

## Hermetically Sealed Limit Switches HE Series

003126

Issue 1

Datasheet



### DESCRIPTION

True hermetic sealing with metal-to-metal and glass-to-metal design and manufacturing processes assures the Honeywell MICRO SWITCH™ HE Series mechanical limit switches are durable in severe environments. The hermetically sealed HE Series limit switches are an effective solution for harsh applications where the atmospheric pressures and temperatures exhibit significant variations such as in commercial and military aircraft. With a 300 series stainless steel bushing and housing, the HE limit switch is able to resist most severe environments with the environmental and hermetic sealing. Select HE Series catalog listings are qualified to MIL-PRF-8805 standards.

HE Series limit switches are designed with either a 5/8 inch or 15/32 inch diameter threaded bushing for panel mounted applications.

### VALUE TO CUSTOMERS

- Honeywell HE Series hermetically sealed switches offer solutions for end-of-travel and precise position indication of critical applications on commercial/military aircraft and military systems

### FEATURES

- Select HE catalog listings qualified or compliant to MIL-PRF-8805
- Hermetic sealing per MIL-PRF-8805 symbol 5 and environmentally sealed
- Variety of integral actuators: pin plunger, roller plunger, adjustable roller plunger, ball bearing plunger, and rotary roller lever
- Electrical connection/termination: end or side exit wire leads, screw terminals, end or side exit connectors
- Circuitries from single-pole double-throw (SPDT) up to six-pole double-throw (6PDT)
- Silver contacts standard; gold contacts optional for low energy electrical loads
- Wide temperature range: -55 °C to 125 °C [-67 °F to 257 °F]

### POTENTIAL APPLICATIONS

- Cargo loading latch detection (pallet locked)
- Doors (open/closed position, locked status)
- Evacuation slide door-lock mechanism
- Flight controls (flap/slat, spoilers)
- Landing gear (uplock, downlock, and weight on wheels (WOW))
- Thrust reverser actuation system (TRAS) (stowed or deployed status)

### DIFFERENTIATION

- Available with up to 6PDT switch option
- Rotary actuated roller lever option

### PORTFOLIO

In addition to the HE hermetically sealed switches, Honeywell offers a complete range of sealed switches for aircraft and military systems. The sealed switches include the [EN Series](#), [HM Series](#), [HR Series](#), [HS Series](#), [SE Series](#), and [XE Series](#).

# Hermetically Sealed Limit Switches, HE Series

**Table 1. Specifications**

Characteristic	Parameter
Description	Hermetically sealed limit switch
Standards	Designed to MIL-PRF-8805 requirements
Housing & bushing material	300 Series stainless steel
Contacts	Silver alloy, gold plated, gold bifurcated
Circuitry	1PDT to 6PDT
Electrical rating	Up to 7 A @ 28 Vdc; reference page 2, table 2
Mechanical endurance	25,000 cycles min.
Electrical endurance	25,000 cycles min. @ rated load
Dielectric strength (initial)	1000 V RMS; 500 $\mu$ A max. leakage
Insulation resistance (initial)	500 Vdc; 1000 Megohms min.
Environmental sealing	Symbol 5, hermetic seal per MIL-PRF-8805
Temperature range	-55 °C to 125 °C [-67 °F to 257 °F]
Shock	Catalog listing specific, up to symbol M, 100 g per MIL-PRF-8805
Vibration	Catalog listing specific, up to symbol 2, 10 to 2000 Hz, 15 g per MIL-PRF-8805

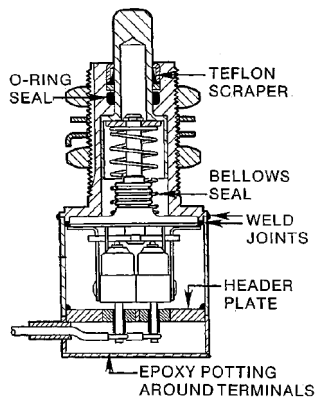
**Table 2. Electrical Specifications**

Rating Code	Contact Material	Sea Level @ 28 Vdc			Altitude @ 28 Vdc		
		Resistive	Inductive	Motor	Resistive	Inductive	Motor
A	Silver	5	3	4	5	3	4
B	Silver	7	4	4	–	–	–
	Gold	1	0.5	–	–	–	–
C	Gold	0.5	0.25	–	0.5	0.25	–
D	Gold	1	0.5	–	1	0.5	–
E	Silver	7	4	4	7	4	4
F	Silver	7	4	4	7	2.5	–

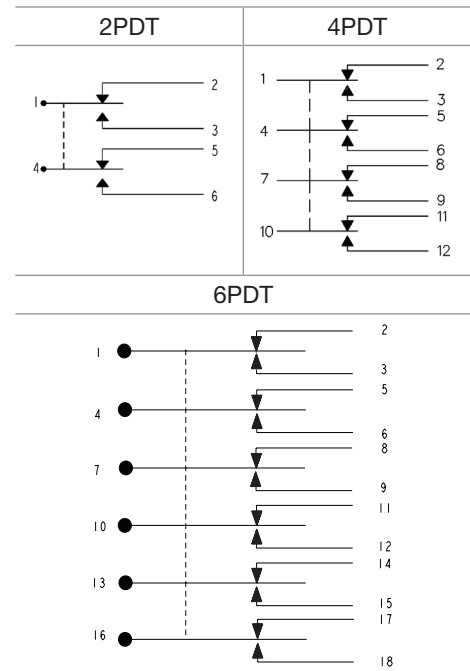
## HE SERIES SWITCHES

The HE Series hermetically sealed switches are designed with a threaded bushing for panel mount applications. The standard HE Series has a threaded bushing, 0.625 in [5/8 in] diameter. The miniature HE Series and rotary actuated HE Series have a threaded bushing that measures 0.469 in [15/32 in] diameter.

HE Series switches generally feature electrical termination as side-exit or end-exit wire leads, or terminal screws integral to the switch. Military-style connectors, integral to the HE switch, are also available.



## CIRCUITRY



# Hermetically Sealed Limit Switches, HE Series

## ELECTROMECHANICAL SWITCHES

Definitions below explain the meaning of operating characteristics. Characteristics shown in tables were chosen as most significant. They are taken at normal room temperature and humidity. These may vary as temperature and humidity conditions differ. Sketches show how characteristics are measured for in-line plunger actuation.

Linear dimensions for in-line actuation are from top of plunger to a reference line, usually the center of the mounting holes.

**Differential Travel (D.T.)** – Plunger or actuator travel from point where contacts “snap-over” to point where they “snap-back.”

**Free Position (F.P.)** – Position of switch plunger or actuator when no external force is applied (other than gravity).

**Full Overtravel Force** – Force required to attain full overtravel of actuator.

**Operating Position (O.P.)** – Position of switch plunger or actuator at which point contacts snap from normal to operated position. Note that in the case of flexible or adjustable actuators, the operating position is measured from the end of the lever or its maximum length. Location of operating position measurement shown on mounting dimension drawings.

**Operating Force (O.F.)** – Amount of force applied to switch plunger or actuator to cause contact “snap-over.” Note in the case of adjustable actuators, the force is measured from the maximum length position of the lever.

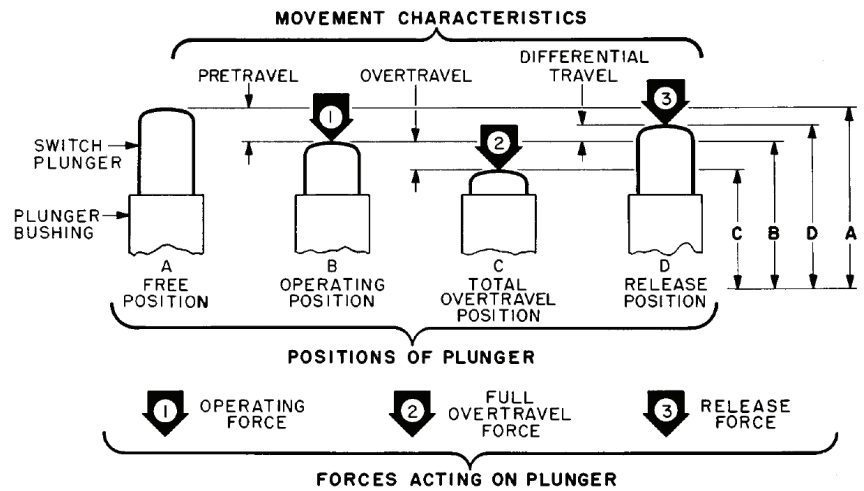
**Overtravel (O.T.)** – Plunger or actuator travel available beyond operating position.

**Pretravel (P.T.)** – Distance or angle traveled in moving plunger or actuator from free position to operating position.

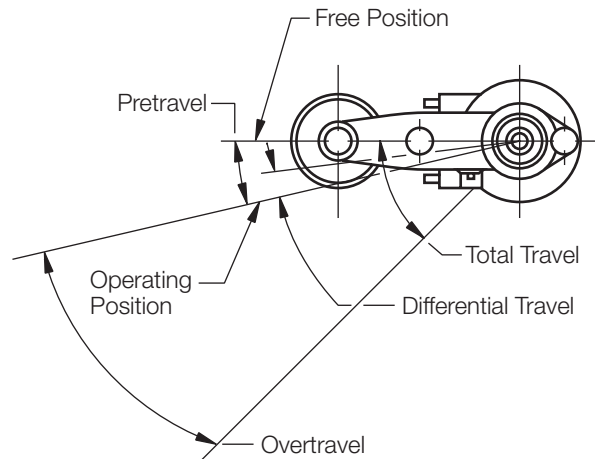
**Release Force (R.F.)** – Amount of force still applied to switch plunger or actuator at moment contacts snap from operated position to unoperated position.

**Total Travel (T.T.)** – Distance from actuator free position to overtravel limit position.

## IN-LINE PLUNGER ACTUATION



## ROTARY ACTUATION



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Table 3. Order Guide

Actuator	Circuitry	Catalog Listing	Military Number or Note	Electrical Termination	Electrical Rating Code*	Switch Characteristics						Dimensional		
						Operating Force N [lb]	Release Force min. N [lb]	Free Position nom. mm [in]	Pretravel max. mm [in]	Overtravel min. mm [in]	Differential Travel max. mm [in]	Bushing Thread	Housing Height max. mm [in]	Housing Diameter nom. mm [in]
Pin Plunger	2PDT	<b>1HE1-6</b>	M8805/80-01	Leadwire #20 AWG (side exit) MIL-W-22759/7	A [5 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	34,92 [1.375]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	24,9 [0.98]	25,4 [1.0]
Pin Plunger	2PDT	<b>1HE1-S</b>	-	Screws (6), #4-48	A [5 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	34,92 [1.375]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	37,5 [1.48]	25,4 [1.0]
Ball-bearing Plunger	2PDT	<b>2001HE242-6B</b>	-	Leadwire #20 AWG (end exit) MIL-W-22759/16-20-9	B [7 A] & [1 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	81,53 [3.210]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	29,6 [1.16]	25,4 [1.0]
Roller Plunger	2PDT	<b>21HE9-6</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	A [5 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	45,24 [1.781]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	24,9 [0.98]	25,4 [1.0]
Pin Plunger	4PDT	<b>404HE2-6</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	D [1 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	34,92 [1.375]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	30,5 [1.20]	25,4 [1.0]
Roller Plunger	4PDT	<b>424HE55-6</b>	FAA-PMA	Leadwire #20 AWG (side exit) MIL-W-22759/7	E [7 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	45,24 [1.781]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	30,5 [1.20]	25,4 [1.0]
Roller Plunger	6PDT	<b>426HE16-8</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	F [7 A]	26,7 to 53,4 [6 to 12]	17,8 [4]	45,24 [1.781]	1,02 [0.040]	6,35 [0.250]	0,76 [0.030]	0.625-24 UNEF	32,8 [1.29]	38,1 [1.50]
Pin Plunger	2PDT	<b>602HE1-6</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	E [7 A]	22,2 to 53,4 [5 to 12]	13,3 [3]	22,22 [0.875]	1,02 [0.040]	3,17 [0.125]	0,51 [0.020]	0.469-32 UNS	27,9 [1.10]	17,5 [0.69]
Pin Plunger	4PDT	<b>604HE1-6</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	E [7 A]	22,2 to 53,4 [5 to 12]	13,3 [3]	22,22 [0.875]	1,02 [0.040]	3,17 [0.125]	0,51 [0.020]	0.469-32 UNS	30,5 [1.20]	25,4 [1.0]
Roller Plunger	2PDT	<b>622HE1-6</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	E [7 A]	22,2 to 53,4 [5 to 12]	13,3 [3]	22,22 [0.875]	1,02 [0.040]	3,17 [0.125]	0,51 [0.020]	0.469-32 UNS	27,9 [1.10]	17,5 [0.69]
Roller Plunger	4PDT	<b>624HE1-6</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	E [7 A]	22,2 to 53,4 [5 to 12]	13,3 [3]	22,22 [0.875]	1,02 [0.040]	3,17 [0.125]	0,51 [0.020]	0.469-32 UNS	30,5 [1.20]	25,4 [1.0]

Actuator	Circuitry	Catalog Listing	Military Number or Note	Electrical Termination	Electrical Rating Code*	Switch Characteristics					Dimensional		
						Operating Torque Nm [in-lb]	Release Torque min. Nm [in-lb]	Pretravel nom. Degrees	Total Travel nom. degrees	Differential Travel max. degrees	Bushing Thread	Housing Height max. mm [in]	Housing Diameter nom. mm [in]
Rotary	2PDT	<b>31HE101-6 [CW act.]</b>	FAA-PMA	Leadwire #20 AWG (side exit) MIL-W-22759/7	C [0.5]	1,36 to 2,82 [12 to 25]	1,02 [9]	13°	45°	4°	0.469-32 UNS	60,4 [2.38]	25,4 [1.0]
Rotary	2PDT	<b>31HE102-6 [CCW act.]</b>	-	Leadwire #20 AWG (side exit) MIL-W-22759/7	C [0.5]	1,36 to 2,82 [12 to 25]	1,02 [9]	13°	45°	4°	0.469-32 UNS	60,4 [2.38]	25,4 [1.0]

\* Reference Table 2, page 2, for additional detail.

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## PRODUCT DIMENSIONS

Figure 1. 1HE1-6 (pin plunger, standard size) mm [in]

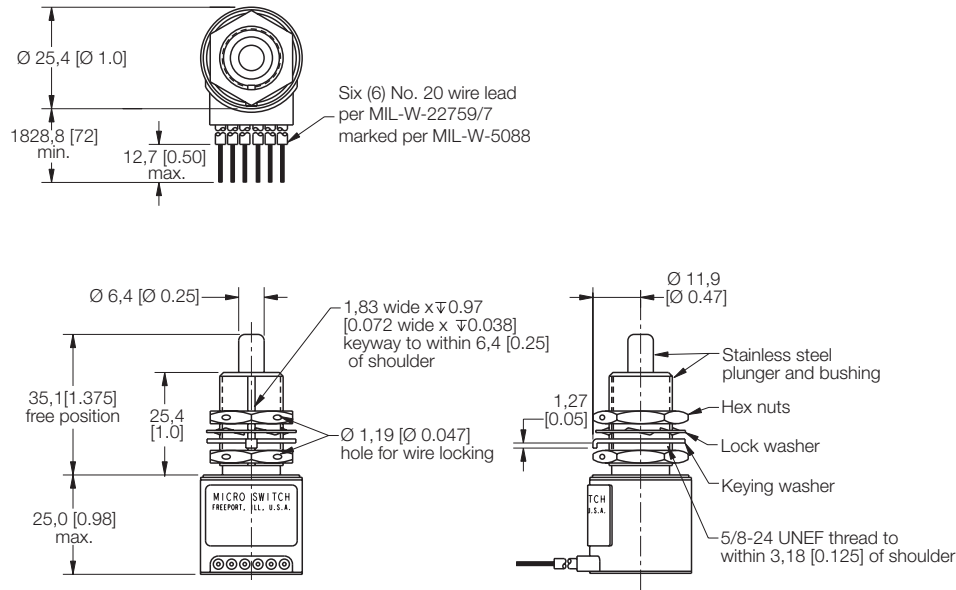
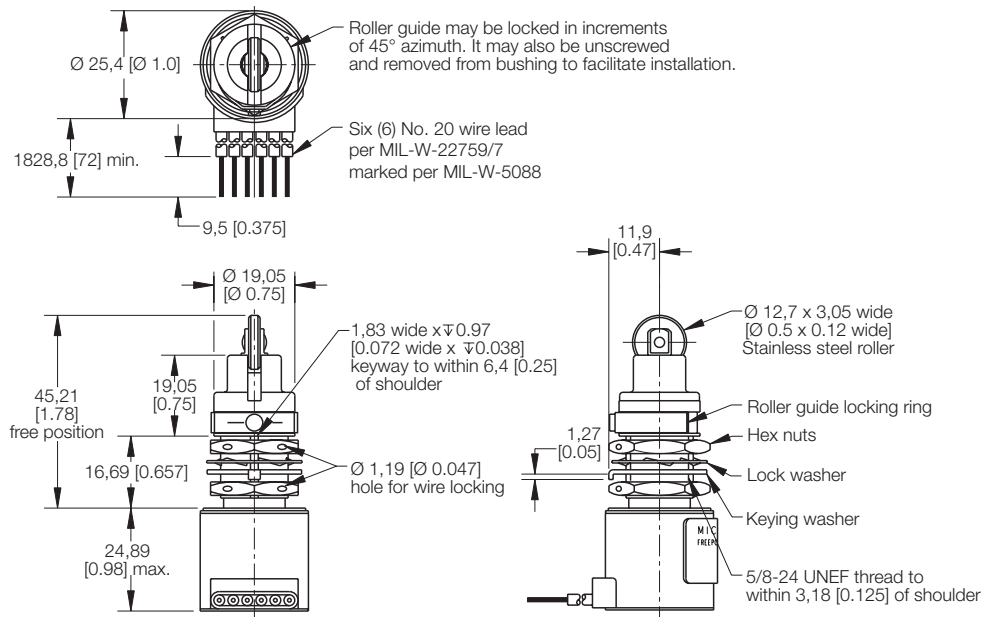


Figure 2. 21HE9-6 (roller plunger, standard size) mm [in]



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Figure 3. 602HE1-6 (pin plunger, miniature size) mm [in]

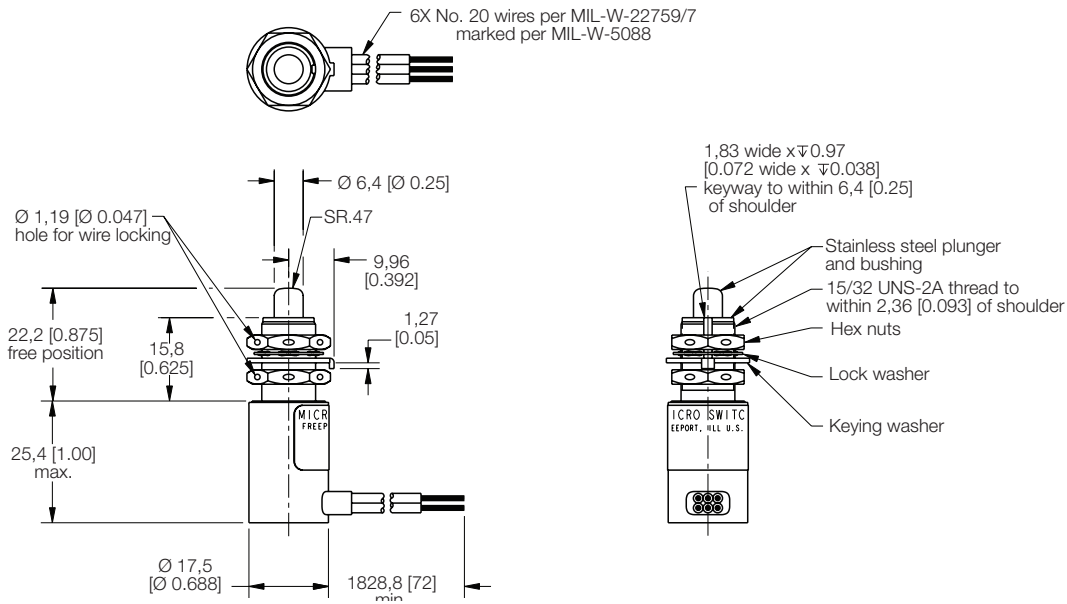
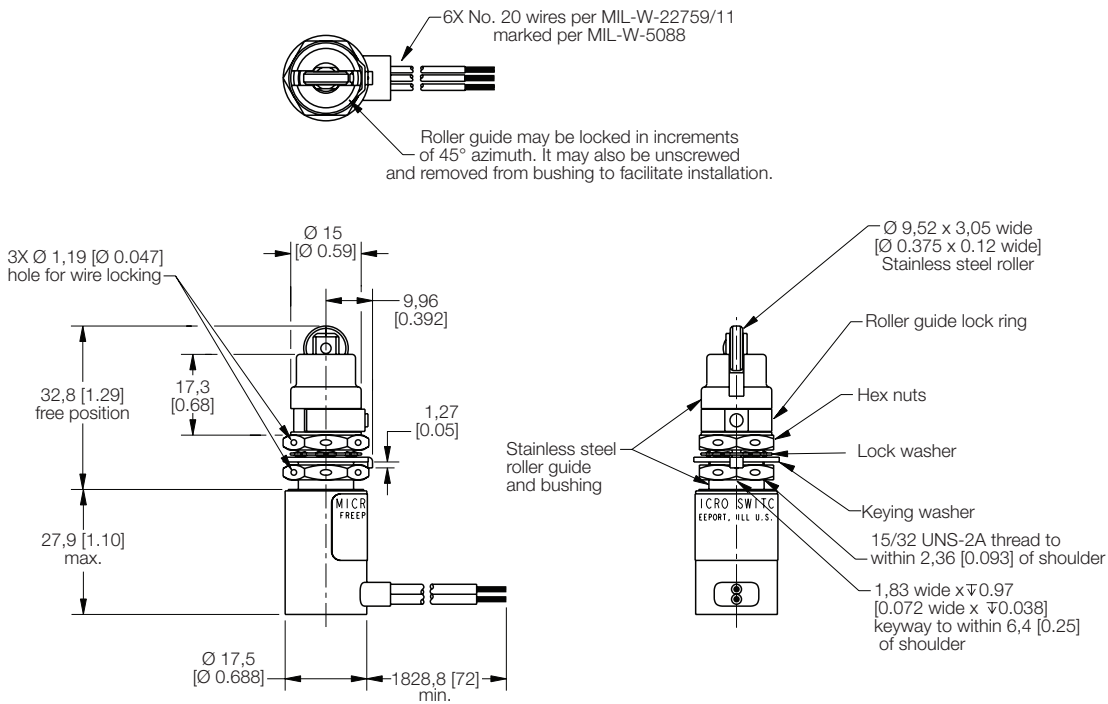
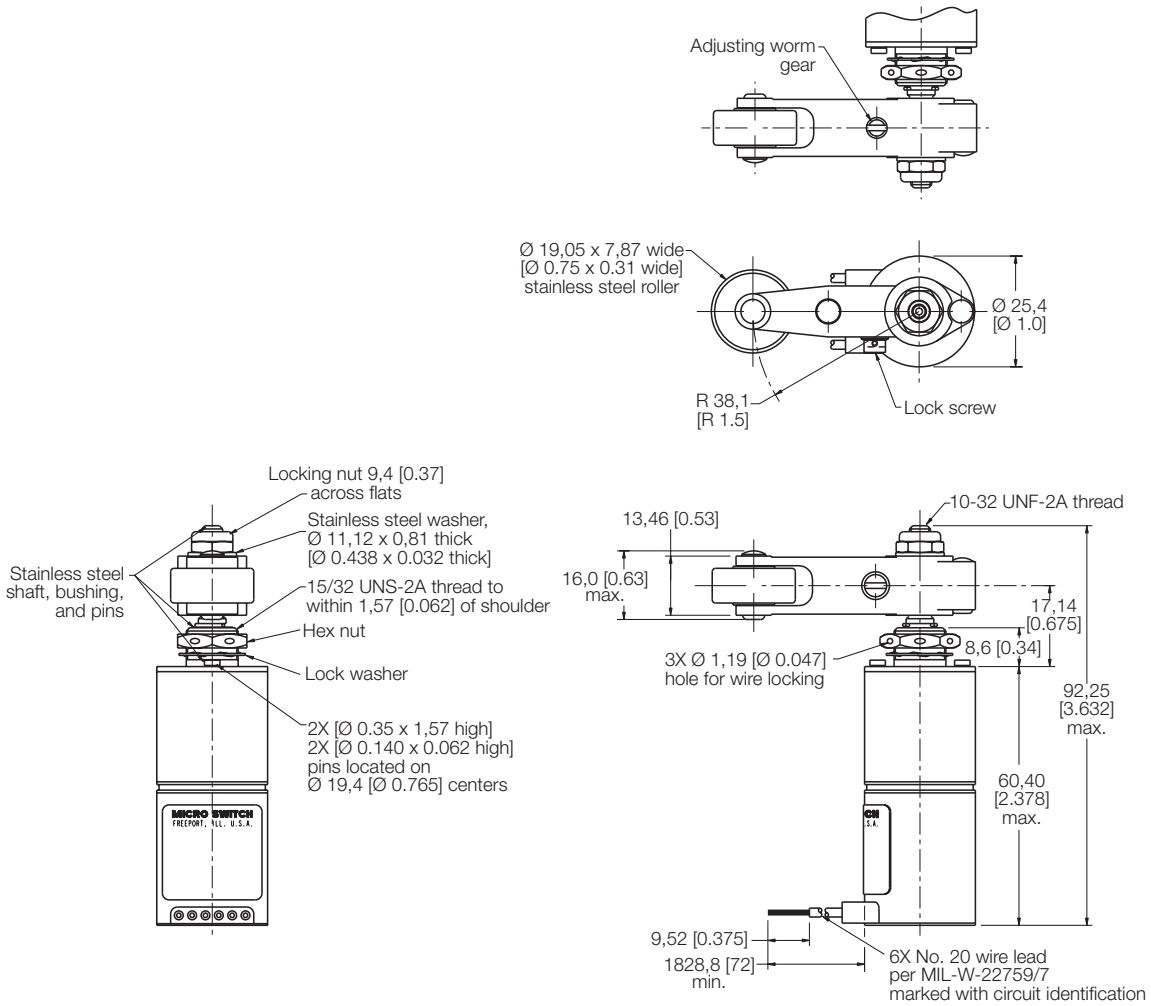


Figure 4. 622HE1-6 (roller plunger, miniature size) mm [in]



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Figure 5. 31HE101-6 (rotary roller lever, standard size) mm [in]



## ADDITIONAL MATERIALS

The following associated literature is available on the Honeywell web site at [sensing.honeywell.com](http://sensing.honeywell.com):

- Product installation instructions
- Aerospace range guide

### **WARNING** **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

### **WARNING** **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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