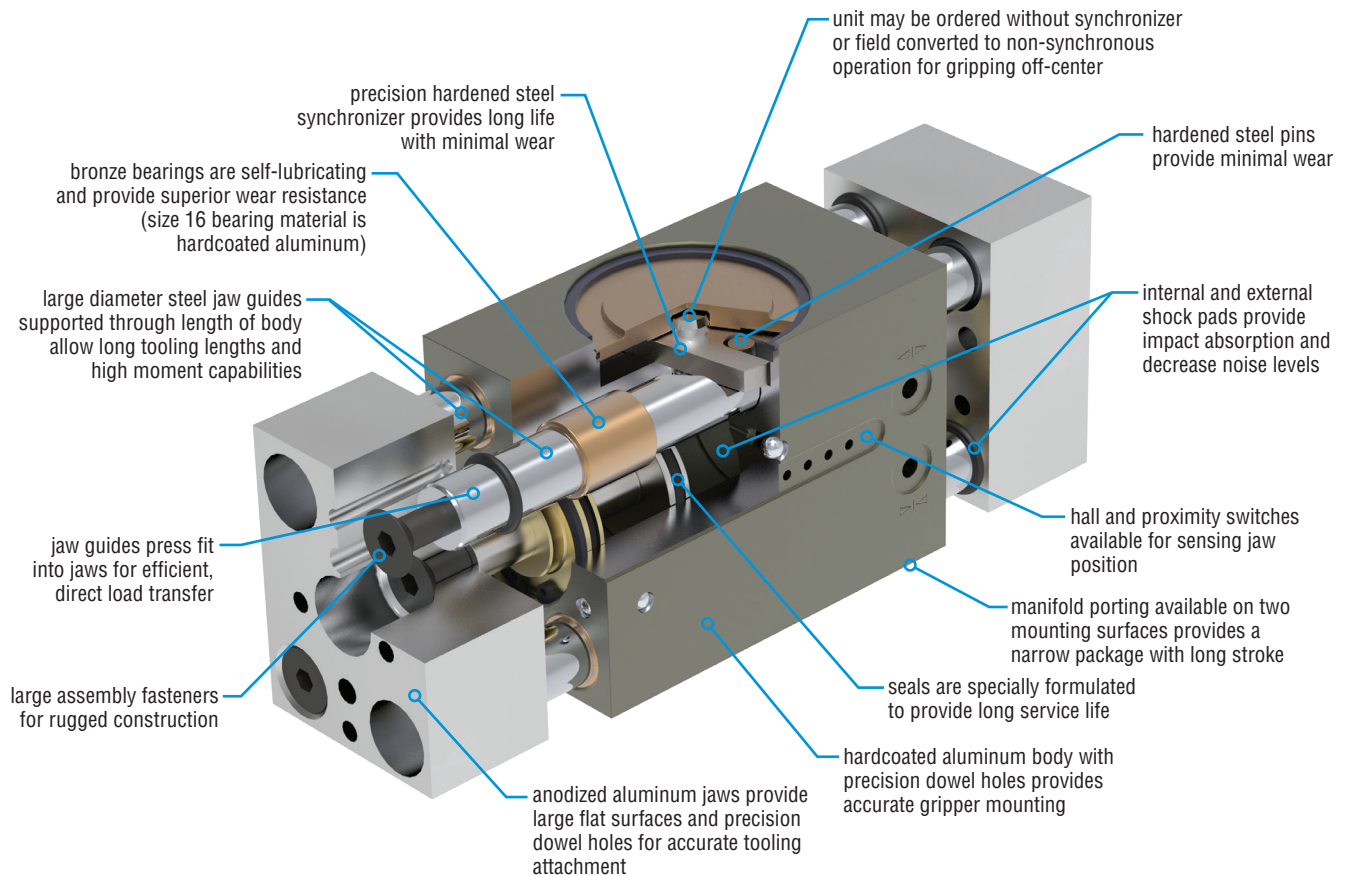
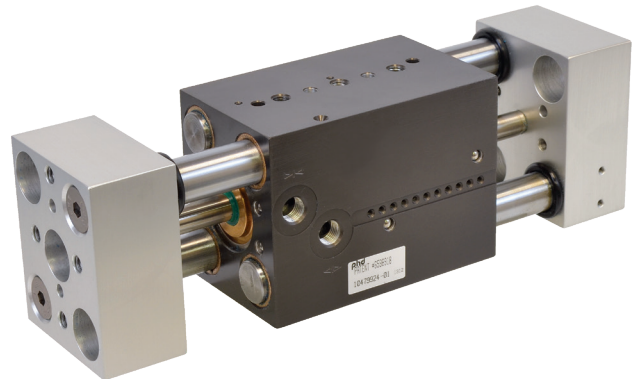


GRW

Major Benefits

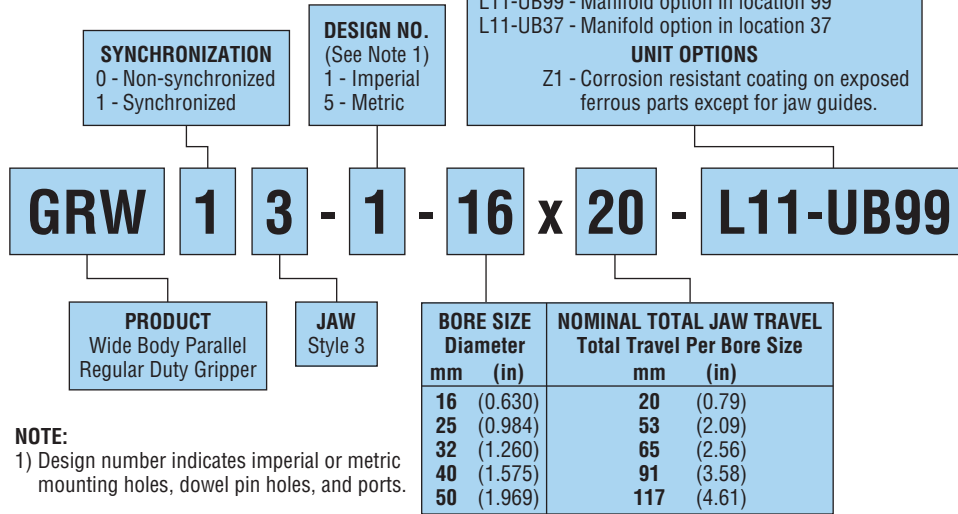
- Units can be ordered without synchronous jaw motion or converted in the field
- Large diameter jaw guides provide superior jaw stability and high moment capacities
- Manifold porting options
- Two standard mounting surfaces
- Five sizes available in both imperial and metric versions
- 6 million cycles minimum rated life



ORDERING DATA: Series GRW Grippers

TO ORDER SPECIFY:

Product Line, Series, Type, Synchronization, Jaw, Design No., Size, Total Jaw Travel, and Options required.



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

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

8 mm THREADED INDUCTIVE PROXIMITY SWITCHES (40 & 50 mm BORE UNITS)

PART NO.	DESCRIPTION
51422-005-02	NPN (Sink) 2 meter cable
51422-006-02	PNP (Source) 2 meter cable

PROXIMITY SWITCH MOUNTING KITS

SIZE	KIT NUMBER	
	STANDARD PLATING	-Z1 PLATING
16	65710-16-20	68465-16-20
25	65710-25-53	68465-25-53
32	65710-32-65	68465-32-65
40	68457-40-91	68466-40-91
50	68457-50-117	68466-50-117

Each kit includes 1 target bracket, 2 switch mounting brackets, and socket head cap screws for mounting.

5580 SWITCH REPLACEMENT CHART

SWITCH KIT NUMBER	REPLACEMENT KIT INCLUDES	JC1 SWITCH DESCRIPTION
55803-1-02	JC1HDN-5 switch with adaptor	NPN (Sink), Radial Sensing, 5 meter cable
55823-1	JC1HDN-K switch with adaptor	NPN (Sink), Radial Sensing, Quick Connect
55804-1-02	JC1HDP-5 switch with adaptor	PNP (Source), Radial Sensing, 5 meter cable
55824-1	JC1HDP-K switch with adaptor	PNP (Source), Radial Sensing, Quick Connect

For additional switch information, go to phdinc.com.

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

Cordsets are ordered separately.

5580 SWITCH MOUNTING KITS

SIZE	KIT NUMBER	
	STANDARD PLATING	-Z1 PLATING
16	68446-16-20	68467-16-20
25	68446-25-53	68467-25-53
32	68446-32-65	68467-32-65
40	68446-40-91	68467-40-91
50	68446-50-117	68467-50-117

Each kit includes 1 target bracket, 2 switch mounting brackets, and socket head cap screws for mounting.

CAD & Sizing Assistance

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

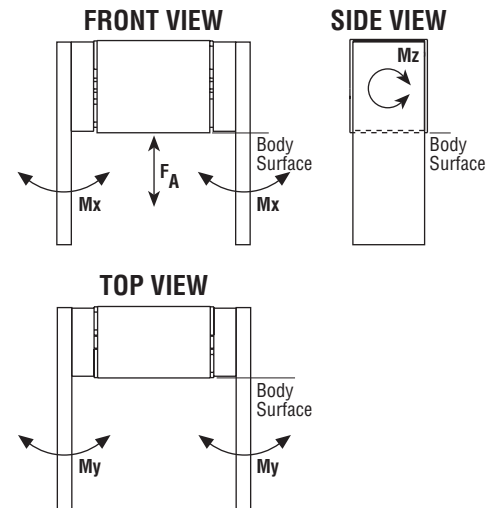
SPECIFICATIONS	SERIES GRW
OPERATING PRESSURE STANDARD UNIT	30 psi min to 100 psi max [2 bar min to 7 bar max] air
OPERATING TEMPERATURE	-20°F to +180°F [-28°C to +82°C]
RATED LIFE	6 million cycles minimum
GRIP REPEATABILITY	Within ± 0.002 in [± 0.05 mm] of original centered position
CYCLE TIME	See table below
LUBRICATION	Factory lubricated for rated life
MAINTENANCE	Field repairable

SIZE	NOMINAL TOTAL JAW TRAVEL		TOTAL CLOSE GRIP FORCE AT 87 psi [6 bar]		GRIPPER WEIGHT		CLOSE OR OPEN TIME 87 psi [6 bar]	DISPLACEMENT		GRIP FORCE FACTOR G_f			
										EXTERNAL GRIP		INTERNAL GRIP	
	in	mm	lb	N	lb	kg	sec	in ³	cm ³	IMPERIAL	METRIC	IMPERIAL	METRIC
16	0.79	20	36	160	0.69	0.3	0.09	0.25	4.0	0.41	26	0.49	31
25	2.09	53	90	400	2.5	1.1	0.14	1.59	26	1.03	66	1.21	78
32	2.56	65	170	756	5.5	2.4	0.24	3.19	52	1.96	126	2.17	140
40	3.58	91	207	921	11.2	5.1	0.30	7.0	114	2.38	154	2.61	168
50	4.61	117	429	1908	22.1	10.0	0.60	14.0	229	4.93	318	5.49	354

MAX. ALLOWABLE FORCES AND MOMENTS ON GRIPPER JAWS

SIZE	Fa		Mx				My				Mz			
	Both Jaws		Per Jaw		Both Jaws		Per Jaw		Both Jaws		Per Jaw		Both Jaws	
	lb	N	in-lb	Nm	in-lb	Nm	in-lb	Nm	in-lb	Nm	in-lb	Nm	in-lb	Nm
16	60	270	100	11	200	22	100	11	200	22	45	5	90	10
25	150	670	285	32	570	64	285	32	570	64	100	11	200	22
32	550	2445	790	89	1580	178	790	89	1580	178	300	34	600	68
40	1400	6225	1100	124	2200	248	1100	124	2200	248	390	44	780	88
50	2600	11565	2640	298	5280	596	2640	298	5280	596	900	101	1800	202

Mx, My, Mz: Moment allowables, with moments measured from the body surface. When calculating values for Mx, My, and Mz, include the grip force per jaw, tooling weight, part weight, external forces, and acceleration as applicable. When calculating the value for Fa, include weight of tooling, part weight, acceleration, and external forces.

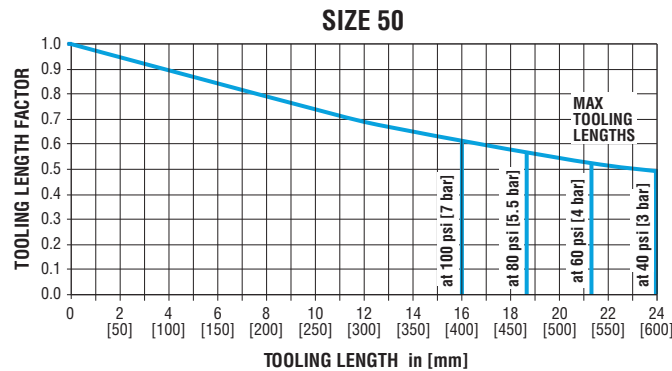
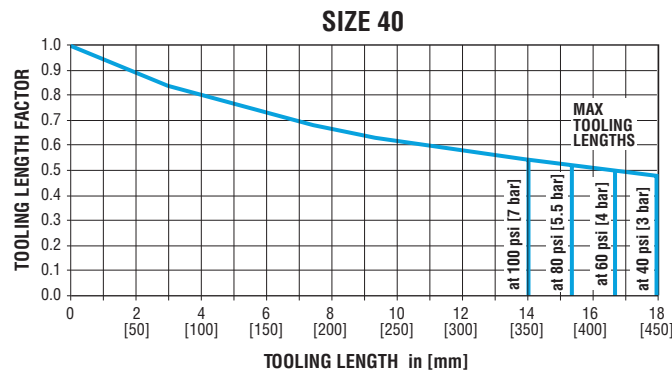
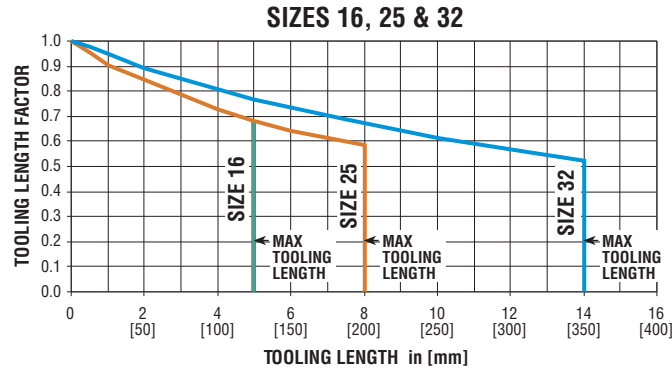
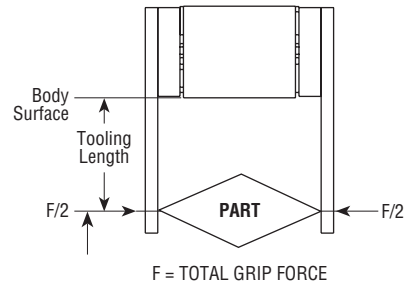


Application & Sizing Assistance

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

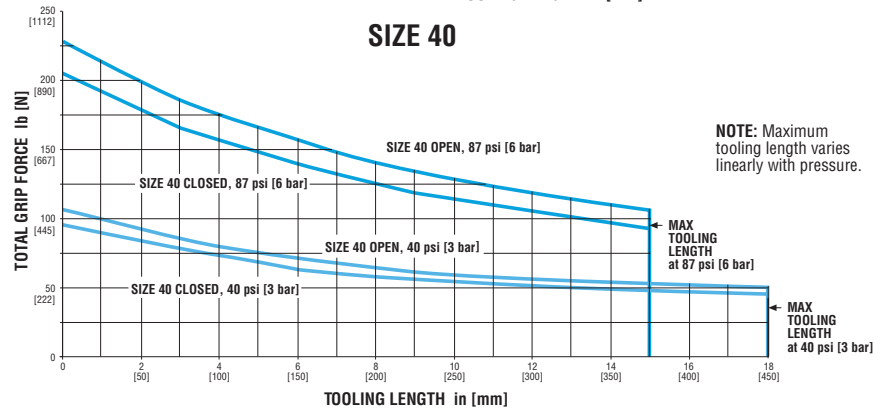
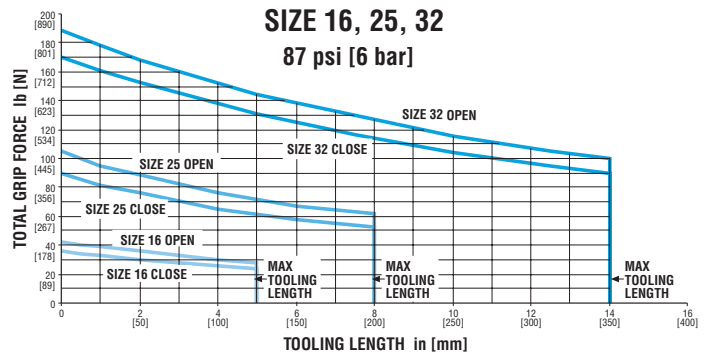
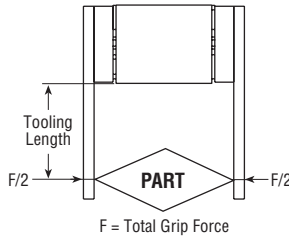
TOOLING LENGTH FACTOR

Jaw tooling should be designed so that the grip point is as close to the body surface as possible. As the grip point is moved away from the body surface, the applied moment causes jaw friction to increase, resulting in reduced effective grip force. The Grip Force Factor (Gf) values given on page 60 are for zero tooling length (body surface). The graphs show how grip force decreases as the grip point is moved from the body surface.

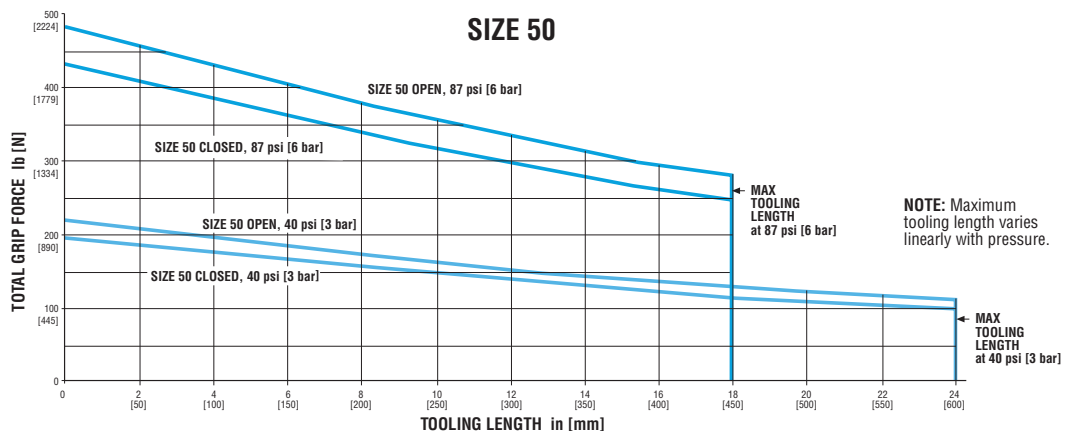


GRIP FORCE

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 chart also indicates the maximum tooling length for each gripper size.



NOTE: Maximum tooling length varies linearly with pressure.



NOTE: Maximum tooling length varies linearly with pressure.

GRIP FORCE CALCULATION EQUATIONS:

IMPERIAL:

$$\text{Total Grip Force [lb]} = (\text{Pressure [psi]} \times G_F) \times \text{Tooling Length Factor}$$

METRIC:

$$\text{Total Grip Force [N]} = (\text{Pressure [bar]} \times G_F) \times \text{Tooling Length Factor}$$

GRIPPER CALCULATION EXAMPLE

$$\text{TOTAL GRIP FORCE lb [N]} = \text{Pressure psi [bar]} \times G_F \times \text{Tooling Length Factor}$$

GRW13-1-25-53 [GRW13-5-25-53]

Operating Pressure = 87 psi [6 bar]

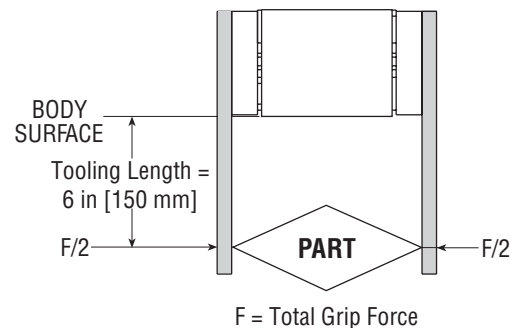
External Grip

Find Grip Force Factor $G_F = 1.03$ [66.4] (from table on page 60)

Find Tooling Length Factor = 0.64 [0.64] (See Tooling Length Factor Graph on page 61)

(Tooling Length of 6 in [150 mm] $\rightarrow$ 0.64 [0.64])

Total Grip Force = 87 psi $\times$ 1.03 $\times$ 0.64 = 57 lb [6 bar $\times$ 66.4 $\times$ 0.64 = 255 N]

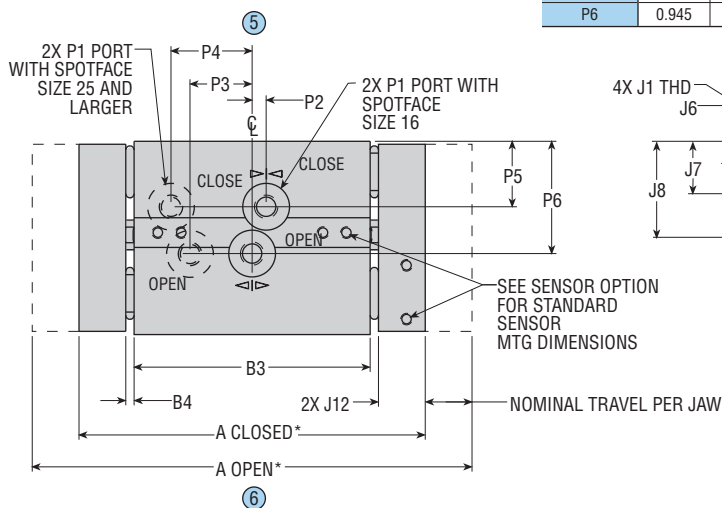
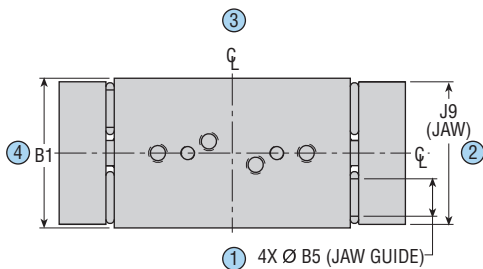
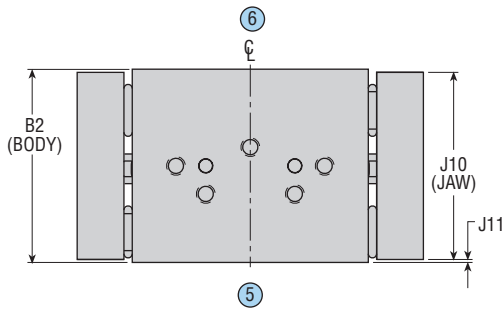


DIMENSIONS: Series GRW Grippers

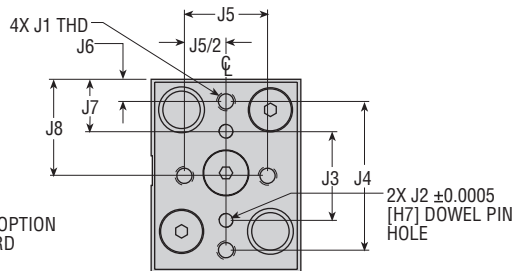
DIMENSIONS SHOWN APPLY TO ALL SIZES
UNLESS NOTED OTHERWISE, SEE OTHER
VIEWS FOR SIZE DEPENDENT FEATURES

NOTES:

- 1) DESIGNATED ϕ IS CENTERLINE OF UNIT
- 2) METRIC INFORMATION SHOWN IN []
- 3) UNMARKED HOLES ARE USED FOR PHD MANUFACTURING, CONTACT PHD IF DIMENSIONAL INFORMATION IS REQUIRED
- 4) CIRCLED NUMBERS INDICATE POSITIONS
- 5) *A CLOSED REFLECTS THE LARGEST POSSIBLE CLOSED DIMENSION
A OPEN REFLECTS THE SMALLEST POSSIBLE OPEN DIMENSION
- 6) SEE NEXT PAGE FOR MOUNTING DIMENSIONS



LETTER DIM	SIZE									
	16		25		32		40		50	
	in	mm	in	mm	in	mm	in	mm	in	mm
NOM TRAVEL PER JAW	0.394	10.0	1.043	26.5	1.280	32.5	1.791	45.5	2.303	58.5
A CLOSED*	2.900	73.7	5.380	136.7	6.730	170.9	9.125	231.8	11.645	295.8
A OPEN*	3.660	93.0	7.380	187.5	9.230	234.4	12.625	320.7	16.157	410.4
B1	1.260	32.0	1.790	45.5	2.362	60.0	2.913	74.0	3.543	90.0
B2	1.625	41.3	2.244	57.0	2.874	73.0	3.504	89.0	4.528	115.0
B3	1.987	50.5	3.201	81.3	3.929	99.8	5.390	136.9	6.932	176.1
B4	0.063	1.6	0.063	1.6	0.125	3.2	0.125	3.2	0.238	6.0
B5	0.315	8.0	0.472	12.0	0.630	16.0	0.787	20.0	0.984	25.0
J1	8-32 thru	M4 x 0.7 thru	10-32 x 0.500 DP	M5 x 0.8 x 13.0 DP	1/4-20 x 0.750 DP	M6 x 1.0 x 19.0 DP	5/16-18 x 1.000 DP	M8 x 1.25 x 25.0 DP	3/8-16 x 1.000 DP	M10 x 1.5 x 25.0 DP
J2	0.1283 thru	3.0 thru	0.1908 x 0.500 DP	5.0 x 13.0 DP	0.1908 x 0.500 DP	5.0 x 13.0 DP	0.1908 x 0.500 DP	5.0 x 12.5 DP	0.3158 x 0.512 DP	8.0 x 13.0 DP
J3	0.750	19.05	1.000	25.40	1.250	31.75	1.312	33.32	2.375	60.33
J4	1.250	31.8	1.625	41.3	2.125	54.0	2.250	57.2	3.375	85.7
J5	0.700	17.8	0.875	22.2	1.188	30.2	1.625	41.3	1.660	42.2
J6	0.187	4.7	0.188	4.8	0.250	6.35	0.500	12.7	0.282	7.2
J7	0.438	11.1	0.500	12.7	0.687	17.45	0.968	24.6	0.782	19.9
J8	0.813	20.7	1.000	25.4	1.312	33.3	1.625	41.3	1.969	50.0
J9	1.200	30.5	1.654	42.0	2.240	56.9	2.835	72.0	3.425	87.0
J10	1.575	40.0	2.158	54.8	2.795	71.0	3.400	86.4	4.429	112.5
J11	0.025	0.6	0.033	0.8	0.040	1.0	0.040	1.0	0.040	1.0
J12	0.390	9.9	1.024	26.0	1.270	32.3	1.735	44.1	2.105	53.5
K1	8-32 x 0.200 DP	M4 x 0.7 x 5.0 DP	10-32 x 0.250 DP	M5 x 0.8 x 6.3 DP	1/4-20 x 0.354 DP	M6 x 1.0 x 9.0 DP	5/16-18 x 0.472 DP	M8 x 1.0 x 12.0 DP	5/16-18 x 0.551 DP	M8 x 1.25 x 14.0 DP
K2	0.1283 x 0.188 DP	3.0 x 5.0 DP	0.1283 x 0.250 DP	4.0 x 6.0 DP	0.1908 x 0.440 DP	5.0 x 11.0 DP	0.1908 x 0.440 DP	5.0 x 11.0 DP	0.3158 x 0.500 DP	8.0 x 12.5 DP
K3	0.750	19.1	0.787	20.0	0.750	19.05	N/A	N/A	3.000	76.2
K4	1.250	31.8	2.000	50.8	2.000	50.8	2.500	63.5	5.500	139.7
K5	0.813	20.7	0.738	18.75	1.042	26.5	1.150	29.2	1.594	40.5
K6	0.157	4.0	0.625	15.88	0.750	19.05	1.125	28.6	1.340	34.0
K7	0.236	6.0	N/A	N/A	N/A	N/A	0.563	14.3	0.670	17.0
K8	0.394	10.0	1.250	31.75	N/A	N/A	N/A	N/A	2.500	63.5
K9	0.750	19.1	0.750	19.05	1.000	25.40	1.250	31.8	4.000	101.6
K10	1.252	31.8	2.250	57.15	2.000	50.8	2.500	63.5	5.118	130.0
K11	0.098	2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
K12	0.630	16.0	0.895	22.7	1.181	30.0	1.457	37.0	1.772	45.0
K13	8-32 x 0.280 DP	M4 x 0.7 x 7.0 DP	10-32 x 0.375 DP	M5 x 0.8 x 9.0 DP	1/4-20 x 0.492 DP	M6 x 1.0 x 12.5 DP	5/16-18 x 0.561 DP	M8 x 1.25 x 14.0 DP	3/8-16 x 0.709 DP	M10 x 1.5 x 18.0 DP
K14	0.1283 x 0.188 DP	3.0 x 6.0 DP	0.1283 x 0.250 DP	4.0 x 6.0 DP	0.1908 x 0.440 DP	5.0 x 11.0 DP	0.1908 x 0.440 DP	5.0 x 11.0 DP	0.3158 x 0.500 DP	8.0 x 12.5 DP
K15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.024	26.0
P1	10-32	M5 x 0.8	10-32	M5 x 0.8	1/8 NPT	1/8 BSP	1/8 NPT	1/8 BSPP	1/8 NPT	1/8 BSPP
P2	0.118	3.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
P3	N/A	N/A	1.260	32.0	1.000	25.4	1.868	47.4	2.639	67.0
P4	N/A	N/A	1.260	32.0	1.592	40.4	2.245	57.0	2.931	74.4
P5	0.551	14.0	0.768	19.5	1.161	29.5	1.301	33.0	1.713	43.5
P6	0.945	24.0	1.398	35.5	1.673	42.5	2.069	52.6	2.697	68.5

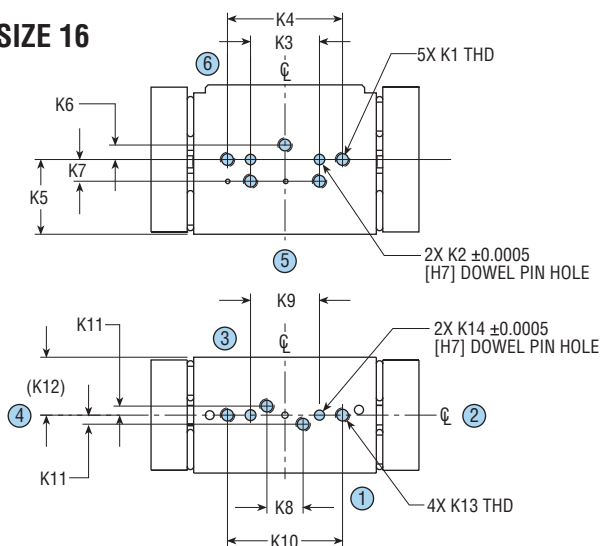


CAD & Sizing Assistance

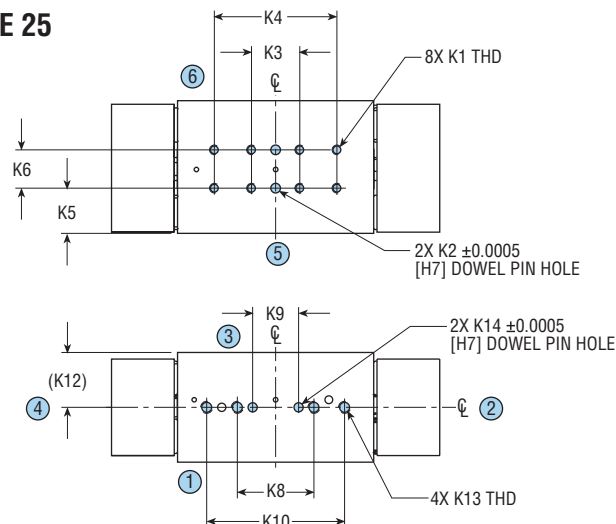
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MOUNTING DIMENSIONS: Series GRW Grippers

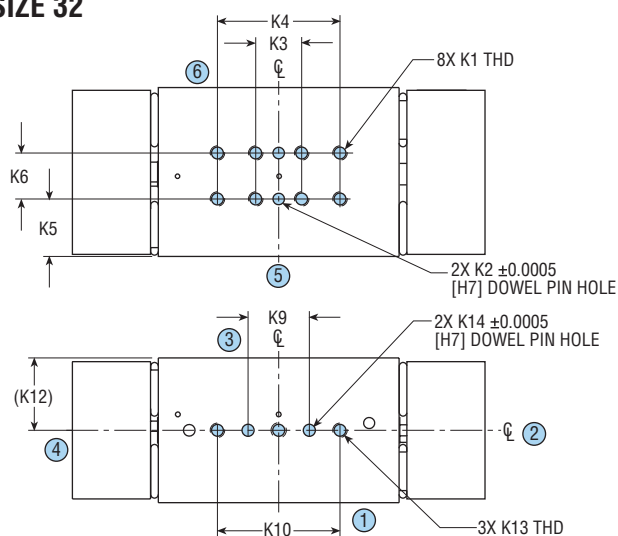
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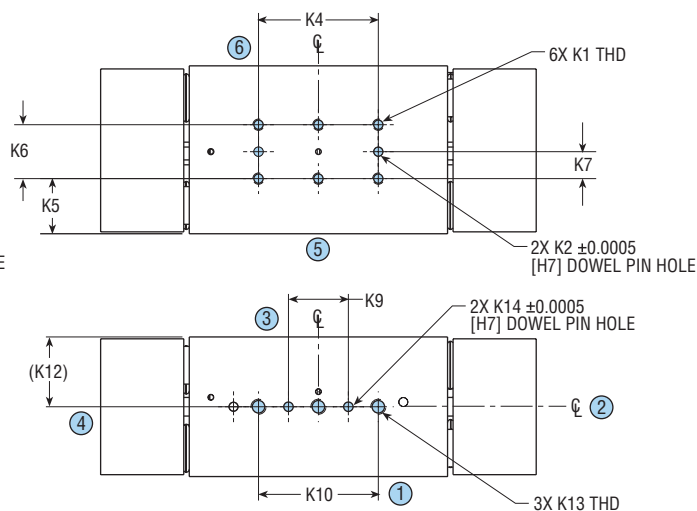
SIZE 25



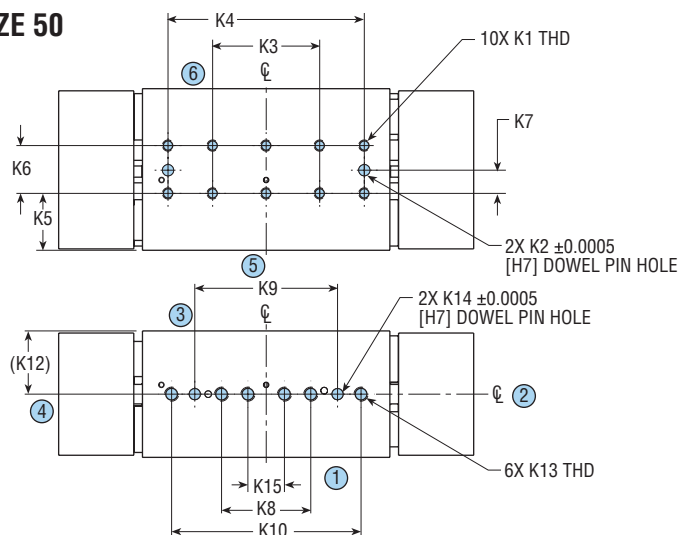
SIZE 32



SIZE 40



SIZE 50



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.

L11-UB99

MANIFOLD PORTS

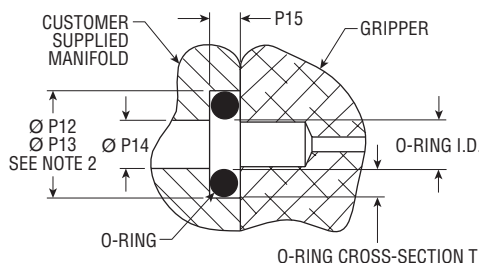
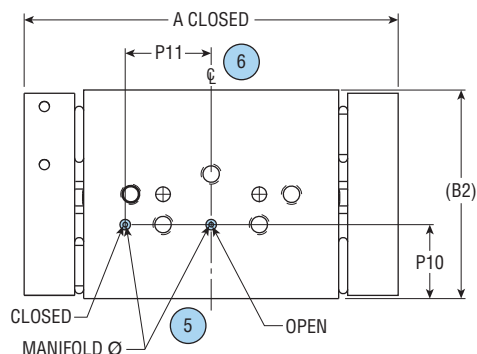
L11-UB37

With this option the gripper is configured for manifold mounting on one of the two standard mounting surfaces, according to the selected option code. The standard ports are plugged. O-ring seals are provided for mounting between the gripper and the manifold.

TYPE	MANIFOLD REPLACEMENT KIT NUMBER				
	SIZE 16	SIZE 25	SIZE 32	SIZE 40	SIZE 50
IMPERIAL	65709-16-1-1	65709-25-1-1	65709-32-1-1	65709-40-1-1	65709-50-1-1
METRIC	65709-16-5-1	65709-25-5-1	65709-32-5-1	65709-40-5-1	65709-50-5-1

Manifold kit includes port plugs and O-rings.

MANIFOLD OPTION L11-UB37



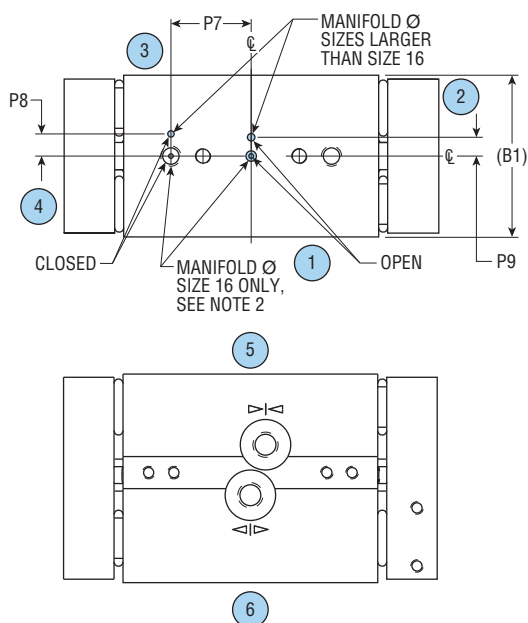
MANIFOLD PORTING DIMENSIONS

FOR CUSTOMER USE
(DIMENSIONS REQUIRED
ON CUSTOMER MOUNTING SURFACE)

NOTES:

- 1) DESIGNATED ϕ IS CENTERLINE OF UNIT
- 2) USE P12 FOR ALL UNITS EXCEPT SIZE 16 WITH MANIFOLD OPTION IN LOCATION 99. FOR THIS UNIT ONLY, ONE MANIFOLD ORIFICE IS LOCATED IN A MOUNTING THREAD (SEE OPTION ILLUSTRATION) AND REQUIRES THE P13 DIAMETER.
- 3) CIRCLED NUMBERS INDICATE POSITION.

MANIFOLD OPTION L11-UB99



LETTER DIM	SIZE									
	16		25		32		40		50	
	in	mm	in	mm	in	mm	in	mm	in	mm
P7	0.625	15.9	1.266	32.2	1.590	40.4	2.245	57.0	2.931	74.4
P8	—	—	0.138	3.5	0.177	4.5	0.197	5.0	0.236	6.0
P9	—	—	0.138	3.5	0.236	6.0	0.335	8.5	0.236	6.0
P10	0.577	14.7	1.050	26.7	1.417	36.0	1.713	43.5	1.969	50.0
P11	0.670	17.0	1.266	32.2	1.590	40.4	2.245	57.0	2.931	74.4
P12	0.236	6.0	0.197	5.0	0.197	5.0	0.276	7.0	0.276	7.0
P12 O-RING (I.D. x T)	3 mm x 1.5 mm		2 mm x 1.5 mm		2 mm x 1.5 mm		4 mm x 1.5 mm		4 mm x 1.5 mm	
P13	0.276	7.0	See Note 2							
P13 O-RING (I.D. x T)	4 mm x 1.5 mm		See Note 2							
P14	0.098	2.5	0.080	2.0	0.098	2.5	0.125	3.2	0.125	3.2
P15	0.048	1.2	0.048	1.2	0.048	1.2	0.048	1.2	0.048	1.2
(B1)	1.260	32.0	1.790	45.5	2.362	60.0	2.913	74.0	3.543	90.0
(B2)	1.625	41.3	2.244	57.0	2.874	73.0	3.504	89.0	4.528	115.0
A CLOSED	2.900	73.7	5.380	136.7	6.729	170.9	9.125	231.8	11.645	295.8

Z1

CORROSION RESISTANT

This option provides appropriate corrosion resistant coating on all ferrous parts except jaw guides.

All dimensions are reference only unless specifically tolerated.

PROXIMITY SWITCH KIT

This kit equips the gripper with brackets to provide for the mounting of up to two 4 mm round proximity switches. Proximity switches must be ordered separately. For additional switch information, go to phdinc.com.

PROXIMITY SWITCH MOUNTING KITS

SIZE	KIT NUMBER	
	STANDARD PLATING	-Z1 PLATING
16	65710-16-20	68465-16-20
25	65710-25-53	68465-25-53
32	65710-32-65	68465-32-65
40	68457-40-91	68466-40-91
50	68457-50-117	68466-50-117

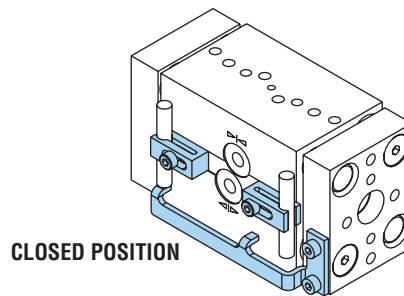
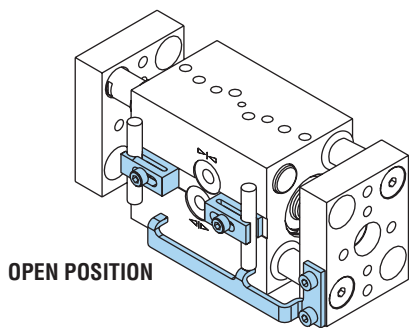
Each kit includes 1 target bracket, 2 switch mounting brackets, and socket head cap screws for mounting.

4 mm ROUND PROXIMITY SWITCHES (SIZES 16, 25, 32)

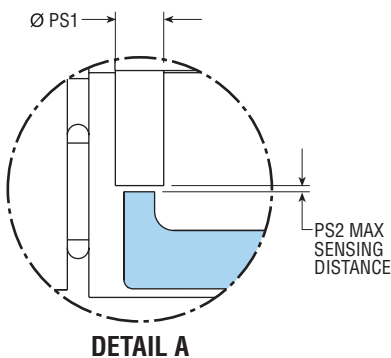
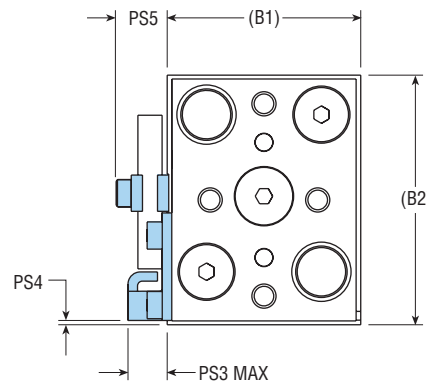
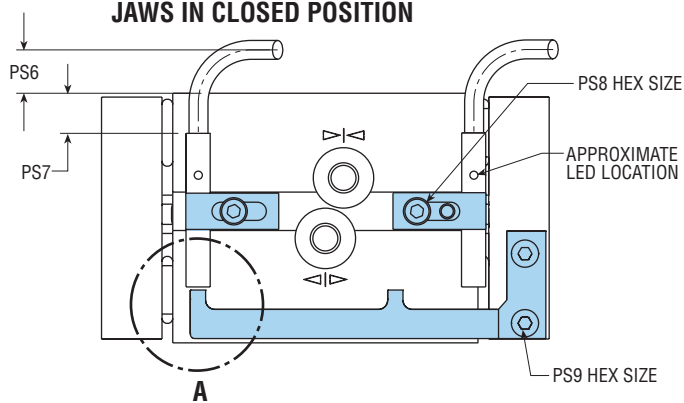
PART NO.	DESCRIPTION
18430-001-02	NPN (Sink) 2 meter cable
18430-002-02	PNP (Source) 2 meter cable

8 mm THREADED PROXIMITY SWITCHES (SIZES 40, 50)

PART NO.	DESCRIPTION
51422-005-02	NPN (Sink) 2 meter cable
51422-006-02	PNP (Source) 2 meter cable



JAWS IN CLOSED POSITION



LETTER DIM	SIZE									
	16		25		32		40		50	
	in	mm	in	mm	in	mm	in	mm	in	mm
PS1	4 mm ROUND		4 mm ROUND		4 mm ROUND		8 mm THREADED		8 mm THREADED	
PS2	0.020	0.5	0.020	0.5	0.020	0.5	0.030	0.8	0.030	0.8
PS3	0.265	6.73	0.150	3.81	0.250	6.35	0.571	14.50	0.551	14.00
PS4	0.028	0.71	0.100	2.54	0.067	1.70	0.140	3.56	0.154	3.91
PS5	0.347	8.81	0.347	8.81	0.347	8.81	0.571	14.50	0.571	14.50
PS6	0.67	17.0	0.29	7.4	N/A	N/A	N/A	N/A	N/A	N/A
PS7	0.26	6.6	0.64	16.3	1.08	27.4	1.797	45.7	2.746	69.8
PS8	0.08	2.0	0.08	2.0	0.08	2.0	0.079	2.0	0.079	2.0
PS9	0.08	2.0	0.10	2.5	0.10	2.5	0.118	3.0	0.157	4.0
(B1)	1.260	32.0	1.790	45.5	2.362	60.0	2.913	74.0	3.543	90.0
(B2)	1.625	41.3	2.244	57.0	2.874	73.0	3.504	89.0	4.528	115.0

All dimensions are reference only unless specifically toleranced.

5580 SWITCHES AND MOUNTING KITS

This kit equips the gripper with brackets to provide for the mounting of up to two 6 mm square Solid State switches. Switches must be ordered separately.

5580 SWITCH REPLACEMENT CHART

SWITCH KIT NUMBER	REPLACEMENT KIT INCLUDES	JC1 SWITCH DESCRIPTION
55803-1-02	JC1HDN-5 switch with adaptor	NPN (Sink), Radial Sensing, 5 meter cable
55823-1	JC1HDN-K switch with adaptor	NPN (Sink), Radial Sensing, Quick Connect
55804-1-02	JC1HDP-5 switch with adaptor	PNP (Source), Radial Sensing, 5 meter cable
55824-1	JC1HDP-K switch with adaptor	PNP (Source), Radial Sensing, Quick Connect

For additional switch information, go to phdinc.com.

CORDSETS

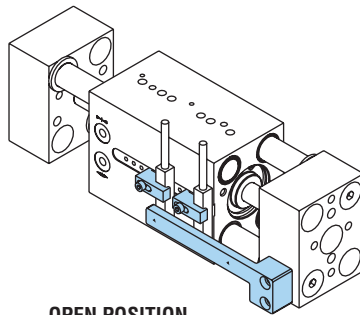
PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 meter cable
63549-05	M8, 3 pin, Straight Female Connector, 5 meter cable

Cordsets are ordered separately.

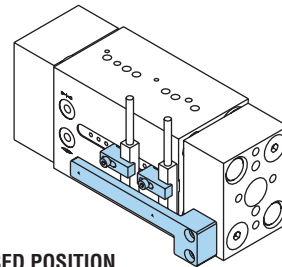
SWITCH MOUNTING KITS

SIZE	KIT NUMBER	
	STANDARD PLATING	-Z1 PLATING
16	68446-16-20	68467-16-20
25	68446-25-53	68467-25-53
32	68446-32-65	68467-32-65
40	68446-40-91	68467-40-91
50	68446-50-117	68467-50-117

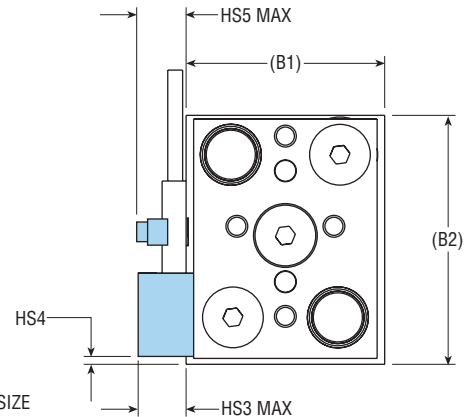
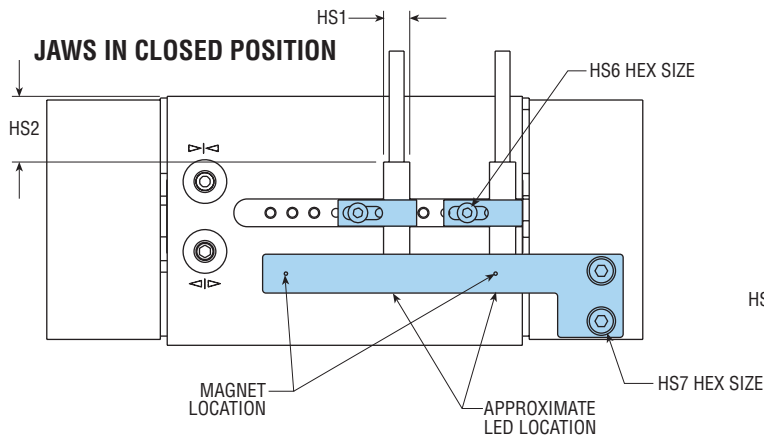
Each kit includes 1 target bracket, 2 switch mounting brackets, and socket head cap screws for mounting.



OPEN POSITION



CLOSED POSITION



LETTER DIM	SIZE									
	16		25		32		40		50	
	in	mm	in	mm	in	mm	in	mm	in	mm
HS1	6 mm SQUARE		6 mm SQUARE		6 mm SQUARE		6 mm SQUARE		6 mm SQUARE	
HS2	0.365	9.3	0.592	15.0	0.950	24.1	2.020	51.3	2.640	67.06
HS3	0.581	14.8	0.543	13.8	0.550	14.0	0.571	14.50	0.551	14.00
HS4	0.030	0.8	0.070	1.8	0.096	2.4	0.184	4.7	0.154	3.9
HS5	0.465	11.8	0.465	11.8	0.465	11.8	0.465	11.8	0.465	11.8
HS6	0.079	2.0	0.079	2.0	0.079	2.0	0.079	2.0	0.079	2.0
HS7	0.079	2.0	0.098	2.5	0.098	2.5	0.118	3.0	0.157	4.0
(B1)	1.260	32.0	1.790	45.5	2.362	60.0	2.913	74.0	3.543	90.0
(B2)	1.625	41.3	2.244	57.0	2.874	73.0	3.504	89.0	4.528	115.0

All dimensions are reference only unless specifically tolerated.