

190/191

Major Benefits

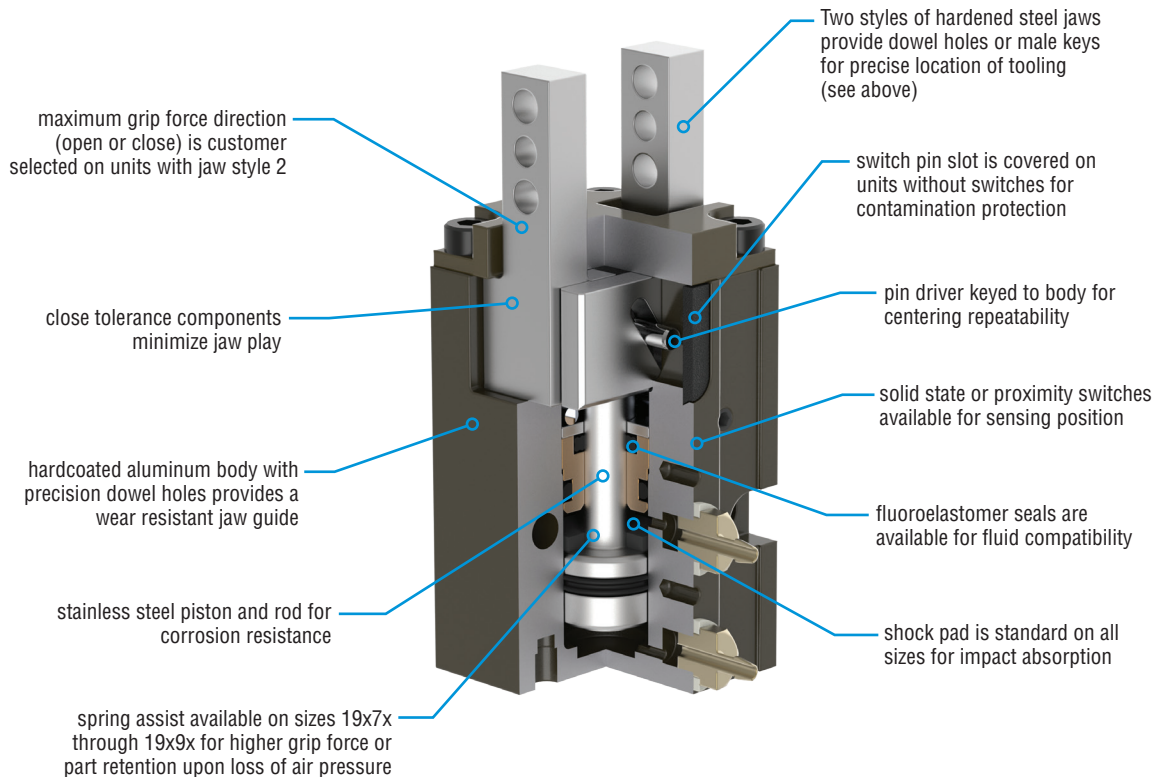
- Compact size
- Spring assist on open or close, sizes 19x7x through 19x9x, two jaw styles, two jaw travels
- Mounting holes on one or three surfaces
- Jaw travel adjustment kits available
- 10 million cycles minimum rated life with standard seals (includes spring assist units)



JAW STYLE 1



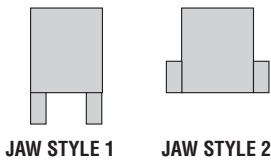
JAW STYLE 2



ORDERING DATA: Series 190/191 Grippers

TO ORDER SPECIFY:

Model, Design No., Sensor or Switch Ready Options, Maximum Force, Spring Options, and Seals.



DESIGN NO.

MAXIMUM FORCE REVERSED JAW MOVEMENT

0 - Maximum Force on Open
5 - Maximum Force on Close
(Available on Jaw Style 2 only)

SPRING OPTIONS

0 - None
3 - Spring Assist Close
(Available with -x53x Option combination only)
4 - Spring Assist Open
(Available with -x04x Option combination only.)
(Not available on 19x6x size.)

SEALS

1 - Buna-N (Standard)
2 - Fluoroelastomer

19171 - 2 - 0 5 3 1

			190 MODELS FULL MOUNTING		191 MODELS BOTTOM MOUNTING	
			IMPERIAL	METRIC	IMPERIAL	METRIC
MODEL	BORE SIZE		JAW STYLE 1	JAW STYLE 1	JAW STYLE 1	JAW STYLE 1
JAW STYLE 1	mm	in				
19x6x	8.7	0.343	19060	19065	19160	19165
19x7x	12.7	0.500	19070	19075	19170	19175
19x8x	19	0.750	19080	19085	19180	19185
19x9x	25.4	1.00	19090	19095	19190	19195
JAW STYLE 2			JAW STYLE 2	JAW STYLE 2	JAW STYLE 2	JAW STYLE 2
SHORT TRAVEL			SHORT TRAVEL	SHORT TRAVEL	SHORT TRAVEL	SHORT TRAVEL
19x6x	8.7	0.343	19061	19066	19161	19166
19x7x	12.7	0.500	19071	19076	19171	19176
19x8x	19	0.750	19081	19086	19181	19186
19x9x	25.4	1.00	19091	19096	19191	19196
LONG TRAVEL			LONG TRAVEL	LONG TRAVEL	LONG TRAVEL	LONG TRAVEL
19x6x	8.7	0.343	19062	19067	19162	19167
19x7x	12.7	0.500	19072	19077	19172	19177
19x8x	19	0.750	19082	19087	19182	19187
19x9x	25.4	1.00	19092	19097	19192	19197

SENSOR OR SWITCH OPTIONS

0 - Plain
4 - Sensor Ready or JC1STP-x
Switch Ready
(Not available with Spring Option.
See notes 1 & 2.)
5 - Proximity & Solid State Switch
Ready (6 mm square)
See notes 1 & 2.

NOTES:

- 1) Gripper with sensor option 4 or 5 is assembled with the internal components required to use the respective devices listed in each option. The sensor and any related devices and/or mounting kits must be ordered separately.
- 2) Switches and all kits must be ordered separately.



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

SERIES JC1ST TWO POSITION TEACHABLE MAGNETIC SWITCHES

PART NO.	DESCRIPTION
JC1STP-2	PNP (Source), Solid State, 12-30 VDC, 2 meter cable
JC1STP-K	PNP (Source), Solid State, 12-30 VDC, Quick Connect

Includes one switch and installation directions.

SERIES JC1STP CORDSET

PART NO.	DESCRIPTION
81284-1-001	M8, 4 pin, Straight Female Connector, 5 meter cable

SERIES JCSTP SENSOR MOUNTING KITS

MODEL NO.	KIT NO.	
	IMPERIAL	METRIC
19x6x	86944-05-1	86944-05-5
19x7x	86944-06-1	86944-06-5
19x8x	86944-07-1	86944-07-5
19x9x	86944-08-1	86944-08-5

NOTE: See Switches and Sensors section for additional switch information and complete specification. Switches must be ordered separately.

SWITCH BRACKETS & TARGETS FOR INDUCTIVE PROXIMITY SWITCHES

MODEL NO.	PART NO.	
	IMPERIAL	METRIC
19x6x	59792-1	18432
19x7x	59793-1	18437
19x8x	18438	18438
19x9x	18439	18439

Switches must be ordered separately.
See Switches and Sensors section.

SWITCH BRACKETS & TARGET KITS FOR USE WITH: PHD SERIES 5580 KIT

MODEL NO.	KIT NO.	
	IMPERIAL	METRIC
19x6x	59794-1	55770
19x7x	59795-1	55771
19x8x	55772	55772
19x9x	55773	55773

Switches must be ordered separately.
See Switches and Sensors section.

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.

CAD & Sizing Assistance

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

SPECIFICATIONS	SERIES 190 & 191
OPERATING PRESSURE	30 psi min to 150 psi max [2 bar min to 10 bar max] air
OPERATING TEMPERATURE	-20°F to +180°F [-28°C to +82°C]
RATED LIFE	10 million cycles minimum with standard seals (including spring assist units)
GRIP REPEATABILITY	Within ± 0.002 in [± 0.05 mm] of original centered position
LUBRICATION	Factory lubricated for rated life
MAINTENANCE	Field repairable

GRIPPER NO.	DISPLACEMENT		GRIPPER WEIGHT				GRIP FORCE FACTOR G _F				SPRING ASSIST GRIP FORCE S _F	
			STANDARD		SPRING ASSIST		MAX. DIRECTION		MIN. DIRECTION			
	in ³	cm ³	lb	kg	oz	g	IMPERIAL *	METRIC*	IMPERIAL	METRIC	IMPERIAL	METRIC
19x60 & 19x65	0.012	0.2	0.11	0.05	—	—	0.061	3.93	0.049	3.16	—	—
19x61 & 19x66	0.012	0.2	0.11	0.05	—	—	0.061	3.93	0.049	3.16	—	—
19x62 & 19x67	0.012	0.2	0.13	0.06	—	—	0.037	2.39	0.029	1.87	—	—
19x70 & 19x75	0.036	0.6	0.24	0.11	0.26	0.12	0.122	7.87	0.092	5.93	2.230	9.99
19x71 & 19x76	0.036	0.6	0.25	0.11	0.26	0.12	0.122	7.87	0.092	5.93	2.230	9.99
19x72 & 19x77	0.036	0.6	0.27	0.12	0.28	0.12	0.093	6.00	0.069	4.45	1.690	7.57
19x80 & 19x85	0.110	1.8	0.64	0.29	0.65	0.29	0.250	16.13	0.210	13.55	4.280	19.17
19x81 & 19x86	0.110	1.8	0.67	0.30	0.68	0.31	0.250	16.13	0.210	13.55	4.280	19.17
19x82 & 19x87	0.110	1.8	0.71	0.32	0.73	0.33	0.150	9.68	0.130	8.39	2.630	11.78
19x90 & 19x95	0.250	4.1	1.44	0.65	1.47	0.67	0.490	31.61	0.370	23.87	8.700	38.98
19x91 & 19x96	0.250	4.1	1.46	0.66	1.48	0.67	0.490	31.61	0.370	23.87	8.700	38.98
19x92 & 19x97	0.250	4.1	1.62	0.73	1.64	0.74	0.270	17.42	0.200	12.90	4.760	21.32

*Maximum grip force direction is always open (internal grip) on all Series 190 and 191 Jaw Style One units.
(19x60, 19x65, 19x70, 19x75, 19x80, 19x85, 19x90, and 19x95)

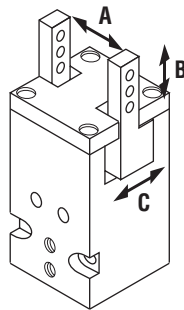
TOOLING LENGTH FACTOR

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 (G_F) values given in the table above are for zero tooling length (body surface).

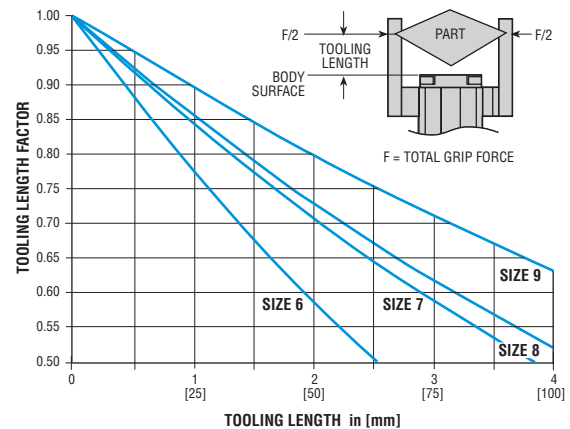
JAW BACKLASH

Jaw backlash in the (A) direction will not exceed 0.005 in [0.127 mm] per jaw.
Total clearance between the parallel jaws and the body or cover will not exceed the following figures:

(B) 0.0025 inch [0.064 mm] per jaw
(C) 0.003 inch [0.076 mm] per jaw



TOOLING LENGTH FACTOR



Application & Sizing Assistance

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

GRIP FORCE CALCULATION EQUATIONS:

IMPERIAL:

Total Grip Force [lb] = (Pressure [psi] x Gr) x Tooling Length Factor

Total Grip Force with Springs [lb] = ((Pressure [psi] x Gr) ± S_F [lb]) x Tooling Length Factor

METRIC:

Total Grip Force [N] = (Pressure [bar] x Gr) x Tooling Length Factor

Total Grip Force with Springs [N] = ((Pressure [bar] x Gr) ± S_F [N]) x Tooling Length Factor

GRIP FORCE CALCULATION EXAMPLE:

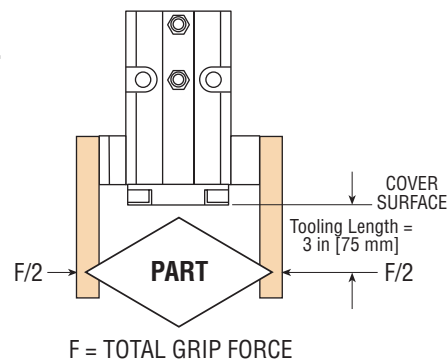
Gripper: 19x9x-2-x50x

Common Parameters:

Operating Pressure = 60 psi [4 bar]

Tooling Length = 3 in [75 mm]

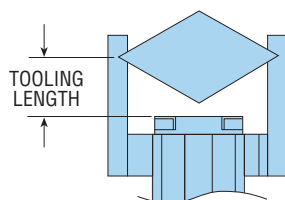
1. Determine Grip Force Factor Gr = 0.490 [31.61] (from table on previous page)
2. Determine Tooling Length Factor = 0.71 [0.71] (from Tooling Length Factor Graph on previous page at 3 in [75 mm] tooling length)
3. Total Grip Force Calculations:
For Standard Unit: 19191-2-x50x [19196-2-x50x]
Total Grip Force = 60 psi x 0.490 x 0.71 = 20.8 [4 bar x 31.6 x 0.71 = 89.77 N]



GRIP FORCE GRAPHS: MODELS 1906x & 1916x

Gripping forces are the arithmetic sum of all forces occurring at gripper jaws.

Gripping force in relation to tooling length at 87 psi [6 bar] actuating pressure.



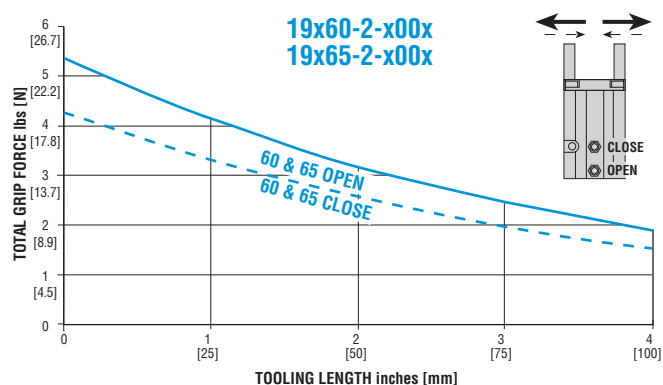
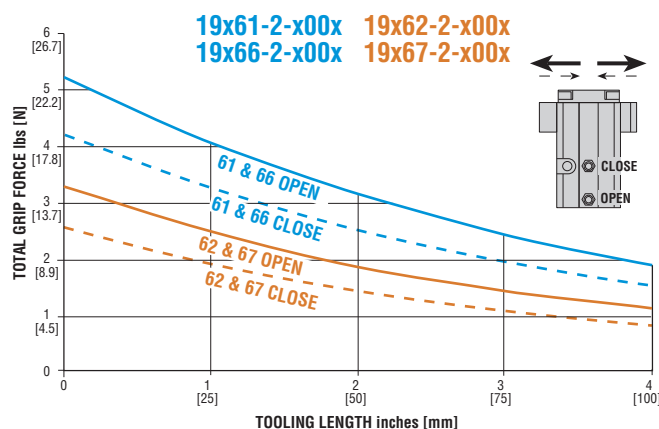
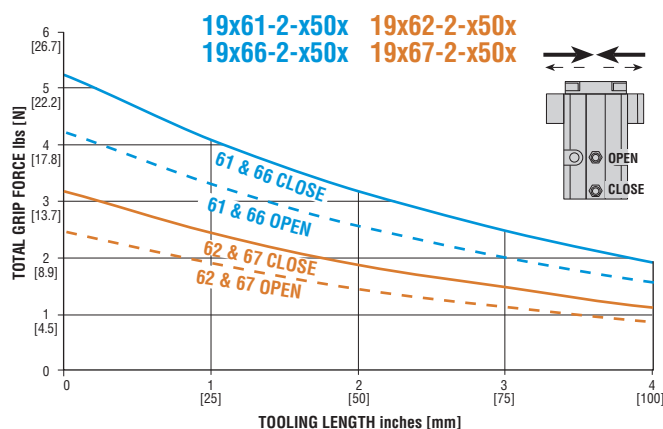
LEGEND

SHORT TRAVEL

LONG TRAVEL

Max. Grip Force Direction
Min. Grip Force Direction

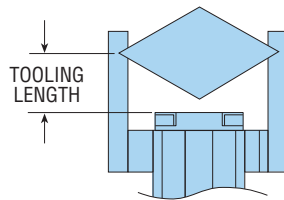
DOUBLE ACTING



GRIP FORCE GRAPHS: MODELS 1907x & 1917x

Gripping forces are the arithmetic sum of all forces occurring at gripper jaws.

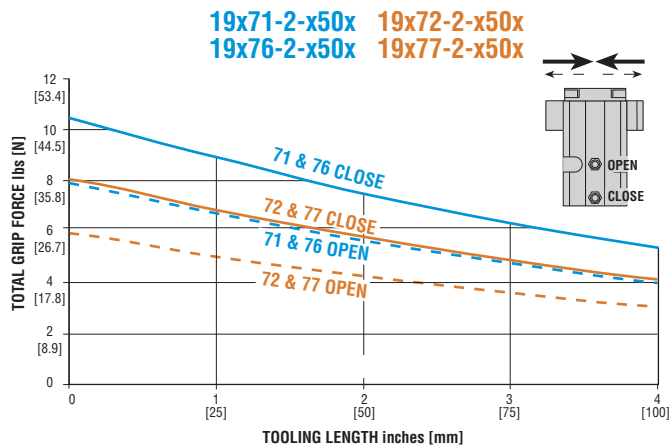
Gripping force in relation to tooling length at 87 psi [6 bar] actuating pressure.



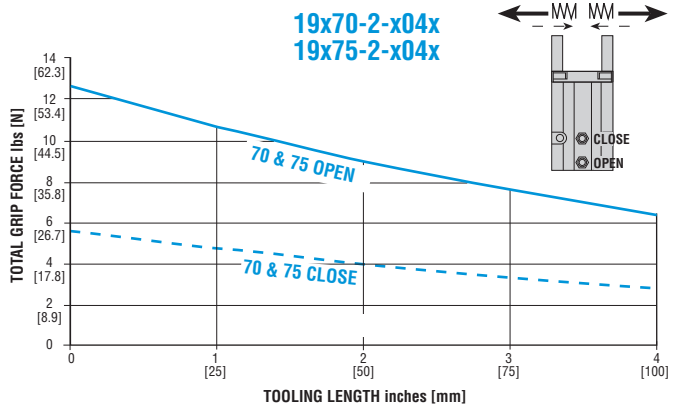
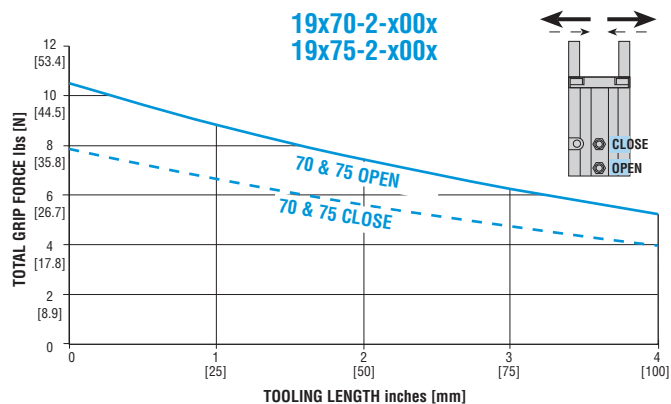
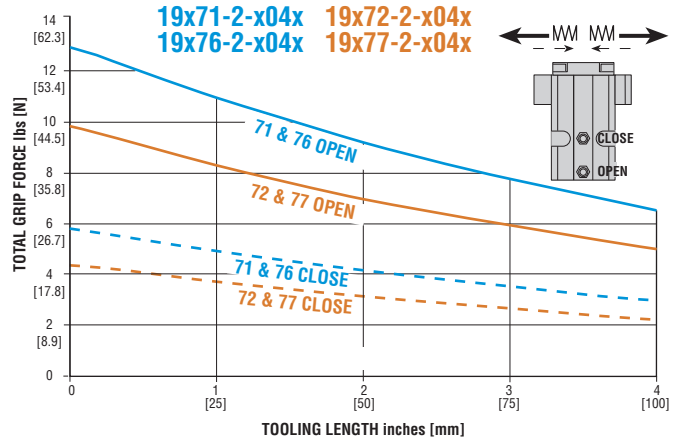
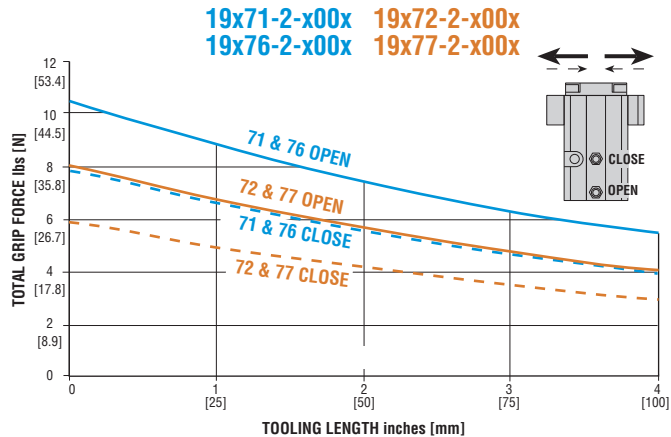
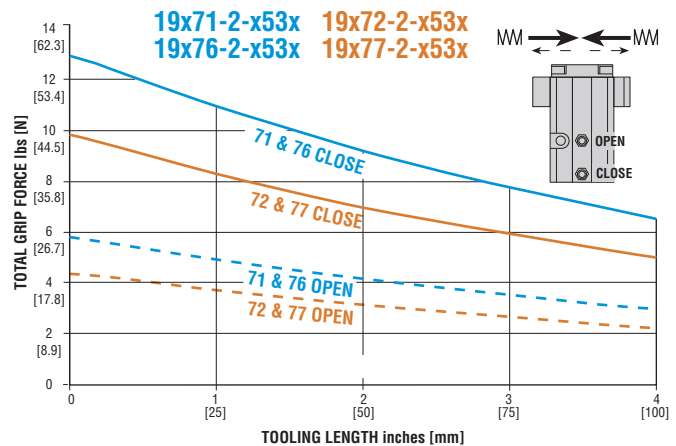
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DOUBLE ACTING



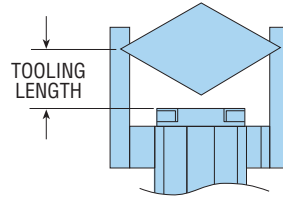
DOUBLE ACTING SPRING ASSIST



GRIP FORCE GRAPHS: MODELS 1908x & 1918x

Gripping forces are the arithmetic sum of all forces occurring at gripper jaws.

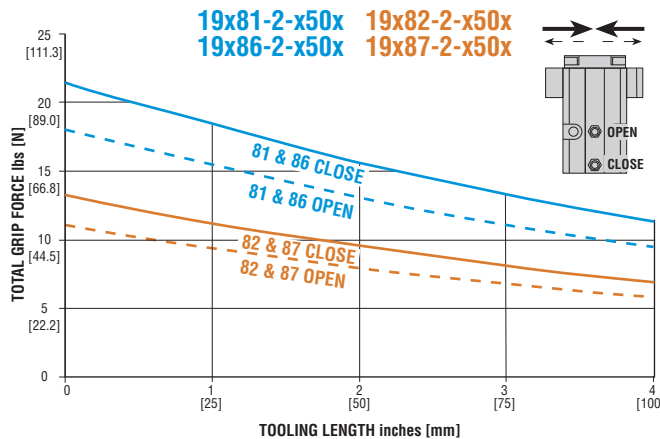
Gripping force in relation to tooling length at 87 psi [6 bar] actuating pressure.



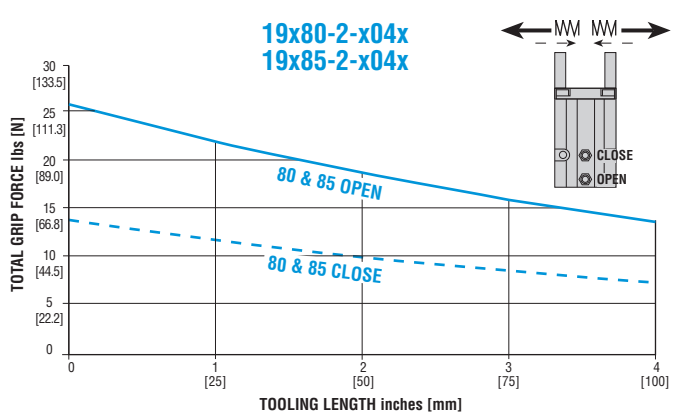
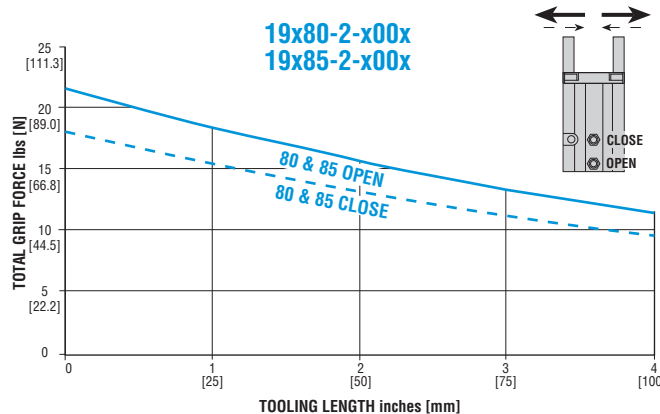
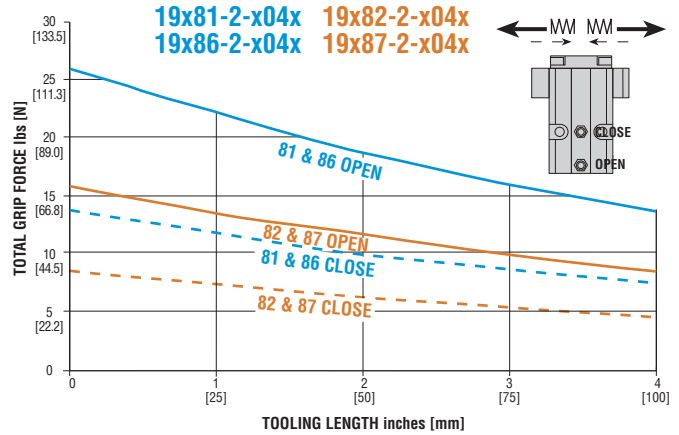
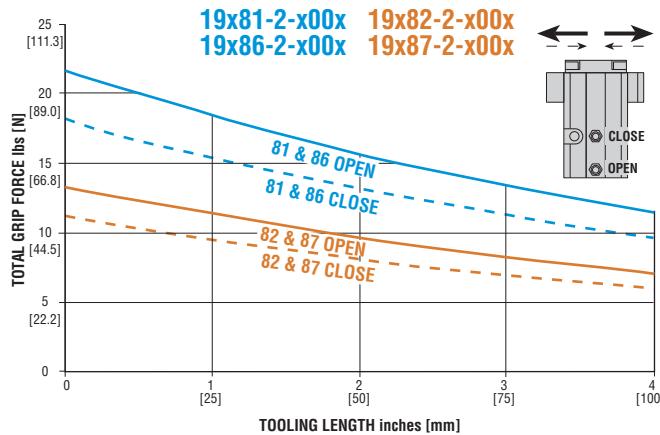
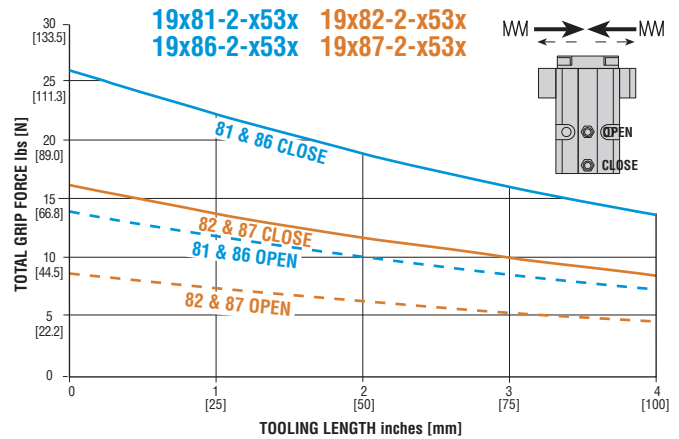
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DOUBLE ACTING



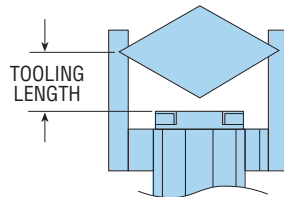
DOUBLE ACTING SPRING ASSIST



GRIP FORCE GRAPHS: MODELS 1909x & 1919x

Gripping forces are the arithmetic sum of all forces occurring at gripper jaws.

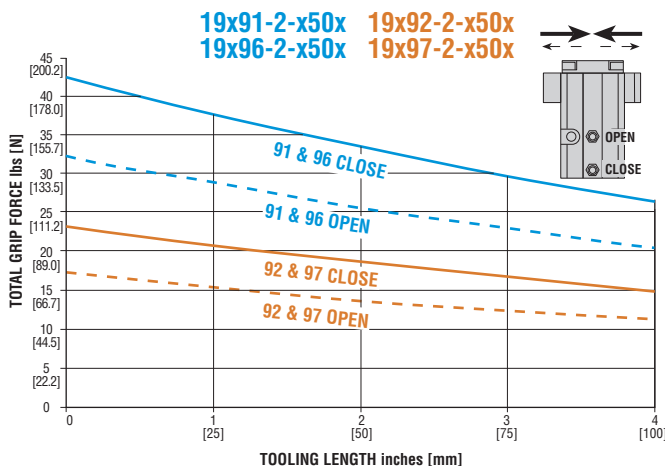
Gripping force in relation to tooling length at 87 psi [6 bar] actuating pressure.



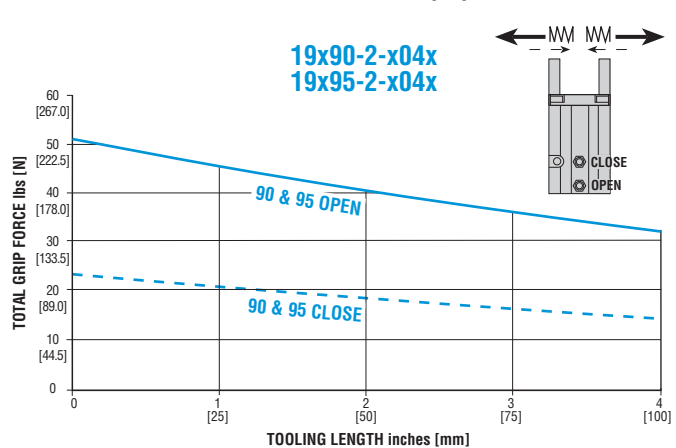
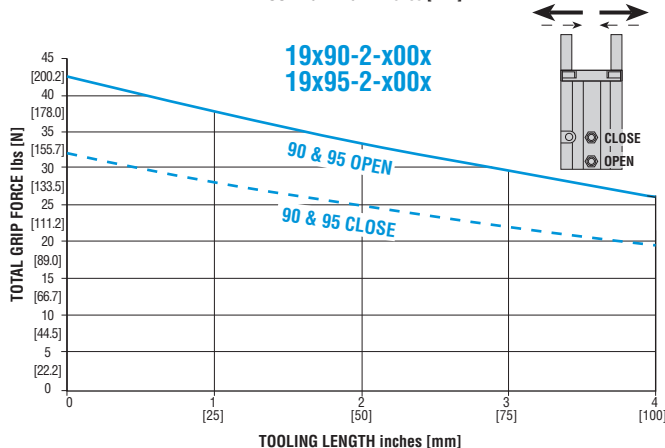
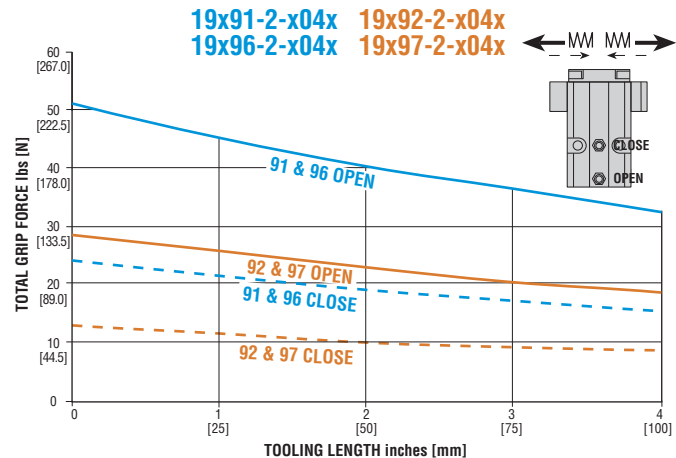
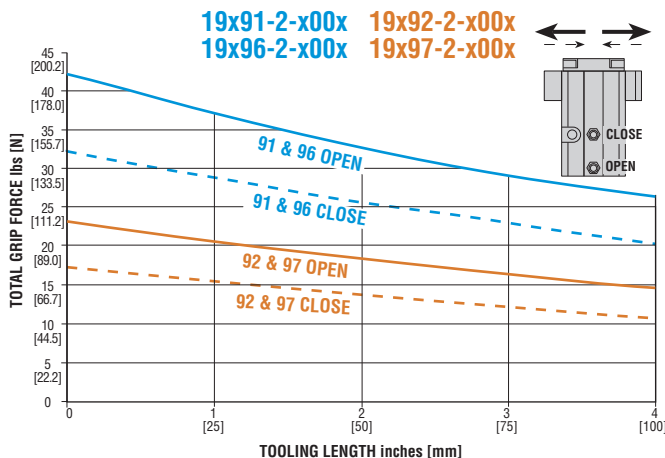
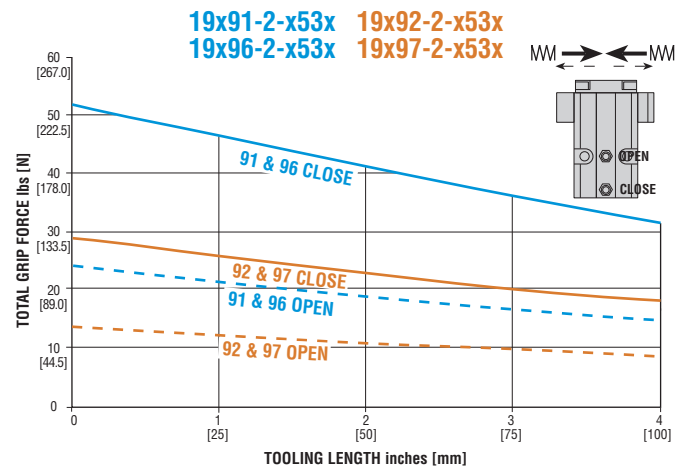
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DOUBLE ACTING



DOUBLE ACTING SPRING ASSIST

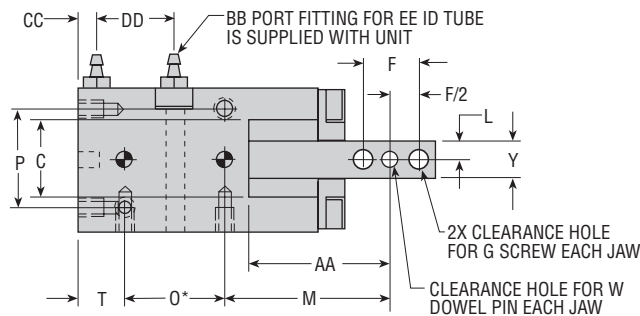
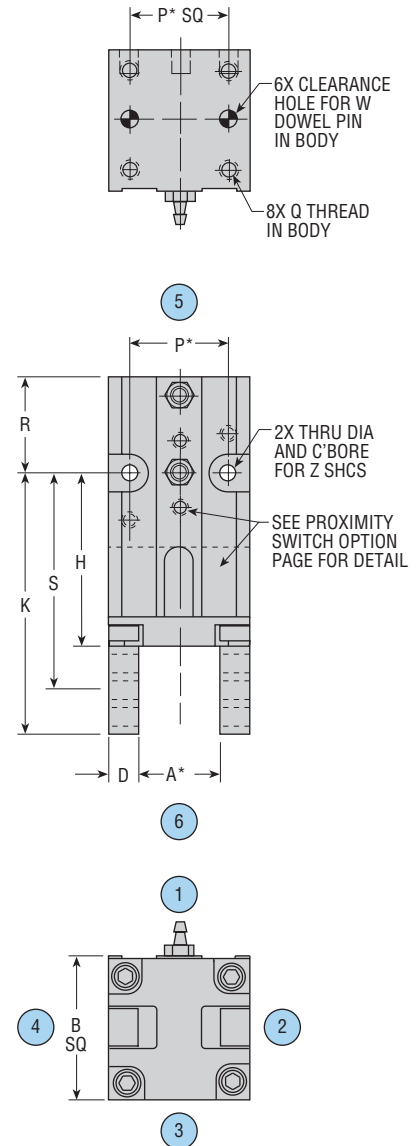


FULL MOUNTING IN POSITIONS 3 & 4

LETTER DIM	MODEL NUMBER							
	19060	19065	19070	19075	19080	19085	19090	19095
	in	mm	in	mm	in	mm	in	mm
NOMINAL JAW TRAVEL	0.157	4	0.276	7	0.394	10	0.512	13
A CLOSED**	0.315	7.75	0.345	8.75	0.581	14.75	0.700	17.75
A OPEN**	0.403	10.25	0.540	13.75	0.915	23.25	1.150	29.25
B	0.787	20.0	1.024	26.0	1.496	38.0	1.968	50.0
C	0.398	10.0	0.555	14.0	0.791	20.0	1.027	26.0
D	0.177	4.5	0.215	5.5	0.256	6.5	0.394	10.0
F	0.312	8.0	0.375	10.0	0.500	12.0	0.625	16.0
G	#4	M2.5	#5	M3	#8	M4	#10	M5
H	1.012	25.5	1.289	32.0	1.635	41.0	2.081	53.0
K	1.563	39.5	1.937	48.5	2.500	63.5	3.242	82.5
L	0.098	2.5	0.138	3.5	0.196	5.0	0.256	6.5
M	1.031	26.01	1.249	31.0	1.624	41.0	2.108	53.5
O*	0.5310	14.0	0.6875	18.0	0.8430	22.0	1.0940	28.0
P*	0.550	14.0	0.710	18.0	1.100	28.0	1.535	39.0
Q	4-40 x 0.19 DP	M3 x 0.5 x 4.5 DP	6-32 x 0.22 DP	M3 x 0.5 x 4.5 DP	8-32 x 0.28 DP	M4 x 0.7 x 6.0 DP	10-24 x 0.38 DP	M5 x 0.8 x 7.5 DP
R	0.601	15.5	0.681	18.0	0.785	20.5	0.870	22.0
S	1.312	33.0	1.624	40.0	2.062	52.0	2.655	67.5
T	0.351	8.5	0.367	9.0	0.380	9.5	0.322	8.0
W	3/32	2.5	1/8	3.0	1/8	4.0	3/16	5.0
Y	0.196	5.0	0.276	7.0	0.393	10.0	0.511	13.0
Z	#4	M3	#6	M3	#8	M4	#10	M5
AA	0.871	22.0	1.045	26.0	1.412	36.0	1.854	47.0
BB	10-32	M3 x 0.5	10-32	M3 x 0.5	10-32	M5 x 0.8	10-32	M5 x 0.8
CC	0.167	3.0	0.176	3.5	0.193	5.5	0.153	4.5
DD	0.465	12.5	0.505	14.5	0.592	15.0	0.750	19.5
EE	1/16	2.5	1/16	2.5	1/16	3.0	1/16	3.0

NOTES:

- 1) *TOLERANCE BETWEEN DOWEL PIN HOLES IS ± 0.0008 [± 0.02]
- 2) NUMBERS IN [] ARE FOR METRIC UNITS AND ARE IN mm
- 3) CIRCLED NUMBERS INDICATE POSITIONS
- 4) **A CLOSED REFLECTS THE LARGEST POSSIBLE CLOSED DIMENSION.
**A OPEN REFLECTS THE SMALLEST POSSIBLE OPEN DIMENSION



CAD & Sizing Assistance

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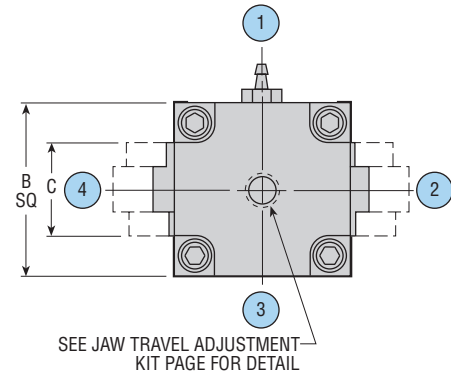
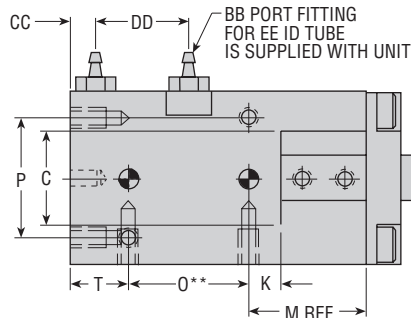
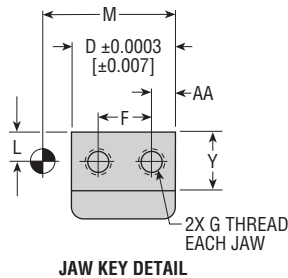
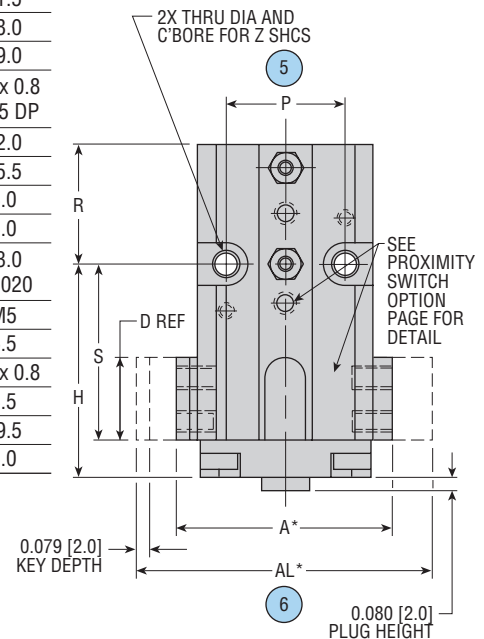
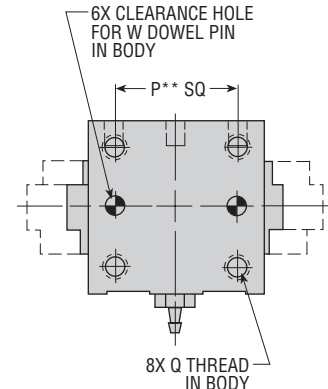
All dimensions are reference only unless specifically toleranced.

FULL MOUNTING IN POSITIONS 3 & 4

LETTER DIM	MODEL NUMBER							
	19061/62	19066/67	19071/72	19076/77	19081/82	19086/87	19091/92	19096/97
	in	mm	in	mm	in	mm	in	mm
NOMINAL JAW TRAVEL								
SHORT	0.157	4	0.276	7	0.394	10	0.512	13
LONG	0.315	8	0.433	11	0.630	16	0.866	22
A CLOSED**	1.054	26.75	1.329	33.75	1.841	46.75	2.353	59.75
A OPEN**	1.151	29.25	1.545	39.25	2.175	55.25	2.805	71.25
AL CLOSED**	1.447	36.75	1.802	45.75	2.353	59.75	2.865	72.75
AL OPEN**	1.702	43.25	2.175	55.25	2.923	74.25	3.671	93.25
B	0.787	20.0	1.024	26.0	1.496	38.0	1.968	50.0
C	0.398	10.0	0.555	14.0	0.791	20.0	1.027	26.0
D	0.3937	10.0	0.4921	12.5	0.7480	19.0	0.9842	25.0
F	0.188	5.0	0.250	6.5	0.375	10.0	0.625	12.0
G	3-56 x 0.18 DP	M2.5 x 0.45 x 5.0 DP	6-32 x 0.28 DP	M3 x 0.5 x 6.0 DP	8-32 x 0.32 DP	M4 x 0.7 x 8.0 DP	10-24 x 0.38 DP	M5 x 0.8 x 10.0 DP
H	1.012	25.5	1.289	32.0	1.635	41.0	2.081	53.0
K	0.159	4.0	0.204	5.0	0.212	5.5	0.254	6.5
L	0.098	2.5	0.138	3.5	0.197	5.0	0.256	6.5
M	0.553	14.0	0.696	17.5	0.960	24.0	1.238	31.5
O**	0.5310	14.0	0.6875	18.0	0.8430	22.0	1.0940	28.0
P**	0.550	14.0	0.710	18.0	1.100	28.0	1.535	39.0
Q	4-40 x 0.19 DP	M3 x 0.5 x 4.5 DP	6-32 x 0.22 DP	M3 x 0.5 x 4.5 DP	8-32 x 0.28 DP	M4 x 0.7 x 6.0 DP	10-24 x 0.38 DP	M5 x 0.8 x 7.5 DP
R	0.601	15.5	0.681	18.0	0.785	20.5	0.870	22.0
S	0.834	21.0	1.071	26.5	1.398	35.0	1.785	45.5
T	0.351	8.5	0.367	9.0	0.380	9.5	0.322	8.0
W	3/32	2.5	1/8	3.0	1/8	4.0	3/16	5.0
Y	0.1970 ±0.0006	5.0 ±0.015	0.2756 ±0.0006	7.0 ±0.015	0.3940 ±0.0007	10.0 ±0.018	0.5118 ±0.0008	13.0 ±0.020
Z	#4	M3	#6	M3	#8	M4	#10	M5
AA	0.103	2.5	0.121	3.0	0.186	4.5	0.180	6.5
BB	10-32	M3 x 0.5	10-32	M3 x 0.5	10-32	M5 x 0.8	10-32	M5 x 0.8
CC	0.167	3.0	0.176	3.5	0.193	5.5	0.153	4.5
DD	0.465	12.5	0.505	14.5	0.592	15.0	0.750	19.5
EE	1/16	2.5	1/16	2.5	1/16	3.0	1/16	3.0

NOTES:

- 1) *A CLOSED & OPEN ARE FOR MODELS 19061, 71, 81, 91, 66, 76, 86, & 96
*AL CLOSED & OPEN ARE FOR MODELS 19062, 72, 82, 92, 67, 77, 87, & 97
- 2) **TOLERANCE BETWEEN DOWEL PIN HOLES IS ±0.0008 [±0.02]
- 3) CIRCLED NUMBERS INDICATE POSITIONS.
- 4) *A OR AL CLOSED REFLECTS THE LARGEST POSSIBLE CLOSED DIMENSION.
*A OR AL OPEN REFLECTS THE SMALLEST POSSIBLE OPEN DIMENSION.

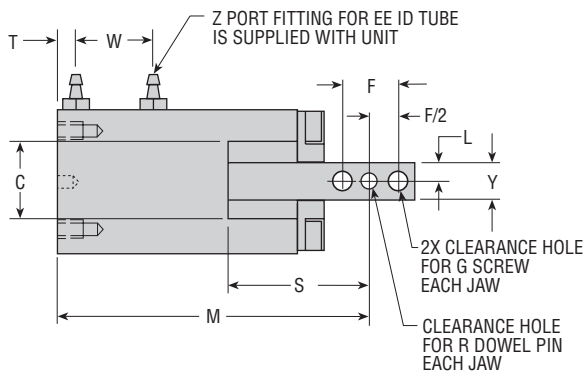
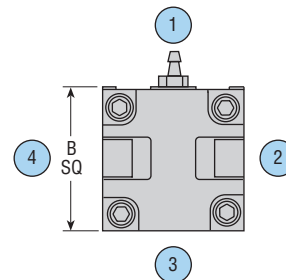
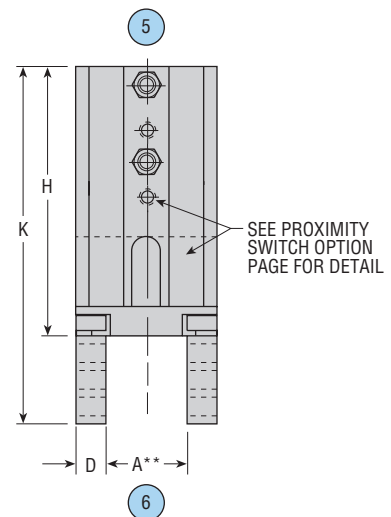
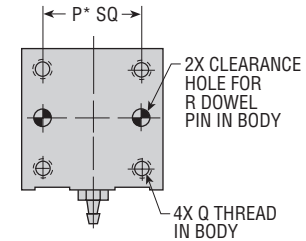


BOTTOM MOUNTING ONLY

LETTER DIM	MODEL NUMBER							
	19160	19165	19170	19175	19180	19185	19190	19195
	in	mm	in	mm	in	mm	in	mm
NOMINAL JAW TRAVEL	0.157	4	0.276	7	0.394	10	0.512	13
A CLOSED**	0.315	7.75	0.345	8.75	0.581	14.75	0.700	17.75
A OPEN**	0.403	10.25	0.540	13.75	0.915	23.25	1.150	29.25
B	0.787	20.0	1.024	26.0	1.496	38.0	1.968	50.0
C	0.398	10.0	0.555	14.0	0.791	20.0	1.027	26.0
D	0.177	4.5	0.215	5.5	0.256	6.5	0.394	10.0
F	0.312	8.0	0.375	10.0	0.500	12.0	0.625	16.0
G	#4	M2.5	#5	M3	#8	M4	#10	M5
H	1.613	41.0	1.970	50.0	2.420	61.5	2.951	75.0
K	2.164	55.0	2.618	66.5	3.285	83.5	4.112	104.5
L	0.098	2.5	0.138	3.5	0.196	5.0	0.256	6.5
M	1.913	48.5	2.305	58.5	2.847	72.5	3.525	89.5
P*	0.550	14.0	0.710	18.0	1.100	28.0	1.535	39.0
Q	4-40 x 0.19 DP	M3 x 0.5 x 4.5 DP	6-32 x 0.22 DP	M3 x 0.5 x 4.5 DP	8-32 x 0.28 DP	M4 x 0.7 x 6.0 DP	10-24 x 0.38 DP	M5 x 0.8 x 7.5 DP
R	3/32	2.5	1/8	3.0	1/8	4.0	3/16	5.0
S	0.871	22.0	1.045	26.0	1.412	36.0	1.854	47.0
T	0.167	3.0	0.176	3.5	0.193	5.5	0.153	4.5
W	0.465	12.5	0.505	14.5	0.592	15.0	0.750	19.5
Y	0.196	5.0	0.276	7.0	0.393	10.0	0.511	13.0
Z	10-32	M3 x 0.5	10-32	M3 x 0.5	10-32	M5 x 0.8	10-32	M5 x 0.8
EE	1/16	2.5	1/16	2.5	1/16	3.0	1/16	3.0

NOTES:

- 1) *TOLERANCE BETWEEN DOWEL PIN HOLES IS ± 0.0008 [± 0.02]
- 2) NUMBERS IN [] ARE FOR METRIC UNITS AND ARE IN mm
- 3) CIRCLED NUMBERS INDICATE POSITIONS
- 4) **A CLOSED REFLECTS THE LARGEST POSSIBLE CLOSED DIMENSION.
- 5) **A OPEN REFLECTS THE SMALLEST POSSIBLE OPEN DIMENSION



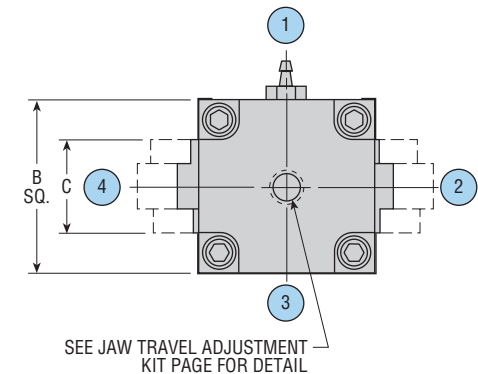
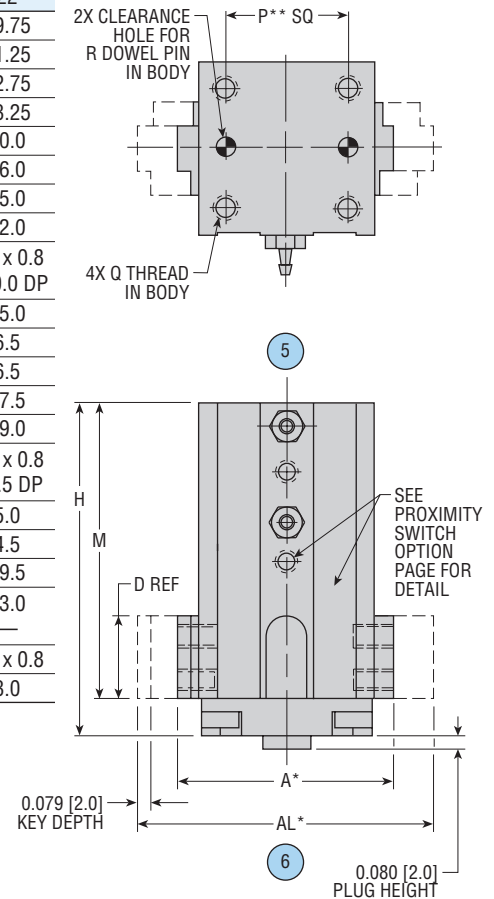
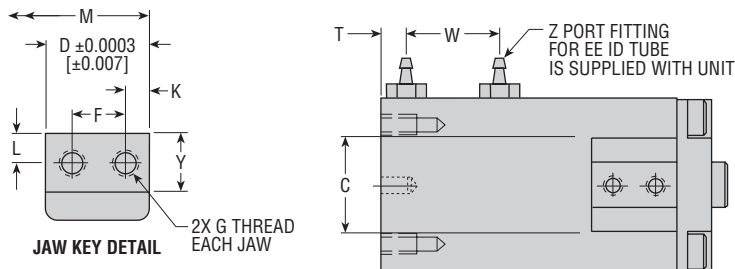
All dimensions are reference only unless specifically toleranced.

BOTTOM MOUNTING ONLY

LETTER DIM	MODEL NUMBER							
	19161/62	19166/67	19171/72	19176/77	19181/82	19186/87	19191/92	19196/97
	in	mm	in	mm	in	mm	in	mm
NOMINAL JAW TRAVEL								
SHORT	0.157	4	0.276	7	0.394	10	0.512	13
LONG	0.315	8	0.433	11	0.630	16	0.866	22
A CLOSED*	1.054	26.75	1.329	33.75	1.841	46.75	2.353	59.75
A OPEN*	1.151	29.25	1.545	39.25	2.175	55.25	2.805	71.25
AL CLOSED*	1.447	36.75	1.802	45.75	2.353	59.75	2.865	72.75
AL OPEN*	1.702	43.25	2.175	55.25	2.923	74.25	3.671	93.25
B	0.787	20.0	1.024	26.0	1.496	38.0	1.968	50.0
C	0.398	10.0	0.555	14.0	0.791	20.0	1.027	26.0
D	0.3937	10.0	0.4921	12.5	0.7480	19.0	0.9842	25.0
F	0.188	5.0	0.250	6.5	0.375	10.0	0.625	12.0
G	3-56 x 0.18 DP	M2.5 x 0.45 x 5.0 DP	6-32 x 0.28 DP	M3 x 0.5 x 6.0 DP	8-32 x 0.32 DP	M4 x 0.7 x 8.0 DP	10-24 x 0.38 DP	M5 x 0.8 x 10.0 DP
H	1.613	41.0	1.970	50.0	2.420	61.5	2.951	75.0
K	0.103	2.5	0.121	3.0	0.186	4.5	0.180	6.5
L	0.098	2.5	0.138	3.5	0.197	5.0	0.256	6.5
M	1.435	36.5	1.752	44.5	2.183	55.5	2.655	67.5
P**	0.550	14.0	0.710	18.0	1.100	28.0	1.535	39.0
Q	4-40 x 0.19 DP	M3 x 0.5 x 4.5 DP	6-32 x 0.22 DP	M3 x 0.5 x 4.5 DP	8-32 x 0.28 DP	M4 x 0.7 x 6.0 DP	10-24 x 0.38 DP	M5 x 0.8 x 7.5 DP
R	3/32	2.5	1/8	3.0	1/8	4.0	3/16	5.0
T	0.167	3.0	0.176	3.5	0.193	5.5	0.153	4.5
W	0.465	12.5	0.505	14.5	0.592	15.0	0.750	19.5
Y	0.1970 ±0.0006	5.0 ±0.015	0.2756 ±0.0006	7.0 ±0.015	0.3940 ±0.0007	10.0 ±0.018	0.5118 —	13.0 —
Z	10-32	M3 x 0.5	10-32	M3 x 0.5	10-32	M5 x 0.8	10-32	M5 x 0.8
EE	1/16	2.5	1/16	2.5	1/16	3.0	1/16	3.0

NOTES:

- 1) *A CLOSED AND OPEN ARE FOR MODELS 19161, 71, 81, 91, 66, 76, 86, & 96
- *AL CLOSED & OPEN ARE FOR MODELS 19162, 72, 82, 92, 67, 77, 87, & 97
- 2) **TOLERANCE BETWEEN DOWEL PIN HOLES IS ±0.0008 [±0.02]
- 3) CIRCLED NUMBERS INDICATE POSITIONS.
- 4) *A CLOSED REFLECTS THE LARGEST POSSIBLE CLOSED DIMENSION.
- *A OPEN REFLECTS THE SMALLEST POSSIBLE OPEN DIMENSION.



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4

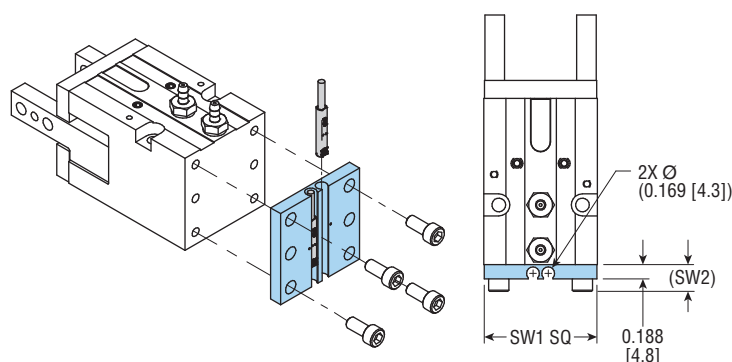
JC1STP SWITCH READY

This option provides unit installed with magnet for use with PHD JC1STP Switch Kits. Kits must be ordered separately.

MOUNTING KIT FOR SERIES JC1STP 2-POSITION TEACHABLE SENSOR

This kit provides the mounting components required to utilize one or two Series JC1STP-x Sensors. Using two sensors allows sensing of up to four positions throughout the jaw travel (see note). Sensors are ordered separately.

NOTE: Sensor ready option 4 must be specified to use these sensors.



SERIES JCSTP SENSOR MOUNTING KITS

MODEL NO.	KIT PART NO.	
	IMPERIAL	METRIC
19x6x	86944-05-1	86944-05-5
19x7x	86944-06-1	86944-06-5
19x8x	86944-07-1	86944-07-5
19x9x	86944-08-1	86944-08-5

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

NOTES:

- For optimal switch performance, align arrows on switch with dots on mounting plate (see mounting instructions).
- Switch plate may be rotated allowing the switch cable(s) to extend from any side of the gripper.
- Switch plate must mount directly to gripper using bottom mounting holes. When mounting gripper from bottom, place switch plate between gripper and mounting surface using customer supplied fasteners.
- Due to size limitations, the switch plate for the smallest of each gripper series has one switch slot and can accommodate one switch providing two jaw position sensing.

LETTER DIM	MODEL NUMBER							
	19x6x		19x7x		19x8x		19x9x	
	in	mm	in	mm	in	mm	in	mm
SW1	0.770	19.6	0.970	24.6	1.480	37.6	1.950	49.5
SW2*	0.303	7.7	0.324	8.2	0.350	8.9	0.381	9.7

*SW2 calculated using nominal head height of standard SHCS

All dimensions are reference only unless specifically tolerated.

5

PROXIMITY & SOLID STATE SWITCH READY

This option provides the grippers with a pin to mount a switch target for 6 mm square inductive proximity or solid state switch. See additional information below for details on switch bracket/target kits.

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.

6 mm SQUARE INDUCTIVE PROXIMITY SWITCHES

PART NO.	DESCRIPTION
18431-001-02	NPN (Sink), 10-30 VDC, 2 meter cable
18431-002-02	PNP (Source), 10-30 VDC, 2 meter cable

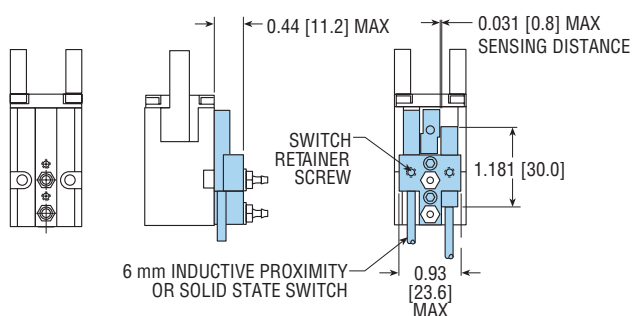
CORDSETS

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 BRACKET AND TARGET KITS

FOR IMPERIAL MODELS 19x6x AND 19x7x ONLY



EACH SWITCH BRACKET & TARGET KIT CONTAINS THE FOLLOWING ITEMS:
1 TARGET WITH SCREW
BRACKET FOR 6 mm SQUARE SWITCH AND ALL MOUNTING COMPONENTS

SWITCHES ARE ORDERED SEPARATELY

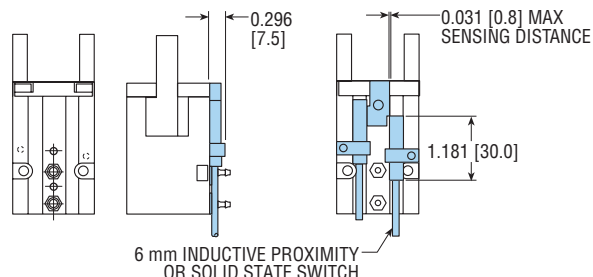
FOR USE WITH: SERIES 5580 KIT

MODEL NO.	SWITCH BRACKET & TARGET KIT
19x6x	59794-1
19x7x	59795-1

FOR USE WITH: 6 mm SQUARE INDUCTIVE PROXIMITY SWITCHES

MODEL NO.	SWITCH BRACKET & TARGET KIT
19x6x	59792-1
19x7x	59793-1

FOR IMPERIAL MODELS 19x8x & 19x9x METRIC MODELS 19x6x, 19x7x, 19x8x, & 19x9x



EACH SWITCH BRACKET & TARGET KIT CONTAINS THE FOLLOWING ITEMS:
1 TARGET WITH SCREW
2 SENSOR BRACKETS WITH MOUNTING SCREWS

SWITCHES ARE ORDERED SEPARATELY
NUMBERS IN [] ARE FOR METRIC UNITS AND ARE IN mm

FOR USE WITH: SERIES 5580 KIT

MODEL NO.	SWITCH BRACKET & TARGET KIT
19x6x*	55770
19x7x*	55771
19x8x	55772
19x9x	55773

*Metric units only

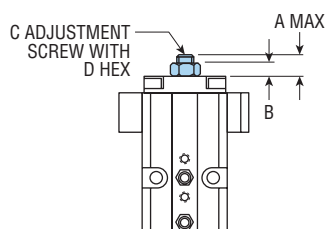
FOR USE WITH: 6 mm SQUARE INDUCTIVE PROXIMITY SWITCHES

MODEL NO.	SWITCH BRACKET & TARGET KIT
19x6x*	18432
19x7x*	18437
19x8x	18438
19x9x	18349

*Metric units only

All dimensions are reference only unless specifically tolerated.

JAW TRAVEL ADJUSTMENT KIT



MODEL NO.	KIT NO.	LETTER DIM.			
		A	B	C	D
19x6x	18433	0.197 [5.0]	0.094 [2.4]	[M3 x 10.0]	0.05 [1.3]
19x7x	18434	0.315 [8.0]	0.157 [4.0]	[M5 x 14.0]	0.094 [2.4]
19x8x	18435	0.394 [10.0]	0.197 [5.0]	[M6 x 18.0]	0.125 [3.2]
19x9x	18436	0.591 [15.0]	0.315 [8.0]	[M10 x 22.0]	0.188 [4.8]

NUMBERS IN [] ARE FOR METRIC UNITS AND ARE IN mm

JAW TRAVEL ADJUSTMENT AVAILABLE ON STYLE 2 JAWS ONLY (19XX1, 19XX2, 19XX6, AND 19XX7 MODELS).

EACH JAW TRAVEL ADJUSTMENT KIT CONTAINS THE FOLLOWING ITEMS: ONE ADJUSTMENT SCREW AND NUT

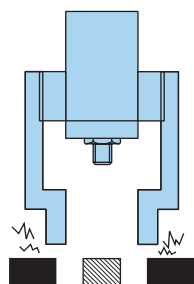
TRAVEL CAN ONLY BE ADJUSTED IN THE MAX FORCE DIRECTION OF ANY MODEL.

EXAMPLE 1: A MAX FORCE CLOSE GRIPPER; TRAVEL IS ONLY VARIED IN THE CLOSE DIRECTION, TRAVEL IN THE OPEN DIRECTION REMAINS UNCHANGED.

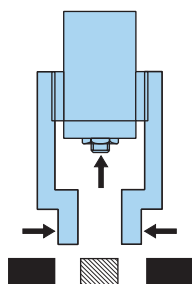
EXAMPLE 2: A MAX FORCE OPEN GRIPPER; TRAVEL IS ONLY VARIED IN THE OPEN DIRECTION, TRAVEL IN THE CLOSE DIRECTION REMAINS UNCHANGED.

The Jaw Travel Adjustment Kit contains a screw and a lock nut used to limit the jaw opening on Jaw Style 2 parallel grippers. Jaw travel can be adjusted from zero opening to maximum opening. Below is one application example showing how the jaw travel adjustment

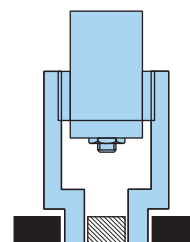
kit can be of benefit. If the option of maximum grip force on jaw closure is specified, (-x5xx option) the adjustment kit will limit the travel in the closing direction.



With jaws fully open, the tooling hits the obstruction and the part cannot be gripped.



Turning jaw travel adjustment screw inward reduces the maximum open position; allowing the tooling to clear the obstruction.

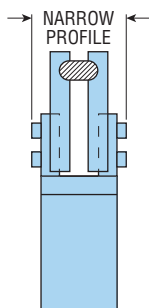


The part can now be gripped. (The jaw closed dimension is not affected by the jaw travel adjustment.)

JAW TOOLING

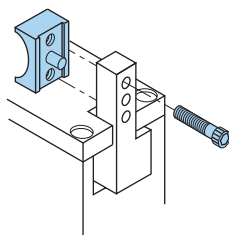
JAW STYLE 1

Jaw Style 1 is ideally suited for small parts. Simple tooling can provide a long narrowed profile for small parts or for reaching into confined areas.



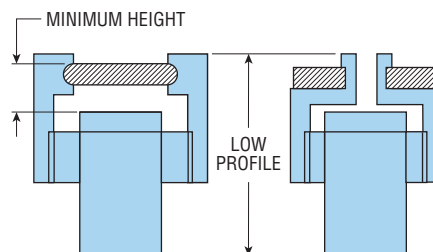
DOWEL PINS

Style 1 jaw is provided with a dowel pin hole as a means of orienting and locating jaw tooling.



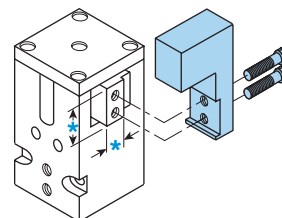
JAW STYLE 2

Jaw Style 2 allows simple tooling of wide parts. This type of tooling keeps the part close to the unit for a low profile package. Jaw Style 2 provides the lowest profile assembly for internal gripping by keeping the tooling close to the gripper.



MALE KEY

Style 2 jaws have a close tolerance * male key for orientation and precise location of jaw tooling. Jaw tooling can be readily machined to include a mating slot for the jaw key.



All dimensions are reference only unless specifically toleranced.