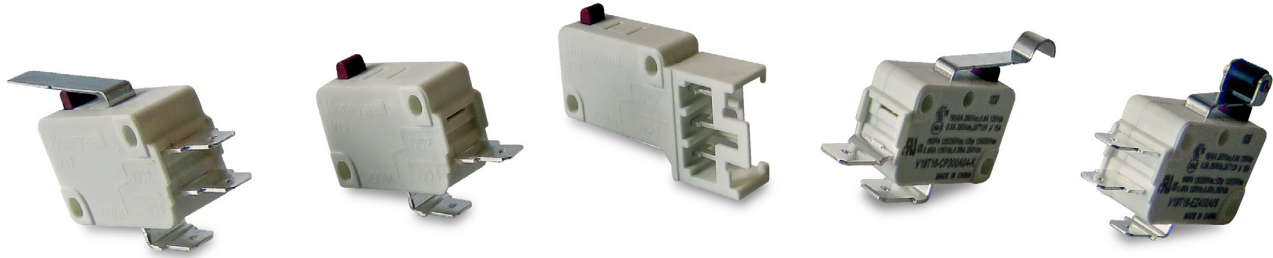


V19 SERIES

32349182

Issue E

MICRO SWITCH Technology



APPLICATIONS



Presence Detection

Ensures door latching and safe operation



Float Switch

On/off power to stop overflow conditions



Flow Switch

Enables safe and efficient water usage



Power Switch

Reliable system control for motors, pumps, fans



Operator Controls

Interface control for system auxiliary functions

VALUE PROPOSITION

The V19, Honeywell's unsealed MICRO SWITCH family provides a cost-conscious switch solution to assist in hitting overall system-level cost and design goals in high volume applications. The V19 switch provides a fully certified, reliable, and repeatable solution over the lifetime of the product. RAST 2.5, 5, and 7 termination styles available for automated manufacturing requirements (white goods).

V19 FEATURES	V19 BENEFITS	OUR VALUE
5 A & 16 A	Electrical ratings for design flexibility in one industry standard package size	Competitive cross references available
> 1M mechanical operations	Globally certified for reliable, repeatable actuation for life	Snap-spring mechanism with more than 80 years of MICRO SWITCH service
UL/CSA, cUL, CE, UKCA, ENEC, CQC	Identical system designs for platform applications worldwide	Certifications enable global design acceptance and cost savings in agency approvals
Cadmium-free contacts	RoHS 3, REACH and CalProp 65 compliant	
RAST 2.5 termination and housing	Enables IDT termination for automated machinery builds on signal-level and control circuits	Combined terminal and housing construction enables agency certification (UL94V-0 & IEC 60335-1) and material cost savings

Honeywell

MICRO SWITCH V19 SERIES

Unless otherwise stated, all characteristic measurements tested according to UL, EN, and IEC standards and conditions. Parameters and acceptance criteria validated and confirmed in a certified lab environment. Technical details available upon request.

TABLE 1. PERFORMANCE SPECIFICATIONS

CHARACTERISTIC	MEASURE
Circuitry	SPDT, SPNO, SPNC
Operating force	0,15 N to 3,92 N [15 g to 400 g]
Termination	quick connect; 6,35 mm x 0,80 mm [0.250 in x 0.032 in] quick connect 4,80 mm x 0,50 mm [0.187 in x 0.020 in] RAST-5 250#; RAST-7 250#; RAST-2.5 straight PCB
Actuators	pin plunger, integral lever options
Agency certification	ENEC, CQC, UL, cUL, CE, UKCA
Operating temperature (manufacturer specified)	code S: -25°C to 85°C [-13°F to 185°F] code T: -25°C to 125°C [-13°F to 257°F]
Humidity	validated to 240 hours at 40°C [40°F], 95 %RH
Mechanical life (cycles)	1 million cycles @ 60 cycles/minute max.
Ingress protection rating	IP40 per IEC 60529
Vibration resistance	10 Hz to 55 Hz, displacement 1,5 mm (peak-to-peak); no contact separation > 1 millisecond
Shock resistance	destruction: 500 m/s ² (50 g max.); switch is functional after test malfunction: 100 m/s ² (10 g max.); no contact separation > 1 millisecond
Switch resistance	50 mΩ max. for operating force >50; 100 mΩ max. for operating force ≤50
Dielectric strength	1000 Vac (RMS) for 1 minute; leakage current ≤0.5 mA between open contacts 1500 Vac (RMS) for 1 minute, leakage current ≤0.5 mA between live parts and ground
Insulation resistance	min. 100 mΩ (500 Vdc for one minute)
Contact material	cadmium-free silver alloy
Housing material	PBT thermoplastic polyester
Actuating button material	phenolic
Auxiliary actuator material	stainless steel
Common terminal material	brass
NO/NC terminal material	brass
Moving blade	silver-plated brass
Operating speed	0,3 mm/s to 1000 mm/s (pin plunger)
Operating frequency	60 CPM mechanical, 25 CPM electrical
Average unit weight	7.17g
Packaging dimensions/weight	505 mm x 310 mm x 225 mm/1900 g

MICRO SWITCH V19 SERIES

TABLE 2. ELECTRICAL SPECIFICATIONS

RATING/NOMENCLATURE CODE	UL/CUL (CUL 61058-1, FILE 12252) AMERICAS	ENEC (IEC 61058-1) EUROPE CQC (GB15092-1) ASIA-PACIFIC
05	5 GPA 125/250 Vac; 6 GPA 125/250 Vac 1/10 HP 125/250 Vac 0.4 RA 125 Vdc; 0.3 RA 250 Vdc 10,000 cycles	5 (2.5) A 125/250 Vac, 6 (2.5) A 125/250 Vac 0.4 A 125 Vdc, 0.3 A 250 Vdc 10,000 cycles
16	16 GPA 125/250 Vac 1/2 HP 125/250 Vac 0.6 RA 125 Vdc; 0.3 RA 250 Vdc 10,000 cycles	16 (4) A 250 Vac 0.6 A 125 Vdc; 0.3 A 250 Vdc 10,000 cycles

- RA = Resistive Amps (Resistive Load)
- GPA = General Purpose Amps (Inductive Load, 75 % to 80 % power factor)
- VL = Lamp Load
- XX (Y) = XX max. resistive value (Amps) and (Y) max. inductive value (Amps)

Figure 1. Product Nomenclature

V19	S	05	—	C	2	Z	200	A	06	—	K
Switch Type	Temperature Grade	Electrical Rating		Terminal Type	Housing Type	Circuit Code	Operating Force (at pin plunger max)	Lever Position	Lever Type		Mounting Holes
V19 Series MICRO Switch	S -25°C to 85°C [-13°F to 185°F] T -25°C to 125°C [-13°F to 257°F]	05 5 GPA 125/250 Vac; 6 GPA 125/250 Vac 1/10 HP 125/250 Vac 0.4 RA 125 Vdc; 0.3 RA 250 Vdc 10,000 cycles 16 16 GPA 125/250 Vac 1/2 HP 125/250 Vac 0.6 RA 125 Vdc; 0.3 RA 250 Vdc 10,000 cycles		C Quick connect 6.30 mm x 0.80 mm [0.250 in x 0.032 in] E Quick connect 4.70 mm x 0.50 mm [0.187 in x 0.020 in] H RAST 5 6.30 mm x 0.80 mm [0.250 in x 0.032 in] N RAST 7 6.30 mm x 0.80 mm [0.250 in x 0.032 in] P Straight PCB terminal V RAST 2.5 terminal	Basic 2 Fully flat 3 RAST 2.5	Z SPDT P SPST-NO C SPST-NC	015 15 gf; 0.15 N 025 25 gf; 0.25 N 050 50 gf; 0.5 N 100 100 gf; 0.98 N 200 200 gf; 1.96 N 300 300 gf; 2.94 N 400 400 gf; 3.92 N	Pin plunger, no lever A Far from pin plunger B Near pin plunger	Plunger without lever 01 Short straight lever 02 Standard straight lever 03 Long straight lever 04 Simulated roller lever 05 Roller lever 06 Long roller lever		Metric Ø 3.1 mm K USA Ø 2.9 mm

- * Temperature rating "S" is allowed only with electrical rating "05"
 * Temperature rating "T" is allowed only with electrical rating "16"
 * Terminal style "V" and housing type "3" are offered together, only allowed with electrical rating "05"
 * Operating forces 015, 025 and 050 are only allowed with electrical rating "05"
 * Operating forces 300 and 400 are only allowed with electrical rating "16"

MICRO SWITCH V19 SERIES

FIGURE 2. LOAD LIFE CURVES

The data used to develop the following load-life curves was obtained through actual laboratory testing under controlled ambient conditions. It does not attempt to include or address specific application variables, and is meant as a representative guide to potential performance expectations of Honeywell V19 Series switches.

The following graphs, showcasing general reliability expectations, was developed from lab tested electrical lifetime data. Subsequent reliability calculations were based on:

- Life curve regression analysis was used for mean life cycles to achieve a smooth life curve
- To determine the mean life cycles for all currents, the Weibull distribution method was used
- From the regression analysis, the best fit life curves were determined based on data rankings

Tests representing the V19S05 design (5 A variant) were conducted at three (3) intermittent current levels: 2 A, 3.5 A and 5 A. Similarly, tests representing the V19T16 design (16 A variant) were executed at four (4) intermittent current levels: 3 A, 7 A, 12 A and 16 A. All switches used to obtain data for these calculations were tested until failure occurred. For the purposes of this evaluation, failure was defined as ten (10) cumulative faults to change electrical state.

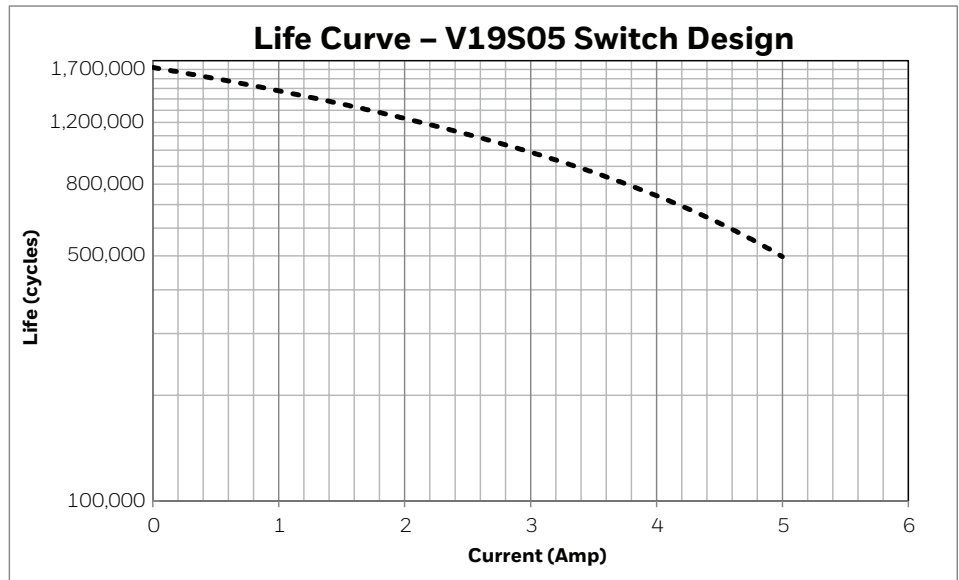
MTTF = Mean Time To failure

B10 = The number of cycles at which 10 % of the V19 switches will reach failure

GRAPH 1. LIFE CURVE FOR V19S05 SWITCH DESIGN

MTTF (cycles)	Amperage	B10 (cycles)
1,236,551	2	513,167
855,118	3.5	412,696
501,921	5	286,561

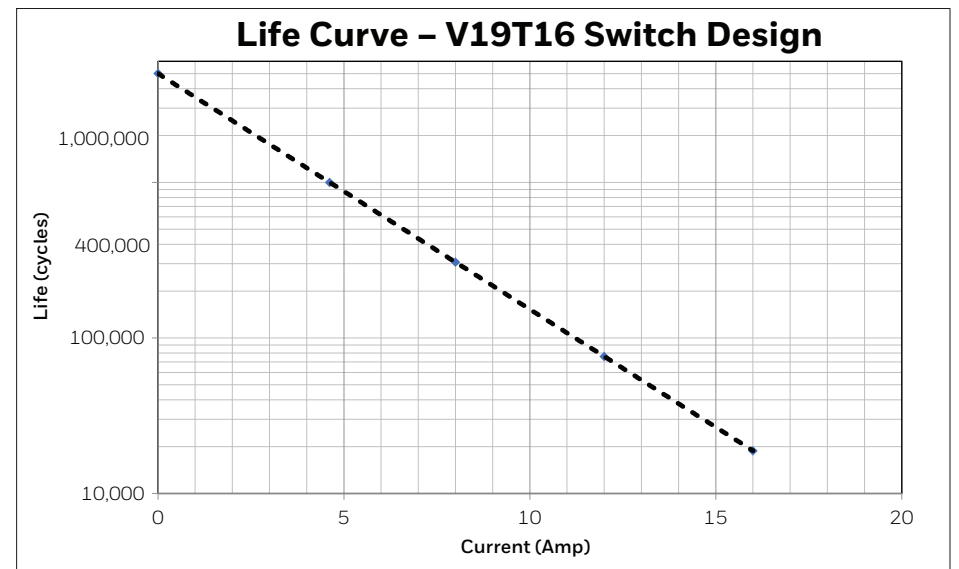
* All cycle values shown with 90 % confidence interval



GRAPH 2. LIFE CURVE FOR V19T16 SWITCH DESIGN

MTTF (cycles)	Amperage	B10 (cycles)
1,929,593	3	1,662,559
408,988	7	271,069
63,020	12	40,816
21,504	16	14,645

* All cycle values shown with 90 % confidence interval



MICRO SWITCH

V19 SERIES

TABLE 3. CONFIGURATIONS AND CHARACTERISTICS

LEVER POSITION	ACTUATION TYPE	ACTUATION PICTURE	APPLICABLE ELECTRICAL RATING	OPERATING FORCE CODE	MAX OPERATING FORCE (g)	MIN RELEASE FORCE (g)	OP (mm)	PT MAX. (mm)	DT MAX. (mm)	OT MIN. (mm)
A	Pin plunger		5 A	015	15	4	14,7 ±0,4	1,2	0,4	1,0
			5 A	025	25	5				
			5 A	050	50	8				
			5 A and 16 A	100	100	15				
			5 A and 16 A	200	200	50				
			16 A	300	300	75				
			16 A	400	400	79				
	Short straight (01)		5 A	015	15	4	15,2 ±0,5	1,6	1,2	0,8
			5 A	025	25	5				
			5 A	050	50	8				
			5 A and 16 A	100	100	15				
			5 A and 16 A	200	200	50				
			16 A	300	300	75				
			16 A	400	400	50				
	Standard straight (02)		5 A	015	10	2	15,2 ±1,2	4,0	2,0	1,6
			5 A	025	15	3				
			5 A	050	30	4				
			5 A and 16 A	100	50	10				
			5 A and 16 A	200	125	14.3				
			16 A	300	150	40				
			16 A	400	250	25.5				
	Long straight (03)		5 A	015	5	2	15,2 ±2,6	9,0	3,8	2,0
			5 A	025	10	2				
			5 A	050	15	3				
			5 A and 16 A	100	25	4				
			5 A and 16 A	200	70	6				
			16 A	300	100	15				
			16 A	400	130	12.2				
	Simulated roller (04)		5 A	015	10	2	18,7 ±1,2	4,0	3,5	1,6
			5 A	025	15	3				
			5 A	050	30	4				
			5 A and 16 A	100	50	10				
			5 A and 16 A	200	125	14.3				
			16 A	300	150	40				
			16 A	400	250	25.5				

Abbreviation	Term	Definition
OP	Operating Position	position that the switch contacts change state
PT	Pretravel	distance the actuator moves to trigger the switch
DT	Differential Travel	distance between the OP and the RP
OT	Overtravel	max distance the actuator can move past the OP
RP	Release Point	point that contacts return to free state from OP

MICRO SWITCH V19 SERIES

TABLE 3. CONFIGURATIONS AND CHARACTERISTICS

LEVER POSITION	ACTUATION TYPE	ACTUATION PICTURE	APPLICABLE ELECTRICAL RATING	OPERATING FORCE CODE	MAX OPERATING FORCE (g)	MIN RELEASE FORCE (g)	OP (mm)	PT MAX. (mm)	DT MAX. (mm)	OT MIN. (mm)
A	Roller lever (05)		5 A	015	30	4	20,7 ±0,6	1,6	0,9	0,8
			5 A	025	35	8				
			5 A	050	70	8				
			5 A and 16 A	100	140	15				
			5 A and 16 A	200	240	50				
			16 A	300	340	50				
			16 A	400	480	50				
	Long roller (06)		5 A	015	10	2	20,7 ±1,2	4,0	2,7	1,6
			5 A	025	15	2				
			5 A	050	30	4				
			5 A and 16 A	100	50	10				
			5 A and 16 A	200	125	14.3				
			16 A	300	150	40				
B	Pin plunger		5 A	015	15	2	14,7 ±0,4	1,2	0,4	1,0
			5 A	025	25	5				
			5 A	050	60	8				
			5 A and 16 A	100	100	15				
			5 A and 16 A	200	200	50				
			16 A	300	300	75				
			16 A	400	400	150				
	Short straight (01)		5 A	015	10	2	15,7 ± 0,5	2,0	1,2	1,1
			5 A	025	15	3				
			5 A	050	35	5				
			5 A and 16 A	100	65	8				
			5 A and 16 A	200	130	16				
			16 A	300	150	45				
			16 A	400	300	75				
	Standard straight (02)		5 A	015	5	2	15,9 ± 1,2	4,0	2,0	2,5
			5 A	025	10	2				
			5 A	050	20	3				
			5 A and 16 A	100	35	4				
			5 A and 16 A	200	70	8				
			16 A	300	75	25				
			16 A	400	130	40				

Abbreviation	Term	Definition
OP	Operating Position	position that the switch contacts change state
PT	Pretravel	distance the actuator moves to trigger the switch
DT	Differential Travel	distance between the OP and the RP
OT	Overtravel	max distance the actuator can move past the OP
RP	Release Point	point that contacts return to free state from OP

MICRO SWITCH V19 SERIES

TABLE 3. CONFIGURATIONS AND CHARACTERISTICS

LEVER POSITION	ACTUATION TYPE	ACTUATION PICTURE	APPLICABLE ELECTRICAL RATING	OPERATING FORCE CODE	MAX OPERATING FORCE (g)	MIN RELEASE FORCE (g)	OP (mm)	PT MAX. (mm)	DT MAX. (mm)	OT MIN. (mm)
B	Long straight (03)		5 A	015	2	2	17,2 ± 2,6	9,0	3,8	4,0
			5 A	025	5	2				
			5 A	050	10	2				
			5 A and 16 A	100	20	2				
			5 A and 16 A	200	35	4				
			16 A	300	40	10				
			16 A	400	80	25				
	Simulated roller (04)		5 A	015	5	2	19,4 ± 1,2	4,0	3,5	2,0
			5 A	025	10	2				
			5 A	050	20	3				
			5 A and 16 A	100	40	3				
			5 A and 16 A	200	75	10				
			16 A	300	80	20				
			16 A	400	150	50				
	Roller lever (05)		5 A	015	10	2	21,0 ± 1,0	2,0	0,9	1,0
			5 A	025	15	3				
			5 A	050	35	3				
			5 A and 16 A	100	80	8				
			5 A and 16 A	200	160	15				
			16 A	300	200	40				
			16 A	400	350	100				
	Long roller lever (06)		5 A	015	5	2	21,4 ± 1,2	4,0	2,7	2,0
			5 A	025	2	10				
			5 A	050	20	5				
			5 A and 16 A	100	40	3				
			5 A and 16 A	200	75	10				
			16 A	300	100	30				
			16 A	400	150	50				

Abbreviation	Term	Definition
OP	Operating Position	position that the switch contacts change state
PT	Pretravel	distance the actuator moves to trigger the switch
DT	Differential Travel	distance between the OP and the RP
OT	Overtravel	max distance the actuator can move past the OP
RP	Release Point	point that contacts return to free state from OP

MICRO SWITCH
V19 SERIES

MOUNTING DIMENSIONS

Figure 3. V19 Series Standard Switch Dimensions

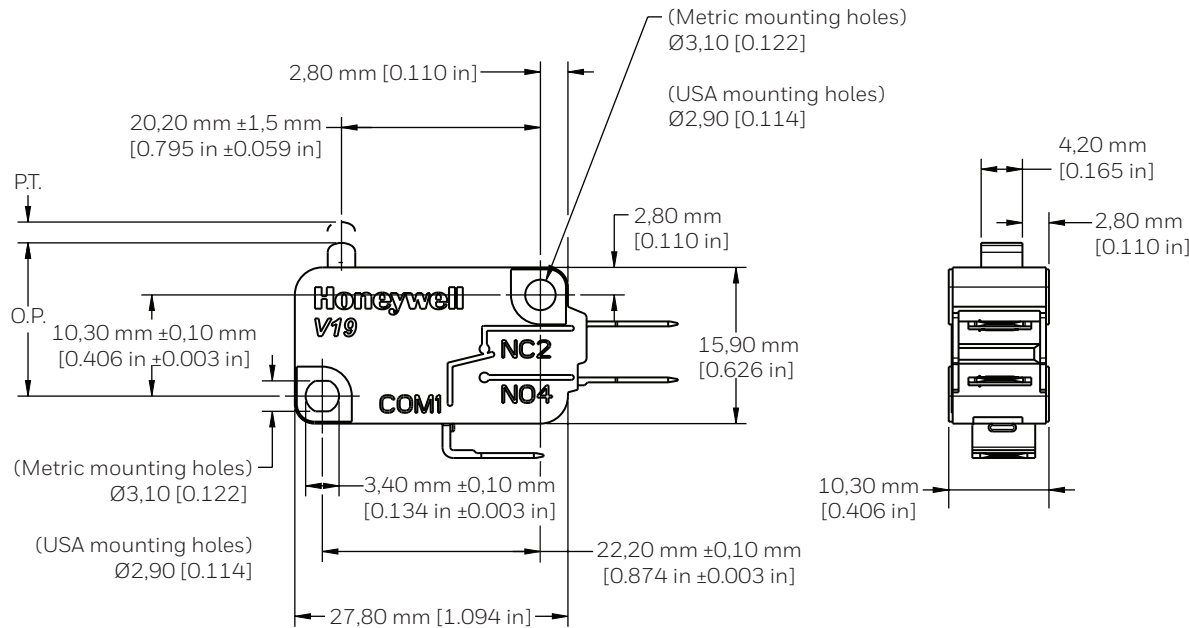


Figure 4. V19 Series Housing DimensionS

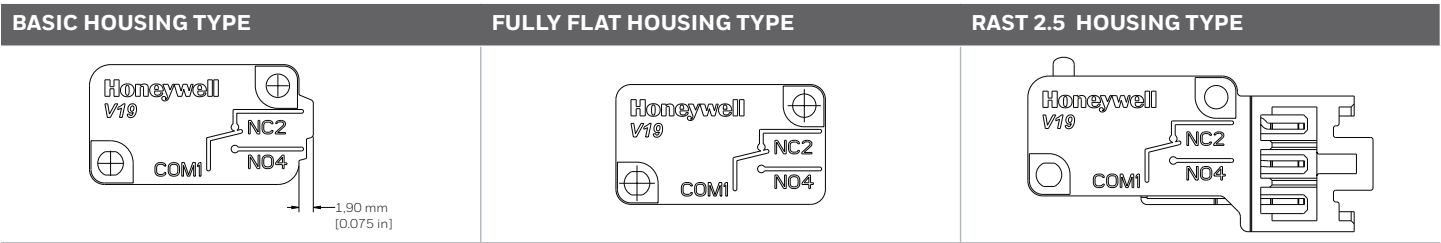
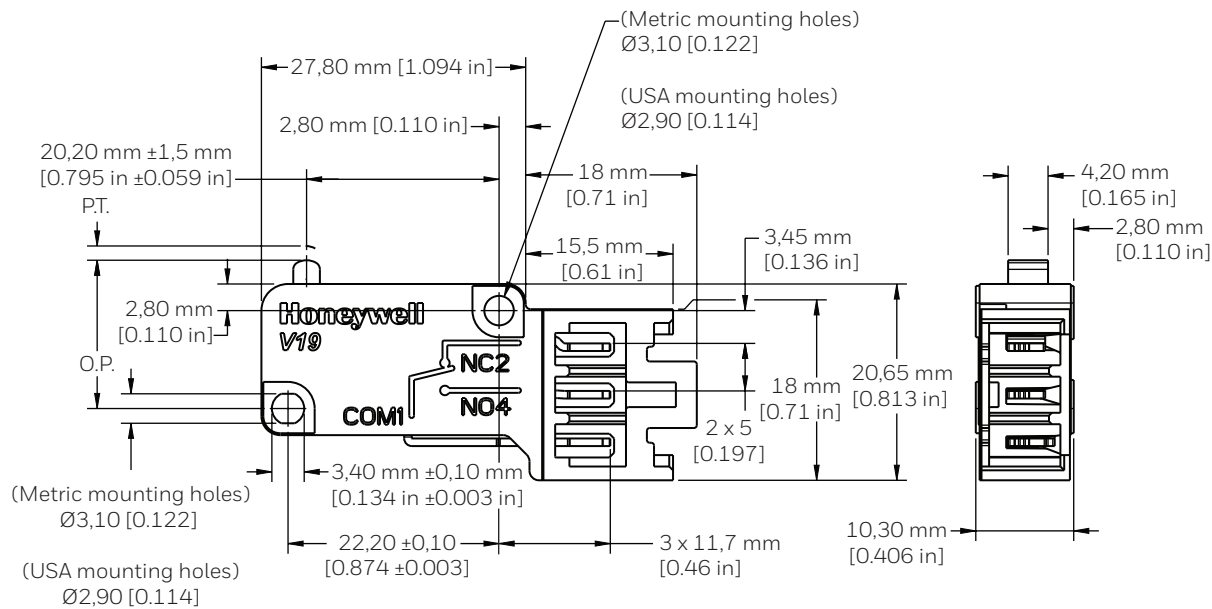


Figure 5. V19 Series RAST 2.5 Switch Dimensions



MICRO SWITCH V19 SERIES

CONNECTION DIMENSIONS

Figure 6. V19 Series C-style Quick Connect •
6,35 mm wide x 0,8 mm thick [0.25 in wide x 0.031 in thick]

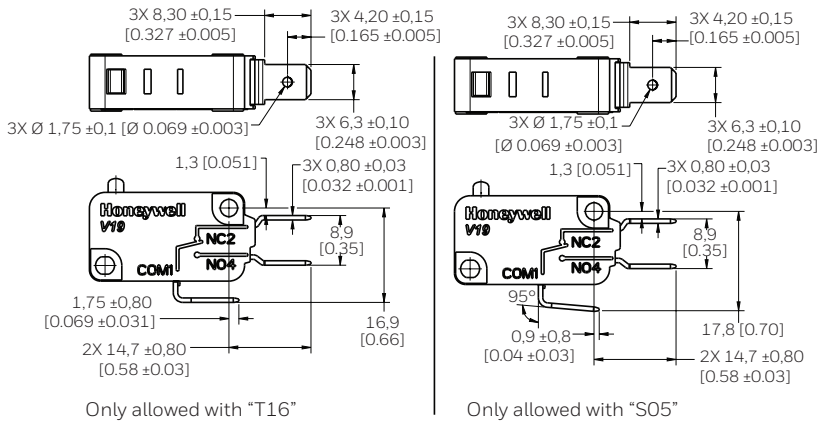


Figure 7. V19 Series H-style RAST-5 250# Connector

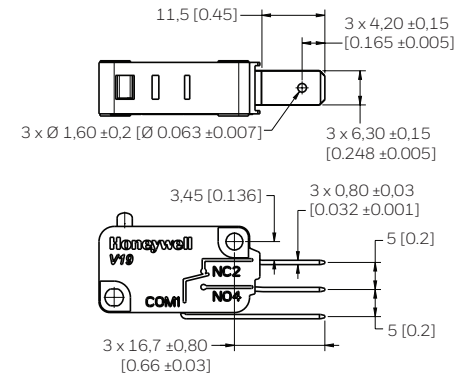


Figure 8. V19 Series E-style Quick Connect •
4,80 mm wide x 0,5 mm thick [0.189 in wide x 0.020 in thick]

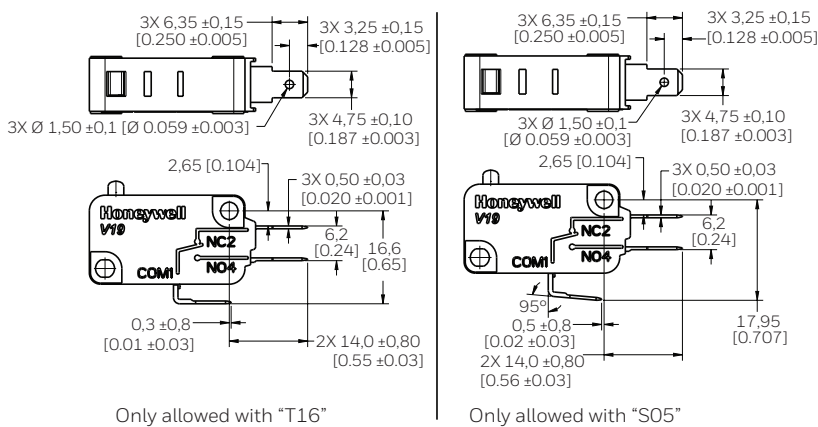


Figure 9. V19 Series N-style RAST-7 250# Connector

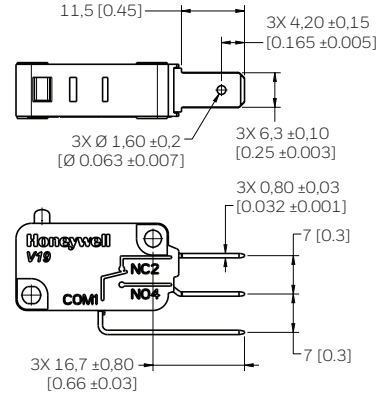
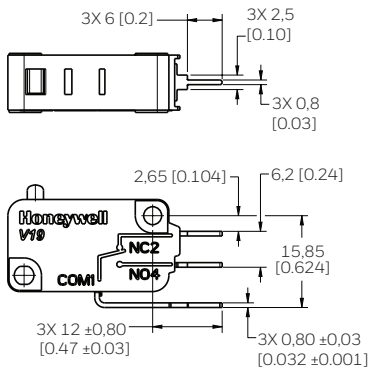


Figure 10. V19 Series P-Style straight pcb terminal



MICRO SWITCH V19 SERIES

STANDARD LEVER OPTIONS • DIMENSIONS

Figure 11. V19 Series A01/Straight Short Lever

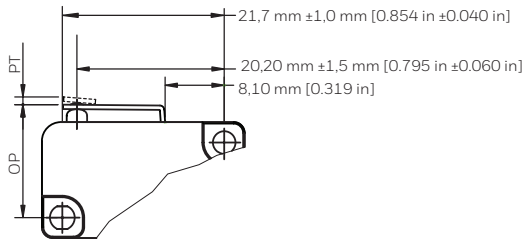


Figure 13. V19 Series A03/Long Straight Lever

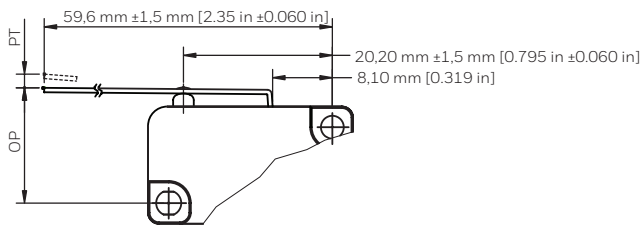
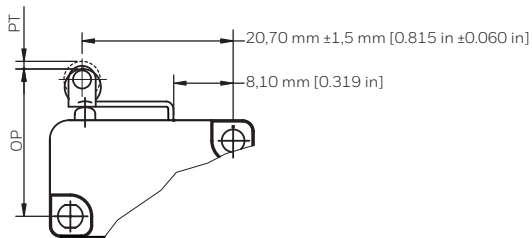


Figure 15. V19 Series A05/Short Roller Lever



NOTE: These dimensions apply for the "A" lever position. For the "B" lever position, please add 5,8 mm [0.224 in].

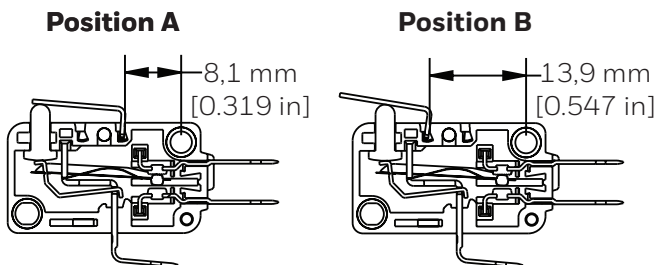


Figure 12. V19 Series A02/Standard Straight Lever

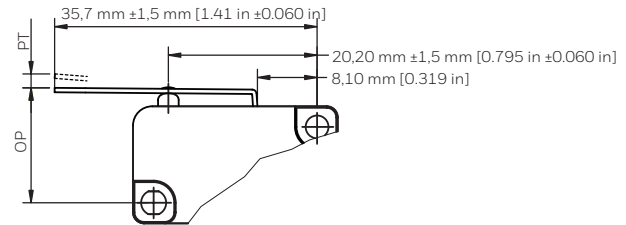


Figure 14. V19 Series A04/Simulated Roller Lever

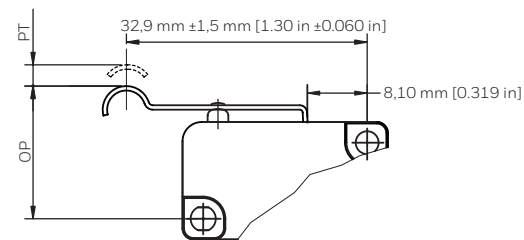
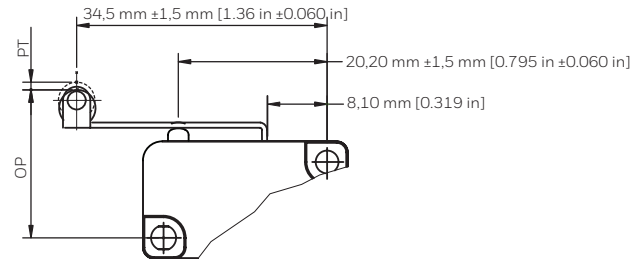


Figure 16. V19 Series A06/Roller Lever



HONEYWELL UNSEALED V BASIC PORTFOLIO

	V7	V15	V19
			
Target Market	Applications requiring precision, long term reliability, and design flexibility in electrical ratings	Cost sensitive applications requiring configurability in actuation, termination, and operating characteristics	Applications in major and small appliances or designs that require simple configurations
Differentiator	Wide range of max operating force and precise differential travel specs key for a more accurate switch actuation	Industry standard switch footprint and global certifications ideal for “low-cost-of-failure” applications	Provides balance between cost and performance in high-volume switch applications
Options	MIL-PRF-8805 listings available V3 family designed for rugged applications where reliability and repeatability is key	Multiple Contact Material Options Contact variants to enable design and regulation compliance	RAST Termination Multiple RAST standard terminal options for optimizing automated manufacturing processes

RELATED DOCUMENTATION

- Basics Range Guide
- V Basic Switch Comparison
- Subminiature Basic Comparison
- Large Basic Comparison
- Sealed Basic Comparison
- Applying Precision Switches
- V7 Datasheet
- V15 Datasheet

FOR MORE INFORMATION

Honeywell Sensing and Safety Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing, or the nearest Authorized Distributor, visit sps.honeywell.com/ast or call:

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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 application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

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.

⚠ WARNING **IMPROPER INSTALLATION**

- Consult with local safety agencies and their requirements when designing a machine-control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

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.