

## IMPRECISIONS IN FIRST-ANGLE OR THIRD-ANGLE PROJECTION USING

Modern technologies bring for us unlimited possibilities for information exchange. “Engineering drawing: a universal language in two dialects” (Belofsky H.) is widely used for graphical information exchange. As a general rule first-angle projection is used according to ISO standard system and third-angle projection – ANSI standard system. An analysis of widely represented first-angle or third-angle projection examples shows that there are some imprecision in explanation of these methods differences. As often as not three primary views and position of object in axonometric view are not correct.

Example: According to Giesecke F.E. et al. Engineering Graphics, “Ultimately, the only difference between third-angle and first-angle projection is the arrangement of views.” (Fig.1). It is a view from a third-angle standpoint.

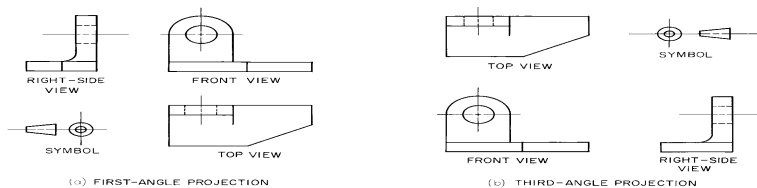


Fig.1. First-angle and third-angle projection (Giesecke F.E. et al.)

Another example: Front, top, and left side view as three primary views are shown (Fig.2) in look from first-angle standpoint.

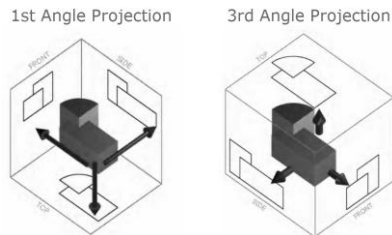


Fig.2. First-angle and third-angle projection (<http://www.rab3d.com/index.html>)

Some ideas on this question are found in Wikipedia: “Monge's original formulation uses two planes only, and obtains the top and front views only. The addition of a third plane to show a side view (either left or right) is a modern extension. The terminology of *quadrant* is a mild anachronism, as a modern orthographic projection with three views corresponds more precisely to an octant of 3D space.” But here this problem is not explained in detail.

For the better orthographic projection understanding of our students we use the system of three projection plane (Fig.3).

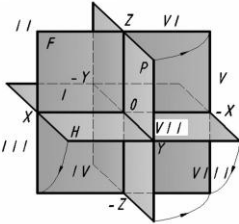


Fig.3. Three projection plane model and octant numbering

The object position in isometric view is not the same in first-angle or third-angle projection. The principal views most often used are front, top, and left side according to first-angle system, and - top, front, and right side – according to third-angle system (Fig.4).

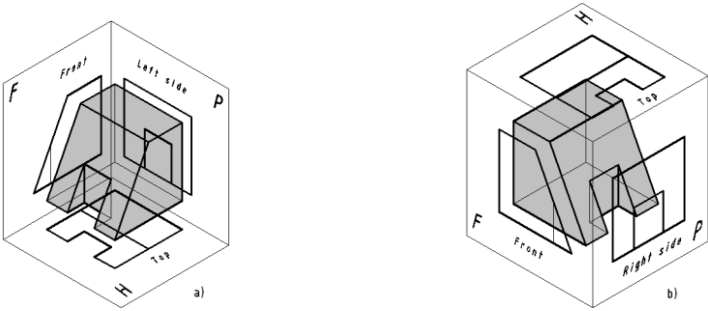


Fig.4. First-angle (a) and third-angle (b) projection to the octants of 3-D space