

# Cantilever Shafts (Pilot – Threaded with Retaining Ring Groove)

Standard / Stepped

**Cantilever Shafts – Pilot – Threaded with Retaining Ring Groove Standard**

RoHS10

| Type                |                            | Material  | Surface Treatment          |
|---------------------|----------------------------|---|----------------------------|
| Thread Length Fixed | Thread Length Configurable |   |                            |
| FXCA                | FXNCA                      | 1045 Carbon Steel or Equivalent                     | Black Oxide                |
| PFXCA               | SFXNCA                     |   | Electroless Nickel Plating |
| SFXCA               | SFXNCA                     | 304 Stainless Steel                                 | —                          |
| HFXCA               | —                          | 4137 Alloy Steel Equivalent Hardness 35–40 HRC min. | Black Oxide                |

Dimensions of Wrench Flats when Y ≥ 17:  $6.3 / (1.6/)$

⚠ This type may have centering holes depending on dimensions.

| Part Number Type   | No.   | Dg <sub>6</sub> | 1 mm Increment |        |        |       | Pg <sub>6</sub> | M (Coarse) | H    | W      | d         |           | m    | n |
|--|---|-----------------|----------------|--------|--------|-------|-----------------|------------|------|--------|-----------|-----------|------|---|
|  |   |                 | Y              | F      | G      | ⊘ N   |                 |            |      |        | Ref. Dim. | Tolerance |      |   |
| Thread Length Fixed<br>FXCA<br>PFXCA<br>SFXCA<br>HFXCA (D≥6) | 3   | 3               | 2–30           | 3–50   | 3–8    | 3–6   | M3              | 7          | 5    | 2      | +0.060    | 0.5       | 2    |   |
|  | 4   | 4               |                |        |        | 4–8   | M4              | 8          | 6    | 3      | 0         |           |      |   |
|  | 5   | 5               |                |        |        | 5–10  | M5              | 9          | 7    | 4      | +0.075    |           |      |   |
|  | 6   | 6               | 5–100          | 5–10   | 6–12   | M6    | 10              | 8          | 5    | 0      | 0.7       | 3         | 2    |   |
|  | 8   | 8               |                |        | 8–16   | M8    | 12              | 10         | 7    | +0.090 |           |           |      |   |
|  | 10  | 10              |                |        | 10–20  | M10   | 13              | 11         | 4    | 0      |           |           |      |   |
|  | 12  | 12              |                |        | 12–24  | M12   | 14              | 10         | 5    | -0.090 |           |           |      |   |
|  | Thread Length Configurable<br>FXNCA<br>PFXNCA<br>SFXNCA | 13              | 13             | 4–75   | 10–150 | 5–15  | 12–24           | M12        | 15   | 13     | 9.6       | 0         | 1.15 | 4 |
|  |   | 14              | 14             |        |        |       | 15              | 14         | 11.5 | 0      |           |           |      |   |
|  |   | 15              | 15             |        |        |       | 16              | 14         | 12.4 | 0      |           |           |      |   |
| 16   |   | 16              | 5–20           | 20–40  | 16–24  | M16   | 17              | 15         | 12.4 | 0      | -0.110    | 1.35      | 5    |   |
| 17   |   | 17              |                |        | 18     | 16    | 14.3            | 0          |      |        |           |           |      |   |
| 18   |   | 18              |                |        | 19     | 16    | 15.2            | 0          |      |        |           |           |      |   |
| 19   |   | 19              |                |        | 20     | 16    | 16.2            | 0          |      |        |           |           |      |   |
| 20   |   | 20              | 4–60           | 10–100 | 5–20   | 20–40 | M20             | 20         | 24   | 19     | 0         | -0.210    | 1.65 | 5 |
| 21   |   | 21              |                |        |        | 21    | M16             | 26         | 24   | 21     | 0         |           |      |   |
| 22   |   | 22              |                |        |        | 22    | M20             | 28         | 25   | 21     | 0         |           |      |   |
| 23   | 23  | 23              |                |        |        | M16   | 31              | 27         | 23.9 | 0      |           |           |      |   |
| 24   | 24  | 24              |                |        |        | M20   | 36              | 32         | 28.6 | 0      |           |           |      |   |
| 25   | 25  | 25              |                |        |        | M16   | —               | —          | —    | —      |           |           |      |   |

⚠ HFXCA is applicable to D6 or larger specifications. ⊕ N dimension can only be specified for the Thread Length Configurable Type.

**Cantilever Shafts – Pilot – Threaded with Retaining Ring Groove Stepped**

RoHS10

| Type  | Material                        | Surface Treatment          |
|-------|---------------------------------|----------------------------|
| FXDA  | 1045 Carbon Steel or Equivalent | Black Oxide                |
| PFXDA | —                               | Electroless Nickel Plating |
| SFXDA | 304 Stainless Steel             | —                          |

Dimensions of Wrench Flats when W < V, Y ≥ 17:  $6.3 / (1.6/)$

⚠ This type may have centering holes depending on dimensions.

| Part Number Type       | No.                    | Dg <sub>6</sub> | 1 mm Increment |        |        |       | Pg <sub>6</sub> | M (Coarse) | V    | H    | W      | d         |           | m    | n |
|------------------------|------------------------|-----------------|----------------|--------|--------|-------|-----------------|------------|------|------|--------|-----------|-----------|------|---|
|                        |                        |                 | Y              | F      | G      | ⊘ N   |                 |            |      |      |        | Ref. Dim. | Tolerance |      |   |
| FXDA<br>PFXDA<br>SFXDA | 3                      | 3               | 7–30           | 3–50   | 3–8    | 3–6   | M3              | 5          | 7    | 5    | 2      | +0.060    | 0.5       | 2    |   |
|                        | 4                      | 4               |                |        |        | 4–8   | M4              | 6          | 8    | 6    | 3      | 0         |           |      |   |
|                        | 5                      | 5               |                |        |        | 5–10  | M5              | 7          | 9    | 7    | 4      | +0.075    |           |      |   |
|                        | 6                      | 6               | 5–100          | 5–10   | 6–12   | M6    | 8               | 10         | 8    | 5    | 0      | 0.7       | 3         | 2    |   |
|                        | 8                      | 8               |                |        | 8–16   | M8    | 10              | 12         | 10   | 7    | +0.090 |           |           |      |   |
|                        | 10                     | 10              |                |        | 10–20  | M10   | 11              | 13         | 11   | 4    | 0      |           |           |      |   |
|                        | 12                     | 12              |                |        | 12–24  | M12   | 12              | 14         | 12   | 5    | -0.090 |           |           |      |   |
|                        | FXDA<br>PFXDA<br>SFXDA | 13              | 13             | 7–60   | 10–100 | 5–15  | 12–24           | M12        | 13   | 15   | 13     | 9.6       | 0         | 1.15 | 4 |
|                        |                        | 14              | 14             |        |        |       | 15              | 14         | 11.5 | 0    |        |           |           |      |   |
|                        |                        | 15              | 15             |        |        |       | 16              | 14         | 12.4 | 0    |        |           |           |      |   |
| 16                     |                        | 16              | 5–20           | 20–40  | 16–24  | M16   | 17              | 15         | 12.4 | 0    | -0.110 | 1.35      | 5         |      |   |
| 17                     |                        | 17              |                |        | 18     | 16    | 14.3            | 0          |      |      |        |           |           |      |   |
| 18                     |                        | 18              |                |        | 19     | 16    | 15.2            | 0          |      |      |        |           |           |      |   |
| 19                     |                        | 19              |                |        | 20     | 16    | 16.2            | 0          |      |      |        |           |           |      |   |
| 20                     |                        | 20              | 4–60           | 10–100 | 5–20   | 20–40 | M20             | 20         | 26   | 24   | 19     | 0         | -0.210    | 1.65 | 5 |
| 21                     |                        | 21              |                |        |        | 21    | M16             | 24         | 26   | 24   | 19     | 0         |           |      |   |
| 22                     |                        | 22              |                |        |        | 22    | M20             | 26         | 28   | 25   | 21     | 0         |           |      |   |
| 23                     | 23                     | 23              |                |        |        | M16   | 29              | 31         | 27   | 23.9 | 0      |           |           |      |   |
| 24                     | 24                     | 24              |                |        |        | M20   | 34              | 36         | 32   | 28.6 | 0      |           |           |      |   |
| 25                     | 25                     | 25              |                |        |        | M16   | —               | —          | —    | —    | —      |           |           |      |   |

⚠ When W < V, width across flats W reaches outer diameter V.

# Cantilever Shafts (Pilot – Threaded with Retaining Ring Groove)

Hex

**Cantilever Shafts – Pilot – Threaded with Retaining Ring Groove Hex**

RoHS10

| Type                |                            | Material                        | Surface Treatment          |
|---------------------|----------------------------|---------------------------------|----------------------------|
| Thread Length Fixed | Thread Length Configurable |                                 |                            |
| LXCA                | LXNCA                      | 1045 Carbon Steel or Equivalent | Black Oxide                |
| PLXCA               | PLXNCA                     |                                 | Electroless Nickel Plating |
| SLXCA               | SLXNCA                     | 304 Stainless Steel             | —                          |

Thread Length Fixed:  $6.3 / (1.6/)$

Thread Length Configurable:  $6.3 / (1.6/)$

⚠ This type may have centering holes depending on dimensions.

| Part Number Type                              | No.   | Dg <sub>6</sub> | 1 mm Increment |        |        |       | Pg <sub>6</sub> | M (Thread) | B      | (C)    | d         |           | m    | n |
|---|---|-----------------|----------------|--------|--------|-------|-----------------|------------|--------|--------|-----------|-----------|------|---|
|   |   |                 | Y              | F      | G      | ⊘ N   |                 |            |        |        | Ref. Dim. | Tolerance |      |   |
| Thread Length Fixed<br>LXCA<br>PLXCA<br>SLXCA | 3   | 3               | 2–30           | 3–50   | 3–8    | 3–6   | M3              | 6          | 6.9    | 3      | +0.060    | 0.5       | 2    |   |
|   | 4   | 4               |                |        |        | 4–8   | M4              | 3          | 0      |        |           |           |      |   |
|   | 5   | 5               |                |        |        | 5–10  | M5              | 4          | +0.075 |        |           |           |      |   |
|   | 6   | 6               | 5–100          | 5–10   | 6–12   | M6    | 7               | 8.1        | 4      | 0      | 0.7       | 3         | 2    |   |
|   | 8   | 8               |                |        | 8–16   | M8    | 8               | 9.2        | 5      | 0      |           |           |      |   |
|   | 10  | 10              |                |        | 10–20  | M10   | 10              | 11.5       | 7      | +0.090 |           |           |      |   |
|   | 12  | 12              |                |        | 12–24  | M12   | 11              | 12.4       | 4      | 0      |           |           |      |   |
|   | Thread Length Configurable<br>LXNCA<br>PLXNCA<br>SLXNCA (No. 3-15 only) | 13              | 13             | 4–60   | 10–100 | 5–15  | 12–24           | M12        | 12     | 15.0   | 9.6       | 0         | 1.15 | 4 |
|   |   | 14              | 14             |        |        |       | 15              | 14         | 11.5   | 0      |           |           |      |   |
|   |   | 15              | 15             |        |        |       | 16              | 14         | 12.4   | 0      |           |           |      |   |
| 16  |   | 16              | 5–20           | 20–40  | 16–24  | M16   | 17              | 19.6       | 12.4   | 0      | -0.110    | 1.35      | 5    |   |
| 17  |   | 17              |                |        | 18     | 16    | 14.3            | 0          |        |        |           |           |      |   |
| 18  |   | 18              |                |        | 19     | 16    | 15.2            | 0          |        |        |           |           |      |   |
| 19  |   | 19              |                |        | 20     | 16    | 16.2            | 0          |        |        |           |           |      |   |
| 20  |   | 20              | 4–60           | 10–100 | 5–20   | 20–40 | M20             | 20         | 27.7   | 19     | 0         | -0.210    | 1.65 | 5 |
| 21  |   | 21              |                |        |        | 21    | M16             | 24         | 27.7   | 19     | 0         |           |      |   |
| 22  |   | 22              |                |        |        | 22    | M20             | 26         | 28     | 21     | 0         |           |      |   |
| 23  | 23  | 23              |                |        |        | M16   | 27              | 31.2       | 23.9   | 0      |           |           |      |   |
| 24  | 24  | 24              |                |        |        | M20   | 32              | 36.9       | 28.6   | 0      |           |           |      |   |
| 25  | 25  | 25              |                |        |        | M16   | —               | —          | —      | —      |           |           |      |   |

⊕ N is available for Thread Length Configurable Type only.

**Part Number Example**

Part Number - Y - F - G - N

FXCA12 - 12 - F15 - G6

LXNCA20 - 25 - F30 - G10 - N40

**Part Number Alterations**

Part Number - Y - F - G - N - (YKC / WSC / SET)

FXCA25 - 30 - F15 - G8 - YKC

**Application Example**

| Alterations                     | Y Dimension Tolerance   | Four Wrench Flats  | Retaining Ring Set  |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
|---------------------------------|---|--|---|-------------------|--|----------------|----------|-------------------|----------|---------------------------------|-------------|--------------|---------------------|----------------------------|---------------------|------------------|-------------|--------------|---|----------------------------|---------------------|
|                                 | YKC   | WSC  |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| Code                            | YKC   | WSC  | SET   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| Spec.                           | Changes Y dimension tolerance to ±0.05.<br>⊕ Applicable to all types.<br>Ordering Code: YKC | Changes from two wrench flats to four wrench flats.<br>⊕ Applicable to Standard / Stepped Types.<br>Ordering Code: WSC | Attaches a retaining ring to each applicable shaft diameter.<br>Ordering Code: SET<br>⊕ Applicable to all types.<br>Retaining Ring Shape<br>No.3–8A: E Type Retaining Ring<br>No.10–30A: C Type Retaining Ring<br>Retaining Ring Material<br><table border="1"> <thead> <tr> <th colspan="2">Cantilever Shafts</th> <th>Retaining Ring</th> </tr> <tr> <th>Material</th> <th>Surface Treatment</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>1045 Carbon Steel or Equivalent</td> <td>Black Oxide</td> <td>Spring Steel</td> </tr> <tr> <td>304 Stainless Steel</td> <td>Electroless Nickel Plating</td> <td>304 Stainless Steel</td> </tr> <tr> <td>4137 Alloy Steel</td> <td>Black Oxide</td> <td>Spring Steel</td> </tr> <tr> <td>—</td> <td>Electroless Nickel Plating</td> <td>304 Stainless Steel</td> </tr> </tbody> </table> | Cantilever Shafts |  | Retaining Ring | Material | Surface Treatment | Material | 1045 Carbon Steel or Equivalent | Black Oxide | Spring Steel | 304 Stainless Steel | Electroless Nickel Plating | 304 Stainless Steel | 4137 Alloy Steel | Black Oxide | Spring Steel | — | Electroless Nickel Plating | 304 Stainless Steel |
| Cantilever Shafts               |   | Retaining Ring   |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| Material                        | Surface Treatment   | Material   |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| 1045 Carbon Steel or Equivalent | Black Oxide   | Spring Steel   |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| 304 Stainless Steel             | Electroless Nickel Plating  | 304 Stainless Steel  |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| 4137 Alloy Steel                | Black Oxide   | Spring Steel   |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |
| —                               | Electroless Nickel Plating  | 304 Stainless Steel  |   |                   |  |                |          |                   |          |                                 |             |              |                     |                            |                     |                  |             |              |   |                            |                     |

