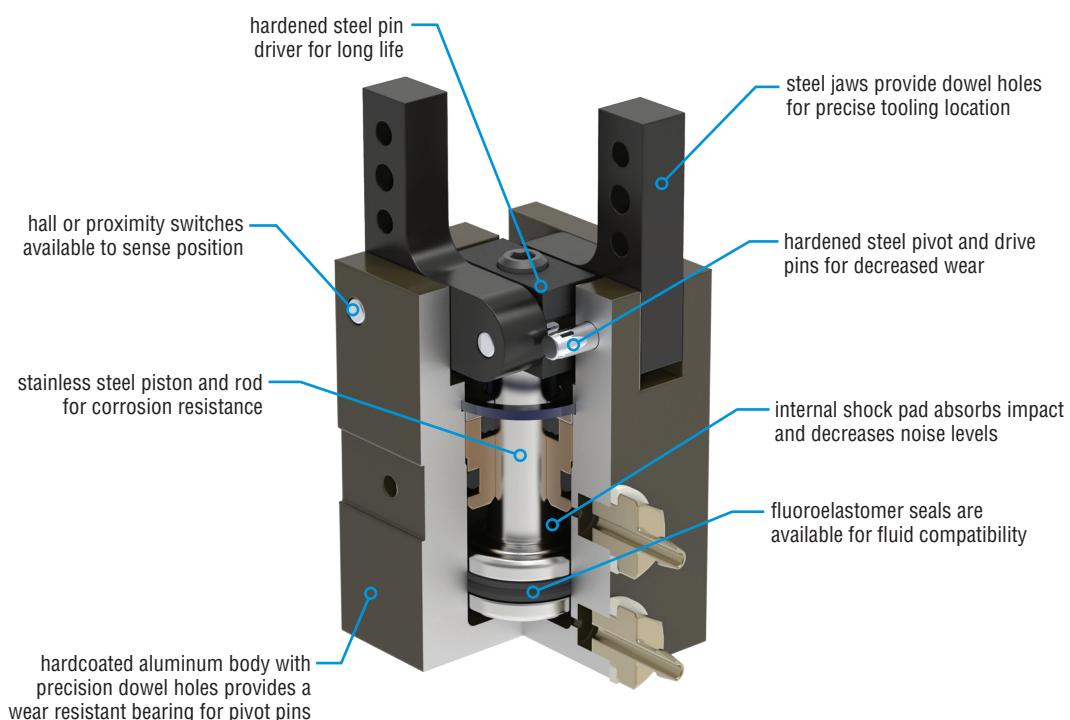


8400

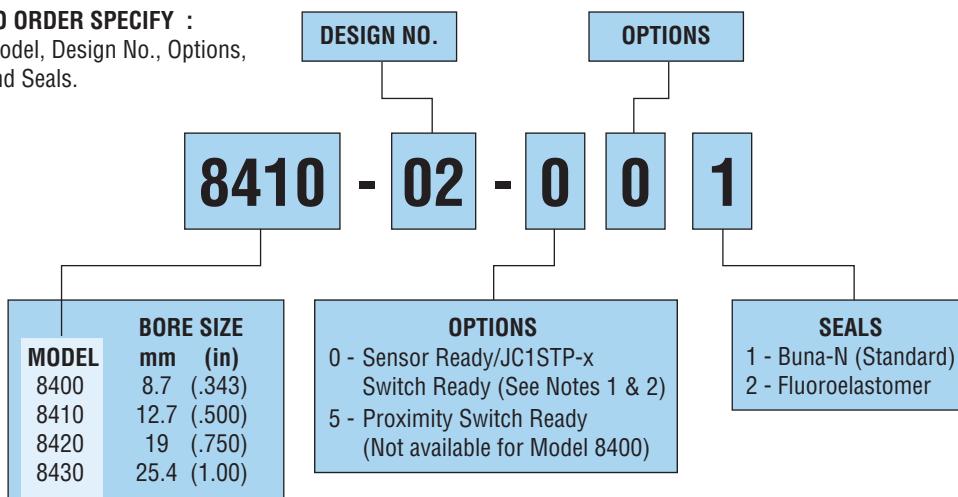
Major Benefits

- 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 | DELRIN 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 | GRIPPER WEIGHT | GRIP FORCE FACTOR G_F | |
|-----------|--------------|----------------|-------------------------|---------------|
| | | | EXTERNAL GRIP | INTERNAL GRIP |
| 8400 | 0.007 | 0.06 | 0.027 | 0.032 |
| 8410 | 0.018 | 0.16 | 0.068 | 0.092 |
| 8420 | 0.055 | 0.43 | 0.25 | 0.306 |
| 8430 | 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 toolled 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

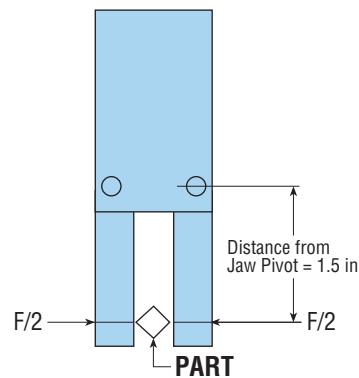
Distance from Jaw Pivot = 1.5 in

1. Determine Grip Force Factor $G_F = 0.068$ (from table above)

2. Total Grip Force Calculations:

For Standard Unit: 8410-02-001

Total Grip Force = $(87 \text{ psi} \times 0.068) / 1.5 \text{ in} = 3.95 \text{ lb}$

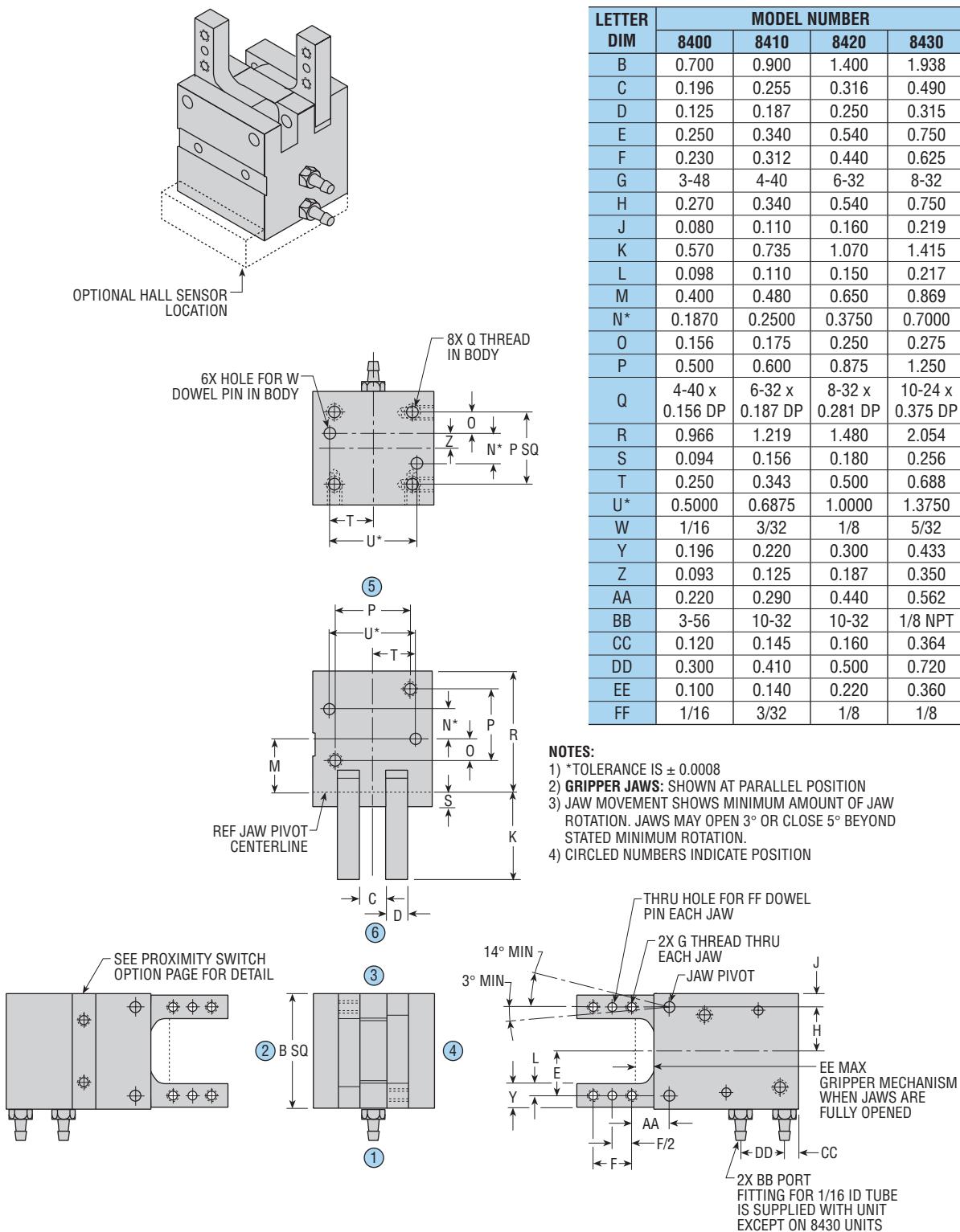


$F = \text{TOTAL GRIP FORCE}$

Application & Sizing Assistance

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

DIMENSIONS: Series 8400 Grippers



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

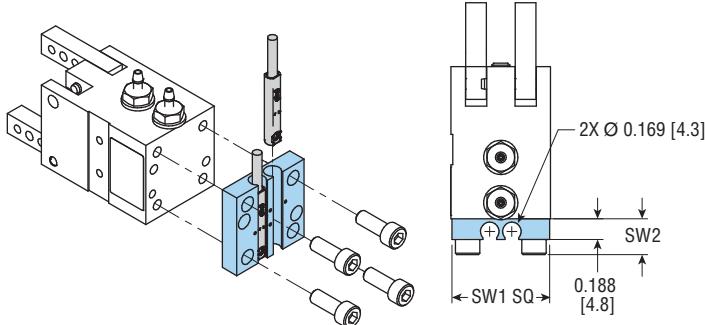
0

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:

1. For optimal switch performance, align arrows on switch with dots on mounting plate (see mounting instructions).
2. Switch plate may be rotated allowing the switch cable(s) to extend from any side of the gripper.
3. 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.
4. 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

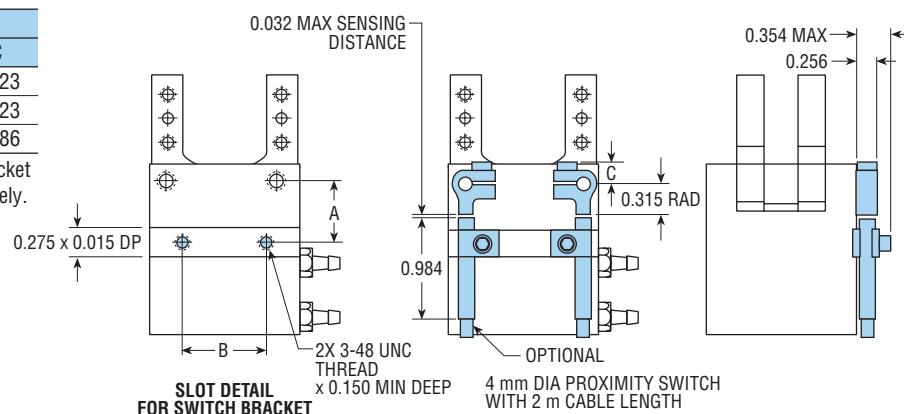
Provides unit ready for installation of kits for proximity switch mounting.

| 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

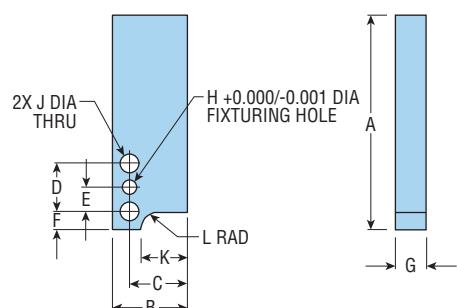
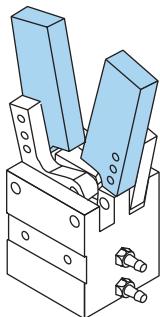
| PART NO. | DESCRIPTION |
|--------------|----------------------------|
| 18430-001-02 | NPN (Sink) 2 meter cable |
| 18430-002-02 | PNP (Source) 2 meter cable |



All dimensions are reference only unless specifically tolerated.

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 | DELRIN AF |
|---------|----------|-----------|
| 8400 | 8573 | 8574 |
| 8410 | 8575 | 8576 |
| 8420 | 8577 | 8578 |
| 8430 | 18613 | 18614 |

All dimensions are reference only unless specifically toleranced.