Manual Expansion Locating Pin

Model VX

The repetitive location accuracy is 5 μm with a wrench
Zero clearance between reference hole, locating pin with high accuracy.

VX is the one that locates with high accuracy by expanding and reducing diameter manually.

The general locating pin has some clearance between pin and reference hole

Expanding locating pin have zero clearance between pin and reference hole!
High accuracy, cutting down the operation time and total cost reduced

The pin diameter expanding-releasing function

When expanded: The clearance between pin and reference hole get become zero and it leads to locate with high accuracy.
When released: At the time when the work piece is loaded and unloaded, reducing diameter makes enough clearance for changeover and makes it easier.
**Action Description**

Manual Expansion Locating Pin

Object for Locating

< Released State >

< Locked State >

Two types of locating pins. (Cylindrical & Diamond shaped pins)

**Application Examples**

For locating workpiece

For locating a fixture of which shape is tombstone or sub-plate

For locating plate and pallet

> ※ VX has no ability to clamp. VX is only for location, a different clamping method is required to hold the workpiece and pallet.
**Sectional Structure**

The VX designed to locate one direction (the cut) has diamond function inside it.

**Model No. Indication**

**VX 012 0 - D**

1. **Workpiece Hole Diameter (Standard)**
   - 008: Applicable Workpiece Hole Diameter φ 8H8
   - 010: Applicable Workpiece Hole Diameter φ 10H8
   - 012: Applicable Workpiece Hole Diameter φ 12H8
   - 016: Applicable Workpiece Hole Diameter φ 16H8
   - 020: Applicable Workpiece Hole Diameter φ 20H8

2. **Design No.**
   - 0: Revision Number

3. **Function Classification**
   - D: Datum (For Reference Locating)
   - C: Cut (For One Direction Locating)

**Taper Sleeve and Taper Reference Surface**

- VX-D: Datum (For Reference Locating)
- VX-C: Cut (For One Direction Locating)
### Specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>VX0080-☐</th>
<th>VX0100-☐</th>
<th>VX0120-☐</th>
<th>VX0160-☐</th>
<th>VX0200-☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workpiece Hole Diameter (Standard) mm</td>
<td>8 H8 *0.023</td>
<td>10 H8 *0.022</td>
<td>12 H8 *0.027</td>
<td>16 H8 *0.027</td>
<td>20 H8 *0.033</td>
</tr>
<tr>
<td>Datum Diameter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Released (max.) mm</td>
<td>7.93</td>
<td>9.91</td>
<td>11.88</td>
<td>15.84</td>
<td>19.84</td>
</tr>
<tr>
<td>At Full Stroke (min.) mm</td>
<td>8.04</td>
<td>10.05</td>
<td>12.06</td>
<td>16.06</td>
<td>20.06</td>
</tr>
<tr>
<td>Expansion Stroke mm</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Locating Repeatability mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.005</td>
</tr>
<tr>
<td>Locating Force Calculation Formula kN</td>
<td>1.33T−0.16</td>
<td>0.99T−0.18</td>
<td>0.88T−0.21</td>
<td>0.59T−0.22</td>
<td>0.56T−0.23</td>
</tr>
<tr>
<td>Allowable Offset (C·Cut) mm</td>
<td>±0.05</td>
<td>±0.10</td>
<td>±0.10</td>
<td>±0.15</td>
<td>±0.15</td>
</tr>
<tr>
<td>Allowable Thrust Load kN</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.5</td>
<td>7.0</td>
</tr>
<tr>
<td>Allowable Tightening Torque N·m</td>
<td>1.25</td>
<td>2.5</td>
<td>3.2</td>
<td>6.3</td>
<td>10.0</td>
</tr>
<tr>
<td>Operation Sequence</td>
<td>VX-D → VX-C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting Torque of Main Body N·m</td>
<td>10</td>
<td>25</td>
<td>25</td>
<td>80</td>
<td>200</td>
</tr>
<tr>
<td>Operating Temperature °C</td>
<td>0~120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass g</td>
<td>7</td>
<td>15</td>
<td>20</td>
<td>40</td>
<td>80</td>
</tr>
</tbody>
</table>

Note: 1. T: Tightening Torque (N·m)

### Performance Curve (Tightening Torque—Locating Force)

- **VX0080**
  - Tightening Torque (N·m) vs. Locating Force (kN)
  - Graph showing the relationship between tightening torque and locating force for VX0080.

- **VX0100**
  - Similar to VX0080, but with different values for tightening and locating forces.

- **VX0120**
  - Graph for VX0120, showing higher values compared to VX0080.

- **VX0160**
  - Graph with higher tightening and locating forces compared to VX0080 and VX0100.

- **VX0200**
  - Graph with the highest tightening and locating forces among the models presented.
External Dimensions

- Cut Mark
- Hexagon By Bx
- Datum Diameter
- Cap
- Workpiece (Pallet)
- Seating Surface
- Mounting Surface
- Grease Slot
- φ Bx

Machining Dimensions of Mounting Area

- φ Q or more (Range)
- φ D+K

Distance Accuracy of Mounting Dimensions

- VX-D
- Machine Part (Pallet)
- VX-C

Dimensions Table

<table>
<thead>
<tr>
<th>Model No.</th>
<th>VX0080-□</th>
<th>VX0100-□</th>
<th>VX0120-□</th>
<th>VX0160-□</th>
<th>VX0200-□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hole Diameter of Machine Part (Standard Diameter)</td>
<td>φ 8H8</td>
<td>φ 10H8</td>
<td>φ 12H8</td>
<td>φ 16H8</td>
<td>φ 20H8</td>
</tr>
<tr>
<td>Datum Diameter</td>
<td>7.93</td>
<td>9.91</td>
<td>11.88</td>
<td>15.84</td>
<td>19.84</td>
</tr>
<tr>
<td>Min. Diameter (mm)</td>
<td>8.04</td>
<td>10.05</td>
<td>12.06</td>
<td>16.06</td>
<td>20.06</td>
</tr>
<tr>
<td>Max. Diameter (mm)</td>
<td>7.93</td>
<td>9.91</td>
<td>11.88</td>
<td>15.84</td>
<td>19.84</td>
</tr>
<tr>
<td>Expansion Stroke</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>A</td>
<td>24</td>
<td>28.3</td>
<td>30</td>
<td>37</td>
<td>43.5</td>
</tr>
<tr>
<td>Bx</td>
<td>11</td>
<td>15.5</td>
<td>15.5</td>
<td>19</td>
<td>24.5</td>
</tr>
<tr>
<td>By</td>
<td>10</td>
<td>14</td>
<td>14</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>C</td>
<td>0.12</td>
<td>0.16</td>
<td>0.20</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>DK6</td>
<td>7×10⁻³</td>
<td>9×10⁻³</td>
<td>9×10⁻³</td>
<td>13×10⁻³</td>
<td>17×10⁻³</td>
</tr>
<tr>
<td>DH6</td>
<td>7×10⁻³</td>
<td>9×10⁻³</td>
<td>9×10⁻³</td>
<td>13×10⁻³</td>
<td>17×10⁻³</td>
</tr>
<tr>
<td>E</td>
<td>M6 × 1</td>
<td>M8 × 1</td>
<td>M8 × 1</td>
<td>M12 × 1.5</td>
<td>M16 × 1.5</td>
</tr>
<tr>
<td>F</td>
<td>9</td>
<td>11.5</td>
<td>11.5</td>
<td>15</td>
<td>18.5</td>
</tr>
<tr>
<td>G</td>
<td>3</td>
<td>3.5</td>
<td>3.5</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>H</td>
<td>12</td>
<td>13.3</td>
<td>15</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>J</td>
<td>1.6</td>
<td>1.7</td>
<td>2.2</td>
<td>2.8</td>
<td>2.5</td>
</tr>
<tr>
<td>K</td>
<td>2.5</td>
<td>3</td>
<td>3.5</td>
<td>4.2</td>
<td>5</td>
</tr>
<tr>
<td>L</td>
<td>7.9</td>
<td>9.8</td>
<td>11.8</td>
<td>15.7</td>
<td>19.7</td>
</tr>
<tr>
<td>M</td>
<td>4.7</td>
<td>6</td>
<td>6.5</td>
<td>9</td>
<td>12.4</td>
</tr>
<tr>
<td>N (Hex. × Depth)</td>
<td>2.5 × 2.5</td>
<td>3 × 3</td>
<td>3 × 3</td>
<td>4 × 3.5</td>
<td>5 × 4</td>
</tr>
<tr>
<td>P (Recommend Clearance)</td>
<td>0.5 ~ 1</td>
<td>0.5 ~ 1</td>
<td>0.5 ~ 1</td>
<td>1 ~ 1.5</td>
<td>1 ~ 1.5</td>
</tr>
<tr>
<td>Q</td>
<td>10</td>
<td>14</td>
<td>14</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>R</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5.6</td>
<td>5.6</td>
</tr>
<tr>
<td>S</td>
<td>11</td>
<td>13.5</td>
<td>13.5</td>
<td>17</td>
<td>20.5</td>
</tr>
</tbody>
</table>

Notes:
1. This drawing shows the released (contracted) state.
2. The ★ identification mark shows the direction of expansion of VX-C.
   To identify, ▼▼ area is made smoothly by polishing.
   In regard to phasing, please take a look at the phasing of [the cut pin] (VX-C) at next page.
3. When mounting, apply grease on the part marked with ▼.

Offset Tolerance (C Cut): VX Distance Accuracy + Workpiece Hole Distance Accuracy
(Tolerance Listed in JIS B 0613)
Cautions

1) Locating in the directions of the X and Y axes.
   ● The reference position (origin) is determined by VX-D (Datum: for reference locating).
   ● VX-C (Cut: for one direction locating) only locates in one direction (Y-axis direction). Use the X-axis direction within the allowable offset.
   ● When mounting, adjust the VX-C cut mark with the supplied shim so that it is perpendicular to VX-D.

   VX-C (cut) phasing requirements.
   Decide the necessary number of shims according to the position of the cut mark when VX-C (cut) is mounted without any shims, and adjust the cut mark so that it is within the range of "AA" as shown in the figure.
   ※ Make adjustments within 180°. The unit may interfere with the workpiece if too many shims are inserted.

   VX0080, VX0100, VX0120

   Number of Shims to Insert (Reference)
<table>
<thead>
<tr>
<th>Cut Mark Position</th>
<th>1st Dia Number of Shims</th>
<th>2nd Dia Number of Shims</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AB</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AC</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AD</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>AE</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>
   (Adjusted Minimum Angle: 36°/0.11)

   VX0160, VX0200

   Number of Shims to Insert (Reference)
<table>
<thead>
<tr>
<th>Cut Mark Position</th>
<th>1st Dia Number of Shims</th>
<th>2nd Dia Number of Shims</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AB</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>AC</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>AD</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>AE</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>AF</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>AG</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>AH</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
   (Adjusted Minimum Angle: 24°/0.11)

2) Datum plane for Z-axis direction.
   ● This product is for positioning on the X and Y-axis, so there is no seating plane (Z-axis datum plane).
   Accordingly, make sure there is clearance between the hexagonal flange surface and the workpiece (pallet).
   (Please see the machining dimension of mounting part to make sure machining dimension.)
   ● Embed the hexagonal flange as shown in the figure or install a separate seat.

   When the hexagonal flange cannot be embedded in the base plate

   When the hexagonal flange is embedded in the base plate

3) Check Specifications
   ● The locating (expansion) and release (contraction) operations are both performed manually.
   ● When performing the operations use the hexagonal socket on the cap.
   ● This product is a locating pin and has no clamping mechanism.
   ● The locating (expansion) operation should be performed in the sequence of VX-D -> VX-C, and the tightening torque should be within the allowable range.
   When performing the release (contraction) operation, loosen the cap one turn.
   ● When there is too much vibration during the processing the drive screw in the expansion mechanism may become loosened. Select an appropriate clamp so that the workpiece does not move due to the machining load in such a case.

4) Cautions for Use.
   ● It should be handled by qualified personnel.
   ● Avoid performing the operation with a hexagonal wrench that has a ball point tip. Using such a wrench could damage the hexagonal socket on the cap.
   ● Make sure the unit is tightened before using it.
   The equipment could be damaged if it is used in a loosened state.
   ● Do not handle or remove the machine unless the safety is ensured.
   ● Do not disassemble or modify it. If it is disassembled or modified, the warranty will become invalid even if it is still within the warranty period.

※ Please refer to P.1239 for common caution.
   • Notes on Handling  • Maintenance/Inspection  • Warranty
**Cautions**

**Notes on Handling**

1) It should be handled by qualified personnel.
2) Do not handle or remove the machine unless the safety protocols are ensured.
3) Do not touch clamp (cylinder) while clamp (cylinder) is working. Otherwise, your hands may be injured due to clinching.
4) Do not disassemble or modify.
   - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

**Maintenance and Inspection**

1) Removal of the Machine and Shut-off of Pressure Source
   - Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
   - Make sure there is no abnormality in the bolts and respective parts before restarting.
2) Regularly clean the area around the piston rod and plunger.
   - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.
3) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VFL/VFM/VFJ/VFK/WVS/WVM/WV/K/VX/VXF)
   - Location products, except VX/VXF model, can remove contaminants with cleaning functions.
   - When installing pallets makes sure there is no thick sludge like substances on pallets.
   - Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.
4) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.
6) Make sure the hydraulic fluid has not deteriorated.
7) Make sure there is smooth action and no abnormal noise.
   - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
8) The products should be stored in the cool and dark place without direct sunshine or moisture.
9) Please contact us for overhaul and repair.
Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense. Defects or failures caused by the following are not covered.

1. If the stipulated maintenance and inspection are not carried out.
2. If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
3. If it is used or handled in inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
4. If the defect is caused by reasons other than our responsibility.
5. If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
6. Other caused by natural disasters or calamities not attributable to our company.
7. Parts or replacement expenses due to parts consumption and deterioration.
   (Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.
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Fukuoka Sales Office

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