

The Titan Centering Microscopes are designed for job set-up and inspection with vertical milling machines, large jig borers, boring mills, lathes, electrical discharge machines, tape-controlled machines, drill presses. Three Coordinate Measuring Machines.

Titan Centering Microscopes have an upright image, optically correct from left to right so that the operator sees the workpiece with the microscope the same as without it, Mistakes due to transposing or converting are eliminated.

The New CS Series Centering Microscopes all come with hardened and ground 1/2" diameter shanks so that they are adaptable to all machines through the use of collets. It is suggested if it will be used continuously in one machine that it be fitted with its own collets.

The most precise spindle run-out can be compensated with the CS Series Centering Microscopes.

The CS Series Centering Microscope have a "Prismatic" centering device where only two screws are needed for especially simple and fast centering to compensate for spindle runout. The prismatic setting on the CS Series has the advantage of not changing the settings of one axis while you are adjusting the other axis, as both settings are entirely independent of each other. Both methods can be quickly mastered. Special instructions come with the units. It is an easy matter to adjust the microscope for perfect centering every time.

- Surface finish can easily be checked with Model CS-50X under 50X magnification.
- The drilling of printed circuit boards through prior location and centering.
- Details too small, or inaccessible to an indicator or edge finder can be easily picked up.
- A vertical mill or jig borer with optical scale or precise lead screws can be turned into a three coordinate measuring machine for checking the accuracy of completed dies, molds, castings and precision parts. These parts are sometimes too big to fit into a comparator or a Tool Maker's Microscope table as these means of measuring the larger parts are too limited to check the job properly.
- The uses of 3 coordinate measuring machines can be greatly enlarged by their usage with the CS-20X adapted to video with the TSTVA-12 Video adapter specifically designed for this purpose.
- The human element of "feel or touch" is eliminated so all errors resulting from misreading micrometers, verniers and indicators is eliminated by the lack of physical contact between the operator and what he is measuring through the use of microscopes.
- Model CS-20X is especially useful for setting up on Electrical Discharge Machines, because of its extra-long focal length and long eyetube, made so the operator has easy access to the instrument over the closed tub or basin of the machine. (With some care the operator can learn to view the workpiece through clean oil, once the angle of distortion is calculated.) This eliminates constant draining between changing electrodes.
- The zero (0) or starting position for use on tape-controlled machinery can easily and quickly be plotted through their usage by sighting through the various positions needed in the work cycle and punching the tape accordingly.
- Model CS-10Xwith low magnification and extremely long focal length is ideally suited for alignment on Boring Mills.
- Model CS-100X with High Magnification depth Measurement of Minute Slots and Grooves by the difference in Focus Principal. Sight on the Bottom of the Groove zero an indicator attached to the Vertical Spindle, come to the top of the Groove and read the displacement on the indicator.
- Checking Printed Circuit Boards on Three Coordinate Measuring Machines for Size of Holes and Circuit Patterns.

VIDEO ADAPTER FOR TITAN CENTERING MICROSCOPES:

It is easy to adapt all Titan Centering Microscopes CS Series to Video. It is necessary to remove the Eyepiece and use the Video Adapter instead. These Video Adapters will screw directly into the C Mount of any Video Camera. The Centering Microscope can still be centered to the center of rotation of a spindle. The only difference is that the image is now captured on the screen of the Video Monitor. This maybe especially desirable for Large Coordinate Measuring Machines, Large Jig Borers and any Machine where it is impossible to look in the Eyepiece because of table size or obstructions on the machine.

Further Advantages of Video Adaptation:

- (a) It alleviates eye strain.
- (b) More than one person can view the image at the same time.
- (c) The image can now be frozen, digitized or computerized.
- (d) In some cases, it may be possible to reach higher magnifications through Video.

Standard Data for CS Series models:

Overall Length: 6.25"
 Front Prism Housing: 1.8" x 2.20"
 Side Prism Housing: 2.50" x 2.20"
 Shank: 0.500" Diameter Hardened & Ground - 2.40" Long.
 Length of Objective: 0.75"
 Eyetube: 4.2" long at a 20° angle to the center line of the body.
 Image: Right side up, not inverted. Optically correct.

Centering Device: Prismatic type consists of 2 screws, one under the eyetube for correcting misalignment of the X-X axis of the spindle of the machine and one on the right side of the microscope for correcting run-out of the Y-Y axis of the machine. Each screw has its own independent action and is not related to the other screw correcting the other axis. This device greatly simplifies spindle run-out correction. The independent action of each screw does not misalign or change the previous setting of the other screw, as in most centering devices. Weight 1 3/4 lbs.

10X Standard Wide Field Eyepiece with standrd reticle & color coated & corrected for chromatic aberrations comes with all units.

	Model CS-10X		Model CS-20X		Model CS-50X		Model CS-50X-LWD		Model CS-100X		Model CS-200X	
	Magnification	Field of View	Magnification	Field of View	Magnification	Field of View	Magnification	Field of View	Magnification	Field of View	Magnification	Field of View
Magnification Standard with 10X Eyepiece.	10X	.760"	20X	.340"	50X	.150"	50X	.150"	100X	.070"	200X	.036"
Magnification Standard with 20X Eyepiece.	20X	.500"	40X	.240"	100X	.100"	100X	.100"	200X	.045"	400X	.024"
Working Distance	6.50"		2.90"		.520"		1.772"		0.255"		0.060"	
Standard all units	Consists of 90° cross lines and 6 concentric circles of .100", .200", .300", .400", .500" & .600" diameter. DIVISIONS: 90° cross lines on the vertical & horizontal axis with .005" divisions.		Consists of 90° cross lines and 6 concentric circles of .050", .100", .150", .200", .250" & .300" diameter. DIVISIONS: 90° cross lines on the vertical & horizontal axis with .0025" divisions.		Consists of 90° cross lines and 6 concentric circles of .020", .400", .060", .080", .100" & .120" diameter. DIVISIONS: 90° cross lines on the vertical & horizontal axis with .001" divisions.		Consists of 90° cross lines and 6 concentric circles of .010", .020", .030", .040", .050" & .060" diameter. DIVISIONS: 90° cross lines on the vertical & horizontal axis with .0005" divisions.		Consists of 90° cross lines and 6 concentric circles of .005", .010", .015", .020", .025" & .030" diameter. DIVISIONS: 90° cross lines on the vertical & horizontal axis with .00025" divisions.			
Uses	The unit has been used especially for Boring Mills, because of its extremely long focal length. It can also be used on Vertical Milling Machines or Jig Borers whenever a long focal length is necessary.		A Centering Microscope especially well suited for use on electrical discharge machines and Bridgeport Type Milling Machines and some Three Coordinate Measuring Machines. It has a larger field of view, longer focal length, longer eyetube, which allows the viewer easier access to the microscope as is combined with an almost horizontal position of the eyetube. The prismatic 2 screw centering method for spindle run out makes for easy and fast set-ups.		The unit has been specially designed for use on the ThreeCoordinate Measuring Machines as "Moore, Sip, Bendix, Boice, Numerex", etc. It has a larger field of view, larger spacing between lines on the reticle, higher magnification and a Prismatic Centering Device for spindle run out which makes for easy and fast setups.		These models are ideal for extremely close measuring. It is ideally suited for Three Coordinate Measuring Machines, or miniature electronic chip measuring, sizing and locating. Readings of .0001" to .00005" are possible. The machine where these are to be used, must be absolutely stable with no vibration due to the high magnifications used.					
Objective Magnification	1X		2X		5X		10X		20X			
Resolution (In lines per mm)	10 X Eyepiece 40.3 Lines per mm		10 X Eyepiece 80.6 Lines per mm		10 X Eyepiece 203 Lines per mm		10 X Eyepiece 400 Lines per mm		10 X Eyepiece 400+ Lines per mm			
	20 X Eyepiece 60 Lines per mm		20 X Eyepiece 128 Lines per mm		20 X Eyepiece 400 Lines per mm		20 X Eyepiece 400+ Lines per mm		20 X Eyepiece 400+ Lines per mm			



TSTVA-12 Video Adapter



TR-L1-LED Ring Light



TR-L1-18RR Reducer Ring



Ordering Information

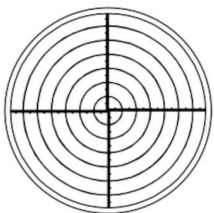
Model Number	Description
CS-10X	10X Centering Microscope
CS-20X	20X Centering Microscope
CS-50X	50X Centering Microscope
CS-50X-LWD	50X Centering Microscope Long W.D.
CS-100X	100X Centering Microscope
CS-200X	200X Centering Microscope

Optional Extras

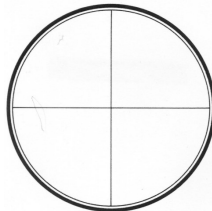
MJOB-1X	1X Objective
MJOB-2X	2X Objective
MJOB-5X	5X Objective
MJOB-5X-LWD	5X Objective Long W.D.
MJOB-10X	10X Objective
MJOB-20X	20X Objective
CS-EP-10	10X E.P. Standard Reticle
CS-CHEP-10	10X E.P. Crosshair Reticle
CS-EP-20	20X E.P. Standard Reticle
CS-CHEP-20	20X E.P. Crosshair Reticle
TSTVA-12	"C" Mount Video Adapter
TR-L1-LED	16 LED Ring Light for CS Scope
TR.L1.18RR	26mm to 18mm Reducer Ring
RI-17	Fiber Optic Ring Light
FOI-150	150 Watt Fiber Optic Illuminator
LuxPro-LED	LED Fiber Optic Illuminator
CS-SCFL	Foam Lined Storage Case



CS CENTERING SCOPE CASE



CS Series Standard Reticle



CS Series Cross Hair Reticle

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