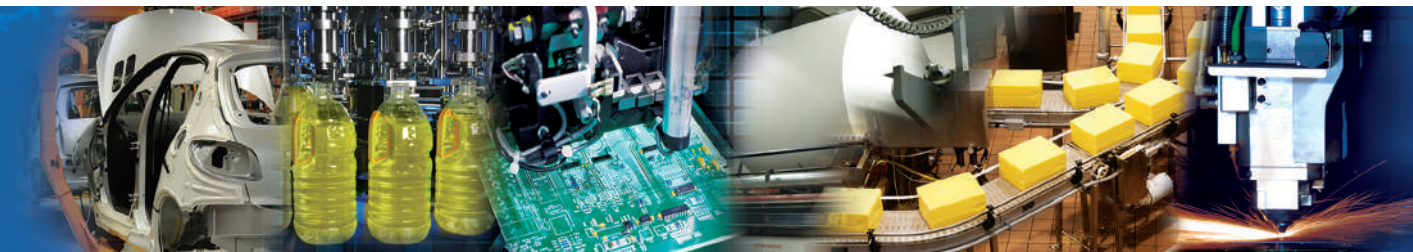
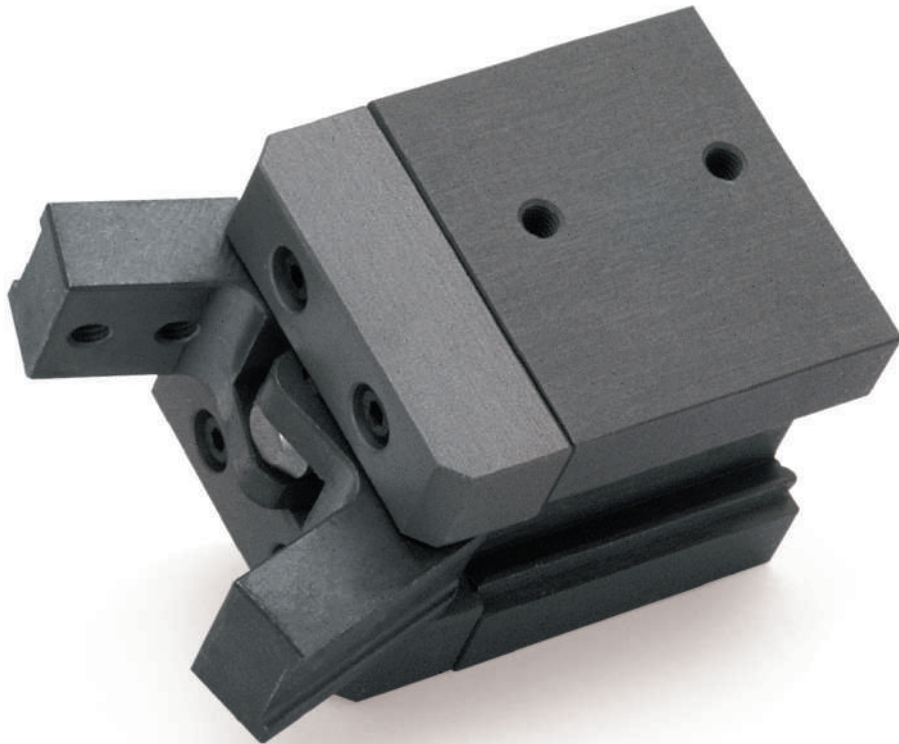


NUMATICS®

AG Series

Angular Grippers



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EMERSON
Industrial Automation

AG Series Angular Grippers

Features and Benefits	3
How to Order	4
Dimensions	5
Specifications and Load Ratings	6
Sensing Part Numbers	7
Quick Disconnect Cables	8

AG-Series Angular Grippers

Designed to handle real world angular gripper applications

The AG-Series Angular Gripper utilizes a double acting piston with a dual pivot system. The piston has a single center pivot that drives each gripper jaw open and closed. The gripper jaws have an independent stationary pivot which each jaw arcs about. The ratio between the piston and jaw pivots has been optimized for maximum operating performance.

The AG-Series Angular Gripper is a cartridge style design. The cartridge design utilizes a minimum number of components, seven major components in all. The cartridge design offers the greatest grip force to size ratio over other conventional designs.

A. Body:

Cartridge design produced from extruded alloy aluminum.
 Hardcoat anodized with PTFE, reduced friction, reduced wear
 High finish bores for increased seal life
 Sensor mounting rail for easy access mounting (not available on AG010)
 Lightweight, durable, long life

B. Piston:

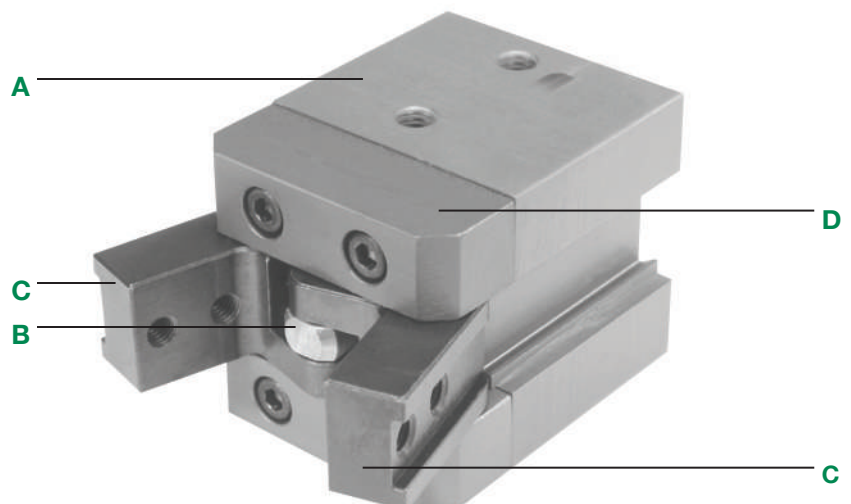
Single piece, stainless steel design
 Corrosion resistant
 Magnetic sensing band standard on ALL sizes

C. Jaws:

Hardened alloy steel with lubrication
 Keyway slot for tooling location
 32 degree jaw motion
 Each jaw travels 1 degree beyond center

D. Pivot Pins:

Hardened alloy steel
 Reduced friction, low wear, increased service life
 Supported by polymer bushings



How to Order

AG 010 A 1 6 D 1

Gripper Series

- 010 = 9 lbs.
- 020 = 22 lbs.
- 035 = 35 lbs.

Seal Type

- 1 = Buna-N Seals

Options

- 1 = No Options
- 2 = Air Close/Spring Open

Sensing Position

- A* = Single Position Open
- D = No Sensing
- *AG20 & AG35 available only with "A" option single position open

Sensing Type

- Standard Cord Set
- 3 = Reed Switch
- 6 = No Sensing
- Quick Disconnect Cord Set
- X = Reed Switch
- See Sensor section.

Example order:

Part Number: AG020A13A1*

Part Description: 22 pound grip force angular gripper, Buna-N seals, reed switch open position, no option.

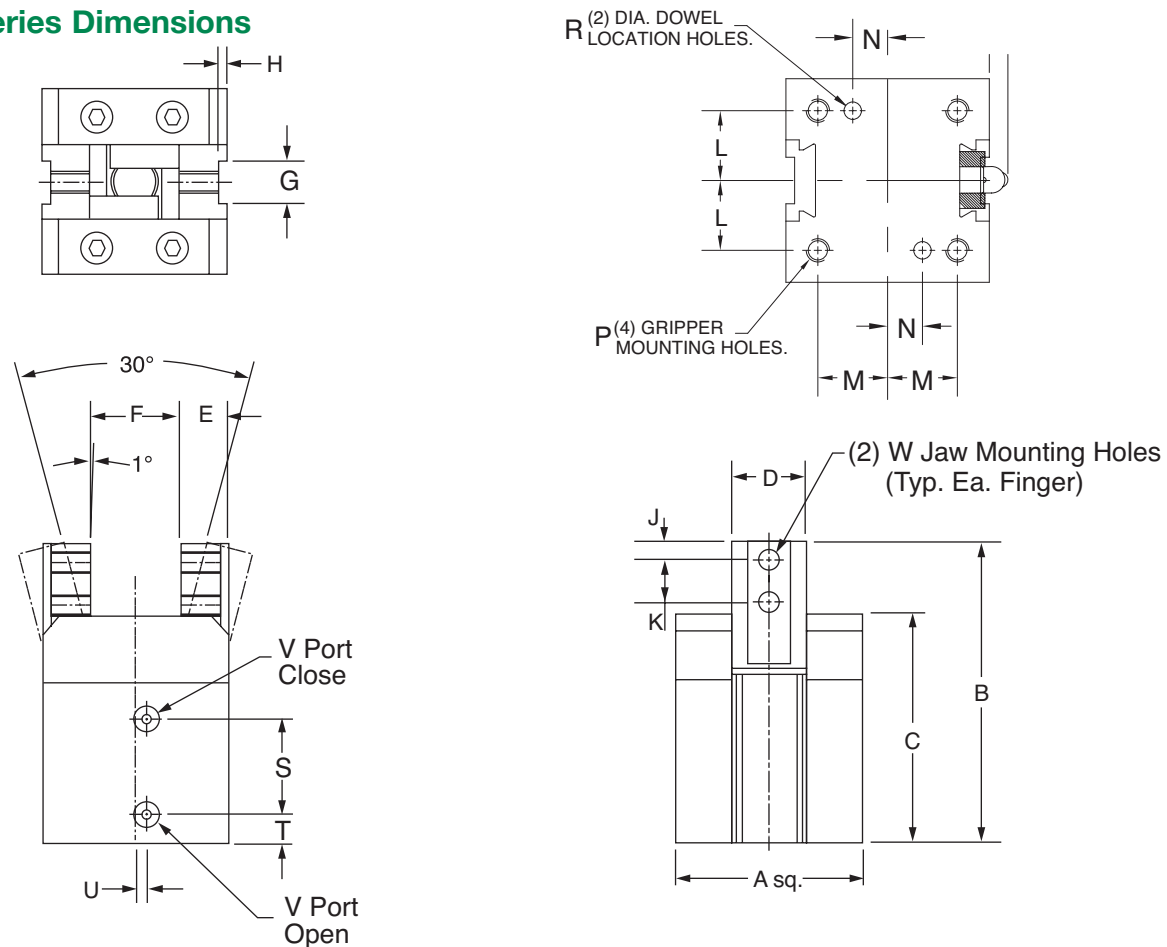
*When ordering, DO NOT use spaces or dashes.

When ordering additional seal kits:

Seal Kit Series	Buna-N Seal Kit
AG010A	AGSKB-010A
AG020A	AGSKB-020A
AG035A	AGSKB-035A

Dimensions: Inches (mm)

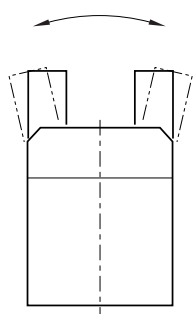
AG Series Dimensions



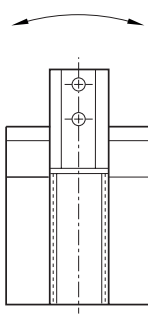
	AG010A		AG020A		AG035A	
	inches	mm	inches	mm	inches	mm
A	0.78	20.0	1.10	28.0	1.38	35.0
B	1.35	34.4	1.83	46.5	2.24	57.0
C	1.06	27.0	1.38	35.1	1.70	43.3
D	0.28	7.0	0.43	11.0	0.55	14.0
E	0.20	5.0	0.27	7.0	0.35	9.0
F	0.39	10.0	0.55	14.0	0.67	17.0
G	0.16	4.0	0.27	7.0	0.31	8.0
H	0.03	0.8	0.04	1.0	0.06	1.5
J	0.08	2.0	0.12	3.0	0.14	3.5
K	0.16	4.0	0.23	6.0	0.31	8.0
L	0.26	6.5	0.37	9.5	0.47	12.0
M	0.26	6.5	0.37	9.5	0.47	12.0
N	0.98	2.5	0.197	5.0	0.236	6.0
P	M3x0.5		M3x0.5		M4x0.7	
R	0.079	2.0	0.1	3.0	0.118	3.0
S	0.42	10.7	0.57	14.4	0.71	18.1
T	0.13	3.2	0.18	4.7	0.23	6.0
U	0.08	2.0	0.08	2.0	0.08	2.0
V	M3		M3		M5	
W	M2x0.4		M3x0.5		M4x0.7	

AG-Series Gripper Performance Data

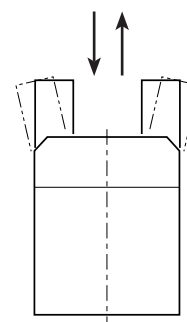
	AG010A		AG020A		AG035A	
Grip Force						
open @ 100 PSI	11 lbs	5 kgf	28 lbs	12.5 kgf	44 lbs	20 kgf
close @ 100 PSI	9 lbs	4 kgf	22 lbs	10 kgf	35 lbs	16 kgf
Jaw Travel	32 degrees		32 degrees		32 degrees	
Weight	1.3 oz.	.04 kg	5.0 oz.	.14 kg	6.3 oz	.18 kg
Max Operating Pressure	250 PSI		250 PSI		250 PSI	
Displacement	.01 cu in	.16cm	.04 cu in	.57cm	.06 cu in	1.1cm
Temp Range Buna-N Seals	-30 F to 180 F	-34 C to 82 C	-30 F to 180 F	-34 C to 82 C	-30 F to 180 F	-34 C to 82 C



Position A



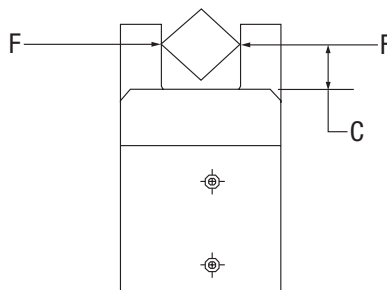
Position B



Position C

Recommended Maximum Load Ratings

	AG010A		AG020A		AG035A	
Max Load Position A	4 in-lbs	.45 Nm	15 in-lbs	1.7 Nm	30 in-lbs	3.4 Nm
Max Load Position B	4 in-lbs	.45 Nm	12 in-lbs	1.4 Nm	25 in-lbs	2.8 Nm
Max Load Position C	12 lbs	5.5 Kgf	29 lbs	13 Kgf	47 lbs	21 Kgf



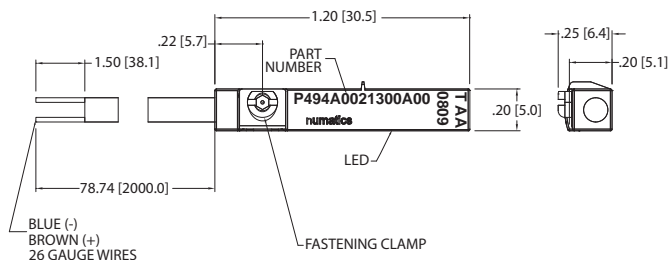
Grip Force VS. Finger Length

	Grip Force (lbs)		Grip Force (Newtons)	
AG010	$F = \frac{(0.024) \times (P)}{(C+0.126)}$	$P = \text{PSI}, C = \text{in}$	$F = \frac{(39.328) \times (P)}{(C+3.200)}$	$P = \text{bars}, C = \text{mm}$
AG020	$F = \frac{(0.088) \times (P)}{(C+0.167)}$	$P = \text{PSI}, C = \text{in}$	$F = \frac{(144.207) \times (P)}{(C+4.242)}$	$P = \text{bars}, C = \text{mm}$
AG035	$F = \frac{(0.175) \times (P)}{(C+0.233)}$	$P = \text{PSI}, C = \text{in}$	$F = \frac{(286.771) \times (P)}{(C+5.918)}$	$P = \text{bars}, C = \text{mm}$

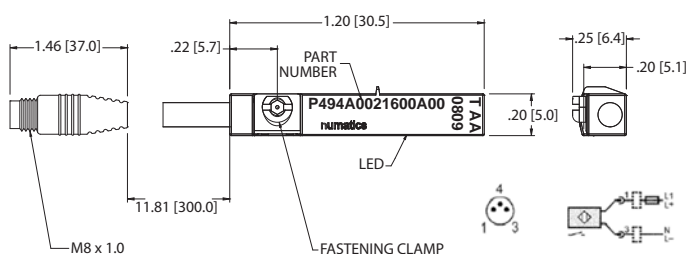
Example AG020: Operating Pressure => P=80 PSI, Grip Distance => C=0.75 in
 Grip Force (lbs) = $\{(0.088) \times (80 \text{ PSI})\} / \{0.75 \text{ (in)} + 0.167\} = 7.04/0.917 = 7.68 \text{ lbs}$

Sensing Part Numbers

P494A0021300A00



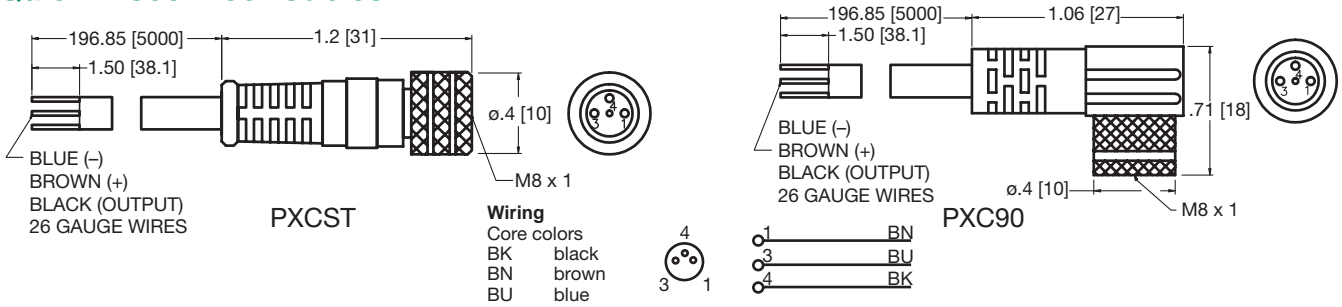
P494A0021600A00



ELECTRICAL DESIGN	AC/DC REED
OUTPUT	Normally Open
OPERATING VOLTAGE	5-120 VAC/DC
CURRENT RATING	100 mA*
SHORT-CIRCUIT PROTECTION	No
OVERLOAD PROTECTION	No
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 5 V
REPEATABILITY	± .2mm
MAKETIME INCLUDING BOUNCE	< .6 ms
BREAKTIME	< .1 ms
SWITCHING POWER (MAX)	5 W
SWITCH FREQUENCY	1000 Hz
AMBIENT TEMPERATURE	-25°C to 70°C
PROTECTION	IP 67, II
HYSTERESIS	.9mm
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	Flying Leads, Pur Cable (2m Long, 2 x26 Gauge Wire)
REMARKS	*External Protective Circuit for Inductive Load (Valve, Contactor, Etc..) Necessary. Conforms to 2008 NEC Section 725 III, Class 2 Circuits Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5. No LED Function in case of Polarity in DC Operation
ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
AGENCY APPROVALS	

ELECTRICAL DESIGN	AC/DC REED
OUTPUT	Normally Open
OPERATING VOLTAGE	5-60 VDC / 5-50 VAC #
CURRENT RATING	100 mA*
SHORT-CIRCUIT PROTECTION	No
OVERLOAD PROTECTION	No
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 5 V
REPEATABILITY	± .2mm
MAKETIME INCLUDING BOUNCE	< .6 ms
BREAKTIME	< .1 ms
SWITCHING POWER (MAX)	5 W
SWITCH FREQUENCY	1000 Hz
AMBIENT TEMPERATURE	-25°C to 70°C
PROTECTION	IP 67, II
HYSTERESIS	.9mm
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	M8 Connector, Pur Cable (.3m)
REMARKS	*External Protective Circuit for Inductive Load (Valve, Contactor, Etc..) Necessary. Conforms to 2008 NEC Section 725 III, Class 2 Circuits # M8 Connector voltage limited to 5-60 VDC/ 5-50 VAC to conform with 2008 IEC 61076-2-104 Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5. No LED Function in case of Polarity in DC Operation
ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
AGENCY APPROVALS	

Quick Disconnect Cables



Order Code	Type	Operating Voltage	Current Rating	Cable Material	Protection	Connector
PXCST	Straight 5 m Cable (3 x 26 Gauge wire)	60 AC/75 DC	3 A	PUR	IP 68, III	M8
PXC90	90° 5 m Cable (3 x 26 Gauge wire)	60 AC/75 DC	3 A	PUR	IP 68, III	M8



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