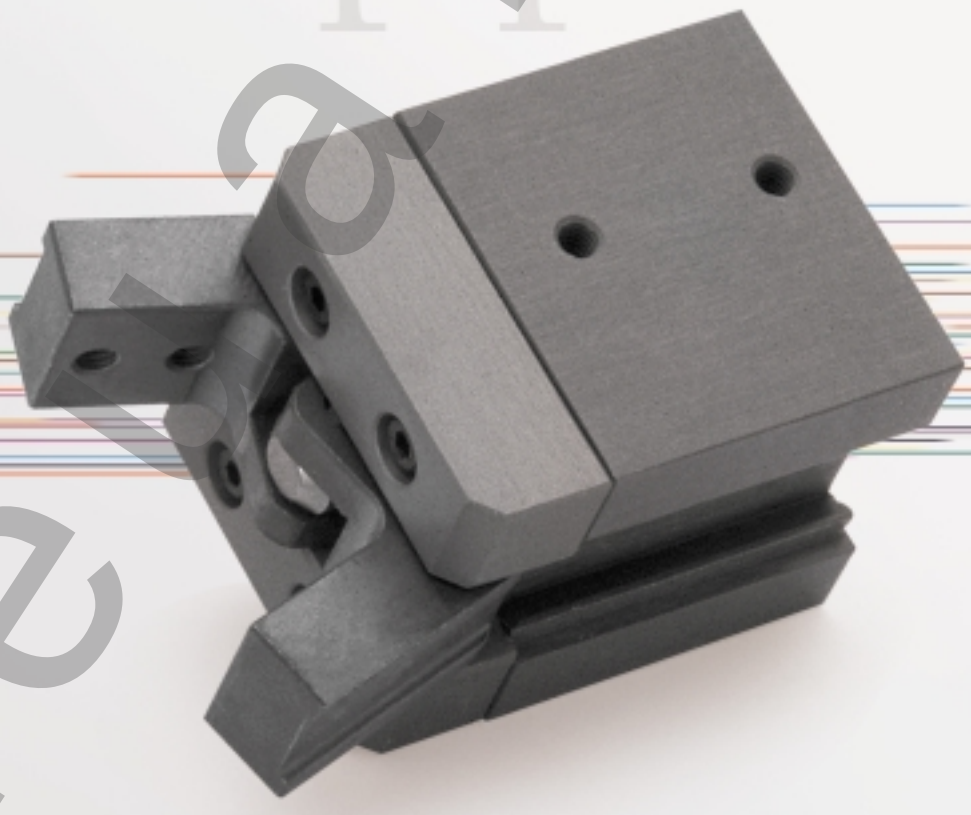
numatics®

Grippers



AG Series

Angular Gripper

We're everywhere you need us to be!

AG Series Angular Grippers 3-6

AG-Series Angular Grippers
Designed to handle real world angular gripper applications

The Numatics Motion Control 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.

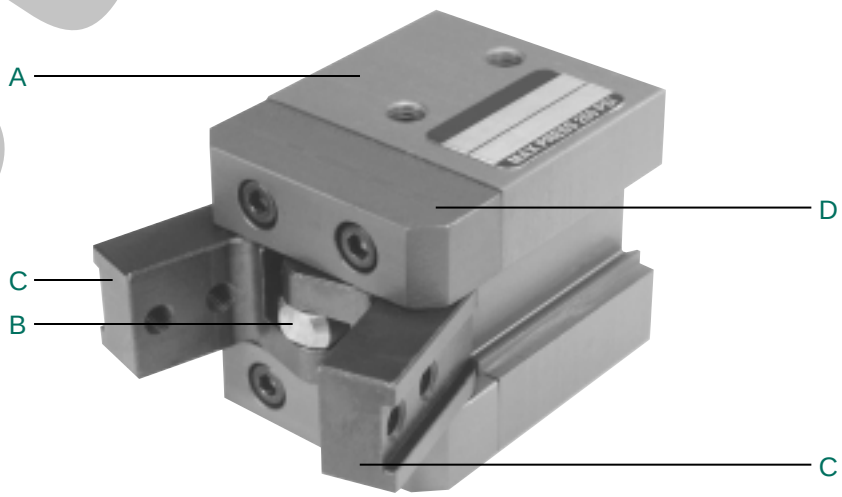
The Numatics Motion Control AG-Series Angular Gripper is a cartridge style design. The cartridge design utilizes a minimum number of components, seven major components in all. The cartridge design offers the greatest grip force to size ratio over other conventional designs.

A. Body:
Cartridge design produced from extruded alloy aluminum.
Hardcoat anodized with Teflon®, reduced friction, reduced wear
High finish bores for increased seal life
Sensor mounting rail for easy access mounting (not available on AG010)
Light weight, durable, long life

B. Piston:
Single piece, stainless steel design
Corrosion resistant
Magnetic sensing band standard 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



numatics®

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
2 = Viton Seals

Spring Option
1 = No Springs
2 = Air Close/Spring Open
8* = 90º Fittings Installed
9* = Straight Fittings Installed
* 1/8" Diameter tube push-in.

Sensing Position
A* = Single Position Open
B = Single Position Close
C** = Two Position Sensing
D = No Sensing
*AG020 available only with "A" option single position open.
**"C" option only available on AG035. Sensing not available on AG010

Sensing Type
Standard Cord Set
1 = Hall Switch - PNP (sourcing)
2 = Hall Switch - NPN (sinking)
3 = Reed Switch
6 = No Sensing
Quick Disconnect Cord Set
Z = Hall Switch - PNP (sourcing)
Y = Hall Switch - NPN (sinking)
X = Reed Switch
See Sensor section.

Example order:

Part Number: AG020A13C1*
Part Description: 22 pound grip force angular gripper, buna-n seals, two reed switches included to sense open and close, no springs.

*When ordering, DO NOT use spaces or dashes.

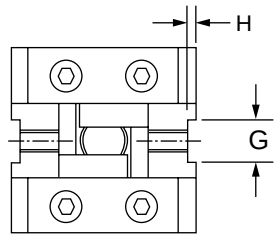
When ordering additional seal kits:

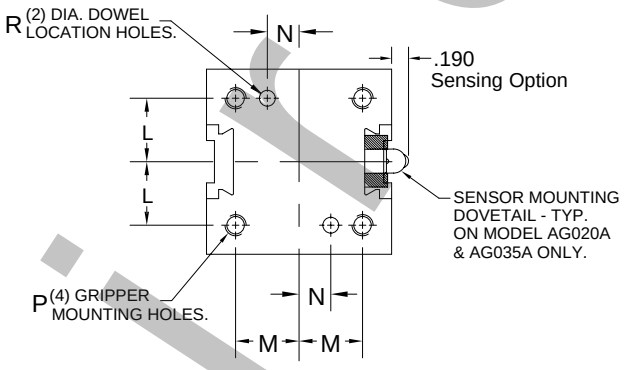
SEAL KIT SERIES	BUNA SEAL KIT	VITON SEAL KIT
AG010A	AGSKB-010A	AGSKV-010A
AG020A	AGSKB-020A	AGSKV-020A
AG035A	AGSKB-035A	AGSKV-035A

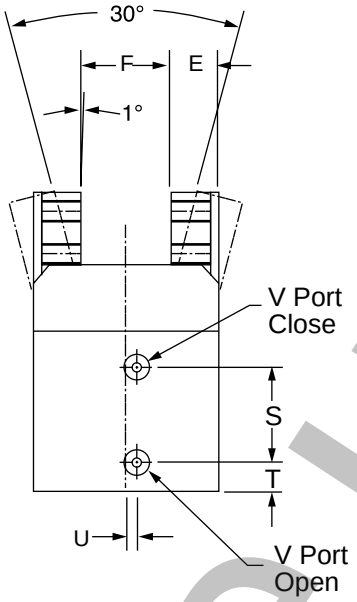
When ordering additional switches:

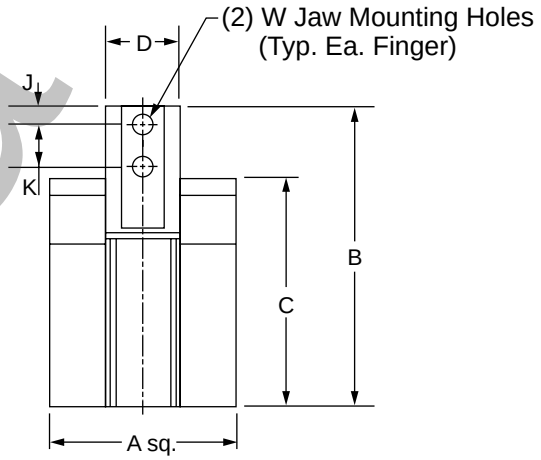
SWITCH DESCRIPTION	STANDARD PART NO.	QUICK DISCONNECT PART NO.
Hall Effect–PNP (Sourcing)	HPNPS31	HPNPQ31
Hall Effect–NPN (Sinking)	HNPNS32	HNPNQ32
Reed Switch	RSS02	RSQ02
90° 5 meter cable	-	PXC90
Straight 5 meter cable	-	PXCST

AG Series Dimensions





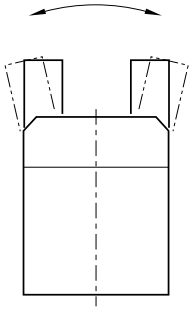




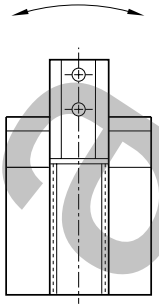
	AG010A		AG020A		AG035A	
	mm	Inches	mm	Inches	mm	Inches
A	20.0	0.78	28.0	1.10	35.0	1.38
B	34.4	1.35	46.5	1.83	57.0	2.24
C	27.0	1.06	35.1	1.38	43.3	1.70
D	7.0	0.28	11.0	0.43	14.0	0.55
E	5.0	0.20	7.0	0.27	9.0	0.35
F	10.0	0.39	14.0	0.55	17.0	0.67
G	4.0	0.16	7.0	0.27	8.0	0.31
H	0.8	0.03	1.0	0.04	1.5	0.06
J	2.0	0.08	3.0	0.12	3.5	0.14
K	4.0	0.16	6.0	0.23	8.0	0.31
L	6.5	0.26	9.5	0.37	12.0	0.47
M	6.5	0.26	9.5	0.37	12.0	0.47
N	2.50	.098	5.00	0.197	6.00	0.236
P	M3x0.5		M3x0.5		M4x0.7	
R	2.0	0.079	3.0	0.118	3.0	0.118
S	10.7	0.42	14.4	0.57	18.1	0.71
T	3.2	0.13	4.7	0.18	6.0	0.23
U	2.0	0.08	2.0	0.08	2.0	0.08
V	M3		M3		M5	
W	M2x0.4		M3x0.5		M4x0.7	

AG-Series Gripper Performance Data

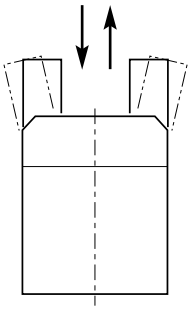
	AG010A		AG020A		AG035A	
Grip Force						
open @ 100 psi	11 lbs	5 kgf	28 lbs	12.5 kgf	44 lbs	20 kgf
close @ 100 psi	9 lbs	4 kgf	22 lbs	10 kgf	35 lbs	16 kgf
Jaw Travel	32 degrees		32 degrees		32 degrees	
Weight	1.3 oz.	.04 kg	5.0 oz.	.14 kg	6.3 oz.	.18 kg
Max Operating Pressure	250 psi		250 psi		250 psi	
Displacement	.01 cuin	.16cm	.04 cuin	.57cm	.06 cuin	1.1cm
Temp Range Buna 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
Temp Range Viton Seals	-25 F to 400 F	-31 C to 204 C	-25 F to 400 F	-31 C to 204 C	-25 F to 400 F	-31 C to 204 C



Position A



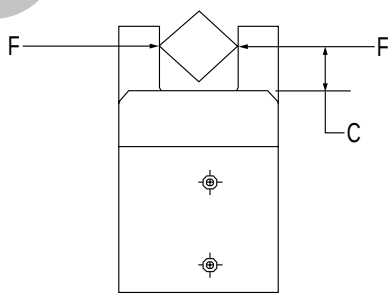
Position B



Position C

Recommended Maximum Load Ratings

	AG010A		AG020A		AG035A	
Max Load Position A	4 inlb	.45 Nm	15 inlb	1.7 Nm	30 inlb	3.4 Nm
Max Load Position B	4 inlb	.45 Nm	12 inlb	1.4 Nm	25 inlb	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	$F = \frac{(0.024)x(P)}{(C+0.126)}$	*P = psi, C = in*	$F = \frac{(39.328)x(P)}{(C+3.200)}$	*P = bars, C = mm*
AG020	$F = \frac{(0.088)x(P)}{(C+0.167)}$	*P = psi, C = in*	$F = \frac{(144.207)x(P)}{(C+4.242)}$	*P = bars, C = mm*
AG035	$F = \frac{(0.175)x(P)}{(C+0.233)}$	*P = psi, C = in*	$F = \frac{(286.771)x(P)}{(C+5.918)}$	*P = bars, C = mm*

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