**ID Xpansion Clamps - Machinable**

for clamping internal bores

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**Material**

Mild steel body, with heat-treated tapered screw (coated to prevent seizing).
The largest size 12051.W0250 is made from 7075-T6 aluminium.

**Technical Notes**

For holding parts on an inside diameter, for high density machining on vertical or horizontal mills.

Diameter can be from 4,1mm to a maximum of 250mm! It can also be used as an expanding mandrel on a lathe. The flange diameter of the base is held to a close tolerance for precision location in a machined pocket.

**Tips**

"g" is the minimum diameter the "f" dimension can be machined or turned down to.

Mounting screws included.

**Important Notes**

Installation for clamps 12051.W0010 to .W0051.

1. Expand clamp 0.1mm over the relaxed diameter and machine to fit workpiece bore (on lathe or mill).

If using the clamp on a lathe then use the nut provided to tighten the taper screw. This nut is only used to machine the clamp.

2. Machine a pocket in the fixture for the close tolerance "e" dimension, and drill and tap mounting holes "h".

3. Drill and tap a hole "i" in the centre of the pocket for the tapered screw.

A recessed dowel pin can be installed into the flange for extra rigidity if required.

4. Range of expansion 0.13 to 0.64mm depending on clamp size. Installation for clamps 12051.W0010 to .W0051.

1. Insert machining locking ring (provided), tighten taper screw and machine clamp to required bore size.

2. Release taper screw and remove locking ring prior to any machining of workpieces.

Note: 12051.W0175 and W0250 have four mounting holes on PCD as dimension "h".

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**Order No.**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f Stock</th>
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**Order No.**

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<tr>
<th>Order No.</th>
<th>g min.</th>
<th>i</th>
<th>j</th>
<th>Torque Nm.</th>
<th>Holding force kN.</th>
<th>Max expansion from relaxed dia.</th>
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Material
Mild steel body, with heat-treated tapered screw (coated to prevent seizing).
The largest size 12051.W0250 is made from 7075-T6 aluminium.

Technical Notes
For holding parts on an inside diameter, for high density machining on vertical or horizontal mills.
Diameter can be from 4.1mm to a maximum of 250mm!
It can also be used as an expanding mandrel on a lathe.
Tighten with hex key or hydraulic pull cylinders.
The flange diameter of the base is held to a close tolerance for precision location in a machined pocket.

Tips
“g” is the minimum diameter the “f” dimension can be machined or turned down to.
Mounting screws included.

Important Notes
Installation for clamps 12051.W0010 to .W0051.
1. Expand clamp 0.1mm over the relaxed diameter and machine to fit workpiece bore (on lathe or mill).
If using the clamp on a lathe then use the nut provided to tighten the taper screw. This nut is only used to machine the clamp.
2. Machine a pocket in the fixture for the close tolerance “e” dimension, and drill and tap mounting holes “h”.
3. Drill and tap a hole “i” in the centre of the pocket for the tapered screw.
4. A recessed dowel pin can be installed into the flange for extra rigidity if required.
5. Range of expansion 0.13 to 0.64mm depending on clamp size.
Installation for clamps 12051.W0077 to .W0250.
1. Insert machining locking ring (provided), tighten taper screw and machine clamp to required bore size.
2. Release taper screw and remove locking ring prior to any machining of work pieces.
Note: 12051.W0175 and W0250 have four mounting holes on PCD as dimension “h”.

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**Material**
Mild steel body, with heat-treated tapered screw (coated to prevent seizing).

**Technical Notes**
For clamping blind holes from 17.8mm to 53mm.
Actuated from the side - the cam shaft and the plunger expand the clamp.

**Tips**
Actuated by turning a socket head cam shaft on the side which moves a tapered plunger to expand the clamp.
Two versions - one for milling and one for turning.
“g” is the minimum diameter the “f” dimension can be machined or turned down to.
Mounting screws included.

**Important Notes**
Installation Instructions:
ID Expansion Clamps are designed for clamping on the inside diameter of a component, to install correctly please follow the following guidelines.
1. Expand the clamp approximately 0.1mm over its relaxed diameter, and machine diameter f to suit bore of the workpiece, either on lathe or mill.
2. If machining the clamp on a lathe use the nut provided, on the back of the clamp, to tighten the tapered screw. This nut is used only to machine the clamp.
3. Machine a pocket in the fixture to the close tolerance of dimension e, and depth d.
4. Drill and tap mounting holes as per dimensions h.
5. In the centre of the pocket, drill and tap a hole to dimension i for the tapered screw.
6. For additional rigidity a recessed dowel pin may be installed into the flange, if required.

**Order No.**

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<th>Type</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h on PHC</th>
<th>j</th>
<th>k</th>
<th>Hex. key</th>
<th>Torque</th>
<th>Holding force</th>
<th>kN.</th>
<th>g</th>
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<td>17.8</td>
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<td>M 6</td>
<td>66</td>
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<td>M 6</td>
<td>66</td>
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ID Xpansion Clamp

The ID Xpansion Clamp is the ideal way to hold multiple parts on an inside diameter for machining on your VMC or HMC.

ID Xpansion Clamps can be used to hold components with complex internal shapes, not just plain bores. These machinable clamps are produced in 10 sizes and can hold internal diameters from 21.8 to 45.5mm.

- Low profile and ideal for secondary operations on lathe parts.
- Easily machined to size on lathe or mill.
- Excellent for palletised setups.
- Allow more parts per workcube or fixture plates.
- Body made of mild steel for machinability.
- Tighten with hex key, hydraulic pull cylinders or speed block.

Side-Loc Xpansion Clamp

Wixroyd introduces a new style clamp to its range of ID-Xpansion clamps, the Side-Loc Xpansion Clamp. Actuated by turning a socket head cam shaft on the side, it is ideal for clamping on blind internal diameters. The locking ring provides an accurate preset diameter and rigidity for machining. Like our original ID Xpansion clamps, the Side-Loc Xpansion Clamp has the dead length feature which is critical for close tolerance dimensions.

Designed in two styles, one for milling operations and one for lathe applications; the mill Side-Loc Xpansion Clamp can be machined from 28.4 to 18mm and the lathe version from 53 to 18mm.

Clamp activated from the side with a standard hex key.

Side-Loc Xpansion Clamp, when the component obstructs the clamps tapered screw.
Manual Actuators for ID Xpansion Clamps

Material
Steel.

Technical Notes
Versatile manual actuators when combined with out ID xpansion clamps 12051, enables clamping of smaller internal diameters and blind holes. Mount corresponding ID xpansion clamp, mill type actuator is adaptable and can be used on both vertical and horizontal planes. Once installed the clamp can be actuated with use of actuator screw (6mm a/f).

Tips
Order ID xpansion clamp 12051 separately.

Important Notes
Manual Actuators for Mills and Lathes. Introducing another new and innovative workholding system. Specifically designed to clamp on blind internal diameters smaller than our Side-Loc clamps would allow. We took the design a step further increasing the functionality to clamp smaller inside diameters; for the mill version the option of holding the workpiece in a vertical or horizontal plane. By simply mounting our standard ID Xpansion clamps on these manual actuators, or using another style clamp that has a "straight draw", you can now perform operations that previously required extensive hydraulic/pneumatic cylinders. Mill mounted manual actuators for ID Xpansion clamps holding workpieces of very small blind internal diameters.

<table>
<thead>
<tr>
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<th>d₁</th>
<th>d₂</th>
<th>d₃</th>
<th>d₄</th>
<th>b₁</th>
<th>l₁</th>
<th>h₁</th>
<th>h₂</th>
<th>a/f</th>
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Internal Centering Clamps - Rear Actuated
for delicate components

**Material**
- Body: tool steel 1.2842, blackened.
- Top cone: case hardened steel 1.4112, blackened and ground.
- Ball: steel, 1.4112, hardened and ground.
- Spring: steel, 1.4310 (AISI 301).

**Technical Notes**
- Suitable for concentric positioning and chucking inside holes with surfaces prone to damage.
- Locking pin for precise ball positioning.
- Pull down version can be actuated from rear either manually, or via pneumatic or hydraulic cylinder attached to thread “d5” at rear of clamp.
- For deep installation applications, “d2 max” must be maintained for clearance.
- Repeatability and rotational accuracy, ±0.025.

**Tips**
- Suitable for perforated walls prone to damage, machining centres, welding devices, transfer units, assembly units etc.

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**Order No.**

| Order No. | d1 min. | d1 max. | d2 | d3 | d4 | d5 | h1 | h2 | h3 | h4 | h5 | h6 | l1 | e1 | e2 | e3 | f1 | f2 | f3 |
|-----------|---------|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 12062.W0214 | 14.5 | 18.5 | 12 | M 6 | M 3 | 2.0 | 14.2 | 9.8 | 8.6 | 17.0 | 5.5 | 14.1 | 12 | 4.5 | 21 |
| 12062.W0218 | 18.5 | 22.5 | 15 | M 8 | M 4 | 2.5 | 16.6 | 11.5 | 10.4 | 20.5 | 7.5 | 18.2 | 14 | 5.5 | 46 |
| 12062.W0222 | 22.5 | 26.5 | 20 | M10 | M 5 | 3.0 | 19.7 | 14.1 | 13.0 | 24.4 | 6.0 | 17.4 | 15 | 7.0 | 78 |
| 12062.W0226 | 26.5 | 30.5 | 20 | M10 | M 5 | 3.0 | 19.9 | 14.2 | 13.0 | 24.6 | 6.0 | 17.4 | 15 | 7.0 | 96 |
| 12062.W0230 | 30.5 | 38.5 | 25 | M12 | M 6 | 4.0 | 23.2 | 14.0 | 11.7 | 28.8 | 7.0 | 21.9 | 20 | 9.0 | 143 |
| 12062.W0238 | 38.5 | 46.5 | 30 | M12 | M 6 | 4.0 | 27.2 | 18.0 | 15.5 | 33.1 | 7.5 | 22.5 | 20 | 11.0 | 250 |
| 12062.W0246 | 46.5 | 54.5 | 30 | M12 | M 6 | 4.0 | 27.2 | 18.0 | 15.7 | 33.1 | 7.5 | 22.5 | 20 | 11.0 | 340 |
| 12062.W0254 | 54.5 | 70.5 | 45 | M14x1.5 | M 8 | 5.0 | 40.7 | 23.7 | 19.1 | 50.0 | 9.0 | 24.9 | 32 | 15.0 | 680 |
| 12062.W0270 | 70.5 | 86.5 | 60 | M16x1.5 | M 8 | 5.0 | 46.0 | 28.1 | 23.5 | 55.3 | 10.0 | 29.4 | 20 | 17.0 | 1300 |
| 12062.W0286 | 86.5 | 102.5 | 60 | M16x1.5 | M10 | 5.0 | 51.1 | 30.1 | 25.5 | 61.5 | 10.0 | 29.4 | 25 | 25.0 | 2060 |

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**Technical Notes**
- Suitable for concentric positioning and chucking inside holes with surfaces prone to damage.
- Locking pin for precise ball positioning.
- Pull down version can be actuated from rear either manually, or via pneumatic or hydraulic cylinder attached to thread “d5" at rear of clamp.
- For deep installation applications, “d2 max” must be maintained for clearance.
- Repeatability and rotational accuracy, ±0.025.

**Tips**
- Suitable for perforated walls prone to damage, machining centres, welding devices, transfer units, assembly units etc.
Material
Body: tool steel 1.2842, blackened.
Top cone: case hardened steel 1.4112, blackened and ground.
Ball: steel, 1.4112, hardened and ground.
Spring: steel, 1.4310 (AISI 301).

Technical Notes
Suitable for concentric positioning and chucking inside holes with surfaces prone to damage.
Locking pin for precise ball positioning.
Pull down version can be actuated from rear either manually, or via pneumatic or hydraulic cylinder attached to thread “d₃” at rear of clamp.
For deep installation applications, “d₃ max” must be maintained for clearance.
Repeatability and rotational accuracy, ±0.025.

Tips
Suitable for perforated walls prone to damage, machining centres, welding devices, transfer units, assembly units etc.
Internal Centering Clamps - Standard Version
for casts and forgings

Material
Body: tool steel hardened, blackened.
Top cone: case hardened steel 1.4112, blackened and ground.
Ball: steel, 1.4034, hardened and ground.
Spring: stainless steel, 1.4310.

Technical Notes
For deep installation applications, “d₂ max” must be maintained for clearance. A locking pin can be used for precise ball positioning.
Suitable for concentric positioning and chucking inside holes, repeatability and rotary accuracy ±0.025.

Tips
Precise self-centering, providing clamping and positioning of components.

Important Notes
If machining delicate components, see parts 12061.

Order No. | d₁ min. | d₁ max. | d₂ | d₃ | d₄ + 0.3 | h₁ -1 | h₂ | h₃ | h₄ | c° | w
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
12071.W011 | 11.7 | 14.2 | 10 | M 4 | 1.5 | 8.6 | 3.9 | 3.2 | 3.5 | 9
12071.W014 | 14.5 | 18.5 | 12 | M 4 | 2.0 | 14.2 | 9.8 | 8.6 | 5.5 | 20
12071.W0218 | 18.5 | 22.5 | 15 | M 5 | 2.5 | 16.5 | 11.6 | 10.4 | 7.5 | 39
12071.W0222 | 22.5 | 26.5 | 20 | M 6 | 3.0 | 19.6 | 14.1 | 12.9 | 6.0 | 60
12071.W0230 | 30.5 | 38.5 | 25 | M 6 | 4.0 | 23.2 | 14.1 | 11.8 | 7.0 | 125
12071.W0238 | 38.5 | 46.5 | 30 | M 8 | 4.0 | 27.2 | 18.0 | 15.7 | 7.5 | 233
12071.W0246 | 46.5 | 54.5 | 30 | M 8 | 4.0 | 27.1 | 18.0 | 15.7 | 7.5 | 323
12071.W0254 | 54.5 | 70.5 | 45 | M10 | 5.0 | 40.6 | 23.7 | 19.1 | 9.0 | 653
12071.W0270 | 70.5 | 86.5 | 60 | M12 | 5.0 | 46.1 | 28.3 | 23.7 | 10.0 | 1,271
12071.W0286 | 86.5 | 102.5 | 60 | M16 | 5.0 | 51.2 | 30.3 | 25.6 | 10.0 | 1,783

Order No. | h₅ | l₁ ±0.1 | Ball Ø | t | No. of balls | Stroke | a/ft | a/f₁ | a/f₂ |
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
12071.W0211 | 14.7 | 3.5 | 2.5 | 4 | 3 | 1.3 | 3 | - | 0.5 | 10
12071.W0214 | 19.2 | 4.5 | 4.0 | 6 | 3 | 2.3 | 3 | 5 | 3.5 | 12
12071.W0218 | 22.7 | 5.5 | 4.0 | 7 | 3 | 2.3 | 4 | 5 | 4.5 | 20
12071.W0222 | 28.6 | 7.0 | 4.0 | 8 | 3 | 2.3 | 5 | 6 | 5.0 | 15
12071.W0226 | 28.8 | 7.0 | 4.0 | 8 | 3 | 2.3 | 5 | 6 | 5.0 | 20
12071.W0230 | 32.2 | 9.0 | 8.0 | 8 | 3 | 4.6 | 5 | 6 | 5.0 | 25
12071.W0238 | 39.2 | 11.0 | 8.0 | 10 | 6 | 4.6 | 6 | 8 | 6.5 | 30
12071.W0246 | 39.2 | 11.0 | 8.0 | 10 | 6 | 4.6 | 6 | 8 | 6.5 | 30
12071.W0254 | 54.6 | 15.0 | 16.0 | 12 | 6 | 9.2 | 8 | 10 | 8.0 | 45
12071.W0270 | 63.1 | 17.0 | 16.0 | 15 | 6 | 9.2 | 10 | 12 | 10.0 | 60
12071.W0286 | 72.2 | 25.0 | 16.0 | 15 | 6 | 9.2 | 14 | 17 | 10.0 | 60

wixroyd.com
Internal Centering Clamps - Rear Actuated
for casts and forgings

Material
Body: tool steel 1.2842, blackened.
Top cone: case hardened steel 1.4112, blackened and ground.
Ball: steel, 1.4034, hardened and ground.
Spring: stainless steel, 1.4310 (AISI 301).

Technical Notes
Suitable for concentric positioning and chucking inside holes, provided that small ball impressions can be accepted.
Pull down version can be actuated from rear either manually, or via pneumatic or hydraulic cylinder attached to thread "d5" at rear of clamp.
For deep installation applications, "d2 max" must be maintained for clearance.
A locking pin can be used for precise ball positioning.
Repeatability and rotational accuracy, ±0.025.

Tips
Suitable for: machining centres, welding devices, transfer units, assembly units etc.

Important Notes
If machining delicate components, see parts 12062.

Order No.  d1 min.  d1 max.  d2 tol. H7  d3  d4  d5 +0.3  h1  h2  h3  h4 -0.2  h5  h6  h7  l1  l2  l3  l4
12072.W0211  11.7  14.2  10  M5  M3  1.5  9.9  3.9  3.2  12.7  3.5  11.0  10  3.5  12
12072.W0214  14.5  18.5  12  M6  M3  2.0  14.2  9.8  8.6  17.0  5.5  14.1  12  4.5  21
12072.W0218  18.5  22.5  15  M8  M4  2.5  16.5  11.6  10.4  20.4  7.5  18.2  14  5.5  45
12072.W0222  22.5  26.5  20  M10  M5  3.0  19.6  14.1  12.9  24.3  6.0  17.4  15  7.0  77
12072.W0226  26.5  30.5  20  M10  M5  3.0  19.8  14.1  13.0  24.5  6.0  17.4  15  7.0  96
12072.W0230  30.5  38.5  25  M12  M6  4.0  23.2  14.1  11.8  28.8  7.0  21.9  20  9.0  140
12072.W0238  38.5  46.5  30  M12  M6  4.0  27.1  18.0  15.5  33.0  7.5  22.5  20  11.0  246
12072.W0246  46.5  54.5  30  M12  M6  4.0  27.2  18.0  15.7  33.1  7.5  22.5  20  11.0  327
12072.W0254  54.5  70.5  45  M14x1.5  M8  5.0  40.6  23.7  19.1  49.9  9.0  24.5  32  15.0  650
12072.W0270  70.5  86.5  60  M16x1.5  M8  5.0  46.1  28.3  23.7  55.4  10.0  29.4  20  17.0  1272
12072.W0286  86.5  102.5  60  M16x1.5  M10  5.0  51.2  30.3  25.7  61.6  10.0  29.4  25  25.0  2042

Order No.  Ball Ø  Number of balls  n  Strokes e  a/f1  a/f2  a/f3  Clamping force F kN.  e1  e2 +e3  +0.5  e4  e5  f1  f2  f3
12072.W0211  2.5  3  1.3  5.5  4  8  0.5  10  1.5  5  M5  2.0  3.5  3.5
12072.W0214  4.0  3  2.3  5.5  3  10  3.5  12  2.0  6  M6  2.5  5.5  4.5
12072.W0218  4.0  3  2.3  7.0  5  13  4.0  15  2.5  8  M8  3.5  7.5  5.5
12072.W0222  4.0  3  2.3  8.0  6  16  4.5  20  3.0  10  M10  3.5  6.0  7.0
12072.W0226  4.0  3  2.3  8.0  6  16  4.5  20  3.0  10  M10  3.5  6.0  7.0
12072.W0230  8.0  3  4.6  10.0  6  18  4.5  25  4.0  12  M12  3.5  7.0  9.0
12072.W0238  8.0  6  4.6  10.0  8  18  6.5  30  4.0  12  M12  4.5  7.5  11.0
12072.W0246  8.0  6  4.6  10.0  8  18  6.5  30  4.0  12  M12  6.5  7.5  11.0
12072.W0254  16.0  6  9.2  13.0  10  21  8.0  45  5.0  14  M14x1.4  6.5  9.0  15.0
12072.W0270  16.0  6  9.2  13.0  12  24  10.0  60  5.0  16  M16x1.5  6.5  10.0  17.0
12072.W0286  16.0  6  9.2  16.0  12  24  15.5  60  5.0  16  M16x1.5  6.5  10.0  25.0
Material
Body: tool steel 1.2842, blackened.
Top cone: case hardened steel 1.4112, blackened and ground.
Ball: steel, 1.4034, hardened and ground.
Spring: stainless steel, 1.4310 (AISI 301).

Technical Notes
Suitable for concentric positioning and chucking inside holes, provided that small ball impressions can be accepted.
Pull down version can be actuated from rear either manually, or via pneumatic or hydraulic cylinder attached to thread "d" at rear of clamp.
For deep installation applications, "d_max" must be maintained for clearance.
A locking pin can be used for precise ball positioning.
Repeatability and rotational accuracy, ±0.025.

Tips
Suitable for: machining centres, welding devices, transfer units, assembly units etc.

Important Notes
If machining delicate components, see parts 12062.
The internal centering clamp provides autocentric chucking inside both round and square holes, at the simple turn of a hexagon screw. Precise self-centering is achieved through the expansion of the ring of balls which, during clamping, are pressed outward across a precision cone. As the outer diameter of the clamp changes the balls transmit force between its body and the bore. The clamps are used in machining and welding fixtures, product assemblies and transfer units.

- Easy to use.
- Precise self-centering and downhold clamping minimising tolerance errors.
- 3 or 6 points of clamping for maximum stability.

- Clamping on uneven surfaces, such as casts and forgings.
- Low height clamping element.
- Bore sizes 11 to 102mm.
- Repeatable positioning accuracy ±0,025 and rotational accuracy ±0,025.

- Easily actuated by the turn of a screw.
- Clamping of workpieces with perforated walls without distortion.
- Actuation from above or below.

### Advantages

#### Centering

1. **Manual from above**
2. **Manual, hydraulic or pneumatic from below**
3. **Actuation models**

- 12061 - for delicate workpieces (non-marking).
- 12062 - for delicate workpieces (non-marking).
- 12071 - for cast and more robust workpieces.
- 12072 - for cast and more robust workpieces.