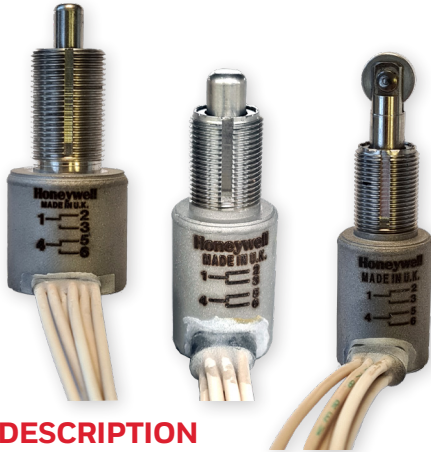


EN NH SERIES

003131

Issue 3

MICRO SWITCH Environmentally Sealed Limit Switches



DESCRIPTION

The Honeywell MICRO SWITCH Series of EN limit switches are bushing mount designed, manufactured, and qualified to aerospace standards. These products provide a durable switch for commercial aircraft as well as commercial and heavy-duty ground-based equipment. Other applications include off-road equipment where severe environments are encountered.

The EN NH Series of switches have proven to deliver consistent and reliable operation in harsh environments on critical applications for more than 65 years.

VALUE TO CUSTOMERS

- Precise and reliable position indication of critical applications on aircraft

DIFFERENTIATION

- MICRO SWITCH EN Series' products are highly configurable; offering a variety of integral actuators, electrical circuitries, and electrical terminations

FEATURES

- Circuitry options from 1PST (one-pole single throw) circuit to 4PDT (four-pole double throw) circuits for position indication of different independent circuits or providing redundant circuit capabilities
- Rugged stainless steel housing and bushing
- All-metal drive train for consistent operating characteristics at high or low temperatures
- Suitable for non-military applications
- Resilient environmental sealing to keep dust, water & ice from entering switch enclosure
- Silver-alloy switch contacts for reliably controlling electrical loads from up to 4 A (power duty)
- Wide temperature range from -54°C to 85°C [-65°F to 185°F] for sea level or high altitude commercial applications
- Assortment of switch actuators and electrical terminations
- Miniature package size [400EN Series and 600EN Series] reduces housing diameter by 30 % for smaller space required on equipment

APPLICATIONS

- Landing gear systems for commercial aircraft including helicopters
 - WOW switch (Weight-on-Wheels) for landing gear
 - Up-lock and down-lock sensing
 - Landing gear bay doors closed/locked
- External doors and hatches for commercial aircraft including helicopters
 - Closed and locked indication for passenger entry/exit doors, cargo bay doors, and/or other doors or hatches (refueling door, APU air inlet door)
- Heavy-duty vehicles
 - Doors or hatches closed/locked or open
- Off-road construction equipment
 - Doors or panels present/closed/open
 - Up-stop or down-stop limits

PORTFOLIO

Honeywell offers many Series of MICRO SWITCH sealed switches including the HM Series, SE Series, XE Series, HS Series, HE Series, and HR Series.

Honeywell

MICRO SWITCH ENVIRONMENTALLY SEALED LIMIT SWITCHES

EN NH SERIES

TABLE 1. SPECIFICATIONS	
Characteristic	Parameter
Description	Environmentally sealed aerospace-grade limit switch series
Housing & bushing material	300 Series stainless steel
Contact material	Silver alloy
Mechanical endurance	25,000 cycles min.
Electrical endurance	25,000 cycles min. @ rated load
Circuitry	1PST (one-pole single throw) to 4PDT (four-pole double throw); reference Figure 2
Electrical rating	Up to 4 A @ 28 Vdc; reference Table 2
Dielectric strength (initial)	1000 V RMS; 5 mA max. leakage
Insulation resistance (initial)	500 Vdc; 1000 Megohms min.
Environmental sealing	Resilient environmental sealing, protecting against dust, water, and ice
Temperature range (std.)	-54°C to 85°C [-65°F to 185°F]
Shock	100 g
Vibration	10 g peak (10 Hz to 500 Hz)

TABLE 2. ELECTRICAL RATINGS								
Rating Code	Sea Level @ 28 Vdc				Altitude 50,000 ft			
	Inrush	Motor	Res.	Ind.	Inrush	Motor ¹	Res.	Ind.
A	24	4	4	2	24	4	4 ¹	2
F	N/A	4	7	4	N/A	4	7	2.5

¹ Application information only

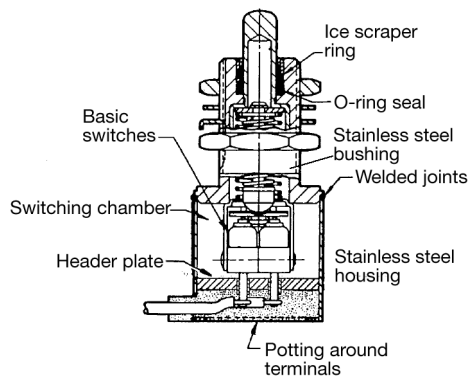
STANDARD SWITCHES

While the standard EN NH Series provides a wide variety of products, Honeywell offers a miniature EN NH Series and a special EN NH Series per the following descriptions.

MINIATURE SWITCHES

Miniature type EN NH switches meet the demand for smaller size and lighter weight without sacrificing performance or electrical capacity. These types are of the same construction, seal, and materials as the standard size EN NH switches.

Figure 1. Typical EN Switch Construction



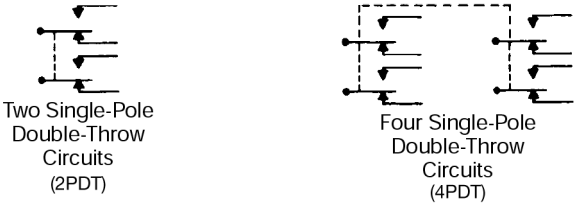
TERMINATION

Termination is specified in the order guides. Leadwires are generally six feet long, and of the gage and specifications noted in the order guides.

MOUNTING

Plunger actuator switches mount through 5/8 in [Ø 0.625 in] or 15/32 in [Ø 0.469 in] holes. Lock washer, keyed washer, and wire lock hexagon mounting nuts lock the switches in their mounting holes.

Figure 2. Circuitry Diagrams



MICRO SWITCH ENVIRONMENTALLY SEALED LIMIT SWITCHES

EN NH SERIES

TABLE 3. EN SERIES ORDER GUIDE

Actuator	Circuitry	Termination	Electrical Rating Code**	Catalog Listing	Series	O.F. N [lb]	R.F. min. N [lb]	F.P. nom. mm [in]	P.T. max. mm [in]	O.T. min. mm [in]	D.T. max. mm [in]	Bushing Thread Size	Housing Height mm [in]	Housing Diameter or Length mm [in]	Replacement Mounting Hardware Packet
PIN PLUNGER	2PDT	Leadwire #20 AWG (side exit) MIL-DTL-22759/7	A [4 A]	1EN1-6-NH (1EN1-6 in Europe)	Standard	26,7 to 53,4 [6 to 12]	17,8 [4]	35,0 [1.38]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	24,9 [0.980]	Ø 25,4 [1.0]	19PA8
	2PDT	Leadwire #20 AWG (side exit) MIL-W-22759/7	F [7 A]	602EN1-6-NH (602EN1-6 in Europe)	Miniature	26,7 to 53,4 [6 to 12]	17,8 [4]	22,3 [0.88]	1,02 [0.040]	3,18 [0.125]	0,51 [0.020]	0.469-32 UNS	25,4 [1.0]	Ø 17,5 [0.69]	19PA9
	2PDT	Leadwire #20 AWG (side exit) MIL-W-22759/7	F [7 A]	402EN1-6-NH (402EN1-6 in Europe)	Miniature	26,7 to 53,4 [6 to 12]	17,8 [4]	35,0 [1.38]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	24,9 [0.980]	Ø 17,5 [0.69]	-
	4PDT	Leadwire #20 AWG (side exit) MIL-W-22759/7	F [7 A]	604EN1-6-NH (604EN1-6 in Europe)	Miniature	26,7 to 53,4 [6 to 12]	17,8 [4]	22,3 [0.88]	1,02 [0.040]	3,18 [0.125]	0,51 [0.020]	0.469-32 UNS	30,5 [1.2]	Ø 25,4 [1.0]	19PA9
ROLLER PLUNGER*	2PDT	Leadwire #20 AWG (side exit) MIL-DTL-22759/7	A [4 A]	21EN9-6-NH (21EN9-6 in Europe)	Standard	26,7 to 53,4 [6 to 12]	17,8 [4]	45,2 [1.78]	1,02 [0.040]	6,35 [0.250]	0,51 [0.020]	0.625-24 UNEF	24,9 [0.980]	Ø 25,4 [1.0]	19PA115-EN
	2PDT	Leadwire #20 AWG (side exit) MIL-W-22759/7	F [7 A]	622EN1-6-NH (622EN1-6 in Europe)	Miniature	26,7 to 53,4 [6 to 12]	17,8 [4]	32,9 [1.30]	1,02 [0.040]	3,18 [0.125]	0,51 [0.020]	0.469-32 UNS	25,4 [1.0]	Ø 17,5 [0.69]	19PA9

O.F.- Operating Force; R.F.- Release Force; F.P.-Free Position; P.T.-Pretravel; O.T.-Overtravel; D.T.-Differential Travel

* Roller plunger field adjustable in 45° increments.

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

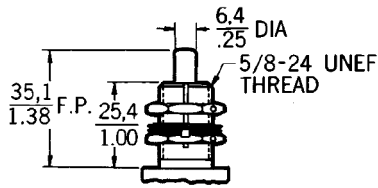
MICRO SWITCH ENVIRONMENTALLY SEALED LIMIT SWITCHES

EN NH SERIES

OPERATION

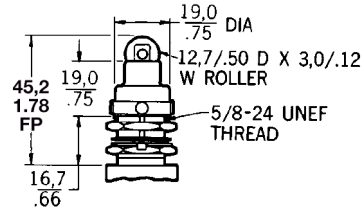
Plunger Actuators

For in-line actuation. An ice scraper ring cleans the actuator with each operation.



Roller Plunger Actuators

For cam and slide actuation not to exceed 20° rise. Roller adjusts laterally in 45° increments. An ice scraper ring cleans the actuator with each operation.



DIMENSIONAL DRAWINGS

Figure 3. Standard-size EN Switches

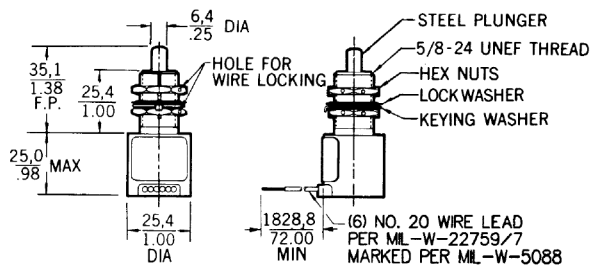
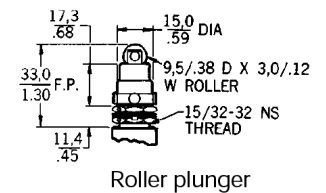
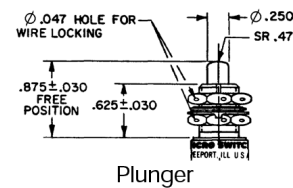


Figure 4. Miniature-size EN Switches

600EN actuators



MICRO SWITCH ENVIRONMENTALLY SEALED LIMIT SWITCHES

EN NH SERIES

TABLE 4. REPLACEMENT PARTS			
	Catalog Listing	Description	Used On
	6PA32	Roller lever arm	1EN and 1HE Series
	6PA202-EN	Roller lever arm	600EN and 600HE Series
	15PA104	Roller guide and locking ring	21EN, 422/424EN Series (5/8 in bushing)
	15PA105	Roller guide and locking ring	622/624EN Series (15/32 in bushing)
	15PA137	Locking ring only	21EN 422/424EN Series (5/8 in bushing)
	15PA107	Locking ring only	622EN and 624EN Series (15/32 in bushing)
	19PA8	Military-type mounting hardware	1EN Series (5/8 in bushing)
	19PA9	Military-type mounting hardware	600EN Series (15/32 in bushing)

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

While Honeywell may provide information or engineering support for its products through Honeywell personnel, literature and website, it is the buyer's sole responsibility to determine the suitability of the Honeywell product(s) for the buyer's requirements.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

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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.

NOTICE MILITARY SPECIFICATION

- Please note: NH Series switches are not currently qualified as military specification
- EN NH Series Switches are suitable for commercial applications, or for any others where specific military specifications are not required