

# GRIPPERS



# GRIPPERS

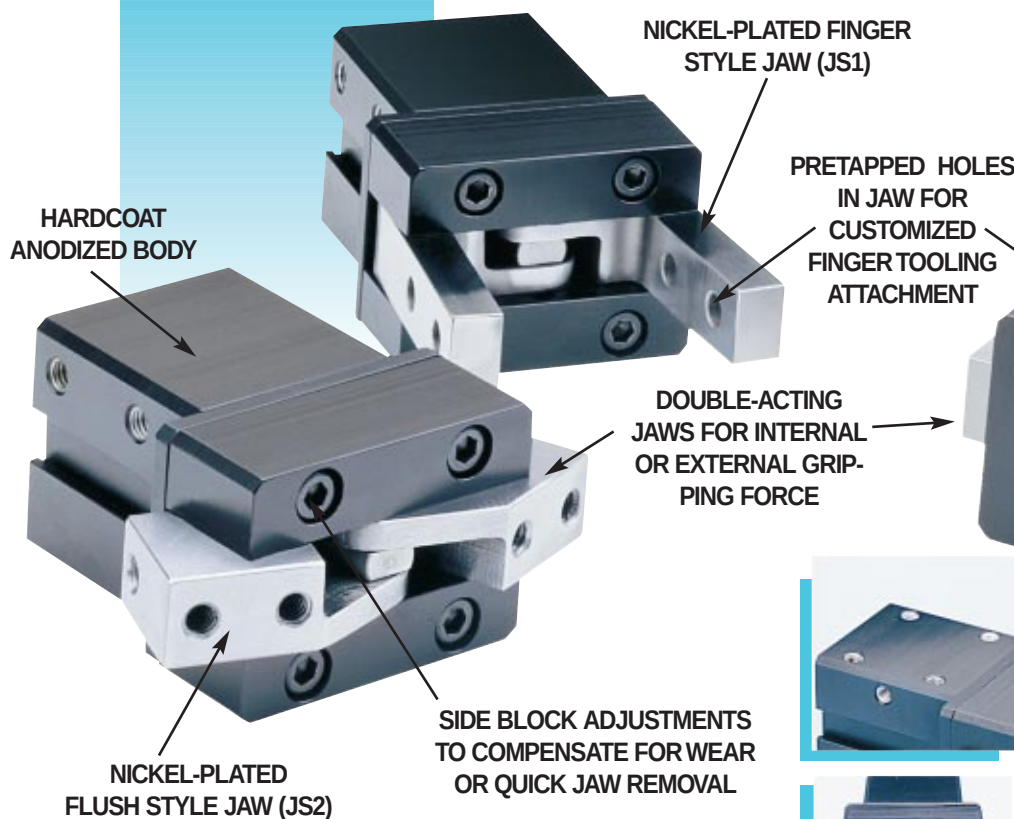
Tol-O-Matic's line of hardworking grippers are price competitive units, available in both angular and parallel styles and come in a range of six bore sizes (3/8", 5/8", 1", 1-1/2", 2" and 3") for a multitude of light- or heavy-duty "pick-and-place" applications.

All Tol-O-Matic grippers are designed with efficient, durable features and are prelubricated, making them long-lasting and dependable cycle after cycle. Double-acting for either internal or external gripping applications, these grippers are totally field repairable as well.

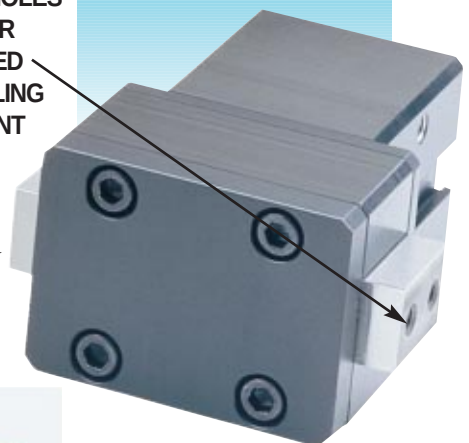
- **Hardcoat anodized extruded body** of light-weight 6063-T6 aluminum, features a smooth finished bore for long seal life with low breakaway.
- **Gripper jaw design** incorporates a hardened steel actuator pin for maximum cam bearing surface and precision-machined cam slot in jaw keeps backlash at a minimum. Side blocks eliminate side play of jaws, are adjustable to compensate for wear and can be easily removed for quick jaw replacement if necessary. Both jaw styles are nickel-plated for rust-resistance. For reduced jaw friction and longer life, the 1-1/2", 2" and 3" bore parallel grippers feature ball bearings riding on hardened steel rails in the jaw mechanism.

- **High-performance internal components** include an oil-impregnated bronze bearing, which provides a lubricated, low-friction guide surface for the piston shaft while stabilizing the piston. Efficient piston design incorporates a shock-absorbing bumper on the piston, effective on the extension stroke. Groove on the piston accommodates a magnet for signalling dc Hall-effect, Reed and ac Triac switches.
- **Pretapped mounting holes** on the housing sides and end allow for multiple mounting options and may be combined with Tol-O-Matic rack and pinion rotary actuators and other Tol-O-Matic rod cylinder slides utilizing adapter plates. Dowel pin holes are also provided for alignment checks.

## ANGULAR GRIPPERS



## PARALLEL GRIPPER



# ANGULAR GRIPPERS



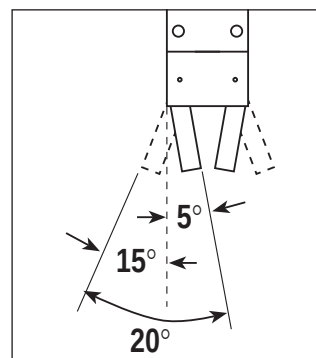
## ANGULAR GRIPPER OPTIONS

SEALS OF VITON® MATERIAL  
SWITCHES..... 214

APPLICATION GUIDELINES . . 241  
ORDERING ..... 195  
SELECTION..... 196

Tol-O-Matic angular grippers are available in two different jaw styles. Finger jaw style (JS1) is available in four bore sizes of 3/8", 5/8", 1" and 1-1/2". Flush jaw style (JS2) is available in all six bore sizes of 3/8", 5/8", 1", 1-1/2", 2" and 3".

Under normal operating conditions, these angular grippers have a life expectancy of 10 million cycles.



Jaw opening characteristics of each jaw style provides 20° of travel.

## OVERALL MODEL SPECIFICATIONS

|                                      | GPA038          | GPA063          | GPA100          | GPA150          | GPA200          | GPA300          |
|--------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Bore Size (in.)                      | 0.375           | 0.625           | 1               | 1.5             | 2               | 3               |
| Max. Air Pressure (PSI)              | 100             | 100             | 100             | 100             | 100             | 100             |
| Max. Air Pressure (bars)             | 6.9             | 6.9             | 6.9             | 6.9             | 6.9             | 6.9             |
| Grip Force at 100 PSI (open) (lbs.)  | 1.8 @ L=.751"   | 6.0 @ L=1.0"    | 25 @ L=1.60"    | 59 @ L=1.0"     | 132 @ L=1.0"    | 368 @ L=1.0"    |
| Grip Force at 100 PSI (open) (kgs.)  | .82 @ L=19mm    | 2.72 @ L=25mm   | 11.34 @ L=25mm  | 26.76 @ L=25mm  | 59.87 @ L=25mm  | 166.9 @ L=25mm  |
| Grip Force @ 100 PSI (closed) (lbs.) | 1.6 @ L=.751"   | 5.1 @ L=1.0"    | 21 @ L=1.60"    | 53 @ L=1.0"     | 119 @ L=1.0"    | 346 @ L=1.0"    |
| Grip Force @ 100 PSI (closed) (kgs.) | .73 @ L=19mm    | 2.31 @ L=25mm   | 9.53 @ L=25mm   | 24.04 @ L=25mm  | 53.97 @ L=25mm  | 156.9 @ L=25mm  |
| Weight (lbs.) with JS1 Finger Jaw    | 0.09            | 0.22            | 0.61            |                 | NA              | NA              |
| Weight (kgs.) with JS1 Finger Jaw    | 0.04            | 0.10            | 0.28            |                 |                 |                 |
| Weight (lbs.) with JS2 Flush Jaw     | 0.11            | 0.26            | 0.62            | 1.52            | 3.5             | 8.1             |
| Weight (kgs.) with JS2 Flush Jaw     | 0.05            | 0.12            | 0.28            | 0.69            | 1.59            | 3.67            |
| Operating Temp. (°F) (Buna-N seals)  | 0° to 180°F     | 0° to 180°F     | 0° to 180°F     | 0° to 180°F     | 0° to 180°F     | 0° to 180°F     |
| Operating Temp. (°C) (Buna-N seals)  | "-18° to 82°C"  | "-18° to 82°C"  | "-18° to 82°C"  | "-18° to 82°C"  | "-18° to 82°C"  | "-18° to 82°C"  |
| Operating Temp.* (°F) (Viton® seals) | 0° to 240°F     | 0° to 240°F     | 0° to 240°F     | 0° to 240°F     | 0° to 240°F     | 0° to 240°F     |
| Operating Temp.* (°C) (Viton® seals) | "-18° to 116°C" | "-18° to 116°C" | "-18° to 116°C" | "-18° to 116°C" | "-18° to 116°C" | "-18° to 116°C" |
| Max. Breakaway (PSI)                 | 10              | 10              | 10              | 10              | 10              | 10              |
| Max. Breakaway (bars)                | 0.69            | 0.69            | 0.69            | 0.69            | 0.69            | 0.69            |
| Stroke                               | 20°             | 20°             | 20°             | 20°             | 20°             | 20°             |

\* 180°F (82°C) is the maximum operating temperature when using magnets. Therefore magnets should not be used with seals of Viton® material.

## CALCULATING GRIP FORCE OF ANGULAR GRIPPERS

Jaw opening grip force:

$$GF = \frac{(P - 10)}{L} \times J_o$$

Where:

GF = Grip force (lbs.)

P = Applied system pressure (PSI)

L = Distance from jaw pivot to point of applied force (In)

J<sub>o</sub> = Jaw opening multiplier constant (see chart)

J<sub>c</sub> = Jaw closing multiplier constant (see chart)

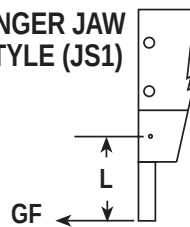
Jaw closing grip force:

$$GF = \frac{(P - 10)}{L} \times J_c$$

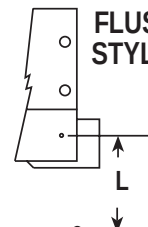
### MULTIPLIER CONSTANTS

|                | GPA038 | GPA063 | GPA100 | GPA150 | GPA200 | GPA300 |
|----------------|--------|--------|--------|--------|--------|--------|
| J <sub>o</sub> | .015   | .070   | .278   | .663   | 1.473  | 4.103  |
| J <sub>c</sub> | .013   | .057   | .239   | .589   | 1.328  | 3.847  |

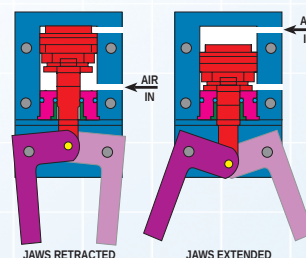
FINGER JAW  
STYLE (JS1)



FLUSH JAW  
STYLE (JS2)



## ANGULAR GRIPPER ACTUATION



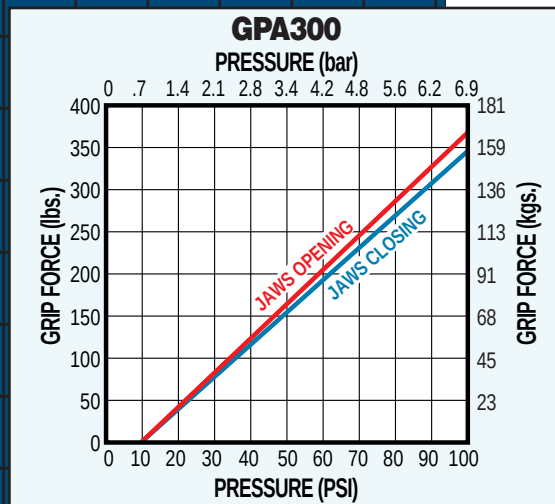
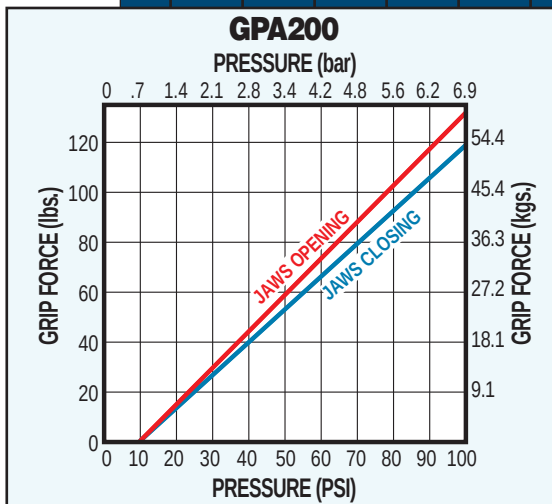
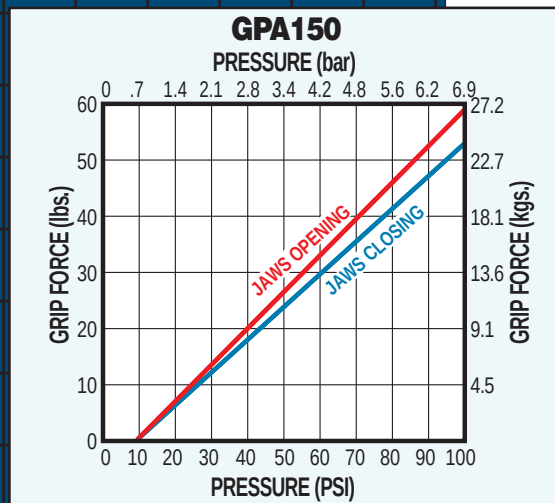
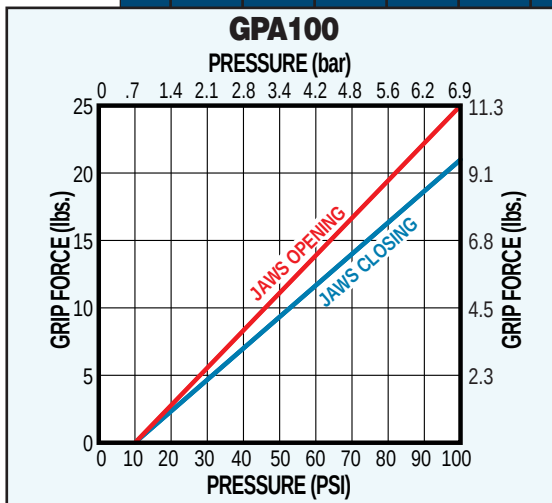
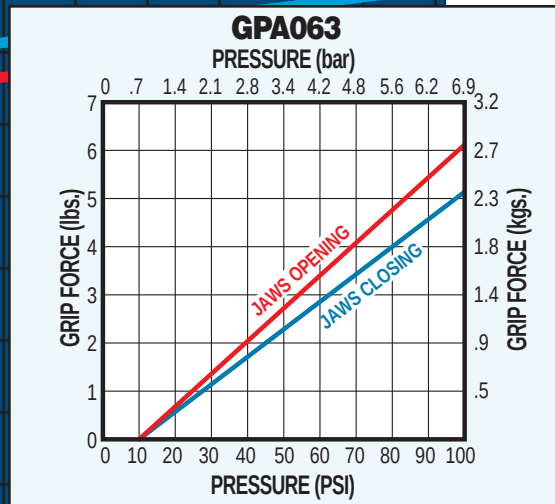
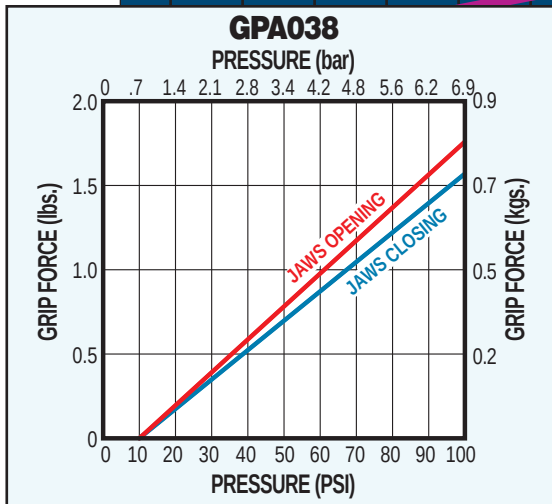




# ANGULAR GRIPPER

## PERFORMANCE DATA

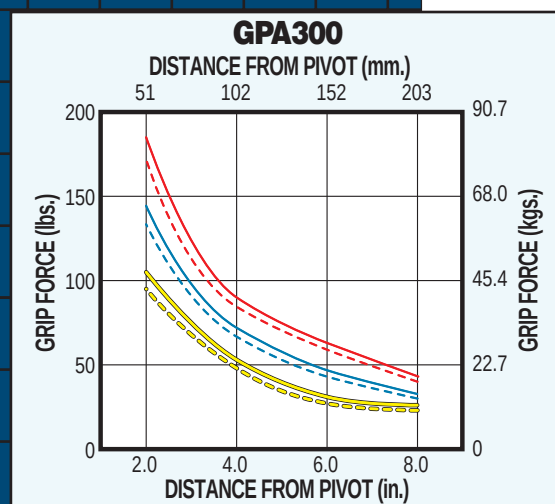
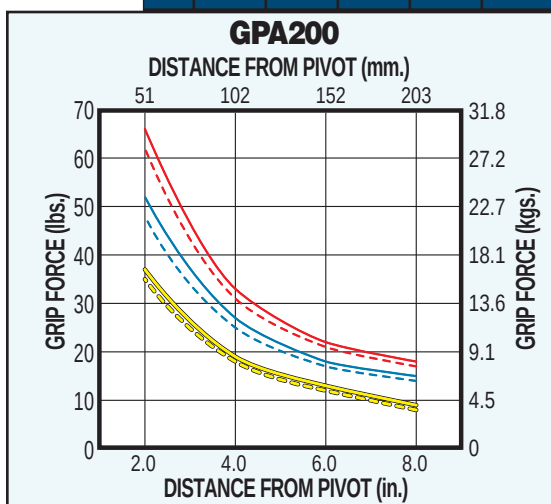
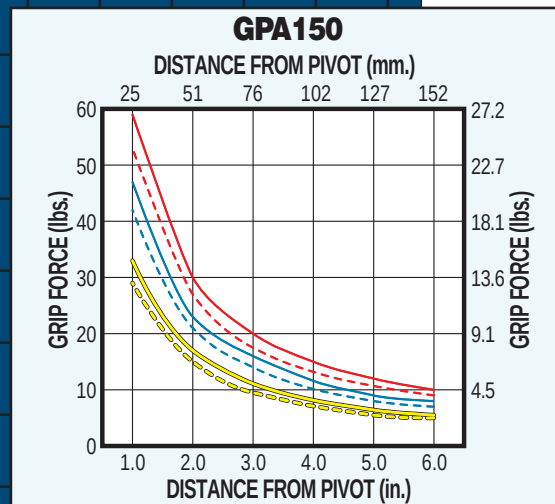
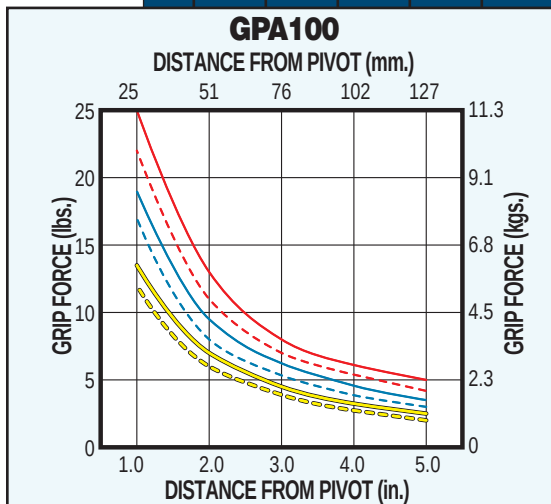
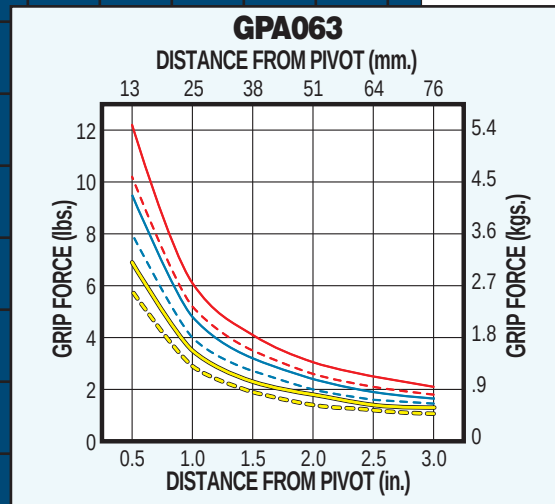
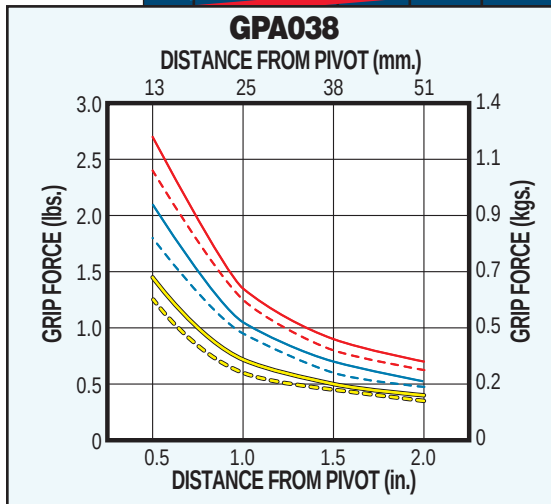
### GRIP FORCE vs PRESSURE



# ANGULAR GRIPPER

## PERFORMANCE DATA

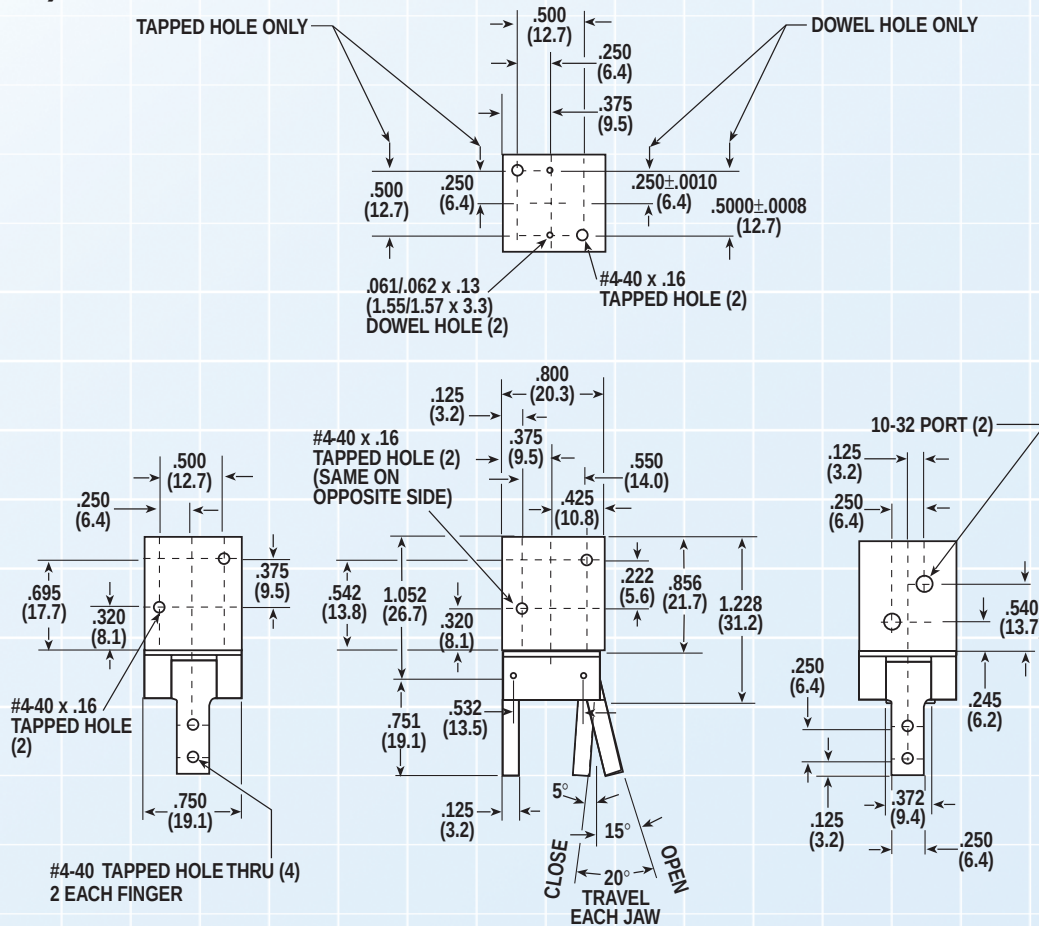
### GRIP FORCE vs LENGTH TO PIVOT



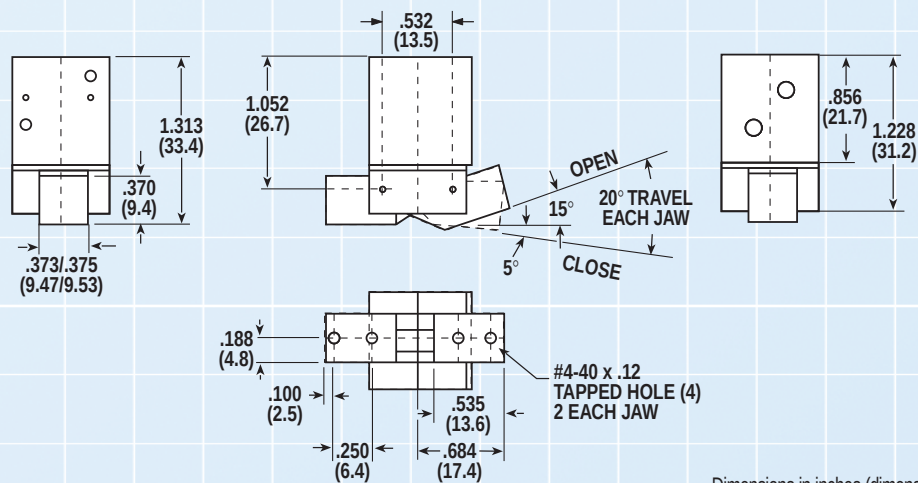
## DIMENSIONAL DATA

GP.EXE  
GP038.DWG  
GP038.DXF

### FINGER STYLE JAW (JS1)



### FLUSH STYLE JAW (JS2)

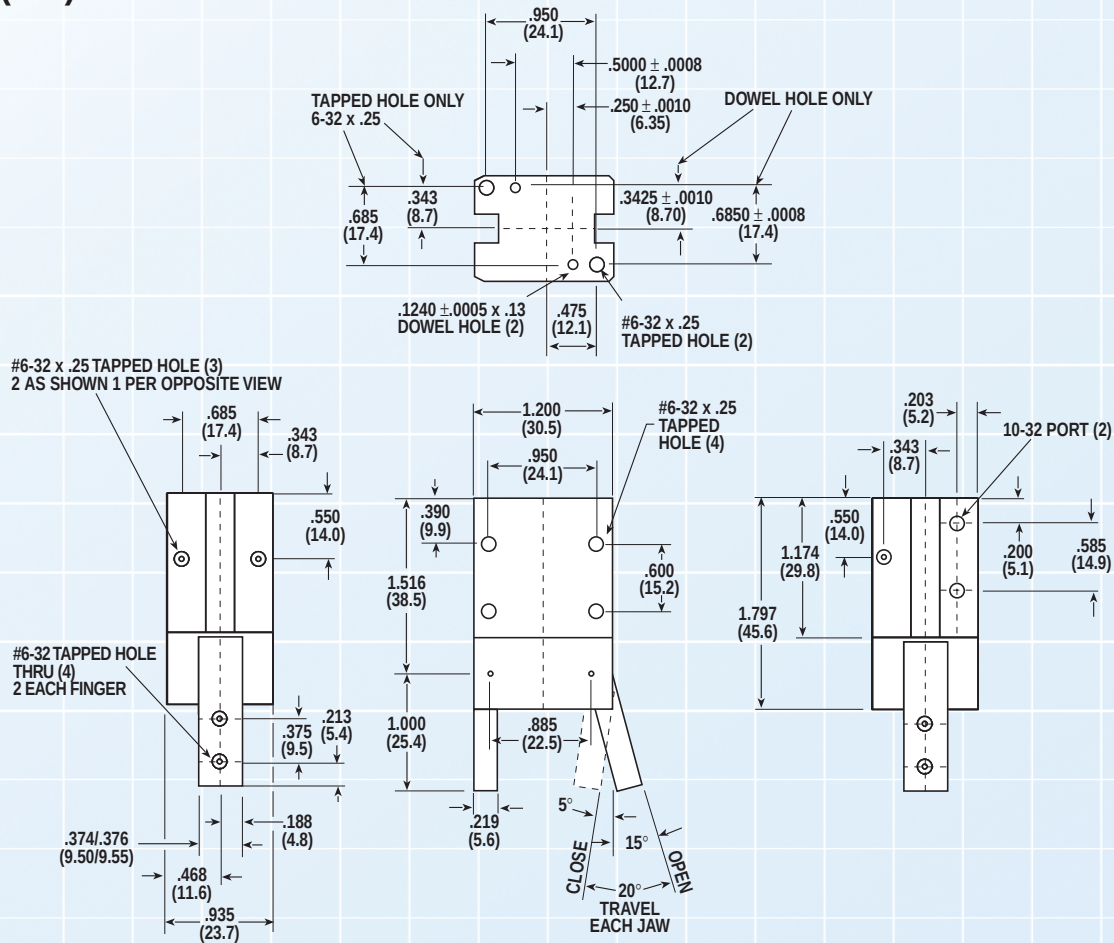


Dimensions in inches (dimensions in millimeters)

## DIMENSIONAL DATA

GP.EXE  
GP063.DWG  
GP063.DXF

### FINGER STYLE JAW (JS1)



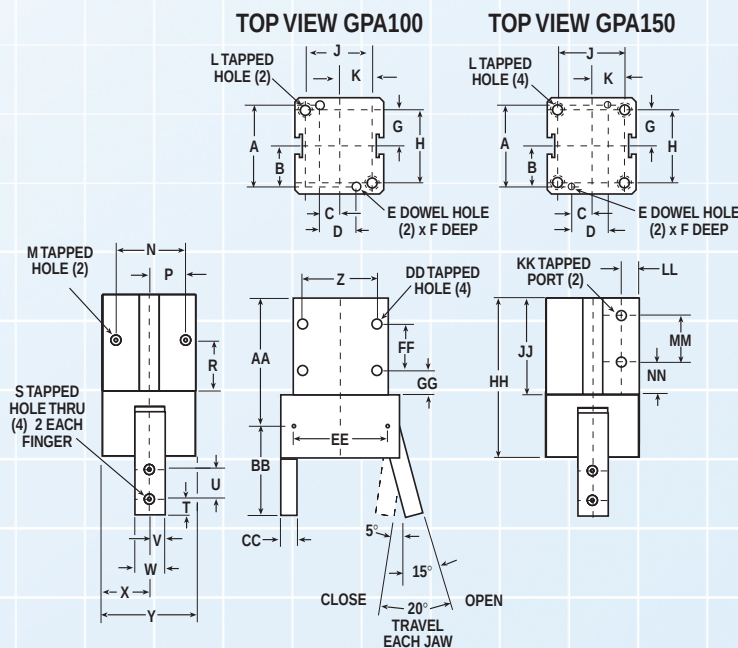


# GPA100 & GPA150

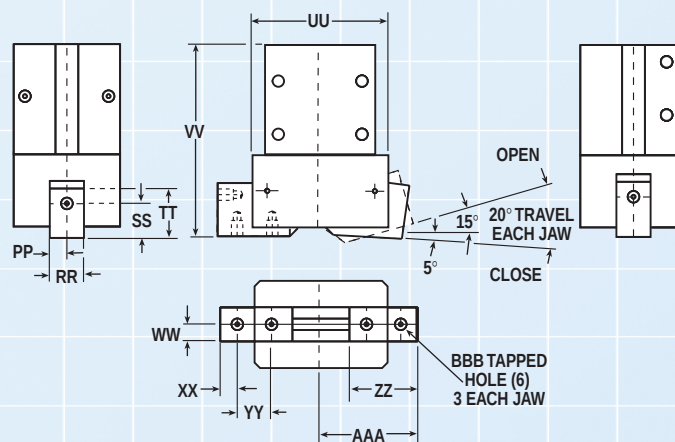
GP.EXE  
GP100.DWG  
GP100.DXF  
GP150.DWG  
GP150.DXF



## FINGER STYLE JAW (JS1)



## FLUSH STYLE JAW (JS2)



| GPA | 100                    | 150               |
|-----|------------------------|-------------------|
| A   | 1.115<br>± .0008       | 1.6<br>± .0008    |
| B   | 0.5575<br>± .0010      | 0.8<br>± .0010    |
| C   | 0.2875<br>± .0010      | 0.5<br>± .001     |
| D   | 0.575<br>± .0008       | 1<br>± .0008      |
| E   | .124 /<br>0.1255       | .1245 /<br>0.1235 |
| F   | 0.2                    | 0.25              |
| G   | 0.5                    | 0.75              |
| H   | 1                      | 1.5               |
| J   | 1                      | 1.5               |
| K   | 0.5                    | 0.75              |
| L   | #8-32 UNC<br>-2B x .22 | 10-32<br>x .38    |
| M   | #8-32 UNC<br>x .22     | NA                |
| N   | 1                      | NA                |
| P   | 0.5                    | NA                |
| R   | 0.75                   | NA                |
| S   | 10-24 x .28            | 1/4-28 UNF-2B     |
| T   | 0.312                  | 0.375             |
| U   | 0.625                  | 1                 |
| V   | 0.25                   | 0.375             |
| W   | .499/.501              | 0.75              |
| X   | 0.6875                 | 0.99              |
| Y   | 1.375                  | 1.98              |
| Z   | 1                      | 1.5               |
| AA  | 1.952                  | 2.637             |
| BB  | 1.6                    | 2                 |
| CC  | 0.33                   | 0.437             |
| DD  | #8-32 x .22            | 10-32 X .38       |
| EE  | 1.416                  | 1.5               |
| FF  | 0.875                  | 1                 |
| GG  | 0.313                  | 0.512             |
| HH  | 2.377                  | 3.075             |
| JJ  | 1.5                    | 2.012             |
| KK  | 10-32                  | 10-32             |
| LL  | 0.25                   | 0.615             |
| MM  | 0.75                   | 1.001             |
| NN  | 0.5                    | 0.676             |
| PP  | 0.25                   | 0.375             |
| RR  | 0.5                    | 0.75              |
| SS  | 0.625                  | 0.672             |
| TT  | 0.812                  | 0.859             |
| UU  | 1.875                  | 1.98              |
| VV  | 2.539                  | 3.215             |
| WW  | 0.25                   | 0.375             |
| XX  | 0.187                  | 0.311             |
| YY  | 0.5                    | 0.563             |
| ZZ  | 0.875                  | 1.103             |
| AAA | 1.25                   | 1.435             |
| BBB | 10-24 x .28            | 1/4-28 x .44      |

Dimensions in inches

Dimensions in millimeters

| GPA | 100                    | 150            |
|-----|------------------------|----------------|
| A   | 28.3<br>± .020         | 40.6<br>± .020 |
| B   | 14.2<br>± .025         | 20.3<br>± .025 |
| C   | 7.3<br>± .025          | 12.7<br>± .025 |
| D   | 14.6<br>± .020         | 25.4<br>± .020 |
| E   | 3.15/<br>3.2           | 3.16/<br>3.1   |
| F   | 5.1                    | 6.4            |
| G   | 12.7                   | 19.1           |
| H   | 25.4                   | 38.1           |
| J   | 25.4                   | 38.1           |
| K   | 12.7                   | 19.1           |
| L   | #8-32 UNC<br>-2B x .22 | 10-32<br>x .38 |
| M   | #8-32 UNC<br>x .22     | NA             |
| N   | 25.4                   | NA             |
| P   | 12.7                   | NA             |
| R   | 19.1                   | NA             |
| S   | 10-24 x .28            | 1/4-28 UNF-2B  |
| T   | 7.9                    | 9.5            |
| U   | 15.9                   | 25.4           |
| V   | 6.4                    | 9.5            |
| W   | 12.67/12.72            | 19.1           |
| X   | 17.5                   | 25.1           |
| Y   | 34.9                   | 50.3           |
| Z   | 25.4                   | 38.1           |
| AA  | 49.6                   | 67.0           |
| BB  | 40.6                   | 50.8           |
| CC  | 8.4                    | 11.1           |
| DD  | #8-32 x .22            | 10-32 X .38    |
| EE  | 36.0                   | 38.1           |
| FF  | 22.2                   | 25.4           |
| GG  | 8.0                    | 13.0           |
| HH  | 60.4                   | 78.1           |
| JJ  | 38.1                   | 51.1           |
| KK  | 10-32                  | 10-32          |
| LL  | 6.4                    | 15.6           |
| MM  | 19.1                   | 25.4           |
| NN  | 12.7                   | 17.2           |
| PP  | 6.4                    | 9.5            |
| RR  | 12.7                   | 19.1           |
| SS  | 15.9                   | 17.1           |
| TT  | 20.6                   | 21.8           |
| UU  | 47.6                   | 50.3           |
| VV  | 64.5                   | 81.7           |
| WW  | 6.4                    | 9.5            |
| XX  | 4.7                    | 7.9            |
| YY  | 12.7                   | 14.3           |
| ZZ  | 22.2                   | 28.0           |
| AAA | 31.8                   | 36.4           |
| BBB | 10-24 x .28            | 1/4-28 x .44   |



# GRIPPERS

GP.EXE  
GP200.DWG  
GP200.DXF  
GP300.DWG  
GP300.DXF

Dimensions in inches

Dimensions in millimeters

Technical drawing of a 2-jaw V-block chuck, showing three views: Top View, Front View, and Side View.

**Top View:**

- U TAPPED HOLE (4)
- G DOWEL HOLE (2) x H DEEP
- Dimensions: C, D, B, A, E, E/2, F, F/2

**Front View:**

- U TAPPED HOLE (4)
- Dimensions: HH, R, R/2, V, W, S, T
- OPEN position (15° travel each jaw)
- CLOSE position (5° travel each jaw)

**Side View:**

- GG PORT (2)
- Dimensions: X, Y, Z, AA

**Bottom View:**

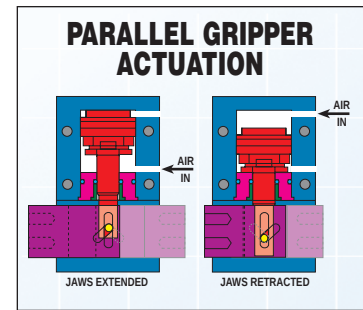
- BB TAPPED HOLE (6) 3 EACH JAW
- Dimensions: M/2, CC, DD, EE, EE/2, FF

# PARALLEL GRIPPERS



Tol-O-Matic parallel style grippers are available in 3/8", 5/8", 1", 1-1/2", 2" and 3" bore sizes. Larger bore sizes of 1-1/2", 2" and 3", utilize ball bearings on harden steel rails in the jaw mechanism for reduced jaw friction and longer life.

Under normal operating conditions, these parallel grippers have a life expectancy of 10 million cycles.



| OVERALL MODEL SPECIFICATIONS          |         |         |         |         |         |         |
|---------------------------------------|---------|---------|---------|---------|---------|---------|
|                                       | GPP038  | GPP063  | GPP100  | GPP150  | GPP200  | GPP300  |
| Bore Size (in.)                       | .375    | .625    | 1.00    | 1.50    | 2.00    | 3.00    |
| Max. Air Pressure (PSI)*              | 100     | 100     | 100     | 100     | 100     | 100     |
| Grip Force at 100 PSI (open) (lbs.)   | 3.1     | 8.1     | 21.2    | 49.5    | 95.7    | 208.7   |
| Grip Force at 100 PSI (closed) (lbs.) | 3.4     | 9.63    | 24.7    | 55.6    | 105.6   | 238.5   |
| Weight (lbs.)                         | .09     | .24     | .63     | 2.54    | 6.5     | 13.3    |
| Operating Temp. (°F) (Buna-N Seals)   | 0°-180° | 0°-180° | 0°-180° | 0°-180° | 0°-180° | 0°-180° |
| Operating Temp. (°F) (Seals of Viton) | 0°-240° | 0°-240° | 0°-240° | 0°-240° | 0°-240° | 0°-240° |
| Max. Breakaway (PSI)                  | 10      | 10      | 10      | 10      | 10      | 10      |
| Stroke per Jaw (in.)                  | .125    | .125    | .200    | .250    | .34     | .500    |
| Total Stroke (in.)                    | .250    | .250    | .400    | .500    | .70     | 1.00    |

| OVERALL MODEL SPECIFICATIONS (METRIC) |             |             |             |             |             |             |
|---------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                       | GPP038      | GPP063      | GPP100      | GPP150      | GPP200      | GPP300      |
| Bore Size (in.)                       | 0.375"      | 0.625"      | 1.00"       | 1.50"       | 2.00"       | 3.00"       |
| Max. Air Pressure (bars)*             | 6.9         | 6.9         | 6.9         | 6.9         | 6.9         | 6.9         |
| Grip Force at 100 PSI (open) (kgs.)   | 1.4         | 3.7         | 9.6         | 22.5        | 43.4        | 94.7        |
| Grip Force at 100 PSI (closed) (kgs.) | 1.5         | 4.4         | 11.2        | 25.2        | 47.9        | 108.2       |
| Weight (kgs.)                         | 0.04        | 0.11        | 0.29        | 1.15        | 2.95        | 6.03        |
| Operating Temp. (°C) (Buna-N Seals)   | -18° to 82° | -18° to 82° | -18° to 82° | -18° to 82° | -18° to 82° | -18° to 82° |
| Operating Temp. (°C) (Seals of Viton) | -18 to 116° | -18 to 116° | -18 to 116° | -18 to 116° | -18 to 116° | -18 to 116° |
| Max. Breakaway (bars)                 | 0.69        | 0.69        | 0.69        | 0.69        | 0.69        | 0.69        |
| Stroke per Jaw (mm.)                  | 3.18        | 3.18        | 5.08        | 6.35        | 8.89        | 12.70       |
| Total Stroke (mm.)                    | 6.35        | 6.35        | 10.16       | 12.70       | 17.78       | 25.40       |

\* 180°F (82°C) is the maximum operating temperature when using magnets. Therefore magnets should not be used with the seals of Viton® material.

## CALCULATING GRIP FORCE OF PARALLEL GRIPPERS

Jaw opening grip force:

$$GF = (P - 10) \times J_o$$

Where:

GF = Grip force (lbs.)

P = Applied system pressure (PSI)

Jaw closing grip force:

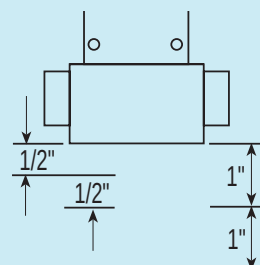
$$GF = (P - 10) \times J_c$$

$J_o$  = Jaw opening multiplier constant (see chart)

$J_c$  = Jaw closing multiplier constant (see chart)

| MULTIPLIER CONSTANTS |        |        |        |        |        |        |
|----------------------|--------|--------|--------|--------|--------|--------|
|                      | GPP038 | GPP063 | GPP100 | GPP150 | GPP200 | GPP300 |
| $J_o$                | .034   | .090   | .236   | .550   | 1.052  | 2.319  |
| $J_c$                | .038   | .107   | .274   | .618   | 1.173  | 2.650  |

NOTE: For models GPP038 and GPP063, reduce grip force by 20% for each additional 1/2" (12.7mm) from jaw face. For models GPP100, GPP150, GPP200 and GPP300 reduce grip force by 20% for each additional 1" (25.4mm) from jaw face.



### PARALLEL GRIPPER OPTIONS

SEALS OF VITON® MATERIAL SWITCHES..... 214

APPLICATION GUIDELINES .. 241

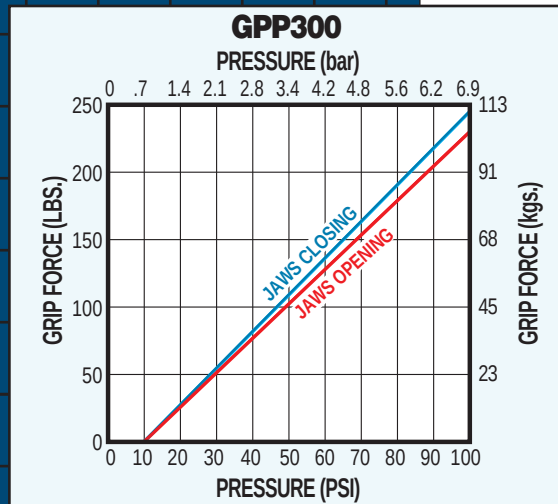
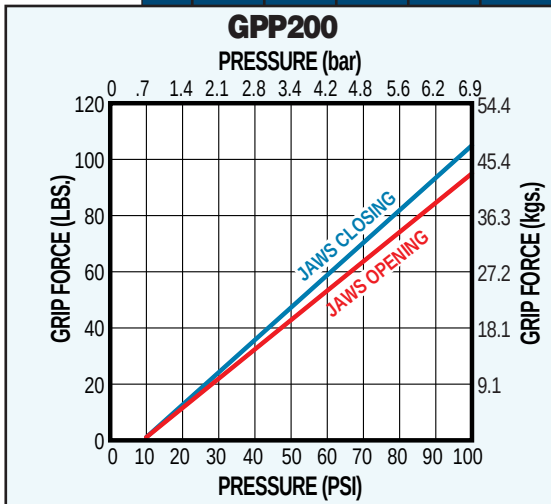
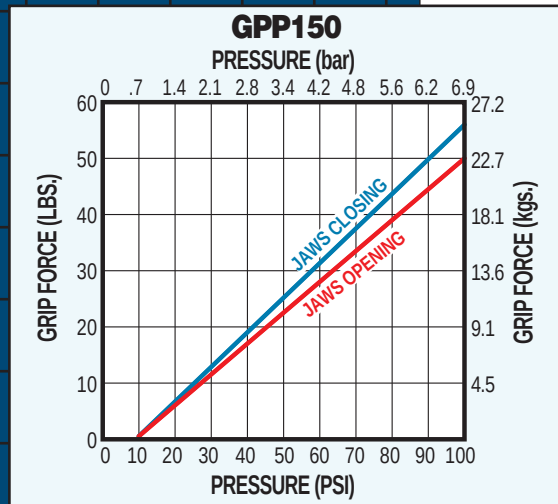
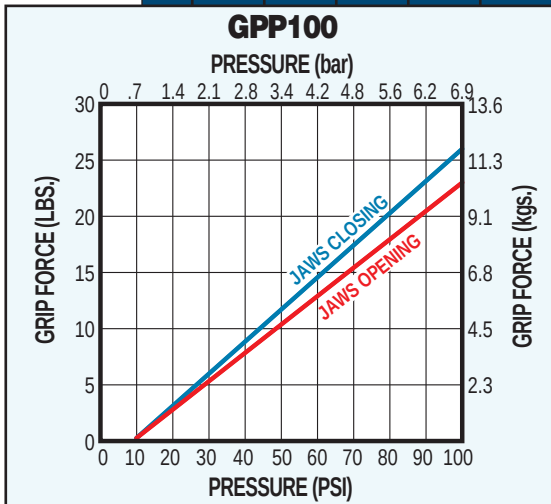
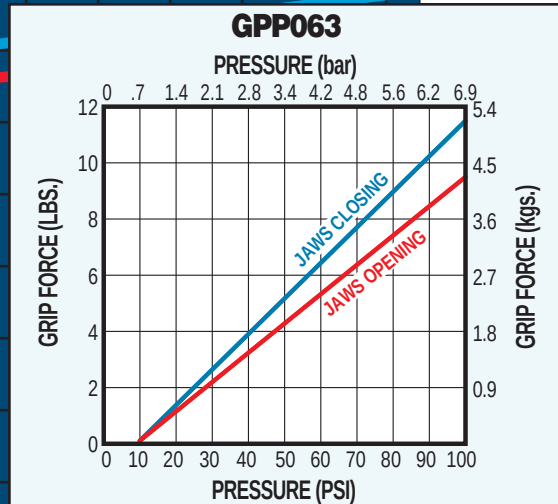
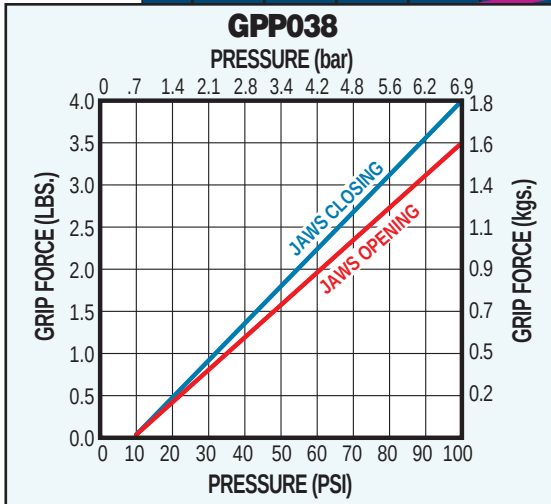
ORDERING ..... 195

SELECTION..... 196

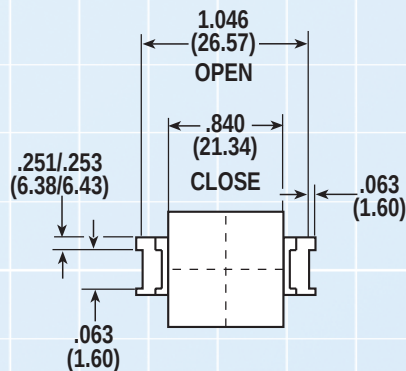
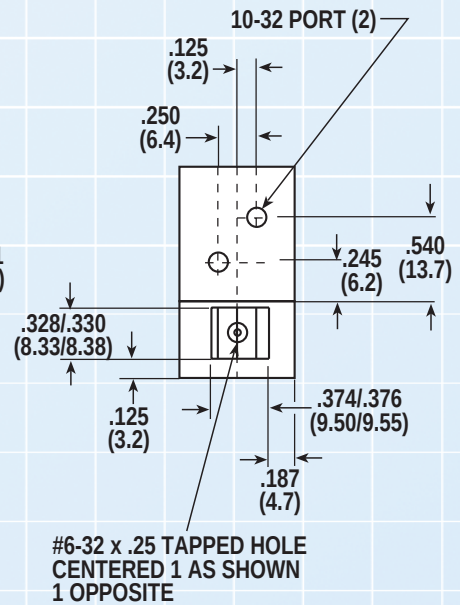
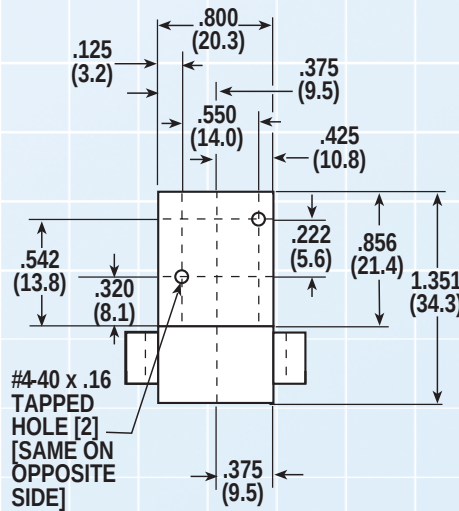
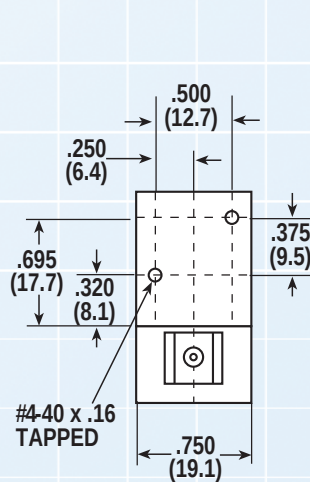
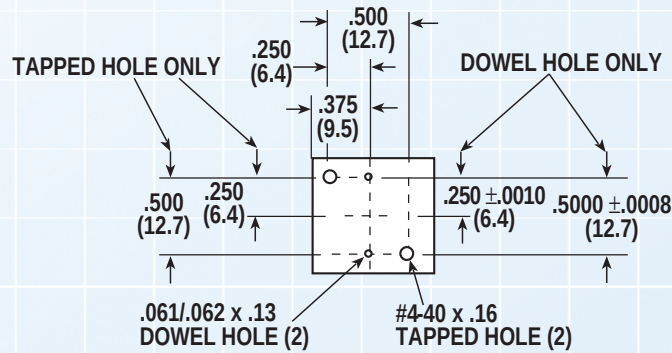
# PARALLEL GRIPPER

## PERFORMANCE DATA

### GRIP FORCE vs PRESSURE



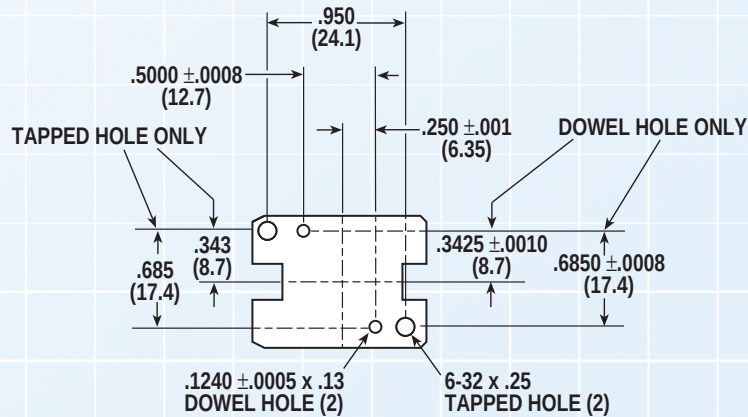
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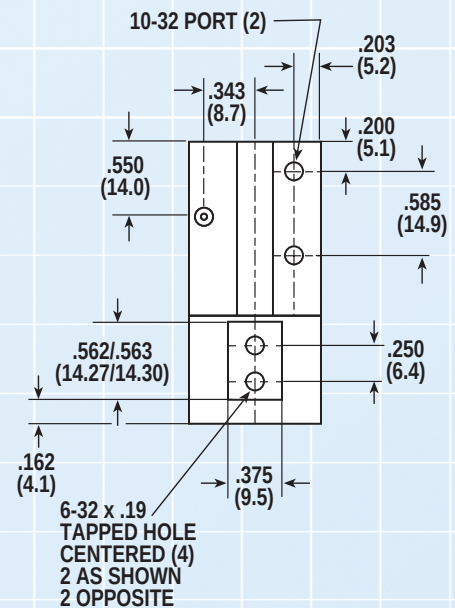
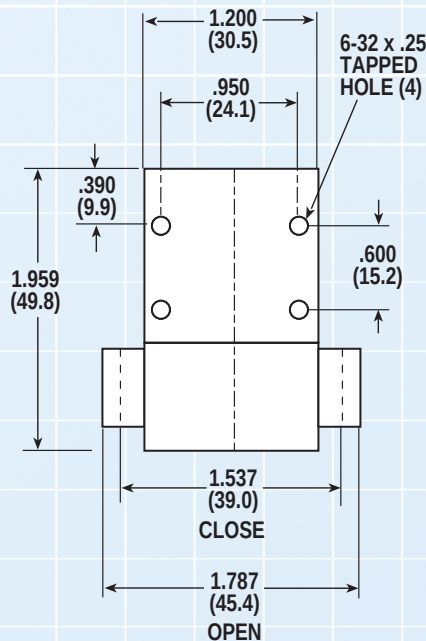
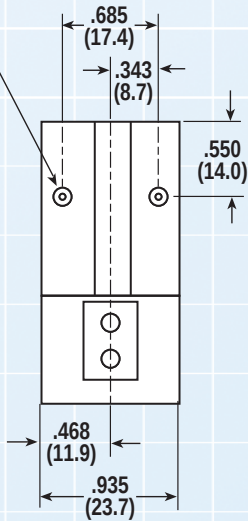
Dimensions in inches (Dimensions in millimeters)



## DIMENSIONAL DATA



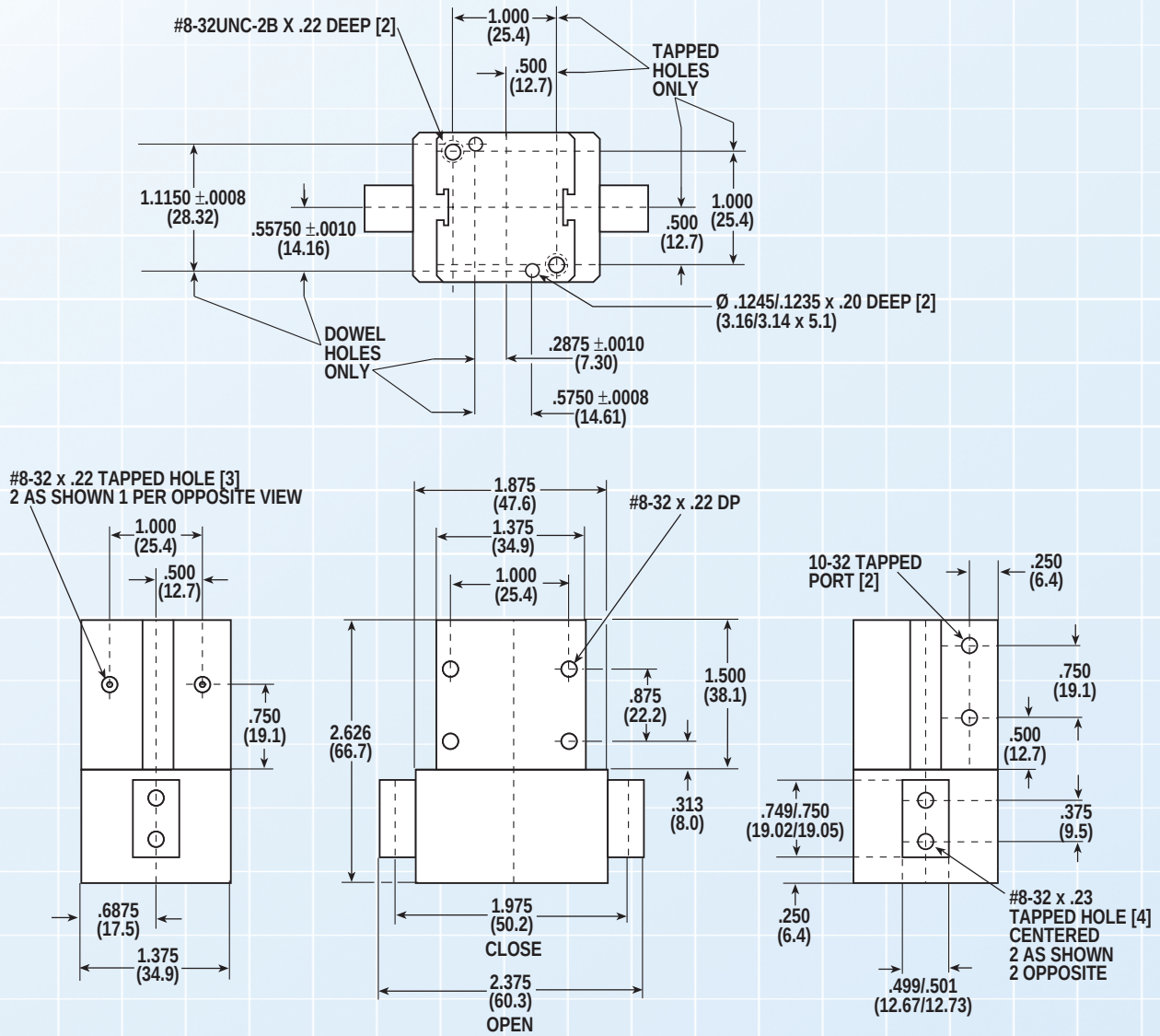
6-32 x .25 TAPPED HOLE (3)  
2 AS SHOWN 1 PER OPPOSITE VIEW



Dimensions in inches (Dimensions in millimeters)

For Assistance Call  
1-800-328-2174  
(Toll Free U.S. and Canada)  
or  
763-478-8000  
Fax 763-478-8080

## DIMENSIONAL DATA

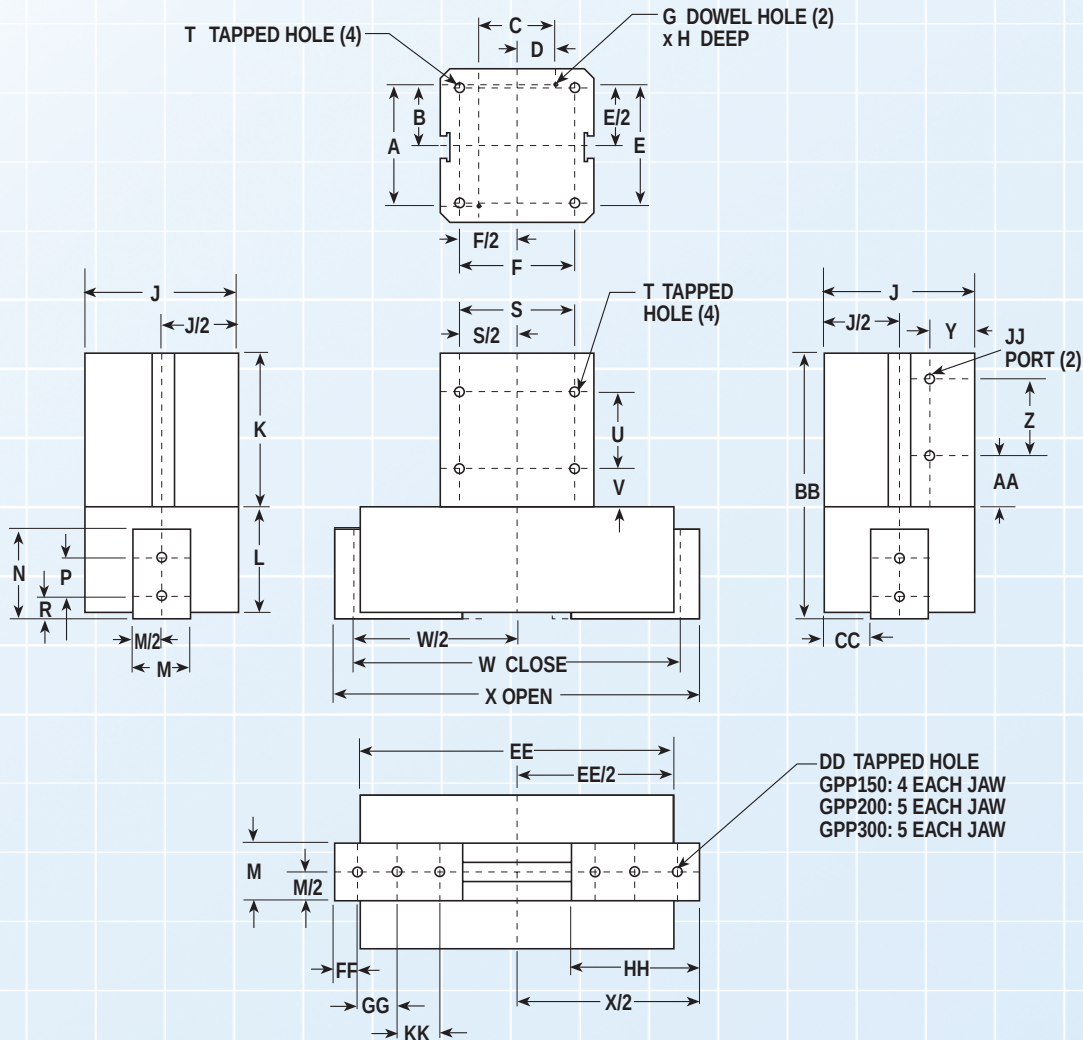


Dimensions in inches (Dimensions in millimeters)

# GPP150, GPP200, GPP300

## DIMENSIONAL DATA

GP.EXE  
GP150.DWG  
GP150.DXF  
GP200.DWG  
GP200.DXF  
GP300.DWG  
GP300.DXF



| MODEL  | A                | B              | C                | D             | E     | F     | G              | H    | J     | K     | L     | M     | N     | P    | R    | S     | T                 | U     | V    | W     | X     | Y     | Z     | AA    | BB    | CC    | DD               | EE    | FF   | GG    | HH    | JJ     | KK    |
|--------|------------------|----------------|------------------|---------------|-------|-------|----------------|------|-------|-------|-------|-------|-------|------|------|-------|-------------------|-------|------|-------|-------|-------|-------|-------|-------|-------|------------------|-------|------|-------|-------|--------|-------|
| GPP150 | 1.6000<br>±.0008 | .800<br>±.001  | 1.0000<br>±.0008 | .500<br>±.001 | 1.500 | 1.500 | .1250<br>1.240 | .250 | 1.980 | 2.012 | 1.390 | .750  | 1.170 | .500 | .295 | 1.500 | 10-32<br>x .38"   | 1.000 | .512 | 4.245 | 4.745 | .615  | 1.011 | .676  | 3.467 | .615  | 10-32<br>x .50"  | 4.125 | .500 | .625  | 1.652 | 10-32  | NA    |
| GPP200 | 2.1000<br>±.0008 | 1.050<br>±.001 | 1.1000<br>±.0008 | .550<br>±.001 | 1.960 | 1.960 | .2490<br>2.500 | .375 | 2.480 | 2.393 | 1.523 | .693  | 1.048 | .437 | .313 | 1.960 | 1/4-28<br>x .38"  | .800  | .865 | 5.986 | 6.664 | .615  | 1.100 | .834  | 3.968 | .893  | 1/4-28<br>x .38" | 5.916 | .574 | .700  | 2.321 | 1/8-27 | .700  |
| GPP300 | 3.0000<br>±.0008 | 1.500<br>±.001 | 1.8130<br>±.0008 | .906<br>±.001 | 2.750 | 2.750 | .2490<br>2.500 | .375 | 3.500 | 3.550 | 1.960 | 1.040 | 1.592 | .544 | .689 | 2.750 | 5/16-18<br>x .50" | 1.500 | .900 | 8.996 | 9.996 | 1.000 | 1.625 | 1.320 | 5.662 | 1.230 | 3/8-16<br>x .62" | 8.874 | .943 | 1.000 | 3.559 | 1/8-27 | 1.000 |

Dimensions in inches

| MODEL  | A               | B              | C               | D              | E     | F     | G              | H    | J     | K     | L     | M     | N     | P     | R    | S     | T                 | U     | V     | W      | X      | Y     | Z     | AA    | BB    | CC    | DD               | EE     | FF    | GG    | HH    | JJ     | KK    |
|--------|-----------------|----------------|-----------------|----------------|-------|-------|----------------|------|-------|-------|-------|-------|-------|-------|------|-------|-------------------|-------|-------|--------|--------|-------|-------|-------|-------|-------|------------------|--------|-------|-------|-------|--------|-------|
| GPP150 | 40.640<br>±.020 | 20.32<br>±.025 | 25.400<br>±.020 | 12.70<br>±.025 | 38.10 | 38.10 | 3.175<br>3.150 | 6.35 | 50.29 | 51.10 | 35.31 | 19.05 | 29.72 | 12.70 | 7.49 | 38.10 | 10-32<br>x .38"   | 25.40 | 13.00 | 107.82 | 120.52 | 15.62 | 25.68 | 17.17 | 88.06 | 15.62 | 10-32<br>x .50"  | 104.78 | 12.70 | 15.88 | 41.96 | 10-32  | NA    |
| GPP200 | 53.340<br>±.020 | 26.67<br>±.025 | 27.940<br>±.020 | 13.97<br>±.025 | 49.78 | 49.78 | 6.325<br>6.350 | 9.53 | 62.99 | 60.78 | 38.68 | 17.6  | 26.62 | 11.10 | 7.95 | 49.8  | 1/4-28<br>x .38"  | 20.3  | 21.97 | 152.04 | 169.3  | 15.6  | 27.9  | 21.2  | 100.8 | 22.7  | 1/4-28<br>x .38" | 150.27 | 14.58 | 17.78 | 58.95 | 1/8-27 | 17.78 |
| GPP300 | 76.200<br>±.020 | 38.10<br>±.025 | 46.050<br>±.020 | 23.01<br>±.025 | 69.85 | 69.85 | 6.325<br>6.350 | 9.53 | 88.90 | 90.17 | 49.78 | 26.4  | 40.44 | 13.8  | 17.5 | 69.9  | 5/16-18<br>x .50" | 38.1  | 22.9  | 228.5  | 253.9  | 25.4  | 41.3  | 33.5  | 143.8 | 31.2  | 3/8-16<br>x .62" | 225.4  | 23.95 | 25.4  | 90.4  | 1/8-27 | 25.40 |

Dimensions in millimeters

# GRIPPER - ORDERING

## CONFIGURATOR EXAMPLE

### MODEL, BORE, AND JAW STYLE

|       |       |       |
|-------|-------|-------|
| 1.    | 2.    | 3.    |
| G P A | 0 6 3 | J S 2 |

### ACCESSORIES AND OPTIONS

|    |       |
|----|-------|
| 4. | 5.    |
|    | K X 1 |

The above example describes an Angular Gripper with  $\frac{5}{8}$ " (0.625 in.) bore and Jaw Style Two (Flush). Optional items are one Hall-effect (Sinking) Quick Disconnect Switch with 5 meter lead.

Boxes above represent the number of fields available for each section and not all of them will be used in every application. Omit empty boxes when you construct your configurator number (placeholders are not required). For the above example, the order string as it is typed would appear as follows:

**GPA063JS2KZ1.**

### 1. MODEL TYPE

Enter:

**GPA** for Angular Gripper

**GPP** for Parallel Gripper

### 2. BORE SIZE

Enter:

**038** for  $\frac{3}{8}$ " (0.375 in.)      **063** for  $\frac{5}{8}$ " (0.625 in.)

**100** for 1.00 in.      **150** for  $1\frac{1}{2}$ " (1.5 in.)

**200** for 2.00 in.      **300** for 3.0 in.

### 3. JAW STYLE (Must Choose One)

Enter:

**JS1** for Angular Jaw Style One (Finger)\*

**JS2** for Angular Jaw Style Two (Flush).

**JS3** for Parallel Jaw Style Three (Flush).

\* JS1 not available on 2" and 3" bore angular grippers.

### 4. SEALS

Enter:

Leave blank for standard Buna N

**V** for Viton®.

(Seals of Viton® material are not available when ordering switches)

### 5. SWITCHES

Enter:

**BY** for Form C Reed Switch 5-meter lead.

**BX** for Form C Reed Switch 5-meter lead Quick-disconnect

**RY** for Form A Reed Switch 5-meter lead.

**RX** for Form A Reed Switch 5-meter lead Quick-disconnect

**CY** for AC Triac Reed Switch 5-meter lead.

**CX** for AC Triac Reed Switch 5-meter lead Quick-disconnect

**KY** for Hall-effect (Sinking) 5-meter lead.

**KX** for Hall-effect (Sinking) 5-meter lead Quick-disconnect

**TY** for Hall-effect (Sourcing) 5-meter lead.

**TX** for Hall-effect (Sourcing) 5-meter lead Quick-disconnect

Enter:

Number of switches in third box.

When ordered with any actuator, all options and accessories listed will be factory installed unless specified. For special model and option requirements not shown, consult Tol-O-Matic, Inc.

**NOTE:** Only Universal Mini Hall-effect switches are available for  $\frac{3}{8}$ ",  $\frac{5}{8}$ " and 1" bore Grippers

For the available field retrofit options and accessories, refer to kit listings on page 210 for part numbers.





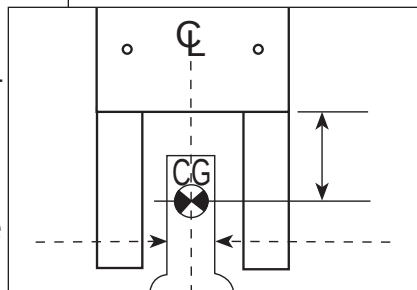
# SELECTION GP

Grippers are used to move a multitude of various shaped objects in different sizes and weights. As a result, many factors need to be considered when choosing the right gripper for an application.

Movement, speeds, rotational speeds, center of gravity and inertias of the gripper, as well as the part it will be moving, all play a role in the selection process. When choosing a gripper, the following guidelines should be considered.

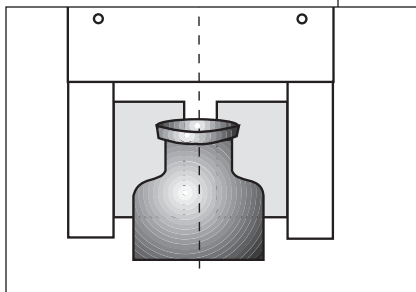
## 1. THE CENTER OF GRAVITY

The center of gravity of the part to be gripped should be on or as close to the center line of the gripper's bore axis as possible. The center of gravity of the part to be gripped should also be between the grip point of the jaws, as close to the gripper body as possible.



## 2. DETERMINE GRIPPER JAW AND FINGER SHAPE

Gripper jaws and finger tooling should conform to the shape of the part as closely as possible, particularly if the center of gravity is outside the grip point of the jaws.



## 3. DETERMINE THE GRIPPER JAW/FINGER COEFFICIENT OF FRICTION

Jaw/finger attachments should be of a material that will provide a high coefficient of friction when in contact with the part it will be moving.

For example steel finger tooling picking up a steel part has a low coefficient of friction (0.3). In contrast, rubber material in contact with steel has a coefficient of 1.0.

## 4. SAFETY FACTORS

Applying a safety factor will assure the grip force is adequate for the conditions of the application. Refer to the chart below for general guidelines in determining safety factor values. These should be used only as guidelines. For critical applications, please consult the factory for additional technical assistance regarding safety factors.

Review the 6 categories listed and assign a safety value for each (1, 2 or 3) if applicable to your application. Then take the sum of all values assigned, times the load weight to determine grip force required. Consult the grip force calculations on page 182 and 183, or grip force performance charts on pages 183, 184 and 190, for appropriate gripper model.

| GENERAL SAFETY FACTOR GUIDELINES |                                            |                                        |                                                        |                                              |                                  |                                   |
|----------------------------------|--------------------------------------------|----------------------------------------|--------------------------------------------------------|----------------------------------------------|----------------------------------|-----------------------------------|
| Safety Value                     | 1. Center of Gravity of Load               | 2. Conformation of Jaw Profile to Part | 3. Coefficient of Friction Between Jaw/Finger and Part | 4. Linear Movement of Gripper (jaw position) | 5. Rotation of Part 180° (speed) | 6. Deceleration of Gripper Travel |
| 1                                | Center of axis, grip distance 1" or less   | Totally conforming                     | HIGH<br>Rubber on Steel = 1                            | Jaws inline with travel                      | SLOW<br>5 seconds or more        | Shock absorber or cushion         |
| 2                                | Center of axis, grip distance more than 1" | Semi-conforming                        | MEDIUM<br>Plastic on Steel                             | —                                            | MEDIUM<br>2-1/2 to 5 seconds     | Bumper                            |
| 3                                | Center of gravity outside of center axis   | Non-conforming                         | LOW<br>Steel on Steel = .3                             | Jaws 90° of inline                           | FAST<br>2-1/2 seconds or less    | Hard stop                         |

For Assistance Call  
1-800-328-2174  
(Toll Free U.S. and Canada)  
or  
763-478-8000  
Fax 763-478-8080