

XT440 Shaft alignment

Step by step

10-1080 Rev1 en-GB



Document Information

Document title: **Step by step guide Shaft Alignment**

Document number: *10-1080*

Document Revision: *Rev1*

Published: *2025-04-29*

Document description

This document describes the hardware and software used for calibrating belt alignment tools BTA XT190, E180 sensor, BTA lasers D90 and D92 at service centres.

Copyright

© Easy-Laser AB 2025

We might change and correct the guide in later issues without further information.

Changes to Easy-Laser® equipment may also affect the accuracy of the information.

Address

Easy-Laser AB, Alfagatan 6, SE-431 49 Mölndal, Sweden

Phone: +46 (0)31-708 63 00, info@easylaser.com

Web: www.easylaser.com

Disclaimer

Easy-Laser AB and our authorized dealers will take no responsibility for damage to machines and plant as a result of use of Easy-Laser® measurement and alignment systems.

Table of content

>> Safety	5
Safety definitions	7
Safety instructions	7
Safety precautions	8
Laser safety	8
>> Planning	11
Things to consider	13
Batteries	14
Before leaving the office	17
Tips!	17
Cleaning optics	19
Tools needed	19
Clean the lenses	19
>> On site	21
Mounting	23
Mount the shaft bracket and detector	25
Tools needed for these steps	25
Mounting step by step	25
Measure	29
Measure the shaft alignment	31
>> Troubleshooting	41
Measured values do not repeat	43
No measurement values	44

>> Safety



Shaft Alignment



Safety definitions

We use the following definition of Danger, Warning, Caution.



DANGER means if the danger is not avoided, it *will* cause death or serious injury.



WARNING means if the warning is not heeded, it *can* cause death or serious injury.

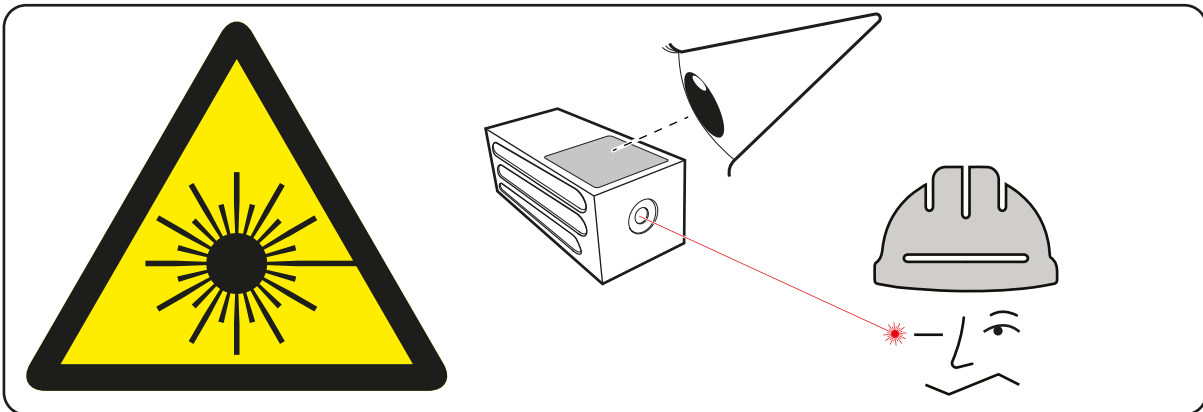


CAUTION means if the precaution is not taken, it *may* cause minor or moderate injury.

Safety instructions

Read the product label and never stare into a laser beam regardless of laser class.

60-0477





Safety precautions

NOTE! Opening the laser units can result in hazardous radiation, and will invalidate the manufacturer warranty.

If starting the machine to be measured would result in injuries, the possibility to unintentionally start it must be disabled before mounting the equipment, for example by locking the switch in the off position or removing the fuses. These safety precautions should remain in place until the measurement equipment has been removed from the machine.

These products are intended for professional use, measurement according to the manual, performed by specially trained personnel.

If these products are not used as intended, the protection provided by the devices may be impaired.

NOTE! The system must not be used in explosive risk areas.

Laser safety

Easy-Laser® is a laser instrument in laser class 2 which requires the following safety precautions:

- Never stare directly into the laser beam
- Never aim the laser beam at anyone's eyes

This document contains information about laser safety according to standard EN 60825-1:2014+A11:2021 and 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

The information enables the person responsible for the product and the person who actually uses the equipment, to anticipate and avoid operational hazards.

According to EN 60825-1:2014+A11:2021 and 21 CFR 1040.10 and 1040.11, products classified as laser class 2 do **not** require:

- laser safety officer involvement
- protective clothes and eyewear
- special warning signs in the laser working area

if used and operated as defined in this document due to the low eye hazard level.

National laws and local regulations could impose more stringent instructions for the safe use of lasers.

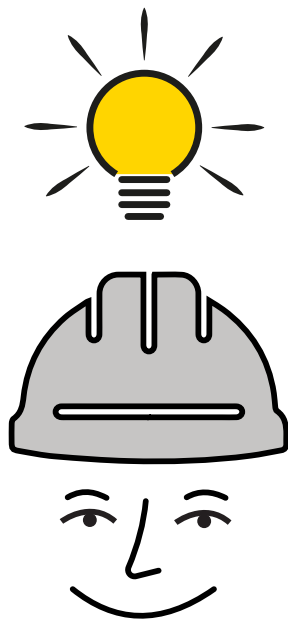
It may be hazardous to look directly into the beam, in particular for deliberate exposure. The beam may cause strong temporary blindness, especially under low ambient light conditions. However, the risk of injury for Class 2 laser products is very low because:

- A. The exposure limits for the laser class include a safety margin, which means that the limits are substantially below those levels of radiation that are known to cause damage.
- B. The natural reflex of the eye to avoid strong light limits unintentional exposure to a very short time (0.25 s).

The following warning symbols are used to indicate Class 2 laser products.

The following warning symbol indicates the aperture where laser light is emitted. Avoid exposure to the eyes.

>> Planning



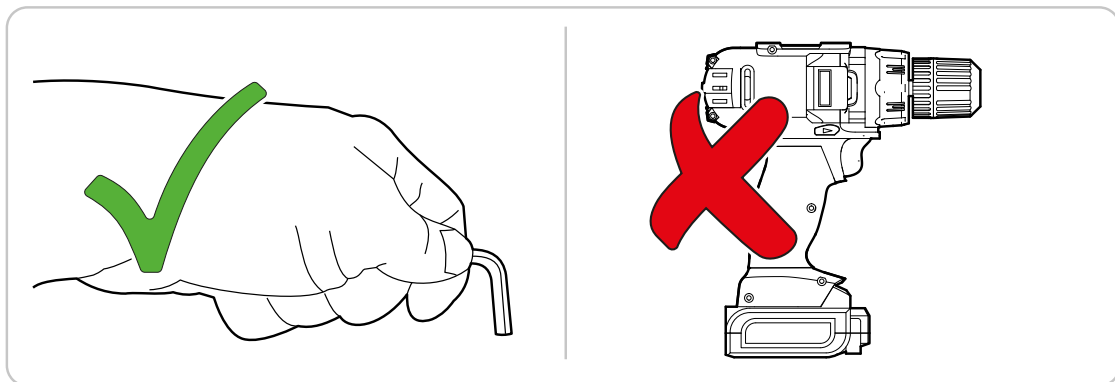
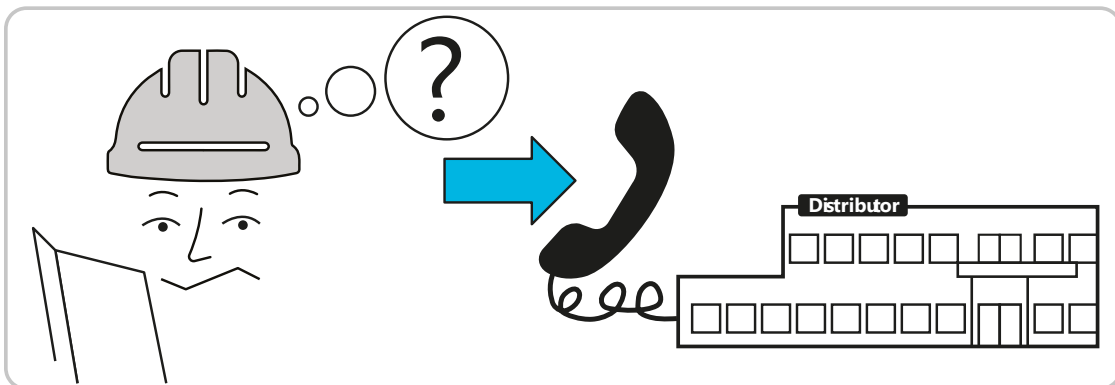
<input checked="" type="checkbox"/>	— —
<input checked="" type="checkbox"/>	— —
<input type="checkbox"/>	— —
<input type="checkbox"/>	— —



Things to consider

NOTE! This guide is not a substitute for training

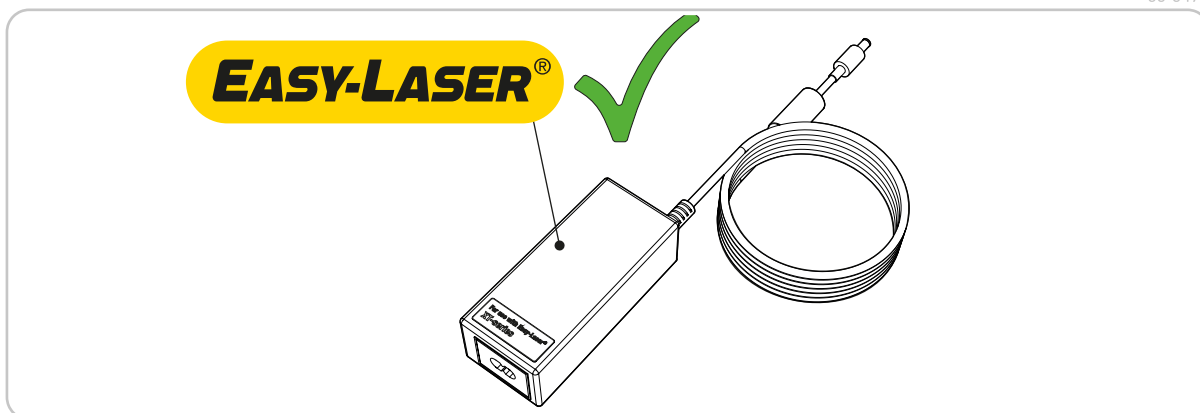
60-0344



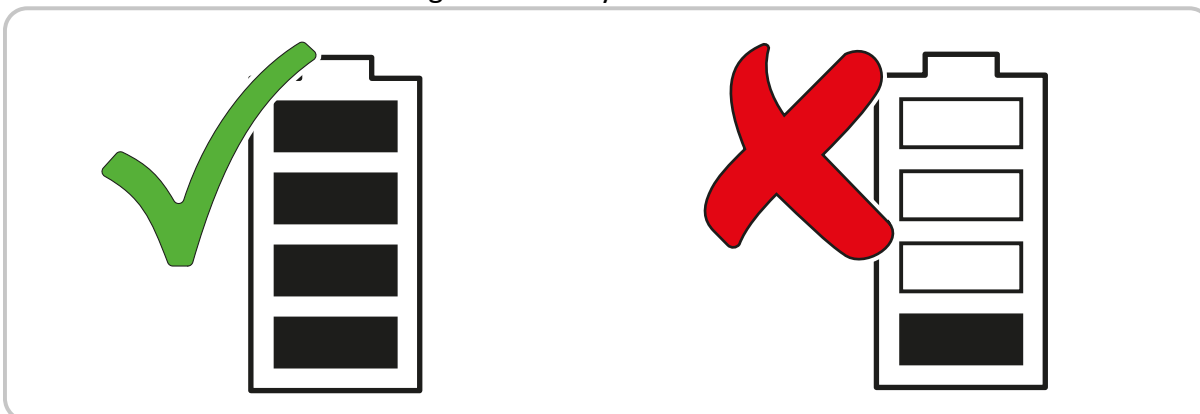
Batteries

Use only Easy-Laser original charger.

60-0471

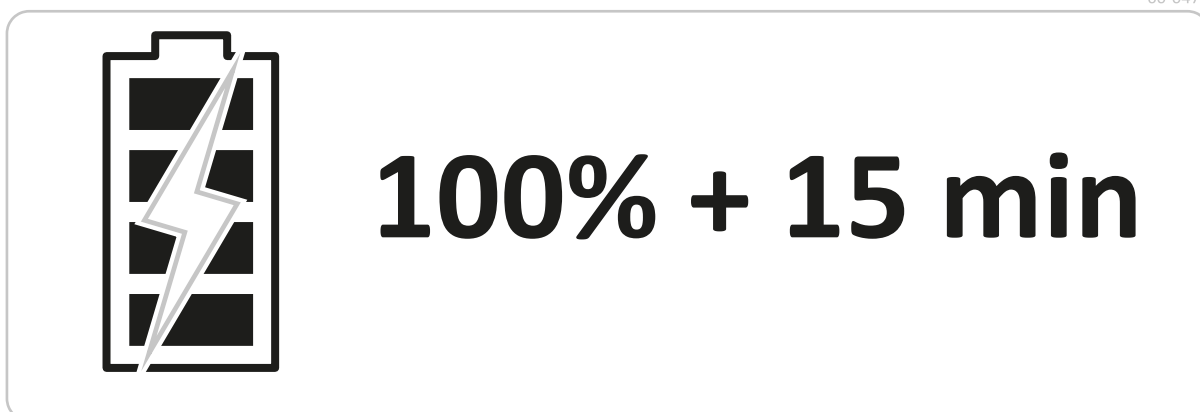


Make sure the batteries are charged and ready for the task.



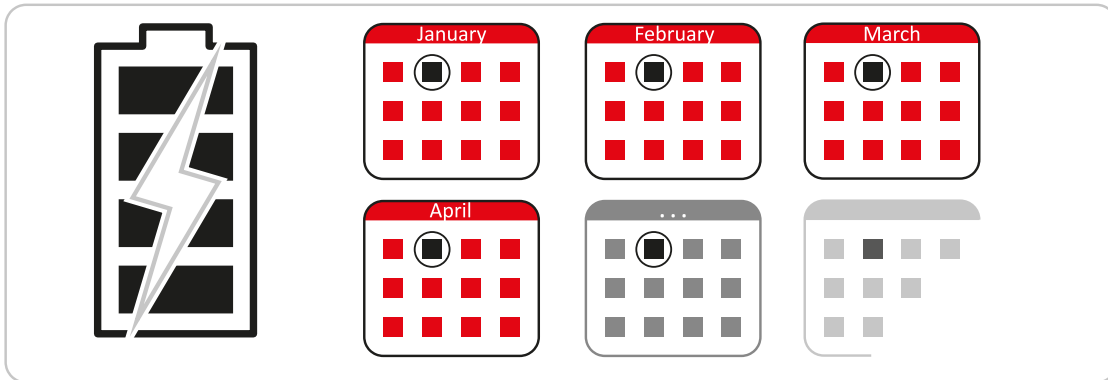
For optimal daily performance charge the batteries to 100% and additional 15 minutes.

60-0472



When the equipment will not be used for an extended period, trickle charge the batteries at least *once a month*.

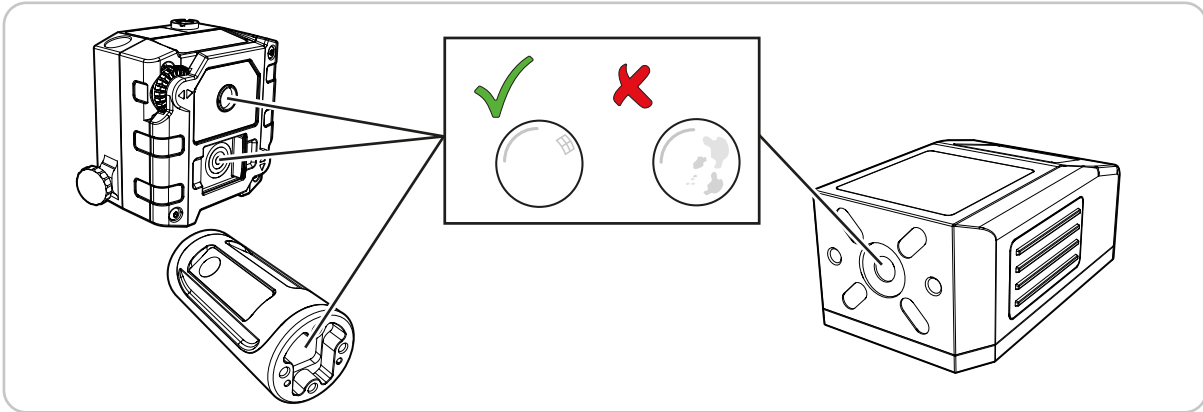
60-0473



Before leaving the office

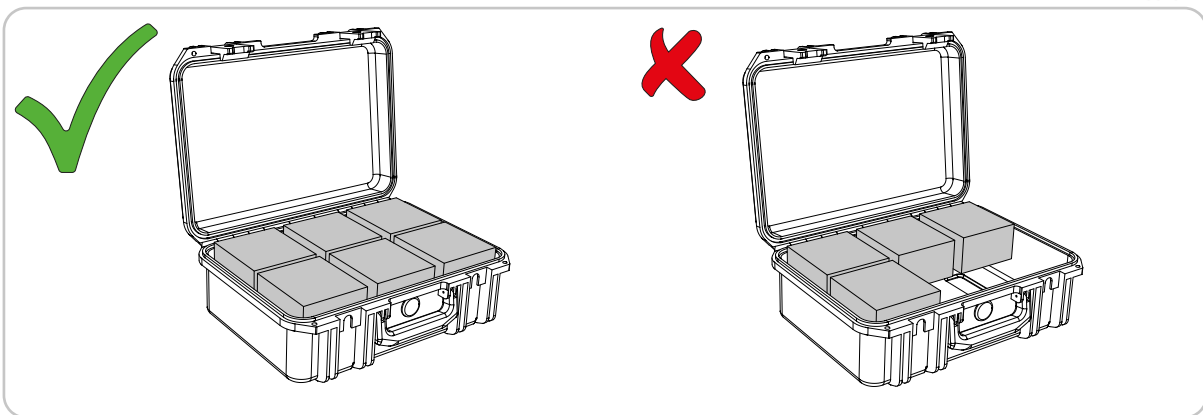
Verify that the lenses are clean. If not, clean them as described in "*Cleaning optics* " on page 19.

60-0423



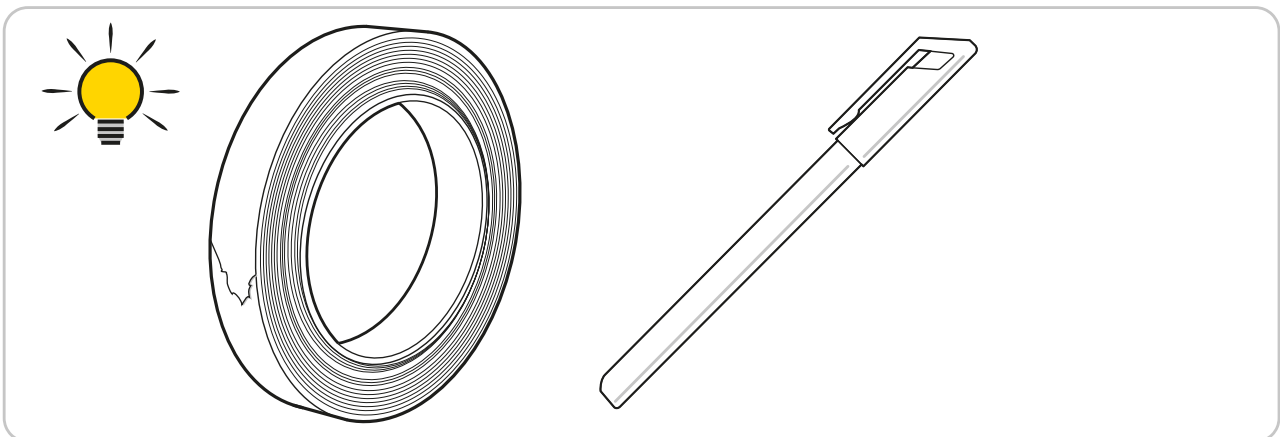
Make sure no items are missing in the case!

60-0274



Tips!

The following items are nice to have.

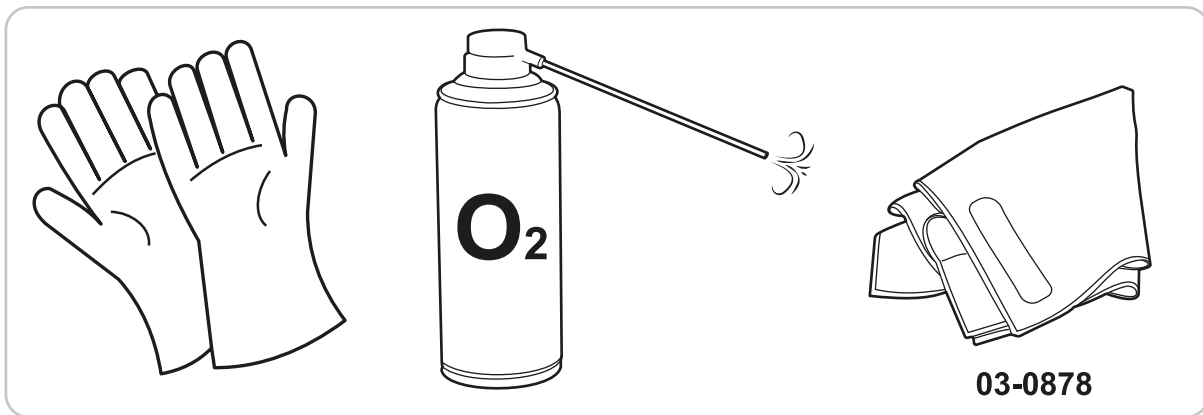


Shaft Alignment

- Freezer tape
- Marking pen

Cleaning optics

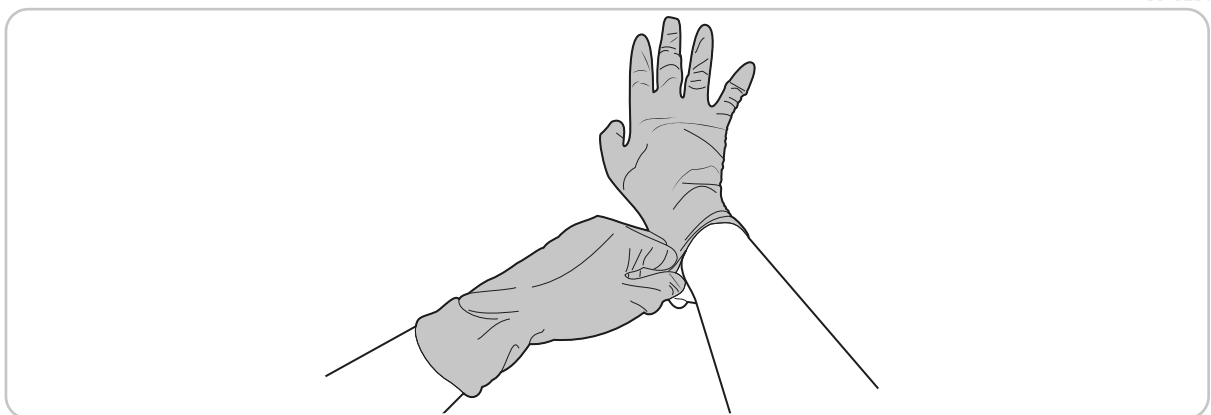
Tools needed



Clean the lenses

To clean the optics follow the steps below. This applies to both circular and rectangular lenses.

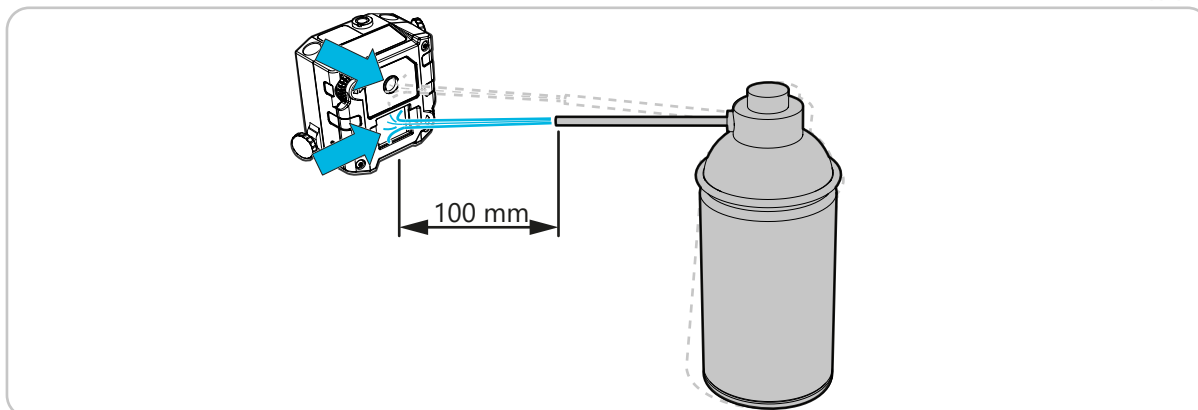
1. Use gloves when working with optics during the whole process.



Shaft Alignment

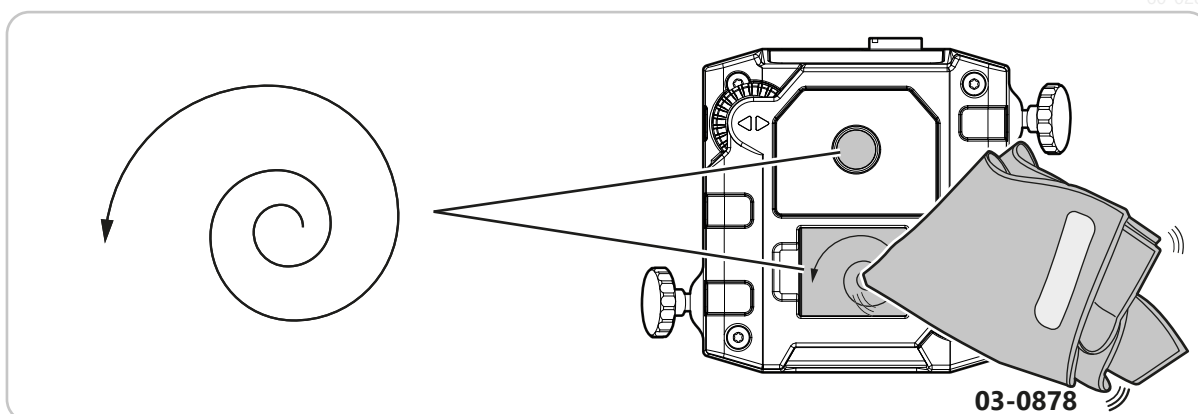
2. Start cleaning the optics with the dust blower/conditioned compressed air. Blow the lens clean from a distance of about *100 mm*.

60-0282



3. Use the *Cleaning cloth* (03-0878) or a lint-free paper and start in the center of the optics and work your way out to the edge in a spiral. *Note! Do not use ordinary dry cloth, they could cause scratches.* Give the edge a wipe at the end.

60-0283



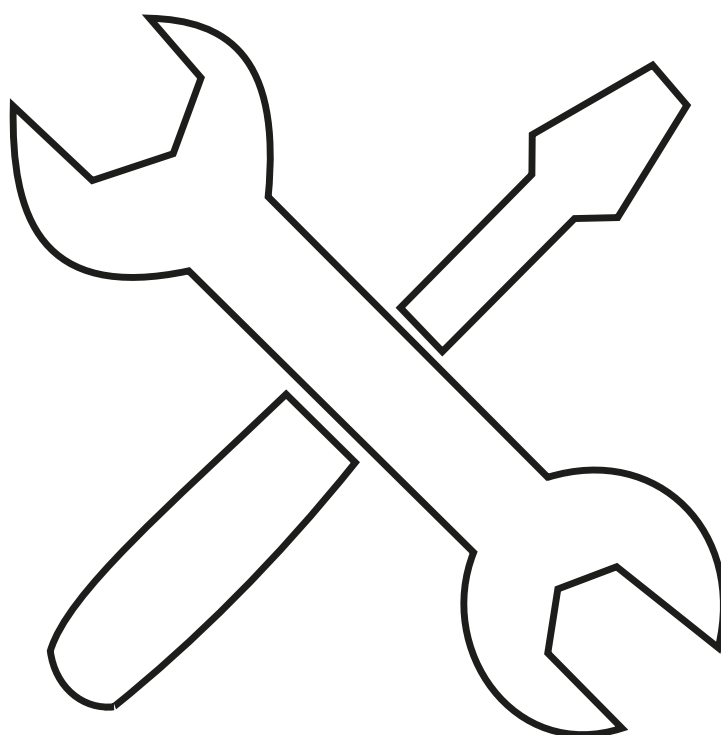
4. If there is any dust left on the lenses repeat the steps above.

>> On site



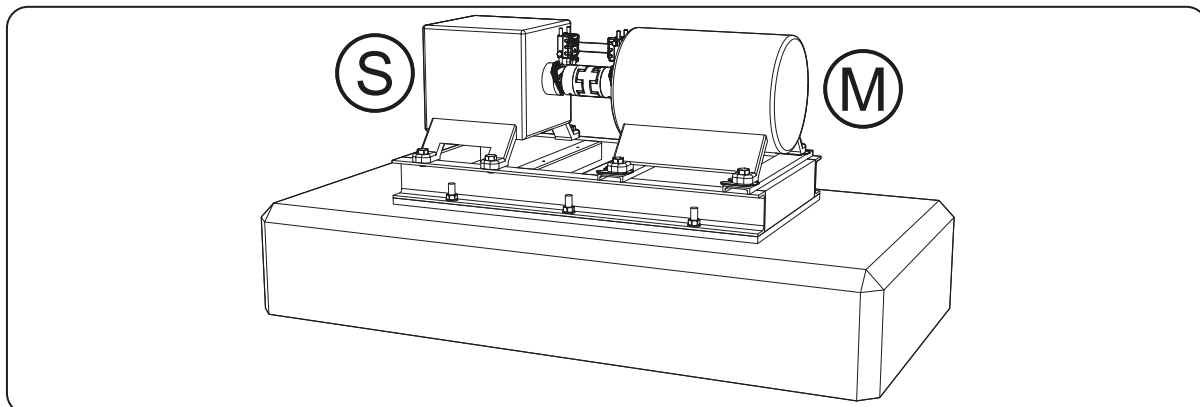


Mounting



Mount the shaft bracket and detector

60-0580



Tools needed for these steps

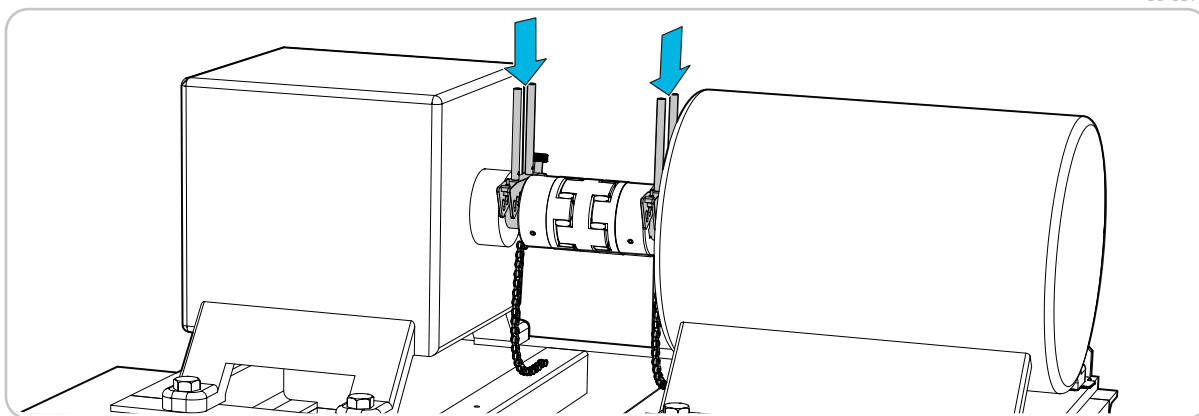
No special tools needed.

Mounting step by step

To mount the shaft bracket and the detector follow the steps below:

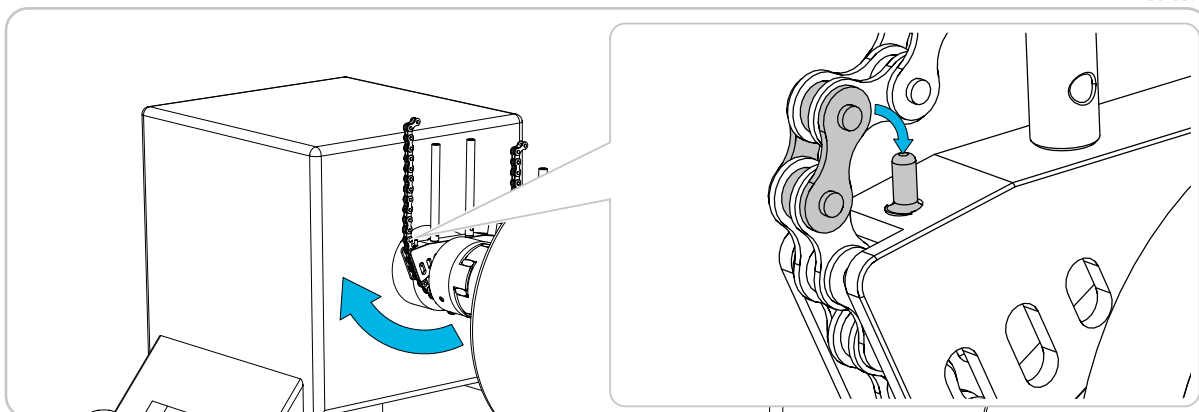
1. Place the shaft brackets on the shaft.

60-0576



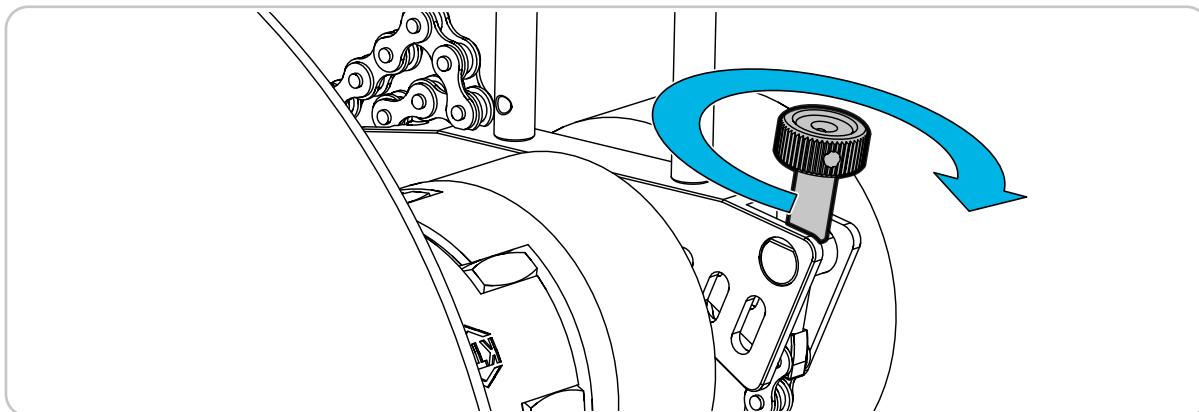
2. Tighten the chain so it rests against the shaft and attach the chain to the pin.

60-0577



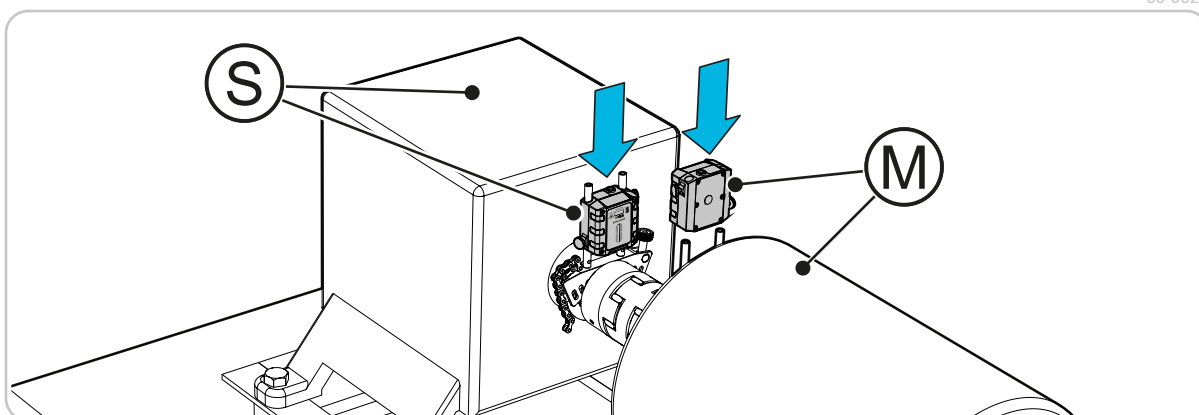
3. Tighten the screw using hand power.

60-0578



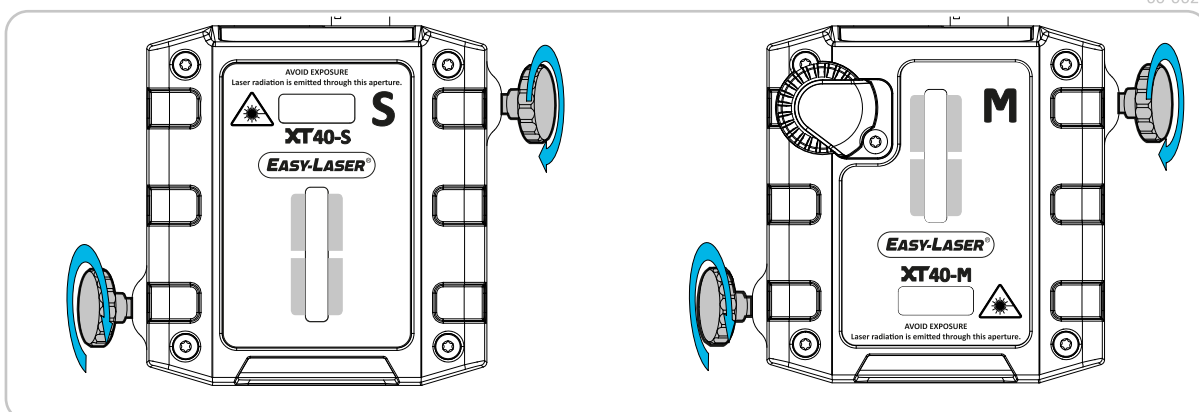
4. Mount the respective S-Unit and M-Unit on the bracket.

60-0620



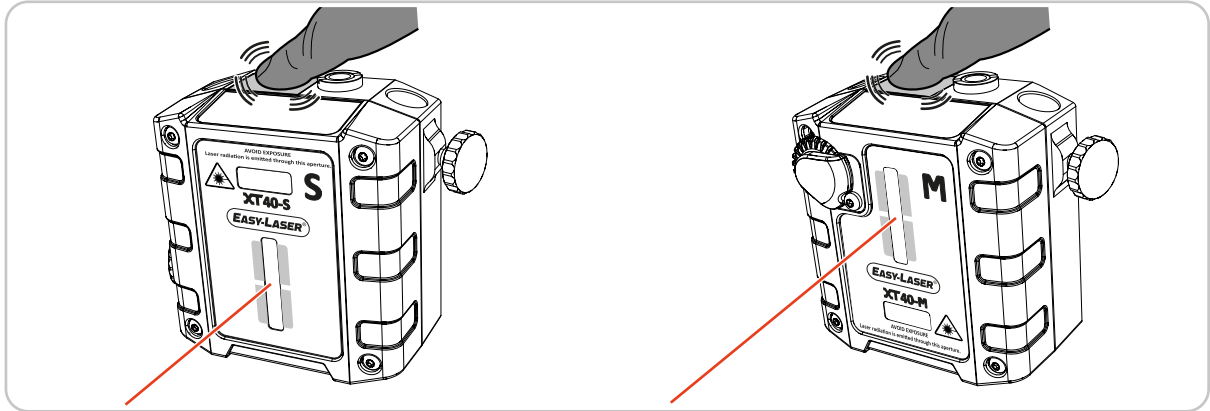
5. Tighten the screws.

60-0621



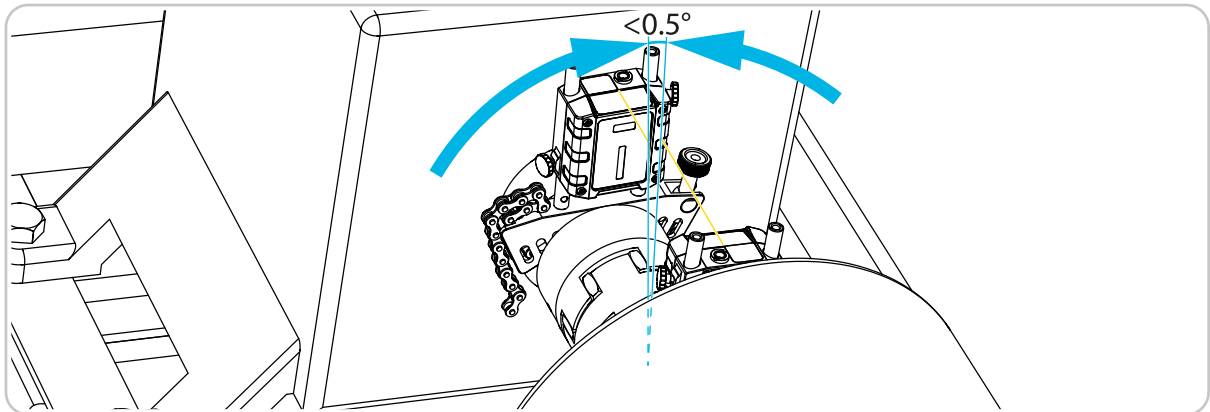
6. Power up the S-Unit and M-Unit if not already done.

60-0622



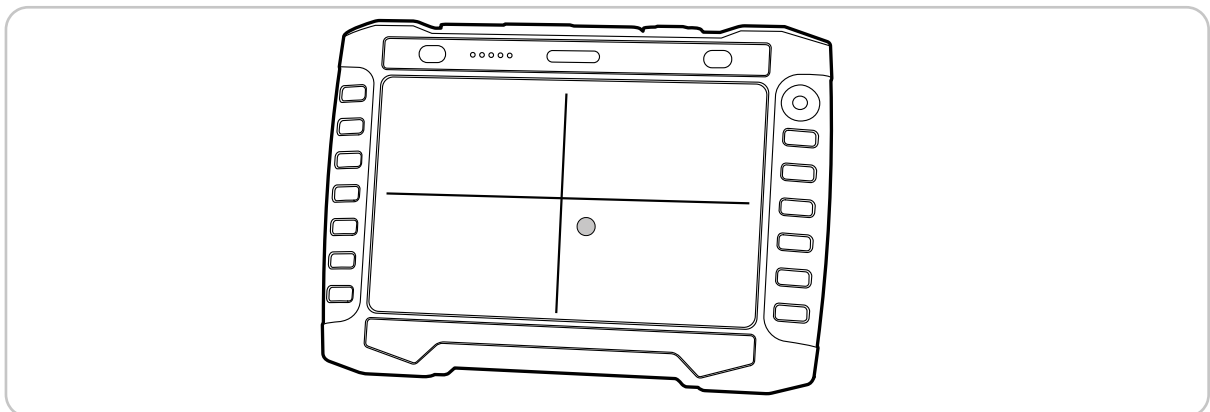
7. Set the angle of the detectors within 0.5° from each other.

60-0626

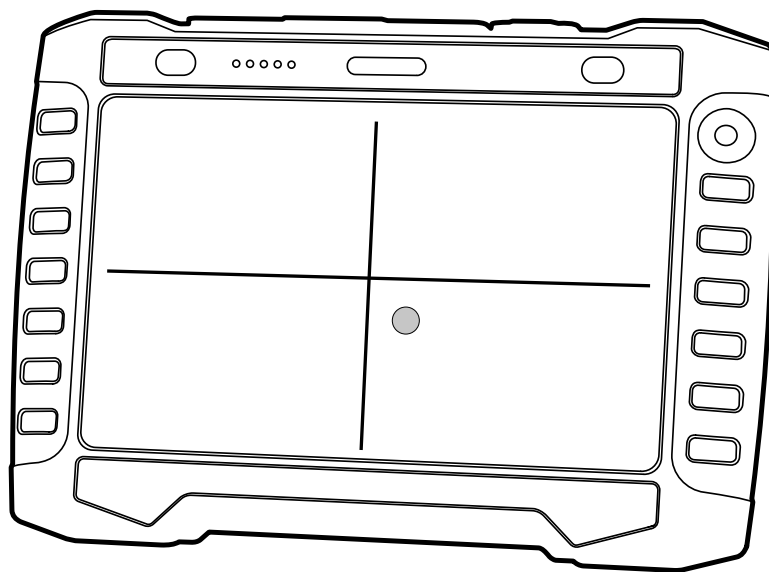


8. The system is now ready for measurement.

60-0431

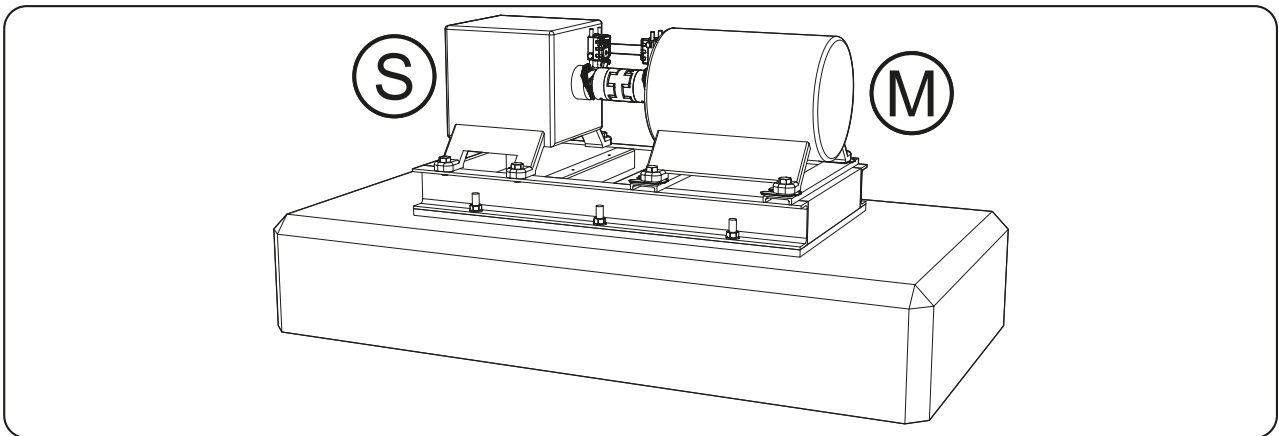


Measure



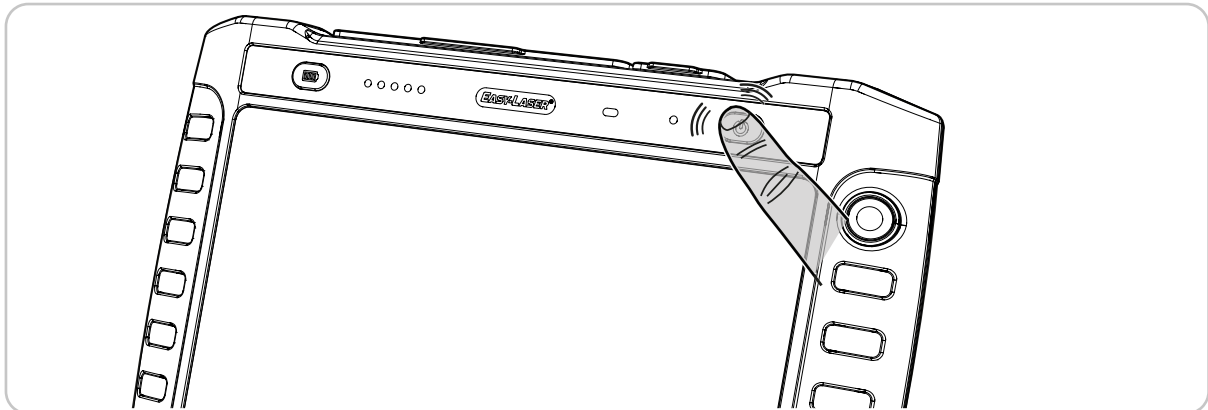
Measure the shaft alignment

60-0580



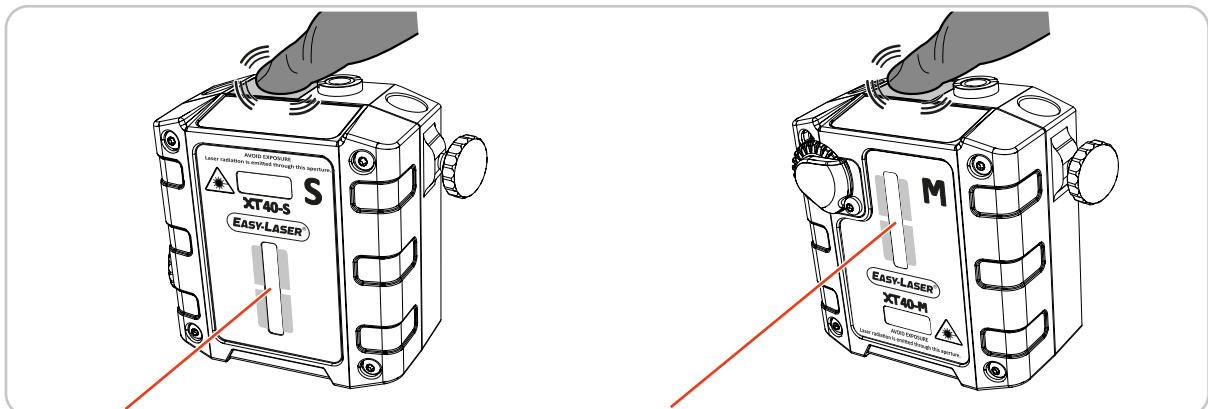
1. Power up the XT12 if not already done.

60-0310



2. Power up the S-Unit and M-Unit if not already done.

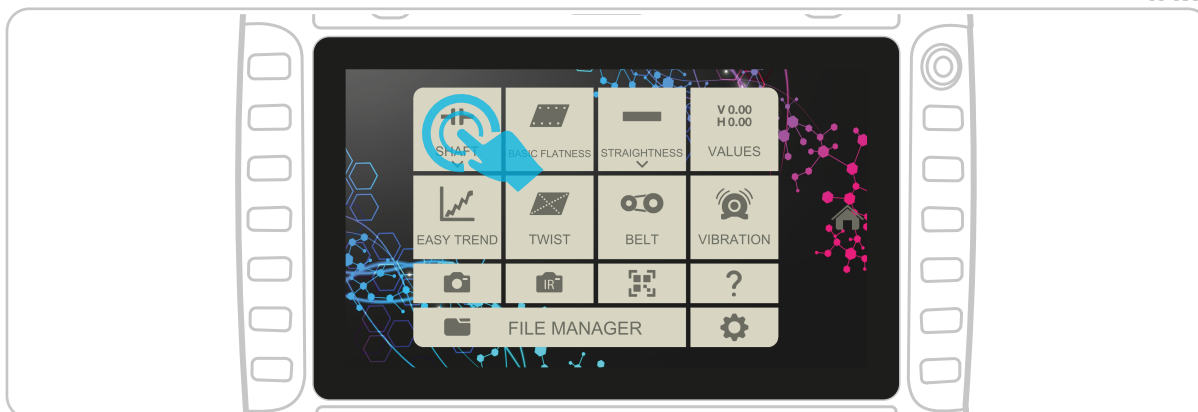
60-0622



Shaft Alignment

3. Tap the **[SHAFT]** button.

60-0366



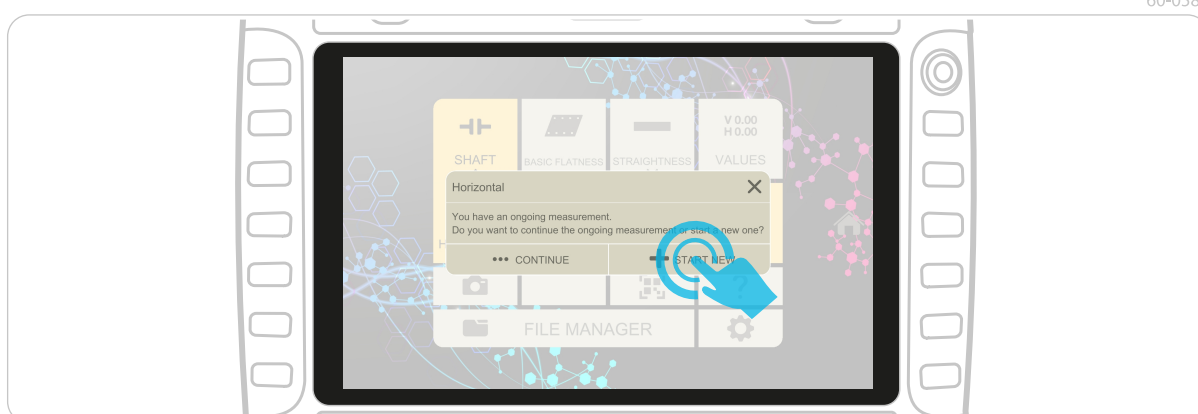
4. Tap the **[HORIZONTAL]** button.

60-0575



5. Choose to **[... Continue]** or **[START NEW]** measurement, if the option is given.

60-0581



6. Enter the measurements **S-M**, **RPM**, **M-F1** and **F1-F2**. *Tips! Measure from the center of the rods for S-M and M-F1.*

60-0582



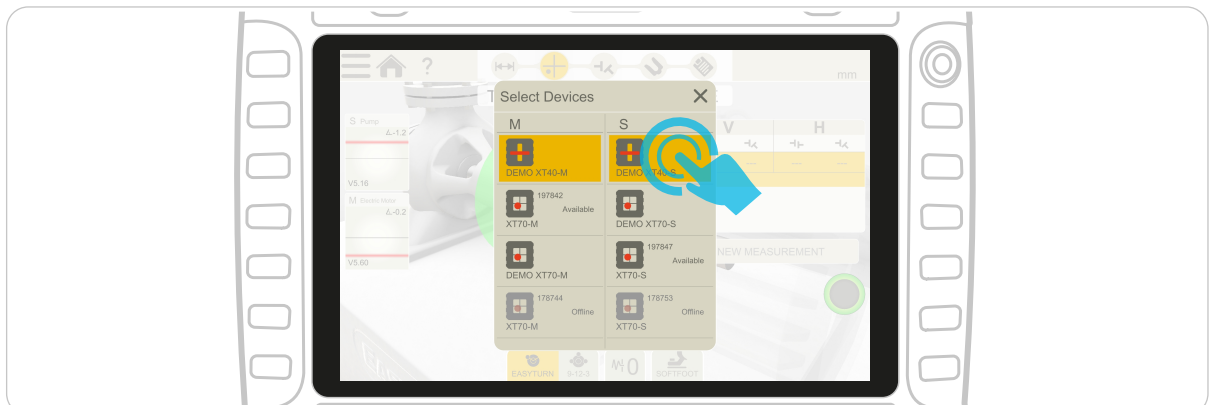
7. Tap the **[MEASURE]** button at the top of the screen.

60-0583



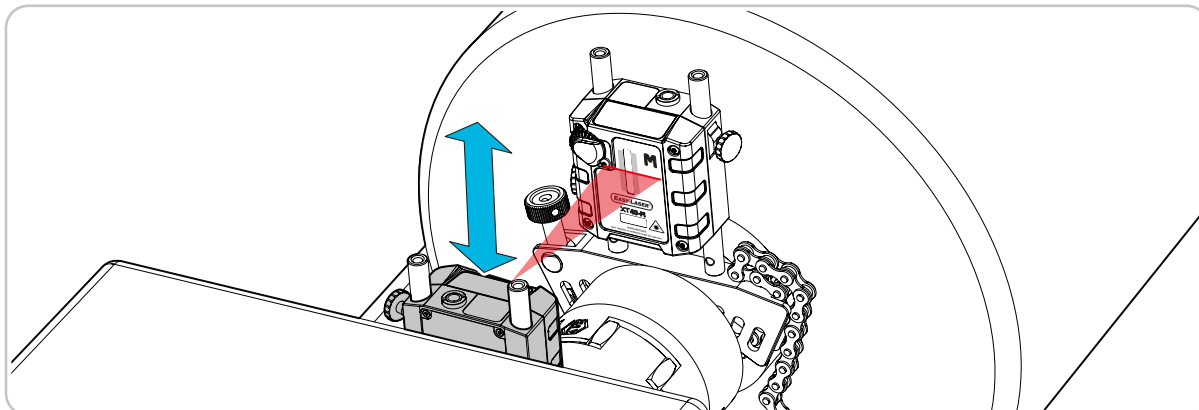
8. Select devices if this hasn't already been done.

60-0628



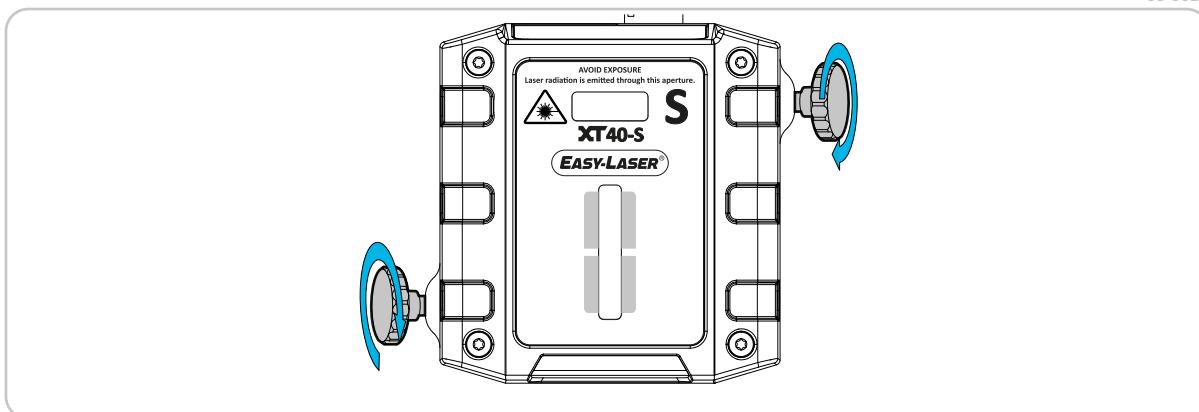
9. Loosen the screws and adjust the height of the *S-Unit* so the laser hits the center of the target on the *M-Unit*.

60-0623



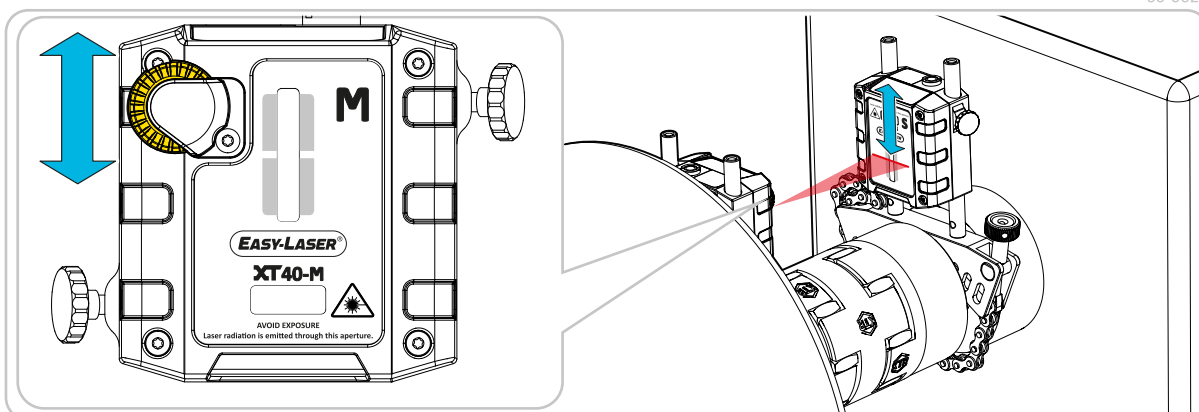
10. Tighten the screws again on the *S-Unit*.

60-0624



11. Center the laser beam from the *M-Unit*, on the *S-Unit* target, using the yellow knob on the *M-Unit*.

60-0625



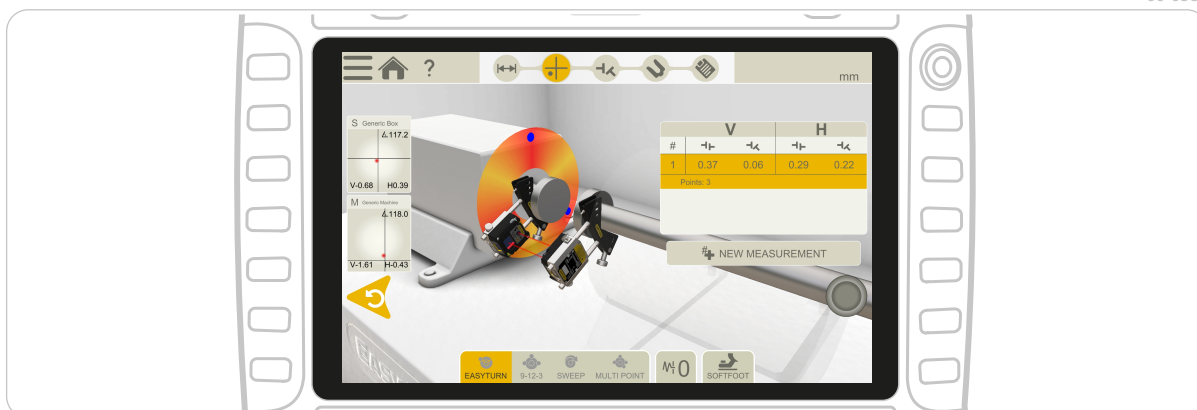
12. Use the method you prefer the most. *Note! if you choose the 9-12-3 method, you must register the points in that specific order.*

60-0585



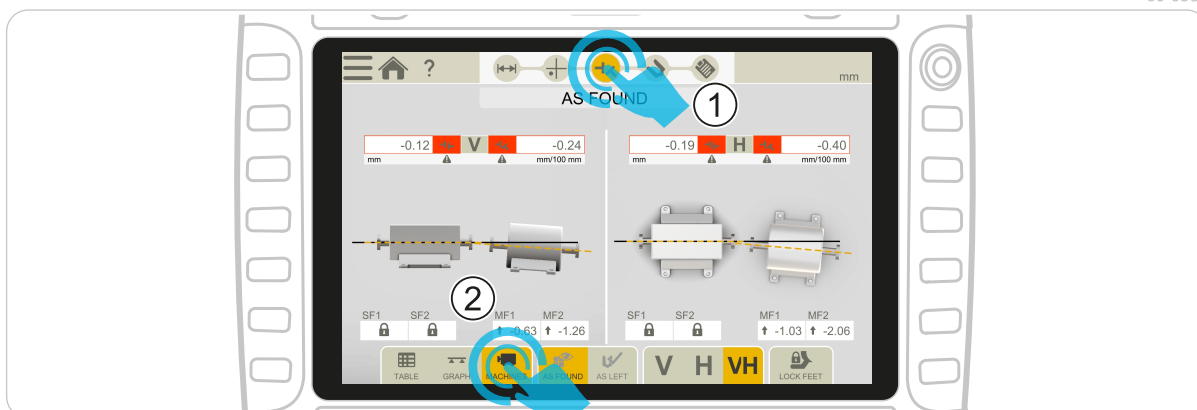
13. In this example we use *EASYTURN* method, place the detectors in a green area (*ONLY rotate the detectors by holding the shaft*) Do not block the laser beam! and press the green button, on the screen or on the XT12. Repeat the step for all green positions, at least three points are needed.

60-0586



14. Tap the **[RESULT]** button at the top of the screen (1) and on the **[MACHINES]** button (2) at the bottom, if not already selected.

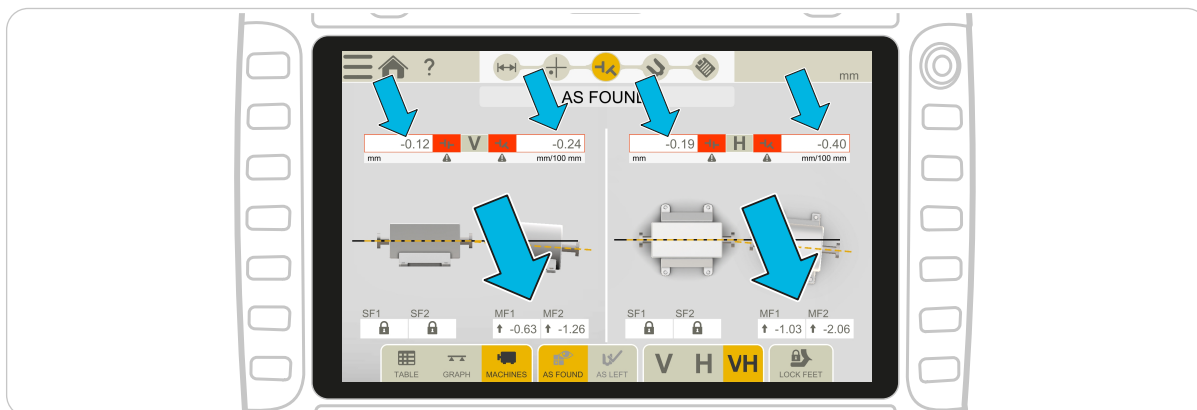
60-0587



Shaft Alignment

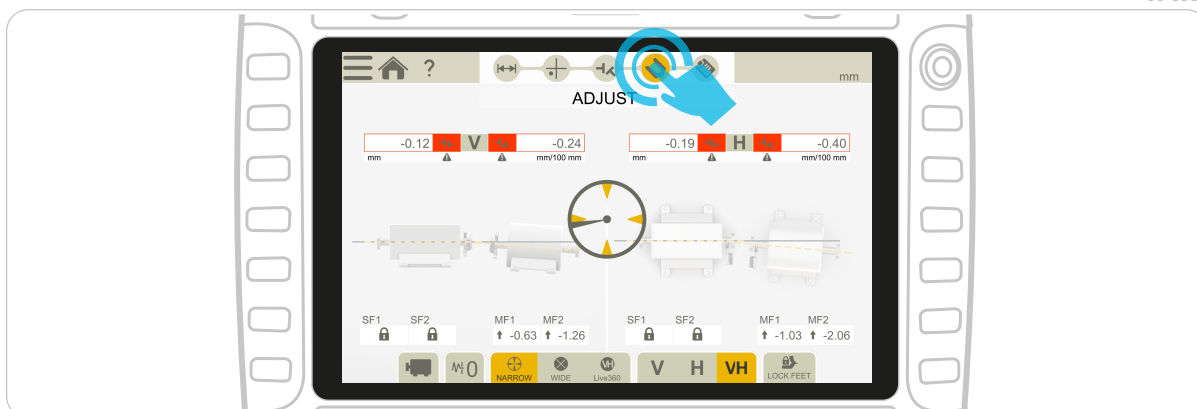
15. The axle deviation is shown on the screen and in which direction the motor should be adjusted.

60-0588



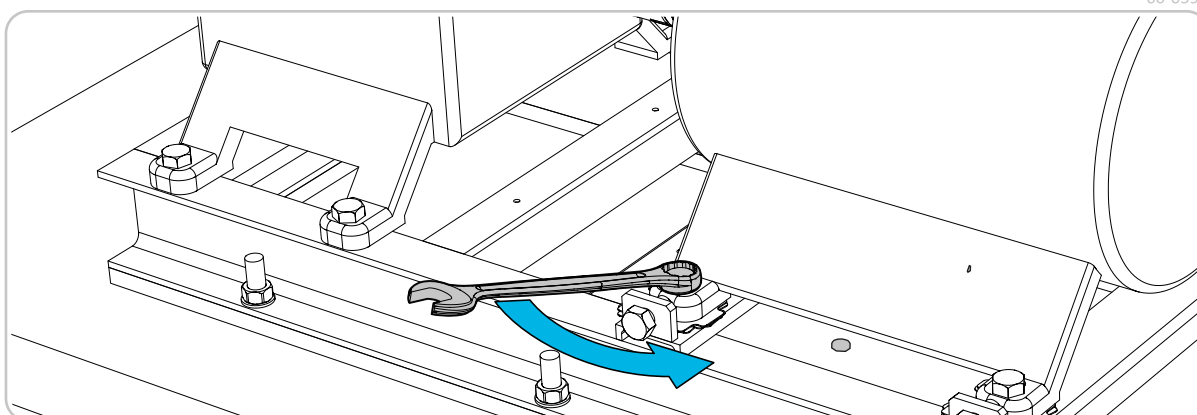
16. Tap the **[ADJUST]** button at the top of the screen.

60-0589



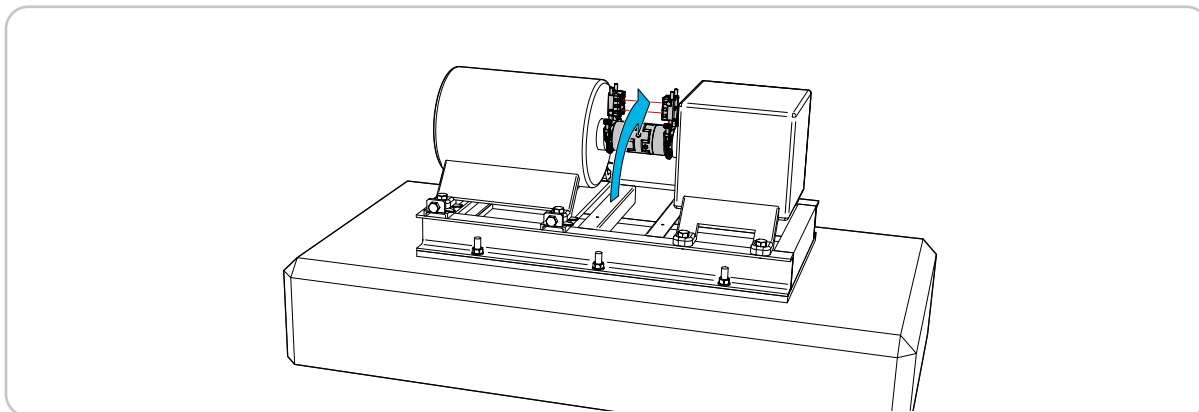
17. Write down, or take a screenshot of, the values for the shims *before* you loosen the bolts, *these values change when the bolts are loosened*..Loosen the bolts on the motor.

60-0592



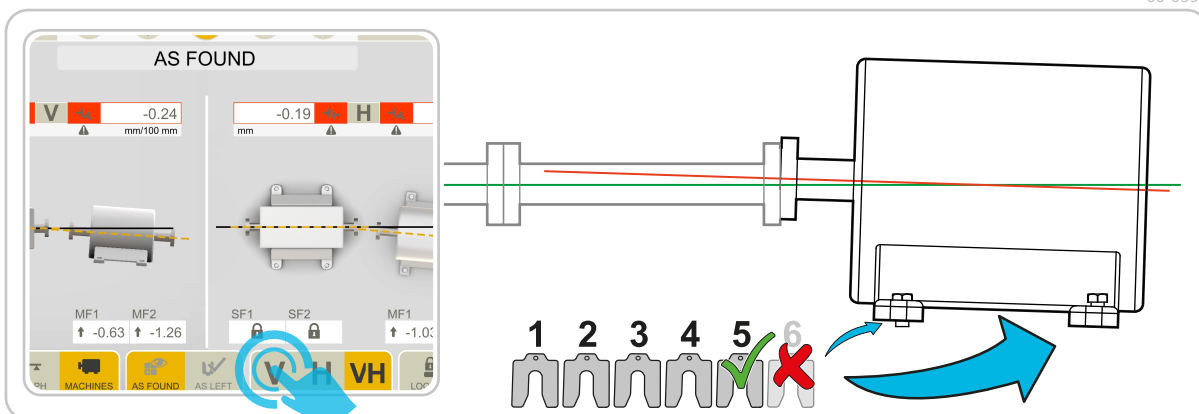
18. Rotate the detectors to 0° for the vertical adjustment.

60-0682



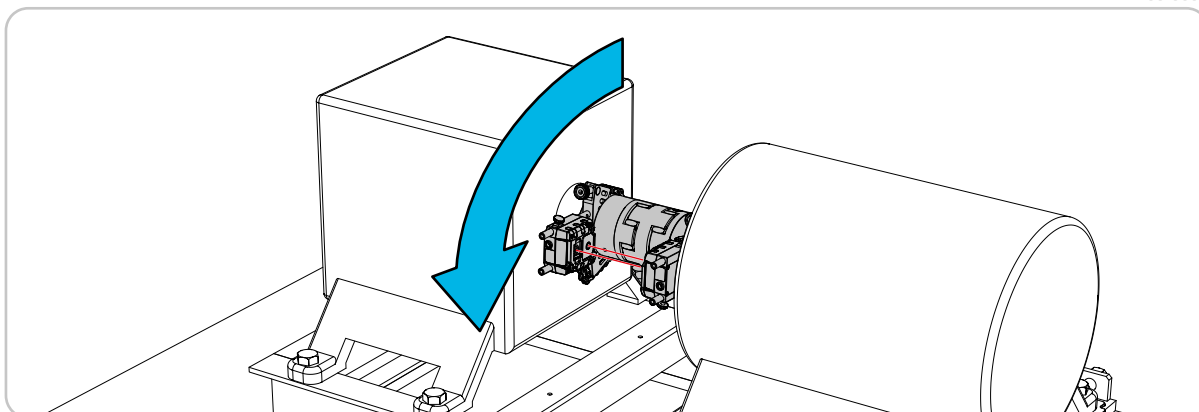
19. Tap the [V] button and adjust the motor (M), preferably starting with the vertical direction first, as the horizontal will be easier to perform afterward.
Note! Never use more than 5 shims at the same foot.

60-0590



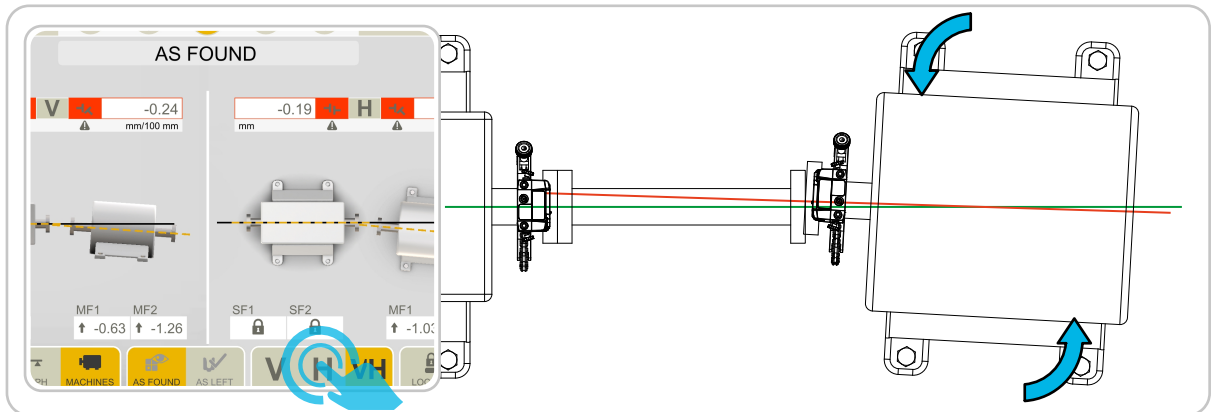
20. Rotate the detectors to 90° for the horizontal adjustment.

60-0604



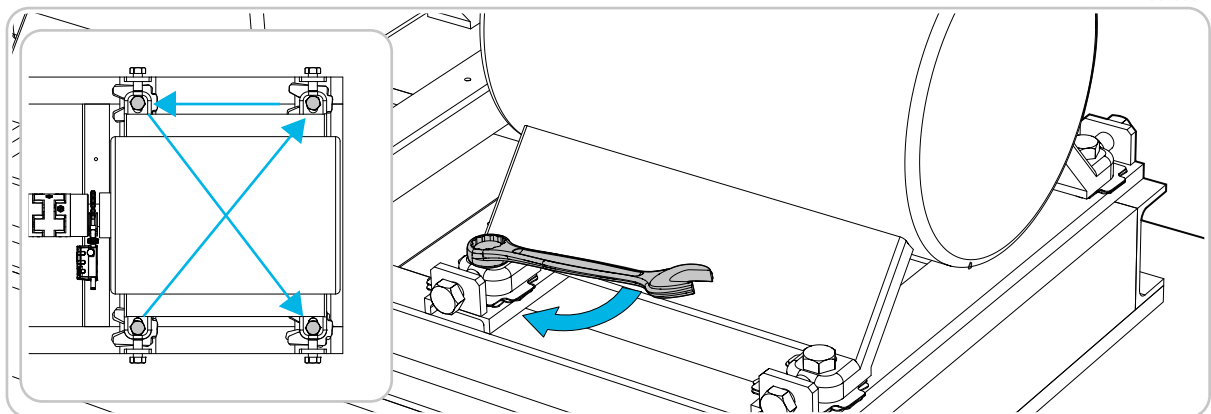
21. Tap the **[H]** button and adjust the motor horizontally using the jackbolts as suggested of the software.

60-0591



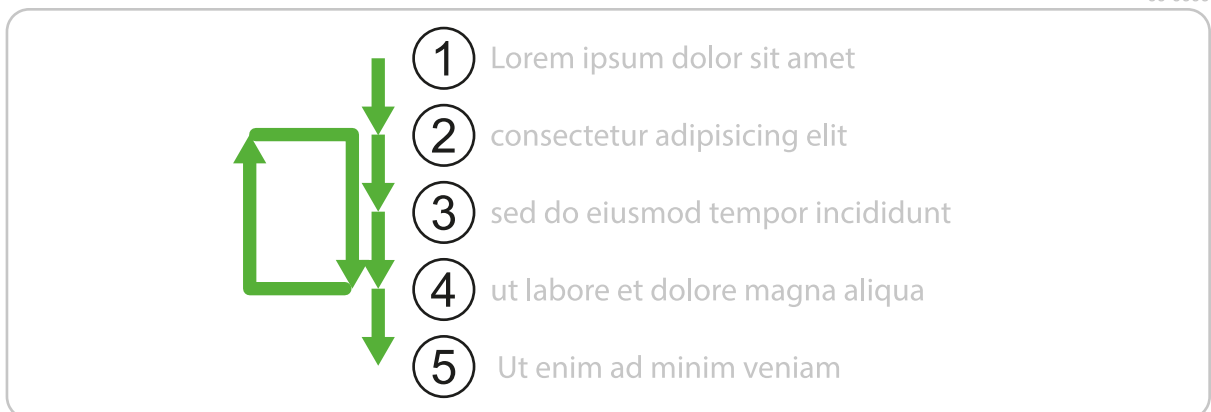
22. Cross-tighten the bolts to avoid introducing errors when tightening them. Don't forget to account for the specified torque, if any.

60-0594



23. When satisfied with the adjustment repeat from *step 12* to verify the new positions.


60-0666



24. For a report on the result tap on the **[REPORT]** button at the top.

60-0595



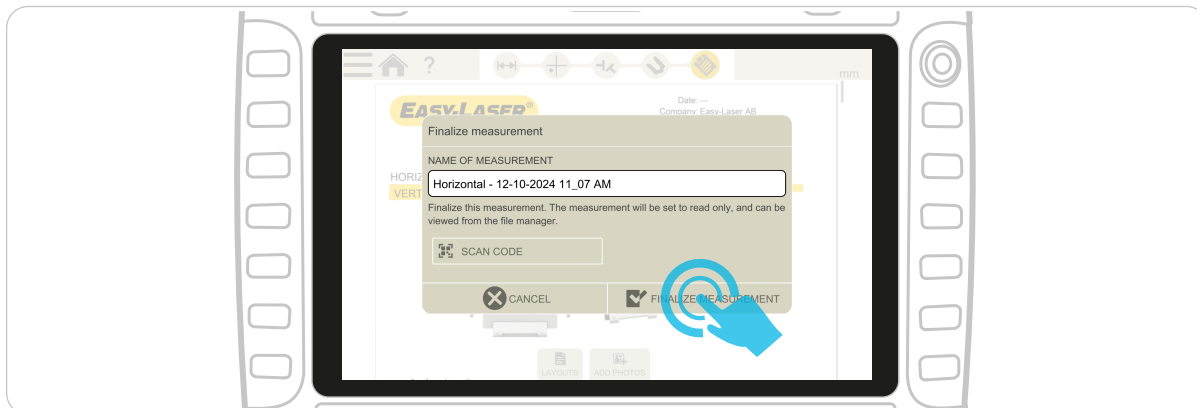
25. At the report screen photos can be added as well as notes. The **[NOTES]** and **[CAMERA]** are found under the burgermenu () at top left.

60-0596



26. The **[FINALIZE]** choice saves the report. Enter a name or choose the suggested. Tap **[FINALIZE MEASUREMENT]** to end this measurement.

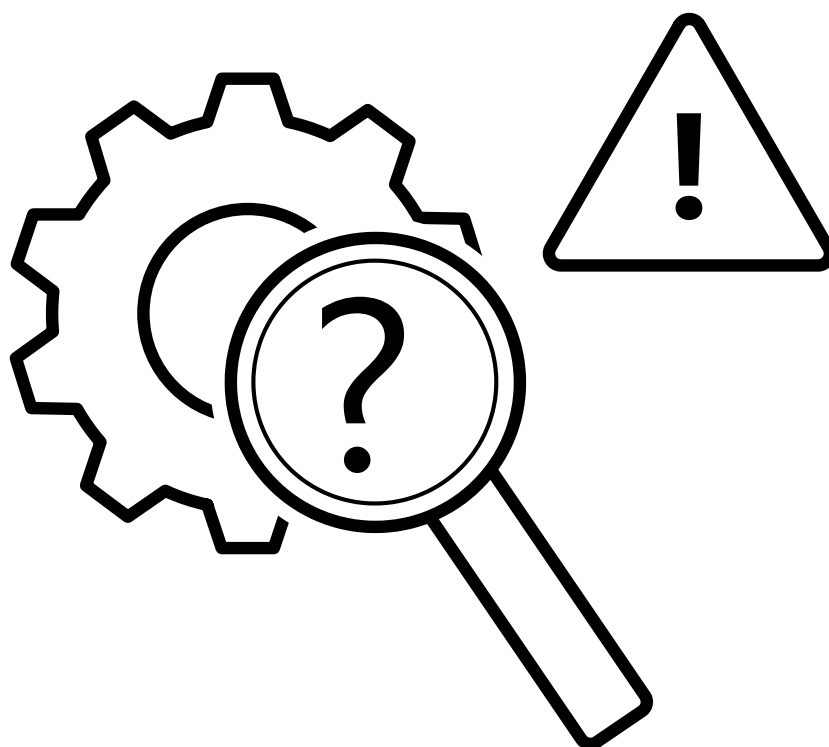
60-0597



27. The measurement is finished.



>> Troubleshooting





Measured values do not repeat

Problem: When re-measuring, previous measurement values are not repeated

When re-measuring previous measurement values should repeat. But they don't, they change.

Solution:

The following things should be checked:

Check brackets

- Is any of the physical equipment loose?
- Is something stuck mechanically?
- Are the magnets stuck?
- Are the Laser bracket arms tightened?
- Are the adjustment screw on the offset hub, or locking screws on micrometer screws, tight?
- Are the detector rods tight?

Measurement points on the object

- What do the surfaces look like on the measurement object, is the surface of the measurement object dirty? The measurement result will never be better than the measurement surfaces.
- Do you measure at the same points when re-measuring? Use the same points as for the first measurement.
- Are all brackets correctly fitted (contact on all points on the slide bracket/probe)?

External factors

- Vibrations?
- Is the object moving (thermal growth during measurement)?
- Direct sunlight or welding nearby?

- Are the optics cleaned?
- Is there other work in progress that affects the measurement object?

No measurement values

Problem: No measured values are visible

All the components are in place but no measurement values are visible

Solution:

If no values are visible check the following:

- Low battery level in the laser transmitter?
- Target lid on the detector not open, or partly open?
- Correct detector connected to the system?
- The laser beam is far outside the target when rotating the detector? - Perform a pre-aligning of the laser transmitter and try again.

Easy-Laser® is manufactured by Easy-Laser AB, Hagatan 6 SE-431 49 Mölndal, Sweden
Tel +46 31 708 63 00 Fax +46 31 708 63 50-mailinfo@easylaser.com www.easylaser.com
© 2024 Easy-Laser AB. We reserve the right to make changes without prior notification.
Easy-Laser® and Easy-Laser PLUS are registered trademarks of Easy-Laser AB. Android, Google Play and the Google Play logo are trademarks of Google. Apple, the Apple logo, iPhone and iPod touch are trademarks of Apple Inc. registered in the U.S. and other countries. App Store is a service mark of Apple Inc. Other trademarks belong to their respective owners.

