

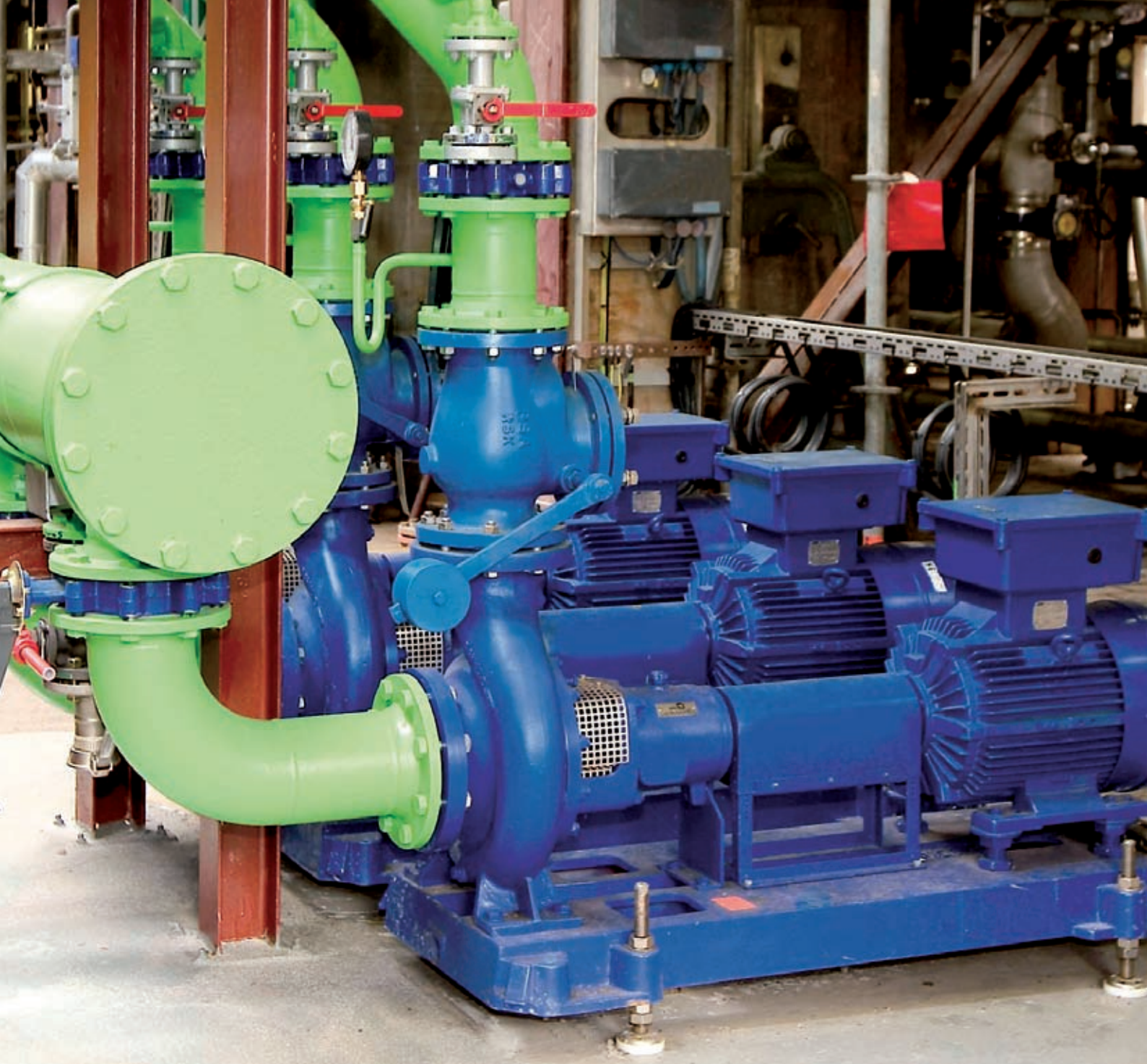
ALIGNEO®

Precision laser alignment instantly. No trial and error!

Number 1 in laser precision alignment

 PRÜFTECHNIK
Alignment Systems

www.pruftechnik.com



Expertise in precision laser alignment

For over two decades, PRÜFTECHNIK Alignment Systems has continued to develop undisputed precision laser alignment products. The maintenance departments in the top industrial organizations worldwide employ these highly-developed and user-friendly systems to measure and align machinery used in the power, chemical, water treatment, production and processing industries.

From the numerous PRÜFTECHNIK patents, a good number have been incorporated in the current ALIGNEO®. Its straightforward and

intuitive operation, combined with a modular upgrade concept transforms the new ALIGNEO® to a dynamic precision laser alignment measurement instrument without overstretching your budget.

With ALIGNEO®, the alignment of rotating machinery has never been simpler and convenient.

Value added through patented solutions

The single laser beam technology UniBeam® ensures exact precision alignment.

The patented UniBeam® feature guarantees that the laser set-up and beam adjustment for all PRÜFTECHNIK Alignment Systems laser units remains quick and straightforward, even in cases of extreme angularity. An additional advantage of UniBeam® is the use of one laser and one cable.

InfiniRange® extends the effective measurement range considerably.

Alignment procedures are dependent on the application. The alignment of machines with gross misalignment – in particular angularity – or those that are distant from each other, can be handled using InfiniRange®, a PRÜFTECHNIK Alignment Systems precision alignment feature. This function extends the detector surface mathematically, making it possible to measure machines with severe misalignment or distant from each other without loss in accuracy of alignment results.

No rough alignment of machines is necessary. ALIGNEO® is equipped with powerful features for productive maintenance.

- ▶ **Single beam technology (UniBeam®)**
- ▶ **Intuitive user guidance**
3-key alignment (define machines, automatic measurement, view alignment results).
- ▶ **Soft foot**
Check and record soft foot (if found) in the measurement report.
- ▶ **Static measurement mode**
Measurement points are taken at any of the eight 45° clock positions.
- ▶ **Live move**
Guides the user interactively during alignment correction.
- ▶ **Data protection and printing reports**
Measurement files are saved and reports printed. In case of power interruption, the current file is saved automatically.
- ▶ **Continuous sweep mode (optional)**
For quick measurement and higher accuracy of results.

Investing in innovative ideas has transformed PRÜFTECHNIK Alignment Systems into a leading global performer in the world of precision laser alignment. Our hi-tech instruments – developed and produced in Germany – are used in top industrial organizations worldwide.



Precision laser alignment instantly. No trial and error!

ALIGNEO® offers both precision alignment and timesaving convenience expected of a laser precision measurement system. Its intuitive operation, well thought-out design and the loaded features make ALIGNEO® a necessary device in the maintenance world when it comes to the alignment of pumps, motors, gearboxes and compressors. The achieved resolution of a micron increases the overall precision, leading to more accurate alignment. Aligned machines reduce the load on the shafts dramatically, resulting in increased machinery life, extended machine availability and increased saving on maintenance costs.

In ALIGNEO® you have a measuring system that can be equipped with the exact features required for your machinery. As job demands grow, additional modules can be purchased, enhancing capabilities at any time. ALIGNEO® is tailored to suit all budgets.

ALIGNEO®, like all PRÜFTECHNIK Alignment Systems laser-optical measurement instruments, has an ergonomic design. The operating keys are conveniently positioned allowing jobs to be carried out under extreme conditions. The secret behind the intuitive user guidance in ALIGNEO® lies in the simple 3-blue-key operation: 1. Enter dimensions, 2. Measure, 3. Display results. Uncomplicated and easy to use.

ALIGNEO®

Match your alignment requirements with ALIGNEO®. Configure the instrument with **useful alignment functions** such as "thermal growth", "vertical machine alignment" or "interactive dynamic tolerances".

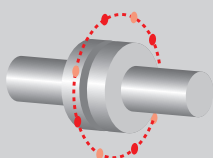
ALIGNEO® stands for industrial alignment. It is shockproof and is used in **extreme industrial and environmental conditions** – it is water spray resistant and dustproof in accordance with IP 65; the transducer and reflector are both submersible and dustproof in accordance with IP 67.

Set-up

The pre-assembled brackets facilitate quick and rigid mounting of the components. The measurement principle and UniBeam® ensures rapid laser set-up and high accuracy.

Static measurement mode

Readings are taken at any 45° position. Measurement results are obtained with any 3 of the 8 available positions. This mode can be used in the alignment of uncoupled and nonrotatable shafts, and vertical machines.



Live Move

Both horizontal and vertical coupling and foot results are automatically calculated. The large display shows the machine feet to be moved, the direction and the correction value. During the alignment correction, ALIGNEO® monitors and displays the live move.



The colours **blue, grey and yellow** denote the order in which ALIGNEO® is operated. The blue keys are for the main steps. The grey keys are for entering data. The yellow keys are used for confirming entries and cycling through the operations.

You can equip ALIGNEO® with **brackets for every need**. The **compact magnetic bracket** with its powerful magnets, fits onto nearly any flat coupling surface for rigid mounting.

When one or both shafts cannot be rotated, the **sliding magnetic bracket** provides an elegant solution. It glides around the outside of the coupling or shaft end from one measurement position to the next.

Precision laser alignment in 3 steps

Quick and straightforward



Enter dimensions

Define machine with the aid of the large LCD display which shows the required dimensions blinking.



Measure

After the on-screen laser beam adjustment, rotate shafts in their normal direction of rotation. Measurement can start and stop at any position.



Display results

The alignment condition at the coupling and the machine feet corrections are displayed on the screen in both graphical and numerical formats.

Use the blue keys to switch quickly from the results to the dimensions screen.

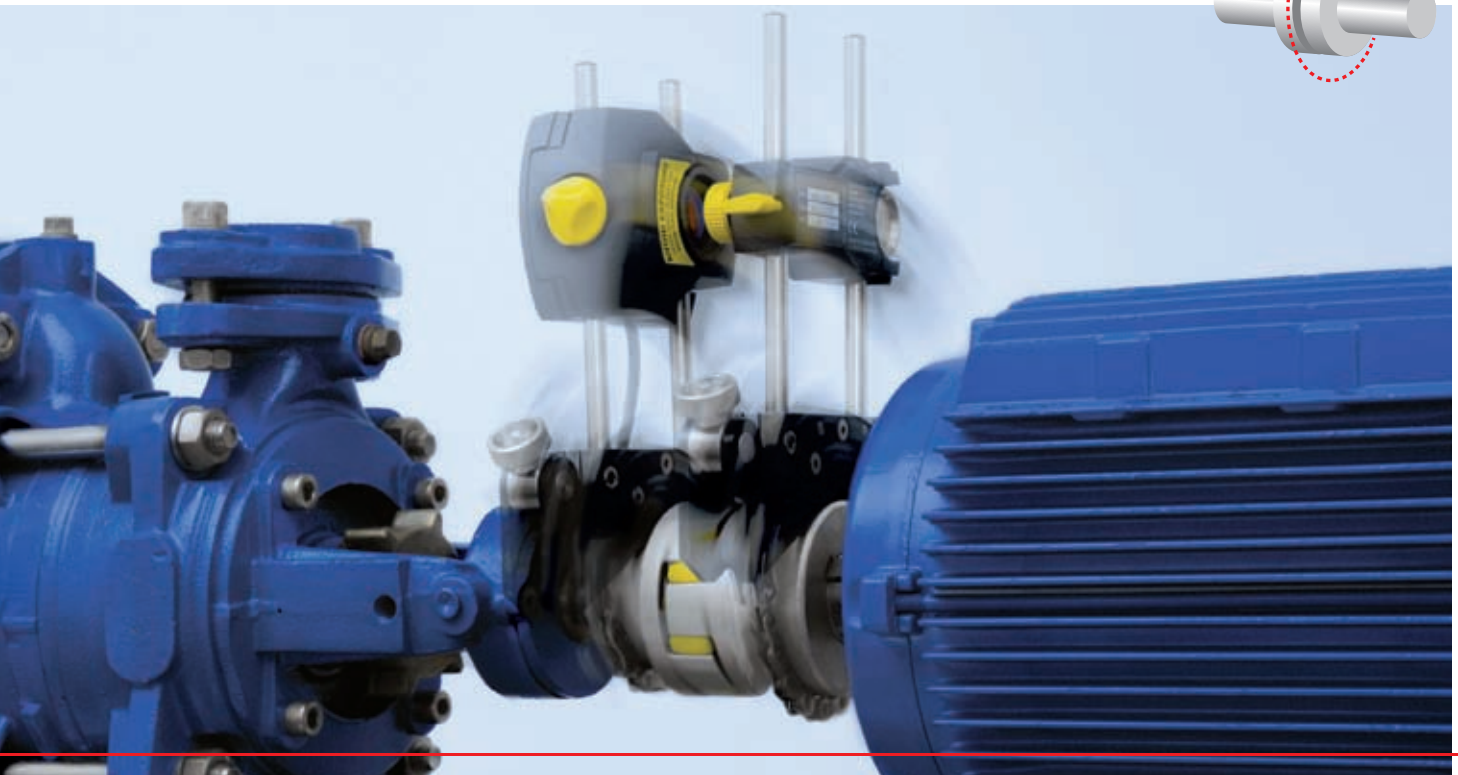
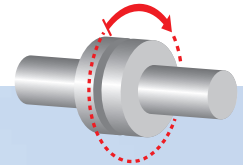


Continuous sweep measurement mode (optional)

As the shaft is rotated, data is automatically and continuously collected. ALIGNEO® determines the alignment condition with a shaft rotation of as little as 60°. Measurement can start at any shaft position and in any direction. This mode is quick and captures well over a hundred

measurement points, hence more accurate than the 3-clock positions measurement method. Most rotating machines require an accuracy that corresponds to that attained by the continuous sweep mode.

ALIGNEO® determines the alignment condition with minimal shaft rotation.



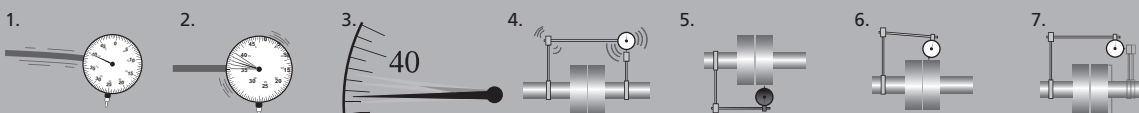
Do dial indicators possess the precision of a laser system?

Conventional measurement methods possess a resolution that may be too low for the adjustment of modern machinery. The straightedge/feeler gauge methods depend on the limited resolution of the human eye. The resulting resolution of 1/10 mm is for most machinery inadequate.

Dial gauges have on the other hand a resolution of 1/100 mm, but calculations tend to be complicated, requiring highly experienced users,

and tasks take longer to accomplish. Sources of error within the system include:

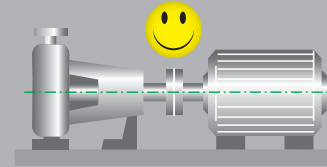
1. Sagging indicator brackets
2. Low resolution
3. Sticking/jumping dial hands
4. Play in mechanical linkages
5. Reading errors
6. Tilted dial indicator
7. Axial shaft play



Convenient, beneficial and quick precise alignment

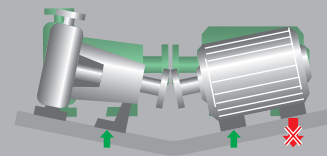
Tolerances (TolChek®)

Avoid unnecessary moves by automatically evaluating alignment condition with respect to tolerances using the “smiley” which is also active during live machine correction.



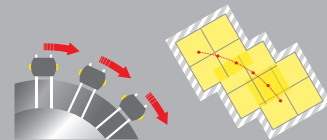
Bolt-bound or base-bound?

Problems arising from base-bound or bolt-bound feet are resolved by redefining fixed/movable feet.



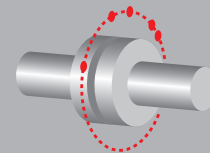
InfiniRange®

The detector measurement area is automatically extended to allow alignment of grossly misaligned machines and is ideal for very long spans. It eliminates the need for rough alignment in uncoupled machines.



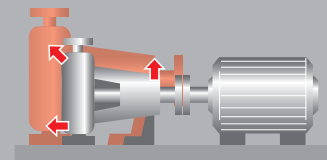
Multipoint mode

For shafts mounted on any type of bearing – measurement is carried out at any 3 or more selected positions over 60° or wider.



Thermal growth and Target specifications

Thermal growth at the feet and targets at the coupling can be input for both machines to take into account positional changes.



Why laser precision is accurate and faster

Laser shaft alignment instruments from PRÜFTECHNIK Alignment Systems employ UniBeam®, the patented single laser and detector principle, and provide a resolution of 1 micron. The universal precision brackets have been designed for quick and rigid set-up with no sag. The patented multiple measurement points technology makes it possible to measure more than only 3 points. As shafts are rotated, a vast number of readings are continuously taken, or measurements taken by positioning the shaft at any rotational angle. This ensures an unmatched reliability of alignment results even in situations where vibration is prevalent.

In addition to providing high accuracy, laser precision alignment systems have other huge advantages. Coupling values and feet corrections are automatically computed and displayed in graphical format. TolChek® (optional) shows whether alignment corrections are needed. Should corrections be necessary, live move of the machines is monitored on the computer display, which also shows the updated values and the direction of correction. A happy “smiley” appears as soon as the optimal machine positions are attained. Retighten the feet bolts and machine is ready to run.

Extend machine availability and longevity

Precision alignment pays

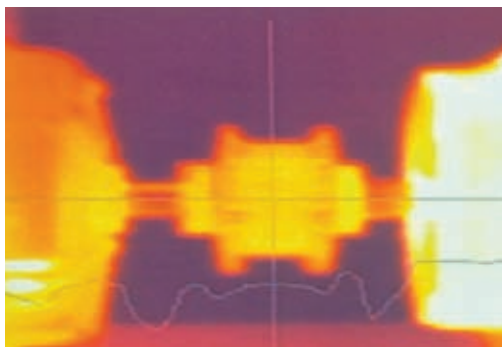
Rotating machinery are susceptible to misalignment. Machines that are well aligned at the commissioning stage and thereafter regularly maintained, will in the long term reduce both plant operating and maintenance costs.

Laser precision alignment extends machine availability as the Mean Time Between Failure (MTBF) increases. It protects assets and increases product quality, as vibration is reduced to a very low level.

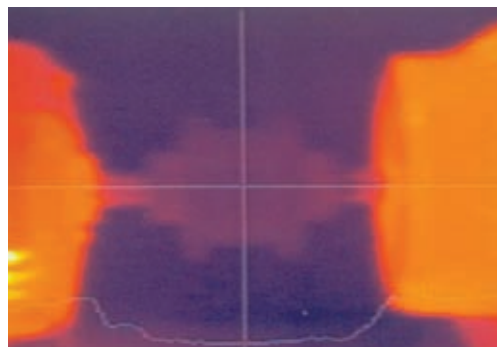
When misaligned, the loading of the shafts dramatically increases due to the reaction forces created within the coupling. Precision laser alignment pays back through:

- ▶ Reduction in bearing, seal, shaft and coupling failure
- ▶ Reduced bearing and coupling temperatures
- ▶ Reduced vibration
- ▶ Reduced energy consumption
- ▶ No breaking (or cracking) of shafts at/or close to the inboard
- ▶ Secure foundation bolts

1)



2)



The effect of increased coupling loading due to misalignment can readily be shown using infrared thermography.

1) The flexible element coupling heats up.

The machine develops elevated temperatures, particularly around the bearing housings.

2) Precision laser alignment drastically reduces these problems.



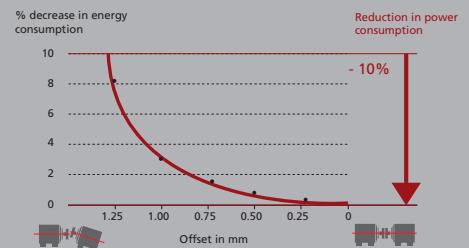
3 reasons for precision alignment

1. Reduced energy consumption

Effects on power consumption

Significant power savings can be made through accurate alignment. Precise alignment eliminates reaction forces and can reduce energy consumption by up to 10 %.

Courtesy of (C) ICI PLC

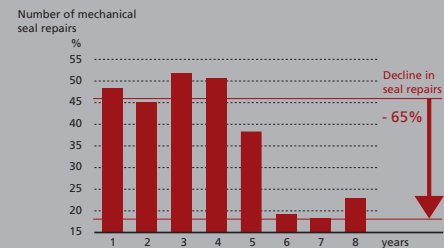


2. Reduced repair incidences

Mechanical seal repairs

Mechanical seal repairs decline by up to 65 % when precision alignment is carried out on a regular basis.

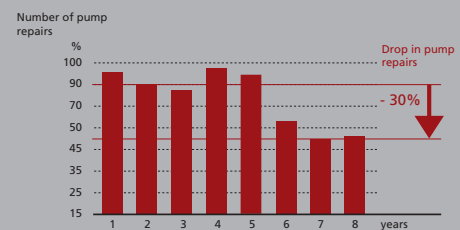
Courtesy of (C) HOECHST AG Gendorf / Deutschland



Pump repairs

The rate of repairs decline by up to 30% when precision laser alignment becomes an integral part of the pump repair schedule. Maintenance costs are also reduced through lower parts expense and inventory levels.

Courtesy of (C) HOECHST AG Gendorf / Deutschland

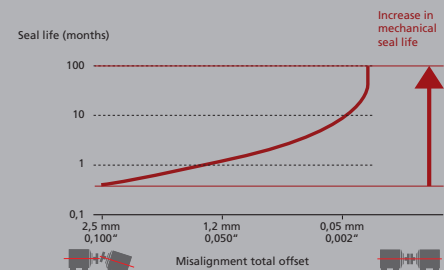


3. Longer machine life

Relation between offset and mechanical seal life

The smaller the offset misalignment, the higher mechanical seal life.

Courtesy of (C) DURAMETALLIC Inc.



Align machines to within specified tolerances

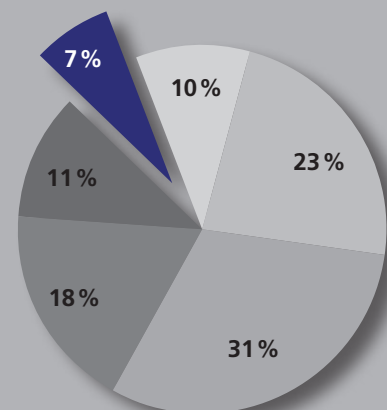
A survey conducted by one of the world's leading rotating equipment service organizations shows that less than 10 % of the 160 machines randomly chosen for measurement were found to be aligned within acceptable limits.

Offset (mm)	Machines measured
0.00 – 0.05	7 % acceptable alignment
0.06 – 0.10	10 % out of tolerance
0.11 – 0.20	23 % out of tolerance
0.21 – 0.50	31 % out of tolerance
0.51 – 1.00	18 % out of tolerance
> 1.00	11 % out of tolerance

The above tolerances are for equipment running at 3000 rpm.

Statistics courtesy of a major UK chemical company

Only 7 % of the measured machines fall within the acceptable alignment tolerances.



Standard features and powerful options

Standard features

Static measurement mode – requires any 3 of the 8 available 45° measurement positions

UniBeam® – for quick adjustment of the single laser beam

Coupling and foot results displayed in both numerical and graphical format

Live monitoring of horizontal or vertical machine corrections

Soft foot check – measure, correct and save results

Alignment of 6-feet machines

Alignment of nonrotatable and uncoupled shafts

Measurements unaffected by coupling backlash

Save up to 10 measurement files

Automatic data protection in case of power interruption

Pre-assembled brackets designed for quick and rigid set-up

Protected against dust, water and grease in compliance with classifications IP 65 and IP 67

PC freeware ALIGNMENT REPORTER for measurement file backup and printing reports

Powerful options

Automatic continuous measurement as shaft is rotated – start and stop rotation at any position

TolChek® – automatic evaluation of alignment condition

Ability to enter alignment targets and thermal growth values

Fixed feet selection – resolves base-bound and bolt-bound problems

InfiniRange® extends detector measurement range to handle gross misalignment

Multipoint mode – measurement at any 3 or more positions over 60° rotation or wider

Alignment of vertical and flange mounted machines

Alignment of spacer shafts

An attractive package consisting all features plus the ability to save up to 99 measurement files

The PC Software ALIGNMENT CENTER provides the perfect solution for preparing, analyzing, organizing, archiving and printing professional colour reports

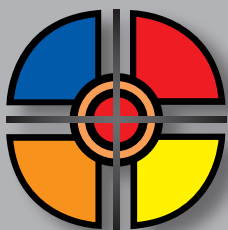
Products from PRÜFTECHNIK

Alignment Systems are used by top industrial organizations worldwide within the following industries:

- ▶ Oil, Gas, Coal
- ▶ Petrochemical
- ▶ Power
- ▶ Maintenance
- ▶ Cement
- ▶ Pulp and Paper
- ▶ Chemical
- ▶ Food processing
- ▶ Water treatment and Sewage
- ▶ Steel
- ▶ Pharmaceuticals
- ▶ Production and Processing

And also in leading service organizations worldwide.

ALIGNMENT CENTER – The PC partner for alignment professionals



ALIGNMENT CENTER is a PC software used for preparing, analyzing, organizing and archiving measurement files.

ALIGNMENT CENTER is a Windows™ based common PC software platform for all PRÜFTECHNIK alignment instruments and applications.

Use ALIGNMENT CENTER to manage your measurement files and data, and use the two-way communication to transfer files from PC to instrument and vice versa.

ALIGNMENT CENTER simplifies job preparation as all alignment and measurement specifications including thermal growth compensation and tolerances are saved for future use.

Measurement related data is also saved and the measurement history can also be followed. The software generates professional colour reports that include photos, company information and logo.

Measurement reports can be viewed using any web browser and data can be exported in .xls format.

Improve your alignment efficiency and productivity by utilizing this indispensable tool in your everyday alignment tasks.

ALIGNEO® Technical data

Control unit		
Display	Fixed segment LCD display Dimensions: approx 94 x 73 mm	
Keyboard	Robust, membrane keyboard	
Environmental protection	IP 65 (dust-tight, protected against water jets)	
Operating temperature	0°C to 55°C	
Power supply	4 x 1.5V IEC LR6 ("AA") batteries (rechargeables permitted)	
Battery life (alkaline)	35 hours – based upon an operating cycle of 33% measurement, 33% standby and 33% 'sleep' mode	
Interfaces	1 x sensor; 1 x printer/PC (serial)	
Dimensions	approx 220 x 165 x 45 mm	
Weight with batteries	approx 820 g	
Transducer		
Details	Measurement principle: Coaxial, reflected laser beam	
	Environmental protection: IP 67 (submersible, dustproof)	
	Ambient light protection: yes	
	Storage temperature: -20°C to 80°C	
	Operating temperature: 0°C to 55°C	
	Dimensions: ca. 107 x 70 x 49 mm	
Weight: ca. 177 g		
Laser	Type: Ga-Al-As semiconductor laser	
	Wavelength (typical) 675 nm (red, visible)	
	Safety class: Class 2, FDA 21 CFR 1000 und 1040	
	Beam power: < 1 mW	
Detector	Safety precaution: Do not look into laser beam	
	Measurement area: unlimited, extendible (U.S. Patent 6,040,903)	
	Resolution: 1µm	
Inclinometer	Accuracy (average): > 98%	
	Measurement range: 0° bis 360°	
Reflector	Resolution: <1°	
	Details	Type: 90° roof prism
		Accuracy (average): > 99%
		Environmental protection: IP 67 (submersible and waterproof)
		Storage temperature: -20°C to 80°C
		Operating temperature: -20°C to 60°C
Dimensions: approx 100 x 41 x 35 mm		
Weight: approx 65 g		
Carrying case		
Details	Standard: ABS, drop tested 2 m	
	Case dimensions: approx 470 x 400 x 195 mm	
	Weight (including all standard parts): approx 5.6 kg	

**ALIGNMENT REPORTER – A useful freeware**

ALIGNMENT REPORTER is a PRÜFTECHNIK Alignment Systems freeware used for generating measurement reports and backup of measurement files on a PC.

Using the backup, measurement files can be opened without the need of connecting the measurement instrument to the PC. The generated reports can be printed on any available printer.

High-end alignment services**Industrial services from PRÜFTECHNIK Alignment Systems**

In addition to offering leading-edge alignment products, we also provide a wide range of high-end alignment services. Our dedicated experts assist you in special alignment situations and geometric measurements.

We also offer roll alignment service throughout the world.

“Over the years we have continued to rely on the laser precision alignment instruments from PRÜFTECHNIK Alignment Systems. The trust has paid dividends in the maintenance of our machinery hands.” **Maintenance Manager, leading US international industrial organization**

“In our field, as a leading service organization, we are extremely satisfied with the measurement instruments from PRÜFTECHNIK Alignment Systems. They are both user friendly and technically superior.” **Director, a Germany-based international service organization for maintenance and facility management**

“I use measurement instruments from PRÜFTECHNIK Alignment Systems on a daily basis. Measurement with these systems is quicker, easier, more flexible and precise.” **Maintenance Technician, a sewage treatment plant in Germany**

“The continuous sweep measurement mode makes instruments from PRÜFTECHNIK Alignment Systems the perfect alignment tool.” **Maintenance Technician, a sewage treatment plant in Germany**

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