CATALOG

grippers

NRG Series

Parallel Gripper

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EMERSON
Industrial Automation

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Rev. 1/09

NRG-Series Parallel Robotic Gripper

Gripper Summary of Operation,
Synchronized Motion:

Two opposing pistons share a common bore. Each piston transfers force and motion (undiminished) independently to each slide. The motion of both pistons is guided through a single piece mechanism which provides synchronous self centering motion of each slide, repeatable within 0.002 inches. Gripping force and synchronization are totally independent of each other. This results in minimum wear and maximum performance life.

Gripper Summary of Operation,
Compliant (non-synchronized) Motion:

The compliant gripper utilizes the same construction as described above, except the single piece mechanism providing synchronized slide motion is removed. The slides are now independent of each other, allowing the gripper to comply to the part's position. Once the part has been gripped, its exact position is held. Position drift does not occur. Compliant grippers offer an economical solution, potentially eliminating the use of a compliant wrist.

Gripper Features

A. One-piece body construction for maximum rigidity.
- Hardcoat Teflon® impregnated inside and out.
- Compact, lightweight, high grip force to size ratio.

B. Slides are 100% engaged in body throughout the entire stroke length.
- Electroless Nickel plated.
- No external arms, reduced pinch points, OSHA recognized.

C. Synchronizing mechanism housed internally,protected from external contamination.
- Hardened tool steel.

D. Position sensor mounting track and magnetic pistons, standard on all models.
- Easy access, total adjustability, factory or field installed.
- Hall effect (NPN, PNP) and AC/DC reed switches.

Permanently lubricated seals are standard on all models, no lube required.
- Viton compound seals, optional.

Dowel location holes are standard on body and slides.
- Precision gripper and jaw (tooling) positioning.

Multiple control port locations are standard on all models.
- Bottom and side ported, easy access and added versatility.

Factory lubricated, fluorinated grease.
- Non-toxic, non-migrating and no chlorine, silicones or chlorofluorocarbons (CFC's)
- Clean room applied.

NuMate™ direct mount mounting system, standard on all models.
- Mount directly to NMC's SH-Series Linear Slides, no adapters and no transitions plates.
- Easy access and reduced cost.

Optional Features:

Spring open/air to close.
Spring close/air to open.

How to Order

NRG 025 S 1 Z C 1

Gripper Series
010
025
050
150

Motion Code
S = Sychronous
C = Complaint

Seal Type
1 = Buna-N
2 = Viton

Spring Option
1 = No Springs
2 = Air Open/Spring Close
3 = Air Close/Spring Open

Sensing Position
A = Single Position Open
B = Single Position Close
C* = Two Position Sensing
D = No Sensing
*NRG010 available with one position sensing only.

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

Example order:

Part Number: NRG025S1ZC1*
Part Description: 25 pound grip force, synchronous motion, permanently lubed seals, Hall Effect PNP/quick disconnect (sourcing) switch, two position and no springs.

*When entering an order, DO NOT use spaces or dashes.

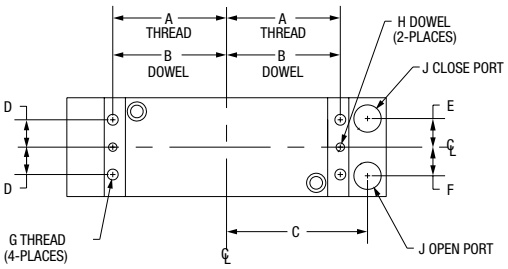
When ordering additional switches & Seal Kits:

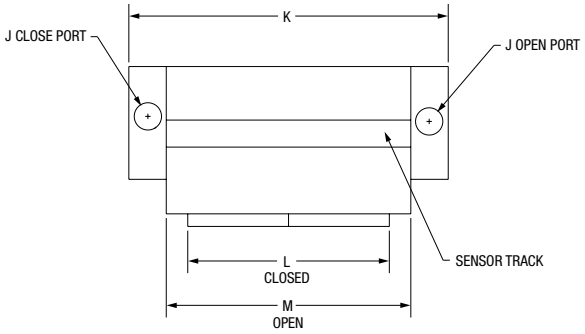
SENSING KITS	
Hall Effect–PNP (Sourcing)	HPNPS31
Hall Effect–NPN (Sinking)	HNPNS32
Reed Switch	RSS02

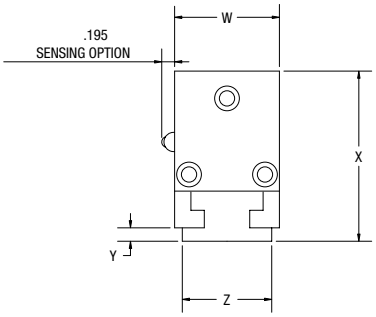
SENSING KITS QUICK DISCONNECT CORD SET	
Hall Effect–PNP (Sourcing)	HPNPQ31
Hall Effect–NPN (Sinking)	HNPNQ32
Reed Switch	RSQ02
90° 5 meter cable	PXC90
Straight 5 meter cable	PXCST

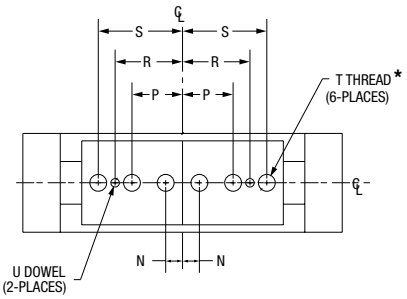
SERIES	BUNA SEAL KIT	VITON SEAL KIT
NRG010	NRGSKB-010	NRGSKV-010
NRG025	NRGSKB-025	NRGSKV-025
NRG050	NRGSKB-050	NRGSKV-050
NRG150	NRGSKB-150	NRGSKV-150

NRG Series Dimensions









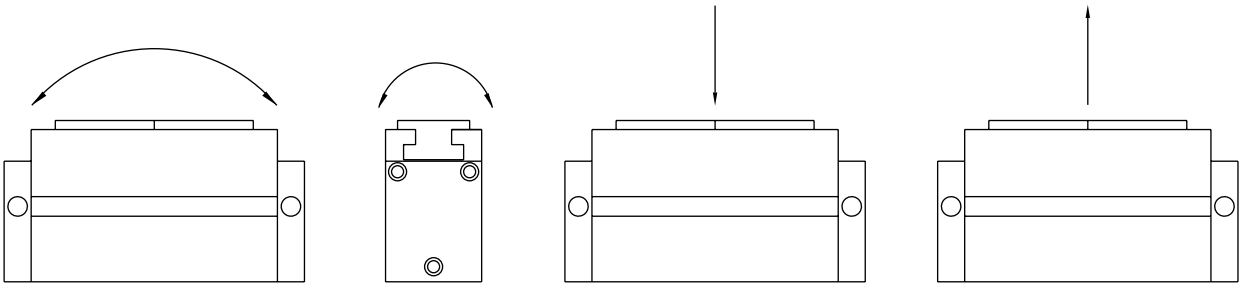
	NRG010	NRG025	NRG050	NRG150
A	0.87	1.18	1.68	1.90
B	0.875/0.876	1.187/1.188	1.687/1.688	1.906/1.907
C	1.17	1.67	2.09	2.84
D	0.31	0.31	0.40	0.56
E	0.28	0.37	0.42	0.50
F	0.28	0.37	0.42	0.62
G	#6-32	#6-32	#10-32	1/4-20
H	0.124/0.125	0.124/0.125	0.124/0.125	0.186/0.187
J	#10-32	#10-32	1/8 NPTF	1/8 NPTF
K	2.62	3.62	4.74	6.25
L	1.81	2.56	3.00	4.12
M	2.06	3.06	3.62	5.12
N	0.18	0.21	0.25	0.25
P	N/A	0.63	0.75	1.03
R	0.45	0.85	1.00	1.42
S	0.71	1.06	1.25	1.81
T	*#8-32 (4 PLACES ONLY)	#10-32	1/4-20	5/16-18
U	.092/.093	.124/.125	.124/.125	.186/.187
W	0.87	1.12	1.47	2.00
X	1.37	1.65	2.37	3.30
Y	0.12	0.15	0.18	0.18
Z	0.626/0.628	0.873/0.875	1.248/1.250	1.498/1.500

NRG-Series Parallel Robotic Gripper

Technical Performance Data

TECHNICAL DATA	NRG010	NRG025	NRG050	NRG150
* Force - open lbs.	13.5	27.6	54.1	159
* Force - closed lbs.	13.5	27.6	54.1	159
Stroke in.	0.25	0.50	0.62	1.00
Weight lbs.	0.45	0.7	1.70	3.9
Displacement in^3	0.04	0.15	0.37	1.76
Max. pressure psi	250	250	250	250

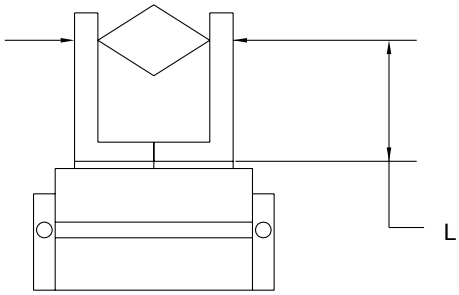
* Force @ 100 psi from each jaw.



POSITION “A” POSITION “B” POSITION “C” POSITION “D”

Recommended Maximum Load Ratings

	NRG010	NRG025	NRG050	NRG150
Position “A” ft - lb	4.0	11.0	15.0	30.0
Position “B” ft - lb	1.8	4.8	6.6	13.6
Position “C” lbf	20.0	39.5	79.3	116.8
Position “D” lbf	15.4	24.0	44.0	101.0



Grip Force VS. Finger Length

L (FINGER LENGTH)	NRG010	NRG025	NRG050	NRG150
1 inch	10.0	25.0	49.8	150.0
2 inches	9.3	21.8	44.9	138.0
3 inches	7.9	19.8	39.9	120.0
4 inches	7.3	17.8	35.9	109.7
5 inches	6.8	15.8	32.8	99.8
6 inches	6.4	13.0	30.8	90.0

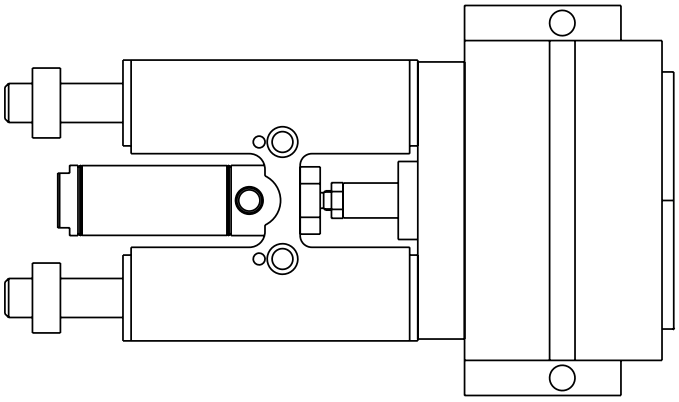
* Force @ 100 psi from each jaw.

NuMate™ Direct Mount, Mounting System

The *NuMate*™ mounting system provides a standard series of drilled, tapped and counterbored holes allowing each slide series to mount with each other and other slide series in various combinations without the use of adapters, transition plates or other costly methods. The *NuMate*™ mounting system also utilizes dowel hole locations for precision mounting.

The *NuMate*™ mounting system is the most versatile mounting method of its kind, providing customers with a cost effective method for building modular component automation. The *NuMate*™ mounting system is consistent across the Numatics Motion Control spectrum of products for automation.

	APPLICATION
Gripper	Slide
NRG010	SH056
NRG025	SH056
NRG050	SH075
NRG150	SH106



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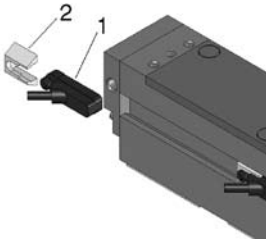
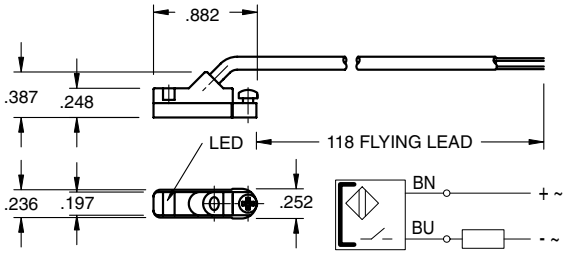
NRG Series Switch Information

	SWITCH OR BRACKET DESCRIPTION	STANDARD PART NO.	QUICK DISCONNECT PART NO,
1	Hall Effect - PNP (Sourcing)	HPNPS31	HPNPQ31
1	Hall Effect -NPN (Sinking)	HNPNS32	HNPNQ32
1	Reed Switch	RSS02	RSQ02
2	Dovetail Bracket	DSA	DSA



RSS02 – Reed Switch (AC/DC NO), flying lead



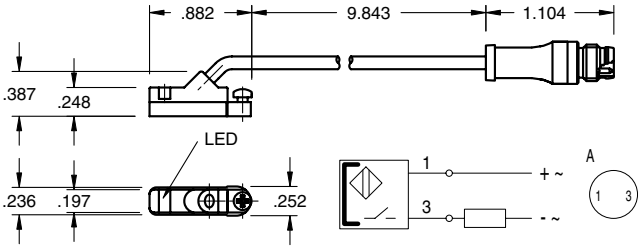
Sensing Data

Ambient temperature range T_a	(°F/°C)	-4 to 176 (-20 to 80)
Frequency of operating cycles f at U_e	(kHz)	0.5
Turn on time t	(ms)	<= 0.25
turn off time t	(ms)	0.03
LED function indication		yes

Electrical Data

Rated operational voltage U_e	(V)	3...130 AC/DC
Supply voltage U_B	(V)	3...130 AC/DC
Voltage drop U_d at I_e Stat./dyn.	(V)	3.5
Rated insulation volatage U_i	(V)	2750 DC (EN 60335-1)
Rated supply frequency	(Hz)	AC/DC
Rated operational current I_e	(mA)	50 (10W max.)
No-load supply current I_o at U_e d./und.	(mA)	0
Observe polarity for correct LED function		

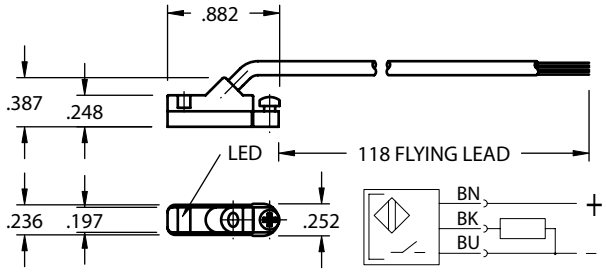
RSQ02 – 8mm connector



Mechanical Data

Housing material		Polyamide
Material of sensing face		Polyamide
Connection		PVC cable
Degree of Protection	IP	67
Rated shock: half-sinus, 50g, 11 ms		
Rated vibration environment: 10g, 10...2000 Hz. 90 min		

HPNPS31 – Electronic Switch (PNP NO), flying lead



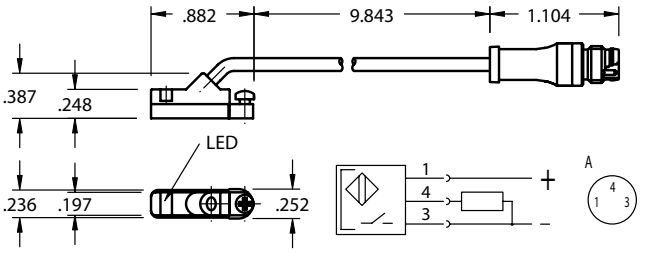
Sensing Data

Ambient temperature range $_d$	(°F/°C)	-13 to +158 (-25 to +70)
Temperature drift	(% of)	<= 0.3%/°C
Frequency of operating cycles f at U_e	(kHz)	10
Turn on time t	(ms)	.05
turn off time t	(ms)	.05
Utilization categories		DC13
Function–/supply voltage indication		YES

Electrical Data

Rated operational voltage U_e	(V)	24 DC
Supply voltage U_B	(V)	10...30 DC
incl. ripple	(% of U_e)	15
Voltage drop U_d at I_e Stat./dyn.	(V)	1/–
Rated insulation volatage U_i	(V)	75 AC
Rated supply frequency	(Hz)	DC
Rated operational current I_e	(mA)	200
No-load supply current I_o at U_e d./und.	(mA)	25/13
Protected against polarity reversal		YES

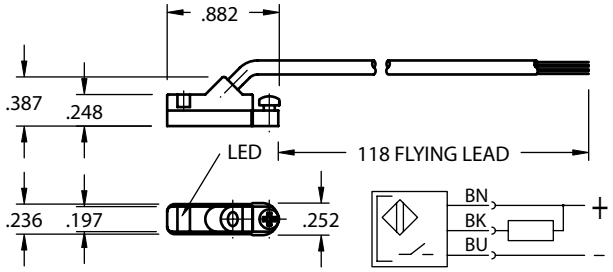
HPNPQ31 – 8mm connector



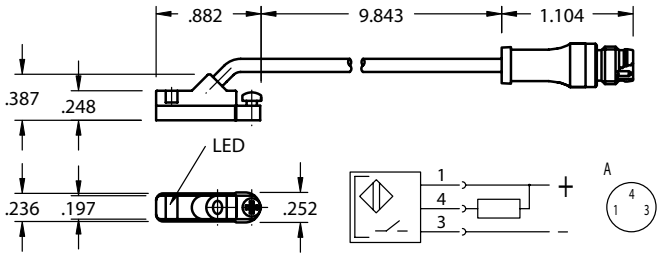
Mechanical Data

Housing material		Polyamide
Material of sensing face		Polyamide
Connection		PVC cable
Degree of Protection	IP	67
Rated shock: half-sinus, 30 g, 11 ms		
Rated vibration environment: 55 Hz, 1mm amplitude, 3 x 30		

HNPNS32 – Electronic Switch (NPN NO), flying lead



HNPNQ32 – 8mm connector



Sensing Data

Ambient temperature range $_d$	(°F/°C)	-13 to +158 (-25 to +70)
Temperature drift	(% of S_r)	<= 0.3%/°C
Frequency of operating cycles f at U_e	(kHz)	10
Turn on time t	(ms)	.05
turn off time t	(ms)	.05
Utilization categories		DC13
Function–/supply voltage indication		YES

Electrical Data

Rated operational voltage U_e	(V)	24 DC
Supply voltage U_B	(V)	10...30 DC
incl. ripple	(% of U_e)	15
Voltage drop U_d at I_e Stat./dyn.	(V)	1/–
Rated insulation volatage U_i	(V)	75 AC
Rated supply frequency	(Hz)	DC
Rated operational current I_e	(mA)	200
No-load supply current I_o at U_e d./und.	(mA)	25/13
Protected against polarity reversal		YES

Mechanical Data

Housing material		Polyamide
Material of sensing face		Polyamide
Connection		PVC cable
Degree of Protection	IP	67

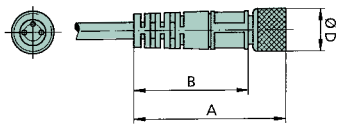
Rated shock: half-sinus, 30 g, 11 ms
Rated vibration environment: 55 Hz, 1mm amplitude, 3 x 30

Female Connectors for Reed Switches and Hall Effect Sensors

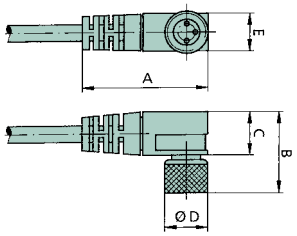
Dimensions (mm)

TYPE	ORDER CODE
Straight, 5 m Cable	PXCST
Elbow, 5 m Calbe	PXC90

Straight Type



Elbow Type



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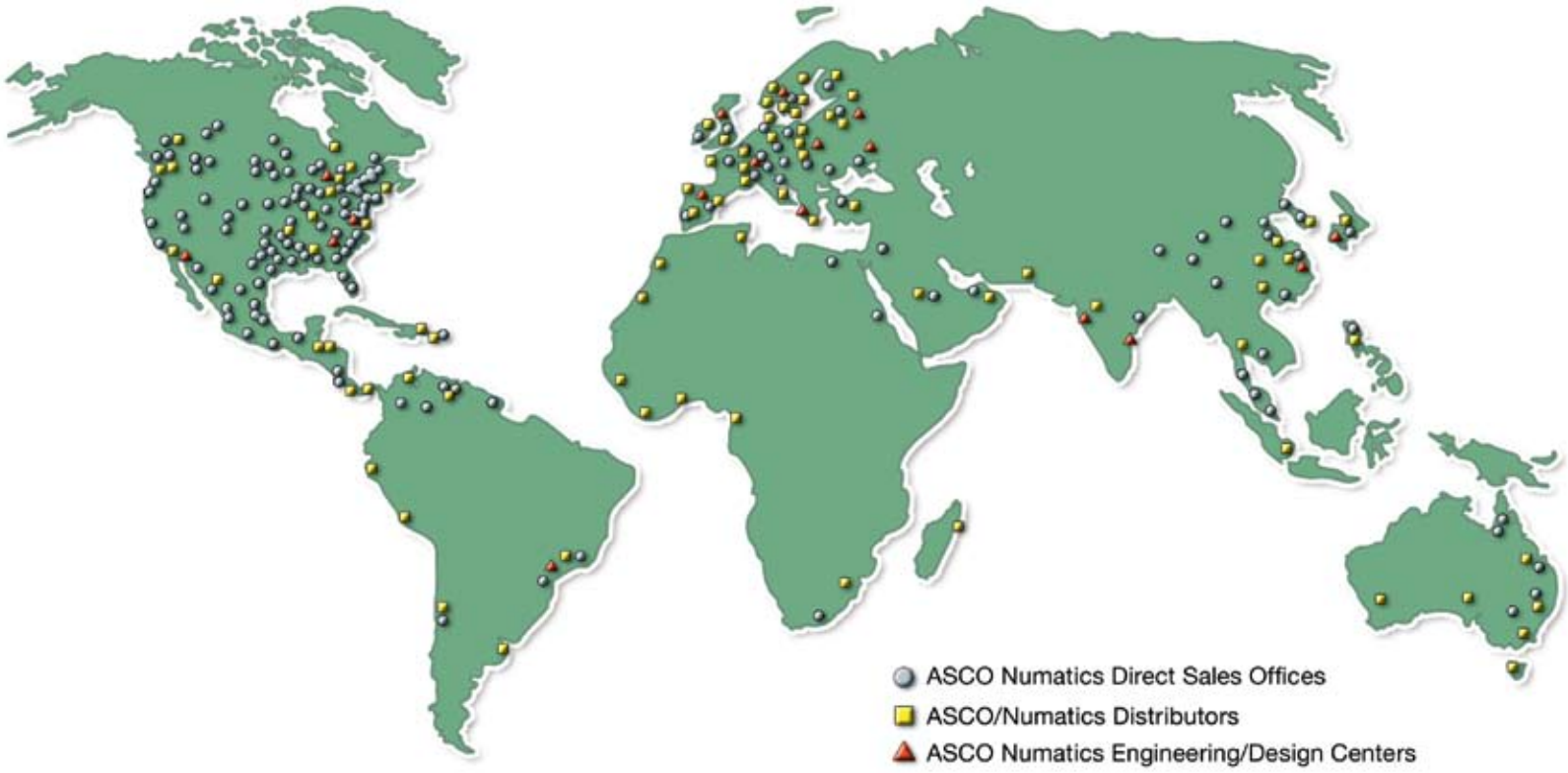

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