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Grippers P5G Series

Sizes 10, 12, 16, 20, 25 and 32mm




ENGINEERING YOUR SUCCESS.

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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

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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General technical data



Series	P5GA					P5GB					P5GD				P5GL			
	12	16	20	25	32	12	16	20	25	32	10	16	20	25	10	16	20	25
Size	12	16	20	25	32	12	16	20	25	32	10	16	20	25	10	16	20	25
Total stroke (mm)	-					6	9	12	14	16	4	6	10	14	-			
Total operating angle (°)	-10° to +30°					-					-				-3° to +180°			
Total Force* (N) - Closed side	13	30	57	113	203	10	26	70	120	170	22	68	94	130	11	36	73	152
Total Force* (N) - Open side	17	40	77	147	270	16	48	94	140	200	34	90	132	208	-			
Total Torque* (Nm) - Closed side	0.40	0.90	1.70	3.40	6.10	-					-				0.32	1.08	2.20	4.56
Total Torque* (Nm) - Open side	0.50	1.20	2.30	4.40	8.10	-					-				-			
Ø Piston bore (mm)	12	16	20	25	32	12	16	20	25	32	10	16	20	25	10	16	20	25
Ø Air port size (mm)	M3	M5				M3	M5				M3	M5			M5			
Air consumption (cm ³ cycle) **	0.7	3	6	11	18	0.7	3	7	14	21	0.5	2	6	14	2	7	14	28
Repeatability (mm)	-					± 0.04					± 0.01				-			
Repeatability (°)	± 0.04					-					-				± 0.2			
Max. work frequency (Hz)	3					3					3				1			
Min. closing time (s)	0.01	0.01	0.02	0.02	0.03	0.015	0.02	0.05	0.07	0.09	0.015	0.02	0.05	0.07	0.1	0.1	0.15	0.15
Weight (g)	53	103	193	327	525	66	144	255	479	719	55	125	250	450	80	150	320	600
Max. jaw length (mm)	30	40	60	70	85	30	40	60	70	85	50	55	80	100	60	70	80	90
Max. temperature (°C)	-5° to +60°					-5° to +60°					-10° to +60°				-10° to +60°			
Air pressure (bar)	1.5 to 7					1.5 to 7					2 to 7	1.5 to 7			1 to 6			
Operation	Dry air, lubricated or unlubricated					Dry air, lubricated or unlubricated					Dry air, lubricated or unlubricated				Dry air, lubricated or unlubricated			

* At 5 bar at closing, force depends on position of the holding point, values are for 30mm, 20mm for P5GD

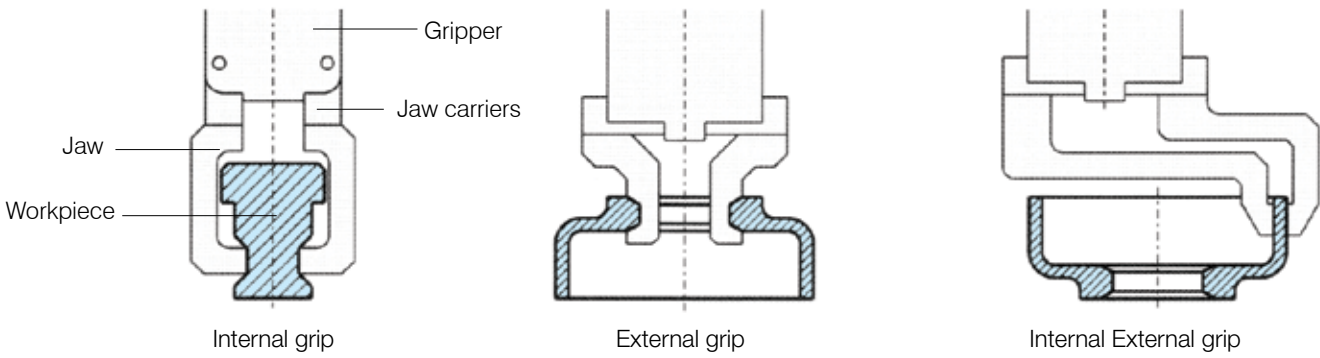
** Cycle = opening + closing (without jaws)

Operating and environmental data

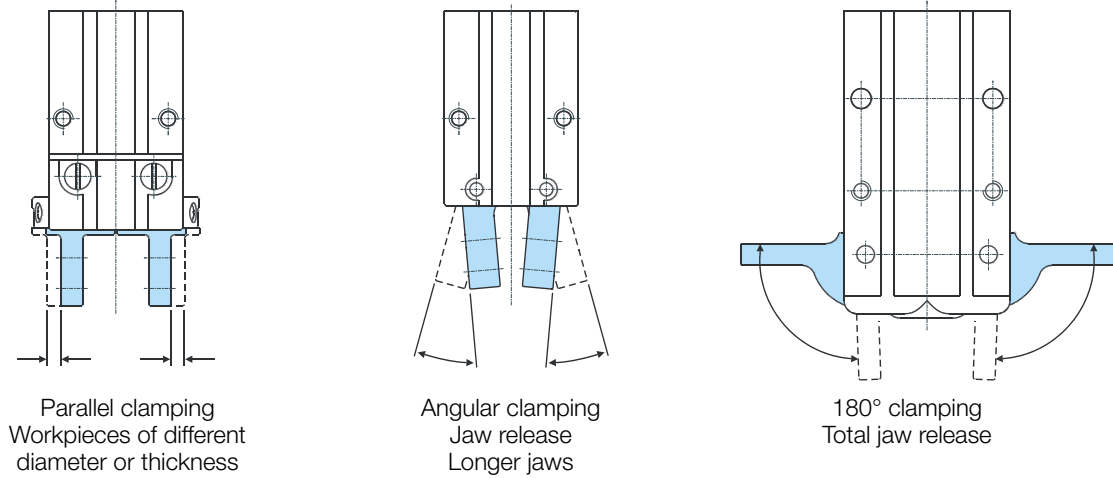
Operating medium	For best possible service life and trouble-free operation dry, filtered compressed air to ISO 8573-1:2010 quality class 3.4.3 should be used. This specifies a dew point of +3C for indoor operation (a lower dew point should be selected for outdoor operation) and is in line with the air quality from most standard compressors with a standard filter.
Operating pressure	See above
Ambient temperature	See above
Pre-lubricated	Further lubrication is normally not necessary. If additional lubrication is introduced it must be continued.
Corrosion resistance	Resistance to corrosion and chemicals.

Choice of gripper

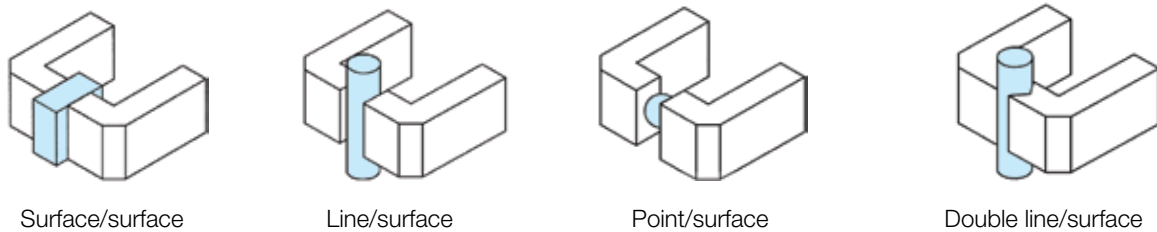
Types of grip



Types of clamping



Contact between workpiece/jaw



Main points to note in selecting grippers :

- The weight of the workpiece to be moved
- Geometry and volume of the workpiece
- The type of gripper (parallel or angular)
- Dynamic movement of gripper and workpiece combination
- Environment (shocks, additional external forces...)
- Coefficient of friction between workpiece and jaws (see chart below)

Workpiece material	Jaw material	Coefficient of friction μ
Steel	Steel	0,25
Steel	Aluminium	0,35
Steel	Plastic	0,50
Aluminium	Aluminium	0,49
Aluminium	Plastic	0,70
Plastic	Plastic	1

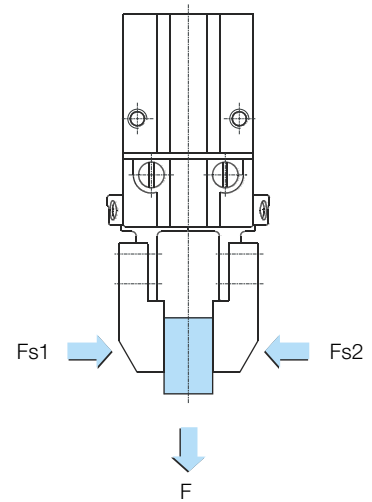
Formula calculation for clamping force

For internal or external clamping

Fs1 = Fs2

$$F_s = F_{s1} + F_{s2} = \frac{F}{\mu} \times S_o$$

- Fs : Clamping force (N)
- F : Force acting on jaws (N)
(When static F corresponds to the weight of the workpiece in N)
- μ : Coefficient of friction between the workpiece and jaws (μ < 1)
- So : Safety factor (between 2 and 4, refer to chart below)



Safety factor So	Type of use
2	Normal use
3	Movement in several directions (slow acceleration or decelerations)
4	Shocks, fast accelerations or decelerations

P5GA - Angular double acting, square jaw carriers

The P5GA is a compact angular gripper with a closed angle of -10° and an open angle of $+30^\circ$. With double acting mechanism the gripper is suitable for internal or external gripping applications.

For flexible installation mounting is available on three sides and the anodised body has recessed sensor grooves.



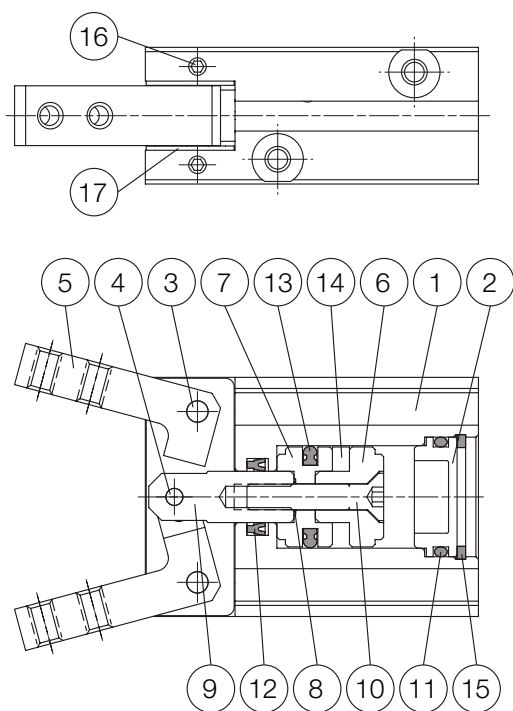
- Bore sizes \varnothing 12, 16, 20, 25 and 32mm
- Double acting
- Anodised corrosion protection
- Magnetic piston as standard
- Optional sensors

General technical data

Size	12	16	20	25	32
Total operating angle (°)	-10° to +30°				
Total Force* (N) - Closed side	13	30	57	113	203
Total Force* (N) - Open side	17	40	77	147	270
Total Torque* (Nm) - Closed side	0.40	0.90	1.70	3.40	6.10
Total Torque* (Nm) - Open side	0.50	1.20	2.30	4.40	8.10
\varnothing Piston bore (mm)	12	16	20	25	32
\varnothing Air port size (mm)	M3	M5			
Air consumption (cm ³ cycle) **	0.7	3	6	11	18
Repeatability (°)	± 0.04				
Max. work frequency (Hz)	3				
Min. closing time (s)	0.01	0.01	0.02	0.02	0.03
Weight (g)	53	103	193	327	525
Max. jaw length (mm)	30	40	60	70	85
Max. temperature (°C)	-5° to +60°				
Air pressure (bar)	1.5 to 7				
Operation	Dry air, lubricated or unlubricated				

* At 5 bar, L=30mm.

** Cycle = opening + closing (without jaws)



Pos	Part	Specification
1	Body	Aluminium alloy
2	Sealing cap	Aluminium alloy
3	Jaw spindle	Medium carbon steel
4	Retaining pin	Bearing steel
5	Jaw carrier	Medium carbon steel
6	Lower piston half	Aluminium alloy
7	Upper piston half	Aluminium alloy
8	Gasket	NBR
9	Piston rod	Stainless steel

Pos	Part	Specification
10	Piston retaining screw	Stainless steel
11	O ring	NBR
12	U cup	NBR
13	Piston seal	NBR
14	Magnet	Magnetic material
15	Circlip	Spring steel
16	Set screw	SCM
17	Guide plate	Stainless steel
	Note on materials	RoHS Compliant

How to select the correct model (or required clamp force) according to the weight of workpiece.

The friction coefficient of the workpiece will be influenced by the shape and shifting condition but in connection with the weight of workpiece, the safety factor of clamping force is as shown below. Please select your model according to the result of below calculation.

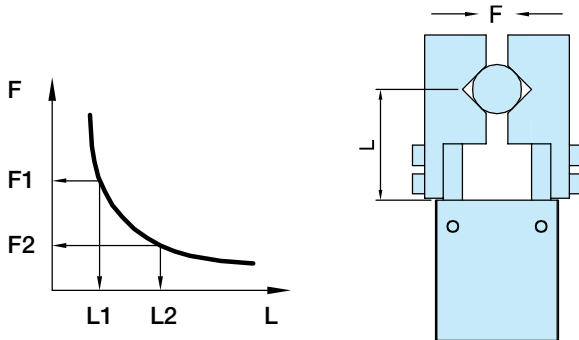
- Clamp force only W: (FxN) = 1:5
- Shifting under normal condition W: (FxN) = 1:10
- Shifting under acceleration W: (FxN) = 1:20

W = Weight of workpiece
 F : Clamp force per jaw
 (Please refer to clamp force performance chart)
 N : Number of finger blanks

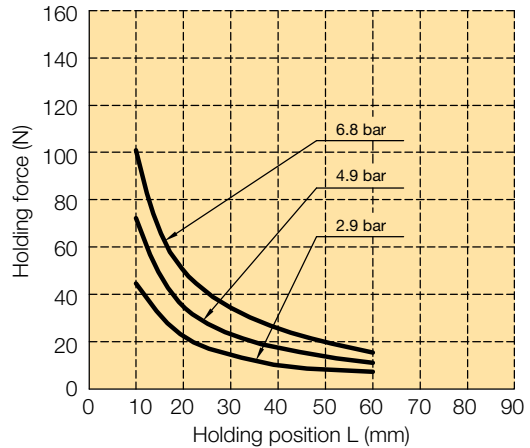
To obtain gripping power from performance data, if the distance to the workpiece's center of gravity is L when manufacturing the small jaw, gripping power F is expressed as follows

When L = L1, then F = F1

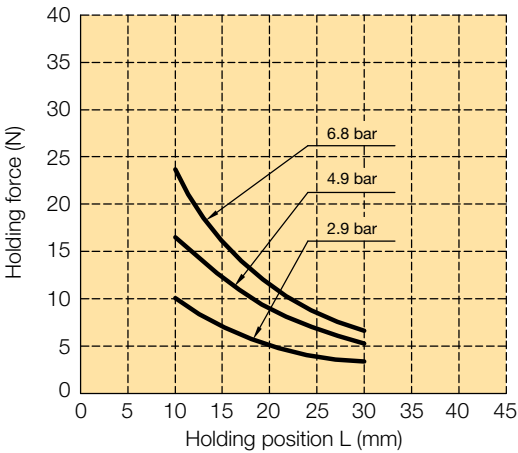
When L = L2, then F = F2



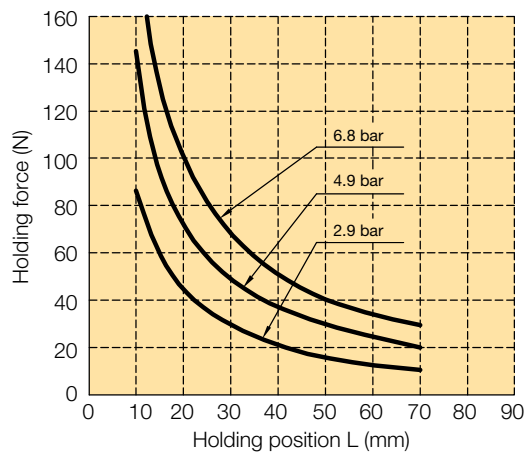
P5GA-020MSG030B



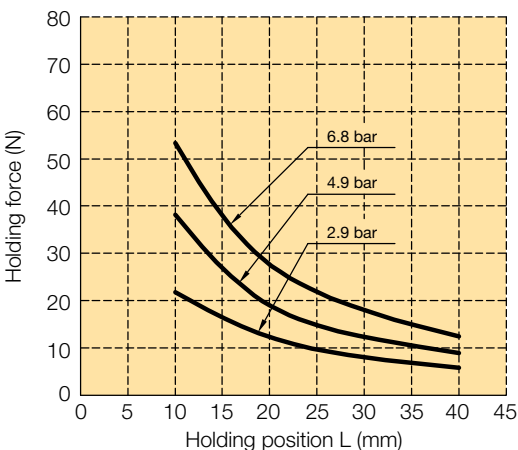
P5GA-012MSG030B



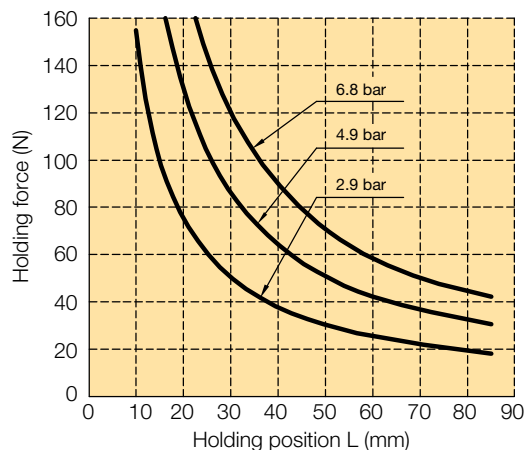
P5GA-025MSG030B



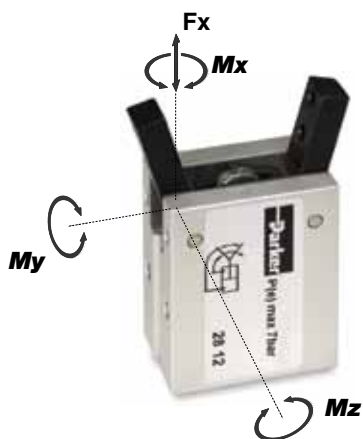
P5GA-016MSG030B



P5GA-032MSG030B



P5GA - Permissible force and torques on each jaw carrier



Static

Size	12	16	20	25	32
F_x	40N	60N	100N	100N	100N
M_x	0,5Nm	0,9 Nm	2,2 Nm	2,2 Nm	2,2 Nm
M_y	0,5Nm	0,9 Nm	2,2 Nm	2,2 Nm	2,2 Nm
M_z	0,20Nm	0,45 Nm	0,85 Nm	1,70 Nm	2,05 Nm

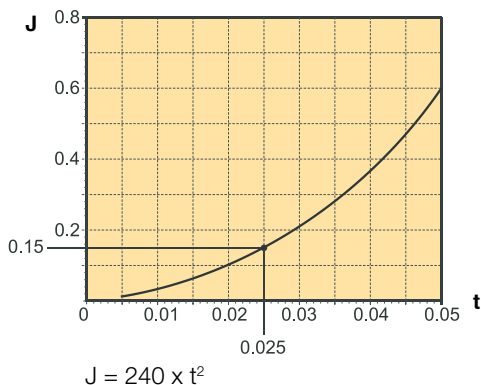
M_z at 5 bar.

Recommendation is to use a flow control to limit the speed for opening to reduce impact at the end of the stroke.

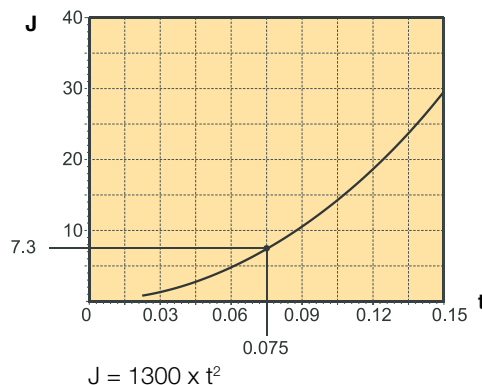
Dynamic

Inertia of one of the 2 jaws (kgcm²) closing or opening time (t) in seconds :

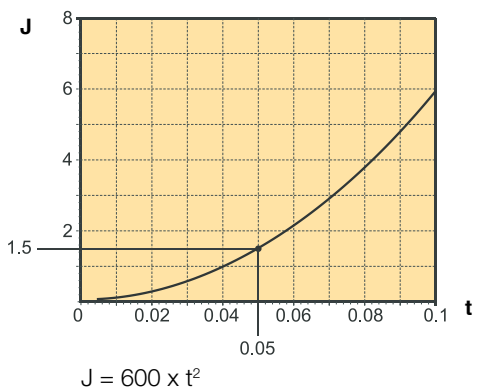
Size 12



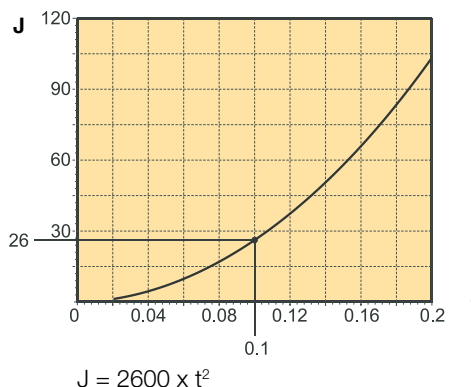
Size 20



Size 16



Size 25 & 32



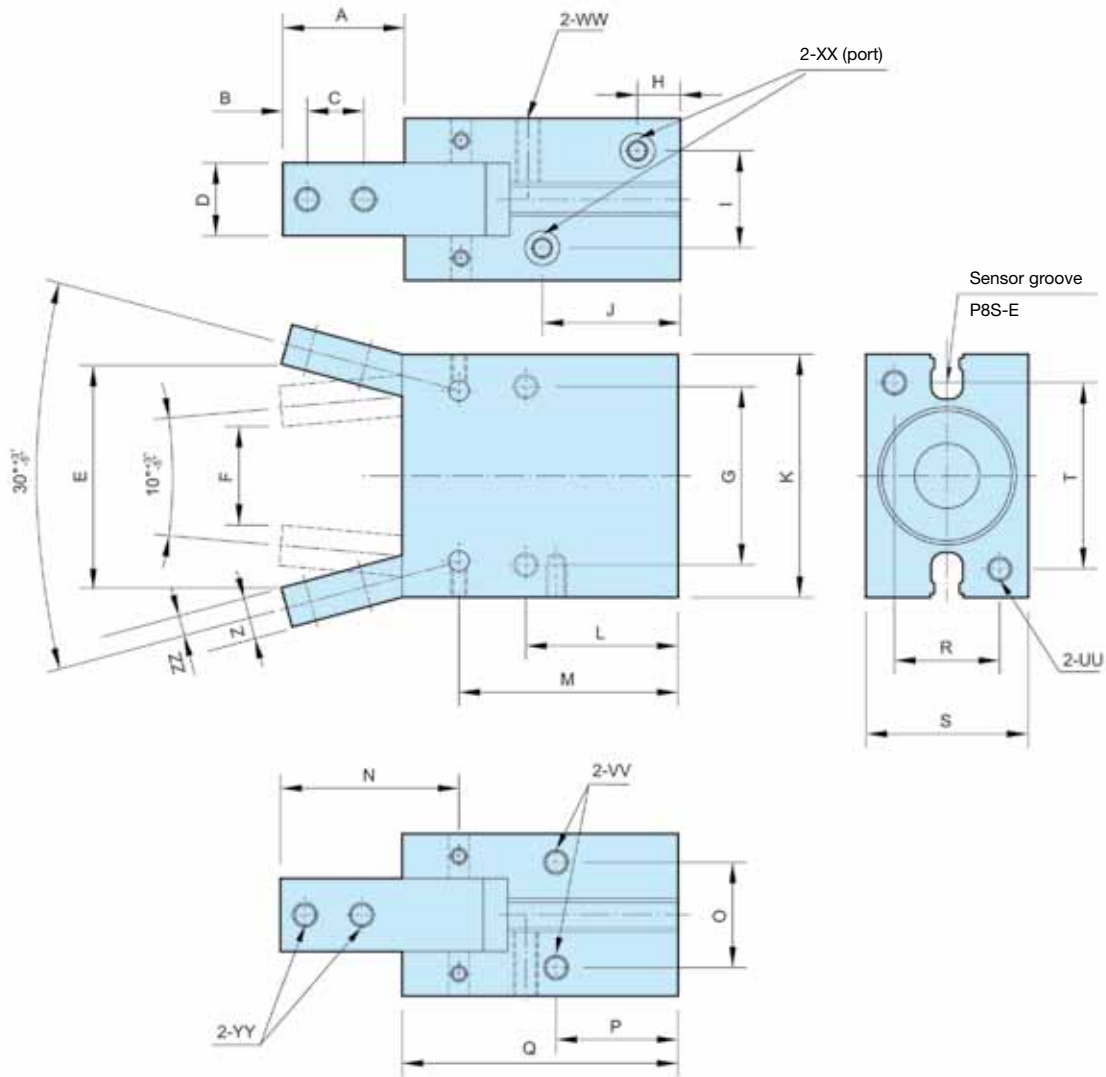
For a 0,15 kgcm² inertia one of the 2 jaws, the closing or opening time of the gripper is 0,025s for a **size 12**.

These indications must not be exceeded if :

- any extra forces are exerted on the workpiece or on the jaws, in addition to the force or the clamping torque.
- handling forces (acceleration, shocks, ...) must also be added.

These values are cumulative if the forces act in different directions at the same time.

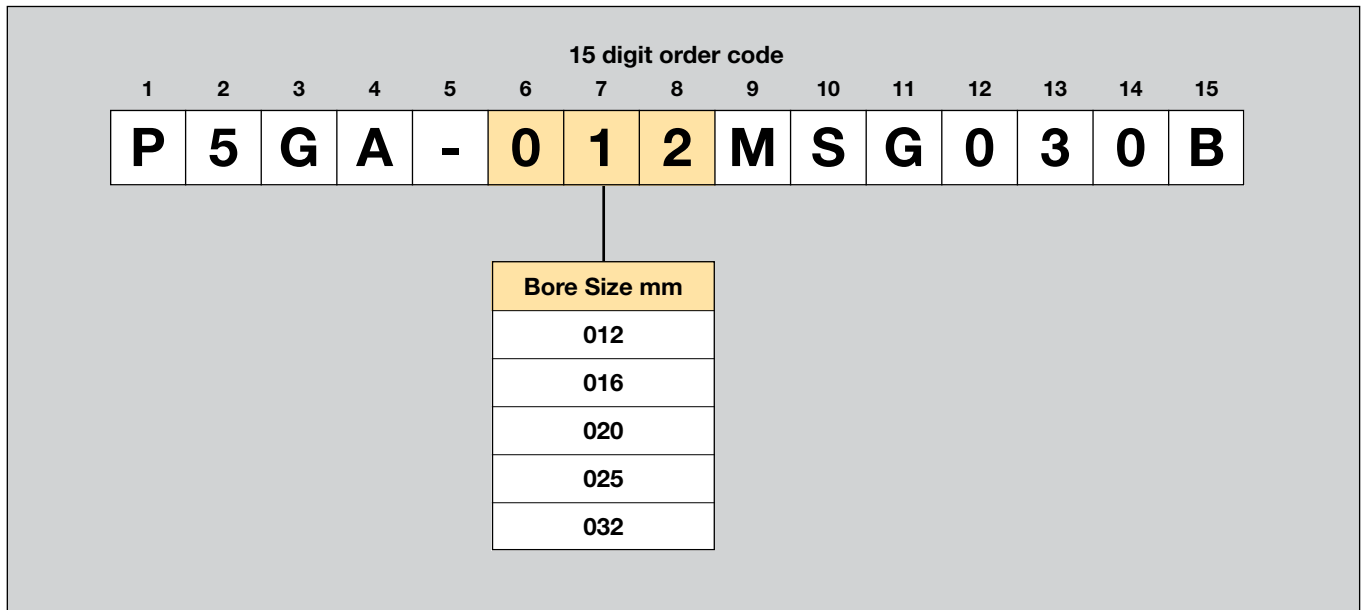
Dimensions (mm)



Bore mm	A	B	C	D 0/-0.03	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
12	15,4	3	6	7	26,3	9	20	7,5	10,2	23,5	28	20	32,9	21,5	10,2	16	39	10	16	22
16	17,5	3	8	9	31,1	14	24	7,5	12	22	34	22,5	35	25	14	18	42,5	14	22	26
20	22	4	10	12	40,1	18	30	8	13	25	45	25	39,5	32,5	16	19	50	16	26	35
25	26	5	12	14	47,9	21	36	8,5	18	28	52	28,5	45,5	38,5	20	21,5	58	20	32	40
32	30	6	14	18	55,1	24	44	10,5	24	34	60	37,5	54	44	26	30	68	26	40	46

Bore mm	UU	VV	WW	XX	YY	Z	ZZ
12	M3 x 5 depth	M3 x 5 depth	M3 x 5 depth	M3 x 5 depth	M3	5	2,5
16	M4 x 7 depth	M4 x 7 depth	M4 x 7 depth	M5 x 5 depth	M3	6	3
20	M5 x 8 depth	M5 x 8 depth	M5 x 8 depth	M5 x 5 depth	M4	7	3,5
25	M6 x 10 depth	M6 x 10 depth	M6 x 10 depth	M5 x 5 depth	M5	9	4
32	M6 x 10 depth	M6 x 10 depth	M6 x 10 depth	M5 x 5 depth	M6	10	5

Order Key Code



Note : All grippers are supplied magnetic for optional sensing

P5GA - Angular Grippers

Bore mm	Order code
12	P5GA-012MSG030B
16	P5GA-016MSG030B
20	P5GA-020MSG030B
25	P5GA-025MSG030B
32	P5GA-032MSG030B

P8S Sensors Series

The P8S family of sensors provides a broad range of reed and solid state sensor types with flying lead or M8 options available. Mounting on all grippers is within the integrated sensor grooves allowing for compact installation.

Electronic sensors

The electronic sensors utilise "Solid State" technology, providing operation with no moving parts. These switches are available in NPN and PNP type, both provide built in short circuit and transient protection as standard. The solid state operation allows for high switching on off frequency, ideal for applications where long service life is required.

Technical data

Design	GMR (Giant Magnetic Resistance) magneto-resistive function
Installation	Mounts within cylinder switch groove
Outputs	PNP or NPN, normally open
Voltage range	5-30 V DC
Voltage drop	1.5 V max
Switching current	50 mA max
Switch rating	1.5 W max
Leakage current	0.01 mA max
Internal consumption	10 mA max (NPN) 12 mA max (PNP)
On/off switching frequency	1000 Hz max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red (NPN) LED Green (PNP)
Cable	Polyurethane

Reed sensors

Reed type sensors are based on proven reed switch technology and provide reliable function in many applications. Simple installation and the available AC voltage range are advantages for this range of sensors.

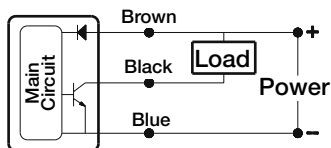
Technical data

Design	Reed element
Installation	Mounts within cylinder switch groove
Outputs	Normally open
Voltage range	5-120 V DC/AC
Voltage drop	2.5 V max
Switching current	100 mA max
Switch rating	10 W max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red
Cable	Polyurethane

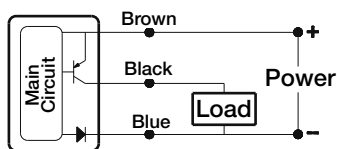
Electronic sensors

Schematic

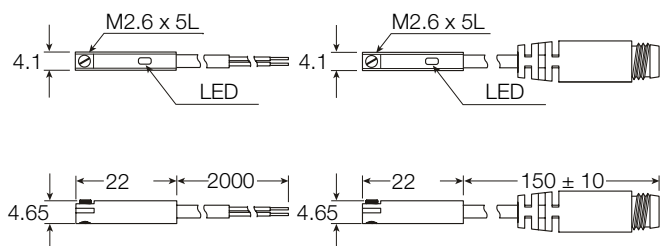
NPN type



PNP type



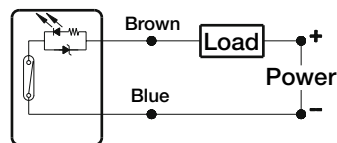
Dimensions



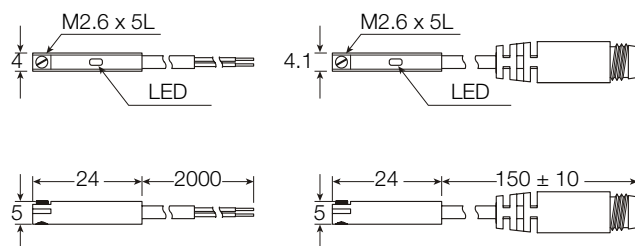
Reed sensors

Schematic

Reed type

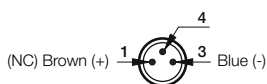


Dimensions

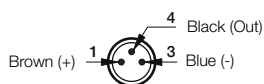


M8 Quick Connector

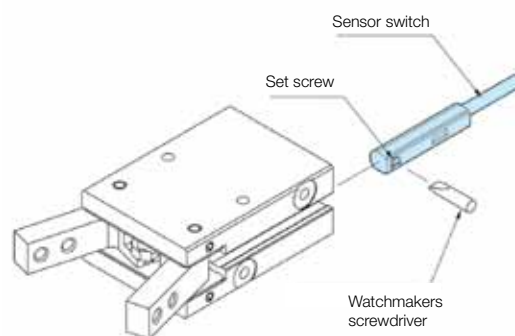
2 wire QC wiring



3 wire QC wiring



Installation of Sensor



Electronic and Reed Sensors

Size	Description	Order code
Flush Mount Style		
PNP Type, normally open	0.165 m cable and M8 screw male connector	P8S-EPSUS
PNP Type, normally open	2 m PUR cable without connector	P8S-EPFXS
NPN Type, normally open	0.165 m cable and M8 screw male connector	P8S-ENSUS
NPN Type, normally open	2 m PUR cable without connector	P8S-ENFXS
Reed Type, normally open	0.15 m cable and M8 screw male connector	P8S-ERSUS
Reed Type, normally open	2 m PUR cable without connector	P8S-ERFXS

P5GB - Parallel double acting, square jaw carriers

Available with a comprehensive range of bore sizes Ø12 - 32 mm the P5GB double acting parallel gripper is an accurate workpiece holding device. The anodised aluminium body has flexible installation mountings on three sides and recessed sensor grooves.

- Bore sizes Ø12, 16, 20, 25 and 32mm
- Double acting
- Anodised corrosion protection
- Magnetic piston as standard
- Optional sensors

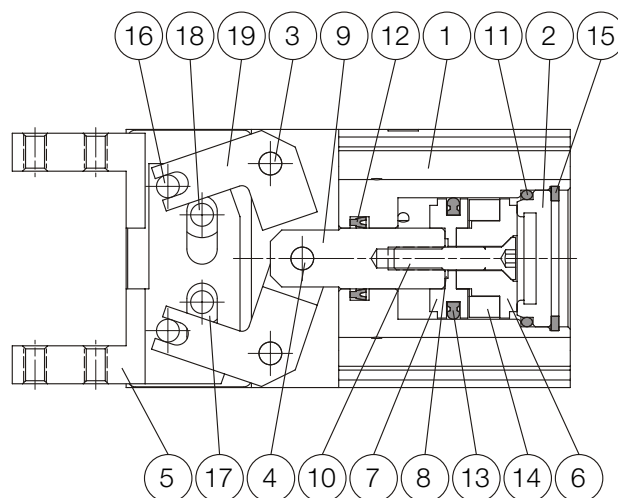


General technical data

Size	12	16	20	25	32
Total stroke (mm)	6	8	12	14	16
Total Force* (N) - Closed side	10	26	70	120	170
Total Force* (N) - Open side	16	48	94	140	200
Ø Piston bore (mm)	12	16	20	25	32
Ø Air port size (mm)	M3	M5			
Air consumption (cm ³ cycle) **	0.7	3	7	14	21
Repeatability (mm)	± 0.04				
Max. work frequency (Hz)	3				
Min. closing time (s)	0.015	0.02	0.05	0.07	0.09
Weight (g)	66	144	255	419	719
Max. jaw length (mm)	30	40	60	70	85
Max. temperature (°C)	-5° to +60°				
Air pressure (bar)	1.5 to 7				
Operation	Dry air, lubricated or unlubricated				

* At 5 bar, L=30mm.

** Cycle = opening + closing (without jaws)



Pos	Part	Specification
1	Body	Aluminium alloy
2	Sealing cap	Aluminium alloy
3	Lever spindle	Medium carbon steel
4	Retaining pin	Bearing steel
5	Jaw carrier	Medium carbon steel
6	Lower piston half	Aluminium alloy
7	Upper piston half	Aluminium alloy
8	Gasket	NBR
9	Piston rod	Stainless steel
10	Piston retaining screw	Stainless steel
11	O ring	NBR
12	U cup	NBR

Pos	Part	Specification
13	Piston seal	NBR
14	Magnet	Magnetic material
15	Circlip	Spring steel
16	Lever pin	Bearing steel
17	Guide plate	Stainless steel
18	Jaw spindle	Medium carbon steel
19	Lever	Medium carbon steel
20	Set screw	SCM (Not shown)
21	Set screw	SCM (Not shown)
22	Washer for gripper	Stainless steel (Not shown)
	Note on materials	RoHS Compliant

How to select the correct model (or required clamp force) according to the weight of workpiece.

The friction coefficient of the workpiece will be influenced by the shape and shifting condition but in connection with the weight of workpiece, the safety factor of clamping force is as shown below. Please select your model according to the result of below calculation.

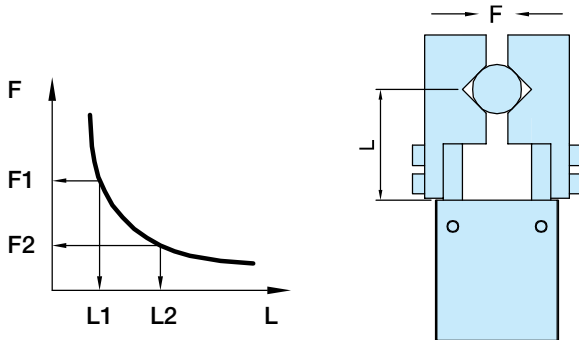
- Clamp force only W: (FxN) = 1:5
- Shifting under normal condition W: (FxN) = 1:10
- Shifting under acceleration W: (FxN) = 1:20

W = Weight of workpiece
 F : Clamp force per jaw
 (Please refer to clamp force performance chart)
 N : Number of finger blanks

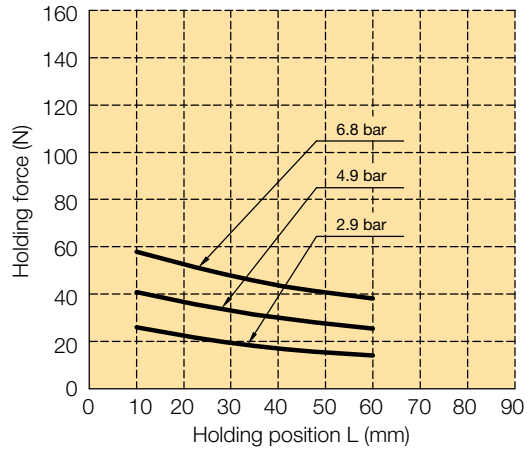
To obtain gripping power from performance data, if the distance to the workpiece's center of gravity is L when manufacturing the small jaw, gripping power F is expressed as follows

When L = L1, then F = F1

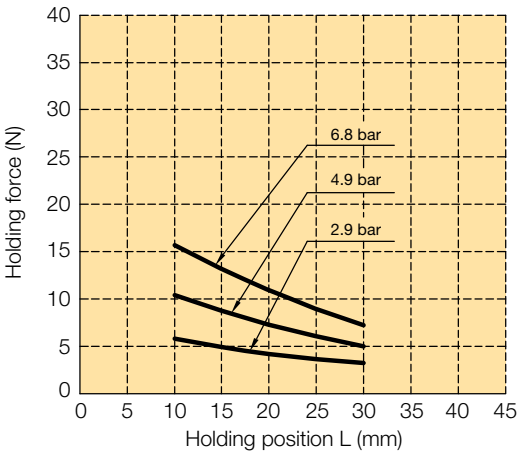
When L = L2, then F = F2



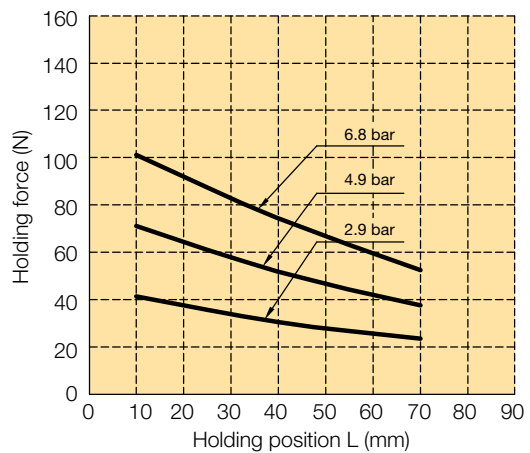
P5GB-020MSG012B



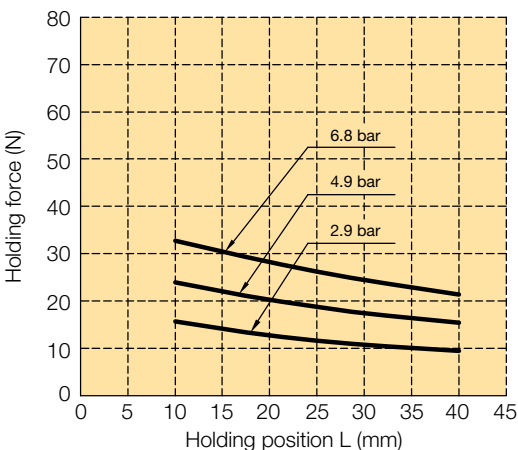
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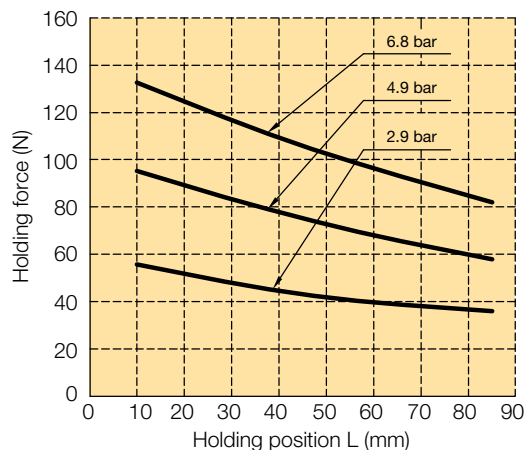
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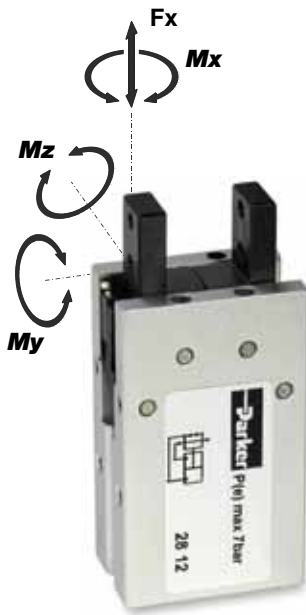
P5GB-016MSG008B



P5GB-032MSG016B



P5GB - Permissible force and torques on jaw carriers



Static

Size	12	16	20	25 & 32
Fx	30N	50N	75N	125N
Mx	0,26Nm	0,67 Nm	1,32 Nm	1,94 Nm
My	0,26Nm	0,67 Nm	1,32 Nm	1,94 Nm
Mz	0,26Nm	0,67 Nm	1,32 Nm	1,94 Nm

Mass of one of the 2 jaws (g) / closing and opening time (s) :

Size	12	16	20	25 & 32
m 0,2s	40g	80g	150g	250g
m 0,07s	25g	45g	75g	100g
m 0,05s	20g	35g	50g	-
m 0,02s	15g	25g	-	-
m 0,01s	10g	-	-	-

m is the permissible mass of the jaw for using gripper without flow controllers. If the mass of jaw is higher, use flow controllers to reduce the jaw-carriers speed.

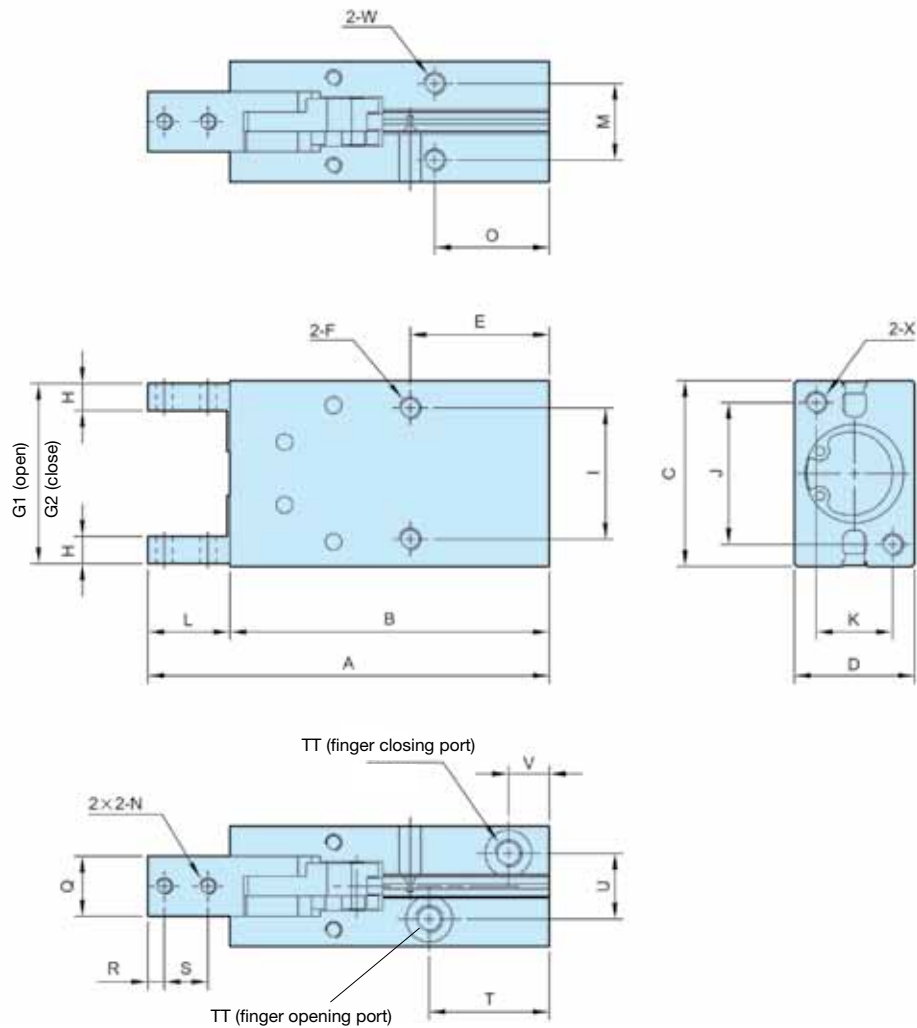
m 0,2s gives the max. mass of jaw to fix on one of the jaw-carriers for a 0,2 s closing time.

These indications must not be exceeded if :

- any extra forces are exerted on the workpiece or the jaws, in addition to the force of the clamping torque.
- handling forces (acceleration, shocks..) must also be added.

These values are cumulative if the forces act in different directions at the same time.

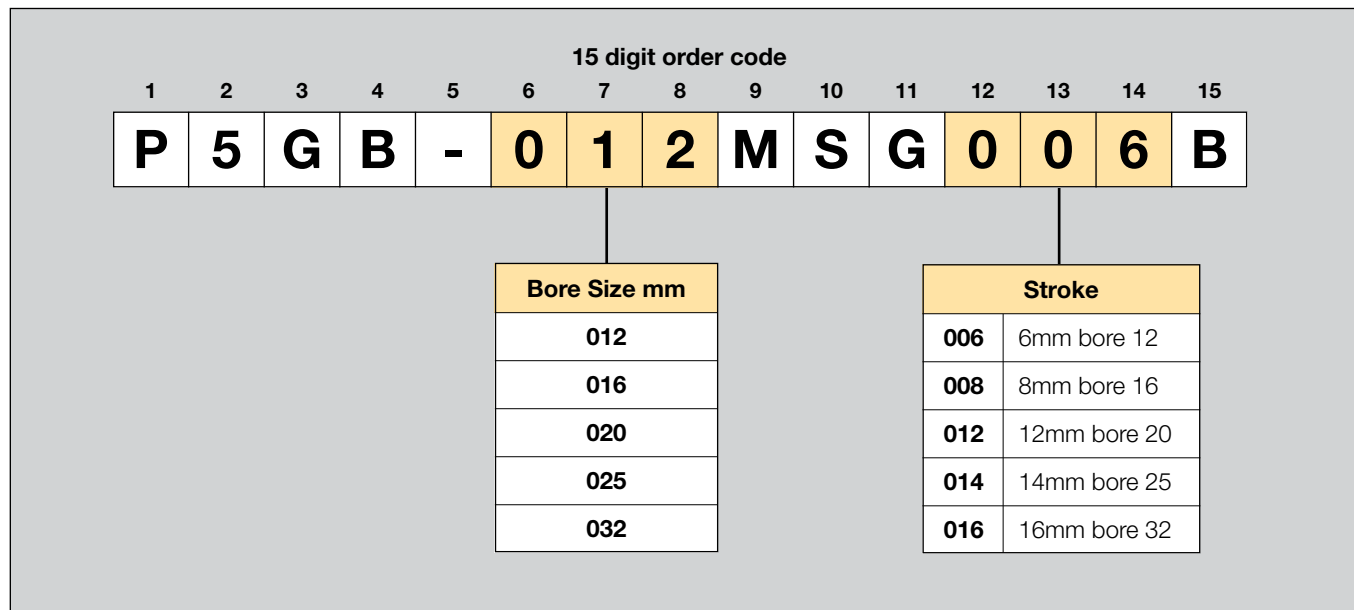
Dimensions (mm)



Bore mm	A	B	C	D	E	F	G1	G2	H	I	J	K	L	M	N	O	Q0/-0.03	R
12	63,5	50,5	28	16	20	M3 x 0.5 x 5 depth	27	21	4	18	17	10	13	10	M3 x 0.5	16	7	3
16	73,5	58,5	34	22	25,5	M4 x 0.7 x 11 depth	33	25	5	24	26	14	15	14	M3 x 0.5	21	11	3
20	88,5	69,5	45	26	25	M5 x 0.8 x 8 depth	44	32	6	30	35	16	19	16	M4 x 0.7	19	12	4
25	102,5	78,5	52	32	28	M6 x 1.0 x 10 depth	51	37	8	36	40	20	24	20	M5 x 0.8	22	14	5
32	120,5	90,5	60	40	34	M6 x 1.0 x 10 depth	59	43	10	44	46	24	30	26	M6 x 1.0	26	20	7

Bore mm	S	T	TT	U	V	W	X
12	6	23	M5 x 0,8 x 5 depth	10,2	7,5	M3 x 0.5 x 5 depth	M3 x 0.5 x 5 depth
16	8	22	M5 x 0,8 x 5 depth	12	7,5	M4 x 0.7 x 7 depth	M4 x 0.7 x 7 depth
20	10	26	M5 x 0,8 x 5 depth	13	8	M5 x 0.8 x 8 depth	M5 x 0.8 x 8 depth
25	12	29	M5 x 0,8 x 5 depth	18	8,5	M6 x 1.0 x 10 depth	M6 x 1.0 x 10 depth
32	15	35	M5 x 0,8 x 5 depth	24	10,5	M6 x 1.0 x 10 depth	M6 x 1.0 x 10 depth

Order Key Code



Note : All grippers are supplied magnetic for optional sensing

P5GB - Parallel Grippers

Bore mm	Order code
12	P5GB-012MSG006B
16	P5GB-016MSG008B
20	P5GB-020MSG012B
25	P5GB-025MSG014B
32	P5GB-032MSG016B

P8S Sensors Series

The P8S family of sensors provides a broad range of reed and solid state sensor types with flying lead or M8 options available. Mounting on all grippers is within the integrated sensor grooves allowing for compact installation.

Electronic sensors

The electronic sensors utilise “Solid State” technology, providing operation with no moving parts. These switches are available in NPN and PNP type, both provide built in short circuit and transient protection as standard. The solid state operation allows for high switching on off frequency, ideal for applications where long service life is required.

Technical data

Design	GMR (Giant Magnetic Resistance) magneto-resistive function
Installation	Mounts within cylinder switch groove
Outputs	PNP or NPN, normally open
Voltage range	5-30 V DC
Voltage drop	1.5 V max
Switching current	50 mA max
Switch rating	1.5 W max
Leakage current	0.01 mA max
Internal consumption	10 mA max (NPN) 12 mA max (PNP)
On/off switching frequency	1000 Hz max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red (NPN) LED Green (PNP)
Cable	Polyurethane

Reed sensors

Reed type sensors are based on proven reed switch technology and provide reliable function in many applications. Simple installation and the available AC voltage range are advantages for this range of sensors.

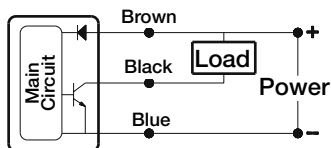
Technical data

Design	Reed element
Installation	Mounts within cylinder switch groove
Outputs	Normally open
Voltage range	5-120 V DC/AC
Voltage drop	2.5 V max
Switching current	100 mA max
Switch rating	10 W max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red
Cable	Polyurethane

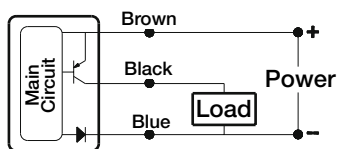
Electronic sensors

Schematic

NPN type



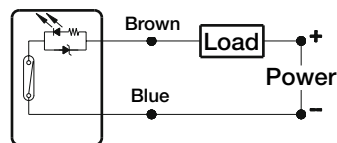
PNP type



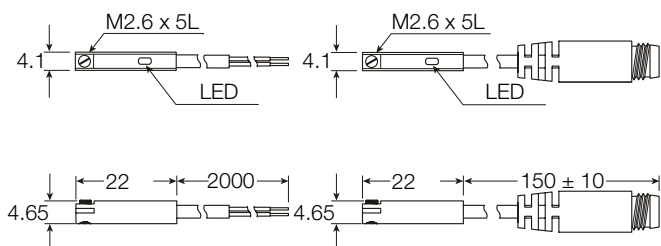
Reed sensors

Schematic

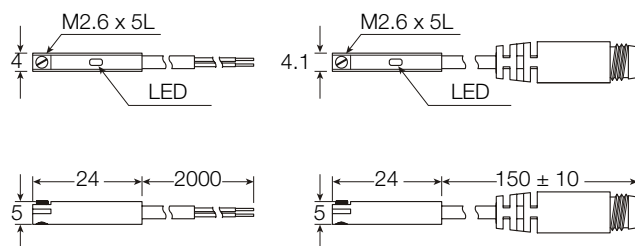
Reed type



Dimensions

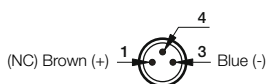


Dimensions

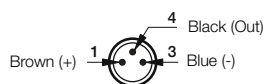


M8 Quick Connector

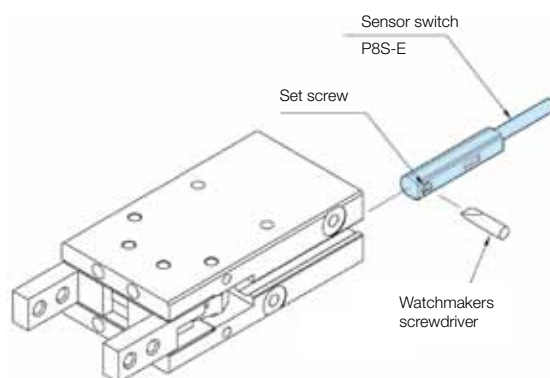
2 wire



3 wire



Installation of Sensor



Electronic and Reed Sensors

Size	Description	Order code
Flush Mount Style		
PNP Type, normally open	0.165 m cable and M8 screw male connector	P8S-EPSUS
PNP Type, normally open	2 m PUR cable without connector	P8S-EPFXS
NPN Type, normally open	0.165 m cable and M8 screw male connector	P8S-ENSUS
NPN Type, normally open	2 m PUR cable without connector	P8S-ENFXS
Reed Type, normally open	0.15 m cable and M8 screw male connector	P8S-ERSUS
Reed Type, normally open	2 m PUR cable without connector	P8S-ERFXS

P5GD - Parallel precision guided double acting, square jaw carriers

The P5GD is a parallel double acting gripper with integral linear guides that provide rigidity and high precision for the stainless steel jaw carriers. The anodised aluminium body has mounting points on four sides and integral sensors grooves.



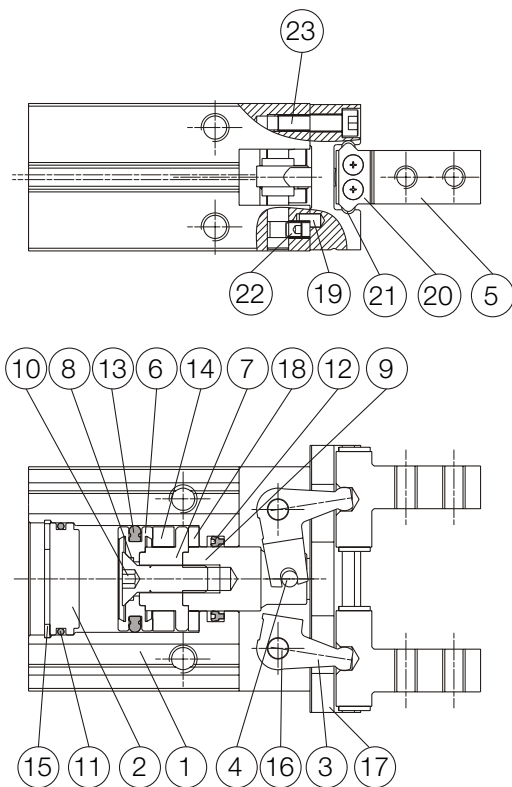
- Bore sizes Ø10, 16, 20 and 25mm
- Double acting
- Stainless steel jaw carriers
- Anodised corrosion protection
- Magnetic piston as standard
- Optional sensors

General technical data

Size	10	16	20	25
Total stroke (mm)	4	6	10	14
Total Force* (N) - Closed side	22	68	94	130
Total Force* (N) - Open side	34	90	132	208
Ø Piston bore (mm)	10	16	20	25
Ø Port size (mm)	M3	M5		
Air consumption (cm ³ cycle) **	0.5	2	6	14
Repeatability (mm)	± 0.01			
Max. work frequency (Hz)	3			
Min. closing time (s)	0.015	0.02	0.05	0.07
Weight (g)	55	125	250	460
Max. jaw length (mm)	50	55	80	100
Max. temperature (°C)	-10° to +60°			
Pressure (bar)	2 to 7	1.5 to 7		
Operation	Dry air, lubricated or unlubricated			

* At 5 bar, L=20mm.

** Cycle = opening + closing (without jaws)



Pos	Part	Specification	Pos	Part	Specification
1	Body	Aluminium alloy	13	Piston seal	NBR
2	Sealing cap	Aluminium alloy	14	Magnet	Magnetic material
3	Lever	Stainless steel	15	Circlip	Spring steel
4	Retaining pin	Carbon steel	16	Lever pin	Bearing steel
5	Jaw carrier	Stainless steel	17	Guide plate	Stainless steel
6	Lower piston half	Aluminium alloy	18	Buffer	PU
7	Upper piston half	Aluminium alloy	19	Pin	Carbon steel
8	Gasket	NBR	20	Roller stopper	Stainless steel
9	Piston rod	Stainless steel	21	Steel ball	Stainless steel
10	Piston retaining screw	Stainless steel	22	Screw	Carbon steel
11	O ring	NBR	23	Screw	Stainless steel
12	U cup	NBR		Note on materials	RoHS Compliant

P5GD - Permissible force and torques on jaw carriers



Static

Size	10	16	20	25
Fx	60N	100N	150N	255N
Mx	0,26Nm	0,68 Nm	1,32 Nm	1,94 Nm
My	0,53Nm	1,36 Nm	2,65 Nm	3,88 Nm
Mz	0,26Nm	0,68 Nm	1,32 Nm	1,94 Nm

Mass of one of the 2 jaws (g) / closing and opening time (s) :

Size	10	16	20	25
m 0,2s	40g	80g	150g	250g
m 0,07s	25g	45g	75g	100g
m 0,05s	20g	35g	50g	-
m 0,02s	15g	25g	-	-
m 0,01s	10g	-	-	-

m is the permissible mass of the jaw for using gripper without flow controllers. If the mass of jaw is higher, use flow controllers to reduce the jaw-carriers speed.

m 0,2s gives the max. mass of jaw to fix on one of the jaw-carriers for a 0,2 s closing time.

These indications must not be exceeded if :

- any extra forces are exerted on the workpiece or the jaws, in addition to the force of the clamping torque.
- handling forces (acceleration, shocks..) must also be added.

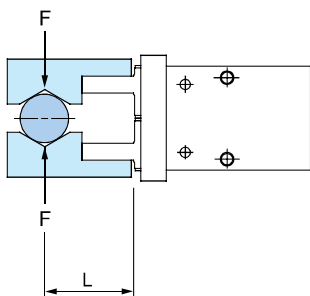
These values are cumulative if the forces act in different directions at the same time.

Calculate of allowable external force (when moment load is applied)	Calculation example
$\text{Allowable load } F \text{ (N)} = \frac{M \text{ (maximum allowable moment) (N.m)}}{L \times 10^{-3} *}$ <p>(* Unit conversion constant)</p>	<p>When a static load of f = 10N is operating, which applies pitch moment point L = 30mm from the P5GD-016MSG006B guide</p> $\text{Allowable load } F = \frac{0.68}{30 \times 10^{-3}}$ $= 22.7 \text{ (N)}$ <p>Load f = 10 (N) < 22.7 (N)</p> <p>Therefore, it can be used.</p>

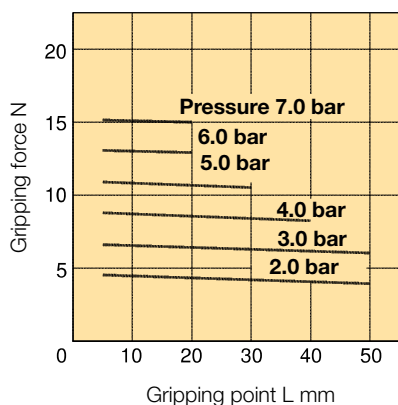
Effective gripping force: Double acting / External gripping force

Expressing the effective gripping force.

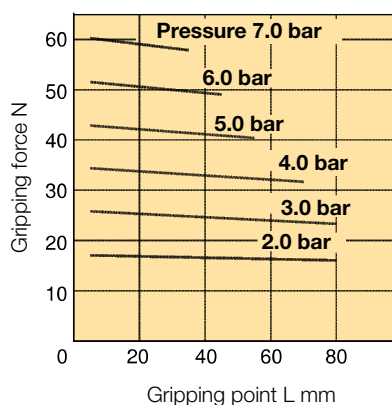
The effective gripping force shown in the graphs below is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



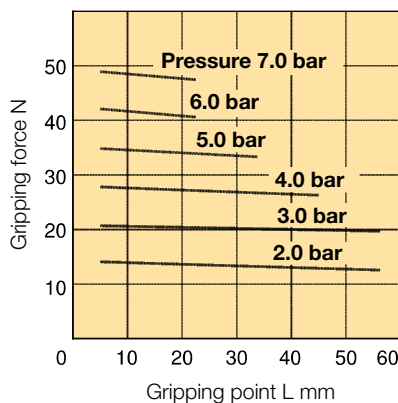
Size 10



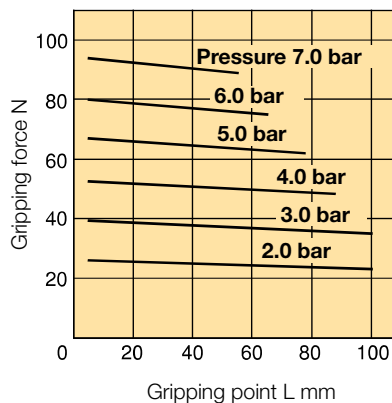
Size 20



Size 16



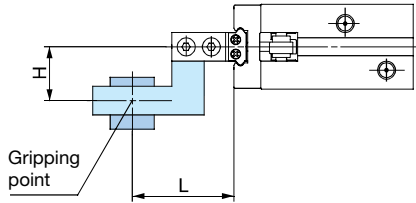
Size 25



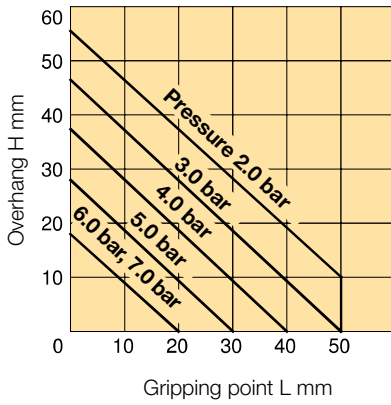
Confirmation of gripping point: External gripping

The air gripper should be operated so that the work piece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs below.

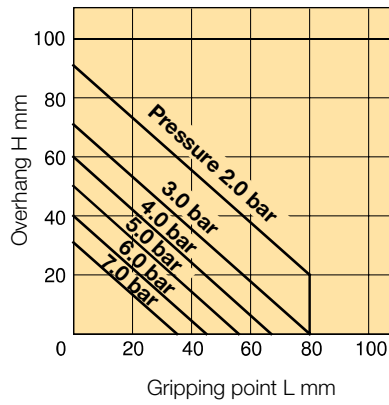
If the work piece gripping point goes beyond the range limits, this will have an adverse effect on the life of the air gripper.



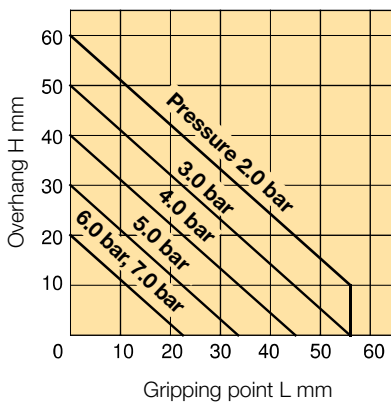
Size 10



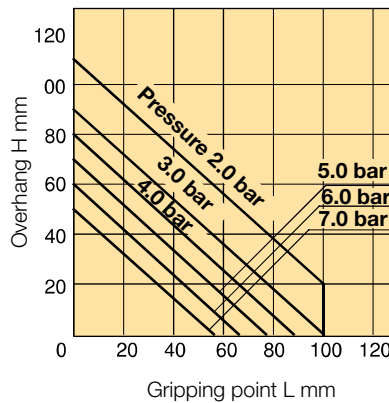
Size 20



Size 16



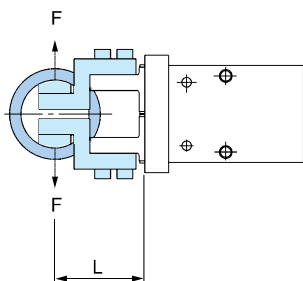
Size 25



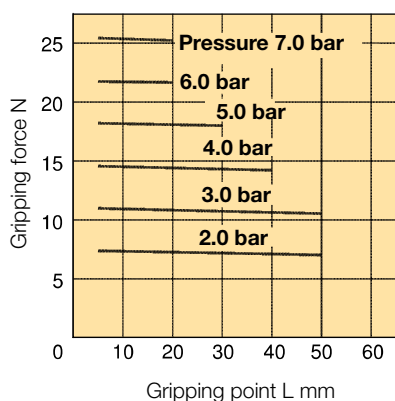
Effective gripping force: Double acting / Internal gripping force

Expressing the effective gripping force.

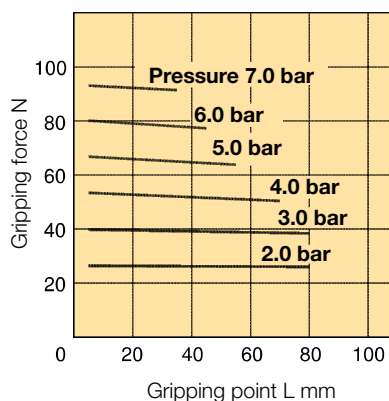
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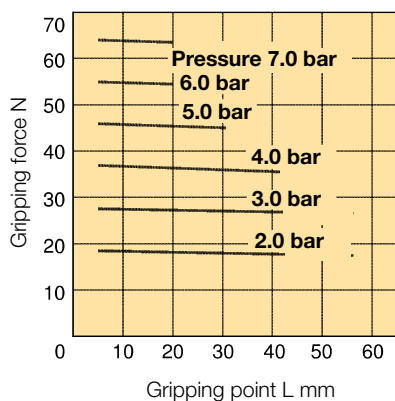
Size 10



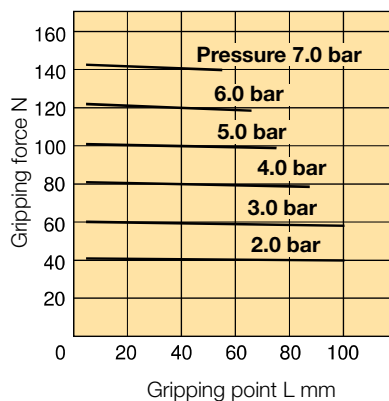
Size 20



Size 16



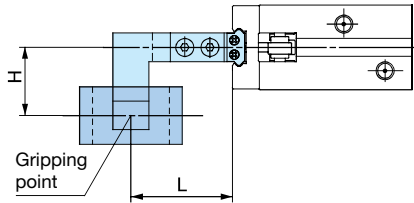
Size 25



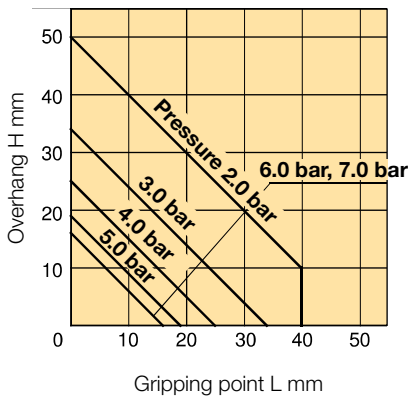
Confirmation of gripping point: Internal gripping

The air gripper should be operated so that the work piece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs below.

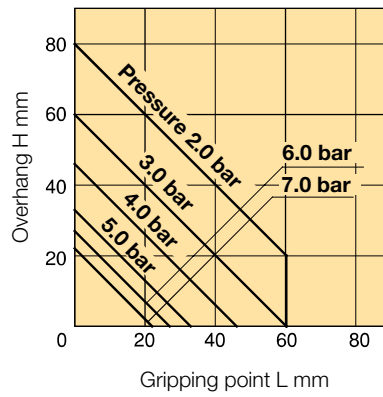
If the work piece gripping point goes beyond the range limits, this will have an adverse effect on the life of the air gripper.



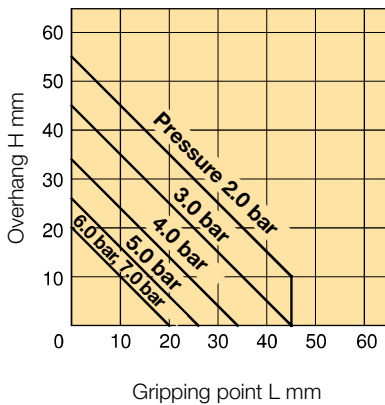
Size 10



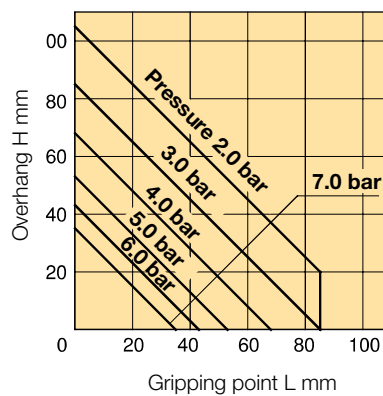
Size 20



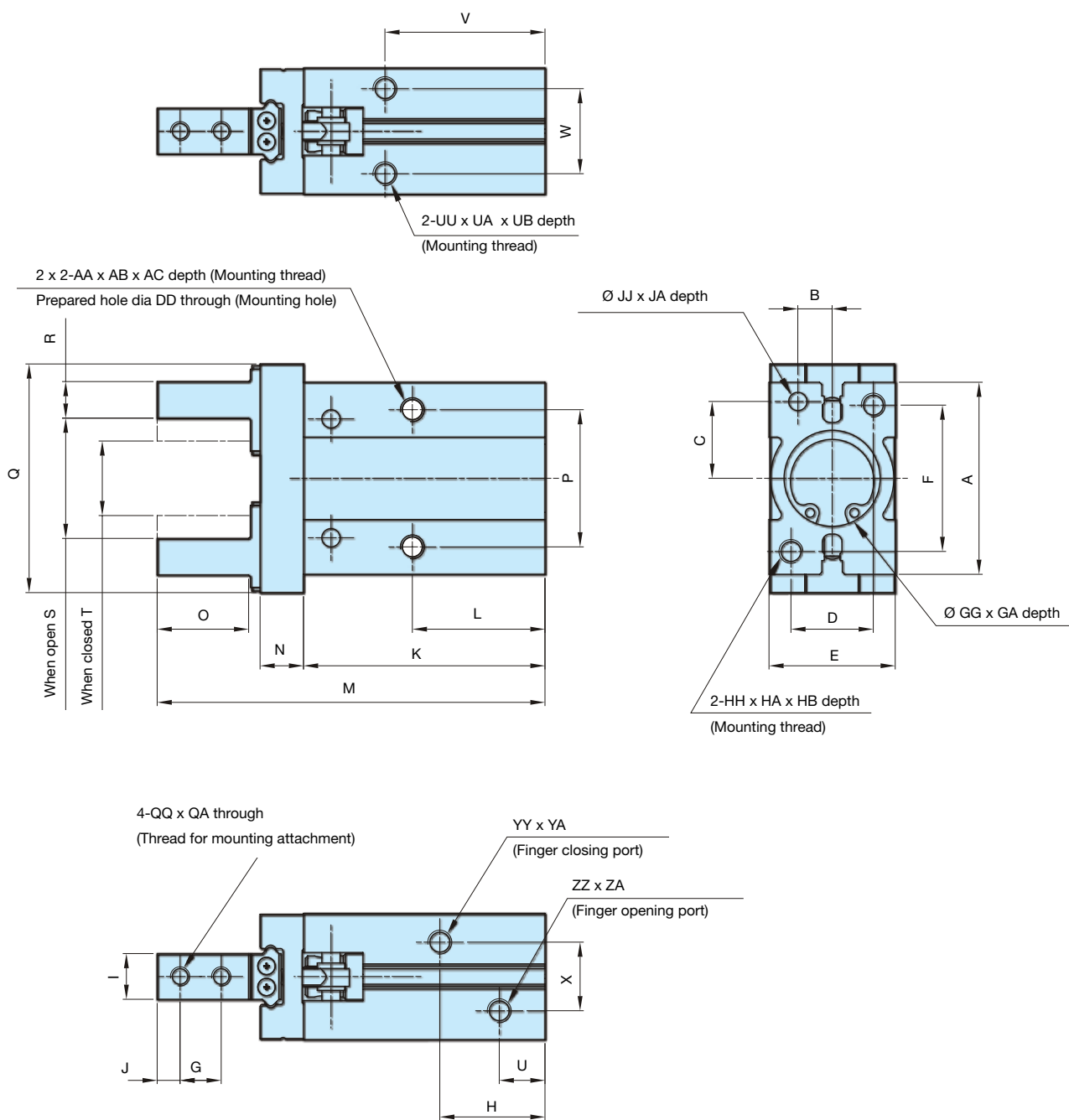
Size 16



Size 25

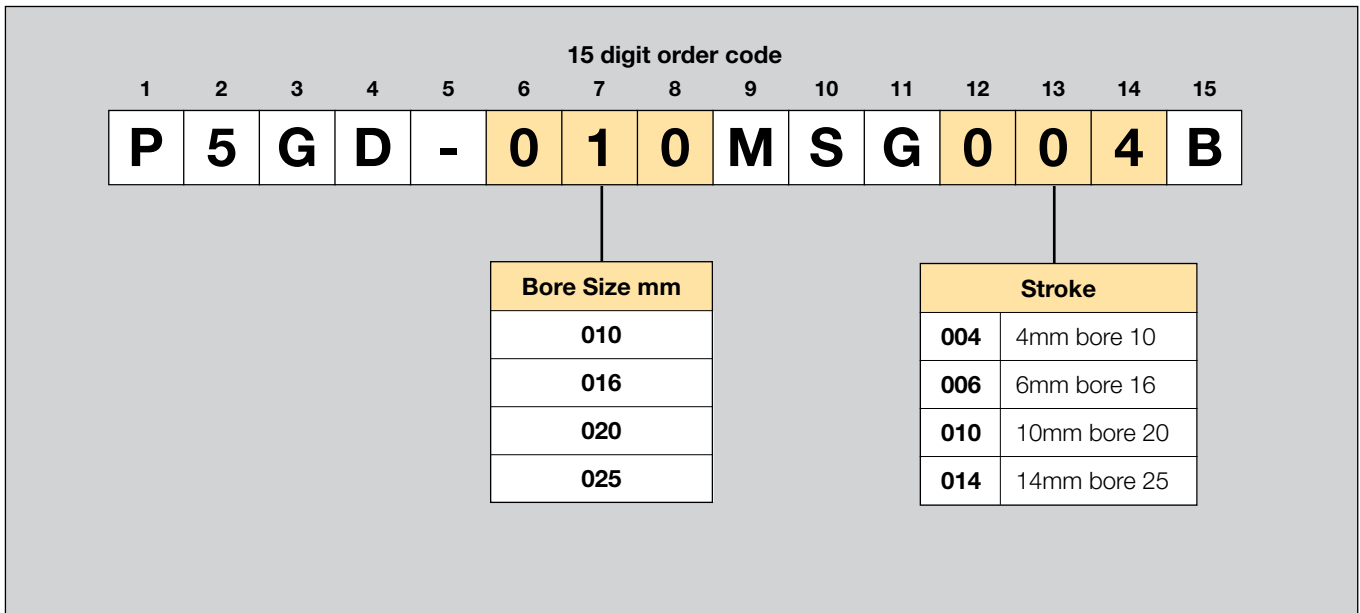


Dimensions (mm)



Bore mm	A	AA	AB	AC	B	C	D	DD	E	F	G	GG	GA	H	HH	HA	HB	I	J	JJ	JA	K	L	M
10	23	M3	0.5	5.5	5.2 ^{+0.025} ₋₀	7.6 ^{+0.02} _{-0.02}	12	2.6	16.4 ^{+0.05} _{-0.05}	18	5.7	11H9 ^{+0.043} ₋₀	2	19	M3	0.5	6	5 ⁰ _{-0.05}	3	2H9 ^{+0.025} ₋₀	3	37.8	23	57
16	30.6	M4	0.7	8	6.5 ^{+0.025} ₋₀	11 ^{+0.02} _{-0.02}	15	3.4	23.6 ^{+0.05} _{-0.05}	22	7	17H9 ^{+0.043} ₋₀	2	19	M4	0.7	8	8 ⁰ _{-0.05}	4	3H9 ^{+0.025} ₋₀	3	42.5	24.5	67.3
20	42	M5	0.8	10	7.5 ^{+0.030} ₋₀	16.8 ^{+0.02} _{-0.02}	18	3.4	27.6 ^{+0.05} _{-0.05}	32	9	21H9 ^{+0.052} ₋₀	3	23	M5	0.8	10	10 ⁰ _{-0.05}	5	4H9 ^{+0.030} ₋₀	4	52.8	29	84.8
25	52	M6	1	12	10 ^{+0.02} _{-0.02}	21.8 ^{+0.02} _{-0.02}	22	5.1	33.6 ^{+0.05} _{-0.05}	40	12	21H9 ^{+0.052} ₋₀	3.5	23.5	M6	1	12	12 ⁰ _{-0.05}	6	4H9 ^{+0.02} _{-0.02}	4	63.6	30	102.7
Bore mm	N	O	P	Q	QQ	QA	R	S	T	U	UU	UA	UB	V	W	X	YY	YA	ZZ	ZA				
10	6	12	16	29	M2.5	0.45	4 ⁰ _{-0.1}	15.2 ^{+2.2} ₀	11.2 ⁰ _{-0.7}	9	M3	0.5	6	27	11.4	10	M3	0.5	M3	0.5				
16	7.5	15	24	38	M3	0.5	5 ⁰ _{-0.1}	20.9 ^{+2.2} _{-0.2}	14.9 ⁰ _{-0.7}	8.5	M4	0.7	4.5	30	16	13	M5	0.8	M5	0.8				
20	9.5	20	30	50	M4	0.7	8 ⁰ _{-0.1}	26.3 ^{+2.2} _{-0.2}	16.3 ⁰ _{-0.7}	10	M5	0.8	8	35	18.6	15	M5	0.8	M5	0.8				
25	11	25	36	63	M5	0.8	10 ⁰ _{-0.1}	33.3 ^{+2.2} _{-0.2}	19.3 ⁰ _{-0.8}	9.7	M6	1	10	36.5	22	20	M5	0.8	M5	0.8				

Order Key Code



Note : All grippers are supplied magnetic for optional sensing

P5GD - Parallel Grippers

Bore mm	Order code
10	P5GD-010MSG004B
16	P5GD-016MSG006B
20	P5GD-020MSG010B
25	P5GD-025MSG014B

P8S Sensors Series

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Electronic sensors

The electronic sensors utilise “Solid State” technology, providing operation with no moving parts. These switches are available in NPN and PNP type, both provide built in short circuit and transient protection as standard. The solid state operation allows for high switching on off frequency, ideal for applications where long service life is required.

Technical data

Design	GMR (Giant Magnetic Resistance) magneto-resistive function
Installation	Mounts within cylinder switch groove
Outputs	PNP or NPN, normally open
Voltage range	5-30 V DC
Voltage drop	1.5 V max
Switching current	50 mA max
Switch rating	1.5 W max
Leakage current	0.01 mA max
Internal consumption	10 mA max (NPN) 12 mA max (PNP)
On/off switching frequency	1000 Hz max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red (NPN) LED Green (PNP)
Cable	Polyurethane

Reed sensors

Reed type sensors are based on proven reed switch technology and provide reliable function in many applications. Simple installation and the available AC voltage range are advantages for this range of sensors.

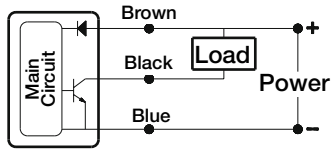
Technical data

Design	Reed element
Installation	Mounts within cylinder switch groove
Outputs	Normally open
Voltage range	5-120 V DC/AC
Voltage drop	2.5 V max
Switching current	100 mA max
Switch rating	10 W max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red
Cable	Polyurethane

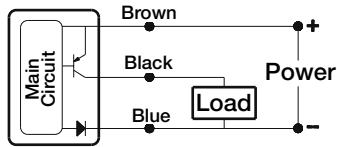
Electronic sensors

Schematic

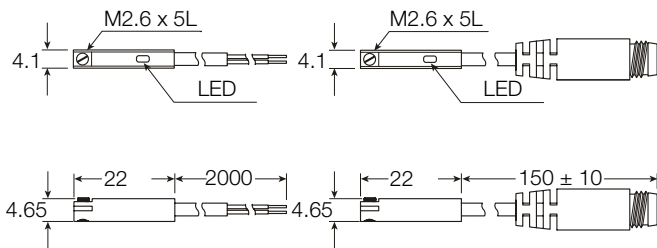
NPN type



PNP type



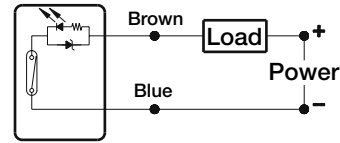
Dimensions



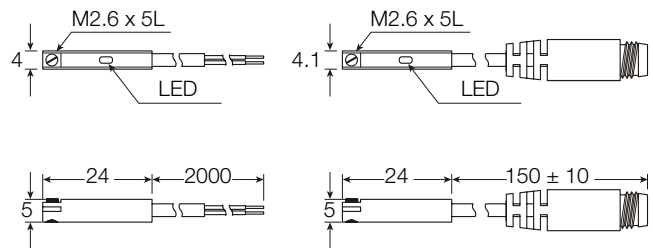
Reed sensors

Schematic

Reed type

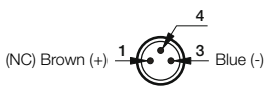


Dimensions

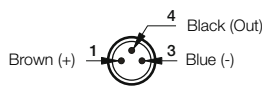


M8 Quick Connector

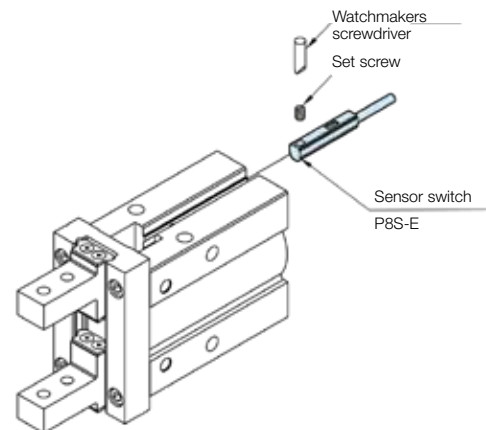
2 wire



3 wire



Installation of Sensor



Electronic and Reed Sensors

Size	Description	Order code
Flush Mount Style		
PNP Type, normally open	0.165 m cable and M8 screw male connector	P8S-EPSUS
PNP Type, normally open	2 m PUR cable without connector	P8S-EPFXS
NPN Type, normally open	0.165 m cable and M8 screw male connector	P8S-ENSUS
NPN Type, normally open	2 m PUR cable without connector	P8S-ENFXS
Reed Type, normally open	0.15 m cable and M8 screw male connector	P8S-ERSUS
Reed Type, normally open	2 m PUR cable without connector	P8S-ERFXS

P5GL - 180° Angular double acting, cam style, square jaw carriers

The P5GL is a 180° angular gripper of compact size and lightweight construction. With double acting movement high gripping forces are achieved via internal cams. The anodised body has mounting points on four sides and sensors can be fitted in any of the four integral grooves.



- Bore sizes Ø10, 16, 20 and 25mm
- Double acting
- Anodised corrosion protection
- Magnetic piston as standard
- Optional sensors

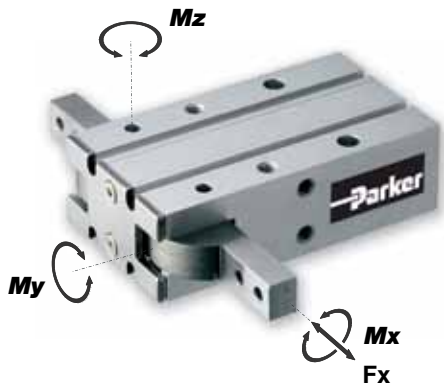
General technical data

Size	10	16	20	25
Total operating angle (°)	-3° to +180°			
Total Force* (N) - Closed side	11	36	73.00	152
Total Force* (N) - Open side	-			
Total Torque* (Nm) - Closed side	0.32	1.08	2.20	4.56
Total Torque* (Nm) - Open side	-			
Ø Piston bore (mm)	10	16	20	25
Ø Port size (mm)	M5			
Air consumption (cm ³ cycle) **	2	7	14	28
Repeatability (mm)	± 0.02			
Max. work frequency (Hz)	1			
Min. closing time (s)	0.1	0.1	0.15	0.15
Weight (g)	80	150	320	600
Max. jaw length (mm)	60	70	80	90
Max. temperature (°C)	-10° to +60°			
Pressure (bar)	1 to 6			
Operation	Dry air, lubricated or unlubricated			

* At 5 bar, L=30mm.

** Cycle = opening + closing (without jaws)

P5GL - Permissible force and torques on each jaw carrier



Static

Size	10	16	20	25
Fx	35N	60N	100N	140N
Mx	0,5Nm	2 Nm	4 Nm	7 Nm
My	0,5Nm	2 Nm	4 Nm	7 Nm
Mz	0,5Nm	1 Nm	2 Nm	7 Nm

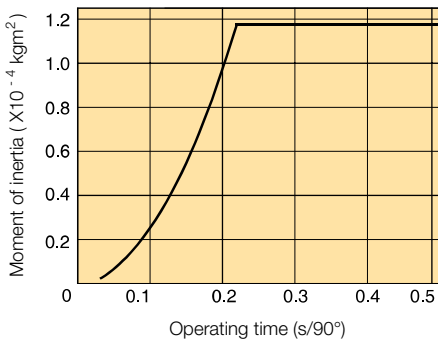
Mz at 5 bar.

Recommendation is to use flow control to limit the speed of opening to reduce impact at the end of the stroke.

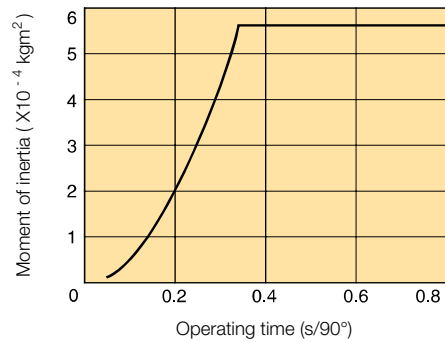
Dynamic

Inertia of one of the 2 jaws (kgcm²) closing or opening time (s) :

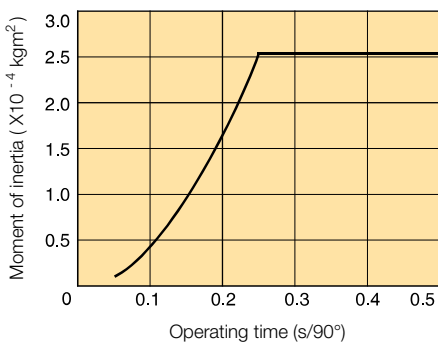
P5GL-010MSG180B



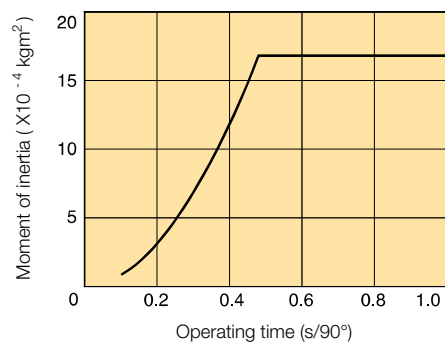
P5GL-020MSG180B



P5GL-016MSG180B



P5GL-025MSG180B



For a inertia of one of the 2 jaws of 0,22 kgcm², the opening or closing time of the gripper is 0,15 s for a **size 10**.

These indications must not be exceeded if :

- any extra forces are exerted on the workpiece or on the jaws, in addition to the force or to the clamping torque.
- handling forces (acceleration, shocks, ...) must also be added.

These values are cumulative if the forces act in different directions at the same time.

Effective holding force

Indication of effective holding force

1. Although the condition differs according to the coefficient of friction between the attachment and work, select a model that can produce a holding force of 10 to 20 times the work.
2. Further allowance should be provided when great acceleration or impact is expected during work transfer.

EX.)

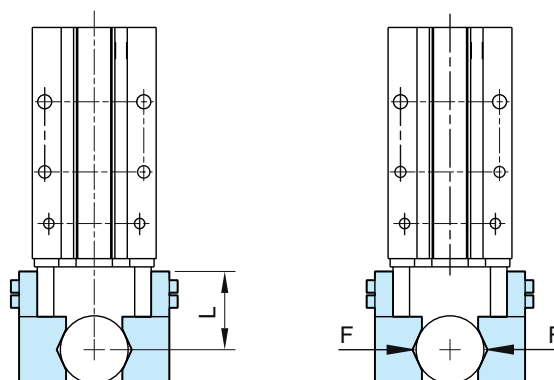
For setting the holding force to be at least 20 times the work weight;
 Required holding force = $0.05\text{kg} \times 20 \times 9.8\text{m/s}^2 = 10\text{N min.}$

When P5GL-016MSG180B is selected, the holding force is determined to be 17N according to the holding point distance (L = 30mm) and the pressure (5kgf/cm²).

3. The holding force shown in the table represents the holding force of one finger when all fingers and attachments are in contact with the work.

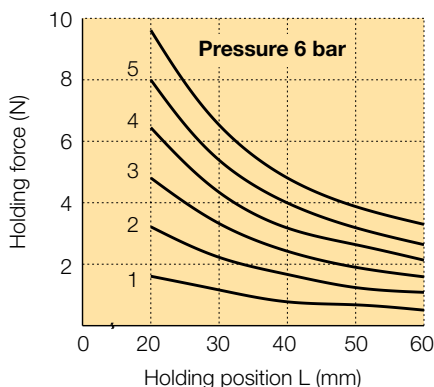
L: Holding point distance

F: Thrust of one finger

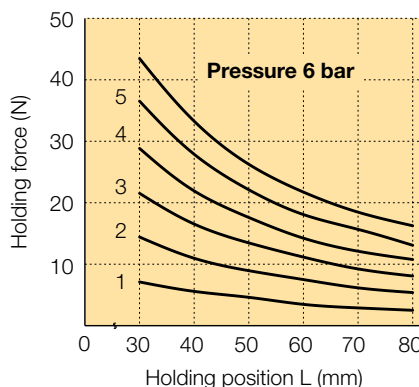


External hold

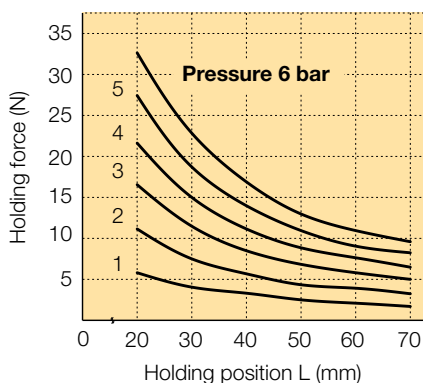
P5GL-010MSG180B



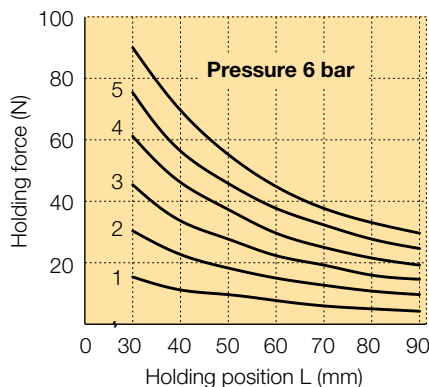
P5GL-020MSG180B



P5GL-016MSG180B

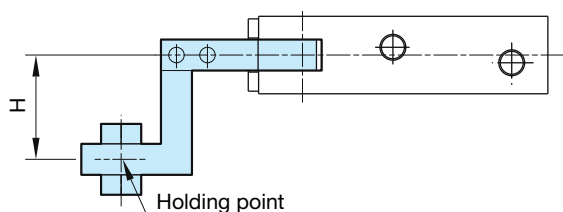


P5GL-025MSG180B

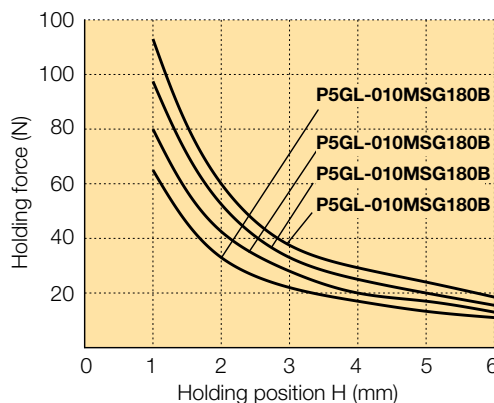


Confirmation of holding point

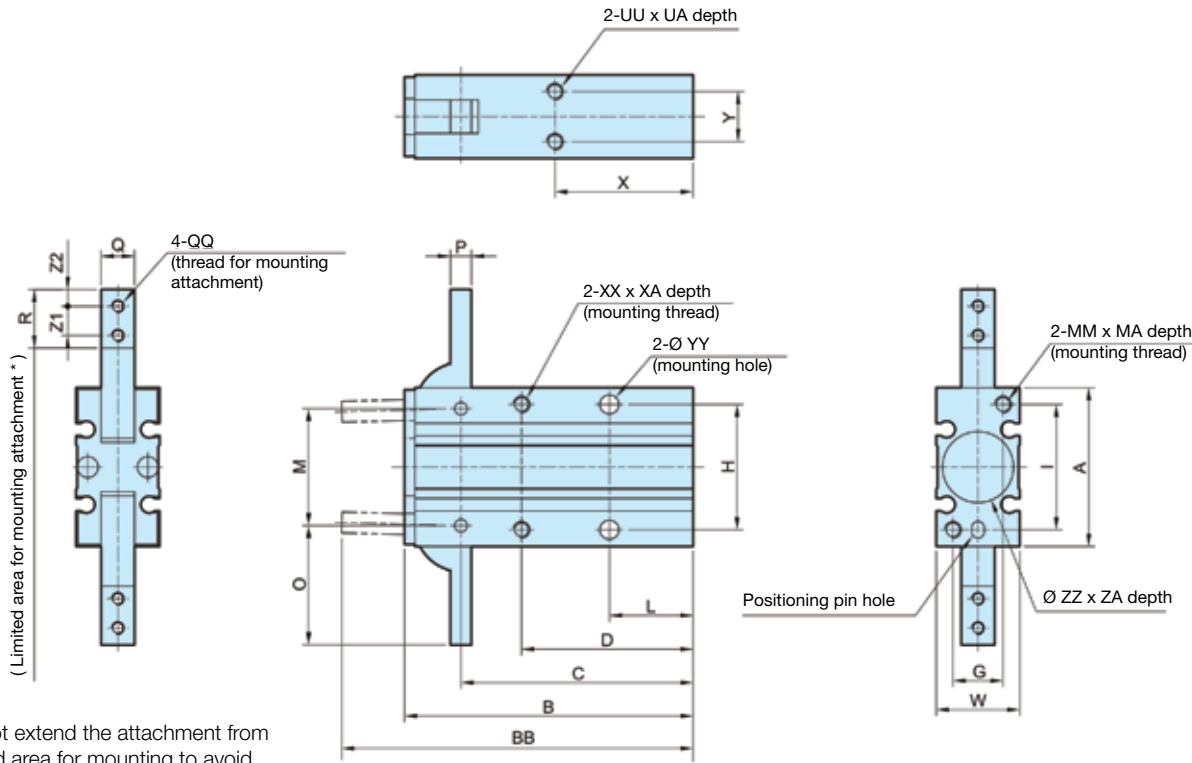
Work should be held at a point within the range of overhanging distance (H) for a given pressure indicated in the tables. When the work is held at a point outside of the recommended range for a given pressure, it may cause adverse effect on the product life.



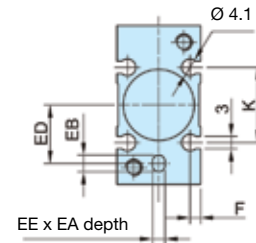
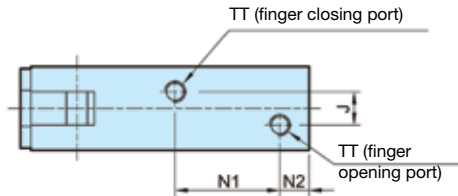
P5GL



Dimensions (mm)



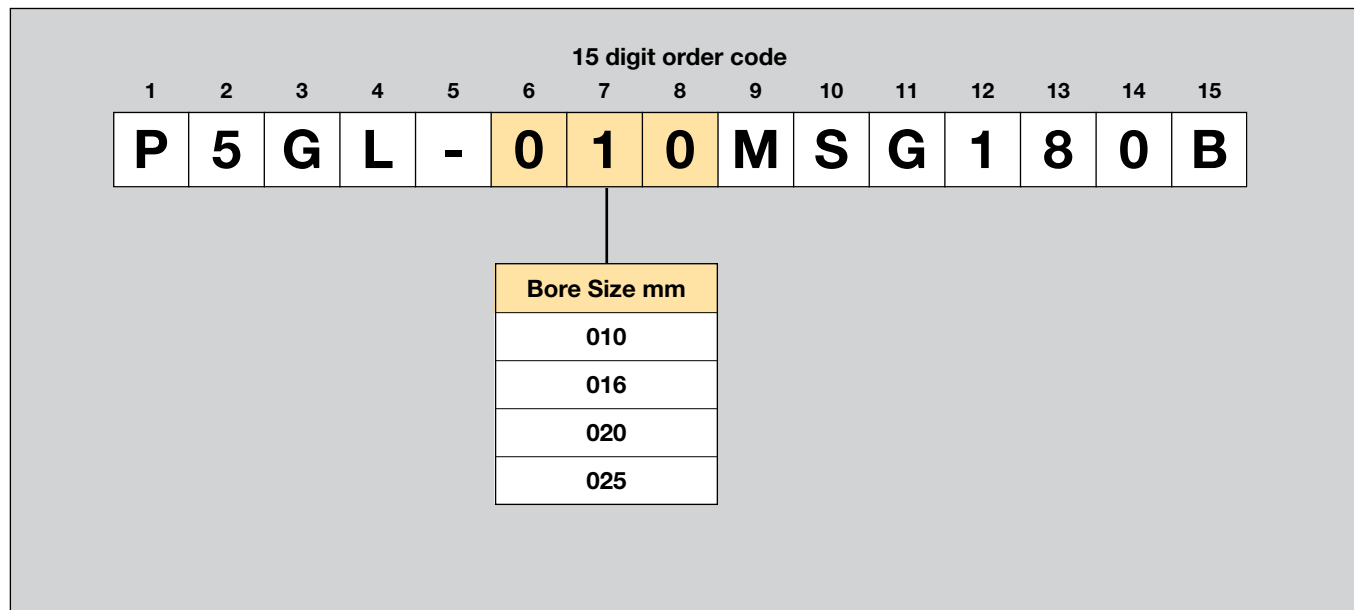
* Do not extend the attachment from limited area for mounting to avoid interference with the attachment or main body.



Bore mm	A	B	BB	C	D	EE	EA	EB	ED	F	G	H	I	J	K	L	M	MA	MM	N1	N2	O	P	Q
12	30	58	71	47,5	35	3H9 ^{+0.025} ₀	3	4	9	2	9	24	24	3	13	18	22	6	M3 x 0.5	23	7	23,5	4	6 ^{+0.005} _{-0.025}
16	38	69	84	55,5	41	3H9 ^{+0.025} ₀	3	4	15	2,5	12	30	30	8	18	20	28	8	M4 x 0.7	25	7	28,5	5	8 ^{+0.005} _{-0.025}
20	48	86	106	69	50	4H9 ^{+0.030} ₀	4	5	19	3	16	36	38	12	20	25	36	10	M5 x 0.8	32	8	37	8	10 ^{+0.005} _{-0.025}
25	58	107	131	86	60	4H9 ^{+0.030} ₀	4	5	23	3	18	42	46	14	24	30	45	12	M6 x 1	42	8	45	10	12 ^{+0.005} _{-0.025}

Bore mm	QH	QQ	R	TT	UA	UU	W	X	XA	XX	Y	YY	ZA	ZZ	Z1	Z2
12	3,4	M3 x 0.5	12	M5 x 0.8 x 5 depth	4	M3 x 0.5	15	30	6	M3 x 0.5	9	3,4	1,5	11H9 ^{+0.043} ₀	6	3
16	3,4	M3 x 0.5	14	M5 x 0.8 x 5 depth	5	M4 x 0.7	20	33	8	M4 x 0.7	12	4,5	1,5	17H9 ^{+0.043} ₀	7	4
20	4,5	M4 x 0.7	18	M5 x 0.8 x 5 depth	8	M5 x 0.8	26	42	10	M5 x 0.8	14	5,5	1,5	21H9 ^{+0.052} ₀	9	5
25	5,5	M5 x 0.8	22,5	M5 x 0.8 x 5 depth	10	M6 x 1	30	50	12	M6 x 1	16	6,6	1,5	26H9 ^{+0.052} ₀	12	6

Order Key Code



Note : All grippers are supplied magnetic for optional sensing

P5GL - 180° Angular Grippers

Bore mm	Order code
10	P5GL-010MSG180B
16	P5GL-016MSG180B
20	P5GL-020MSG180B
25	P5GL-025MSG180B

Reed sensors

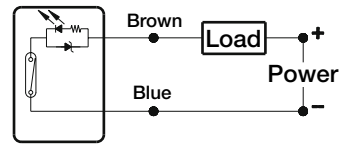
Reed type sensors are based on proven reed switch technology and provide reliable function in many applications. Simple installation and the available AC voltage range are advantages for this range of sensors.

Technical data

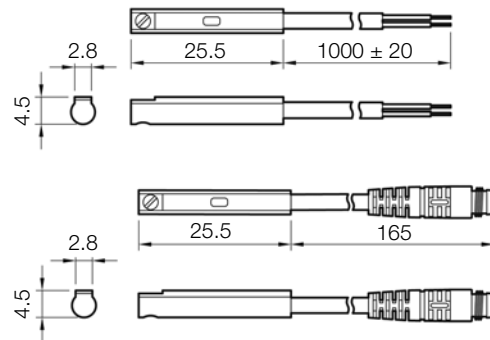
Design	Reed element
Installation	Mounts within cylinder switch groove
Outputs	Normally open
Voltage range	5-120 V DC/AC
Voltage drop	2.5 V max
Switching current	100 mA max
Switch rating	10 W max
Encapsulation	IP 67 (NEMA 6)
Temperature range	-10°C to +70°C
Indication	LED Red
Cable	Polyurethane

Schematic

Reed type

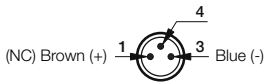


Dimensions

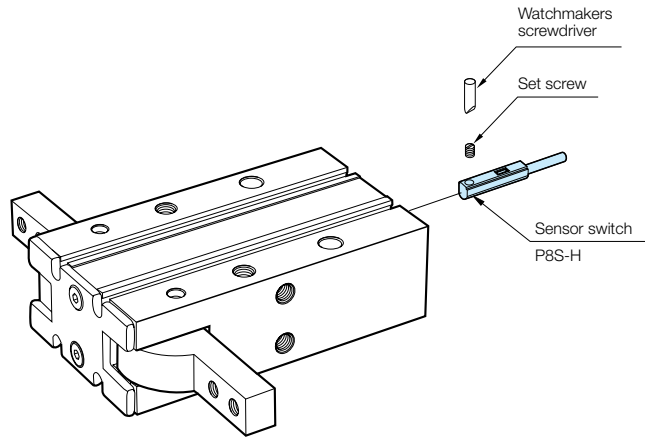


M8 Quick Connector

2 wire QC wiring



Installation of Sensor



Reed Sensors

Size	Description	Order code
Flush Mount Style		
Reed Type, normally open	0.15 m PUR cable and M8 screw male connector	P8S-HRSUS
Reed Type, normally open	1 m PUR cable without connector	P8S-HRFCS

Connecting cables with one connector

The cables have an integral snap-in female connector.



Type of cable	Cable/connector	Weight kg	Order code
Cables for sensors, complete with one female connector			
Cable, Flex PVC	3 m, 8 mm Snap-in connector	0,07	9126344341
Cable, Flex PVC	10 m, 8 mm Snap-in connector	0,21	9126344342
Cable, Super Flex PVC	3 m, 8 mm Snap-in connector	0,07	9126344343
Cable, Super Flex PVC	10 m, 8 mm Snap-in connector	0,21	9126344344
Cable, Polyurethane	3 m, 8 mm Snap-in connector	0,01	9126344345
Cable, Polyurethane	10 m, 8 mm Snap-in connector	0,20	9126344346

Male connectors for connecting cables

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



Connector	Weight kg	Order code
M8 screw connector	0,017	P8SCS0803J
M12 screw connector	0,022	P8SCS1204J

Ready to use connecting cables with connectors at each end

As accessories the system comprises a large number of different cables in order to meet all requirements that may arise and to make the installation simple, fast and reliable.

Cables with moulded 8 mm snap-in round contacts in both ends. The cables are available in two types, one with a straight male and female connectors respectively, and one with a straight 3-pole male connector in one end and an angled 3-pole female connector in the other end.



Technical data

Contacts

Moulded 8 mm snap-in male/female contacts.

Enclosure IP67

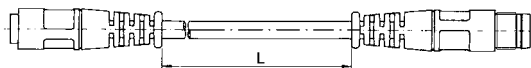
Cable

Conductor 3x0,25 mm² (32x0,10 mm²)

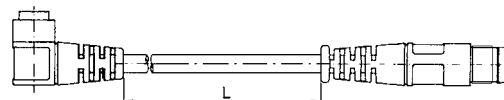
Sheath PVC/PUR

Colour Black

Cables with straight 3-pole male and female connectors respectively.



Cables with a straight 3-pole male connector in one end and an angled 3-pole female connector in the other end.



Designation	Weight kg	Order code
Cable with straight contacts, 0,2 m	0,02	9121717014
Cable with straight contacts, 0,3 m	0,02	9121717015
Cable with straight contacts, 0,5 m	0,03	9121717016
Cable with straight contacts, 1,0 m	0,03	9121717017
Cable with straight contacts, 2,0 m	0,05	9121717018
Cable with straight contacts, 3,0 m	0,07	9121717019
Cable with straight contacts, 5,0 m	0,12	9121717020
Cable with straight contacts, 10 m	0,23	9121717021

Designation	Weight kg	Order code
Cable with straight and angled connectors, 0,2 m	0,02	9121717022
Cable with straight and angled connectors, 0,3 m	0,02	9121717023
Cable with straight and angled connectors, 0,5 m	0,03	9121717024
Cable with straight and angled connectors, 1,0 m	0,03	9121717025
Cable with straight and angled connectors, 2,0 m	0,05	9121717026
Cable with straight and angled connectors, 3,0 m	0,07	9121717027
Cable with straight and angled connectors, 5,0 m	0,12	9121717028
Cable with straight and angled connectors, 10 m	0,23	9121717029

Installation and Maintenance for P5GA, P5GB, P5GD and P5GL Grippers



Disconnect air and electrical supplies before attempting repair or maintenance.
 See ISO 4414-1982 for safety requirements covering the installation and use of pneumatic equipment.

Selection

❶ Do not apply a load over the operating limit range.

Select the model considering max. allowable load and allowable moment. When the grippers are used outside of the normal operating limits, excessive loads can cause wear that can lead to malfunction, shorter life expectancy and safety concerns.

❷ Do not apply excessive forces and impacts.

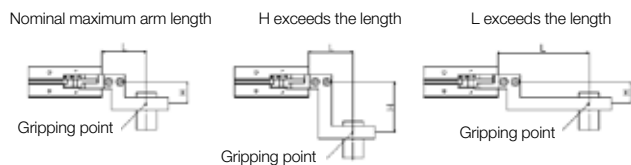
This may cause problems and possible failure.

Mounting

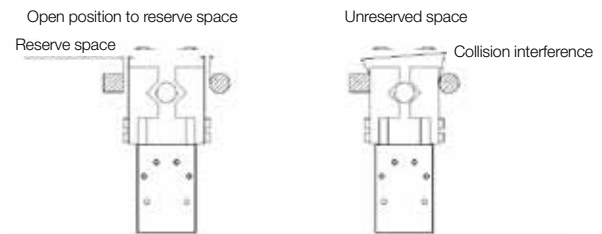
1. Use air as media. When piping, make sure the pipeline is completely cleaned to maintain the cleanliness of the air.
2. Install an air filter in the gripper pipeline to eliminate / reduce moisture and replace the filter element periodically.
3. Avoid using the gripper in moist, oily or dusty environments.
4. When installing the gripper, tighten the fix screw according to normal specified torque standard.
5. When the gripper is operating do not put your hands on/near the grippers to prevent injuries.
6. To prevent gripper malfunction or injuries please do not exceed the capacity range of gripper when operating.
7. When installing and operating the gripper, avoid vibration and instant impact caused by any external force.
8. Apply lithium lubricant to the slide track of the gripper to prevent rust and extend the gripper life cycle.

Operation

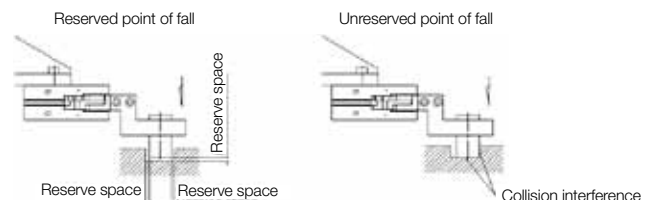
1. When designing the operation path for the gripper, well planned path and reserve extra space is suggested to prevent impact occur. External impact could endanger the safety of the operator and cause damage to the equipment.
2. When designing the finger blanks, the strength of material should be able to bear the weight of the workpiece. Finger blanks should be lightweight. Over size/weight could affect the grippers ability to function normally.
3. Please take note of the 'maximum arm length' specified in the catalogue. Finger blanks exceeding the specified length will cause the gripping force to drop rapidly.
7. The gripping contact area should be reduced when the finger blanks are designed for gripping small / thinner workpiece. Holding small / thinner workpiece with large contact areas will cause the workpiece to shift / loosen easily.
8. Notice the position when installing the gripper. You should avoid lateral impact to the gripper when the fingers are at the opening position. This may cause the fingers to break easily.



4. The bore size of the gripper should correspond to the size/weight of the workpiece. Several grippers can be used to grip large/heavy work piece. Overloading the gripper cylinder is strictly prohibited.
5. Avoid allowing the fingers to sustain lateral force and torque force. This may cause the fingers to loosen resulting in excessive wear.
6. Be cautious when the power is off for periods of time or when experiencing power failure. This could cause a drop in the air pressure and cause the workpiece to fall or become loose.



9. When configuring the gripper to certain designated position and unloading the workpiece, clearance must be reserved at the point of fall to avoid direct collision interference.



Environment

❶ Do not use in atmosphere where the gripper contacts directly with liquid such as cutting oil.

Conditions where the gripper is exposed directly to cutting oil, coolant and oil mist may lead to vibration, increase of moving part resistance, air leakage, etc.

❷ Do not use in atmosphere where the gripper contacts directly with material such as powder dust, dust, spatter etc.

❸ Do not use in direct sun light.

❹ Do not use in environment where there is heat source.

Use a cover when there is a heat source around the gripper, or if temperature of product increases and exceeds operating temperature range by emissive heat.

❺ Do not subject it to excessive vibration and/or impact.

This results in damage and/or malfunction.

Contact Parker if the gripper is used in the above conditions.

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			Mass Concentration mg/m ³	Water		Oil
	Maximum number of particles per 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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