

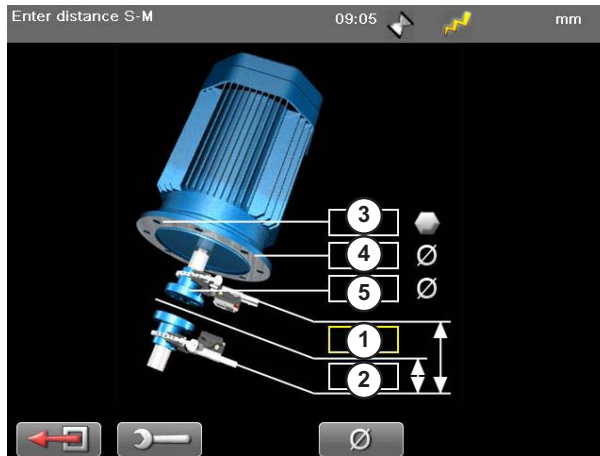



# VERTICAL

The program Vertical is used for vertical flange mounted machines.




## Preparations

1. Mount the M-unit on the movable machine and the S-unit on the stationary machine.
2. Select  and  to open Vertical program.
3. Enter distances. Confirm each distance with **OK**.



- 1 Distance between S-unit and M-unit. Measure between the rods. **Mandatory**.
- 2 Distance between S-unit and centre of coupling. **Mandatory**.
- 3 Coupling diameter. Select  to activate field.
- 4 Bolt circle diameter (centre of the bolts).
- 5 Number of bolts (4, 6 or 8 bolts).

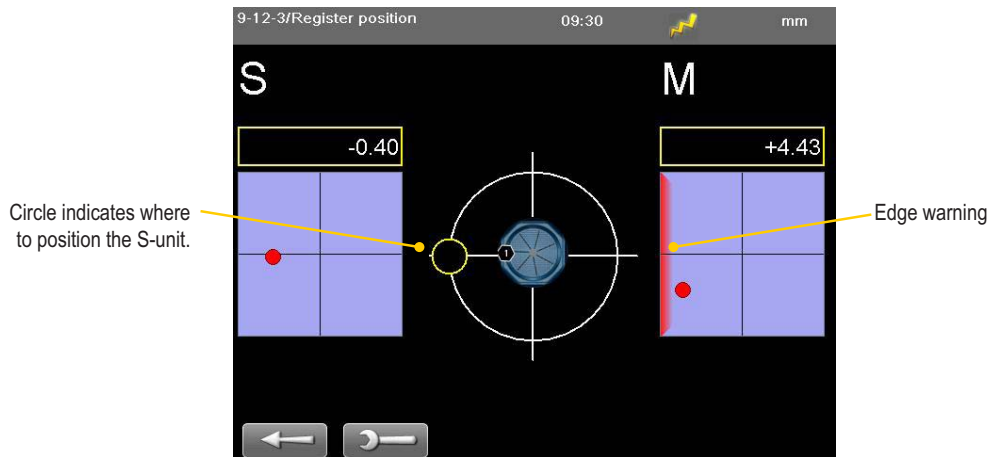
## Function buttons

	Leave program.
	Open Control panel.
	Select to enter diameter of coupling.

## Measure

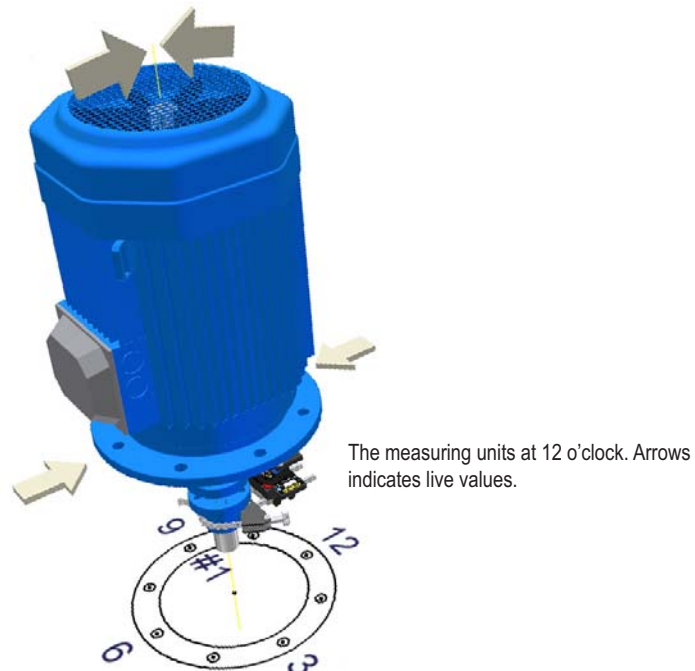
The program Vertical uses the 9-12-3 method.

1. Position the units at 9 o'clock, at bolt number one. Make sure that it is possible to also position the units at 12 and 3 o'clock.
2. Press **OK** to register first position. The first position is automatically set to zero.
3. Turn units to position 12 o'clock.
4. Press **OK** to register position.
5. Turn units to position 3 o'clock.
6. Press **OK** to register position. Measurement result is displayed.



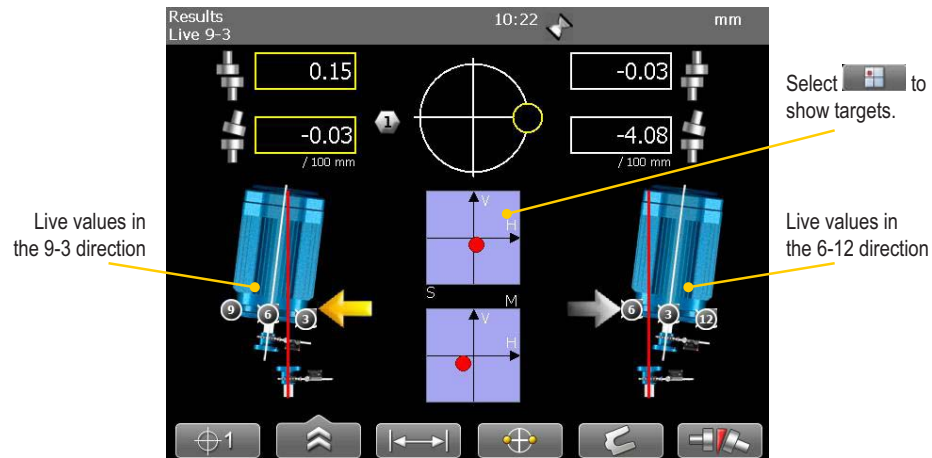
### Edge warning

When the laser beam is close to the edge, the edge is “lit up” as a warning. It is not possible register values when you see the edge warning. Values registered here are not fully reliable.



## Result

The result is displayed as sideways offset in the coupling and angular error between shafts.



### Live values

The values can be displayed live in two directions:

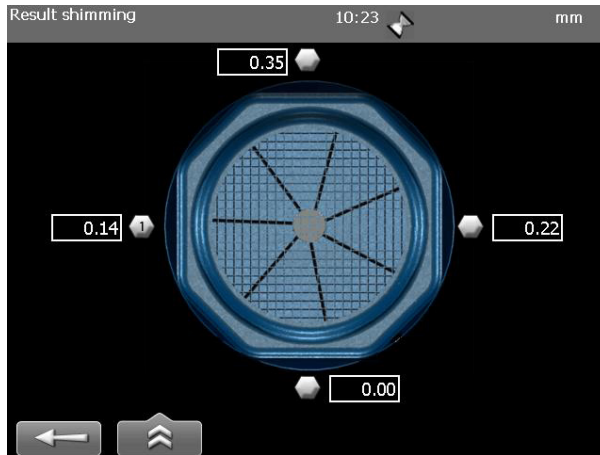
- Live in the 9-3 direction.  
Select [9-3 icon] and position the measuring units at 3 o'clock.
- Live in the 6-12 direction.  
Select [6-12 icon] and position the measuring units at 12 o'clock.



### Function buttons

	<b>Back</b>
	<b>More.</b> Select to display a sub-menu.
	<b>Open Control panel.</b>
	<b>Save file.</b>
	<b>Save as report.</b>
	<b>Set tolerance.</b>
	<b>Show target.</b> This is a quick way to see where the laser beam hits the target and how the measuring units are positioned.
	<b>Adjust distances.</b> Press <b>OK</b> to confirm changes. The result is recalculated.
	<b>Toggle button.</b> Switch between showing live values in the direction 9-3 or 6-12.
	<i>See Shim result on next page.</i>
	<b>Toggle button.</b> Switch between to show gap and show angular error per 100 mm. For this to work you need to set the coupling diameter.

## Shim result view

To view this, you need to enter number of bolts and diameter of bolt circle.



1. Select  to open Shim value view. The values are not live.
2. Read values. The highest bolt is calculated as 0.00. Values below zero indicates that the bolt is low and need shimming.
3. Select  to return to Result view.

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### **Note!**

*If you shim the machine, remeasure from position 9 to update all measurement values.*

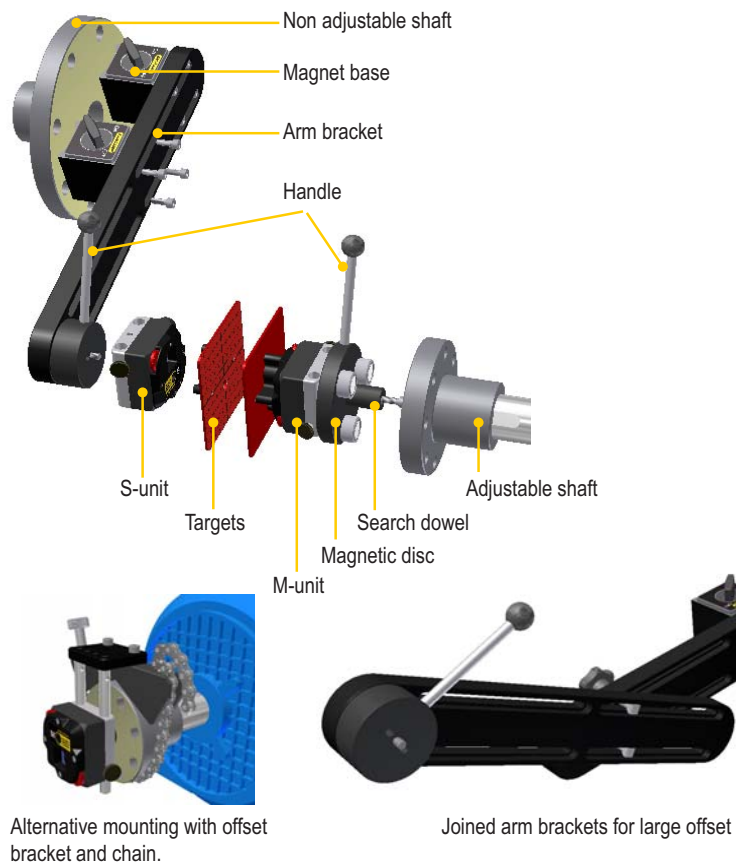
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## Adjust machine



1. Compare the offset and angular error to the tolerance demands.
2. If the angular error need to be adjusted, please shim the machine first, then adjust the offset.
3. Tighten the bolts and remeasure.

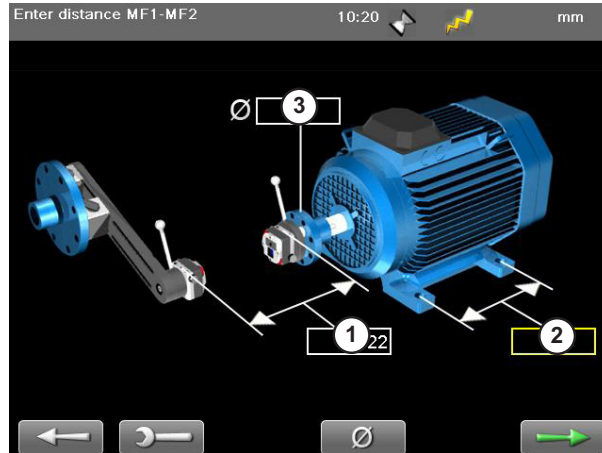
## Mount the units


1. Mount the arm bracket on the non adjustable shaft. You can use the magnet bases or mount the bracket directly on the flange.
2. Mount the S-unit on the arm bracket.
3. Mount the M-unit on the magnetic disc. If the adjustable shaft has a thread, use suitable search dowel. This makes the centering easier.
4. Mount the targets.







## Enter distances

1. Select  and  to open Cardan program.
2. Enter distances. Confirm each distance with **OK**.



- 1 Distance between S-unit and M-unit. Measure between the rods. **Mandatory**.
- 2 Distance between feet pair one and feet pair two. Optional.
- 3 Coupling diameter. Optional, select  to activate field.

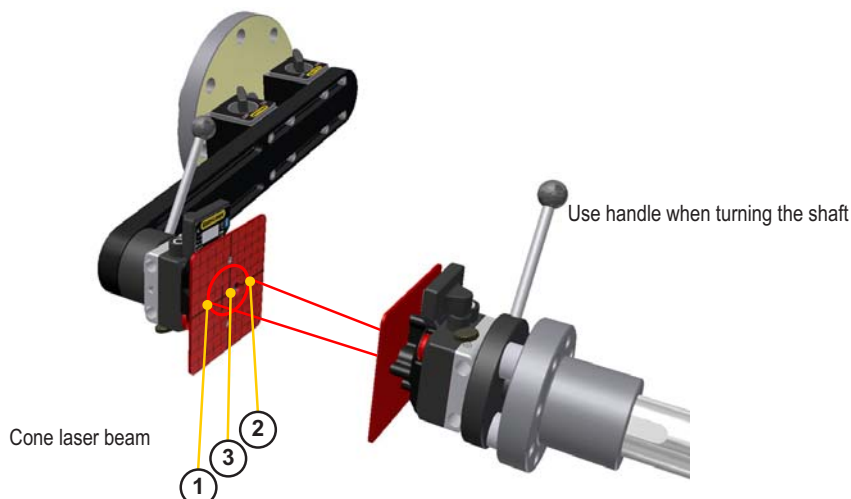
## Function buttons

	<b>Leave program.</b>
	<b>Open Control panel.</b>
	<b>Diameter.</b> Select to enter coupling diameter. This is necessary if you want the result based on the gap of the coupling instead of angle.
	<b>Continue.</b> Available when you have entered the mandatory distances.

## Cone laser beam

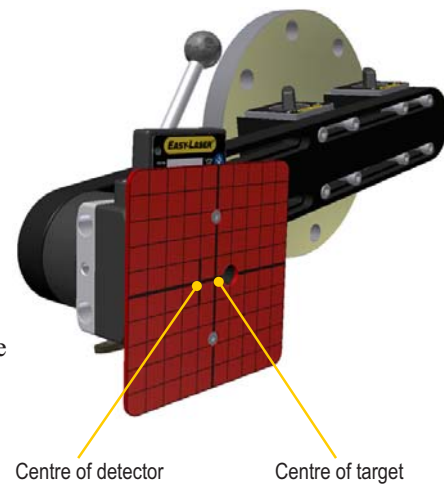
When you turn the shaft, the laser beam will draw a circle on the target. If the distance between S and M is small (<300 mm), it can be difficult to cone the laser beam. If this is the case, proceed to *Rough alignment*.

1. Enter distances. See information above.
2. Note where the laser beam hit the target at position **1**.
3. Turn the shaft 180°. Note the position **2**.
4. Adjust the laser beam halfway towards position **1**, to position **3**.
5. Turn the shaft. If the laser beam does not move when you turn, the laser beam is correctly coned.
6. Repeat step 2-5 with the opposite unit.



## Rough alignment

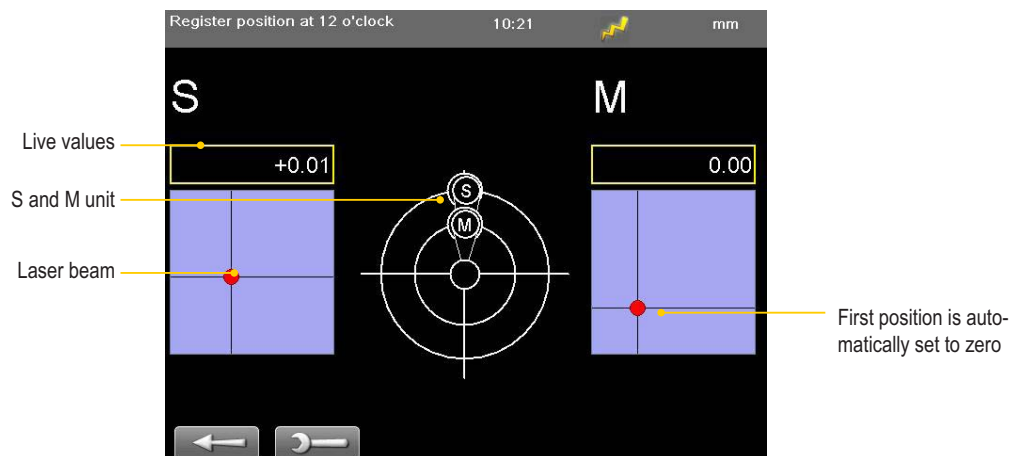
1. Adjust the arm bracket until the laser beam from the M-unit hits the centre of the target.
2. Adjust the movable machine until both laser beams hit **centre of the targets**.
3. Adjust the arm bracket if the adjustment of the machine is not enough.
4. Turn the shafts to 9 o'clock. Connectors pointing upwards.
5. Adjust the laser beams to the marking for **centre of detector**.
6. Remove the targets. The Display unit shows the position of the laser beams.



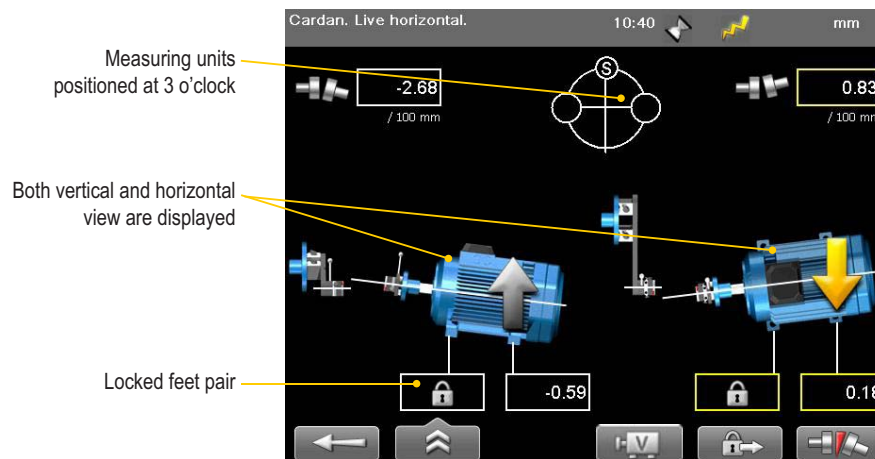
## Measure

The shafts are positioned at 9 o'clock.

1. Press **OK** to register first position. The first position is automatically set to zero.
2. Turn the shafts to 12 o'clock.
3. Press **OK** to register position.
4. Turn the shafts to 3 o'clock.
5. Press **OK** to register position.
6. The result for the angular error is displayed.



## Result



## Function buttons

	<b>Back</b>
	<b>More.</b> Select to display a sub-menu.
	<b>Open Control panel.</b>
	<b>Save file.</b>
	<b>Save as report.</b>
	<b>Show target.</b> This is a quick way to see where the laser beam hits the target and how the measuring units are positioned.
	Toggle button. Show vertical or horizontal live values.
	Toggle button to move the lock. By default, the feet pair with the <b>highest value</b> is set to zero and locked.
	Toggle button. Switch between to show gap and show angular error per 100 mm. For this to work you need to set the coupling diameter.

## Adjustment

Check the machine according to the tolerance and adjust the machine if needed. No offset adjustment is made.

1. Adjust the machine in vertically by shimming according to the vertical feet values.
2. Adjust the machine sideways according to the live horizontal values.
3. Tighten the feet.
4. Select to remeasure.

# TECHNICAL DATA

System Easy-Laser® E710 Shaft, Part No. 12-0440

A complete system contains	
1	Measuring unit M
1	Measuring unit S
1	Display unit
2	Bluetooth® units
2	Cables 2 m
2	Shaft brackets with chains
2	Extension chains
2	Magnet bases
2	Offset brackets
1	Set of rods (4x60 mm, 4x120 mm)
1	Manual
1	Measuring tape 3 m
1	USB memory stick
1	USB cable
1	Battery charger (100–240 V AC)
1	Toolbox
1	Cleaning cloth for optics
1	CD with documentation
1	Carrying case



System	
Relative humidity	10–95%
Weight (complete system)	10 kg [22 lbs]
Carrying case	WxHxD: 500x400x200 mm [19.7x15.7x7.8"] Drop tested. Water and dust tight.

## Display unit E418

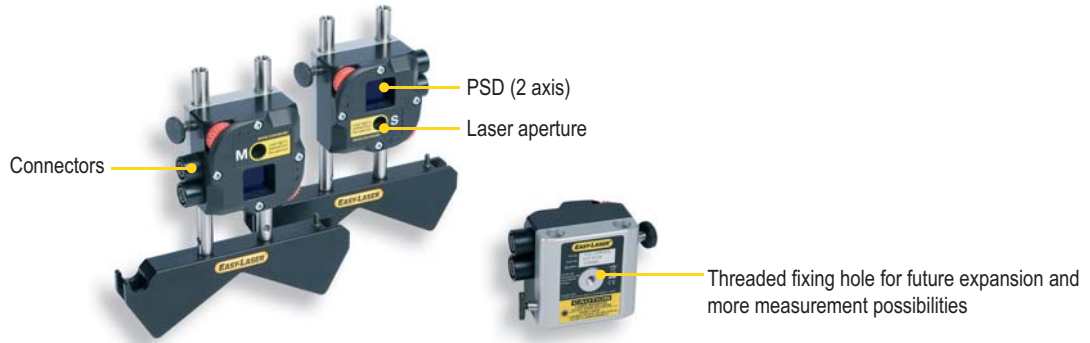
In the Display unit you are guided through the measurement procedure and can save and analyze the results.



- A Connection for charger
- B Network connection
- C Expansion port
- D USB A
- E USB B
- F Easy-Laser® measurement equipment

<b>Display unit</b>	
Type of display/size	VGA 5.7" colour
Displayed resolution	0.001 mm / 0.05 thou
Power management	Endurio™ system for unbroken power supply
Internal battery (stationary)	Li Ion
Battery compartment	For 4 pcs R 14 (C)
Operating time	Appro. 30 hours (Normal operating cycle)
Connections	USB A, USB B, External, Easy-Laser® units, Network
Storage memory	>100,000 measurements
Help functions	Calculator, Converter
Environmental protection	IP Class 65
Housing material	ABS / PC / TPE
Dimensions	WxHxD: 250x175x63 mm [9.8x6.9x2.5"]
Weight (without batteries)	1030 g [2.3 lbs]
<b>Cables</b>	
Type	With Push/Pull connectors
System cable	Length 2 m [78.7"]
Extension system cable	Length 5 m [196.8"]
USB cable	Length 1.8 m [70.8"]
<b>EasyLink™ data base software for PC</b>	
Minimum requirements	Windows® 95 or later 256 Mb RAM, 5 Mb free hard drive space

## Measuring units



<b>Measuring units</b>	
Type of display/size	2-axis PSD 20x20 mm
Detector resolution	0.001 mm / 0.05 thou
Type of laser	Diode laser
Laser wavelength	635–670 nm
Laser safety class	Class 2
Laser output power	<1 mW
Inclinometers	0.1° resolution
Thermal sensors	± 1° C accuracy
Environmental protection	IP Class 66 and 67
Dimensions	BxHxD: 60x60x42 mm [2.36x2.36x1.65"]
Weight	202 g [0.45 lbs]
<b>Wireless connection unit (optional)</b>	
Wireless communication	Class II Bluetooth® Wireless Technology
Operating temperature	-10–50 °C
Housing material	ABS
Environmental protection	IP Class 66 and 67
Dimensions	53x32x24 mm [2.1x1.2x0.9"]
Weight	25 g [0.06 lbs]

