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Sensing and Control  
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### Sensing and Control

Honeywell Inc.

11 West Spring Street

Freeport, IL 61032

appropriate MIL specification for ratings applicable to specific switches.

## DC RATINGS (Amps)

Rating <sup>2</sup> Code	Voltage	Sea Level				50,000 Feet			
		Inrush	Motor	Res.	Ind.	Inrush	Motor	Res.	Ind.
A	28 VDC	24	4	4	2	24	4 <sup>3</sup>	4 <sup>1</sup>	2
B	28 VDC	36	6	10	3	36	6 <sup>3</sup>	10	3
C	28 VDC	30	5	15	10	30	5 <sup>3</sup>	15	10
D	28 VDC	24	4	5	3	N/A			
E	28 VDC	N/A		1	.5	N/A		1	.5
F	28 VDC	24	4	7	4	24	4 <sup>3</sup>	7	2.5

Notes:

<sup>1</sup> 5 amps for rotary switches

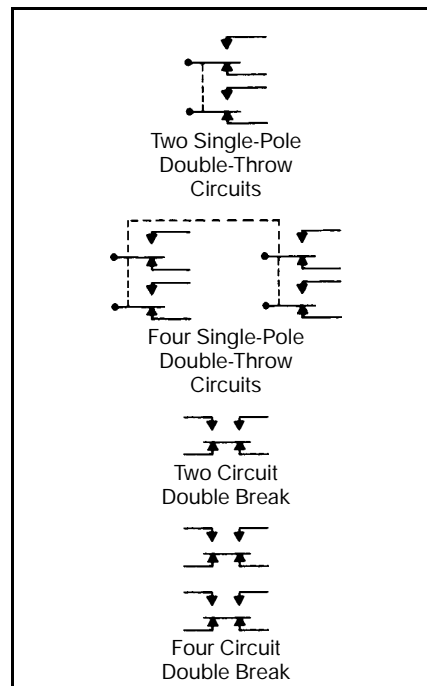
<sup>2</sup> For other electrical data, contact your nearest MICRO SWITCH Sales Office. MIL-S-8805 ratings apply when this specification is invoked.

<sup>3</sup> Application information only.

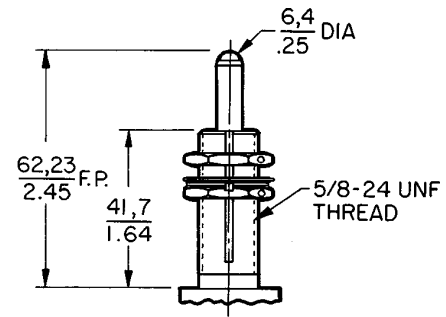
## AC RATINGS (Amps)

Rating Code	Voltage	Sea Level			
		Motor		Res.	Ind.
		Make	Break		
A&D	125/460 VAC @ 60 Hz	24	4	5	3
	125 VAC @ 400 Hz	24	4	5	5
B	125/250 VAC @ 60 Hz	20	3	5	5
	460 VAC @ 60 Hz	20	3	3	3
	125 VAC @ 400 Hz	36	6	10	6
C	125/250 VAC @ 60 Hz	20	3	5	5
	460 VAC @ 60 Hz	20	3	3	3
	125 VAC @ 400 Hz	30	5	10	6
F	125/460 VAC @ 60 Hz	12	2	2	2
	125 VAC @ 400 Hz	24	4	5	5

## CIRCUITRY



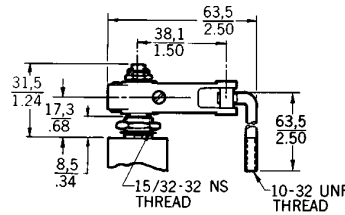
Position Sensors



for positive actuation. The rotary lever operates in either direction and adjusts laterally to any position through  $360^\circ$ . The threaded rod pivots in two planes. The actuator has no spring return, but is controlled directly by the movement of the actuating device.

Key:  $\frac{0,0}{0.00} = \text{mm}$   
 $\frac{0.00}{0.00} = \text{inches}$

**DIMENSIONS SHOWN ARE FOR REFERENCE ONLY**





1EN1-6



1EN1-S



1EN42-R

Characteristics: O.F. – Operating Force; R.F. – Release Force; P.T. – Pretravel; O.T. – Overtravel; D.T. – Differential Travel.

**EN STANDARD SIZE SWITCHES ORDER GUIDE**

**Position Sensors**

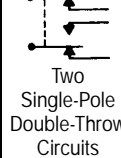
Circuitry	Actuator	Termination	Elec. Rating <sup>1</sup> Code	Catalog Listing	Characteristics					Housing Dimensions <sup>2</sup>			Repl. Mtg. Hdw. Pkt. <sup>6</sup>
					O.F. N lbs.	R.F. min. N lbs.	P.T. max. mm inches	O.T. min. mm inches	D.T. max. mm inches	Height mm inches	Dia. mm inches	Wgt. max. g oz.	
<p>Two Single-Pole Double-Throw Circuits</p>	Plunger	No. 20 Leadwire MIL-W-22759/7	A	1EN1-6 (MS24331-1) (8805/40)	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	24,9 .980	25,4 1.0	207 7.3	1
	Ball Bearing Plunger	as above	A	2001EN1-6	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	24,9 .980	25,4 1.0	207 7.3	1
	Plunger	Screw <sup>4</sup>	A	1EN1-S	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	38,2 1.505	25,4 1.0	99 3.5	3
	Plunger	Side <sup>5</sup> Receptacle	A	1EN42-R	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	26,9 1.06	58,4 <sup>3</sup> 2.3	221 7.8	3

Notes:

- <sup>1</sup> Electrical ratings are on page 25.
- <sup>2</sup> Combine housing diameter and height with actuator on page 26 for overall size.
- <sup>3</sup> Maximum length rather than housing diameter.

- <sup>4</sup> This listing has 4-48 NF x .175 inch round head screws with lockwashers. Terminals are well isolated by phenolic barriers and epoxy casting resin.
- <sup>5</sup> These listings have pin receptacles (mating connectors should be ordered from a local supplier).

- <sup>6</sup> See page 33 for replacement mounting hardware packet catalog listings.  
N = Newtons



Two Single-Pole Double-Throw Circuits

Two Single-Pole Double-Throw Circuits	Plunger	No. 18 Leadwire MIL-W-22759/7	B	2EN1-6 (MS24331-2) (8805/40)	26,7-53,4 6-12	22,8 5	1,27 .050	6,35 .250	0,89 .035	38,1 1.5	38,1 1.5	156 5.5	1
	Roller Plunger	No. 20 Leadwire (MIL-W-22759/7)	A	21EN9-6	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	24,9 .980	25,4 1.0	252 8.9	4
	Roller Plunger	No. 18 Leadwire (MIL-W-22759/7)	B	22EN9-6	26,7-53,4 6-12	22,2 5	1,02 .040	6,35 .250	0,76 .030	38,1 1.5	38,1 1.5	38,3 13.5	4
	Rotary Roller Lever	No. 20 Leadwire MIL-W-22759/7	A	31EN11-6 (CW) (MS21320-1) (8805/48) 31EN1-6 (CCW) (MS21320-2)	1,4-2,8 Nm max. 12-25 in. lb.	1,0 Nm 9 in. lb.	13" 32"	— —	4" max.	53,6 2.11	25,4 1.0	269 9.5	5
	Rotary Roller Lever	No. 18 Leadwire MIL-W-22759/7	B	32EN11-6 (CW) (MS21320-3) (8805/48) 32EN1-6 (CCW) (MS21320-4) (8805/48)	1,4-2,8 Nm max. 12-25 in. lb.	1,0 Nm 9 in. lb.	20" 25"	— —	6" max.	68,6 2.7	38,1 1.5	368 13	5
	Rotary Linkage Lever	No. 20 Leadwire MIL-W-22759/7	A	41EN1-6 (MS24420-1)	0,34 Nm max. 3 in. lb.	—	—	—	12" max.	25,4 1	25,4 1.0	213 7.5	5
	Rotary Linkage Lever	No. 18 Leadwire MIL-W-22759/7	B	42EN1-6 (MS24420-2) (8805/49)	0,57 Nm max. 5 in. lb.	—	—	—	12" max.	42,2 1.66	38,1 1.5	220 7.75	5

Notes:

<sup>1</sup> Electrical ratings are on page 25.



<sup>2</sup> Combine housing diameter and height with actuator on page 26 for overall size.

<sup>3</sup> These listings have pin receptacles (mating connectors should be ordered from a local supplier).

<sup>4</sup> See page 33 for replacement mounting hardware packet catalog listings.

N = Newtons

Position Sensors

Double-Throw Circuits  (See p. 25 for circuit drawing)	Roller Plunger	No. 20 Leadwire (MIL-W-5086)	A	25EN9-6	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,76 .030	30,5 1.2	38,1 1.5	360 12.7	4
 Two Circuit Double Break	Plunger	No. 18 Leadwire MIL-W-22759/7	C	3EN1-6 (MS24331-3) (8805/40)	26,7-53,4 6-12	22,2 5	1,52 .060	6,35 .250	0,89 .035	33,3 1.31	38,1 1.5	241 8.5	1
	Roller Plunger	No. 18 Leadwire (MIL-W-5086)	C	23EN9-6	26,7-53,4 6-12	22,2 5	1,52 .060	6,35 .250	0,89 .035	33,3 1.31	38,1 1.5	255 9	4
	Rotary Roller Lever	No. 18 Leadwire MIL-W-22759/7	C	33EN11-6 (CW) (MS21320-5) (8805/48) 33EN1-6 (CCW) (MS21320-6) (8805/48)	1,4-2,8 Nm 12-25 in. lb.	0,9 Nm 8 in. lb.	15°	30°	5°	62 2.44	38,1 1.5	269 9.5	5 5
 Four Circuit Double Break	Plunger	No. 18 Leadwire MIL-W-22759/7	C	4EN1-6 (MS24331-4) (8805/40)	26,7-53,4 6-12	22,2 5	1,78 .070	6,35 .250	1,14 .045	43,2 1.7	38,1 1.5	368 13	1
	Roller Plunger	No. 18 Leadwire (MIL-W-5086)	C	24EN9-6	26,7-53,4 6-12	22,2 5	1,78 .070	6,35 .250	1,14 .045	43,2 1.7	38,1 1.5	368 13	4
	Rotary Roller Lever	No. 18 Leadwire MIL-W-22759/7	C	34EN11-6 (CW) (MS21320-7) (8805/48) 34EN1-6 (CCW) (MS21320-8) (8805/48)	1,4-2,8 Nm 12-25 in. lb.	0,9 Nm 8 in. lb.	15°	30°	10°	71,6 2.82	38,1 1.5	439 15.5	5 5
	Rotary Linkage Lever	No. 18 Leadwire MIL-W-22759/7	C	44EN1-6 (MS24420-4) (8805/49)	1,1 Nm max. 10 in. lb.	—	—	—	20"	45,7 1.8	38,1 1.5	451 15.9	5

Notes:

<sup>1</sup> Electrical ratings are on page 25.

<sup>2</sup> Combine housing diameter and height with actuator dimension on page 26 for overall size.

<sup>3</sup> See page 33 for replacement mounting hardware packet catalog listings.

N = Newtons

Increased Overtravel	Plunger	Screw	(2)SPDT	A	1EN194-S	26,7-53,4 6-12	17,8 4	0,38-1,02 .015-.040	21,8 .860	0,51 .020	113 4	7 7
High Shock	Plunger	Bottom Receptacle	(2)SPDT	A	1EN75-R	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	198 7	8 8
High Shock	Plunger	Side Receptacle	(2)SPDT	A	1EN76-R	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	227 8	8 8
High Shock	Plunger	Bottom Receptacle	(2)SPDT	D	1EN75-R3 (M8805/65-001)	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	198 7	8 8
High Shock	Roller Plunger	Bottom Receptacle	(2)SPDT	A	21EN75-R1	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	204 7.2	11 11
High Shock	Roller Plunger	No. 20 Leadwire (MIL-W-22759/7)	(2)SPDT	A	21EN75-2	26,7-53,4 6-12	17,8 4	1,02 .040	6,35 .250	0,51 .020	207 7.3	11 11

Notes:

<sup>1</sup> Electrical ratings are on page 25.

<sup>2</sup> These are just a few of the designs that have been developed to meet special application requirements. If you have similar or different special requirements, contact MICRO SWITCH for the right switch to meet them.

<sup>3</sup> See page 33 for replacement mounting hardware packet catalog listings  
N = Newtons

## EXPLANATIONS OF SWITCHES WITH SPECIAL REQUIREMENTS

### High velocity actuation

This switch is designed to withstand near “hammer-blow” actuation as is found in over-center locking mechanisms. It is dimensionally interchangeable with standard listing 1EN1-6.

### Low force operation

Special spring construction within this switch reduces the normal 6 to 12 pound (26,7 to 53,4 N) EN operating force to 3 to 6 pounds (13,3 to 26,7 N). This switch is also dimensionally interchangeable with the standard size 1EN1-6. Low force 600 series ENs have 3 to 6 pounds (13,3 to 26,7 N) of operating force.

### Increased overtravel

A longer plunger and bushing on the switch extends the EN overtravel capabilities from the normal .250 inch to .860 (6,35 to 21,8 mm). The longer bushing also permits additional adjustment of the plunger position.

### High impact shock

Catalog listing 1EN75-R3 (M8805/65-001) has been qualified to MIL-S-8805, including high impact shock class H. Other switches rated for high impact shock applications incorporate the same plunger mechanism and internal switch design as used in the 1EN75-R3 and are expected to conform to the same requirements.

Terminations of these listings are:

1EN75-R                      DM-9601-7P-1D  
Deutch receptacle

1EN75-R3                    GS02-16S-1P-003  
Cannon receptacle

1EN76-R                      DM-9601-7P-1D  
Deutch receptacle

21EN75-R1                   GS02-16S-1P-003  
Cannon receptacle

21EN75-2                    MIL-W-22759/7  
Two foot lead wire 20 gage

MICRO SWITCH does not furnish mating connectors with these products.

602EN222-6	MS27240-5				at 15gs								
604EN222-6	MS27240-6												
622EN222-6	MS27240-7												
624EN222-6	MS27240-8												

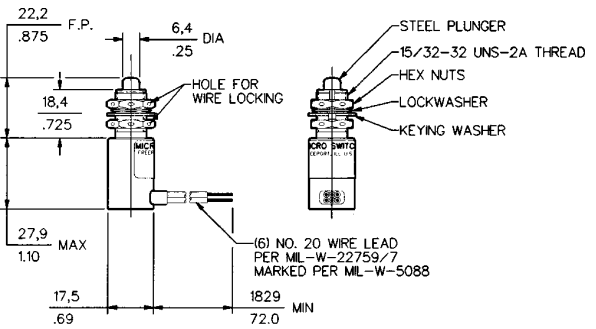
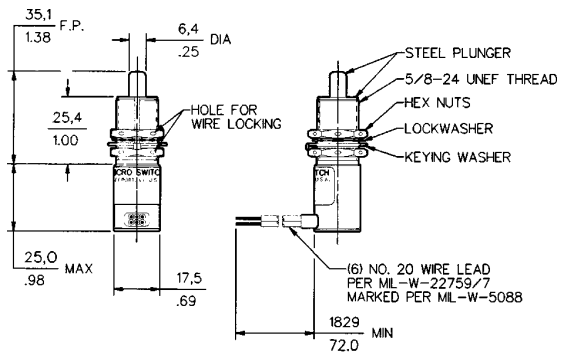
Notes:  
 1D.A. = double amplitude or displacement.



402EN1-6



602EN1-6



Position Sensors



Two SPDT Circuits	Plunger	F	602EN1-6 (MS27240-1) (8805/43)	26,7-53,4 6-12	17,8 4	1,02 .040	3,18 .125	0,51 .020	25,4 1.0	17,5 .688	176 6.2	2
		E	602EN222-6 (MS27240-5) (8805/43)									2
	Roller Plunger	F	622EN1-6 (MS27240-3) (8805/43)	26,7-53,4 6-12	17,8 4	1,02 .040	3,18 .125	0,51 .020	25,4 1.0	17,5 .688	204 7.2	10
		E	622EN222-6 (MS27240-7) (8805/43)									10
Four SPDT Circuits	Plunger	F	604EN1-6 (MS27240-2) (8805/43)	26,7-53,4 6-12	17,8 4	1,02 040	3,18 .125	0,51 .020	30,5 1.2	25,4 1.0	354 12.5	2
		E	604EN222-6 (MS27240-6) (8805/43)									2
	Roller Plunger	F	624EN1-6 (MS27240-4) (8805/43)	26,7-53,4 6-12	17,8 4	1,02 040	3,18 .125	0,51 .020	30,5 1.2	25,4 1.0	354 12.5	10
		E	624EN222-6 (MS27240-8) (8805/43)									
Two SPDT Circuits	.125 Dia. Plunger	F	602EN602-6	8,9-17,8 2-4	4,4 1	0,38 .015±.010	6,35 .250	0,51 .020	25,4 1.0	17,5 .688	170 6.0	2

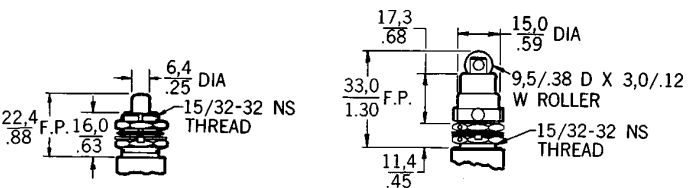
Notes:

<sup>1</sup> Combine housing diameter and height with actuator dimension on this page or page 26 for overall size of the switch.




<sup>2</sup> All miniature EN limit switches listed here have 6 foot (1,8m) lengths of No. 20 leadwire per MS22759-7, marked per MIL-W-5088. For variations, contact MICRO SWITCH.

<sup>3</sup> See page 33 for replacement mounting hardware packet catalog listings  
N = Newtons

## 600EN ACTUATOR DIMENSIONS



400EN actuator dimensions are the same as those shown for standard size ENs on page 26.

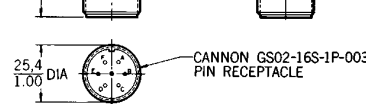
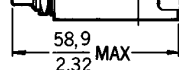
			
	<b>15PA137</b>	Locking ring only	21EN 422/424EN series ( $\frac{5}{8}$ " bushing)
	<b>15PA107</b>	Locking ring only	622EN & 624EN series ( $\frac{15}{32}$ " bushing)
	<b>19PA8</b>	Military-type mounting hardware	1EN series ( $\frac{5}{8}$ " bushing)
	<b>19PA9</b>	Military-type mounting hardware	600EN series ( $\frac{15}{32}$ " bushing)

**REPLACEMENT MOUNTING HARDWARE PACKETS**

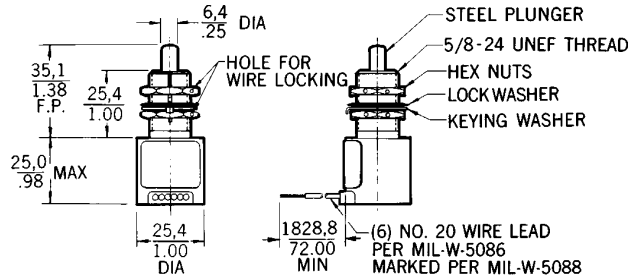
Refer to EN order guides on previous pages (catalog listing column and right hand column) for switch/mounting hardware cross-reference.

Repl. Mtg. Hdw. Pkt.	Catalog Listing	Repl. Mtg. Hdw. Pkt.	Catalog Listing
1	19PA8	7	19PA120-EN
2	19PA9	8	19PA121-EN
3	19PA78-EN	9	19PA122-EN
4	19PA115-EN	10	19PA123-EN
5	19PA117-EN	11	19PA124-EN
6	19PA119-EN		

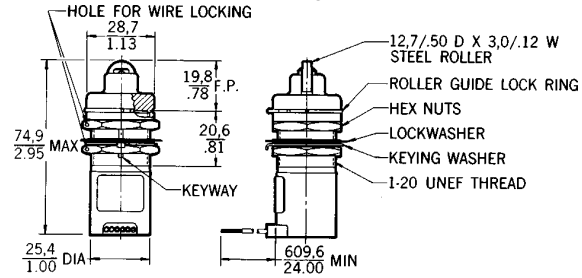
<sup>1</sup> Other packets are available. Contact your local MICRO SWITCH sales office for more information.



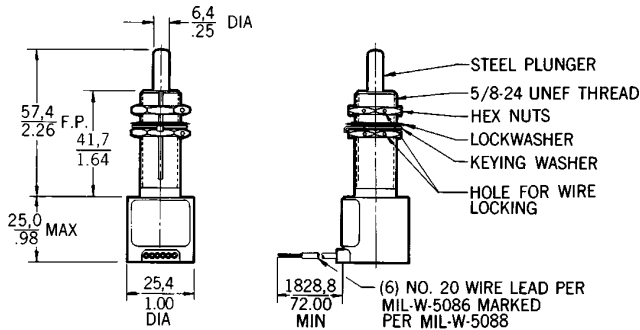
1EN51-6  
1EN231-6



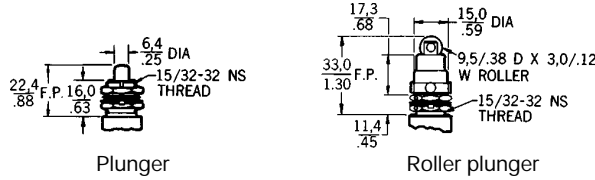
21EN75-2



1EN61-6



600EN actuators



Key:  $\frac{0,0}{0.00} = \text{mm}$   
 $\frac{0.00}{0.00} = \text{inches}$

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[6SE1](#) [6SX1-H58](#) [70500840](#) [MBD5B1](#) [MBH2731](#) [73-316-0012](#) [79211759](#) [79211923](#) [79218589](#) [7AS12](#) [ML-1155](#) [ML-1376](#) [831010C3.0](#)  
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