KeyCreator Lesson KC4631

Ordinate Dimension Basics

Ordinate dimensions are extremely useful when dimensioning parts with a large number of dimensions.

Toolmakers especially like the ability to instantly see the distance of any feature, such as a hole, from a common reference location since this simplifies manual positioning using X/Y slides on machining equipment.



In this lesson we'll quickly review the basic steps used to create and modify ordinate dimensions.



Start with a new file in View 1. (The Top View.) Click on the CREATE RECTANGLE BY WIDTH HEIGHT Icon.

Use the BotLeft Anchor Option. Type 4 for the Width and 2 for the Height.

Using the KeyIn Option, hit the ENTER Key three times to position the rectangle at the origin.

Next, click on the CREATE CIRCLE BY DIAMETER Icon.

Type 0.25 for the Diameter.

Using the KeyIn Option, place six circles at the following locations using the KeyIn Option.

Hole #	Xlocation	Ylocation	Zlocation
1	1.125	0.375	0
2	1.250	0.750	0
3	2.125	0.500	0
4	2.250	0.250	0
5	2.750	1.750	0
6	3.500	1.000	0





Now we could certainly dimension the holes on this plate using regular linear horizontal and vertical dimensions. If you did that the drawing might look like this:

When you are done, your screen should look like this:



In this type of situation, however, the ordinate dimensioning provides a much cleaner end result.

Click on the HORIZONTAL ALIGNED ORDINATE DIMENSION Icon.

Using the EndEnt Option, click on the bottom, left corner of the rectangle to set the base position.

Move the cursor downward and click to set the dimension text.

Now, using the CtrMid Option, click on each of the circles. Then using the EndEnt Option, click on the bottom right corner of the rectangle.

Your screen should look like this:





Your dimensioned drawing should look like this: (Note: I like to use Centerlines for circles on my drawings to add some clarity as shown. If you haven't used the centerline tool before, see KeyLesson KC4632.)

Click on the VERTICAL ALIGNED ORDINATE DIMENSION Icon.

Using the EndEnt Option, click on the bottom, left corner of the rectangle to set the base position.

Move the cursor to the left and click to set the dimension text.

Then, using the Ctr/Mid Option, click on each of the circles. Using the EndEnt Option, click on the top, left corner of the rectangle to complete the vertical entries.



Modifying Ordinate Dimensions

Realigning the Dimensions

Modifying ordinate dimensions is easy. Let's take a moment to go over the various options.

First, if you just want to move the dimensions away from or toward the part, click on the GENERIC MOVE Icon.



Drag the base reference dimension (0.000) and the entire string will instantly realign.

Adding to a Dimension

Adding to an existing ordinate dimension is easy. Create another 0.250 diameter hole at X=3.75, Y=0.5, Z=0.



Then, click on the ADD TO BASELINEAR DIMENSION Icon.

Click on the 0.000 base reference of the horizontal dimension and then, using the CtrMid Option, click on the new circle that you just created.

Notice that the horizontal dimension updates to include the new circle position. You can immediately do the same thing to update the vertical ordinate dimension.

2.750 3.500 4.000 4.000 4.000 4.000

Subtracting from a Dimension

Subtracting from an ordinate dimension is just as easy.

Delete one of the circles on the plate.





Notice that both the vertical and horizontal ordinate dimensions on the drawing now have underlines on the values associated with the deleted circle. (That is because these dimensions are no longer associated with geometry.)



Click on the REMOVE A DIMENSION FROM A BASELINEAR DIMENSION Icon.

Click on the underlined dimension and hit the ENTER Key. This cleans up the ordinate dimension so it matched the existing geometry on the screen.

Moving a Dimension in an Ordinate Dimension



Let' suppose that you are finishing up a drawing and you notice that you inadvertently selected the wrong location for one of the dimensions in an ordinate dimension. (Maybe you used EndEnt instead of CtrMid when you clicked on one of the circles.)

You can quickly fix this by clicking on the MOVE DIMENSION IN ORDINATE DIMENSION Icon.

Click on the dimension text first. Then, using the appropriate position option, click on the correct location. Notice that the dimension reattaches and updates to the new location.

Adding an Offset Value to an Ordinate Dimension

By default the ordinate dimensions that we placed on this plate start at 0.000 since that is the origin of the system. If the plate was positioned at another location and you wanted the ordinate dimension values to show the true absolute position values, you could easily do this by using the Add Offset Value to Ordinate Dimension Function.

To do this, click on the ADD OFFSET VALUE TO ORDINATE DIMENSION Icon.





Click on the 0.000 Base text of the horizontal dimension.

Type "3" for the offset and hit the ENTER Key.

Notice that all of the dimension values are incremented by 3.

Take a second to click on the UNDO Icon to revert back to 0.000 for the base dimension.



Moving an Ordinate Dimension

Let's suppose that you want to move the basepoint of the horizontal ordinate dimensions on the plate to the bottom right corner of the rectangle.

You can do this easily by clicking on the MOVE ORDINATE DIMENSION Icon. Then, click on the 4.000 dimension at the right end.

If you wanted to reset the dimensions so they measured both right and left from the center of the bottom edge of the rectangle, you would first add the midpoint of the bottom edge as a dimension and then use the Move Function to reset the basepoint to that location.

