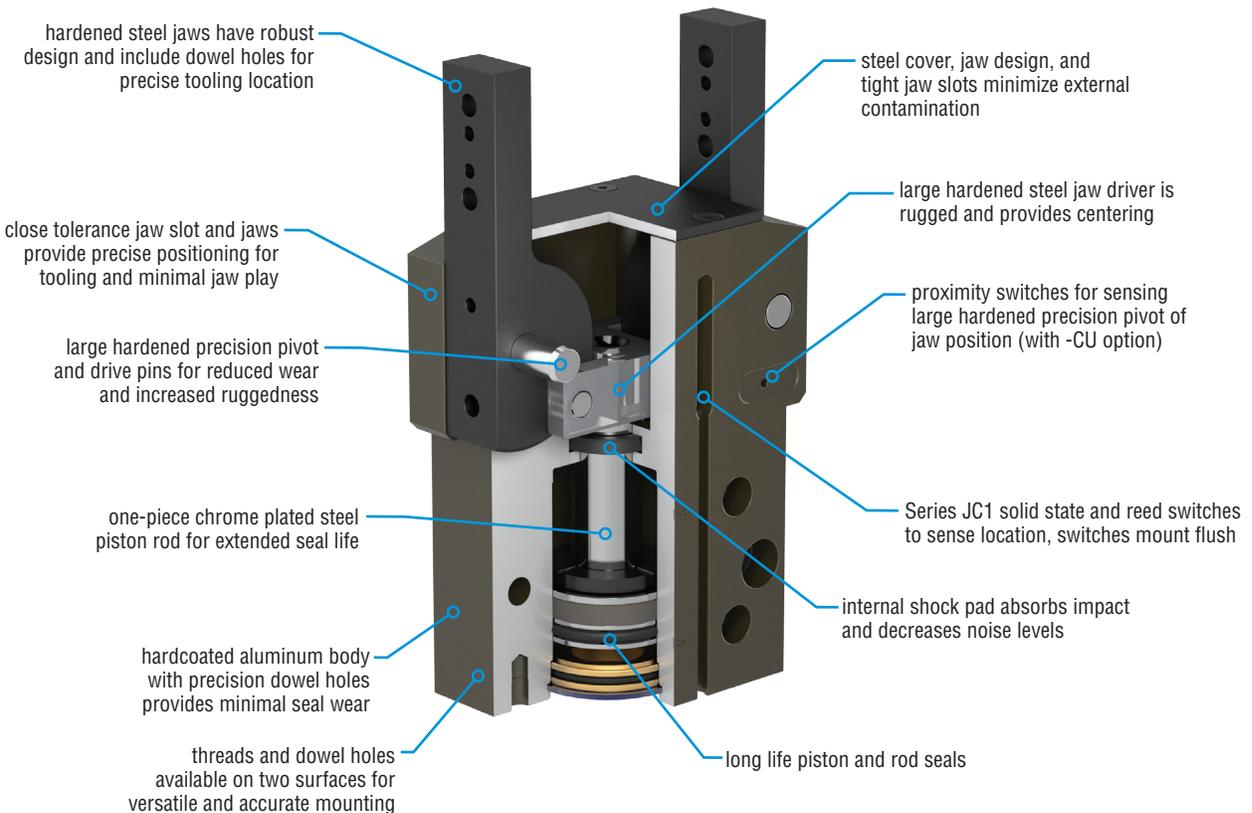


GRB

Major Benefits

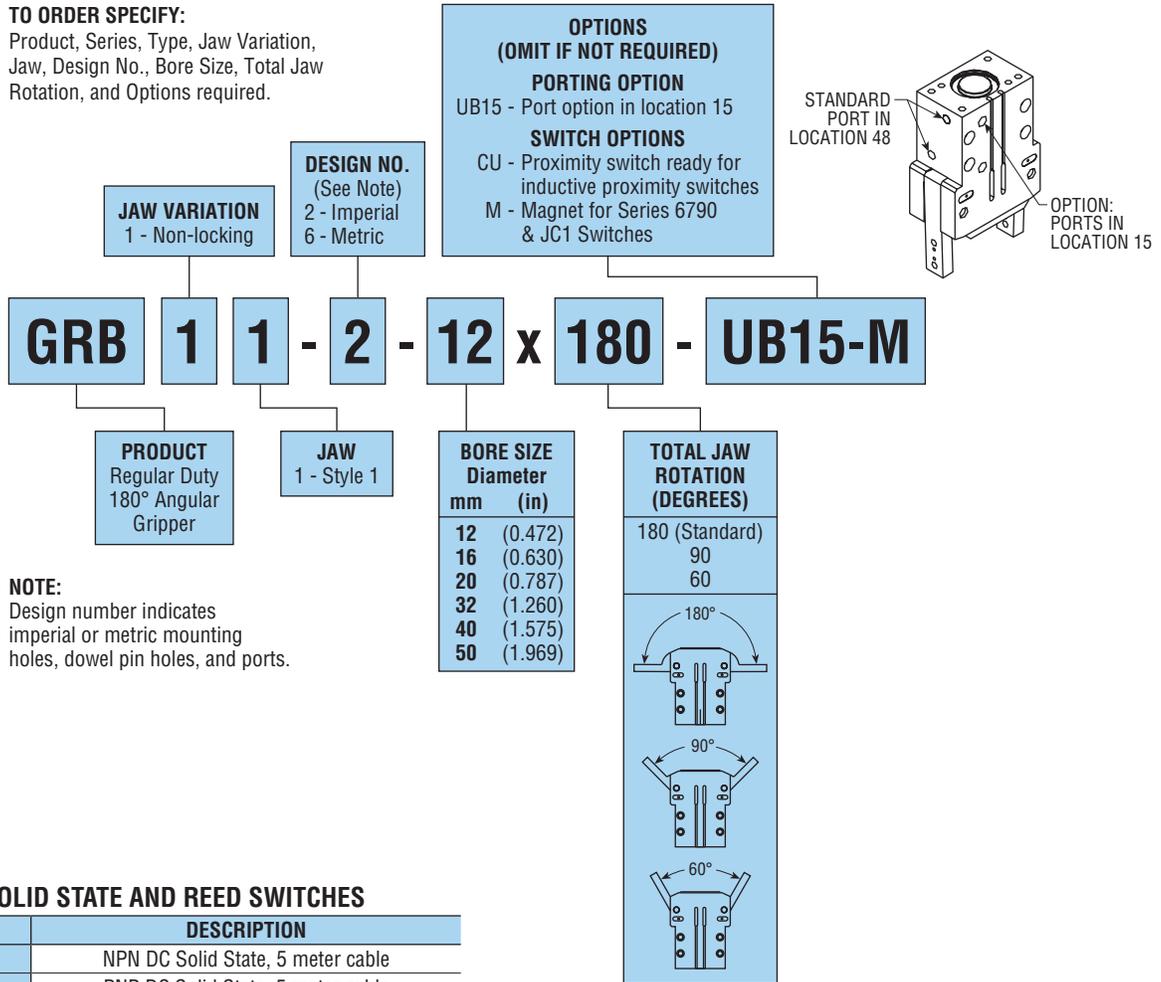
- Jaws rotate completely clear of work area eliminating an otherwise required axis of travel
- Three standard jaw rotations available: 60°, 90°, and 180°
- One piece body minimizes jaw play
- Internal speed restriction removes the need for external speed controls in standard applications
- All units incorporate twin switch slots for flush switch mounting
- Two mounting surfaces
- Six sizes available
- 5 million cycles minimum rated life



ORDERING DATA: Series GRB Grippers

TO ORDER SPECIFY:

Product, Series, Type, Jaw Variation, Jaw, Design No., Bore Size, Total Jaw Rotation, and Options required.



JC1 SOLID STATE AND REED SWITCHES

JC1 SWITCH	DESCRIPTION
JC1SDN-5	NPN DC Solid State, 5 meter cable
JC1SDP-5	PNP DC Solid State, 5 meter cable
JC1SDN-K	NPN DC Solid State, Quick Connect
JC1SDP-K	PNP DC Solid State, Quick Connect
JC1RDU-5	PNP or NPN DC Reed, 5 meter cable
JC1RDU-K	PNP or NPN DC Reed, Quick Connect
JC1ADU-K	AC Reed, Quick Connect

NOTE: For additional switch information, go to phdinc.com. Switches must be ordered separately.

JC1 SOLID STATE AND REED CORDSETS

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 meter cable
63549-05	M8, 3 pin, Straight Female Connector, 5 meter cable
81284-1-010	M12, 3 pin, Straight Female Connector, 2 meter cable

NOTE: Cordsets are ordered separately.

4 mm ROUND INDUCTIVE PROXIMITY SWITCHES

PART NO.	DESCRIPTION
18430-001-02	NPN (Sink) 2 meter cable
18430-002-02	PNP (Source) 2 meter cable

INDUCTIVE PROXIMITY SWITCH MOUNTING KITS FOR -CU OPTION

SIZE	KIT NO.
12	18074
16	18090
20	18075
32	18091
40	18091
50	18091

Each kit includes 1 target, 1 switch mounting bracket, and fasteners for mounting. Switches sold separately.



Options may affect unit length. See dimensional pages and option information details.

CAD & Sizing Assistance

Use PHD's free online Product Sizing and CAD Configurator at phdinc.com/myphd

ENGINEERING DATA: Series GRB Grippers

SPECIFICATIONS	SERIES GRB
OPERATING PRESSURE STANDARD UNIT	30 psi min. to 100 psi max. [2 bar min. to 7 bar max.] air
OPERATING TEMPERATURE	-28°C to +82°C [-20°F to +180°F]
RATED LIFE	5 million cycles minimum with standard seals
CYCLE TIME	See table below
LUBRICATION	Factory lubricated for rated life
MAINTENANCE	Field repairable

SIZE	NOMINAL TOTAL JAW ROTATION	GRIP FORCE FACTOR G_f				GRIPPER WEIGHT		CLOSE TIME 87 psi [6 bar]	OPEN TIME 87 psi [6 bar]	DISPLACEMENT	
		EXTERNAL GRIP		INTERNAL GRIP		lb	kg	sec	sec	in ³	cm ³
		IMPERIAL	METRIC	IMPERIAL	METRIC						
12	180°	0.065	106	0.083	136	0.28	0.13	0.12	0.07	0.09	1.4
16	180°	0.18	299	0.21	346	0.55	0.25	0.25	0.13	0.21	3.5
20	180°	0.61	994	0.75	1221	0.98	0.45	0.26	0.13	0.38	6.2
32	180°	1.9	3170	2.4	3951	2.2	0.98	0.41	0.19	1.33	22
40	180°	3.7	6089	4.3	7049	4.3	2.0	0.55	0.30	2.84	47
50	180°	12	19964	14	22864	11.5	5.2	0.56	0.32	7.00	115

MAX. ALLOWABLE FORCES & MOMENTS ON GRIPPER JAWS

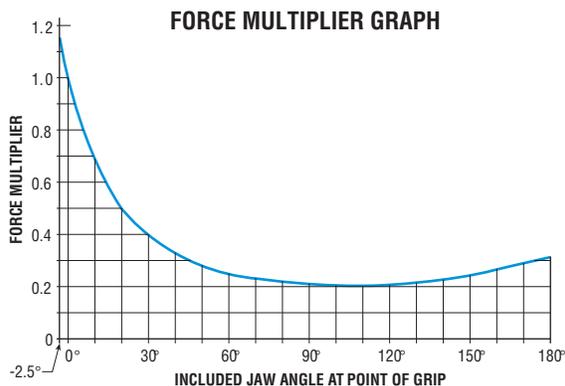
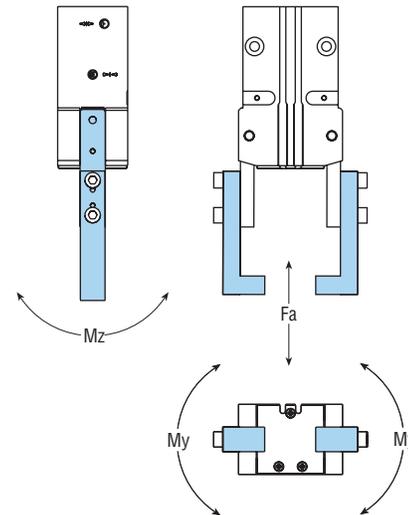
SIZE	MAX TOOLING LENGTH		F_a (TENSION OR COMPRESSION)		M_y		M_z	
	in	mm	lb	N	in-lb	Nm	in-lb	Nm
12	3	75	20	90	20	2.3	20	2.3
16	4	100	40	180	40	5	40	5
20	4.5	115	80	355	60	7	60	7
32	5	125	175	780	120	14	120	14
40	6	150	380	1690	300	34	300	34
50	8	200	700	3110	600	68	600	68

M_y , M_z : Allowable moments per jaw. Moments measured from the jaw pivot.

F_a : Allowable total force

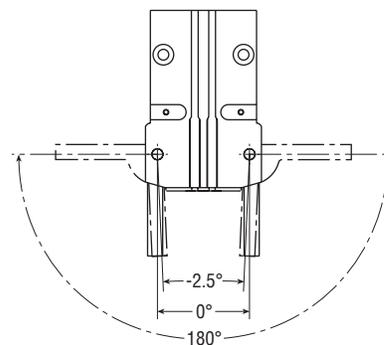
Max Tooling Length: Measured from jaw pivot.

NOTE: When calculating values for M_y , M_z , and F_a , include the grip force per jaw, tooling weight, part weight, external forces, and acceleration, as applicable.



NOTES:

- 1) The force multiplier is a function of the jaw position at point of grip.
- 2) Force multiplier with the jaws parallel (0°) is 1.



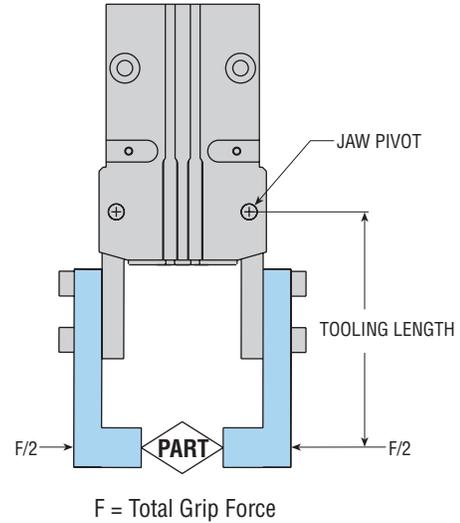
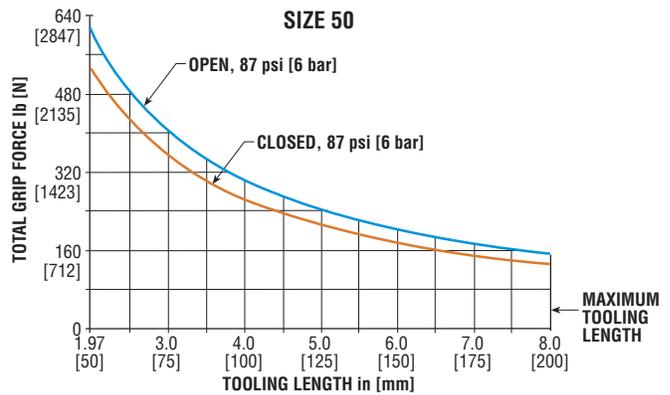
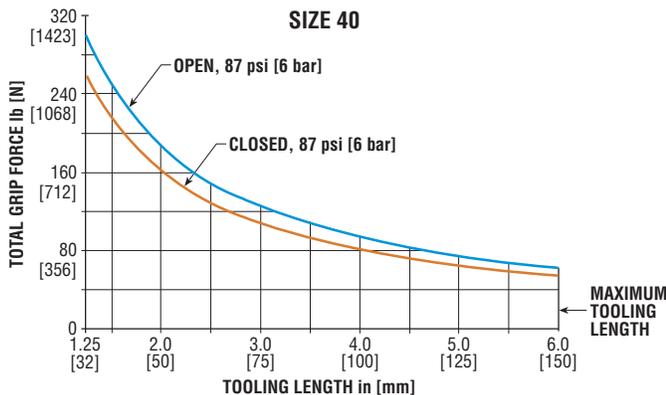
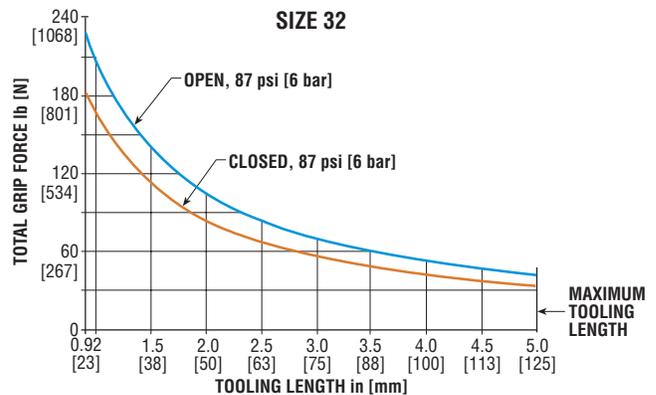
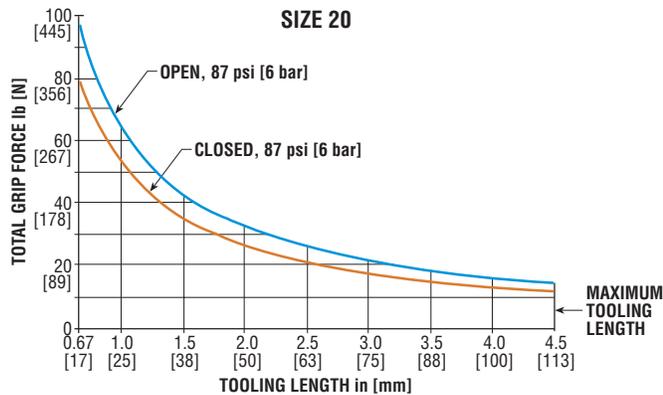
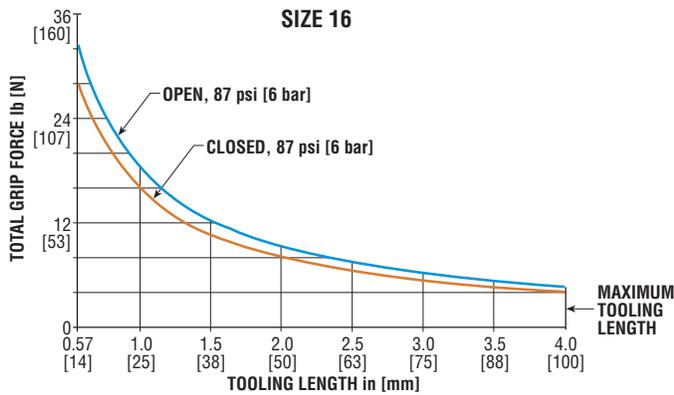
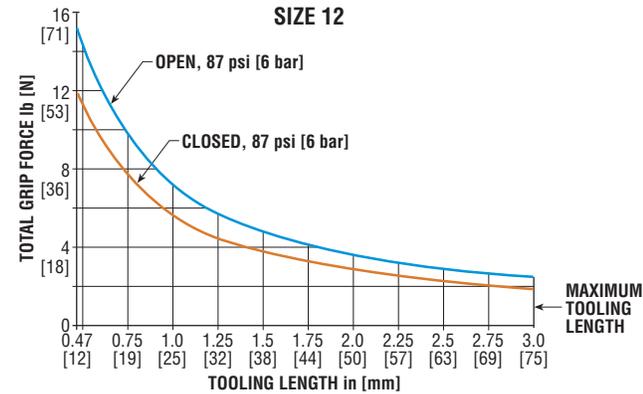
Application & Sizing Assistance

Use PHD's free online Product Sizing and Application at www.phdinc.com/apps/sizing

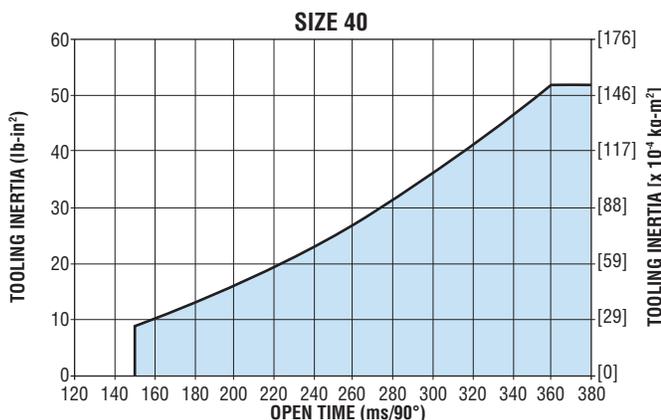
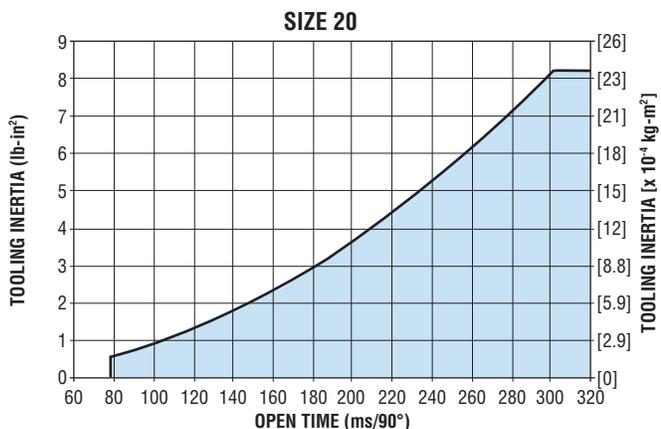
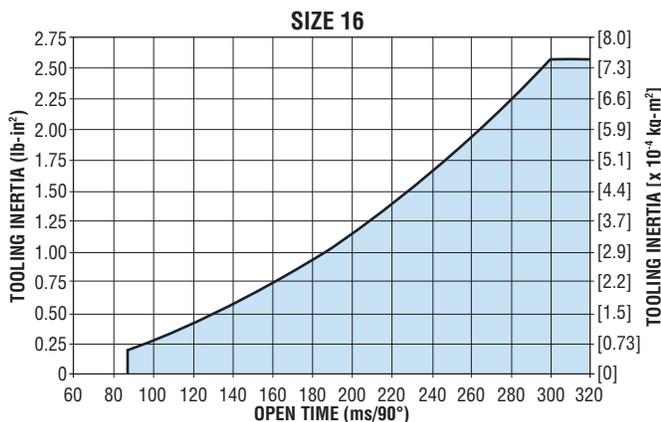
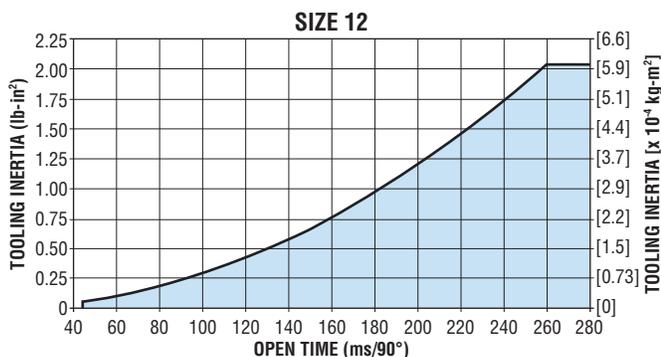
GRIP FORCE GRAPHS

GRIP FORCE

Total gripping force relative to tooling length is shown below at the stated actuating pressure. Grip force per jaw equals the total grip force divided by two. The graphs also indicate the maximum tooling length for each gripper size.

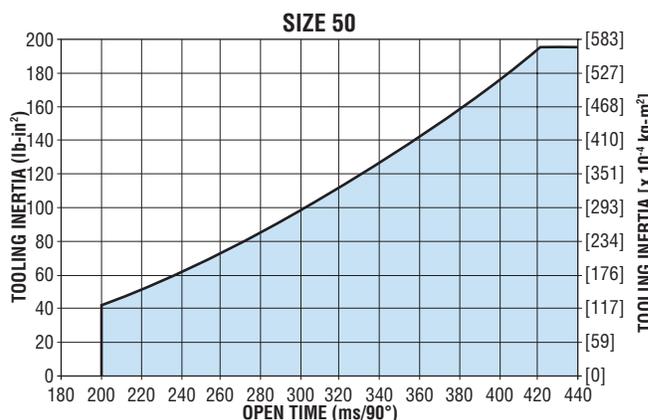
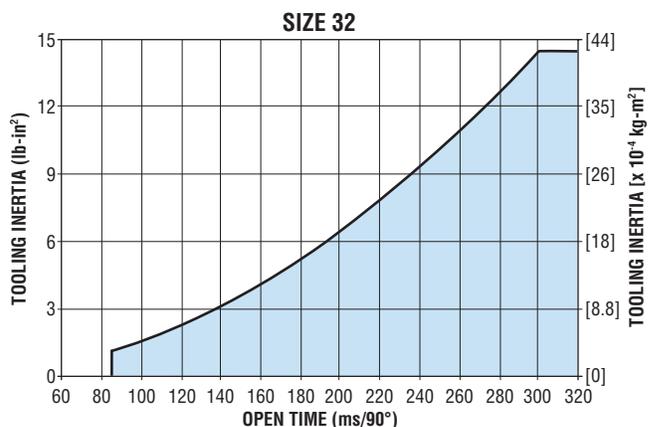
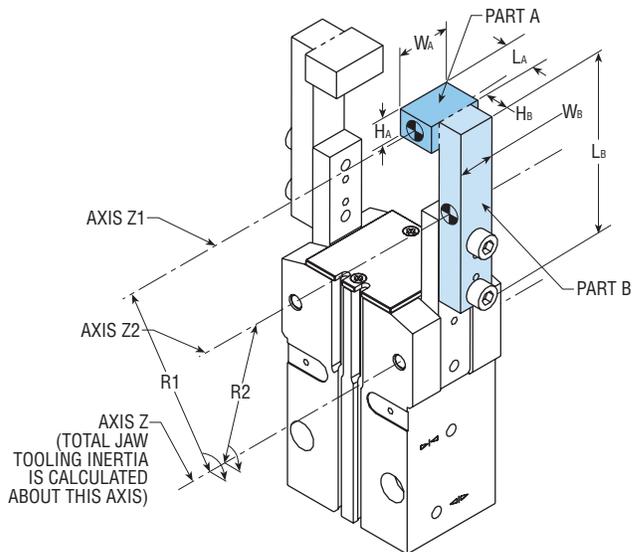


JAW TOOLING INERTIA GRAPHS (PER JAW)



JAW TOOLING

Jaw tooling must be sized in such a manner as to keep the total jaw tooling inertia (per jaw) in the shaded areas of the charts below. Use the calculation example on page 191 as a template for your tooling design.



JAW TOOLING INERTIA CALCULATION (PER JAW)

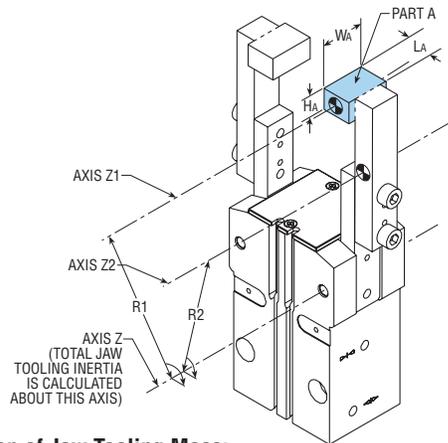
STEP 1:

Determine the Gripper Size, Jaw Tooling Dimensions, and Gripper Opening Time.

STEP 2:

Calculate the moments of inertia for the Jaw Tooling.

PART A



Calculation of Jaw Tooling Mass:

$$M_A = L_A \times H_A \times W_A \times \text{Mass Density of Jaw Tooling Material}$$

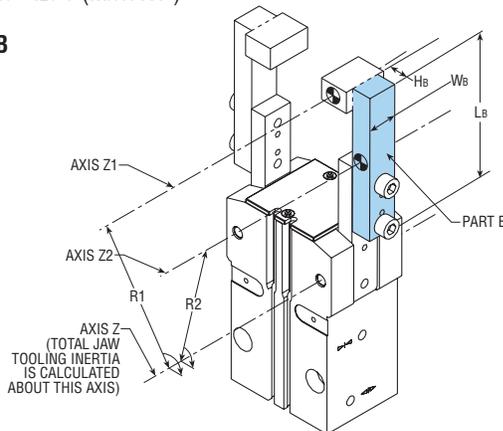
Moment of Inertia Calculation for the Jaw Tooling about Axis Z1:

$$I_{Z1} = (1/12) \times (M_A) \times (H_A^2 + L_A^2)$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z:

$$I_{ZA} = I_{Z1} + (M_A \times R1^2)$$

PART B



Calculation of Jaw Tooling Mass:

$$M_B = L_B \times H_B \times W_B \times \text{Mass Density of Jaw Tooling Material}$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z2:

$$I_{Z2} = (1/12) \times (M_B) \times (H_B^2 + L_B^2)$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z:

$$I_{ZB} = I_{Z2} + (M_B \times R2^2)$$

TOTAL JAW TOOLING INERTIA:

$$I_{TOTAL} = I_{ZA} + I_{ZB}$$

STEP 3:

Verify Jaw Tooling Inertia by comparing I_{TOTAL} with Jaw Tooling Inertia graph.

EXAMPLE:

STEP 1:

Gripper Size: 20

Jaw Tooling Dimensions: see graphic

Gripper Opening Time: 130 ms

STEP 2:

PART A

$$L_A = 0.500 \text{ in } [0.013 \text{ m}]$$

$$H_A = 0.625 \text{ in } [0.016 \text{ m}]$$

$$W_A = 0.750 \text{ in } [0.019 \text{ m}]$$

$$\text{Mass Density of Aluminum} = 0.098 \text{ lb/in}^3 [2712.6 \text{ kg/m}^3]$$

$$R1 = 3.000 \text{ in } [0.075 \text{ m}]$$

Calculation of Jaw Tooling Mass:

$$M_A = 0.500 \text{ in} \times 0.625 \text{ in} \times 0.750 \text{ in} \times 0.098 \text{ lb/in}^3$$

$$[0.013 \text{ m} \times 0.016 \text{ m} \times 0.019 \text{ m} \times 2712.6 \text{ kg/m}^3]$$

$$M_A = 0.023 \text{ lb } [0.011 \text{ kg}]$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z1:

$$I_{Z1} = (1/12) \times (0.023 \text{ lb}) \times (0.625^2 \text{ in} + 0.500^2 \text{ in})$$

$$[(1/12) \times (0.011 \text{ kg}) \times (0.016^2 \text{ m} + 0.013^2 \text{ m})]$$

$$I_{Z1} = 0.0013 \text{ lb-in}^2 [3.9 \times 10^{-7} \text{ kg-m}^2]$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z:

$$I_{ZA} = 0.0013 \text{ lb-in}^2 + (0.023 \text{ lb} \times 3.000^2 \text{ in})$$

$$[3.9 \times 10^{-7} \text{ kg-m}^2 + (0.011 \text{ kg} \times 0.075^2 \text{ m})]$$

$$I_{ZA} = 0.208 \text{ lb-in}^2 [6.2 \times 10^{-5} \text{ kg-m}^2]$$

PART B

$$L_B = 2.500 \text{ in } [0.064 \text{ m}]$$

$$H_B = 0.350 \text{ in } [0.009 \text{ m}]$$

$$W_B = 0.600 \text{ in } [0.015 \text{ m}]$$

$$\text{Mass Density of Aluminum} = 0.098 \text{ lb/in}^3 [2712.6 \text{ kg/m}^3]$$

$$R2 = 2.000 \text{ in } [0.051 \text{ m}]$$

Calculation of Jaw Tooling Mass:

$$M_B = 2.500 \text{ in} \times 0.350 \text{ in} \times 0.600 \text{ in} \times 0.098 \text{ lb/in}^3$$

$$[0.064 \text{ m} \times 0.009 \text{ m} \times 0.015 \text{ m} \times 2712.6 \text{ kg/m}^3]$$

$$M_B = 0.051 \text{ lb } [0.023 \text{ kg}]$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z2:

$$I_{Z2} = (1/12) \times (0.051 \text{ lb}) \times (0.350^2 \text{ in} + 2.500^2 \text{ in})$$

$$[(1/12) \times (0.023 \text{ kg}) \times (0.009^2 \text{ m} + 0.064^2 \text{ m})]$$

$$I_{Z2} = 0.027 \text{ lb-in}^2 [8.0 \times 10^{-6} \text{ kg-m}^2]$$

Moment of Inertia Calculation for the Jaw Tooling about Axis Z:

$$I_{ZB} = 0.027 \text{ lb-in}^2 + (0.051 \text{ lb} \times 2.000^2 \text{ in})$$

$$[8.0 \times 10^{-6} \text{ kg-m}^2 + (0.023 \text{ kg} \times 0.051^2 \text{ m})]$$

$$I_{ZB} = 0.231 \text{ lb-in}^2 [6.8 \times 10^{-5} \text{ kg-m}^2]$$

TOTAL JAW TOOLING INERTIA:

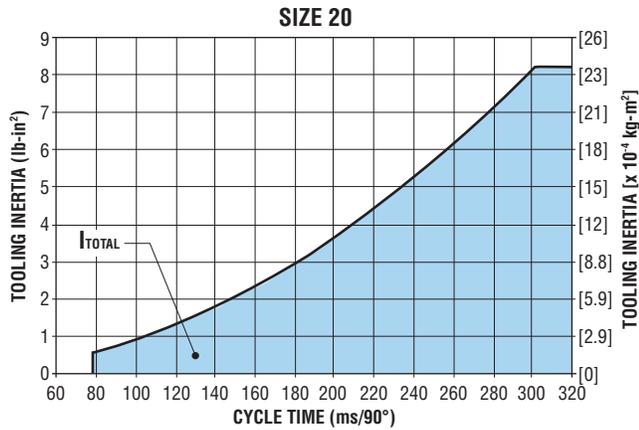
$$I_{TOTAL} = 0.208 \text{ lb-in}^2 + 0.231 \text{ lb-in}^2$$

$$[6.2 \times 10^{-5} \text{ kg-m}^2 + 6.8 \times 10^{-5} \text{ kg-m}^2]$$

$$I_{TOTAL} = 0.439 \text{ lb-in}^2 [1.3 \times 10^{-4} \text{ kg-m}^2]$$

STEP 3:

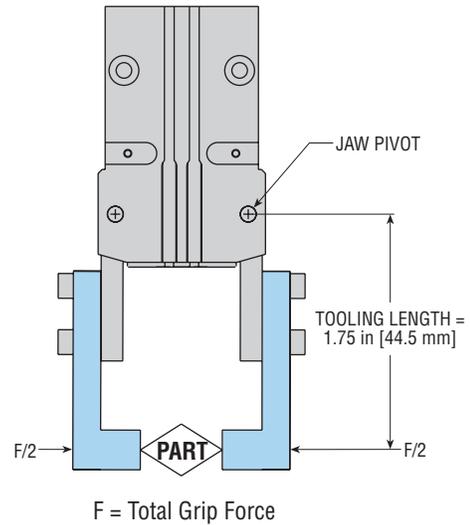
Verify Jaw Tooling Inertia by comparing I_{TOTAL} with Jaw Tooling Inertia graph on the following page.



GRIP FORCE CALCULATION EQUATIONS:

IMPERIAL:
 Total Grip Force [lb] = $\frac{\text{Pressure (psi)} \times G_f}{\text{Distance from Jaw Pivot (in)}} \times \text{Force Multiplier}$

METRIC:
 Total Grip Force [N] = $\frac{\text{Pressure (bar)} \times G_f}{\text{Distance from Jaw Pivot (mm)}} \times \text{Force Multiplier}$



GRIP FORCE CALCULATION EXAMPLE:

Gripper: GRB11-2-20 x 180 [GRB11-6-20 x 180]

Operating Pressure = 87 psi [6 bar]

Find Tooling Length (Distance Between Jaw Pivot and Gripping Point): Desired tooling length is 1.75 in [44.5 mm].

Find Jaw Angle at Point of Grip: Jaws will be parallel (0°) at point of grip.

Determine Force Multiplier Based on Jaw Angle at Point of Grip:

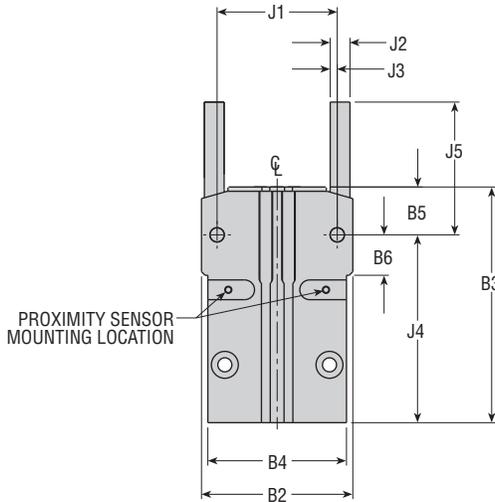
Because jaws are parallel (0°) at point of grip, force multiplier = 1 (from Force Multiplier Graph on page 187).

Find Grip Factor (G_f) = 0.61 [994] (from table on page 187)

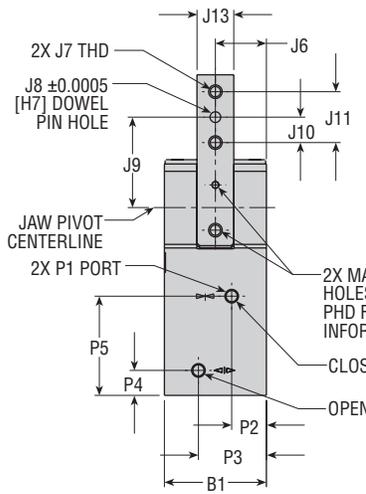
Total Grip Force = ((87 psi x 0.61) / 1.75) x 1 = 30.3 lb [((6 bar x 994) / 44.5) x 1 = 134 N]

DIMENSIONS: Series GRB Grippers

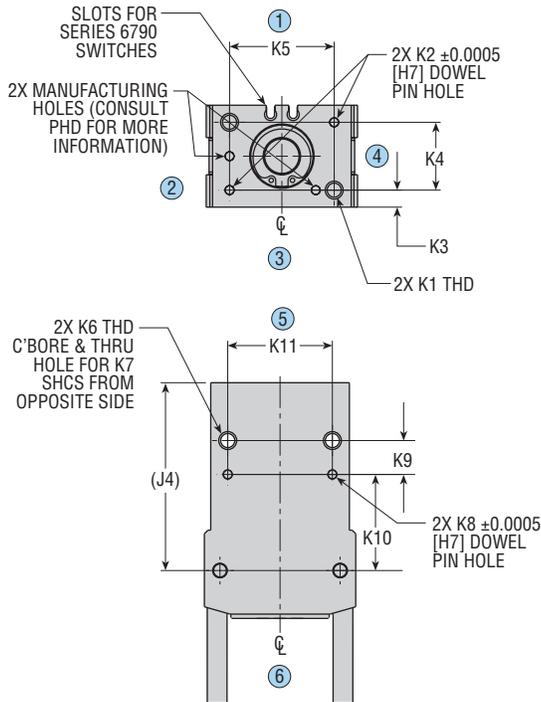
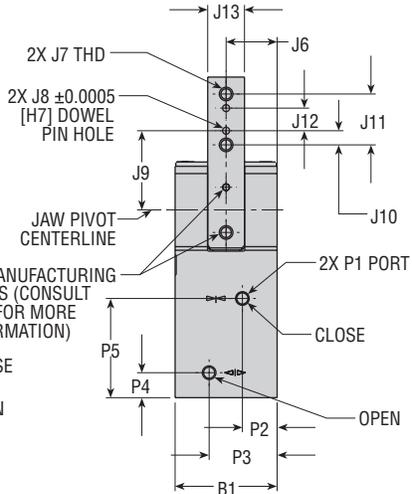
SIZE 12, 16, 20, & 32



SIZE 12 & 16



SIZE 20 & 32



LETTER DIM	SIZE							
	12		16		20		32	
	in	mm	in	mm	in	mm	in	mm
B1	0.966	24.5	1.142	29.0	1.422	36.1	1.635	41.5
B2	1.420	36.1	1.810	46.0	2.107	53.5	3.070	78.0
B3	2.197	55.8	2.709	68.8	3.286	83.5	4.210	106.9
B4	1.102	28.0	1.654	42.0	1.930	49.0	2.600	66.0
B5	0.444	11.3	0.562	14.3	0.668	17.0	0.923	23.4
B6	0.386	9.8	0.523	13.3	0.564	14.3	0.869	22.1
J1	1.063	27.0	1.417	36.0	1.673	42.5	2.400	61.0
J2	0.196	5.0	0.216	5.5	0.275	7.0	0.394	10.0
J3	0.019	0.5	0.059	1.5	0.098	2.5	0.0790	2.0
J4	1.752	44.5	2.146	54.5	2.618	66.5	3.287	83.5
J5	1.142	29.0	1.575	40.0	1.850	47.0	2.402	61.0
J6	0.452	11.5	0.550	14.0	0.710	18.0	0.7870	20.0
J7	6-32 THRU	M4 x 0.7 THRU	8-32 THRU	M4 x 0.7 THRU	10-24 THRU	M5 x 0.8 THRU	1/4-20 THRU	M6 x 1.0 THRU
J8	0.0971 THRU	2.5 THRU	0.0971 THRU	2.5 THRU	0.0971 THRU	2.5 THRU	0.1283 THRU	3.0 THRU
J9	0.8270	21.0	1.0820	27.5	1.1024	28.0	1.5355	39.0
J10	0.177	4.5	0.256	6.5	0.197	5.0	0.236	6.0
J11	0.354	9.0	0.512	13.0	0.709	18.0	0.787	20.0
J12	—	—	—	—	0.315	8.0	0.315	8.0
J13	0.3150	8.0	0.3937	10.0	0.5120	13.0	0.6500	16.5
K1	8-32 x 0.296 DP	M4 x 0.7 x 7.5 DP	10-24 x 0.300 DP	M5 x 0.8 x 7.6 DP	1/4-20 x 0.375 DP	M6 x 1.0 x 9.5 DP	5/16-18 x 0.551 DP	M8 x 1.25 x 14.0 DP
K2	0.0947 x 0.187 DP	2.5 x 4.75 DP	0.1283 x 0.200 DP	3.0 x 5.0 DP	0.1283 x 0.200 DP	3.0 x 5.0 DP	0.1908 x 0.354 DP	5.0 x 9.0 DP
K3	0.216	5.5	0.215	5.5	0.239	6.1	0.295	7.5
K4	0.4724	12.0	0.6694	17.0	0.9450	24.0	0.9844	25.0
K5	0.7480	19.0	1.2206	31.0	1.4568	37.0	2.0080	51.0
K6	10-24 x 0.400 DP	M5 x 0.8 x 10.0 DP	1/4-20 x 0.500 DP	M6 x 1.0 x 12.7 DP	1/4-20 x 0.551 DP	M6 x 1.0 x 14.0 DP	5/16-18 x 0.630 DP	M8 x 1.25 x 16.0 DP
K7	#6	M4	#10	M5	#10	M5	1/4	M6
K8	0.0947 x 0.187 DP	2.5 x 4.75 DP	0.1283 x 0.200 DP	3.0 x 5.0 DP	0.1283 x 0.200 DP	3.0 x 5.0 DP	0.1908 x 0.354 DP	5.0 x 9.0 DP
K9	0.256	6.5	0.354	9.0	0.472	12.0	0.591	15.0
K10	0.906	23.0	1.123	28.5	1.339	34.0	1.634	41.5
K11	0.7480	19.0	1.2206	31.0	1.4568	37.0	2.0080	51.0
P1	10-32	M5 x 0.8	10-32	M5 x 0.8	10-32	M5 x 0.8	1/8 NPT	1/8 BSPP
P2	0.433	11.0	0.472	12.0	0.710	18.0	0.728	18.5
P3	0.511	13.0	0.669	17.0	0.946	24.0	0.905	23.0
P4	0.236	6.0	0.256	6.5	0.348	8.8	0.433	11.0
P5	0.886	22.5	1.142	29.0	1.378	35.0	1.673	42.5

NOTES:

- 1) DESIGNATED ϕ IS CENTERLINE OF UNIT
- 2) METRIC INFORMATION SHOWN IN [] OR SHOWN IN COLUMNS DESIGNATED mm
- 3) CIRCLED NUMBERS INDICATE POSITIONS

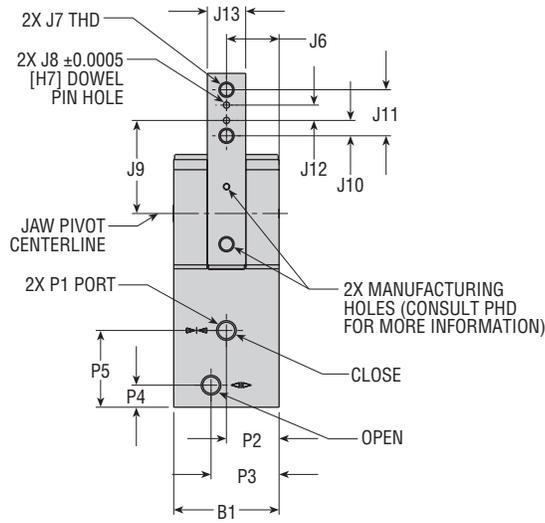
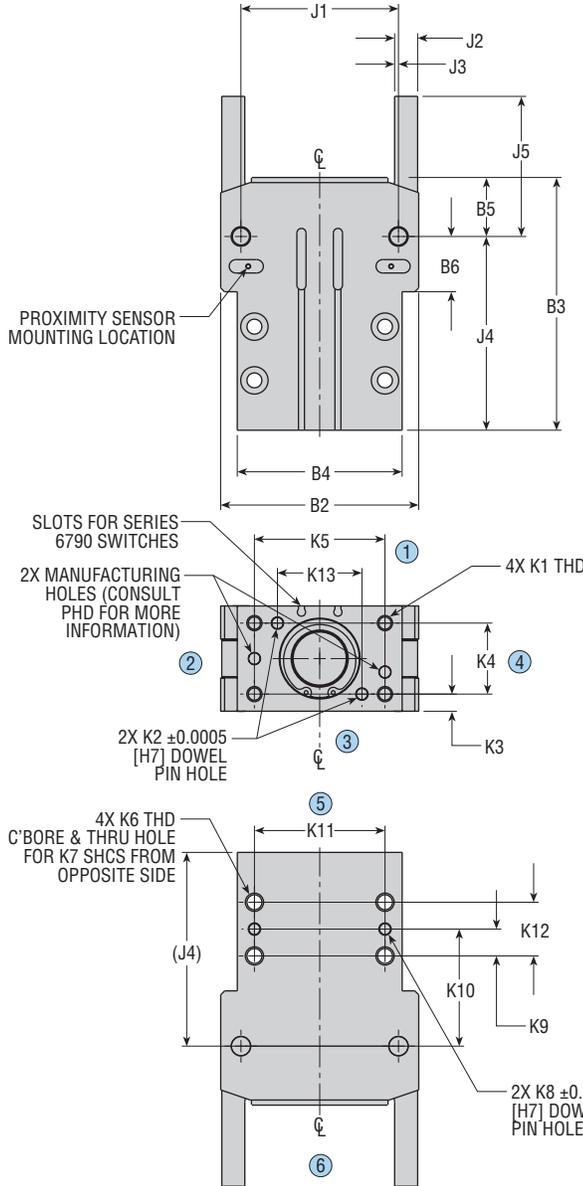
CAD & Sizing Assistance

Use PHD's free online Product Sizing and CAD Configurator at phdinc.com/myphd

All dimensions are reference only unless specifically tolerated.

DIMENSIONS: Series GRB Grippers

SIZE 40 & 50

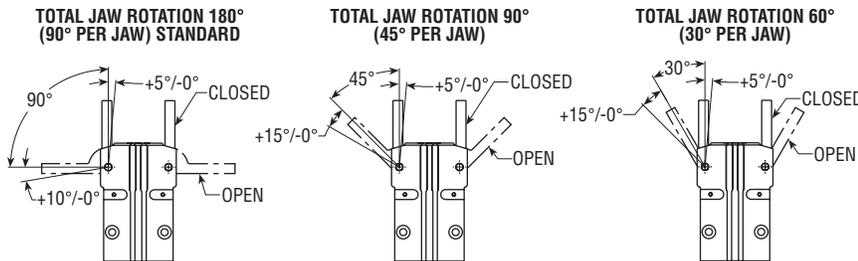


LETTER DIM	SIZE			
	40		50	
	in	mm	in	mm
B1	2.160	54.9	2.560	65.0
B2	4.060	103.1	6.220	158.0
B3	5.188	131.8	7.609	193.3
B4	3.380	85.9	4.880	124.0
B5	1.213	30.8	1.901	48.3
B6	1.134	28.8	1.676	42.6
J1	3.230	82.0	5.040	128.0
J2	0.472	12.0	0.708	18.0
J3	0.079	2.0	0.196	5.0
J4	3.975	101.0	5.708	145.0
J5	2.875	73.0	4.133	105.0
J6	1.080	27.4	1.280	32.5
J7	5/16-18 THRU	M8 x 1.25 THRU	3/8-16 THRU	M10 x 1.5 THRU
J8	0.1283 THRU	3.0 THRU	0.2533 THRU	6.0 THRU
J9	1.9094	48.5	2.9528	75.0
J10	0.315	8.0	0.394	10.0
J11	0.945	24.0	1.181	30.0
J12	0.3150	8.0	0.3937	10.0
J13	0.7875	20.0	0.9840	25.0
K1	5/16-18 x 0.551 DP	M8 x 1.25 x 14.0 DP	3/8-16 x 0.787 DP	M10 x 1.5 x 20.0 DP
K2	0.2533 x 0.397 DP	6.0 x 10.0 DP	0.3158 x 0.590 DP	8.0 x 15.0 DP
K3	0.352	8.9	0.434	11.0
K4	1.4567	37.0	1.6930	43.0
K5	2.6772	68.0	4.0160	102.0
K6	3/8-16 x 0.787 DP	M10 x 1.5 x 20.0 DP	1/2-13 x 0.984 DP	M12 x 1.75 x 25.0 DP
K7	5/16	M8	3/8	M10
K8	0.2533 x 0.397 DP	6.0 x 10.0 DP	0.3158 x 0.590 DP	8.0 x 15.0 DP
K9	0.551	14.0	0.729	18.5
K10	2.401	61.0	3.485	88.5
K11	2.6772	68.0	4.0160	102.0
K12	1.102	28.0	1.457	37.0
K13	1.7323	44.0	2.8740	73.0
P1	1/8 NPT	1/8 BSPP	1/8 NPT	1/8 BSPP
P2	1.080	27.4	0.414	10.5
P3	1.395	35.4	1.654	42.0
P4	0.453	11.5	0.551	14.0
P5	1.575	40.0	3.484	88.5

NOTES:

- 1) DESIGNATED ϕ IS CENTERLINE OF UNIT
- 2) METRIC INFORMATION SHOWN IN [] OR SHOWN IN COLUMNS DESIGNATED mm
- 3) CIRCLED NUMBERS INDICATE POSITIONS

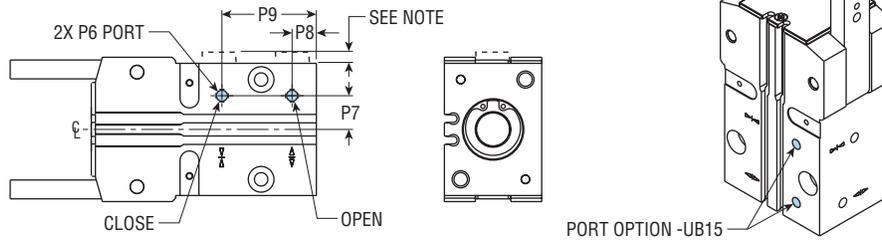
ANGULAR JAW ROTATION TOLERANCE (ALL SIZES)



All dimensions are reference only unless specifically tolerated.

UB15 PORT OPTION IN LOCATION 15

This option provides ports in Location 15. The standard ports are plugged.

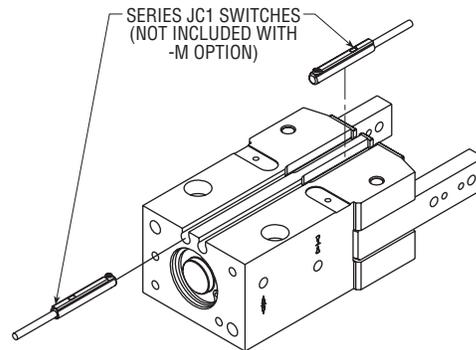


LETTER DIM	SIZE											
	12		16		20		32		40		50	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
P6	10-32	M5 x 0.8	10-32	M5 x 0.8	10-32	M5 x 0.8	1/8 NPT	1/8 BSPP	1/8 NPT	1/8 BSPP	1/8 NPT	1/8 BSPP
P7	0.296	7.5	0.374	9.5	0.492	12.5	0.728	18.5	0.925	23.5	1.321	33.6
P8	0.315	8.0	0.256	6.5	0.354	9.0	0.571	14.5	0.453	11.5	0.551	14.0
P9	0.906	23.0	1.122	28.5	1.378	35.0	1.730	43.9	1.575	40.0	3.484	88.5

NOTE: 0.098 [2.5 mm] PORT PLUG HEAD FOR SIZE 32, 40, & 50 METRIC UNITS ONLY

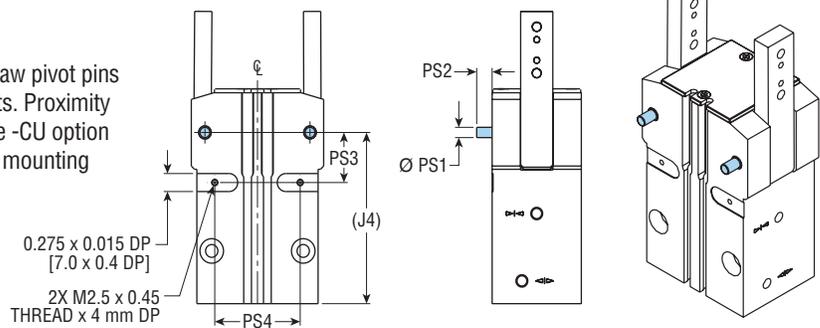
M MAGNET FOR PHD SERIES JC1 SWITCHES

This option equips the unit with a magnetic piston for use with PHD's JC1 Switches. The switches mount easily into two small grooves located on the front of the gripper body and are locked into place with a set screw. PHD's Series JC1 Switches are required in addition to the -M option and are sold separately.



CU SENSOR READY

With this option the gripper is assembled with extended jaw pivot pins for use with PHD inductive proximity switch mounting kits. Proximity switches and mounting kits are required in addition to the -CU option and are sold separately. See next pages for switches and mounting kits.



LETTER DIM	SIZE											
	12		16		20		32		40		50	
	in	mm	in	mm								
∅ PS1	0.079	2.0	0.118	3.0	0.157	4.0	0.196	5.0	0.196	5.0	0.196	5.0
PS2	0.236	6.0	0.236	6.0	0.295	7.5	0.295	7.5	0.295	7.5	0.295	7.5
PS3	0.523	13.3	0.671	17.0	0.765	19.4	0.612	15.5	0.612	15.5	0.612	15.5
PS4	0.828	21.0	1.060	26.9	1.360	34.5	2.100	53.3	2.930	74.4	4.740	120.4
(J4)	1.752	44.5	2.146	54.5	2.618	66.5	3.287	83.5	3.975	101.0	5.708	145.0

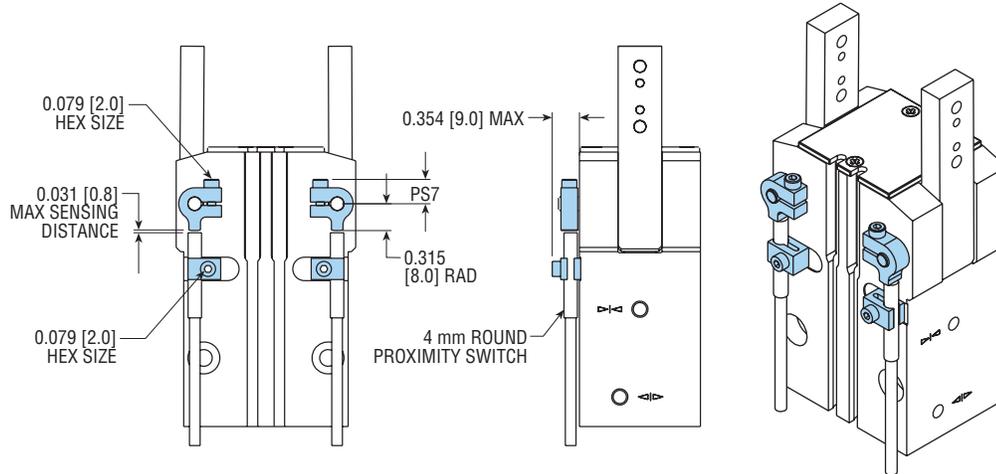
All dimensions are reference only unless specifically tolerated.

PROXIMITY SWITCHES (-CU OPTION REQUIRED)

For additional switch information, go to phdinc.com.

4 mm ROUND INDUCTIVE PROXIMITY SWITCHES

PART NO.	DESCRIPTION
18430-001-02	NPN (Sink) 2 meter cable
18430-002-02	PNP (Source) 2 meter cable



PROXIMITY SWITCH MOUNTING KITS

SIZE	KIT NO.
12	18074
16	18090
20	18075
32	18091
40	18091
50	18091

Each kit includes 1 target, 1 switch mounting bracket, and fasteners for mounting. Switches sold separately.

LETTER DIM.	SIZE											
	12		16		20		32		40		50	
	in	mm										
PS7	0.236	6.0	0.236	6.0	0.295	7.5	0.295	7.5	0.295	7.5	0.295	7.5

All dimensions are reference only unless specifically toleranced.

SERIES JC1 SWITCHES (-M OPTION REQUIRED)

For additional switch information, go to phdinc.com.

Hand tighten the setscrew until the switch is securely retained.
Do not overtighten.

JC1 SOLID STATE AND REED CORDSETS

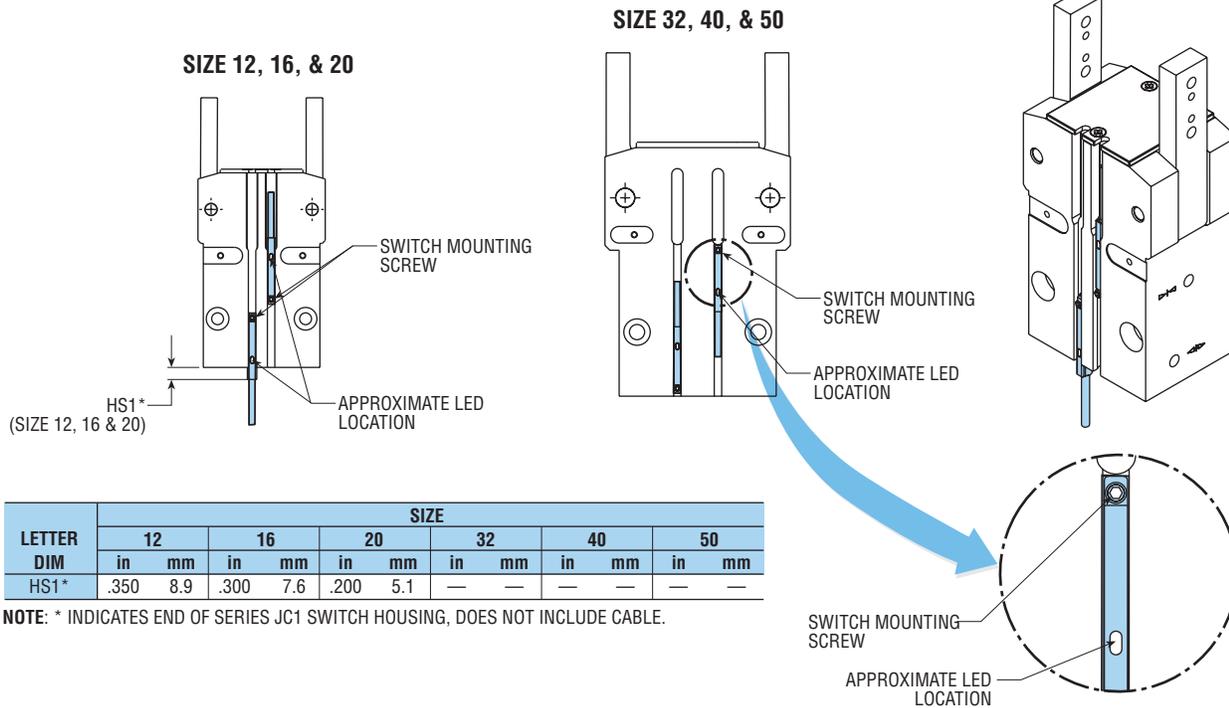
PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 meter cable
63549-05	M8, 3 pin, Straight Female Connector, 5 meter cable
81284-1-010	M12, 3 pin, Straight Female Connector, 2 meter cable

NOTE: Cordsets are ordered separately.

JC1 SOLID STATE AND REED SWITCHES

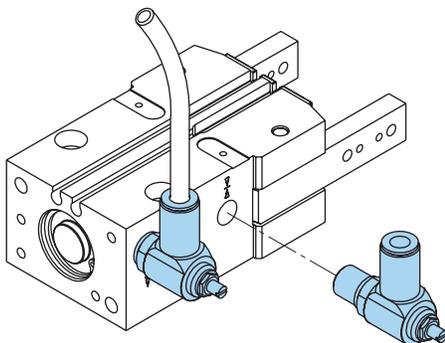
JC1 SWITCH	DESCRIPTION
JC1SDN-5	NPN DC Solid State, 5 meter cable
JC1SDP-5	PNP DC Solid State, 5 meter cable
JC1SDN-K	NPN DC Solid State, Quick Connect
JC1SDP-K	PNP DC Solid State, Quick Connect
JC1RDU-5	PNP or NPN DC Reed, 5 meter cable
JC1RDU-K	PNP or NPN DC Reed, Quick Connect
JC1ADU-K	AC Reed, Quick Connect

NOTE: For additional switch information, go to phdinc.com.
Switches must be ordered separately.



FLOW CONTROLS

This accessory may be used to control the jaw actuation speed of the gripper. By decreasing the jaw actuation speed, the tooling inertia may be increased.



IMPERIAL FLOW CONTROLS

SIZE	PORT SIZE	TUBE OD	KIT NO.
12	10-32 UNC-2B	5/32"	70695-01
16	10-32 UNC-2B	5/32"	70695-01
20	10-32 UNC-2B	5/32"	70695-01
32	1/8 NPT	1/4"	70695-03
40	1/8 NPT	1/4"	70695-03
50	1/8 NPT	1/4"	70695-03

NOTE: Each kit contains 1 flow control

METRIC FLOW CONTROLS

SIZE	PORT SIZE	TUBE OD	KIT NO.
12	M5 x 0.8	4.0 mm	70696-01
16	M5 x 0.8	4.0 mm	70696-01
20	M5 x 0.8	4.0 mm	70696-01
32	1/8 BSP	6.0 mm	70696-03
40	1/8 BSP	6.0 mm	70696-03
50	1/8 BSP	6.0 mm	70696-03

NOTE: Each kit contains 1 flow control