

LOCATORS



Locating Pins



Construction Balls



Fixture Keys

6

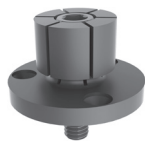
Also see:



**Center Locating Keys
for Rotary Tables**
p. 382



Fixture Locating Pins
p. 416



Internal Clamps
p. 308-309



Carr Lock® System
p. 358-372



**CL5® Quick-Change
5-Axis Workholding**
p. 373-394



Rest Buttons & Pads
p. 218-222

LOCATING PINS

TYPES



ROUND & DIAMOND PINS

Precision locating pins with a chamfered tip for easy part loading, and a shoulder to resist downward forces. Round Pins and Diamond Pins are frequently used together to locate from two holes in a workpiece, or align two pieces of a fixture, without binding.



ROUND & DIAMOND LOCATING PINS

Functionally similar to Round and Diamond Pins, except with a wider selection of head diameters (including any custom diameter from .1150" to 1.0400") and a large shoulder to resist downward forces. Frequently used together to locate from two holes in a workpiece without binding.



FLOATING LOCATING PINS

These locating pins slide in a slotted bushing to provide precise location in one axis while allowing considerable float in the perpendicular axis. Functionally similar to Diamond Pins, except that they allow greater variation in hole spacing.



BULLET-NOSE DOWELS

Precision locating pin often used with a mating bushing to align two pieces of a fixture.



BULLET-NOSE PINS

Bullet-nose round pins and diamond pins are often used together, each with a mating bushing, to align two pieces of a fixture. The pin's shank diameter and the bushing's OD are the same size, to allow boring the installation hole in both fixture pieces at the same time, for greater accuracy.



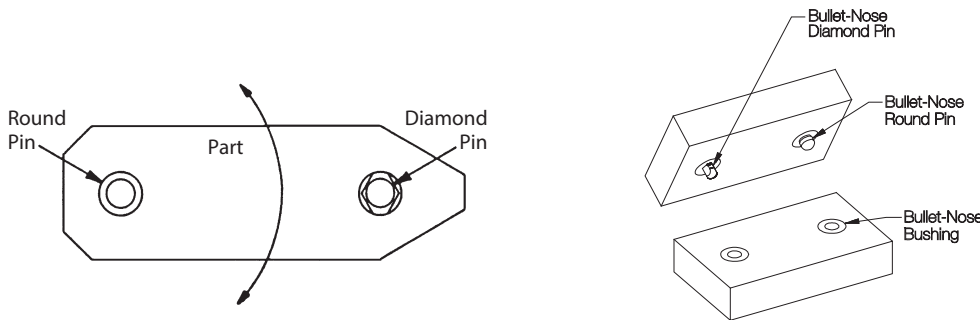
CONE-LOCATOR PINS

Medium-accuracy tapered locating pin used with a mating tapered bushing. Can be used for quick assembly of two fixture pieces.

6

TECHNICAL INFORMATION

Round Pins and Diamond Pins are frequently used together. Diamond Pins are relieved to locate only radially around the Round Pin, avoiding redundant location. This prevents binding while loading and unloading the part, yet still maintains high accuracy. The Round Pin serves as the primary, 2-axis locator, while the Diamond Pin is the secondary, 1-axis locator.



ROUND & DIAMOND PINS

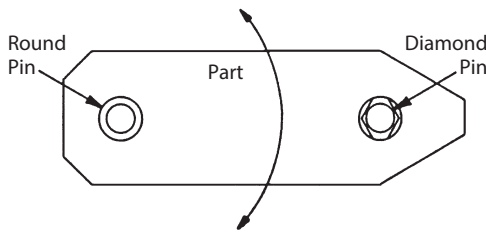
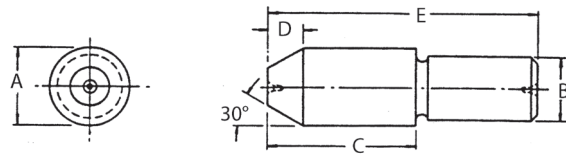
1144 STEEL, HEAT TREATED RC 50-55 BLACK OXIDE FINISH



Round Pin



Diamond Pin



These precision locating pins have a chamfered tip for easy part loading, and a shoulder to resist downward forces – important advantages over standard dowel pins. One Round Pin and one Diamond Pin are often used together to locate from two machined holes in a workpiece, or to align two pieces of a fixture, without binding. Diamond Pins are relieved, to locate in only 1 axis. Round Pins are also extremely useful as side locators. Head and shank diameters are concentric to within .0005" TIR. Available with head diameters from 1/4 to 1" (6 to 20mm in metric).

ROUND PINS (INCH)

| PART NO. | A HEAD DIA | | B SHANK DIA | | C | D | E |
|----------|------------|-------------|-------------|-------------|--------|------|-------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | | | |
| CL-1-RP | 1/4 | .2495/.2492 | 3/16 | .1878/.1876 | 11/32 | 3/32 | 3/4 |
| CL-2-RP | 5/16 | .3120/.3117 | 1/4 | .2503/.2501 | 13/32 | | 7/8 |
| CL-3-RP | 3/8 | .3745/.3742 | 5/16 | .3128/.3126 | 1/2 | 1/8 | 1 |
| CL-4-RP | 7/16 | .4370/.4367 | 3/8 | .3753/.3751 | 19/32 | 5/32 | 1-1/4 |
| CL-5-RP | 1/2 | .4995/.4992 | 7/16 | .4378/.4376 | 21/32 | | 1-3/8 |
| CL-6-RP | 9/16 | .5620/.5617 | 1/2 | .5003/.5001 | 3/4 | 3/16 | 1-1/2 |
| CL-7-RP | 5/8 | .6240/.6237 | 9/16 | .5628/.5626 | 27/32 | 7/32 | 1-3/4 |
| CL-8-RP | 11/16 | .6865/.6862 | 5/8 | .6253/.6251 | 29/32 | | 2 |
| CL-9-RP | 3/4 | .7490/.7487 | 11/16 | .6885/.6880 | 1 | 1/4 | 2-1/8 |
| CL-10-RP | 13/16 | .8115/.8112 | 3/4 | .7510/.7505 | 1-3/32 | 9/32 | 2-1/4 |
| CL-11-RP | 7/8 | .8740/.8737 | 13/16 | .8135/.8130 | 1-5/32 | | 2-1/2 |
| CL-12-RP | 15/16 | .9365/.9362 | 7/8 | .8760/.8755 | 1-1/4 | 5/16 | 2-3/4 |
| CL-13-RP | 1 | .9985/.9980 | 15/16 | .9385/.9380 | 1-5/16 | | 2-7/8 |

ROUND PINS (METRIC)

| PART NO. | A HEAD DIA | A HEAD DIA | B SHANK DIA | B SHANK DIA | C | D | E |
|------------|--------------|-----------------|--------------|-----------------|------|-----|------|
| | NOMINAL (mm) | ACTUAL (mm) | NOMINAL (mm) | ACTUAL (mm) | | | |
| CLM-60-RP | 6 | 5.987 / 5.979 | 5 | 5.008 / 5.002 | 8.5 | 2.4 | 19 |
| CLM-80-RP | 8 | 7.987 / 7.979 | 6 | 6.008 / 6.002 | 10.5 | 2.4 | 22 |
| CLM-100-RP | 10 | 9.987 / 9.979 | 8 | 8.008 / 8.002 | 12.5 | 3.2 | 25.5 |
| CLM-120-RP | 12 | 11.987 / 11.979 | 10 | 10.008 / 10.002 | 16.5 | 4 | 35 |
| CLM-140-RP | 14 | 13.987 / 13.979 | 12 | 12.008 / 12.002 | 19 | 4.8 | 38 |
| CLM-160-RP | 16 | 15.975 / 15.967 | 14 | 14.008 / 14.002 | 21.5 | 5.5 | 44.5 |
| CLM-180-RP | 18 | 17.975 / 17.967 | 16 | 16.008 / 16.002 | 23 | 5.5 | 51 |
| CLM-200-RP | 20 | 19.975 / 19.967 | 18 | 18.026 / 18.012 | 28 | 7 | 57 |

Also available with LIFE-EX® coating!

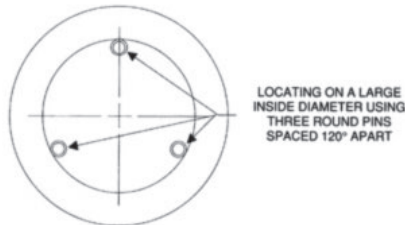
Many sizes of Round & Diamond Pins are available with our proprietary LIFE-EX® coating. This PVD coating is very hard, abrasion resistant, and slippery, resulting in a component that has a longer lifecycle for high-production applications. This extended lifecycle allows these items to remain in production longer with less need for replacement than standard uncoated items.

LIFE-EX® ROUND PINS (INCH)

| PART NO. | A HEAD DIA | | B SHANK DIA | | C | D | E |
|------------|------------|-------------|-------------|-------------|-------|------|-------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | | | |
| CL-2-RP-LX | 5/16 | .3120/.3117 | 1/4 | .2503/.2501 | 13/32 | 3/32 | 7/8 |
| CL-3-RP-LX | 3/8 | .3745/.3742 | 5/16 | .3128/.3126 | 1/2 | 1/8 | 1 |
| CL-5-RP-LX | 1/2 | .4995/.4992 | 7/16 | .4378/.4376 | 21/32 | 5/32 | 1-3/8 |

LIFE-EX® ROUND PINS (METRIC)

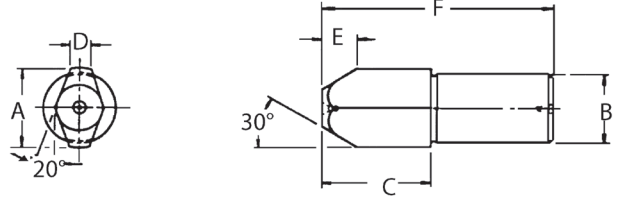
| PART NO. | A HEAD DIA | A HEAD DIA | B SHANK DIA | B SHANK DIA | C | D | E |
|---------------|--------------|-----------------|--------------|-----------------|------|-----|------|
| | NOMINAL (mm) | ACTUAL (mm) | NOMINAL (mm) | ACTUAL (mm) | | | |
| CLM-80-RP-LX | 8 | 7.987 / 7.979 | 6 | 6.008 / 6.002 | 10.5 | 2.4 | 22 |
| CLM-100-RP-LX | 10 | 9.987 / 9.979 | 8 | 8.008 / 8.002 | 12.5 | 3.2 | 25.5 |
| CLM-120-RP-LX | 12 | 11.987 / 11.979 | 10 | 10.008 / 10.002 | 16.5 | 4 | 35 |



A series of locating pins can be used to locate a large diameter, instead of making a custom locating plug. In this example, three Round Pins are positioned 120° apart around the internal diameter of a large bored hole.

ROUND & DIAMOND PINS

1144 STEEL, HEAT TREATED RC 50-55 BLACK OXIDE FINISH



DIAMOND PINS (INCH)

| PART NO. | | | A HEAD DIA | | | | B SHANK DIA | | C | D | E | F |
|-----------|------------|-----------|------------|-------------|-------------|-------------|-------------|-------------|--------|------|------|-------|
| X (Tight) | Y (Medium) | Z (Loose) | NOMINAL | X | Y | Z | NOMINAL | ACTUAL | | | | |
| CL-1-DPX | CL-1-DPY | CL-1-DPZ | 1/4 | .2493/.2490 | .2485/.2482 | .2470/.2467 | 3/16 | .1878/.1876 | 11/32 | .062 | 3/32 | 3/4 |
| CL-2-DPX | CL-2-DPY | CL-2-DPZ | 5/16 | .3118/.3115 | .3110/.3107 | .3095/.3092 | 1/4 | .2503/.2501 | 13/32 | .078 | | 7/8 |
| CL-3-DPX | CL-3-DPY | CL-3-DPZ | 3/8 | .3743/.3740 | .3735/.3732 | .3720/.3717 | 5/16 | .3128/.3126 | 1/2 | .093 | 1/8 | 1 |
| CL-4-DPX | CL-4-DPY | CL-4-DPZ | 7/16 | .4368/.4365 | .4360/.4357 | .4345/.4342 | 3/8 | .3753/.3751 | 19/32 | .109 | 5/32 | 1-1/4 |
| CL-5-DPX | CL-5-DPY | CL-5-DPZ | 1/2 | .4993/.4990 | .4985/.4982 | .4970/.4967 | 7/16 | .4378/.4376 | 21/32 | .125 | | 1-3/8 |
| CL-6-DPX | CL-6-DPY | CL-6-DPZ | 9/16 | .5615/.5610 | .5595/.5590 | .5575/.5570 | 1/2 | .5003/.5001 | 3/4 | .140 | 3/16 | 1-1/2 |
| CL-7-DPX | CL-7-DPY | CL-7-DPZ | 5/8 | .6240/.6235 | .6220/.6215 | .6200/.6195 | 9/16 | .5628/.5626 | 27/32 | .156 | 7/32 | 1-3/4 |
| CL-8-DPX | CL-8-DPY | CL-8-DPZ | 11/16 | .6865/.6860 | .6845/.6840 | .6825/.6820 | 5/8 | .6253/.6251 | 29/32 | .172 | | 2 |
| CL-9-DPX | CL-9-DPY | CL-9-DPZ | 3/4 | .7490/.7485 | .7470/.7465 | .7450/.7445 | 11/16 | .6885/.6880 | 1 | .187 | 1/4 | 2-1/8 |
| CL-11-DPX | CL-11-DPY | CL-11-DPZ | 7/8 | .8740/.8735 | .8720/.8715 | .8700/.8695 | 13/16 | .8135/.8130 | 1-5/32 | .219 | 9/32 | 2-1/2 |
| CL-13-DPX | CL-13-DPY | CL-13-DPZ | 1 | .9980/.9972 | .9960/.9952 | .9920/.9912 | 15/16 | .9385/.9380 | 1-5/16 | .250 | 5/16 | 2-7/8 |

DIAMOND PINS (METRIC)

| PART NO. | A HEAD DIA NOMINAL (mm) | A HEAD DIA ACTUAL (mm) | B SHANK DIA NOMINAL (mm) | B SHANK DIA ACTUAL (mm) | C (mm) | D (mm) | E (mm) | F (mm) |
|-------------|-------------------------|------------------------|--------------------------|-------------------------|--------|--------|--------|--------|
| CLM-60-DPX | 6 | 5.982 / 5.974 | 5 | 5.008 / 5.002 | 8.5 | 1.57 | 2.4 | 19 |
| CLM-60-DPY | 6 | 5.961 / 5.954 | 5 | 5.008 / 5.002 | 8.5 | 1.57 | 2.4 | 19 |
| CLM-60-DPZ | 6 | 5.923 / 5.916 | 5 | 5.008 / 5.002 | 8.5 | 1.57 | 2.4 | 19 |
| CLM-80-DPX | 8 | 7.983 / 7.976 | 6 | 6.008 / 6.002 | 10.5 | 1.98 | 2.4 | 22 |
| CLM-80-DPY | 8 | 7.963 / 7.955 | 6 | 6.008 / 6.002 | 10.5 | 1.98 | 2.4 | 22 |
| CLM-80-DPZ | 8 | 7.925 / 7.917 | 6 | 6.008 / 6.002 | 10.5 | 1.98 | 2.4 | 22 |
| CLM-100-DPX | 10 | 9.982 / 9.975 | 8 | 8.008 / 8.002 | 12.5 | 2.36 | 3.2 | 25.5 |
| CLM-100-DPY | 10 | 9.962 / 9.954 | 8 | 8.008 / 8.002 | 12.5 | 2.36 | 3.2 | 25.5 |
| CLM-100-DPZ | 10 | 9.924 / 9.916 | 8 | 8.008 / 8.002 | 12.5 | 2.36 | 3.2 | 25.5 |
| CLM-120-DPX | 12 | 11.981 / 11.974 | 10 | 10.008 / 10.002 | 16.5 | 3.18 | 4 | 35 |
| CLM-120-DPY | 12 | 11.961 / 11.953 | 10 | 10.008 / 10.002 | 16.5 | 3.18 | 4 | 35 |
| CLM-120-DPZ | 12 | 11.923 / 11.915 | 10 | 10.008 / 10.002 | 16.5 | 3.18 | 4 | 35 |
| CLM-140-DPX | 14 | 13.975 / 13.962 | 12 | 12.008 / 12.002 | 19 | 3.56 | 4.8 | 38 |
| CLM-140-DPY | 14 | 13.924 / 13.912 | 12 | 12.008 / 12.002 | 19 | 3.56 | 4.8 | 38 |
| CLM-140-DPZ | 14 | 13.873 / 13.861 | 12 | 12.008 / 12.002 | 19 | 3.56 | 4.8 | 38 |
| CLM-160-DPX | 16 | 15.974 / 15.961 | 14 | 14.008 / 14.002 | 21.5 | 3.96 | 5.5 | 44.5 |
| CLM-160-DPY | 16 | 15.923 / 15.910 | 14 | 14.008 / 14.002 | 21.5 | 3.96 | 5.5 | 44.5 |
| CLM-160-DPZ | 16 | 15.872 / 15.860 | 14 | 14.008 / 14.002 | 21.5 | 3.96 | 5.5 | 44.5 |
| CLM-180-DPX | 18 | 17.976 / 17.963 | 16 | 16.008 / 16.002 | 23 | 4.37 | 5.5 | 51 |
| CLM-180-DPY | 18 | 17.925 / 17.912 | 16 | 16.008 / 16.002 | 23 | 4.37 | 5.5 | 51 |
| CLM-180-DPZ | 18 | 17.874 / 17.861 | 16 | 16.008 / 16.002 | 23 | 4.37 | 5.5 | 51 |
| CLM-200-DPX | 20 | 19.974 / 19.962 | 18 | 18.026 / 18.012 | 28 | 5.16 | 7 | 57 |
| CLM-200-DPY | 20 | 19.924 / 19.911 | 18 | 18.026 / 18.012 | 28 | 5.16 | 7 | 57 |
| CLM-200-DPZ | 20 | 19.873 / 19.860 | 18 | 18.026 / 18.012 | 28 | 5.16 | 7 | 57 |

Also available with LIFE-EX® coating!

Many sizes of Round & Diamond Pins are available with our proprietary LIFE-EX® coating. This PVD coating is very hard, abrasion resistant, and slippery, resulting in a component that has a longer lifecycle for high-production applications. This extended lifecycle allows these items to remain in production longer with less need for replacement than standard uncoated items.

LIFE-EX® DIAMOND PINS (INCH)

| PART NO. | | | A HEAD DIA | | | | B SHANK DIA | | C | D | E | F |
|-------------|------------|-----------|------------|-------------|-------------|-------------|-------------|-------------|-------|------|------|-------|
| X (Tight) | Y (Medium) | Z (Loose) | NOMINAL | X | Y | Z | NOMINAL | ACTUAL | | | | |
| CL-2-DPX-LX | — | — | 5/16 | .3118/.3115 | .3110/.3107 | .3095/.3092 | 1/4 | .2503/.2501 | 13/32 | .078 | 3/32 | 7/8 |
| CL-3-DPX-LX | — | — | 3/8 | .3743/.3740 | .3735/.3732 | .3720/.3717 | 5/16 | .3128/.3126 | 1/2 | .093 | 1/8 | 1 |
| CL-5-DPX-LX | — | — | 1/2 | .4993/.4990 | .4985/.4982 | .4970/.4967 | 7/16 | .4378/.4376 | 21/32 | .125 | 5/32 | 1-3/8 |

LIFE-EX® DIAMOND PINS (METRIC)

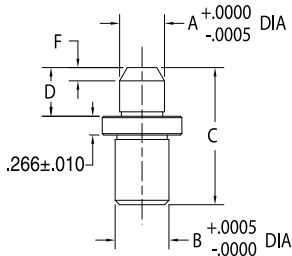
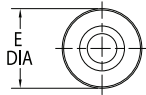
| | | | | | | | | | | | | |
|----------------|---|---|------|-------------|-------------|-------------|-----|-------------|-------|------|------|-----|
| CLM-60-DPX-LX | — | — | 6mm | .2357/.2354 | .2347/.2344 | .2332/.2329 | 5mm | .1972/.1970 | 11/32 | .062 | 3/32 | 3/4 |
| CLM-80-DPX-LX | — | — | 8mm | .3145/.3142 | .3135/.3132 | .3120/.3117 | 6mm | .2365/.2363 | 13/32 | .078 | | 7/8 |
| CLM-100-DPX-LX | — | — | 10mm | .3932/.3929 | .3922/.3919 | .3907/.3904 | 8mm | .3153/.3151 | 1/2 | .093 | 1/8 | 1 |

ROUND & DIAMOND LOCATING PINS

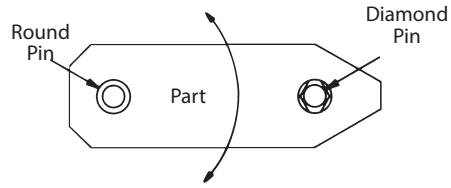
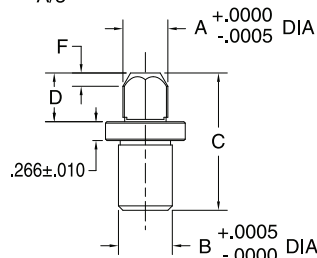
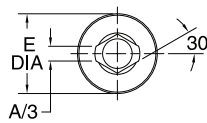
1144 STEEL, HEAT TREATED RC 50-55, BLACK OXIDE FINISH



**Press-Fit Type
Round Pin**

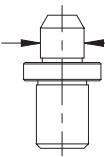


**Press-Fit Type
Diamond Pin**



These precision locating pins are especially useful for workpiece location because of the wide selection of head diameters available to fit machined holes in the part. In addition to standard diameters, these pins are also quickly made to order in any special head diameter from .1150" to 1.0400" in .0001" increments. One Round Locating Pin and one Diamond Locating Pin is relieved to locate in only 1 axis. The type shown here, with a press-fit shank, is designed for permanent installation.

Round & Diamond Locating Pins are available in four standard shank diameters, each with a range of standard head diameters in 1/32" increments (2mm increments in metric), each available in either standard or undersize fit. Head and shank diameters are concentric to within .0005" TIR. Made in USA.



Special head diameters (A dimensions) are readily available in any of the four standard shank diameters:

- 5 = 5/16" shank (.1150-.3180 head dia)
- 8 = 1/2" shank (.2780-.5040 head dia)
- 12 = 3/4" shank (.4640-.7540 head dia)
- 16 = 1" shank (.7140-1.0040 head dia)

Example: For a press-fit round pin with a 1/2-inch shank and A=.4000 inches, order CL-8-RPT-.4000.

PRESS-FIT TYPE (INCH)

| ROUND PIN PART NO. | DIAMOND PIN PART NO. | B SHANK DIA | A HEAD DIA | | C | D | E DIA | F |
|--------------------|----------------------|-------------|------------|--------|--------|------|-------|------|
| | | | NOMINAL | ACTUAL | | | | |
| CL-123-RPT | CL-123-DPT | 5/16 | 1/8 | .1235 | 1-3/16 | 7/16 | 5/8 | 3/32 |
| CL-124-RPT | CL-124-DPT | | | .1245 | | | | |
| CL-154-RPT | CL-154-DPT | | 5/32 | .1548 | | | | |
| CL-155-RPT | CL-155-DPT | | | .1558 | | | | |
| CL-186-RPT | CL-186-DPT | | 3/16 | .1860 | | | | |
| CL-187-RPT | CL-187-DPT | | | .1870 | | | | |
| CL-217-RPT | CL-217-DPT | | 7/32 | .2173 | | | | |
| CL-218-RPT | CL-218-DPT | | | .2183 | | | | |
| CL-248-RPT | CL-248-DPT | | 1/4 | .2485 | | | | |
| CL-249-RPT | CL-249-DPT | | | .2495 | | | | |
| CL-279-RPT | CL-279-DPT | | 9/32 | .2798 | | | | |
| CL-280-RPT | CL-280-DPT | | | .2808 | | | | |
| CL-311-RPT | CL-311-DPT | 5/16 | .3110 | | | | | |
| CL-312-RPT | CL-312-DPT | | .3120 | | | | | |
| CL-310-RPT | CL-310-DPT | 1/2 | 5/16 | .3105 | 1-1/2 | 1/2 | 7/8 | 1/8 |
| CL-3115-RPT | CL-3115-DPT | | | .3115 | | | | |
| CL-341-RPT | CL-341-DPT | | 11/32 | .3418 | | | | |
| CL-342-RPT | CL-342-DPT | | | .3428 | | | | |
| CL-373-RPT | CL-373-DPT | | 3/8 | .3730 | | | | |
| CL-374-RPT | CL-374-DPT | | | .3740 | | | | |
| CL-404-RPT | CL-404-DPT | | 13/32 | .4043 | | | | |
| CL-405-RPT | CL-405-DPT | | | .4053 | | | | |
| CL-435-RPT | CL-435-DPT | | 7/16 | .4355 | | | | |
| CL-436-RPT | CL-436-DPT | | | .4365 | | | | |
| CL-466-RPT | CL-466-DPT | | 15/32 | .4668 | | | | |
| CL-467-RPT | CL-467-DPT | | | .4678 | | | | |
| CL-498-RPT | CL-498-DPT | 1/2 | .4980 | | | | | |
| CL-499-RPT | CL-499-DPT | | .4990 | | | | | |

CONTINUED ON NEXT PAGE

ROUND & DIAMOND LOCATING PINS

| ROUND PIN PART NO. | DIAMOND PIN PART NO. | B SHANK DIA | A HEAD DIA | | C | D | E DIA | F | | | | | |
|------------------------------|-------------------------|----------------|------------|--------|---------|-------|-------|------|-------|-------|---|-------|------|
| | | | NOMINAL | ACTUAL | | | | | | | | | |
| CONTINUED FROM PREVIOUS PAGE | | | | | | | | | | | | | |
| CL-4980-RPT | CL-4980-DPT | 3/4 | 1/2 | .4980 | 1-15/16 | 11/16 | 1-1/8 | 3/16 | | | | | |
| CL-4990-RPT | CL-4990-DPT | | | .4990 | | | | | | | | | |
| CL-529-RPT | CL-529-DPT | | 17/32 | .5293 | | | | | | | | | |
| CL-530-RPT | CL-530-DPT | | | .5303 | | | | | | | | | |
| CL-560-RPT | CL-560-DPT | | 9/16 | .5605 | | | | | | | | | |
| CL-561-RPT | CL-561-DPT | | | .5615 | | | | | | | | | |
| CL-591-RPT | CL-591-DPT | | 19/32 | .5918 | | | | | | | | | |
| CL-592-RPT | CL-592-DPT | | | .5928 | | | | | | | | | |
| CL-623-RPT | CL-623-DPT | | 5/8 | .6230 | | | | | | | | | |
| CL-624-RPT | CL-624-DPT | | | .6240 | | | | | | | | | |
| CL-654-RPT | CL-654-DPT | | 21/32 | .6543 | | | | | | | | | |
| CL-655-RPT | CL-655-DPT | | | .6553 | | | | | | | | | |
| CL-685-RPT | CL-685-DPT | | 11/16 | .6855 | | | | | | | | | |
| CL-686-RPT | CL-686-DPT | | | .6865 | | | | | | | | | |
| CL-716-RPT | CL-716-DPT | | 23/32 | .7168 | | | | | | | | | |
| CL-717-RPT | CL-717-DPT | | | .7178 | | | | | | | | | |
| CL-748-RPT | CL-748-DPT | | 3/4 | .7480 | | | | | | | | | |
| CL-749-RPT | CL-749-DPT | | | .7490 | | | | | | | | | |
| CL-7480-RPT | CL-7480-DPT | | 1 | 3/4 | | | | | .7480 | 2-5/8 | 1 | 1-1/2 | 9/32 |
| CL-7490-RPT | CL-7490-DPT | | | | | | | | .7490 | | | | |
| CL-779-RPT | CL-779-DPT | 25/32 | | .7793 | | | | | | | | | |
| CL-780-RPT | CL-780-DPT | | | .7803 | | | | | | | | | |
| CL-810-RPT | CL-810-DPT | 13/16 | | .8105 | | | | | | | | | |
| CL-811-RPT | CL-811-DPT | | | .8115 | | | | | | | | | |
| CL-841-RPT | CL-841-DPT | 27/32 | | .8418 | | | | | | | | | |
| CL-842-RPT | CL-842-DPT | | | .8428 | | | | | | | | | |
| CL-873-RPT | CL-873-DPT | 7/8 | | .8730 | | | | | | | | | |
| CL-874-RPT | CL-874-DPT | | | .8740 | | | | | | | | | |
| CL-904-RPT | CL-904-DPT | 29/32 | | .9043 | | | | | | | | | |
| CL-905-RPT | CL-905-DPT | | | .9053 | | | | | | | | | |
| CL-935-RPT | CL-935-DPT | 15/16 | | .9355 | | | | | | | | | |
| CL-936-RPT | CL-936-DPT | | | .9365 | | | | | | | | | |
| CL-966-RPT | CL-966-DPT | 31/32 | | .9668 | | | | | | | | | |
| CL-967-RPT | CL-967-DPT | | | .9678 | | | | | | | | | |
| CL-998-RPT | CL-998-DPT | 1 | | .9980 | | | | | | | | | |
| CL-999-RPT | CL-999-DPT | | | .9990 | | | | | | | | | |

6

PRESS-FIT TYPE (METRIC)

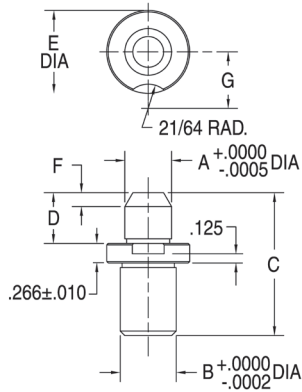
| PART NO. | B SHANK DIA | A DIA NOMINAL (mm) | A DIA ACTUAL (mm) | C (mm) | D (mm) | E DIA (mm) | F (mm) |
|-----------------|-------------------|-----------------------------|----------------------------|-----------|-----------|------------------|-----------|
| CL-5-RPT-.2347 | 5/16" | 6 | 5.961 | 30 | 11 | 16 | 2.4 |
| CL-5-RPT-.2357 | | | 5.987 | | | | |
| CL-8-RPT-.3130 | 1/2" | 8 | 7.950 | 38 | 12.5 | 22 | 3.2 |
| CL-8-RPT-.3140 | | | 7.976 | | | | |
| CL-8-RPT-.3917 | | 10 | 9.949 | | | | |
| CL-8-RPT-.3927 | | | 9.974 | | | | |
| CL-8-RPT-.4704 | | 12 | 11.948 | | | | |
| CL-8-RPT-.4714 | | | 11.974 | | | | |
| CL-12-RPT-.5492 | 3/4" | 14 | 13.950 | 49 | 17.5 | 28.5 | 4.8 |
| CL-12-RPT-.5502 | | | 13.975 | | | | |
| CL-12-RPT-.6279 | | 16 | 15.949 | | | | |
| CL-12-RPT-.6289 | | | 15.974 | | | | |
| CL-12-RPT-.7067 | | 18 | 17.950 | | | | |
| CL-12-RPT-.7077 | | | 17.976 | | | | |
| CL-16-RPT-.7854 | 1" | 20 | 19.949 | 66.5 | 25.5 | 38 | 7 |
| CL-16-RPT-.7864 | | | 19.974 | | | | |

ROUND & DIAMOND LOCATING PINS

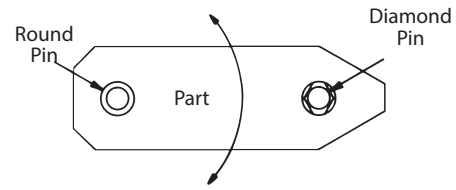
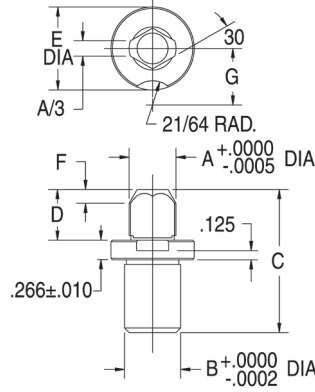
1144 STEEL, HEAT TREATED RC 50-55, BLACK OXIDE FINISH



**Lockscrew-Type
Round Pin**

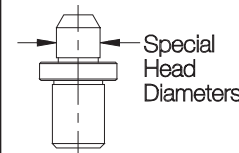


**Lockscrew-Type
Diamond Pin**



These precision locating pins are especially useful for workpiece location because of the wide selection of head diameters available to fit machined holes in the part. In addition to standard diameters, these pins are also quickly made to order in any special head diameter from .1150" to 1.0400" in .0001" increments. One Round Locating Pin and one Diamond Locating Pin is relieved to locate in only 1 axis. The type shown here, with a slip-fit shank and lockscrew slot, is designed for renewable installation.

Round & Diamond Locating Pins are available in four standard shank diameters, each with a range of standard head diameters in 1/32" increments (2mm increments in metric), each available in either standard or undersize fit. Head and shank diameters are concentric to within .0005" TIR. Made in USA.



Special head diameters (A dimensions) are readily available in any of the four standard shank diameters:

- 5 = 5/16" shank (.1150-.3180 head dia)
- 8 = 1/2" shank (.2780-.5040 head dia)
- 12 = 3/4" shank (.4640-.7540 head dia)
- 16 = 1" shank (.7140-1.0040 head dia)

Example: For a press-fit round pin with a 1/2-inch shank and A=.4000 inches, order CL-8-RLT-4000.

LOCKSCREW TYPE (INCH)

| ROUND PIN PART NO. | DIAMOND PIN PART NO. | B SHANK DIA | A HEAD DIA | | C | D | E DIA | F | G | LINER PART NO. | HEAD LINER PART NO. | LOCK- SCREW PART NO. |
|-----------------------|-------------------------|----------------|------------|--------|--------|------|-------|------|-------|-------------------|---------------------------|----------------------------|
| | | | NOMINAL | ACTUAL | | | | | | | | |
| CL-123-RLT | CL-123-DLT | 5/16 | 1/8 | .1235 | 1-3/16 | 7/16 | 5/8 | 3/32 | 33/64 | L-32-8 | HL-32-8 | LS-1 |
| CL-124-RLT | CL-124-DLT | | | .1245 | | | | | | | | |
| CL-154-RLT | CL-154-DLT | | | .1548 | | | | | | | | |
| CL-155-RLT | CL-155-DLT | | 5/32 | .1558 | | | | | | | | |
| CL-186-RLT | CL-186-DLT | | 3/16 | .1860 | | | | | | | | |
| CL-187-RLT | CL-187-DLT | | | .1870 | | | | | | | | |
| CL-217-RLT | CL-217-DLT | | | .2173 | | | | | | | | |
| CL-218-RLT | CL-218-DLT | | 7/32 | .2183 | | | | | | | | |
| CL-248-RLT | CL-248-DLT | | 1/4 | .2485 | | | | | | | | |
| CL-249-RLT | CL-249-DLT | | | .2495 | | | | | | | | |
| CL-279-RLT | CL-279-DLT | | | .2798 | | | | | | | | |
| CL-280-RLT | CL-280-DLT | | 9/32 | .2808 | | | | | | | | |
| CL-311-RLT | CL-311-DLT | 5/16 | .3110 | | | | | | | | | |
| CL-312-RLT | CL-312-DLT | | .3120 | | | | | | | | | |
| CL-310-RLT | CL-310-DLT | | .3105 | | | | | | | | | |
| CL-3115-RLT | CL-3115-DLT | 5/16 | .3115 | | | | | | | | | |
| CL-341-RLT | CL-341-DLT | 11/32 | .3418 | | | | | | | | | |
| CL-342-RLT | CL-342-DLT | | .3428 | | | | | | | | | |
| CL-373-RLT | CL-373-DLT | | .3730 | | | | | | | | | |
| CL-374-RLT | CL-374-DLT | 3/8 | .3740 | | | | | | | | | |
| CL-404-RLT | CL-404-DLT | 13/32 | .4043 | | | | | | | | | |
| CL-405-RLT | CL-405-DLT | | .4053 | | | | | | | | | |
| CL-435-RLT | CL-435-DLT | | .4355 | | | | | | | | | |
| CL-436-RLT | CL-436-DLT | 7/16 | .4365 | | | | | | | | | |
| CL-466-RLT | CL-466-DLT | 15/32 | .4668 | | | | | | | | | |
| CL-467-RLT | CL-467-DLT | | .4678 | | | | | | | | | |
| CL-498-RLT | CL-498-DLT | | .4980 | | | | | | | | | |
| CL-499-RLT | CL-499-DLT | 1/2 | .4990 | | | | | | | | | |

CONTINUED ON NEXT PAGE

ROUND & DIAMOND LOCATING PINS

| ROUND PIN PART NO. | DIAMOND PIN PART NO. | B SHANK DIA | A HEAD DIA | | C | D | E DIA | F | G | LINER PART NO. | HEAD LINER PART NO. | LOCK- SCREW PART NO. |
|-----------------------|-------------------------|----------------|------------|--------|---|---|-------|---|---|-------------------|---------------------------|----------------------------|
| | | | NOMINAL | ACTUAL | | | | | | | | |

CONTINUED FROM PREVIOUS PAGE

| | | | | | | | | | | | | |
|-------------|-------------|-------|-------|-------|---------|-------|-------|------|-------|---------|----------|------|
| CL-4980-RLT | CL-4980-DLT | 3/4 | 1/2 | .4980 | 1-15/16 | 11/16 | 1-1/8 | 3/16 | 49/64 | L-64-16 | HL-64-16 | LS-1 |
| CL-4990-RLT | CL-4990-DLT | | | .4990 | | | | | | | | |
| CL-529-RLT | CL-529-DLT | | 17/32 | .5293 | | | | | | | | |
| CL-530-RLT | CL-530-DLT | | | .5303 | | | | | | | | |
| CL-560-RLT | CL-560-DLT | | 9/16 | .5605 | | | | | | | | |
| CL-561-RLT | CL-561-DLT | | | .5615 | | | | | | | | |
| CL-591-RLT | CL-591-DLT | | 19/32 | .5918 | | | | | | | | |
| CL-592-RLT | CL-592-DLT | | | .5928 | | | | | | | | |
| CL-623-RLT | CL-623-DLT | | 5/8 | .6230 | | | | | | | | |
| CL-624-RLT | CL-624-DLT | | | .6240 | | | | | | | | |
| CL-654-RLT | CL-654-DLT | | 21/32 | .6543 | | | | | | | | |
| CL-655-RLT | CL-655-DLT | | | .6553 | | | | | | | | |
| CL-685-RLT | CL-685-DLT | | 11/16 | .6855 | | | | | | | | |
| CL-686-RLT | CL-686-DLT | | | .6865 | | | | | | | | |
| CL-716-RLT | CL-716-DLT | | 23/32 | .7168 | | | | | | | | |
| CL-717-RLT | CL-717-DLT | | | .7178 | | | | | | | | |
| CL-748-RLT | CL-748-DLT | | 3/4 | .7480 | | | | | | | | |
| CL-749-RLT | CL-749-DLT | | | .7490 | | | | | | | | |
| CL-7480-RLT | CL-7480-DLT | | 1 | 3/4 | | | | | | | | |
| CL-7490-RLT | CL-7490-DLT | .7490 | | | | | | | | | | |
| CL-779-RLT | CL-779-DLT | 25/32 | | .7793 | | | | | | | | |
| CL-780-RLT | CL-780-DLT | | | .7803 | | | | | | | | |
| CL-810-RLT | CL-810-DLT | 13/16 | | .8105 | | | | | | | | |
| CL-811-RLT | CL-811-DLT | | | .8115 | | | | | | | | |
| CL-841-RLT | CL-841-DLT | 27/32 | | .8418 | | | | | | | | |
| CL-842-RLT | CL-842-DLT | | | .8428 | | | | | | | | |
| CL-873-RLT | CL-873-DLT | 7/8 | | .8730 | | | | | | | | |
| CL-874-RLT | CL-874-DLT | | | .8740 | | | | | | | | |
| CL-904-RLT | CL-904-DLT | 29/32 | | .9043 | | | | | | | | |
| CL-905-RLT | CL-905-DLT | | | .9053 | | | | | | | | |
| CL-935-RLT | CL-935-DLT | 15/16 | | .9355 | | | | | | | | |
| CL-936-RLT | CL-936-DLT | | | .9365 | | | | | | | | |
| CL-966-RLT | CL-966-DLT | 31/32 | | .9668 | | | | | | | | |
| CL-967-RLT | CL-967-DLT | | | .9678 | | | | | | | | |
| CL-998-RLT | CL-998-DLT | 1 | | .9980 | | | | | | | | |
| CL-999-RLT | CL-999-DLT | | | .9990 | | | | | | | | |

6

LOCKSCREW TYPE (METRIC)

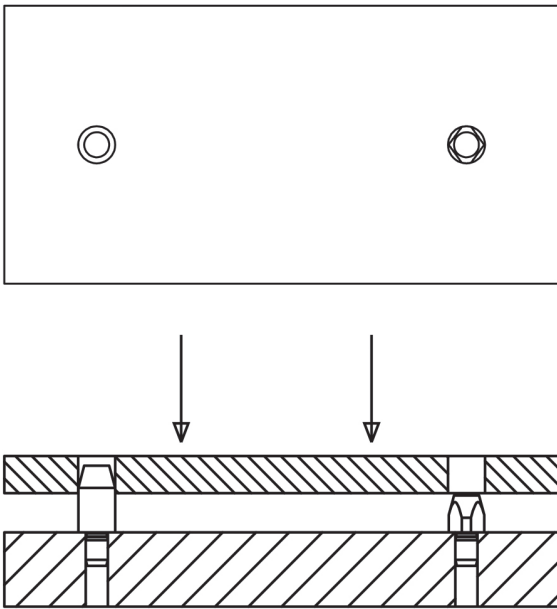
| PART NO. | B SHANK DIA | A DIA NOMINAL (mm) | A DIA ACTUAL (mm) | C (mm) | D (mm) | E DIA (mm) | F (mm) | G (mm) |
|----------------|-------------------|-----------------------------|----------------------------|-----------|-----------|------------------|-----------|-----------|
| CL-5-RLT-2347 | 5/16" | 6 | 5.961 | 30 | 11 | 16 | 2.4 | 13 |
| CL-5-RLT-2357 | 5/16" | 6 | 5.987 | 30 | 11 | 16 | 2.4 | 13 |
| CL-8-RLT-3130 | 1/2" | 8 | 7.950 | 38 | 12.5 | 22 | 3.2 | 16.5 |
| CL-8-RLT-3140 | 1/2" | 8 | 7.976 | 38 | 12.5 | 22 | 3.2 | 16.5 |
| CL-8-RLT-3917 | 1/2" | 10 | 9.949 | 38 | 12.5 | 22 | 3.2 | 16.5 |
| CL-8-RLT-3927 | 1/2" | 10 | 9.974 | 38 | 12.5 | 22 | 3.2 | 16.5 |
| CL-8-RLT-4704 | 1/2" | 12 | 11.948 | 38 | 12.5 | 22 | 3.2 | 16.5 |
| CL-8-RLT-4714 | 1/2" | 12 | 11.974 | 38 | 12.5 | 22 | 3.2 | 16.5 |
| CL-12-RLT-5492 | 3/4" | 14 | 13.950 | 49 | 17.5 | 28.5 | 4.8 | 19.5 |
| CL-12-RLT-5502 | 3/4" | 14 | 13.975 | 49 | 17.5 | 28.5 | 4.8 | 19.5 |
| CL-12-RLT-6279 | 3/4" | 16 | 15.949 | 49 | 17.5 | 28.5 | 4.8 | 19.5 |
| CL-12-RLT-6289 | 3/4" | 16 | 15.974 | 49 | 17.5 | 28.5 | 4.8 | 19.5 |
| CL-12-RLT-7067 | 3/4" | 18 | 17.950 | 49 | 17.5 | 28.5 | 4.8 | 19.5 |
| CL-12-RLT-7077 | 3/4" | 18 | 17.976 | 49 | 17.5 | 28.5 | 4.8 | 19.5 |
| CL-16-RLT-7854 | 1" | 20 | 19.949 | 66.5 | 25.5 | 38 | 7 | 24 |
| CL-16-RLT-7864 | 1" | 20 | 19.974 | 66.5 | 25.5 | 38 | 7 | 24 |

Order liner bushing and lock screws separately. See table above for proper sizes. (See drill-bushing catalog section for additional dimensions).



ROUND & DIAMOND LOCATING PINS DIN 6321

A2 TOOL STEEL, HEAT TREATED, BLACK OXIDE FINISH

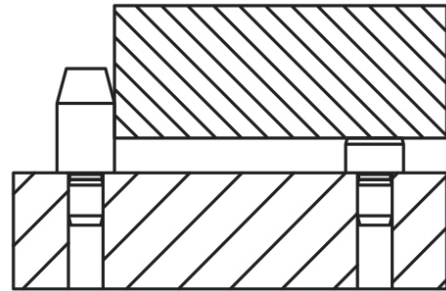


In this application, a Round Locating Pin (Type B, tall version) is used together with a Diamond Locating Pin (Type C, short version) to locate from two holes in a workpiece. Using a taller round pin allows smoother loading because that pin's hole can be fully engaged first, making it easier to engage the second hole.

New item!

DIN 6321 is a system of locating pins designed for hole location, side location, and supporting. These locating pins are available in three distinct types:

- Type A Round Locating Pads are dual-purpose precision locators, with a ground top surface for use as a rest pad, and a ground head diameter for use as a locating pin.
- Type B Round Locating Pins have a ground head diameter for use as a hole locator or for side location
- Type C Diamond Locating Pins also have a ground head diameter for use as a hole locator, but are relieved to locate in only 1 axis

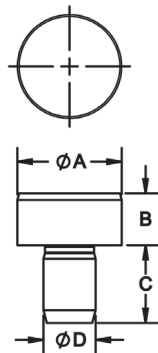


In this application, a Round Locating Pin (Type B) is used as a side locator, together with a Round Locating Pad (Type A) used as a rest pad.



**Round Locating Pads
DIN 6321
Type A**

Round Locating Pads per DIN 6321 Type A are dual-purpose precision locators, with a ground top surface for use as a rest pad, and a ground head diameter for use as a locating pin. These pads are especially useful as locating pins for side location of thin workpieces. Available with head diameters from 6 to 25mm.



ROUND LOCATING PADS, TYPE A (METRIC)

| PART NO. | A DIA (mm) g6 | B (mm) h9 | C (mm) | D (mm) n6 |
|-----------------|------------------------|-----------------|-----------|-----------------|
| CL-6321-6-5-A | 6 | 5 | 6 | 4 |
| CL-6321-10-6-A | 10 | 6 | 9 | 6 |
| CL-6321-16-8-A | 16 | 8 | 12 | 8 |
| CL-6321-25-10-A | 25 | 10 | 18 | 12 |

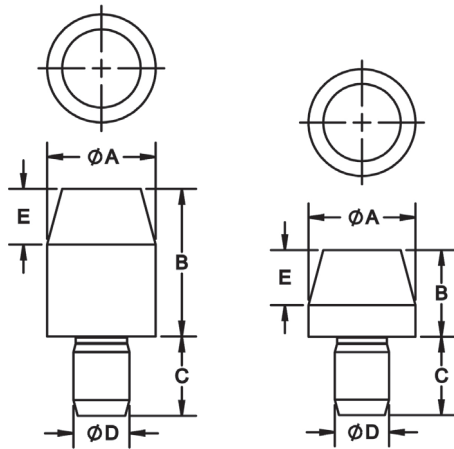
ROUND & DIAMOND LOCATING PINS DIN 6321

A2 TOOL STEEL, HEAT TREATED, BLACK OXIDE FINISH



**Round Locating Pins
DIN 6321
Type B
(Tall and Short)**

Round Locating Pins per DIN 6321 Type B have a ground head diameter for use as a hole locator or for side location. One Round Locating Pin and one Diamond Locating Pin are often used together to locate from two machined holes in a workpiece, or to align two pieces of a fixture, without binding. Round Locating Pins are also extremely useful as side locators. Head and shank diameters are concentric to within .0005" TIR. Available with head diameters from 6 to 25mm, each in a tall and a short version.



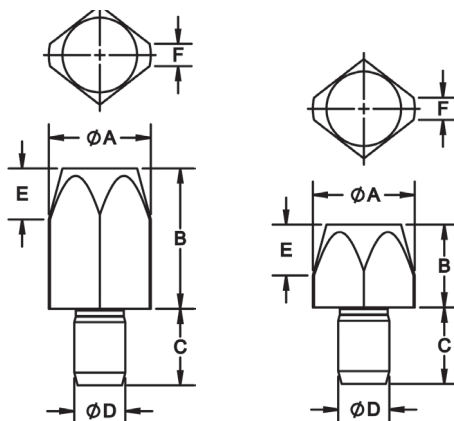
ROUND LOCATING PINS, TYPE B (METRIC)

| PART NO. | A DIA (mm) g6 | VERSION | B (mm) | C (mm) | D DIA (mm) n6 | E (mm) |
|-----------------|---------------|---------|--------|--------|---------------|--------|
| CL-6321-6-7-B | 6 | Short | 7 | 6 | 4 | 4 |
| CL-6321-6-12-B | | Tall | 12 | | | |
| CL-6321-8-10-B | 8 | Short | 10 | 9 | 6 | 6 |
| CL-6321-8-16-B | | Tall | 16 | | | |
| CL-6321-10-10-B | 10 | Short | 10 | 9 | 6 | 6 |
| CL-6321-10-18-B | | Tall | 18 | | | |
| CL-6321-12-10-B | 12 | Short | 10 | 9 | 6 | 6 |
| CL-6321-12-18-B | | Tall | 18 | | | |
| CL-6321-16-13-B | 16 | Short | 13 | 12 | 8 | 8 |
| CL-6321-16-22-B | | Tall | 22 | | | |
| CL-6321-20-15-B | 20 | Short | 15 | 18 | 12 | 9 |
| CL-6321-20-25-B | | Tall | 25 | | | |
| CL-6321-25-15-B | 25 | Short | 15 | 18 | 12 | 9 |
| CL-6321-25-25-B | | Tall | 25 | | | |



**Diamond Locating Pins
DIN 6321
Type C
(Tall and Short)**

Diamond Locating Pins per DIN 6321 Type C also have a ground head diameter for use as a hole locator, but are relieved to locate in only 1 axis. One Round Locating Pin and one Diamond Locating Pin are often used together to locate from two machined holes in a workpiece, or to align two pieces of a fixture, without binding. Head and shank diameters are concentric to within .0005" TIR. Available with head diameters from 6 to 25mm, each in a tall and a short version.



DIAMOND LOCATING PINS, TYPE C (METRIC)

| PART NO. | A DIA (mm) g6 | VERSION | B (mm) | C (mm) | D DIA (mm) n6 | E (mm) | F (mm) |
|-----------------|---------------|---------|--------|--------|---------------|--------|--------|
| CL-6321-6-7-C | 6 | Short | 7 | 6 | 4 | 4 | 1 |
| CL-6321-6-12-C | | Tall | 12 | | | | |
| CL-6321-8-10-C | 8 | Short | 10 | 9 | 6 | 6 | 1.6 |
| CL-6321-8-16-C | | Tall | 16 | | | | |
| CL-6321-10-10-C | 10 | Short | 10 | 9 | 6 | 6 | 2.5 |
| CL-6321-10-18-C | | Tall | 18 | | | | |
| CL-6321-12-10-C | 12 | Short | 10 | 9 | 6 | 6 | 2.5 |
| CL-6321-12-18-C | | Tall | 18 | | | | |
| CL-6321-16-13-C | 16 | Short | 13 | 12 | 8 | 8 | 3.5 |
| CL-6321-16-22-C | | Tall | 22 | | | | |
| CL-6321-20-15-C | 20 | Short | 15 | 18 | 12 | 9 | 5 |
| CL-6321-20-25-C | | Tall | 25 | | | | |
| CL-6321-25-15-C | 25 | Short | 15 | 18 | 12 | 9 | 5 |
| CL-6321-25-25-C | | Tall | 25 | | | | |

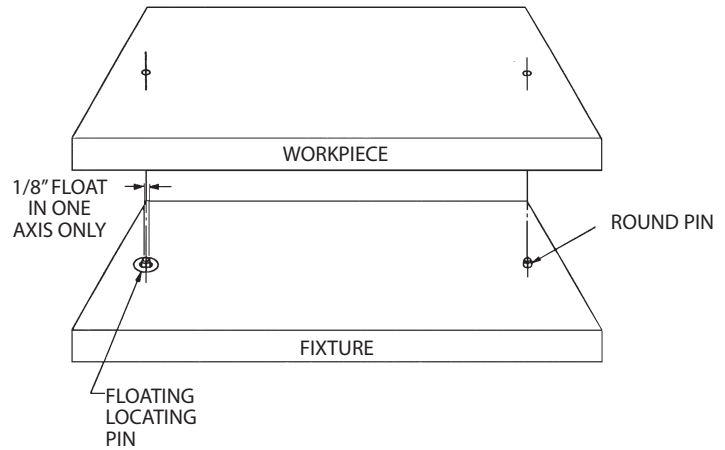
FLOATING LOCATING PINS

BODY: TOOL STEEL, HEAT TREATED, BLACK OXIDE FINISH
 PIN: 1144 STEEL, HEAT TREATED, BLACK OXIDE FINISH

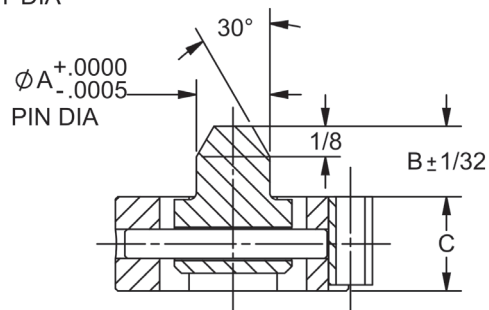
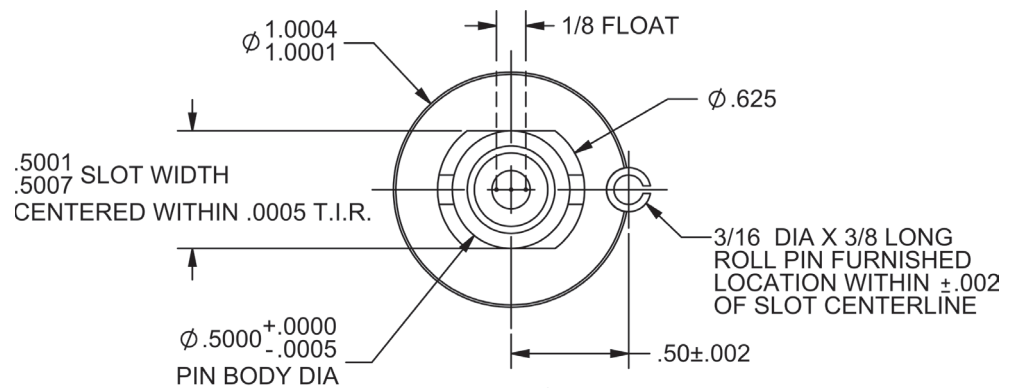
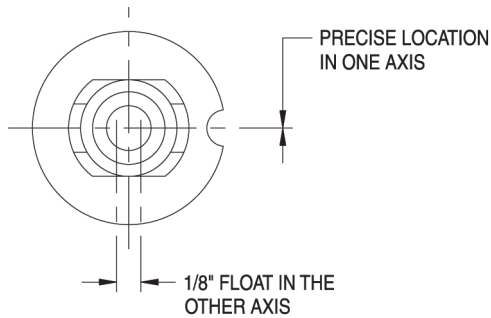


Provides precise location in one axis while allowing considerable float in the perpendicular axis. Use in conjunction with a Round Pin when loose workpiece-hole tolerances require more float than a Diamond Pin would allow. Special pin diameters (A dimensions) are available. Please contact factory.

Patent no. 3,381,554.



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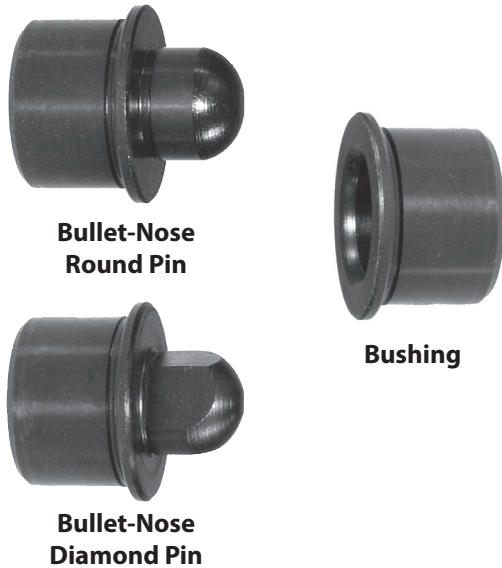


INCH

| PART NO. | A DIA | B | C |
|-----------|-------|------|------|
| CL-4-FLP | .2500 | .300 | .400 |
| CL-5-FLP | .3125 | .300 | .400 |
| CL-6-FLP | .3750 | .300 | .400 |
| CL-8-FLP | .5000 | .300 | .400 |
| CL-10-FLP | .6250 | .310 | .400 |

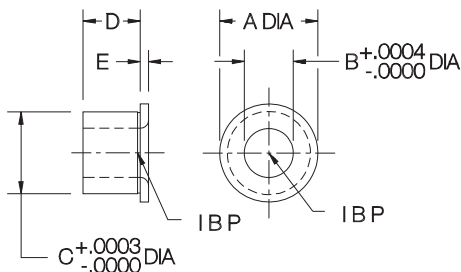
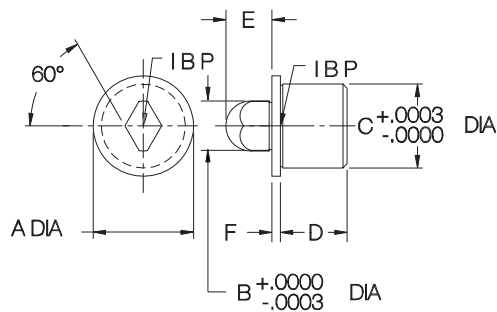
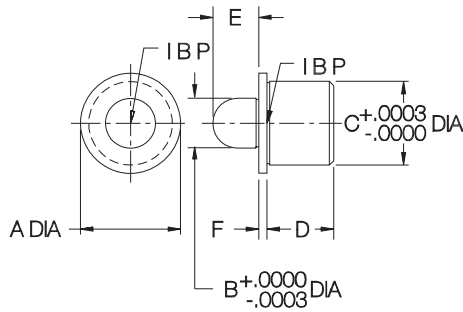
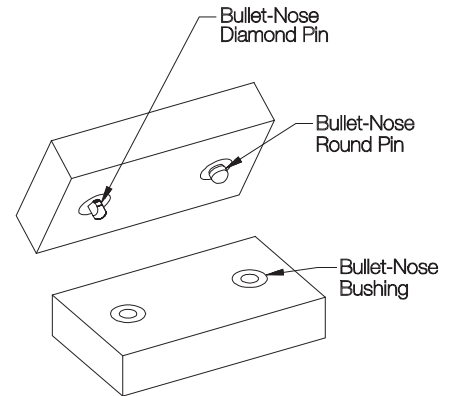
BULLET-NOSE PINS

1144 STEEL, HEAT TREATED RC 50-62, BLACK OXIDE FINISH



Bullet-Nose Round Pins and Diamond Pins are often used together (with matching bushings) to align two pieces of a fixture. The Diamond Pin is relieved, to locate only radially around the round pin, avoiding redundant location. This prevents binding, yet still maintains high accuracy.

The pin's shank diameter and the bushing's OD are the same size to allow boring the installation hole in both fixture pieces at the same time, for greater accuracy. The pin's head and shank diameters are concentric to within .0005 TIR. The bushing's ID and OD are concentric to within .0003 TIR.



ROUND PINS (INCH)

| PART NO. | A DIA | B HEAD DIA NOMINAL | B HEAD DIA ACTUAL | C SHANK DIA NOMINAL | C SHANK DIA ACTUAL | D | E | F |
|-----------|-------|--------------------|-------------------|---------------------|--------------------|-----|----|------|
| CL-8-BND | 9/16 | 1/4 | .2499 | 13/32 | .4075 | 3/8 | 6 | 1/16 |
| CL-9-BND | 5/8 | 5/16 | .3124 | 1/2 | .5014 | | 7 | |
| CL-10-BND | 3/4 | 3/8 | .3748 | 5/8 | .6265 | 1/2 | 9 | 10 |
| CL-11-BND | 7/8 | 1/2 | .4998 | 3/4 | .7515 | | 10 | |
| CL-12-BND | 1-1/8 | 3/4 | .7498 | 1 | 1.0015 | 3/4 | 9 | 1/8 |
| CL-13-BND | 1-1/2 | 1 | .9998 | 1-3/8 | 1.3768 | | 10 | |

ROUND PINS (METRIC)

| PART NO. | A DIA | B DIA NOMINAL | B DIA ACTUAL | C DIA NOMINAL | C DIA ACTUAL | D | E | F |
|------------|-------|---------------|--------------|---------------|--------------|------|------|------|
| CLM-6-BRP | 13mm | 6mm | 5.997 | 10mm | 10.033 | 9mm | 6mm | 2mm |
| CLM-8-BRP | 15mm | 8mm | 7.997 | 12mm | 12.035 | | 7mm | |
| CLM-10-BRP | 18mm | 10mm | 9.995 | 15mm | 15.038 | 11mm | 9mm | 10mm |
| CLM-12-BRP | 22mm | 12mm | 11.995 | 18mm | 18.038 | | 10mm | |

DIAMOND PINS (INCH)

| PART NO. | A DIA | B DIA NOMINAL | B DIA ACTUAL | C DIA NOMINAL | C DIA ACTUAL | D | E | F |
|-----------|-------|---------------|--------------|---------------|--------------|-----|-------|-------|
| CL-8-BDP | 9/16 | 1/4 | .2499 | 13/32 | .4075 | 3/8 | 7/32 | 1/16 |
| CL-9-BDP | 5/8 | 5/16 | .3124 | 1/2 | .5014 | | 9/32 | |
| CL-10-BDP | 3/4 | 3/8 | .3748 | 5/8 | .6265 | 1/2 | 11/32 | 13/32 |
| CL-11-BDP | 7/8 | 1/2 | .4998 | 3/4 | .7515 | | 13/32 | |
| CL-12-BDP | 1-1/8 | 3/4 | .7498 | 1 | 1.0015 | 3/4 | 9/16 | 1/8 |
| CL-13-BDP | 1-1/2 | 1 | .9998 | 1-3/8 | 1.3768 | | 3/4 | |

DIAMOND PINS (METRIC)

| PART NO. | A DIA | B DIA NOMINAL | B DIA ACTUAL | C DIA NOMINAL | C DIA ACTUAL | D | E | F |
|------------|-------|---------------|--------------|---------------|--------------|------|------|------|
| CLM-6-BDP | 13mm | 6mm | 5.997 | 10mm | 10.033 | 9mm | 6mm | 2mm |
| CLM-8-BDP | 15mm | 8mm | 7.997 | 12mm | 12.035 | | 7mm | |
| CLM-10-BDP | 18mm | 10mm | 9.995 | 15mm | 15.038 | 11mm | 9mm | 10mm |
| CLM-12-BDP | 22mm | 12mm | 11.995 | 18mm | 18.038 | | 10mm | |

BUSHINGS (INCH)

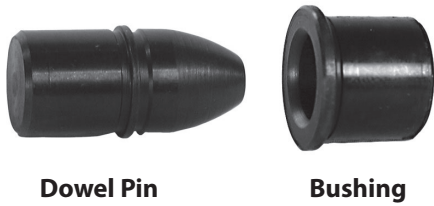
| PART NO. | A DIA | B DIA NOMINAL | B DIA ACTUAL | C DIA NOMINAL | C DIA ACTUAL | D | E |
|-----------|-------|---------------|--------------|---------------|--------------|-------|------|
| CLB-8000 | 9/16 | 6 | .2501 | 13/32 | .4075 | 7/16 | 1/16 |
| CLB-9000 | 5/8 | 8 | .3126 | 1/2 | .5014 | | |
| CLB-10000 | 3/4 | 10 | .3751 | 5/8 | .6265 | 1/2 | 1/8 |
| CLB-11000 | 7/8 | 12 | .5001 | 3/4 | .7515 | | |
| CLB-12000 | 1-1/8 | 10 | .7502 | 1 | 1.0015 | 11/16 | 1/8 |
| CLB-13000 | 1-1/2 | 12 | 1.0002 | 1-3/8 | 1.3768 | | |

BUSHINGS (METRIC)

| PART NO. | A DIA | B DIA NOMINAL | B DIA ACTUAL | C DIA NOMINAL | C DIA ACTUAL | D | E |
|----------|-------|---------------|--------------|---------------|--------------|------|-----|
| CLM-6-B | 13mm | 6mm | 6.002 | 10mm | 10.033 | 8mm | 2mm |
| CLM-8-B | 15mm | 8mm | 8.002 | 12mm | 12.035 | | |
| CLM-10-B | 18mm | 10mm | 10.002 | 15mm | 15.038 | 10mm | 2mm |
| CLM-12-B | 22mm | 12mm | 12.002 | 18mm | 18.038 | | |

BULLET-NOSE DOWELS

1144 STEEL, HEAT TREATED RC 50-62, BLACK OXIDE FINISH



Dowel Pin

Bushing

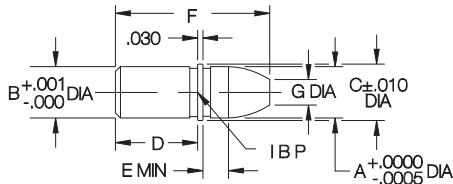
Precision locating pin often used with a matching bushing to align two pieces of a fixture. The pin's head and shank diameters are concentric to within .0005 TIR. The bushing's ID and OD are concentric to within .0003 TIR.

DOWEL PINS (INCH)

| PART NO. | A | A | B | B | C | D | E | F | G |
|----------|----------|----------|-----------|-----------|------|-----|-----|------|-----|
| | HEAD DIA | HEAD DIA | SHANK DIA | SHANK DIA | | | | | |
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | DIA | | | | DIA |
| CL-1-BND | 1/4 | .2499 | 1/4 | .2510 | .280 | 1/2 | .12 | .90 | 3mm |
| CL-2-BND | 5/16 | .3124 | 5/16 | .3135 | .344 | | .15 | .94 | 4mm |
| CL-3-BND | 3/8 | .3749 | 3/8 | .3760 | .407 | | .18 | 1.03 | 5mm |
| CL-4-BND | 1/2 | .4999 | 1/2 | .5010 | .532 | | .18 | 1.09 | 6mm |

DOWEL PINS (METRIC)

| PART NO. | A | A | B | B | C | D | E | F | G |
|-------------|------|--------|------|--------|------|------|-----|------|-----|
| | | | | | | | | | |
| CLM-60-BND | 6mm | 5.997 | 6mm | 6.025 | 7mm | 12mm | 3mm | 22mm | 3mm |
| CLM-80-BND | 8mm | 7.997 | 8mm | 8.025 | 9mm | | 4mm | 23mm | 4mm |
| CLM-100-BND | 10mm | 9.997 | 10mm | 10.025 | 11mm | | 5mm | 25mm | 5mm |
| CLM-120-BND | 12mm | 11.997 | 12mm | 12.025 | 13mm | | | 27mm | 6mm |

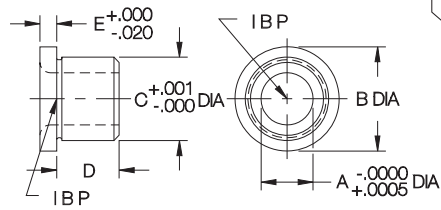
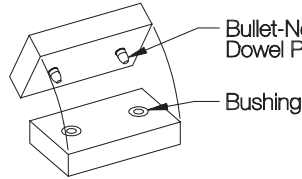


BUSHINGS (INCH)

| PART NO. | A | A | B | C | C | D | E |
|----------|---------|--------|------|-----------|-----------|-----|------|
| | DIA | DIA | | | | | |
| | NOMINAL | ACTUAL | DIA | SHANK DIA | SHANK DIA | | |
| CLB-1000 | 1/4 | .2501 | .625 | 1/2 | .5002 | 3/8 | .100 |
| CLB-2000 | 5/16 | .3126 | .750 | 5/8 | .6253 | 1/2 | |
| CLB-3000 | 3/8 | .3751 | .875 | 3/4 | .7504 | 5/8 | |
| CLB-4000 | 1/2 | .5001 | | | | | |

BUSHINGS (METRIC)

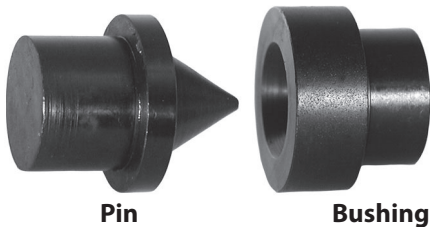
| PART NO. | A | A | B | C | C | D | E |
|-----------|------|--------|------|------|--------|----|---|
| | | | | | | | |
| CLM-60-B | 6mm | 6.002 | 13mm | 10mm | 10.005 | 7 | 3 |
| CLM-80-B | 8mm | 8.002 | 15mm | 12mm | 12.005 | 7 | 3 |
| CLM-100-B | 10mm | 10.002 | 18mm | 15mm | 15.008 | 9 | 3 |
| CLM-120-B | 12mm | 12.002 | 22mm | 18mm | 18.011 | 12 | 4 |



6

CONE LOCATOR PINS

1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Pin

Bushing

Medium-accuracy tapered locating pin used with the mating bushing. These pins can be used for quick assembly of two fixture pieces, because they compensate for considerable misalignment. The pin's shank diameter and the bushing's OD are exactly the same size, to allow boring the installation hole in both fixture pieces at the same time for greater accuracy.

PIN (INCH)

| PART NO. | A | B DIA | | C | D | E | F |
|----------|-----|---------|--------|------|------|------|------|
| | | NOMINAL | ACTUAL | | | | |
| CL-5-CLP | 3/4 | 1/2 | .5014 | 3/16 | 3/8 | 5/16 | .438 |
| CL-7-CLP | 1 | 3/4 | .7515 | 3/16 | 9/16 | 1/2 | .676 |

PIN (METRIC)

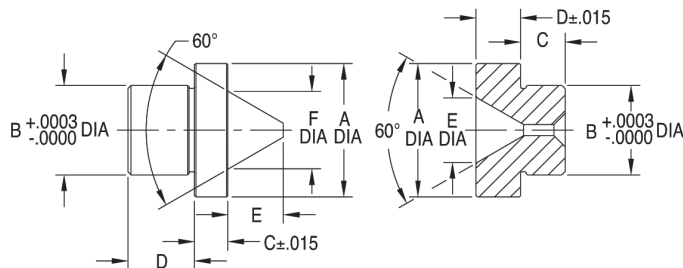
| | | | | | | | |
|-----------|-----|------|--------|------|------|------|------|
| CLM-5-CLP | 3/4 | 12mm | 12.039 | 4.76 | 9.5 | 7.9 | 11.1 |
| CLM-7-CLP | 1 | 20mm | 20.038 | 4.76 | 14.5 | 12.7 | 17.2 |

BUSHING (INCH)

| PART NO. | A | B DIA | | C | D | E | GAP BETWEEN PIN & BUSHING HEAD WHEN ASSEMBLED |
|----------|-----|---------|--------|-----|-----|------|---|
| | | NOMINAL | ACTUAL | | | | |
| CL-5-CLB | 3/4 | 1/2 | .5014 | 1/4 | 1/4 | .370 | .050-.068 |
| CL-7-CLB | 1 | 3/4 | .7515 | 3/8 | 3/8 | .616 | .043-.061 |

BUSHING (METRIC)

| | | | | | | | |
|-----------|-----|------|--------|------|------|------|------|
| CLM-5-CLB | 3/4 | 12mm | 12.039 | 4.76 | 9.5 | 7.9 | 11.1 |
| CLM-7-CLB | 1 | 20mm | 20.038 | 4.76 | 14.5 | 12.7 | 17.2 |

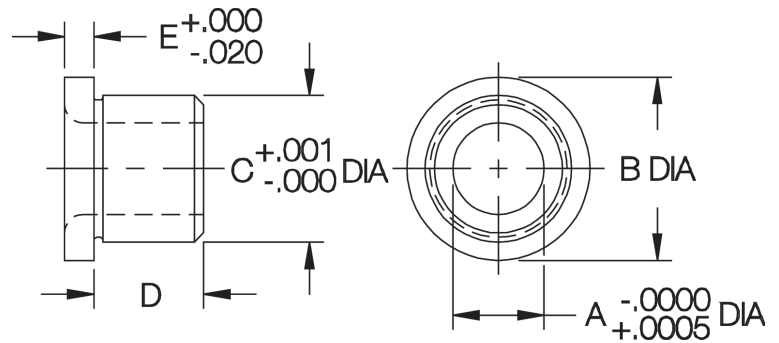


ON-SIZE® BUSHINGS

INVAR 36® NICKEL-IRON ALLOY



**ON-SIZE® Bushings
for Bullet-Nose Dowels
(Head Type)**



ON-SIZE® Bushings are made from Invar 36, a 36% nickel-iron alloy that has an extremely low coefficient of thermal expansion. Invar material is particularly useful in applications where minimum thermal expansion and high dimensional stability is required. Useful in high temperature applications up to 750°F (400°C), these products will maintain their size and accuracy even under heat-cool multiple cycles.

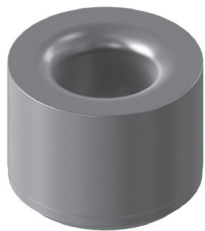
The precision bushings shown here are used with Bullet-Nose Dowels to align two pieces of a fixture. The bushing's ID and OD are concentric to within .0003" TIR. Available for pin diameters 1/4, 5/16, 3/8, and 1/2" (6, 8, 10, and 12mm in metric).

HEAD TYPE (INCH)

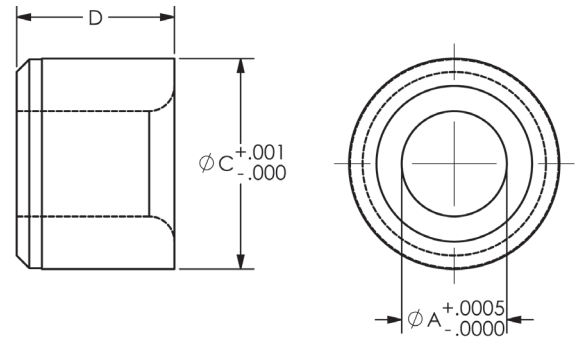
| PART NO. | A DIA | | B DIA | C DIA | | D | E |
|-------------|----------|--------|----------|----------|--------|-----|------|
| | NOMINAL | ACTUAL | | NOMINAL | ACTUAL | | |
| CL-1000-BNV | 1/4 | .2501 | .625 | 1/2 | .5002 | 3/8 | .100 |
| CL-2000-BNV | 5/16 | .3126 | .625 | 1/2 | .5002 | 3/8 | .100 |
| CL-3000-BNV | 3/8 | .3751 | .750 | 5/8 | .6253 | 1/2 | .100 |
| CL-4000-BNV | 1/2 | .5001 | .875 | 3/4 | .7504 | 5/8 | .100 |

HEAD TYPE (METRIC)

| | | | | | | | |
|-------------|------|-------|------|------|-------|------|------|
| CLM-60-BNV | 6mm | .2363 | .512 | 10mm | .3939 | .276 | .118 |
| CLM-80-BNV | 8mm | .3151 | .591 | 12mm | .4726 | .276 | .118 |
| CLM-100-BNV | 10mm | .3938 | .709 | 15mm | .5909 | .354 | .118 |
| CLM-120-BNV | 12mm | .4725 | .866 | 18mm | .7091 | .472 | .157 |



**ON-SIZE® Bushings
for Bullet-Nose Dowels
(Headless Type)**



HEADLESS TYPE (INCH)

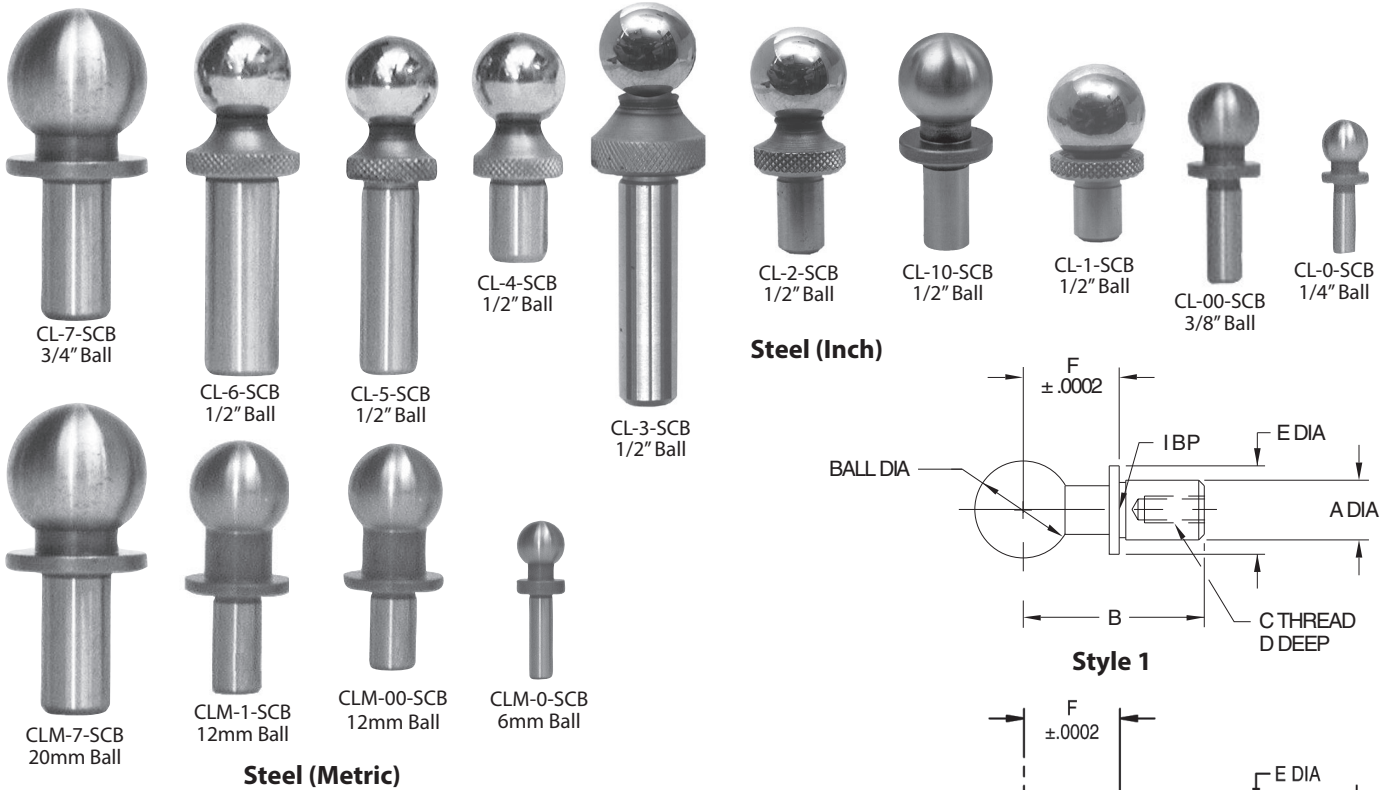
| PART NO. | A DIA | | C DIA | | D |
|--------------|----------|--------|----------|--------|-----|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | |
| CL-1000-BPNV | 1/4 | .2501 | 1/2 | .5002 | 3/8 |
| CL-2000-BPNV | 5/16 | .3126 | 1/2 | .5002 | 3/8 |
| CL-3000-BPNV | 3/8 | .3751 | 5/8 | .6253 | 1/2 |
| CL-4000-BPNV | 1/2 | .5001 | 3/4 | .7504 | 5/8 |

HEADLESS TYPE (METRIC)

| | | | | | |
|--------------|------|-------|------|-------|------|
| CLM-60-BPNV | 6mm | .2363 | 10mm | .3939 | .276 |
| CLM-80-BPNV | 8mm | .3151 | 12mm | .4726 | .276 |
| CLM-100-BPNV | 10mm | .3938 | 15mm | .5909 | .354 |
| CLM-120-BPNV | 12mm | .4725 | 18mm | .7091 | .472 |

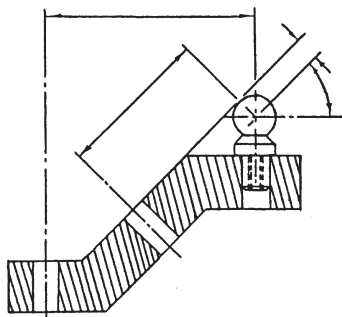
CONSTRUCTION BALLS (SHOULDER TYPE)

STEEL: 1144 STEEL, HEAT TREATED RC 54-56



New 20mm ball diameter!

Precision tooling ball used as a reference point for critical inspection, layout, and machining operations. Shoulder type has a precision height-reference shoulder to locate the ball in three dimensions. Concentricity between ball and shank is .0002" TIR. Available with ball diameters from 1/4 to 3/4" (6 to 20mm in metric), in various shank diameters and lengths.



Shoulder-Type Construction Balls provide a reference point in three dimensions.

STEEL (INCH)

| PART NO. | BALL DIA | | A DIA | | B | C | D | E DIA | F | STYLE |
|-----------|----------|-------------|---------|-------------|-------|-------|------|-------|-------|-------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | | | | | | |
| CL-0-SCB | 1/4 | .2502/.2498 | 1/8 | .1250/.1246 | .56 | — | — | .25 | .2000 | 1 |
| CL-00-SCB | 3/8 | .3752/.3748 | 3/16 | .1875/.1871 | .75 | — | — | .37 | .3000 | |
| CL-1-SCB | 1/2 | .5000/.4997 | 1/4 | .2500/.2497 | .63 | #6-32 | 1/4 | .46 | .3125 | 2 |
| CL-10-SCB | | | | .2500/.2496 | .94 | — | — | | .4000 | |
| CL-2-SCB | | | | .2500/.2497 | .94 | #6-32 | 5/16 | | 2 | |
| CL-3-SCB | | | 5/16 | .3125/.3122 | 1.50 | — | — | .46 | | .5000 |
| CL-4-SCB | | | | .94 | #6-32 | 5/16 | 1 | | | |
| CL-5-SCB | | | 3/8 | .3750/.3747 | 1.50 | — | | — | .56 | .5000 |
| CL-6-SCB | 3/4 | .7502/.7498 | 3/8 | .3750/.3746 | 1.25 | — | — | .75 | .5000 | 1 |
| CL-7-SCB | | | | | | | | | | |

STEEL (METRIC)

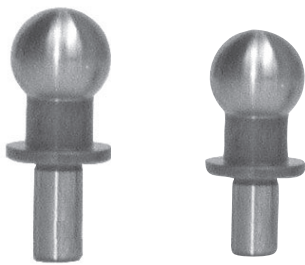
| PART NO. | BALL DIA | | A DIA | | B | C | D | E DIA | F | STYLE |
|------------|----------|-------------|---------|-------------|------|-----|-----|-------|--------------|-------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | | | | | | |
| CLM-0-SCB | 6mm | .2364/.2360 | 3mm | .1181/.1177 | .47 | — | — | .24 | .2362 (6mm) | 1 |
| CLM-00-SCB | 12mm | .4726/.4722 | 6mm | .2362/.2358 | .87 | — | — | .47 | .4724 (12mm) | |
| CLM-1-SCB | | | | .98 | M3.5 | .24 | | | | |
| CLM-7-SCB | 20mm | .7876/.7872 | 10mm | .3937/.3983 | 1.50 | M6 | .38 | .79 | .7874 (20mm) | |

CONSTRUCTION BALLS (SHOULDER TYPE)

STAINLESS STEEL: 440C STAINLESS STEEL, HEAT TREATED RC 57-59



Stainless Steel (Inch)

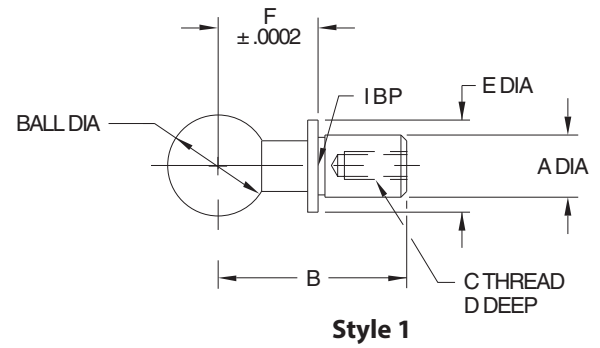


CLM-1-SCB 12mm Ball
CLM-00-SCB 12mm Ball

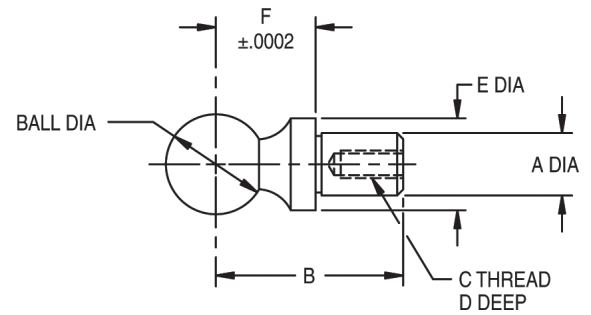
Stainless Steel (Metric)

Also available in stainless steel!

Precision tooling ball used as a reference point for critical inspection, layout, and machining operations. Shoulder type has a precision height-reference shoulder to locate the ball in three dimensions. Concentricity between ball and shank is .0002" TIR. Stainless steel version is available with ball diameters from 1/4 to 1/2" (12mm in metric).



Style 1



Style 2

STAINLESS STEEL (INCH)

| PART NO. | BALL DIA | | A DIA | | B | C | D | E DIA | F | STYLE |
|------------|----------|-------------|---------|-------------|-----|-------|------|-------|-------|-------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | | | | | | |
| CL-0-SCB-S | 1/4 | .2502/.2498 | 1/8 | .1250/.1246 | .56 | — | — | .25 | .2000 | 1 |
| CL-1-SCB-S | 1/2 | .5000/.4997 | 1/4 | .2500/.2497 | .63 | #6-32 | 1/4 | .46 | .3125 | 2 |
| CL-2-SCB-S | | .5000/.4997 | | | .94 | #6-32 | 5/16 | | .5000 | |

STAINLESS STEEL (METRIC)

| PART NO. | BALL DIA | | A DIA | | B | C | D | E DIA | F | STYLE |
|--------------|----------|-------------|---------|-------------|-----|------|-----|-------|--------------|-------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | | | | | | |
| CLM-00-SCB-S | 12mm | .4726/.4722 | 6mm | .2362/.2358 | .87 | — | — | .47 | .4724 (12mm) | 1 |
| CLM-1-SCB-S | | | | | .98 | M3.5 | .24 | | | |

CONSTRUCTION BALLS (ADJUSTABLE TYPE)

1144 STEEL, HEAT TREATED RC 54-56



CL-5-CB
1/2" Ball



CL-3-CB
1/2" Ball



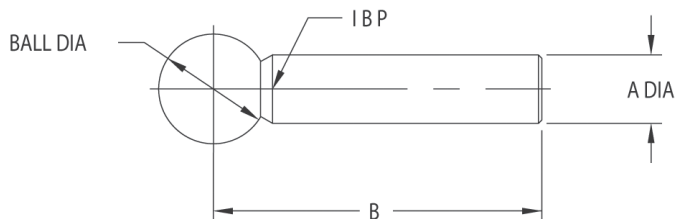
CL-1-CB
1/2" Ball



CL-00-CB
3/8" Ball



CL-0-CB
1/4" Ball



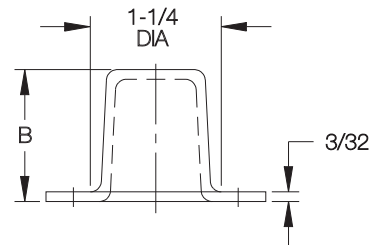
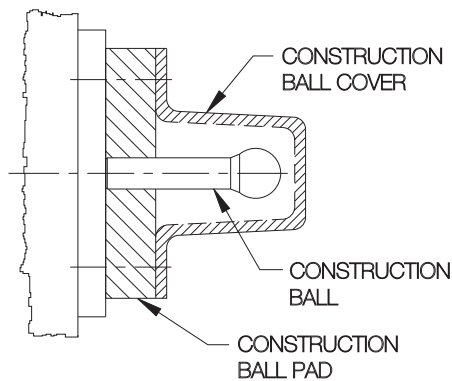
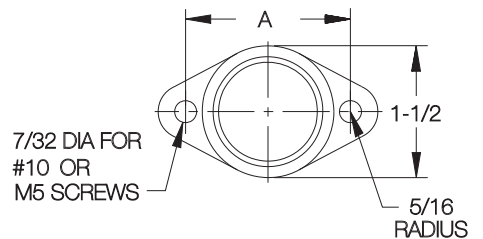
Precision tooling ball used as a reference point for critical inspection, layout, and machining operations. Adjustable type has no shoulder, so it can be set at any desired height then locked with a set screw. Concentricity between ball and shank is .0002" TIR. Available with ball diameters from 1/4 to 1/2", in various shank diameters and lengths.

STEEL (INCH)

| PART NO. | BALL DIA | | A DIA | | B |
|----------|----------|-------------|---------|-------------|------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | |
| CL-0-CB | 1/4 | .2502/.2498 | 1/8 | .1250/.1246 | .56 |
| CL-00-CB | 3/8 | .3752/.3748 | 3/16 | .1875/.1871 | |
| CL-1-CB | 1/2 | .5000/.4997 | 1/4 | .2500/.2497 | 1.50 |
| CL-3-CB | | | 5/16 | .3125/.3122 | |
| CL-5-CB | | | 3/8 | .3750/.3747 | |

CONSTRUCTION-BALL COVERS

ZINC DIE CASTING

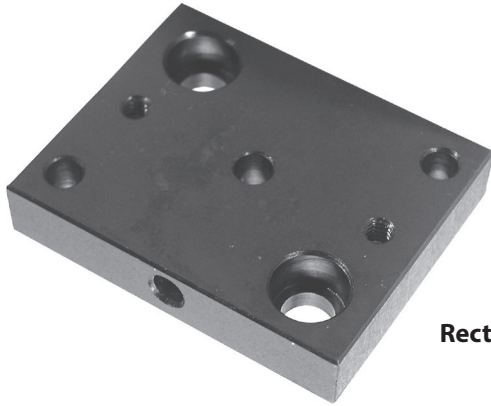


Sturdy cover that protects a Construction Ball from damage after installation.

| PART NO. | A | B |
|------------|-------|-------|
| CL-2-COVER | 1-7/8 | 1-1/2 |

CONSTRUCTION-BALL PADS

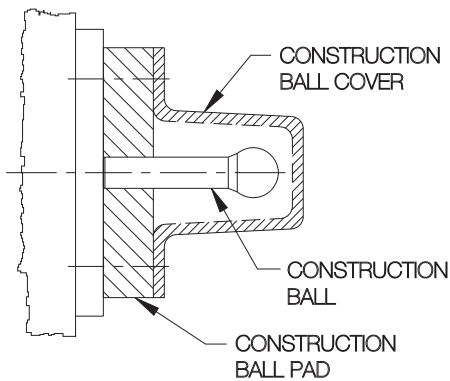
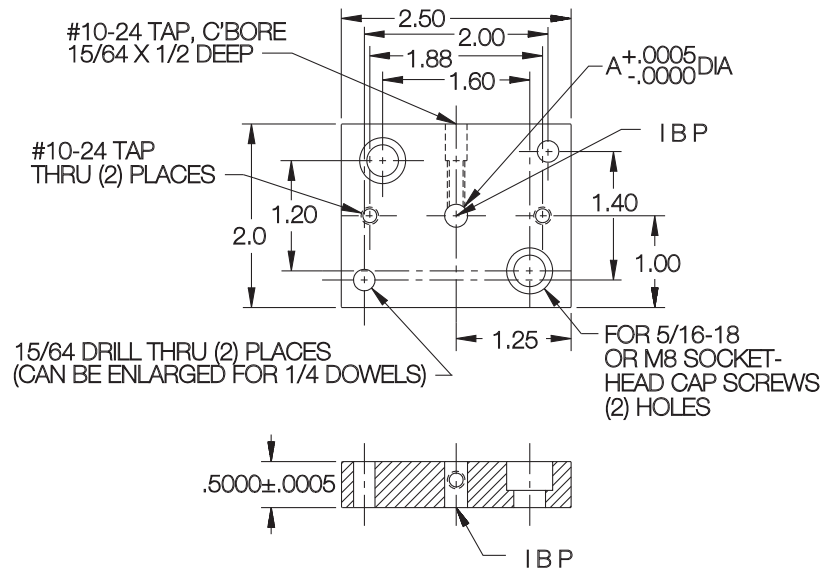
RECTANGULAR (STEEL): 1018 STEEL, BLACK OXIDE FINISH. RECTANGULAR (STAINLESS STEEL): 17-4PH STAINLESS STEEL PASSIVATED.



Rectangular

Now also available in stainless steel!

Rectangular Construction-Ball Pads should be fastened with two socket-head cap screws, then can be doweled in place to maintain accurate location. The Construction Ball can be secured by installing a #10-24 set screw (not furnished) in the crosshole.



RECTANGULAR - STEEL (INCH)

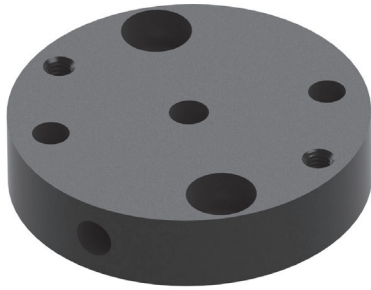
| PART NO. | A DIA | |
|----------|----------|--------|
| | NOMINAL | ACTUAL |
| CL-1-CBP | 1/4 | .2500 |
| CL-2-CBP | 5/16 | .3125 |
| CL-3-CBP | 3/8 | .3750 |

RECTANGULAR - STAINLESS STEEL (INCH)

| PART NO. | A DIA | |
|------------|----------|--------|
| | NOMINAL | ACTUAL |
| CL-1-CBP-S | 1/4 | .2500 |
| CL-2-CBP-S | 5/16 | .3125 |
| CL-3-CBP-S | 3/8 | .3750 |

CONSTRUCTION-BALL PADS

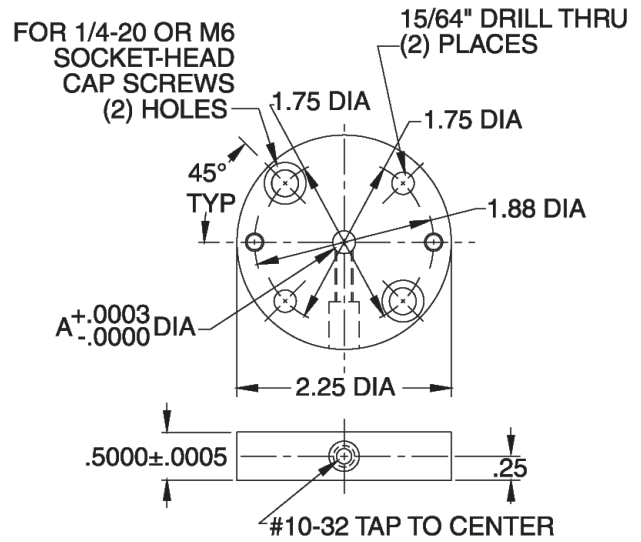
ROUND (STEEL): 1144 STEEL, BLACK OXIDE FINISH. ROUND (STAINLESS STEEL): 17-4PH STAINLESS STEEL, PASSIVATED.
 SHANK TYPE: 8620 STEEL. CARBURIZED-HARDENED, BLACK OXIDE FINISH



Round

Now also available in stainless steel!

Round Construction-Ball Pads should be fastened with two socket-head cap screws, then can be doweled in place to maintain accurate location. The Construction Ball can be secured by installing a #10-32 set screw (not furnished) in the crosshole.



ROUND – STEEL (INCH)

| PART NO. | A DIA | |
|-----------|---------|--------|
| | NOMINAL | ACTUAL |
| CL-1-CBPR | 1/4 | .2500 |

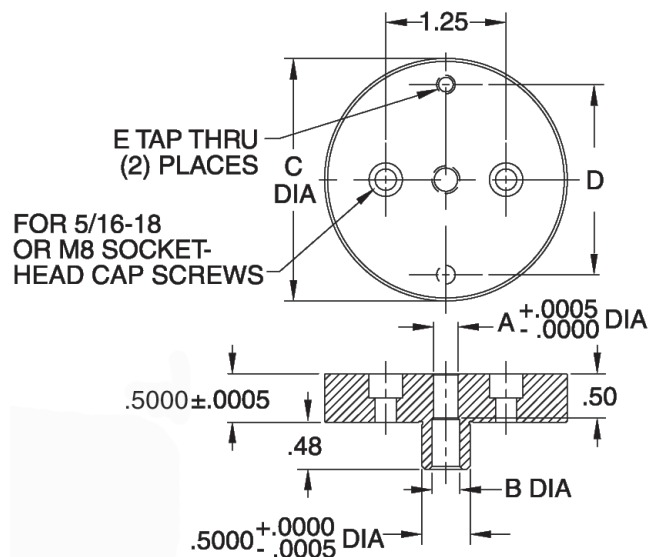
ROUND – STAINLESS STEEL (INCH)

| | | |
|-------------|-----|-------|
| CL-1-CBPR-S | 1/4 | .2500 |
|-------------|-----|-------|



Shank Type

Shank-type Construction-Ball Pads should be installed in a reamed hole for accurate location, then fastened with two socket-head cap screws.

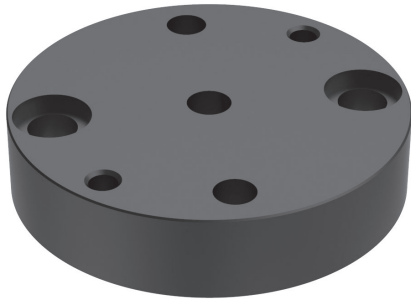


SHANK TYPE – STEEL (INCH)

| PART NO. | A DIA | | B DIA | C DIA | D | E |
|-----------|---------|--------|-------|-------|------|--------|
| | NOMINAL | ACTUAL | | | | |
| CL-1-CBPK | 1/4 | .2500 | .257 | 2.50 | 1.88 | #10-24 |

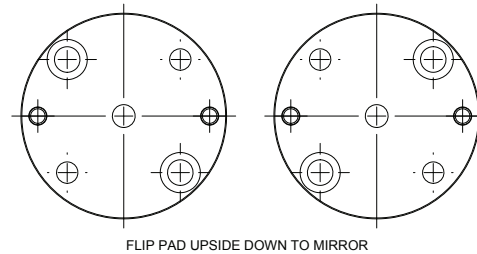
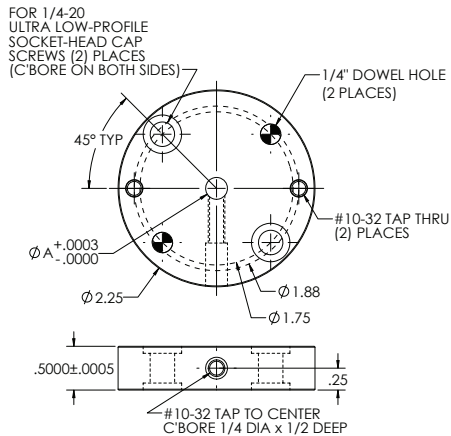
REVERSIBLE CONSTRUCTION BALL PAD

STEEL: 1144 STEEL, BLACK OXIDE
 STAINLESS STEEL: 17-4PH STAINLESS STEEL, PASSIVATED



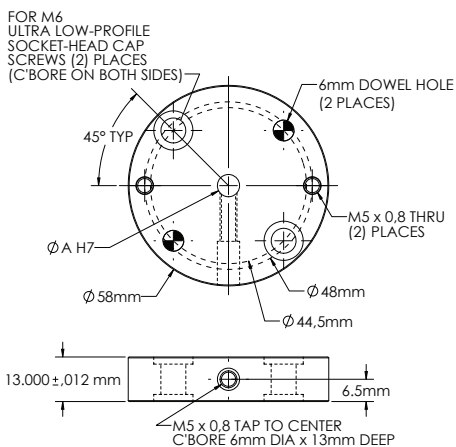
INCH

Reversible round pad for mounting a Construction Ball. This precision reversible round pad can be flipped over in order to mirror a fixture (see application). These round pads should be fastened with two ultra-low-profile socket-head cap screws, then doweled in place to maintain accurate location. The Construction Ball can be secured by installing a #10-32 setscrew (not furnished) in the crosshole. Available in steel and stainless steel. Made in USA.



METRIC

Reversible round pad for mounting a Construction Ball. This precision reversible round pad can be flipped over in order to mirror a fixture (see application). These round pads should be fastened with two ultra-low-profile socket-head cap screws, then doweled in place to maintain accurate location. The Construction Ball can be secured by installing a m5 setscrew (not furnished) in the crosshole. Available in steel and stainless steel. Made in USA.



STEEL

| PART NO. | A DIA NOMINAL | A DIA ACTUAL |
|-------------|---------------|--------------|
| CL-1-R-CBPR | 1/4 | .2500 |
| CL-2-R-CBPR | 5/16 | .3125 |
| CL-3-R-CBPR | 3/8 | .3750 |

STAINLESS STEEL

| | | |
|---------------|------|-------|
| CL-1-R-CBPR-S | 1/4 | .2500 |
| CL-2-R-CBPR-S | 5/16 | .3125 |
| CL-3-R-CBPR-S | 3/8 | .3750 |

STEEL

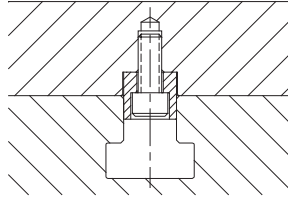
| PART NO. | A DIA NOMINAL | A DIA ACTUAL |
|---------------|---------------|-----------------|
| CLM-3-R-CBPR | 3mm | 3,010 / 3,000 |
| CLM-6-R-CBPR | 6mm | 6,012 / 6,000 |
| CLM-10-R-CBPR | 10mm | 10,015 / 10,000 |

STAINLESS STEEL

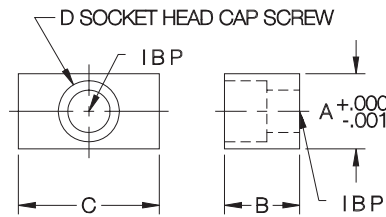
| | | |
|-----------------|------|-----------------|
| CLM-3-R-CBPR-S | 3mm | 3,010 / 3,000 |
| CLM-6-R-CBPR-S | 6mm | 6,012 / 6,000 |
| CLM-10-R-CBPR-S | 10mm | 10,015 / 10,000 |

FIXTURE KEYS

1018 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Standard key for fixtures slotted to mount on one specific machine table. Depth of slot in fixture should be 1/2 of B dimension.



INCH

| PART NO. | TABLE SLOT SIZE | A | B | C | D |
|----------|-----------------|-------|-----|-------|---------|
| CL-1-FK | 1/2 | .5000 | 1/2 | 3/4 | 1/4-20 |
| CL-3-FK | 5/8 | .6250 | | 3/4 | 5/16-18 |
| CL-4-FK | 11/16 | .6875 | | 1 | |
| CL-5-FK | 3/4 | .7500 | | 1-1/4 | |
| CL-6-FK | 13/16 | .8125 | | | |

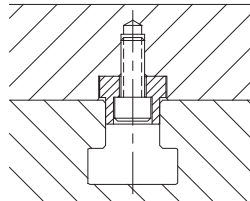
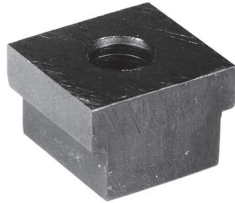
METRIC

| | | | | | | |
|-----------|------|----|----|----|----|----|
| CLM-12-FK | 12mm | 12 | 10 | 8 | 20 | M5 |
| CLM-14-FK | 14mm | 14 | | 22 | M6 | |
| CLM-16-FK | 16mm | 16 | | | | |
| CLM-18-FK | 18mm | 18 | | | | |
| CLM-20-FK | 20mm | 20 | | | | |

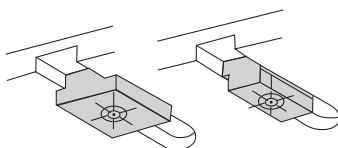
6

STEP FIXTURE KEYS

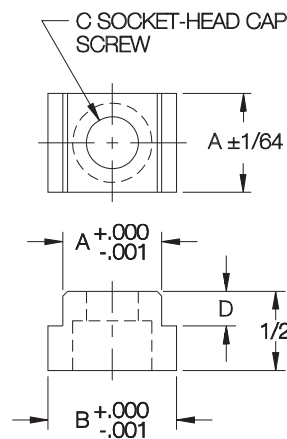
MILD STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Adapts a key-slotted fixture or vise to machine tables with a different slot size. Available for inch or metric slots. Top and bottom of key are centered within .0005 of each other.



Step Fixture Keys are available for machine-table slots either larger or smaller than a given fixture slot. (Viewed from underside of fixture.)



INCH FIXTURE SLOTS

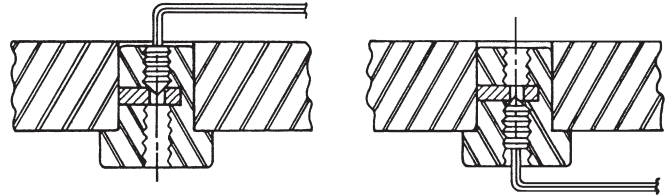
| PART NO. | FIXTURE SLOT SIZE | A | TABLE SLOT SIZE | B | C SOCKET-HEAD CAP SCREW (ORDER SEPARATELY) | D |
|---------------|-------------------|-------|-----------------|-------|--|------|
| CL-10-SFK-18 | 5/8 | .6250 | 18mm | .7087 | CL-5/16-18X.75-SHCS | 7/32 |
| CL-11-SFK-625 | 11/16 | .6875 | 5/8 | .6250 | CL-5/16-18X.75-SHCS | 9/32 |
| CL-11-SFK-16 | | | 16mm | .6299 | | 9/32 |
| CL-11-SFK-18 | | | 18mm | .7087 | | 7/32 |
| CL-11-SFK-20 | | | 20mm | .7874 | | |
| CL-12-SFK-625 | 3/4 | .7500 | 5/8 | .6250 | CL-5/16-18X.75-SHCS | 9/32 |
| CL-12-SFK-18 | | | 18mm | .7087 | 9/32 | |
| CL-13-SFK-18 | 13/16 | .8125 | 18mm | .7087 | CL-5/16-18X.75-SHCS | 9/32 |

METRIC FIXTURE SLOTS

| PART NO. | FIXTURE SLOT SIZE | A | TABLE SLOT SIZE | B | C SOCKET-HEAD CAP SCREW (ORDER SEPARATELY) | D |
|--------------|-------------------|----|-----------------|-----|--|---|
| CL-20-SFK-18 | 20mm | 20 | 18mm | 181 | CLM-6X15-SHCS | 7 |

SURE-LOCK™ FIXTURE KEYS

1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH

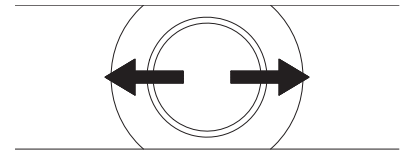


Lock in place from above or below using a hex wrench.

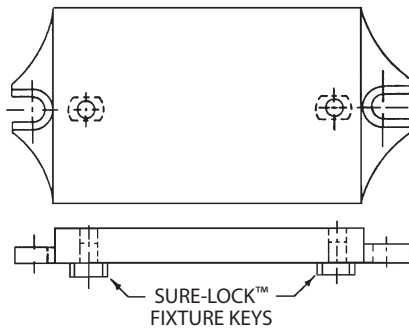
Perfect fixture key for most applications. Keys are interchangeable because they all fit in a 5/8 reamed hole. Allows mounting any fixture on any machine simply by switching keys. Eliminates the need to slot fixtures. Concentricity .0005 TIR or better. Available for inch or metric machine-table slots.

INCH

| PART NO. | TABLE SLOT SIZE | A | B | C | D |
|--------------|-----------------|-------|-----|------|-----|
| CL-375-SLFK | 3/8 | .3750 | 1/2 | 3/8 | .23 |
| CL-437-SLFK | 7/16 | .4375 | | | |
| CL-500-SLFK | 1/2 | .5000 | 3/4 | 7/16 | .41 |
| CL-5000-SLFK | | | 1/2 | 3/8 | .23 |
| CL-562-SLFK | 9/16 | .5625 | 3/4 | 7/16 | .41 |
| CL-5625-SLFK | | | 1/2 | 3/8 | .23 |
| CL-625-SLFK | 5/8 | .6250 | 3/4 | 7/16 | .41 |
| CL-6250-SLFK | | | 1/2 | 3/8 | .23 |
| CL-687-SLFK | 11/16 | .6875 | 3/4 | 7/16 | .41 |
| CL-6875-SLFK | | | 1/2 | 3/8 | .23 |
| CL-7500-SLFK | 3/4 | .7500 | 3/4 | 7/16 | .41 |
| CL-8125-SLFK | 13/16 | .8125 | | | |

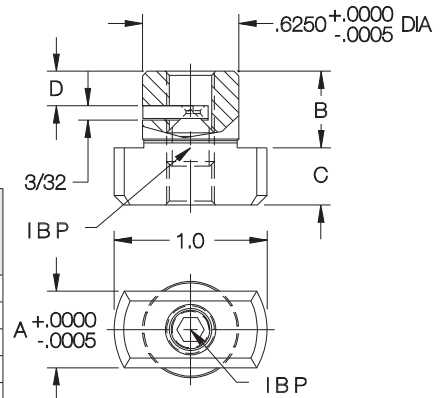


Patented locking action aligns fixture key perfectly with slot axis.



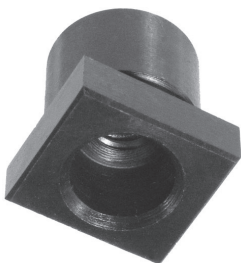
METRIC

| PART NO. | TABLE SLOT SIZE | A (mm) | SHANK DIA | B (mm) | C (mm) | D (mm) |
|------------|-----------------|--------|-----------|--------|--------|--------|
| CL-12-SLFK | 12mm | 12 | 5/8" | 12.5 | 9.5 | 9 |
| CL-14-SLFK | 14mm | 14 | 5/8" | 19 | 11 | 10.5 |
| CL-16-SLFK | 16mm | 16 | 5/8" | 19 | 11 | 10.5 |
| CL-18-SLFK | 18mm | 18 | 5/8" | 19 | 11 | 10.5 |
| CL-20-SLFK | 20mm | 20 | 5/8" | 19 | 11 | 10.5 |
| CL-22-SLFK | 22mm | 22 | 5/8" | 19 | 11 | 10.5 |



REAMED-HOLE FIXTURE KEYS

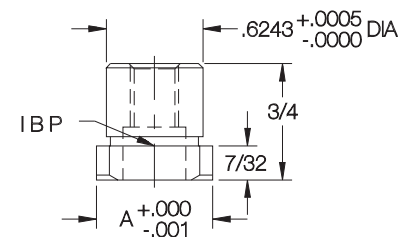
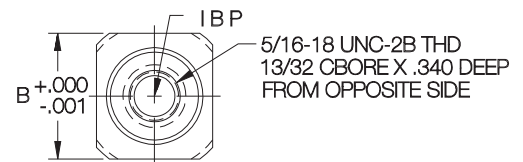
1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Each key fits two different table slots by turning 90°. Install in a 5/8 reamed hole. Fasten from above with a 5/16-18 Socket-Head Cap Screw, or from below with a 1/4-20 Socket-Head Cap Screw. Concentricity .0005 or better.

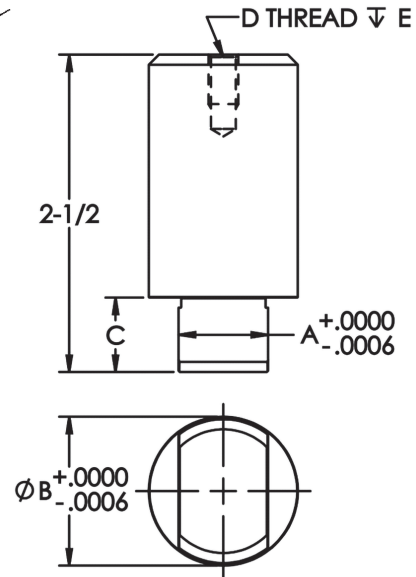
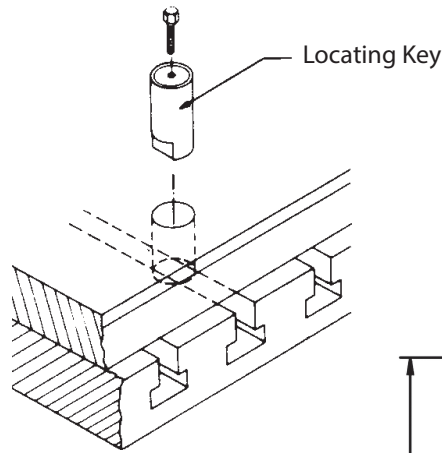
INCH

| PART NO. | TABLE SLOT SIZES | A | B |
|----------|------------------|-------|-------|
| CL-1-RFK | 5/8 and 11/16 | .6875 | |
| CL-2-RFK | 5/8 and 3/4 | .6250 | .7500 |
| CL-3-RFK | 5/8 and 13/16 | | .8125 |
| CL-4-RFK | 11/16 and 3/4 | .6875 | .7500 |
| CL-6-RFK | 3/4 and 13/16 | .7500 | .8125 |



LOCATING KEYS

1144 OR 1045 STEEL, HEAT TREATED, BLACK OXIDE FINISH



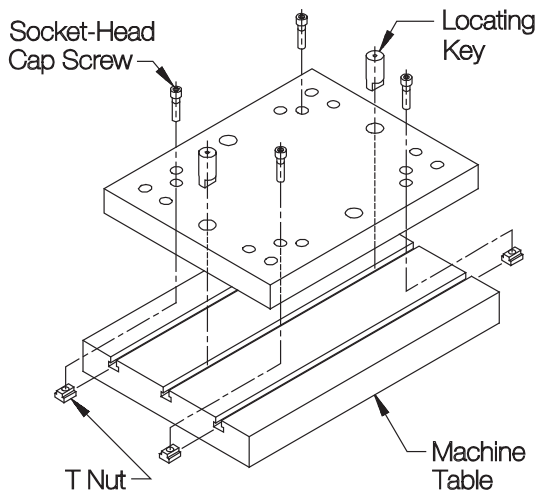
These heavy-duty removable-type keys are our standard fixture keys for large fixture plates. Locating keys are available in two body diameters — metric (30mm) and inch (1-1/8"). These keys can be used for mounting all of our Rectangular Tooling Plates, blank and modular. Locating Keys can be inserted from above after placing the fixture plate on the machine table, to keep the top free of obstructions. If desired, Locating Keys can be removed before machining, after the fixture is fastened to the machine table. The tapped hole in the key's top surface makes insertion and removal easier. Locating flats are accurate to within .0005" true position of the body diameter.

METRIC DIAMETER (30mm)

| PART NO. | TABLE SLOT SIZE | A (mm) | B DIA (mm) | C (mm) | D THREAD | THREAD PITCH (mm) | E (mm) |
|-------------|-----------------|--------|------------|--------|----------|-------------------|--------|
| CLM-14-LK | 14mm | 14 | 30 | 15 | M6 | 1 | 10 |
| CLM-6250-LK | 5/8" | 15.88 | | | | | |
| CLM-18-LK | 18mm | 18 | | | | | |
| CLM-8125-LK | 13/16" | 20.64 | | | | | |
| CLM-22-LK | 22mm | 22 | | | | | |
| CLM-8750-LK | 7/8" | 22.23 | | | | | |

INCH DIAMETER (1-3/16")

| PART NO. | TABLE SLOT SIZE | A | B DIA | C | D THREAD | E |
|--------------|-----------------|-------|--------|-----|----------|-----|
| CL-MF10-4401 | 14mm | .5512 | 1.1875 | 5/8 | 1/4-20 | 3/8 |
| CL-MF10-4406 | 9/16 | .5625 | | | | |
| CL-MF10-4407 | 5/8 | .6250 | | | | |
| CL-MF10-4402 | 16mm | .6299 | | | | |
| CL-MF10-4408 | 11/16 | .6875 | | | | |
| CL-MF10-4403 | 18mm | .7087 | | | | |
| CL-MF10-4409 | 3/4 | .7500 | | | | |
| CL-MF10-4404 | 20mm | .7874 | | | | |
| CL-MF10-4411 | 13/16 | .8125 | | | | |
| CL-MF10-4405 | 22mm | .8661 | | | | |
| CL-MF10-4410 | 7/8 | .8750 | | | | |



PALLET FIXTURE KEYS

1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH

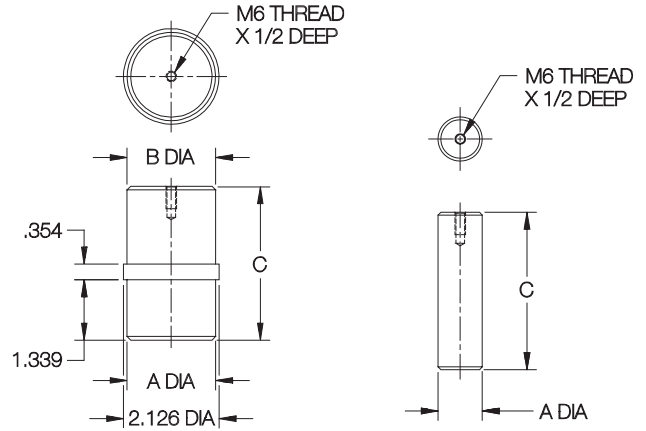


Center Pin



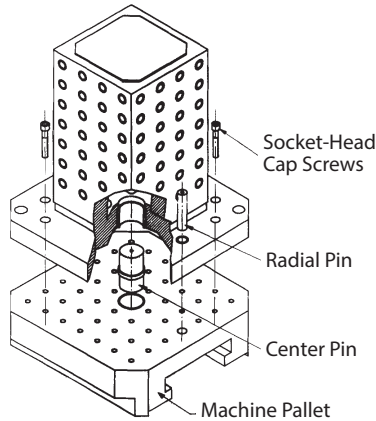
Radial Pin

Fixture keys for mounting tooling plates and blocks on standard DIN pallets. Each pallet requires one Center Pin and one Radial Pin (for orientation). The Radial Pin is usually removed after fastening the pallet to the machine table.



Center Pin

Radial Pin



CENTER PINS

| PART NO. | A DIA | | B DIA | | C |
|-------------|---------|---------------|---------|---------------|------|
| | NOMINAL | ACTUAL | NOMINAL | ACTUAL | |
| CLM-25-PFKC | | | 25mm | .9839/.9835 | 2.87 |
| CLM-30-PFKC | 50mm | 1.9681/1.9676 | 30mm | 1.1808/1.1804 | 3.42 |
| CLM-50-PFKC | | | 50mm | 1.9681/1.9676 | |

RADIAL PINS

| PART NO. | A DIA | | C |
|-------------|---------|-------------|------|
| | NOMINAL | ACTUAL | |
| CLM-20-PFKR | 20mm | .7871/.7867 | 3.50 |
| CLM-25-PFKR | 25mm | .9839/.9835 | 4.92 |

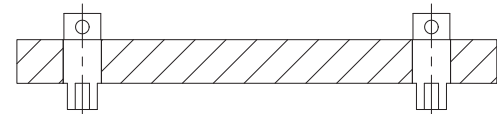
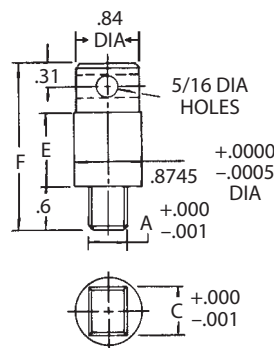
6

MILL FIXTURE KEYS

1215 STEEL, CARBURIZED-HARDENED, BLACK OXIDE FINISH



Can be removed from above after mounting fixture on machine. Fits either 11/16 or 13/16 table slots by turning 90°. Install in a 7/8 reamed hole. Concentricity .0005 or better.



INCH

| PART NO. | TABLE SLOT SIZES | A C E F | | | |
|------------|------------------|---------|-------|------|------|
| | | A | C | E | F |
| CL-1-MFK-1 | 11/16 or 13/16 | .6873 | .8123 | 1.00 | 2.20 |
| CL-1-MFK-2 | | | | 3.20 | 4.40 |