grippers

E Series

Parallel, Angular, Radial and 3 Jaw Grippers

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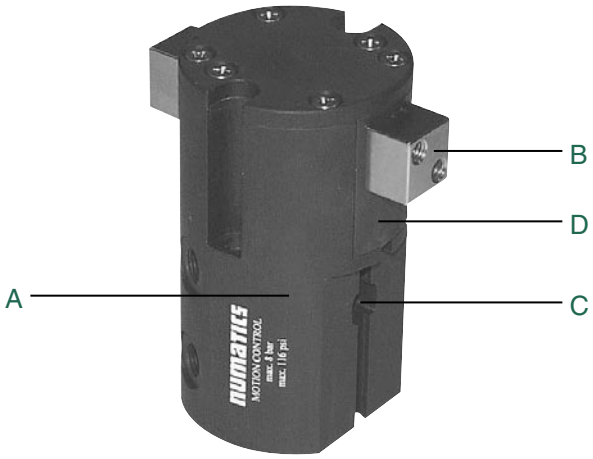
Rev. 11/03

Euro-Series Parallel Robotic Gripper

Gripper Summary of Operation:

The “EPG” (two jaw) and “ETG” (three jaw) parallel gripper lines utilize a double acting piston and rocker arm design. The piston has a radial groove to which the rocker arm engages. As the piston moves up or down, the rocker arms pivot moving the gripper jaw open or closed. All jaw motions are synchronous.



EPG

ETG

A. Body

Hardcoat Anodized Teflon impregnated aluminum inside and out.
Round lightweight highly rigid design.
Flexible mounting options with dowel holes and locating boss standard.

B. Stainless steel alloy slides.

High resistance to corrosion.
No external arms, reduced pinch points, OSHA recognized.

C. Dual position sensor mounting tracks and magnetic piston standard on all models.

Easy access, total adjustability, factory or field installed.
Hall effect (NPN, PNP) and AC/DC reed switches.

D. A Polyoxymethylene (POM), or acetal polymer bearing surface, reinforced by MoS2, standard on all models.

High Resistance to harsh chemicals.
Isolates internal parts from environmental contamination.
Superior Slide Support.

Euro-Series Radial & Angular Robotic Gripper

Gripper Summary of Operation:

Radial “ERG”
The piston rod has multiple gear teeth machined on one end. Each jaw has a pinion gear arrangement which engages the piston rack. As the piston moves up and down, the pinion arrangement rotates the radial jaws open and closed.

Angular “EAG”
Like the parallel grippers, the double acting piston has a radial groove to which the same rocker arm engages. As the piston moves up and down, the rocker pivots moving the gripper jaws in an angular motion open and close.

ERG

EAG

A. Body

Hardcoat Anodized Teflon impregnated aluminum inside and out.
Round lightweight highly rigid design.
Flexible mounting options with dowel holes and locating boss standard.

B. Jaws

Hardcoat Anodized Teflon impregnated aluminum
Lightweight, Durable, high strength
Each jaw travels 2 degrees beyond center.

C. Dual position sensor mounting tracks and magnetic piston standard on all models.

Easy access, total adjustability, factory or field installed.
Hall effect (NPN, PNP) and AC/DC reed switches.

D. A Polyoxymethylene (POM), or acetal polymer bearing surface, reinforced by MoS2. standard on all models.

High Resistance to harsh chemicals.
Isolates internal parts from environmental contamination.
Superior jaw support.

E. Stainless steel alloy pivot pins

Reduced friction, low wear, increased service life.

How to Order

EPG 016 A 1 6 D 1

Model
EPG
ETG
ERG
EAG

Bore Size
016 = 16 mm
025 = 25 mm
032 = 32 mm

Seal Options
1* = Buna
*Gripper max operating temperature 140 degrees. Viton not available.

Sensing Position
A = Single Position Open
B = Single Position Close
C = Two Position Sensing
D = No Sensing

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 page 12.

Example order:

Part Number: EPG016A16D1*
Part Description: 2 jaw parallel with 16 mm bore, standard buna seals no sensing.

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

When ordering additional seal kits:

SEAL KIT SERIES	BUNA SEAL KIT
All 16mm Bore Models	ESKB-016
All 25mm Bore Models	ESKB-025
All 32mm Bore Models	ESKB-032

When ordering additional switches:
Sensing Kits

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

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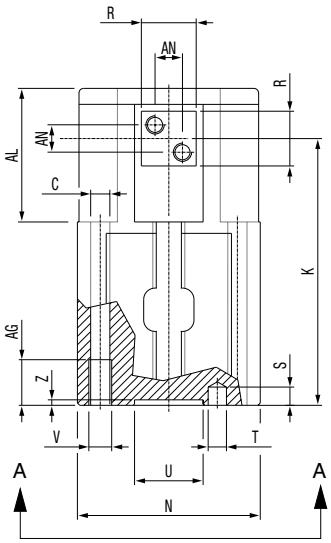
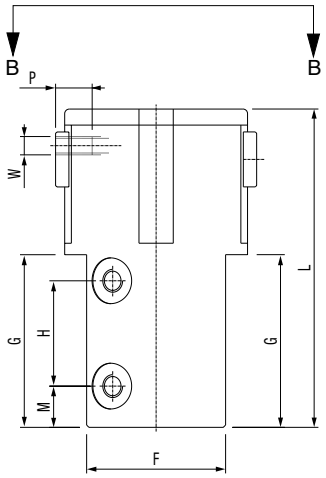
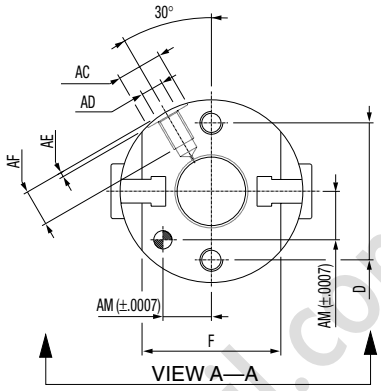
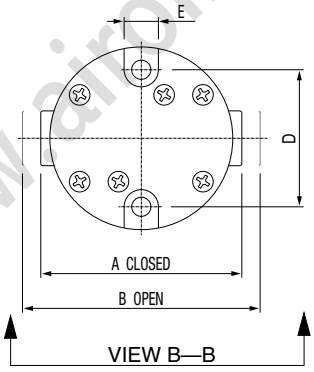
EPG Series



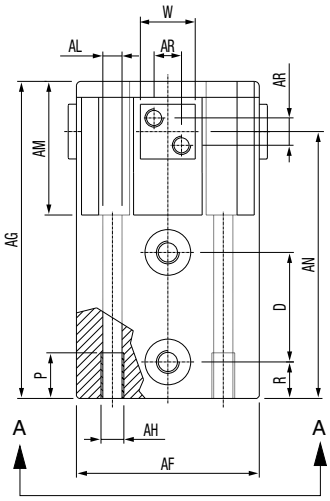


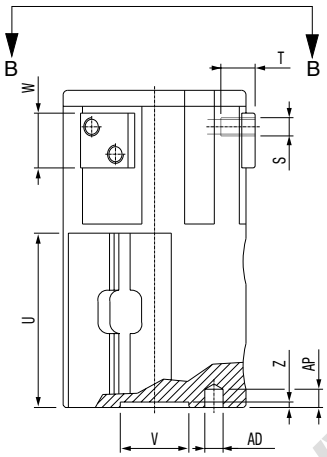


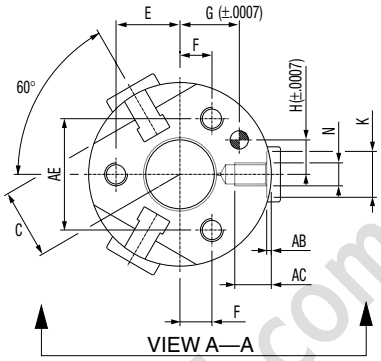


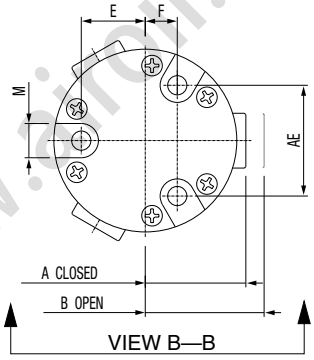
	EPG016		EPG025		EPG032	
	Inches	mm	Inches	mm	Inches	mm
A	1.7	44.0	2.1	55.0	2.6	66.0
B	2.0	52.0	2.6	68.0	3.3	84.0
C	0.157	4.0	0.196	5.0	0.26	6.8
D	1.18	30.0	1.59	40.5	1.88	48.0
E	0.29	7.5	0.37	9.5	0.43	11.0
F	1.19	30.4	1.67	42.6	1.85	47.0
G	1.48	37.7	1.88	48.0	2.14	54.5
H	0.90	23.0	1.18	30.0	1.14	29.0
K	2.30	58.5	2.93	74.5	3.40	86.5
L	2.73	69.5	3.46	88.0	4.05	103.0
M	0.35	9.0	0.51	13.0	0.70	18.0
N	1.57	40.0	1.96	50.0	2.36	60.0
P	0.23	6.0	0.31	8.0	0.39	10.0
R	0.47	12.0	0.59	15.0	0.70	18.0
S	0.157	4.0	0.23	6.0	0.31	8.0
T	M4	M4	M5	M5	M6	M6
U	0.59	15.0	0.78	20.0	0.09	25.0
V	10-32	M5	M6	M6	M8	M8
W	M4	M4	10-32	M5	M6	M6
Z	0.04	1.2	0.07	1.8	0.09	2.5
AC	0.39	10.0	0.39	10.0	0.62	16.0
AD	10-32	M5	10-32	M5	1/8 NPTF	1/8 NPTF
AE	0.03	1.0	0.03	1.0	0.05	1.5
AF	0.31	8.0	0.31	8.0	0.37	9.5
AG	0.39	10.0	0.47	12.0	0.59	15.0
AL	1.15	29.3	1.42	36.2	1.75	44.5
AM	0.41	10.6	0.56	14.3	0.66	17.0
AN	0.23	6.0	0.29	7.5	0.35	9.0

ETG Series



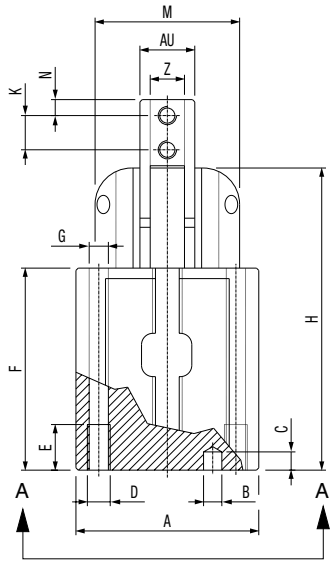


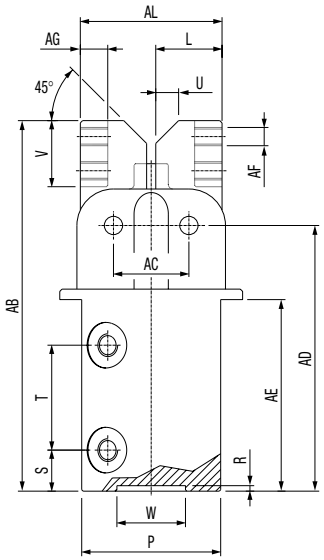


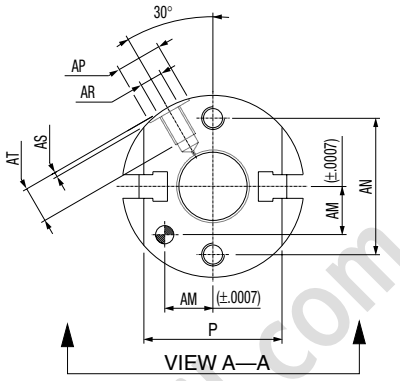


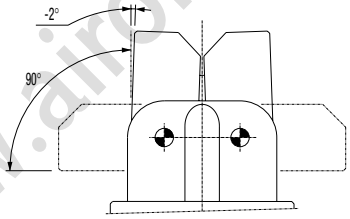
	ETG016		ETG025		ETG032	
	Inches	mm	Inches	mm	Inches	mm
A	0.86	22.0	1.08	27.5	1.29	33.0
B	1.02	26.0	1.33	34.0	1.65	42.0
C	0.59	15.2	0.83	21.3	0.92	23.5
D	0.90	23.0	1.18	30.0	1.14	29.0
E	0.55	14.0	0.79	20.2	0.94	24.0
F	0.27	7.0	0.39	10.1	0.47	12.0
G	0.51	13.0	0.66	17.0	0.80	20.5
H	0.29	7.5	0.39	10.0	0.49	12.5
K	0.39	10.0	0.39	10.0	0.62	16.0
M	0.29	7.5	0.37	9.5	0.43	11.0
N	10-32	M5	10-32	M5	1/8 NPTF	1/8 NPTF
P	0.39	10.0	0.47	12.0	0.59	15.0
R	0.35	9.0	0.51	13.0	0.70	18.0
S	M4	M4	10-32	M5	M6	M6
T	0.23	6.0	0.31	8.0	0.39	10.0
U	1.48	37.7	1.88	48.0	2.14	54.5
V	0.59	15.0	0.78	20.0	0.98	25.0
W	0.47	12.0	0.59	15.0	0.70	18.0
Z	0.04	1.2	0.07	1.8	0.09	2.5
AB	0.03	1.0	0.03	1.0	0.06	1.5
AC	0.31	8.0	0.31	8.0	0.37	9.5
AD	M4	M4	M5	M5	M6	M6
AE	0.95	24.2	1.37	35.0	1.63	41.5
AF	1.57	40.0	1.96	50.0	2.36	60.0
AG	2.73	69.5	3.46	88.0	4.05	103.0
AH	10-32	M5	M6	M6	M8	M8
AL	0.16	4.2	0.12	5.2	0.26	6.8
AM	1.15	29.3	1.42	36.2	1.75	44.5
AN	2.30	58.5	2.93	74.5	3.40	86.5
AP	0.15	4.0	0.23	6.0	0.31	8.0
AR	0.23	6.0	0.29	7.5	0.35	9.0

ERG Series



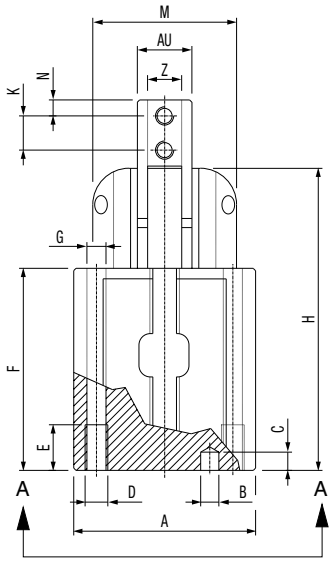


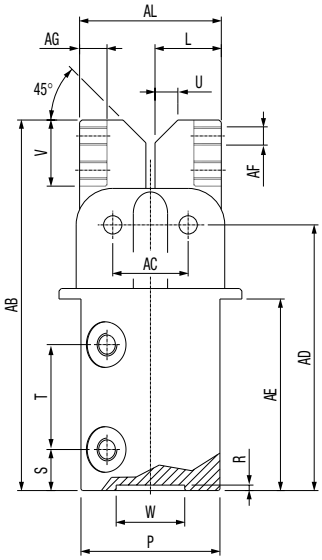


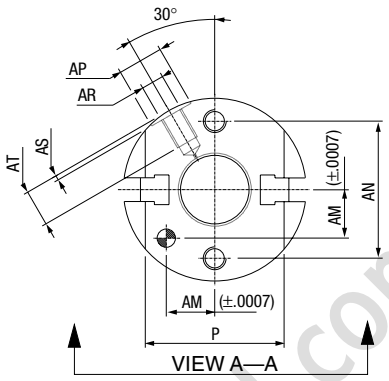


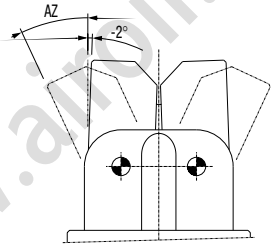
	ERG016		ERG025		ERG032	
	Inches	mm	Inches	mm	Inches	mm
A	1.57	40.0	1.96	50.0	2.36	60.0
B	M4	M4	M5	M5	M6	M6
C	0.15	4.0	0.23	6.0	0.31	8.0
D	M5	M5	M6	M6	M8	M8
E	0.39	10.0	0.47	12.0	0.59	15.0
F	1.74	44.3	2.34	59.5	2.65	67.4
G	0.15	4.2	0.19	5.2	0.27	6.8
H	2.60	66.25	3.66	93.0	4.24	107.9
K	0.29	7.55	0.39	10.0	0.51	13.0
L	0.57	14.5	0.82	21.0	1.06	27.0
M	1.27	32.5	1.73	44.0	2.12	54.0
N	0.13	3.5	0.19	5.0	0.23	6.0
P	1.19	30.4	1.67	42.6	1.85	47.0
R	0.04	1.2	0.07	1.8	0.09	2.5
S	0.35	9.0	0.51	13.0	0.70	18.0
T	0.90	23.0	1.18	30.0	1.14	29.0
U	0.19X45°	5X45°	0.31X45°	8X45°	0.43X45°	11X45°
V	0.57	14.5	0.78	20.0	0.98	25.0
W	0.59	15.0	0.78	20.0	0.98	25.0
Z	0.29	7.5	0.45	11.5	0.55	14.0
AB	3.19	81.25	4.48	114.0	5.29	134.4
AC	0.64	16.5	0.90	23.0	1.14	29.0
AD	2.29	58.25	3.14	81.0	3.67	93.4
AE	1.65	42.0	2.24	57.0	2.51	64.0
AF	M4	M4	10-32	M5	M6	M6
AG	0.23	6.0	0.33	8.5	0.43	11.0
AL	1.22	31.0	1.73	44.0	2.20	56.0
AM	0.41	10.6	0.56	14.3	0.66	17.0
AN	1.18	30.0	1.59	40.5	1.88	48.0
AP	0.39	10.0	0.39	10.0	0.62	16.0
AR	10-32	M5	10-32	M5	1/8 NPTF	1/8 NPTF
AS	0.03	1.0	0.03	1.0	0.05	1.5
AT	0.31	8.0	0.31	8.0	0.37	9.5
AU	0.47	12.0	0.70	18.0	0.90	23.0

EAG Series



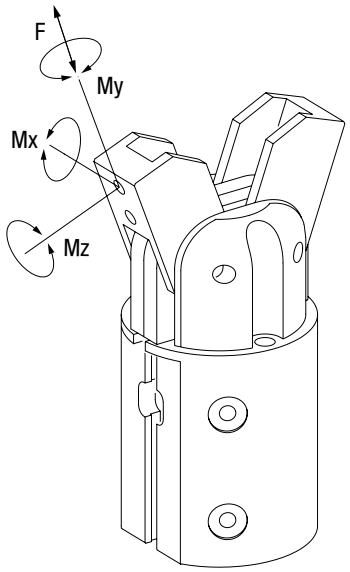




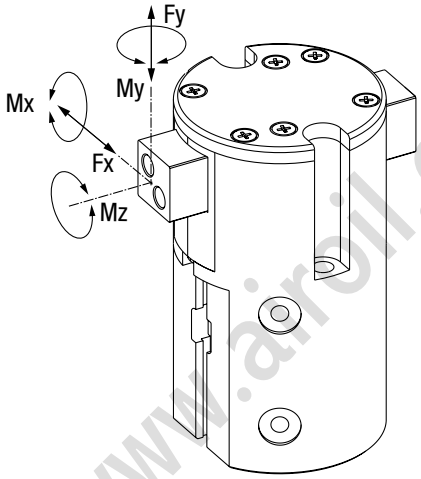


	EAG016		EAG025		EAG032	
	Inches	mm	Inches	mm	Inches	mm
A	1.57	40.0	1.96	50.0	2.36	60.0
B	0.15	4.0	0.19	5.0	0.23	6.0
C	0.15	4.0	0.23	6.0	0.31	8.0
D	M5	M5	M6	M6	M8	M8
E	0.39	10.0	0.47	12.0	0.59	15.0
F	1.74	44.3	2.34	59.5	2.65	67.4
G	0.15	4.2	0.19	5.2	0.27	6.8
H	2.60	66.25	3.66	93.0	4.24	107.9
K	0.29	7.55	0.39	10.0	0.51	13.0
L	0.57	14.5	0.82	21.0	1.06	27.0
M	1.27	32.5	1.73	44.0	2.12	54.0
N	0.13	3.5	0.19	5.0	0.23	6.0
P	1.19	30.4	1.67	42.6	1.85	47.0
R	0.04	1.2	0.07	1.8	0.09	25.0
S	0.35	9.0	0.51	13.0	0.70	18.0
T	0.90	23.0	1.18	30.0	1.14	29.0
U	0.19X45°	5X45°	0.31X45°	8X45°	0.43X45°	11X45°
V	0.57	14.5	0.78	20.0	0.98	25.0
W	0.59	15.0	0.78	20.0	0.98	25.0
Z	0.29	7.5	0.45	11.5	0.55	14.0
AB	3.19	81.25	4.48	114.0	5.29	134.4
AC	0.64	16.5	0.90	23.0	1.14	29.0
AD	2.29	58.25	3.14	81.0	3.67	93.4
AE	1.65	42.0	2.24	57.0	2.51	64.0
AF	M4	M4	10-32	M5	M6	M6
AG	0.23	6.0	0.33	8.5	0.43	11.0
AL	1.22	31.0	1.73	44.0	2.20	56.0
AM	0.41	10.6	0.56	14.3	0.66	17.0
AN	1.18	30.0	1.59	40.5	1.88	48.0
AP	0.39	10.0	0.39	10.0	0.62	16.0
AR	10-32	M5	10-32	M5	1/8 NPTF	1/8 NPTF
AS	0.03	1.0	0.03	1.0	0.05	1.5
AT	0.31	8.0	0.31	8.0	0.37	9.5
AU	0.47	12.0	0.70	18.0	0.90	23.0
AZ	19°	19°	20°	20°	21°	21°

Typical For
EAG & ERG



Typical For
ETG & EPG



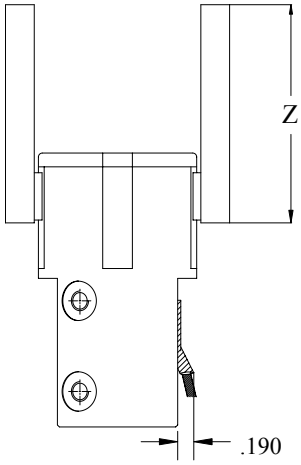
	EAG016 ERG016	EAG025 ERG025	EAG032 ERG032		EPG016 ETG016	EPG025 ETG025	EPG032 ETG032
F	6 lbs.	15 lbs.	29 lbs	Fx	11 lbs.	22 lbs.	33 lbs.
Mx	10 in. lbs.	32 in. lbs.	73 in. lbs.	Fy	11 lbs.	22 lbs.	33 lbs.
My	11 in. lbs.	43 in. lbs.	97 in. lbs.	Mx	17 in. lbs.	54 in. lbs.	107 in. lbs.
Mz	10 in. lbs.	36 in. lbs.	81 in lbs.	My	15 in. lbs.	45 in. lbs.	89 in. lbs.
				Mz	15 in. lbs.	45 in. lbs.	89 in. lbs.

Forces @ 100 psi

	EPG016	EPG025	EPG032	ETG016	ETG025	ETG032
Force-open lbs.	31.0	57.0	93.0	31.0	57.0	93.0
Force-closed lbs.	27.0	51.0	83.0	27.0	51.0	83.0
Total Stroke in. (mm)	0.314 (8.0)	0.511 (13.0)	0.708 (18.0)	0.320 (8.0)	0.546 (14.0)	0.720 (18.2)
Weight lbs.	0.44	0.90	1.43	0.46	0.94	1.49
Displacement in3	0.183072	0.793312	1.586624	0.183072	0.793312	1.586624
Max Pressure psi	116.0	116.0	116.0	116.0	116.0	116.0

	ERG016	ERG025	ERG032	EAG016	EAG025	EAG032
Force-open lbs.	31.0	57.0	93.0	31.0	57.0	93.0
Force-closed lbs.	27.0	51.0	83.0	27.0	51.0	83.0
Total Stroke Deg.	184 deg.	184 deg.	184 deg.	42 deg.	44 deg.	46 deg.
Weight lbs.	0.35	0.81	1.3	0.33	0.79	1.2
Displacement in3	0.183072	0.793312	1.586624	0.183072	0.793312	1.586624
Max Pressure psi	116.0	116.0	116.0	116.0	116.0	116.0

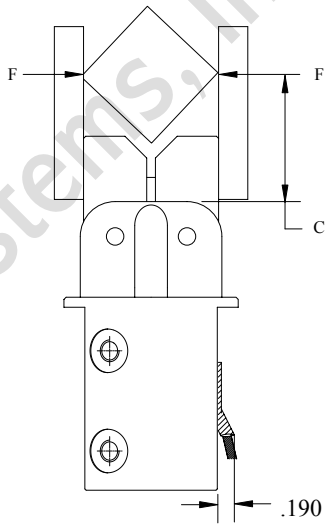
Grip Force VS. Finger Length



SENSING OPTION

Grip force in pounds @ 100 psi

Z	EPG016	EPG025	EPG032	ETG016	ETG025	ETG032
1inch	18	48	72	18	48	72
2 inches	10	40	64	10	40	64
3 inches	3	30	60	3	30	60



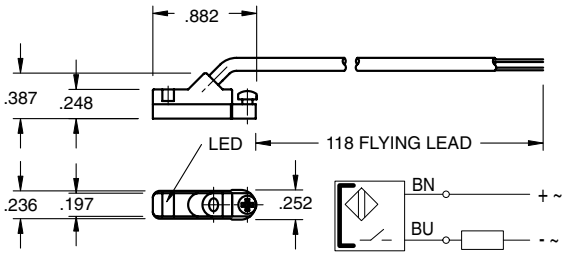
SENSING OPTION

	Grip Force (lbs.)		Grip Force (Newtons)	
ERG016 EAG016	$F = \frac{(0.27) \times (P)}{(C+.315)}$	P=psi C=in.	$F = \frac{(442.44) \times (P)}{(C+8.001)}$	P=Bars C=mm
ERG025 EAG025	$F = \frac{(0.51) \times (P)}{(C+.472)}$	P=psi C=in.	$F = \frac{(835.73) \times (P)}{(C+11.988)}$	P=Bars C=mm
ERG032 EAG032	$F = \frac{(0.83) \times (P)}{(C+.570)}$	P=psi C=in.	$F = \frac{(1360.12) \times (P)}{(C+14.478)}$	P=Bars C=mm

E 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

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



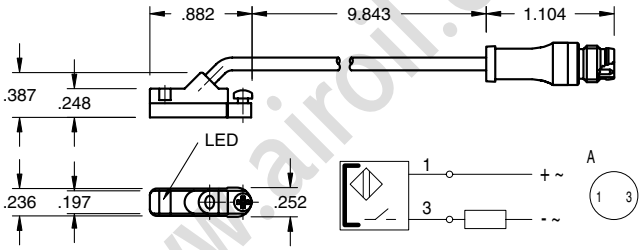
Sensing Data

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		

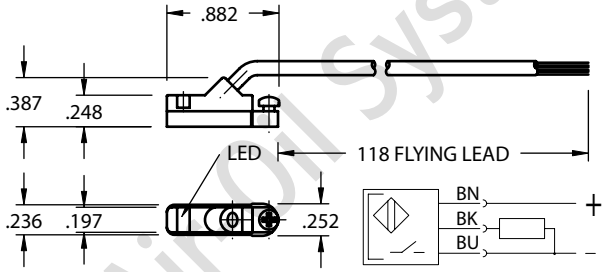
RSQ02 – 8mm connector



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



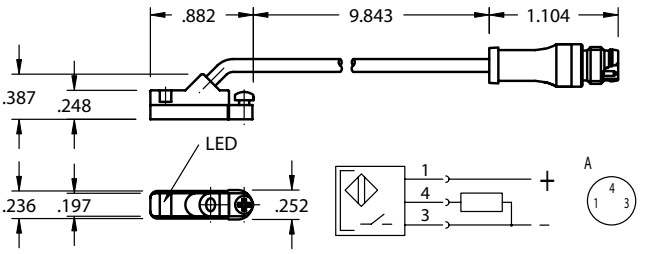
Sensing Data

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

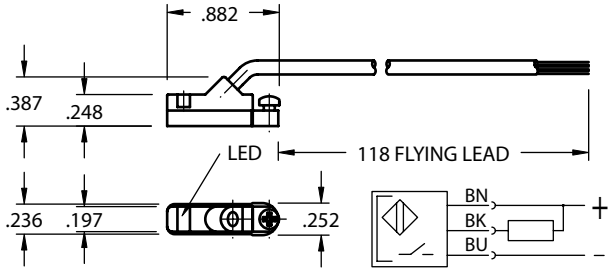
HPNPQ31 – 8mm connector



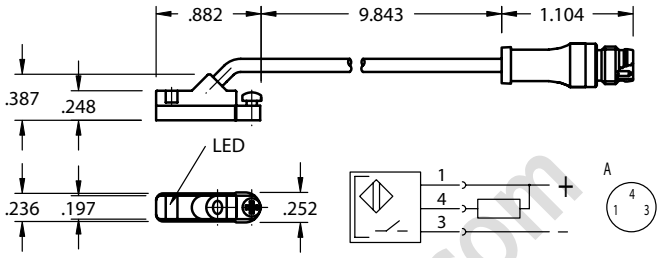
Mechanical Data

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

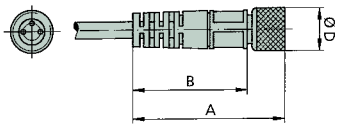
Rated shock: half-sinus, 30 g, 11 ms
Rated vibration environment: 55 Hz, 1mm amplitude, 3 x 30

Female Connectors for Reed Switches and Hall Effect Sensors

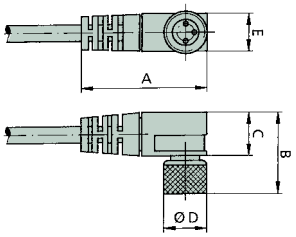
Dimensions (mm)

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

Straight Type



Elbow Type



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