Fixturlaser GO Pro user`s

MANUAL

GO PRO

FIXTUR LASER

VibrAlign

CONTENT

VibrAlign

1 INTRODUCTION

Congratulations on your choice of the Fixturlaser GO Pro!

We are convinced that you have made the right decision and we hope the system will meet, and even exceed, your expectations.

It is important that you read the sections about safety and care before you proceed with your first measurement.

The purpose of this manual is to guide you through the different procedures and operations of the hardware and software. Since machine installations and setups are often different from each other, we have focused this manual on measurement principles and how to handle the system.

We wish you many successful measurements!

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2 DECLARATION OF CONFORMITY

In accordance with the EMC Directive 2004/108/EC, the Low Voltage Directive 73/23/EEC, including amendments by the CE-marking Directive 93/68/EEC & EC directives RoHS, 2002/95.

Type of equipment

Alignment System

Brand name or trade mark

Fixturlaser GO Pro

Type designation(s)/Model no(s)

1-0875 Fixturlaser GO Pro

Manufacturer's name, address, telephone & fax no

Elos Fixturlaser AB
Box 7
SE-431 21 Mölndal
Sweden

Tel: +46 31 7062800
Fax: +46 31 7062850

The following standards and/or technical specifications, which comply with good engineering practice in safety matters in force within the EEA, have been applied:

Standard/Test report/Technical construction file/Normative document

Emission: EN 61000-6-3:2007.
Immunity: EN 61000-6-2:2005, EN 61000-4-2, -3.
ISO9001:2008 Ref. No/ Issued by: DNV Certification AB Certification No. 2009-SKM-AQ-2704 / 2009-SKM-AE-1419.

The laser is classified in accordance with the International Standard IEC-60825-1:2007,
USA FDA Standard 21 CFR, Ch 1, Part 1040.10 and 1040.11 except for deviations pursuant to laser notice No. 50, dated June 24, 2007.

Additional information

The product was CE-marked in 2010.

As manufacturer, we declare under our sole responsibility that the equipment follows the provisions of the Directives stated above.

Date and place of issue

Mölndal 2010-09-30

Signature of authorized person

Hans Svensson, Managing Director

3 SAFETY

Retain and follow all product safety and operating instructions. Observe all warnings on the product and in the operating instructions.

Failure to observe the safety precautions and operating instructions can cause bodily injury, fire, and damage to the equipment.

Do not disassemble, modify or use the equipment in other ways than explained in the operating instructions. Fixturlaser will not accept any liability for such use.

LASER PRECAUTIONS

Fixturlaser GO Pro uses laser diodes with a power output of < 1.0 mW. The laser classification is Class 2.

Class 2 is considered safe for its intended use with only minor precautions required. These are:

- Never stare directly into the laser transmitter.
- Never shine the laser directly into anyone else's eyes.

Your system complies with the requirements in:

- SS-EN-60825-1-1994
- British Standard BS 4803 Parts 1 to 3
- Deutsche Industrie Norm DIN JEC 76 (CO) 6
- USA FDA Standard 21 CFR, Ch 1, Part 1040.10 and 1040.11

POWER SUPPLY

Fixturlaser GO Pro is powered by three 1.5V LR-14 (C) Alkaline batteries or by corresponding 1.2V NiMH HR-14 Rechargeable Nickel Metal Hydride cells.

Only use high performance alkaline batteries.

Remove batteries when the system is stored for prolonged periods of time.

WARNING!

USE OF ANY OTHER BATTERIES THAN THOSE SPECIFIED BY FIXTURLASER WILL CAUSE SEVERE DAMAGE TO THE DISPLAY UNIT AND CAN CAUSE RISK FOR PERSONAL INJURY!

Handle any batteries with care. Batteries pose a burn hazard if handled improperly. Do not disassemble and keep away from heat sources. Handle damaged or leaking batteries with extreme care. Please keep in mind that batteries can harm the environment. Dispose of batteries in accordance with local regulatory guidelines, if in doubt contact your local sales representative.

WIRELESS TRANSCEIVER

The GO Pro system is fitted with Bluetooth wireless transceivers.

Make sure that there are no restrictions on the use of radio transceivers at the site of operation before using the wireless transceivers.

WARNING!

Before using the wireless transceivers make sure that there are no restrictions on the use of radio transceivers at the site. Do not use on aircraft.

VibrAlign

4 CARE

The system should be cleaned with a cotton cloth or a cotton bud moistened with a mild soap solution, with the exception of the detector and laser window surfaces, which should be cleaned with alcohol.

Do not use paper tissue, which can scratch the detector surface.

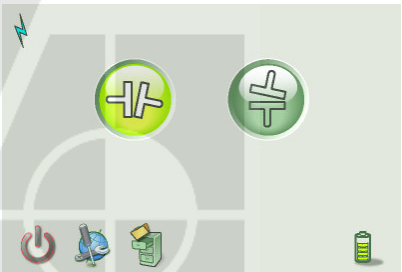
Do not use acetone.

For the best possible function, the laser diode apertures, detector surfaces and connector terminals should be kept free from grease or dirt. The display unit should be kept clean and the screen surface protected from scratches.

The chains on the V-block fixtures are delivered dry. If the system is used in highly corrosive environments, the chains should be oiled.

5 MAIN MENU

The Fixturlaser GO Pro is provided with different programs for specific purposes.



Press the red On/Off button to start the system and the Main Menu appears. Here you can select the program that you want to use.

In the Main Menu you will also find the Memory Manager and Global Settings.

Select icon with the arrow buttons and confirm with the OK button.

APPLICATION PROGRAMS

Shaft Alignment
Horizontal Machines

Shaft Alignment
Vertical Machines

MEMORY MANAGER

Memory Manager

SYSTEM FUNCTIONS

Global Settings

Off

Wireless indicator

Battery indicator

6 SHAFT ALIGNMENT HORIZONTAL MACHINES

INTRODUCTION

Shaft alignment: Determine and adjust the relative position of two machines that are connected, such as a motor and a pump, so that the rotational centres of the shafts are collinear, when the machines are working in a normal operating condition. Correction of horizontal shaft alignment is done by moving the front and the rear pair of one machine's feet, vertically and horizontally, until the shafts are aligned within the given tolerances. A tolerance table is available in the system.

The Fixturlaser GO Pro system has two measuring units that are placed on each shaft by using the fixtures supplied with the system. After rotating the shafts into different measuring positions the system calculates the relative position between the two shafts in two planes. The distance between the two measuring planes, distance to the coupling and distances to the machine feet are entered into the system. The display box then shows the actual alignment condition together with the position of the feet. Adjustment of the machine can be made directly, according to the displayed values.

The alignment results can be saved in the memory manager. The measurements in the memory manager can easily be transferred to a PC for further documentation purposes.

PRE-ALIGNMENT FUNCTIONS

In an effort to obtain the best possible conditions for shaft alignment, it is necessary to perform some pre-alignment checks. In many cases it is necessary to make these checks in order to obtain precise alignment. It is often impossible to reach the desired alignment results if you do not make any pre-alignment checks.

Before going on site, check the following:

- Safety regulations?
- What are the required tolerances?
- Any offsets for dynamic movements?
- Are there any restrictions for mounting the measuring system?
- Is it possible to rotate the shafts?
- What shim size is needed?

Before setting up the alignment system on the machine, check the machine foundation, bolt and shim condition. Also check if there are any restrictions in adjusting the machine (if e.g. there is enough space to move the machine).

After the visual checks have been performed, there are some conditions that have to be considered:

- Make sure the machine is off line and safety tagged.
- Check that the machine has the right temperature for alignment.
- Take away old rusty shims (check that you can remove shims).
- Check coupling assembly and loosen the coupling bolts.
- Check soft foot conditions.
- Mechanical looseness.

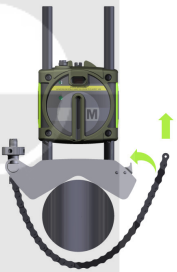
- Check coupling and shaft run-out.
- Pipe work strain.
- Coarse alignment.
- Check coupling gap (axial alignment).

MOUNTING

The sensor marked "M" should be mounted on the moveable machine and the sensor marked "S" on the stationary machine. The sensors shall be assembled on their V-block fixture, and placed on each side of the coupling.

Hold the V-block fixture upright and mount it on the shafts of the measurement object.

Lift the open end of the chain, tension it so that the slack is removed and attach it to the hook.



Firmly tighten the chain with the tensioning screw. If necessary, use the supplied tensioning tool. Do not over-tighten. If the shaft diameter is too large the chains can be extended with extension chains (optional).

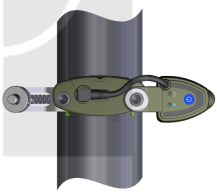
Adjust the height of the sensor by sliding it on the posts until a line of sight is obtained for both lasers. Secure its position by locking both clamping devices on the back of both units.

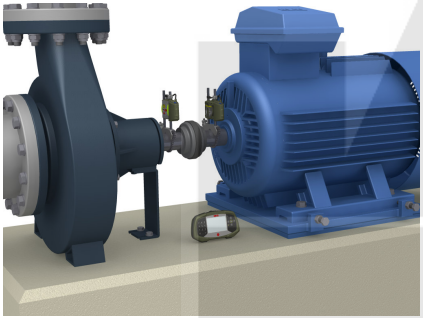
The laser of the M-sensor can be adjusted with the adjustment screw on the top of the unit. There is normally no need to adjust the laser, but this might be necessary when measuring at long distances.

NOTE: Make sure that the adjustment screw is secured with the locking nut after adjustment.

Connect the cables from the wireless communication devices to the sensor units and make sure that the tightening screws are locked.

Always let the cables from the wireless communication devices stay connected to the sensor units.





STARTING THE PROGRAM

Start the program by selecting the Horizontal Shaft Alignment icon in the Main Menu and press OK.

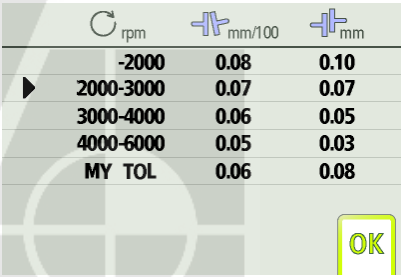
When the program is started, a tolerance table will be displayed first.

Select tolerance and press OK.

Go to settings for selecting settings.

TOLERANCE TABLE

Alignment tolerances depend to a large extent on the rotation speed of the shafts. Machine alignment should be carried out within the manufacturer's tolerances. The table provided in Fixturlaser GO Pro can be helpful if no tolerances are specified. The suggested tolerances can be used as a starting point for developing in-house tolerances when the machinery manufacturer's recommended tolerances are not available. The tolerances are the maximum allowed deviation from desired values.



Select tolerance

The arrow to the left indicates selected tolerance.

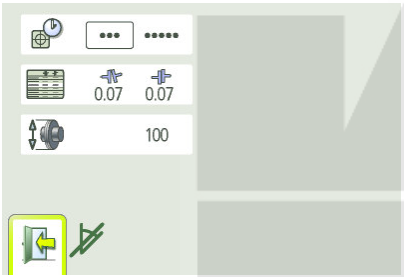
Select tolerance by scrolling up/down and press OK.

Select the OK icon and press OK to continue to shaft alignment.

Enter a customized tolerance

1. Scroll down to the last row.
2. Enter tolerance name/rotation speed and press OK or scroll to the right.
3. Enter tolerance for the angle values and press OK or scroll to the right.
4. Enter tolerance for the offset values and press OK or scroll to the right.

SETTINGS



Settings unique for this application.

Sampling time

Select normal or long sampling time.

To change sampling time, select the sampling time icon and press OK. Select normal or long sampling time with the left/right buttons and press OK.

Long sampling time is suitable for high vibration environments.

Tolerance table

Open the tolerance table by selecting the tolerance table icon and press OK.

Unit of angularity

To change unit of angularity, select the unit of angularity icon and press OK. Enter another unit of angularity and press OK.

Turn off inclinometers

If the inclinometers are not functioning properly, e.g. in high vibrations, they can be disabled.

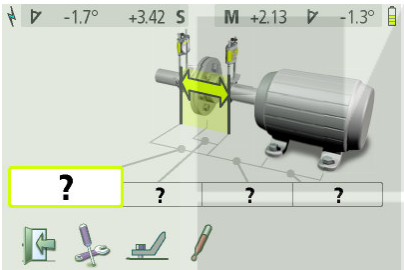
Turns off the inclinometers.

Measurement with disabled inclinometers is described at the end of this chapter.

Exit

Exits the Settings and returns to the application.

ENTER DIMENSIONS



The screen displays the movable machine.

You must enter all the distances. The distance between the sensors, the distance between the centre of the coupling and the M-sensor, the distance between the M-sensor and the first pair of feet and the distance between the first and the second pairs of feet.

Select the dimension boxes to enter dimensions.

Measure and enter dimensions.

SOFTCHECK

Go to Softcheck for checking soft foot conditions.

See chapter "Softcheck".

TARGET VALUES

Go to Target Values for entering target values.

See chapter "Target Values".

MEASUREMENT METHOD

Tripoint™ method

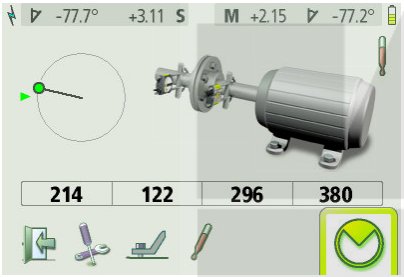
In the Tripoint method, the alignment condition can be calculated by taking three points while rotating the shaft at least 90°.

NOTE: The shafts should be coupled during measurement in order to achieve as reliable and accurate results as possible, when using the Tripoint method.

TIP: The larger the angle over which the three points are measured, the fewer moves and repeat measurements will have to be made. Minimum angle between readings is 45°.

- A green flashing arrow suggests suitable measurement positions.

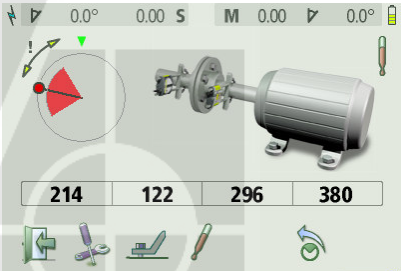
MEASUREMENT POINT REGISTRATION



Set the sensors so that they are approximately at the same rotational angle at the first measurement position.

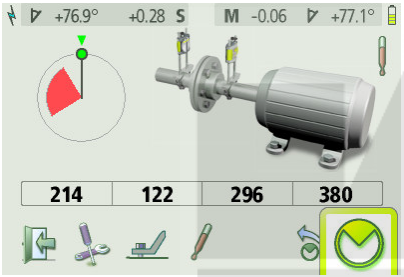
Select the register icon and press OK.

This registers the first reading.



Rotate the shafts to the next position. The shafts must be rotated over a minimum of 45°.

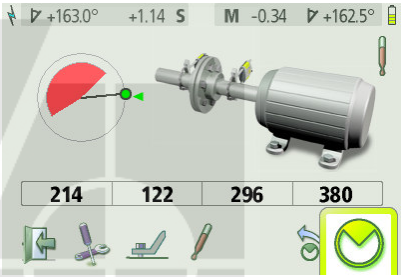
Green sector show permitted positions. Red sector show forbidden positions. The Register icon is not shown if the rotation is less than 45°.



Select the register icon and press OK.

This registers the second reading.

Rotate the shafts to the third position.

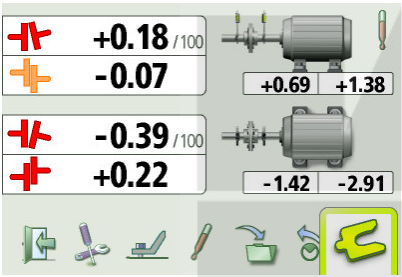


Select the register icon and press OK.

This registers the third reading.

TIP: By registering the third reading at the position 3 o'clock, the sensors will already be in the right position for horizontal alignment.

MEASUREMENT RESULTS



The Measurement Result screen shows coupling values and foot values in both the vertical and horizontal direction.

The symbol to the left of the coupling values indicates the angular direction and offset, and also if the values are within tolerance.

Within tolerance (green).

Within double tolerance (yellow and inverted).

Out of double tolerance (red and inverted).

A symbol at the coupling indicates the status of the coupling.

Within tolerance.

EVALUATING THE RESULT

The angle and offset values are used to determine the alignment quality. These values are compared with the alignment tolerances to determine whether correction is necessary. If suitable tolerances are selected in the tolerance table, the symbols described above indicate if the angle and offset values are within tolerance or not.

The foot values indicate the movable machine's foot positions where corrections can be made.

Depending on the result, the program will also guide the user.

First, the program will always recommend the user to save the measurement.

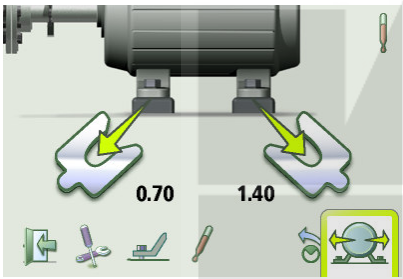
Then, if the measurement result shows that the machine is misaligned, the user will be recommended to go to shimming.

If the measurement result is within tolerance, the system will recommend the user to exit the measurement.

Save the measurement result.

Go to shimming.

SHIMMING



The Shimming screen shows foot values in the vertical direction as suitable shim values.

The arrows show if shims must be added or removed to adjust the machine in the vertical direction.

The check signs show that shimming is not needed.

When shimming is completed, continue to alignment for adjustments in the horizontal direction.

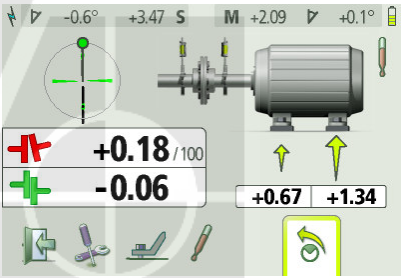
Go to alignment.

ALIGNMENT

If the machine has been adjusted vertically in the shimming screen, go directly to alignment in the horizontal direction.

If the machine has not been adjusted in the shimming screen, alignment in the vertical direction has to be done first.

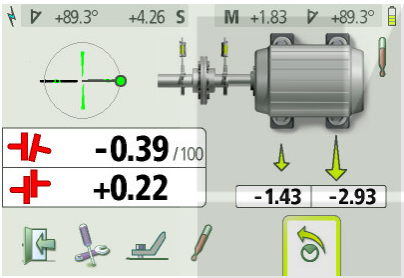
Vertical direction



Rotate the shafts to the 12 or 6 o'clock position to make adjustments in the vertical direction. The angle guide helps you to reach the right position.

Adjust the machine vertically until the values for both angular and parallel alignment are within tolerance. The arrows at the feet show in which direction the machine shall be moved.

Horizontal direction



Rotate the shafts to the 3 or 9 o'clock position to make adjustments in the horizontal direction. The angle guide helps you to reach the right position.

Adjust the machine horizontally until the values for both angular and parallel alignment are within tolerance. The arrows at the feet show in which direction the machine shall be moved.

Check and re-measure

Rotate the shafts back to the 12 or 6 o'clock position and check that the machine is still within tolerance.

Alignment is now completed. To confirm the result, re-do the measurement.

Re-measure.

OTHER FEATURES

M and S unit LED function

The front of the M and S units has two LEDs.

Laser operation LED (close to laser):

Continuously green:	Laser is firing.

Status LED (close to detector):

Continuously green:	Unit OK and ready.
Continuously red:	Unit start up or malfunction during start up.
Flashing green:	Unit placed at 9, 12 or 3 o'clock positions (within +/-3°).
Flashing red:	Measurement in progress.

Looseness indicator

The system has a function for detecting coupling backlash and looseness in order to achieve optimal accuracy. The system will display the looseness indicator if one of the following conditions is met:

- The M and S units are more than 3° apart.
- The mutual angular position of the M and S units changes more than 0.7° at the following measurement points, compared to the first measurement point.

When the coupling backlash or looseness is eliminated to avoid any of the above conditions, the looseness indicator will automatically disappear.

Target Value symbol

When Target Values are used in the measurement, this is indicated with the Target Value symbol in the upper right corner of the screen.

Measurement with disabled inclinometers

If the inclinometers are not functioning properly, e.g. in high vibrations, they can be disabled.

- Turn off the inclinometers in Settings.

When the inclinometers are disabled the system will work as normal with the following exceptions:

- The readings have to be registered according to the "clock method". Register the first reading at 9 o'clock, rotate the shafts 180° and register the second reading at 3 o'clock, rotate 90° back to 12 o'clock to register the third and final reading.
- During alignment, use the up and down buttons to change from horizontal to vertical view of the machine and vice versa.

Change view.

VibrAlign

7 SHAFT ALIGNMENT VERTICAL MACHINES

INTRODUCTION

Shaft alignment: Determine and adjust the relative position of two machines that are connected, such as a motor and a pump, so that the rotational centres of the shafts are collinear, when the machines are working at a normal operating temperature. Correction of vertical shaft alignment is done by moving the flange of the machine until the shafts are aligned within given tolerances. A tolerance table is available in the system.

The Fixturlaser system has two measuring units that are placed on each shaft by using the fixtures supplied with the system. After rotating the shafts to different measuring positions, the system calculates the relative position between the two shafts in two planes. The distance between the two measuring planes, distance to the coupling, number of bolts and pitch circle diameter are entered into the system. The display box then shows the actual alignment condition together with the position of the feet. Adjustment of the machine can be made according to the values displayed. The angular misalignment is corrected by placing shims under the bolts and offset is corrected by moving the machine laterally.

The alignment results can be saved in the memory manager. The measurements in the memory manager can easily be transferred to a PC for further documentation purposes.

PRE-ALIGNMENT FUNCTIONS

In an effort to obtain the best possible conditions for shaft alignment, it is necessary to perform some pre-alignment checks. In many cases it is necessary to make these checks in order to obtain precise alignment. It is often impossible to reach the desired alignment results if you do not make any pre-alignment checks.

Before going on site, check the following:

- Safety regulations?
- What are the required tolerances?
- Any offsets for dynamic movements?
- Are there any restrictions for mounting the measuring system?
- Is it possible to rotate the shafts?
- What shim size is needed?

Before setting up the alignment system on the machine, check the machine foundation, bolt and shim conditions. Also check if there are any restrictions in adjusting the machine (if e.g. there is enough space to move the machine).

After the visual checks have been performed, there are some conditions that have to be considered:

- Make sure the machine is off line and safety tagged.
- Check that the machine has the right temperature for alignment?
- Take away old rusty shims (check that you can remove shims).
- Check coupling assembly and loosen the coupling bolts.
- Check soft foot conditions.
- Mechanical looseness.

- Check coupling and shaft run-out.
- Pipe work strain.
- Coarse alignment.
- Check coupling gap (axial alignment).

MOUNTING

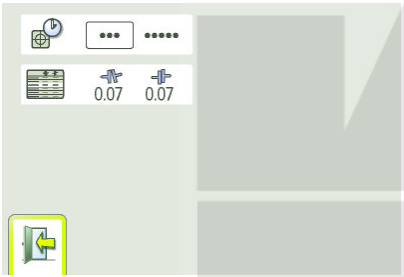
The sensors are mounted as described in chapter "Shaft Alignment Horizontal Machines".

STARTING THE PROGRAM

Start the program by selecting the Vertical Shaft Alignment icon in the Main Menu and press OK.

Go to Settings for selecting settings.

SETTINGS



Settings unique for this application.

Sampling time

Select normal or long sampling time.

To change sampling time, select the sampling time icon and press OK. Select normal or long sampling time with the left/right buttons and press OK.

Long sampling time is suitable for high vibration environments.

Tolerance table

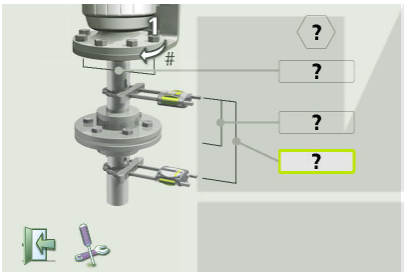
Open the tolerance table by selecting the tolerance table icon and press OK.

The tolerance table is described in the chapter “Shaft Alignment Horizontal Machines”.

Exit

Exits the Settings and returns to the application.

ENTER DIMENSIONS



The screen displays the movable machine.

? Select the dimension boxes to enter dimensions.

Measure and enter dimensions.

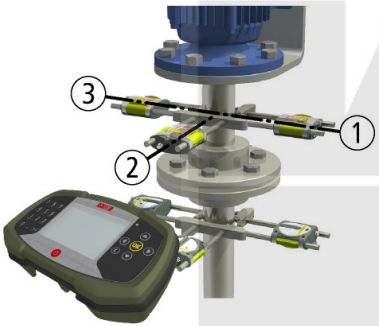
You must enter all the distances. The distance between the sensors, the distance between the centre of the coupling and the M-sensor, and the pitch circle diameter and the number of bolts.

Up to 8 bolts can be entered.

MEASUREMENT METHOD

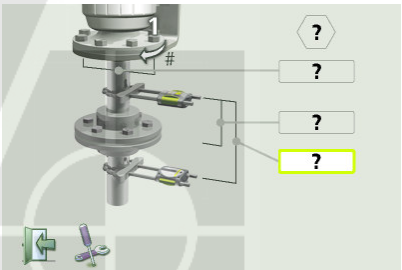
In the Vertical Shaft Alignment program, machinery positions are calculated by taking three points with 180° of rotation.

MEASUREMENT POINT REGISTRATION



Place yourself at the position corresponding to the second measurement position, where it is easiest to turn the shafts through 180°.

Tip: Mark the positions 1, 2 and 3 before you start measuring.

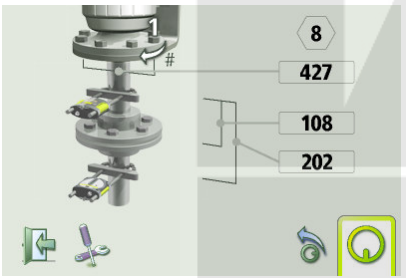


Set the sensors at approximately the same rotational angle at the first measurement position, with bolt number 1 to the right.

Select the register icon and press OK.

This registers the first reading.

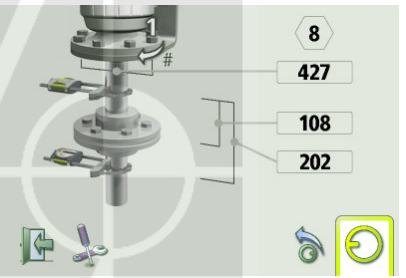
Rotate the shafts 90° to the second position (where you are standing).



Select the register icon and press OK.

This registers the second reading.

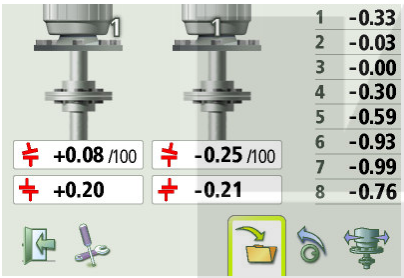
Rotate the shafts 90° to the third position, to the left.



Select the register icon and press OK.

This registers the third reading.

MEASUREMENT RESULTS



The Measurement Result screen shows coupling values in both directions, and bolt values.

The symbol to the left of the coupling values indicates the angular direction and offset, and also if the values are within tolerance.

Within tolerance (green).

Within double tolerance (yellow and inverted).

Out of double tolerance (red and inverted).

A symbol at the coupling indicates the status of the coupling.

Within tolerance.

Save the measurement result.

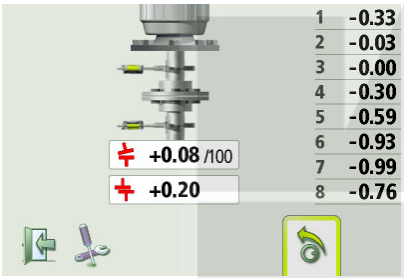
Go to alignment.

EVALUATING THE RESULT

The angle and offset values are used to determine the alignment quality. These values are compared with alignment tolerances to determine if any correction is necessary. If suitable tolerances are selected in the tolerance table, the symbols described above indicate if the angle and offset values are within tolerance or not.

The foot values indicate the movable machine's foot positions where corrections can be made.

ALIGNMENT



Adjust the angular error by placing shims under the bolts as required (negative bolt value means that shims should be added.) The angular error is displayed live in the first direction when the sensors are placed in position number 1, and in the second direction when they are placed in position number 2.

Now adjust the parallel offset in both directions by moving the machine. The parallel offset is displayed live in the first direction when the sensors are placed in position number 1, and in the second direction when they are placed in position number 2.

Check that both the angular value and the parallel offset lie within the required tolerances once the adjustments are completed.

Alignment is now complete. To confirm the result, re-do the measurement.

Re-measure.

8 SOFTCHECK™

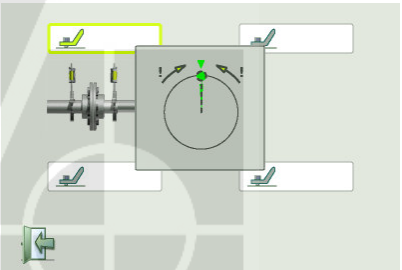
INTRODUCTION

A soft foot condition needs to be corrected before any alignment takes place. If not, the measurement result will be of no value. It is more or less impossible to establish if there is a soft foot condition without using some kind of measurement tool. The Fixturlaser Alignment System's built-in Softcheck program checks each foot and displays the result in mm or mils.

The Softcheck program is entered from the Horizontal Shaft Alignment program.

STARTING THE PROGRAM

Start the Softcheck by selecting its icon in the Shaft Alignment program and press OK.

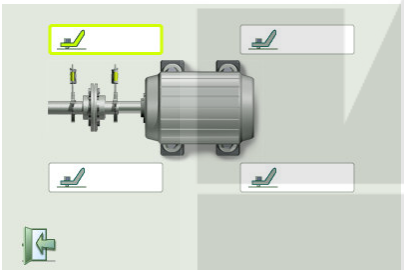


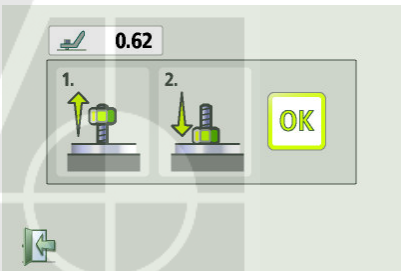
Place the sensors at the 12 o'clock position.

All the distances must be entered, before checking for soft foot.

Check that all foot bolts are firmly tightened.

MEASUREMENT VALUE REGISTRATION

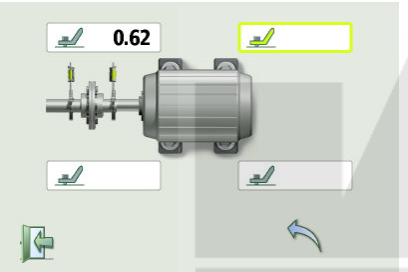




Select a bolt of your choice and press OK.

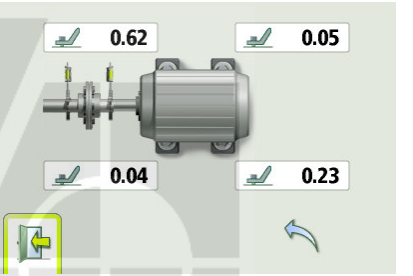
Loosen the bolt fully and then tighten it firmly, preferably with a dynamometric wrench.

Press OK to register the measurement value.



Continue with the rest of the bolts.

Re-measurements can be done at any time by selecting the requested bolt again and press OK.



Make the necessary corrections and then check each foot again (the values show approximately how many shims that are needed to eliminate the soft foot).

Return to shaft alignment by selecting the Exit icon and press OK.

9 TARGET VALUES

INTRODUCTION

Most machines develop a certain amount of heat while running. In the best case both the driving and the driven machine are affected equally requiring no input of compensation values. But in some applications the driven machine is either hotter, i.e. a pump for hot liquid, or cooler than the driving machine.

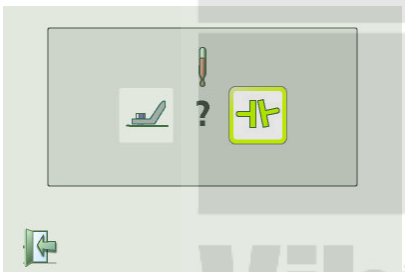
Machine manufacturers define the thermal expansion of machines differently, but in most cases you will find it as a factor of deliberate misalignment expressed in parallel offset and angular error.

In the Fixturlaser GO Pro system, you can enter target values while doing your alignment work. Accepted values are feet values and angle and offset values.

The entered values are target values. Target values mean that these are the values at which the machine should be positioned when not running (cold condition) in order to obtain correct alignment while the machine is running (hot condition).

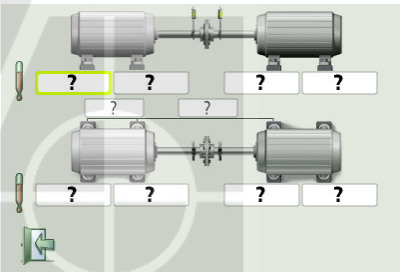
STARTING THE PROGRAM

Start the Target Values program by selecting its icon in the Horizontal Shaft Alignment program and press OK.

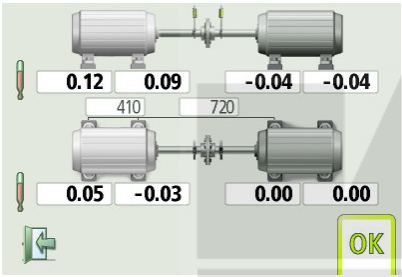


Select one of two ways to express the offset values: Feet values or angle and offset values.

FEET VALUES

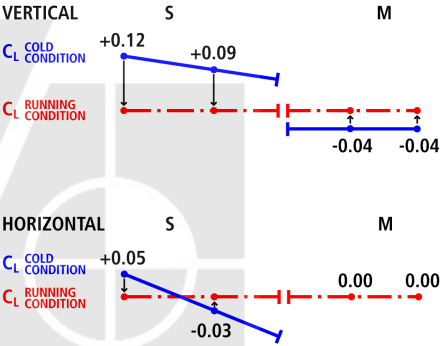


Select the feet value boxes. Enter target values for the feet in mm or mils according to the pre-set measurement unit together with the required distances.



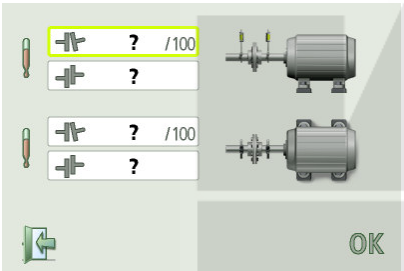
In the example above, the stationary machine will shrink vertically by 0.12 mm at the rear feet and 0.09 mm at front feet while the movable machine will expand 0.04 mm while running.

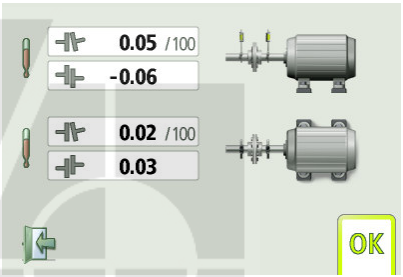
Horizontally, the rear feet will move 0.05 mm towards you and the front feet will move 0.03 mm away from you while the movable machine does not change its position while running.



After entering these feet values, the system calculates how the movable machine should be positioned (target position) in cold condition in order to obtain perfect alignment during running condition.

ANGLE AND OFFSET VALUES



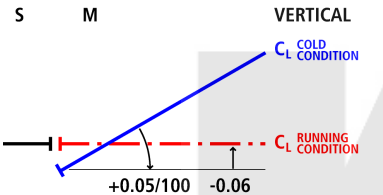


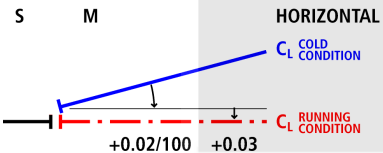
?

Select the value boxes and enter target values for the angles in mm/100 mm and target values for the offsets in mm, or mils/inch and mils, according to the pre-set measurement unit.

In the example above, the movable machine should be vertically adjusted to a position with an angular misalignment of +0.05 mm/100 mm and an offset of -0.06 mm.

Horizontally, the movable machine should be positioned with a +0.02 mm/100 mm angular misalignment and a +0.03 mm offset, in cold condition to obtain perfect alignment while running.



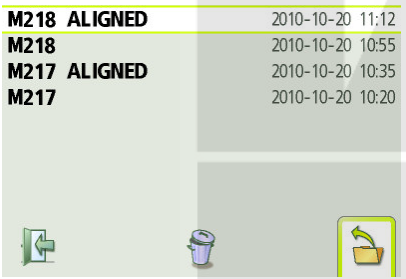


Return to shaft alignment by selecting the Exit icon and press OK.

VibrAlign

10 MEMORY MANAGER

FILE MANAGER



Select file

Files can be selected by scrolling.

Scroll upwards.

Scroll downwards.

Open file

Opens selected file.

Delete

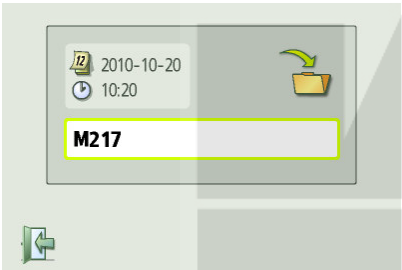
Deletes selected file.

Exit

Exits the Memory Manager.

NOTE: When there are a lot of files in the memory, processing can be slow.

SAVE MEASUREMENT



When saving a measurement, both a text file and a picture file (bmp) are created.

Enter file name

Enter file name with the keyboard, when the file name field is selected.

Confirm

OK Confirm.

TRANSFER FILES TO A PC

1. Turn on the display unit and stay in the Main Menu.

2. Attach the display unit to the PC with the USB cable. The display unit will be automatically detected and will appear as a mass storage device on the PC.

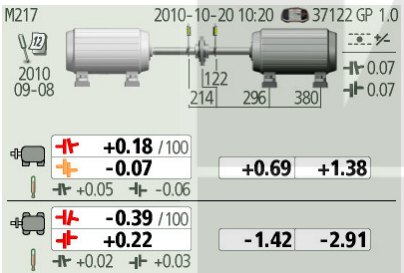
   NOTE: The display unit must be turned on and in the Main Menu before it is connected to the PC in order for the display unit to appear on the PC.

3. The files in the display unit can be transferred to the PC using the ordinary functions in Windows Explorer (i.e. cut, copy or drag and drop).

In the PC there will be two files for each measurement; a picture file (.bmp) and a text file (.txt). The picture file shows the same picture as in the memory. The text file shows just the measurement data.

It is recommended that you delete the files from the display unit after they have been safely transferred in order to avoid full memory.

SHAFT ALIGNMENT FOR HORIZONTAL MACHINES



The screen displays measurement results, dimensions, target values if any, file name, date and time, serial number of the display unit, program, program version, calibration date and tolerances.

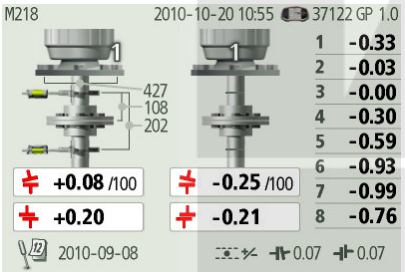
OK — Exits the measurement file.

Scrolls to measurement saved after the one displayed.

Scrolls to measurement saved prior to the one displayed.

C — Deletes the measurement file.

SHAFT ALIGNMENT FOR VERTICAL MACHINES



The screen displays measurement results, dimensions, file name, date and time, serial number of the display unit, program, program version, calibration date and tolerances.

Exits the measurement file.

Scrolls to measurement saved after the one displayed.

Scrolls to measurement saved prior to the one displayed.

Deletes the measurement file.

VibrAlign

11 GLOBAL SETTINGS

The global settings menu includes settings that are universal for all applications.

For most of the settings, the current selection is shown in the icon.

The program version number is also shown on this screen.

Date

Date settings.

To change date, select the date icon and press OK. Enter year and press OK. Enter month and press OK. Enter day and press OK.

Time

Time settings.

To change time, select the time icon and press OK. Enter hour and press OK. Enter minute and press OK.

Measurement unit

Changes between mm mode and inch mode.

To change measurement unit, select the measurement unit icon and press OK. Select mm or inch with the left/right buttons and press OK.

Battery type

Changes between standard batteries and rechargeable batteries.

To change battery type, select the battery type icon and press OK. Select standard batteries or rechargeable batteries with the left/right buttons and press OK.

Wireless settings

Wireless settings. See chapter "Wireless Transceivers".

Open the wireless settings by selecting the wireless settings icon and press OK.

Exit

Exits the global settings.

12 DISPLAY UNIT
GO PRO D

1. Alfa-numeric keyboard
2. LED indicator
3. On/Off button
4. Navigation buttons

1. USB slave

OPERATING MODES

The display unit has two operating modes: On and Off.

The display unit is turned on by a short press on the On/Off button.

To turn off the unit, select the Off icon in the main menu and press OK or while in the main menu press the On/Off button on the front.

In case the system fails to respond, remove the batteries and reinstall them.

CONNECTIONS

- USB slave; for attaching the DU to a PC.

WARNING!

To fulfill the IP 54 classification, the lids protecting the USB port must be properly sealed. Do not use the USB connection in wet conditions.

POWER SUPPLY

Fixturlaser GO Pro is powered by three 1.5V LR-14 (C) Alkaline batteries or by 1.2V NiMH HR-14 Rechargeable Nickel Metal Hydride cells.

Only use high performance alkaline batteries.

The operating time of the batteries is approximately 30 hours when the system is used for a typical alignment job. The power indicator in the main menu displays the capacity of the batteries. When the capacity is low, a battery low warning appears on the screen.

Remove batteries when the system is stored for prolonged periods of time.

BACKLIGHT

If no button is pressed within 15 minutes the backlight will turn off automatically.

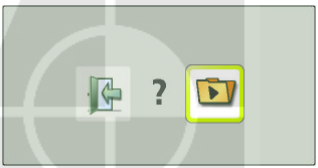
Press one of the navigation buttons to turn the backlight on again.

AUTO-OFF

If no button is pressed within 60 minutes the system will turn off automatically.

RESUME FUNCTION

If the system is turned off due to low power or auto-off, the resume function will save the data.



When the system is turned on again after battery exchange or auto-off, you will be prompted to choose whether to return to the stage when the system was turned off (i.e. resuming operation without loss of data) or start the main menu.

UPGRADING THE SOFTWARE

Any upgrades of the software will be distributed or made available for download on our website.

1. Turn on the display unit and stay in the Main Menu.

2. Attach the display unit to the PC with the USB cable. The display unit will be automatically detected and will appear as a mass storage device on the PC.

   NOTE: The display unit must be turned on and in the Main Menu before it is connected to the PC in order for the display unit to appear on the PC.

3. Copy the file containing the new software to the display unit.

4. Disconnect the display unit from the PC and wait until the display unit turns itself off (this can take several minutes).

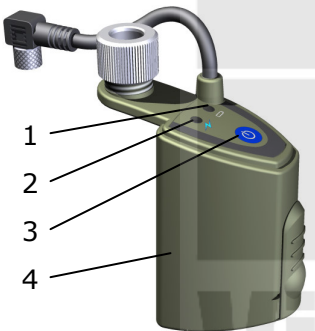
5. Turn on the display unit. The upgrade file will be automatically detected and installed. This can take approximately one minute. Wait until the Main Menu is displayed, and the DU is then ready to be used again.

Settings and stored measurements will not be affected by an upgrade.

The upgrade file will be automatically deleted from the display unit when the upgrade is completed.

13 WIRELESS TRANSCEIVERS

The wireless transceivers/battery packs uses standard Bluetooth technology.



1. Battery status indicator.
    a. Flashing red – low battery.
2. Status indicator.
    a. Continuously green – ON and connected.
    b. Flashing green – ON and trying to connect.
3. On/Off button.
4. Battery compartment.

OPERATION

In order for the display unit to communicate with the wireless units they need to be paired. This is normally done at the factory when a system is ordered. If this is not the case please refer to the section "Pairing wireless units".

The communication mode also needs to be set to wireless on. (See the wireless settings part below.)

WARNING!

Before using the wireless option make sure that there are no restrictions on radio transceivers on the site. Do not use on aircraft.

For the fastest connection turn on the wireless units/battery packs before turning on the display unit. It can take up to one minute for the wireless units to connect. When connected the status LED will become continuously green.

Long distances and rough environments can affect the data transmission speed adversely. This will make the display unit appear slower.

If the connection for some reason should be lost, the system will try to resend messages for 5 seconds after which it will automatically try to reconnect.

POWER SUPPLY

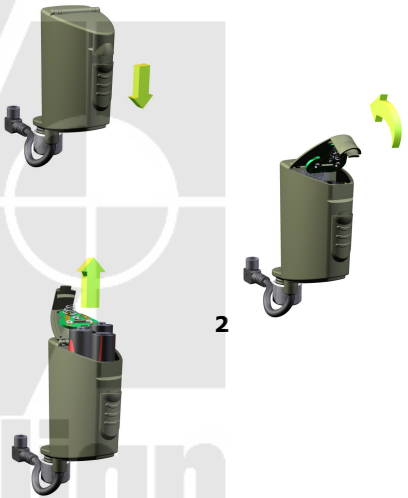
Each wireless unit/battery pack contains 3 AA (LR6) batteries. These batteries are used to supply power both to the wireless unit as well as to the sensor it is connected to.

When connected to Fixturlaser M1 or S1 the operating time will be over 8 hours continuously measuring.

The battery warning LED will flash when the batteries need to be replaced.

Note: Turn the wireless units/battery packs off before attempting to replace the batteries.

Battery replacement



WIRELESS SETTINGS

The Wireless Settings are accessed from the Global Settings.

Information on which units are paired to the display unit is displayed. The display unit will only communicate with units that are paired.

There is also a battery indicator for each wireless unit (requires that the unit is turned on and that the wireless link is on).

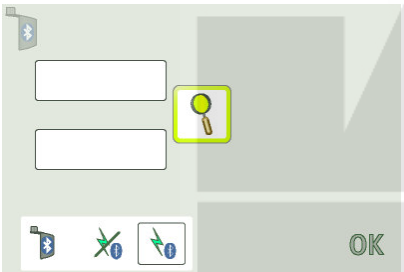
Communication mode

Changes between wireless on and off.

To change communication mode, select the communication mode icon and press OK. Select wireless on or off with the left/right buttons and press OK.

You have to exit the settings menu in order for the changes to take place.

Pairing wireless units

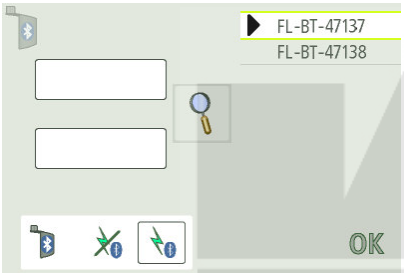


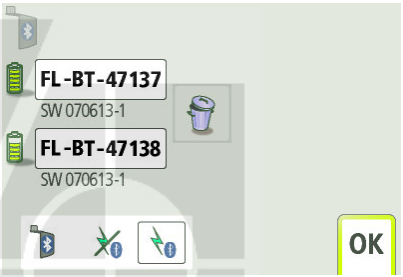
If no units are displayed in window touch the search icon to search for units that are available. If there already are units paired to the display unit press the delete icon to release them.

Search for wireless battery packs.

Release paired wireless battery packs.

When the search is finished a list of pair able units will be displayed. Notice – the wireless units/battery packs must be switched on for the display unit to discover them. The display unit will only discover units approved by Fixturlaser.





Choose the unit to pair with the display unit from the list. That unit will be automatically paired and stored by the display unit.

Select the OK icon and press OK to confirm wireless settings.

TROUBLESHOOTING

There are three major factors that can affect the system's ability to connect and communicate; distance between transceivers, obstructions between transceivers and electromagnetic interference.

The wireless units will not connect

Try these steps until the units connect:

- Make sure that communication mode Wireless is on.
- Go into the setting and check that the wireless units that are used are paired with this display unit.
- If possible bring the wireless units and the display unit close together without any obstructing objects between them – wait one minute.
- Restart the wireless units – wait one minute.
- Turn off both the wireless units and the display unit. Restart the wireless units. Restart the display unit. Wait one minute.
- Go into the settings and release the paired unit. Search for pairable units. If none are available they are either out of range, or unable to communicate due to interference or damage. If the units are available, choose them and they will be paired and automatically connected when the settings menu is exited.
- If still not connected, try at another location or contact your nearest Fixturlaser representative.

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14 TECHNICAL SPECIFICATION – FIXTURLASER GO PRO D

GO Pro D Part. No. 1-0876

Housing material	High impact ABS plastic and TPE rubber
Operating temperature	-10 to 60°C (14 to 140°F)
Storage temperature	-20 to 70°C (-4 to 158°F)
Relative humidity	10 – 90%
Weight	0.7 kg (1.54 lbs) with batteries
Dimensions	205 mm x 116 mm x 56 mm (8.1 in x 4.6 in x 2.2 in)
Environmental protection	IP 54
Flash storage memory	500 MB
Display	Colour TFT-LCD backlit
Display size	4” diagonal (84 x 56 mm)
Display resolution	400x272 pixels
Colour depth	16 000 000 colors
Interface	Membrane Switch Keyboard

Peripherals	1 USB slave port
Wireless communication	Class I Bluetooth transceiver with multi-drop capability
Power supply	3 x 1.5V LR-14 (C) Alkaline batteries or 1.2V NiMH HR-14 Rechargeable Nickel Metal Hydride cells.
Operating time	30 hours typical use
LED indicator	Green/Red

15 TECHNICAL SPECIFICATION – FIXTURLASER M1/S1

M1 Part. No: 1-0754

S1 Part. No: 1-0755

Housing material	Anodized aluminum and high impact ABS plastic over molded with TPE rubber
Operating temperature	-10° to 60°C (14 to 140°F)
Storage temperature	-20 to 70°C (-4 to 158°F)
Relative humidity	10 – 90%
Weight	186 g (6,56 oz)
Dimensions	79 mm x 77 mm x 33 mm (3.1 in x 3.0 in x 1.3 in)
Environmental protection	IP 65
Laser	650 nm class II diode laser
Laser line fan angle	6°
Laser line width ($1/e^2$)	1.6 mm
Laser line divergence (full angle)	0.25 mrad
Laser power	< 1 mW

Measurement distance	Up to 10m
Detector	CCD
Detector length	30 mm (1.2 in)
Detector angular sub tense	30 mrad/m (3 mm/100 mm per meter)
Detector resolution	1 µm
Measurement accuracy	0.3% ± 7 µm
Ambient light protection	Optical filtering and ambient light signal rejection
Inclinometer resolution	0.1°
Inclinometer accuracy	±0.5°
LED indicators	Laser transmission and status indicators

VibrAlign

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www.fixturlaser.com

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