## General-purpose Enclosed <br> Switches with High Breaking Capacity and High Durability

- Z General-purpose Basic Switches are built into ZE, ZV, and ZV2 Switches. They provided high durability and high breaking capacity.
- X Basic Switches with magnetic blowout are built into XE, XV, and XV2 Switches. DC models have also been added to the series.
- Three mounting methods (side, base, and diagonal side) and many types of actuator are available.
- Terminals face the front when the cover is removed for easy connection.
- Switches with ground terminals have CE marking.
- Approved by UL, CSA, and CCC (Chinese standard). (Ask your OMRON representative for information on approved models.)


For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Be sure to read Safety Precautions on page 8 to 9 and
Safety Precautions for All Limit Switches.

## Model Number Structure

Model Number Legend (Not all combinations are possible. Ask your OMRON representative for details.)
$\square \square$ - $\square$-2 $\square$
$\overline{(1)} \overline{(2)} \overline{(3)} \quad \overline{(4)}$
(1) Built-in Switch

| Z | $:$ SPDT (AC) |
| :--- | :--- |
| X | SPDT (DC) |

(2) Mounting Direction

E : Side mounting
V : Base mounting
V2 : Diagonal side mounting

## (3) Actuator

Q : Plunger
Q22 : Roller plunger
Q21 : Crossroller plunger
QA2 : Roller arm lever
QA277 : One-way action roller arm lever
N : Sealed plunger
N22 : Sealed roller plunger (ZE, ZV, ZV2 only)
N21 : Sealed crossroller plunger (ZE, ZV, ZV2 only)
NA2 : Sealed roller arm lever
NA277 : Sealed one-way action roller arm lever

## (4) Conduit/Ground Terminal *

None : G 1/2/without ground terminal
G1 : G $1 / 2 /$ with ground terminal
G : Pg13.5/with ground terminal
SG1: 1/2-14NPSM/with ground terminal
YG1 : M20/with ground terminal
S : 1/2-14NPSM/without ground terminal
Y : M20/without ground terminal

[^0] models.

Ordering Information

|  |  | nting |  |  |  | Baser |  |  | Diagonal s |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Actuator |  |  | Model | App stan | ved ards | Model |  | ved <br> ards | Model |  | oved ards |
|  |  |  |  | UL | CSA |  | UL | CSA |  | UL | CSA |
|  |  | AC | ZE-Q-2 | $\bullet$ | $\bullet$ | ZV-Q-2 | $\bullet$ | $\bullet$ | ZV2-Q-2 | $\bullet$ | $\bullet$ |
|  | Plunge | DC | XE-Q-2 |  |  | XV-Q-2 |  |  | XV2-Q-2 |  |  |
|  |  | AC | ZE-Q22-2 | $\bullet$ | $\bullet$ | ZV-Q22-2 | $\bullet$ | - | ZV2-Q22-2 | - | $\bullet$ |
|  | Roller plunge | DC | XE-Q22-2 |  |  | XV-Q22-2 |  |  | XV2-Q22-2 |  |  |
| General |  | AC | ZE-Q21-2 | - | - | ZV-Q21-2 | - | - | ZV2-Q21-2 | $\bullet$ | - |
| purpose |  | DC | XE-Q21-2 |  |  | XV-Q21-2 |  |  | --- |  |  |
|  | Roller arm lever | AC | ZE-QA2-2 | $\bullet$ | $\bullet$ | ZV-QA2-2 | $\bullet$ | - | ZV2-QA2-2 | $\bullet$ | $\bullet$ |
|  | Roller a | DC | XE-QA2-2 |  |  | XV-QA2-2 |  |  | XV2-QA2-2 |  |  |
|  | One-way action roller $\rightarrow$ S | AC | ZE-QA277-2 | $\bullet$ | $\bullet$ | -- |  |  | ZV2-QA277-2 | $\bullet$ | $\bullet$ |
|  | arm lever | DC | XE-QA277-2 |  |  | -- |  |  | --- |  |  |
|  |  | AC | ZE-N-2 | - | - | ZV-N-2 | - | - | ZV2-N-2 | $\bullet$ | $\bullet$ |
|  | plu | DC | XE-N-2 |  |  | XV-N-2 |  |  | XV2-N-2 |  |  |
|  | Sealed roller plunger | AC | ZE-N22-2 | $\bullet$ | $\bullet$ | ZV-N22-2 | $\bullet$ | $\bullet$ | ZV2-N22-2 | $\bullet$ | $\bullet$ |
| Sealed <br> (Booted) | Sealed crossroller plunger | AC | ZE-N21-2 | $\bullet$ | $\bullet$ | ZV-N21-2 | $\bullet$ | $\bullet$ | ZV2-N21-2 | $\bullet$ | $\bullet$ |
|  | ) | AC | ZE-NA2-2 | $\bullet$ | $\bullet$ | ZV-NA2-2 | $\bullet$ | - | ZV2-NA2-2 | $\bullet$ | $\bullet$ |
|  | Sealed roller arm lever | DC | XE-NA2-2 |  |  | XV-NA2-2 |  |  | XV2-NA2-2 |  |  |
|  | One-way action $\rightarrow$ S | AC | ZE-NA277-2 | $\bullet$ | $\bullet$ | ZV-NA277-2 | $\bullet$ | $\bullet$ | ZV2-NA277-2 | $\bullet$ | $\bullet$ |
|  | sealed roller arm lever | DC | XE-NA277-2 |  |  | -- |  |  | XV2-NA277-2 |  |  |

Note: 1. The diagonal side mounting model feature improved sealing property, improved mounting strength through use of M5 screws, increased stability in seating with large mounting width ( $31 \times 75 \mathrm{~mm}$ ) and permit coupling of a number of Switch units.
2. Ask your OMRON representative for information on models with ground terminals.

## Specifications

## Approved Standards

| Agency | Standard | File No. |
| :--- | :---: | :---: |
| UL | UL508 | E76675 |
| CSA | CSA C22.2 No.14 | LR45746 |
| CCC (CQC) | GB14048.5 | 2003010303077623 |

Note: 1. Models XE, XV, and XV2 are not approved by UL, CSA, and CCC.
2. Ask your OMRON representative for information on approved models.

## Ratings

| Model | Rated voltage | Non-inductive load (A) |  |  |  | Inductive load (A) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Resistive load |  | Lamp load |  | Inductive load |  | Motor load |  |
|  |  | NC | NO | NC | NO | NC | NO | NC | NO |
|  | 125 VAC | 15 |  | 3 | 1.5 | 15 |  | 5 | 2.5 |
| ZE- $\square$ | 250 VAC | 15 |  | 2.5 | 1.25 | 15 |  | 3 | 1.5 |
| ZV- $\square$ | 480 VAC | 10 |  | 1.5 | 0.75 | 6 |  | 1.5 | 0.75 |
| ZV2-■ | 125 VDC | $\begin{aligned} & \hline 0.5 \\ & 0.25 \\ & \hline \end{aligned}$ |  | $\begin{aligned} & 0.5 \\ & 0.25 \end{aligned}$ |  | $\begin{aligned} & 0.05 \\ & 0.03 \end{aligned}$ |  | $\begin{aligned} & 0.05 \\ & 0.03 \end{aligned}$ |  |
|  | 250 VDC |  |  |  |  |  |  |  |  |
|  | 8 VDC | 10 |  | 3 | 1.5 | 10 | 10 | 5 | 2.5 |
| XE- $\square$ | 14 VDC | 10 |  | 3 | 1.5 | 10 | 10 | 5 | 2.5 |
| XV- $\square$ | 30 VDC | 10 |  | 3 | 1.5 | 10 | 10 | 5 | 2.5 |
| XV2-■ | 125 VDC | 10 |  | 3 | 1.5 | 7.5 | 6 | 2 | 2.5 |
|  | 250 VDC | 3 |  | 1.5 | 0.75 | 2 | 1.5 | 2 | 1.5 |


| Inrush <br> current | NC | 30 A max. |
| :--- | :--- | :--- |
|  | NO | 15 A max. |

Note: 1. The above figures are for standard currents.
2. Inductive loads have a power factor of 0.4 min . (AC) and a time constant of 7 ms max. (DC).
3. Lamp load has an inrush current of 10 times the steadystate current.
4. Motor load has an inrush current of 6 times the steady-state current.

## Approved Standard Ratings

## UL/CSA

| Model | Rated voltage | Current | Horsepower |
| :---: | :---: | :---: | :---: |
| ZE | 125 VAC | 15 A | $1 / 8 \mathrm{HP}$ |
|  | 250 VAC | 15 A | $1 / 4 \mathrm{HP}$ |
|  | 480 VAC | 15 A | -- |
|  | 125 VDC | 0.5 A |  |

## CCC (GB14048.5)

| Applicable category and ratings |
| :---: |
| AC-12 $10 \mathrm{~A} / 250$ VAC |

## Characteristics

| Degree of protection |  | IP65*1 |
| :---: | :---: | :---: |
| Durability* 2 | Mechanical | $Z \square: 10,000,000$ operations min. X $\square$ : 1,000,000 operations min. |
|  | Electrical | Z $\square: 500,000$ operations min., for 15 A, 250 VAC resistive load <br> $X \square: 100,000$ operations min., for 10 A, 125 VDC resistive load |
| Operating speed |  | Plunger type: $0.01 \mathrm{~mm} / \mathrm{s}$ to $0.5 \mathrm{~m} / \mathrm{s}$ Lever type: $0.02 \mathrm{~mm} / \mathrm{s}$ to $0.5 \mathrm{~m} / \mathrm{s}$ |
| Operating frequency | Mechanical | 120 operations/min |
|  | Electrical | 20 operations/min |
| Rated frequency |  | $50 / 60 \mathrm{~Hz}$ |
| Insulation resistance |  | $100 \mathrm{M} \Omega$ min. (at 500 VDC ) |
| Contact resistance |  | $15 \mathrm{~m} \Omega$ max. (initial value) |
| Terminal temperature rise |  | $50^{\circ} \mathrm{C}$ max. |
| Dielectric strength | Between terminals of the same polarity | 1,000 VAC, $50 / 60 \mathrm{~Hz}$ for 1 min |
|  | Between currentcarrying metal part and ground | $Z \square: 2,000$ VAC, $50 / 60 \mathrm{~Hz}$ for 1 min $X \square: 1,500 \mathrm{VAC}, 50 / 60 \mathrm{~Hz}$ for 1 min |
|  | Between each terminal and non-current-carrying metal part | Z $\square:$ : 2,000 VAC, $50 / 60 \mathrm{~Hz}$ for 1 min $X \square: 1,500 \mathrm{VAC}, 50 / 60 \mathrm{~Hz}$ for 1 min |
| Vibration resistance | Malfunction | 10 to $55 \mathrm{~Hz}, 1.5-\mathrm{mm}$ double amplitude*3 |
| Shock resistance *3 | Destruction | 1,000m/s ${ }^{2}$ max. |
|  | Malfunction | $\begin{aligned} & 100 \mathrm{~m} / \mathrm{s}^{2} \mathrm{max} .{ }^{*} 4 \\ & 50 \mathrm{~m} / \mathrm{s}^{2} \mathrm{max} .{ }^{*} 5 \end{aligned}$ |
| Ambient operating temperature |  | $-10^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$ (with no icing) |
| Ambient operating humidity |  | General-purpose type: $35 \%$ to $85 \%$ RH Sealed type: $35 \%$ to $95 \%$ RH |
| Weight |  | Approx. 260 to 280 g |

Note: The above figures are initial values.
*1. IP65 for $\square$-N models and IP60 for $\square$-Q models.
*2. The values are calculated at an operating temperature of $+5^{\circ} \mathrm{C}$ to $+35^{\circ} \mathrm{C}$, and an operating humidity of $40 \%$ to $70 \%$ RH. Contact your OMRON sales
representative for more detailed information on other operating environments.
*3. At the operation limit positions.
*4. Only for plunger, sealed plunger, roller arm lever, and sealed roller arm lever.
*5. Only for crossroller plunger, sealed crossroller plunger, roller plunger, and sealed roller plunger.

## Engineering Data

## Electrical Durability

## $Z E(\cos \phi=1)$



ZE $(\cos \phi=0.4)$


## Structure and Nomenclature

## Structure

ZE-NA2-2


Note: The conduit thread indication has been changed from "PF1/2" to "G1/2" accompanying the JIS B 0202 revision. This changes applies only to the indication; thread sizes and pitches have not been affected

## Contact Form



Note: With the XE- $\square$, $\mathrm{XV}-\square$, and $\mathrm{XV} 2-\square \square$, be sure to connect COM to the + terminal.

Dimensions and Operating Characteristics
Side Mounting Models


Note: 1. Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.
2. The diagrams shown the Switches with two, M4 screws (length: 45) attached. (The screws are provided.)

| Operating characteristics | Model | ZE-Q-2 | XE-Q-2 | ZE-Q22-2 | XE-Q22-2 | ZE-Q21-2 | XE-Q21-2 | ZE-QA2-2 | XE-QA2-2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Operating force | OF | 2.45 to 3.43 N | 5.00 N max. | 2.45 to 3.43 N | 5.00 N max. | 2.45 to 3.43 N | 5.00 N max. | 5.59 N max. | 6.47 N max. |
| Release force | RF min. | 1.12 N | 1.12 N | 1.12 N | 1.12 N | 1.12 N | 1.12 N | 1.67 N | 1.67 N |
| Pretravel | PT max. | 0.4 mm | 0.9 mm | 0.5 mm | 0.9 mm | 0.5 mm | 0.9 mm | 4 mm | 6 mm |
| Over Travel | OT min. | 5.5 mm | 5.5 mm | 3.6 mm | 3.6 mm | 3.6 mm | 3.6 mm | 6 mm | 5.5 mm |
| Movement Differential | MD max. | 0.05 mm | 0.47 mm | 0.05 mm | 0.47 mm | 0.05 mm | 0.47 mm | 0.4 mm | 0.72 mm |
| Operating Position | OP | $38.2 \pm 0.8 \mathrm{~mm}$ |  | $49.7 \pm 1 \mathrm{~mm}$ |  | $49.7 \pm 1 \mathrm{~mm}$ |  | --- |  |



Note: 1. Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.
2. The diagrams shown the Switches with two, M4 screws (length: 45) attached. (The screws are provided.)

|  | ZE-QA277-2 | XE-QA277-2 | ZE-N-2 | XE-N-2 | ZE-N22-2 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| OF max. | 5.59 N | 6.47 N | 7.85 N | 10.20 N | 4.90 N |
| RF min. | 1.67 N | 1.67 N | 2.35 N | 2.35 N | 0.98 N |
| PT max. | 4 mm | 6 mm | 2 mm | 3 mm | 1 mm |
| OT min. | 6 mm | 5.5 mm | 5 mm | 4 mm | 3.5 mm |
| MD max. | 0.4 mm | 0.72 mm | 0.1 mm | 0.47 mm | 0.12 mm |
| OP | $45.8 \pm 0.8 \mathrm{~mm}$ |  |  |  | $49.7 \pm 0.8 \mathrm{~mm}$ |


|  | ZE-N21-2 | ZE-NA2-2 | XE-NA2-2 | ZE-NA277-2 | XE-NA277-2 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| OF max. | 4.90 N | 6.28 N | 7.26 N | 6.28 N | 7.26 N |
| RF min. | 0.98 N | 2.26 N | 2.26 N | 2.26 N | 2.26 N |
| PT max. | 1 mm | 5 mm | 6 mm | 5 mm | 6 mm |
| OT min. | 3.5 mm | 6 mm | 5.5 mm | 6 mm | 5.5 mm |
| MD max. | 0.12 mm | 0.4 mm | 0.72 mm | 0.4 mm | 0.72 mm |
| OP | $49.7 \pm 0.8 \mathrm{~mm}$ | --- |  |  |  |

Base Mounting/Diagonal Side Mounting Models
The diagrams show the base-mounted model ( $\mathrm{ZV}-\square$ or XV- $\square$ ) on top and the diagonal side-mounted model (ZV2- $\square$ or XV2- $\square$ ) on bottom. The flange on base-mounted models is shown with dotted lines.


Note: Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.

|  | $\begin{aligned} & \hline Z V-Q-2 \\ & \text { ZV2-Q-2 } \end{aligned}$ | $\begin{aligned} & \hline \text { XV-Q-2 } \\ & \text { XV2-Q-2 } \end{aligned}$ | $\begin{aligned} & \text { ZV-Q22-2 } \\ & \text { ZV2-Q22-2 } \end{aligned}$ | $\begin{aligned} & \hline \text { XV-Q22-2 } \\ & \text { XV2-Q22-2 } \end{aligned}$ | $\begin{aligned} & \text { ZV-Q21-2 } \\ & \text { ZV2-Q21-2 } \end{aligned}$ | XV-Q21-2 | $\begin{aligned} & \text { ZV-QA2-2 } \\ & \text { ZV2-QA2-2 } \end{aligned}$ | $\begin{aligned} & \text { XV-QA2-2 } \\ & \text { XV2-QA2-2 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OF <br> RF min. <br> PT max. <br> OT min. <br> MD max. | $\begin{gathered} \hline 2.45 \text { to } 3.43 \mathrm{~N} \\ 1.12 \mathrm{~N} \\ 0.4 \mathrm{~mm} \\ 5.5 \mathrm{~mm} \\ 0.05 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 5.00 \mathrm{~N} \mathrm{max} . \\ 1.12 \mathrm{~N} \\ 0.9 \mathrm{~mm} \\ 5.5 \mathrm{~mm} \\ 0.47 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} 2.45 \text { to } 3.43 \mathrm{~N} \\ 1.12 \mathrm{~N} \\ 0.5 \mathrm{~mm} \\ 3.6 \mathrm{~mm} \\ 0.05 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 5.00 \mathrm{~N} \mathrm{max} . \\ 1.12 \mathrm{~N} \\ 0.9 \mathrm{~mm} \\ 3.6 \mathrm{~mm} \\ 0.47 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} 2.45 \text { to } 3.43 \mathrm{~N} \\ 1.12 \mathrm{~N} \\ 0.5 \mathrm{~mm} \\ 3.6 \mathrm{~mm} \\ 0.05 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 5.00 \mathrm{~N} \mathrm{max} . \\ 1.12 \mathrm{~N} \\ 0.9 \mathrm{~mm} \\ 3.6 \mathrm{~mm} \\ 0.47 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 5.59 \mathrm{~N} \mathrm{max} . \\ 1.67 \mathrm{~N} \\ 4 \mathrm{~mm} \\ 6 \mathrm{~mm} \\ 0.4 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 6.47 \mathrm{~N} \mathrm{max} . \\ 1.67 \mathrm{~N} \\ 6 \mathrm{~mm} \\ 5.5 \mathrm{~mm} \\ 0.72 \mathrm{~mm} \\ \hline \end{gathered}$ |
| OP | $\begin{gathered} 63.7 \pm 0.8 \mathrm{~mm} \text { (see note 1) } \\ (\mathrm{ZV}-\mathrm{Q}-2, \mathrm{XV}-\mathrm{Q}-2) \end{gathered}$ |  | $\begin{gathered} 75.2 \pm 0.8 \mathrm{~mm} \text { (see note 2) } \\ \text { (ZV-Q22-2, XV-Q21-2) } \\ \hline \end{gathered}$ |  | $\begin{gathered} 75.2 \pm 0.8 \mathrm{~mm} \text { (see note 3) } \\ \text { (ZV-Q22-2, XV-Q21-2) } \end{gathered}$ |  | --- |  |

Note: 1. OP for ZV2-Q-2 and XV2-Q-2 is $24.2 \pm 0.8 \mathrm{~mm}$.
2. OP for ZV2-Q22-2 and XV2-Q22-2 is $35.7 \pm 1 \mathrm{~mm}$.
3. OP for ZV2-Q21-2 is $35.7 \pm 0.8 \mathrm{~mm}$.

One-way Action Roller Arm Lever ZV2-QA277-2


Sealed Plunger
ZV(2)-N-2
XV(2)-N-2


## Sealed Roller Plunger

ZV(2)-N22-2


Two, $4.3 \pm 0.2$ dia. holes $\longleftarrow 36.6 \longrightarrow$


Sealed Crossroller Plunger
ZV(2)-N21-2


Note: Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.

|  | ZV2-QA277-2 | $\begin{aligned} & \hline \text { ZV-N-2 } \\ & \text { ZV2-N-2 } \end{aligned}$ | $\begin{aligned} & \hline \text { XV-N-2 } \\ & \text { XV2-N-2 } \end{aligned}$ | $\begin{aligned} & \hline \text { ZV-N22-2 } \\ & \text { ZV2-N22-2 } \end{aligned}$ | $\begin{aligned} & \hline \text { ZV-N21-2 } \\ & \text { ZV2-N21-2 } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| OF max. RF min. PT max. OT min. MD max. | $\begin{gathered} \hline 5.59 \mathrm{~N} \\ 1.67 \mathrm{~N} \\ 4 \mathrm{~mm} \\ 6 \mathrm{~mm} \\ 0.4 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 7.85 \mathrm{~N} \\ 2.35 \mathrm{~N} \\ 2 \mathrm{~mm} \\ 5 \mathrm{~mm} \\ 0.1 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} 10.20 \mathrm{~N} \\ 2.35 \mathrm{~N} \\ 3 \mathrm{~mm} \\ 4 \mathrm{~mm} \\ 0.47 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} \hline 4.90 \mathrm{~N} \\ 0.98 \mathrm{~N} \\ 1 \mathrm{~mm} \\ 3.5 \mathrm{~mm} \\ 0.12 \mathrm{~mm} \end{gathered}$ | $\begin{gathered} 4.90 \mathrm{~N} \\ 0.98 \mathrm{~N} \\ 1 \mathrm{~mm} \\ 3.5 \mathrm{~mm} \\ 0.12 \mathrm{~mm} \end{gathered}$ |
| OP | --- | $71.4 \pm 0.8 \mathrm{~mm}$ (see note 1) (ZV-N-2, XV-N-2) |  | $\begin{gathered} 75.2 \pm 0.8 \mathrm{~mm} \\ \text { (see note 2) } \\ \text { (ZV-N22-2) } \end{gathered}$ | $75.2 \pm 0.8 \mathrm{~mm}$ (see note 3) (ZV-N21-2) |

Note: 1. OP for $\mathrm{ZV} 2-\mathrm{N}-2$ and $\mathrm{XV} 2-\mathrm{N}-2$ is $31.9 \pm 0.8 \mathrm{~mm}$.
2. OP for ZV2-N22-2 is $35.7 \pm 0.8 \mathrm{~mm}$.
3. OP for ZV2-N21-2 is $35.7 \pm 0.8 \mathrm{~mm}$.

Sealed Roller Arm Lever
ZV(2)-NA2-2
XV(2)-NA2-2


One-way Action Sealed Roller Arm Lever ZV(2)-NA277-2

## XV2-NA277-2



Note: Unless otherwise specified, a tolerance of $\pm 0.4 \mathrm{~mm}$ applies to all dimensions.

|  | ZV-NA2-2 <br> ZV2-NA2-2 | XV-NA2-2 <br> XV2-NA2-2 | ZV-NA277-2 <br> ZV2-NA277-2 | XV2-NA277-2 |
| :--- | :---: | :---: | :---: | :---: |
| OF max. | 6.28 N | 7.26 N | 6.28 N | 7.26 N |
| RF min. | 2.26 N | 2.26 N | 2.26 N | 2.26 N |
| PT max. | 5 mm | 6 mm | 5 mm | 6 mm |
| OT min. | 6 mm | 5.5 mm | 6 mm | 5.5 mm |
| MD max. | 0.4 mm | 0.72 mm | 0.4 mm | 0.72 mm |

## Safety Precautions

## Refer to Safety Precautions for All Limit Switches.

## Precautions for Correct Use

## Operating Environment

- Seal material may deteriorate if a Switch is used outdoor or where subject to special cutting oils, solvents, or chemicals. Always appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- Be sure to protect part A with grease in order to maintain the mechanical durability and performance of the Limit Switch. The use of molybdenum disulfide grease is recommended.

- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.

- Constantly subjecting a Switch to vibration or shock can result in wear, which can lead to contact interference with contacts, operation failure, reduced durability, and other problems. Excessive vibration or shock can lead to false contact operation or damage. Install Switches in locations not subject to shock and vibration and in orientations that will not produce resonance.
- The Switches have physical contacts. Using them in environments containing silicon gas will result in the formation of silicon oxide $\left(\mathrm{SiO}_{2}\right)$ due to arc energy. If silicon oxide accumulates on the contacts, contact interference can occur. If silicon oil, silicon filling agents, silicon cables, or other silicon products are present near the Switch, suppress arcing with contact protective circuits (surge killers) or remove the source of silicon gas.


## Mounting

- With the Roller Lever-type Enclosed Switches, the roller arm has been temporarily tightened prior to shipment, so that its position may be adjusted later. When mounting the Switch, be sure to retighten the roller arm so as to prevent it from becoming loose during operation.
- To adequately maintain the seals at the mounting screw section on the side of the Enclosed Switch, insert each O-ring correctly and secure it with the lock nut.
- To provide the Switch with improved sealing property, use of the SC Connector is recommended. Refer to Limit Switch Connectors for details on SC Connectors.
- When routing wires into the conduit opening, be sure that cuttings and other foreign matter do not enter the Switch.


## Appropriate Tightening Torque

A loose screw may result in a malfunction. Be sure to tighten each screw to the proper tightening torque as shown below.

| No. | Type | Appropriate tightening torque |
| :---: | :--- | :---: |
| $\mathbf{1}$ | Cover mounting screw | 1.18 to $1.37 \mathrm{~N} \cdot \mathrm{~m}$ |
| $\mathbf{2}$ | Switch mounting screw*1 $^{*}$ | 1.18 to $1.37 \mathrm{~N} \cdot \mathrm{~m}$ |
| $\mathbf{3}$ | Switch mounting screw*2 | 4.90 to $5.88 \mathrm{~N} \cdot \mathrm{~m}$ |
| $\mathbf{4}$ | Switch terminal screw <br> (M4 screws) | 0.78 to $1.18 \mathrm{~N} \cdot \mathrm{~m}$ |
| $\mathbf{5}$ | Roller arm mounting nut | 4.90 to $5.88 \mathrm{~N} \cdot \mathrm{~m}$ |

[^1] *2. This torque range applies to diagonal side mounting. (M5 Allen-head bolt)


## Mounting

Mounting Holes


## Operation

- Operating method, shape of cam or dog, operating frequency, and the overtravel (OT) have significant effect on the service life and precision of the Limit Switch. Make sure that the shape of the cam is smooth enough.
- Check that OT has a sufficient margin. The actual OT should be rated OT x 0.7 to 1 .


## Dedicated Wrench

1. The roller arm can be set freely within a range of $225^{\circ}$ after loosening the nut.
2. The roller arm mounting bracket can be set in any direction after loosening the nut.


- Make sure that the nut is free of foreign substances when the nut is loosened.
- A dedicated wrench is provided separately.

| Model |
| :---: |
| SUPANA FOR ZE |

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[^0]:    * Consult with your OMRON representative concerning availability, pricing, and delivery of conduit sizes and ground terminal specifications other than those on standard

[^1]:    *1. This torque range applies to side mounting or bottom mounting. (M4 screws)

