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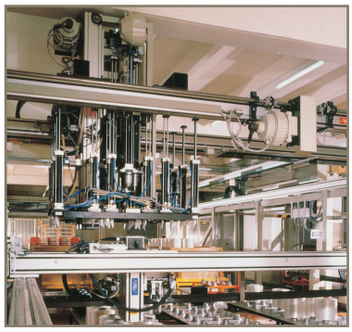
Pneumatic Cylinders

Series P1D-C Ultra Clean According to ISO 15552

PDE2642TCUK June 2014



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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

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The clean design P1D-C cylinder range is available in bore sizes 32 - 125 mm and stroke lengths up to 2800 mm.

The Ultra Clean cylinders, ISO 15552

Pneumatic cylinders for clean design applications

A clean external design of pneumatic cylinders is a request in more and more applications. It is always an advantage to able to keep the cylinders clean. Within the food and packaging industries this is a clear demand. However, also in various applications on vehicles and within the sawmill and bag-filling industries a clean design is important.

The new P1D-C...N range is an ISO 15552 cylinder version without sensor function meeting the demands for a clean pneumatic cylinder.

Ultimately clean design

P1D-C has a careful design providing a fully clean machine element. The end covers do not have any cavities from the outside (which is the most common design of pneumatic cylinders) thanks to the sandwich design with internal plastic parts. The cavities for the end cover screws can be sealed off (IP67) by plugs. On the top face you find the protruding cushioning screws which allows thorough cleaning. The new range of body extrusions is designed without any grooves or cavities whatsoever. To summarize - the new P1D-C is an ultimately clean ISO 15552 cylinder.

Corrosion resistance

The P1D-C…N cylinder range is designed for high chemical resistance. Aluminium end covers and body extrusion are anodised for excellent corrosion resistance. Piston rod in stainless steel and acetal plastic cushioning screws makes the cylinder suitable for demanding applications in the food and packaging industries. The IP67 plugs, available as accessory, seal off the end cover screws in zinc-plated steel. Stainless steel end cover screws are available as option.

Every P1D-C…N cylinder is delivered with a piston rod nut in stainless steel as standard.

Conforms to ISO 15552 standard

The P1D-C cylinder range is developed for full compliance with the installation dimensions in ISO 15552. This means that the cylinder range gives you global interchangeability.

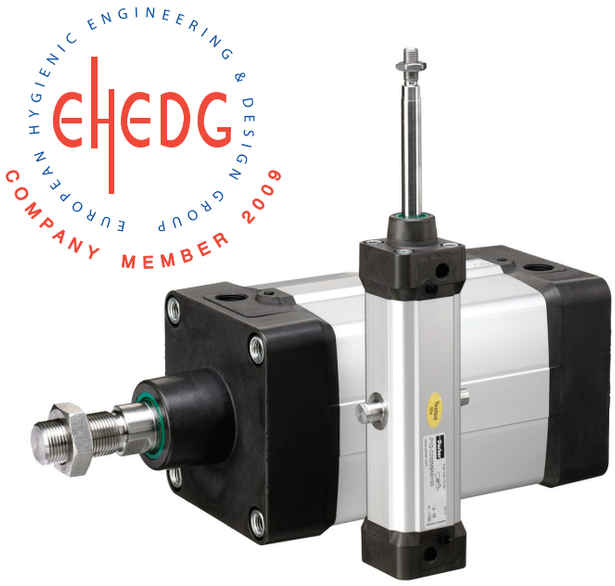
Bore size and stroke lengths

P1D-C...N is available in bore 32 to 125 mm and in any stroke length up to 2800 mm.

EHEDG design principles

The innovative design of P1D-C follows the preferred principles for products used in the food industry developed by EHEDG (European Hygienic Engineering & Design Group) of which Parker Hannifin is an active member. The careful design of this ultra clean cylinder range eliminates spots or traps, where liquids, dirt etc. can stay - no recesses, grooves, pockets or any other "inbound" geometry.

All design elements are worked out in detail to have a protruding shape, i. e. a positive geometry. This facilitates cleaning and eliminates dirt traps. Examples of this are the convex shape body extrusion, end covers without any cavities or recesses and the protruding cushioning screws.



The biggest (bore 125 mm) and the smallest (bore 32 mm) of the P1D-C cylinder series.

Food approved grease

The initial lubrication of the P1D-C cylinder range is made with our proven grease approved for use in the food industry. This edible grease is used for all our standard cylinders.

Patented clean design centre trunnions

The design of traditional centre trunnions is typically not clean. Pockets, cavities and slots accumulate dirt, liquids etc. which disqualify this type of trunnion fore use in the food industry.

The P1D-C range offers a new solution for centre trunnion. This is an exceptionally clean design. The innovative design uses principles in line with EHEDG recommendations. All main dimensions comply with ISO 15552. The stainless steel pivots are countersunk into the body extrusion which seals off the pivots. The new centre trunnion allows you to have an articulated cylinder installation in applications with high hygienic requirements.

The clean design centre trunnion represents a new and important opportunity for applications in the food and packaging industries. The new centre trunnion is factory-fitted and is available for all P1D-C cylinders in bore sizes 32-80 mm and up to stroke length 700 mm. Longer stroke length on request.

The stainless steel pivots fit flush to the surface of the body extrusion. The picture shows the patented centre trunnion for bore size 32 mm.

Dedicated plugs seal off end cover screw recesses

Normally 4 out of the 8 threads in the end cover screws are used for the installation. In order to seal off the threads not used, dedicated plugs are available. The collar of the head has a convex lip design and a rubber gasket is supplied with every plug. The plug is threaded into the end cover screw thread providing a high force and reliable sealing function. Assembled plugs seal against water intrusion as per IP67. These plugs are available as accessory in bags of 4.

Dedicated threaded plugs in high strength plastics provides IP67 tightness. The external hexagon makes them easy to mount.

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Design variants for P1D-C...N

Alternative piston rod materials

All P1D cylinders in all bores, Ø32-125 mm, can be ordered with the following piston rod materials:
– Steel, chromed-plated
– Stainless steel, roller polished (standard)
– Acid-proof steel, roller polished
– Stainless steel, chromed-plated

Through piston rod

All P1D cylinders in all bores, Ø32-125 mm, are available with a through rod. Cylinders with a through rod can take higher side forces thanks to the double support for the piston rod.

Operation with dry piston rod

In many applications, primarily in the foodstuffs industry, the cylinders are cleaned frequently. This means that the film of grease on the piston rod is washed off, which puts special demands on the materials and the design of the piston rod seal system (scraper ring and piston rod seal). Parker Hannifin has developed a piston rod seal system specially designed for dry rod operation. This is available as options for this type of applications, for all bores of P1D cylinders. The system has a specially designed L-shaped seal and the material is self-lubricating, high molecular weight plastics (HDPE) – the same system as in our P1S stainless steel cylinders.

Alternative scraper materials

For use in applications where chemicals may affect the scraper in the front end cover, an option with a scraper in FPM rubber for better chemical resistance is available.
On request there is also a scraper in food approved polyurethane material.

Cylinder forces, double acting variants

Cyl. bore/ pist. rod mm	Stroke	Pistonarea cm²	Max theoretical force in N (bar) 1,0	2,0	3,0	4,0	5,0	6,0	7,0	8,0	9,0	10,0
32/12	+	8,0	80	161	241	322	402	**483**	563	643	724	804
	-	6,9	69	138	207	276	346	**415**	484	553	622	691
40/16	+	12,6	126	251	377	503	628	**754**	880	1005	1131	1257
	-	10,6	106	212	318	424	530	**636**	742	848	954	1060
50/20	+	19,6	196	393	589	785	982	**1178**	1374	1571	1767	1963
	-	16,5	165	330	495	660	825	**990**	1155	1319	1484	1649
63/20	+	31,2	312	623	935	1247	1559	**1870**	2182	2494	2806	3117
	-	28,0	280	561	841	1121	1402	**1682**	1962	2242	2523	2803
80/25	+	50,3	503	1005	1508	2011	2513	**3016**	3519	4021	4524	5027
	-	45,4	454	907	1361	1814	2268	**2721**	3175	3629	4082	4536
100/25	+	78,5	785	1571	2356	3142	3927	**4712**	5498	6283	7069	7854
	-	73,6	736	1473	2209	2945	3682	**4418**	5154	5890	6627	7363
125/32	+	122,7	1227	2454	3682	4909	6136	**7363**	8590	9817	11045	12272
	-	114,7	1147	2294	3440	4587	5734	**6881**	8027	9174	10321	11468

+ = Outward stroke
- = Return stroke

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

Main data: P1D-C

Cylinder designation	Cylinder bore mm	Cylinder area cm²	dia. mm	Piston rod area cm²	thread	Cushioning length mm	Air consumption[2] litre	Connection thread
P1D-C032••NXXXX[1]	32	8,0	12	1,1	M10x1,25	17	0,105	G1/8
P1D-C040••NXXXX[1]	40	12,6	16	2,0	M12x1,25	19	0,162	G1/4
P1D-C050••NXXXX[1]	50	19,6	20	3,1	M16x1,5	20	0,253	G1/4
P1D-C063••NXXXX[1]	63	31,2	20	3,1	M16x1,5	23	0,414	G3/8
P1D-C080••NXXXX[1]	80	50,3	25	4,9	M20x1,5	23	0,669	G3/8
P1D-C100••NXXXX[1]	100	78,5	25	4,9	M20x1,5	27	1,043	G1/2
P1D-C125••NXXXX[1]	125	122,7	32	8,0	M27x2	30	1,662	G1/2

Total mass including moving parts

Cylinder designation	Total mass (kg) at 0 mm stroke	Total mass (kg) Supplement per 10 mm stroke
P1D-C032••NXXXX[1]	0,55	0,023
P1D-C040••NXXXX[1]	0,80	0,033
P1D-C050••NXXXX[1]	1,20	0,048
P1D-C063••NXXXX[1]	1,73	0,051
P1D-C080••NXXXX[1]	2,45	0,075
P1D-C100••NXXXX[1]	4,00	0,084
P1D-C125••NXXXX[1]	6,87	0,138

Mass moving parts only (for cushioning calculation)

Cylinder designation	Mass moving parts (kg) at 0 mm stroke	Supplement per 10 mm stroke
P1D-C032••NXXXX[1]	0,13	0,009
P1D-C040••NXXXX[1]	0,24	0,016
P1D-C050••NXXXX[1]	0,42	0,025
P1D-C063••NXXXX[1]	0,50	0,025
P1D-C080••NXXXX[1]	0,90	0,039
P1D-C100••NXXXX[1]	1,10	0,039
P1D-C125••NXXXX[1]	2,34	0,063

1) XXXX = stroke
2) Free air consumption per 10 mm stroke for a double stroke at 6 bar

Standard strokes

Standard strokes for all P1D-C...N cylinders comply with ISO 4393 (with the exception of stroke 40 mm).
Special strokes up to 2800 mm for P1D-C without sensors.

● = Standard stroke (mm) ▭ = Stroke to special order

Order no XXXX = Stroke	Cylinder bore (mm)	25	40	50	80	100	125	160	200	250	320	400	500	600	700	800	2800
P1D-C without sensor																	
P1D-C032MSNXXXX	**32**	●	●	●	●	●	●	●	●	●	●	●	●			//	
P1D-C040MSNXXXX	**40**	●	●	●	●	●	●	●	●	●	●	●	●			//	
P1D-C050MSNXXXX	**50**	●	●	●	●	●	●	●	●	●	●	●	●			//	
P1D-C063MSNXXXX	**63**	●	●	●	●	●	●	●	●	●	●	●	●			//	
P1D-C080MSNXXXX	**80**	●	●	●	●	●	●	●	●	●	●	●	●			//	
P1D-C100MSNXXXX	**100**	●	●	●	●	●	●	●	●	●	●	●	●			//	
P1D-C125MSNXXXX	**125**	●	●	●	●	●	●	●	●	●	●	●	●			//	

Operation data

Working pressure	Min 0,5 bar
	Max 10 bar
Working temperature	Min -20 °C
	Max +80 °C

Greased for life, does not normally need additional lubrication. If extra lubrication is given, this must always be continued.

Bores and strokes

Bores	32 - 125 mm
Standard strokes	25 - 500 mm according to ISO 4393
Max stroke	P1D-C...N without sensor 2800 mm

Chemical resistance

Tested for normally used industrial detergents both acid and alkaline.

Working medium, air quality

Working medium Dry, filtered compressed air to ISO 8573-1 class 3.4.3.

Recommended air quality for cylinders

For best possible service life and trouble-free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5 µm filter (standard filter), dew point +3 °C for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m³, which is what a standard compressor with a standard filter gives.

ISO 8573-1 quality classes

Quality class	Pollution particle size (µm)	Pollution max concentration (mg/m³)	Water max. press. dew point (°C)	Oil max concentration (mg/m³)
1	0,1	0,1	-70	0,01
2	1	1	-40	0,1
3	5	5	-20	1,0
4	15	8	+3	5,0
5	40	10	+7	25
6	-	-	+10	-

Important!

If the cylinder is used in applications with significant lateral loads on the piston rod, an external guide must be used to achieve maximum service life. See the P1D-S series.

Material specification

Standard design

Body extrusion	Natural colour, anodised aluminium
End cover	Black anodised aluminium
End cover inserts	POM
End cover screws	Zinc plated steel 8.8
Piston rod nut	Zinc plated steel
Piston rod	Stainless steel, X 10 CrNiS 18 9
Scraper ring	PUR
Piston rod bearing	POM
Piston	POM
Piston bearing	POM
Piston bolt	Zinc plated steel
Piston seal	PUR
O-rings	Nitrile rubber, NBR
End-of-stroke washers	PUR
Cushioning seals	PUR
Cushioning screws	POM

Options

Cylinders for dry rod operation

Seals/scraper ring	FPM/HDPE

Alternative piston rod material

Piston rod material	- Hard-chromium plated steel, Fe 490-2 FN - Acid-proof steel, X 5 CrNiMo 17 13 3 - Hard-chromium plated stainless steel, X 10 CrNiS 18 9

Alternative end cover screws

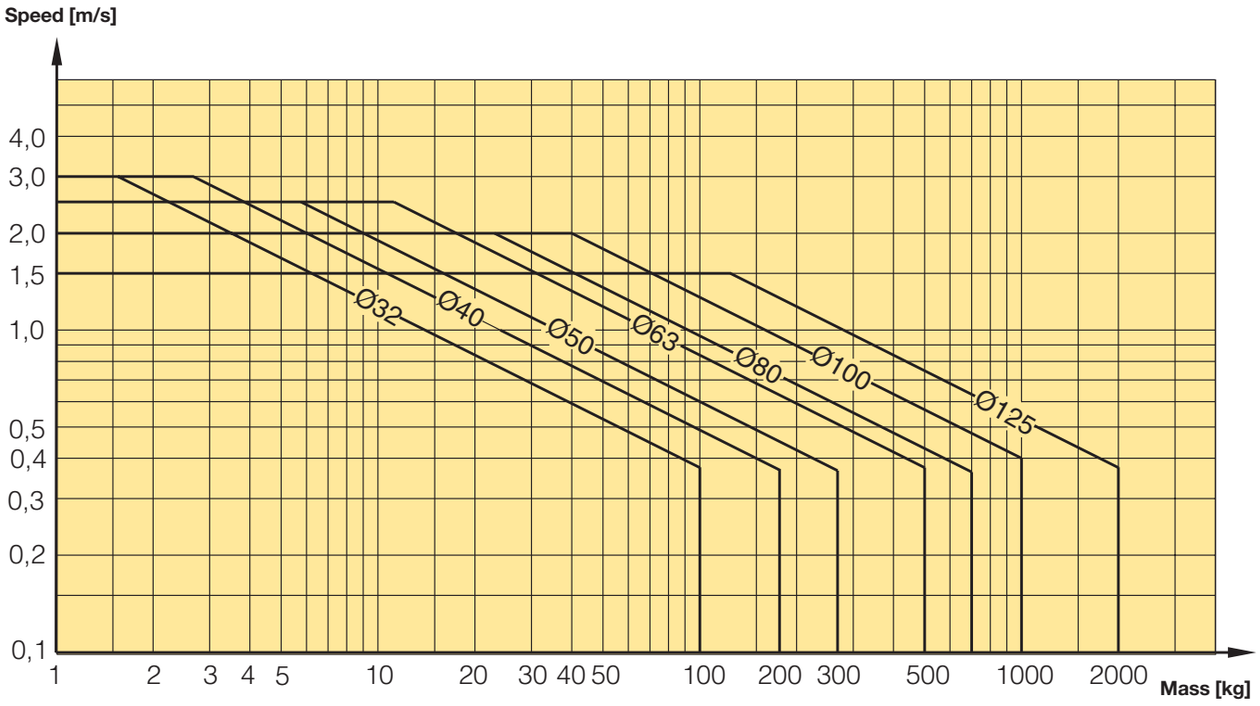
End cover screws	Stainless steel X 10 CrNiS 18 9

Cushioning characteristics

The diagram below is used for dimensioning of cylinders related to the cushioning capacity. The maximum cushioning capacity shown in the diagram assumes the following:

- Low load, i.e. low pressure drop across the piston
- Equilibrium speed
- Correctly adjusted cushioning screw
- 6 bar at cylinder port

The load is the sum of internal and external friction, plus any gravitational forces. At high relative load (pressure drop exceeding 1 bar), we recommend that for any given speed, the mass should be reduced by a factor of 2.5, or for a given mass, the speed should be reduced by a factor of 1.5. This is in relation to the maximum performance given in the diagram



Guide for selecting suitable tubing

The selection of the correct size of tubing is often based on experience, with no great thought to optimizing energy efficiency and cylinder velocity. This is usually acceptable, but making a rough calculation can result in worthwhile economic gains.

The following is the basic principle:

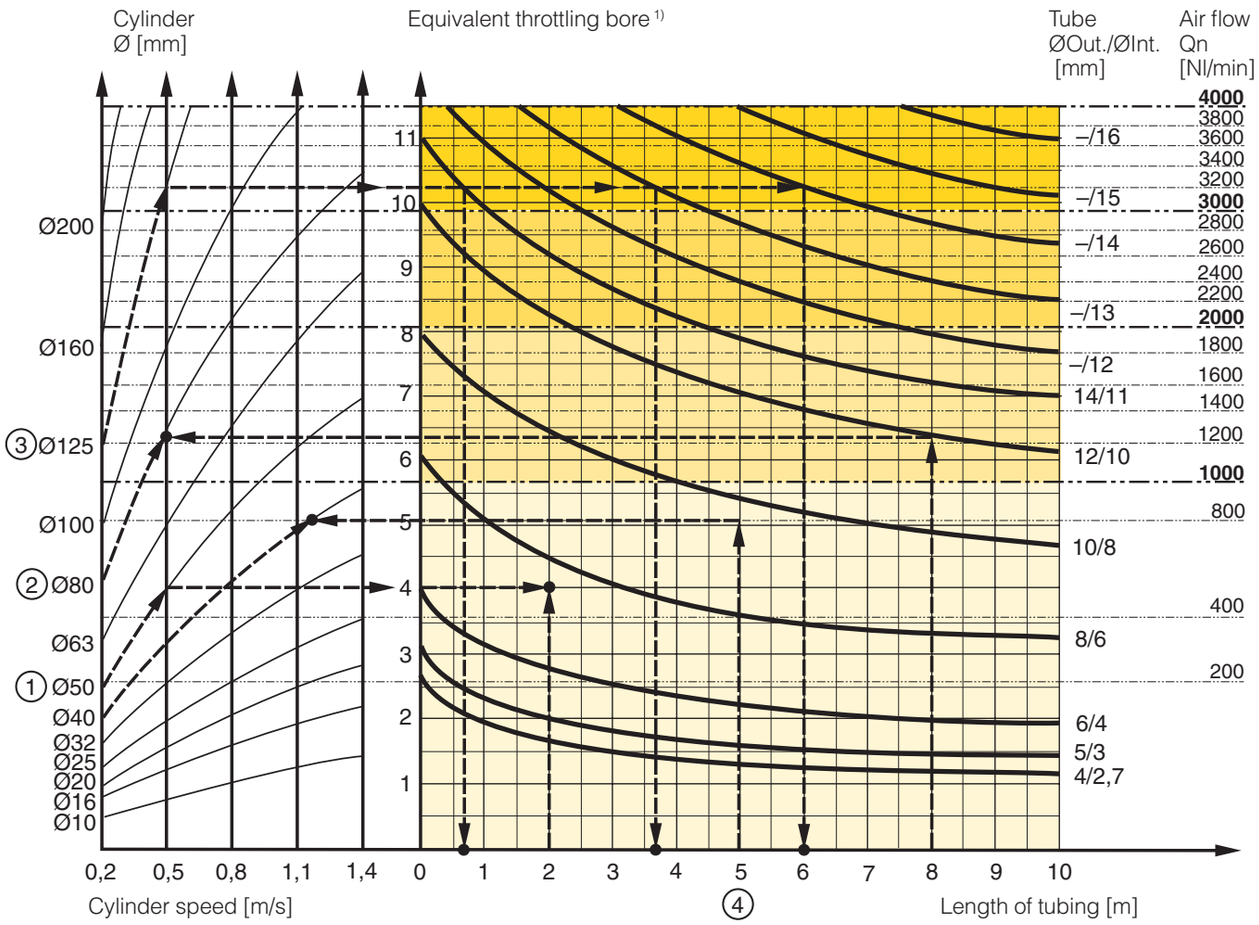
1. The primary line to the working valve could be over sized (this does not cause any extra air consumption and consequently does not create any extra costs in operation).
2. The tubes between the valve and the cylinder should, however, be optimized according to the principle that an insufficient bore throttles the flow and thus limits the cylinder speed, while an oversized pipe creates a dead volume which increases the air consumption and filling time.

The chart below is intended to help when selecting the correct size of tube to use between the valve and the cylinder.

The following prerequisites apply:

The *cylinder load should be about 50%* of the theoretical force (= normal load). A lower load gives a higher velocity and vice versa. The tube size is selected as a function of the *cylinder bore*, the desired *cylinder velocity* and the *tube length* between the valve and the cylinder.

If you want to use the capacity of the valve to its maximum, and obtain maximum speed, the tubing should be chosen so that they at least correspond with the equivalent restriction diameter (see description below), so that the tubing does not restrict the total flow. This means that a short tubing must have at least the equivalent restriction diameter. If the tubing is longer, choose it from the table below. Straight fittings should be chosen for highest flow rates. (Elbow and banjo fittings cause restriction.)



1) The "equivalent throttling bore" is a long throttle (for example a tube) or a series of throttles (for example, through a valve) converted to a short throttle which gives a corresponding flow rate. This should not be confused with the "orifice" which is sometimes specified for valves. The value for the orifice does not normally take account of the fact that the valve contains a number of throttles.

2) Qn is a measure of the valve flow capacity, with flow measured in litre per minute (l/min) at 6 bar(e) supply pressure and 1 bar pressure drop across the valve.

Example ① : Which tube diameter should be used?

A 50 mm bore cylinder is to be operated at 0.5 m/s. The tube length between the valve and cylinder is 2 m. In the diagram we follow the line from 50 mm bore to 0.5 m/s and get an “equivalent throttling bore“ of approximately 4 mm. We continue out to the right in the chart and intersect the line for a 2 m tube between the curves for 4 mm (6/4 tube) and 6 mm(8/6 tube). This means that a 6/4 tube throttles the velocity somewhat, while an 8/6 tube is a little too large. We select the 8/6 tube to obtain full cylinder velocity.

Example ②: What cylinder velocity will be obtained?

A 80 mm bore cylinder will be used, connected by 8 m 12/10 tube to a valve with Qn 1200 Nl/min. What cylinder velocity will we get? We refer to the diagram and follow the line from 8 mm tube length up to the curve for 12/10 tube. From there, we go horizontally to the curve for the Ø80 cylinder. We find that the velocity will be about 0.5 m/s.

Example ③: What is the minimum inner diameter and maximum lenght of tube?

For a application a 125 mm bore cylinder will be used. Maximum velocity of piston rod is 0.5 m/s. The cylinder will be controlled by a valve with Qn 3200 Nl/min. What diameter of tube can be used and what is maximum lenght of tube.
We refer to the diagram. We start at the left side of the diagram cylinder Ø125. We follow the line until the intersection with the velocity line of 0.5 m/s. From here we draw a horizontal line in the diagram. This line shows us we need an equivalent throttling bore of approximately 10 mm. Following this line horizontally we cross a few intersections. These intersections shows us the minimum inner diameter (rightside diagram) in combination with the maximum length of tube (bottomside diagram).

For example:
Intersection one: When a tube (14/11) will be used, the maximum length of tube is 0.7 meter.
Intersection two: When a tube (—/13) will be used, the maximum length of tube is 3.7 meter.
Intersection three: When a tube (—/14) will be used, the maximum length of tube is 6 meter.

Example ④ : Determining tube size and cylinder velocity with a particular cylinder and valve?

For an application using a 40 mm bore cylinder with a valve with Qn=800 Nl/min. The distance between the cylinder and valve has been set to 5 m.
Tube dimension: What tube bore should be selected to obtain the maximum cylinder velocity? Start at pipe length 5 m, follow the line up to the intersection with 800 Nl/min. Select the next largest tube diameter, in this case Ø10/8 mm.
Cylinder velocity: What maximum cylinder velocity will be obtained? Follow the line for 800 Nl/min to the left until it intersects with the line for the Ø40 mm cylinder. In this example, the speed is just above 1.1 m/s.

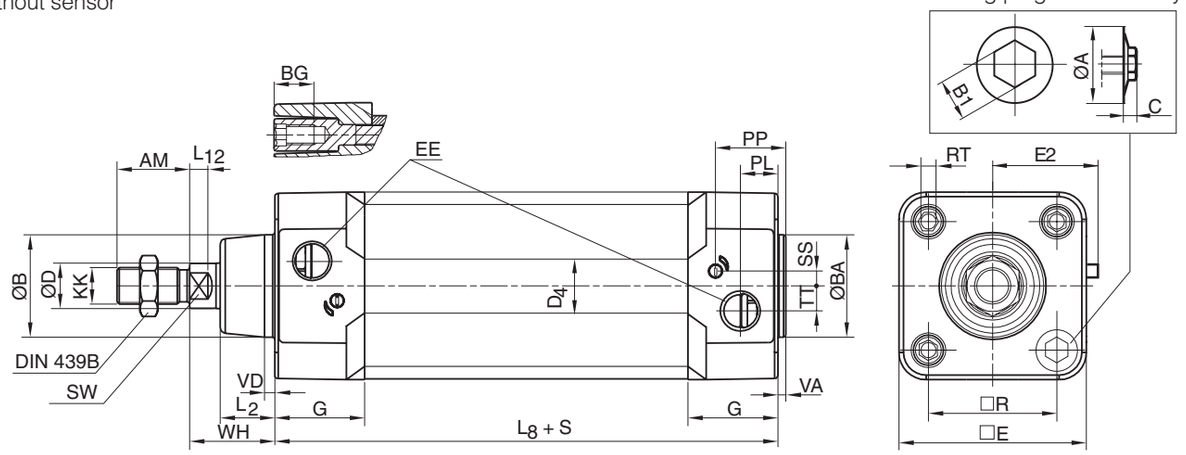
Valve series with respective flows in Nl/minute

Valve series	Qn in Nl/Min
Interface PS1	120
Moduflex Size 1 - Double 4/2 single solenoid	165
Adex A05	173
Isys Micro - Single 5/3 APB	228
Moduflex Size 1 - Single or Double 3/2	235
Isys Micro - Double 3/2	276
Isys Micro - Single 5/2	282
Moduflex Size 1 - Single 4/2	310
ISOMAX DX02	378
ISYS ISO HB	390
Moduflex Size 2 - Single or Double 3/2	440
PVL-B stackable inline valve	540
Adex A12	560
ISOMAX DX01	588
Viking Xtrem P2LAX - G1/8"	660
Moduflex Size 2 - Single 4/2	800
ISYS ISO HA	918
ISOMAX DX1 & DX Rail	1032
PVL-C stackable inline valve	1100
ISYS ISO H1	1248
Viking Xtrem P2LBX - G1/4"	1290
ISOMAX DX2 & DX Rail	2298
Viking Xtrem P2LCX - G3/8"	2460
ISYS ISO H2	2520
Viking Xtrem P2LDX - G1/2"	2658
ISOMAX DX3 & DX Rail	3840
ISYS ISO H3	5022

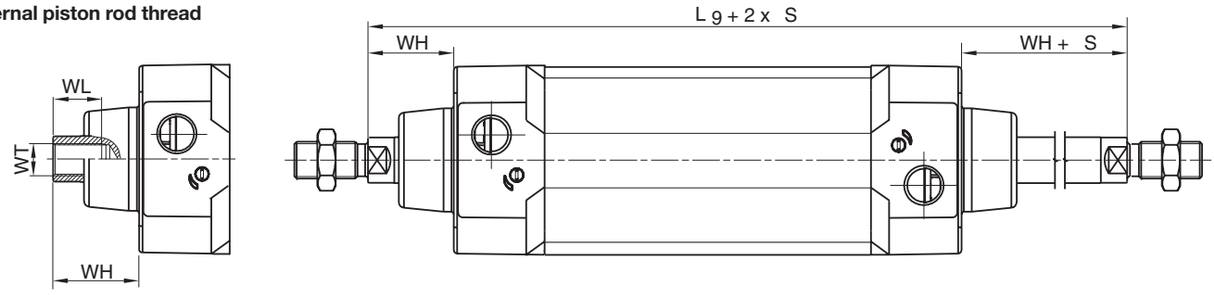
P1D-C...N

Without sensor

Sealing plug as accessory



Internal piston rod thread



Dimensions (mm)

Cylinder bore mm	A mm	AM mm	B mm	B1 mm	BA mm	BG mm	C mm	D mm	D4 mm	E mm	EE mm	G mm	KK	L2 mm
32	15	22	30	8	30	16	5,2	12	45,0	50,0	G1/8	28,5	M10x1,25	16,0
40	15	24	35	8	35	16	5,2	16	52,0	57,4	G1/4	33,0	M12x1,25	19,0
50	18,5	32	40	10	40	16	6,7	20	60,7	69,4	G1/4	33,5	M16x1,5	24,0
63	18,5	32	45	10	45	16	6,7	20	71,5	82,4	G3/8	39,5	M16x1,5	24,0
80	21,5	40	45	11	45	17	7,8	25	86,7	99,4	G3/8	39,5	M20x1,5	30,0
100	21,5	40	55	11	55	17	7,8	25	106,7	116,0	G1/2	44,5	M20x1,5	32,4
125	24	54	60	13	60	20	9,3	32	134,0	139,0	G1/2	51,0	M27x2	45,0

Cylinder bore mm	L8 mm	L9 mm	L12 mm	PL mm	PP mm	R mm	RT	SS mm	SW mm	TT mm	VA mm	VD mm	WH mm	WL mm	WT
32	94	146	6,0	13,0	21,8	32,5	M6	4,0	10	4,5	3,5	4,5	26	21	M8x1
40	105	165	6,5	14,0	21,9	38,0	M6	8,0	13	5,5	3,5	4,5	30	23	M10x1,25
50	106	180	8,0	14,0	23,0	46,5	M8	4,0	17	7,5	3,5	5,0	37	31	M14x1,5
63	121	195	8,0	16,4	27,4	56,5	M8	6,5	17	11,0	3,5	5,0	37	31	M14x1,5
80	128	220	10,0	16,0	30,5	72,0	M10	0	22	15,0	3,5	4,0	46	39	M18x1,5
100	138	240	14,0	18,0	35,8	89,0	M10	0	22	20,0	3,5	4,0	51	39	M18x1,5
125	160	290	18,0	28,0	40,5	110,0	M12	0	27	17,5	5,5	6,0	65	53	M24x2

S=Stroke

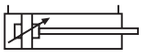
Tolerances (mm)

Cylinder bore mm	B	BA	L_8 mm	L_9 mm	R mm	Stroke tolerance up to stroke 500 mm	Stroke tolerance for stroke over 500 mm
32	d11	d11	±0,4	±2	±0,5	+0,3/+2,0	+0,3/+3,0
40	d11	d11	±0,7	±2	±0,5	+0,3/+2,0	+0,3/+3,0
50	d11	d11	±0,7	±2	±0,6	+0,3/+2,0	+0,3/+3,0
63	d11	d11	±0,8	±2	±0,7	+0,3/+2,0	+0,3/+3,0
80	d11	d11	±0,8	±3	±0,7	+0,3/+2,0	+0,3/+3,0
100	d11	d11	±1,0	±3	±0,7	+0,3/+2,0	+0,3/+3,0
125	d11	d11	±1,0	±3	±1,1	+0,3/+2,0	+0,3/+3,0

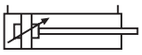
P1D-C...N without sensor

The order numbers on this page refer to P1D-C without sensor. The cylinders can be ordered as a complete unit with fittings, piston rod and cylinder mountings, speed controls etc. for efficient logistics. Please refer to the order code key to select cylinders with factory-fitted accessories.

P1D-C...N without sensor

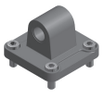
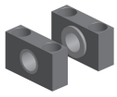


Cyl. bore mm	Stroke mm	Order code
32 Conn. G1/8	25	**P1D-C032MSN0025**
	40	**P1D-C032MSN0040**
	50	**P1D-C032MSN0050**
	80	**P1D-C032MSN0080**
	100	**P1D-C032MSN0100**
	125	**P1D-C032MSN0125**
	160	**P1D-C032MSN0160**
	200	**P1D-C032MSN0200**
	250	**P1D-C032MSN0250**
	320	**P1D-C032MSN0320**
	400	**P1D-C032MSN0400**
	500	**P1D-C032MSN0500**
40 Conn. G1/4	25	**P1D-C040MSN0025**
	40	**P1D-C040MSN0040**
	50	**P1D-C040MSN0050**
	80	**P1D-C040MSN0080**
	100	**P1D-C040MSN0100**
	125	**P1D-C040MSN0125**
	160	**P1D-C040MSN0160**
	200	**P1D-C040MSN0200**
	250	**P1D-C040MSN0250**
	320	**P1D-C040MSN0320**
	400	**P1D-C040MSN0400**
	500	**P1D-C040MSN0500**
50 Conn. G1/4	25	**P1D-C050MSN0025**
	40	**P1D-C050MSN0040**
	50	**P1D-C050MSN0050**
	80	**P1D-C050MSN0080**
	100	**P1D-C050MSN0100**
	125	**P1D-C050MSN0125**
	160	**P1D-C050MSN0160**
	200	**P1D-C050MSN0200**
	250	**P1D-C050MSN0250**
	320	**P1D-C050MSN0320**
	400	**P1D-C050MSN0400**
	500	**P1D-C050MSN0500**
63 Conn. G3/8	25	**P1D-C063MSN0025**
	40	**P1D-C063MSN0040**
	50	**P1D-C063MSN0050**
	80	**P1D-C063MSN0080**
	100	**P1D-C063MSN0100**
	125	**P1D-C063MSN0125**
	160	**P1D-C063MSN0160**
	200	**P1D-C063MSN0200**
	250	**P1D-C063MSN0250**
	320	**P1D-C063MSN0320**
	400	**P1D-C063MSN0400**
	500	**P1D-C063MSN0500**



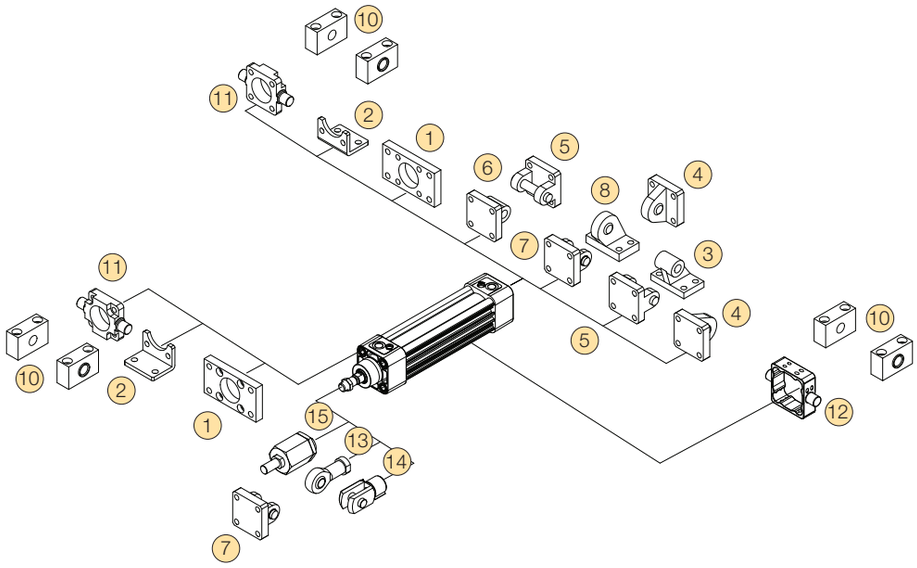
Cyl. bore mm	Stroke mm	Order code
80 Conn. G3/8	25	**P1D-S080MSN0025**
	40	**P1D-C080MSN0040**
	50	**P1D-C080MSN0050**
	80	**P1D-C080MSN0080**
	100	**P1D-C080MSN0100**
	125	**P1D-C080MSN0125**
	160	**P1D-C080MSN0160**
	200	**P1D-C080MSN0200**
	250	**P1D-C080MSN0250**
	320	**P1D-C080MSN0320**
	400	**P1D-C080MSN0400**
	500	**P1D-C080MSN0500**
100 Conn. G1/2	25	**P1D-C100MSN0025**
	40	**P1D-C100MSN0040**
	50	**P1D-C100MSN0050**
	80	**P1D-C100MSN0080**
	100	**P1D-C100MSN0100**
	125	**P1D-C100MSN0125**
	160	**P1D-C100MSN0160**
	200	**P1D-C100MSN0200**
	250	**P1D-C100MSN0250**
	320	**P1D-C100MSN0320**
	400	**P1D-C100MSN0400**
	500	**P1D-C100MSN0500**
125 Conn. G1/2	25	**P1D-C125MSN0025**
	40	**P1D-C125MSN0040**
	50	**P1D-C125MSN0050**
	80	**P1D-C125MSN0080**
	100	**P1D-C125MSN0100**
	125	**P1D-C125MSN0125**
	160	**P1D-C125MSN0160**
	200	**P1D-C125MSN0200**
	250	**P1D-C125MSN0250**
	320	**P1D-C125MSN0320**
	400	**P1D-C125MSN0400**
	500	**P1D-C125MSN0500**

	Flange MF1/MF2 [1]	Foot brackets MS1 [2]	Pivot bracket with rigid bearing AB7 [3]	Swivel eye bracket MP6 [4]	Clevis bracket MP2 [5]
Ø 32	P1C-4KMB	P1C-4KMF	P1C-4KMD	P1C-4KMSA	P1C-4KMT
Ø 40	P1C-4LMB	P1C-4LMF	P1C-4LMD	P1C-4LMSA	P1C-4LMT
Ø 50	P1C-4MMB	P1C-4MMF	P1C-4MMD	P1C-4MMSA	P1C-4MMT
Ø 63	P1C-4NMB	P1C-4NMF	P1C-4NMD	P1C-4NMSA	P1C-4NMT
Ø 80	P1C-4PMB	P1C-4PMF	P1C-4PMD	P1C-4PMSA	P1C-4PMT
Ø 100	P1C-4QMB	P1C-4QMF	P1C-4QMD	P1C-4QMSA	P1C-4QMT
Ø 125	P1C-4RMB	P1C-4RMF	P1C-4RMD	P1C-4RMSA	P1C-4RMT

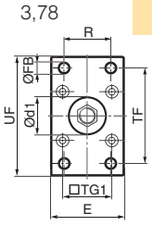
	Clevis bracket MP4 [6]	Clevis bracket AB6 [7]	Pivot bracket with swivel bearing CS7 [8]	3 and 4 positions flange JP1	Pivot brackets AT4 for MT* trunnion [10]
					
Ø 32	P1C-4KME	P1C-4KMCA	P1C-4KMA	P1E-6KB0	9301054261
Ø 40	P1C-4LME	P1C-4LMCA	P1C-4LMA	P1E-6LB0	9301054262
Ø 50	P1C-4MME	P1C-4MMCA	P1C-4MMA	P1E-6MB0	9301054262
Ø 63	P1C-4NME	P1C-4NMCA	P1C-4NMA	P1E-6NB0	9301054264
Ø 80	P1C-4PME	P1C-4PMCA	P1C-4PMA	P1E-6PB0	9301054264
Ø 100	P1C-4QME	P1C-4QMCA	P1C-4QMA	P1E-6QB0	9301054266
Ø 125	P1C-4RME	P1C-4RMCA	P1C-4RMA		9301054266

	Flange trunnion MT5/MT6 [11]	Center Trunnion MT4 [12]	Swivel rod eye AP6 [13]	Clevis AP2 [14]	Flexo coupling PM5 [15]
Ø 32	P1D-4KMYF	Factory fitted	P1C-4KRS	P1C-4KRC	P1C-4KRF
Ø 40	P1D-4LMYF	Factory fitted	P1C-4LRS	P1C-4LRC	P1C-4LRF
Ø 50	P1D-4MMYF	Factory fitted	P1C-4MRS	P1C-4MRC	P1C-4MRF
Ø 63	P1D-4NMYF	Factory fitted	P1C-4MRS	P1C-4MRC	P1C-4MRF
Ø 80	P1D-4PMYF	Factory fitted	P1C-4PRS	P1C-4PRC	P1C-4PRF
Ø 100	P1D-4QMYF	Factory fitted	P1C-4PRS	P1C-4PRC	P1C-4PRF
Ø 125		Factory fitted	P1C-4RRS	P1C-4RRC	P1C-4RRF

	Zinc-plated steel nut MR9
Ø 32	P14-4KRPZ
Ø 40	P14-4LRPZ
Ø 50	P14-4MRPZ
Ø 63	P14-4MRPZ
Ø 80	P14-4PRPZ
Ø 100	P14-4PRPZ
Ø 125	P14-4RRPZ

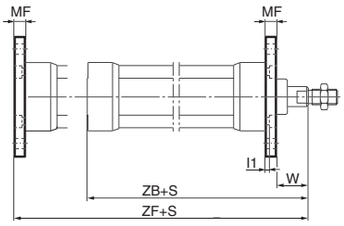


Type	Description	For mounting screws in stainless steel see page 21	Cyl. bore Ø mm	Weight kg	Order code
Flange MF1/MF2	Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder. Material: Flange: Surface-treated steel Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8 Supplied complete with mounting screws for attachment to cylinder.		32	0,23	**P1C-4KMB**
			40	0,28	**P1C-4LMB**
			50	0,53	**P1C-4MMB**
			63	0,71	**P1C-4NMB**
			80	1,59	**P1C-4PMB**
			100	2,19	**P1C-4QMB**
			125	3,78	**P1C-4RMB**



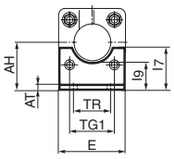
Cyl. bore mm	d1 H11 mm	FB H13 mm	TG1 mm	E mm	R JS14 mm	MF JS14 mm	TF JS14 mm	UF mm	l1 -0,5 mm	W mm	ZF mm	ZB mm
32	30	7	32,5	45	32	10	64	80	5,0	16	130	123,5
40	35	9	38,0	52	36	10	72	90	5,0	20	145	138,5
50	40	9	46,5	65	45	12	90	110	6,5	25	155	146,5
63	45	9	56,5	75	50	12	100	120	6,5	25	170	161,5
80	45	12	72,0	95	63	16	126	150	8,0	30	190	177,5
100	55	14	89,0	115	75	16	150	170	8,0	35	205	192,5
125	60	16	110,0	140	90	20	180	205	10,5	45	245	230,5

S = Stroke length



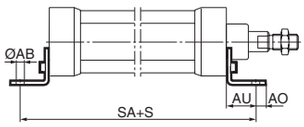
Foot brackets MS1	Intended for fixed mounting of cylinder. Foot bracket can be fitted to front and rear end covers of cylinder. Material: Foot bracket: Surface-treated steel Mounting screws acc. to DIN 912: Zinc-plated steel 8.8 Supplied in pairs with mounting screws for attachment to cylinder.		32	0,06**	**P1C-4KMF**
			40	0,08**	**P1C-4LMF**
			50	0,16**	**P1C-4MMF**
			63	0,25**	**P1C-4NMF**
			80	0,50**	**P1C-4PMF**
			100	0,85**	**P1C-4QMF**
			125	1,48**	**P1C-4RMF**

** Weight per item

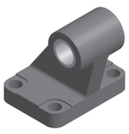


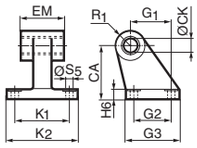
Cyl. bore mm	AB H14 mm	TG1 mm	E mm	TR JS14 mm	AO mm	AU mm	AH JS15 mm	l7 mm	AT mm	l9 JS14 mm	SA mm
32	7	32,5	45	32	10	24	32	30	4,5	17,0	142
40	9	38,0	52	36	8	28	36	30	4,5	18,5	161
50	9	46,5	65	45	13	32	45	36	5,5	25,0	170
63	9	56,5	75	50	13	32	50	35	5,5	27,5	185
80	12	72,0	95	63	14	41	63	49	6,5	40,5	210
100	14	89,0	115	75	15	41	71	54	6,5	43,5	220
125	16	110,0	140	90	22	45	90	71	8,0	60,0	250

S = Stroke length



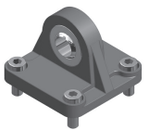
Pivot bracket with rigid bearing AB7	Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2. Material: Pivot bracket: Surface-treated aluminium, black Bearing: Sintered oil-bronze bushing		32	0,06	**P1C-4KMD**
			40	0,08	**P1C-4LMD**
			50	0,15	**P1C-4MMD**
			63	0,20	**P1C-4NMD**
			80	0,33	**P1C-4PMD**
			100	0,49	**P1C-4QMD**
			125	1,02	**P1C-4RMD**

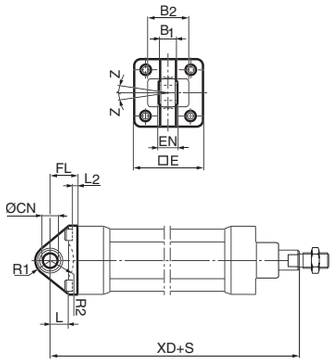




Cyl. bore mm	CK H9 mm	S5 H13 mm	K1 JS14 mm	K2 mm	G1 JS14 mm	G2 JS14 mm	EM mm	G3 mm	CA JS15 mm	H6 mm	R1 mm
32	10	6,6	38	51	21	18	25,5	31	32	8	10,0
40	12	6,6	41	54	24	22	27,0	35	36	10	11,0
50	12	9,0	50	65	33	30	31,0	45	45	12	13,0
63	16	9,0	52	67	37	35	39,0	50	50	12	15,0
80	16	11,0	66	86	47	40	49,0	60	63	14	15,0
100	20	11,0	76	96	55	50	59,0	70	71	15	19,0
125	25	14,0	94	124	70	60	69,0	90	90	20	22,5

Type	Description	For mounting screws in stainless steel see page 21	Cyl. bore Ø mm	Weight kg	Order code
Swivel eye bracket MP6	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. Mounting screws acc. to DIN 912: Zinc-plated steel 8.8		32	0,08	**P1C-4KMSA**
			40	0,11	**P1C-4LMSA**
			50	0,20	**P1C-4MMSA**
			63	0,27	**P1C-4NMSA**
			80	0,52	**P1C-4PMSA**
			100	0,72	**P1C-4QMSA**
			125	1,53	**P1C-4RMSA**

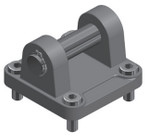


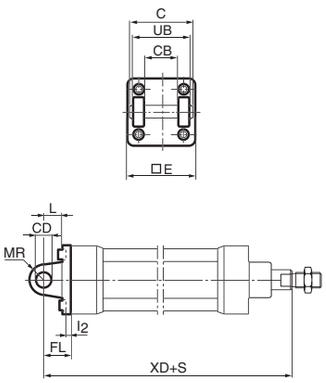


Cyl. bore mm	E mm	B1 mm	B2 mm	EN mm	R1 mm	R2 mm	FL mm	l2 mm	L mm	CN H7 mm	XD mm	Z
32	45	10,5	-	14	16	-	22	5,5	12	10	142	4°
40	52	12,0	-	16	18	-	25	5,5	15	12	160	4°
50	65	15,0	51	21	21	19	27	6,5	15	16	170	4°
63	75	15,0	-	21	23	-	32	6,5	20	16	190	4°
80	95	18,0	-	25	29	-	36	10,0	20	20	210	4°
100	115	18,0	-	25	31	-	41	10,0	25	20	230	4°
125	140	25,0	-	37	40	-	50	10,0	30	30	275	4°

S = Stroke length

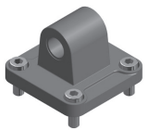
Clevis bracket MP2	Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4. Material: Clevis bracket: Surface-treated aluminium, black Pin: Surface hardened steel Circlips according to DIN 471: Spring steel Mounting screws acc. to DIN 912: Zinc-plated steel 8.8 Supplied complete with mounting screws for attachment to cylinder.	32	0,08	**P1C-4KMT**
		40	0,11	**P1C-4LMT**
		50	0,14	**P1C-4MMT**
		63	0,29	**P1C-4NMT**
		80	0,36	**P1C-4PMT**
		100	0,64	**P1C-4QMT**
		125	1,17	**P1C-4RMT**





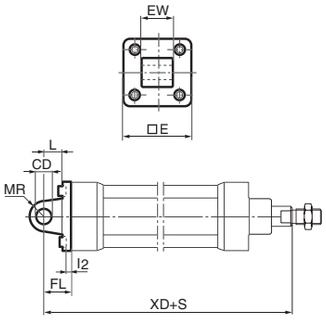
Cyl. bore mm	C mm	E mm	UB h14 mm	CB H14 mm	FL ±0,2 mm	L mm	l2 mm	CD H9 mm	MR mm	XD mm
32	53	45	45	26	22	13	5,5	10	10	142
40	60	52	52	28	25	16	5,5	12	12	160
50	68	65	60	32	27	16	6,5	12	12	170
63	78	75	70	40	32	21	6,5	16	16	190
80	98	95	90	50	36	22	10,0	16	16	210
100	118	115	110	60	41	27	10,0	20	20	230
125	139	140	130	70	50	30	10,0	25	25	275

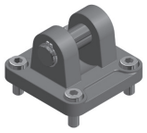
S = Stroke length

Type	Description	For mounting screws in stainless steel see page 21	Cyl. bore Ø mm	Weight kg	Order code
Clevis bracket MP4 	Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2. Material: Clevis bracket: Surface-treated aluminium, black Mounting screws acc. to DIN 912: Zinc-plated steel 8.8 Supplied complete with mounting screws for attachment to cylinder.		32	0,09	**P1C-4KME**
			40	0,13	**P1C-4LME**
			50	0,17	**P1C-4MME**
			63	0,36	**P1C-4NME**
			80	0,46	**P1C-4PME**
			100	0,83	**P1C-4QME**
			125	1,53	**P1C-4RME**

Cyl. bore mm	E mm	EW mm	FL mm	L ±0,2 mm	l2 mm	CD mm	MR H9 mm	XD mm
32	45	26	22	13	5,5	10	10	142
40	52	28	25	16	5,5	12	12	160
50	65	32	27	16	6,5	12	12	170
63	75	40	32	21	6,5	16	16	190
80	95	50	36	22	10,0	16	16	210
100	115	60	41	27	10,0	20	20	230
125	140	70	50	30	10,0	25	25	275

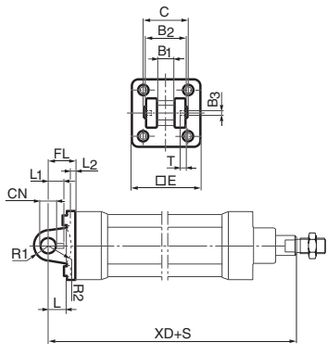
S = Stroke length



Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Clevis bracket AB6 	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. Material: Clevis bracket: Surface-treated 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 Supplied complete with mounting screws for attachment to cylinder.	32	0,09	**P1C-4KMCA**
		40	0,13	**P1C-4LMCA**
		50	0,17	**P1C-4MMCA**
		63	0,36	**P1C-4NMCA**
		80	0,58	**P1C-4PMCA**
		100	0,89	**P1C-4QMCA**
		125	1,75	**P1C-4RMCA**

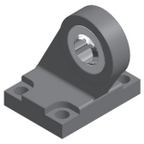
Cyl. bore mm	C mm	E mm	B2 d12 mm	B1 H14 mm	T mm	B3 mm	R2 mm	L1 mm	FL ±0,2 mm	l2 mm	L mm	CN F7 mm	R1 mm	XD mm
32	41	45	34	14	3	3,3	17	11,5	22	5,5	12	10	11	142
40	48	52	40	16	4	4,3	20	12,0	25	5,5	15	12	13	160
50	54	65	45	21	4	4,3	22	14,0	27	6,5	17	16	18	170
63	60	75	51	21	4	4,3	25	14,0	32	6,5	20	16	18	190
80	75	95	65	25	4	4,3	30	16,0	36	10,0	20	20	22	210
100	85	115	75	25	4	4,3	32	16,0	41	10,0	25	20	22	230
125	110	140	97	37	6	6,3	42	24,0	50	10,0	30	30	30	275

S = Stroke length

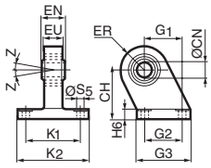


For mounting screws in stainless steel see page 21

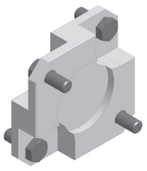
Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Pivot bracket with swivel bearing CS7	Intended for use together with clevis bracket GA. Material: Pivot bracket: Surface-treated steel, black Swivel bearing acc. to DIN 648K: Hardened steel	32	0,18	**P1C-4KMA**
		40	0,25	**P1C-4LMA**
		50	0,47	**P1C-4MMA**
		63	0,57	**P1C-4NMA**
		80	1,05	**P1C-4PMA**
		100	1,42	**P1C-4QMA**
		125	3,10	**P1C-4RMA**



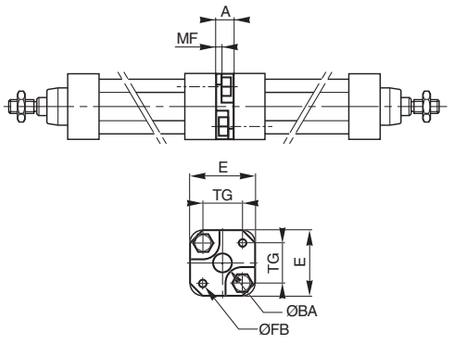
Cyl. bore mm	CN H7 mm	S5 H13 mm	K1 JS14 mm	K2 mm	EU mm	G1 JS14 mm	G2 JS14 mm	EN mm	G3 mm	CH JS15 mm	H6 mm	ER mm	Z
32	10	6,6	38	51	10,5	21	18	14	31	32	10	16	4°
40	12	6,6	41	54	12,0	24	22	16	35	36	10	18	4°
50	16	9,0	50	65	15,0	33	30	21	45	45	12	21	4°
63	16	9,0	52	67	15,0	37	35	21	50	50	12	23	4°
80	20	11,0	66	86	18,0	47	40	25	60	63	14	28	4°
100	20	11,0	76	96	18,0	55	50	25	70	71	15	30	4°
125	30	14,0	94	124	25,0	70	60	37	90	90	20	40	4°



3 and 4 positions flange JP1	Mounting kit for back to back mounted cylinders, 3 and 4 position cylinders. Material: Mounting: Aluminium Mounting screws acc. to DIN 912: Zinc-plated steel 8.8 Material: Pivot bracket: Surface-treated steel, black Swivel bearing acc. to DIN 648K: Hardened steel	32	0,060	**P1E-6KB0**
		40	0,078	**P1E-6LB0**
		50	0,162	**P1E-6MB0**
		63	0,194	**P1E-6NB0**
		80	0,450	**P1E-6PB0**
		100	0,672	**P1E-6QB0**

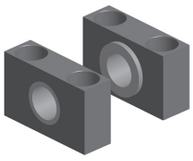


Cyl. bore mm	E mm	TG mm	ØFB mm	MF mm	A mm	ØBA mm
32	50	32,5	6,5	5	16	30
40	60	38,0	6,5	5	16	35
50	66	46,5	8,5	6	20	40
63	80	56,5	8,5	6	20	45
80	100	72,0	10,5	8	25	45
100	118	89,0	10,5	8	25	55

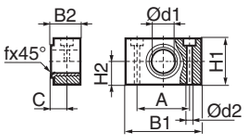


Pivot brackets AT4 for MT* Trunnion	Intended for use together with centre trunnion MT4. Material: Pivot bracket: Surface-treated aluminium Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing Supplied in pairs.	32	0,04*	**9301054261**
		40	0,07*	**9301054262**
		50	0,07*	**9301054262**
		63	0,12*	**9301054264**
		80	0,12*	**9301054264**
		100	0,21*	**9301054266**
		125	0,21*	**9301054266**

* Weight per item.



Cyl. bore mm	B1 mm	B2 mm	A mm	C mm	d1 mm	d2 H13 mm	H1 mm	H2 mm	fx45° min mm
32	46	18,0	32	10,5	12	6,6	30	15	1,0
40	55	21,0	36	12,0	16	9,0	36	18	1,6
50	55	21,0	36	12,0	16	9,0	36	18	1,6
63	65	23,0	42	13,0	20	11,0	40	20	1,6
80	65	23,0	42	13,0	20	11,0	40	20	1,6
100	75	28,5	50	16,0	25	14,0	50	25	2,0
125	75	28,5	50	16,0	25	14,0	50	25	2,0

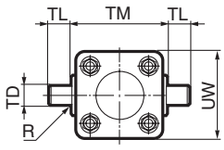


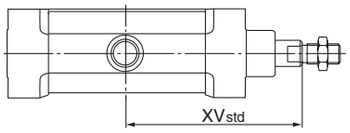
Type	Description	For mounting screws in stainless steel see page 21	Cyl. bore Ø mm	Trunnion weight kg	Order code
Clean design centre trunnion for P1D-C Ultra Clean only	Intended for articulated mounting of P1D-C cylinders. The trunnion is factory-fitted in the centre of the cylinder or at an optional location specified by the XV-measure – see the order code key. Combined with pivot bracket for MT4. Max stroke length 700 mm. Longer stroke length on request.		32 40 50 63 80	0,036 0,082 0,082 0,100 0,110	**See order key on pages 28-29**

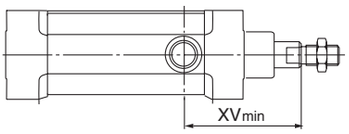
Material:
Trunnion: stainless steel

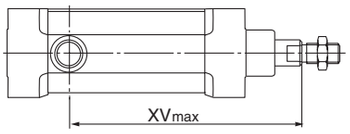
Trunnion centred
The centre trunnion for P1D-C is ordered with letter D in position 17 (no dimension specified in positions 18-20). See the order code key at pages 28-29.

Trunnion with optional location
The centre trunnion for P1D-C is ordered with letter G in position 17 and desired XV-measure (3-digit measure in mm) in positions 18-20.
See the order code key at page 24-25.





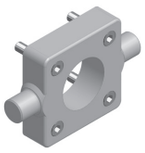




Cyl. bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	X1* mm	XVmin mm	X2 mm	Stroke min mm
32	50	12	12	1,0	52	73,0	69,5	76,0	0
40	63	16	16	1,6	59	82,5	78,0	86,5	0
50	75	16	16	1,6	71	90,0	85,5	94,5	0
63	90	20	20	1,6	84	97,5	103,5	91,0	15
80	110	20	20	1,6	105	110,0	112,5	107,0	10

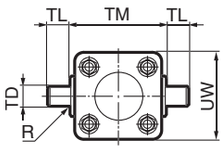
XVstd = X1 + Stroke length/2, XVmax = X2 + Stroke length

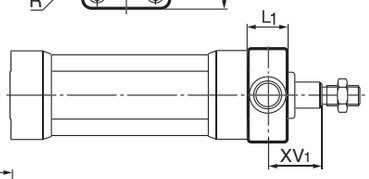
Flange trunnion MT5/MT6	Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. At your choice, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the order code key at pages 28 and 29. Individual trunnions have order code as shown to the right.	32 40 50 63 80 100	0,17 0,43 0,55 1,10 1,66 3,00	**P1D-4KMYF** **P1D-4LMYF** **P1D-4MMYF** **P1D-4NMYF** **P1D-4PMYF** **P1D-4QMYF**

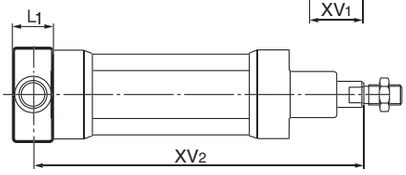


Material:
Trunnion: zinc plated steel
Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Delivered complete with mounting screws for attachment to the cylinder





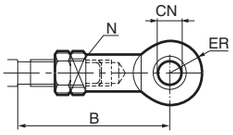


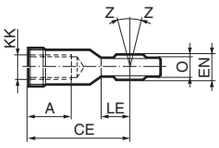
Cyl. bore mm	TM h14 mm	TL h14 mm	TD e9 mm	R mm	UW mm	L1 mm	XV_1 mm	X mm	Y mm
32	50	12	12	1,0	46	14	19,5	126,5	11
40	63	16	16	1,6	59	19	21,0	144,0	14
50	75	16	16	1,6	69	19	28,0	152,0	20
63	90	20	20	1,6	84	24	25,5	169,5	20
80	110	20	20	1,6	102	24	34,5	185,5	26
100	132	25	25	2,0	125	29	37,0	203,0	31

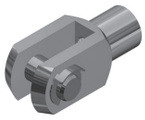
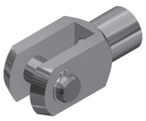
Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Swivel rod eye AP6	Swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA. Maintenance-free. Material: Swivel rod eye: Zinc-plated steel Swivel bearing according to DIN 648K: Hardened steel	32	0,08	**P1C-4KRS**
		40	0,12	**P1C-4LRS**
		50	0,25	**P1C-4MRS**
		63	0,25	**P1C-4MRS**
		80	0,46	**P1C-4PRS**
		100	0,46	**P1C-4PRS**
		125	1,28	**P1C-4RRS**
Stainless steel swivel rod eye AP6	Stainless-steel swivel rod eye for articulated mounting of cylinder. Swivel rod eye can be combined with clevis bracket GA. Maintenance-free. Material: Swivel rod eye: Stainless steel Swivel bearing according to DIN 648K: Stainless steel	32	0,08	**P1S-4JRT**
		40	0,12	**P1S-4LRT**
		50	0,25	**P1S-4MRT**
		63	0,25	**P1S-4MRT**
		80	0,46	**P1S-4PRT**
		100	0,46	**P1S-4PRT**
		125	1,28	**P1S-4RRT**

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	20	48,0	55	43	10	14	14	M10x1,25	15	17	10,5	12°
40	22	56,0	62	50	12	16	16	M12x1,25	17	19	12,0	12°
50	28	72,0	80	64	16	21	21	M16x1,5	22	22	15,0	15°
63	28	72,0	80	64	16	21	21	M16x1,5	22	22	15,0	15°
80	33	87,0	97	77	20	25	25	M20x1,5	26	32	18,0	15°
100	33	87,0	97	77	20	25	25	M20x1,5	26	32	18,0	15°
125	51	123,5	137	110	30	37	35	M27x2	36	41	25,0	15°

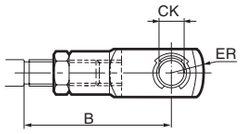


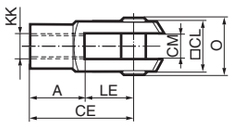


Clevis AP2 	Clevis for articulated mounting of cylinder. Material: Clevis, clip: Galvanized steel Pin: Hardened steel	32	0,09	**P1C-4KRC**
		40	0,15	**P1C-4LRC**
		50	0,35	**P1C-4MRC**
		63	0,35	**P1C-4MRC**
		80	0,75	**P1C-4PRC**
		100	0,75	**P1C-4PRC**
		125	2,10	**P1C-4RRC**
Stainless steel clevis AP2 	Stainless-steel clevis for articulated mounting of cylinder. Material: Clevis: Stainless steel Pin: Stainless steel Circlips according to DIN 471: Stainless steel	32	0,09	**P1S-4JRD**
		40	0,15	**P1S-4LRD**
		50	0,35	**P1S-4MRD**
		63	0,35	**P1S-4MRD**
		80	0,75	**P1S-4PRD**
		100	0,75	**P1S-4PRD**
		125	2,10	**P1S-4RRD**

According to ISO 8140

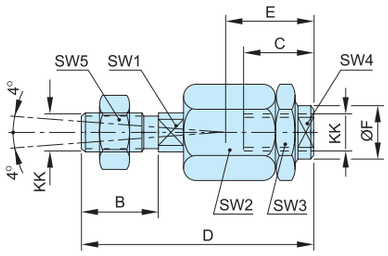
Cyl. bore mm	A mm	B min mm	B max mm	CE mm	CK h11/E9 mm	CL mm	CM mm	ER mm	KK	LE mm	O mm
32	20	45,0	52	40	10	20	10	16	M10x1,25	20	28,0
40	24	54,0	60	48	12	24	12	19	M12x1,25	24	32,0
50	32	72,0	80	64	16	32	16	25	M16x1,5	32	41,5
63	32	72,0	80	64	16	32	16	25	M16x1,5	32	41,5
80	40	90,0	100	80	20	40	20	32	M20x1,5	40	50,0
100	40	90,0	100	80	20	40	20	32	M20x1,5	40	50,0
125	56	123,5	137	110	30	55	30	45	M27x2	54	72,0





Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Flexo coupling PM5	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.	32	0,21	**P1C-4KRF**
		40	0,22	**P1C-4LRF**
		50	0,67	**P1C-4MRF**
		63	0,67	**P1C-4MRF**
		80	0,72	**P1C-4PRF**
		100	0,72	**P1C-4PRF**
		125	1,80	**P1C-4RRF**

Cyl. bore mm	KK mm	B mm	C mm	D mm	E mm	OF mm	SW1 mm	SW2 mm	SW3 mm	SW4 mm	SW5 mm
32	M10x1.25	20	23	73	31	21	12	30	30	19	17
40	M12x1.25	24	23	77	31	21	12	30	30	19	19
50	M16x1.5	32	32	108	45	33.5	19	41	41	30	24
63	M16x1.5	32	32	108	45	33.5	19	41	41	30	24
80	M20x1.5	40	42	122	56	33.5	19	41	41	30	30
100	M20x1.5	40	42	122	56	33.5	19	41	41	30	30
125	M27x2	54	48	147	51	39	24	55	55	32	41

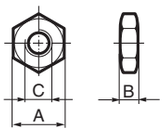


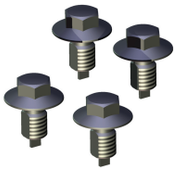
Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Nut MR9 *	Intended for fixed mounting of accessories to the piston rod. Material: Zinc-plated steel	32	0,007	**P14-4KRPZ**
		40	0,010	**P14-4LRPZ**
		50	0,021	**P14-4MRPZ**
		63	0,021	**P14-4MRPZ**
		80	0,040	**P14-4PRPZ**
		100	0,040	**P14-4PRPZ**
		125	0,100	**P14-4RRPZ**
Stainless steel nut MR9 *	Intended for fixed mounting of accessories to the piston rod. All P1D..N cylinders are delivered with a stainless steel piston rod nut Material: Stainless steel A2	32	0,007	**P14-4KRPS**
		40	0,010	**P14-4LRPS**
		50	0,021	**P14-4MRPS**
		63	0,021	**P14-4MRPS**
		80	0,040	**P14-4PRPS**
		100	0,040	**P14-4PRPS**
		125	0,100	**P14-4RRPS**
Acid-proof nut MR9 *	Intended for fixed mounting of accessories to the piston rod. Material: Acid-proof steel A4	32	0,007	**P14-4KRPX**
		40	0,010	**P14-4LRPX**
		50	0,021	**P14-4MRPX**
		63	0,021	**P14-4MRPX**
		80	0,040	**P14-4PRPX**
		100	0,040	**P14-4PRPX**
		125	0,100	**P14-4RRPX**

According to DIN 439 B

Cyl. bore mm	A mm	B mm	C
32	17	5,0	M10x1,25
40	19	6,0	M12x1,25
50	24	8,0	M16x1,5
63	24	8,0	M16x1,5
80	30	10,0	M20x1,5
100	30	10,0	M20x1,5
125	41	13,5	M27x2

* Supplied as pack of 10 off
** Weight per item



Type	Description	Cyl. bore Ø mm	Weight kg	Order code
Stainless steel screw set for MP2, MP4, MS1 and AB6	Set of stainless steel screws for fitting clevis brackets MP2, MP4 and GA onto the cylinder. The screws have an internal hexagonal head and are used in special environments, e.g. the food industry, or where there are extra demands for protection against corrosion. Material: According to DIN 912, Stainless steel, A2 4 pcs per pack.	32 40 50 63 80 100 125	0,02 0,02 0,05 0,05 0,09 0,09 0,15	**9301054321** **9301054321** **9301054322** **9301054322** **9301054323** **9301054323** **9301054324**
Stainless steel screw set for MF1/MF2	Set of stainless steel screws for fitting flanges MF1/MF2 onto the cylinder. The screws have an internal hexagonal head and are used in special environments, e.g. the food industry, or where there are extra demands for protection against corrosion. Material: According to DIN 6912, Stainless steel, A2 4 pcs per pack	32 40 50 63 80 100 125	0,02 0,02 0,04 0,04 0,07 0,07 0,12	**9301054331** **9301054331** **9301054332** **9301054332** **9301054333** **9301054333** **9301054334**
Sealing plugs for end covers screws 	Set of 4 threaded plugs to be fitted in unused end cover screws. A rubber gasket is supplied with every plug. The seal off function is equal to IP67. The plugs can be used for all P1D cylinders to avoid collecting dirt and fluids in the end cover screw recesses. Material: Plug Polyamid PA Gasket Nitrile rubber 4 pcs per pack	32 40 50 63 80 100 125	0,01 0,01 0,02 0,02 0,02 0,02 0,03	**460104801** **460104801** **460104802** **460104802** **460104803** **460104803** **460104804**

Stainless steel pin AA6 set for AB6 mounting

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**
80	0.17	**9301054315**
100	0.31	**9301054316**
125	0.54	**9301054317**

Stainless steel pin AA4 set for MP2 mounting

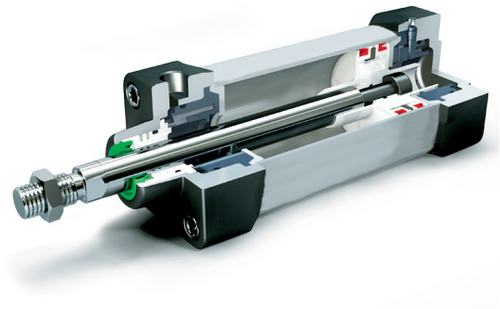
Materials
Pin: stainless steel
Locking pin: stainless steel
Circlips according to DIN 471: stainless steel

Cyl. Bore Ø mm	Weight kg	**Order code**
32	0.07	**on request**
40	0.08	**on request**
50	0.09	**on request**
63	0.09	**on request**
80	0.19	**on request**
100	0.33	**on request**
125	0.56	**on request**

P1D Seal kits

Complete seal kits consisting of:
Piston seals
Cushioning seals
Piston rod bearing
Combined piston rod seal and scraper ring
O-rings

Material specification, see page 8



Order codes

Cyl.bore	P1D-C Ultra Clean
	Standard temperature
32	**P1D-6KRN**
40	**P1D-6LRN**
50	**P1D-6MRN**
63	**P1D-6NRN**
80	**P1D-6PRN**
100	**P1D-6QRN**
125	**P1D-6RRN**

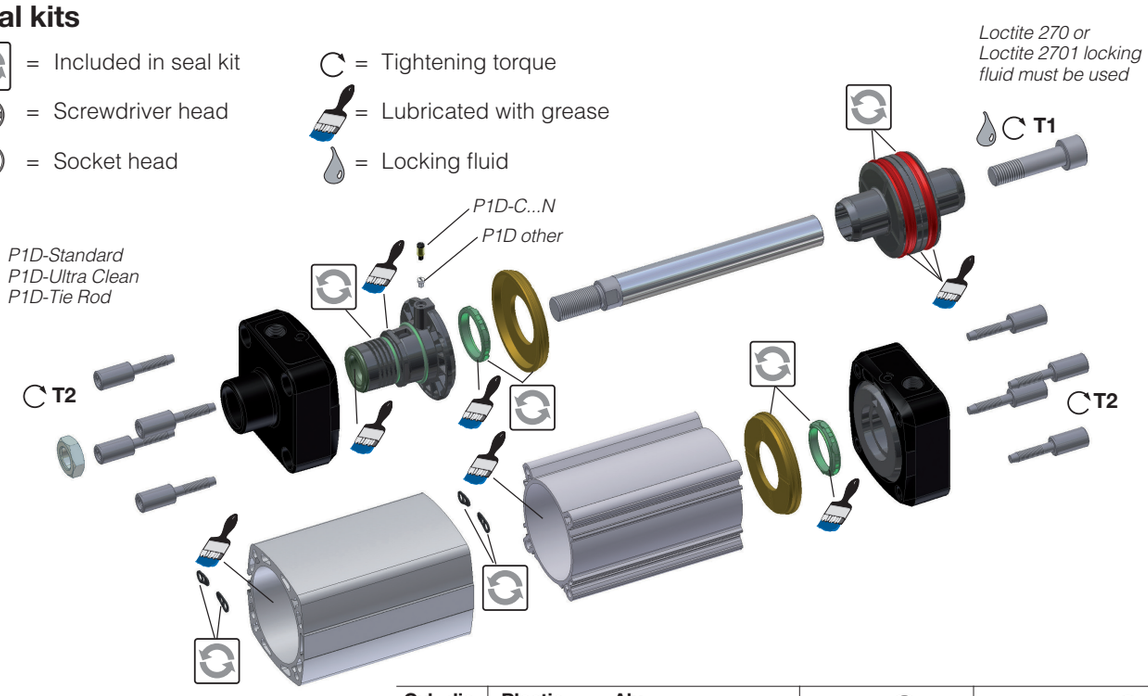
Cyl.bore	Optional through piston rod
	Standard temperature
32	**P1D-6KRNF**
40	**P1D-6LRNF**
50	**P1D-6MRNF**
63	**P1D-6NRNF**
80	**P1D-6PRNF**
100	**P1D-6QRNF**
125	**P1D-6RRNF**

Grease for P1D

Standard	30g	**9127394541**

Seal kits

= Included in seal kit
= Screwdriver head
= Socket head
= Tightening torque
= Lubricated with grease
= Locking fluid



Cyl.-dia mm	Plastic piston T1 Nm	Alu. piston T1 Nm	NV mm	T2 Nm	NV mm	T3 Nm	NV mm	NV mm
32	4,5	15	6	8	6	6	6	
40	11	30	8	8	6	6	6	
50	20	40	10	20	8	11	8	
63	20	40	10	20	8	11	8	
80	40	120	14	20	6	20		3x16
100	120	120	14	20	6	20		3x16
125	120	120	14	70	8	40		4x18

Order code key, spare parts

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P	1	D	–	8	0	3	2	D	G	–	0	1	0	0

8	Spare parts

Cylinder dia. mm
032
040
050
063
080
100
125

Piston rod*	
D	Standard external thread
G	Standard internal thread
H	Through rod ext. threads
J	Through rod int. threads
Cylinder barrel	
N	Smooth profile (without T slots)

Piston rod	
G	Stainless steel
H	Hard-chromium plated
J	Acid-resistant steel
K	Chromium plated stainless
Cylinder barrel	
A	Aluminium

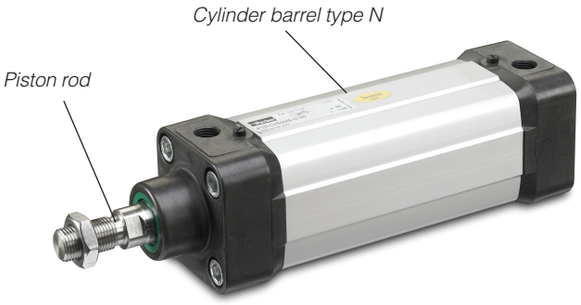
* 2 piston rod pieces delivered in one set if through rod option selected

Stroke (mm) e.g.**
0100 = 100 mm

Any stroke up to max. 2800 mm.

** When ordering piston rods for cylinders with an extended piston rod, add together the stroke and the extension in the order key.
For example, a cylinder with stroke 100 mm and a piston rod extension of 25 mm is ordered with 0125 in the order number.

P1D without T slots



15-digit order code — 20-digit order code *

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
P	1	D	-	C	0	4	0	M	S	N	0	3	2	0	N	D	N	N	N

5

Cylinder version	
C	Ultra Clean smooth profile [2]

6-7-8

Cylinder bore mm
032
040
050
063
080
100
125

6 Rod extension only

Cylinder bore mm	
K	32
L	40
M	50
N	63
P	80
Q	100
R	125

7-8

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	Longer on request	

9

End cover screws						Function
Standard			Stainless steel			
Std scraper	HDPE scraper [1]	FPM sscraper	Std scraper	HDPE scraper	FPM sscraper	
M	D	V	A	H	W	Double-acting
F	E	B	G	Y	Z	Double-acting through rod

10

Piston rod material				Seals
Stainless steel	Chromium-plated steel	Acid-proof steel	Chrom.-pl. stainless steel	
S	C	M	R	Standard -20 °C to +70 °C.

11

Integrated Sensor System	
N	Without sensor [2]

12-13-14-15

Stroke (mm) e.g. 0100 = 100 mm
Optional stroke lengths up to 2800 mm. Standard strokes see table page 7

17-18-19-20

Centre trunnion mountings		
90°	0°	See page 20 for orientation details
D	-	Centre trunnion MT4, mid position NNN digits 18-19-20
G	-	Trunnion MT4, optional pos. (XV-meas. digits 18-19-20)

19

Piston rod thread [1]	
6	Internal piston rod thread

*** Note:** Model code with 20 digits used only for the trunnion option or for a female thread on the piston rod.

1) Piston rod thread according to the ISO-standard. Other threads on request.
2) P1D Ultra Clean without sensor function.
3) XV-measure (from the piston rod thread according to ISO to the centre of the pivots) stated in mm in positions 18-20.

Max 700 mm stroke length for P1D-C with centre trunnion.

P1D cylinders are always delivered with one piston rod nut in stainless steel.

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 PDE2642TCUK - V4 - June 2014

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