

# Technical Data Package

Version 4.0 – April 12, 2022

E5163.00 - DIGITAL CATHETOMETER WITH TELESCOPE  
& OPTIONAL

E5163.A.001 - TELESCOPE IMAGING SYSTEM



5900 Schooner St, Belleville MI 48111 – USA

TEL (800) 422-2558 – FAX (734) 665-9099

[www.Eberbachlabtools.com](http://www.Eberbachlabtools.com)

## **TDP Table of Content**

<b>I. Description</b>	<b>3</b>
<b>II. Machine Specifications</b>	<b>5</b>
<b>a. Mechanical Specifications</b>	<b>6</b>
<b>b. Assembly</b>	<b>6</b>
<b>c. Use</b>	<b>6</b>
<b>d. Battery Replacement</b>	<b>7</b>
<b>e. Maintenance</b>	<b>7</b>
<b>III. Machine Testing Qualification &amp; validation</b>	<b>8</b>
<b>a. Factory Acceptance Test</b>	<b>9</b>
<b>b. Site Acceptance Test</b>	<b>10</b>
<b>IV. Machine Material of Construction (MOC) Documentation</b>	<b>11</b>
<b>Optional E5163.A.001 - Image System Specifications</b>	<b>17</b>
<b>V. Reticle Selection</b>	<b>19</b>
<b>Customer Signoff</b>	<b>20</b>

# I. Description



5900 Schooner St, Belleville MI 48111 – USA  
TEL (800) 422-2558 – FAX (734) 665-9099  
[www.EberbachLabTools.com](http://www.EberbachLabTools.com)

A cathetometer is an instrument for measuring distances between two points with great accuracy in cases where a scale cannot be placed very close to the points whose distance apart is desired.

Eberbach's E5163.00 Cathetometer is used for the easy and accurate measurement of vertical and horizontal distances or displacements, especially where close observation is difficult or dangerous. These units are indispensable where ordinary methods would introduce errors of parallax. Units measure either vertically or horizontally.

Eberbach's E5163.00 Cathetometer consists essentially of a column with an accurate digital scale and an optical system capable of being moved up and down or horizontally on the rigid column.

The optical system consists of a short-focus telescope with a drawtube, an eyepiece with reticle rotatable through 360 degrees, and a built-in image erecting system, making the unit convenient for reading thermometers, other scales, or printed matter. The telescope is 8" long while closed and opens up to 10 1/2". The draw tube can be clamped firmly to prevent shifting between readings while making focusing easy at any distance between 30 cm and infinity. The magnification of the telescope is varying from 20X at 30cm to 8X at infinity while the field is 13mm in diameter at 30 cm and 118 mm at 200 cm.

The telescope is mounted on a custom clamp which is mounted onto a column slide and travels the main column by way of a smoothly operating rack-and-pinion system. The telescope swings through a 90-degree plane about the axis of the main column while being supported by the support which can be adjusted laterally for a distance of 3/4" and fixed at any position about its vertical axis. The digital slide system has a resolution of 0.01 mm with an accuracy of +/- (0.02 + 0.00005 x L (mm) and can travel 21.75inch (55.24cm) and it is powered by a silver oxide battery. Optionally Eberbach offers a telescope mounted digital imaging system, part# E5163.A.001 which can capture photos taken through the telescope and save them to a computer.

To use the E5163.00 Cathetometer, the position of the telescope can be read by means of the digital scale mounted to the column. In measuring the distance between two points, the instrument must first be leveled. Next, the reticle in the eyepiece of the telescope is brought into coincidence with the image of one point and the position of the telescope noted; the reticle is then brought into coincidence with the image of the other point and the new position of the telescope noted. The difference between these readings is the distance required.

Among the uses of a cathetometer is reading the levels of a liquid in a capillary tube, such as in measurements of surface tension. A cathetometer also can be used for following the changes in liquid level in a dilatometer due to, for example, a chemical reaction therein. They are also used to calibrate the scales on instruments such as mercury barometers, and to read instruments such as liquid column thermometers and manometers.

## II. Machine Specifications



5900 Schooner St, Belleville MI 48111 – USA  
TEL (800) 422-2558 – FAX (734) 665-9099  
[www.EberbachLabTools.com](http://www.EberbachLabTools.com)

### **I.a Mechanical Specifications**

- Telescope Magnification: 20X at 30 cm – 8X at infinity
- Length: 9.5"
- Width: 9.5"
- Height: 37"
- Weight Unloaded: 28 lbs.

### **I.b Assembly**

Remove parts from packaging carefully. Do not discard packing materials until instrument has been assembled. First, remove the hex bolt and spring washer from the round section of the pillar. Slide the round section of the pillar into the base and refasten the hex bolt and spring washer. Note that the spring washer will pivot into two pins. Once the hex bolt is snug, the pillar will be able to be rotated. When the pillar is in the desired orientation, tighten the knurled head screw in the round portion of the base to fix the assembly. The horizontal support leg can now be inserted into the upper end of the column. The telescope can be slide into the rails and clamp in place. If the Optional Imaging System is purchased, assembly to the cathetometer as described in the instructions.

### **I.c Use**

In vertical use, the cathetometer is leveled by means of the three large, knurled head screws in the base, using centering level placed in the base for this purpose. The telescope can be focused by loosening the set screw on the eyepiece, moving the eyepiece in, or out as required and resetting the set screw. The instrument is then ready for use. Large hand wheel moves the carriage and telescope up or down. At anyone setting accurate readings can be made by means of the digital display to 0.01 mm.

For horizontal use, remove the telescope and its support from the carriage, lay the entire instrument on its side so that it rests on the horizontal support leg mentioned above. Then replace the telescope support in the end of the carriage side arm rather than on the top as previously. The pillar can be placed in a horizontal position by adjusting the length of the horizontal support leg which also has a locking nut to secure it in place once the adjustment is accomplished. Measurements are made in the same manner as described above.

**I.d Battery Replacement**

When the display keeps flashing or even does not appear, push the cover open as the arrow shows and replace the battery with a new one (SR44, 1.55V). The positive pole of the battery must face out.

**I.e Maintenance**

Normal cautions for use of scientific instruments apply. The cathetometer should not be dropped or misused in any other way. Lenses of the telescope can be cleaned with lens paper. The unit should be kept free of dust, particularly in the rack and pinion. Although all material employed are non-corrosive in character, a small quantity of light grade oil on a cloth can be used to clean off fingerprints, dust, etc. A light coat of Vaseline on the rack and pinion will keep the unit operating smoothly.

### III. Machine Testing Qualification & Validation



5900 Schooner St, Belleville MI 48111 – USA  
TEL (800) 422-2558 – FAX (734) 665-9099  
[www.EberbachLabTools.com](http://www.EberbachLabTools.com)



## II.a Factory Acceptance Test

(Eberbach's Responsibility)

E5163.00

Serial#: \_\_\_\_\_

Production Order#: \_\_\_\_\_

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	Check Telescope	Ensure lenses are free from dirt and debris.	<input type="checkbox"/>	<input type="checkbox"/>
2	Check Telescope	Ensure reticle is installed	<input type="checkbox"/>	<input type="checkbox"/>
3	Check Digital Readout	Record min and max measurement on digital readout (zero out at bottom and read max dimension on top of slide) Min: _____ Max: _____	<input type="checkbox"/>	<input type="checkbox"/>
4	Check Level	Verify level is clean and filled with fluid	<input type="checkbox"/>	<input type="checkbox"/>
5	Confirm Finish	Verify base is free from chips and scratches	<input type="checkbox"/>	<input type="checkbox"/>
6	Machine documentation Completed	Verify the Use and Care for the machine is completed and packaged with the machine.	<input type="checkbox"/>	<input type="checkbox"/>

Checked by: \_\_\_\_\_

Date: \_\_\_\_\_

## II.b Site Acceptance Test

(Clients Responsibility)

E5163.00

Serial#: \_\_\_\_\_

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	Check Telescope	Ensure lenses are free from dirt and debris.	<input type="checkbox"/>	<input type="checkbox"/>
2	Check Telescope	Ensure reticle is installed	<input type="checkbox"/>	<input type="checkbox"/>
3	Check Digital Readout	Record min and max measurement on digital readout (zero out at bottom and read max dimension on top of slide) Min: _____ Max: _____	<input type="checkbox"/>	<input type="checkbox"/>
4	Check Level	Verify level is clean and filled with fluid	<input type="checkbox"/>	<input type="checkbox"/>
5	Confirm Finish	Verify base is free from chips and scratches	<input type="checkbox"/>	<input type="checkbox"/>
6	Machine documentation Completed	Verify the Use and Care for the machine is completed and packaged with the machine.	<input type="checkbox"/>	<input type="checkbox"/>

Checked by: \_\_\_\_\_

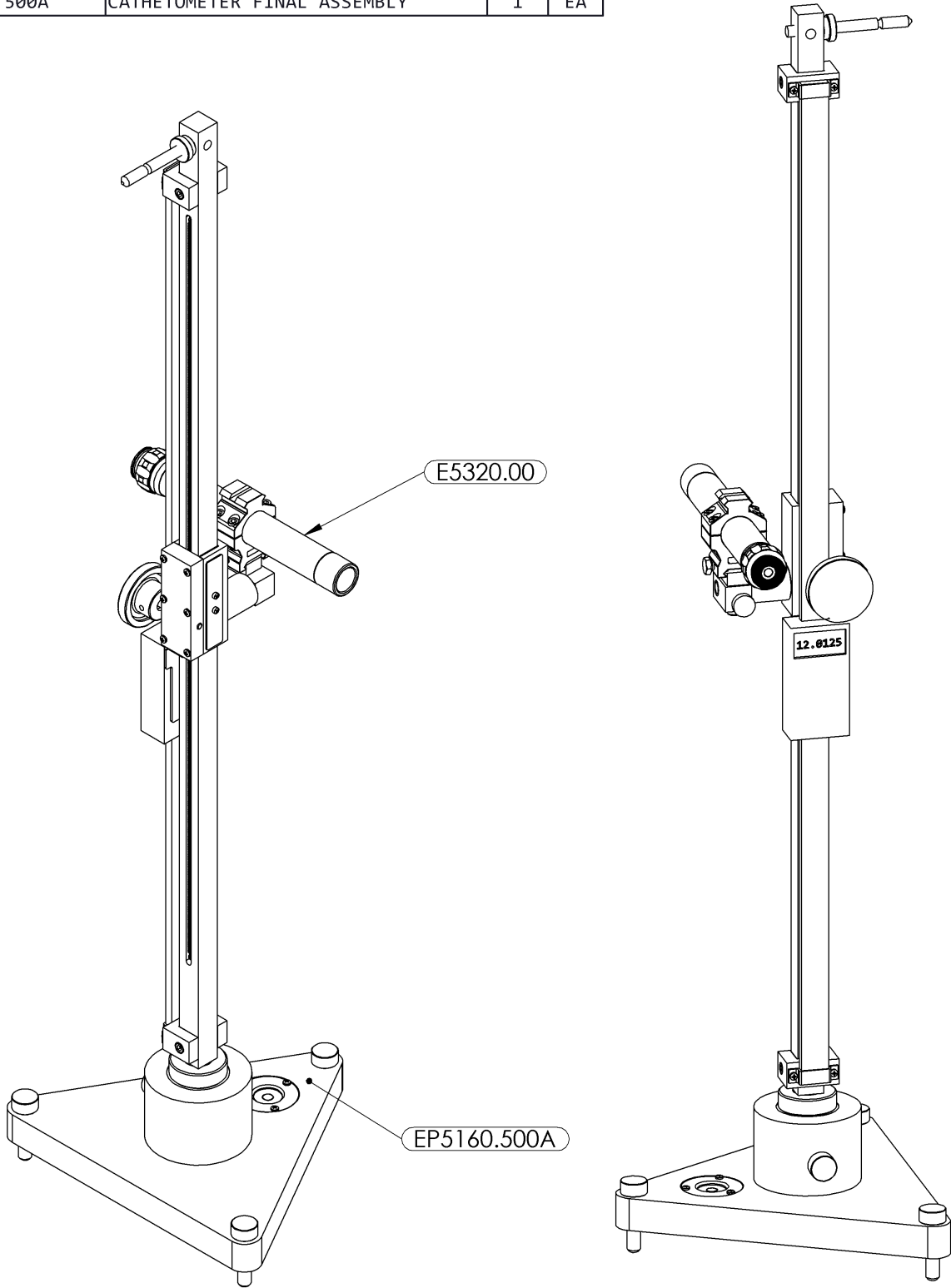
Date: \_\_\_\_\_

## IV. Machine Material of Construction (MOC) Documentation

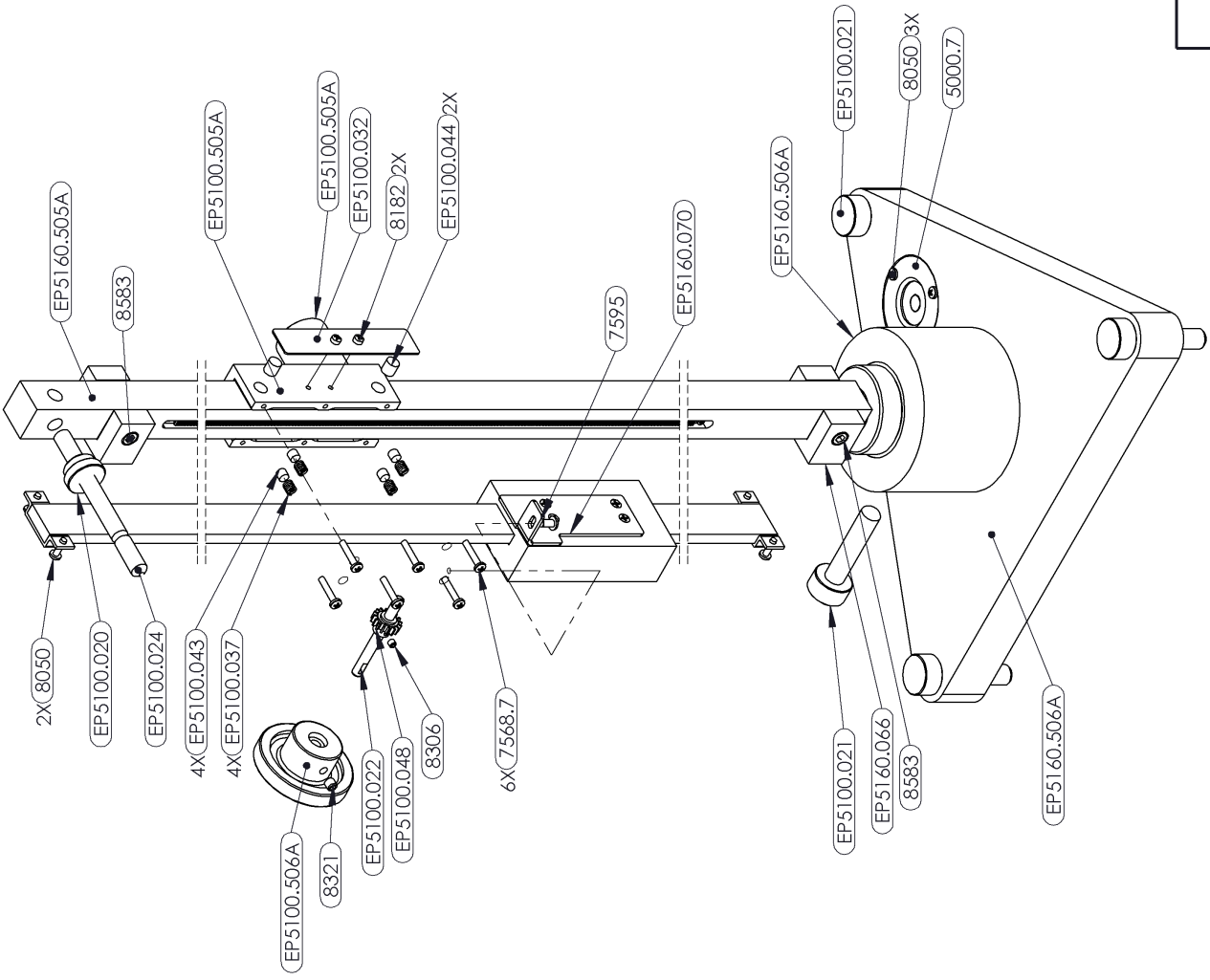
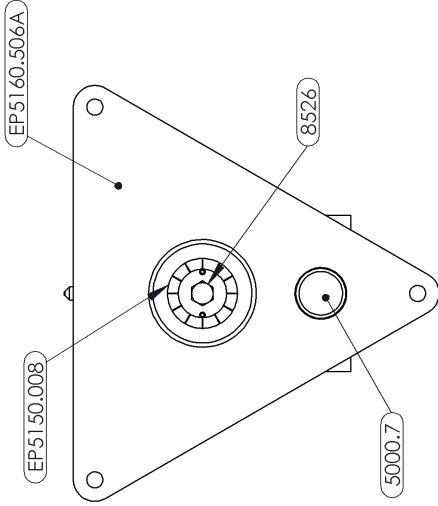


5900 Schooner St, Belleville MI 48111 – USA  
TEL (800) 422-2558 – FAX (734) 665-9099  
[www.EberbachLabTools.com](http://www.EberbachLabTools.com)

PartNo	DESCRIPTION	QTY.	UoM
E5320.00	TELESCOPE FOR CATHETOMETER	1	EA
EP5160.500A	CATHETOMETER FINAL ASSEMBLY	1	EA



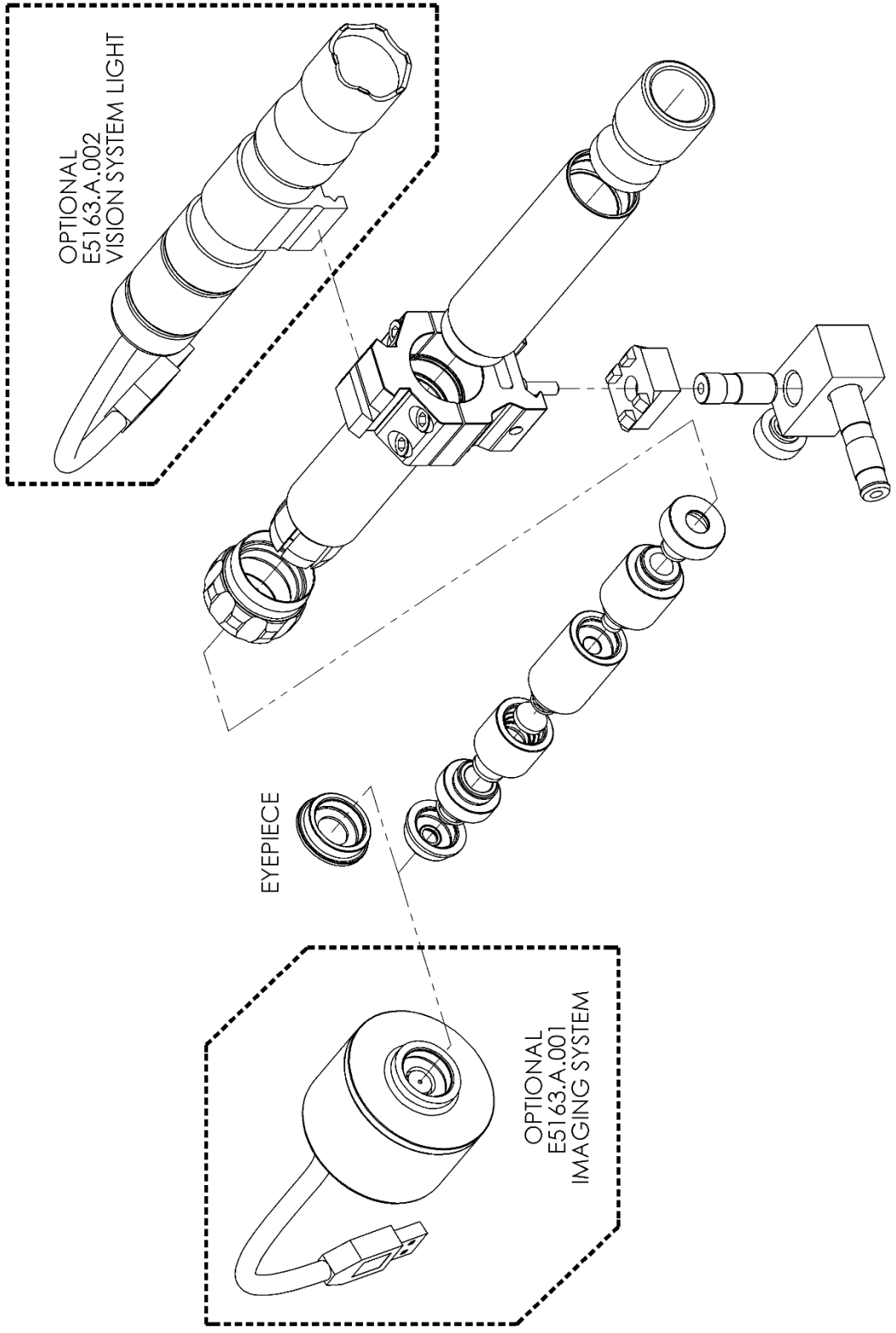
<b>EBERBACH CORPORATION</b>		
<small>PART NAME</small>	CATHETOMETER FINAL ASSEMBLY	<small>PART NO.</small> E5163.00

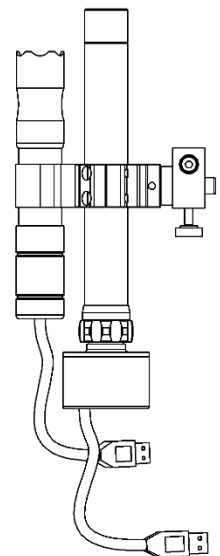
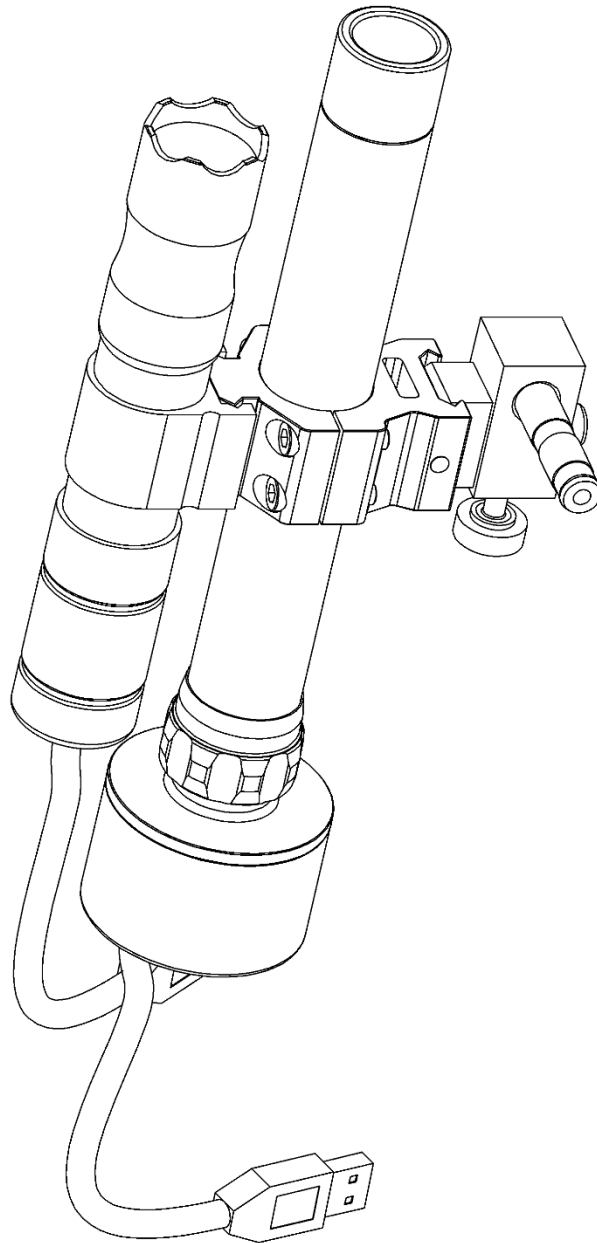
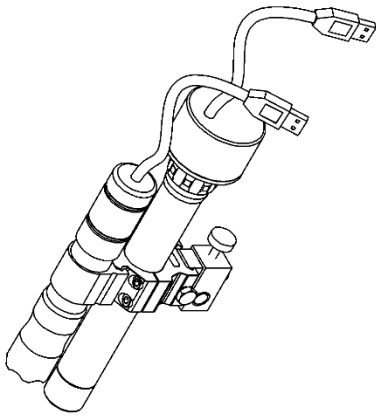


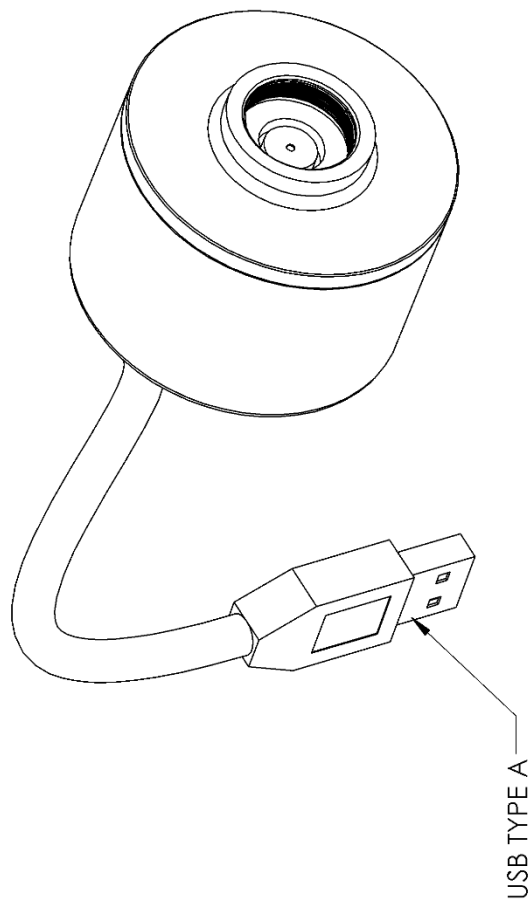
PartNo	DESCRIPTION	QTY.
5000.7	CIRCULAR LEVEL	1
6004.5	ELECTRONIC LINEAR SCALE 24"	1
7568.7	#4-40 X 5/8" S/S PAN HD. MACHINE SCREW	6
7595	#6-32 X 1/4" S/S ROUND HD. MACHINE SCREW	1
8048	#4-40 X 3/16" FLAT HD UNDERCUT MACHINE SCREW	4
8050	#4-40 X 3/8" S/S PAN HD. MACHINE SCREW	7
8182	#4-40 X 3/16" S/S FILLISTER HD. MACHINE SCREW	2
8306	#5-40 X 1/8" S/S SET SCREW	1
8321	#10-32 X 3/16" SET SCREW	1
8323	1/4"-20 X 3/16" SET SCREW	2
8526	5/16"-24 X 5/8" HEX HEAD SCREW	1
8583	#10-32 X 1/2" SOCKET HD. SCREW	4
9041	HANDKNOB	2
EP5100.009	BEARING BLOCK	1
EP5100.020	KNURLED NUT (HORIZ. SUP.)	1
EP5100.021	LEVELING SCREW	4
EP5100.022	PINION SHAFT	1
EP5100.024	HORIZONTAL SUPPORT	1
EP5100.027	CLAMP BLOCK	1
EP5100.032	LEAF SPRING	1
EP5100.037	PRESSURE SPRING	4
EP5100.043	PRESSURE BUTTON	4
EP5100.044	LARGE PRESSURE BUTTON	2
EP5100.048	PINION GEAR	1
EP5100.505A	SLIDE AND CLAMP ASSEMBLY	1
EP5100.506A	KNOB AND BUSHING ASSEMBLY	1
EP5100.512A	TELESCOPE SUPPORT OR CLAMP ASSEMBLY	1
EP5150.008	SPRING WASHER	1
EP5150.502A	SLEEVE ASSEMBLY	1
EP5160.066	LINEAR GAUGE SUPPORT	2
EP5160.070	ANGLE BRACKET CONNECTOR	1
EP5160.505A	PILLAR GEAR ASSEMBLY	1
EP5160.506A	BASE ASSEMBLY	1

**EBERBACH CORPORATION**

CATHETERMETER FINAL ASSEMBLY PART NO. EP5160.500A







USB TYPE A



## **E5163.A.001 - Image System Specifications**

Requires two USB ports – One for camera and one for light

### **Vision System Camera**

- Controlled using supplied Eberbach vision application
- Operating System – Windows XP/Vista/7/8/10
- Capture Images at 1920 x 1080 JPG
- Capture Video at AVI, resolution TBD
- Save images and videos to Windows file system
- USB Plug and Play
- 10ft USB Cable Included
  - Extended cables can be provided optionally
- Securely attached to telescope

### **Vision System Light**

- Light controlled via Eberbach vision application (turn on and off within app)
- 1500 Lumen light
- USB plug and play
- 10ft USB cable included
  - Extended cables can be provided optionally
- Securely attached to telescope



*Image was taken from 8ft (2.4m) away. Full framed image. Image resize to fit page*

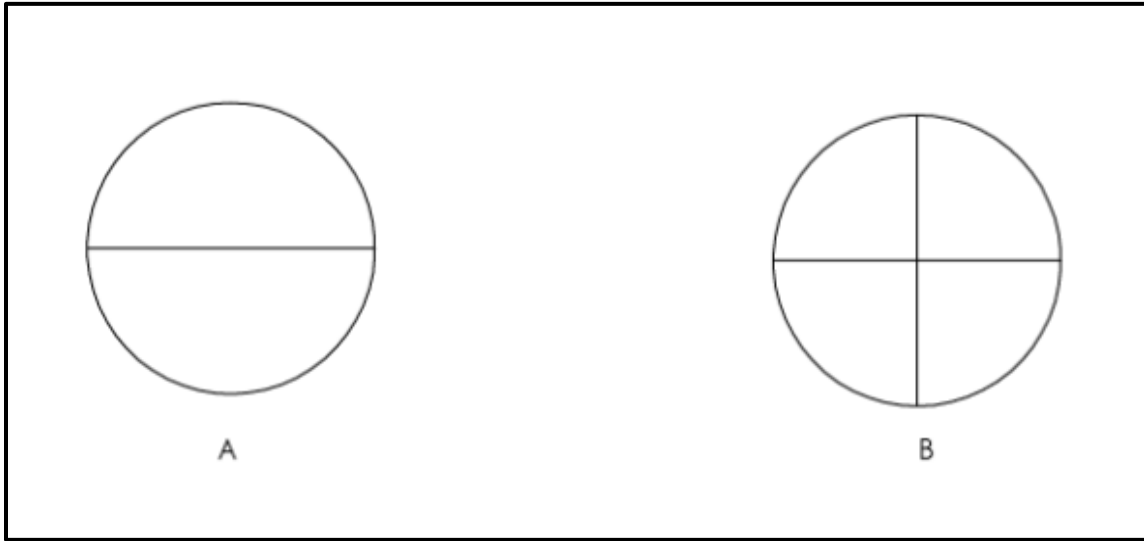


*Eberbach vision application. Menu button layout subject to change.*

## **Image System Factory Acceptance Test**

Step	Description	Specification or Acceptance Criteria	Result	
			Pass	Fail
1	Check App Installation	Eberbach Imaging System App installs on computer (Win OS)	<input type="checkbox"/>	<input type="checkbox"/>
2	Check Camera Installation	Camera System assembles onto telescope without issue	<input type="checkbox"/>	<input type="checkbox"/>
3	Check Camera Image	Plug camera USB into computer, view image without issue	<input type="checkbox"/>	<input type="checkbox"/>
4	Check Save Image Button	Image can be saved when Save Image button is pressed	<input type="checkbox"/>	<input type="checkbox"/>
5	Check Save Video Button	Video can be saved when Save Video button is pressed	<input type="checkbox"/>	<input type="checkbox"/>
6	Check Light Button	Light button will turn on and off the telescope light when pressed	<input type="checkbox"/>	<input type="checkbox"/>
7	Check Scan Devices Button	Camera can be selected when Scan Devices button is pressed	<input type="checkbox"/>	<input type="checkbox"/>

**Choose Reticle:**



**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

# Technical Data Package

Version 3.8 – December 22, 2021

## E5160.00 - DIGITAL CATHETOMETER WITH TELESCOPE & OPTIONAL E5163.A.001 - TELESCOPE IMAGING SYSTEM

### Customer Signoff

All purchases are governed by the legal contract available at <https://www.eberbachlabtools.com/About-Us/Terms.html><sup>1</sup> (the “Terms”). Buyer agrees that this Technical Data Package is governed in all respects by the terms in the relevant quotation and the Terms (and only the Terms) which together form a binding contract between Eberbach and Buyer. The Terms are incorporated herein by reference and this Technical Data Package or Eberbach’s acceptance of this order is expressly limited to, and expressly made conditional on, Buyer’s acceptance of the Terms.

Buyer expressly acknowledges that the Products purchased pursuant to this Technical Data Package are “Custom Products,” as described in the Terms.

The person executing this Technical Data Package on behalf of Buyer is an authorized representative of Buyer; this Technical Data Package has been duly and validly executed and delivered by Buyer and constitutes the legal, valid and binding obligation of Buyer, enforceable against Buyer in accordance with its terms.

**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

---

<sup>1</sup> NTD: May change to “Terms of Sale.”