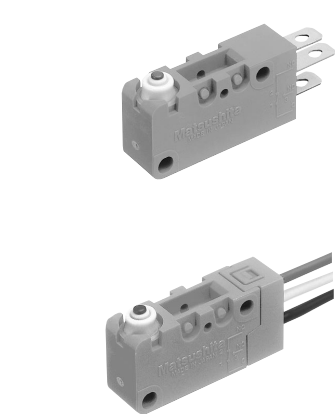


NAiS

HIGH ENVIRONMENTAL  
RESISTANCE

TURQUOISE  
SWITCHES  
V TYPE (ABV)



FEATURES

- Miniature size (33×15.9×10.3 mm) (1.299×.626×.406 inch)
- Sealed construction for use in adverse environment–Sealed construction by epoxy resin and rubber cap keeps off the cause of miscontact such as dust Conforming to IP67\* of IEC protective construction classification
- Elastomer double molding technology, an industry first and ultrasonic swaging technology contribute to uniform seling in high production quantities
- UL/CSA/VDE/SEMKO approved

\*Based on the protective construction classification of IED, items which satisfy the test requirements are denoted with an IP designation.

TYPICAL APPLICATIONS

- Automotives
- Agricultural devices
- Industrial equipment

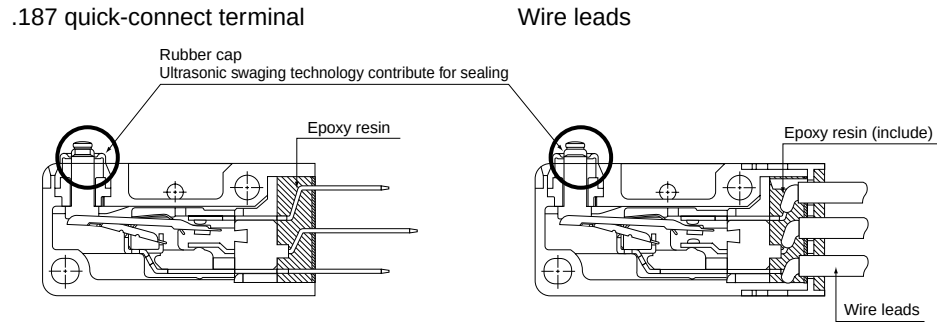
ORDERING INFORMATION

Ex.    ABV1    2    1    0    6    1

| Type of switch                      | Terminal                                        | Contact arrangement                 | Actuator                                                                                                  | Operating force by pin plunger (max.)                          | Contact                         |
|-------------------------------------|-------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------------------------|
| ABV1:<br>Turquoise switch<br>V type | 2: .187 quick-connect terminal<br>6: Wire leads | 1: SPDT<br>2: SPST-NC<br>3: SPST-NO | 0: Pin plunger<br>2: Hinge lever<br>4: Simulated roller lever<br>5: Short roller lever<br>6: Roller lever | 4: 0.98 N {100 gf}<br>5: 1.96 N {200 gf}<br>6: 2.94 N {300 gf} | 1: Gold-clad<br>0: Silver-alloy |

Remarks: 1. Standard packing: Dust protected type 50 pcs./carton, 500 pcs./case; Immersion protected type 50 pcs./case.  
2. Not every combination is available. Please refer to the following table, "PRODUCT TYPES".

CONSTRUCTION



## PRODUCT TYPES

### Silver-alloy

| Contact      | Actuator               | Contact Arrangement | Operating force, Max. | 187 Quick-connect terminal | Wire Leads |
|--------------|------------------------|---------------------|-----------------------|----------------------------|------------|
| Silver-alloy | Pin plunger            | SPDT                | 0.98 N {100 gf}       | ABV121040                  | ABV161040  |
|              |                        |                     | 1.96 N {200 gf}       | ABV121050                  | ABV161050  |
|              |                        |                     | 2.94 N {300 gf}       | ABV121060                  | ABV161060  |
|              |                        | SPST-NC             | 0.98 N {100 gf}       | ABV122040                  | ABV162040  |
|              |                        |                     | 1.96 N {200 gf}       | ABV122050                  | ABV162050  |
|              |                        |                     | 2.94 N {300 gf}       | ABV122060                  | ABV162060  |
|              |                        | SPST-NO             | 0.98 N {100 gf}       | ABV123040                  | ABV163040  |
|              |                        |                     | 1.96 N {200 gf}       | ABV123050                  | ABV163050  |
|              |                        |                     | 2.94 N {300 gf}       | ABV123060                  | ABV163060  |
|              | Hinge lever            | SPDT                | 0.59 N {60 gf}        | ABV121240                  | ABV161240  |
|              |                        |                     | 1.18 N {120 gf}       | ABV121250                  | ABV161250  |
|              |                        |                     | 1.77 N {180 gf}       | ABV121260                  | ABV161260  |
|              |                        | SPST-NC             | 0.59 N {60 gf}        | ABV122240                  | ABV162240  |
|              |                        |                     | 1.18 N {120 gf}       | ABV122250                  | ABV162250  |
|              |                        |                     | 1.77 N {180 gf}       | ABV122260                  | ABV162260  |
|              |                        | SPST-NO             | 0.59 N {60 gf}        | ABV123240                  | ABV163240  |
|              |                        |                     | 1.18 N {120 gf}       | ABV123250                  | ABV163250  |
|              |                        |                     | 1.77 N {180 gf}       | ABV123260                  | ABV163260  |
|              | Simulated roller lever | SPDT                | 0.59 N {60 gf}        | ABV121440                  | ABV161440  |
|              |                        |                     | 1.18 N {120 gf}       | ABV121450                  | ABV161450  |
|              |                        |                     | 1.77 N {180 gf}       | ABV121460                  | ABV161460  |
|              |                        | SPST-NC             | 0.59 N {60 gf}        | ABV122440                  | ABV162440  |
|              |                        |                     | 1.18 N {120 gf}       | ABV122450                  | ABV162450  |
|              |                        |                     | 1.77 N {180 gf}       | ABV122460                  | ABV162460  |
|              |                        | SPST-NO             | 0.59 N {60 gf}        | ABV123440                  | ABV163440  |
|              |                        |                     | 1.18 N {120 gf}       | ABV123450                  | ABV163450  |
|              |                        |                     | 1.77 N {180 gf}       | ABV123460                  | ABV163460  |
|              | Short roller lever     | SPDT                | 1.08 N {110 gf}       | ABV121540                  | ABV161540  |
|              |                        |                     | 2.16 N {220 gf}       | ABV121550                  | ABV161550  |
|              |                        |                     | 3.14 N {320 gf}       | ABV121560                  | ABV161560  |
|              |                        | SPST-NC             | 1.08 N {110 gf}       | ABV122540                  | ABV162540  |
|              |                        |                     | 2.16 N {220 gf}       | ABV122550                  | ABV162550  |
|              |                        |                     | 3.14 N {320 gf}       | ABV122560                  | ABV162560  |
|              |                        | SPST-NO             | 1.08 N {110 gf}       | ABV123540                  | ABV163540  |
|              |                        |                     | 2.16 N {220 gf}       | ABV123550                  | ABV163550  |
|              |                        |                     | 3.14 N {320 gf}       | ABV123560                  | ABV163560  |
|              | Roller lever           | SPDT                | 0.59 N {60 gf}        | ABV121640                  | ABV161640  |
|              |                        |                     | 1.18 N {120 gf}       | ABV121650                  | ABV161650  |
|              |                        |                     | 1.77 N {180 gf}       | ABV121660                  | ABV161660  |
|              |                        | SPST-NC             | 0.59 N {60 gf}        | ABV122640                  | ABV162640  |
|              |                        |                     | 1.18 N {120 gf}       | ABV122650                  | ABV162650  |
|              |                        |                     | 1.77 N {180 gf}       | ABV122660                  | ABV162660  |
|              |                        | SPST-NO             | 0.59 N {60 gf}        | ABV123640                  | ABV163640  |
|              |                        |                     | 1.18 N {120 gf}       | ABV123650                  | ABV163650  |
|              |                        |                     | 1.77 N {180 gf}       | ABV136660                  | ABV163660  |

Remarks: When ordering UL/CSA approved types, please attach suffix "9" to the part number.  
When ordering VDE/SEMKO approved types, please attach suffix "8" to the part number.

# ABV1

## Gold-clad

| Contact   | Actuator               | Contact Arrangement | Operating force, Max. | 187 Quick-connect terminal | Wire Leads |
|-----------|------------------------|---------------------|-----------------------|----------------------------|------------|
| Gold-clad | Pin plunger            | SPDT                | 0.98 N {100 gf}       | ABV121041                  | ABV161041  |
|           |                        |                     | 1.96 N {200 gf}       | ABV121051                  | ABV161051  |
|           |                        |                     | 2.94 N {300 gf}       | ABV121061                  | ABV161061  |
|           |                        | SPST-NC             | 0.98 N {100 gf}       | ABV122041                  | ABV162041  |
|           |                        |                     | 1.96 N {200 gf}       | ABV122051                  | ABV162051  |
|           |                        |                     | 2.94 N {300 gf}       | ABV122061                  | ABV162061  |
|           |                        | SPST-NO             | 0.98 N {100 gf}       | ABV123041                  | ABV163041  |
|           |                        |                     | 1.96 N {200 gf}       | ABV123051                  | ABV163051  |
|           |                        |                     | 2.94 N {300 gf}       | ABV123061                  | ABV163061  |
|           | Hinge lever            | SPDT                | 0.59 N {60 gf}        | ABV121241                  | ABV161241  |
|           |                        |                     | 1.18 N {120 gf}       | ABV121251                  | ABV161251  |
|           |                        |                     | 1.77 N {180 gf}       | ABV121261                  | ABV161261  |
|           |                        | SPST-NC             | 0.59 N {60 gf}        | ABV122241                  | ABV162241  |
|           |                        |                     | 1.18 N {120 gf}       | ABV122251                  | ABV162251  |
|           |                        |                     | 1.77 N {180 gf}       | ABV122261                  | ABV162261  |
|           |                        | SPST-NO             | 0.59 N {60 gf}        | ABV123241                  | ABV163241  |
|           |                        |                     | 1.18 N {120 gf}       | ABV123251                  | ABV163251  |
|           |                        |                     | 1.77 N {180 gf}       | ABV123261                  | ABV163261  |
|           | Simulated roller lever | SPDT                | 0.59 N {60 gf}        | ABV121441                  | ABV161441  |
|           |                        |                     | 1.18 N {120 gf}       | ABV121451                  | ABV161451  |
|           |                        |                     | 1.77 N {180 gf}       | ABV121461                  | ABV161461  |
|           |                        | SPST-NC             | 0.59 N {60 gf}        | ABV122441                  | ABV162441  |
|           |                        |                     | 1.18 N {120 gf}       | ABV122451                  | ABV162451  |
|           |                        |                     | 1.77 N {180 gf}       | ABV122461                  | ABV162461  |
|           |                        | SPST-NO             | 0.59 N {60 gf}        | ABV123441                  | ABV163441  |
|           |                        |                     | 1.18 N {120 gf}       | ABV123451                  | ABV163451  |
|           |                        |                     | 1.77 N {180 gf}       | ABV123461                  | ABV163461  |
|           | Short roller lever     | SPDT                | 1.08 N {110 gf}       | ABV121541                  | ABV161541  |
|           |                        |                     | 2.16 N {220 gf}       | ABV121551                  | ABV161551  |
|           |                        |                     | 3.14 N {320 gf}       | ABV121561                  | ABV161561  |
|           |                        | SPST-NC             | 1.08 N {110 gf}       | ABV122541                  | ABV162541  |
|           |                        |                     | 2.16 N {220 gf}       | ABV122551                  | ABV162551  |
|           |                        |                     | 3.14 N {320 gf}       | ABV122561                  | ABV162561  |
|           |                        | SPST-NO             | 1.08 N {110 gf}       | ABV123541                  | ABV163541  |
|           |                        |                     | 2.16 N {220 gf}       | ABV123551                  | ABV163551  |
|           |                        |                     | 3.14 N {320 gf}       | ABV123561                  | ABV163561  |
|           | Roller lever           | SPDT                | 0.59 N {60 gf}        | ABV121641                  | ABV161641  |
|           |                        |                     | 1.18 N {120 gf}       | ABV121651                  | ABV161651  |
|           |                        |                     | 1.77 N {180 gf}       | ABV121661                  | ABV161661  |
|           |                        | SPST-NC             | 0.59 N {60 gf}        | ABV122641                  | ABV162641  |
|           |                        |                     | 1.18 N {120 gf}       | ABV122651                  | ABV162651  |
|           |                        |                     | 1.77 N {180 gf}       | ABV122661                  | ABV162661  |
|           |                        | SPST-NO             | 0.59 N {60 gf}        | ABV123641                  | ABV163641  |
|           |                        |                     | 1.18 N {120 gf}       | ABV123651                  | ABV163651  |
|           |                        |                     | 1.77 N {180 gf}       | ABV136661                  | ABV163661  |

Remarks: When ordering UL/CSA approved types, please attach suffix "9" to the part number.  
When ordering VDE/SEMKO approved types, please attach suffix "8" to the part number.

## SPECIFICATIONS

### 1. Contact rating

| Type              | Standard rating                                                                          | Low-level rating                            |
|-------------------|------------------------------------------------------------------------------------------|---------------------------------------------|
| Gold-clad contact | 3 A 250 V AC (O.F. 1.96 N {200gf}, 2.94 N {300gf})<br>1 A 250 V AC (O.F. 0.98 N {100gf}) | 5 mA 6 V DC<br>2 mA 12 V DC<br>1 mA 24 V DC |
| Silver-alloy      | 5 A 250 V AC (O.F. 1.96 N {200gf}, 2.94 N {300gf})<br>3 A 250 V AC (O.F. 0.98 N {100gf}) | —                                           |

### 2. Characteristics

|                                                     |                                          |                                                                                                                               |
|-----------------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Mechanical life (O.T.: Specified value)             |                                          | Min. 5x10 <sup>6</sup> (at 60 cpm)                                                                                            |
| Electrical life                                     | Nominal rating (O.T.: Max.)              | Min. 10 <sup>5</sup> (at 20 cpm)                                                                                              |
|                                                     | Low-level rating (O.T.: Specified value) | Min. 10 <sup>6</sup> (at 20 cpm)                                                                                              |
| Insulation resistance                               |                                          | Min. 100 MΩ (at 500 V DC insulation resistance meter)                                                                         |
| Dielectric strength                                 |                                          |                                                                                                                               |
| Between non-continuous terminals                    |                                          | 1,000 Vrms                                                                                                                    |
| Between each terminal and other exposed metal parts |                                          | 2,000 Vrms                                                                                                                    |
| Between each terminal and ground                    |                                          | 2,000 Vrms                                                                                                                    |
| Vibration resistance                                |                                          | 10 to 55 Hz at single amplitude of 0.75 mm (Contact opening: max. 1 msec.)                                                    |
| Shock resistance                                    |                                          | Min. 294 m/s <sup>2</sup> {30 G} (Contact opening: Max. 1 msec.)                                                              |
| Contact resistance                                  | Silver alloy contact type                | Dust protected type (IP50): Max. 50 mΩ<br>Immersion protected type (IP67): Max. 100 mΩ<br>(By voltage drop 1 A 6 to 8 V DC)   |
|                                                     | Gold-clad contact type                   | Dust protected type (IP50): Max. 50 mΩ<br>Immersion protected type (IP67): Max. 100 mΩ<br>(By voltage drop 0.1 A 6 to 8 V DC) |
| Allowable operating speed (at no load)              |                                          | 1 to 500 mm/sec.                                                                                                              |
| Ambient temperature (at no load)                    |                                          | −40°C to +85°C −40°F to +185°F                                                                                                |
| Unit weight                                         |                                          | Approx. 7 g .247 oz (IP50 type)                                                                                               |

### 3. Operating characteristics

| Type of actuator       | Operating force, Max. |                  |                  | Release force, Min. |                 |                  | Pretravel,<br>Max. mm inch | Movement<br>differential,<br>Max. mm inch | Overtravel,<br>Min. mm inch | Operating<br>position,<br>mm inch |
|------------------------|-----------------------|------------------|------------------|---------------------|-----------------|------------------|----------------------------|-------------------------------------------|-----------------------------|-----------------------------------|
| Pin plunger            | 2.94N<br>{300gf}      | 1.96N<br>{200gf} | 0.98N<br>{100gf} | 0.59N<br>{60gf}     | 0.39N<br>{40gf} | 0.25N<br>{25gf}  | 1.6<br>.063                | 0.4<br>.016                               | 0.8<br>.031                 | 14.7±0.6<br>.579 ± .024           |
| Hinge lever            | 1.77N<br>{180gf}      | 1.18N<br>{120gf} | 0.59N<br>{60gf}  | 0.20N<br>{20gf}     | 0.13N<br>{13gf} | 0.098N<br>{10gf} | 3.2<br>.126                | 1.2<br>.047                               | 1.2<br>.047                 | 15.3±1.2<br>.602 ± .047           |
| Simulated roller lever | 1.77N<br>{180gf}      | 1.18N<br>{120gf} | 0.59N<br>{60gf}  | 0.20N<br>{20gf}     | 0.13N<br>{13gf} | 0.098N<br>{10gf} | 3.2<br>.126                | 1.2<br>.047                               | 1.2<br>.047                 | 18.5±1.2<br>.728 ± .047           |
| Short roller lever     | 3.14N<br>{320gf}      | 2.16N<br>{220gf} | 1.08N<br>{110gf} | 0.59N<br>{60gf}     | 0.39N<br>{40gf} | 0.20N<br>{20gf}  | 1.6<br>.063                | 0.5<br>.020                               | 0.8<br>.031                 | 20.7±0.8<br>.815 ± .031           |
| Roller lever           | 1.77N<br>{180gf}      | 1.18N<br>{120gf} | 0.59N<br>{60gf}  | 0.20N<br>{20gf}     | 0.13N<br>{13gf} | 0.098N<br>{10gf} | 3.2<br>.126                | 1.2<br>.047                               | 1.2<br>.047                 | 20.7±1.2<br>.815 ± .047           |

( ) : Low force type

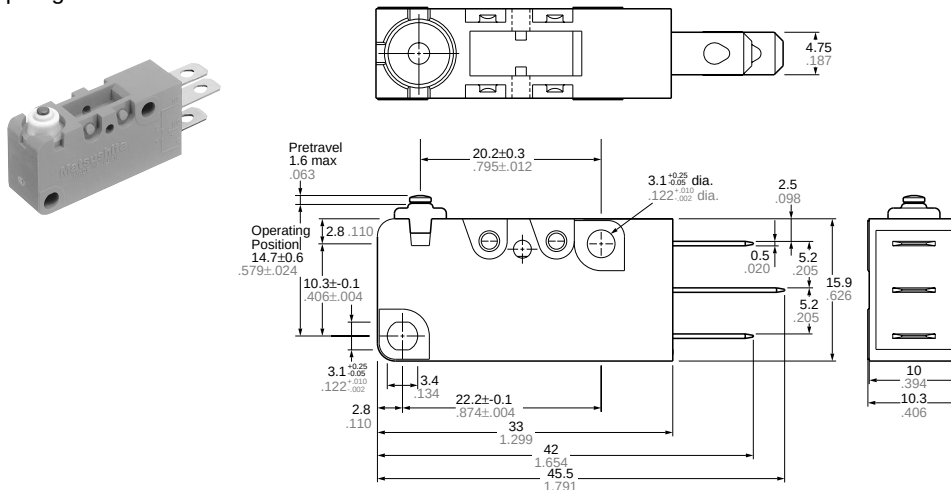
## DIMENSIONS

mm inch General tolerance: ±0.4 ± .016

### 1. Dust protected type

1-(1) .187 quick-connect terminal

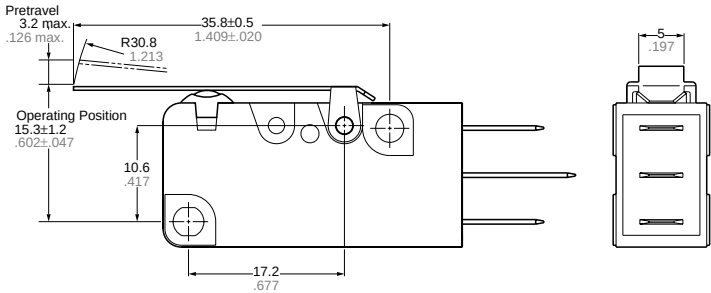
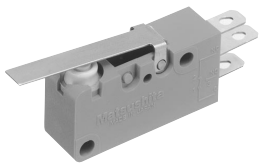
Pin plunger



|                                        |                         |
|----------------------------------------|-------------------------|
| Pretravel,<br>Max. mm inch             | 1.6 .063                |
| Movement differential,<br>Max. mm inch | 0.4 .016                |
| Overtravel,<br>Min. mm inch            | 0.8 .031                |
| Operating position,<br>mm inch         | 14.7±0.6<br>.579 ± .024 |

ABV1

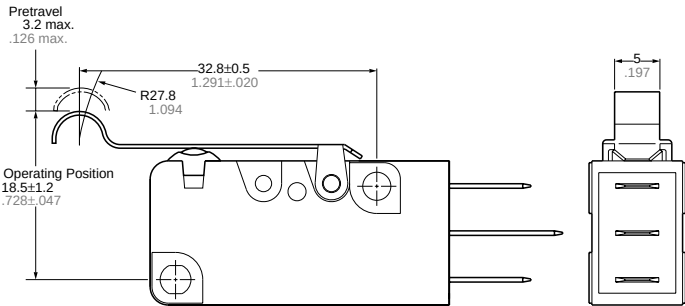
Hinge lever



mm inch General tolerance: ±0.25 ± .010

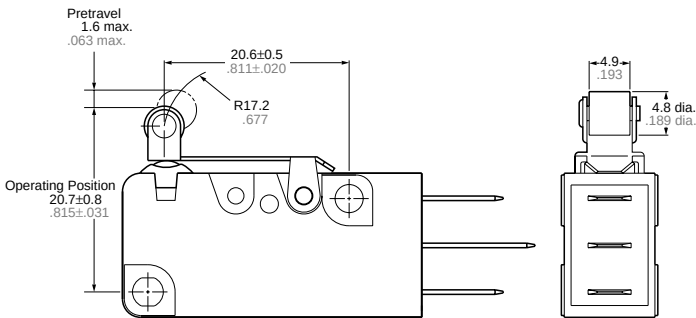
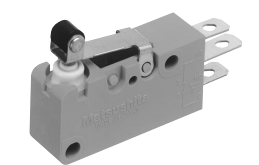
|                                     |                      |
|-------------------------------------|----------------------|
| Pretravel, Max. mm inch             | 3.2 .126             |
| Movement differential, Max. mm inch | 1.2 .047             |
| Overtravel, Min. mm inch            | 1.2 .047             |
| Operating position, mm inch         | 15.3±1.2 .602 ± .047 |

Simulated roller lever



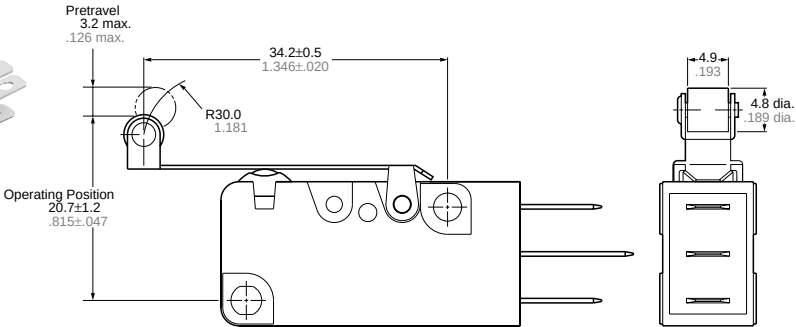
|                                     |                      |
|-------------------------------------|----------------------|
| Pretravel, Max. mm inch             | 3.2 .126             |
| Movement differential, Max. mm inch | 1.2 .047             |
| Overtravel, Min. mm inch            | 1.2 .047             |
| Operating position, mm inch         | 18.5±1.2 .728 ± .047 |

Short roller lever



|                                     |                      |
|-------------------------------------|----------------------|
| Pretravel, Max. mm inch             | 1.6 .063             |
| Movement differential, Max. mm inch | 0.5 .020             |
| Overtravel, Min. mm inch            | 0.8 .031             |
| Operating position, mm inch         | 20.7±0.8 .815 ± .031 |

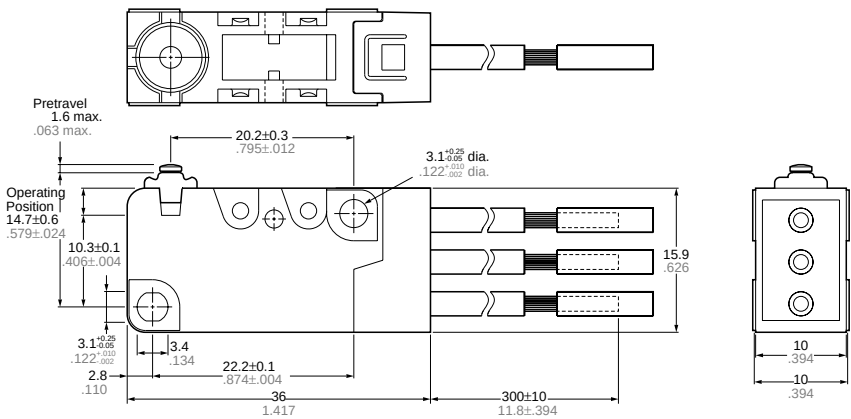
Roller lever



|                                     |                      |
|-------------------------------------|----------------------|
| Pretravel, Max. mm inch             | 3.2 .126             |
| Movement differential, Max. mm inch | 1.2 .047             |
| Overtravel, Min. mm inch            | 1.2 .047             |
| Operating position, mm inch         | 20.7±1.2 .815 ± .047 |

2. Immersion protected type

Wire Leads



Thickness of the lead wire:  
Standard type: 0.75mm<sup>2</sup>  
UL/CSA approved type:  
AWG #18  
Color of the lead wire  
COM ...black  
N.C. ...red  
N.O. ...white

# Mouser Electronics

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[ABV1214518](#) [ABV1214519](#) [ABV121461](#) [ABV1214619](#) [ABV1215519R](#) [ABV1215609](#) [ABV121561](#) [ABV1215619](#)  
[ABV1215619R](#) [ABV1216609](#) [ABV1216619](#) [ABV1220519](#) [ABV1220619](#) [ABV1222619](#) [ABV1224619](#) [ABV1225619](#)  
[ABV1226619](#) [ABV1230503](#) [ABV1230619](#) [ABV123241](#) [ABV1232419](#) [ABV1232619](#) [ABV1234509](#) [ABV1234619](#)  
[ABV1235619](#) [ABV1236619](#) [ABV1610503](#) [ABV1610509](#) [ABV1610513](#) [ABV1610519](#) [ABV161061](#) [ABV1610619](#)  
[ABV1612503](#) [ABV1612509](#) [ABV1612513](#) [ABV161261](#) [ABV1612618](#) [ABV1612619](#) [ABV1614509](#) [ABV161461](#)  
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[ABV1616619](#) [ABV1620619](#) [ABV1622619](#) [ABV1624619](#) [ABV1625619](#) [ABV1626619](#) [ABV1630619](#) [ABV1632619](#)  
[ABV1634509](#) [ABV1634619](#) [ABV1635409](#) [ABV1635419](#) [ABV1635619](#) [ABV1636619](#) [ABV1615619R](#) [ABV1610403](#)  
[ABV1620503](#) [ABV1620508](#) [ABV1630513](#) [ABV1634513](#) [ABV1215603R](#) [ABV1215613R](#) [ABV1210413](#) [ABV1215513R](#)  
[ABV121541R](#) [ABV1622503](#) [ABV1214503](#) [ABV1625619R](#) [ABV1216403](#) [ABV1612413](#) [ABV1212413](#)  
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