

# 5300



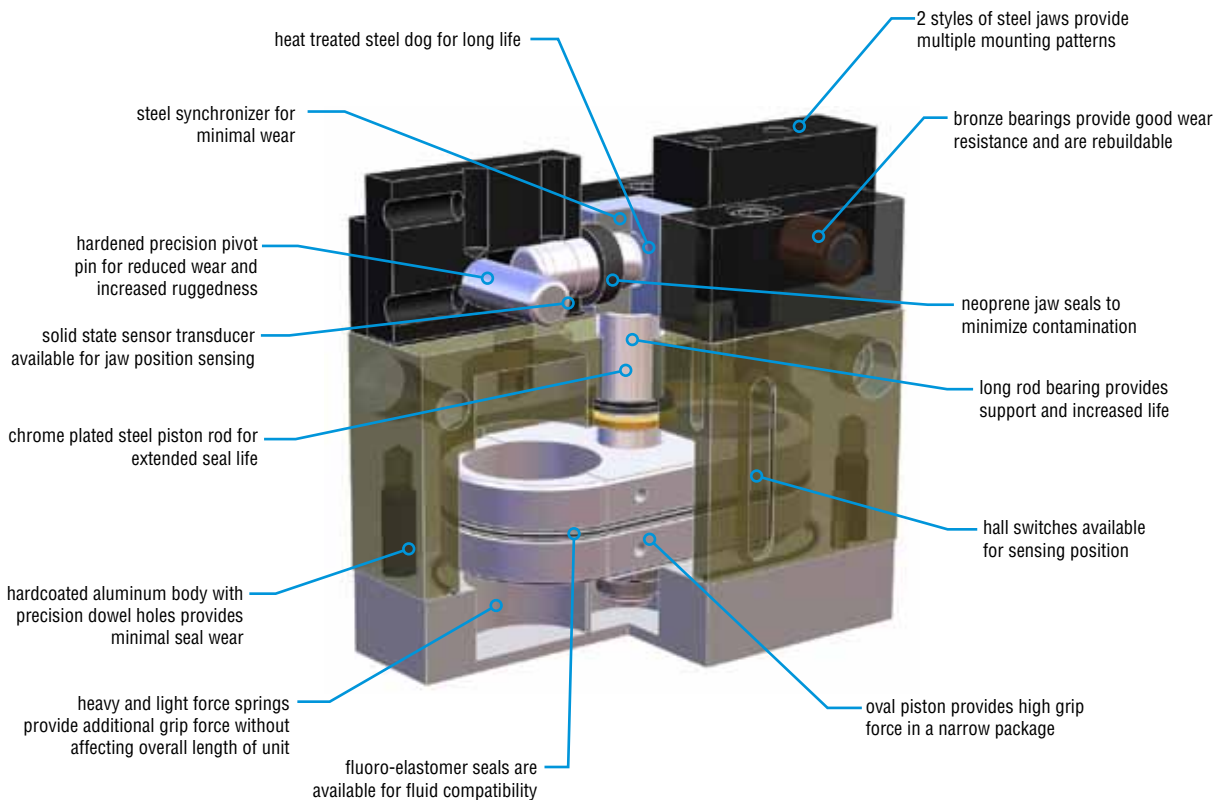
## HEAVY DUTY ANGULAR PNEUMATIC GRIPPER

### Major Benefits

- Spring assist on open or close available in different forces
- High grip force to weight ratio
- Hardened steel pivot mechanism
- Close tolerance jaw mechanism minimizes jaw play
- Four sizes available in both imperial and metric versions
- 1-2 day shipping
- 5 million cycles minimum rated life with standard seals (includes spring assist units)



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# ORDERING DATA: SERIES 5300 ANGULAR GRIPPERS

## TO ORDER SPECIFY:

Model, Design No., Switches, Options, and Seals.

**SENSORS & SWITCHES**  
 0 - None  
 3 - Hall Sensor (See note 1.)  
 4 - Hall Sensor Ready  
 7 - Hall Effect Magnet on piston and "T" slot on body for Series 5360 Hall Switches

**OPTIONS**  
 0 - None  
**LIGHT SPRING FORCE**  
 3 - Spring Close  
 4 - Spring Open  
**HEAVY SPRING FORCE**  
 5 - Spring Close  
 6 - Spring Open

**15321 - 1 - 3 0 0 2**

MODEL	EQUIVALENT BORE DIAMETER	
	mm	(in)
<b>JAW STYLE 1</b>		
1532x	45.5	(1.79)
1533x	65	(2.56)
1534x	87.4	(3.44)
1535x	123	(4.85)
<b>JAW STYLE 2</b>		
1532x	45.5	(1.79)
1533x	65	(2.56)
1534x	87.4	(3.44)
1535x	123	(4.85)

IMPERIAL MODEL	
<b>JAW STYLE 1</b>	
15320	- Size 2
15330	- Size 3
15340	- Size 4
15350	- Size 5
<b>JAW STYLE 2</b>	
15321	- Size 2
15331	- Size 3
15341	- Size 4
15351	- Size 5

METRIC MODEL	
<b>JAW STYLE 1</b>	
15322	- Size 2
15332	- Size 3
15342	- Size 4
15352	- Size 5
<b>JAW STYLE 2</b>	
15323	- Size 2
15333	- Size 3
15343	- Size 4
15353	- Size 5

**DESIGN NO.**

**OPTIONS**

**SEALS**  
 1 - Buna-N (Standard)  
 2 - Fluoro-Elastomer

### SERIES 5360 MINIATURE HALL EFFECT SWITCHES

PART NO.	DESCRIPTION
53603-1-02	NPN (Sink) 4.5-24 VDC, 2 meter Cable
53604-1-02	PNP (Source) 4.5-24 VDC, 2 meter Cable
53623-1	NPN (Sink) 4.5-24 VDC, Quick Connect
53624-1	PNP (Source) 4.5-24 VDC, Quick Connect

See Switches and Sensors section for switch information.

## NOTES:

- 1) Sensor must be used with a PHD Set Point Module which is ordered separately. See Switches and Sensors section for information and ordering data.
- 2) Proximity Switches must be ordered separately.

## SET POINT MODULES

PART NO.	DESCRIPTION
9800-01-0300	4.5-24 VDC, Sink Type Output
9800-01-0400	4.5-24 VDC, Source Type Output

See Switches and Sensors section for information.



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



Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

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



## CAD & Sizing Assistance

Use PHD's free online Product Sizing and CAD Configurator at [www.phdinc.com/myphd](http://www.phdinc.com/myphd)

# ENGINEERING DATA: SERIES 5300 ANGULAR OVAL GRIPPERS

SPECIFICATIONS	SERIES 5300 ANGULAR
OPERATING PRESSURE	
STANDARD UNIT	25 psi min to 150 psi max [1.7 bar min to 10 bar max] air
LIGHT SPRING ASSIST UNIT	35 psi min to 150 psi max [2.4 bar min to 10 bar max] air
HEAVY SPRING ASSIST UNIT	65 psi min to 150 psi max [4.5 bar min to 10 bar max] air
OPERATING TEMPERATURE	-20° to +180°F [-28° to +82°C]
RATED LIFE	5 million cycles minimum with standard seals
GRIP BACKLASH	Within .2° per jaw
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		GRIP FORCE FACTOR $G_F$				SPRING GRIP FORCE $S_F$			
			EXTERNAL GRIP		INTERNAL GRIP		LIGHT SPRING		HEAVY SPRING	
			IMPERIAL	METRIC	IMPERIAL	METRIC	lb	N	lb	N
1532x	.59	9.6	1.87	3058.0	2.03	3323.0	34.50	3908.0	49.50	5582.0
1533x	1.78	29.2	5.56	9085.0	6.08	9938.0	93.00	10518.0	157.50	17751.0
1534x	4.29	70.3	14.14	23109.0	14.85	24255.0	221.00	24968.0	366.50	41318.0
1535x	12.66	207.5	41.85	68355.0	43.70	71382.0	590.00	66492.0	1275.00	143796.0

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**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 fingers, etc. PHD recommends that the fingers of jaws be tooled or machined to conform to the shape of the part being gripped.

GRIPPER NO.	GRIPPER WEIGHT					
	STANDARD		SPRING ASSIST			
			LIGHT		HEAVY	
lb	kg	lb	kg	lb	kg	
1532x	2.40	1.08	2.5	1.11	2.5	1.12
1533x	4.87	2.2	5.0	2.28	5.1	2.32
1534x	9.58	4.35	10.0	4.53	10.2	4.63
1535x	27.73	12.57	29.5	13.37	29.8	13.53

## GRIP FORCE CALCULATION EQUATIONS:

### IMPERIAL:

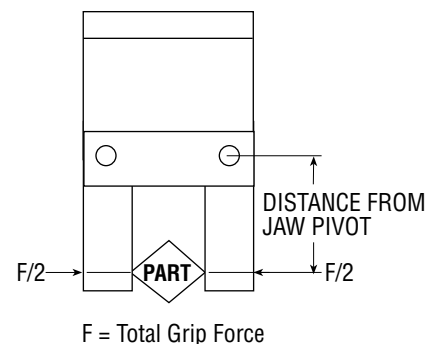
$$\text{TOTAL GRIP FORCE [lb]} = (\text{Pressure [psi]} \times G_F) \times \frac{\text{Distance from jaw pivot (in)}}{\text{Distance from jaw pivot (in)}}$$

$$\text{TOTAL GRIP FORCE WITH SPRINGS [lb]} = ((\text{Pressure [psi]} \times G_F) \pm S_F) \times \frac{\text{Distance from jaw pivot (in)}}{\text{Distance from jaw pivot (in)}}$$

### METRIC:

$$\text{TOTAL GRIP FORCE [N]} = (\text{Pressure [bar]} \times G_F) \times \frac{\text{Distance from jaw pivot (mm)}}{\text{Distance from jaw pivot (mm)}}$$

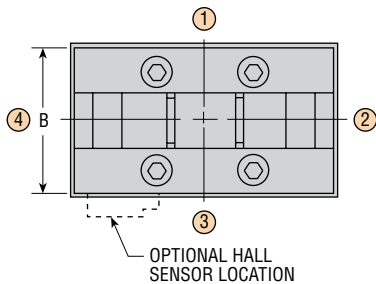
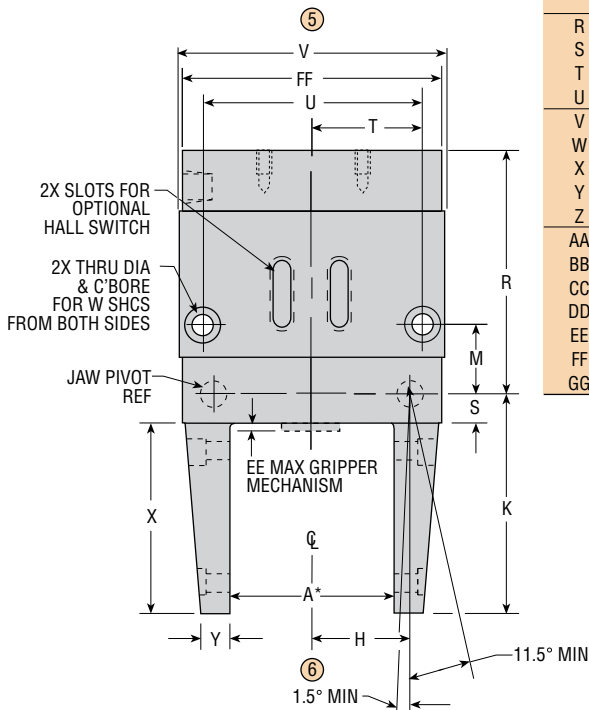
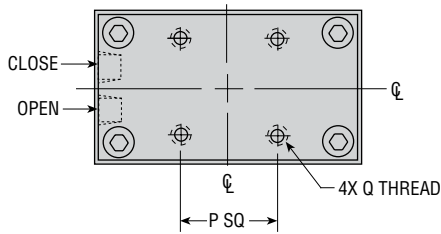
$$\text{TOTAL GRIP FORCE WITH SPRINGS [N]} = ((\text{Pressure [bar]} \times G_F) \pm S_F) \times \frac{\text{Distance from jaw pivot (mm)}}{\text{Distance from jaw pivot (mm)}}$$



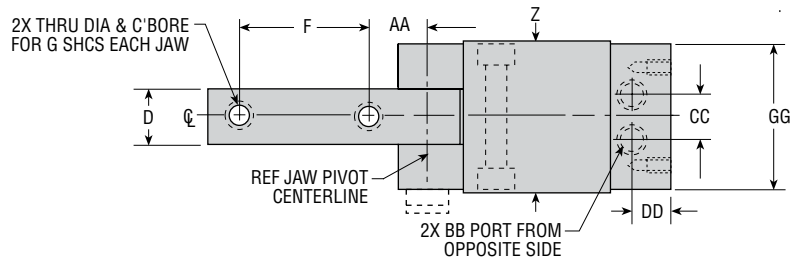
## Sizing & Application Assistance

Use PHD's free online Product Sizing Application or view the Product Sizing Catalog at: [www.phdinc.com/apps/sizing](http://www.phdinc.com/apps/sizing)

# DIMENSIONS: SERIES 5300 ANGULAR OVAL GRIPPER - JAW STYLE 1



LETTER DIM	MODEL NUMBER							
	15320 in	15322 mm	15330 in	15332 mm	15340 in	15342 mm	15350 in	15352 mm
A*	1.812	46.0	2.500	63.5	3.500	88.9	5.125	130.2
B	1.750	44.5	2.250	57.2	2.750	69.9	4.000	101.6
D	.750	19.1	.875	22.2	1.000	25.4	1.500	38.1
F	1.500	38.1	2.000	50.8	2.750	69.9	3.500	88.9
G	#10	5	1/4	M6	5/16	M8	3/8	M10
H	1.062	27.0	1.500	38.1	2.000	50.8	2.875	73.0
K	2.438	61.9	3.390	86.1	4.587	116.5	5.734	145.6
M	.875	22.2	1.062	27.0	1.187	30.1	1.625	41.3
P	1.250	31.8	1.500	38.1	1.750	44.5	2.750	69.9
Q	10-24 x .38 DP	M5 x 0.8 x 9.7 DP	1/4-20 x .38 DP	M6 x 1 x 9.7 DP	5/16-18 x .44 DP	M8 x 1.25 x 11.2 DP	3/8-16 x .56 DP	M10 x 1.5 x 14.2 DP
R	3.063	77.8	3.749	95.2	4.312	109.5	5.875	149.2
S	.312	7.9	.438	11.1	.562	14.3	.845	21.5
T	1.156	29.4	1.687	42.8	2.375	60.3	3.250	82.6
U	2.312	58.7	3.375	85.7	4.750	120.7	6.500	165.1
V	2.843	72.2	4.031	102.4	5.531	140.5	7.531	191.3
W	1/4	M6	5/16	M8	3/8	M10	1/2	M12
X	2.126	54.0	2.952	75.0	4.025	102.2	4.859	123.4
Y	.285	7.2	.450	11.4	.598	15.2	.688	17.5
Z	1.781	45.2	2.281	57.9	2.781	70.6	4.031	102.4
AA	.688	17.5	.900	22.9	1.312	33.3	1.750	44.5
BB	10-32	M5 x 0.8	1/8 NPT	1/8 BSP	1/8 NPT	1/8 BSP	1/4 NPT	1/4 BSP
CC	.562	14.3	.750	19.1	.937	23.8	1.625	41.3
DD	.440	11.2	.500	12.7	.590	15.1	.760	19.3
EE	.125	3.2	.160	4.1	.200	5.1	.250	6.4
FF	2.810	71.4	4.000	101.6	5.500	139.7	7.500	190.5
GG	1.75	44.5	2.25	57.2	2.75	69.9	3.96	100.5



\*GRIPPER JAWS: SHOWN AT PARALLEL POSITION

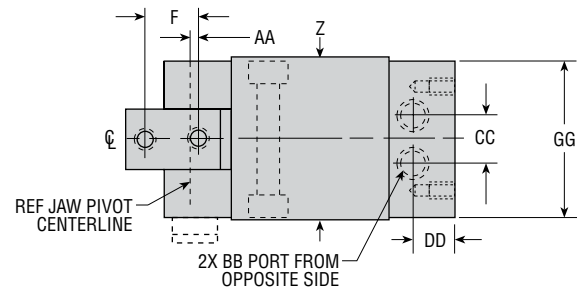
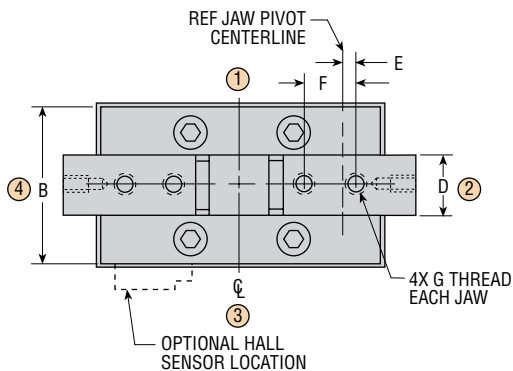
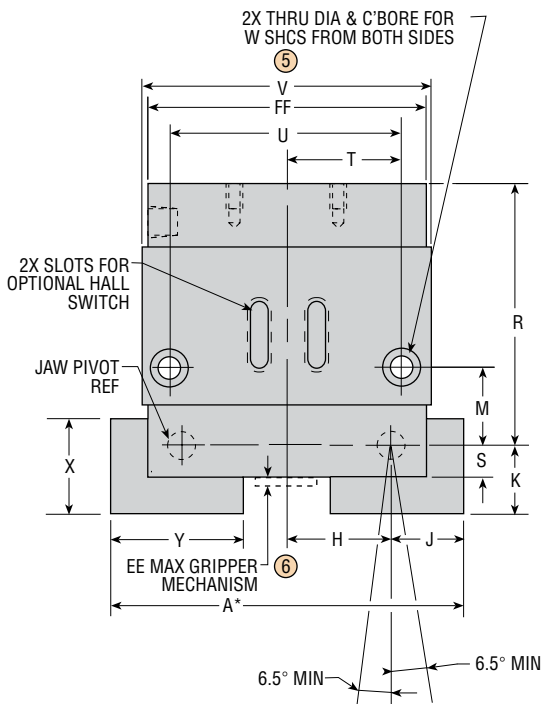
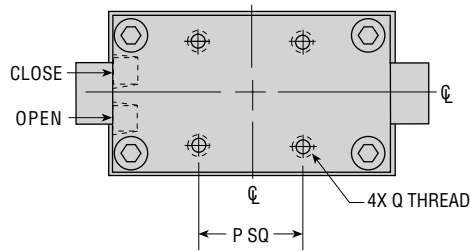
JAW MOVEMENT SHOWS MINIMUM AMOUNT OF JAW ROTATION. JAWS MAY OPEN 3° OR CLOSE 3° BEYOND STATED MINIMUM ROTATION.



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# DIMENSIONS: SERIES 5300 ANGULAR OVAL GRIPPER - JAW STYLE 2



\*GRIPPER JAWS: SHOWN AT PARALLEL POSITION

JAW MOVEMENT SHOWS MINIMUM AMOUNT OF JAW ROTATION. JAWS MAY OPEN 3° OR CLOSE 3° BEYOND STATED MINIMUM ROTATION.

LETTER DIM	MODEL NUMBER							
	15321 in	15323 mm	15331 in	15333 mm	15341 in	15343 mm	15351 in	15353 mm
A*	3.937	100.0	5.000	127.0	6.236	158.4	8.610	218.7
B	1.750	44.5	2.250	57.2	2.750	69.9	4.000	101.6
D	.750	19.1	.875	22.2	1.000	25.4	1.500	38.1
E	.231	5.9	.187	4.7	.063	1.6	0.00	0.0
F	.625	15.9	.750	19.1	1.000	25.4	1.500	38.1
G	1/4-20 x .38 DP	M6 x 1 x 9.7 DP	5/16-18 x .44 DP	M8 x 1.25 x 11.2 DP	3/8-16 x .56 DP	M10 x 1.5 x 14.2 DP	1/2-13 x .75 DP	M12 x 1.75 x 19.0 DP
H	1.062	27.0	1.500	38.1	2.000	50.8	2.875	73.0
J	.906	23.0	1.000	25.4	1.118	28.4	1.430	36.3
K	.813	20.7	.968	24.6	1.200	30.5	1.680	42.7
M	.875	22.2	1.062	27.0	1.187	30.1	1.625	41.3
P	1.250	31.8	1.500	38.1	1.750	44.5	2.750	69.9
Q	10-24 x .38 DP	M5 x 0.8 x 9.7 DP	1/4-20 x .38 DP	M6 x 1 x 9.7 DP	5/16-18 x .44 DP	M8 x 1.25 x 11.2 DP	3/8-16 x .56 DP	M10 x 1.5 x 14.2 DP
R	3.063	77.8	3.749	95.2	4.312	109.5	5.875	149.2
S	.312	7.9	.438	11.1	.562	14.3	.845	21.5
T	1.156	29.4	1.687	42.8	2.375	60.3	3.250	82.6
U	2.312	58.7	3.375	85.7	4.750	120.7	6.500	165.1
V	2.843	72.2	4.031	102.4	5.531	140.5	7.531	191.3
W	1/4	M6	5/16	M8	3/8	M10	1/2	M12
X	1.125	28.6	1.375	34.9	1.700	43.2	2.430	61.7
Y	1.500	38.1	1.875	47.6	2.430	61.7	3.430	87.1
Z	1.781	45.2	2.281	57.9	2.781	70.6	4.031	102.4
AA	.062	1.6	.095	2.4	.150	3.8	.300	7.6
BB	10-32	M5 x 0.8	1/8 NPT	1/8 BSP	1/8 NPT	1/8 BSP	1/4 NPT	1/4 BSP
CC	.562	14.3	.750	19.1	.937	23.8	1.625	41.3
DD	.440	11.2	.500	12.7	.590	15.1	.760	19.3
EE	.125	3.2	.160	4.1	.200	5.1	.250	6.4
FF	2.810	71.4	4.000	101.6	5.500	139.7	7.500	190.5
GG	1.75	44.5	2.25	57.2	2.75	69.9	3.96	100.5

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# OPTIONS & ACCESSORIES: SERIES 5300 ANGULAR OVAL GRIPPER

3

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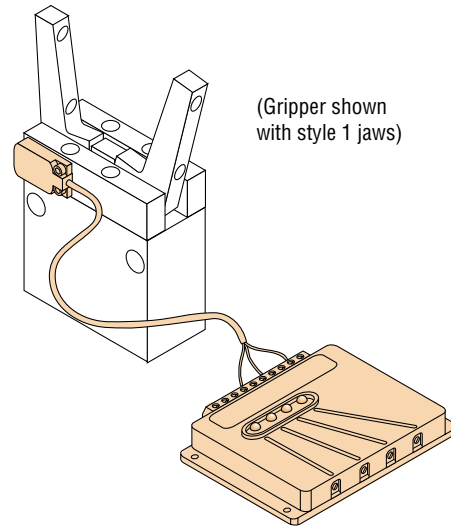
## SENSOR/TRANSDUCER

PHD offers a solid-state sensor transducer option -3 along with a set point module for sensing four or more positions throughout the jaw travel. The set point module allows independent adjustment of each sensing position and is available for 4.5 to 24 VDC NPN or PNP.

### SET POINT MODULE

PART NO.	DESCRIPTION
9800-01-0300	4.5-24 VDC, Sink Type Output
9800-01-0400	4.5-24 VDC, Source Type Output

See Switches and Sensors section for information.



7

## HALL EFFECT MAGNET

Equips piston with magnets and “T” slot on body for Series 5360 Switches.



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



Refer to this product's online catalog in the product section for complete information including related dimensions and additional specifications. See link at bottom of this page.

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# OPTION: SERIES 5300 ANGULAR GRIPPER

**3**

**4**

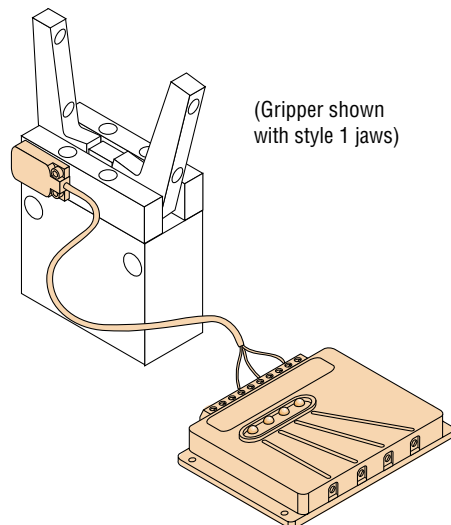
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### SET POINT MODULE

PART NO.	DESCRIPTION
9800-01-0300	4.5-24 VDC, Sink Type Output
9800-01-0400	4.5-24 VDC, Source Type Output

See Switches and Sensors section for information.



(Gripper shown with style 1 jaws)

**7**

## HALL EFFECT MAGNET

Equips piston with magnet and "T" slot on body for Series 5360 Switches.

### SERIES 5360 MINIATURE HALL EFFECT SWITCHES

PART NO.	DESCRIPTION
53603-1-02	NPN (Sink) 4.5-24 VDC, 2 meter Cable
53604-1-02	PNP (Source) 4.5-24 VDC, 2 meter Cable
53623-1	NPN (Sink) 4.5-24 VDC, Quick Connect
53624-1	PNP (Source) 4.5-24 VDC, Quick Connect

#### NOTES:

- 1) See Switches and Sensors section for switch information.
- 2) Switches must be ordered separately.

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