AlignCam™ System

Manual for Models
8420, 8430, 8440 & 8450
Teleview Software v1.20

Part No. 17362

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Thank you for purchasing a Brunson AlignCam. Remember that our customer support does not stop after shipment of a product–we are here to help you with any measurement challenges that you may have.

System Components

1. Durable plastic case with protective foam for optical components

2. USB Cable to connect the CCD camera to a computer: USB 2.0, 5 meters long

3. CCD camera attached to the telescope lens adapter assembly

4. Jump drive containing the TeleView installation and support files

5. Two (2) plastic end caps [*pictured on camera*] to protect the optics if camera is removed from the assembly

6. Certificate of Authenticity [*not shown*]: 8-1/2" x 11" certificate identifying the camera serial number

Overview

This manual applies to the Brunson Instrument Company **Model 8420, 8430, 8440 and 8450 Camera Kits.**

Each camera kit is designed to work with a specific type of Brunson instrument. See the table below for the AlignCam systems and their corresponding instruments.

AlignCam Model	Instrument Type
8420	2022, 2022-02, 2024, 2024-02, C47280
8430	2062
8440	Precision Levels (545 series), Jig Transits (771, 75, 76 series)
8450	2030, 2024BL

This kit has everything to outfit an instrument having a standard eyepiece with a camera system that outputs a video image to a computer running Microsoft Windows 7, 8 or 10. This field conversion is easily accomplished with the help of this manual. Please refer to the pictures and illustrations throughout the manual for component details.

If purchasing an instrument and/or computer along with an Aligncam, your installation may not require all of the procedures described below.

System Requirements

The computer system requirements to run TeleView are relatively simple. The minimal requirements are:
  • Windows 7, 8 or 10; 32- or 64-bit
  • 2.6 GHz Processor
  • 4 GB RAM Memory
 • At least one USB 2.0 or 3.0 port

Hardware Assembly

Step One: Mount the instrument in a V-block or other secure fixture in preparation for taking measurements as shown below.

Step Two: Unscrew the eyepiece assembly from the telescope. Images of the eye piece removal for each camera kit is shown on the next page.

8420 AlignCam eyepiece removal.
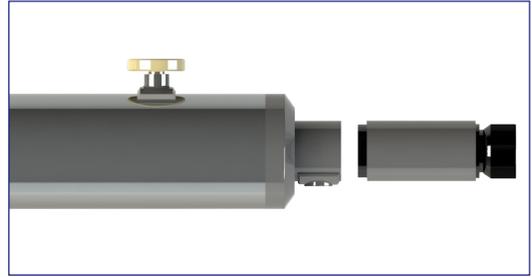
8430 AlignCam eyepiece removal.

8440 AlignCam eyepiece removal.

8450 AlignCam eyepiece removal.

Step Three: Remove the CCD camera and lens adapter assembly from the plastic case. Pull the plastic cap off the threaded end of the lens adapter assembly.

Step Four: Attach the CCD camera and lens adapter assembly by threading it on to the telescope body. Images of each attachment are shown below.

8420 AlignCam attachment.
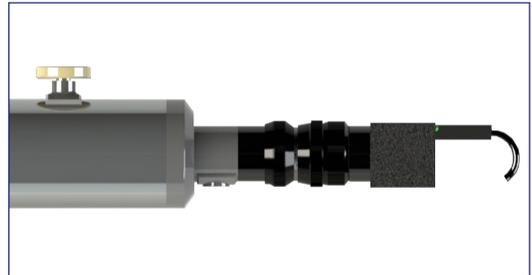
8430 AlignCam attachment.

8440 AlignCam attachment.

8450 AlignCam attachment.

Centering Adjustment Screws shown in white circles

8450 Only

Step Five: The 8450, when purchased with a 2030 or 2024BL, comes delivered so that when installed on said instrument the reticle is centered in the camera image. If purchased separately, installed on a different instrument, or simply over time, the image may need to be re-centered. To do this, use two 0.050" allen wrenches to adjust the four sets screws in the lens adapter. Higher level centering can be achieved by digitally zooming in the camera image displayed in the software.

Software Installation

Attention:
- Be sure you are logged in as an administrator when installing the software.
- If you subsequently wish to install TeleView version 1.00 - 1.04 on a machine which has TeleView 1.10 (or newer) installed, you **must** run the uninstaller supplied with TeleView prior to starting the install of the older version (TeleView 1.00 - 1.04). Installing Version 1.00 – 1.04 on a machine with a newer version installed is not recommended and may lead to unpredictable behaviors.

To install TeleView on a Windows machine:

Insert the jump drive into a USB port on your computer. Open the TeleView folder and double click on the executable file **'Setup_x.xx.exe'**, where x.xx indicates the software revision.

When you double-click the installation file, a security dialog may pop up, depending upon the user account control settings on your computer. Click the 'Yes' button to allow the changes.
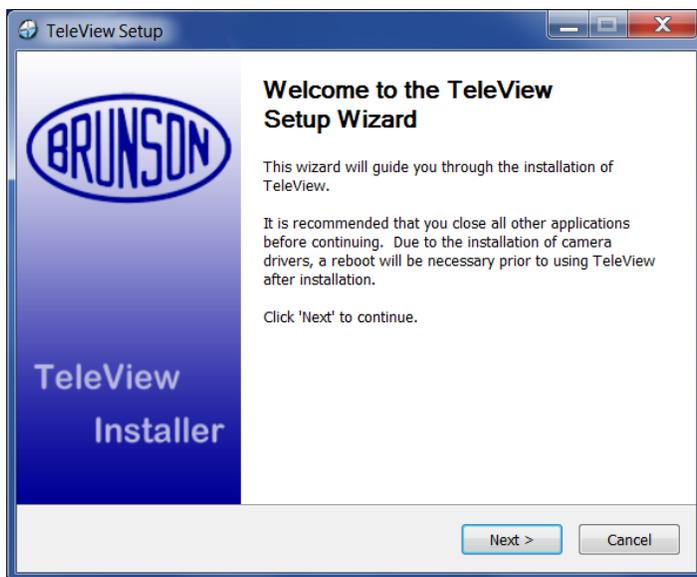
To begin the setup wizard, click 'Next'.
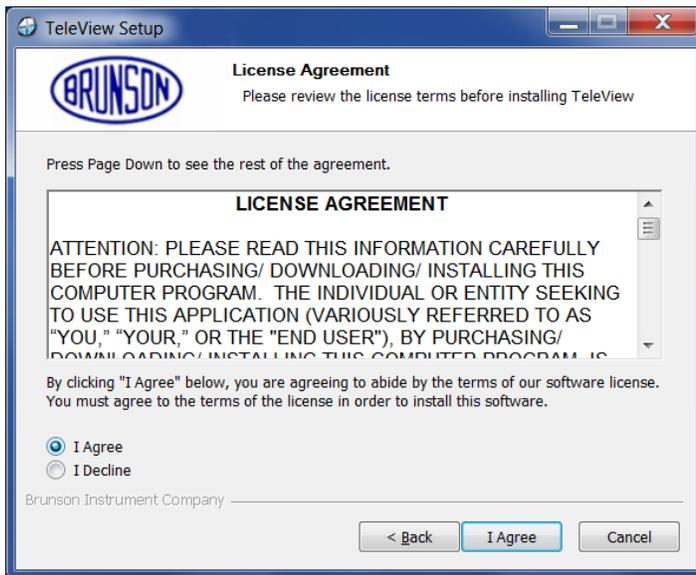
Read the license agreement and click the 'I Agree' radio button, then click 'I Agree' in the lower right corner.
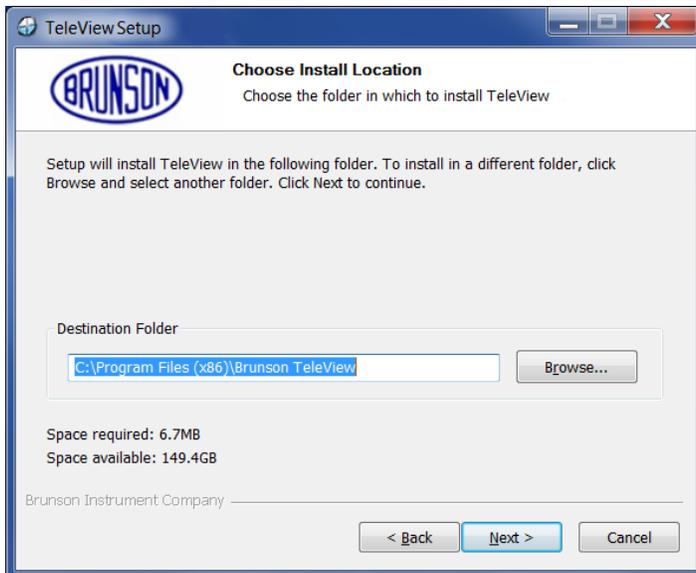
Accept or customize the destination folder, then click 'Next'.
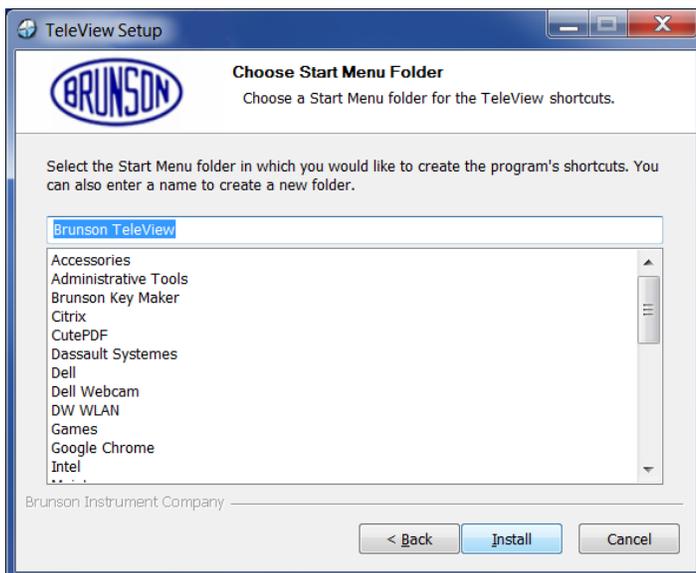
Accept or customize the Start Menu folder, then click 'Install'.
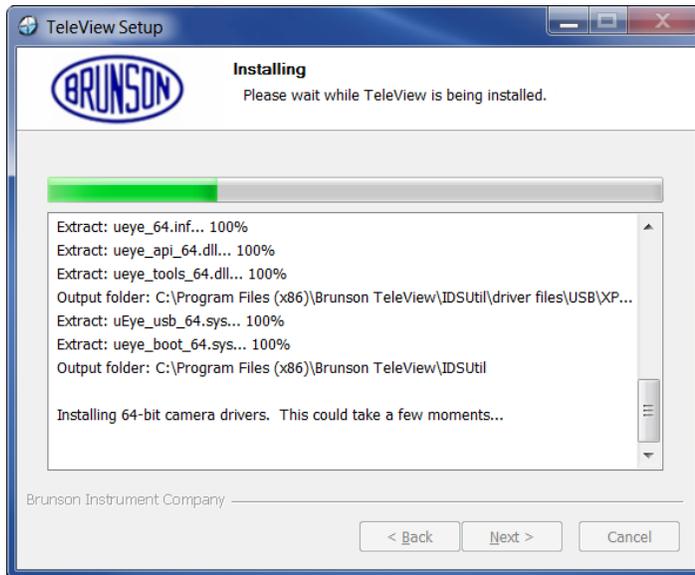
The green status bar indicates installation progress.
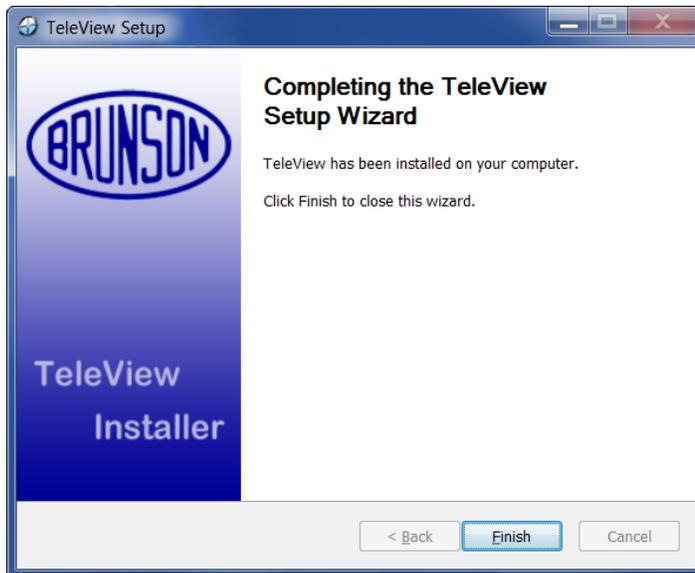
Click the 'Finish' button to complete the installation.
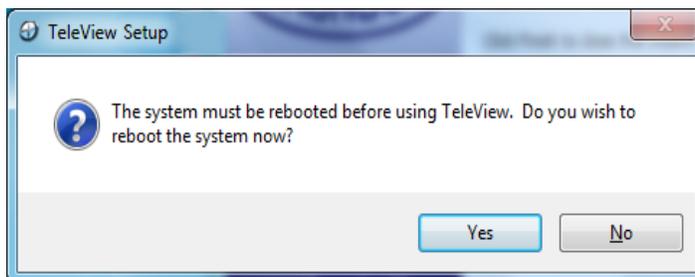
Allow the computer to reboot itself if you wish to use TeleView right away. This will ensure driver registration.

Connecting the Camera

Windows will recognize that a device has joined the USB bus and will search for the locally resident drivers. A popup window may appear on the lower right part of the screen near the task tray. Clicking on this popup will allow you to monitor progress of driver installation (*image below*), although no actions are required. Two drivers will be installed; a generic camera driver and a driver specific to the model of camera being used. If you subsequently use a different USB port, the registration will be repeated.
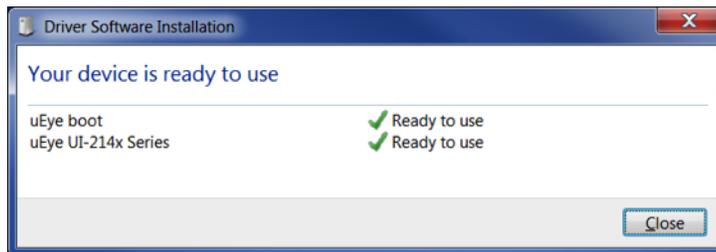
You may connect the camera to the computer via a USB 2.0 hub, if it is a "full powered" hub able to provide 500 mA per USB port. To obtain the highest video transfer rates, we recommend connecting the cameras directly to the USB ports on the motherboard itself. Many USB 2.0 ports on PCI/PCIe cards and the USB 2.0 ports on the front of the PC support lower bandwidths.

When the indicator light on the camera turns from red to green, the camera is successfully communicating with the camera drivers.

Registering the Key File

The first time that TeleView is used, a key file must be registered to enable the software. Each camera has a unique key file associated with it.

To register a key file during your initial TeleView start-up:

Launch TeleView and connect the camera. The dialog below will pop up, requiring that you navigate to and select the key file associated with your camera. Click 'OK' and navigate to the folder containing the **.bkey file**. This key file is provided on a USB thumb drive or may be emailed to you. Open the file associated with your camera serial number. This must only be done once each time TeleView is installed on a given computer, unless a) you wish to use a camera with a different serial number, which will require a different key file, or b) the **Config.ini file** created by TeleView is deleted.

There are two types of key files that you may have received. A **'p-type' key file** has no expiration date. An **'e-type' key file** expires on a given date. If you have an e-type key file, a message will be displayed each time that TeleView is started, indicating the length of the trial period remaining. If you have a p-type key file this dialog will not appear.

When TeleView is launched, it automatically searches for any connected camera, and starts a live video stream. If a camera is connected after TeleView has been launched, it will be detected automatically as well. A dialog will pop up while the camera is being initialized. During this process, the bus is tested to determine the highest speed of reliable data transfer. The pixel clock of the camera is set at the highest speed that the bus will handle. The pixel clock speed is used to determine the fastest frame rate that the camera may use.

There is no need to press 'OK', as this dialog will close automatically when complete. The Camera Tab will then display the live video stream.

```
Preparing Camera...                                    ✕

Attempting to connect to camera...
Connected to camera.
Camera serial number: 4002740313
Camera manufacturer: IDS GmbH
USB board hardware version: V14.1
Camera driver version: 4.40
Camera driver build: 11
Pixel clock range: 5 - 30 MHz
Verified camera capability to accept manual exposure settings.
Debugging error reporting enabled.
Sensor information successfully read from camera.
Initial frame rate set to: 10


                    [   OK   ]
```

The camera may be disconnected or reconnected at any time, the software simply reconnects when the camera is available.

Focusing the Camera

Focusing the camera correctly is very similar to focusing the standard eyepiece. There are two parts: focusing the reticle image (*cross hairs*) and focusing the target image. Each is described as follows.

AlignCam Model 8420

Lock Ring   Camera Rotating Ring

Reticle Focus

AlignCam Model 8430

Lock Ring   Camera Rotating Ring

Reticle Focus

AlignCam Model 8440

Lock Ring   Camera Rotating Ring

Reticle Focus

AlignCam Model 8450

Reticle Focus

Camera Rotating Ring

Lock Ring

The images on the previous page illustrates the camera adapter adjustments.

Reticle Focus: Rotating ring used to adjust the sharpness of the reticle.

Lock Ring: Threaded ring used to lock the focus setting when proper reticle focus is achieved.

Camera Rotating Ring: Rotational control to orient the camera image for a user-friendly view on the computer monitor.

Point the telescope at a white or other light colored object. This provides a good background to clearly view the black reticle.

Rotate the Reticle Focus ring until the reticle comes sharply into focus on the computer monitor.

Rotate the Lock Ring until it seats against the Reticle Focus ring to prevent inadvertent movement once the focus has been adjusted.

Focusing the Target Image

Point the instrument at the target of interest, and rotate the instrument's focusing knob until the target image is sharp and clear. Since the measurement process is primarily concerned with proper focus at the center of the reticle, optimize the target image focus in this area.

Most likely, the target image is clocked off in some arbitrary orientation on the monitor. Correct this by turning Camera Rotating Ring to orient the reticle and target image 'upright' as viewed on the monitor.

The telescope and camera are now focused correctly and ready to take measurements.

Using TeleView

TeleView provides a simple digital interface that allows users to easily view a measurement session on a computer monitor and save viewed images as common image file types. The software menu items are documented below.

There are two tabs on the main window:

Camera View tab: Displays a live video stream or, if the image is 'frozen', the last image captured by the camera when the stream was frozen.

File View tab: Displays image files that have been loaded from disk.

File Menu

Open Image: Navigate to a saved image and open it (*switches automatically to the File View tab for viewing*).

Save Image As: Save any image currently being viewed (*on either the Camera Tab or the File View tab*) to disk. The image is saved as currently viewed on the screen, whether zoomed, rotated, etc.

Close Image: Available only on the File View tab, closes an open image without saving.
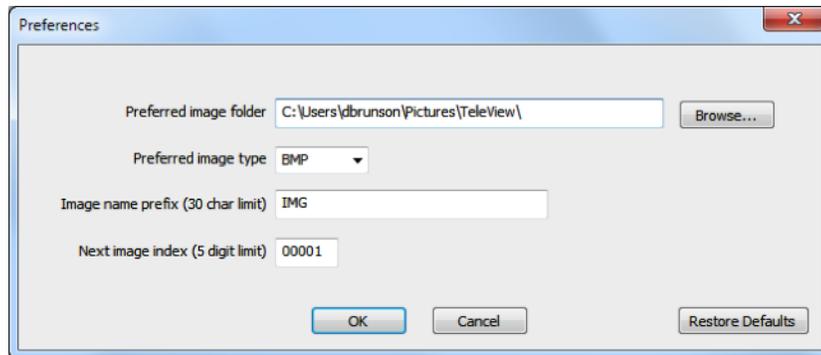
Preferences: Customize the default settings for saving images.

Display Menu

Exit: Exit the TeleView program.
Freeze Image: When checked, toggles the video streaming off to capture a single frame on the Camera View tab. Click again to return to a live streaming image.

Rotate Image 180: Rotates the orientation of the image by 180 degrees.

Zoom: Accesses sub menu with the following options: Fit to Window, Zoom In, Zoom Out, Define Zoom Center, and Cancel Zoom Center.

Here is an explanation of the zoom commands:
    Fit to Window: Fits the entire camera image into the available window size without altering the aspect ratio of the image.

    Zoom In: Incrementally zooms into the center of the screen unless an alternative zoom center point has been defined. The mouse wheel may also be used to control this function.

    Zoom Out: Incrementally zooms out from the center of the screen unless an alternative zoom center point has been defined. The mouse wheel may also be used to control this function.

Define Zoom Center: Use this to zoom in towards a selected point. A green cross hair will appear when this option is invoked, showing the location of the current zoom center. Select a new zoom center by clicking anywhere in the viewing area. This will move the green cross hair to the new Zoom Center. If you wish to see the current location of the zoom center but don't wish to change it, click Define Zoom Center, but cancel the command by clicking anywhere outside of the image.

Cancel Zoom Center: Returns the zoom center to its default location at the center of the image. This function is available only if a zoom center point has been previously defined.

Adjust Exposure: Sometimes the camera's auto-exposure capabilities do not result in a desirable target image, e.g. when the field of view is dominated by objects which are much brighter or much darker than the target you are trying to see. The Adjust Exposure function allows manual control of frame rate, exposure time and gain to obtain a desirable image.

Uncheck the 'Use automatic exposure control' check box to enable these controls. Each parameter includes a description next to its slider bar control. Click 'OK' to accept the new settings. Adjust as desired. **To make the target image brighter**, slow the frame rate, increase exposure time, or increase gain. **To make the target image darker**, lower the gain, increase frame rate, or lower the exposure time. **For the least 'noisy' image**, leave the gain at the lowest setting possible, and use
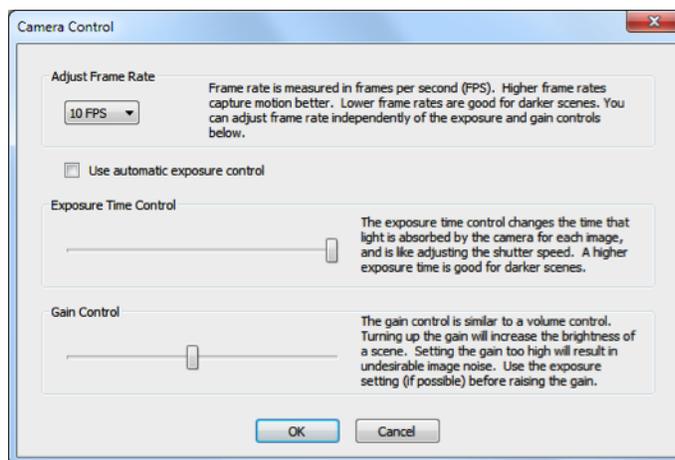
the frame rate and exposure time to achieve a proper image.

Information: Displays a dialog containing camera-specific information that may be valuable for system support questions.

Connect: The camera generally connects automatically, but there are certain limited cases

Help Menu

wherein this command may be used to restart a video stream.

About: Displays software version and copyright date information.

Read Key File: Manually reads and registers a key file. This function is usually invoked automatically, but this menu item may be helpful when registering a new key file without having a camera connected.

Tool Bar Button Legend

For convenieince, a toolbar replicates some of the functions which are accessible via the menu.
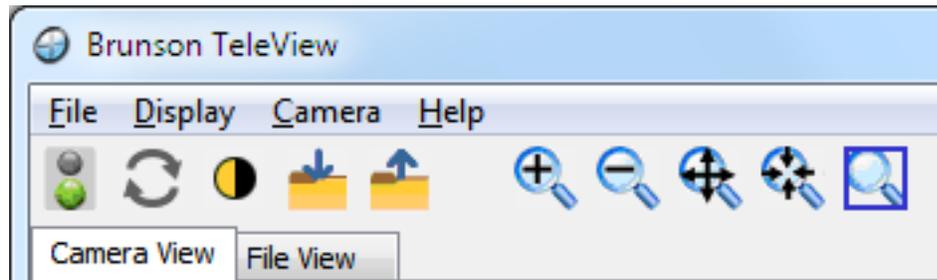
Freeze Image / Return to Live video stream

Rotate Image 180 º

Adjust image exposure

Save Image As

Open image from folder

Zoom In

Zoom Out

Define Zoom Center

Cancel Zoom Center (return to default location in center of image)

Fit-to-Screen

Warranty Information

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Any goods manufactured by Brunson Instrument Company, and found by Brunson Instrument Company, to be defective in material or workmanship will be repaired, or at Brunson Instrument Company's option, replaced, for the original purchaser only, provided the goods are returned with authorization to and by Brunson Instrument Company, transportation prepaid, within one year of the original shipment from Brunson Instrument Company. This warranty does not apply to goods, which have been subjected to alteration or servicing, rough handling, misuse, negligent use, fire damage, water damage, or other casualty or to ordinary wear and tear.

Repair or replacement of the defective products, as provided above, is the sole remedy of the purchaser of products covered by this warranty and is the complete statement of Brunson Instrument Company's liability with respect to such products. Brunson Instrument Company shall have no other or further liability with respect to such products, whether in tort, negligence, contract, theory of strict tort liability or other theory.

Limited life time warranty for horizontal and vertical axis ball bearings: trunnion and spindle bearings manufactured by Brunson Instrument Company, and found by Brunson Instrument Company to be defective in material or workmanship, will be repaired or replaced at Brunson Instrument Company's option for the original purchaser only, provided the instrument for which the bearings were returned, with authorization to and by Brunson Instrument Company, transportation prepaid with documentation to support that the instrument has been fully serviced by an authorized Brunson Instrument Company service representative at least at a minimum of three – and a maximum of five – year intervals from the date of original shipment at the time of purchase from Brunson Instrument Company, and the instrument has not been subjected to alteration, rough handling, misuse, negligent use, fire damage, water damage or any other casualty.

The repair or replacement of the defective products, as provided above, is the sole remedy of the purchaser of products covered by this warranty as the complete statement of Brunson Instrument Company's liability with respect to such products. Brunson Instrument Company shall have no other or further liability with respect to such products, whether in tort, negligence, contract, theory of strict tort liability, or other theory.
Adjustments, calibrations, repairs, lamps, fuses, and batteries are specifically excluded from the foregoing statements.

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