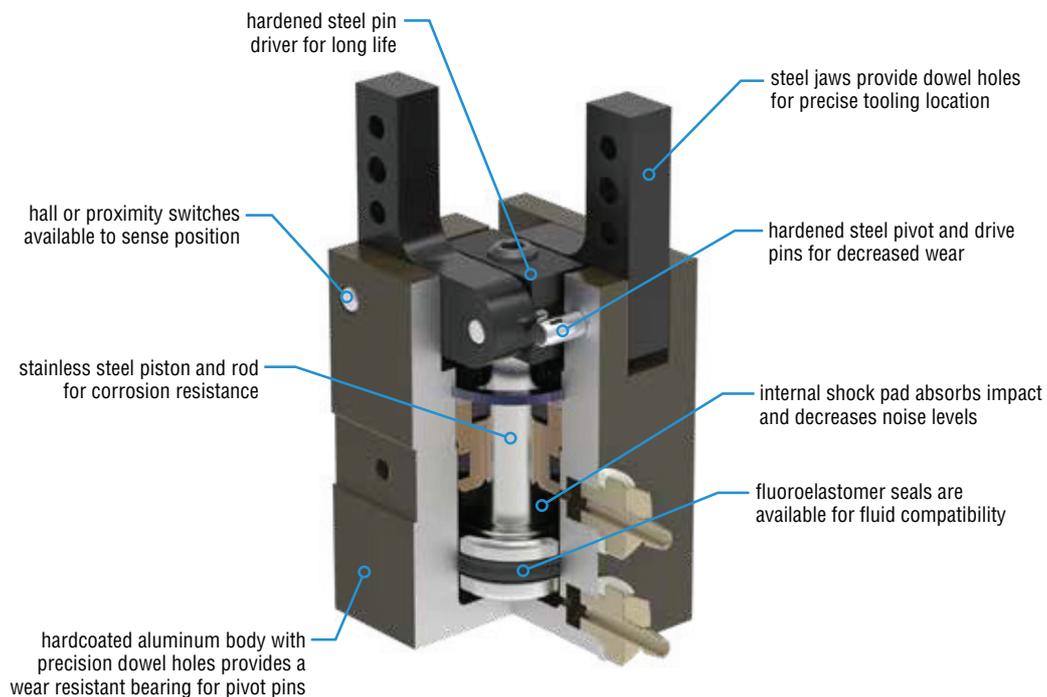


MICRO PNEUMATIC ANGULAR GRIPPER

8400

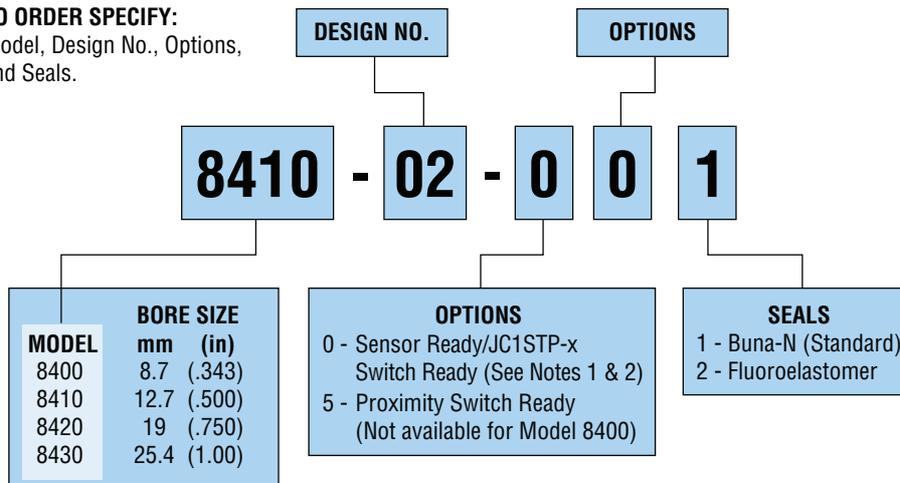
Major Benefits

- Compact size
- Rugged body and jaw design
- Four sizes available
- Hardened steel pivot mechanism
- Close tolerance jaw mechanism minimizes jaw play
- Three mounting surfaces as standard
- Blank fingers available for customizing jaw tooling
- 5 million cycles minimum rated life with standard seals



ORDERING DATA: Series 8400 Grippers

TO ORDER SPECIFY:
Model, Design No., Options,
and Seals.



NOTES:

- 1) Gripper with sensor option 0 (zero) is assembled with the internal components required to use the respective devices listed in each option. The sensor/switch and any related devices and/or mounting kits must be ordered separately.
- 2) Proximity Switches, Bracket Kits, and Finger Blanks must be ordered separately.

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

PROXIMITY SWITCH KIT

TO FIT:	KIT NO.
8410	19813
8420	19814
8430	19631

FINGER BLANK KIT

TO FIT:	ALUMINUM	DELTRIN AF
8400	8573	8574
8410	8575	8576
8420	8577	8578
8430	18613	18614

SERIES JC1STP SENSOR MOUNTING KITS

MODEL NO.	KIT PART NO.
8400	86944-01-1
8410	86944-02-1
8420	86944-03-1
8430	86944-04-1

SERIES JC1STP 2-POSITION MAGNETIC SENSORS

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

NOTE: Includes 1 sensor and installation directions. For additional switch information, go to phdinc.com. Switches must be ordered separately.

CAD & Sizing Assistance

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

ENGINEERING DATA: Series 8400 Grippers

SPECIFICATIONS	SERIES 8400 ANGULAR
OPERATING PRESSURE	
STANDARD UNIT	40 psi min to 150 psi max [2.8 bar min to 10 bar max] air
OPERATING TEMPERATURE	-20°F to +180°F [-28°C to +82°C]
RATED LIFE	5 million cycles minimum with standard seals
GRIP BACKLASH	Within 1° per jaw
LUBRICATION	Factory lubricated for rated life
MAINTENANCE	Field repairable

MODEL NO.	DISPLACEMENT in ³	GRIPPER WEIGHT lb	GRIP FORCE FACTOR G _F	
				
			EXTERNAL GRIP	INTERNAL GRIP
1536x	0.007	0.06	0.027	0.032
1537x	0.018	0.16	0.068	0.092
1538x	0.055	0.43	0.25	0.306
1539x	0.150	1.17	0.576	0.774

NOTE: Maximum load that grippers can handle will vary based on size of part being picked up, shape of part, texture of part, speed at which part is transferred, working pressure, shape of finger pads, etc. PHD recommends that the fingers or jaws be tooled or machined to conform to the shape of the part being gripped.

GRIP FORCE CALCULATION EQUATIONS:

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

NOTE: Gripping force is defined as the maximum value at which the jaws will not move from their gripping position. The above figures are based on calculations and will vary slightly due to friction. Gripping force is proportional to input pressure.

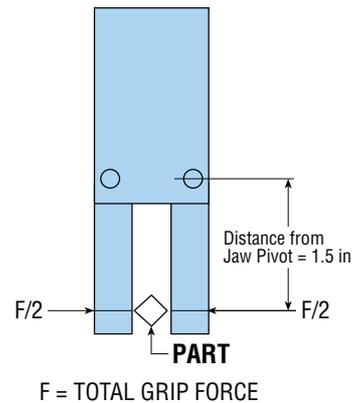
GRIP FORCE CALCULATION EXAMPLE:

Gripper: 8410

Operating Pressure = 87 psi

Distance from Jaw Pivot = 1.5 in

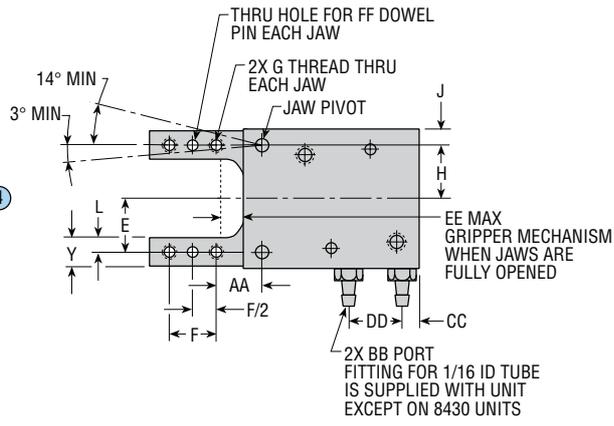
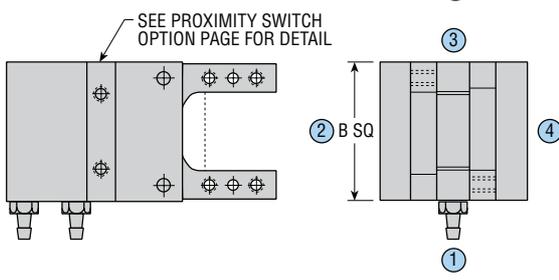
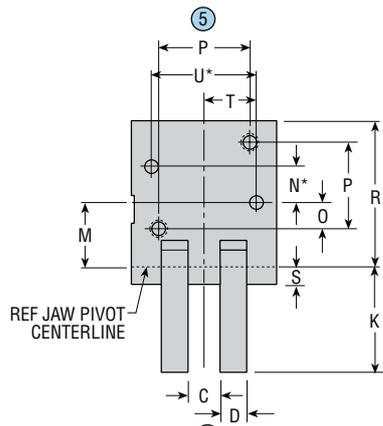
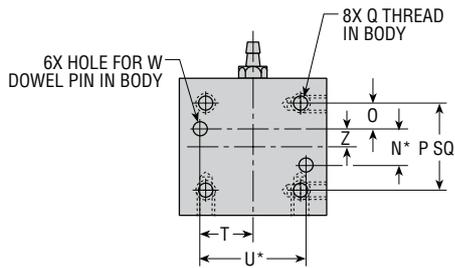
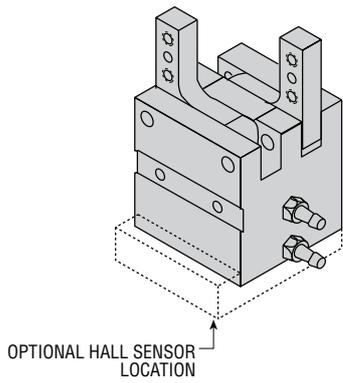
- Determine Grip Force Factor G_F** = 0.068 (from table above)
- Total Grip Force Calculations:**
For Standard Unit: 8410-02-001
Total Grip Force = (87 psi x 0.068) / 1.5 in = 3.95 lb



Application & Sizing Assistance

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

DIMENSIONS: Series 8400 Grippers



LETTER DIM	MODEL NUMBER			
	8400	8410	8420	8430
B	0.700	0.900	1.400	1.938
C	0.196	0.255	0.316	0.490
D	0.125	0.187	0.250	0.315
E	0.250	0.340	0.540	0.750
F	0.230	0.312	0.440	0.625
G	3-48	4-40	6-32	8-32
H	0.270	0.340	0.540	0.750
J	0.080	0.110	0.160	0.219
K	0.570	0.735	1.070	1.415
L	0.098	0.110	0.150	0.217
M	0.400	0.480	0.650	0.869
N*	0.1870	0.2500	0.3750	0.7000
O	0.156	0.175	0.250	0.275
P	0.500	0.600	0.875	1.250
Q	4-40 x 0.156 DP	6-32 x 0.187 DP	8-32 x 0.281 DP	10-24 x 0.375 DP
R	0.966	1.219	1.480	2.054
S	0.094	0.156	0.180	0.256
T	0.250	0.343	0.500	0.688
U*	0.5000	0.6875	1.0000	1.3750
W	1/16	3/32	1/8	5/32
Y	0.196	0.220	0.300	0.433
Z	0.093	0.125	0.187	0.350
AA	0.220	0.290	0.440	0.562
BB	3-56	10-32	10-32	1/8 NPT
CC	0.120	0.145	0.160	0.364
DD	0.300	0.410	0.500	0.720
EE	0.100	0.140	0.220	0.360
FF	1/16	3/32	1/8	1/8

- NOTES:**
- 1) *TOLERANCE IS ± 0.0008
 - 2) **GRIPPER JAWS:** SHOWN AT PARALLEL POSITION
 - 3) JAW MOVEMENT SHOWS MINIMUM AMOUNT OF JAW ROTATION. JAWS MAY OPEN 3° OR CLOSE 5° BEYOND STATED MINIMUM ROTATION.
 - 4) CIRCLED NUMBERS INDICATE POSITION

CAD & Sizing Assistance

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

All dimensions are reference only unless specifically toleranced.

OPTIONS: Series 8400 Grippers

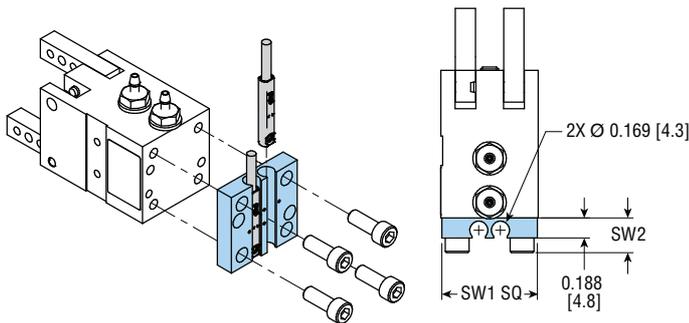
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HALL SENSOR READY (without sensor or brackets - for use with JC1STP Switches)

MOUNTING KIT FOR SERIES JC1STP 2-POSITION TEACHABLE SWITCHES

These kits provide the mounting plate required to utilize one or two Series JC1STP Teachable Switches with Series 8400 Angular. Using two switches allows sensing of up to four jaw positions throughout the jaw travel (see note 4). The appropriate switch option must be ordered to use these switches. Switches are ordered separately.

Switch Option -0 (zero) must be specified with the gripper to use Series JC1STP Switches.



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 8400 series has one switch slot and can accommodate one switch providing two jaw position sensing.



SERIES JC1STP 2-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

NOTE: Includes 1 sensor and installation directions. For additional switch information, go to phdinc.com. Switches must be ordered separately.

GRIPPER MODEL NO.	KIT PART NO.	MAXIMUM NO. OF SET POINTS
8400	86944-01-1	2
8410	86944-02-1	4
8420	86944-03-1	4
8430	86944-04-1	4

LETTER DIM	MODEL NUMBER							
	8400		8410		8420		8430	
	in	mm	in	mm	in	mm	in	mm
SW1	0.685	17.4	0.885	22.5	1.385	35.2	1.900	48.3
SW2	0.298	7.6	0.324	8.2	0.350	8.9	0.375	9.5

SW2 calculated using nominal head height of standard SHCS.

5

PROXIMITY SWITCH READY

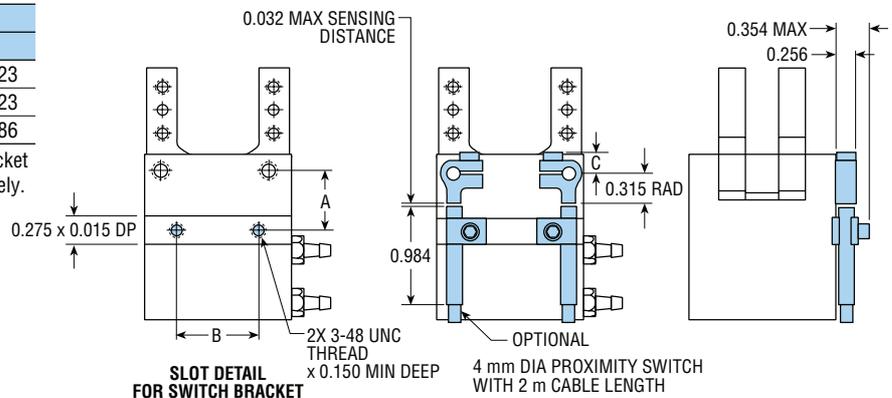
Provides unit ready for installation of kits for proximity switch mounting.

GRIPPER	KIT NO.	LETTER DIMENSION		
		A	B	C
8410	19813	0.594	0.374	0.223
8420	19814	0.594	0.770	0.223
8430	19631	0.594	1.190	0.286

Each kit contains: 1 target with screw, 1 switch bracket with screw. Proximity switches are ordered separately.

4 mm ROUND INDUCTIVE PROXIMITY SWITCHES

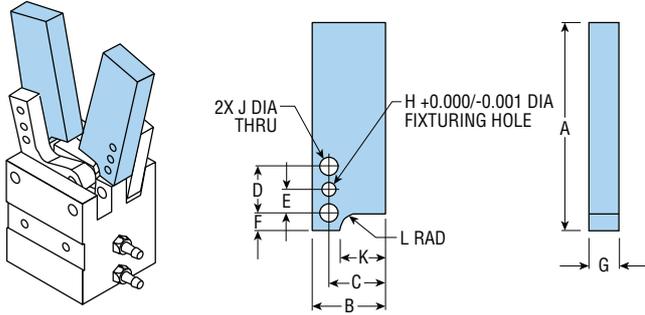
PART NO.	DESCRIPTION
18430-001-02	NPN (Sink) 2 meter cable
18430-002-02	PNP (Source) 2 meter cable



All dimensions are reference only unless specifically toleranced.

ACCESSORIES: Series 8400 Grippers

FINGER BLANK KITS



FINGER BLANK KITS CONTAIN: 2 FINGER BLANKS, 4 MTG SCREWS, & 2 DOWEL PINS FINGERS MAY ALSO BE MOUNTED FACING OUTWARD

LETTER DIM	MODEL NUMBER			
	8400	8410	8420	8430
A	1.000	1.500	2.000	2.500
B	0.340	0.440	0.690	0.939
C	0.240	0.330	0.530	0.739
D	0.230	0.312	0.440	0.625
E	0.115	0.156	0.220	0.313
F	0.095	0.110	0.170	0.200
G	0.187	0.250	0.312	0.500
H	0.0620	0.0937	0.1245	0.1240
J	0.109	0.129	0.162	0.180
K	0.180	0.250	0.420	0.520
L	0.094	0.094	0.156	0.234

FINGER BLANK KIT

TO FIT:	ALUMINUM	DELTRIN AF
8400	8573	8574
8410	8575	8576
8420	8577	8578
8430	18613	18614

All dimensions are reference only unless specifically toleranced.