Pneumatic Cylinders

∅160 to ∅320 mm P1F Series
According to ISO 15552

Catalogue PDE2667TCEN

Parker

ENGINEERING YOUR SUCCESS.

Important
Before attempting any external or internal work on the cylinder or any connected components, make sure the cylinder is vented and disconnect the air supply in order to ensure isolation of the air supply.

Note
All technical data in this catalogue are typical data only.
Air quality is essential for maximum cylinder service life (see ISO 8573).

WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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Standard Cylinders ISO 15552

Global product range

The P1F Series meets the specifications of the ISO 15552 standard. This means full interchangeability to any cylinder anywhere around the globe.
The P1F will be available throughout the extensive worldwide Parker Hannifin organisation – for the benefit to you and your customers.

Features

- Tie-Rods design.
- Bore sizes 160 - 320 mm.
- Stroke up to 2300 mm.
- Corrosion resistant design.
- Stainless steel piston rod.
- Polyurethane seal technology.
- Stainless steel cushioning screws on same side.
- Adjustable pneumatic cushioning.
- Full range of mountings.
- Full range of drop-in‘ sensors.

Design Variants

Tie-Rods round profile - P1F-T, P1F-N

Tie-Rods design for heavy duty applications. Round tube is made in anodised aluminium; Tie-Rods in stainless steel as standard.
Bore sizes Ø32 to Ø125 mm, see catalogue PDE3570TC
Large bore sizes Ø160 to Ø320 mm.

Options

High temperature

All seals in the high temperature version of P1F are developed and validated for continuous operation up to +150°C. The combination of the seal geometry and the FKM (fluoro elastomers) material ensures reliable and long service life. High temperature cylinders have no magnetic piston and cannot be fitted with sensors (the magnetic field strength in high temperatures is too low to ensure correct reliable sensor function).

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Technical Data

Cylinder forces

Bore/ piston rod	Stroke	Surface area	Max theorical force in N (under different pressure bar)									
[mm]		[cm²]	1	2	3	4	5	6	7	8	9	10
160/40	+	201.1	2011	4021	6032	8042	10053	**12064**	14074	16085	18096	20106
	-	188.5	1885	3770	5655	7540	9425	**11310**	13195	15080	16965	18850
200/40	+	314.2	3142	6283	9425	12566	15708	**18850**	21991	25133	28274	31416
	-	301.6	3016	6032	9048	12064	15080	**18096**	21112	24127	27143	30159
250/50	+	490.9	4909	9818	14726	19635	24544	**29453**	34361	39270	44179	49088
	-	471.2	4712	9425	14137	18850	23562	**28274**	32987	37699	42412	47124
320/63	+	804.2	8042	16085	24127	32170	40212	**48255**	56297	64340	72382	80425
	-	773.1	7731	15462	23192	30923	38654	**46385**	54115	61846	69577	77308

+ = outward stroke
- = return stroke

Cylinder air consumption

Bore/ piston rod [mm]	Stroke	Surface area [cm²]	Air Consumption in l [Nl] / 10 mm (under different pressure bar)									
			1	2	3	4	5	6	7	8	9	10
160/40	+	201.1	0.400	0.598	0.797	0.995	1.193	**1.392**	1.590	1.789	1.987	2.186
	-	188.5	0.375	0.561	0.747	0.933	1.119	**1.305**	1.491	1.677	1.863	2.049
200/40	+	314.2	0.624	0.934	1.245	1.555	1.865	**2.175**	2.485	2.795	3.105	3.415
	-	301.6	0.599	0.897	1.195	1.492	1.790	**2.088**	2.386	2.683	2.981	3.279
250/50	+	490.9	0.975	1.460	1.945	2.429	2.914	**3.398**	3.883	4.367	4.852	5.337
	-	471.2	0.936	1.402	1.867	2.332	2.797	**3.262**	3.728	4.193	4.658	5.123
320/63	+	804.2	1.598	2.392	3.186	3.980	4.774	**5.568**	6.362	7.156	7.950	8.744
	-	773.1	1.536	2.299	3.063	3.826	4.589	**5.352**	6.115	6.878	7.641	8.405

+ = outward stroke
- = return stroke

Weight

Cyl.-bore	P1F-T		P1F-N		Moving parts	
[mm]	Base 0 mm [kg]	per 100 mm [kg]	Base 0 mm [kg]	per 100 mm [kg]	Base 0 mm [kg]	per 100 mm [kg]
Ø160	11.90	1.816	on request			
Ø200	14.83	1.986				
Ø250	29.00	3.700				
Ø320	55.00	5.860				

Tolerances [mm]

Cyl.-bore	L_2	TG	stroke tolerance	stroke tolerance
[mm]	[mm]	[mm]	<= 500 mm	> 500 mm
Ø160	± 1.1	± 1.1	+ 0.3 / + 2.0	+ 0.3 / + 3.0
Ø200	± 1.6	± 1.1	+ 0.3 / + 2.0	+ 0.3 / + 3.0
Ø250	± 1.6	± 1.5	+ 0.3 / + 2.0	+ 0.3 / + 3.0
Ø320	± 2.2	± 1.5	+ 0.3 / + 2.0	+ 0.3 / + 3.0

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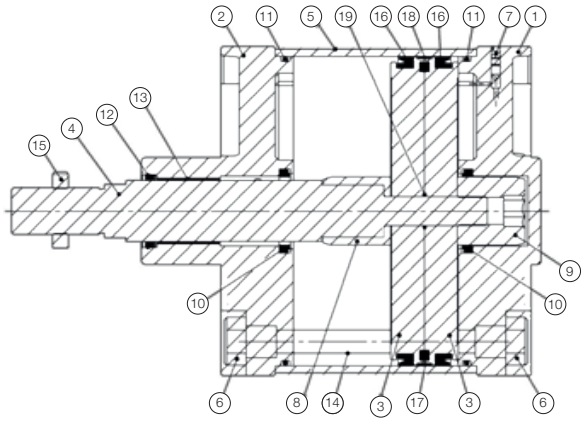
Pneumatic Cylinders ISO 15552

Technical Data

Product type	Standard cylinder according to ISO 15552
Bore size	160 - 320 mm
Stroke length	10 - 2300 mm
Versions	Double acting
Cushioning	Adjustable air cushioning
Position sensing	Proximity sensor
Installation	ISO cylinder and piston rod mountings

Operating and environmental data

Operating medium	For best possible service life and trouble-free operation dry filtered compressed air to ISO 8573-1:2010 quality 3.4.3 should be used. This specifies a dew point of + 3°C for indoor operation (a lower dew point should be selected for minus temperature operation and we recommend the use of an inline dryer) and is in line with the air quality from most standard compressors with a standard filter.
Operating pressure	1 to 10 bar
Ambient temperature	Standard temperature (option M): -20°C to +80°C High temperature (option F): -20°C to +150°C
Pre-lubricated	Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued. Hydraulic oil type HLP (DIN 51524. ISO 11158). Viscosity by 40°C: 32 mm2/s (cst). Example: Shell Tellus 32 or equal.
Corrosion resistance	Material and surface treatment selected for typical industrial applications with resistance to corrosion and chemicals.



Material specification

Pos	Part		Specification
1, 2	End covers		Die-cast painted aluminium
3	Piston		Die-cast alumium (in 2 pieces)
4	Piston rod		Austenistic Stainless steel, DIN X8 CrNiS 18-9
5	Cylinder barrel		Anodised aluminium
6	Tie rod nut		Zinc plated steel
7	Cushioning screws		Stainless steel DIN X8 CrNiS 18-9
	O-ring cushioning screws		Nitrile rubber (NBR)
			Fluoro elastomer (FKM)
8	Sleeves		Aluminium (integrated into the piston's half)
9	Piston nut		Zinc plated steel
10	Cushioning seal	Standard	Polyurethane (PUR)
		Optional	Fluoro elastomer (FKM)
11	O-ring end covers	Standard	Nitrile rubber (NBR)
		Optional	Fluoro elastomer (FKM)
12	Piston rod seal	Standard	Polyurethane (PUR)
		Optional	Fluoro elastomer (FKM)
13	Piston rod bearing		Self-lubricating sintered bronze
14	Tie rods		Austenistic Stainless steel, DIN X8 CrNiS 18-9
15	Piston rod nut		Zinc plated steel
16	Piston seals	Standard	Nitrile rubber (NBR)
		Optional	Fluoro elastomer (FKM)
17	Magnet		Magnet rubber
18	Piston bearing		PTFE and carbographite
19	O-ring piston	Standard	Nitrile rubber (NBR)
		Optional	Fluoro elastomer (FKM)

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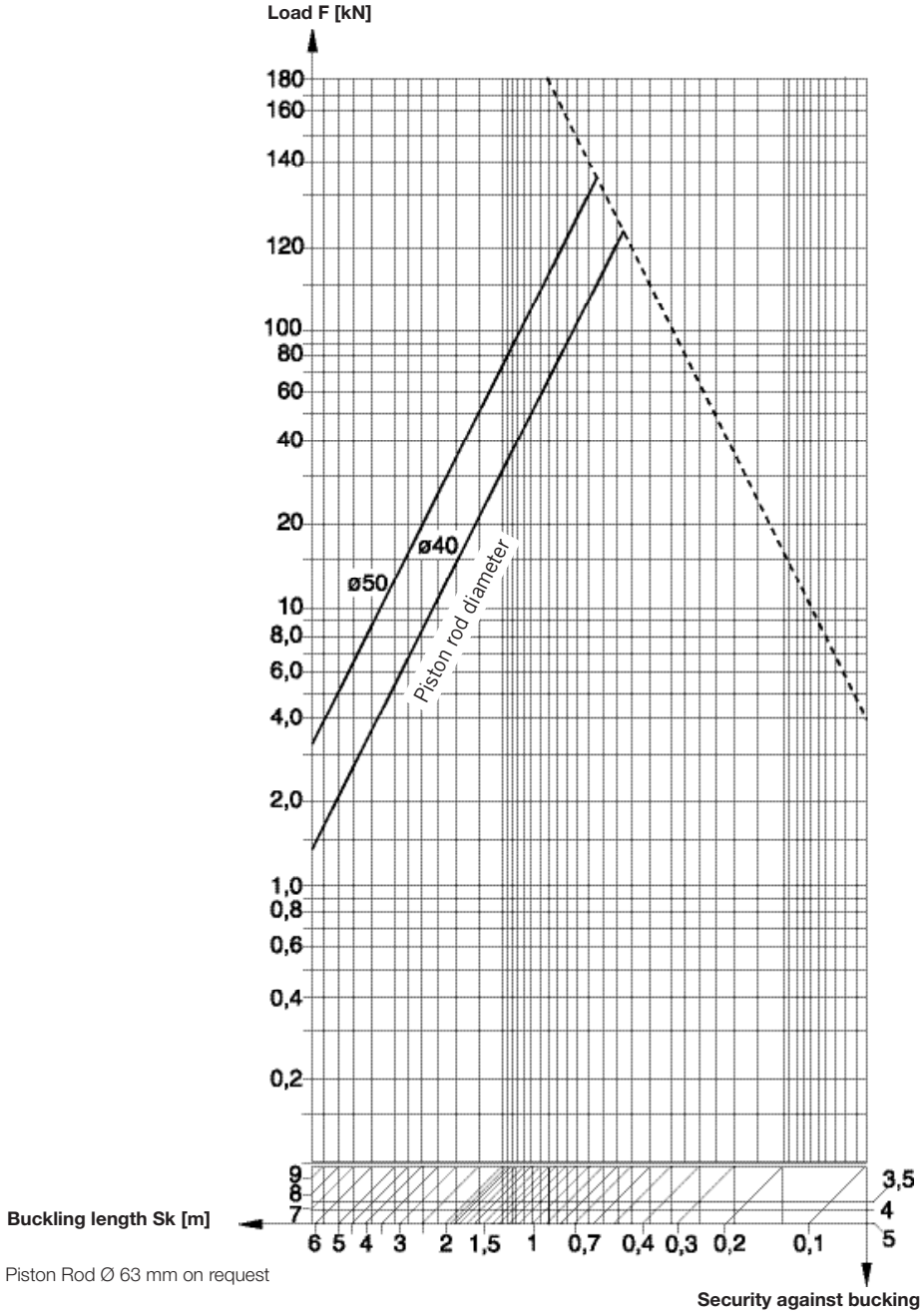
Piston rod load diagram

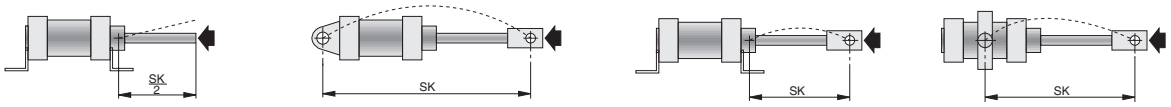
The piston rod diameter has to be determined to prevent the rod from buckling. Always take the maximum piston thrust force attainable at the specified operating pressure with the cylinder in question.

Loads resulting from longer strokes (as indicated in the diagram) on request. In case of special mounting conditions and transverse forces please consult. Recommended security factor against buckling: 3,5 to 5.



Piston Rod Ø 63 mm on request

Buckling Possibilities of Piston Rods



Cushioning Characteristics

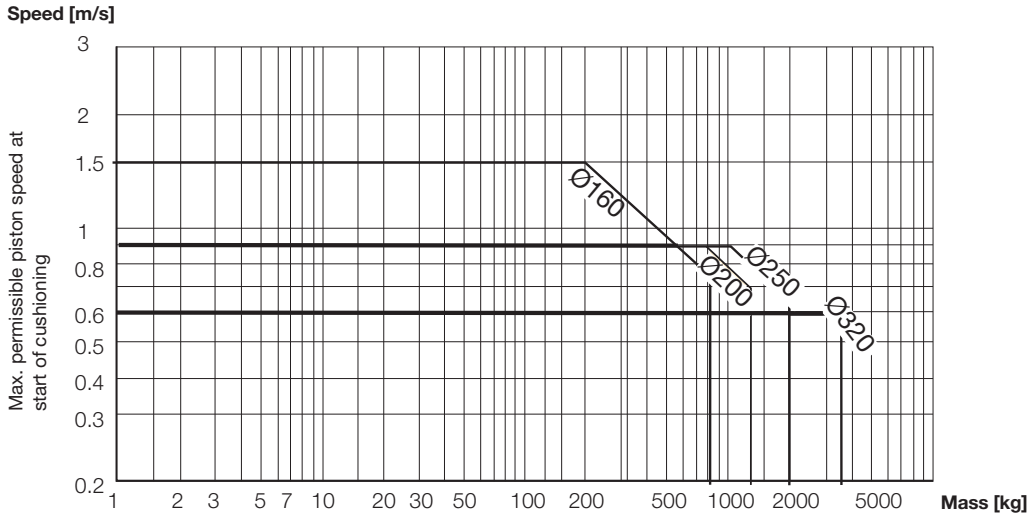
Air cushion is used to absorb kinetic energy due to load and speed at both end of stroke. This typically consists of a threaded needle screw that adjusts into an orifice in the cylinder end plate. By adjusting the screw further into the orifice you lessen the amount of air that can escape in a given time. Slowing the exhaust of air creates back pressure which slows the piston as it enters into the end cushioning seal.

Cushioning Diagram

Work out your expected moving mass and read off the maximum permissible speed at start of cushioning. Alternatively, take your desired speed and expected mass and find the cylinder size required.

Please note that piston speed at start of cushioning is typically approx. 50 % higher than the average speed, and that it is this higher speed which determines the choice of cylinder.

The mass is the sum of internal and external friction, plus any gravitational forces.

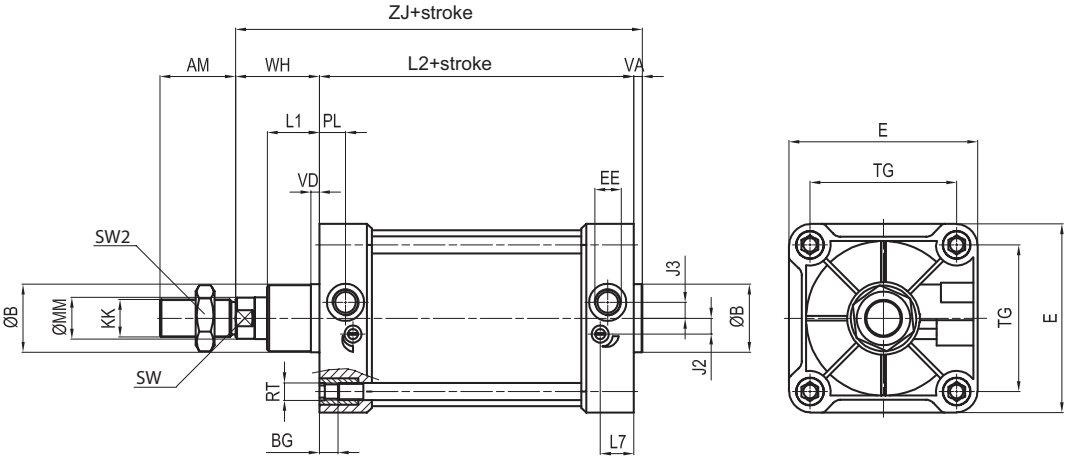


Horizontal application, pressure p = 6 bar, mass guided externally

Dimensions

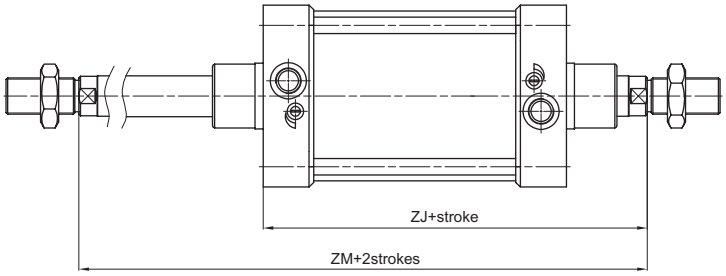
Tie-Rods with round profile design

P1F-T



Tie-Rods with through piston rod

P1F-N

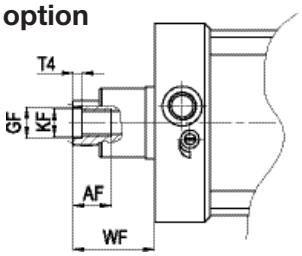


Dimensions [mm]

Cyl.-bore	AM	$ØB_{d11}$	BG	E	EE	J_2	J_3	KK	L_1	L_2	H	L_7	$MM_{ø7}$	PL	RT	SW	SW2	TG	VA	VD	WH	ZJ	ZJ*	ZM*
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Ø160	72	65	24	180	3/4“	15	15	M36x2	50	180	14	32	40	25	M16	36	55	140	6	8	80	266	260	340
Ø200	72	75	24	220	3/4“	15	15	M36x2	65	180	14	34	40	25	M16	36	55	175	6	25	95	281	275	370
Ø250	84	90	25	270	1“	25	25	M42x2	75	200	20	40	50	30	M20	46	65	220	8	25	105	313	305	410
Ø320	96	110	30	350	1“	35	35	M48x2	90	220	17	45	63	30	M24	55	75	270	10	25	120	350	340	460

*for through piston rod version

Female thread option



Dimensions [mm]

Cyl.-bore	AF	KF	T4	WF	GF
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Ø160	36	M20	10	80	22
Ø200	36	M20	10	95	22
Ø250	40	M24	12	105	26
Ø320	50	M30	15	120	32

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Order code

Order Instructions	P	1	F	-	T	1	6	0	M	S	X	0	1	6	0	-	0	0	0	0

Profile/cylinder design	
T	Tie-Rods
N	Tie-Rods with through rod

Cylinder bore size	
160	160 mm
200	200 mm
250	250 mm
320	320 mm

Temperature range	
M	Standard Temperature -20°C to +80°C
F	High Temperature -20°C to +150°C

Rod extension or trunnion mounting	
0000	without
P . . .	Piston rod extension in mm
G . . .[1)]	Trunnion mount +90° vs. air ports
7 . . . [1)]	Trunnion mount +0° vs. air ports

[1)] Trunnion position following XV dimension see page 15

Cylinder Stroke	
....	Stroke length in mm

Piston style	
X	Aluminium with magnet
A	Aluminium w/o magnet

Piston Rod material male thread	
S	Stainless steel

Piston Rod material female thread	
E	Stainless steel

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Mountings

	Flange MF1 / MF2 (1)	Foot brackets MS1 (2)	Pivot bracket with rigid bearing AB7 (3)	Swivel eye bracket MP6 (4)	Clevis bracket MP2 (5)
Ø160	P1C-4SMB	P1C-4SMF	P1C-4SMDB	P1C-4SMSB	P1C-4SMTB
Ø200	P1C-4TMB	P1C-4TMF	P1C-4TMDB	P1C-4TMSB	P1C-4TMTB
Ø250	P1C-4VMB	P1C-4VMF	P1C-4VMDB	P1C-4VMSB	P1C-4VMTB
Ø320	P1C-4WMB	P1C-4WMF	P1C-4WMDC	P1C-4WMSB	P1C-4WMTB

	Clevis bracket MP4 (6)	Swivel rod eye AP6 (12)	Clevis AP2 (13)	Flexo coupling PM5 (14)
Ø160	P1C-4SMEB	P1C-4SRS	P1C-4SRC	P1C-4SRF
Ø200	P1C-4TMEB	P1C-4SRS	P1C-4SRC	P1C-4SRF
Ø250	P1C-4VMEB	P1C-4VRS	P1C-4VRC	P1C-4VRF
Ø320	P1C-4WMEB	P1C-4WRS	P1C-4WRC	P1C-4WRF

	Pivot brackets AT4	Intermediate trunnion MT4 (12)
Ø160	PD24425	refer to page 15
Ø200	PD24425	refer to page 15
Ø250	PD25763	refer to page 15
Ø320	KL9130	refer to page 15

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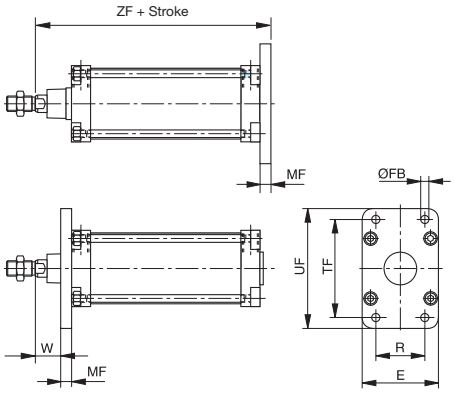
Pneumatic Cylinders ISO 15552

Flange MF1/MF2 ①

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

Materials:
Flange: Surface-treated steel
Mounting screws acc. to DIN 6912:
Zinc-plated steel 8.8
Supplied complete with mounting screws for attachment to the cylinder.



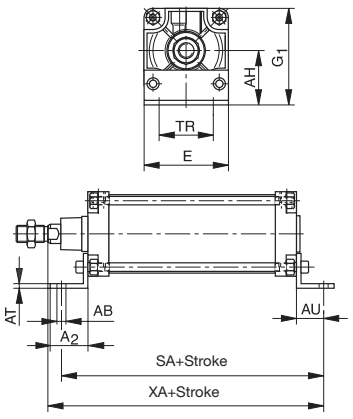
Cyl.-bore [mm]	ZF* [mm]	MF [mm]	W* [mm]	UF [mm]	E [mm]	TF [mm]	R [mm]	ØFB [mm]	Weight [kg]	Order code
Ø160	280	20	60	260	180	230	115	18	6.69	**P1C-4SMB**
Ø200	300	25	70	300	220	270	135	22	11.55	**P1C-4TMB**
Ø250	330	25	80	400	285	330	165	26	20.15	**P1C-4VMB**
Ø320	370	30	90	470	350	400	200	33	34.55	**P1C-4WMB**

*Does not apply to cylinder with piston rod extension.

Foot brackets MS1 ②

Intended for fixed mounting of cylinder.
Foot bracket can be fitted to front or rear end cover of the cylinder.

Materials:
Flange: Surface-treated steel
Mounting screws acc. to DIN 6912:
Zinc-plated steel 8.8:
Intended for fixed mounting of the cylinder.
Foot brackets can be fitted to the front or rear end cover of the cylinder.
Supplied complete with mounting screws for attachement to the cylinder.



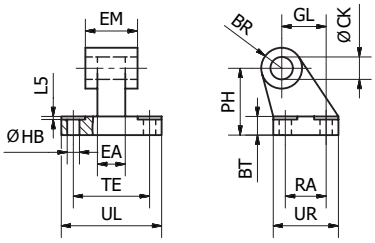
Cyl.-bore [mm]	E [mm]	TR [mm]	AH [mm]	G1 [mm]	AT [mm]	A2 [mm]	ØAB [mm]	SA [mm]	XA* [mm]	AU [mm]	Weight [mm]	Order code
Ø160	180	115	115	208	10	75	18,5	300	320	60	2.24	**P1C-4SMF**
Ø200	220	135	135	245	12	100	24	320	345	70	3.72	**P1C-4TMF**
Ø250	270	165	165	300	14	100	26	350	382	75	6.60	**P1C-4VMF**
Ø320	340	200	200	370	23	120	33	390	425	85	17.00	**P1C-4WMF**

*Does not apply to cylinder with piston rod extension.

Pivot bracket with rigid bearing AB7 ③

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

Materials:
Bores 160 to 250 mm
Pivot bracket: Aluminium
Bush: Steel and PTFE
Bore 320 mm
Pivot bracket: Surface-treated steel



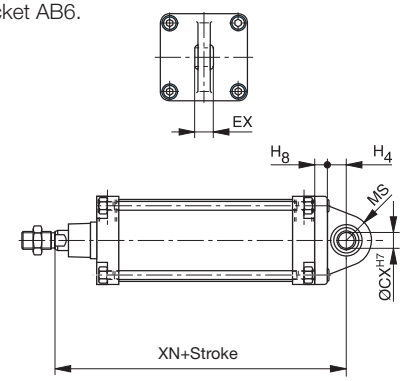
Cyl.-bore [mm]	ØCK H7 [mm]	ØHB [mm]	L5 [mm]	TE [mm]	UL [mm]	GL [mm]	RA [mm]	EA [mm]	EM [mm]	UR [mm]	PH [mm]	BT [mm]	BR [mm]	Weight [mm]	Order code
Ø160	30	14	4	118	156	97	88	36	90	126	115	25	31.5	2.58	**P1C-4SMDB**
Ø200	30	18	4	122	162	105	90	40	90	130	135	30	31.5	3.30	**P1C-4TMDB**
Ø250	40	22	4.5	150	200	128	110	45	110	160	165	35	40	5.70	**P1C-4VMDB**
Ø320	45	26	-	170	234	150	122	55	120	186	200	40	45	21.90	**P1C-4WMDC**

Swivel eye bracket MP6 ④

Intended for use togehter with clevis bracket AB6.

Materials:
Bores 160 to 250 mm
Bracket: Aluminium
Swivel bearing acc. to DIN 648K:
Hardened steel

Bore 320 mm
Pivot bracket: Surface-treated steel
Supplied complete with mounting screws for attachment to cylinder.



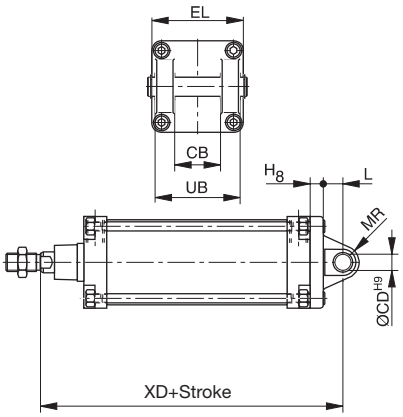
Cyl.-bore [mm]	EX [mm]	XN* [mm]	H8 [mm]	H4 [mm]	MS [mm]	ØCX H7 [mm]	Weight [kg]	Order code Not anodised
Ø160	43	315	20	35	44	35	4.36	**P1C-4SMSB**
Ø200	43	335	25	35	47	35	3.72	**P1C-4TMSB**
Ø250	49	377	25	45	52	40	5.85	**P1C-4VMSB**
Ø320	60	420	30	50	63	45	30.30	**P1C-4WMSB**

*Does not apply to cylinder with piston rod extension.

Clevis bracket MP2 ⑤

Intended for flexible mounting of the cylinder. Clevis bracket MP4 can be combined with pivot bracket and swivel rod eye.

Materials:
Bores 160 to 250 mm
Clevis bracket: Aluminium
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
Bore 320 mm
Pivot bracket: Surface-treated steel
Supplied complete with mounting screws for attachment to the cylinder.



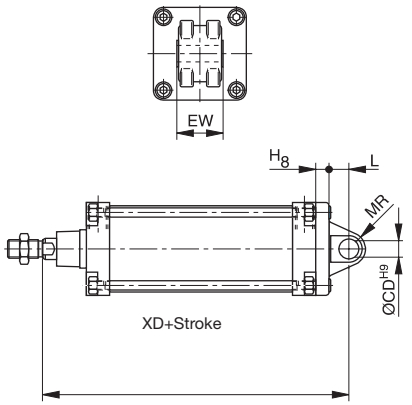
Cyl.-bore [mm]	EL [mm]	XD* [mm]	ØCD H9 [mm]	CB H14 [mm]	UB [mm]	H8 [mm]	L [mm]	MR [mm]	Weight [kg]	Order code
Ø160	180	315	30	90	170	20	35	25	2.20	**P1C-4SMTB**
Ø200	220	335	30	90	170	25	35	25	3.47	**P1C-4TMTB**
Ø250	270	377	40	110	200	25	45	40	5.80	**P1C-4VMTB**
Ø320	340	420	45	120	220	30	50	54	31.00	**P1C-4WMTB**

*Does not apply to cylinder with piston rod extension.

Clevis bracket MP4 ⑥

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

Materials:
Bores 160 to 250 mm
Clevis bracket: Aluminium
Bush: PTFE
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
Bore 320 mm
Pivot bracket: Surface-treated steel
Supplied complete with mounting screws for attachment to the cylinder.



Cyl.-bore [mm]	EW [mm]	XD* [mm]	H8 [mm]	L [mm]	MR [mm]	ØCD [mm]	Weight [kg]	Order code
Ø160	90	315	20	35	30	30	2.31	**P1C-4SMEB**
Ø200	90	335	25	35	31	30	2.50	**P1C-4TMEB**
Ø250	110	375	25	45	41	40	6.20	**P1C-4VMEB**
Ø320	120	420	30	50	46	45	33.00	**P1C-4WMEB**

*Does not apply to cylinder with piston rod extension.

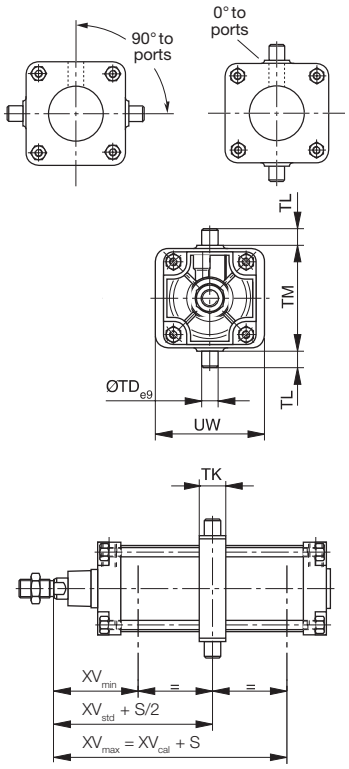
Intermediate Trunnion - MT4

Available for P1F Tie-Rods versions the MT4 centre trunnion when combined with AT4 pivot brackets is intended for articulated mounting of the cylinder.

Material: Zinc plated steel

Refer to the model code page 10 for ordering cylinder with trunnion.

Important note: The trunnion is fixed at factory following XV dimension and cannot be added later on the cylinder.



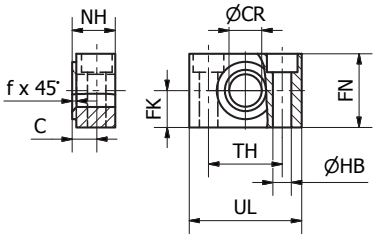
Cyl.-bore [mm]	TK h14 [mm]	TL h14 [mm]	TM [mm]	ØTD e9 [mm]	UW [mm]	XV min [mm]	XV std [mm]	XV cal [mm]	Weight [kg]
Ø160	40	32	200	32	190	150	170	190	6.10
Ø200	40	32	250	32	240	165	185	205	8.10
Ø250	50	40	320	40	296	185	205	225	14.80
Ø320	65	50	400	50		207	230	253	16.00

Important:
If the cylinder is ordered with a piston rod protusion (WH dimension), please add this extra length to XV_{min}, XV_{std} and XV_{cal}

Pivot Brackets for MT Trunnion - AT4

Intended for use together with trunnion MT4.

Materials:
Pivot bracket: Surface-treated aluminium
Bush: Bronze
Supplied in pairs



According to ISO 15552

Cyl.-bore [mm]	UL [mm]	NH [mm]	TH [mm]	C [mm]	CR [mm]	HB [mm]	FN [mm]	FK [mm]	fx45° [mm]	Weight [kg]	Order code
Ø160	92	35	60	17,5	32	18	60	30	1.0	0,35	**PD24425**
Ø200	92	35	60	17,5	32	18	60	30	1.6	0,35	**PD24425**
Ø250	140	40	90	20	40	22	70	35	1.6	0,50	**PD25763**
Ø320	150	60	100	30	50	26	80	40	1.6	6,70	**KL9130**

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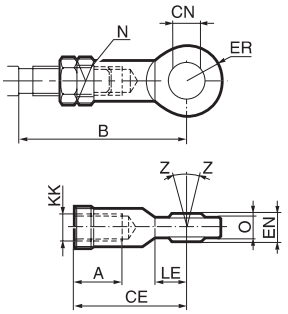
Pneumatic Cylinders ISO 15552

Swivel rod eye AP6 ⑫

Swivel rod eye for articulated mounting of the cylinder

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



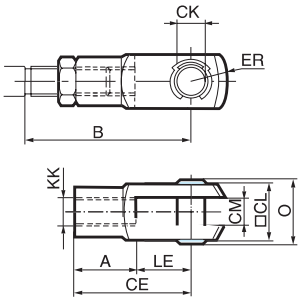
According to DIN ISO 8139

Cyl.-bore [mm]	A [mm]	B min [mm]	CE [mm]	ØCN$_{H9}$ [mm]	EN$_{h12}$ [mm]	ER [mm]	KK [mm]	LE min [mm]	N [mm]	O [mm]	Weight [kg]	Order code
Ø160	56	141	125	35	43	40,5	M36x2	41	50	28	1.6	**P1C-4SRS**
Ø200	56	141	125	35	43	40,5	M36x2	41	50	28	1.6	**P1C-4SRS**
Ø250	60	164	142	40	49	45,5	M42x2	46	55	33	2.4	**P1C-4VRS**
Ø320	65	191	160	50	60	58,5	M48x2	59	65	45	5.0	**P1C-4WRS**

Clevis AP2 ⑬

Clevis for articulated mounting of the cylinder.

Materials: Clevis, clip: Galvanized steel
Pin: Hardened steel



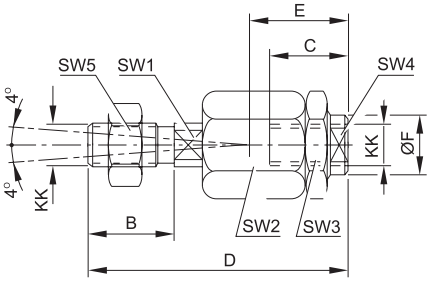
According to DIN ISO 8140

Cyl.-bore [mm]	A [mm]	B min [mm]	CE [mm]	CK$_{h11/e9}$ [mm]	CL [mm]	CM [mm]	ER [mm]	KK [mm]	LE [mm]	O [mm]	Weight [kg]	Order code
Ø160	72	144	144	35	70	35	-	M36x2	72	-	2.93	**P1C-4SRC**
Ø200	72	144	144	35	70	35	-	M36x2	72	-	2.93	**P1C-4SRC**
Ø250	84	168	168	40	85	40	-	M42x2	84	-	5.64	**P1C-4VRC**
Ø320	96	192	192	50	96	50	-	M48x2	96	-	7.86	**P1C-4WRC**

Flexo coupling PM5 ⑭

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

Materials:
Flexo coupling, nut: Zinc-plated steel
Supplied complete with galvanized adjustment nut.



Cyl.-bore [mm]	KK [mm]	B [mm]	C [mm]	D [mm]	E [mm]	ØF [mm]	SW1 [mm]	SW2 [mm]	SW3 [mm]	SW4 [mm]	SW5 [mm]	Weight [kg]	Order code
Ø160	M36x2	72	50	241	110	56	36	75	75	50	55	5.1	**P1C-4SRF**
Ø200	M36x2	72	50	241	110	56	36	75	75	50	55	5.1	**P1C-4SRF**
Ø250	M42x2	82	88	271	120	64	36	85	85	60	65	9.2	**P1C-4VRF**
Ø320	M48x2	82	88	271	120	64	42	85	85	60	75	9.4	**P1C-4WRF**

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Pneumatic Cylinders ISO 15552

Seal Kits

Complete seal kits consisting of:

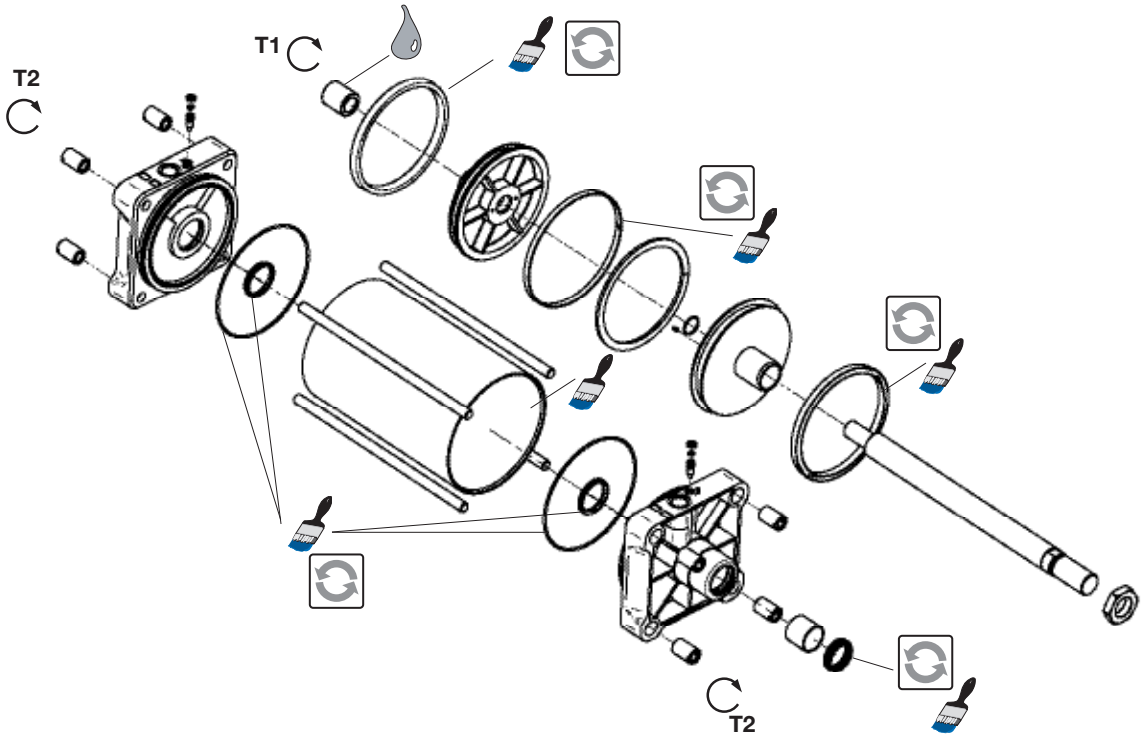
- 2 piston seals.
- 2 cushioning seals.
- 1 wiper seal.
- 1 piston rod seal, 2 for bores 250, 320 mm.
- 2 O-Rings.

Greases

Standard temperature	30 g	**9127394541**
High temperature	30 g	**9127394521**

Cyl.-bore [mm]	Standard temperature [1]	High temperature [1]
Ø160	**P1F-6160RN**	**P1F-6160RF**
Ø200	**P1F-6200RN**	**P1F-6200RF**
Ø250	**P1F-6250RN**	**P1F-6250RF**
Ø320	**P1F-6320RN**	**P1F-6320RF**

[1] for through piston rod, add K at the end, ie P1F-6160RNK



Cyl.-bore [mm]	AF [mm]	Piston T1 [Nm]		T2 Nm
Ø160	27	110-130	25 3,7	65-80
Ø200	27	110-130	25 3,7	65-80
Ø250	27	110-130	32 5,5	65-80
Ø320	27	110-130	32 5,5	65-80

= Included in seal kit

= Socket head across flats

= Tightening torque

Lubricated with grease

Locking fluid
Loctite 243 locking fluid must be used

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Drop-in sensors

The P8S 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.

Electronic sensors

The 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.

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.

	Electronic	Reed
Cylinder type:	Profile with T-slot	
Cylinder type with adaptor:	Profile with S-slot (dovetail) | Tie rods | Round cylinders	
Installation:	Drop-in. Fixed by 1.5 mm stainless steel allen key or flathead screwdriver.	
Housing length:	34.7 mm | 31.5 mm (ATEX)	
Output Type / Function:	PNP, Normally Open (NO) | NPN, Normally Closed (NC)	Normally Open (NO) | Normally Closed (NC)
Switching (on/off) switching frequency:	≤1000 Hz	± 400 Hz
Degree of Protection (IP):	IP67	
Power consumption:	≤ 10 mA	-
Input Supply Voltage Range:	10 to 30 V DC | 18 to 30 V DC (ATEX)	10 to 30 | 10 to 120 | 10 to 230 V AC/DC (2-wire) | 10 to 30 V AC/DC (3-wire)
Voltage Drop:	≤ 2,2 V	≤ 3,5 V (2-wire NO) | ≤ 0,1 V (3-wire) | ≤ 0,1 V (2-wire NC)
Continuous output current:	≤ 100 mA | ≤ 70 mA (ATEX)	≤ 100 mA (2-wire NO) | ≤ 500 mA (3-wire) | ≤ 500 mA (2-wire NC)
Switching capacity:	-	≤ 10 W
Hazardous area category:	3G / 3D (ATEX)	-
Protection Class:	III	II (2-wire) | III (3-wire)
Response Sensitivity:	2.65.. 2.95 mT	2.1.. 3.4 mT
Overrun Distance:	3 mm	9 mm
Histeresis:	≤ 0.5 mT	≤ 0.2 mT
Repeatability:	≤ 0.1 mT	
Reverse Polarity Protection:	Yes	
Short-circuit Protection:	Yes	-
Power-up Pulse Protection:	Yes	-
Ambiant Operating Temperature Range:	-25 to +75 °C (PUR cable) | -20 to +70°C (PVC cable) | -20 to +45°C (ATEX)	
Shock and Vibration resistance:	30 g 11 ms / 10 … 55 Hz, 1 mm	
EMC:	According to EN 60947-5-2	
Industry Standard:	CE | C UL US | RoHs | Ex	CE | C UL US | RoHs
UL Certification:	On request	
Housing Material:	Plastic polyamid PA12 (ATEX) | PA66	Plastic polyamid PA12 (2-wire 240V) | PA66
Cable Specification:	PUR (Polyurethane) | PVC (Polyvinyl Chloride)	
Conductor Cross-Section:	0.14 mm² (3 wire)	0.14 mm² (3-wire) | 0.12 mm² (2-wire)
Colour of LED:	Yellow	
Connection Style:	M8 snap-in | M8R (knurled nuts) | M12 (knurled nuts) | None (Flying lead)	

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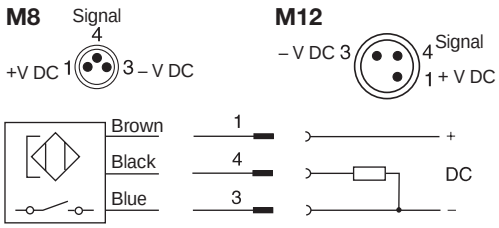
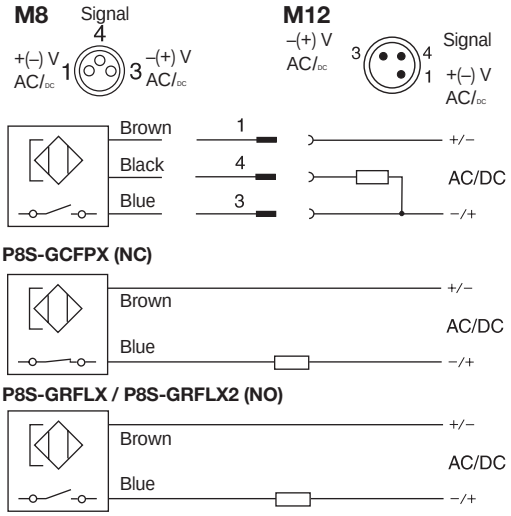
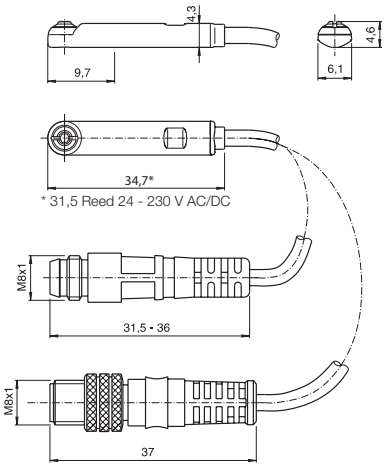
Electronic sensors



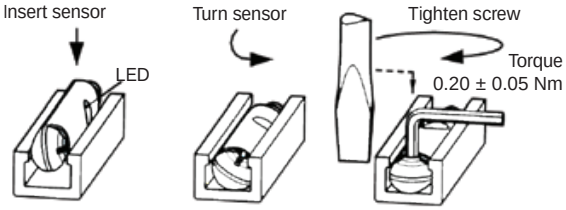
Reed sensors



Dimensions [mm]

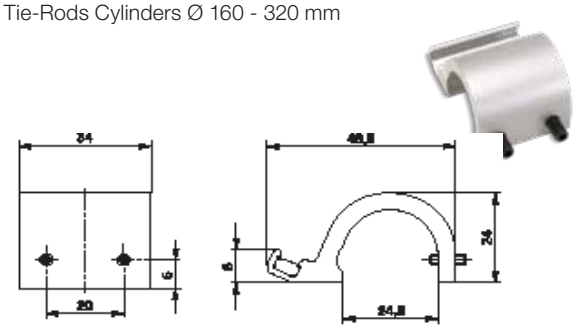


Sensor Installation



Brackets for sensors for Tie-Rods version

P8S-TMA08
(anodised aluminium, zinc plated screws)
Tie-Rods Cylinders Ø 160 - 320 mm



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Sensors

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	5 m PVC cable without connector without LED	0.050	P8S-GCFPX
Reed sensors, 10-120 V AC/DC			
Normally open	3 m PVC cable without connector	0.030	P8S-GRFLX
Reed sensors, 24-230 V AC/DC			
Normally open	3 m PVC cable without connector	0.030	P8S-GRFLX2

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 screw connectors and meet protection class IP 65.

Technical data

Operating voltage:	max. 32V AC/DC
Operating current per contact:	max. 4 A
Connection cross section:	0.25.... 0.5 mm² (conductor diameter min 0.1)
Protection class:	IP65 And IP 67 when plugged and screwed down (EN 60529)
Temperature range:	- 25... +85°C

Connector	Weight [kg]	Order Code
M8 screw connector	0.018	**P8CS0803J**
M12 screw connector	0.022	**P8CS1204J**

Connecting cables

Description	Weight [g]	For Product Series	Order Code
Cable flex PVC 3 meter with 8mm snap-in connector / flying leads	70	P8S Sensors with M8	**9126344341**
Cable flex PVC 10 meter with 8mm snap-in connector / flying leads	210	P8S Sensors with M8	**9126344342**
Cable PUR 3 meter with 8mm snap-in connector / flying leads	70	P8S Sensors with M8	**9126344345**
Cable flex PUR 10 meter with 8mm snap-in connector / flying leads	210	P8S Sensors with M8	**9126344346**
Cable PVC 2.5 meter with M8 screw connector / flying leads	60	P8S Sensors with knurled M8	**KC3102**
Cable PVC 5 meter with M8 screw connector / flying leads	120	P8S Sensors with knurled M8	**KC3104**

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Pneumatic Cylinders ISO 15552

Continuous Position Sensing

Analogue signal or IO-Link communication for linear cylinders many applications require more than just end of stroke sensing of an actuator, but traditional methods of continuous sensing are expensive and difficult to implement. Parker's CPS series of the P8S sensor family enables quick, easy, precise, and contactless position sensing of a piston. This can be installed on a standard linear actuator and offers an outstanding price to performance ratio.

Product Features:

Continuous position sensing
- IO-Link communication with M12 connector
- No modification to the actuator
- Analogue version with M8 connector
- 5 sizes with sensing ranges from 32 mm to 256 mm
- IP67 design suitable for any industrial application
- Yellow teach button for easy set-up

Technical specification:

1 ms sampling rate
0.03% full scale resolution
0.06% full scale repeatability
0.3 mm Linearity error

How it installs:

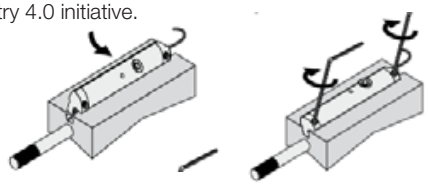
The Parker CPS requires the use of a magnetic piston. The product will ft T-slot cylinders without any additional mounting hardware.
1. Pivot the sensor into the slot
2. Teach the CPS unit the desired measuring range
3. Tighten set screws

How it connects:

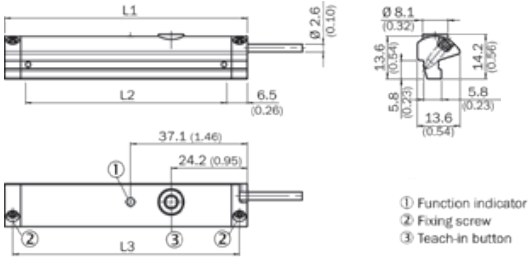
Analogue version has a M8 connector and a voltage output of 0-10V as well as a current output of 4-20mA. IO-Link version has a M12 connector and transmits position via 2 bytes of process input data and also allows for parameter control of measuring range and locking of the teach button. It can be controlled by Class A or Class B IO-Link Masters.

How it works:

The CPS product detects the position of an actuator via the magnet on the piston. The sensor settings can easily be adjusted during installation using the yellow teach button or during operation over the IO-Link communication. This upgrades the functionality of the pneumatic actuator by making it more intelligent and versatile in support of the Industry 4.0 initiative.



Dimensions in mm (inch)



			Order Code	
L1	**L2 ***	**L3**	**Analogue**	**IO-Link**
45	32	40	**P8SAGACHA**	**P8SAGHMHA**
77	64	72	**P8SAGACHB**	**P8SAGHMHB**
141	128	136	**P8SAGACHD**	**P8SAGHMHD**
205	192	200	**P8SAGACHF**	**P8SAGHMHF**
269	256	264	**P8SAGACHH**	**P8SAGHMHH**

*L2 equal to the measuring range

Ordering Data

Drop in T-slot, Turn, Screw, it's done

Output	Measuring length	Configuration Option	Order Code	Weight [g]	For product series
Analogue	32 mm	Teach Button	**P8SAGACHA**	16	With T-slot groove *
	64 mm		**P8SAGACHB**	26	
	128 mm		**P8SAGACHD**	46	
	192 mm		**P8SAGACHF**	66	
	256 mm		**P8SAGACHH**	86	
IO-Link	32 mm	Teach Button or IO-Link parameter	**P8SAGHMHA**	20	With T-slot groove *
	64 mm		**P8SAGHMHB**	30	
	128 mm		**P8SAGHMHD**	50	
	192 mm		**P8SAGHMHF**	70	
	256 mm		**P8SAGHMHH**	90	

* Required magnetic field sensitivity: 3mT / -2 mT (Analogue) / 3mT (IO-Link)
Note: PUR cable with M12 (IO-Link) or M8 (Analogue) male connector knurled nut, 4-pin, 0,3 meter length. Please consult for measuring range 96, 160 & 224 mm.

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) mg/m^3
	0,1 - 0,5 micron	0,5 - 1 micron	1 - 5 micron				
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 PDE2667TCEN-V13 03/2019

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