

# Precision Pivot Pins

## End Shape Selectable

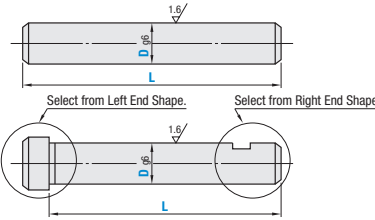
### Precision Pivot Pins – End Shape Selectable



RoHS10

Type	Material	Surface Treatment	Hardness
FCL	1045 Carbon Steel or Equivalent	Black Oxide	—
FCLH		—	40–45 HRC min.
PFCL		Electroless Nickel Plating	—
PFCLH		—	40–45 HRC min.
GFCL	304 Stainless Steel	Hard Chrome Plating	Plating Hardness 750 HV min.
FCLS		—	45–50 HRC min.
FCLSH	440C Stainless Steel Equivalent	—	45–50 HRC min.
GFCLSH		Hard Chrome Plating	Plating Hardness 750 HV min.

### Base Shape (Shape A at Both Ends)



- This type may have centering holes depending on dimensions.
- For L Dimension, Standard Machining Tolerances (Class: Medium) are used.
- When machining is needed at one end only, select Shape A for the other end.
- FCL, PFCL, FCLSH, and GFCLSH may have identification grooves on the side in order to distinguish them from Hardened Type.
- FCLSH and GFCLSH (440C Stainless Steel equivalent) may be discolored by hardening.
- When selecting shapes B and G or BG and GB for both ends, hole and flat positions are as shown in the catalog. The angle tolerance is ±5°.



- For L ≤ the depth of tap's pilot hole, the pilot hole might go through.
- Selecting Shape D (FCLDD) for both ends is not available.
- Shape D: Relief dimension under the shoulder is for reference.
- Shape F: L ≥ 11

### Shape C e / m Dimensions for Selection

D	Ref. Dims.	Tolerance	m+0.14
3	2	+0.06	0.5
4	3	0	0.5
5	4	0	0.5
6	5	+0.075	0.7
7	6	0	0.7
8	7	+0.09	0.9
9	8	0	0.9
10	9.6	0	0.9
11	10.5	-0.09	1.15
12	11.5	0	1.15
13	12.4	0	1.15
14	13.4	0	1.15
15	14.3	-0.11	1.15
16	15.2	0	1.15
17	16.2	0	1.35
18	17	0	1.35
19	18	0	1.35
20	19	-0.21	1.35

### Shape D (d) / (n) Dimensions for Selection

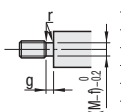
D	(d)	(n)
3	2.9	1.0-1.5
4	3.9	1.0-1.5
5	4.9	1.0-1.5
6	5.9	1.0-1.5
7	6.9	1.0-1.5
8	7.9	1.0-1.5
9	8.9	1.0-1.5
10	9.9	1.0-1.5
11	10.9	1.0-1.5
12	11.9	1.0-1.5
13	12.9	1.0-1.5
14	13.9	1.0-1.5
15	14.9	1.0-1.5
16	15.9	1.0-1.5
17	16.9	1.0-1.5
18	17.9	1.0-1.5
19	18.9	1.0-1.5
20	19.9	1.0-1.5

### Shape H W Dimension for Selection

D	W
6	1.5
7	1.5
8	1.5
9	1.5
10	1.5
11	1.5
12	1.5
13	1.5
14	1.5
15	1.5
16	1.5
17	1.5
18	1.5
19	1.5
20	1.5

### Shape E Details of Thread Relief Machining

M (Coarse Thread)	M x Pitch	g	r	f
3	M3 x 0.5	0.9	0.2-0.4	0.9
4	M4 x 0.7	1.2	0.2-0.6	1.7
5	M5 x 0.8	1.8	0.2-0.6	1.7
6	M6 x 1.0	2.5	0.2-0.6	1.7
8	M8 x 1.25	3	0.2-1.0	2.2
10	M10 x 1.5			
12	M12 x 1.75			
16	M16 x 2.0			



Left End Shape		Right End Shape	
<b>A</b>		<b>A</b>	
<b>B</b>		<b>B</b>	
<b>C</b>		<b>C</b>	
<b>D</b>		<b>D</b>	
<b>E</b>		<b>E</b>	
<b>F</b>		<b>F</b>	
<b>G</b>		<b>G</b>	
<b>H</b>		<b>H</b>	

# Precision Pivot Pins

## End Shape Selectable, continued

Type	Part Number		1 mm Increment		0.1mm Increment					0.5 mm Increment	Selection	C
	Left End Shape	Right End Shape	D	L	T (TC)	N (NC)	G (GC)	K (KC)	Y (YC)	H (HC)	M (MC) (Coarse Thread)	
FCL	A	A	3-20	5-200 (L ≤ D x 20)	0.5 ≤ T(TC) ≤ L/4	2 ≤ N(NC) ≤ L/4 (Shaft End Shape C)	D/5 ≤ G(GC) ≤ D/2	2 ≤ K(KC) ≤ 30	Y(YC) ≤ D/2	D+1 ≤ H(HC) ≤ D+10	3	0.5 or Less
FCLH	B	B	4 ≤ D (Shaft End Shape E)			G(GC), M(MC)/2+1 ≤ N(NC) ≤ L/4 (Shaft End Shape B)					4	
PFCL	C	C	6 ≤ D (Shaft End Shape B / F / H)	0 ≤ N(NC) ≤ L/4 (Shaft End Shape G)	5							
PFCLH	D	D		2 ≤ N(NC) ≤ L/4 (Shaft End Shape H)	6							
GFCL	E	E			8							
FCLSH	F	F			10							
GFCLSH	G	G			12							
	H	H			16							
					(M(MC) ≤ D/2) (Shaft End Shape B)							
					(M(MC) < D) (Shaft End Shape E)							
					(M(MC) ≤ D-3) (Shaft End Shape F)							

**Part Number Example**

Type: FCL, Left End: D, Right End: G, D: D10, L: L100, T: T2, H: H14, NC: NC10, KC: KC6.5, YC: YC1.5

Type	D	Available Types				Available Types of Shaft End Machining							
		Left Shaft: A Shape	Right Shaft: A Shape	B	C	D	E	F	G	H			
FCL	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
FCLH	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
PFCL	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
PFCLH	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
GFCL	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
FCLS	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
FCLSH	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•
GFCLSH	3-5	•	•	•	•	•	•	•	•	•	•	•	•
	6-10	•	•	•	•	•	•	•	•	•	•	•	•
	11-15	•	•	•	•	•	•	•	•	•	•	•	•
	16-20	•	•	•	•	•	•	•	•	•	•	•	•

**Part Number Alterations**

Type: FCL, Left End: D, Right End: G, D: D10, L: L100, T: T2, H: H14, NC: NC10, KC: KC6.5, YC: YC1.5, MC: MC13, DKC

Alterations	Shape D: T (TC) Dimension, Wrench Flats		Shape E M (MC) Length Change		Outer Dia. Tolerance
	Left End Shape	Right End Shape	Left End Shape	Right End Shape	
Code	LFC	RFC	LBC	RBC	DKC
Spec.	Ordering Code: LFC (RFC) 10 LFC (RFC) = 0.5 mm Increment D ≤ LFC(RFC) < H(HC)		Ordering Code: LBC (RBC) 20 LBC (RBC) = 0.5 mm Increment 4 ≤ LBC(RBC) ≤ M(MC) x 3		Changes outer diameter tolerance to h6. Ordering Code: DKC
	Type	LBC (RBC)	Type	LBC (RBC)	
	M3	3-9	M10	7-30	
	M4	3.5-12	M12	8.5-36	
	M5	4-15	M16	9-48	
	M6	5.5-18			
	M8	6.5-24			