

P5GD - Permissible force and torques on jaw carriers



Static

Size	10	16	20	25
Fx	60 N	100 N	150 N	255 N
Mx	0.26 Nm	0.68 Nm	1.32 Nm	1.94 Nm
My	0.53 Nm	1.36 Nm	2.65 Nm	3.88 Nm
Mz	0.26 Nm	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 0.2 s	40 g	80 g	150 g	250 g
m 0.07 s	25 g	45 g	75 g	100 g
m 0.05 s	20 g	35 g	50 g	–
m 0.02 s	15 g	25 g	–	–
m 0.01 s	10 g	–	–	–

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

Order Key Code

15 digit order code

123456789101112131415

P5GD-010MSG004B

Bore Size mm

010

016

020

025

Stroke

004

4mm bore 10

006

6mm bore 16

010

10mm bore 20

014

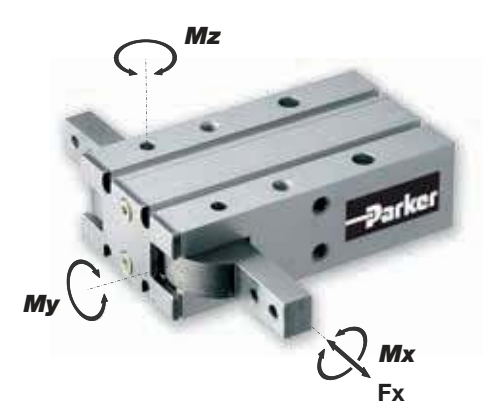
14mm bore 25

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

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

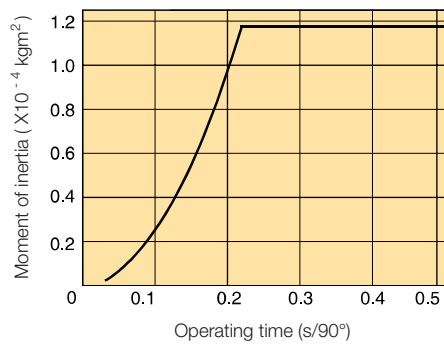
Mz at 5 bar.

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

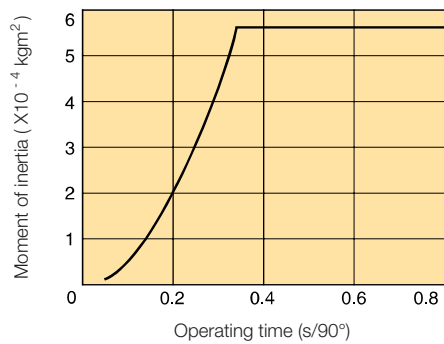
Dynamic

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

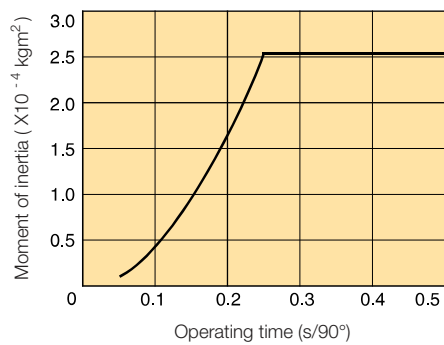
P5GL-010MSG180B



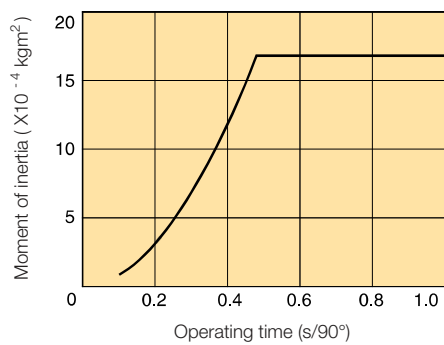
P5GL-020MSG180B



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.)

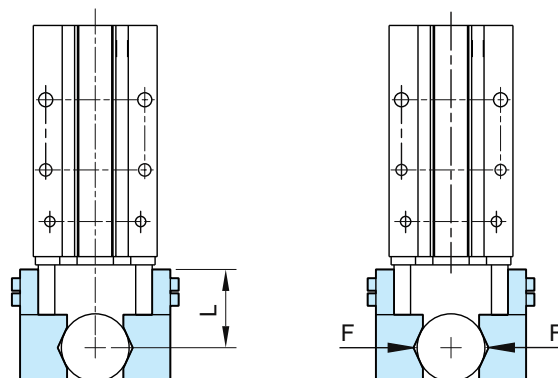
For setting the holding force to be at least 20 times the work weight;
Required holding force = $0.05\text{kg} \times 20 \times 9.8\text{m/s}^2 = 10\text{N min.}$

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.

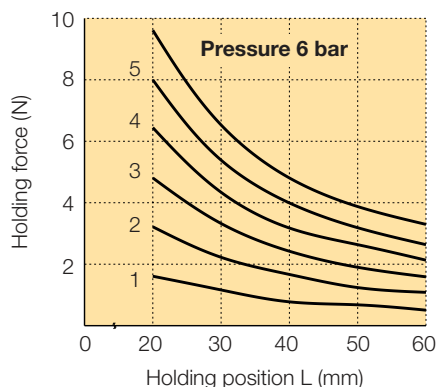
L: Holding point distance

F: Thrust of one finger

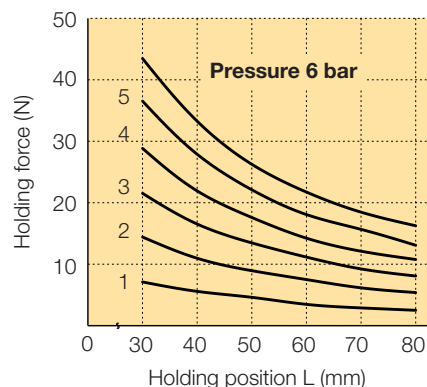


External hold

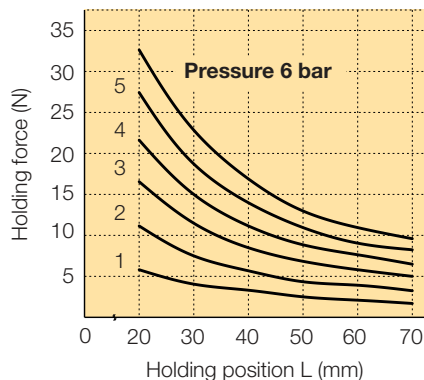
P5GL-010MSG180B



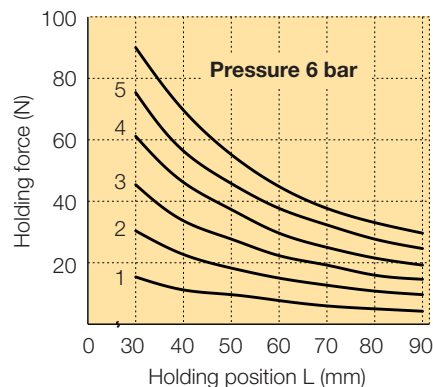
P5GL-020MSG180B



P5GL-016MSG180B

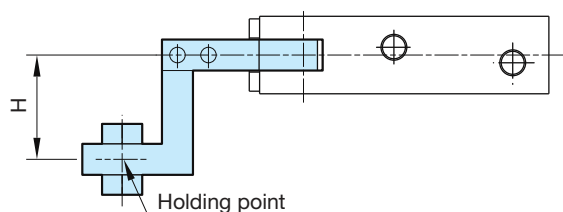


P5GL-025MSG180B

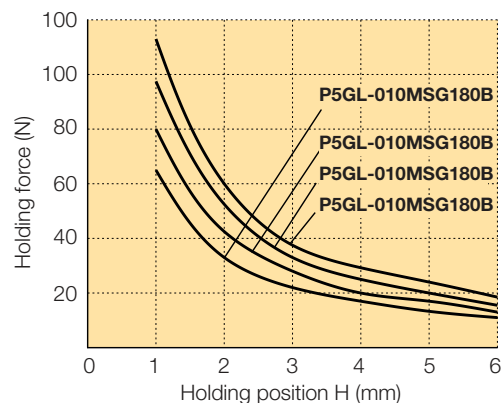


Confirmation of holding point

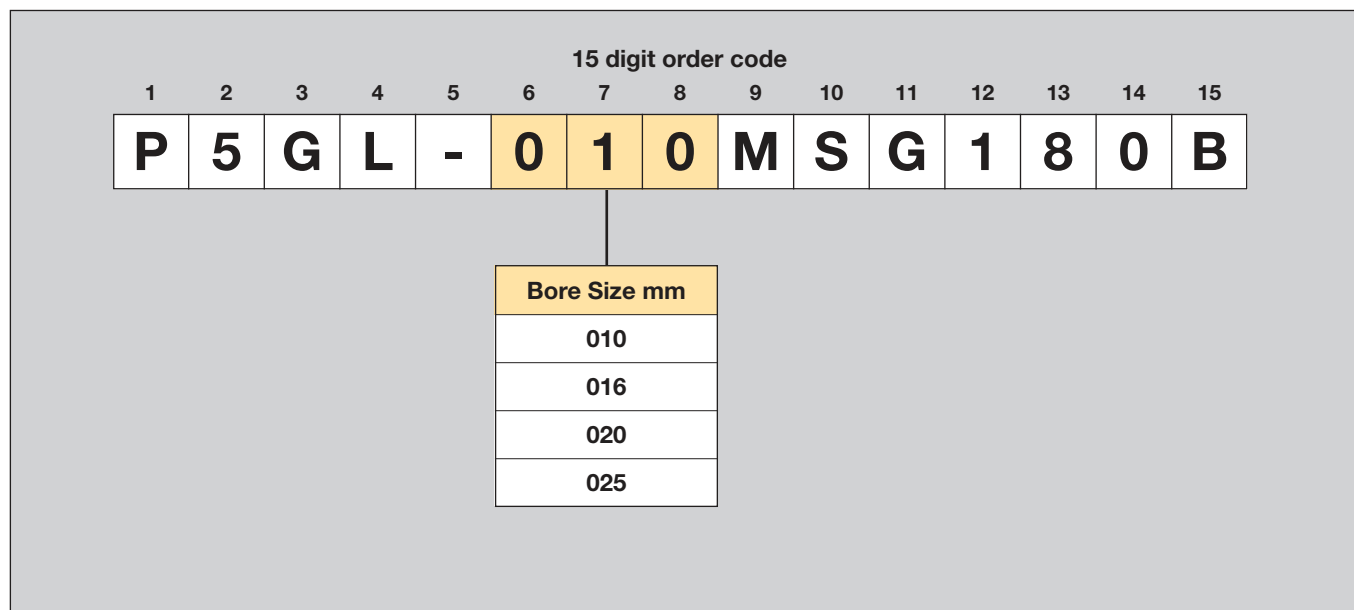
Work should be held at a point within the range of overhanging distance (H) for a given pressure indicated in the tables. When the work is held at a point outside of the recommended range for a given pressure, it may cause adverse effect on the product life.



P5GL



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