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Compact Pneumatic Cylinders P1P Series

According to ISO 21287

Catalogue PDE2660TCUK Febuary 2012

Parker

ENGINEERING YOUR SUCCESS.

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P1P Compact Cylinder according to ISO 21287

The P1P Series is a complete range of ISO 21287 compact cylinders developed to meet the highest requirements for quality and performance. The careful design in every detail provides first class function and service life properties.

Features

- ISO 21287 conformity and global availability throughout the worldwide Parker Hannifin organization.
- Product launch starts with 32, 40, 50 and 63mm bore sizes followed by other sizes shortly after.
- One of the widest ranges of sizes and versions for a broad range of applications.
- Corrosion resistant design with end covers and barrel in anodized aluminium and stainless steel piston rod.
- Long service life thanks to proven high quality materials, surfaces and seal technology.
- Compact design and many installation alternatives for flexible use in narrow spaces.
- Efficient elastic cushioning absorbing residual energy facilitates high speeds and short cycle times.
- Smooth, low noise operation thanks to elastic material in end faces of the piston.
- Flush, drop in global P8S-G sensors on all side faces for flexible and compact assembly and mechanical protection of the sensors.
- P1P is suitable for processing, packaging and handling applications within the food industry thanks to the food approved grease used for the initial greasing.

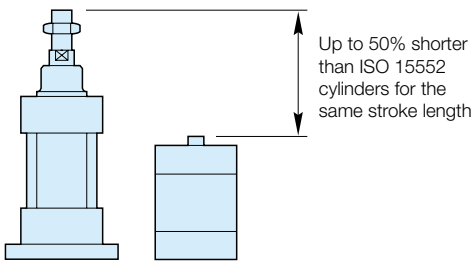
High quality

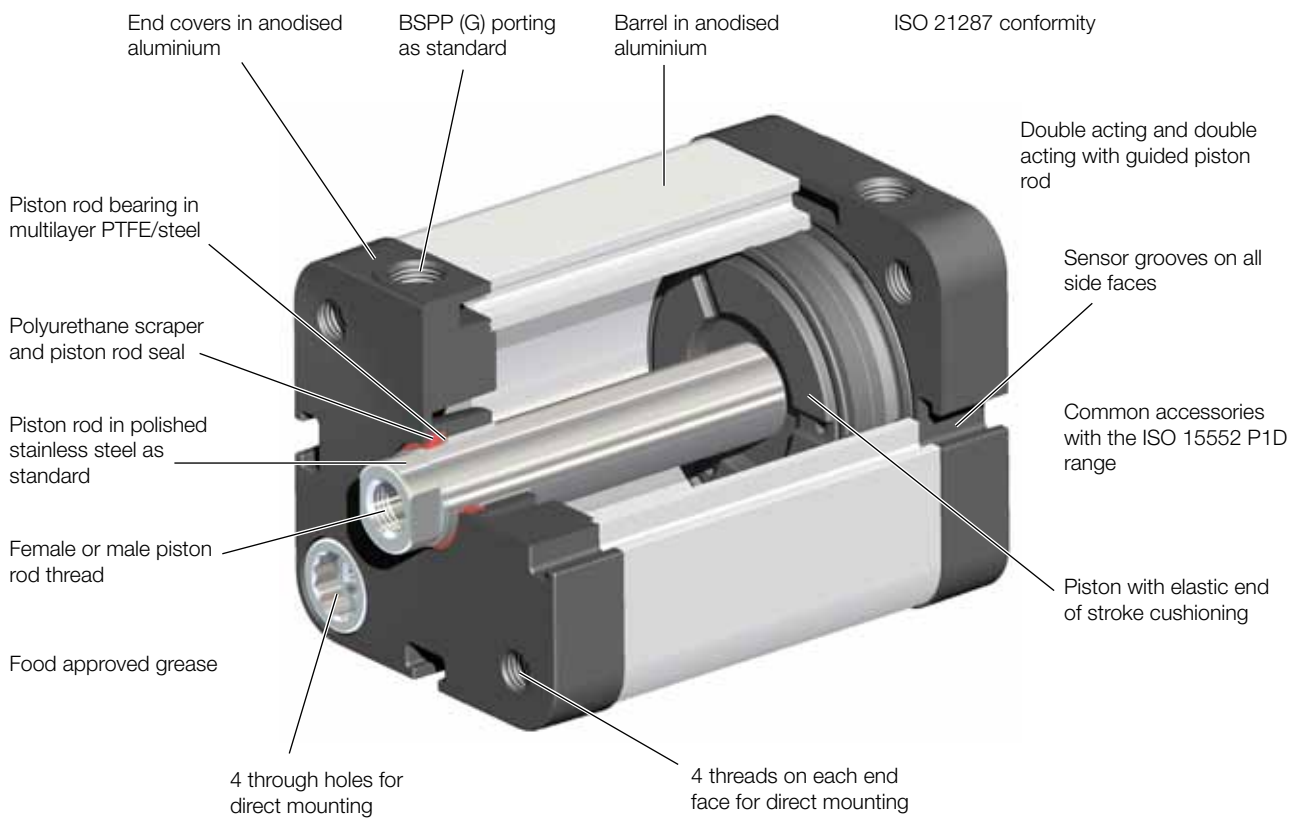
Reliability and long service life are key qualities of any pneumatic cylinder. Therefore we have given P1P highest possible quality in every detail based on our 40 years of experience and extensive testing. The design is based on the following important principles.

- Proven seal design and materials throughout the cylinder. The expertise for seal technology within Parker Hannifin is the basis for leading and proven tribology solutions for all our pneumatic actuators.
- Body extrusion in anodised aluminium with extra fine and hard internal surface for optimum operational conditions.
- End covers and body extrusion with external anodisation for excellent corrosion resistance.
- Stainless steel piston rod for versatile use in corrosive environment.

Compact dimensions for versatile use

The very compact axial dimensions makes it possible to use the P1P cylinders in a broad range of applications. Note that the P1P cylinders are up to 50% shorter than ISO 15552 cylinders for the same stroke length. This is highly valuable in narrow spaces in machines or production lines. The P1P range is a truly versatile cylinder family.

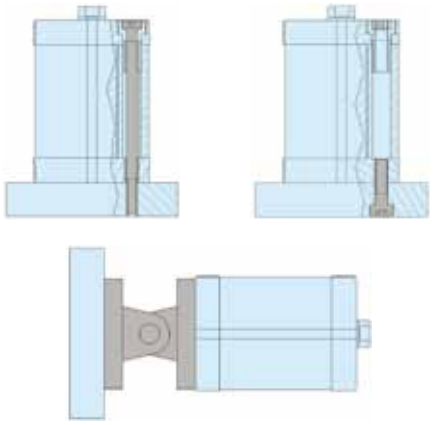




Flexible installation

The new P1P compact cylinder range offers many opportunities for mechanical installation.

- There are holes through the cylinder body. Use these to fix the cylinder with through bolts into threads in the surface behind the cylinder.
- In each end of the same through holes there are female threads. These can be used for flange mounting of the actuator from the rear or front face.
- The wide range of ISO 15552 cylinder mountings are available for use with P1P cylinders bore 32-63 mm. Examples are the foot and flange mountings, as well as MP2 and MP4 mountings for articulated applications.

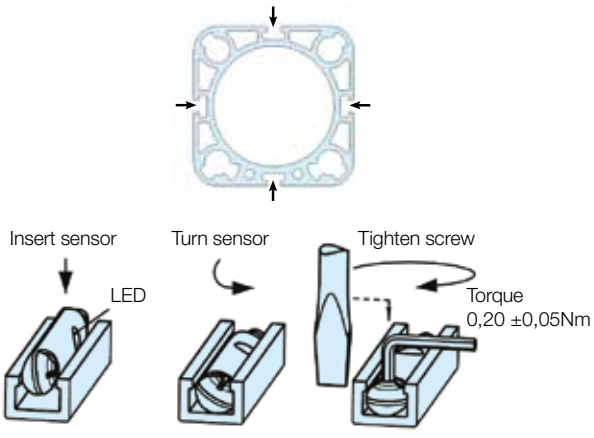


Global drop-in P8S-G sensor range

The global sensor range P8S-G fits P1P as well as most of our pneumatic cylinder families. This simplifies your ordering, stock and overall service of sensors.

The P8S-G sensors has a drop-in mounting into the sensor grooves facilitating the assembly and commissioning work. There are sensor grooves on all four side faces for maximum flexibility and adaptation to each application.

The wide range of P8S-G sensors includes both reed and solid state sensors, flying lead versions with 3 and 10 meter cable and pig tail versions with M8 and M12 connector.



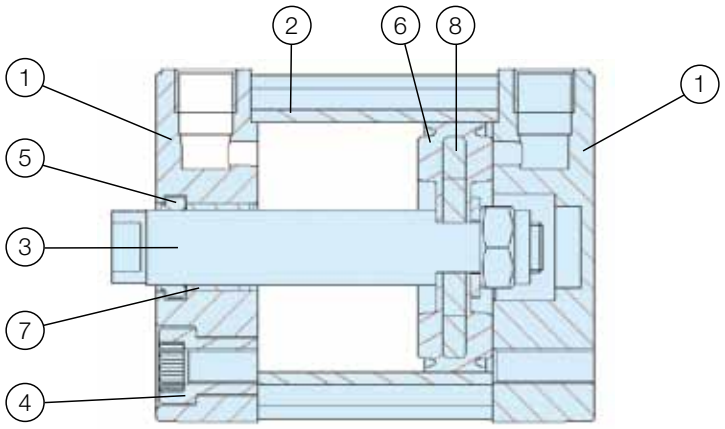
General technical data

Product type		Compact cylinder according to ISO 21287
Bore size		32 - 63 mm
Stroke length		1 - 500 mm
Versions		P1PS...DS Double acting
		P1PG...DS Double acting with non rotating piston rod
Cushioning		Elastic cushioning
Position sensing		Proximity sensor
Installation	Direct	Through holes
		Female thread on front and rear end face
	Accessories	Cylinder and piston rod mountings
Mounting position		Any

Operating and environmental data

Operating medium	For best possible service life and trouble-free operation it is recommended to use dry, filtered compressed air to ISO 8573-1:2010 quality class 3.4.3. This specifies a dew point of +3°C for indoor operation (a lower dew point should be selected for outdoor operation) and is in line with the air quality from most standard compressors with a standard filter. Refer to page 22.
Operating pressure	0.5 bar to 10 bar
Ambient temperature	Standard version -20°C to +80°C
Pre-lubricated	Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued.
Corrosion resistance	High resistance to corrosion and chemicals. Materials and surface treatment have been selected for industrial applications where solvents and detergents are frequently used.

Material specification



Pos	Part		Specification
1	End covers		Anodised aluminium
2	Cylinder barrel		Anodised aluminium
3	Piston rod	Standard	Stainless steel, DIN X 10 CrNiS 18 9
4	End cover screws		Zinc plated steel
5	Piston rod seal		Polyurethane
6	Piston / piston seal		Steel / Nitrile rubber
7	Piston rod bearing		Multilayer PTFE/steel
8	Magnet		Plastic coated magnetic material
	Note on materials		RoHS compliant

Cylinder forces, double acting variants

Cylinder bore mm		Stroke	Bore mm	Piston rod mm	Area cm2	Max theoretical force in N (bar) 1.0 bar	2.0 bar	3.0 bar	4.0 bar	5.0 bar	6.0 bar	7.0 bar	8.0 bar	9.0 bar	10.0 bar
32	Double acting	+	32	12	8.0	79	158	237	315	394	473	552	631	710	789
		-	32	12	6.9	68	136	203	271	339	407	474	542	610	678
40	Double acting	+	40	12	12.6	123	246	370	493	616	740	863	986	1109	1233
		-	40	12	11.4	112	224	336	448	561	673	785	897	1010	1122
50	Double acting	+	50	16	19.6	193	385	578	770	963	1155	1348	1540	1733	1925
		-	50	16	17.6	173	346	518	691	864	1037	1210	1382	1555	1728
63	Double acting	+	63	16	31.2	306	611	917	1223	1528	1834	2140	2445	2751	3056
		-	63	16	29.1	286	572	858	1144	1430	1716	2002	2287	2573	2864

\+ = Outward stroke
\- = Return stroke

Note: Select a theoretical force 50-100% larger than the force required.

Technical data

Cylinder designation	Cylinder bore mm	Cylinder bore area cm²	Piston rod area mm	Piston rod area cm²	Piston rod thread	Total mass at 0 mm stroke kg	Total mass addition per 10 mm stroke kg	Air consumption litres (1)	Port size
P1PS...DS7G	**Double acting with female piston rod thread**								
P1PS032	32	8.0	12	1.1	M8 x 1.25	0.291	0.030	0.105	G1/8
P1PS040	40	12.6	12	1.1	M8 x 1.25	0.375	0.036	0.162	G1/8
P1PS050	50	19.6	16	2.0	M10 x 1.5	0.519	0.050	0.253	G1/8
P1PS063	63	31.2	16	2.0	M10 x 1.5	0.743	0.059	0.414	G1/8
P1PS...DS8G	**Double acting with male piston rod thread**								
P1PS032	32	8.0	12	1.1	M10 x 1.25	0.308	0.030	0.105	G1/8
P1PS040	40	12.6	12	1.1	M10 x 1.25	0.392	0.036	0.162	G1/8
P1PS050	50	19.6	16	2.0	M12 x 1.25	0.548	0.050	0.253	G1/8
P1PS063	63	31.2	16	2.0	M12 x 1.25	0.772	0.059	0.414	G1/8
P1PG...DS7G	**Double acting with guided piston rod**								
P1PS032	32	8.0	12	1.1		0.358	0.033	0.105	G1/8
P1PS040	40	12.6	12	1.1		0.455	0.039	0.162	G1/8
P1PS050	50	19.6	16	2.0		0.664	0.057	0.253	G1/8
P1PS063	63	31.2	16	2.0		0.930	0.067	0.414	G1/8

(1) Free air consumption per 10 mm stroke length for a double stroke at 6 bar

Selecting Pneumatic System Components

Cylinder to Valve: The below chart contains recommendations for selecting air valve products based on 5.5 bar with a 0.35 bar pressure drop. The values within the chart show the corresponding Cv values.

Moduflex Valve System

- Stand-alone valves, short-build valve manifold, or large valve manifold configurations available
- Cv range from 0.18 – 0.80
- Peripheral modules available— flow control, pressure regulation, P.O. check valves and vacuum generatorsIsys

Cylinder speed (mm/s)	Cylinder bore size 32	40	50	63
50	0.03	0.04	0.06	0.10
100	0.05	0.08	0.13	0.20
150	0.08	0.12	0.19	0.30
200	0.10	0.16	0.26	0.41
250	0.13	0.20	0.32	0.51
300	0.16	0.25	0.38	0.61
350	0.18	0.29	0.45	0.71
400	0.21	0.33	0.51	0.81
450	0.24	0.37	0.58	0.91
500	0.26	0.41	0.64	1.10
	Size 1	Size 2		See larger valve system

Micro / ISO Valve System

- Isys Micro Cv range 0.30 – 0.35
- IsysNet system fieldbus, Turck system fieldbus, 25 pin D-sub, or low cost Moduflex fieldbus options available
- Isys ISO offers 5 sizes with Cv range 0.55 – 6.0

Cylinder speed (mm/s)	Cylinder bore size 32	40	50	63	Valve range
50	0.03	0.04	0.06	0.10	Isys Micro
100	0.05	0.08	0.13	0.20	
150	0.08	0.12	0.19	0.30	
200	0.10	0.16	0.26	0.41	HB
250	0.13	0.20	0.32	0.51	
300	0.16	0.25	0.38	0.61	HA
350	0.18	0.29	0.45	0.71	
400	0.21	0.33	0.51	0.81	
450	0.24	0.37	0.58	0.91	
500	0.26	0.41	0.64	1.10	

Order Code Key

P	1	P	S	0	3	2	D	S	7	G	0	0	2	5

Cylinder version

S	Standard
G	Guided

Cylinder bore mm

032
040
050
063

Cylinder ports & magnetic function

Magnet	
G	32 - 63mm : BSPP threads

Stroke length

See below table for standard stroke lengths in mm.

Rod extension only

Cylinder bore mm

K	32
L	40
M	50
N	63

Piston rod extension

E.g. KR5 = Cylinder bore 32 mm with piston rod extension = 255 mm

01-99	1-99	**N0-N9**	220-229
A0-A9	100-109	**P0-P9**	230-239
B0-B9	110-119	**Q0-Q9**	240-249
C0-C9	120-129	**R0-R9**	250-259
D0-D9	130-139	**S0-S9**	260-269
E0-E9	140-149	**T0-T9**	270-279
F0-F9	150-159	**U0-U9**	280-289
G0-G9	160-169	**V0-V9**	290-299
H0-H9	170-179	**W0-W9**	300-309
J0-J9	180-189	**X0-X9**	310-319
K0-K9	190-199	**Y0-Y9**	320-329
L0-L9	200-209	**Z0-Z9**	330-339
M0-M9	210-219		

Piston rod thread

7	Female
8	Male

Function

D	Double acting

Piston rod material	Seals
Stainless steel	
S	Standard -20°C to +80°C

Standard stroke length

Cylinder designation	Cylinder bore	● Standard stroke length in mm / ▭ Non standard stroke length ** 5	10	15	20	25*	30	40	50*	60*	80*
Double acting:											
P1PS032	32	●	●	●	●	●	●	●	●	●	●
P1PS040	40	●	●	●	●	●	●	●	●	●	●
P1PS050	50	●	●	●	●	●	●	●	●	●	●
P1PS063	63	●	●	●	●	●	●	●	●	●	●
Double acting with guided piston rod											
P1PG032	32	●	●	●	●	●	●	●	●	●	●
P1PG040	40	●	●	●	●	●	●	●	●	●	●
P1PG050	50	●	●	●	●	●	●	●	●	●	●
P1PG063	63	●	●	●	●	●	●	●	●	●	●

* Standard stroke lengths in mm according to ISO 4393
** Max stroke 500 mm

Double acting with female piston rod thread

- Bore 32-63 mm with ISO 21287 conformity
- Double acting with female piston rod thread
- Ideal for applications where space is at a premium
- Corrosion resistant thanks to use of anodised aluminium and stainless steel
- Elastic cushioning facilitates high speeds and short cycle times.
- Flexible direct mounting with through holes and threads
- Wide range of mountings and drop-in sensors

Ø 32mm - (G1/8)

Stroke (mm)	Order code
5	P1PS032DS7G0005
10	P1PS032DS7G0010
15	P1PS032DS7G0015
20	P1PS032DS7G0020
25	P1PS032DS7G0025
30	P1PS032DS7G0030
40	P1PS032DS7G0040
50	P1PS032DS7G0050
60	P1PS032DS7G0060
80	P1PS032DS7G0080

Ø 40mm - (G1/8)

Stroke (mm)	Order code
5	P1PS040DS7G0005
10	P1PS040DS7G0010
15	P1PS040DS7G0015
20	P1PS040DS7G0020
25	P1PS040DS7G0025
30	P1PS040DS7G0030
40	P1PS040DS7G0040
50	P1PS040DS7G0050
60	P1PS040DS7G0060
80	P1PS040DS7G0080

Ø 50mm - (G1/8)

Stroke (mm)	Order code
5	P1PS050DS7G0005
10	P1PS050DS7G0010
15	P1PS050DS7G0015
20	P1PS050DS7G0020
25	P1PS050DS7G0025
30	P1PS050DS7G0030
40	P1PS050DS7G0040
50	P1PS050DS7G0050
60	P1PS050DS7G0060
80	P1PS050DS7G0080

Ø 63mm - (G1/8)

Stroke (mm)	Order code
5	P1PS063DS7G0005
10	P1PS063DS7G0010
15	P1PS063DS7G0015
20	P1PS063DS7G0020
25	P1PS063DS7G0025
30	P1PS063DS7G0030
40	P1PS063DS7G0040
50	P1PS063DS7G0050
60	P1PS063DS7G0060
80	P1PS063DS7G0080

Double acting with guided piston rod

- Bore 32-63 mm
- Double acting with non rotating linear movement
- For fixing, clamping and moving anti rotate applications
- Anodised end covers, tool plate and barrel
- Stainless steel guide rods and piston rod as standard
- Flexible direct mounting with through holes and threads
- Wide range of mountings and drop-in sensors

Ø 32mm - (G1/8)

Stroke (mm)	Order code
5	P1PG032DS7G0005
10	P1PG032DS7G0010
15	P1PG032DS7G0015
20	P1PG032DS7G0020
25	P1PG032DS7G0025
30	P1PG032DS7G0030
40	P1PG032DS7G0040
50	P1PG032DS7G0050
60	P1PG032DS7G0060
80	P1PG032DS7G0080

Ø 40mm - (G1/8)

Stroke (mm)	Order code
5	P1PG040DS7G0005
10	P1PG040DS7G0010
15	P1PG040DS7G0015
20	P1PG040DS7G0020
25	P1PG040DS7G0025
30	P1PG040DS7G0030
40	P1PG040DS7G0040
50	P1PG040DS7G0050
60	P1PG040DS7G0060
80	P1PG040DS7G0080

Ø 50mm - (G1/8)

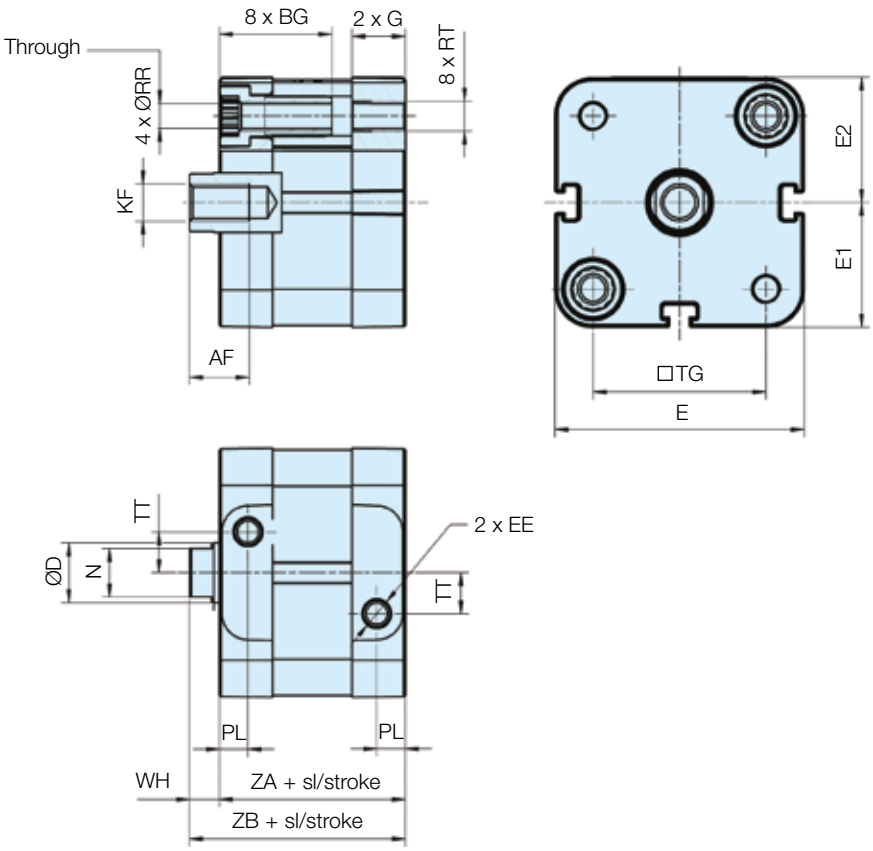
Stroke (mm)	Order code
5	P1PG050DS7G0005
10	P1PG050DS7G0010
15	P1PG050DS7G0015
20	P1PG050DS7G0020
25	P1PG050DS7G0025
30	P1PG050DS7G0030
40	P1PG050DS7G0040
50	P1PG050DS7G0050
60	P1PG050DS7G0060
80	P1PG050DS7G0080

Ø 63mm - (G1/8)

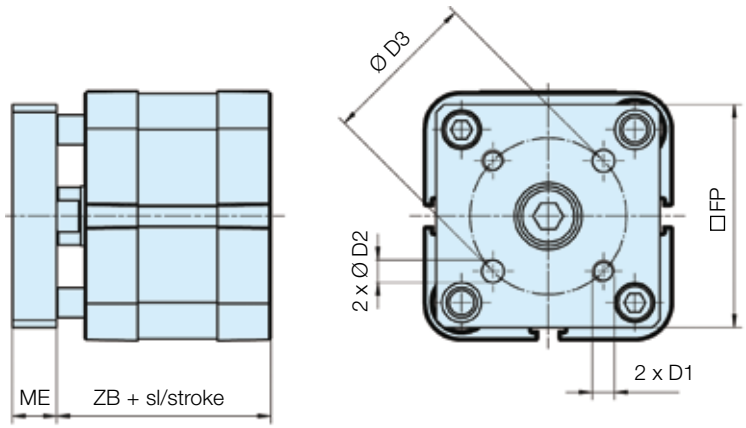
Stroke (mm)	Order code
5	P1PG063DS7G0005
10	P1PG063DS7G0010
15	P1PG063DS7G0015
20	P1PG063DS7G0020
25	P1PG063DS7G0025
30	P1PG063DS7G0030
40	P1PG063DS7G0040
50	P1PG063DS7G0050
60	P1PG063DS7G0060
80	P1PG063DS7G0080

Dimensions

P1PS...DS7G Double acting with female piston rod thread

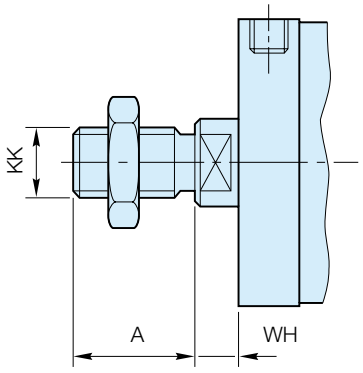


P1PG...DS Double acting with guided piston rod



Bore size	AF min	BG min	ØD	D1	ØD2 H8	ØD3	EE	E	E1	E2	FP	G	KF	ME	N h14	PL	ØRR min	RT	TG	TT	WH	ZA ± 0,3	ZB ± 0,6
Ø32	12	16	12	M5	5	28	G1/8	49,4	24,7	24,9	45	15,25	M8	10	10	7,8	5,1	M6	32,5	6,5	7	44	51
Ø40	12	16	12	M5	5	33	G1/8	56,0	28,0	28,5	50	15,25	M8	10	10	8,0	5,1	M6	38,0	8,0	7	45	52
Ø50	16	16	16	M6	6	42	G1/8	67,0	33,5	33,7	60	14,30	M10	12	13	7,7	6,4	M8	46,5	11,0	8	45	53
Ø63	16	16	16	M6	6	50	G1/8	79,0	39,5	39,8	70	16,30	M10	12	13	8,0	6,4	M8	56,5	16,0	8	49	57

P1PS...DS8G Double acting with male piston rod thread



Bore size	A 0 -0.05	WH nom.	WH tol.	KK
Ø32	19	7	± 1,6	M10 x 1,25
Ø40	19	7	± 1,6	M10 x 1,25
Ø50	22	8	± 1,6	M12 x 1,25
Ø63	22	8	± 1,6	M12 x 1,25

Note: Cylinders with male piston rod thread are delivered with one piston rod nut in zinc plated steel

Cylinder mountings

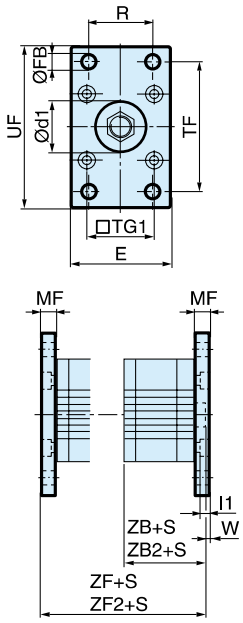
Flange MF1/MF2

Intended for fixed mounting of cylinder. Flange can be fitted to front- or rear end-plates of cylinder.

Materials
Flange: Surface-treated steel
Mounting screws according to DIN 6912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.

Cyl. bore Ø mm	Weight kg	Order code
32	0,23	**P1C-4KMB**
40	0,28	**P1C-4LMB**
50	0,53	**P1C-4MMB**
63	0,71	**P1C-4NMB**



Ø32-100 according to ISO MF1/MF2, VDMA, AFNOR

Cyl. bore mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF mm	l1 -0,5 mm	W mm	ZF* mm	ZB* mm	ZF2* mm	ZB2* mm
32	30,0	7,0	32,5	45	32	10,0	64,0	80	5,0	2,0	58,5	48,5	67,0	57,0
40	35,0	9,0	38,0	52	36	10,0	72,0	90	5,0	2,0	60,5	50,5	68,5	58,5
50	40,0	9,0	46,5	65	45	12,0	90,0	110	6,5	4,0	64,5	52,5	71,0	59,0
63	45,0	9,0	56,5	75	50	12,0	100,0	120	6,5	4,0	70,0	58,0	75,5	63,5

S = Stroke length

Foot bracket MS1

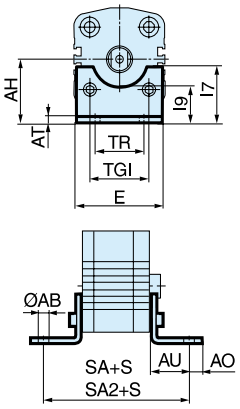
Intended for fixed mounting of cylinder. Angle bracket can be fitted to front- and rear end-plates of cylinder.

Materials
Foot bracket: Surface-treated steel, black
Mounting screws according to DIN 912:
Zinc-plated steel 8.8

Supplied in pairs with mounting screws for attachment to cylinder.

Cyl. bore Ø mm	Weight kg	Order code
32	0,06**	**P1C-4KMF**
40	0,08**	**P1C-4LMF**
50	0,16**	**P1C-4MMF**
63	0,25**	**P1C-4NMF***

** Weight per item



Ø32-63 according to ISO MS1, VDMA, AFNOR

Cyl. bore mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	l7 mm	AT mm	l9 JS14 mm	SA* mm	SA2* mm
32	7,0	32,5	45	32	10,0	24,0	32	30,0	4,5	17,5	88,5	97,0
40	9,0	38,0	52	36	8,0	28,0	36	30,0	4,5	18,5	98,5	106,5
50	9,0	46,5	65	45	13,0	32,0	45	36,0	5,5	25,0	108,5	115,0
63	9,0	56,5	75	50	13,0	32,0	50	35,0	5,5	27,5	114,0	119,5

S = Stroke length

Cylinder mountings

Pivot bracket with rigid bearing

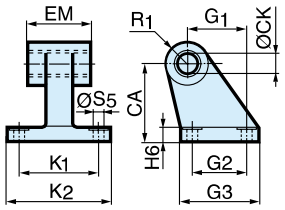
Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

Materials
Pivot bracket: Surface-treated aluminium, black
Bearing: Sintered oil-bronze bushing

Cyl. bore Ø mm	Weight kg	Order code
32	0,06	**P1C-4KMD**
40	0,08	**P1C-4LMD**
50	0,15	**P1C-4MMD**
63	0,20	**P1C-4NMD**

Ø32-63 according to CETOP RP 107 P, VDMA, AFNOR

Cyl. bore mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2 mm	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm
32	10	6,6	38	51	21	18	25,5	31	32	8	10
40	12	6,6	41	54	24	22	27,0	35	36	10	11
50	12	9,0	50	65	33	30	31,0	45	45	12	13
63	16	9,0	52	67	37	35	39,0	50	50	12	15



Clevis bracket MP2

Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.

Materials
Clevis bracket: Surface-treated aluminium, black
Mounting screws according to DIN 912:
Zinc-plated steel 8.8
Pin: surface treated steel

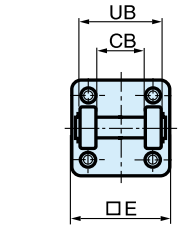
Supplied complete with mounting screws for attachment to cylinder.

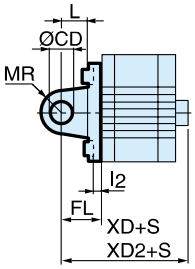
Cyl. bore Ø mm	Weight kg	Order code
32	0,08	**P1C-4KMT**
40	0,11	**P1C-4LMT**
50	0,14	**P1C-4MMT**
63	0,29	**P1C-4NMT**

Ø32-63 according to ISO MP2, VDMA, AFNOR

Cyl. bore mm	E mm	UB h14 mm	CB H14 mm	FL ±0,2 mm	L mm	l2 mm	CD H9 mm	MR mm	XD* mm	XD2* mm
32	45,0	45	26,0	22	13	5,5	10	10	70,5	79,0
40	52,0	52	28,0	25	16	5,5	12	12	75,5	83,5
50	65,0	60	32,0	27	16	6,5	12	12	79,5	86,0
63	75,0	70	40,0	32	21	6,5	16	16	90,0	95,5

S = Stroke length





Cylinder mountings

Clevis bracket MP4

Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2.

Materials
Clevis bracket: Surface-treated aluminium, black
Mounting screws according to DIN 912: Zinc-plated steel 8.8

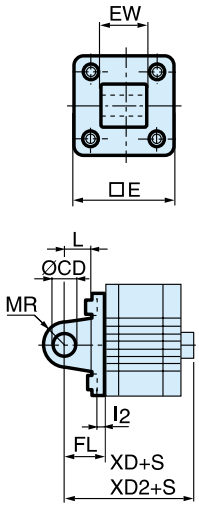
Supplied complete with mounting screws for attachment to cylinder.

Cyl. bore Ø mm	Weight kg	Order code
32	0,09	**P1C-4KME**
40	0,13	**P1C-4LME**
50	0,17	**P1C-4MME**
63	0,36	**P1C-4NME**

Ø32-100 according to ISO MP4, VDMA, AFNOR

Cyl. bore mm	E mm	EW mm	FL ±0,2 mm	L mm	l2 mm	CD H9 mm	MR mm	XD* mm	XD2* mm
32	45,0	26,0	22	13	5,5	10	10	70,5	79,0
40	52,0	28,0	25	16	5,5	12	12	75,5	83,5
50	65,0	32,0	27	16	6,5	12	12	79,5	86,0
63	75,0	40,0	32	21	6,5	16	16	90,0	95,5

S = Stroke length



Clevis bracket GA

Intended for flexible mounting of cylinder. Clevis bracket GA can be combined with pivot bracket with swivel bearing, swivel eye bracket and swivel rod eye.

Materials
Clevis bracket: Surface-treated aluminium, black
Pin: Surface hardened steel
Locking pin: Spring steel
Circlips according to DIN 471: Spring steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

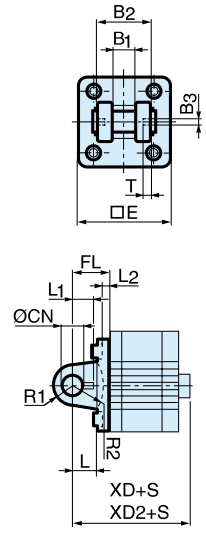
Supplied complete with mounting screws for attachment to cylinder.

Cyl. bore Ø mm	Weight kg	Order code
32	0,09	**P1C-4KMCA**
40	0,13	**P1C-4LMCA**
50	0,17	**P1C-4MMCA**
63	0,36	**P1C-4NMCA**

According to VDMA, AFNOR

Cyl. bore mm	E mm	B2 d12 mm	B1 H14 mm	T mm	B3 mm	R2 mm	L1 mm	FL ±0,2 mm	l2 mm	L mm	CN F7 mm	R1 mm	XD* mm	XD2* mm
32	45	34	14	3	3,3	17	11,5	22	5,5	12	10	11	70,5	79,0
40	52	40	16	4	4,3	20	12,0	25	5,5	15	12	13	75,5	83,5
50	65	45	21	4	4,3	22	14,0	27	6,5	17	16	18	79,5	86,0
63	75	51	21	4	4,3	25	14,0	32	6,5	20	16	18	90,0	95,5

S = Stroke length



Stainless steel Pin Set GA
Materials
Pin: Stainless steel
Locking pin: Stainless steel
Circlips according to DIN 471: Stainless steel

Cyl. bore Ø mm	Weight kg	Order code
32	0,05	**9301054311**
40	0,06	**9301054312**
50	0,07	**9301054313**
63	0,07	**9301054314**

Cylinder mountings

Pivot bracket with swivel bearing

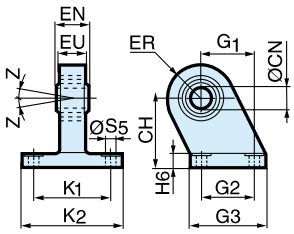
Intended for use together with clevis bracket GA.

Material
Pivot bracket: Surface-treated steel, black
Swivel bearing according to DIN 648K: Hardened steel

Cyl. bore Ø mm	Weight kg	Order code
32	0,18	**P1C-4KMA**
40	0,25	**P1C-4LMA**
50	0,47	**P1C-4MMA**
63	0,57	**P1C-4NMA**

According to VDMA, AFNOR

Cyl. bore mm	CN H7 mm	S5 H13 mm	K1 JS14 mm	K2 mm	EU mm	G1 JS14 mm	G2 JS14 mm	EN mm	G3 mm	CH JS15 mm	H6 mm	ER mm	Z
32	10	6,6	38	51	10,5	21	18	14	31	32	10	16	4°
40	12	6,6	41	54	12,0	24	22	16	35	36	10	18	4°
50	16	9,0	50	65	15,0	33	30	21	45	45	12	21	4°
63	16	9,0	52	67	15,0	37	35	21	50	50	12	23	4°



Swivel eye bracket

Intended for use together with clevis bracket GA

Material
Bracket: Surface-treated aluminium, black
Swivel bearing acc. to DIN 648K: Hardened steel

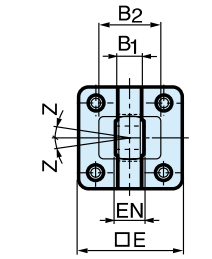
Supplied complete with mounting screws for attachment to cylinder.

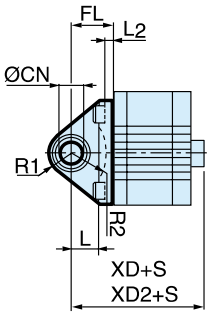
Cyl. bore Ø mm	Weight kg	Order code
32	0,08	**P1C-4KMSA**
40	0,11	**P1C-4LMSA**
50	0,20	**P1C-4MMSA**
63	0,27	**P1C-4NMSA**

According to VDMA, AFNOR

Cyl. bore mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	l2 mm	L mm	CN H7 mm	XD* mm	XD2* mm	Z
32	45	10,5	38	14	16	14	22	5,5	12	10	70,5	79,0	4°
40	52	12,0	44	16	18	16	25	5,5	15	12	75,5	83,5	4°
50	65	15,0	51	21	21	19	27	6,5	15	16	79,5	86,0	4°
63	75	15,0	56	21	23	22	32	6,5	20	16	90,0	95,5	4°

S=Stroke length





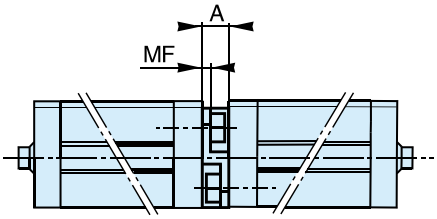
Cylinder mountings

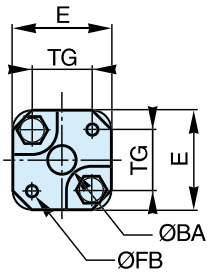
Mounting kit

Mounting kit for back to back mounted cylinders, 3 and 4 position cylinders.

Material:
Mounting: Aluminium
Mounting screws: Zinc-plated steel 8.8

Cyl. bore Ø mm	Weight kg	Order code
32	0,060	**P1E-6KB0**
40	0,078	**P1E-6LB0**
50	0,162	**P1E-6MB0**
63	0,194	**P1E-6NB0**





Cyl. bore mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm
32	50	32,5	6,5	5	16	30
40	60	38,0	6,5	5	16	35
50	66	46,5	8,5	6	20	40
63	80	56,5	8,5	6	20	45

Piston rod mountings

Swivel rod eye

Swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA.
Maintenance-free.

Materials
Swivel rod eye: Zinc-plated steel
Swivel bearing according to DIN 648K: Hardened steel

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,08	**P1C-4KRS**
50 / 63	0,12	**P1C-4LRS**

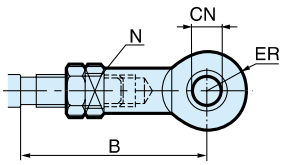
Stainless steel swivel rod eye

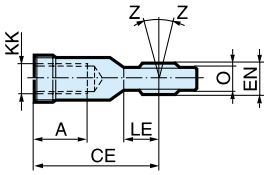
Stainless-steel swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA.
Maintenance-free.

Materials
Swivel rod eye: Stainless steel
Swivel bearing according to DIN 648K: Stainless steel

Use stainless steel nut with stainless steel swivel rod eye.

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,08	**P1S-4JRT**
50 / 63	0,12	**P1S-4LRT**





According to ISO 8139

Cyl. bore mm	A mm	B min mm	B max mm	CE mm	CN H9 mm	EN h12 mm	ER mm	KK	LE min mm	N mm	O mm	Z
32 / 40	20	48,0	55	43	10	14	14	M10x1,25	15	17	10,5	12°
50 / 63	22	56,0	62	50	12	16	16	M12x1,25	17	19	12,0	12°

Clevis

Clevis for articulated mounting of cylinder.

Material
Clevis, clip: Galvanized steel
Pin: Hardened steel

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,09	**P1C-4KRC**
50 / 63	0,15	**P1C-4LRC**

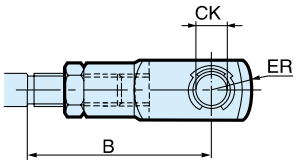
Stainless steel clevis

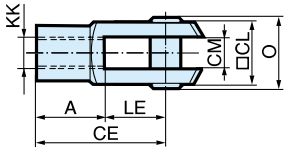
Stainless-steel clevis for articulated mounting of cylinder.

Material
Clevis: Stainless steel
Pin: Stainless steel
Circlips according to DIN 471: Stainless steel

Use stainless steel nut with stainless steel swivel rod eye.

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,09	**P1S-4JRD**
50 / 63	0,15	**P1S-4LRD**





According to ISO 8140

Cyl. bore mm	A mm	B min mm	B max mm	CE mm	CK h11/E9 mm	CL mm	CM mm	ER mm	KK	LE mm	O mm
32 / 40	20	45,0	52	40	10	20	10	16	M10x1,25	20	28,0
50 / 63	24	54,0	60	48	12	24	12	19	M12x1,25	24	32,0

Piston rod mountings

Flexo coupling

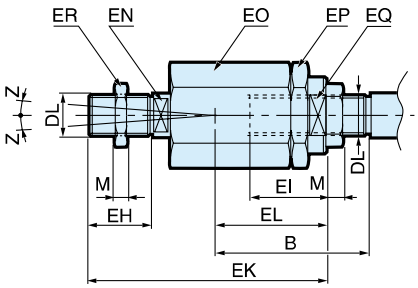
Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of ±4°.

Material
Flexo coupling, nut: Zinc-plated steel
Socket: Hardened steel

Supplied complete with galvanized adjustment nut.

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,21	**P1C-4KRF**
50 / 63	0,22	**P1C-4LRF**

Cyl. bore mm	B min mm	B max mm	DL	EH mm	EI mm	EK mm	EL mm	EN mm	EO mm	EP mm	EQ mm	ER mm	M mm	Z
32 / 40	36,0	43	M10x1,25	20	23	70	31	12	30	30	19	30	5,0	4°
50 / 63	37,0	43	M12x1,25	23	23	67	31	12	30	30	19	30	6,0	4°



Nut

Intended for fixed mounting of accessories to the piston rod.

Material: Galvanized steel

(Supplied in quantities in multiples of 10 only)

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,007	**9128985601**
50 / 63	0,010	**0261109910**

Stainless steel nut

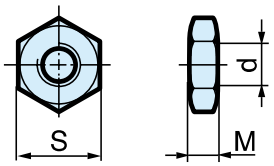
Intended for fixed mounting of accessories to the piston rod.

Material: Stainless steel A2

Cyl. bore Ø mm	Weight kg	Order code
32 / 40	0,007	**9126725404**
50 / 63	0,010	**9126725405**

According to DIN 439 B

Cyl. bore mm	d	M mm	S mm
32 / 40	M10x1,25	5,0	17
50 / 63	M12x1,25	6,0	19



Drop-in sensors

The ”drop-in” sensors can easily be installed from the side in the sensor groove, at any position along the piston stroke.
The sensors are completely recessed and thus mechanically protected. Choose between electronic or reed sensors and several cable lengths and 8 mm and M12 connectors.
The same standard sensors are used for all versions.

Electronic sensors

The new electronic sensors are ”Solid State”, i.e. they have no moving parts at all. They are provided with short-circuit protection and transient protection as standard. The built-in electronics make the sensors suitable for applications with high on and off switching frequency, and where very long service life is required.

Technical data

Design	GMR (Giant Magnetic Resistance) magneto-resistive function
Installation	From side, down into the sensor groove, so-called drop-in
Outputs	PNP, normally open (also available in NPN design, normally closed, on request)
Voltage range	10-30 VDC 10-18 V DC, ATEX sensor
Ripple	max 10%
Voltage drop	max 2,5 V
Load current	max 100 mA
Internal consumption	max 10 mA
Actuating distance	min 9 mm
Hysteresis	max 1,5 mm
Repeatability accuracy	max 0,2 mm
On/off switching frequency	max 5 kHz
On switching time	max 2 ms
Off switching time	max 2 ms
Encapsulation	IP 67 (EN 60529)
Temperature range	–25 °C to +75 °C –20 °C to +45 °C, ATEX sensor
Indication	LED, yellow
Material housing	PA 12
Material screw	Stainless steel
Cable	PVC or PUR 3x0.25 mm^2 see order code respectively

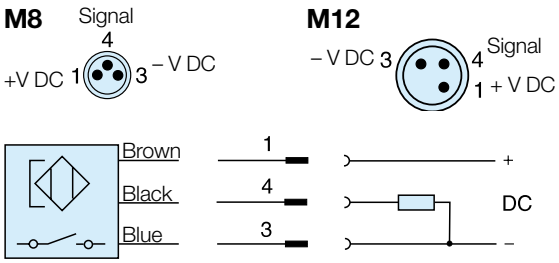
Reed sensors

The sensors are based on proven reed switches, which offer reliable function in many applications. Simple installation, a protected position on the cylinder and clear LED indication are important advantages of this range of sensors.

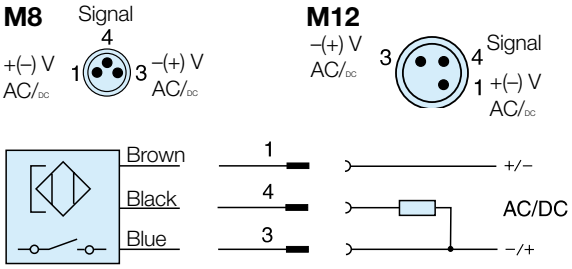
Technical data

Design	Reed element
Mounting	From side, down into the sensor groove, so-called drop-in
Output	Normally open , or normally closed
Voltage range	10-30 V AC/DC or 10-120 V AC/DC 24-230 V AC/DC
Load current	max 500 mA for 10-30 V or max 100 mA for 10-120 V max 30 mA for 24-230 V
Breaking power (resistive)	max 6 W/VA
Actuating distance	min 9 mm
Hysteresis	max 1,5 mm
Repeatability accuracy	0,2 mm
On/off switching frequency	max 400 Hz
On switching time	max 1,5 ms
Off switching time	max 0,5 ms
Encapsulation	IP 67 (EN 60529)
Temperature range	–25 °C to +75 °C
Indication	LED, yellow
Material housing	PA12
Material screw	Stainless steel
Cable	PVC or PUR 3x0.14 mm^2 see order code respectively

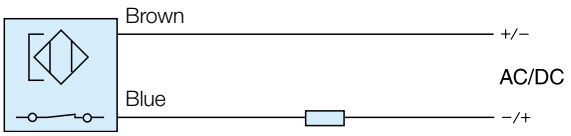
Electronic sensors



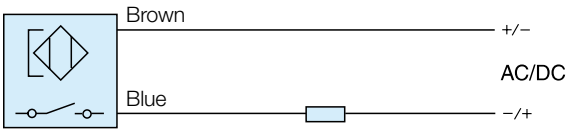
Reed sensors



P8S-GCFPX

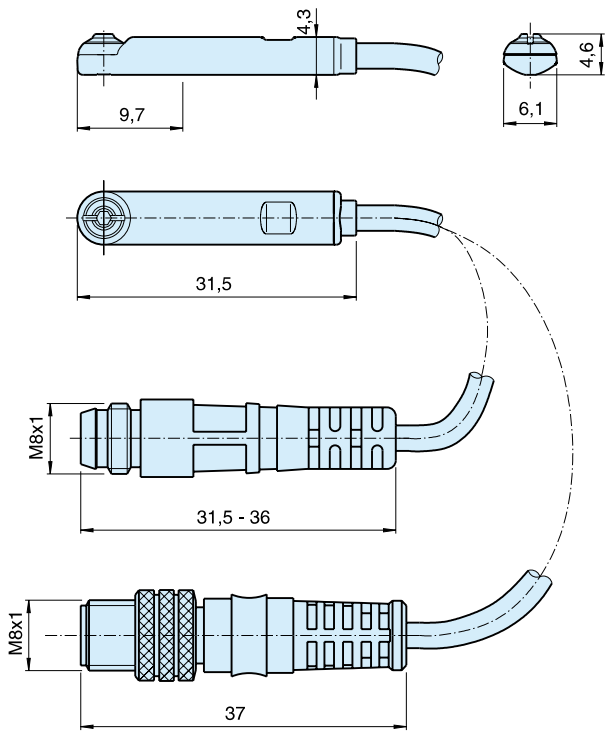


P8S-GRFLX / P8S-GRFLX2

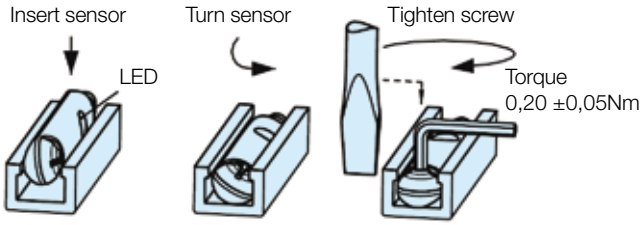


Dimensions

Sensors



Sensor Installation



Ordering data

Output/function	Cable/connector		Weight kg	Order code
Electronic sensors , 10-30 V DC				
PNP type, normally open	0,27 m	PUR-cable and 8 mm snap-in male connector	0,007	**P8S-GPSHX**
PNP type, normally open	0,27 m	PUR-cable and M12 screw male connector	0,015	**P8S-GPMHX**
PNP type, normally open	3 m	PVC-cable without connector	0,030	**P8S-GPFLX**
PNP type, normally open	10 m	PVC-cable without connector	0,110	**P8S-GPFTX**
Reed sensors , 10-30 V AC/DC				
Normally open	0,27 m	PUR-cable and 8 mm snap-in male connector	0,007	**P8S-GSSHX**
Normally open	0,27 m	PUR-cable and M12 screw male connector	0,015	**P8S-GSMHX**
Normally open	3 m	PVC-cable without connector	0,030	**P8S-GSFLX**
Normally open	10 m	PVC-cable without connector	0,110	**P8S-GSFTX**
Normally closed	5m	PVC-cable without connector [1]	0,050	**P8S-GCFPX**
Reed sensors, 10-120 V AC/DC				
Normally open	3 m	PVC-cable without connector	0,030	**P8S-GRFLX**
Reed sensorer, 24-230 V AC/DC				
Normalt öppen	3 m	PVC-kabel utan kontakt	0,030	**P8S-GRFLX2**

1) Without LED

Connecting cables with one connector

The cables have an integral snap-in female connector.

Type of cable	Cable/connector		Weight kg	Order code
Cables for sensors, complete with one female connector				
Cable, Flex PVC	3 m	8 mm Snap-in connector	0,07	**9126344341**
Cable, Flex PVC	10 m	8 mm Snap-in connector	0,21	**9126344342**
Cable, Polyurethane	3 m	8 mm Snap-in connector	0,01	**9126344345**
Cable, Polyurethane	10 m	8 mm Snap-in connector	0,20	**9126344346**
Cable, Polyurethane	5 m	M12 screw connector	0,07	**9126344348**
Cable, Polyurethane	10 m	M12 screw connector	0,20	**9126344349**

Male connectors for connecting cables

Cable connectors for producing your own connecting cables. The connectors can be quickly attached to the cable without special tools. Only the outer sheath of the cable is removed. The connectors are available for M8 and M12 screw connectors and meet protection class IP 65.

Connector	Weight kg	Order code
M8 screw connector	0,017	**P8CS0803J**
M12 screw connector	0,022	**P8CS1204J**

Specifying air quality (purity) in accordance with ISO8573-1:2010, the international standard for Compressed Air Quality

ISO8573-1 is the primary document used from the ISO8573 series as it is this document which specifies the amount of contamination allowed in each cubic metre of compressed air.

ISO8573-1 lists the main contaminants as Solid Particulate, Water and Oil. The purity levels for each contaminant are shown separately in tabular form, however for ease of use, this document combines all three contaminants into one easy to use table.

ISO8573-1:2010 CLASS	Solid Particulate				Water		Oil
	Maximum number of particles per m^3			Mass Concentration mg/m^3	Vapour Pressure Dewpoint	Liquid g/m^3	Total Oil (aerosol liquid and vapour)
	0,1 - 0,5 micron	0,5 - 1 micron	1 - 5 micron				mg/m^3
0	As specified by the equipment user or supplier and more stringent than Class 1						
1	≤ 20 000	≤ 400	≤ 10	-	≤ -70 °C	-	0,01
2	≤ 400 000	≤ 6 000	≤ 100	-	≤ -40 °C	-	0,1
3	-	≤ 90 000	≤ 1 000	-	≤ -20 °C	-	1
4	-	-	≤ 10 000	-	≤ +3 °C	-	5
5	-	-	≤ 100 000	-	≤ +7 °C	-	-
6	-	-	-	≤ 5	≤ +10 °C	-	-
7	-	-	-	5 - 10	-	≤ 0,5	-
8	-	-	-	-	-	0,5 - 5	-
9	-	-	-	-	-	5 - 10	-
X	-	-	-	> 10	-	> 10	> 10

Specifying air purity in accordance with ISO8573-1:2010

When specifying the purity of air required, the standard must always be referenced, followed by the purity class selected for each contaminant (a different purity class can be selected for each contamination if required).

An example of how to write an air quality specification is shown below:

ISO 8573-1:2010 Class 1.2.1

ISO 8573-1:2010 refers to the standard document and its revision, the three digits refer to the purity classifications selected for solid particulate, water and total oil. Selecting an air purity class of 1.2.1 would specify the following air quality when operating at the standard's reference conditions :

Class 1 - Particulate

In each cubic metre of compressed air, the particulate count should not exceed 20,000 particles in the 0.1 - 0.5 micron size range, 400 particles in the 0.5 - 1 micron size range and 10 particles in the 1 - 5 micron size range.

Class 2 - Water

A pressure dewpoint (PDP) of -40°C or better is required and no liquid water is allowed.

Class 1 - Oil

In each cubic metre of compressed air, not more than 0.01mg of oil is allowed. This is a total level for liquid oil, oil aerosol and oil vapour.

ISO8573-1:2010 Class zero

- **Class 0 does not mean zero contamination.**
- **Class 0 requires the user and the equipment manufacturer to agree contamination levels as part of a written specification.**
- **The agreed contamination levels for a Class 0 specification should be within the measurement capabilities of the test equipment and test methods shown in ISO8573 Pt 2 to Pt 9.**
- **The agreed Class 0 specification must be written on all documentation to be in accordance with the standard.**
- **Stating Class 0 without the agreed specification is meaningless and not in accordance with the standard.**
- **A number of compressor manufacturers claim that the delivered air from their oil-free compressors is in compliance with Class 0.**
- **If the compressor was tested in clean room conditions, the contamination detected at the outlet will be minimal. Should the same compressor now be installed in typical urban environment, the level of contamination will be dependent upon what is drawn into the compressor intake, rendering the Class 0 claim invalid.**
- **A compressor delivering air to Class 0 will still require purification equipment in both the compressor room and at the point of use for the Class 0 purity to be maintained at the application.**
- **Air for critical applications such as breathing, medical, food, etc typically only requires air quality to Class 2.2.1 or Class 2.1.1.**
- **Purification of air to meet a Class 0 specification is only cost effective if carried out at the point of use.**

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Catalogue PDE2660TCUK Febuary 2012

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