1-RO-98 **R412000214**	CK1-RO-99 **R412000215**
GSP-Z-50						CK1-RO-100 **R412000216**

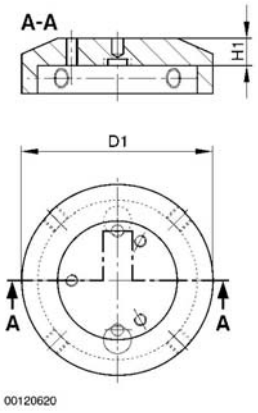
Dimensioned drawing

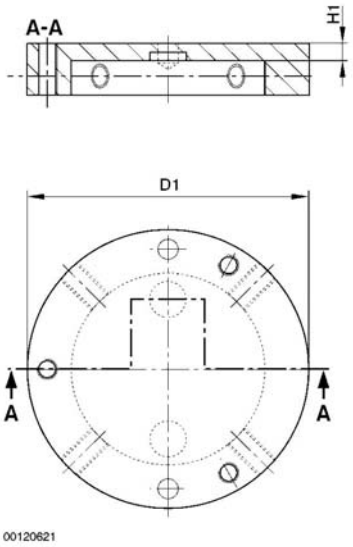
CK1-RO-80 / ... / -87	CK1-RO-88 / -89 / -104	CK1-RO-90 / -91



Dimensioned drawing

CK1-RO-96 / ... / - 99	CK1-RO-100





Type	D1	H1
CK1-RO-80 CK1-RO-81 CK1-RO-82	31 35 35	6,9 6,9 6,9
CK1-RO-83 CK1-RO-84 CK1-RO-85	43 43 50	6,9 6,9 6,9
CK1-RO-86 CK1-RO-87 CK1-RO-88	50 52 52	8,9 8,9 8,9
CK1-RO-89 CK1-RO-90 CK1-RO-91	58 58 68	8,9 10,9 11,9
CK1-RO-96 CK1-RO-97 CK1-RO-98	48 52 58	6,9 6,9 8,9
CK1-RO-99 CK1-RO-100 CK1-RO-104	68 70 53	9,3 4,3 8,9

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Threaded pins
CK1-RO-80	1 x	2 x M3 x 10	4 x Ø 5	4 x M4x4
CK1-RO-81	1 x	2 x M3 x 10	4 x Ø 5	4 x M4x5
CK1-RO-82	1 x	2 x M3 x 10	4 x Ø 5	4 x M4x5
CK1-RO-83	1 x	2 x M3 x 10	2 x Ø 5; 2 x Ø 7	4 x M5x6
CK1-RO-84	1 x	2 x M3x10	2 x Ø 5; 2 x Ø 7	4 x M5x6
CK1-RO-85	1 x	2 x M3 x 10	2 x Ø 5; 2 x Ø 7	4 x M5 x 6
CK1-RO-86	1 x	2 x M4x12	4 x Ø 7	4 x M5 x 6
CK1-RO-87	1 x	2 x M4x12	4 x Ø 7	4 x M6 x 6
CK1-RO-88	1 x	2 x M5 x 12	4 x Ø 7	4 x M6 x 6
CK1-RO-89	1 x	2 x M5 x 12	2 x Ø 7; 2 x Ø 9	4 x M6 x 6
CK1-RO-90	1 x	2 x M6 x 16	2 x Ø 7; 2 x Ø 9	4 x M6 x 6
CK1-RO-91	1 x	2 x M6 x 16	4 x Ø 9	4 x M6 x 10
CK1-RO-96	1 x	3 x M3 x 45	2 x Ø 7	4 x M5 x 6
CK1-RO-97	1 x	3 x M3 x 45	2 x Ø 7	4 x M6 x 6
CK1-RO-98	1 x	3 x M4 x 55	2 x Ø 7	4 x M6 x 6
CK1-RO-99	1 x	3 x M4 x 55	2 x Ø 9	4 x M6 x 6
CK1-RO-100	1 x	3 x M6 x 75	2 x Ø 9	4 x M6 x 6
CK1-RO-104	1 x	2 x M5 x 12	4 x Ø 7	4 x M5 x 6

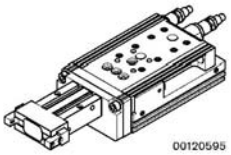
★

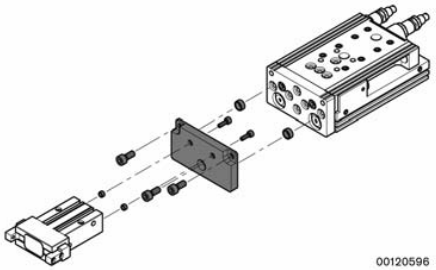
449 Technical Data

Materials for "connecting kit"

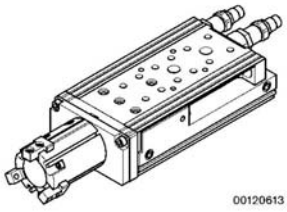
Connecting plate	Aluminium, anodized
Screws (ISO 4762; DIN 6912; DIN 7984)	Steel, galvanized
Centering sleeves	Steel, stainless
Centering pins (ISO 2338)	Steel, hardened

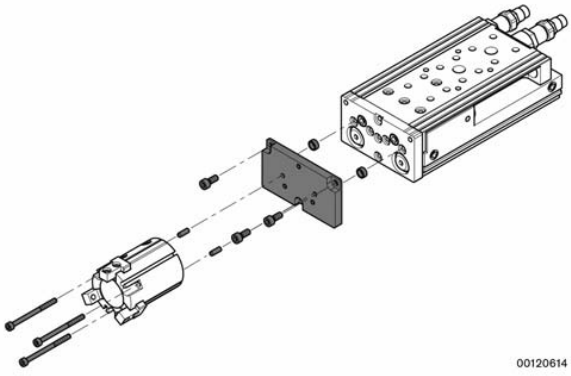
Front mounting: GSP-A / -P / -R





Front mounting: GSP-Z



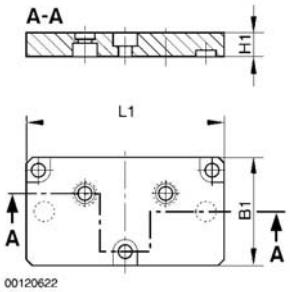


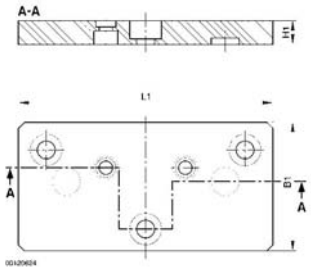
Part no.: Front mounting

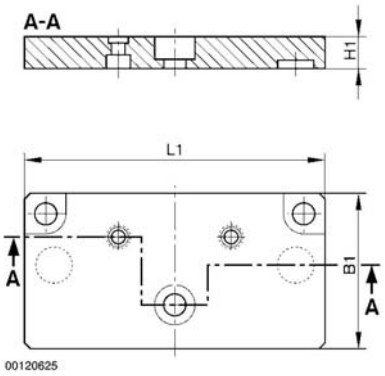
Typ	MSC-08	MSC-12	MSC-16	MSC-20	MSC-25
GSP-A-10	CK1-LI-56 **R412000735**	CK1-LI-57 **R412000759**	CK1-LI-58 **R412000737**		
GSP-A-16		CK1-LI-59 **R412000738**	CK1-LI-60 **R412000739**	CK1-LI-61 **R412000740**	
GSP-A-25			CK1-LI-68 **R412000747**	CK1-LI-65 **R412000744**	CK1-LI-66 **R412000745**
GSP-A-32				CK1-LI-69 **R412000748**	CK1-LI-70 **R412000749**
GSP-P-08	CK1-LI-55 **R412000734**				
GSP-P-10	CK1-LI-56 **R412000735**	CK1-LI-57 **R412000759**	CK1-LI-58 **R412000737**		
GSP-P-16		CK1-LI-59 **R412000738**	CK1-LI-60 **R412000739**	CK1-LI-61 **R412000740**	
GSP-P-20			CK1-LI-62 **R412000760**	CK1-LI-63 **R412000742**	CK1-LI-64 **R412000743**
GSP-P-25				CK1-LI-65 **R412000744**	CK1-LI-66 **R412000745**
GSP-R-10	CK1-LI-56 **R412000735**	CK1-LI-57 **R412000759**	CK1-LI-58 **R412000737**		
GSP-R-16		CK1-LI-59 **R412000738**	CK1-LI-60 **R412000739**	CK1-LI-61 **R412000740**	
GSP-R-25			CK1-LI-68 **R412000747**	CK1-LI-65 **R412000744**	CK1-LI-66 **R412000745**
GSP-R-32				CK1-LI-69 **R412000748**	CK1-LI-70 **R412000749**
GSP-Z-16		CK1-LI-71 **R412000750**	CK1-LI-72 **R412000751**	CK1-LI-73 **R412000752**	
GSP-Z-32				CK1-LI-74 **R412000753**	CK1-LI-75 **R412000754**
GSP-Z-50					CK1-LI-76 **R412000755**

Dimensioned drawing

CK1-LI-55 / -56 / -61 / -63 / -65 / -69	CK1-LI-57 / -58 / -59	CK1-LI-60 / -62 / -68

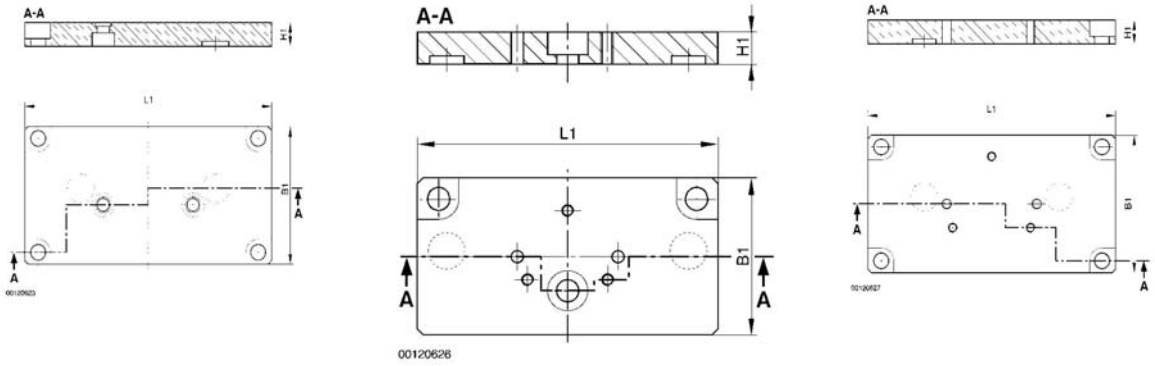






Dimensioned drawing

CK1-LI-64 / -66 / -70	CK1-LI-71 / ... / -74	CK1-LI-75 / -76



Type	B1	H1	L1
CK1-LI-55	27	6	49
CK1-LI-56	27	6	49
CK1-LI-57	32,5	6	64
CK1-LI-58	39	8	74,6
CK1-LI-59	32,5	6	64
CK1-LI-60	39	8	74,6
CK1-LI-61	49	8	91
CK1-LI-62	39	8	74,6
CK1-LI-63	49	8	91
CK1-LI-64	58	10	110
CK1-LI-65	49	8	91
CK1-LI-66	58	10	110
CK1-LI-68	39	8	74,6
CK1-LI-69	49	10	91
CK1-LI-70	58	12	110
CK1-LI-71	32,5	6	64
CK1-LI-72	39	8	74,6
CK1-LI-73	49	8	91
CK1-LI-74	49	8	91
CK1-LI-75	58	10	110
CK1-LI-76	78	12	110

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins
CK1-LI-55	1 x	5 x M3 x 8	4 x Ø 5	–
CK1-LI-56	1 x	5 x M3 x 8	4 x Ø 5	–
CK1-LI-57	1 x	3 x M4 x 8; 2 x M3 x 8	2 x Ø 5; 2 x Ø 7	–
CK1-LI-58	1 x	2 x M3 x 10; 3 x M5 x 12	2 x Ø 5; 2 x Ø 9	–
CK1-LI-59	1 x	2 x M3 x 8; 3 x M4 x 8	2 x Ø 5; 2 x Ø 7	–
CK1-LI-60	1 x	2 x M3 x 10; 3 x M5 x 12	2 x Ø 5; 2 x Ø 9	–
CK1-LI-61	1 x	2 x M3 x 10; 3 x M5 x 12	2 x Ø 5; 2 x Ø 9	–
CK1-LI-62	1 x	2 x M4 x 10; 3 x M5 x 12	2 x Ø 7; 2 x Ø 9	–
CK1-LI-63	1 x	2 x M4 x 10; 3 x M5 x 12	2 x Ø 7; 2 x Ø 9	–
CK1-LI-64	1 x	2 x M4 x 12; 4 x M6 x 12	2 x Ø 7; 2 x Ø 12	–
CK1-LI-65	1 x	5 x M5 x 12	2 x Ø 7; 2 x Ø 9	–
CK1-LI-66	1 x	2 x M5 x 12; 4 x M6 x 12	2 x Ø 7; 2 x Ø 12	–
CK1-LI-68	1 x	2 x M5 x 12*; 3 x M5 x 12	2 x Ø 7; 2 x Ø 9	–
CK1-LI-69	1 x	2 x M6 x 16; 3 x M5 x 16	4 x Ø 9	–
CK1-LI-70	1 x	2 x M6 x 16**; 4 x M6 x 16	2 x Ø 9; 2 x Ø 12	–
CK1-LI-71	1 x	3 x M3 x 45; 4 x M4 x 8	2 x Ø 7	2 x 3 m6 x 8
CK1-LI-72	1 x	3 x M3 x 45; 3 x M5 x 12	2 x Ø 9	2 x 3 m6 x 8
CK1-LI-73	1 x	3 x M3 x 45; 3 x M5 x 12	2 x Ø 9	2 x 3 m6 x 8
CK1-LI-74	1 x	3 x M4 x 55; 3 x M5 x 12	2 x Ø 9	2 x 4 m6 x 12
CK1-LI-75	1 x	3 x M4 x 55; 4 x M6 x 12	2 x Ø 12	2 x 4 m6 x 12
CK1-LI-76	1 x	3 x M5 x 75; 4 x M6 x 16	2 x Ø 12	2 x 5 m6 x 12

* DIN 7984
** DIN 6912

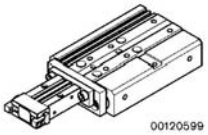
★

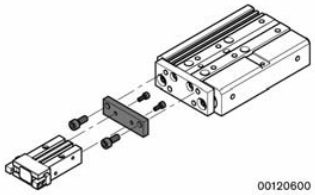
Technical Data

Materials for "connection kit"

Connecting plate	Aluminium, anodized
Screws (ISO 4762)	Steel, galvanized

Front mounting: GSP-A / -P / -R



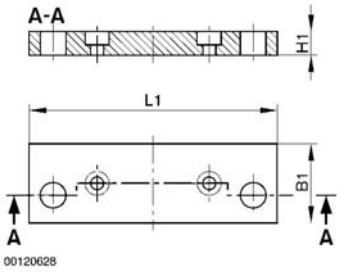


Part no.: Front mounting

Type	ZSC-10	ZSC-16	ZSC-20	ZSC-25
GSP-A-10		CK1-LI-101 **R412000785**		
GSP-A-16			CK1-LI-102 **R412000786**	
GSP-P-08	CK1-LI-106 **R412004678**			
GSP-P-10		CK1-LI-101 **R412000785**		
GSP-P-16			CK1-LI-102 **R412000786**	
GSP-P-20				CK1-LI-103 **R412000787**
GSP-R-10		CK1-LI-101 **R412000785**		
GSP-R-16			CK1-LI-102 **R412000786**	

Dimensioned drawing

CK1-LI-101 / -102 / -103 / -106



Type	B1	H1	L1
CK1-LI-101	16	6	50
CK1-LI-102	20	6	62
CK1-LI-103	24	8	80
CK1-LI-106	*	*	*

* on request

Scope of delivery

Type	Connecting plate	Screws
CK1-LI-101	1 x	2 x M3 x 8; 2 x M5 x 14
CK1-LI-102	1 x	2 x M3 x 8; 2 x M6 x 16
CK1-LI-103	1 x	2 x M4 x 12; 2 x M8 x 20
CK1-LI-106	1 x	*

* on request

Easy-2-Combine System

Combination: GPC-E guide unit with GSP standard gripper

Rexroth
Bosch Group

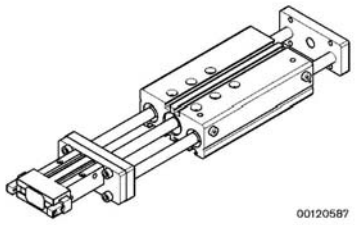
★

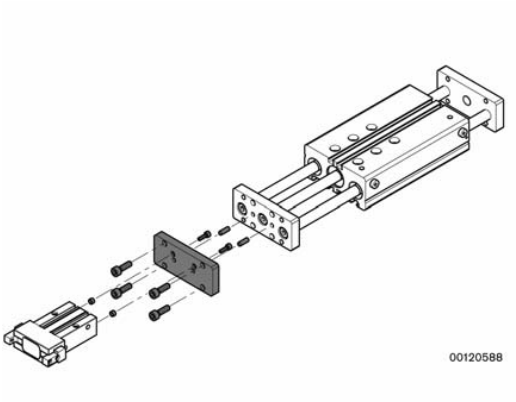
Technical Data

Materials for "connection kit"

Connecting plate	Aluminium, anodized
Screws (ISO 4762)	Steel, galvanized
Centering sleeves	Steel, stainless
Centering pins (ISO 2338)	Steel, hardened

Front mounting: GSP-A / -P / -R



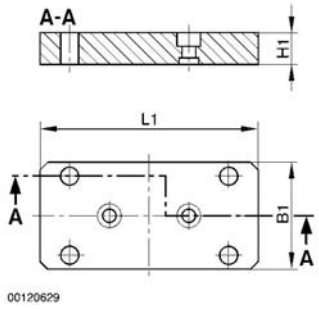


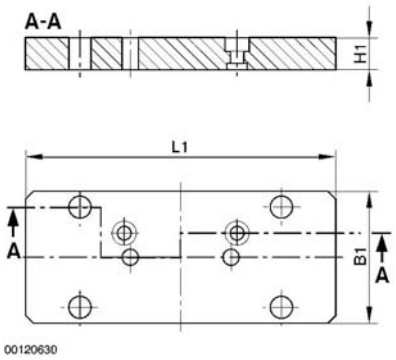
Part no.: Front mounting

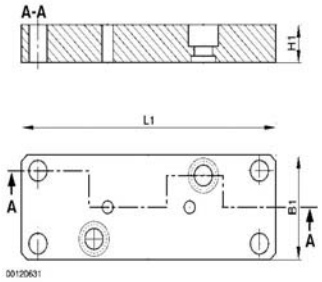
Type	GPC-E-12	GPC-E-16	GPC-E-20	GPC-E-25	GPC-E-32
GSP-A-10	CK1-LI-27 **R412000762**	CK1-LI-28 **R412000763**			
GSP-A-16		CK1-LI-29 **R412000770**	CK1-LI-30 **R412000765**		
GSP-A-25				CK1-LI-33 **R412000768**	CK1-LI-34 **R412000769**
GSP-A-32				CK1-LI-36 **R412000771**	CK1-LI-37 **R412000772**
GSP-P-08	CK1-LI-26 **R412000761**				
GSP-P-10	CK1-LI-27 **R412000762**	CK1-LI-28 **R412000763**			
GSP-P-16		CK1-LI-29 **R412000770**	CK1-LI-30 **R412000765**		
GSP-P-20				CK1-LI-31 **R412000766**	CK1-LI-32 **R412000767**
GSP-P-25				CK1-LI-33 **R412000768**	CK1-LI-34 **R412000769**
GSP-R-10	CK1-LI-27 **R412000762**	CK1-LI-28 **R412000763**			
GSP-R-16		CK1-LI-29 **R412000770**	CK1-LI-30 **R412000765**		
GSP-R-25				CK1-LI-33 **R412000768**	CK1-LI-34 **R412000769**
GSP-R-32				CK1-LI-36 **R412000771**	CK1-LI-37 **R412000772**

Dimensioned drawing

CK1-LI-26 / -27	CK1-LI-28 / ... / -34	CK1-LI-36 / -37







Type	B1	H1	L1
CK1-LI-26	27	8	55
CK1-LI-27	27	8	55
CK1-LI-28	30	8	65
CK1-LI-29	30	8	65
CK1-LI-30	33	8	77
CK1-LI-31	33	10	93
CK1-LI-32	43	10	112
CK1-LI-33	33	10	93
CK1-LI-34	43	10	112
CK1-LI-36	33	12	93
CK1-LI-37	43	12	112

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins
CK1-LI-26	1 x	2 x M3 x 10; 4 x M4 x 16	2 x Ø 5	–
CK1-LI-27	1 x	2 x M3 x 10; 4 x M4 x 16	2 x Ø 5	–
CK1-LI-28	1 x	2 x M3 x 10; 4 x M4 x 16	2 x Ø 5	2 x 4 m6 x 12
CK1-LI-29	1 x	2 x M3 x 10; 2 x M4 x 16	2 x Ø 5	2 x 4 m6 x 12
CK1-LI-30	1 x	2 x M3 x 10; 4 x M5 x 16	2 x Ø 5	2 x 4 m6 x 12
CK1-LI-31	1 x	2 x M4 x 12; 4 x M6 x 20	2 x Ø 7	2 x 4 m6 x 12
CK1-LI-32	1 x	2 x M4 x 12; 4 x M8 x 20	2 x Ø 7	2 x 4 m6 x 12
CK1-LI-33	1 x	2 x M5 x 12; 4 x M6 x 20	2 x Ø 7	2 x 4 m6 x 12
CK1-LI-34	1 x	2 x M5 x 12; 4 x M8 x 20	2 x Ø 7	2 x 4 m6 x 12
CK1-LI-36	1 x	2 x M6 x 16; 4 x M6 x 20	2 x Ø 9	2 x 4 m6 x 12
CK1-LI-37	1 x	2 x M6 x 16; 4 x M8 x 25	2 x Ø 9	2 x 4 m6 x 12

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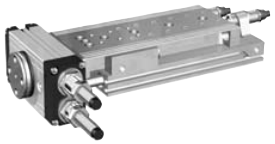
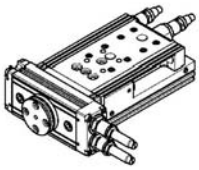
Technical Data

Material

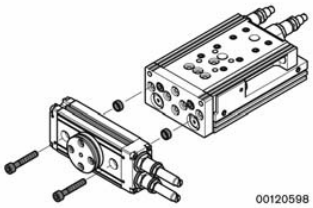
Screws (ISO 4762)	Steel, galvanized



Front mounting: transverse



00120597



00120598

Part no.: Front mounting

Type	MSC-08	MSC-12	MSC-16	MSC-20	MSC-25
RCM-06	2 x M3 x 20				
RCM-08		2 x M4 x 20			
RCM-12			2 x M5 x 30		
RCM-16			2 x M5 x 35	2 x M5 x 35	
RCM-20					2 x M6 x 40
RCM-25					2 x M6 x 45

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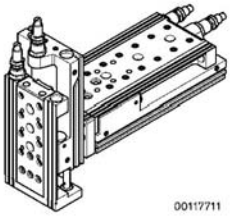
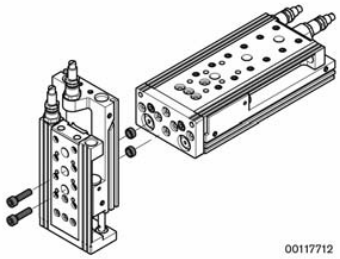
Technical Data

Material

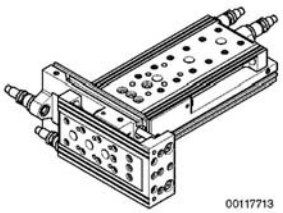
Screws (ISO 4762)	Steel, galvanized

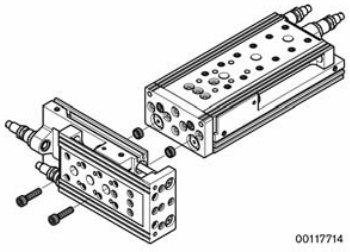
Front mounting: longitudinal





Front mounting: transverse

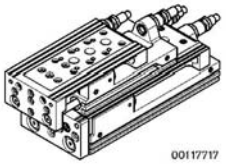


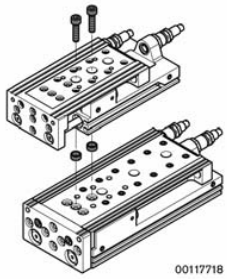


Part no.: Front mounting

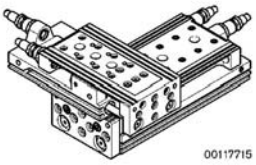
Type	MSC-12	MSC-16	MSC-20	MSC-25
MSC-08	2 x M4 x 18			
MSC-12		2 x M5 x 20		
MSC-16			2 x M5 x 30	
MSC-20				2 x M6 x 35

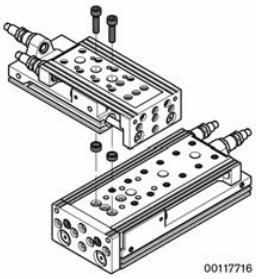
Slide mounting: longitudinal





Slide mounting: transverse





Part no.: Slide mounting

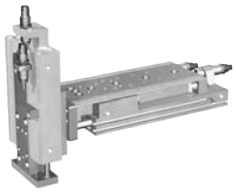
Type	MSC-12	MSC-16	MSC-20	MSC-25
MSC-08	2 x M4 x 16			
MSC-12		2 x M5 x 20		
MSC-16			2 x M5 x 30	
MSC-20				2 x M6 x 35

★

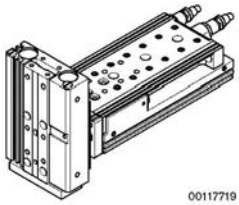
Technical Data

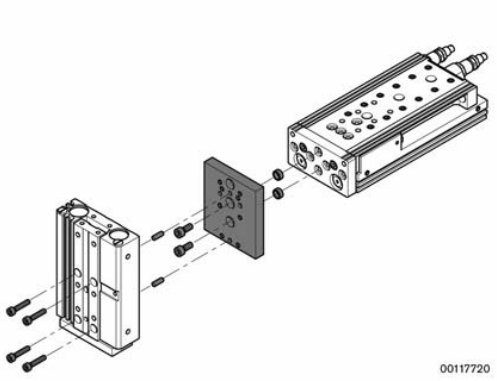
Materials for "connection kit"

Connecting plate		Aluminium, anodized
Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Centering pins (ISO 2338)		Steel, hardened
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

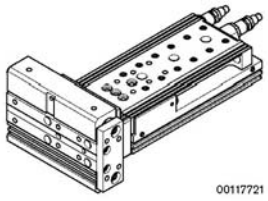


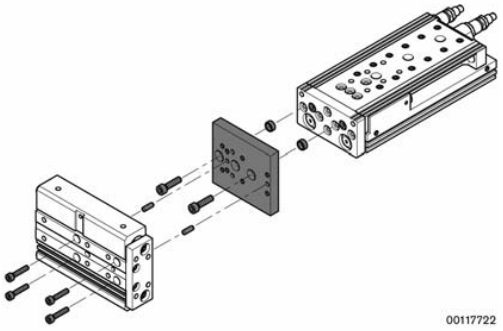
Front mounting: longitudinal



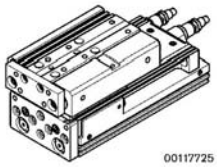


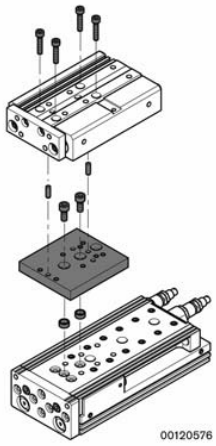
Front mounting: transverse



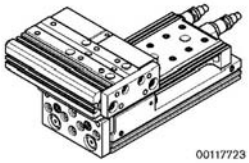


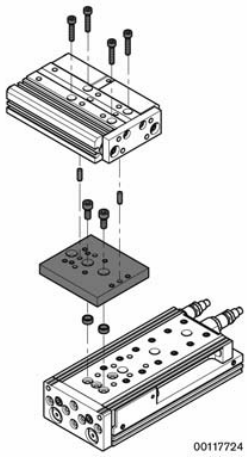
Slide mounting: longitudinal





Slide mounting: transverse



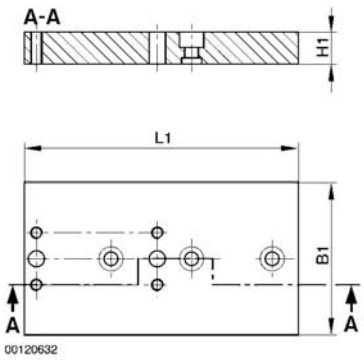


Part no.: Front and slide mounting

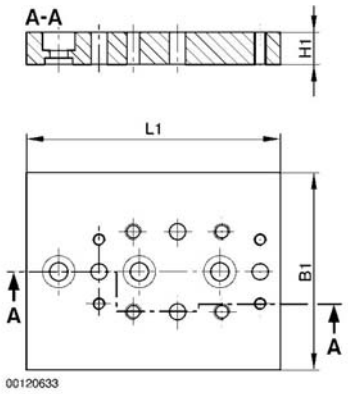
Type	MSC-08	MSC-12	MSC-16	MSC-20	MSC-25
ZSC-06	CK1-LI-12 **R412004641**				
ZSC-10		CK1-LI-13 **R412004665**			
ZSC-16			CK1-LI-14 **R412004661**	CK1-LI-14 **R412004661**	
ZSC-20					CK1-LI-15 **R412004662**
ZSC-25					CK1-LI-16 **R412004663**

Dimensioned drawing

CK1-LI-12

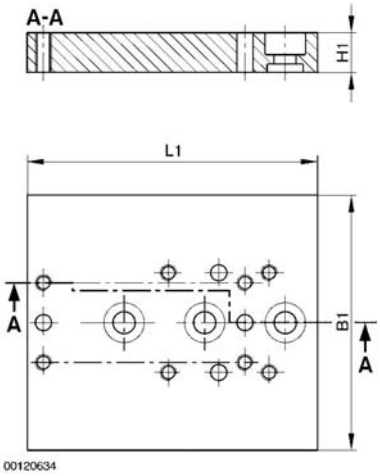


CK1-LI-13

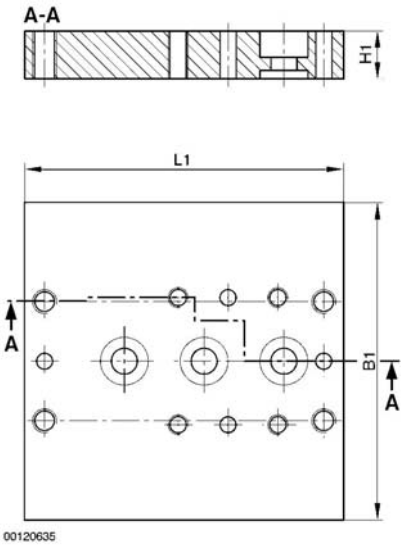


Dimensioned drawing

CK1-LI-14 / -15



CK1-LI-16



Type	B1	H1	L1
CK1-LI-12	38	8	68
CK1-LI-13	49	8	63
CK1-LI-14	64	10	72
CK1-LI-15	76	12	77,5
CK1-LI-16	80	12	80

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins	Sliding blocks
CK1-LI-12	1 x	2 x M3 x 10; 4 x M3 x 16	2 x Ø 5	2 x 4 m6 x 12	–
CK1-LI-13	1 x	4 x M3 x 16; 4 x M4 x 10; 4 x M4 x 30	2 x Ø 7; 2 x Ø 9-7	2 x 4 m6 x 12	2 x N6 / M4
CK1-LI-14	1 x	4 x M4 x 20; 4 x M4 x 35; 2 x M5 x 10; 2 x M5 x 12; 2 x M5 x 14	6 x Ø 9	2 x 4 m6 x 12	2 x N6 / M5
CK1-LI-15	1 x	4 x M5 x 20; 4 x M5 x 40; 2 x M6 x 14; 4 x M6 x 16	4 x Ø 12; 2 x Ø 12-9	2 x 4 m6 x 12	2 x N8 / M6
CK1-LI-16	1 x	4 x M5 x 45; 4 x M6 x 16; 2 x M6 x 14; 4 x M6 x 25	6 x Ø 12	2 x 4 m6 x 12	2 x N8 / M6

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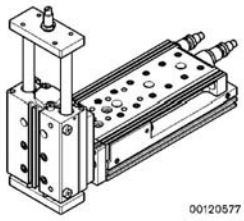
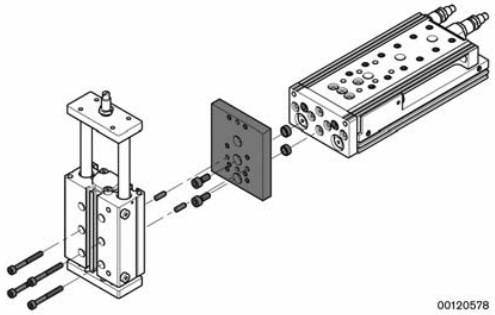
Technical Data

Materials for "connection kit"

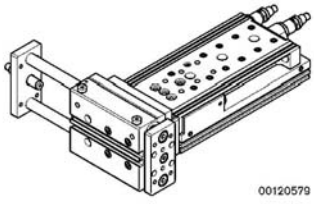
Connecting plate		Aluminium, anodized
Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Centering pins (ISO 2338)		Steel, hardened
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

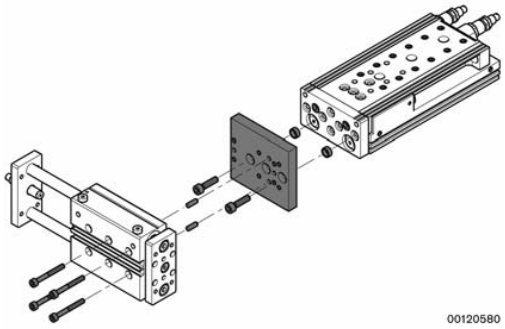
Front mounting: longitudinal



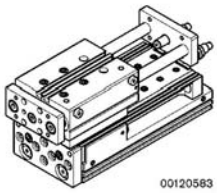


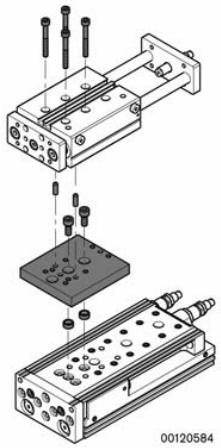
Front mounting: transverse



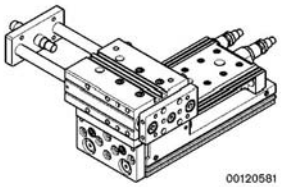


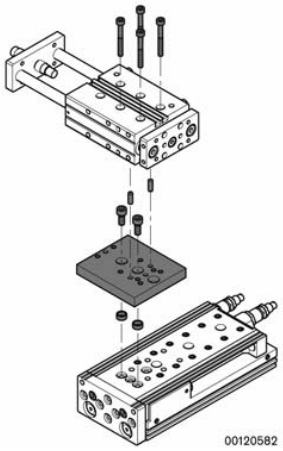
Slide mounting: longitudinal





Slide mounting: transverse



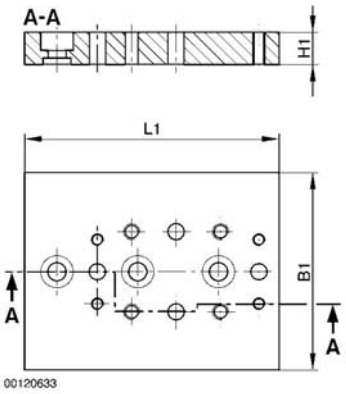


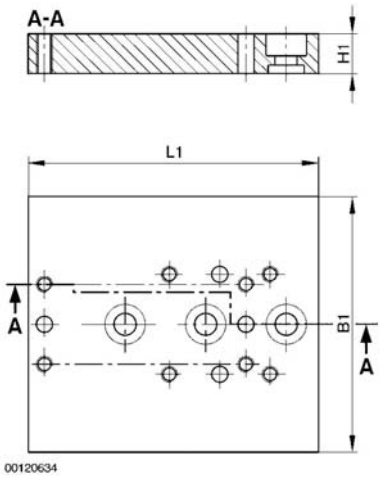
Part no.: Front and slide mounting

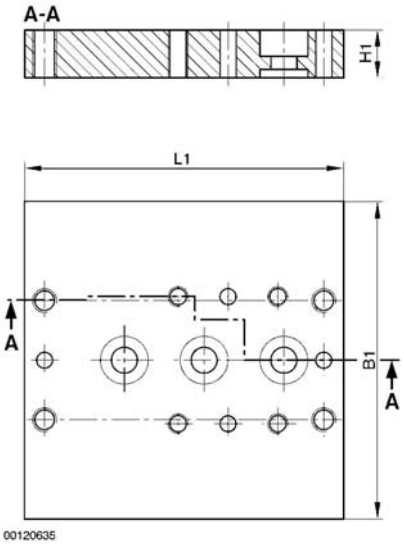
Type	MSC-12	MSC-16	MSC-20	MSC-25
GPC-E-12	CK1-LI-13 **R412004665**			
GPC-E-16		CK1-LI-14 **R412004661**	CK1-LI-14 **R412004661**	
GPC-E-20				CK1-LI-15 **R412004662**
GPC-E-25				CK1-LI-16 **R412004663**

Dimensioned drawing

CK1-LI-13	CK1-LI-14 / -15	CK1-LI-16







Type	B1	H1	L1
CK1-LI-13	49	8	63
CK1-LI-14	64	10	72
CK1-LI-15	76	12	77,5
CK1-LI-16	80	12	80

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins	Sliding blocks
CK1-LI-13	1 x	4 x M3 x 16; 4 x M4 x 10; 4 x M4 x 30	2 x Ø 7; 2 x Ø 9-7	2 x 4 m6 x 12	2 x N6 / M4
CK1-LI-14	1 x	4 x M4 x 20; 4 x M4 x 35; 2 x M5 x 10; 2 x M5 x 12; 2 x M5 x 14	6 x Ø 9	2 x 4 m6 x 12	2 x N6 / M5
CK1-LI-15	1 x	4 x M5 x 20; 4 x M5 x 40; 2 x M6 x 14; 4 x M6 x 16	4 x Ø 12; 2 x Ø 12-9	2 x 4 m6 x 12	2 x N8 / M6
CK1-LI-16	1 x	4 x M5 x 45; 4 x M6 x 16; 2 x M6 x 14; 4 x M6 x 25	6 x Ø 12	2 x 4 m6 x 12	2 x N8 / M6

Easy-2-Combine System

Combination: GPC-E guide unit with GPC-E guide unit

Rexroth
Bosch Group

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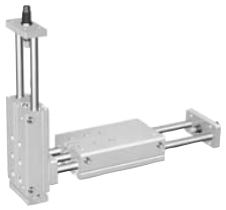
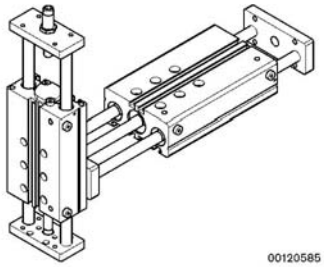
Technical Data

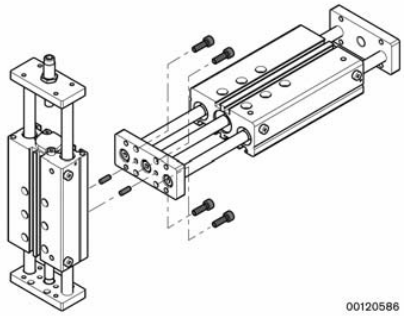
Material

Screws (ISO 4762)	Steel, galvanized



Front mounting: longitudinal





Part no.: Front mounting

Type	GPC-E-16	GPC-E-20	GPC-E-25	GPC-E-32
GPC-E-12	2 x M5 x 15			
GPC-E-16		2 x M5 x 18		
GPC-E-20			2 x M6 x 20	
GPC-E-25				2 x M6 x 20

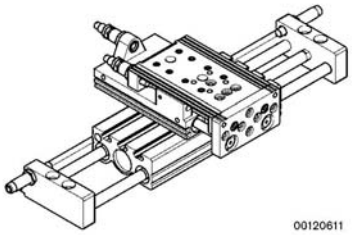
★

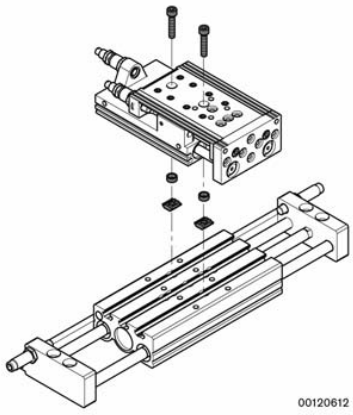
Technical Data

Materials for "connection kit"

Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Centering pins (ISO 2338)		Steel, hardened
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

Slide mounting: transverse





Part no.: Slide mounting

	Type	GPC-ST-12	GPC-ST-20
	MSC-08	CK2-LI-01 **R412004687**	
	MSC-12	CK2-LI-02 **R412004688**	CK2-LI-02 **R412004688**
	MSC-16		CK2-LI-03 **R412004689**

Scope of delivery

	Type	Screws	Centering sleeves	Sliding blocks
	CK2-LI-01	2 x M4 x 16	2 x Ø 9-7	2 x N6 / M4
	CK2-LI-02	2 x M5 x 20	2 x Ø 9	2 x N6 / M5
	CK2-LI-03	2 x M5 x 25	2 x Ø 9	2 x N6 / M5

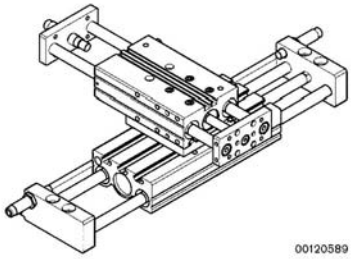
★

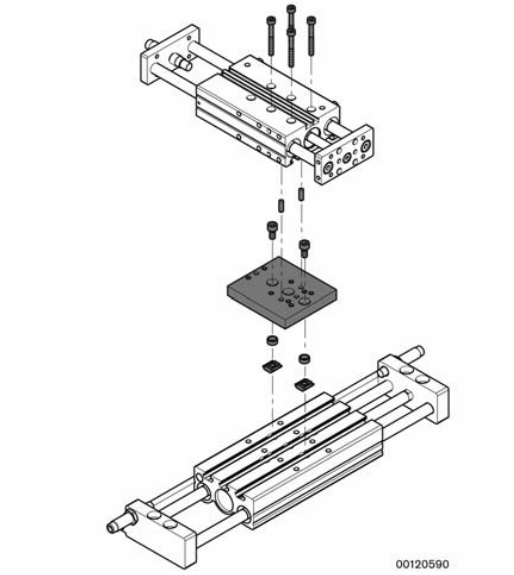
Technical Data

Materials for "connection kit"

Connecting plate		Aluminium, anodized
Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Centering pins (ISO 2338)		Steel, hardened
Sliding blocks	N6	Steel, stainless

Slide mounting: transverse



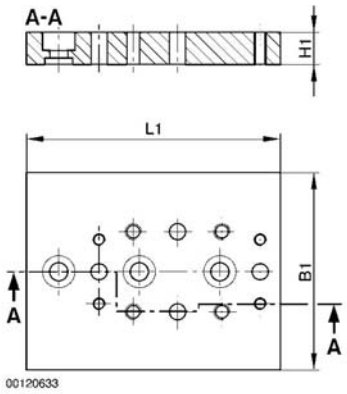


Part no.: Slide mounting

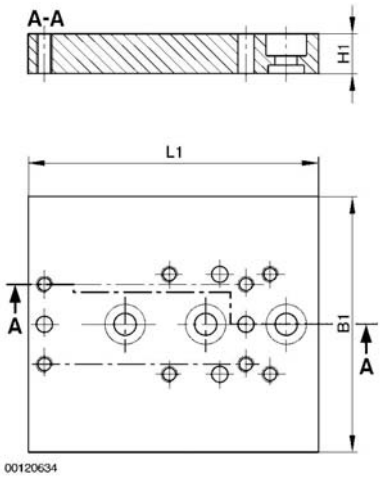
Type	GPC-ST-12	GPC-ST-20
GPC-E-12	CK1-LI-13 **R412004665**	CK1-LI-13 **R412004665**
GPC-E-16	CK1-LI-14 **R412004661**	CK1-LI-14 **R412004661**

Dimensioned drawing

CK1-LI-13



CK1-LI-14



Type	B1	H1	L1
CK1-LI-13	49	8	63
CK1-LI-14	64	10	72

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins	Sliding blocks
CK1-LI-13	1 x	4 x M3 x 16; 4 x M4 10; 4 x M4 x 30	2 x Ø 7; 2 x Ø 9	2 x 4 m6 x 12	2 x N6 / M4
CK1-LI-14	1 x	4 x M4 x 20; 4 x M4 x 35; 2 x M5 x 10; 2 x M5 x 12; 2 x M5 x 14	4 x Ø 9	2 x 4 m6 x 12	2 x N6 / M5

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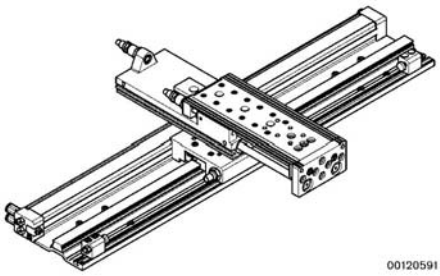
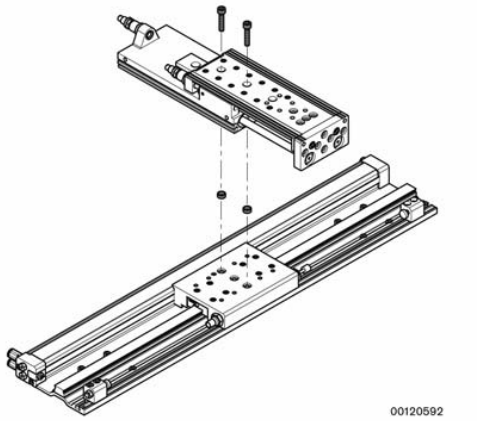
Technical Data

Material

Screws (ISO 4762)	Steel, galvanized

Slide mounting: transverse





Part no.: Slide mounting

	Type	GSU-16	GSU-25
	MSC-12	2 x M5 x 20	
	MSC-16	2 x M5 x 30	
	MSC-20		2 x M6 x 35
	MSC-25		2 x M6 x 40

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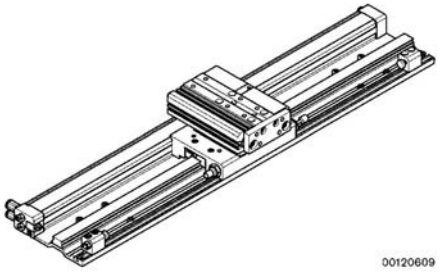
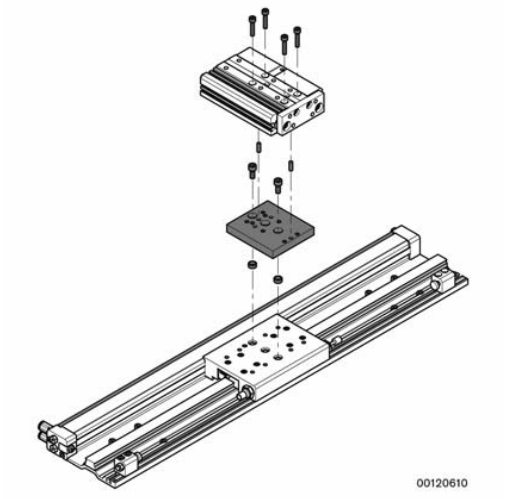
Technical Data

Materials for "connection kit"

Connecting plate		Aluminium, anodized
Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Centering pins (ISO 2338)		Steel, hardened
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

Slide mounting: transverse



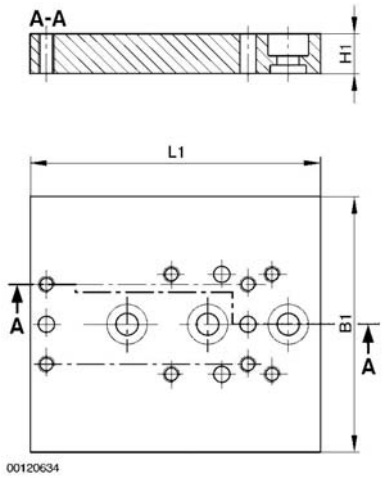


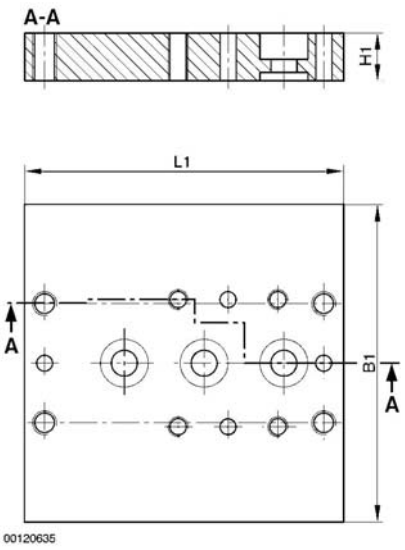
Part no.: Slide mounting

Type	GSU-16	GSU-25
ZSC-16	CK1-LI-14 **R412004661**	
ZSC-20		CK1-LI-15 **R412004662**
ZSC-25		CK1-LI-16 **R412004663**

Dimensioned drawing

CK1-LI-14 / -15	CK1-LI-16





Type	B1	H1	L1
CK1-LI-14	64	10	72
CK1-LI-15	76	12	77,5
CK1-LI-16	80	12	80

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins	Sliding blocks
CK1-LI-14	1 x	4 x M4 x 20; 4 x M4 x 35; 2 x M5 x 10; 2 x M5 x 12; 2 x M5 x 14	6 x Ø 9	2 x 4 m6 x 12	2 x N6 / M5
CK1-LI-15	1 x	4 x M5 x 20; 4 x M5 x 40; 2 x M6 x 14; 4 x M6 x 16	4 x Ø 12; 2 x Ø 12-9	2 x 4 m6 x 12	2 x N8 / M6
CK1-LI-16	1 x	4 x M5 x 45; 4 x M6 x 16; 2 x M6 x 14; 4 x M6 x 25	6 x Ø 12	2 x 4 m6 x 12	2 x N8 / M6

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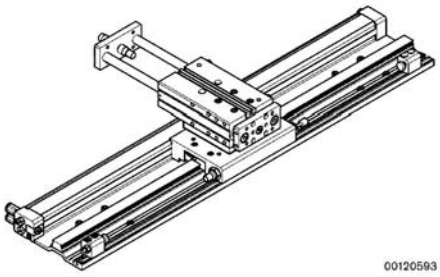
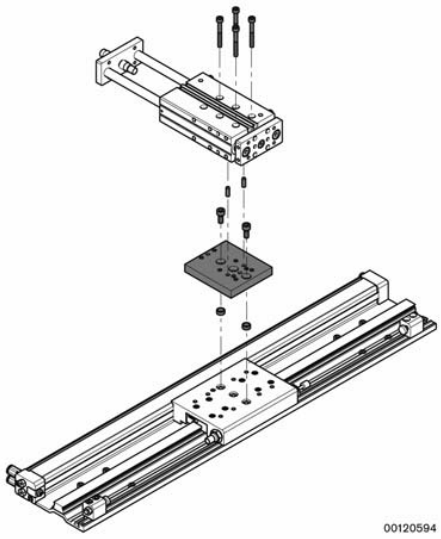
Technical Data

Materials for "connection kit"

Connecting plate		Aluminium, anodized
Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Centering pins (ISO 2338)		Steel, hardened
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

Slide mounting: transverse



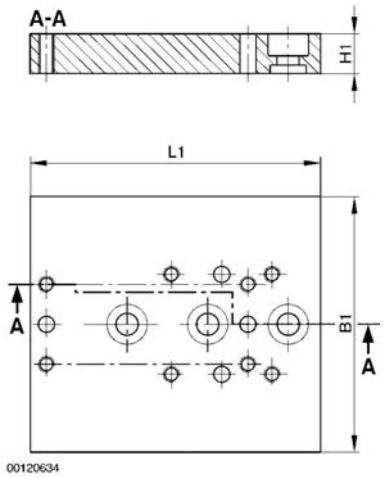


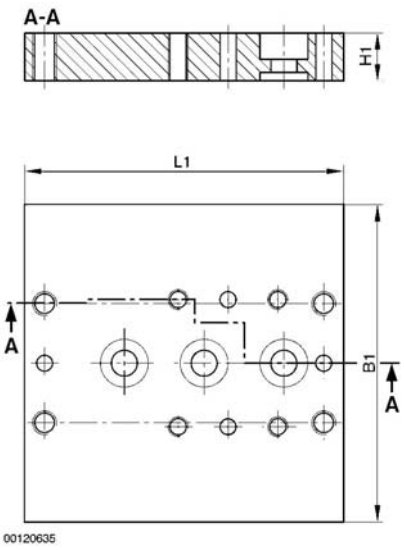
Part no.: Slide mounting

Type	GSU-16	GSU-25
GPC-E-16	CK1-LI-14 **R412004661**	
GPC-E-20		CK1-LI-15 **R412004662**
GPC-E-25		CK1-LI-16 **R412004663**

Dimensioned drawing

CK1-LI-14 / -15	CK1-LI-16





Type	B1	H1	L1
CK1-LI-14	64	10	72
CK1-LI-15	76	12	77,5
CK1-LI-16	80	12	80

Scope of delivery

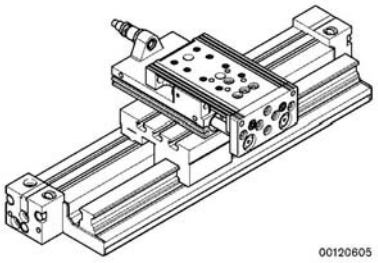
Type	Connecting plate	Screws	Centering sleeves	Centering pins	Sliding blocks
CK1-LI-14	1 x	4 x M4 x 20; 4 x M4 x 35; 2 x M5 x 10; 2 x M5 x 12; 2 x M5 x 14	6 x Ø 9	2 x 4 m6 x 12	2 x N6 / M5
CK1-LI-15	1 x	4 x M5 x 20; 4 x M5 x 40; 2 x M6 x 14; 4 x M6 x 16	4 x Ø 12; 2 x Ø 12-9	2 x 4 m6 x 12	2 x N8 / M6
CK1-LI-16	1 x	4 x M5 x 45; 4 x M6 x 16; 2 x M6 x 14; 4 x M6 x 25	6 x Ø 12	2 x 4 m6 x 12	2 x N8 / M6

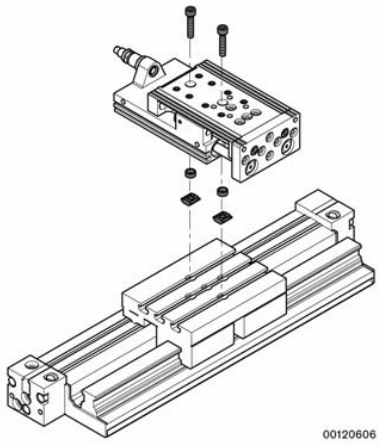
Technical Data

Materials for "connection kit"

Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

Slide mounting: transverse





Part no.: Slide mounting

Type	RMC-HE-16	RMC-HE-25	RMC-HE-32
MSC-08	CK2-LI-01 **R412004687**	CK2-LI-01 **R412004687**	
MSC-12	CK2-LI-02 **R412004688**	CK2-LI-02 **R412004688**	
MSC-16	CK2-LI-03 **R412004689**	CK2-LI-03 **R412004689**	
MSC-20			CK2-LI-04 **R412004690**
MSC-25			CK2-LI-05 **R412004691**

Scope of delivery

Type	Screws	Centering sleeves	Sliding blocks
CK2-LI-01	2 x M4 x 16	2 x Ø 9-7	2 x N6 / M4
CK2-LI-02	2 x M5 x 20	2 x Ø 9	2 x N6 / M5
CK2-LI-03	2 x M5 x 25	2 x Ø 9	2 x N6 / M5
CK2-LI-04	2 x M6 x 30	2 x Ø 12	2 x N8 / M6
CK2-LI-05	2 x M6 x 35	2 x Ø 12	2 x N8 / M6

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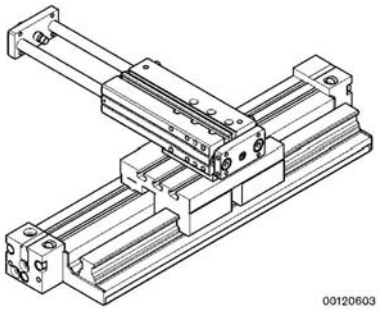
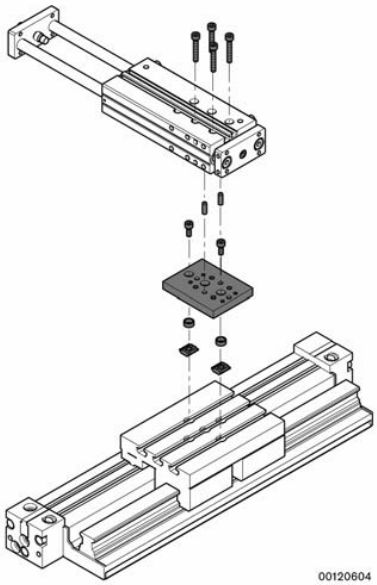
Technical Data

Materials for "connection kit"

Connecting plate		Aluminium, anodized
Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

Slide mounting: transverse



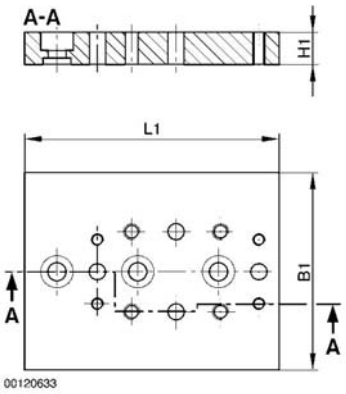


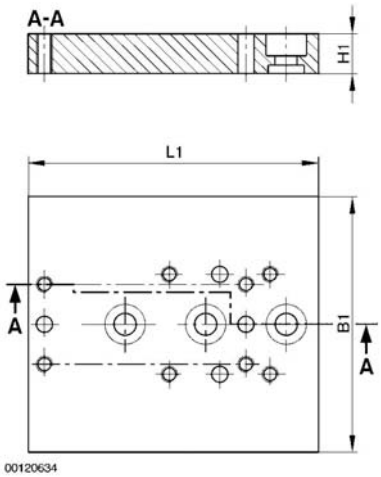
Part no.: Slide mounting

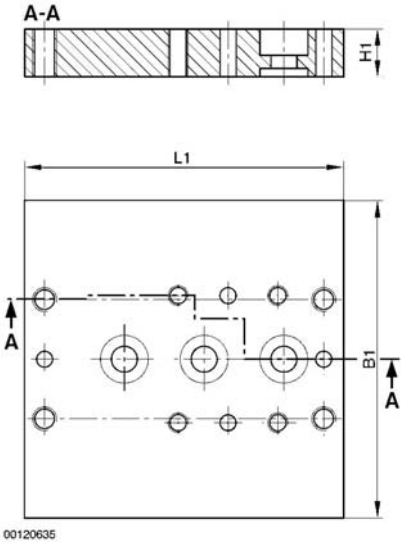
Type	RMC-HE-16	RMC-HE-25	RMC-HE-32
GPC-E-12	CK1-LI-13 **R412004665**	CK1-LI-13 **R412004665**	
GPC-E-16	CK1-LI-14 **R412004661**	CK1-LI-14 **R412004661**	
GPC-E-20			CK1-LI-15 **R412004662**
GPC-E-25			CK1-LI-16 **R412004663**

Dimensioned drawing

CK1-LI-13	CK1-LI-14 / -15	CK1-LI-16







Type	B1	H1	L1
CK1-LI-13	49	8	63
CK1-LI-14	64	10	72
CK1-LI-15	76	12	77,5
CK1-LI-16	30	12	80

Scope of delivery

Type	Connecting plate	Screws	Centering sleeves	Centering pins	Sliding blocks
CK1-LI-13	1 x	4 x M3 x 16; 4 x M4 x 10; 4 x M4 x 30	2 x Ø 7; 2 x Ø 9-7	2 x 4 m6 x 12	2 x N6 / M4
CK1-LI-14	1 x	4 x M4 x 20; 4 x M4 x 35; 2 x M5 x 10; 2 x M5 x 12; 2 x M5 x 14	6 x Ø 9	2 x 4 m6 x 12	2 x N6 / M5
CK1-LI-15	1 x	4 x M5 x 20; 4 x M5 x 40; 2 x M6 x 14; 4 x M6 x 16	4 x Ø 12; 2 x Ø 12-9	2 x 4 m6 x 12	2 x N8 / M6
CK1-LI-16	1 x	4 x M5 x 45; 4 x M6 x 16; 2 x M6 x 14; 4 x M6 x 25	6 x Ø 12	2 x 4 m6 x 12	2 x N8 / M6

Easy-2-Combine System

Combination: CKK/CKR Compact module with MSC mini slide

Rexroth
Bosch Group

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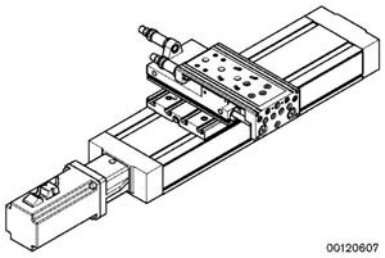
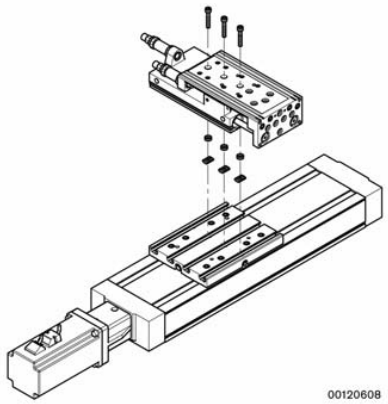
Technical Data

Materials for "connection kit"

Screws (ISO 4762)		Steel, galvanized
Centering sleeves		Steel, stainless
Sliding blocks	N6	Steel, stainless
	N8	Steel, galvanized

Slide mounting: transverse





Part no.: Slide mounting

Type	CKK/CKR-12-90	CKK/CKR-15-110	CKK/CKR-20-145
MSC-08	CK2-LI-01 **R412004687**	CK2-LI-01 **R412004687**	
MSC-12	CK2-LI-02 **R412004688**	CK2-LI-02 **R412004688**	
MSC-16	CK2-LI-03 **R412004689**	CK2-LI-03 **R412004689**	
MSC-20			CK2-LI-04 **R412004690**
MSC-25			CK2-LI-05 **R412004691**

Scope of delivery

Type	Screws	Centering sleeves	Sliding blocks
CK2-LI-01	2 x M4 x 16	2 x Ø 9-7	2 x N6 / M4
CK2-LI-02	2 x M5 x 20	2 x Ø 9	2 x N6 / M5
CK2-LI-03	2 x M5 x 25	2 x Ø 9	2 x N6 / M5
CK2-LI-04	2 x M6 x 30	2 x Ø 12	2 x N8 / M6
CK2-LI-05	2 x M6 x 35	2 x Ø 12	2 x N8 / M6

Mini slides slim, MSN series
MSN

Rexroth
Bosch Group

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Technical Data

Operating type		Double-acting
Operating temperature range		0 °C to +50 °C (32 °F to +122 °F)
Cushioning		Elastomer
Medium		Compressed air, lubricated or oil-free
Lubrication		maintenance-free
Material	Housing	Aluminum (anodized)
	Slide	Aluminum (anodized)
	Guide	Hardened steel
	Seals	NBR+PU (Nitrile Butadiene Rubber+Polyurethane)

Application area

Suitable for accurate, short-stroke handling technology applications where a high packing density is required
Versatile filling and mounting options

Technical information

Type			MSN – 6	MSN – 10	MSN – 16
piston diameter		[mm]	6	10	16
connection thread			M 5	M 5	M 5
Operating pressure		[bar](psi)	2 - 10 (29-145)	1 - 10 (15-145)	1 - 10 (15-145)
Theoretical useful force (6 bar)(87 psi)	Thrust	[N](lbf)	17 (3.8)	47 (10.6)	121 (27.2)
	Retraction force	[N] (lbf)	13 (2.9)	39 (8.8)	104 (23.4)
Speed	Outward stroke	[m/s]	0,5	0,8	0,8
	Retraction stroke	[m/s]	0,5	0,8	0,8
Cushioning	Elastomer	[Nm](in.lbs)	0,01 (0.09)	0,05 (0.44)	0,15 (1.33)
Maximum additional moving mass	Elastomer	[kg] (lbs)	0,18 (0.40)	0,55 (1.21)	1,10 (2.43)

Part no. for MSN

Stroke	MSN–6	MSN–10	MSN–16
5	**0 821 406 500**	**0 821 406 506**	**0 821 406 512**
10	**0 821 406 501**	**0 821 406 507**	**0 821 406 513**
15	**0 821 406 502**	**0 821 406 508**	**0 821 406 514**
20	**0 821 406 503**	**0 821 406 509**	**0 821 406 515**
25	**0 821 406 504**	**0 821 406 510**	**0 821 406 516**
30	**0 821 406 505**	**0 821 406 511**	**0 821 406 517**

Drive weight for nominal stroke [g] (oz.)

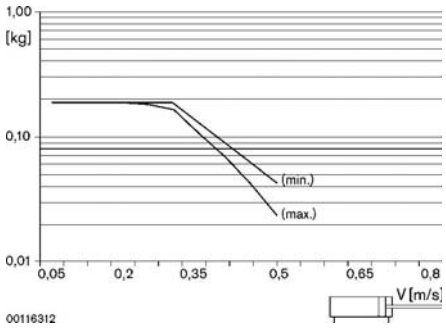
Stroke [mm]	MSN–6	MSN–10	MSN–16
5	71 (2.5)	112 (4.0)	231 (0.1)
10	78 (2.8)	122 (4.3)	231 (0.1)
15	84 (3.0)	131 (4.6)	262 (9.2)
20	89 (3.1)	147 (5.2)	262 (9.2)
25	104 (3.7)	159 (5.6)	295 (10.4)
30	110 (3.9)	170 (6.0)	295 (10.4)

Moving mass for nominal stroke [g] (oz.)

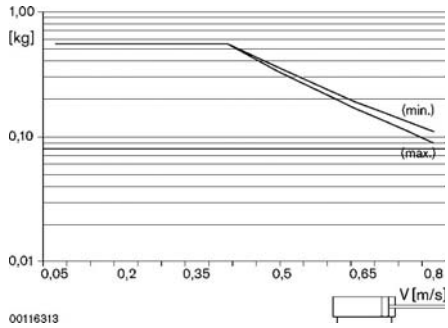
Stroke [mm]	MSN–6	MSN–10	MSN–16
5	34 (1.2)	52 (1.8)	100 (3.5)
10	37 (1.3)	55 (1.9)	100 (3.5)
15	41 (1.4)	58 (2.0)	109 (3.8)
20	43 (1.5)	64 (2.3)	109 (3.8)
25	45 (1.6)	67 (2.4)	126 (10.4)
30	46 (1.6)	69 (2.4)	126 (10.4)

Maximum additional moving mass (min stroke, max stroke)

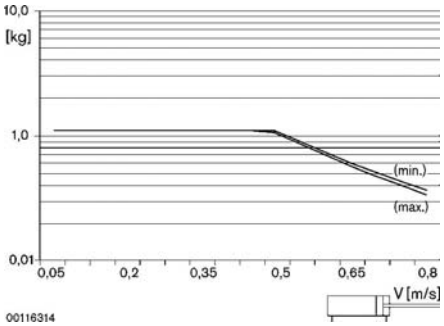
MSN - 6



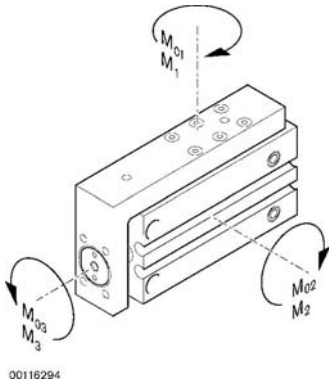
MSN - 10



MSN - 16

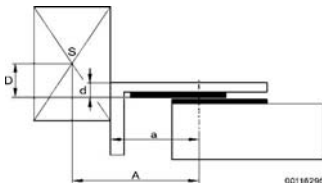


Permissible loads

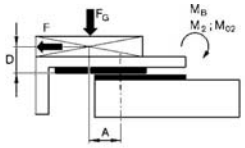


		Correction factors		Permissible loads					
				static			dynamic		
		a	d	M01	M02	M03	M1	M2	M3
Type	Stroke [mm]	[mm]	[mm]	[Nm](ft.lbs)	[Nm](ft.lbs)	[Nm](ft.lbs)	[Nm](ft.lbs)	[Nm](ft.lbs)	[Nm](ft.lbs)
MSN–6	5	27	6,0	3,2 (2.4)	3,2 (2.4)	3,0 (2.2)	0,9 (0.7)	0,9 (0.7)	0,6 (0.4)
	10	32	6,0	3,2 (2.4)	3,2 (2.4)	3,0 (2.2)	0,9 (0.7)	0,9 (0.7)	0,6 (0.4)
	15	32	6,0	3,2 (2.4)	3,2 (2.4)	3,0 (2.2)	0,9 (0.7)	0,9 (0.7)	0,6 (0.4)
	20	37	6,0	3,2 (2.4)	3,2 (2.4)	3,0 (2.2)	0,9 (0.7)	0,9 (0.7)	0,6 (0.4)
	25	42	6,0	3,2 (2.4)	3,2 (2.4)	3,0 (2.2)	0,9 (0.7)	0,9 (0.7)	0,6 (0.4)
	30	47	6,0	3,2 (2.4)	3,2 (2.4)	3,0 (2.2)	0,9 (0.7)	0,9 (0.7)	0,6 (0.4)
MSN–10	5	31	6,8	2,4 (1.8)	2,4 (1.8)	2,3 (1.7)	0,8 (0.6)	0,8 (0.6)	0,6 (0.4)
	10	36	6,8	2,4 (1.8)	2,4 (1.8)	2,3 (1.7)	0,8 (0.6)	0,8 (0.6)	0,6 (0.4)
	15	41	6,8	2,4 (1.8)	2,4 (1.8)	2,3 (1.7)	0,8 (0.6)	0,8 (0.6)	0,6 (0.4)
	20	41	6,8	3,3 (2.4)	3,3 (2.4)	3,2 (2.4)	1,2 (0.9)	1,2 (0.9)	0,7 (0.5)
	25	48	6,8	3,3 (2.4)	3,3 (2.4)	3,2 (2.4)	1,2 (0.9)	1,2 (0.9)	0,7 (0.5)
	30	53	6,8	3,3 (2.4)	3,3 (2.4)	3,2 (2.4)	1,2 (0.9)	1,2 (0.9)	0,7 (0.5)
MSN–16	5	40	7,5	6,9 (5.1)	6,9 (5.1)	6,8 (5.0)	2,1 (1.5)	2,1 (1.5)	1,7 (1.3)
	10	40	7,5	6,9 (5.1)	6,9 (5.1)	6,8 (5.0)	2,1 (1.5)	2,1 (1.5)	1,7 (1.3)
	15	50	7,5	6,9 (5.1)	6,9 (5.1)	6,8 (5.0)	2,1 (1.5)	2,1 (1.5)	1,7 (1.3)
	20	50	7,5	6,9 (5.1)	6,9 (5.1)	6,8 (5.0)	2,1 (1.5)	2,1 (1.5)	1,7 (1.3)
	25	55	7,5	12,3 (9.1)	12,3 (9.1)	10,0 (7.4)	2,7 (2.0)	2,7 (2.0)	1,9 (1.4)
	30	60	7,5	12,3 (9.1)	12,3 (9.1)	10,0 (7.4)	2,7 (2.0)	2,7 (2.0)	1,9 (1.4)

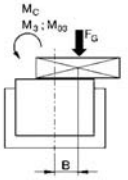
Correction factors (a, d)



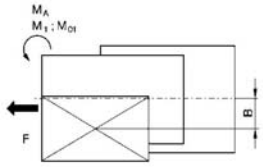
Horizontal application



stat.	$M_{B0} = F_G \cdot A + F \cdot D$
dyn.	$M_B = F_G \cdot A$



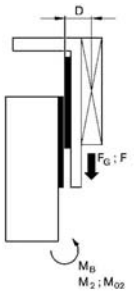
stat.	$M_{CO} = F_G \cdot B$
dyn.	$M_C = F_G \cdot B$



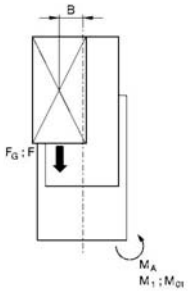
stat.	$M_{A0} = F \cdot B$
dyn.	$M_A = 0$

dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} + \frac{M_C}{M_3} \leq 1$
stat.	$\frac{M_{A0}}{M_{01}} + \frac{M_{B0}}{M_{02}} + \frac{M_{C0}}{M_{03}} \leq 1$

Vertical application



stat.	$M_{B0} = (F_G + F) \cdot D$
dyn.	$M_B = F_G \cdot D$

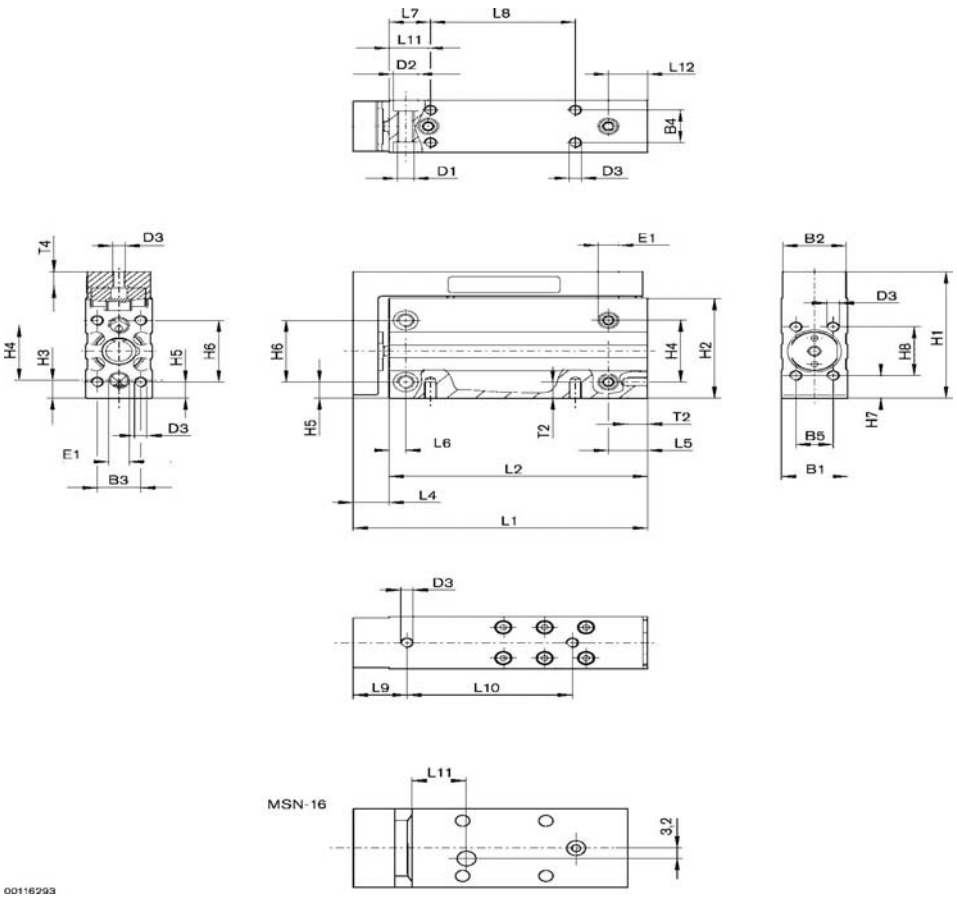


stat.	$M_{AO} = (F_G + F) \cdot B$
dyn.	$M_A = F_G \cdot B$

dyn.	$\frac{M_A}{M_1} + \frac{M_B}{M_2} \leq 1$
stat.	$\frac{M_{A0}}{M_{01}} + \frac{M_{B0}}{M_{02}} \leq 1$

F = retarding power [N]
FG = weight [N]

MSN–6/–10/–16



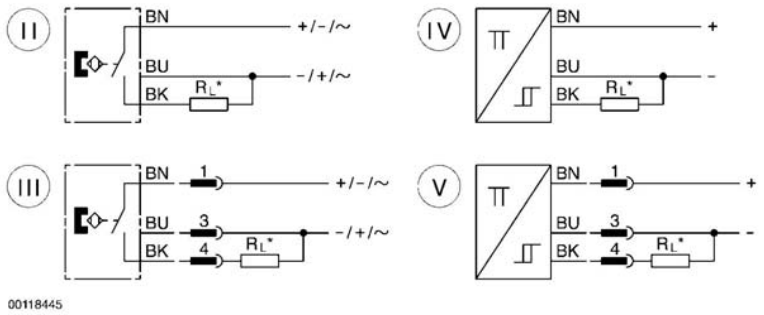
Type	B1	B2	B3	B4	B5	D1	D2	D3	E1	H1	H2	H3	H4	H5	H6	H7	H8
MSN–6	16	15,3	10,5	10	9	M4	6	M3		39	31	5,5	17,5	5	19	7	15
MSN–10	20	19,3	13	13	11	M5	7,5	M4	M5	45	36	6,5	20	5	23	7,5	18
MSN–16	24	23,3	17	17	16	M5	7,5	M4		51	41	6,0	25	5,5	27	6	26

MSN–6															
Stroke	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	T1	T2	T4
5	46	37,5	6	8,5	10	4	10	10	13	20	9,5	9,5	3,3	4,8	5
10	51	42,5	6	8,5	10	4	10	15	13	20	9,5	9,5	3,3	4,8	5
15	56	47,5	6	8,5	10	4	10	20	13	25	9,5	9,5	3,3	4,8	5
20	61	52,5	6	8,5	10	4	10	25	13	30	9,5	9,5	3,3	4,8	5
25	66	57,5	6	8,5	10	4	10	30	13	40	9,5	9,5	3,3	4,8	5
30	71	62,5	6	8,5	10	4	10	35	13	40	9,5	9,5	3,3	4,8	5

MSN–10															
Stroke	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	T1	T2	T4
5	51,5	40	7	11,5	12,5	5	12	10	15	14	11	9,5	4,4	6	5,5
10	65,5	45	7	11,5	12,5	5	12	14	15	19	11	9,5	4,4	6	5,5
15	61,5	50	7	11,5	12,5	5	12	18	15	25	11	9,5	4,4	6	5,5
20	66,5	55	7	11,5	12,5	5	12	24	15	30	11	9,5	4,4	6	5,5
25	73,5	62	7	11,5	12,5	5	12	32	15	40	12	10,5	4,4	6	5,5
30	78,5	67	7	11,5	12,5	5	12	35	15	45	12	10,5	4,4	6	5,5

	MSN–16														
Stroke	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**	**L8**	**L9**	**L10**	**L11**	**L12**	**T1**	**T2**	**T4**
5	66	52	10	14	12,5	5	12	20	18	24	13	12,5	4,4	6	6
10	66	52	10	14	12,5	5	12	20	18	35	13	12,5	4,4	6	6
15	76	62	10	14	12,5	5	12	30	18	45	13,5	12,5	4,4	6	6
20	76	62	10	14	12,5	5	12	30	18	50	13,5	12,5	4,4	6	6
25	86	72	10	14	12,5	5	12	40	18	50	17,5	12,5	4,4	6	6
30	91	77	10	14	12,5	5	12	45	18	55	17,5	12,5	4,4	6	6

Cylinder switch ST4, electrically (Reed contact) and electronic (contactless PNP)



BN = brown, BK = black, BU = blue
* Note on the protective circuit in the case of an inductive load:
DC voltage = diode or Z diode; AC voltage = resistor and condensator or varistor

Fig.	Contact type	Symbol	Length of cable [m] Material	Con-nector	Ambient temperature range	Operating voltage	Switching current I max.	Part no.
A	Reed	II (3-wire)	3 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 640**
A	Reed	II (3-wire)	5 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 641**
B	Reed	III (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	100 mA	**0 830 100 440**
A	contactless	IV (3-wire)	3 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 642**
A	contactless	IV (3-wire)	5 PUR	–	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 643**
B	contactless	V (3-wire)	0,3 PUR	M8x1	–25 °C to +75 °C (–13 °F to +167 °F)	AC/DC 10 ... 30 V	70 mA	**0 830 100 441**

A = Cable connection; B = Plug-in connection M8x1 with knurled screw.
Power supply with protective extra-low voltage (PELV/SELV) according to DIN EN 50178, classification VDE 0160.

Part no.	Switching capacity max.	Rs [Ω]	Voltage drop U at I max.	Operational current (without load) not switched	Operational current (without load) switched	Switching frequency max.	Short-circuit protection	Polarity safe
0 830 100 640	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 641	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 440	3 W / 5 VA	15	I x Rs	–	< 5 mA	0,5 KHz	no	yes
0 830 100 642	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 643	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes
0 830 100 441	3 W / 5 VA	15	< 2,5 V	< 8 mA	< 20 mA	1,0 KHz	yes	yes

General characteristics:
- Degree of protection: IP 67 (NEMA 6) - IEC 60529 (DIN VDE 0470)
- Switching point accuracy (temperature = constant): ±0,1 mm
- Indicator: LED (yellow = operating status: switched)
- Materials, body: polyamide

Reed:
- Rs = protective resistor for reed contact
- Shock resistance max.: 30 g / 11 msec (contact closes)
- Vibration resistance: 10–55 Hz, 1 mm
- Switching response times ON / OFF: ~ 0,5 msec / ~ 0,1 msec

Approximate figures for hysteresis, response travel and overrun speed, see last page of switches.

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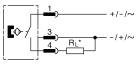
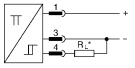
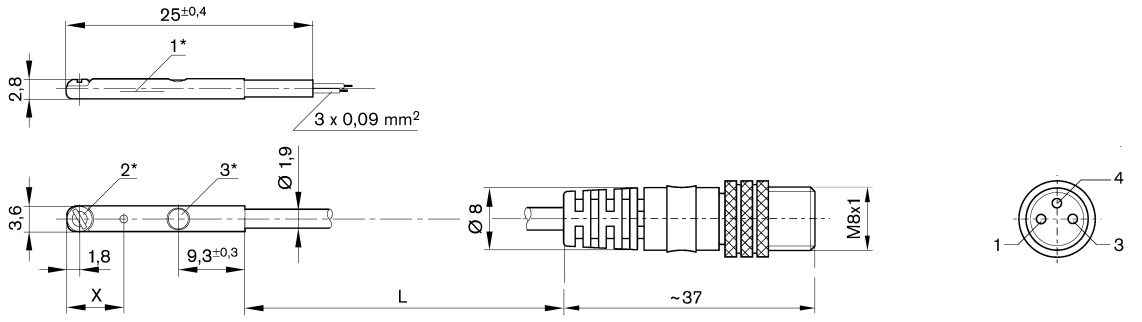
Ambient temperature min. / max.	-25°C / +75°C
Protection class according to DIN EN 60529:2000	IP67
	±0,1
Switching time on	0,5 ms
Switching time off	0,1 ms
LED	yellow
Shock resistance	30 g / 11 ms
Vibration resistance	10-55 Hz, 1 mm
materials:	
Sensor	polyamide

	type of contact	Ambient temperature min. / max. [°C]	cable length L [m]	n-Wire	Operational voltage AC [V]	DC operating voltage [V]	DC switching current [A]	Part No.
	Reed	-	0,3 0,5	3	10 - 30	10 - 30	0,1	R412004577 R412004578
	PNP solid-state	-25 / 75	0,3 0,5	3	-	10 - 30	0,1	R412004580 R412004581

Part No.	Switching capacity [VA]	protective resistor [Ω]	Voltage drop [V]	operating current, not switched [mA]	operating current, switched [mA]	Max. switching frequency [kHz]		Short-circuit protected
R412004577 R412004578	3 W / 5 VA	15	< 1,5	-	< 5	0,5	- +	+
R412004580 R412004581	3 W / 5 VA	-	< 2,5	< 8	< 20	0,1	+ -	+

dimensions



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1* = sensor element 2* = clamping screw 3* = LED
X = PNP, 6 mm, Reed, 10 mm
(1) BN=brown (3) BU=blue (4) BK=black

Rotary Actuator, Series RAP

RAP1, rack-and-pinion method, 0.10 Nm (0.88 in.lbs.)

Rexroth
Bosch Group

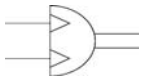
Technical Data

Operating type		Double-acting piston type (rack-and-pinion method)
Turning angles		90°, 100°, 180°, 190°, 360°
Turning angle tolerence		+10° to 0°
Working pressure	RAP1	1.5–7 bar (22 to 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Rod / pinion	Hardened steel (S45C) or stainless steel (SUS304)
	Rack	Plastic
	Piston	Plastic

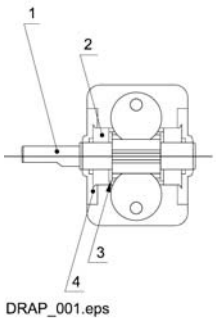
Application area

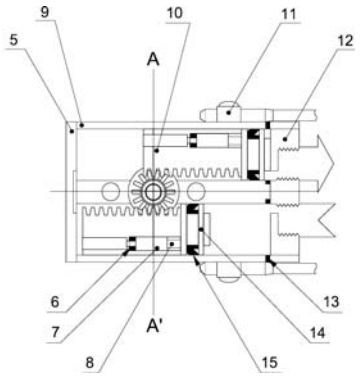
Suitable for all applications with rotary movements.

Technical information

Symbol	Effective torque at 87 psi[6 bar]	Port size	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	0.88 in.lbs [0.10 Nm]	10-32 [M5 x 0.8]	0.16[4]	150[10.3]	0.009[1.0]	0.34[1.5]	0.018[0.08]	None

Operating principle





(1) Rod / pinion. (2) Rod bushing. (3) Thrust ring. (4) Rod cover. (5) End cover. (6) O-ring. (7) Magnet.
(8) Magnet holder. (9) Body. (10) Rack. (11) Sensor switch. (12) Cover. (13) O-ring. (14) Piston. (15) Piston seal.

Body Weight lbs.[kg]

90° and 100°	180° and 190°	360°
0.18[0.083]	0.22[0.101]	0.33[0.148]

Rotary Actuator, Series RAP

RAP1, rack-and-pinion method, 0.10 Nm (0.88 in.lbs.)

Rexroth
Bosch Group

RAP1: Code No. Single rod version

90°	(100°)*	180°	(190°)*	360°
2 650 118 000	2 650 118 010	2 650 118 020	2 650 118 030	2 650 118 040

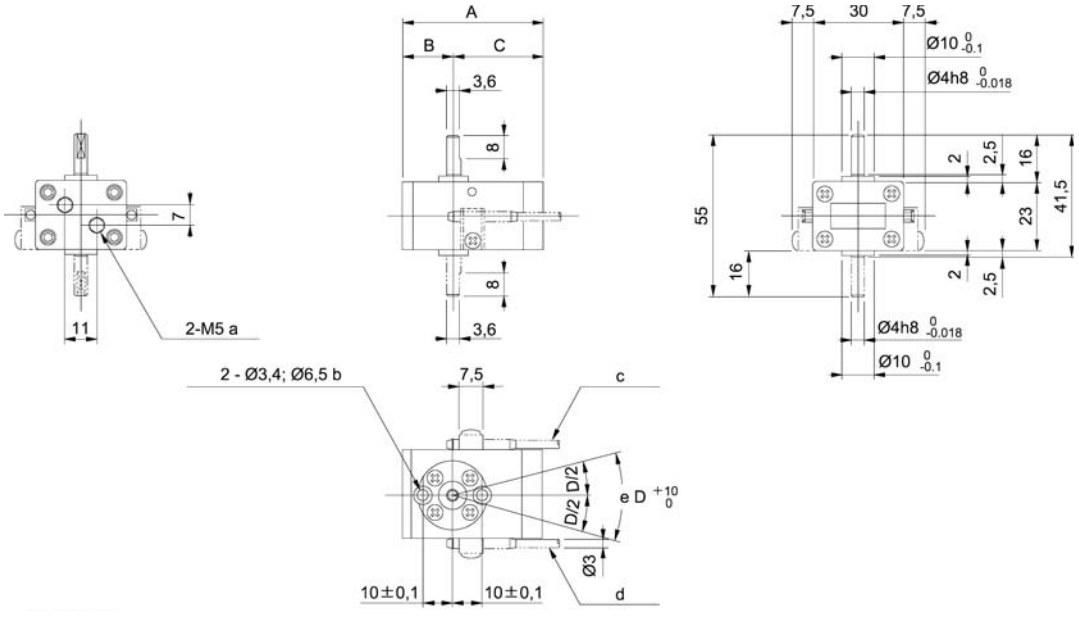
* Rotation angles 100° and 190° are available on request.

RAP1: Code No. Double rod version

90°	(100°)*	180°	(190°)*	360°
2 650 118 200	2 650 118 210	2 650 118 220	2 650 118 230	2 650 118 240

* Rotation angles 100° and 190° are available on request.

Dimensions for RAP1



a: Depth 4 mm. b: Counter bore depth 3,3 mm (both sides). c: Sensor one. d: Sensor two. e: Rotation angle.

Rotation angle	A	B	C	D
90°	48	17	31	90
(100°)*	48	17	31	100
180°	60	23	37	180
(190°)*	60	23	37	190
360°	88	37	51	360

* Rotation angles 100° and 190° are available on request.

Rotary Actuator, Series RAP

RAP5, rack-and-pinion method, 0.47 Nm (4.16 in.lbs.)

Rexroth
Bosch Group

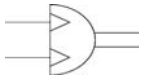
Technical Data

Operating type		Double-acting piston type (rack-and-pinion method)
Turning angles		90°, 100°, 180°, 190°, 360°
Turning angle tolerence		+10° to 0°
Working pressure	RAP5	0.6–7 bar (9 to 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Rod / pinion	Hardened steel (S45C) or stainless steel (SUS304)
	Rack	Plastic
	Piston	Plastic

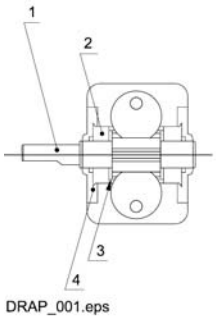
Application area

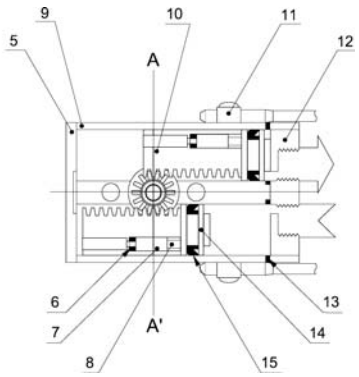
Suitable for all applications with rotary movements.

Technical information

Symbol	Effective torque at 87 psi[6 bar]	Port size NPT/ISO G	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	4.16 in.lbs. [0.47 Nm]	1/8	0.24[6]	150[10.3]	0.027[3.0]	0.56[2.5]	0.03[0.13]	None

Operating principle





(1) Rod / pinion. (2) Rod bushing. (3) Thrust ring. (4) Rod cover. (5) End cover. (6) O-ring. (7) Magnet.
(8) Magnet holder. (9) Body. (10) Rack. (11) Sensor switch. (12) Cover. (13) O-ring. (14) Piston. (15) Piston seal.

Body Weight lbs.[kg]

90° and 100°	180° and 190°	360°
0.47[0.212]	0.57[0.260]	0.83[0.375]

Rotary Actuator, Series RAP

RAP5, rack-and-pinion method, 0.47 Nm (4.16 in.lbs.)

Rexroth
Bosch Group

RAP5: Code No. Single rod version

90°	(100°)*	180°	(190°)*	360°
(G1/8) 2 650 118 050	**2 650 118 060**	**2 650 118 070**	**2 650 118 080**	**2 650 118 090**
(NPT) 2 650 114 210	2 650 114 220	2 650 114 230	2 650 114 240	2 650 114 250

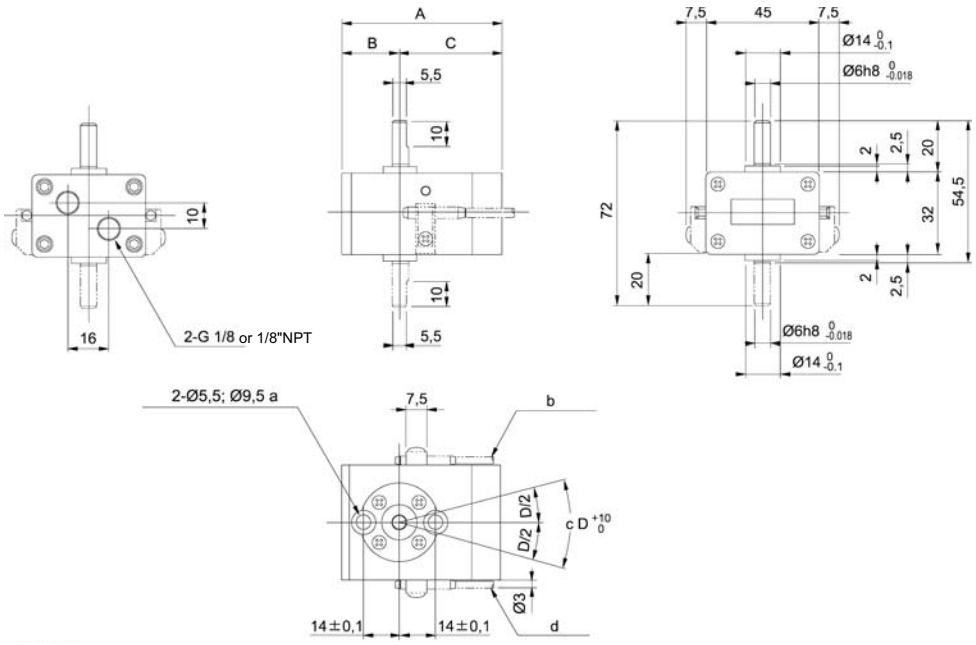
* Rotation angles 100° and 190° are available on request.

RAP5: Code No. Double rod version

90°	(100°)*	180°	(190°)*	360°
(G1/8) 2 650 118 250	**2 650 118 260**	**2 650 118 270**	**2 650 118 280**	**2 650 118 290**
(NPT) 2 650 114 360	2 650 114 540	2 650 114 370	2 650 114 380	2 650 114 390

* Rotation angles 100° and 190° are available on request.

Dimensions for RAP5



a: Counter bore depth 3,3 mm (both sides). b: Sensor one. c: Rotation angle. d: Sensor two.

Rotation angle	A	B	C	D
90°	62	22,5	39,5	90
(100°)*	62	22,5	39,5	100
180°	78	27,5	50,5	180
(190°)*	78	27,5	50,5	190
360°	116	47	69	360

* Rotation angles 100° and 190° are available on request.

Rotary Actuator, Series RAP

RAP10, rack-and-pinion method, 1.15 Nm (10.17 in.lbs.)

Rexroth
Bosch Group

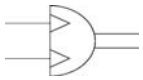
Technical Data

Operating type		Double-acting piston type (rack-and-pinion method)
Turning angles		90°, 100°, 180°, 190°, 360°
Turning angle tolerence		+10° to 0°
Working pressure	RAP10	0.6–7 bar (9 to 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Rod / pinion	Hardened steel (S45C) or stainless steel (SUS304)
	Rack	Plastic
	Piston	Plastic

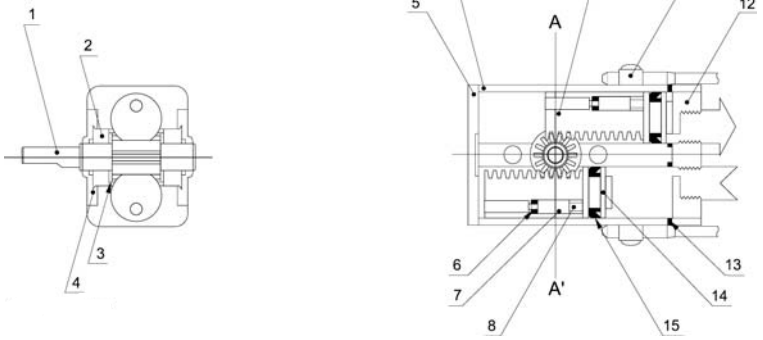
Application area

Suitable for all applications with rotary movements.

Technical information

Symbol	Effective torque at 87 psi[6 bar]	Port size NPT/ISO G	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	10.17 in.lbs. [1.15 Nm]	1/8	0.31[8]	150[10.3]	0.071[8.0]	0.97[4.3]	0.05[0.22]	None

Operating principle



(1) Rod / pinion. (2) Rod bushing. (3) Thrust ring. (4) Rod cover. (5) End cover. (6) O-ring. (7) Magnet.
(8) Magnet holder. (9) Body. (10) Rack. (11) Sensor switch. (12) Cover. (13) O-ring. (14) Piston. (15) Piston seal.

Body Weight lbs.[kg]

90° and 100°	180° and 190°	360°
0.66[0.300]	0.84[0.380]	1.19[0.538]

Rotary Actuator, Series RAP

RAP10, rack-and-pinion method, 1.15 Nm (10.17 in.lbs.)

Rexroth
Bosch Group

RAP10: Code No. Single rod version

90°	(100°)*	180°	(190°)*	360°
(G1/8) 2 650 118 100	**2 650 118 110**	**2 650 118 120**	**2 650 118 130**	**2 650 118 140**
(NPT) 2 650 114 260	2 650 114 270	2 650 114 280	2 650 114 290	2 650 114 300

* Rotation angles 100° and 190° are available on request.

RAP10: Code No. Double rod version

90°	(100°)*	180°	(190°)*	360°
(G1/8) 2 650 118 300	**2 650 118 310**	**2 650 118 320**	**2 650 118 330**	**2 650 118 340**
(NPT) 2 650 114 400	2 650 114 410	2 650 114 420	2 650 114 550	2 650 114 430

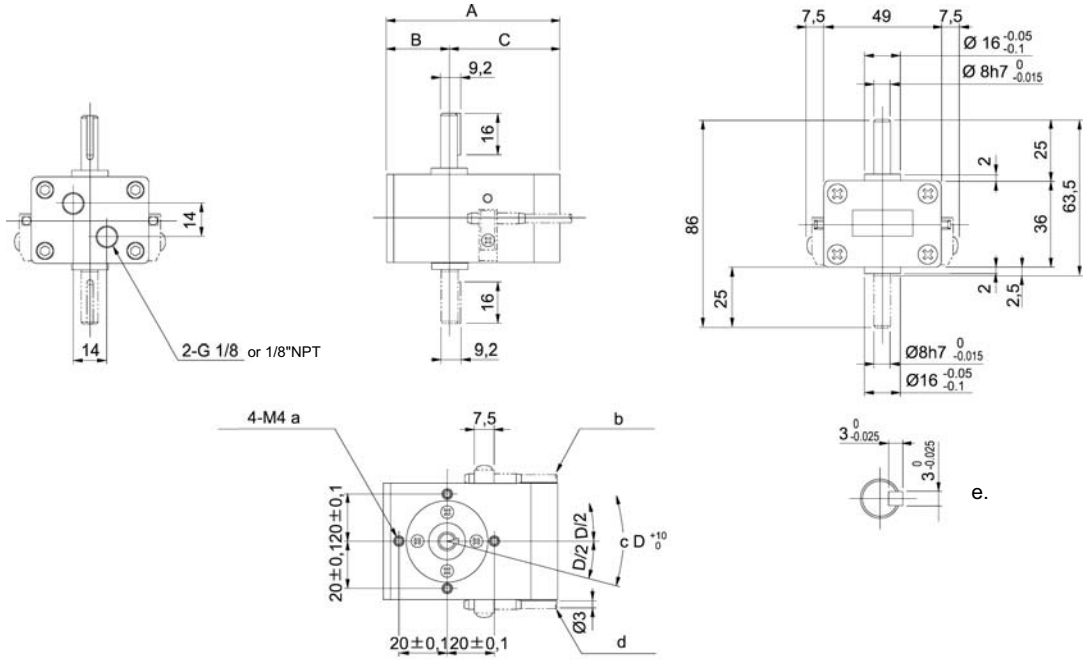
* Rotation angles 100° and 190° are available on request.

Rotary Actuator, Series RAP

RAP10, rack-and-pinion method, 1.15 Nm (10.17 in.lbs.)

Rexroth
Bosch Group

Dimensions for RAP10



a: Depth 7 mm (both sides). b: Sensor one. c: Rotation angle. d: Sensor two. e: Key included

Rotation angle	A	B	C	D
90°	73	26,5	46,5	90
(100°)*	73	26,5	46,5	100
180°	95	35,9	59,1	180
(190°)*	95	35,9	59,1	190
360°	143	59	84	360

* Rotation angles 100° and 190° are available on request.

Rotary Actuator, Series RAP

RAP20, rack-and-pinion method, 2.38 Nm (21.05 in.lbs.)

Rexroth
Bosch Group

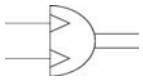
Technical Data

Operating type		Double-acting piston type (rack-and-pinion method)
Turning angles		90°, 100°, 180°, 190°, 360°
Turning angle tolerence		+10° to 0°
Working pressure	RAP20	0.6–7 bar (9 to 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Rod / pinion	Hardened steel (S45C) or stainless steel (SUS304)
	Rack	Plastic
	Piston	Plastic

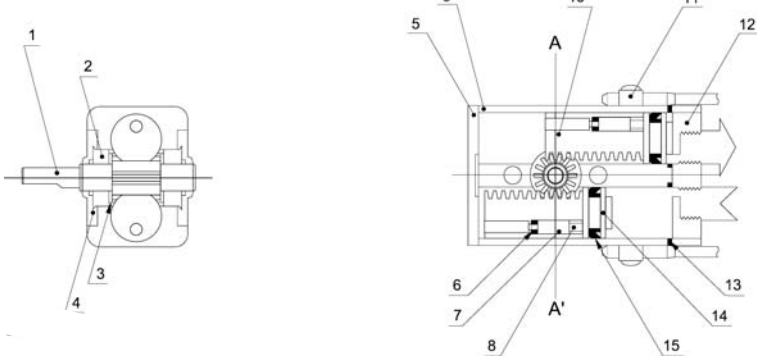
Application area

Suitable for all applications with rotary movements.

Technical information

Symbol	Effective torque at 87 psi[6 bar]	Port size NPT/ISO G	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	21.05 in.lbs (2.38 Nm)	1/8	0.39[10]	150[10.3]	0.133[15]	1.80[8.0]	0.09[0.4]	None

Operating principle



(1) Rod / pinion. (2) Rod bushing. (3) Thrust ring. (4) Rod cover. (5) End cover. (6) O-ring. (7) Magnet.
(8) Magnet holder. (9) Body (10) Rack. (11) Sensor switch. (12) Cover. (13) O-ring. (14) Piston. (15) Piston seal.

Body Weight lbs.[kg]

90° and 100°	180° and 190°	360°
1.10[0.500]	1.35[0.614]	1.92[0.870]

Rotary Actuator, Series RAP

RAP20, rack-and-pinion method, 2,38 Nm (21.05 in.lbs.)

Rexroth
Bosch Group

RAP20: Code No. Single rod version

90°	(100°)*	180°	(190°)*	360°
(G1/8) 2 650 118 150	**2 650 118 160**	**2 650 118 170**	**2 650 118 180**	**2 650 118 190**
(NPT) 2 650 114 310	2 650 114 320	2 650 114 330	2 650 114 340	2 650 114 350

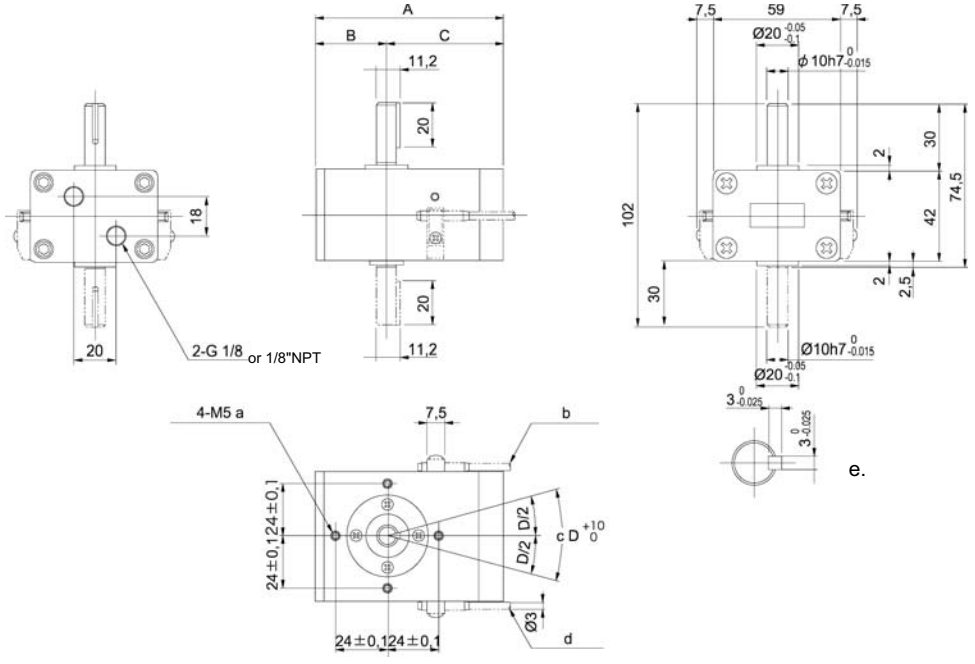
* Rotation angles 100° and 190° are available on request.

RAP20: Code No. Double rod version

90°	(100°)*	180°	(190°)*	360°
(G1/8) 2 650 118 350	**2 650 118 360**	**2 650 118 370**	**2 650 118 380**	**2 650 118 390**
(NPT) 2 650 114 440	2 650 114 450	2 650 114 560	2 650 114 460	2 650 114 470

* Rotation angles 100° and 190° are available on request.

Dimensions for RAP20



a: Depth 8 mm (both sides). b: Sensor one. c: Rotation angle. d: Sensor two. e: Key included.

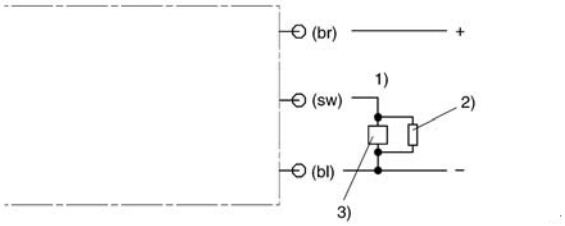
Rotation angle	A	B	C	D
90°	87	33,1	53,9	90
(100°)*	87	33,1	53,9	100
180°	113	45	68	180
(190°)*	113	45	68	190
360°	172	73	99	360

* Rotation angles 100° and 190° are available on request.

Magnetic sensor

Switch type	Solid-state sensor
Output type	Sourcing (PNP), Sinking (NPN)
Cable	Black Polyurethane (PUR) jacket, PVC insulation
Electrical connection	M 8 socket coupling, or cable
Ambient temperature	–10 °C to +70 °C / 14° to 158°F
Operating voltage (DC), Umax	5–28 V DC
Switching current	Max. 50 mA
Current consumption at 24 V DC	Max. 9 mA
Leakage current	Max. 0.01 mA
LED indicator	Provided, green
Voltage drop at 25 mA	Max. 1.2 mA
Enclosure protection class	IP 67(NEMA 6), fully insulated

Electric circuit with LED, 3-wires



br=brown
sw=black
bl=blue

1) Output
2) Protection circuit
3) Load

Type	Cable length ft.[m]	Weight lbs.[kg]	Code no.
M 8 connector PNP	0.5[0.15]	0.01[0.006]	**2 650 122 020**
Without connector PNP	9.8[3.0]	0.09[0.040]	**2 650 122 030**
M 8 connector NPN	9.8[3.0]	0.09[0.040]	**2 650 122 071**
Cable, Reed	9.8[3.0]	0.09[0.040]	2 650 122 031

Sensor holder

Type	Code no.
for RAP1 (one for each sensor)	**2 650 118 400**
for RAP5 (one for each sensor)	**2 650 118 410**
for RAP10 (one for each sensor)	**2 650 118 420**
for RAP20 (one for each sensor)	**2 650 118 430**

See Sensors/Electrical Accessories in last section of catalog for connector cables.

Rotary Actuator, Series RAN

RAN1, vane type, 0.16 Nm (1.41 in.lbs.)

Rexroth
Bosch Group

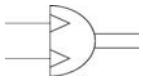
Technical Data

Operating type		Double-acting single vane type
Turning angle	RAN1	90°, 180°, 270°
Turning angle tolerence		+3° to 0°
Working pressure	RAN1	2.5–7 bar (37 - 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Vane rod	Carbon steel (nitriding processing)

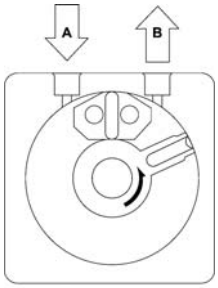
Application area

Suitable for all applications with rotary movements.

Technical Information

Symbol	Effective torque at 87 psi[6 bar]	Port size	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	1.41 in.lbs. (0.16 Nm)	10-32 (M5 x 0.8)	0.16[4]	150[10.3]	0.004[0.4]	4.41[19.6]	0.45[2.0]	None

Operating principle single vane rotary actuator

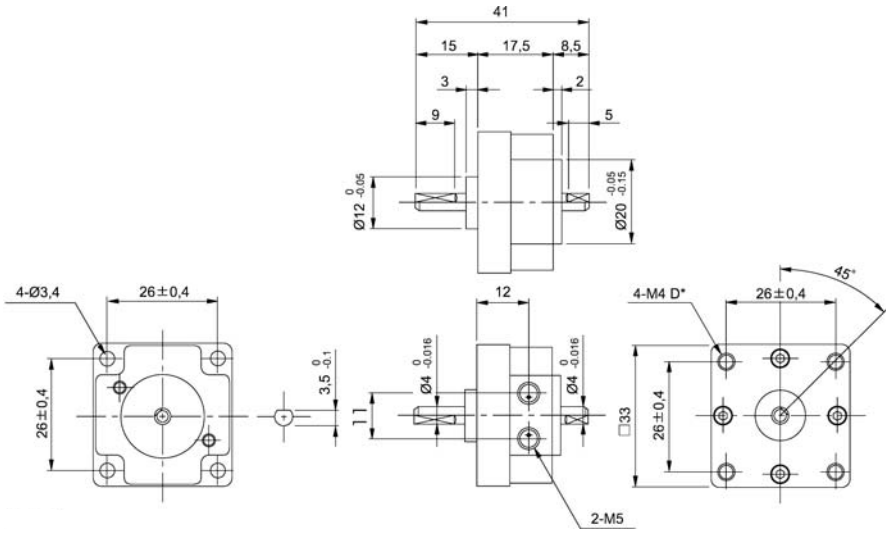


Rotary Actuator, Series RAN

RAN1, vane type, 0.16 Nm (1.41 in.lbs.)

Rexroth
Bosch Group

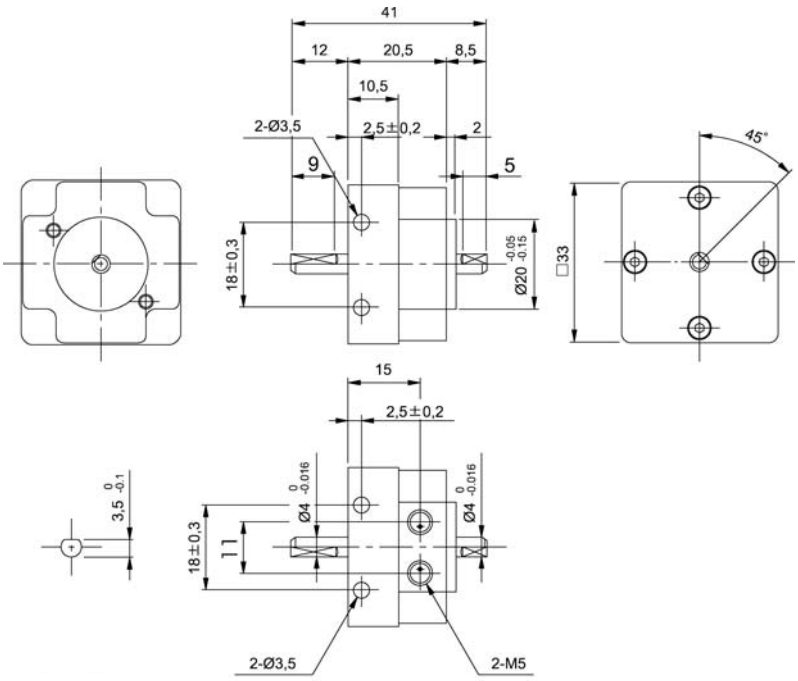
RAN1, front mounting



D* = Depth 6

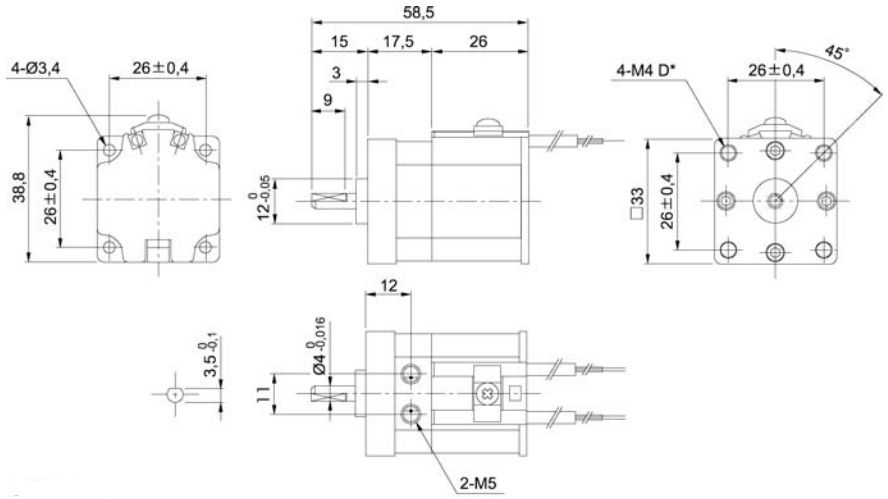
Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 000	**2 650 117 010**	**2 650 117 020**	0.10[0.045]

RAN1, side mounting



Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 150	**2 650 117 160**	**2 650 117 170**	0.11[0.05]

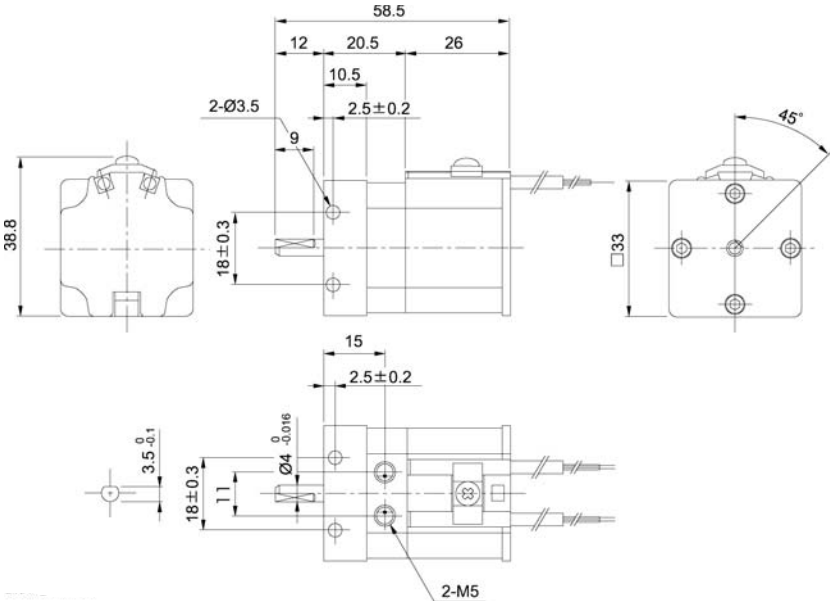
RANS1, front mounting with sensor holder

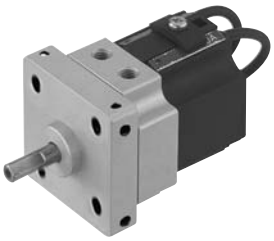


D* = Depth 6

Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 270	**2 650 117 280**	**2 650 117 290**	0.10[0.045]

RANS1, side mounting with sensor holder





Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 420	**2 650 117 430**	**2 650 117 440**	0.11[0.050]

Rotary Actuator, Series RAN

RAN3, vane type, 0.39 Nm (3.45 in.lbs.)

Rexroth
Bosch Group

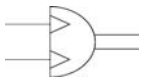
Technical Data

Operating type		Double-acting single vane type
Turning angle	RAN3	90°, 180°, 270°
Turning angle tolerence		+3° to 0°
Working pressure	RAN3	2–7 bar (30 to 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Vane rod	Carbon steel (nitriding processing)

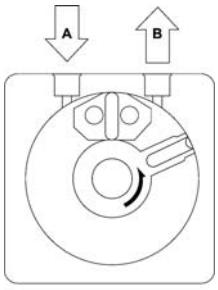
Application area

Suitable for all applications with rotary movements.

Technical Information

Symbol	Effective torque at 87 psi[6 bar]	Port size	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	3.45 in.lbs. [0.39 Nm]	10-32 (M5 x 0.8)	0.20[5]	150[10.3]	0.018[2.0]	8.9[39.6]	0.88[3.9]	Rubber bumper

Operating principle single vane rotary actuator

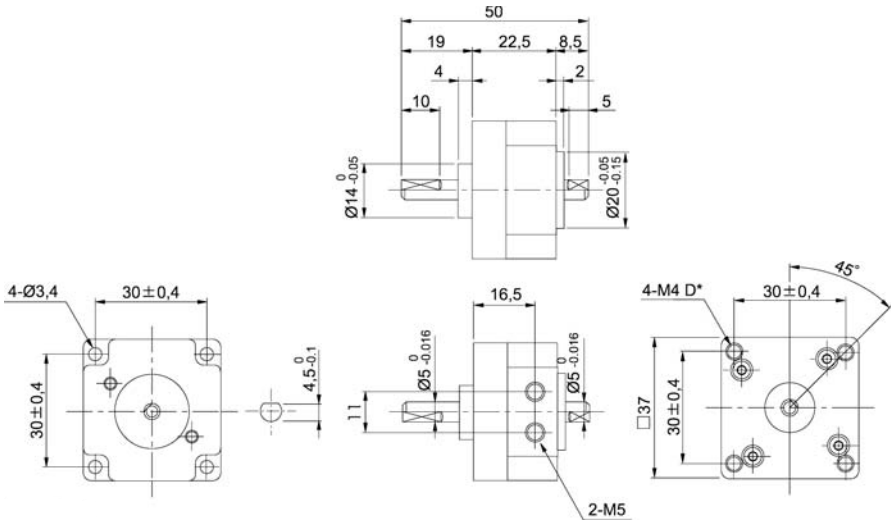


Rotary Actuator, Series RAN

RAN3, vane type, 0.39 Nm (3.45 in.lbs.)

Rexroth
Bosch Group

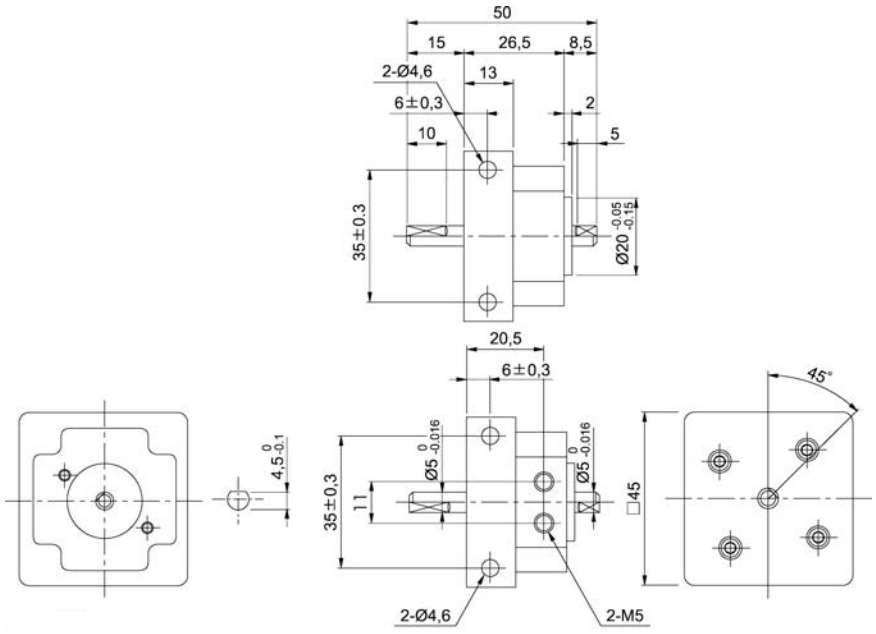
RAN3, front mount



D* = Depth 6

Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 030	**2 650 117 040**	**2 650 117 050**	0.17[0.075]

RAN3, side mount



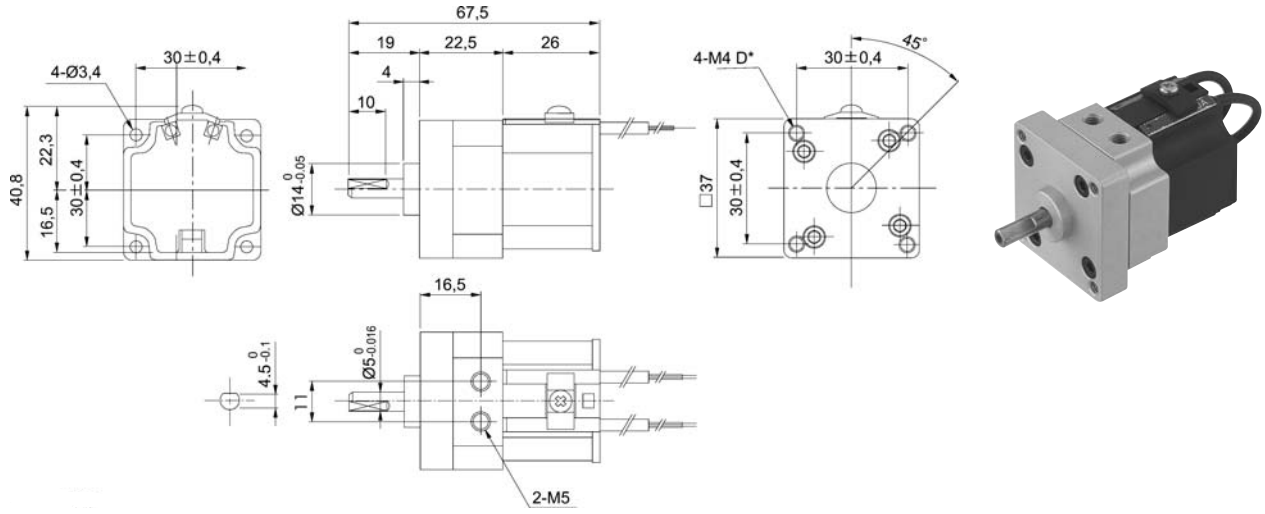
Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 180	**2 650 117 190**	**2 650 117 200**	0.23[0.105]

Rotary Actuator, Series RAN

RAN3, vane type, 0.39 Nm (3.45 in.lbs.)

Rexroth
Bosch Group

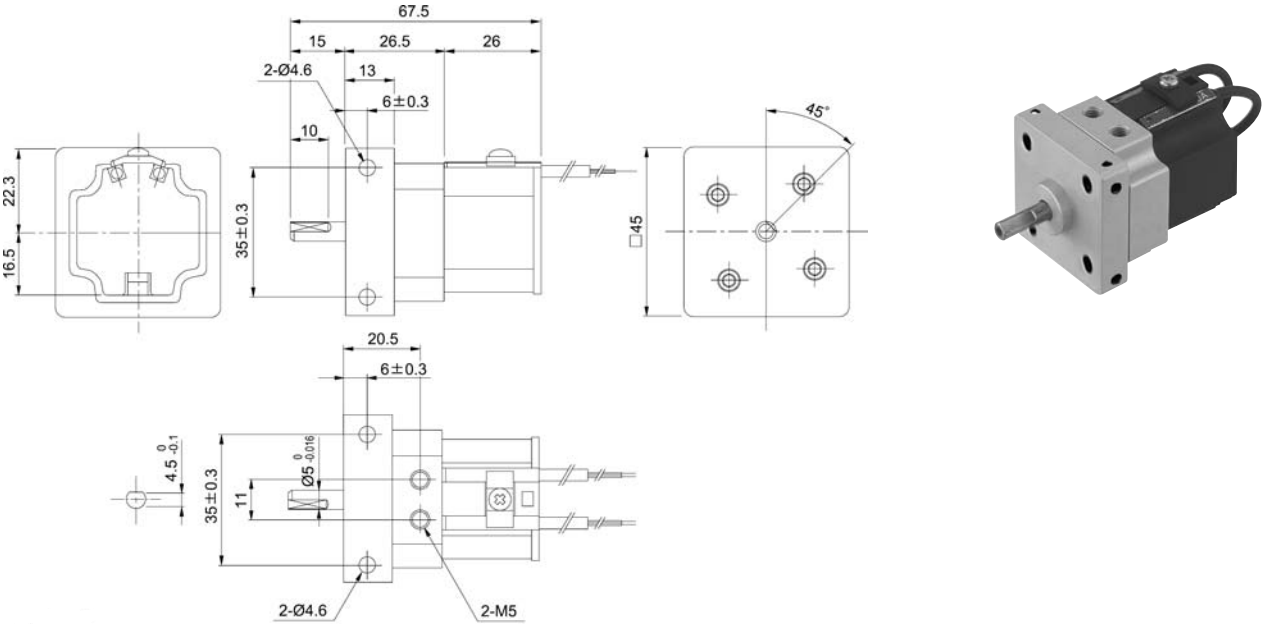
RANS3, front mount with sensor holder



D* = Depth 6

Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 300	**2 650 117 310**	**2 650 117 320**	0.17[0.075]

RANS3, side mount with sensor holder



Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 450	**2 650 117 460**	**2 650 117 470**	0.23[0.075]

Rotary Actuator, Series RAN

RAN8, vane type, 1.0 Nm (8.84 in.lbs.)

Rexroth
Bosch Group

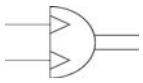
Technical Data

Operating type		Double-acting single vane type
Turning angle	RAN8	90°, 180°, 270°
Turning angle tolerence		+3° to 0°
Working pressure	RAN8	2–7 bar (30 - 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Vane rod	Carbon steel (nitriding processing)

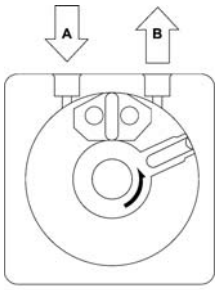
Application area

Suitable for all applications with rotary movements.

Technical Information

Symbol	Effective torque at 87 psi[6 bar]	Port size	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	8.84 in.lbs. (1.00 Nm)	10-32 (M5 x 0.8)	0.24[6]	150[10.3]	0.044[5.0]	13.22[58.8]	1.33[5.9]	Rubber bumper

Operating principle single vane rotary actuator

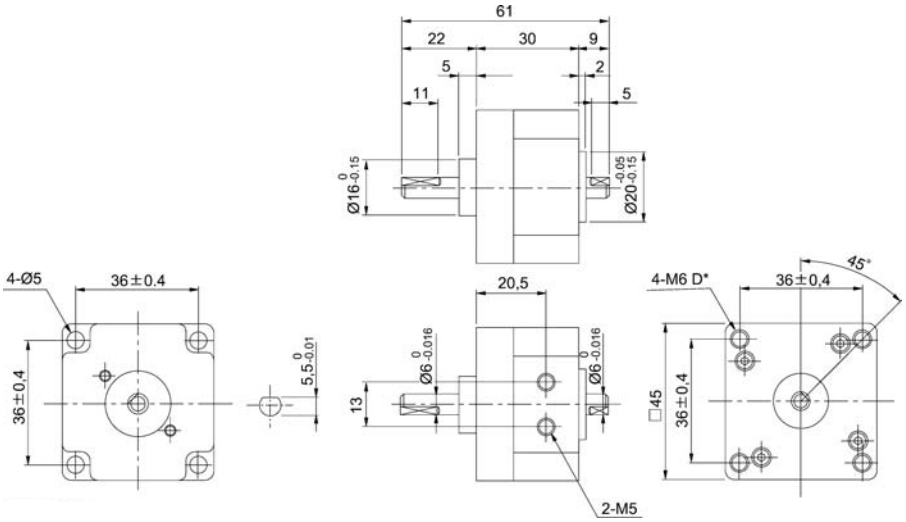


Rotary Actuator, Series RAN

RAN8, vane type, 1.0 Nm (8.84 in.lbs.)

Rexroth
Bosch Group

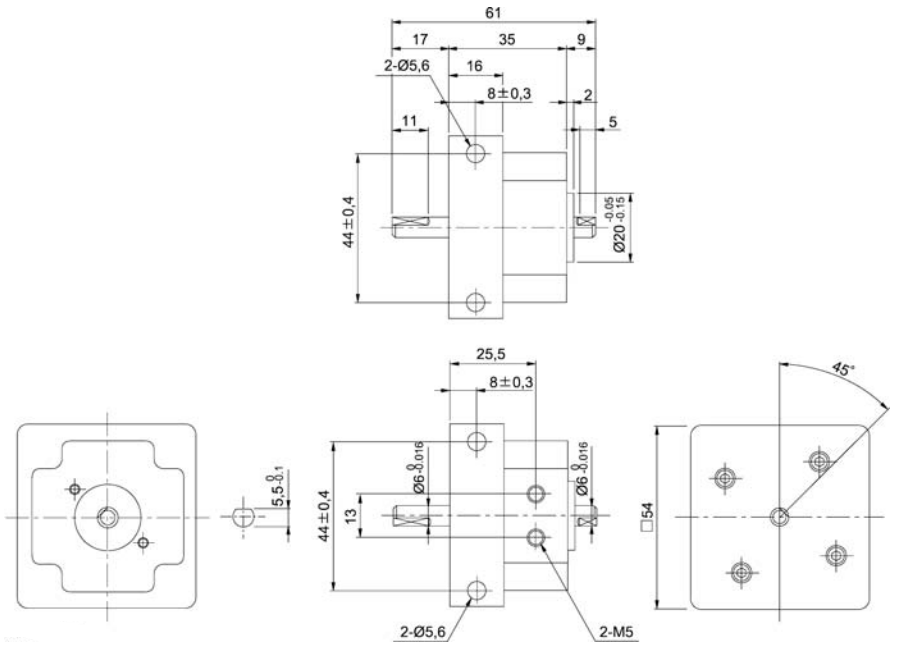
RAN8, front mount



D* = Depth 6

Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 060	**2 650 117 070**	**2 650 117 080**	0.29[0.13]

RAN8, side mount



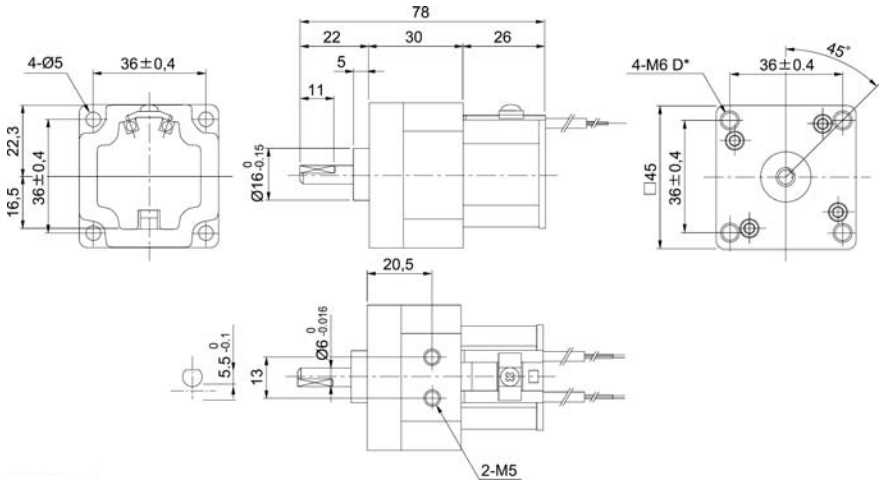
Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 210	**2 650 117 220**	**2 650 117 230**	0.40[0.18]

Rotary Actuator, Series RAN

RAN8, vane type, 1.0 Nm (8.84 in.lbs.)

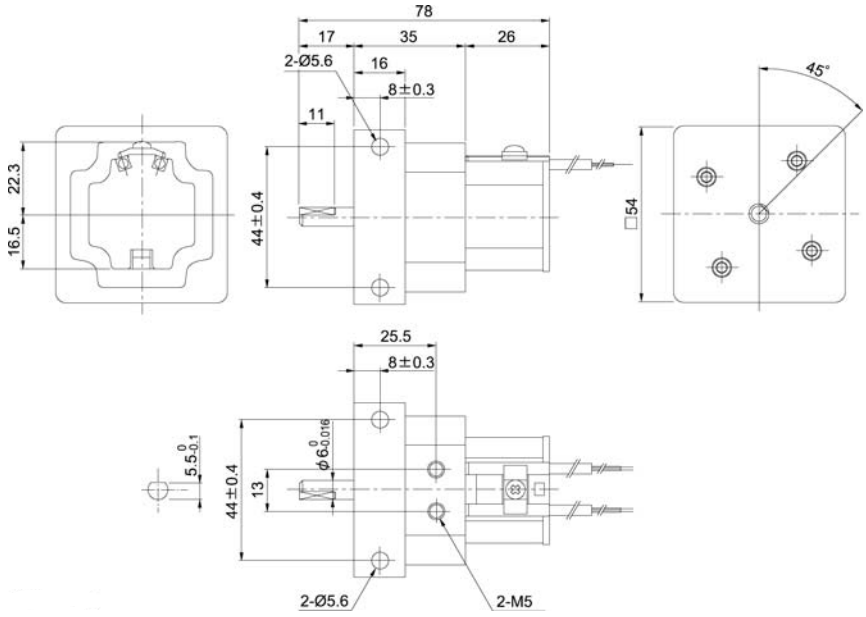
Rexroth
Bosch Group

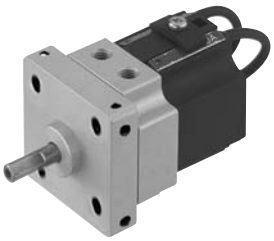
RANS8, front mount with sensor holder



Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 330	**2 650 117 340**	**2 650 117 350**	0.29[0.13]

RANS8, side mount with sensor holder





Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg]
2 650 117 480	**2 650 117 490**	**2 650 117 500**	0.40[0,18]

Rotary Actuator, Series RAN

RAN20, vane type, 2.6 Nm (23.0 in.lbs.)

Rexroth
Bosch Group

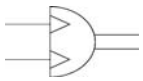
Technical Data

Operating type		Double acting single vane type
Turning angle	RAN20	90°, 180°, 270°
Turning angle tolerence		+3° to 0°
Working pressure	RAN20	2–7 bar (30 - 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Vane rod	Carbon steel (nitriding processing)

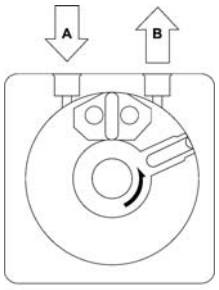
Application area

Suitable for all applications with rotary movements.

Technical Information

Symbol	Effective torque at 87 psi[6 bar]	Port size	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	23.0 in.lbs. (2.60 Nm)	10-32 (M5 x 0.8)	0.31[8]	150[10.3]	0.133[15]	66.14[294.2]	6.61[29.4]	Rubber bumper

Operating principle single vane rotary actuator

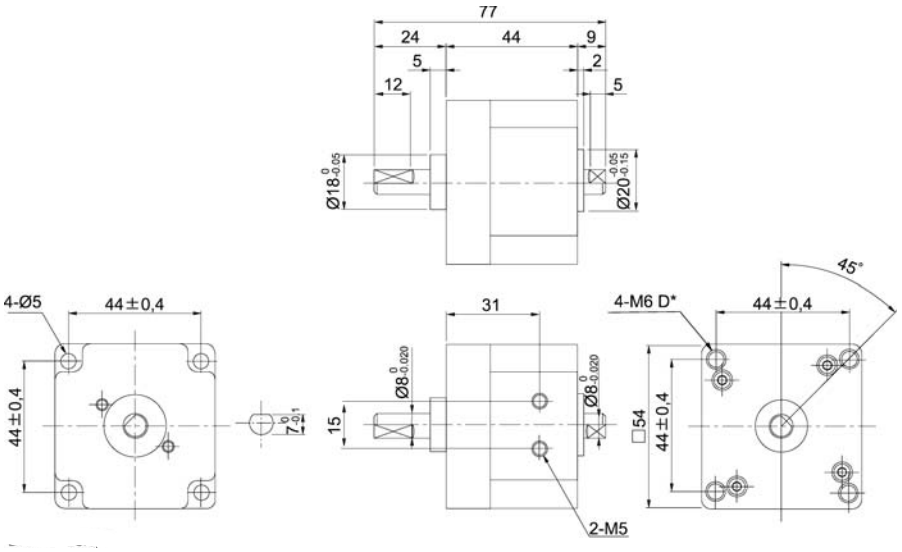


Rotary Actuator, Series RAN

RAN20, vane type, 2.6 Nm (23.0 in.lbs.

Rexroth
Bosch Group

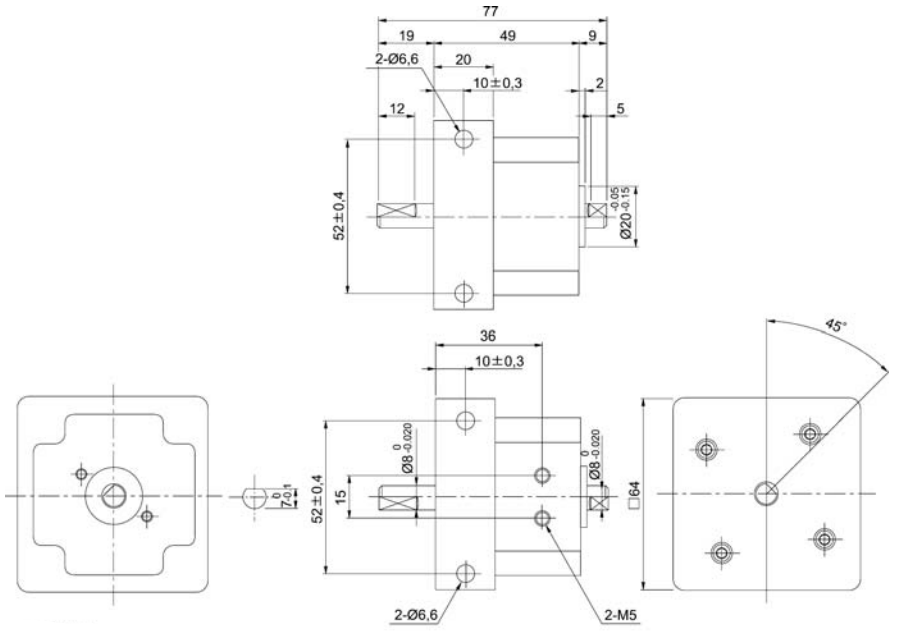
RAN20, front mount



D* = Depth 9

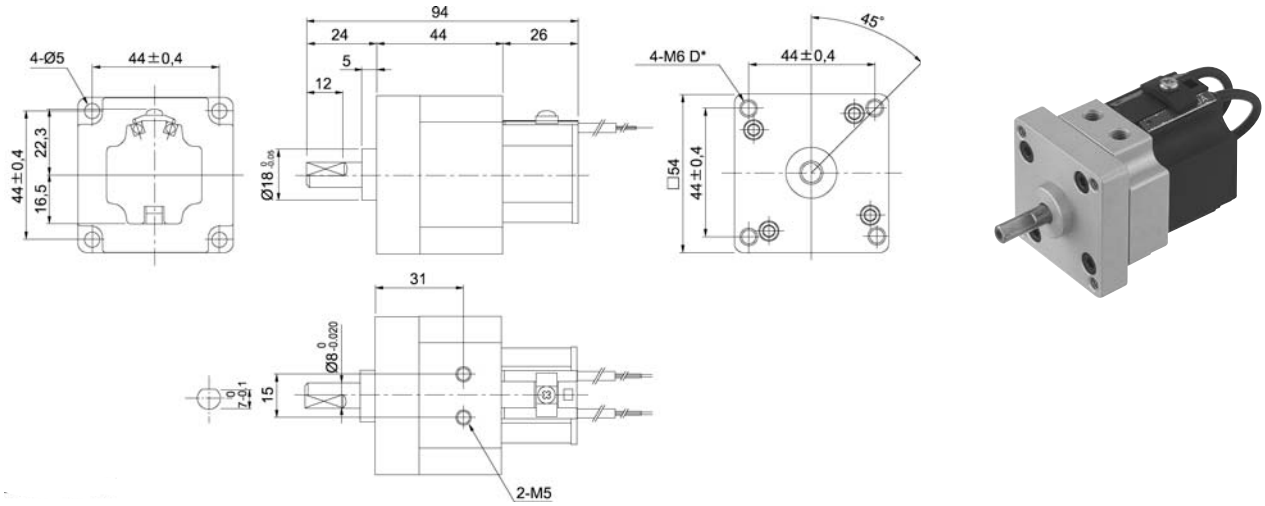
Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg] for 90° and 180°	Weight lbs.[kg] for 270°
2 650 117 090	**2 650 117 100**	**2 650 117 110**	0.60[0.27]	0.80[0.365]

RAN20, side mount



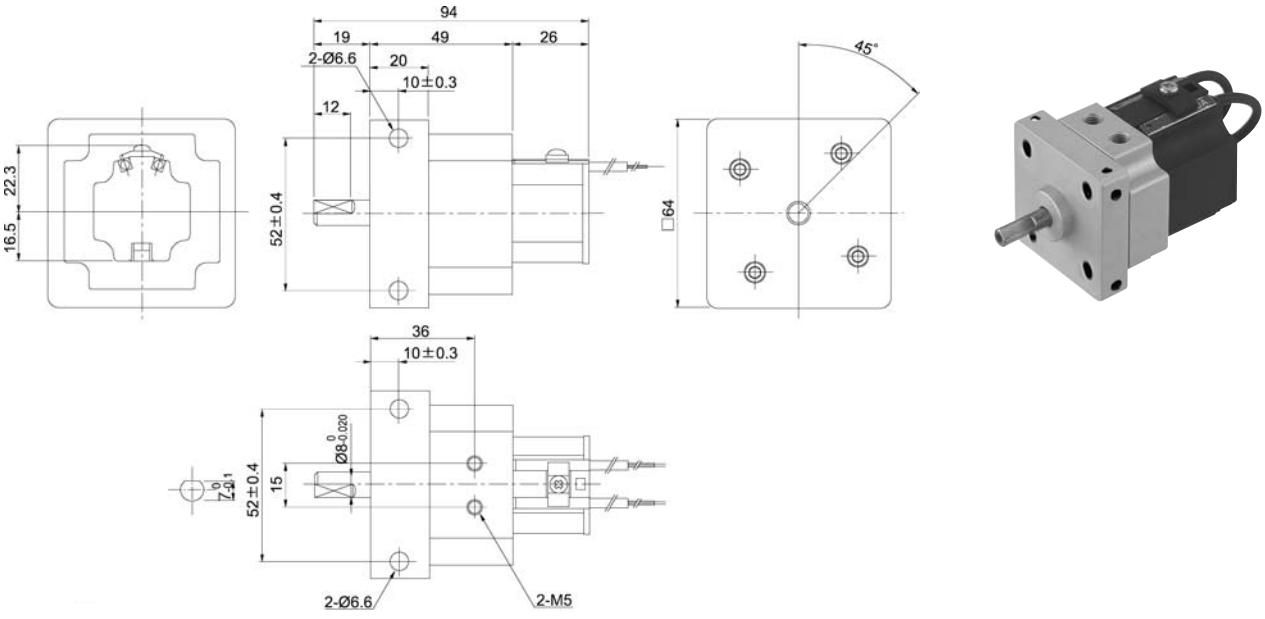
Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg] for 90° and 180°	Weight lbs.[kg] for 270°
2 650 117 240	**2 650 117 250**	**2 650 117 260**	0.77[0.35]	0.76[0.345]

RANS20, front mount with sensor holder



Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg] for 90° and 180°	Weight lbs.[kg] for 270°
2 650 117 360	**2 650 117 370**	**2 650 117 380**	0.60[0.27]	0.80[0.365]

RANS20, side mount with sensor holder



Code no. 90°	Code no. 180°	Code no. 270°	Weight lbs.[kg] for 90° and 180°	Weight lbs.[kg] for 270°
2 650 117 510	**2 650 117 520**	**2 650 117 530**	0.77[0.35]	0.76[0.345]

Rotary Actuator, Series RAN

RAN50, vane type, 7.1 Nm (62.8 in.lbs.)

Rexroth
Bosch Group

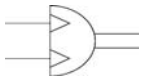
Technical Data

Operating type		Double acting single vane type
Turning angle	RAN50	90°, 180°, 275°
Turning angle tolerence		+3° to 0°
Working pressure	RAN50	2–7 bar (30 - 105 psi)
Ambient temperature range		0 °C to +50 °C / 32° to 122°F
Medium		Compressed air, lubricated or non-lubricated
Material	Housing	Aluminum alloy (anodized)
	Vane rod	Carbon steel (nitriding processing)

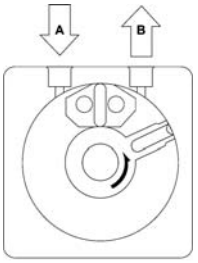
Application area

Suitable for all applications with rotary movements.

Technical Information

Symbol	Effective torque at 87 psi[6 bar]	Port size NPT/ISO G	Rod diameter in.[mm]	Proof pressure psi[bar]	Allowable kinetic energy in.lbs.[mJ]	Allowable radial load lbf[N]	Allowable axial load lbf[N]	Cushion-ing
	62.8 in.lbs. (7.10 Nm)	1/8	0.47[12]	150[10.3]	0.531[60]	64.83[588.4]	22.05[98.1]	None

Operating principle single vane rotary actuator

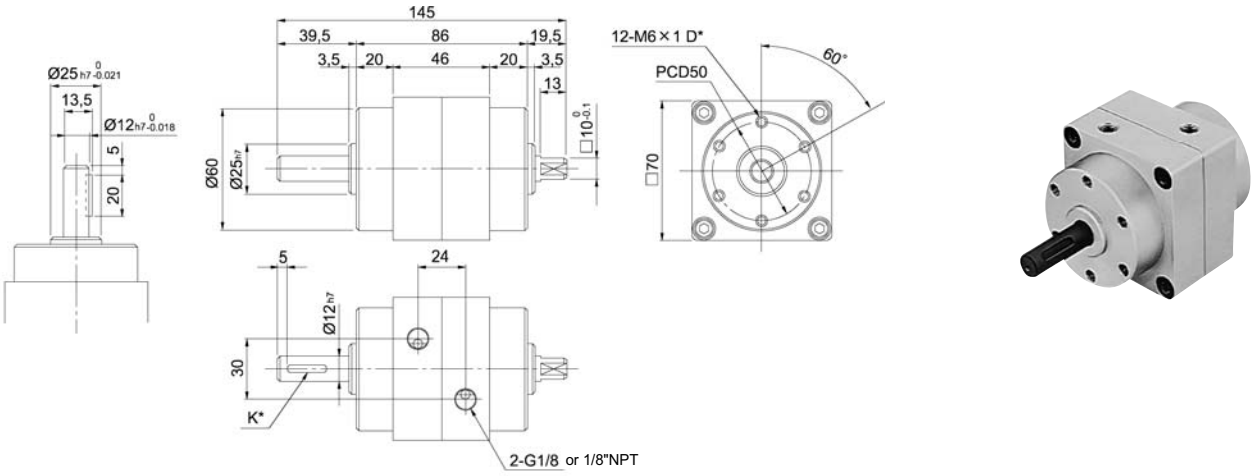


Rotary Actuator, Series RAN

RAN50, vane type, 7.1 Nm (62.8 in.lbs.)

Rexroth
Bosch Group

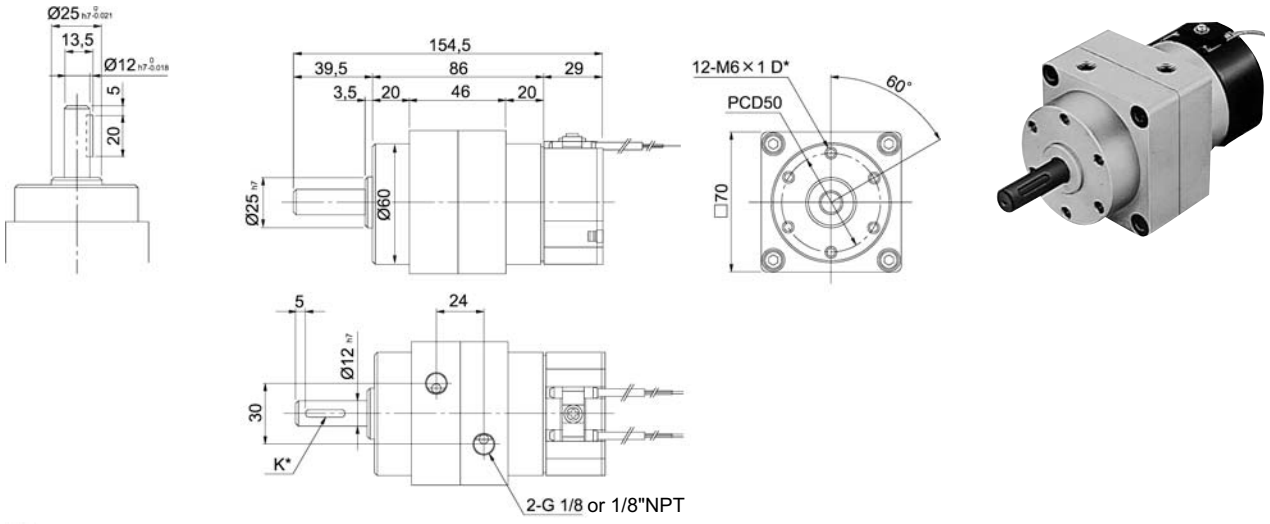
RAN50, front mount



D* = Depth 9 (back 6)
K* = Key groove, width 4 x depth 2.5 x length 20 (key included with actuator)

Code no. 90°	Code no. 180°	Code no. 275°	Weight lbs.[kg] for 90° and 180°	Weight lbs.[kg] for 275°
(G 1/8) 2 650 117 120	**2 650 117 130**	**2 650 117 140**	2.09[0.95]	2.01[0.91]
(1/8" NPT) 2 650 114 480	2 650 114 490	2 650 114 500	2.09[0.95]	2.01[0.91]

RANS50, front mount with sensor holder



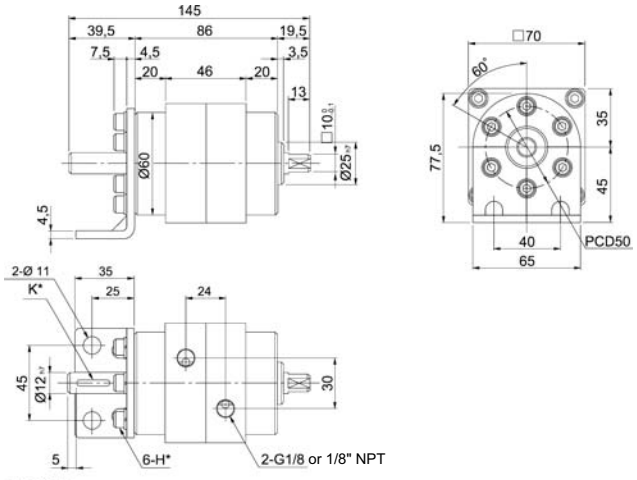
D* = Depth 9 (back 6)
K* = Key groove. Width 4 x depth 2,5 x length 20

Code no. 90°	Code no. 180°	Code no. 275°	Weight lbs.[kg] for 90° and 180°	Weight lbs.[kg] for 275°
(G 1/8) 2 650 117 390	**2 650 117 400**	**2 650 117 410**	2.09[0.95]	2.01[0.91]
(1/8" NPT) 2 650 114 510	2 650 114 520	2 650 114 530	2.09[0.95]	2.01[0.91]

Foot mounting brackets for RAN50 and RANS50

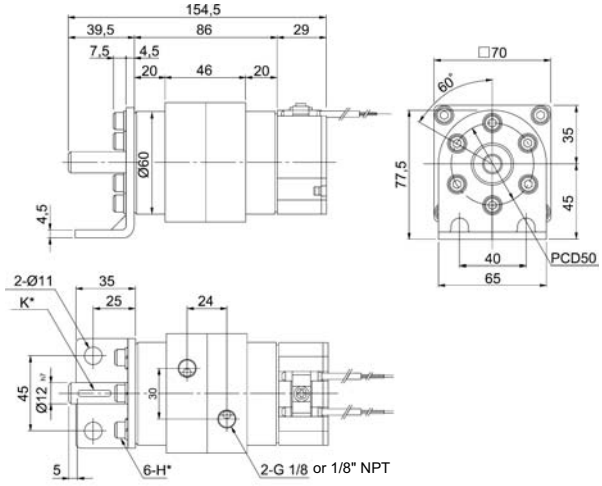
Type	Weight lbs.[kg]	Code no.
Foot mounting bracket	0.41[0.185]	**2 650 117 540**

Dimensions for foot mounting RAN50



K* = Key groove. Width 4 x depth 2,5 x length 20.
H* = Hexagon socket head cap screw.

Dimensions for foot mounting RANS50 with sensor holder

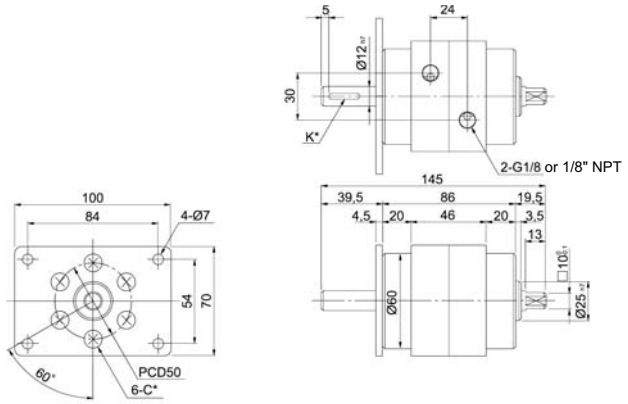


H* = Hexagon socket head cap screw.
K* = Key groove. Width 4 x depth 2,5 x length 20.

Flange mounting brackets for RAN50

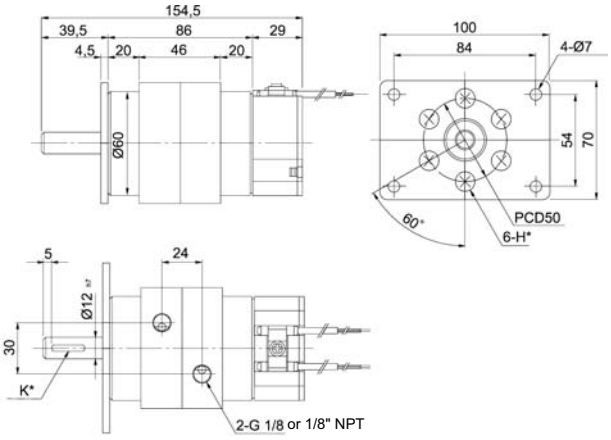
Type	Weight lbs.[kg]	Code no.
Flange mounting bracket	0.44[0.2]	**2 650 117 550**

Dimensions for flange mounting RAN50



K* = Key groove. Width 4 x depth 2,5 x length 20.
H* = Cross recessed head machine screw.

Dimensions for flange mounting RANS50 with sensor holder

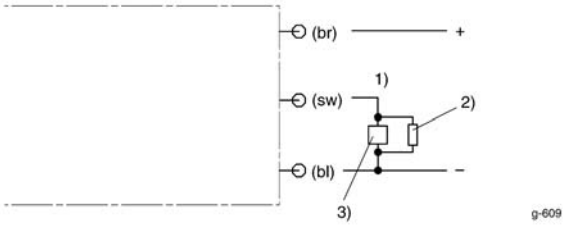


K* = Key groove. Width 4 x depth 2,5 x length 20.
H* = Cross recessed head machine screw.

Magnetic sensor

Switch type	Solid-state sensor
Output type	Sourcing (PNP), Sinking (NPN)
Cable	Black Polyurethane (PUR) jacket, PVC insulation
Electrical connection	M 8 socket coupling, or cable
Ambient temperature	–10 °C to +70 °C /14° to 158°F
Operating voltage (DC), Umax	5–28 V DC
Switching current	Max. 50 mA
Current consumption at 24 V DC	Max. 9 mA
Leakage current	Max. 0,01 mA
LED indicator	Provided, green
Voltage drop at 25 mA	Max. 1,2 mA
Enclosure protection class	IP 67(NEMA 6), fully insulated

Electric circuit with LED, 3-wires



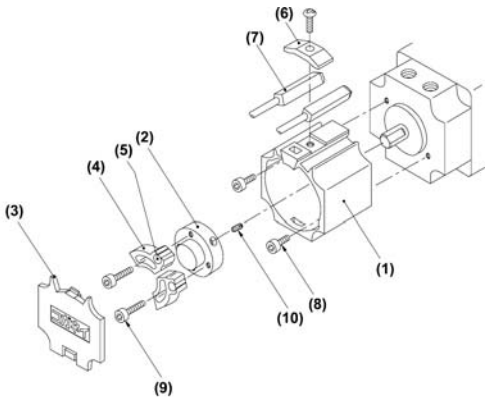
br=brown
sw=black
bl=blue

1) Output
2) Protection circuit
3) Load

Type	Cable length ft.[m]	Weight lbs.[kg]	Code no.
M 8 connector PNP Cable, PNP	0.5[0.15] 9.8[3.0]	0.01[0.006] 0.09[0.040]	**2 650 122 020** **2 650 122 030**
Cable, NPN	9.8[3.0]	0.09[0.040]	**2 650 122 071**
Also available: Cable, Reed	9.8[3.0]	0.09[0.040]	2 650 122 031

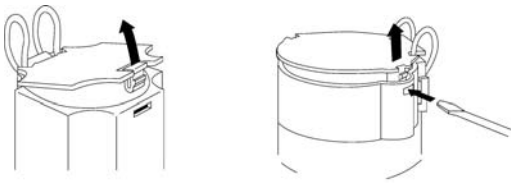
See Sensors/Electrical Accessories in last section of catalog for connector cables.

Sensor instructions



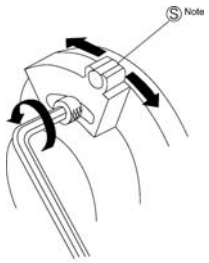
Position	Parts
1	Cover
2	Rotor
3	Cap
4	Magnetic holder
5	Magnet
6	Sensor switch holder
7	Sensor switches
8	Cover mounting bolt
9	Magnet holder fixing bolt
10	Rotor suppression bolt

How to remove the cap



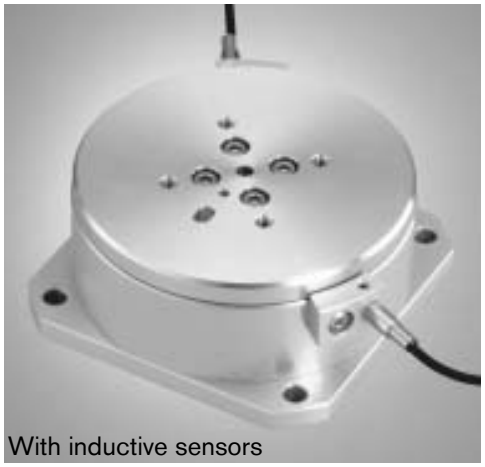
A. RANS1:3:8:20 Push up to remove, as shown in the figure.
B. RANS50 Operation is easily accomplished simply by inserting a screwdriver of appropriate size into the hole and turning lightly, as shown in the figure.

How to adjust the magnet



Note: If the magnet has been removed, always mount it so that the magnet head with the (S) stamp faces toward the RAN body. Mounting in the reverse direction could result in failure of the sensor switch.

Rexroth
Bosch Group

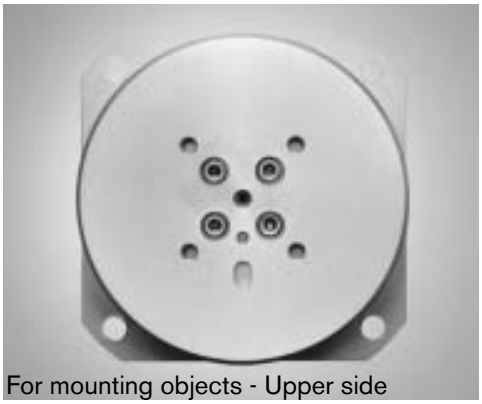

With inductive sensors

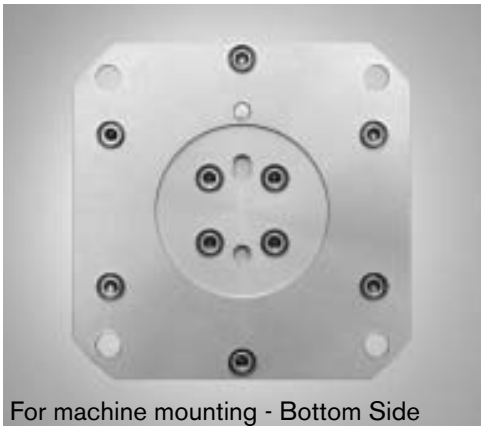
Simple function
The function is simple: the first port is pressurized initially, then the mechanism "locks up". The second port is pressurized and then the table moves. The movement continues as long as there is alternating pressure. All this can be managed with a 5/2 valve.
RWT series index table can be chosen in 6 different versions: 45°, 60°, or 90° index angles with right- or left-hand rotation.

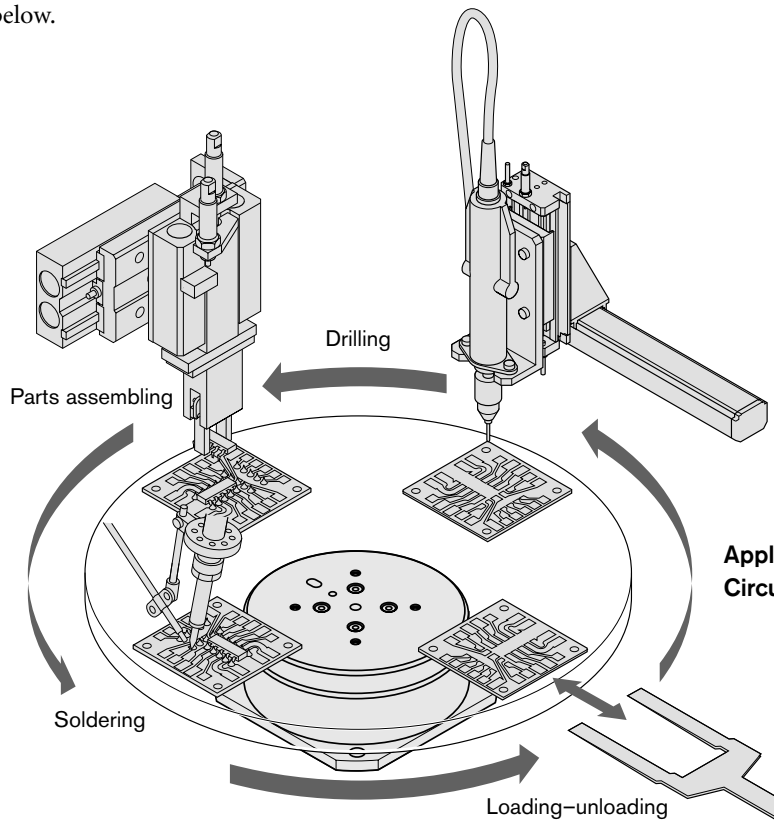
Applications
This new index table substantially simplifies the design and building of assembly machines.
A typical application would be indexing of a workpiece requiring 4 processes (6 or 8 also possible), as pictured below.

Indication of position
The RWT is also prepared for two inductive sensors. One for reset position and one for rotation position. The reset position sensor indicates ready-for-step, and the rotation sensor indicates step complete.

Easy mounting
The table has a useful plane-mounting surface with threaded mounting holes and locating dowels for precision and strength. On the upper side the table consists of 4 M4 holes for mounting the workpiece and two holes for fixing. The table has a square plate, with a 5.5 mm hole in each corner, for machine assembly and two holes for fixing underneath.


For mounting objects - Upper side


For machine mounting - Bottom Side



Application
Circuit board assembly

Index Table, Series RWT

Rexroth
Bosch Group

Technical Data

Operating type		Double acting piston type (ratchet and gear mechanism)
Operating pressure range		2–6 bar (29 to 90 psi)
Operating temperature range		0 °C to +60 °C / 32° to 140°F
Rotation angle	RWT45	45° ±0,2°
	RWT60	60° ±0,2°
	RWT90	90° ±0,2°
Rotation direction		Clockwise or counterclockwise
Medium		Compressed air, lubricated or non-lubricated
Material		Aluminum alloy (anodized)

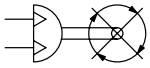
Application Area

Suitable for all indexing applications.

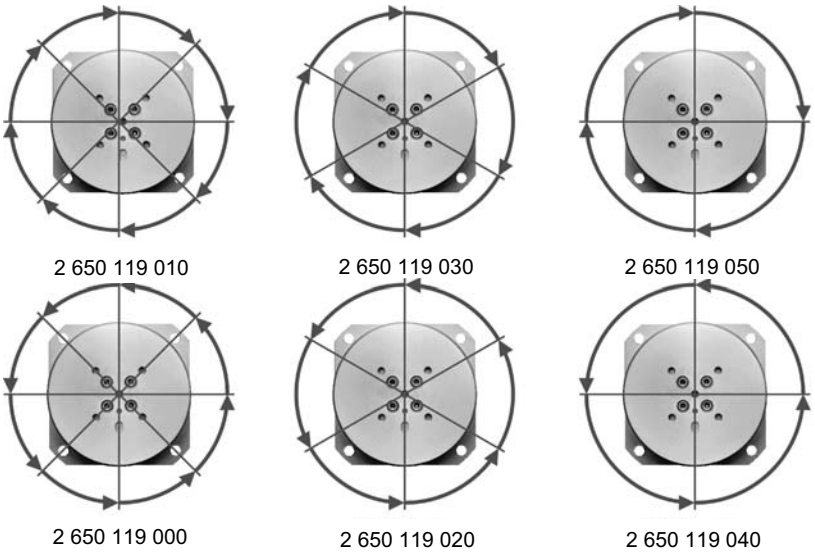
Technical information

All types	RWT
Effective torque at 72.5 psi [5 bar]	8.84 in.lbs. [1.0 Nm]
Port size	10-32 [M 5 x 0.8]
Turning time adjustment range	[0.2–1.0 s/90°]
Allowable kinetic energy	.44 in.lbs. [50 mJ]
Allowable thrust load	11.24 lbf [50 N]
Allowable radial load	0 lbf [0 N]
Allowable bending moment	13.26 in.lbs. [1.5 Nm]

Code No.

Symbol	Type	RWT45	RWT60	RWT90
	Counterclockwise - L Clockwise - R	**2 650 119 000** **2 650 119 010**	**2 650 119 020** **2 650 119 030**	**2 650 119 040** **2 650 119 050**

Operating principle

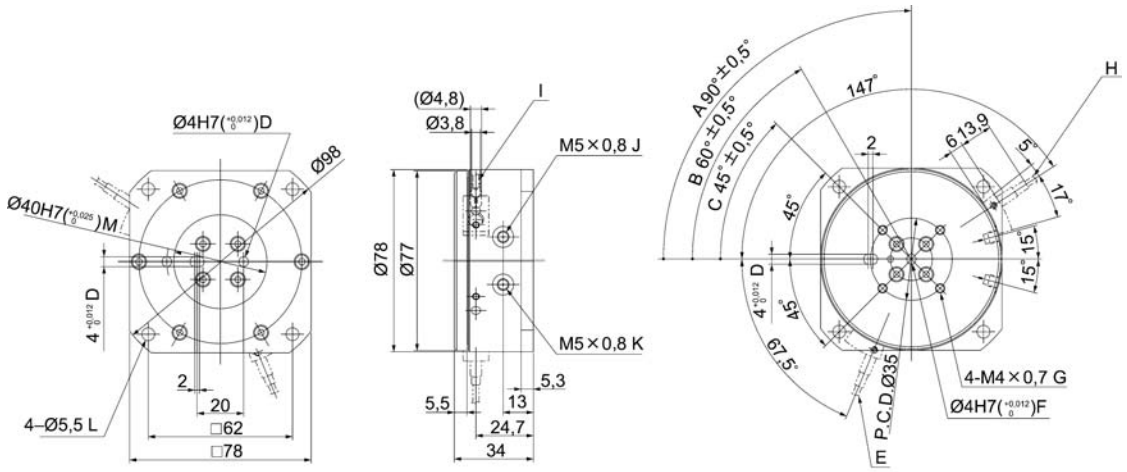


2 650 119 010 2 650 119 030 2 650 119 050

2 650 119 000 2 650 119 020 2 650 119 040

Note. Only for horizontal applications. Max. 45° mounting angle allowed.
Continuously turning 360°. No return required.

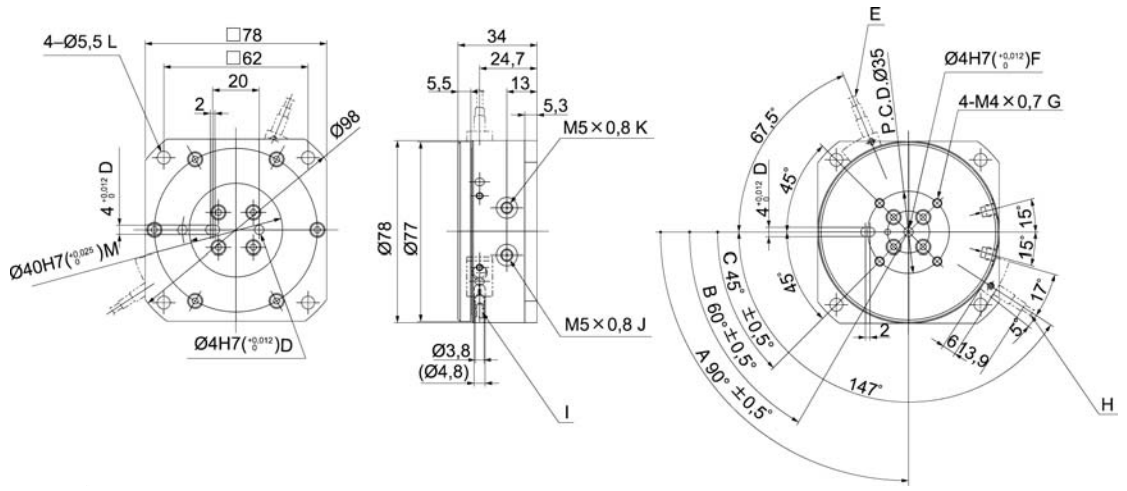
Dimensions for RWT, clockwise (- R)



A	B	C	D	E	F	G
RWT90 - R	RWT60 - R	RWT45 - R	Depth 4	Home position sensor	Depth 1,5	Depth 5

H	I	J	K	L	M
Rotation position sensor	Sensor	Connection port: unlocking	Connection port: rotation	Drilled through	Depth 1

Dimensions for RWT, counterclockwise (- L)



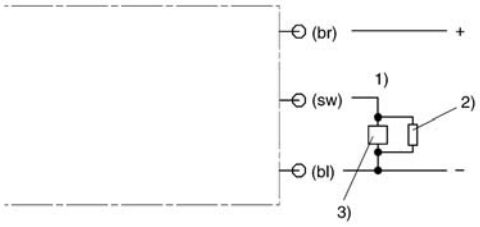
A	B	C	D	E	F	G
RWT90 - L	RWT60 - L	RWT45 - L	Depth 4	Home position sensor	Depth 1,5	Depth 5

H	I	J	K	L	M
Rotation position sensor	Sensor	Connection port: unlocking	Connection port: rotation	Drilled through	Depth 1

Inductive sensor

Switch type	Solid-state sensor
Cable	Black Polyurethane (PUR) jacket, PVC insulation
Electrical connection	M 8 socket coupling, or cable
Ambient temperature	–10 °C to +70 °C / 14° to 158°F
Operating voltage (DC), Umax	5–28 VDC
Switching current	Max. 50 mA
Current consumption at 24 VDC	Max. 9 mA
Leakage current	Max. 0.01 mA
LED indicator	Provided, green
Voltage drop at 25 mA	Max. 1.2 mA
Enclosure protection class	IP 67 (NEMA 6), fully insulated

Electric circuit with LED, 3-wires

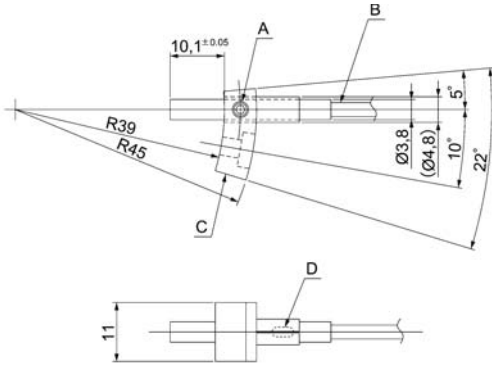


br=brown
sw=black
bl=blue

1) Output
2) Protection circuit
3) Load

Type	Cable length [m]	Weight lbs. [kg]	Code no.
M 8 connector, PNP	0.15	0.13 [0.006]	**2 650 122 000**
Cable, PNP	2.0	0.06 [0.027]	**2 650 122 010**
Cable, NPN	2.0	0.06 [0.027]	**2 650 122 090**

Sensor holder



A: Locking and fixation B: Sensor C: Holder D: LED diode

Type	Code no.
Sensor holder	**2 650 119 060**

Guide Cylinder, Series GPC and GPC-TL

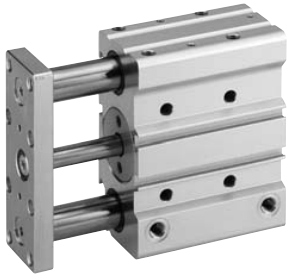
Series GPC, Ø 10–63 mm, double acting, magnetic piston

Rexroth
Bosch Group

★

Technical Data

Ambient temperature range		–10 °C to +70 °C (+14 °F to +158 °F)
Working pressure	Ø 10–25 mm	Min. 1.3 bar (19 psi), max. 8 bar (116 psi)
	Ø 32–63 mm	Min. 1 bar (15 psi), max. 8 bar (116 psi)
Medium		Compressed air, lubricated or non-lubricated
Material	Piston rod	Stainless steel
	Guide rods SB	Stainless steel
	Guide rods BB	Ø 12–20 mm, corrosion resistant steel, hardened
	Guide rods BB	Ø 25–63 mm, steel, hardened
	Barrel	Anodized aluminum
	Scrapers	PUR (Polyurethane)
	Front plate	Steel, galvanized



Technical information
The guide cylinder is equipped with 2 rigid guide rods supported by slide bearings (SB) or ball bearings (BB).
Both types have scrapers on the guide rods.
For corrosive environment we recommend the version SB (guide rods in stainless steel).

Application area

For precise movements with high side load capacity.
The guide cylinder can be used as:
– Stopper in conveyer systems.
– Firm definition point for positioning objects.
– Carrier of a second axis. The next smaller cylinder fits directly on the front plate of a bigger cylinder.
– Carrier of grippers or suction cups in material handling applications.

Technical information

Piston diameter		[mm]	10	12	16	20	25	32	40	50	63
Theoretical piston force	push stroke	[N] (lbf)	45 (10)	67 (15)	120 (27)	180 (41)	290 (65)	480 (108)	750 (169)	1150 (259)	1850 (416)
at 6 bar (87 psi)	pull stroke	[N] (lbf)	40 (9)	50 (11)	100 (23)	140 (32)	240 (54)	410 (92)	680 (153)	1040 (234)	1670 (375)
Max. velocity		[m/s]	0,5	0,5	0,5	0,5	0,8	0,6	0,6	0,6	0,6
		(ft/s)	(1.6)	(1.6)	(1.6)	(1.6)	(2.6)	(2.0)	(2.0)	(2.0)	(2.0)
Max. cushioning energy E_{max}		[Nm] (in.lbs)	0,04 (0.36)	0,1 (0.89)	0,11 (0.97)	0,15 (1.33)	0,35 (3.10)	0,4 (3.54)	0,52 (4.60)	0,64 (5.66)	0,75 (6.64)

Part no.: GPC with slide bearing, SB

Piston Ø	10	12	16	20	25
Stroke					
10	**R402000294**	**0822060000**	**0822061000**	**0822062000**	**0822063000**
20	**R402000296**	**0822060001**	**0822061001**	**0822062001**	**0822063001**
25	**R402000297**	**0822060007**	**0822061007**	**0822062007**	**0822063007**
30	**R402000298**	**0822060002**	**0822061002**	**0822062002**	**0822063002**
40	**R402000300**	**0822060003**	**0822061003**	**0822062003**	**0822063003**
50	**R402000302**	**0822060004**	**0822061004**	**0822062004**	**0822063004**
75	**R402000307**	**0822060005**	**0822061005**	**0822062005**	**0822063005**
100	**R402000312**	**0822060006**	**0822061006**	**0822062006**	**0822063006**
125	–	–	–	–	–
160	–	–	–	–	–
200	–	–	–	–	–

Piston Ø	32	40	50	63
Stroke				
10	–	–	–	–
20	–	–	–	–
25	**0822064000**	**0822065000**	**0822066000**	**0822067000**
30	–	–	–	–
40	–	–	–	–
50	**0822064001**	**0822065001**	**0822066001**	**0822067001**
75	**0822064002**	**0822065002**	**0822066002**	**0822067002**
100	**0822064003**	**0822065003**	**0822066003**	**0822067003**
125	**0822064004**	**0822065004**	**0822066004**	**0822067004**
160	**0822064005**	**0822065005**	**0822066005**	**0822067005**
200	**0822064006**	**0822065006**	**0822066006**	**0822067006**

Part no.: Guide cylinder with ball bearing, BB

Piston Ø	10	12	16	20	25
Stroke					
10	**R402000314**	**0822060100**	**0822061100**	**0822062100**	**0822063100**
20	**R402000316**	**0822060101**	**0822061101**	**0822062101**	**0822063101**
25	**R402000317**	**0822060107**	**0822061107**	**0822062107**	**0822063107**
30	**R402000318**	**0822060102**	**0822061102**	**0822062102**	**0822063102**
40	**R402000320**	**0822060103**	**0822061103**	**0822062103**	**0822063103**
50	**R402000322**	**0822060104**	**0822061104**	**0822062104**	**0822063104**
75	**R402000327**	**0822060105**	**0822061105**	**0822062105**	**0822063105**
100	**R402000332**	**0822060106**	**0822061106**	**0822062106**	**0822063106**
125	–	–	–	–	–
160	–	–	–	–	–
200	–	–	–	–	–

Piston Ø	32	40	50	63
Stroke				
10	–	–	–	–
20	–	–	–	–
25	**0822064100**	**0822065100**	**0822066100**	**0822067100**
30	–	–	–	–
40	–	–	–	–
50	**0822064101**	**0822065101**	**0822066101**	**0822067101**
75	**0822064102**	**0822065102**	**0822066102**	**0822067102**
100	**0822064103**	**0822065103**	**0822066103**	**0822067103**
125	**0822064104**	**0822065104**	**0822066104**	**0822067104**
160	**0822064105**	**0822065105**	**0822066105**	**0822067105**
200	**0822064106**	**0822065106**	**0822066106**	**0822067106**

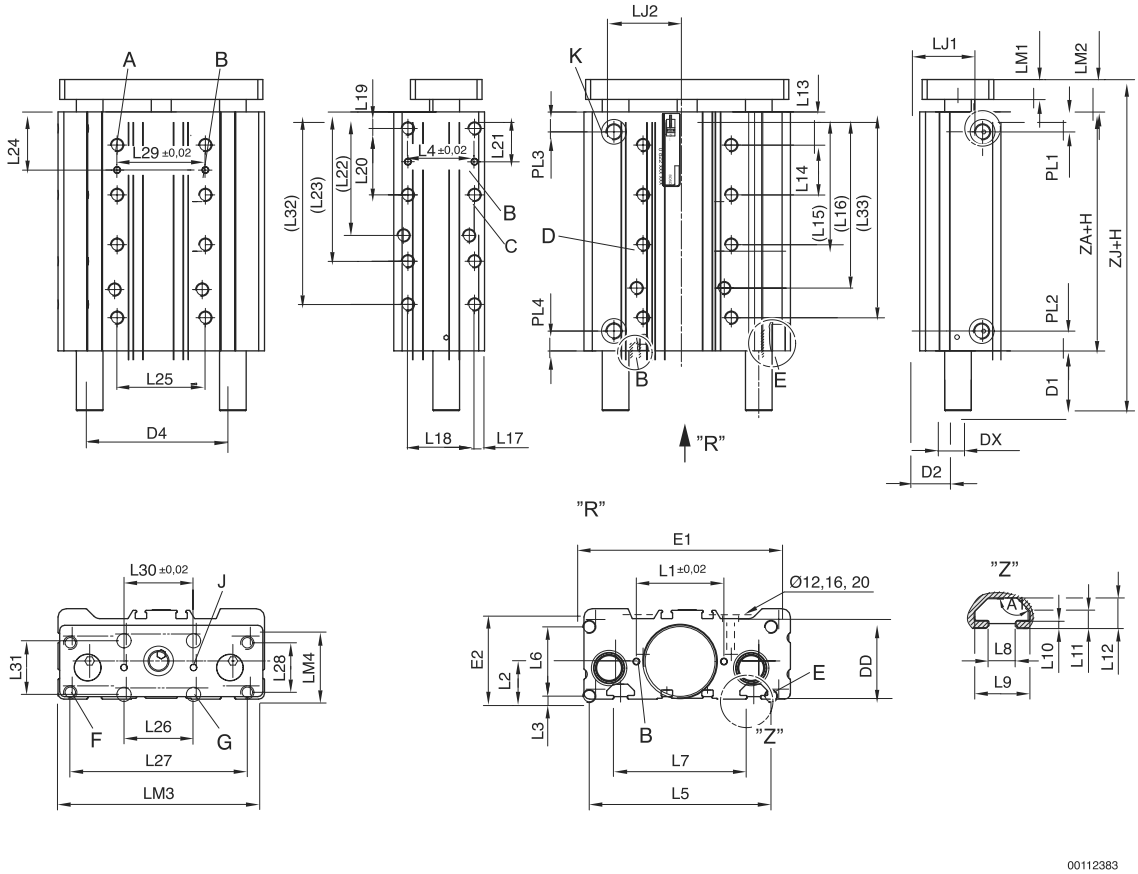
Intermediate stroke lengths

Intermediate strokes are realized by using restriction rings into the body of the next longer cylinder stroke.
Intermediate strokes in steps of 5 mm are possible by using the next longer cylinder body.
To get a dia. 40 cylinder with an 85 mm stroke, for example, a 100 mm stroke body is used with a 15 mm restriction ring.
Max. stroke at 12–20 mm dia.: 150 mm, at 25–63 mm dia.: 200 mm.
The dimensions will be the same as for the basic cylinder.
Each intermediate stroke length cylinder has a specific code number.

Total weight kg (lbs)

Piston Ø	Type	Stroke											
		10	20	25	30	40	50	75	100	125	150	160	200
10	BB	0,18 (0.40)	0,20 (0.44)	0,21 (0.46)	0,23 (0.51)	0,25 (0.55)	0,27 (0.60)	0,33 (0.73)	0,39 (0.86)	–	–	–	–
	SB	0,19 (0.42)	0,22 (0.49)	0,23 (0.51)	0,24 (0.53)	0,27 (0.60)	0,29 (0.64)	0,36 (0.79)	0,42 (0.93)	–	–	–	–
12	BB	0,28 (0.62)	0,32 (0.71)	0,35 (0.77)	0,37 (0.82)	0,43 (0.95)	0,48 (1.06)	0,59 (1.3)	0,70 (1.54)	0,81 (1.79)	0,92 (2.03)	–	–
	SB	0,30 (0.66)	0,34 (0.75)	0,37 (0.82)	0,39 (0.86)	0,45 (0.99)	0,49 (1.08)	0,61 (1.34)	0,73 (1.61)	0,85 (1.87)	0,97 (2.14)	–	–
16	BB	0,36 (0.79)	0,41 (0.90)	0,44 (0.97)	0,47 (1.04)	0,56 (1.23)	0,61 (1.34)	0,74 (1.63)	0,88 (1.94)	1,02 (2.25)	1,15 (2.54)	–	–
	SB	0,38 (0.84)	0,44 (0.97)	0,46 (1.01)	0,49 (1.08)	0,57 (1.26)	0,63 (1.39)	0,77 (1.7)	0,91 (2.01)	1,06 (2.34)	1,20 (2.65)	–	–
20	BB	0,48 (1.06)	0,54 (1.19)	0,58 (1.28)	0,61 (1.34)	0,72 (1.59)	0,79 (1.74)	0,95 (2.09)	1,12 (2.47)	1,30 (2.87)	1,47 (3.24)	–	–
	SB	0,50 (1.1)	0,57 (1.26)	0,60 (1.32)	0,64 (1.41)	0,73 (1.61)	0,80 (1.76)	0,98 (2.16)	1,16 (2.56)	1,35 (2.98)	1,52 (3.35)	–	–
25	BB	0,90 (1.98)	0,93 (2.05)	1,03 (2.27)	1,03 (2.27)	1,13 (2.49)	1,22 (2.69)	1,45 (3.2)	1,69 (3.73)	1,95 (4.3)	–	2,28 (5.03)	2,67 (5.89)
	SB	0,82 (1.81)	0,92 (2.03)	1,05 (2.31)	1,05 (2.31)	1,14 (2.51)	1,25 (2.76)	1,56 (3.44)	1,83 (4.03)	2,15 (4.74)	–	2,53 (5.58)	2,97 (6.55)
32	BB	–	–	1,44 (3.17)	–	–	1,77 (3.9)	2,10 (4.63)	2,41 (5.31)	2,77 (6.11)	–	3,22 (7.1)	3,74 (8.25)
	SB	–	–	1,56 (3.44)	–	–	1,93 (4.25)	2,26 (4.98)	2,62 (5.78)	3,06 (6.75)	–	3,57 (7.87)	4,17 (9.19)
40	BB	–	–	1,72 (3.79)	–	–	2,1 (4.63)	2,5 (5.51)	2,9 (6.39)	3,3 (7.28)	–	3,76 (8.29)	4,4 (9.7)
	SB	–	–	1,8 (3.97)	–	–	2,2 (4.85)	2,6 (5.73)	3,08 (6.79)	3,6 (7.94)	–	4,1 (9.04)	4,8 (10.6)
50	BB	–	–	2,7 (5.95)	–	–	3,2 (7.05)	3,9 (8.6)	4,4 (9.7)	5,0 (11)	–	5,8 (12.8)	6,6 (14.6)
	SB	–	–	3,0 (6.61)	–	–	3,6 (7.94)	4,2 (9.26)	4,8 (10.6)	5,6 (12.3)	–	6,4 (14.1)	7,3 (16.1)
63	BB	–	–	3,55 (7.83)	–	–	4,2 (9.26)	4,96 (10.9)	5,56 (12.3)	6,27 (13.8)	–	7,1 (15.7)	8 (17.6)
	SB	–	–	3,8 (6.79)	–	–	4,5 (9.92)	5,2 (11.5)	5,9 (13)	6,86 (15.1)	–	7,78 (17.2)	8,9 (19.6)

BB = Ball bearing, SB = Slide bearing.



+H = stroke

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Available format: 2D; dxf, 3D; Pro/E and STEP.

Outer dimensions

Piston Ø	D2	D4	E1	E2	LM1	LM2	LM3	LM4	ZA
10	7	–	50	21	5	13,5	48	19	36
12	14,5	40	58	30,5	8	12,7	55	27	34,4
16	15,8	47	68	33	8	13,5	65	30	36
20	16,5	54	80	36	10	15,5	77	33	36
25	18	59	95	43	10	15,5	93	33	42*
32	23	75,6	114	48,5	12	18,5	112	43	46,5
40	23	86	124	54,5	12	19,5	122	43	44
50	27,5	104	148	64	15	23,5	146	52	46
63	35	124	162	78,5	15	24	160	67	51

* For stroke 10 type BB, ZA = 52

Air connection dimensions

Piston Ø	PL1	PL2	PL3	PL4	LJ1	LJ2	K / DE
10	8	8	8	8	15,5	15	M5
12	8,5	8,5	8,5	8,5	24,8	17,5	M5
16	8,8	8,8	8,8	8,8	27	21	M5
20	10	10	10	10	26,5	25	M5
25	11	11	11	11	29,6	32	G 1/8
32	13,5	13,5	13,5	13,5	40	40,5	G 1/8
40	12	12	12	12	37,8	44	G 1/8
50	13	13	13	13	54,5	50,5	G 1/4
63	13,7	13,7	13,7	13,7	57	59	G 1/4

Mounting dimensions

Piston Ø	A1	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
10	–	20 ±0.04	10,5	3	–	20	15	–	–	–	–
12	–	23 ±0.04	15	4	22	50	22	–	–	–	–
16	135°	28 ±0.04	16,5	4	25	61	25	43	6,15	12	1,5
20	135°	30 ±0.04	18	3,5	24	70	29	50	6,15	12	1,5
25	135°	35	20,5	4,5	25	85	34	52	6,15	12	1,5
32	135°	44	24	5	33	105	26	70	8,2	16,7	2,2
40	135°	53	27	6	40	110	42	80	8,2	16,7	2,2
50	135°	66	32	8	48	133	34,5	93	8,2	16,7	2,2
63	135°	84	39	8	60	146	62	112	10,2	20,3	6

Mounting dimensions

Piston Ø	L11	L12	L17	L18	L25	L26	L27	L28	L29	L30	L31
10	–	–	15	–	20	–	20	10	20	–	–
12	–	–	4	22	20	–	40	20	20	–	–
16	1,5	5,5	4	25	25	20	40	20	25	20	22
20	1,5	5,5	4,5	24	30	25	50	25	30	25	25
25	1,5	5,5	5,5	25	32	30	81	23	32	30	24
32	2,8	9	6,5	33	42	32	97	30	42	32	25
40	2,8	9	6	40	53	42	107	30	53	42	33
50	2,8	9	7,5	48	63	53	134	40	63	53	40
63	6	16	11	60	80	63	140	48	80	63	48

Mounting holes position. Top / bottom

Stroke	Ø 10			
	L13	L14	L15	L24
10	15	–	–	25
20	15	20	–	25
25	15	20	–	25
30	15	20	–	25
40	15	20	–	25
50	15	20	55	25
75	15	20	55	25
100	15	20	55	25

Mounting holes position. Top / bottom

Stroke	Ø 12				Ø 16				Ø 20				Ø 25					
	L13	L14	L15	L24	L13	L14	L15	L24	L13	L14	L15	L24	L13	L14	L15	L16	L24	L33
10	14,5	–	–	25,5	14	18	–	26,5	15	16	–	23	16,5	19	–	–	26	–
20	14,5	18	–	25,5	14	25	–	26,5	15	24	–	27	16,5	25	–	–	29	–
25	14,5	22	–	25,5	14	25	–	26,5	15	24	–	27	16,5	25	–	–	29	–
30	14,5	22	–	25,5	14	25	–	26,5	15	24	–	27	16,5	25	–	–	29	–
40	14,5	22	–	25,5	14	25	–	26,5	15	24	–	27	16,5	25	66,5	–	29	–
50	14,5	22	58,5	25,5	14	25	64	26,5	15	24	63	27	16,5	25	66,5	–	29	–
75	14,5	22	58,5	25,5	14	25	64	26,5	15	24	63	27	16,5	25	66,5	91,5	29	–
100	14,5	22	58,5	25,5	14	25	64	26,5	15	24	63	27	16,5	25	66,5	91,5	29	125,5
125	14,5	22	58,5	25,5	14	25	64	26,5	15	24	63	27	16,5	25	66,5	91,5	29	150,5
150	14,5	22	58,5	25,5	14	25	64	26,5	15	24	63	27	–	–	–	–	–	–
160	–	–	–	–	–	–	–	–	–	–	–	–	16,5	25	66,5	91,5	29	180,5
200	–	–	–	–	–	–	–	–	–	–	–	–	16,5	25	66,5	91,5	29	225,5

Mounting holes position. Top / bottom

Stroke	Ø 32						Ø 40						Ø 50						Ø 63				
	L13	L14	L15	L16	L24	L33	L13	L14	L15	L16	L24	L33	L13	L14	L15	L16	L24	L33	L13	L14	L15	L24	L33
25	20,5	30	–	–	35,5	–	20	30	–	–	35	–	23	25	–	–	35,5	–	24	28	–	38	–
50	20,5	33	76	–	37	–	20	40	–	–	40	–	23	48	–	–	47	–	24	28	–	38	–
75	20,5	33	86,5	–	37	–	20	40	100	–	40	–	23	48	–	–	47	–	24	60	–	54	–
100	20,5	33	86,5	119,5	37	–	20	40	100	–	40	–	23	48	119	–	47	–	24	60	127	54	–
125	20,5	33	86,5	119,5	37	151	20	40	100	140	40	–	23	48	119	148	47	–	24	60	144	54	–
160	20,5	33	86,5	119,5	37	186	20	40	100	140	40	184	23	48	119	167	47	–	24	60	144	54	187
200	20,5	33	86,5	119,5	37	226	20	40	100	140	40	224	23	48	119	167	47	223	24	60	144	54	204

Mounting holes position. Side

Stroke	Ø 10			
	L19	L20	L21	L22
10	8	20	13*	–
20	8	20	13*	–
25	8	20	13*	–
30	8	20	13*	–
40	8	20	13*	–
50	8	20	13*	48
75	8	20	13*	48
100	8	20	13*	48

* 2 holes C-C 10 mm.

Mounting holes position. Side

Stroke	Ø 12				Ø 16				Ø 20				Ø 25					
	L19	L20	L21	L22	L19	L20	L21	L22	L19	L20	L21	L22	L19	L20	L21	L22	L23	L32
10	8	20	18	–	8	18	20,5	–	8	20	18	–	8	22	19	–	–	–
20	8	20	18	–	8	25	20,5	–	8	30	23	–	8	22	19	–	–	–
25	8	20	18	–	8	25	20,5	–	8	30	23	–	8	32	24	–	–	–
30	8	20	18	–	8	25	20,5	–	8	30	23	–	8	32	24	–	–	–
40	8	20	18	–	8	25	20,5	–	8	30	23	–	8	32	24	60	–	–
50	8	20	18	48	8	25	20,5	58	8	30	23	68	8	32	24	70	–	–
75	8	20	18	48	8	25	20,5	58	8	30	23	68	8	32	24	72	95	–
100	8	20	18	48	8	25	20,5	58	8	30	23	68	8	32	24	72	104	–
125	8	20	18	48	8	25	20,5	58	8	30	23	68	8	32	24	72	104	145
150	8	20	18	48	8	25	20,5	58	8	30	23	68	8	32	24	–	–	–
160	–	–	–	–	–	–	–	–	–	–	–	–	8	32	24	72	104	180
200	–	–	–	–	–	–	–	–	–	–	–	–	8	32	24	72	104	220

Guide Cylinder, Series GPC and GPC-TL

Series GPC, Ø 10–63 mm, double acting, magnetic piston

Rexroth
Bosch Group

Mounting holes position. Side

Stroke	Ø 32						Ø 40						Ø 50					Ø 63				
	L19	L20	L21	L22	L23	L32	L19	L20	L21	L22	L23	L32	L19	L20	L21	L22	L23	L19	L20	L21	L22	L23
25	10	35	27,5	–	–	–	10	30	25	–	–	–	12	30	27	–	–	12	30	27	–	–
50	10	42	31	–	–	–	10	53	36,5	–	–	–	12	30	27	–	–	12	30	27	–	–
75	10	42	31	94	–	–	10	53	36,5	91	–	–	12	63	43,5	–	–	12	80	52	–	–
100	10	42	31	94	122,5	–	10	53	36,5	116	–	–	12	63	43,5	116	–	12	80	52	–	–
125	10	42	31	94	136	–	10	53	36,5	116	–	–	12	63	43,5	138	–	12	80	52	142	–
160	10	42	31	94	136	182,5	10	53	36,5	116	169	–	12	63	43,5	138	176	12	80	52	172	–
200	10	42	31	94	136	222,5	10	53	36,5	116	169	216	12	63	43,5	138	201	12	80	52	172	217

Mounting holes dimensions, size x depth [mm]

Piston Ø	A	B	C	D dia.*	DD	E dia.	F dia.*	G dia.*	J dia.*
10	M4 x 6	4 H7x4	M4 x 6	3,2	17,4	M4 x 8	M4	–	–
12	M5 x 8	4 H7x4	M5 x 8	4,2	20	M5 x 8	M4	–	–
16	M5 x 8	4 H7x4	M5 x 8	4,2	28,5	M5 x 8	M4	5,5	4 H9
20	M6 x 10	4 H7x4	M6 x 10	5,2	30,5	M5 x 10	M5	5,5	4 H9
25	M6 x 10	4 H7x4	M6 x 10	5,6	35	M6 x 12	M6	6,5	4 H9
32	M8 x 14	4 H7x4	M8 x 14	7,3	42,5	M6 x 12	M8	6,5	4 H9
40	M8 x 14	4 H7x4	M8 x 14	7,3	48,5	M8 x 16	M8	8,5	4 H9
50	M10 x 20	5 H7x5	M10 x 20	9,2	56	M8 x 16	M8	8,5	4 H9
63	M10 x 20	5 H7x5	M10 x 20	9,2	66,5	M10 x 20	M10	10,5	5 H9

* Through hole / thread.

Guide rod dimensions, slide bearing (SB)

Piston Ø	Cyl. with stroke 10–30 mm		Cyl. with stroke 40–100 mm		Cyl. with stroke >100 mm		
	D1	ZJ	D1	ZJ	D1	ZJ	DX
10	13,5	63	13,5	63	13,5	63	8
12	0	47,1	17,1	64,8	32,1	79,8	10
16	0	49,5	21,2	69,6	36,2	84,6	12
20	0	51,5	21,2	71,6	36,2	86,6	12

Guide rod dimensions, slide bearing (SB)

Piston Ø	Cyl. with stroke 10–50 mm		Cyl. with stroke 75–100 mm		Cyl. with stroke >100 mm		
	D1	ZJ	D1	ZJ	D1	ZJ	DX
25	0	57,5	11	68,5	27	84,5	16

Guide rod dimensions, slide bearing (SB)

Piston Ø	Cyl. with stroke 25–100 mm		Cyl. with stroke >100 mm		
	D1	ZJ	D1	ZJ	DX
32	17	82	35	100	20
40	19	82,6	37	100,6	20
50	25	94,5	55	124,5	25
63	19	94,6	49	124,6	25

Guide rod dimensions, ball bearing (BB)

Piston Ø	Cyl. with stroke 10–30 mm		Cyl. with stroke 40–100 mm		Cyl. with stroke >100 mm		
	D1	ZJ	D1	ZJ	D1	ZJ	DX
10	13,5	63	13,5	63	13,5	63	6
12	0	47,1	18	65,6	33	80,6	8
16	0	49,5	22	70,4	37	85,4	10
20	0	51,5	22	72,4	37	87,4	10

Guide rod dimensions, ball bearing (BB)

Piston Ø	Cyl. with stroke 10 mm		Cyl. with stroke 20–30 mm		Cyl. with stroke 40–100 mm		Cyl. with stroke >100 mm		
	D1	ZJ	D1	ZJ	D1	ZJ	D1	ZJ	DX
25	9	76,5	19	76,5	29	86,5	47	104,5	12

Guide rod dimensions, ball bearing (BB)

Piston Ø	Cyl. with stroke 25–50 mm		Cyl. with stroke 75–100 mm		Cyl. with stroke >100 mm		
	D1	ZJ	D1	ZJ	D1	ZJ	DX
32	20	85	35	100	51	116	16
40	21,5	85	37	100,5	53	116,5	16
50	20	89,5	46	115,5	64	133,5	20
63	14	89,5	40	115,5	58	133,5	20

Max. velocity v [m/s] (ft/s) depending on payload

$$v = \sqrt{\frac{2 \cdot E_{max}}{m(1)+m(2)}}$$

m(1) = payload. m(2) = see "Weight of moving parts" table below.

Max. payload m(1) [kg] (lbs) depending on velocity

$$m(1) = \frac{2 \cdot E_{max}}{v^2} - m(2)$$

m(1) = payload. m(2) = see "Weight of moving parts" table below.

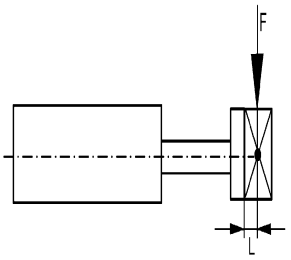
	Piston Ø 10	Piston Ø 12	Piston Ø 16	Piston Ø 20	Piston Ø 25	Piston Ø 32	Piston Ø 40	Piston Ø 50	Piston Ø 63
E_{max} [Nm] (in.lbs)	0,04 (3.54)	0,1 (0.89)	0,11 (0.97)	0,15 (1.33)	0,35 (3.1)	0,4 (3.54)	0,52 (4.60)	0,64 (5.66)	0,75 (6.64)
V_{max} [m/s] (ft/s)	0,5 (1.6)	0,5 (1.6)	0,5 (1.6)	0,5 (1.6)	0,8 (2.6)	0,6 (2.0)	0,6 (2.0)	0,6 (2.0)	0,6 (2.0)

Weight of moving parts [kg] (lbs) (guide rods, front plate, piston and piston rod)

Piston Ø	Type	Stroke											
		10	20	25	32	40	50	75	100	125	150	160	200
10	BB	0,070 (0.154)	0,075 (0.165)	0,075 (0.165)	0,080 (0.176)	0,080(0.176)	0,085 (0.187)	0,090 (0.198)	0,100 (0.220)	–	–	–	–
	SB	0,090 (0.198)	0,095 (0.209)	0,100 (0.220)	0,100 (0.220)	0,105 (0.231)	0,110 (0.243)	0,120 (0.265)	0,140 (0.309)	–	–	–	–
12	BB	0,12 (0.27)	0,13 (0.29)	0,13 (0.29)	0,14 (0.31)	0,15 (0.33)	0,16 (0.35)	0,17 (0.38)	0,19 (0.42)	0,21 (0.46)	0,23 (0.51)	–	–
	SB	0,13 (0.29)	0,14 (0.31)	0,15 (0.33)	0,15 (0.33)	0,17 (0.38)	0,18 (0.40)	0,2 (0.44)	0,22 (0.49)	0,26 (0.57)	0,28 (0.62)	–	–
16	BB	0,17 (0.38)	0,18 (0.40)	0,18 (0.40)	0,19 (0.42)	0,21 (0.46)	0,22 (0.49)	0,25 (0.55)	0,27 (0.60)	0,31 (0.68)	0,33 (0.73)	–	–
	SB	0,18 (0.40)	0,19 (0.42)	0,2 (0.44)	0,21 (0.46)	0,24 (0.53)	0,26 (0.57)	0,29 (0.64)	0,32 (0.71)	0,37 (0.82)	0,4 (0.88)	–	–
20	BB	0,24 (0.53)	0,26 (0.57)	0,26 (0.57)	0,27 (0.60)	0,3 (0.66)	0,31 (0.68)	0,34 (0.75)	0,37 (0.82)	0,41 (0.90)	0,44 (0.97)	–	–
	SB	0,26 (0.57)	0,27 (0.60)	0,28 (0.62)	0,29 (0.64)	0,33 (0.73)	0,34 (0.75)	0,38 (0.84)	0,42 (0.93)	0,47 (1.04)	0,51 (1.12)	–	–
25	BB	0,38 (0.84)	0,4 (0.88)	0,43 (0.95)	0,43 (0.95)	0,47 (1.04)	0,49 (1.08)	0,55 (1.21)	0,61 (1.34)	0,70 (1.54)	–	0,78 (1.72)	0,87 (1.92)
	SB	0,42 (0.93)	0,45 (0.99)	0,49 (1.08)	0,49 (1.08)	0,53 (1.17)	0,57 (1.26)	0,71 (1.57)	0,80 (1.76)	0,94 (2.07)	–	1,07 (2.36)	1,22 (2.69)
32	BB	–	–	0,75 (1.65)	–	–	0,85 (1.87)	1,00 (2.2)	1,10 (2.43)	1,25 (2.76)	–	1,39 (3.06)	1,55 (3.42)
	SB	–	–	0,92 (2.03)	–	–	1,06 (2.34)	1,21 (2.67)	1,35 (2.98)	1,58 (3.48)	–	1,79 (3.95)	2,20 (4.85)
40	BB	–	–	0,82 (1.81)	–	–	0,92 (2.03)	1,07 (2.36)	1,17 (2.58)	1,32 (2.91)	–	1,46 (3.22)	1,62 (3.57)
	SB	–	–	0,99 (2.18)	–	–	1,14 (2.51)	1,28 (2.82)	1,42 (3.13)	1,65 (3.64)	–	1,86 (4.1)	2,10 (4.63)
50	BB	–	–	1,45 (3.2)	–	–	1,61 (3.55)	1,90 (4.19)	2,06 (4.54)	2,31 (5.09)	–	2,54 (5.6)	2,80 (6.17)
	SB	–	–	1,77 (3.9)	–	–	2,01 (4.43)	2,24 (4.94)	2,47 (5.45)	2,93 (6.46)	–	3,25 (7.17)	3,62 (7.98)
63	BB	–	–	1,92 (4.23)	–	–	2,08 (4.59)	2,37 (5.22)	2,53 (5.58)	2,78 (6.13)	–	3,01 (6.64)	3,27 (7.21)
	SB	–	–	2,25 (4.96)	–	–	2,47 (4.59)	2,71 (5.97)	2,94 (6.48)	3,40 (7.5)	–	3,72 (8.2)	4,09 (9.02)

BB = Ball bearing, SB = Slide bearing.

Allowed static side force [N] (lbf), horizontal and vertical position



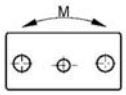
12 dia.; L = 25 mm, 16–63 dia.; L = 50 mm

Max. static side load F [N] (lbf) in full extended position

Piston Ø	Type	Cyl. with stroke											
		10	20	25	30	40	50	75	100	125	150	160	200
10	BB	10 (22.05)	9 (19.84)	8 (17.64)	8 (17.64)	7 (15.43)	6 (13.23)	5 (11.02)	5 (11.02)	–	–	–	–
	SB	12 (26.46)	11 (24.25)	11 (24.25	10 (22.06)	10 (22.06)	9 (19.84)	8 (17.64)	7 (15.43)	–	–	–	–
12	BB	19 (4.27)	17 (3.82)	16 (3.6)	15 (3.37)	23 (5.17)	22 (4.95)	20 (4.5)	19 (4.27)	19 (4.27)	17 (3.82)	–	–
	SB	28 (6.29)	24 (5.4)	23 (5.17)	21 (4.72)	31 (6.97)	28 (6.29)	22 (4.95)	19 (4.27)	16 (3.6)	13 (2.92)	–	–
16	BB	27 (6.07)	24 (5.4)	23 (5.17)	22 (4.95)	58 (13)	56 (12.6)	51 (11.5)	48 (10.8)	44 (9.89)	40 (8.99)	–	–
	SB	63 (14.2)	56 (12.6)	53 (11.9)	51 (11.5)	73 (16.4)	67 (15.1)	55 (12.4)	49 (11)	42 (9.44)	35 (7.87)	–	–
20	BB	27 (6.07)	24 (5.4)	23 (5.17)	22 (4.95)	58 (13)	56 (12.6)	51 (11.5)	48 (10.8)	44 (9.89)	40 (8.99)	–	–
	SB	63 (14.2)	56 (12.6)	53 (11.9)	51 (11.5)	73 (16.4)	67 (15.1)	55 (12.4)	49 (11)	42 (9.44)	35 (7.87)	–	–
25	BB	81 (18.2)	75 (16.9)	72 (16.2)	70 (15.7)	82 (18.4)	77 (17.3)	67 (15.1)	60 (13.5)	73 (16.4)	–	65 (14.6)	57 (12.8)
	SB	53 (11.9)	48 (10.8)	46 (10.3)	44 (9.89)	41 (9.22)	38 (8.54)	59 (13.3)	52 (11.7)	65 (14.6)	–	57 (12.8)	50 (11.2)
32	BB	101 (22.7)	93 (20.9)	90 (20.2)	87 (19.6)	81 (18.2)	76 (17.1)	93 (20.9)	83 (18.7)	95 (21.4)	–	84 (18.9)	74 (16.6)
	SB	156 (35.1)	144 (32.4)	139 (31.2)	134 (30.1)	126 (28.3)	118 (26.5)	103 (23.2)	90,8 (20.4)	116 (26.1)	–	102 (22.9)	90 (20.2)
40	BB	100 (22.5)	93 (20.9)	89 (20)	86 (19.3)	81 (18.2)	76 (17.1)	93 (20.9)	83 (18.7)	95 (21.4)	–	84 (18.9)	74 (16.6)
	SB	155 (34.8)	143 (32.1)	138 (31)	134 (30.1)	125 (28.1)	118 (26.5)	102 (22.9)	90 (20.2)	116 (26.1)	–	102 (22.9)	90 (20.2)
50	BB	123 (27.7)	114 (25.6)	110 (24.7)	107 (24.1)	100 (22.5)	94 (21.1)	135 (30.3)	121 (27.2)	136 (30.6)	–	121 (24.7)	108 (24.3)
	SB	242 (54.4)	226 (50.8)	218 (49)	211 (47.4)	198 (44.5)	187 (42)	164 (36.9)	146 (32.8)	215 (48.3)	–	191 (42.9)	169 (38)
63	BB	122 (27.4)	114 (25.6)	110 (24.7)	106 (23.8)	99,4 (22.3)	93,5 (21)	134 (30.1)	120 (27)	135 (30.3)	–	121 (24.7)	107 (24.1)
	SB	241 (54.2)	224 (50.4)	217 (48.8)	210 (47.2)	197 (44.3)	186 (41.8)	163 (36.6)	145 (32.6)	214 (48.1)	–	190 (42.7)	169 (38)

BB = Ball bearing, SB = Slide bearing.
The steps in load capacity on this chart are related to the number of bushings and distance between bushings.
Note! If a mass is attached to the front plate, please also verify "Max. velocity v" on previous page.

Allowed static moment M [Nm](in.lbs)



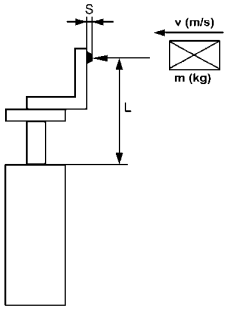
Max. moment M (Nm) (in.lbs)

Piston Ø	Type	Cyl. with stroke										
		10	20	25	30	40	50	75	100	125	160	200
10	BB	0,35 (0.77)	0,31 (0.68)	0,29 (0.64)	0,27 (0.60)	0,25 (0.55)	0,23 (0.51)	0,17 (0.38)	0,14 (0.31)	–	–	–
	SB	1,75 (3.86)	1,5 (3.31)	1,4 (3.09)	1,3 (2.87)	1,2 (2.65)	1,1 (2.43)	0,85 (1.87)	0,75 (1.65)	–	–	–
12	BB	0,38 (3.36)	0,34 (3.01)	0,32 (2.38)	0,3 (2.66)	0,46 (4.07)	0,44 (3.89)	0,4 (3.54)	0,38 (3.36)	0,36 (3.19)	0,34 (3.01)	–
	SB	0,56 (4.96)	0,48 (4.25)	0,46 (4.07)	0,42 (3.72)	0,62 (5.49)	0,56 (4.96)	0,44 (3.89)	0,38 (3.36)	0,32 (2.83)	0,26 (2.30)	–
16	BB	0,63 (5.58)	0,56 (4.96)	0,54 (4.78)	0,52 (4.60)	1,36 (12.04)	1,32 (11.69)	1,2 (10.62)	1,13 (10.0)	1,03 (9.12)	0,94 (8.32)	–
	SB	1,48 (13.10)	1,32 (11.68)	1,25 (11.06)	1,2 (10.62)	1,72 (15.22)	1,57 (13.90)	1,29 (11.42)	1,15 (10.18)	0,99 (8.87)	0,82 (7.26)	–
20	BB	0,73 (6.46)	0,65 (5.75)	0,62 (5.49)	0,59 (5.22)	1,57 (13.90)	1,51 (13.90)	1,38 (1.21)	1,3 (11.51)	1,19 (10.53)	1,08 (9.60)	–
	SB	1,7 (15.05)	1,51 (13.37)	1,43 (12.66)	1,38 (12.21)	1,97 (17.44)	1,81 (16.02)	1,49 (13.19)	1,32 (11.68)	1,13 (10.0)	0,95 (8.41)	–
25	BB	4,19 (37.09)	3,65 (32.31)	3,23 (28.59)	3,23 (28.59)	3,56 (31.51)	3,26 (28.86)	2,68 (23.72)	2,28 (20.18)	2,67 (23.63)	2,29 (20.27)	1,97 (17.44)
	SB	3,11 (27.53)	2,6 (23.01)	2,23 (19.74)	2,23 (19.74)	1,96 (17.35)	1,74 (15.40)	2,41 (21.33)	2,02 (17.88)	2,42 (21.42)	2,05 (18.14)	1,75 (15.49)
32	BB	–	–	5,33 (47.17)	–	–	4,15 (36.73)	4,67 (41.33)	4,02 (35.58)	4,4 (38.94)	3,8 (33.63)	3,28 (29,.03)
	SB	–	–	8,17 (72.31)	–	–	6,4 (56.64)	5,26 (46.56)	4,47 (39.56)	5,45 (48.24)	4,67 (41.33)	4,01 (35.49)
40	BB	–	–	5,99 (53.02)	–	–	4,68 (41.42)	5,27 (46.64)	4,54 (40.18)	4,99 (44.17)	4,3 (38.06)	3,72 (32.93)
	SB	–	–	9,19 (81.34)	–	–	7,22 (63.90)	5,95 (52.66)	5,05 (44.70)	6,17 (54.61)	5,29 (46.82)	4,55 (40.27)
50	BB	–	–	8,83 (78.15)	–	–	6,96 (61.60)	9,07 (80.28)	7,91 (70.01)	8,55 (75.67)	7,45 (65.94)	6,5 (57.53)
	SB	–	–	17 (150.46)	–	–	13,6 (120.37)	11,4 (100.90)	9,73 (86.12)	13,6 (120.37)	11,8 (104.44)	10,3 (91.16)
63	BB	–	–	10,4 (92.05)	–	–	8,23 (72.84)	10,8 (95.6)	9,38 (83.02)	10,2 (90.28)	8,85 (78.33)	7,72 (68.33)
	SB	–	–	20,1 (177.9)	–	–	16,1 (142.5)	13,4 (118.6)	11,5 (101.8)	16,1 (142.5)	14 (123.91)	12,2 (107.98)

BB = Ball bearing, SB = Slide bearing.

GPC used as a stopper

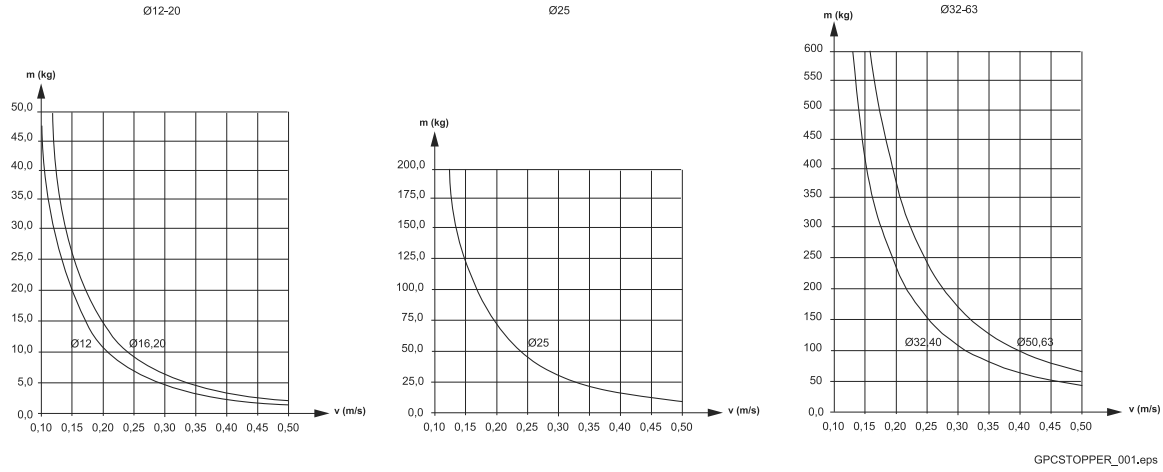
Piston Ø [mm]	12	16	20	25	32	40	50	63
L max. [mm]	50	50	50	75	75	75	75	75
Elastic bumper min. stroke S [mm]	1	1	1	2	2	2	2	2
E max. [Nm] (in.lbs)	0,23 (2.04)	0,28 (2.48)	0,3 (2.66)	1,6 (14.16)	4,8 (42.48)	4,8 (42.48)	7,7 (68.15)	7,7 (68.15)



$E = m \times v^2/2$

Only cylinders with slide bearing guide (SB) may be used

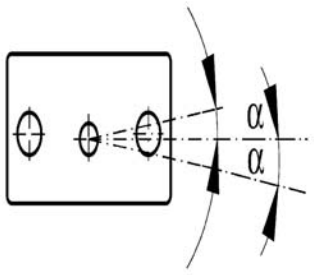
Diagram GPC used as a stopper



m = weight of object [kg]
v = velocity of object [m/s]

Distortion / Play (°)

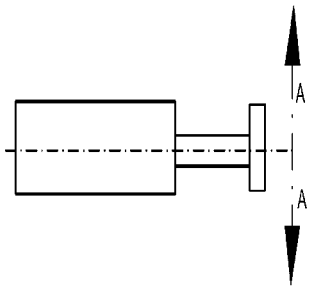
α°	Piston Ø 12	Piston Ø 16	Piston Ø 20	Piston Ø 25	Piston Ø 32	Piston Ø 40	Piston Ø 50	Piston Ø 63
α° SB	0,09	0,09	0,07	0,07	0,06	0,06	0,05	0,05
α° BB	0,08	0,08	0,07	0,07	0,06	0,05	0,05	0,05



Torsion play (α) for slide bearing guide (SB) and ball bearing guide (BB) (retracted, without load).

Piston rod deflection at a stroke 50 mm and a side load of 10 N (2.25 lbf)(mm)

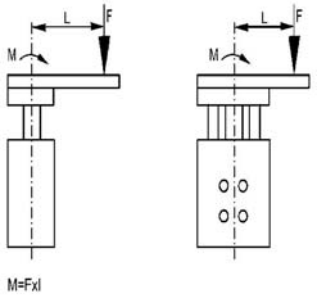
	Piston Ø 12	Piston Ø 16	Piston Ø 20	Piston Ø 25	Piston Ø 32	Piston Ø 40	Piston Ø 50	Piston Ø 63
A [mm] SB	0,11	0,11	0,11	0,15	0,15	0,15	0,16	0,16
A [mm] BB	0,10	0,08	0,08	0,08	0,08	0,09	0,09	0,09



- Piston rod deflection at slide bearing guide (SB) and ball bearing guide (BB) due to bearing play with a side load of 10 N (2.25 lbf)
- Piston rod deflection at stroke of 50 mm.

Off center force capacity, static value, horizontal and vertical postion

Piston Ø	Moment max. M (Nm) (in.lbs) Type	Cyl. with stroke 5–30 mm	Cyl. with stroke >30 mm
12	BB	1,5 (13.3)	2,0 (17.7)
	SB	2,0 (17.7)	3,5 (31)
16	BB	2,0 (17.7)	5,0 (44.3)
	SB	4,5 (39.8)	14 (123.9)
20	BB	2,0 (17.7)	5,0 (44.3)
	SB	4,5 (39.8)	14 (123.9)



M = F x L F = [N] L = [m]
Note! If load is attached to the lever arm when the cylinder reaches its end position, additional F will occur. Depending on the cylinder velocity, this will be 10 to 40 times the original F!

Max. moment M [Nm] (in.lbs)

Piston Ø	Type	Cyl. with stroke 5–30 mm	Cyl. with stroke 35–50 mm	Cyl. with stroke 55–100 mm	Cyl. with stroke >100 mm
25	BB	7,5 (66.4)	10,6 (93.8)	10,8 (95.6)	16,5 (146)
	SB	4,6 (40.7)	4,9 (43.4)	9,4 (83.2)	14,5 (128.3)
32	BB	9,9 (87.6)	10,6 (93.8)	16,2 (143.4)	22,0 (194.7)
	SB	15,2 (134.5)	16,5 (146)	17,2 (152.2)	26,4 (233.7)

Note! If load is attached to the lever arm when the cylinder reaches its end position, additional F will occur. Depending on the cylinder velocity, this will be 10 to 40 times the original F!

Max. moment M [Nm] (in.lbs)

Piston Ø	Type	Cyl. with stroke 5–50 mm	Cyl. with stroke 55–100 mm	Cyl. with stroke >100 mm
40	BB	9,9 (87.62)	16,2 (143.38)	22,0 (194.72)
	SB	15,3 (135.42)	17,2 (152.23)	26,4 (233.66)
50	BB	12,8 (113.30)	24,6 (217.73)	32,9 (291.19)
	SB	26 (230.12)	28,9 (255.79)	51,6 (456.70)
63	BB	12,8 (113.30)	24,6 (217.73)	32,9 (291.19)
	SB	26 (230.12)	28,9 (255.79)	51,6 (456.70)

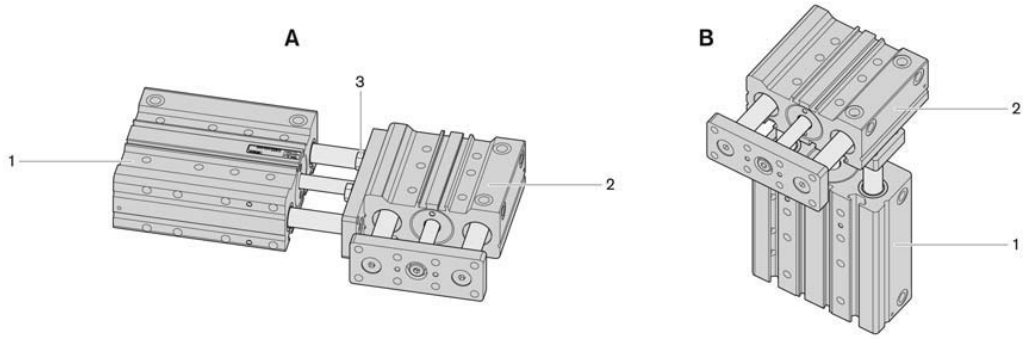
Note! If load is attached to the lever arm when the cylinder reaches its end position, additional F will occur.
Depending on the cylinder velocity, this will be 10 to 40 times the original F!

Limitation when lifting a mass

If the GPC cylinder is used for lifting a mass vertically, the mass must not exceed the percentage of the theoretical piston force shown in the table below.

Piston Ø	12	16	20	25	32	40	50	63
F [N] (lbf)	<40 % (<8.99%)	<40 % (<8.99%)	<50 % (<11.2%)	<50 % (<11.2%)	<60 % (<13.5%)	<60 % (<13.5%)	<60 % (<13.5%)	<60 % (<13.5%)

GPC combinations



Minimum strokes for cylinder 1 when using 2 assembled guide cylinders

Piston Ø	16	20	25	32	40	50	63
Stroke	–	–	–	25	25	30	30

Minimum strokes for cylinder 2 when using 2 assembled guide cylinders

Piston Ø	12 on 16	16 on 20	20 on 25	25 on 32	32 on 40	40 on 50	50 on 63
Min.stroke: Assembly A	–	–	–	25	30	30	55
Min. stroke: Assembly B	–	–	–	15	30	30	30
3 = Screw	M5 x 15	M5 x 18	M6 x 20	M6 x 20	M8 x 25	M8 x 30	M10 x 30

Guide Cylinder, Series GPC and GPC-TL

Series GPC-TL, Ø 12–20 mm, double acting, magnetic piston

Rexroth
Bosch Group

★

Technical Data

Ambient temperature range		-10 °C to +70 °C (+14 °F to +158 °F)
Working pressure	Ø 12–20 mm	Min. 1.3 bar (19 psi), max. 8 bar (116 psi)
Medium		Compressed air, lubricated or non-lubricated
Material	Piston rod	Stainless steel
	Guide rods SB	Stainless steel
	Guide rods BB	Corrosion resistant steel, hardened
	Barrel	Anodized aluminum
	Scrapers	PUR
	Front plate	Steel, galvanized

Technical information
The guide cylinder is equipped with 2 rigid guide rods supported by slide bearings (SB) or ball bearings (BB).
Both types have scrapers on the guide rods.
For corrosive environment we recommend the version SB (guide rods in stainless steel).

Application area

For precise movements with high side load capacity.
The guide cylinder can be used as:
– Carrier of a second axis. The next smaller cylinder fits directly on the front plate of a bigger cylinder.
– Carrier of grippers or suction cups in material handling applications.
– Carrier of tools like automatic screw drivers.
– Carrier of work-piece.

Technical information

Piston diameter		[mm]	12	16	20
Theoretical piston force	push stroke	[N] (lbf)	67 (15.1)	120 (27)	180 (40.5)
at 6 bar (87 psi)	pull stroke	[N] (lbf)	50 (11.2)	100 (22.5)	140 (31.5)
Max. velocity		[m/s]	0,5	0,5	0,5
		(ft/s)	(1.6)	(1.6)	(1.6)
Max. cushioning energy E_{max}		[Nm] (in.lbs)	0,1 (0.89)	0,11 (0.97)	0,15 (1.33)

Part no.: GPC-TL with slide bearing, SB

Piston Ø	12	16	20
Stroke			
10	**0822060600**	**0822061600**	**0822062600**
20	**0822060601**	**0822061601**	**0822062601**
25	**0822060607**	**0822061607**	**0822062607**
30	**0822060602**	**0822061602**	**0822062602**
40	**0822060603**	**0822061603**	**0822062603**
50	**0822060604**	**0822061604**	**0822062604**
75	**0822060605**	**0822061605**	**0822062605**
100	**0822060606**	**0822061606**	**0822062606**

Part no.: GPC-TL with ball bearing, BB

Piston Ø	12	16	20
Stroke			
10	**0822060700**	**0822061700**	**0822062700**
20	**0822060701**	**0822061701**	**0822062701**
25	**0822060707**	**0822061707**	**0822062707**
30	**0822060702**	**0822061702**	**0822062702**
40	**0822060703**	**0822061703**	**0822062703**
50	**0822060704**	**0822061704**	**0822062704**
75	**0822060705**	**0822061705**	**0822062705**
100	**0822060706**	**0822061706**	**0822062706**

Intermediate stroke lengths

Intermediate strokes are realised by using restriction rings into the body of the next longer cylinder stroke.
Intermediate strokes in steps of 5 mm are possible by using the next longer cylinder body.
To get a dia. 20 cylinder with an 85 mm stroke, for example, a 100 mm stroke body is used with a 15 mm restriction ring.
Max. stroke at 12–20 mm dia.: 150 mm.
The dimensions will be the same as for the basic cylinder.
Each intermediate stroke length cylinder has a specific code number.

For GPC and GPC-TL, use Micro sensors located in Sensors/Electrical Accessories section.

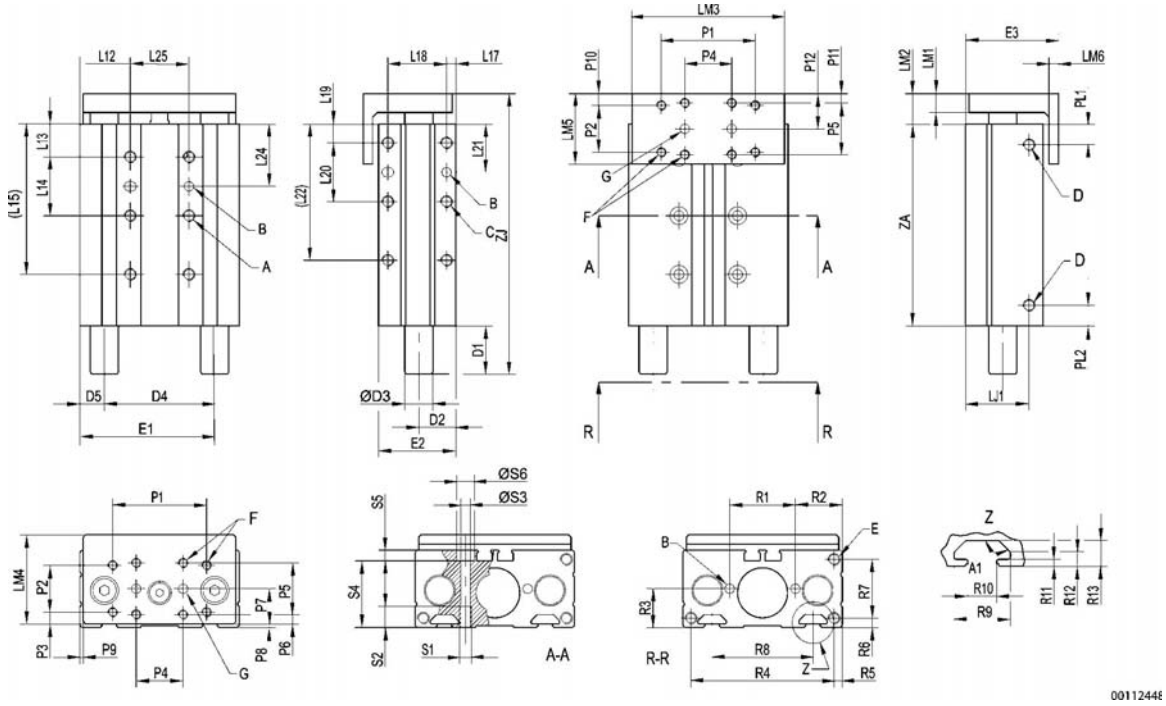
Guide Cylinder, Series GPC and GPC-TL

Series GPC-TL, Ø 12–20 mm, double acting, magnetic piston

Rexroth
Bosch Group

Piston Ø	Type	Total weight [kg] (lbs) Stroke									
		10	20	25	30	40	50	75	100	125	150
12	BB	0,28 (0.62)	0,32 (0.71)	0,35 (0.77)	0,37 (0.82)	0,43 (0.95)	0,48 (1.06)	0,59 (1.3)	0,70 (1.54)	0,81 (1.79)	0,92 (2.03)
	SB	0,30 (0.66)	0,34 (0.75)	0,37(0.82)	0,39 (0.86)	0,45 (0.99)	0,49 (1.08)	0,61 (1.34)	0,73 (1.61)	0,85 (1.87)	0,97 (2.14)
16	BB	0,36 (0.79)	0,41 (0.90)	0,44 (0.97)	0,47 (1.04)	0,56 (1.23)	0,61 (1.34)	0,74 (1.63)	0,88 (1.94)	1,02 (2.25)	1,15 (2.54)
	SB	0,38 (0.84)	0,44 (0.97)	0,46 (1.01)	0,49 (1.08)	0,57 (1.26)	0,63 (1.39)	0,77 (1.7)	0,91 (2.01)	1,06 (2.34)	1,20 (2.65)
20	BB	0,48 (1.06)	0,54 (1.19)	0,58 (1.28)	0,61 (1.34)	0,72 (1.59)	0,79 (1.74)	0,95 (2.09)	1,12 (2.47)	1,30 (2.87)	1,47 (3.24)
	SB	0,50 (1.1)	0,57 (1.26)	0,60 (1.32)	0,64 (1.41)	0,73 (1.61)	0,80 (1.76)	0,98 (2.16)	1,16 (2.56)	1,35 (2.98)	1,52 (3.35)

BB = Ball bearing, SB = Slide bearing.



+H = stroke
(xx) = only on the longer stroke cylinders.

CAD files, free download from the Internet.

To simplify your engineering design we can support 2D - and 3D CAD files for this product. The CAD files can be found under:
www.boschrexroth.com - select: Pneumatics - select: Interactive Designer - select: CAD files - select: GPC-TL - select specific product number - select: 2D - or 3D files.
Available format: 2D; dxf, 3D; Pro/E and STEP.

Outer dimensions

Piston Ø	E1	E2	E3	D2	D3 SB	D3 BB	D4	D5	LM1	LM2
12	58	30,5	36,5	14,5	10	8	40	9	8	12,7
16	68	33	39,5	15,8	12	10	47	10,5	8	13,5
20	80	36	43,5	16,5	12	10	54	13	10	15,5

Overall length

Stroke	Piston dia. 12						Piston dia. 16						Piston dia. 20					
	ZJ SB	ZJ BB	ZA SB	ZA BB	D1 SB	D1 BB	ZJ SB	ZJ BB	ZA SB	ZA BB	D1 SB	D1 BB	ZJ SB	ZJBB	ZA SB	ZA BB	D1 SB	D1 BB
10	57	96	44,4	64,4	0	18	60	100	46	66	0	22	62	102	46	66	0	22
20	67	96	54,4	64,4	0	18	70	100	56	66	0	22	72	102	56	66	0	22
25	72	96	59,4	64,4	0	18	75	100	61	66	0	22	77	102	61	66	0	22
30	77	77	64,4	64,4	0	18	80	80	66	66	0	22	82	82	66	66	0	22
40	105	105	74,4	74,4	17	18	110	110	76	76	21	22	112	112	76	76	21	22
50	115	115	84,4	84,4	17	18	120	120	86	86	21	22	122	122	86	86	21	22
75	140	140	109,4	109,4	17	18	145	145	111	111	21	22	147	147	111	111	21	22
100	165	165	134,4	134,4	17	18	170	170	136	136	21	22	172	172	136	136	21	22
125	205	205	159,4	159,4	80	33	210	210	161	161	85	37	212	212	161	161	87	37
150	230	230	184,4	184,4	80	33	235	235	186	186	85	37	237	237	186	186	87	37

BB = Ball bearing, SB = Slide bearing.

Connection ports

Piston Ø	D	LJ1	PL1	PL2
12	M5	24,8	8,5	8,5
16	M5	27,0	8,8	8,8
20	M5	26,5	10	10

Mounting holes Top / Bottom / Side

Piston Ø	L12	L13	L14 stroke			L15 stroke	L24	L25	S1	S2	S3	S4
			10	20	25–150	50–150						
12	19	14,5	–	18	22	58,5	25,5	20	M5	8	4,2	20
16	21,5	14,0	18	25	25	61	26,5	25	M5	8	4,2	28,5
20	25	15,0	16	24	24	63	27	30	M6	10	5,2	30,5

Mounting dimensions

Piston Ø	S5	S6	B*	C*	L17	L18	L19	L20 stroke		L21 stroke		L22 stroke
								10	20-150	10	20-150	50-150
12	10,5	7,6	4H7x4	M5x8	4	22	8	20	20	18	18	48
16	4,5	7,6	4H7x4	M5x8	4	25	8	18	25	20,5	20,5	58
20	5,5	9,5	4H7x4	M6x10	4,5	24	8	20	30	18	23	68

* Dimension x Depth

Mounting holes Rear / T-groove

Piston Ø	R1	R2	R3	R4	R5	R6	R7	R8	B*	E*	R9	R10	R11	R12	R13	A1
12	23+/-0,04	17,5	15	50	4	4	22	–	4H7x4	M5x8	–	–	–	–	–	–
16	28+/-0,04	20	16,5	61	3,5	4	25	43	4H7x4	M5x8	12	6,15	1,5	1,5	5,5	135°
20	30+/-0,04	25	18	70	5	3,5	29	50	4H7x4	M5x10	12	6,15	1,5	1,5	5,5	135°

* Dimension x Depth

Mounting holes Front Plate

Piston Ø	LM3	LM4	LM5	LM6	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	G	F
12	55	35	28	4	40	20	3,5	20	20	3,5	10	1,5	1,5	4	4	14	4H7	M4
16	65	38	30	4	40	20	5	20	22	4	10	1,5	1,5	5	4	15	4H7	M4
20	77	42	35	5	50	25	4	25	25	4	12,5	1,5	1,5	5	5	17,5	4H7	M5

Weight of moving parts [kg] (lbs) (guide rods, front plate, piston and piston rod)

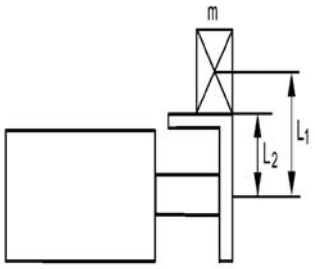
Piston Ø	Type	Stroke									
		10	20	25	30	40	50	75	100	125	150
12	BB	0,23 (0.51)	0,23 (0.51)	0,23 (0.51)	0,23 (0.51)	0,24 (0.53)	0,25 (0.55)	0,28 (0.62)	0,30 (0.66)	0,33 (0.73)	0,35 (0.77)
	SB	0,24 (0.53)	0,25 (0.55)	0,26 (0.57)	0,27 (0.60)	0,28 (0.62)	0,30 (0.66)	0,34 (0.75)	0,37 (0.82)	0,41 (0.90)	0,45 (0.99)
16	BB	0,32 (0.71)	0,32 (0.71)	0,32 (0.71)	0,32 (0.71)	0,34 (0.75)	0,36 (0.80)	0,40 (0.88)	0,44 (0.97)	0,48 (1.06)	0,52 (1.15)
	SB	0,33 (0.73)	0,35 (0.77)	0,37 (0.82)	0,38 (0.84)	0,40 (0.88)	0,42 (0.93)	0,48 (1.06)	0,53 (1.17)	0,59 (1.3)	0,64 (1.41)
20	BB	0,46 (1.01)	0,46 (1.01)	0,46 (1.01)	0,46 (1.01)	0,48 (1.06)	0,49 (1.08)	0,54 (1.19)	0,59 (1.3)	0,63 (1.39)	0,68 (1.5)
	SB	0,46 (1.01)	0,49 (1.08)	0,50 (1.1)	0,51 (1.12)	0,54 (1.19)	0,56 (1.23)	0,62 (1.37)	0,68 (1.5)	0,74 (1.63)	0,80 (1.76)

BB = Ball bearing, SB = Slide bearing.

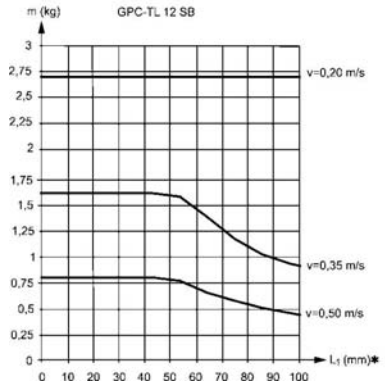
Allowed dynamic load [kg] (lbs) with respect of center of mass [mm] and velocity [m/s]

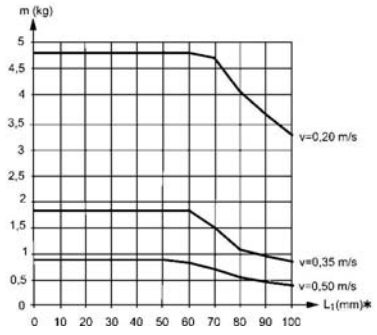
Load attached to carrier plate.
The diagrams show max allowed load in respect of distance from cylinder center and velocity of the movement.
In the horizontal part of the curves the cushioning capacity of the cylinder is limiting the load.

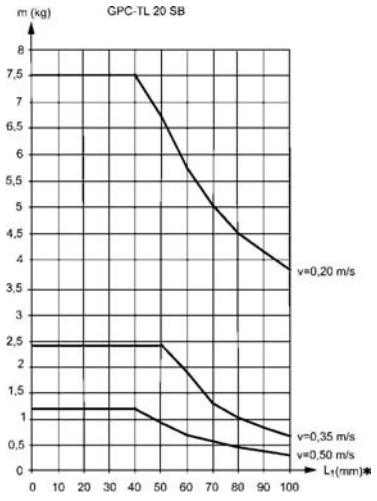
In the decreasing part of the curves the bearings are limiting the load.
The recommendation is to run the cycles in as low velocity as possible. The velocity can be controlled with flow control valve 0821200191 from the Rexroth range.

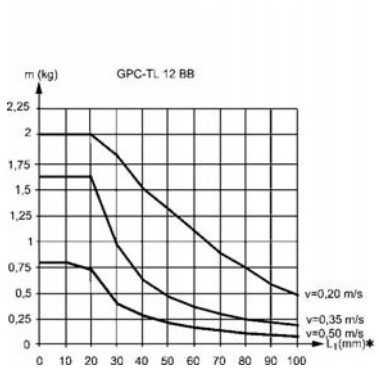


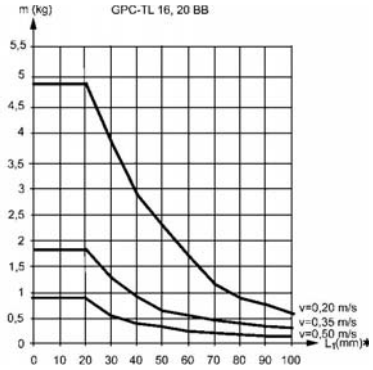
Ø (mm)	Measure L2 [mm]
12	22
16	23,7
20	27







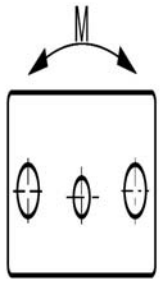




Max. moment M [Nm] (in.lbs)

Piston Ø	Type	10	20	25	30	40	50	75	100	125	150
12	BB	0,38 (3.36)	0,34 (3.01)	0,32 (2.83)	0,3 (2.66)	0,46 (4.07)	0,44 (3.89)	0,4 (3.54)	0,38 (3.36)	0,36 (3.19)	0,34 (3.01)
	SB	0,56 (4.96)	0,48 (4.25)	0,46 (4.07)	0,42 (3.72)	0,62 (5.49)	0,56 (4.96)	0,44 (3.89)	0,38 (3.36)	0,32 (2.83)	0,26 (2.30)
16	BB	0,63 (5.58)	0,56 (4.96)	0,54 (4.78)	0,52 (4.60)	1,36 (12.04)	1,32 (11.69)	1,2 (10.62)	1,13 (10.0)	1,03 (9.12)	0,94 (8.32)
	SB	1,48 (13.10)	1,32 (11.68)	1,25 (11.06)	1,2 (10.62)	1,72 (15.22)	1,57 (13.90)	1,29 (11.42)	1,15 (10.18)	0,99 (8.76)	0,82 (7.26)
20	BB	0,73 (6.46)	0,65 (5.75)	0,62 (5.49)	0,59 (5.22)	1,57 (13.90)	1,51 (13.36)	1,38 (12.21)	1,3 (11.51)	1,19 (10.53)	1,08 (9.60)
	SB	1,7 (15.05)	1,51 (13.37)	1,43 (12.66)	1,38 (12.21)	1,97 (17.44)	1,81 (16.02)	1,49 (13.19)	1,32 (11.68)	1,13 (10.0)	0,95 (8.41)

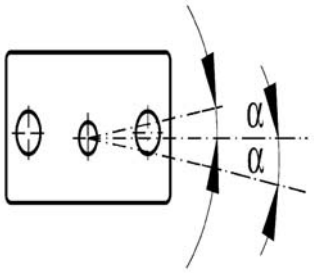
BB = Ball bearing, SB = Slide bearing.



Distortion / Play (°)

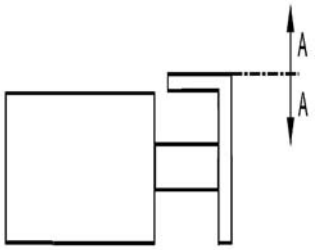
α°	Piston dia. 12	Piston dia. 16	Piston dia. 20
α° SB	0,09	0,09	0,07
α° BB	0,08	0,08	0,07

Torsion play (α) for slide bearing guide (SB) and ball bearing guide (BB) (retracted, without load).



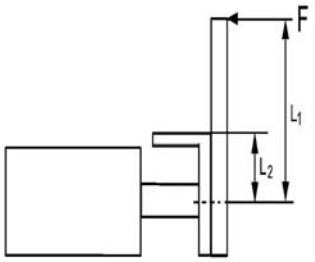
Piston rod deflection at stroke 50 mm and a side load of 10 N (2.25 in.lbs)

	Piston Ø 12	Piston Ø 16	Piston Ø 20
A [mm] SB	0,11	0,11	0,11
A [mm] BB	0,10	0,08	0,08



Allowed lever arm length [mm] with moment created by the cylinder force at 6 bar. (87 psi) Static situation

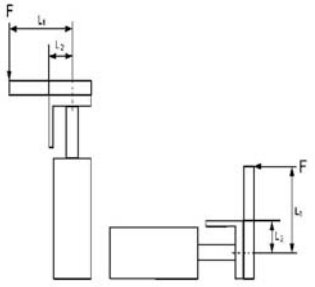
Static situation.
The lever arm meets a stop before the cylinder stroke ends. The cylinder force and the lever arm creates a moment effecting the bearings



Piston Ø	Type	Theoretical cylinder force at 6 bar (87 psi) [N] (lbf)	Max arm length L1 [mm]
12	BB	67 (15.1)	290
	SB	67 (15.1)	115
16	BB	120 (27)	215
	SB	120 (27)	80
20	BB	180 (40.5)	140
	SB	180 (40.5)	55

Allowed lever arm length [mm] when cylinder is used as a pusher/lifter. Dynamic situation

Dynamic situation.
The load is not attached to the front plate of the cylinder. To get a correct performance from the cylinder, the below presented values should not be exceeded.

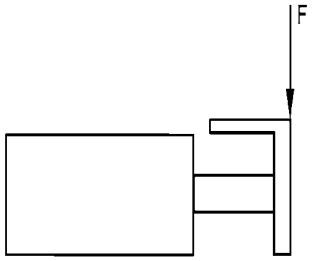


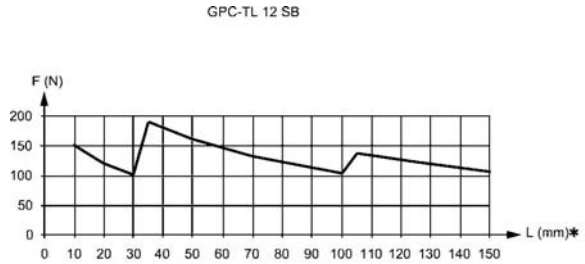
Piston Ø	Type	Theoretical cylinder force at 6 bar (87 psi) [N] (lbf)	Horizontal situation max force [N] (lbf)	Vertical situation max force [N] (lbf)	Max arm length L1
12	BB	67 (15.1)	23 (5.2)	23 (5.2)	250
12	SB	67 (15.1)	23 (5.2)	23 (5.2)	100
16	BB	120 (27)	40 (9)	40 (9)	200
16	SB	120 (27)	40 (9)	40 (9)	75
20	SB	180 (40.5)	65 (14.6)	65 (14.6)	125
20	BB	180 (40.5)	65 (14.6)	65 (14.6)	50

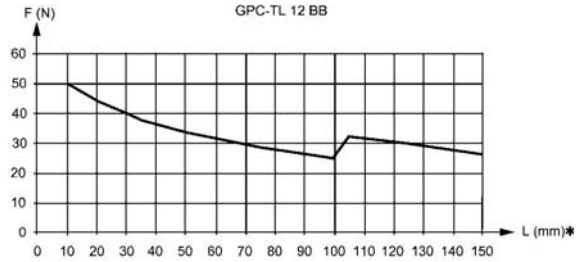
Note! If load is attached to the lever arm when the cylinder reaches its end position, additional F will occure. Depending on the cylinder velocity, this will be 10 to 40 times the original F!

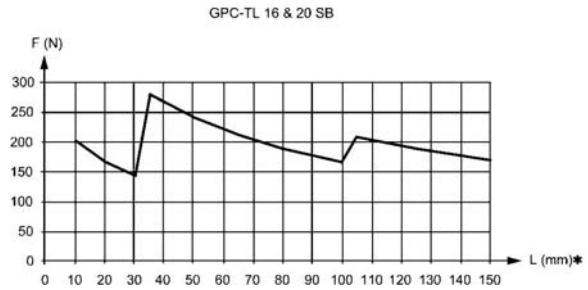
Allowed static side force in out-position [N] (lbf)

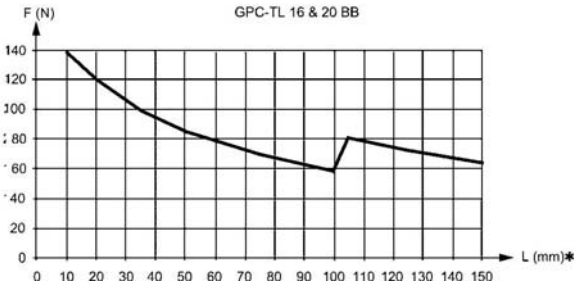
The diagrams show the maximum allowed static force for different stroke lengths, L, depending on max permissible load on bearings.
For example if an additional force is used for drilling, labelling etc. of an object carried by the GPC-TL.
No movement of the cylinder is allowed in this situation.







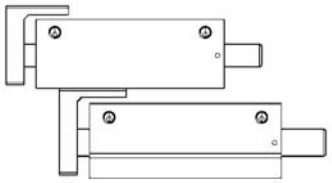




GPC combinations

The GPC-TL can be directly mounted on the front plate of next bigger standard GPC in radial directional, and on next bigger GPC-TL in axial direction.

1



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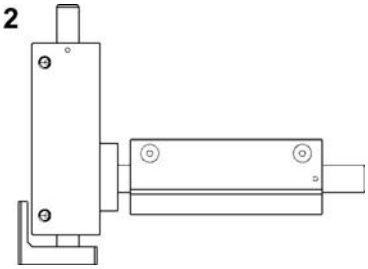


Combination axial direction (1)

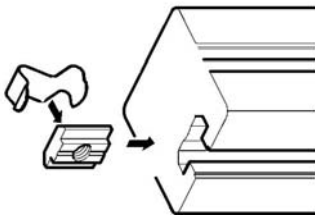
Combination	GPC-TL 12 on GPC-TL 16 GPC 12 on GPC-TL 16	GPC-TL 16 on GPC-TL 20 GPC 16 on GPC-TL 20
Screws	MC6S M4x25	MC6S M5x35

Combination radial direction (2)

Combination	GPC-TL 12 on GPC 16	GPC-TL 16 on GPC 20	GPC-TL 20 on GPC 25
Screws	MC6S M5x15	MC6S M5x15	MC6S M6x15

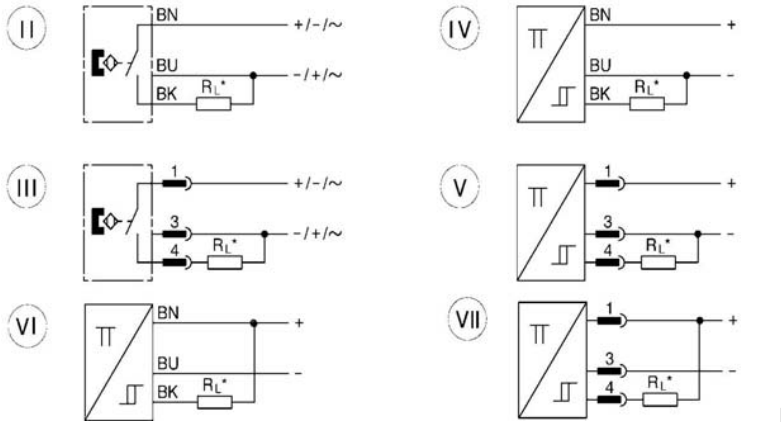
T-groove nut

Thread	GPC size 16 - 25 GPC-TL size 16 - 25 GPC-E size 16, 20 GPC-ST size 12, 20	GPC size, 32–50	GPC size, 63
M 4	**3842523229**	**3842514932**	–
M 5	**3842523231**	**3842514934**	**3842242109**
M6	–	**3842514936**	**3842242111**
M8	–	**3842514938**	**3842242113**
Spring	**3842523223**	**3842519315**	**3842519316**



* Package of 10 pcs.

Cylinder switch Series ST6, electrically (Reed contact) and electronic (contactless)



00111961

BN=brown, BK=black, BU=blue

Style	Contact type	Symbol	Cable length(m) Material	Connector	Ambient temperature range	Operating voltage	Switching current max. (A)	Part no.
B	Reed	II (3-wire)	3 PUR	-	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100629
B	Reed	II (3-wire)	5 PUR	-	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100630
B	Reed	II (3-wire)	10 PUR	-	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	R412004575
A	Reed	III (3-wire)	0.3 PUR	M8 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100488
C	Reed	III (3-wire)	0.3 PUR	M12 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100432
D	Reed	III (3-wire)	0.3 PUR	M8 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100434
D	Reed	III (3-wire)	0.5 PUR	M8 X 1	-20 to +70 °C (-4 to +158 °F)	10 … 30VAC/DC	AC/DC 0.13	0830100436
B	contactless PNP	IV (3-wire)	3 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100631
B	contactless PNP	IV (3-wire)	5 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100632
B	contactless PNP	IV (3-wire)	10 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	R412004576
A	contactless PNP	V (3-wire)	0.3 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100489
C	contactless PNP	V (3-wire)	0.3 PUR	M12 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100433
D	contactless PNP	V (3-wire)	0.3 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100435
D	contactless PNP	V (3-wire)	0.3 PVC	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	R412004762
D	contactless PNP	V (3-wire)	0.5 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100437
B	contactless NPN	(3-wire)	3 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100633
B	contactless NPN	(3-wire)	5 PUR	-	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100634
A	contactless NPN	(3-wire)	0.3 PUR	M8 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100430
C	contactless NPN	(3-wire)	0.3 PUR	M12 X 1	-10 to +70 °C (-14 to +158 °F)	10 … 30VDC	DC 0.1	0830100431

A = Plug-in connection M8 x 1; B = Cable connection; C = Plug-in connection M12x1; D = Plug-in conn M8 x 1 w/knurled screw

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Products

★ Ø 6 - 32, double acting

See page 5.214

★ Ø 16 - 25, double acting, end position lock, retracted

See page 5.221

★ Ø 16 - 25, double acting, end position lock, extended

See page 5.226

Accessories

★ Sensor for Series TWC, Ø 6

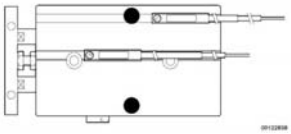
See page 5.231

★ Sensor for Series TWC, Ø 10-32, TWC-HL and TWC-RL

See page 5.232

★ Installation Note: Sensor

See page 5.234



Twin Rod Cylinder, series TWC

6–32 mm dia., double acting

Rexroth
Bosch Group

★

Technical Data

Operating mode		Double-acting type with twin pistons
Operating temperature range		0 °C to +60 °C (+32 °F to +140 °F)
Speed		0,1 to 0,5 m/s (0,33 to 1.64 ft/s)
Guidance		friction bearing
Mounting		Side mounting through holes
Stroke-limiting range		-5 to 0 mm
Medium		Compressed air, lubricated or oil-free
Lubrication		maintenance-free
Material	Housing	Aluminum (anodized)
	Front plate	Steel
	Piston rod	Hardened steel
	Piston	Aluminum (anodized)
	Guide bushing	Aluminum (anodized)
	Seals	NBR
	End plate	Plastic (aluminum anodized only for Ø 32)

Application area

Twin pistons, compared to similar size cylinders, provide increased power with compact dimensions.
Used in material handling to support transverse loads, to separate and feed, as well as for sorting and pushing functions.

Technical information

			TWC 06	TWC 10	TWC 16	TWC 20	TWC 25	TWC 32
Piston dia.	–	[mm]	2 x 6	2 x 10	2 x 16	2 x 20	2 x 25	2 x 32
Connection thread	–		M 5	M 5	M 5	M 5	M 5	G1/8
Operating pressure	–	[bar] (psi)	2,0 - 7,0 (29 - 101.5)	2,0 - 7,0 (29 - 101.5)	1,5 - 7 (21,8 - 101.5)	1,5 - 7 (21,8 - 101.5)	1,5 - 7 (21,8 - 101.5)	1,5 - 7 (21,8 - 10.,5)
Theoretical useful force (6 bar) (87 psi)	Thrust	[N] (lbf)	56 (12.6)	94 (21.1)	241 (54.2)	377 (84.8)	589 (132.4)	964 (216.7)
	Retraction force	[N] (lbf)	31 (7)	60 (13.5)	181 (40.7)	283 (63.6)	496 (111.5)	723 (162.5)
Cushioning	Polymer bumper		without	with	with	with	with	with
Max. additional moving mass	–	[kg] (lbs)	0,075 (0.165)	0,22 (0.485)	0,76 (1.676)	1,25 (2.756)	1,8 (3.968)	3,9 (8.598)

Part no. for TWC 06 to TWC 32

Stroke [mm]	TWC 06	TWC 10	TWC 16	TWC 20	TWC 25
10	**R402000794**	**R402000799**	**R402000806**	**R402000816**	**R402000826**
20	**R402000795**	**R402000800**	**R402000807**	**R402000817**	**R402000827**
30	**R402000796**	**R402000801**	**R402000808**	**R402000818**	**R402000828**
40	**R402000797**	**R402000802**	**R402000809**	**R402000819**	**R402000829**
50	**R402000798**	**R402000803**	**R402000810**	**R402000820**	**R402000830**
60	–	**R402000804**	**R402000811**	**R402000821**	**R402000831**
70	–	**R402000805**	**R402000812**	**R402000822**	**R402000832**
80	–	–	**R402000813**	**R402000823**	**R402000833**
90	–	–	**R402000814**	**R402000824**	**R402000834**
100	–	–	**R402000815**	**R402000825**	**R402000835**

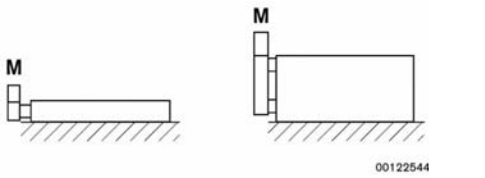
Stroke [mm]	TWC 32
10	**R402000836**
20	**R402000837**
30	**R402000838**
40	**R402000839**
50	**R402000840**
60	**R402000841**
70	**R402000842**
80	**R402000843**
90	**R402000844**
100	**R402000845**

Weight [kg]/(lbs)

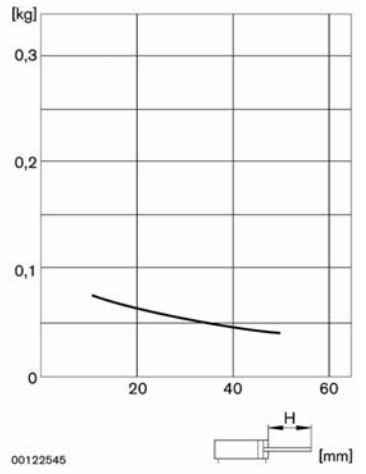
Stroke [mm]	TWC 06	TWC 10	TWC 16	TWC 20	TWC 25
10	0,067 (0.148)	0,137 (0.302)	0,271 (0.598)	0,424 (0.935)	0,619 (1.365)
20	0,079 (0.174)	0,155 (0.342)	0,298 (0.657)	0,460 (1.014)	0,670 (1.477)
30	0,091 (0.201)	0,173 (0.381)	0,325 (0.717)	0,496 (1.094)	0,710 (1.566)
40	0,103 (0.227)	0,191 (0.421)	0,352 (0.776)	0,532 (1.173)	0,772 (1.702)
50	0,115 (0.254)	0,209 (0.461)	0,379 (0.836)	0,568 (1.252)	0,823 (1.815)
60	–	0,227 (0.501)	0,406 (0.895)	0,604 (1.332)	0,874 (1.927)
70	–	0,245 (0.540)	0,433 (0.955)	0,640 (1.411)	0,925 (2.040)
80	–	–	0,460 (1.014)	0,676 (1.491)	0,976 (2.152)
90	–	–	0,487 (1.074)	0,712 (1.570)	1,027 (2.265)
100	–	–	0,514 (1.133)	0,748 (1.649)	1,078 (2.377)

Stroke [mm]	TWC 32
10	1,447 (3.191)
20	1,540 (3.40)
30	1,633 (3.60)
40	1,726 (3.801)
50	1,819 (4.011)
60	1,912 (4.216)
70	2,005 (4.421)
80	2,098 (4.626)
90	2,191 (4.831)
100	2,284 (5.036)

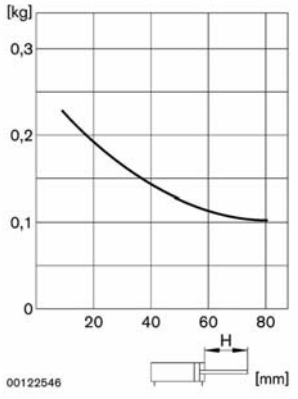
Maximum permissible moving mass depending on the stroke length



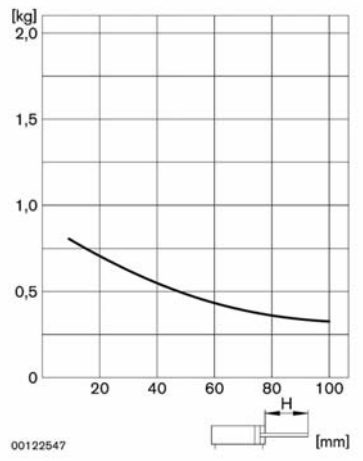
TWC 06



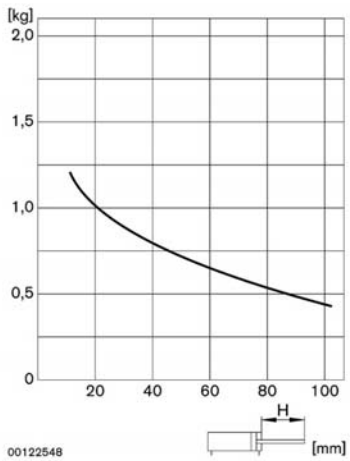
TWC 10



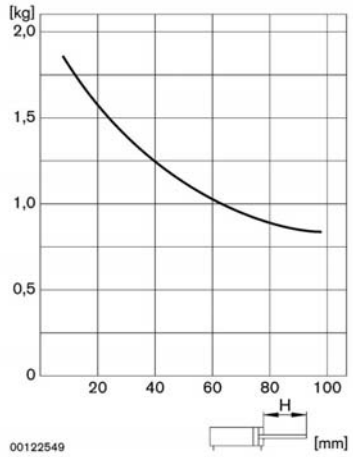
TWC 16



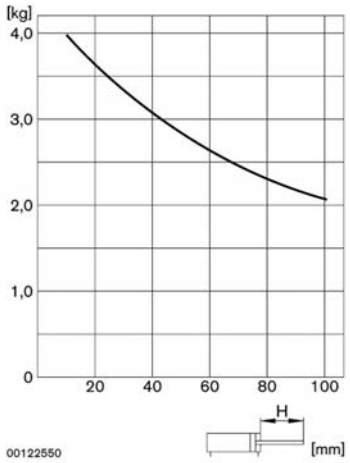
TWC 20



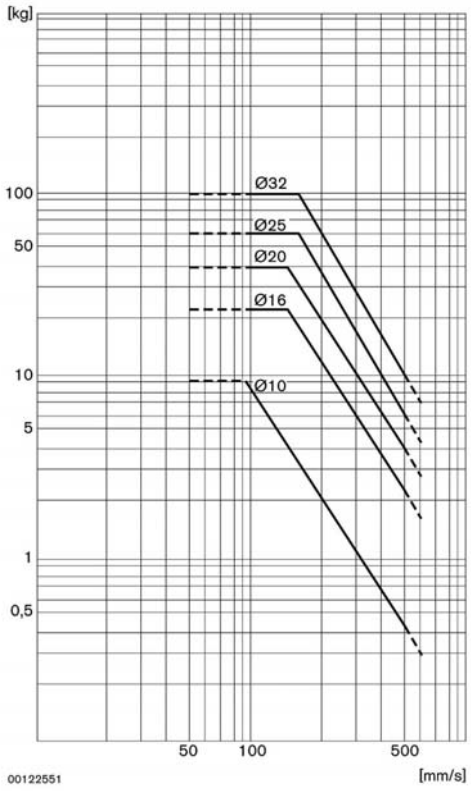
TWC 25



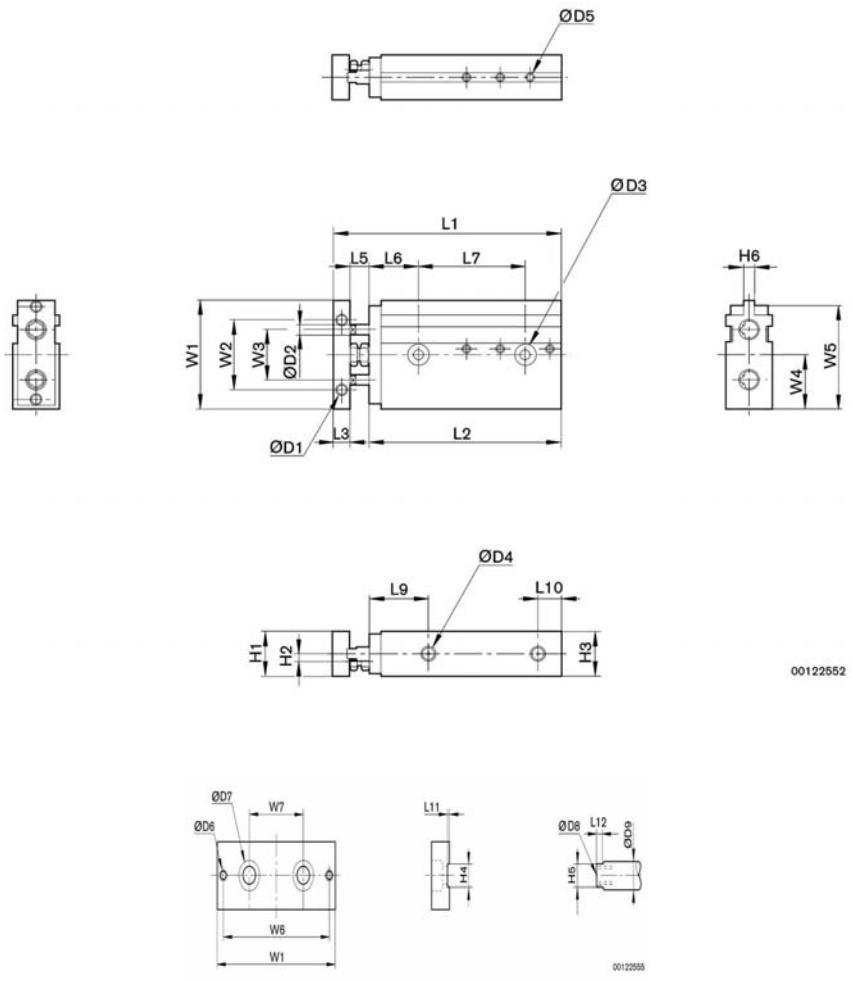
TWC 32



Maximum permissible moving mass depending on the impact speed



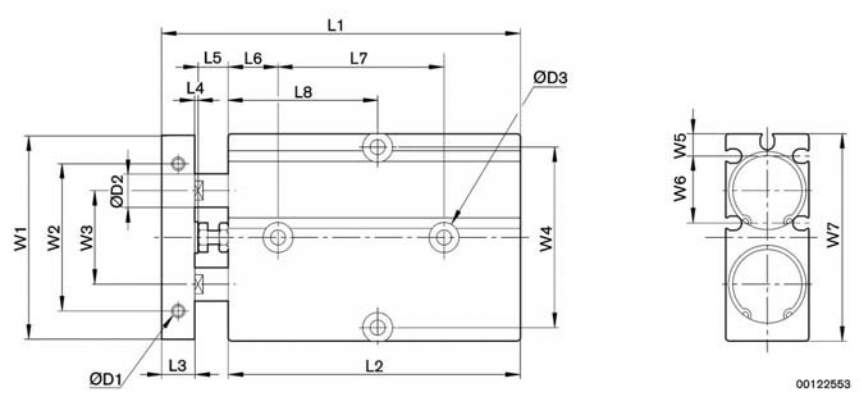
TWC 06

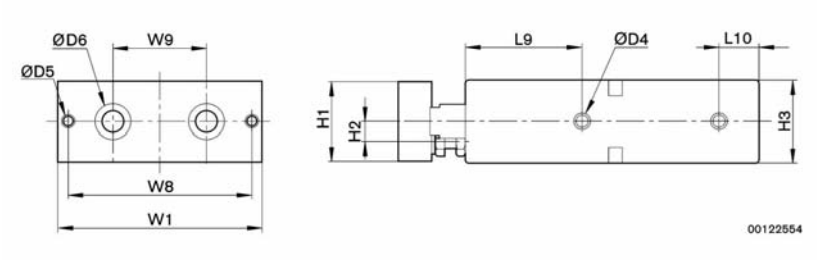


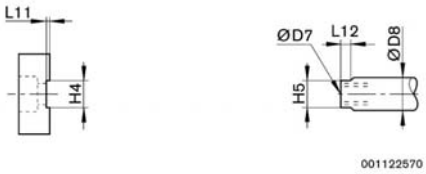
TWC 06															
L1	**L2**	**L3**	**L5**	**L6**	**L7**	**L9**	**L10**	**L11**	**L12**	**W1**	**W2**	**W3**	**W4**	**W5**	**W6**
49	39	5	5	15	13	18,5	7,5	0,5	3	32	21	15	16,5	32,5	27

TWC 06															
W7	**H1**	**H2**	**H3**	**H4**	**H5**	**H6**	**ØD1**	**ØD2**	**ØD3**	**ØD4**	**ØD5**	**ØD6**	**ØD7**	**ØD8**	**ØD9**
15	13	3	14	3,5	3,5	3,8	M3x0,5	4	3,4 + 6x3,3	M5x0,8	M2,6x0,45	M3X0,5	3 + 5x3,2	M2,6x0,45	4

TWC 10 - 32







TWC 10 - 32	L1	L2	L3	L4	L5	L6	L7
TWC 10	68	56	5	0	7	15	25
TWC 16	78	63	8	1	6	15	30
TWC 20	88	68	10	1	9	15	30
TWC 25	91	72	10	1	8	15	40
TWC 32	118	88	17	1	12	17	45

TWC 10 - 32	L8									
Stroke	10	20	30	40	50	60	70	80	90	100
TWC 10	25	40	45	50	55	60	65	--	--	--
TWC 16	40	45	50	55	60	65	70	75	80	85
TWC 20	45	45	45	50	55	60	65	70	75	80
TWC 25	50	50	50	55	60	65	70	75	80	85
TWC 32	55	60	65	70	75	80	85	80	85	100

Twin Rod Cylinder, series TWC

6–32 mm dia., double acting

Rexroth
Bosch Group

TWC 10 - 32	L9	L10	L11	L12	W1	W2	W3	W4
TWC 10	32	10	0,5	3	41	26	18	34
TWC 16	32	10	1	3	53	34	24	47
TWC 20	35	12	1	3	61	44	28	55
TWC 25	40	12	1	3	72	56	34	66
TWC 32	46	15	2	4	94	72	42	83

TWC 10 - 32	W5	W6	W7	W8	W9	H1	H2	H3	H4
TWC 10	5	14	42	34	18	16	2	17	5,2
TWC 16	5,7	18,5	54	47	24	20	4	21	6,2
TWC 20	6,8	20	62	55	28	24	6	25	8,2
TWC 25	8,3	22,5	73	66	34	29	7	30	10,2
TWC 32	10,1	34	96	83	42	38	8	40	14

TWC 10 - 32	H5	Ø D1	Ø D2	Ø D3	Ø D4	Ø D5	Ø D6	Ø D7	Ø D8
TWC 10	5,2	M3x0,5	6	6x3,4	M5x0,8	M3x0,5	6,2x3,3	M3x0,5	6
TWC 16	6,2	M4x0,7	8	8x4,5	M5x0,8	M4x0,7	7,8x4,3	M4x0,7	8
TWC 20	8,2	M4x0,7	10	8x4,5	M5x0,8	M4x0,7	11x6,5	M6x1	10
TWC 25	10,2	M5x0,8	12	9x4,5	M5x0,8	M4x0,7	11x6,5	M6x1	12
TWC 32	14	M8x1,25	16	10,5x5,5	G1/8	M8x1,25	17x11	M10x1,5	16

Twin Rod Cylinder, series TWC-HL

16–25 mm dia., double acting, end position lock, retracted

Rexroth
Bosch Group

★

Technical Data

Operating mode		Double-acting type with twin pistons
Operating temperature range		0 °C to +60 °C (+32 °F to +140 °F)
Speed		0,1 to 0,5 m/s (0,33 to 1.64 ft/s)
Guidance		friction bearing
Mounting		Side mounting through holes
Stroke-limiting range		-5 to 0 mm
Medium		Compressed air, lubricated or oil-free
Lubrication		maintenance-free
Material - Cylinder	Housing	Aluminum (anodized)
	Front plate	Steel
	Piston rod	Hardened steel
	Piston	Aluminum (anodized)
	Guide bushing	Aluminum (anodized)
	Seals	NBR
	End plate	Plastic
Material - End keep	Lock piston	Hardened steel
	Spring	Stainless steel
	Lock cover	Aluminum (anodized)
	End plate	Aluminum
	O-ring and seal	NBR
	Housing	Aluminum (anodized)
	Sleeve	Hardened steel

Application area

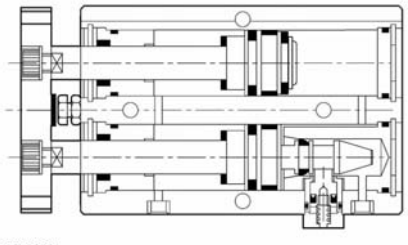
Twin pistons, compared to similar size cylinders, provide increased power with compact dimensions.
Used in material handling to support transverse loads, to separate and feed, as well as for sorting and pushing functions.
End position lock: safety function with pressure drop.

Technical information

			TWC 16-HL	TWC 20-HL	TWC 25-HL
Piston Ø	–	[mm]	2 x 16	2 x 20	2 x 25
Connection thread	–		M 5	M 5	M 5
Operating pressure	–	[bar] (psi)	1,5 - 7,0 (21.8-101.5)	1,5 - 7,0 (21.8-101.5)	1,5 - 7,0 (21.8-101.5)
Theoretical useful force (6 bar) (87 psi)	Thrust	[N] (lbf)	241 (54.2)	377 (84.7)	589 (132.4)
	Retraction force	[N] (lbf)	181 (40.7)	283 (63.6)	496 (111.5)
Cushioning	Polymer bumper		with	with	with
Max. additional moving mass	–	[kg] (lbs)	0,4 (0.88)	0,51 (1.12)	0,9 (1.98)
Max. holding force (at end lock position)		[N] (lbf)	96,1 (21.6)	151 (33.9)	235,4 (52.9)
Backlash (at end position lock)		[mm]	1	1	1

Structure and function (at end position lock)

Compressed air must be applied to the air connection at the lock to release the piston rod. The piston rod is then released and the cylinder is extended.
Note:
Compressed air must be applied to the retraction port to ensure perfect unlocking. The cylinder should be operated with a 5/2-way valve.



Twin Rod Cylinder, series TWC-HL

16–25 mm dia., double acting, end position lock, retracted

Rexroth
Bosch Group

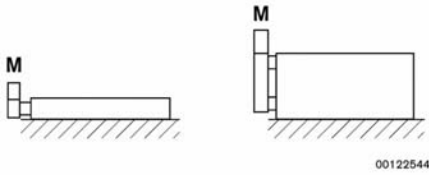
Part no. for TWC 16-HL to TWC 25-HL

Stroke [mm]	TWC 16-HL	TWC 20-HL	TWC 25-HL
10	**R402000846**	**R402000854**	**R402000862**
20	**R402000847**	**R402000855**	**R402000863**
30	**R402000848**	**R402000856**	**R402000864**
40	**R402000849**	**R402000857**	**R402000865**
50	**R402000850**	**R402000858**	**R402000866**
60	**R402000851**	**R402000859**	**R402000867**
70	**R402000852**	**R402000860**	**R402000868**
80	**R402000853**	**R402000861**	**R402000869**

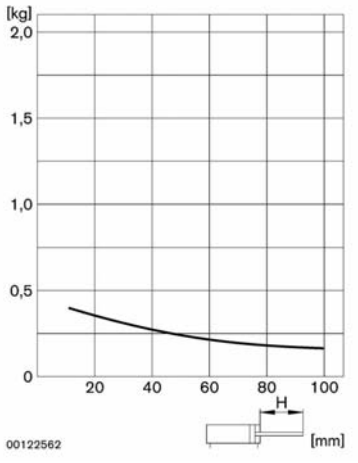
Weight [kg]/(lbs)

Stroke [mm]	TWC 16-HL	TWC 20-HL	TWC 25-HL
10	0,268 (0.591)	0,415 (0.915)	0,685 (1.510)
20	0,303 (0.668)	0,465 (1.025)	0,737 (1.625)
30	0,338 (0.745)	0,515 (1.136)	0,789 (1.74)
40	0,373 (0.822)	0,565 (1.246)	0,841 (1.854)
50	0,408 (0.90)	0,615 (1.356)	0,893 (1.969)
60	0,443 (0.977)	0,665 (1.466)	0,945 (2.084)
70	0,478 (1.054)	0,715 (1.577)	0,997 (2.198)
80	0,513 (1.131)	0,765 (1.687)	1,049 (2.313)

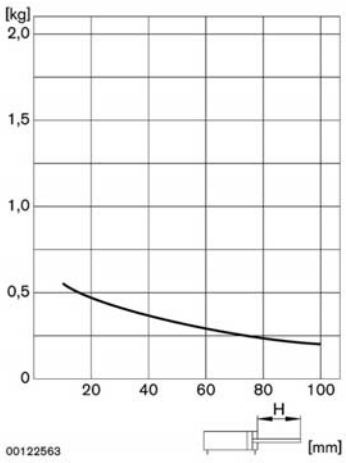
Maximum permissible moving mass depending on the stroke length



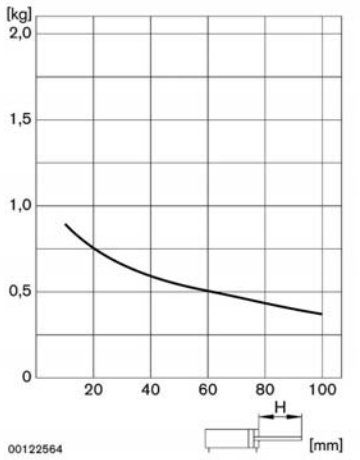
TWC 16-HL



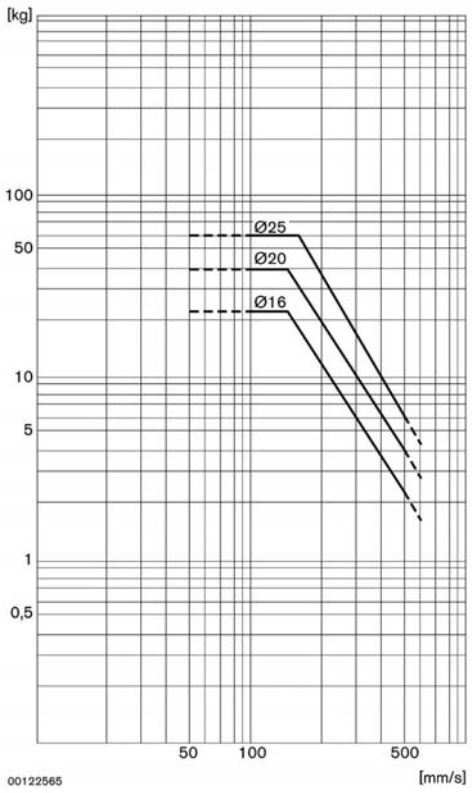
TWC 20-HL



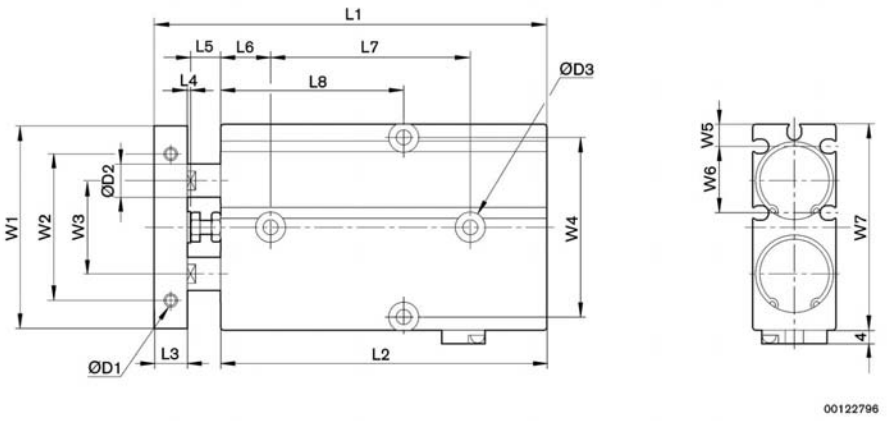
TWC 25-HL

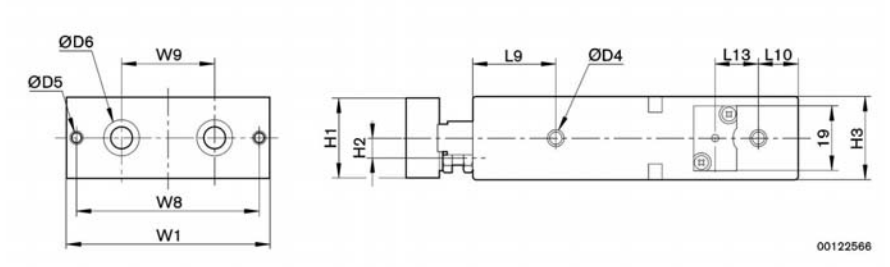


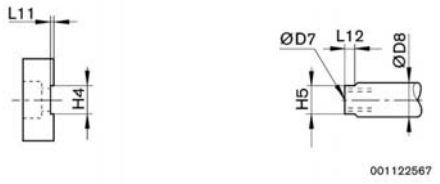
Maximum permissible moving mass depending on the impact speed



TWC 16-HL - 25-HL







TWC 16-HL - 25-HL	L1	L2	L3	L4	L5	L6	L7
TWC 16-HL	88	73	8	1	6	15	40
TWC 20-HL	98	78	10	1	9	15	40
TWC 25-HL	101	82	10	1	8	15	50

TWC 16-HL - 25-HL	L8							
Storke	10	20	30	40	50	60	70	80
TWC 16-HL	40	45	50	55	60	65	70	75
TWC 20-HL	40	45	50	55	60	65	70	75
TWC 25-HL	45	50	55	60	65	70	75	80

Twin Rod Cylinder, series TWC-HL

16–25 mm dia., double acting, end position lock, retracted

Rexroth
Bosch Group

TWC 16-HL - 25-HL	L9	L10	L11	L12	L13	W1	W2	W3	W4
TWC 16-HL	22	10	1	3	13	53	34	24	47
TWC 20-HL	25	12	1	3	13	61	44	28	55
TWC 25-HL	30	12	1	3	10	72	56	34	66

TWC 16-HL - 25-HL	W5	W6	W7	W8	W9	H1	H2	H3	H4
TWC 16-HL	5,7	18,5	54	47	24	20	4	21	6,2
TWC 20-HL	6,8	20	62	55	28	24	6	25	8,2
TWC 25-HL	8,3	22,5	73	66	34	29	7	30	10,2

TWC 16-HL - 25-HL	H5	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6	ØD7	ØD8
TWC 16-HL	6,2	M4x0,7	8	8x4,5	M5x0,8	M4x0,7	7,8x4,3	M4x0,7	8
TWC 20-HL	8,2	M4x0,7	10	8x4,5	M5x0,8	M4x0,7	11x6,5	M6x1	10
TWC 25-HL	10,2	M5x0,8	12	9x4,5	M5x0,8	M4x0,7	11x6,5	M6x1	12

Twin Rod Cylinder, series TWC-RL

16–25 mm dia., double acting, end position lock, extended

Rexroth
Bosch Group

★

Technical Data

Operating mode		Double-acting type with twin pistons
Operating temperature range		0 °C to +60 °C (+32 °F to +140 °F)
Speed		0,1 to 0,5 m/s (0,33 to 1.64 ft/s)
Guidance		friction bearing
Mounting		Side mounting through holes
Stroke-limiting range		-5 to 0 mm
Medium		Compressed air, lubricated or oil-free
Lubrication		maintenance-free
Material - Cylinder	Housing	Aluminum (anodized)
	Front plate	Steel
	Piston rod	Hardened steel
	Piston	Aluminum (anodized)
	Guide bushing	Aluminum (anodized)
	Seals	NBR
	End plate	Plastic
Material - End keep	Lock piston	Hardened steel
	Spring	Stainless steel
	Lock cover	Aluminum (anodized)
	End plate	Aluminum
	O-ring and seal	NBR
	Sleeve	Hardened steel

Application area

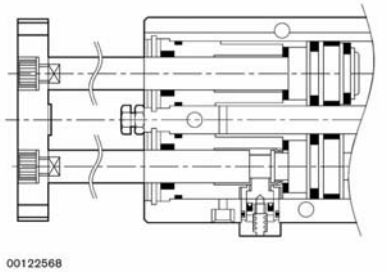
Twin pistons, compared to similar size cylinders, provide increased power with compact dimensions.
Used in material handling to support transverse loads, to separate and feed, as well as for sorting and pushing functions.
End position lock: safety function with pressure drop.

Technical information

			TWC 16-RL	TWC 20-RL	TWC 25-RL
Piston Ø	–	[mm]	2 x 16	2 x 20	2 x 25
Connection thread	–		M 5	M 5	M 5
Operating pressure	–	[bar] (psi)	1,5 - 7,0 (21.8-101.5)	1,5 - 7,0 (21.8-101.5)	1,5 - 7,0 (21.8-101.5)
Theoretical useful force (6 bar) (87 psi)	Thrust	[N] (lbf)	241 (54.2)	377 (84.7)	589 (132.4)
	Retraction force	[N] (lbf)	181 (40.7)	283 (63.6)	496 (111.5)
Cushioning	Polymer bumper		with	with	with
Max. additional moving mass	–	[kg] (lbs)	0,4 (0.88)	0,51 (1.12)	0,9 (1.98)
Max. holding force (at end lock position)		[N] (lbf)	96,1 (21.6)	151 (33.9)	235,4 (52.9)
Backlash (at end lock position)		[mm]	1	1	1

Structure and function (at end position look)

Compressed air must be applied to the air connection at the lock to release the piston rod. The piston rod is then released and the cylinder is retracted.
Note:
Compressed air must be applied to the extension port to ensure perfect unlocking. The cylinder should be operated with a 5/2-way valve.



Twin Rod Cylinder, series TWC-RL

16–25 mm dia., double acting, end position lock, extended

Rexroth
Bosch Group

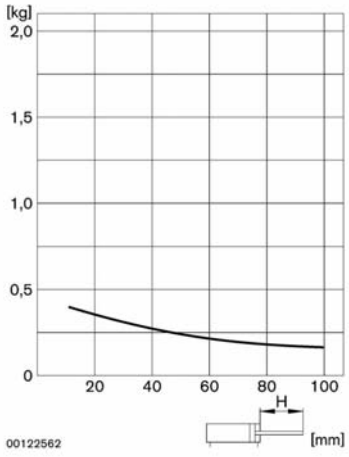
Part no. for TWC 16-RL to TWC 25-RL

Stroke [mm]	TWC 16-RL	TWC 20-RL	TWC 25-RL
10	R402000870	R402000878	R402000886
20	R402000871	R402000879	R402000887
30	R402000872	R402000880	R402000888
40	R402000873	R402000881	R402000889
50	R402000874	R402000882	R402000890
60	R402000875	R402000883	R402000891
70	R402000876	R402000884	R402000892
80	R402000877	R402000885	R402000893

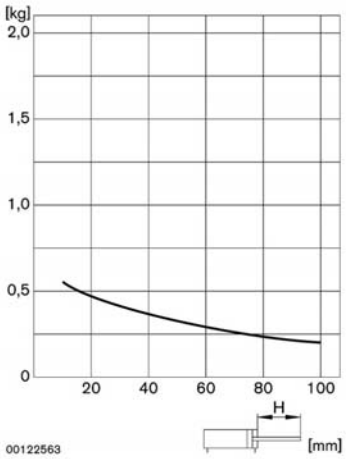
Weight [kg]/(lbs)

Stroke [mm]	TWC 16-RL	TWC 20-RL	TWC 25-RL
10	0,291 (0.642)	0,433 (0.955)	0,712 (1.57)
20	0,324 (0.714)	0,482 (1.063)	0,763 (1.682)
30	0,357 (0.787)	0,531 (1.171)	0,814 (1.795)
40	0,390 (0.86)	0,580 (1.279)	0,865 (1.907)
50	0,423 (0.933)	0,629 (1.387)	0,916 (2.02)
60	0,456 (1.005)	0,678 (1.495)	0,967 (2.132)
70	0,489 (1.078)	0,727 (1.603)	1,018 (2.245)
80	0,522 (1.151)	0,776 (1.711)	1,069 (2.357)

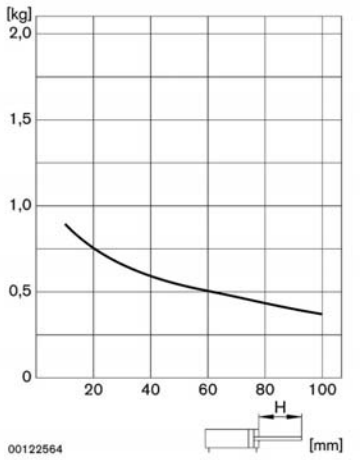
TWC 16-RL



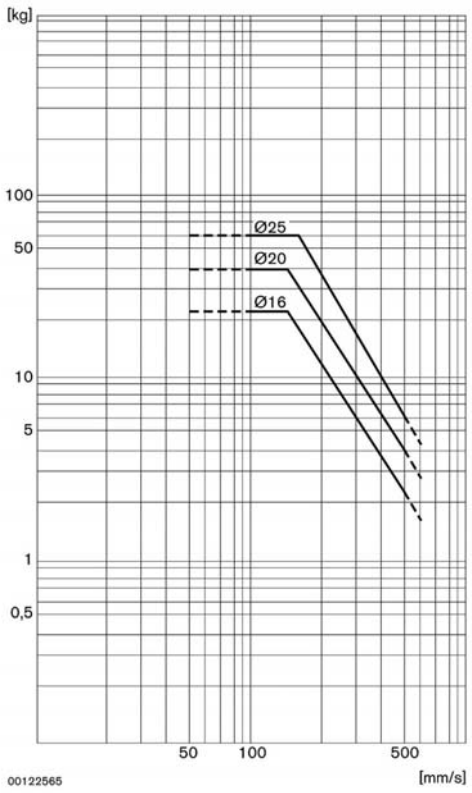
TWC 20-RL



TWC 25-RL



Maximum permissible moving mass depending on the impact speed

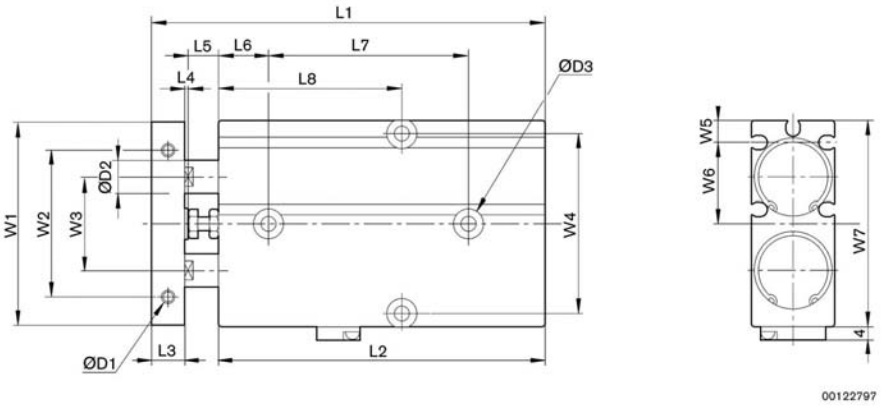


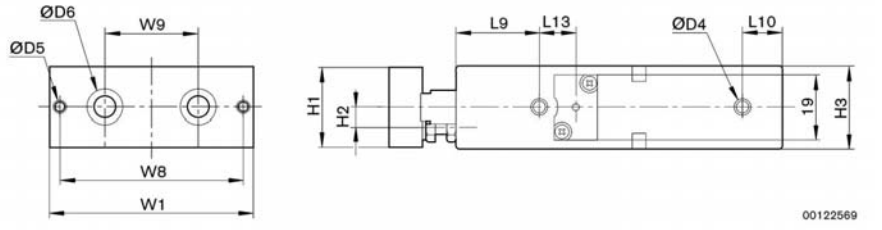
Twin Rod Cylinder, series TWC-RL

16–25 mm dia., double acting, end position lock, extended

Rexroth
Bosch Group

TWC 16-RL - 25-RL





TWC 16-RL - 25-RL	L1	L2	L3	L4	L5	L6	L7
TWC 16-RL	88	73	8	1	6	15	40
TWC 20-RL	98	78	10	1	9	15	40
TWC 25-RL	101	82	10	1	8	15	50

TWC 16-RL - 25-RL	L8							
Storke	10	20	30	40	50	60	70	80
TWC 16-RL	45	45	50	55	60	65	70	75
TWC 20-RL	45	45	50	55	60	65	70	75
TWC 25-RL	50	50	55	60	65	70	75	80

TWC 16-RL - 25-RL	L9	L10	L11	L12	L13	W1	W2	W3	W4
TWC 16-RL	22	10	1	3	11	53	34	24	47
TWC 20-RL	25	12	1	3	11	61	44	28	55
TWC 25-RL	30	12	1	3	9	72	56	34	66

TWC 16-RL - 25-RL	W5	W6	W7	W8	W9	H1	H2	H3	H4
TWC 16-RL	5,7	18,5	54	47	24	20	4	21	6,2
TWC 20-RL	6,8	20	62	55	28	24	6	25	8,2
TWC 25-RL	8,3	22,5	73	66	34	29	7	30	10,2

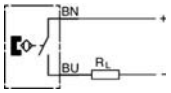
TWC 16-RL - 25-RL	H5	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6	ØD7	ØD8
TWC 16-RL	6,2	M4x0,7	8	8x4,5	M5x0,8	M4x0,7	7,8x4,3	M4x0,7	8
TWC 20-RL	8,2	M4x0,7	10	8x4,5	M5x0,8	M4x0,7	11x6,5	M6x1	10
TWC 20-RL	8,2	M4x0,7	10	2 x 8x4,5	M5x0,8	M4x0,7	2 x 11x6,5	M6x1	10
TWC 25-RL	10,2	M5x0,8	12	9x4,5	M5x0,8	M4x0,7	11x6,5	M6x1	12

Sensor series SH4, for TWC, Ø 6

General characteristics Reed sensor

Operating voltage	DC 10 - 28 V
Switching current Imax.	DC 40 mA
Ambient temperature	0 °C to +60 °C (+32°F to +140°F)
Voltage drop U with Imax	3 V
Leakage current	max. 0,01 mA
Switching frequency	0,5 KHz
Polarity safe	No
Enclosure protection class	IP 67, fully insulated (NEMA 6)
Connection	Cable
Shock resistance	30 G
Vibration firmness	10 - 55 Hz
Switching time	max. 1 ms
Indication	LED (red = switched)

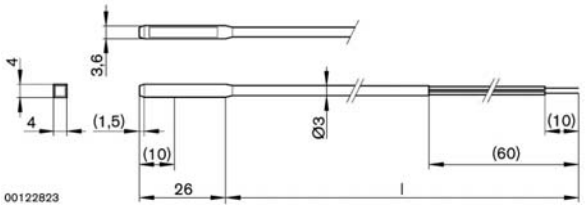
switch symbol, Reed 2-wires



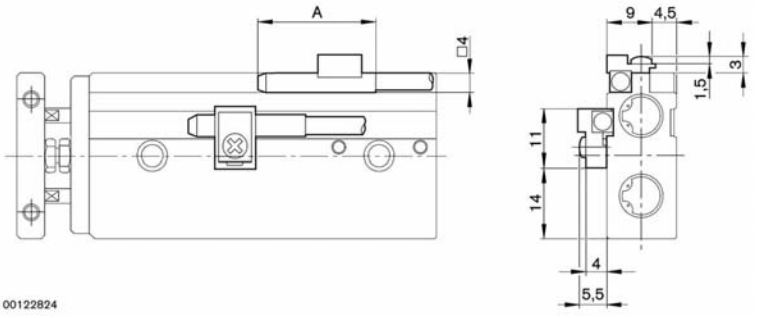
BN = brown, BU = blue

Type	Cable length [m]	Weight [kg] (lbs)	Part number
Reed, 2-wires	3,0	0,029 (0.064)	**2650122031**

Magnetic sensor dimension



Clamp mounting dimension



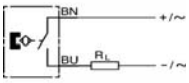
Quantity	Part number
2 (1 x top mount, 1 x side mount)	**R412006637**

▲★ Sensor for Series TWC, Ø 10 - 32

General characteristics Reed sensor

Operating voltage	10 - 28 V DC 85 - 115 V AC
Switching current Imax.	40 mA DC
Ambient temperature	0 °C to +60 °C (+32°F to +140°F)
Voltage drop U with Imax	3 V
Leakage current	max. 0,01 mA
Switching frequency	0,5 KHz
Polarity safe	No
Enclosure protection class	IP 67, fully insulated (NEMA 6)
Connection	Cable
Shock resistance	30 G
Vibration firmness	10 - 55 Hz
Switching time	max. 1 ms
Indication	LED (red = switched)

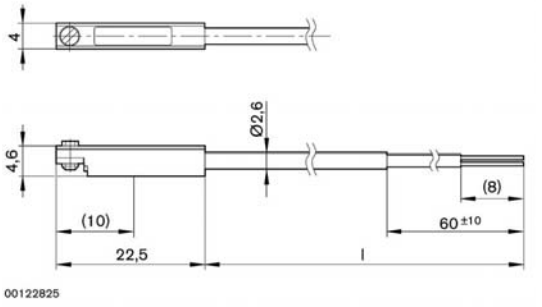
switch symbol, Reed 2-wires

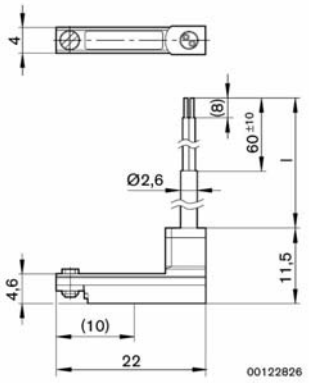


BN = brown, BU = blue

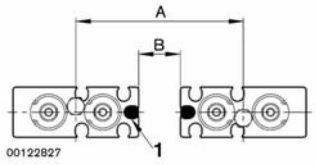
Type	Cable length [m]	Weight [kg] (lbs)	Part number
cable standard	3,0	0,029 (0.064)	**2650122051**
cable right angle	3,0	0,030 (0.066)	**2650122052**

Dimensions



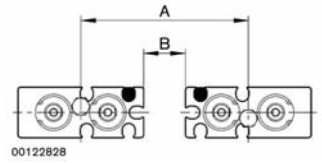


Installation Note:

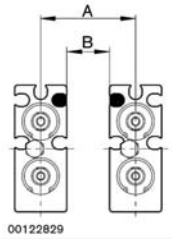


1) Sensor

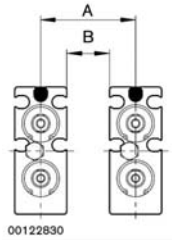
	To prevent interferences, following distances are necessary.					
	Type	**10**	**16**	**20**	**25**	**32**
A	Reed switch type	48	60	68	81	109
B	Reed switch type	6	6	6	8	13



	Type	**10**	**16**	**20**	**25**	**32**
A	Reed switch type	42	54	62	73	98
B	Reed switch type	0	0	0	0	0



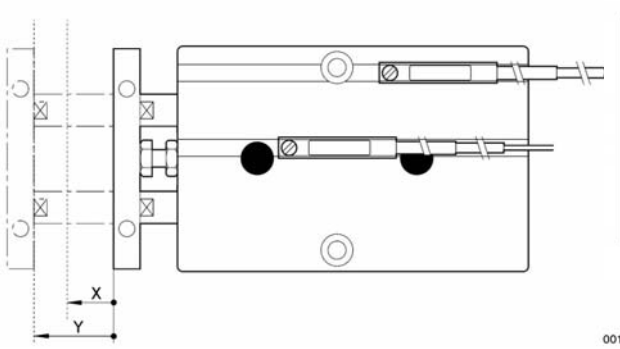
	Type	**10**	**16**	**20**	**25**	**32**
A	Reed switch type	22	27	30	37	53
B	Reed switch type	5	6	5	7	13



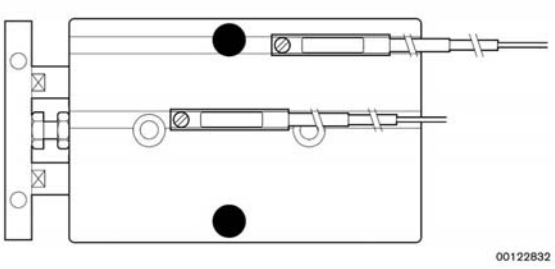
	Type	**10**	**16**	**20**	**25**	**32**
A	Reed switch type	17	21	25	30	40
B	Reed switch type	0	0	0	0	0

TWC 10 - 32

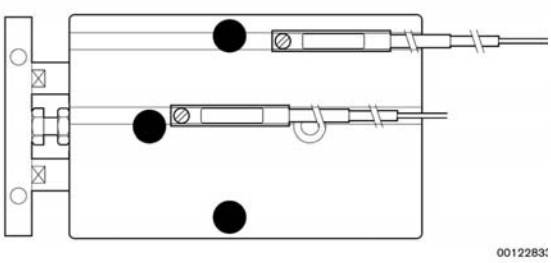
1: Mounting with 2 screws



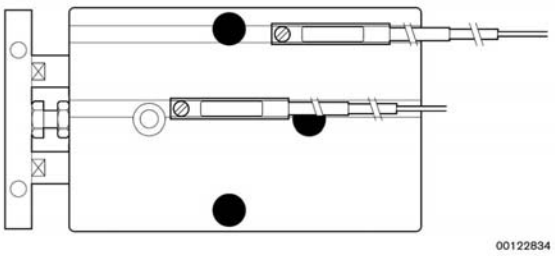
2: Mounting with 2 screws



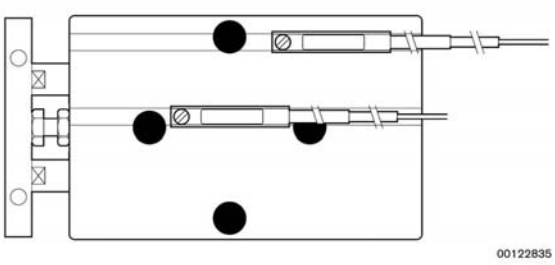
3: Mounting with 3 screws



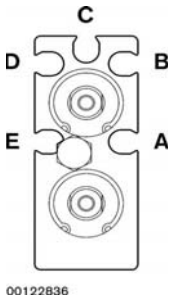
4: Mounting with 3 screws



5: Mounting with 4 screws



Sensor grooves



▲★ **TWC10-32**

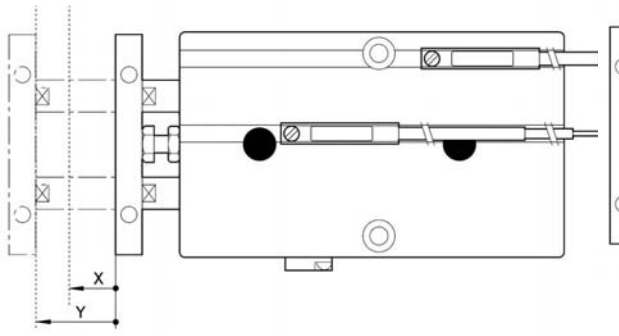
Piston-Ø Symbol	Stroke range x-y [mm] without signal output																
			TWC10					TWC16					TWC20				
	Stroke	Nut	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5
	10	A,E	0-10	-	-	0-10	0-10	0-10	-	-	0-10	0-10	2-10	-	-	2-10	2-10
		B,D	-	5-10	5-10	7-10	7-10	-	8-10	8-10	8-10	-	-	8-10	8-10	8-10	8-10
		C	-	6-10	6-10	8-10	8-10	-	-	-	-	-	-	10	10	-	-
	20	A,E	0-11	-	-	0-11	0-11	0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D	-	15-20	15-20	17-20	17-20	-	15-20	15-20	17-20	17-20	-	18-20	18-20	18-20	18-20
		C	-	16-20	16-20	18-20	18-20	-	17-20	17-20	19-20	19-20	-	-	-	-	-
	30	A,E	0-11	-	-	0-11	0-11	0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D	-	19-30	19-30	21-30	21-30	-	20-30	20-30	22-30	22-30	-	28-30	24-30	26-30	28-30
		C	-	20-30	20-30	22-30	22-30	-	22-30	22-30	24-30	24-30	-	-	26-30	28-30	-
	40	A,E	0-11	-	-	0-11	0-11	0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D	-	25-40	25-40	27-40	27-40	-	25-40	25-40	27-40	27-40	-	34-40	29-40		36-40
		C	-	26-40	26-40	28-40	28-40	-	27-40	27-40	29-40	29-40	-	36-40	31-40	33-40	38-40
	50	A,E	0-11	-	-	0-11	0-11	0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D	-	30-47	30-47	32-45	32-45	-	30-49	30-49	32-46	32-46	-	39-50	34-50	36-50	41-50
		C	-	31-46	31-46	33-44	33-44	-	32-47	32-47	34-44	34-44	-	41-50	36-50	39-50	43-50
	60	A,E	0-11	-	-	0-11	0-11	0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D	-	35-52	35-52	37-50	37-50	-	35-54	35-54	37-51	37-51	-	44-60	39-59	41-57	46-60
		C	-	36-51	36-51	38-49	38-49	-	37-52	37-52	39-49	39-49	-	46-60	41-57	43-55	48-60
	70	A,E	0-11	-	-	0-11	0-11	0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D	-	40-57	40-57	42-55	42-55	-	40-59	40-59	42-56	42-56	-	49-69	44-64	46-62	51-67
		C	-	41-56	41-56	43-54	43-54	-	42-57	42-57	44-54	44-54	-	51-67	46-62	48-60	53-65
	80	A,E						0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D						-	45-64	45-64	47-61	47-61	-	54-74	49-69	51-67	56-72
		C						-	47-62	47-62	49-59	49-59	-	56-72	51-67	53-65	58-70
	90	A,E						0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D						-	50-69	50-69	52-66	52-66	-	59-79	54-74	56-72	61-77
		C						-	52-67	52-67	54-64	54-64	-	61-77	56-72	58-70	63-75
	100	A,E						0-12	-	-	0-12	0-12	2-15	-	-	2-15	2-15
		B,D						-	55-74	55-74	57-71	57-71	-	64-84	59-79	61-77	66-82
		C						-	57-72	57-72	59-69	59-69	-	66-82	61-77	63-75	68-80

▲★ **TWC10-32**

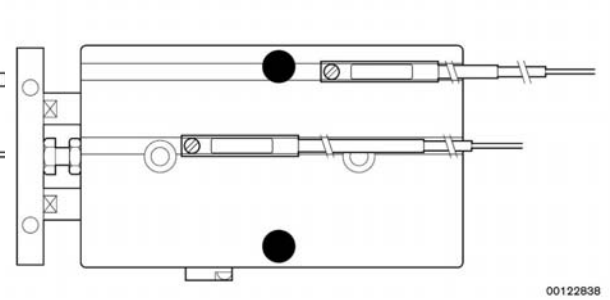
Piston-Ø Symbol	Stroke range x-y [mm] without signal output											
			TWC10					TWC32				
	Stroke	Nut	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5
	10	A,E	-	-	-	-	-	0-10	-	-	0-10	0-10
		B,D	-	-	-	-	-	-	9-10	9-10	9-10	9-10
		C	-	-	-	-	-	-	-	-	-	-
	20	A,E	-	-	-	-	-	0-14	-	-	0-14	0-14
		B,D	-	-	-	-	-	-	19-20	19-20	19-20	19-20
		C	-	-	-	-	-	-	-	-	-	-
	30	A,E	-	-	-	-	-	0-14	-	-	0-14	0-14
		B,D	-	-	26-30	27-30	-	-	27-30	27-30	27-30	27-30
		C	-	-	26-30	27-30	-	-	28-30	28-30	28-30	28-30
	40	A,E	-	-	-	-	-	0-15	-	-	0-14	0-14
		B,D	-	36-40	31-40	32-40	37-40	-	32-40	32-40	32-40	32-40
		C	-	36-40	31-40	32-40	37-40	-	33-40	33-40	33-40	33-40
	50	A,E	-	-	-	-	-	0-15	-	-	0-14	0-14
		B,D	-	41-50	36-50	37-49	42-50	-	37-49	37-49	37-49	37-49
		C	-	41-50	36-50	37-49	42-50	-	38-48	38-48	38-48	38-48
	60	A,E	-	-	-	-	-	0-16	-	-	0-14	0-14
		B,D	-	46-60	41-56	42-54	47-59	-	42-54	42-54	42-54	42-54
		C	-	46-60	41-56	42-54	47-59	-	43-53	43-53	43-53	43-53
	70	A,E	-	-	-	-	-	0-16	-	-	0-14	0-14
		B,D	-	51-66	46-61	47-59	52-64	-	47-59	47-59	47-59	47-59
		C	-	51-66	46-61	47-59	52-64	-	48-58	48-58	48-58	48-58
	80	A,E	-	-	-	-	-	0-17	-	-	0-14	0-14
		B,D	-	56-71	51-66	52-64	57-69	-	52-64	52-64	52-64	52-64
		C	-	56-71	51-66	52-64	57-69	-	53-63	53-63	53-63	53-63
	90	A,E	-	-	-	-	-	0-17	-	-	0-14	0-14
		B,D	-	61-76	56-71	57-69	62-74	-	57-69	57-69	57-69	57-69
		C	-	61-76	56-71	57-69	62-74	-	58-68	58-68	58-68	58-68
	100	A,E	-	-	-	-	-	0-18	-	-	0-14	0-14
		B,D	-	66-81	61-76	62-74	67-79	-	62-74	62-74	62-74	62-74
		C	-	66-81	61-76	62-74	67-79	-	63-73	63-73	63-73	63-73

TWC16-25-RL

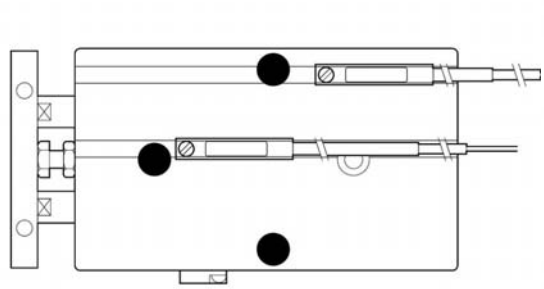
1: Mounting with 2 screws



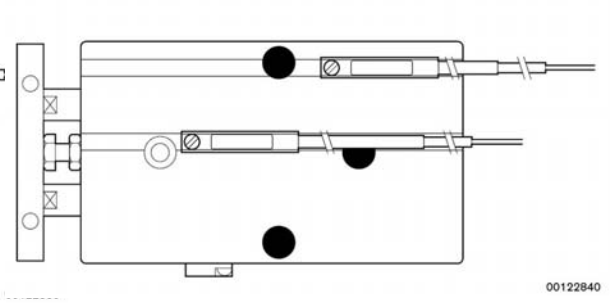
2: Mounting with 2 screws



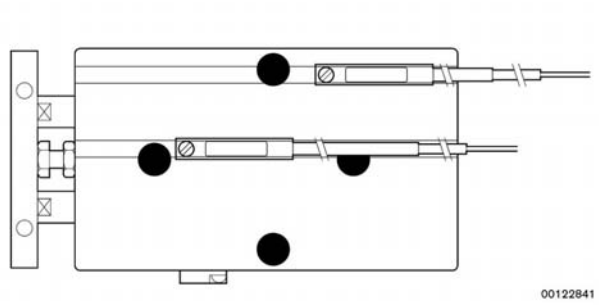
3: Mounting with 3 screws



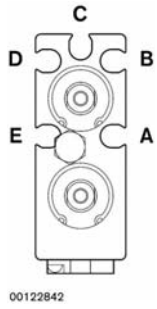
4: Mounting with 3 screws



5:Mounting with 4 screws



Sensor grooves

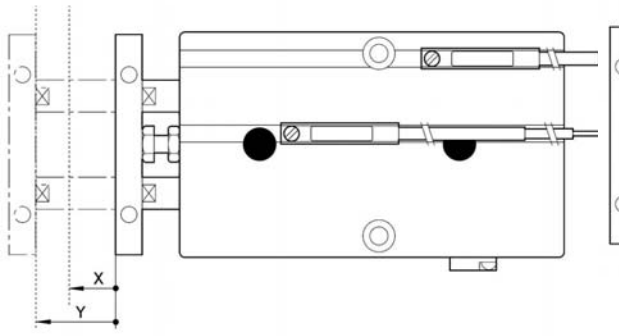


▲★ **TWC10-32**

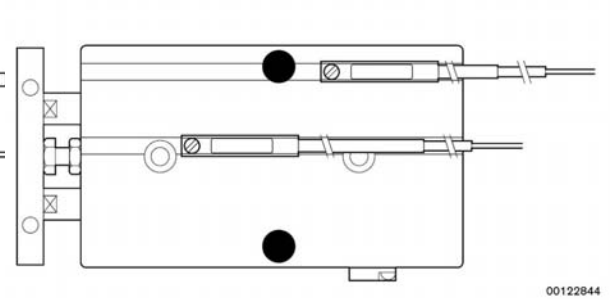
Piston-Ø Symbol	Stroke	Nut	Stroke range x-y [mm] without signal output														
			TWC16-RL					TWC20-RL					TWC25-RL				
			Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5
	10	A,E	0-10	-	-	0-10	0-10	0-10	-	-	0-10	0-10	-	-	-	-	-
		B,D	-	-	8-10	-	-	-	8-10	8-10	-	-	-	-	-	-	-
		C	-	-	-	-	-	-	10	10	-	-	-	-	-	-	-
	20	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	-	15-20	-	-	-	-	18-20	-	-	-	-	-	-	-
		C	-	-	17-20	-	-	-	-	-	-	-	-	-	-	-	-
	30	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	29-30	29-30	29-30	29-30	-	-	24-30	-	-	-	28-30	26-30	26-30	-
		C	-	22-30	-	22-30	-	-	-	26-30	-	-	-	-	26-30	26-30	-
	40	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	35-40	35-40	35-40	35-40	-	39-40	39-40	39-40	39-40	-	-	31-40		-
		C	-	37-40	37-40	37-40	37-40	-	31-40	-	31-40	-	-	-	31-40	31-40	-
	50	A,E	0-14	-	-	2-14	2-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	40-50	40-50	40-50	40-50	-	44-50	44-50	44-50	44-50	-	46-50	46-50	46-50	46-60
		C	-	42-50	42-50	42-50	42-50	-	46-50	46-50	46-50	46-50	-	46-50	46-50	46-50	46-60
	60	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	45-60	45-60	45-60	45-60	-	49-60	49-60	49-60	49-60	-	51-60	51-60	51-60	51-60
		C	-	47-60	47-60	47-60	47-60	-	51-60	51-60	51-60	51-60	-	51-60	51-60	51-60	51-60
	70	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	2-15
		B,D	-	50-69	50-69	50-69	50-69	-	54-70	54-70	54-70	54-70	-	56-70	56-70	56-70	56-70
		C	-	52-67	52-67	52-67	52-67	-	56-70	56-70	56-70	56-70	-	56-70	56-70	56-70	56-70
	80	A,E	0-14	-	-	0-12	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	55-74	55-74	55-74	55-74	-	59-79	59-79	59-79	59-79	-	61-76	61-76	61-76	61-76
		C	-	57-72	-	57-72	57-72	-	61-77	61-77	61-77	61-77	-	61-76	61-76	61-76	61-76
	90	A,E	0-14		-	0-14	0-14	0-12	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	60-79	60-79	60-79	60-79	-	64-84	64-84	64-84	64-84	-	66-81	66-81	66-81	61-77
		C	-	62-77	62-77	62-77	62-77	-	66-82	66-82	66-82	66-82	-	66-81	66-81	66-81	66-81
	100	A,E	0-14	-	-	0-12	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	-	65-84	65-84	65-84	-	69-89	69-89	69-89	69-89	-	71-86	71-86	71-86	71-86
		C	-	67-82	67-82	67-82	67-82	-	71-87	71-87	71-87	71-87	-	71-86	71-86	71-86	71-86

TWC16-25-HL

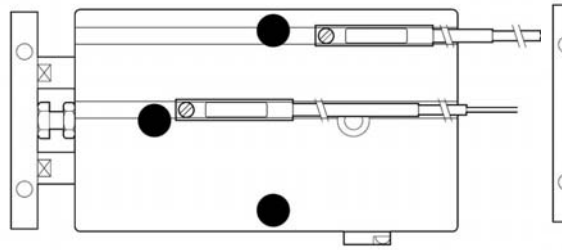
1: Mounting with 2 screws



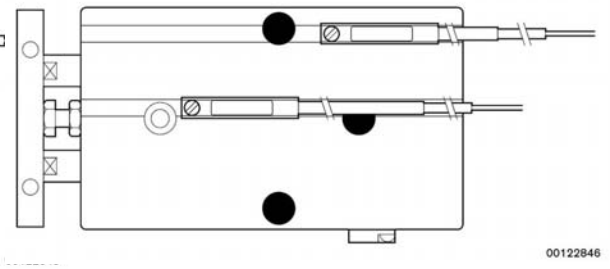
2: Mounting with 2 screws



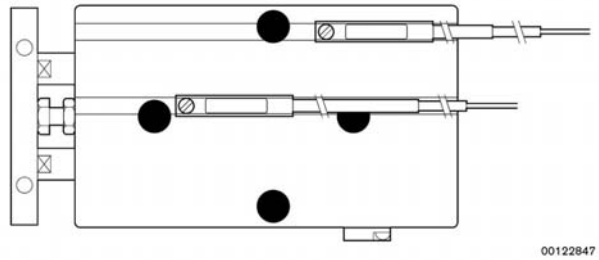
3: Mounting with 3 screws



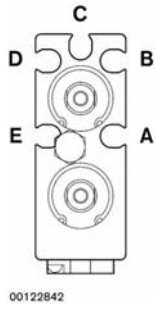
4:Mounting with 3 screws



5:Mounting with 4 screws



sensor grooves



Rexroth
Bosch Group

▲★ **TWC16-25-HL**

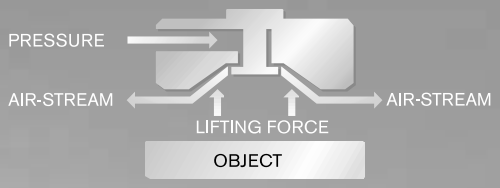
Piston-Ø Symbol	Stroke range x-y [mm] without signal output																
			TWC10					TWC20HRL					TWC25-HL				
	Stroke	Nut	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5	Fig. 1	Fig. 2	Fig. 3	Fig. 4	Fig. 5
	10	A,E	0-10	-	-	0-10	0-10	0-10	-	-	0-10	0-10	-	-	-	-	-
		B,D	-	0-10	0-10	0-10	2-10	-	4-10	4-10	4-10	4-10	-	6-10	6-10	6-10	6-10
		C	-	2-10	2-10	2-10	-	-	6-10	6-10	6-10	6-10	-	6-10	6-10	6-10	6-10
	20	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	5-20	5-20	5-20	5-20	-	9-20	9-20	9-20	9-20	-	11-20	11-20	11-20	11-20
		C	-	7-20	7-20	7-20	7-20	-	11-20	11-20	11-20	11-20	-	11-20	11-20	11-20	11-20
	30	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	10-29	10-29	10-29	10-29	-	14-30	14-30	14-30	14-30	-	16-30	16-30	16-30	16-30
		C	-	12-27	12-27	12-27	12-27	-	16-30	16-30	16-30	16-30	-	16-30	16-30	16-30	16-30
	40	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	15-34	15-34	15-34	15-34	-	19-39	19-39	19-39	19-39	-	21-36	21-36	21-36	21-36
		C	-	17-32	17-32	17-32	17-32	-	21-37	21-37	21-37	21-37	-	21-36	21-36	21-36	21-36
	50	A,E	0-14	-	-	2-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	20-39	20-39	20-39	20-39	-	24-44	24-44	24-44	24-44	-	26-41	26-41	26-41	26-41
		C	-	22-37	22-37	22-37	22-37	-	26-42	26-42	26-42	26-42	-	26-41	26-41	26-41	26-41
	60	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	25-44	25-44	25-44	25-44	-	29-49	29-49	29-49	29-49	-	31-46	31-46	31-46	31-46
		C	-	27-42	27-42	27-42	27-42	-	31-47	31-47	31-47	31-47	-	31-46	31-46	31-46	31-46
	70	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	2-15
		B,D	-	30-49	30-49	30-49	30-49	-	34-54	34-54	34-54	34-54	-	36-51	36-51	36-51	36-51
		C	-	32-47	32-47	32-47	32-47	-	36-52	36-52	36-52	36-52	-	36-51	36-51	36-51	36-51
	80	A,E	0-14	-	-	0-12	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	35-54	35-54	35-54	35-54	-	39-59	39-59	39-59	39-59	-	41-56	41-56	41-56	41-56
		C	-	37-52	37-52	37-52	37-52	-	41-57	41-57	41-57	41-57	-	41-56	41-56	41-56	41-56
	90	A,E	0-14		-	0-14	0-14	0-12	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	40-59	40-59	40-59	40-59	-	44-64	44-64	44-64	44-64	-	46-61	46-61	46-61	46-61
		C	-	42-57	42-57	42-57	42-57	-	46-62	46-62	46-62	46-62	-	46-61	46-61	46-61	46-61
	100	A,E	0-14	-	-	0-14	0-14	0-17	-	-	0-17	0-17	-	-	-	-	-
		B,D	-	45-64	45-64	45-64	45-64	-	49-69	49-69	49-69	49-69	-	51-66	51-66	51-66	51-66
		C	47-62	47-62	47-62	47-62	47-62	-	51-67	51-67	51-67	51-67	-	51-66	51-66	51-66	51-66

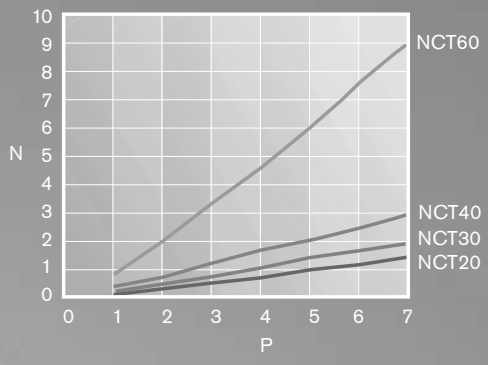
Rexroth
Bosch Group

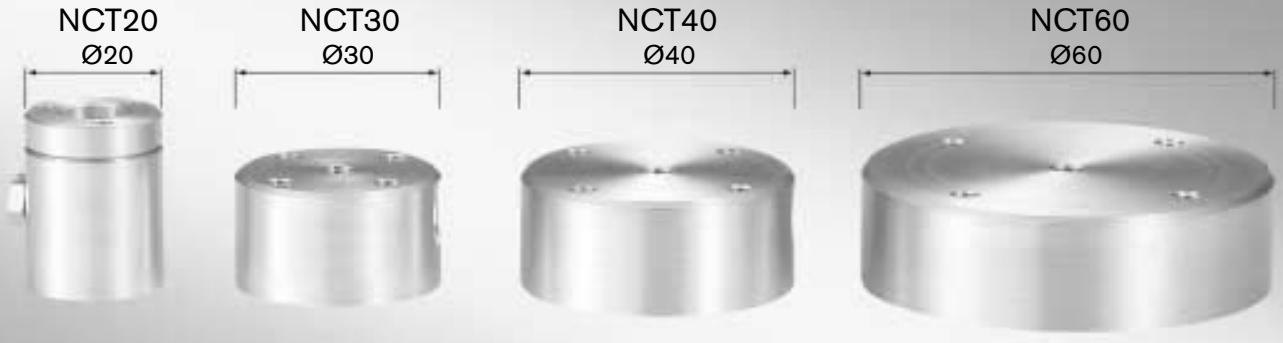
NCT Series

The Non-Contact Transfer Unit from Rexroth is a unique new picking device that operates by the Bernoulli principle.

The airflow under the device creates a vacuum and a lifting force between the center and the circumference. Objects can be lifted without any surface contact, enabling delicate objects to be handled. Because of the dynamic vacuum and the continuous flow, the lifted object will not attach to NCT surfaces. The NCT are equipped with removable rubber pads for rapid horizontal movement.







Rexroth
Bosch Group

Technical Data

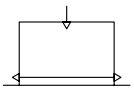
Operating type	Bernoulli principle
Working pressure	1–7 bar (15 - 105 psi)
Ambient temperature range	5 °C to +60 °C / 41° to 140°F
Medium	Compressed air filtered*, non-lubricated
Material	Aluminum alloy (anodized)

Application areas

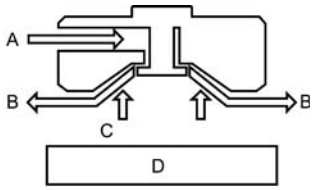
Suitable for all applications where grippers or suction cups not can be used.
- Rough surface
- Hot or cold objects
- Sensitive objects
- Dirty objects
- Porous surfaces (up to 50% holes)

Examples of objects
- Plastic bags
- Paper material
- CDs and DVDs
- Electronic circuit board

Technical information

Symbol	Type	NCT20	NCT30	NCT40	NCT60
	Diameter in. [mm]	.79 [20]	1.18 [30]	1.57 [40]	2.36 [60]
	Lift. force @73 psi(5 bar) lbf [N]	0.20 [0.9]	0.29 [1.3]	0.45 [2.0]	1.35 [6.0]
	Air comsumption scfm [l/min]	3.53 [100]	3.53 [100]	3.88 [110]	7.42 [210]
	Weight lbs. [kg]	0.04 [0.02]	0.07 [0.03]	0.12 [0.054]	0.27 [0.124]
	Port size	M5 x 0,8	M5 x 0,8	M5 x 0,8	M5 x 0,8

Operating principle



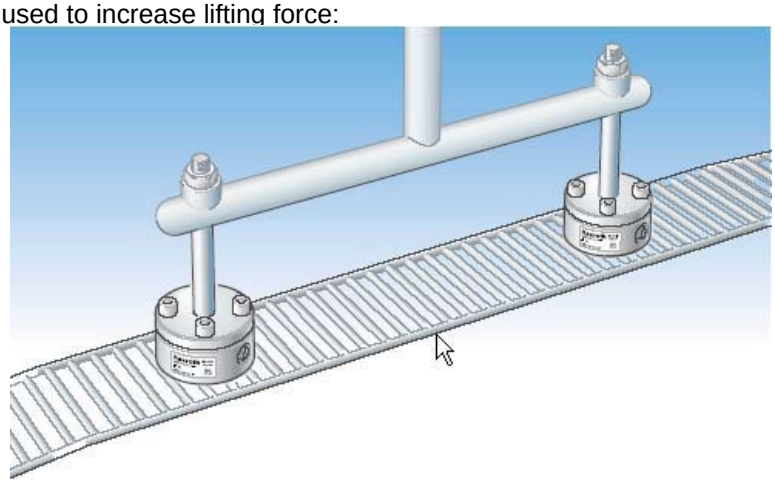
A: Pressure B: Air stream C: Lifting force D: Object

Code no.

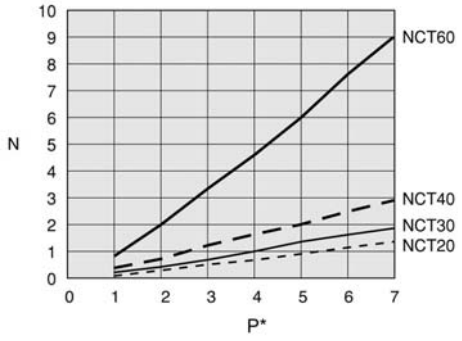
Type	NCT20	NCT30	NCT40	NCT60
Code no.	**2 650 100 010**	**2 650 100 020**	**2 650 100 030**	**2 650 100 040**

*For maximum longevity, a 0.01 micron filter is recommended.

Multiple NCTs can be used to increase lifting force:

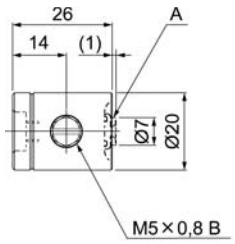


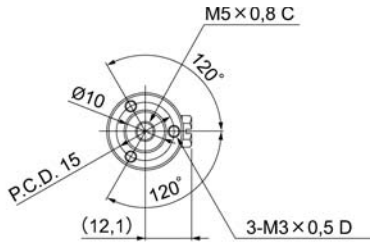
Lifting force N



P* = Pressure (bar) 1 bar = 14.5 psi 1 N = 0.225 lbf

Dimensions for NCT 20

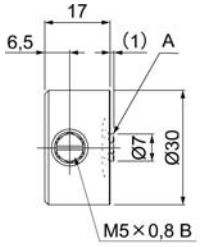


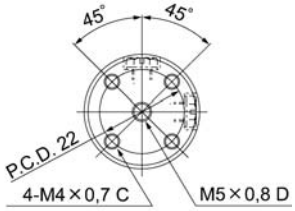


A	B	C	D
Rubber pads*	Plug, can be used as alternative connection port or sensor holder	Connection port	Depth 5

* Can be removed for contactless applications.

Dimensions for NCT 30

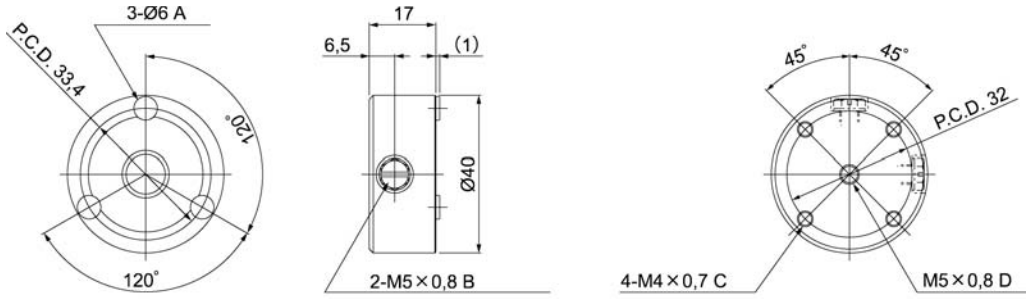




A	B	C	D
Rubber pads*	Two plugs, can be used as alternative connection port or sensor holder	Depth 5	Connection port

* Can be removed for contactless applications.

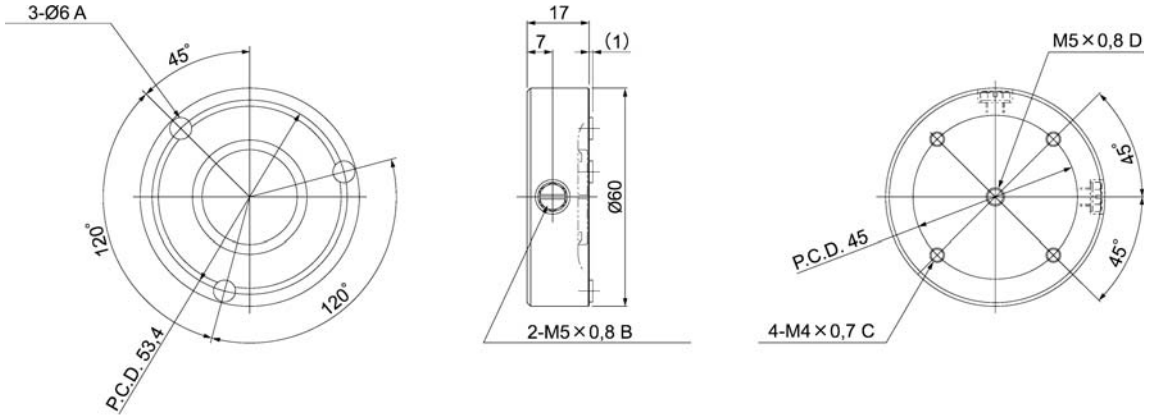
Dimensions for NCT 40



A	B	C	D
Rubber pads*	Two plugs, can be used as alternative connection port or sensor holder	Depth 5	Connection port

* Can be removed for contactless applications.

Dimensions for NCT 60



A	B	C	D
Rubber pads*	Two plugs, can be used as alternative connection port or sensor holder	Depth 5	Connection port

* Can be removed for contactless applications.

▲★ **Spare rubber friction pads**

Item	NCT20, NCT30	NCT40, NCT60
Friction pads, silicone (pack of 10)	R402000761	R402000164
Friction pads, NBR (pack of 10)	R432002664	R432002665

NOTICES TO PRODUCT USERS

1. WARNING: FLUID MEDIA

Bosch Rexroth pneumatic devices are designed and tested for use with filtered, clean, dry, chemical free air at pressures and temperatures within the specified limits of the device. For use with media other than air or for human life support systems, Bosch Rexroth must be consulted. Hydraulic cylinders are designed for operation with filtered, clean, petroleum based hydraulic fluid; operation using fire-resistant or other special types of fluids may require special packing and seals. Consult the factory.

2. WARNING: MATERIAL COMPATIBILITY

Damage to product seals or other parts caused by the use of non-compatible lubricants, oil additives or synthetic lubricants in the air system compressor or line lubrication devices voids Bosch Rexroth's warranty and can result in product failure or other malfunction. See lubrication recommendations below.

AIR LINE LUBRICANTS! In service higher than 18 cycles per minute or with continuous flow of air through the device, an air line lubricator is recommended. * (Do not use line lubrication with vacuum products.) However, the lubricator must be maintained since the oil will wash out the grease, and lack of lubrication will greatly shorten the life expectancy. The oils used in the lubricator must be compatible with the elastomers in the device. The elastomers are normally BUNA-N, NEOPRENE, VITON, SILICONE and HYTREL. Bosch Rexroth recommends the use of only petroleum-based oils without synthetic additives, and with an aniline point between 180° and 210° F.

COMPRESSOR LUBRICANTS! All compressors (with the exception of special "oil free" units) pass oil mist or vapor from the internal crankcase lubricating system through to the compressed air. Since even small amounts of non-compatible lubricants can cause severe seal deterioration (which could result in component and system failure) special care should be taken in selecting compatible compressor lubricants. It is recommended that users review the National Fluid Power Association "Recommended Guide Lines For Use Of Synthetic Lubricants In Pneumatic Fluid Power Systems" (NFPA T1-1978).

3. WARNING: INSTALLATION AND MOUNTING

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when system is under pressure. Always exhaust or drain the pressure from system before performing any service work. Failure to do so can result in serious personal injury.

MOUNTING! Devices should be mounted and positioned in such manner that they cannot be accidentally operated.

4. WARNING: APPLICATION AND USE OF PRODUCTS

The possibility does exist for any device or accessory to fail to operate properly through misuse, wear or malfunction. The user must consider these possibilities and should provide appropriate safe guards in the application or system design to prevent personal injury or property damage in the event of malfunction.

5. WARNING: CONVERSION, MAINTENANCE AND REPAIR

When a device is disassembled for conversion to a different configuration, maintenance or repair, the device must be tested for leakage and proper operation after being reassembled and prior to installation.

MAINTENANCE AND REPAIR! Maintenance periods should be scheduled in accordance with frequency of use and working conditions. All Bosch Rexroth products should provide minimum of 1,000,000 cycles of maintenance free service when used and lubricated as recommended. However, these products should be visually inspected for defects and given an "in system" operating performance and leakage test once a year. Where devices require major repair as result of the one million cycles, one year, or routine inspection, the device must be disassembled, cleaned, inspected, parts replaced as required, rebuilt and tested for leakage and proper operation prior to installation. See individual catalogs for specific cycle life estimates.

6. PRODUCT CHANGES

Product changes including specifications, features, designs and availability are subject to change at any time without notice. For critical dimensions or specifications, contact factory.

*Many Bosch Rexroth pneumatic components can operate with or without air line lubrication; see individual sales catalogs for details.

--Refer to the appropriate service catalog for parts and service information.

LIMITATIONS OF WARRANTIES & REMEDIES

Bosch Rexroth warrants its products sold by it to be free from defects in material and workmanship to the following:
For twelve months after shipment Bosch Rexroth will repair or replace (F.O.B. our works), at its option, any equipment which under normal conditions of use and service proves to be defective in material or workmanship at no charge to the purchaser. No charge will be made for labor with respect to defects covered by this Warranty, provided that the work is done by Bosch Rexroth or any of its authorized service facilities. However, this Warranty does not cover expenses incurred in the removal and reinstallation of any product, nor any downtime incurred, whether or not proved defective.
All repairs and replacement parts provided under this Warranty policy will assume the identity, for warranty purposes, of the part replaced, and the warranty on such replacement parts will expire when the warranty on the original part would have expired. Claims must be submitted within thirty days of the failure or be subject to rejection.
This Warranty is not transferable beyond the first using purchaser. Specifically, excluded from this Warranty are failures caused by misuse, neglect, abuse, improper operation or filtration, extreme temperatures, or unauthorized service or parts. This Warranty also excludes the use of lubricants, fluids or air line additives that are not compatible with seals or diaphragms used in the products. This Warranty sets out the purchaser's exclusive remedies with respect to products covered by it, whether for negligence or otherwise. Neither, Bosch Rexroth nor any of its affiliates will be liable for consequential or incidental damages or other losses or expenses incurred by reason of the use or sale of such products. Our liability (except as to title) arising out of the sale, use or operation of any product or parts, whether on warranty, contract or negligence (including claims for consequential or incidental damage) shall not in any event exceed the cost of replacing the defective products and, upon expiration of the warranted period as herein provided, all such liability is terminated. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. No attempt to alter, amend or extend this Warranty shall be effective unless authorized in writing by an officer of Bosch Rexroth Corporation.
Bosch Rexroth reserves the right to discontinue manufacture of any product, or change product materials, design or specifications without notice.

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Bosch Group

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Further contacts:
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The data specified herein only serves to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The given information does not release the user from obligation of own judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.

Printed in the United States

June 2007