Easy-Laser®

Measurement and Alignment Systems

D650 D660

BORE ALIGNMENT

Straightness measurement of bore and bearing journals

ELECTRONIC INCLINOMETER

PC PROGRAM INCLUDED

PRINTER CONNECTION

EXPANDABLE

IT'S ALL ABOUT STRAIGHTNESS

The Easy-Laser® Linebore and Turbine systems have evolved by more than 20 years of field experience in solving measurement and alignment problems. All of the parts included in the systems are designed and built for even the most demanding workplace and for easy setup on any machinery. The versatile design solves the straightness measurement problems quickly and with precision for any kind of application.

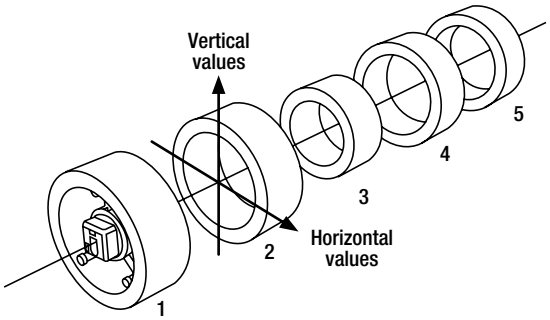
Both the Easy-Laser® Linebore and Turbine systems uses the same transmitter and detector technology. A visible red laserbeam is the reference to which the straightness of the bores are measured.

Objects up to 40 m [132 feet] can be measured. The detector reads 2-axis measurement values (horizontal and vertical), with a resolution down to 0.001 mm [0.05 mils].

After finishing the measurement any two measurement points can be used as reference points, and the results are displayed digitally and graphically on the display unit.

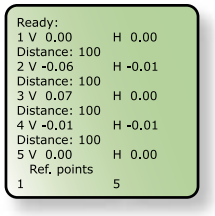
Using Easy-Laser® measurement systems gives you the opportunity to perform accurate alignment, both in production and out in the field.

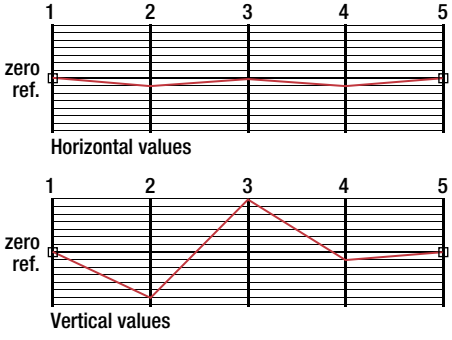
USING REFERENCE POINTS



The display to the left shows the result after finished measurement of five bores, and with points 1 and 5 set to zero (references).

With the Easy-Laser® systems it is very easy to set and alter reference points, allowing you to find the optimum adjustment values.



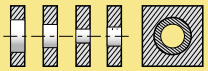


DISPLAY UNIT AND MEASUREMENT PROGRAMS

The Display unit has an RS232 interface for connection to a printer or PC communication, and internal storage memory. The programs in the Display unit guide the user step-by-step on the display through the whole measurement procedure. Each program is optimised to give you as the user maximum performance and ease of use. The “circle” programs are designed specially for the Linebore and Turbine system.

STRAIGHTNESS MEASUREMENT PROGRAMS

CENTER OF CIRCLE – Allows varying diameters. To use with the Linebore system.



STRAIGHTNESS – For bore with equal diameters. To use with the Linebore system.

HALF-CIRCLE – Measurement values are taken in positions 9, 6 and 3 o’clock. Allows varying diameters. To use with the Turbine system.

V 0.00
H 0.00

VALUES – This program displays the values from the detector in live mode, similar to measurement with dial indicators. The values can be zeroed and half-fed. Useful e.g. when positioning a workpiece relative to a spindle in a tooling machine, or when measuring the squareness of a cylinder bore.

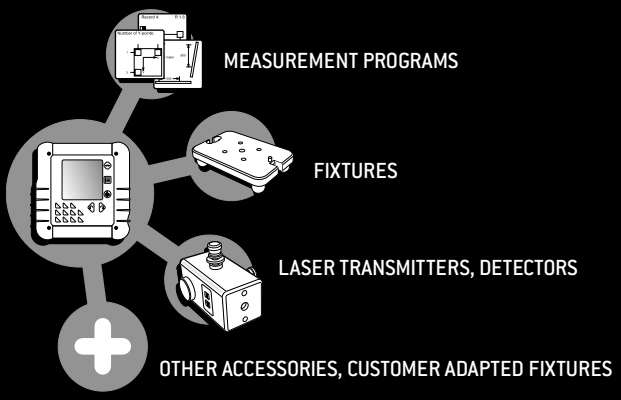
OTHER MEASUREMENT PROGRAMS INCLUDED

MEASUREMENT VALUE FILTER – Advanced electronic filter function for accurate measurement results even in poor measuring conditions like air turbulence and vibration. *Sub function.*

- SQUARENESS
- HORIZONTAL
- PARALLELISM
- SOFTFOOT
- SPINDLE DIRECTION
- EASYTURN™
- FLATNESS
- CARDAN
- PLUMBLINE
- VERTICAL
- FLANGE
- MACHINE TRAIN
- VIBROMETER
- OFFSET AND ANGLE
- BTA DIGITAL

EXPANDABILITY

Since all programs are included in the software of the display unit, the Easy-Laser® D650 Linebore and D660 Turbine system can be expanded to suit your special needs, both now and in the future. You just add the appropriate accessories such as lasers, detectors and fixtures. For detailed information, please see our other brochures.



DOCUMENTATION OF THE MEASUREMENT RESULT

When measurement is complete, you have several options for documenting the results. Choose the one that is best suited for the situation, depending, for example, on whether further analysis is needed or whether a measurement report needs to be produced.

SAVE IN THE DISPLAY UNIT
A keyboard with all characters available makes it quick and easy to give each measurement a unique description. The system then adds the time and date of the measurement. The storage memory is very large. Up to 7000 points for geometry measurement can be saved.

Your description

PRINT
Quickly print all measurement data locally with the battery operated thermal printer. This is useful, for example, if you don’t want to connect to a PC.

Printout with all measurement data

TRANSFER MEASUREMENT DATA TO PC
With the EasyLink™ program for Windows® (included), you can produce professional reports with both measurement data and pictures, export to spreadsheets such as Excel®, etc.

Excel® sheet with graphics

D650 LINEBORE

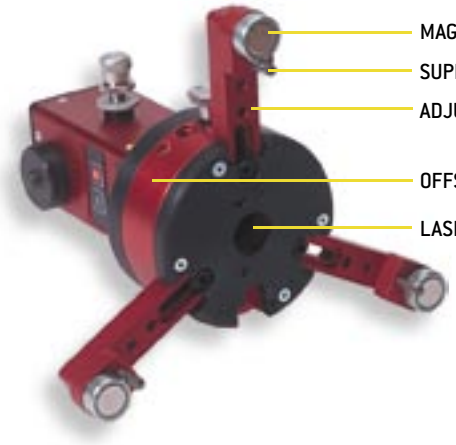
FAST AND PRECISE

For straightness measurement of bore and bearing journals in diesel engines (e.g. crankshaft- and camshaft bearings), gearboxes, propeller shaft installations etc, and positioning of workpieces in tooling machines, with a measurement resolution down to 0.001 mm [0.05 mils].

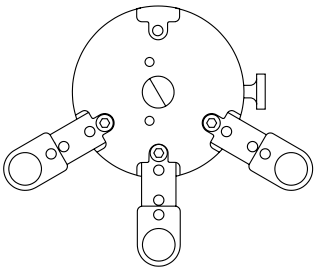
With the standard system, bores from 100 mm to 500 mm [3.9–19.7"] can be measured (accessories for other diameters manufactured on request). Measurement distance up to 40 m [132 feet]. The system automatically calculates the position of the bores in both horizontal and vertical direction compared to each other. Up to 7000 measurement locations can be stored.

LASER TRANSMITTER

The laser transmitter has three sets of rigid adjustable arms with magnets to fit different diameters. The sturdy design assures the highest measurement accuracy. Fine adjustment of the laser beam in horizontal and vertical direction is made very easy with the offset hub.



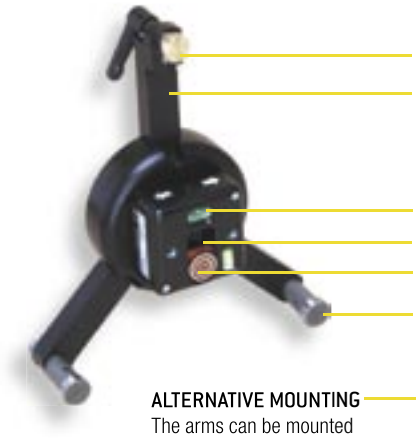
ALTERNATIVE MOUNTING
All three arms can be mounted downwards.



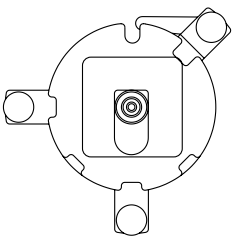
DETECTOR UNIT

The detector unit has eight sets of adjustable arms with eccentric locking cam and hardened, grounded support feet.

Large detection area: ±5 mm deviation from center line.

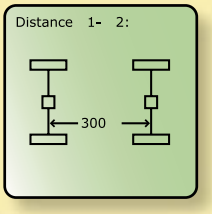


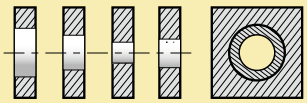
ALTERNATIVE MOUNTING
The arms can be mounted so the bottom and side are supporting instead.

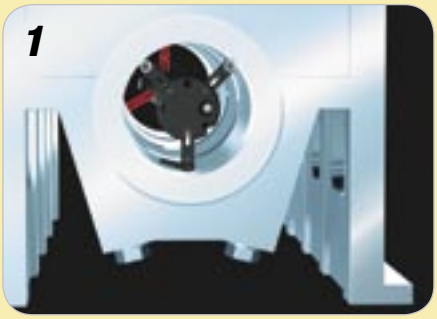


MEASUREMENT PROCEDURE

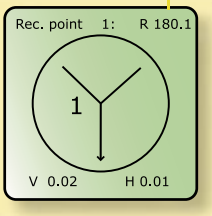
Enter the number of measurement points and the distance between them. By using the Center Of Circle-program, and indexing the detector in each measurement location (the display guides the user how to place the detector), any difference in diameter will not influence the measurement result from being a true value of the center point. The electronic inclinometer asures an exact positioning of the detector unit.

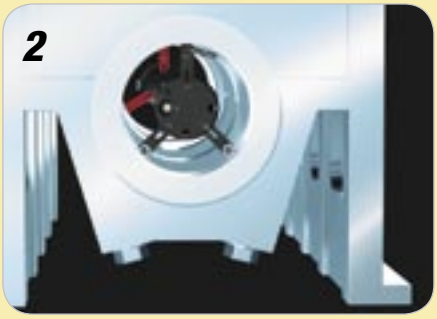


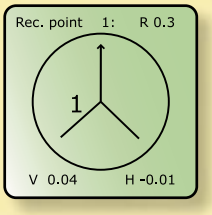


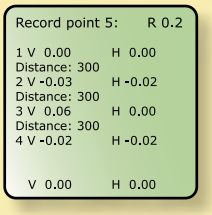


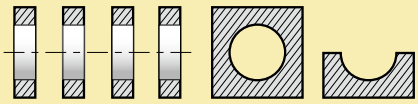
ANGULAR VALUE







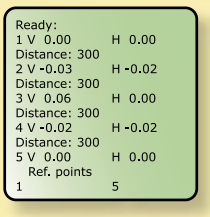


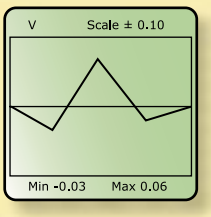


Alternatively: The Straightness program is used when the diameters of the holes are equal.

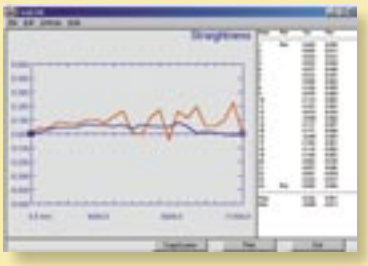
MEASUREMENT RESULT

After finishing the measurement the result is displayed, digitally and graphically.





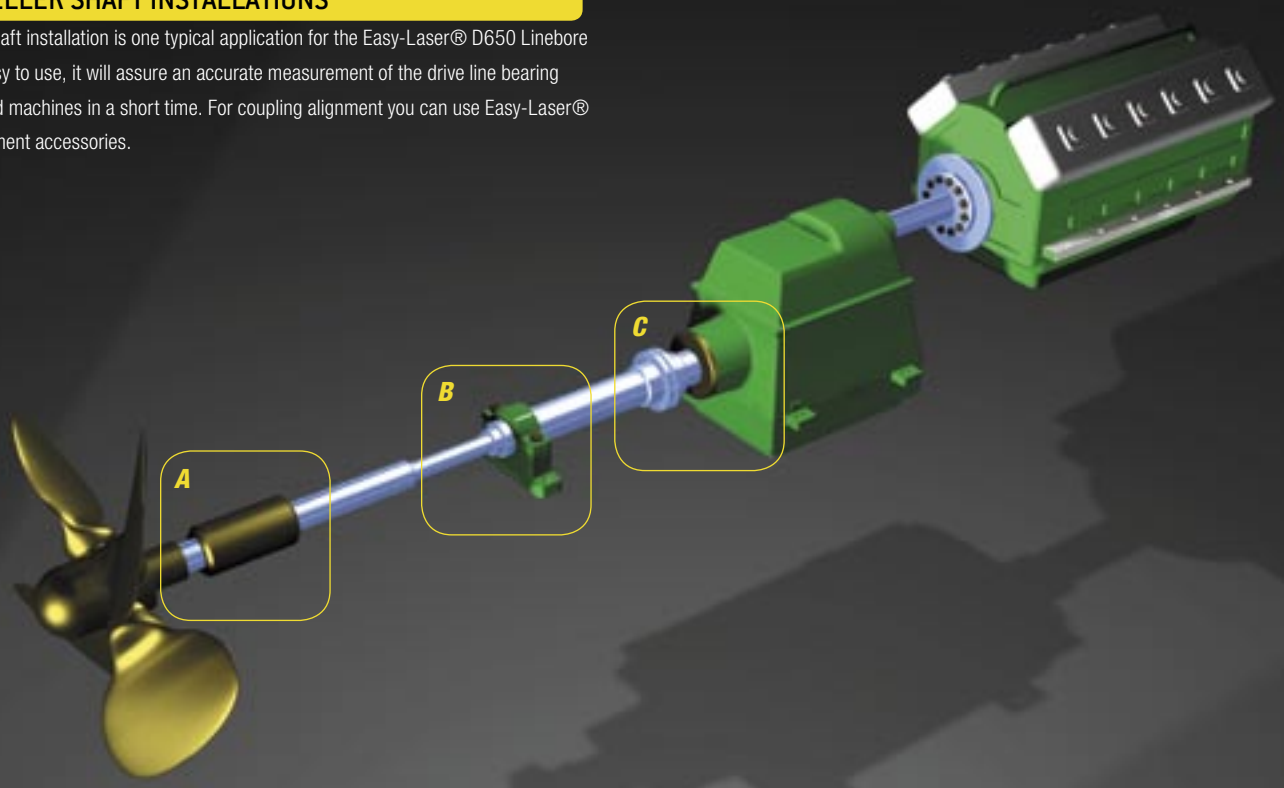
Transferring the result to the EasyLink™ software will give more analyzing opportunities.

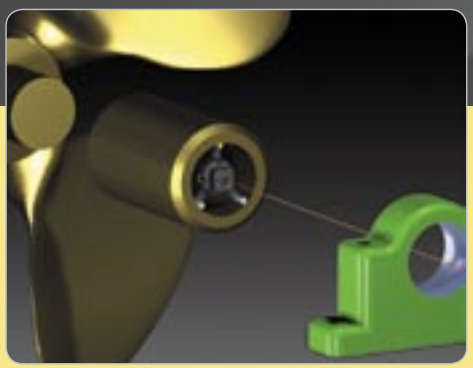


Free Database software !

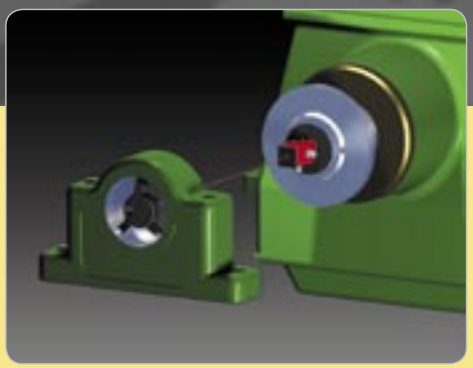
PROPELLER SHAFT INSTALLATIONS

Propeller shaft installation is one typical application for the Easy-Laser® D650 Linebore system. Easy to use, it will assure an accurate measurement of the drive line bearing journals and machines in a short time. For coupling alignment you can use Easy-Laser® Shaft alignment accessories.

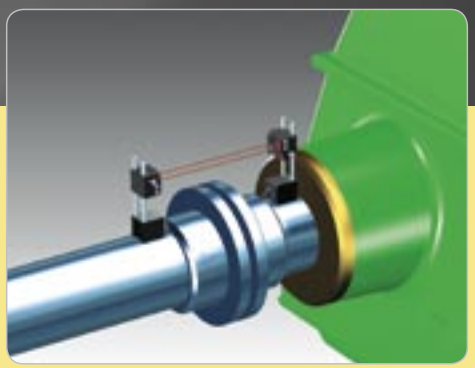




A. Measuring the straightness of a sterntube centerline. The detector placed in the sterntube. The laser transmitter mounted at the gearbox shaft/coupling.



B. Measuring the straightness of the bore centerline. The detector placed in the support bearing. The laser transmitter mounted on the shaft/coupling with standard arms or bracket 12-0187 (accessory).



C. Measuring and aligning shaft and gearbox (and gearbox to engine) with shaft alignment measuring units (accessories). Units mounted with chain and V-fixtures or magnet bases as pictured.

DIESEL ENGINES

Measuring the bearing journal centerline in a diesel engine is another typical application for the Easy-Laser® D650 Linebore system. The laser transmitter is mounted at the first journal according to picture. The detector being placed at each journal according to the measurement procedure at the previous page.

D. Crank shaft bearing journals.

E. Cam shaft bearing journals.

D660 TURBINE

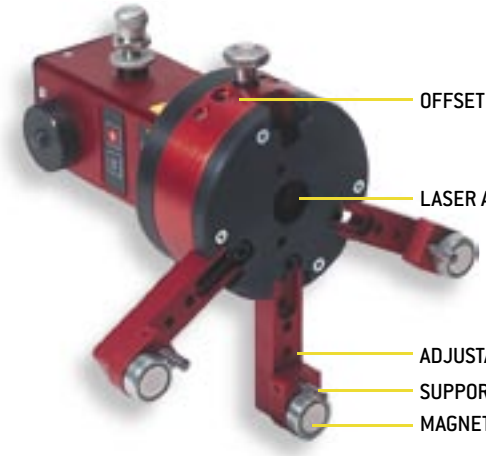
FAST AND PRECISE

For straightness measurement of bearing journals and diaphragms in turbines, with a measurement resolution down to 0.001 mm [0.05 mils]. With the standard kit, journals with diameters from 150 mm to 1700 mm [5.9–66.9"] can be measured (accessories for other diameters manufactured on request). Measurement distance up to 40 m [132 feet].

The system automatically calculates the position of the bores in both horizontal and vertical direction compared to each other. Up to 7000 measurement locations can be stored.

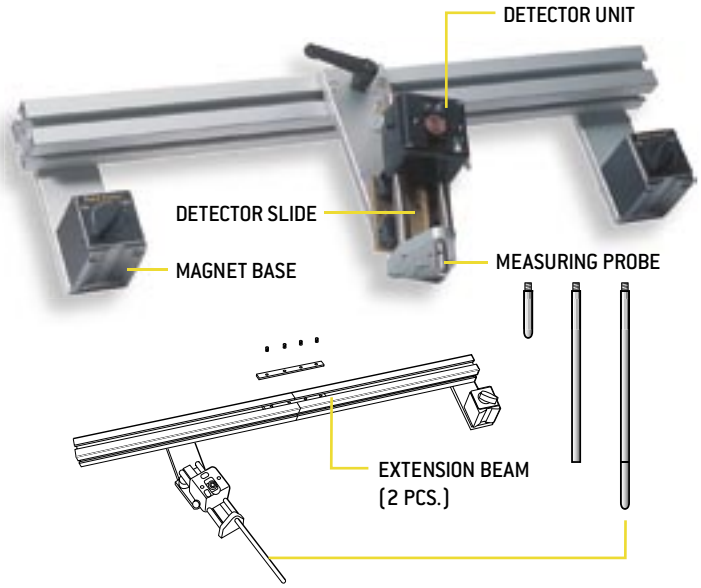
LASER TRANSMITTER

The laser transmitter is the same as for the Linebore system, and its rigid design assures highest measurement accuracy. It has three sets of adjustable arms with magnets to fit different diameters. Fine adjustment of the laser beam in horizontal and vertical direction is made very easy with the offset hub.



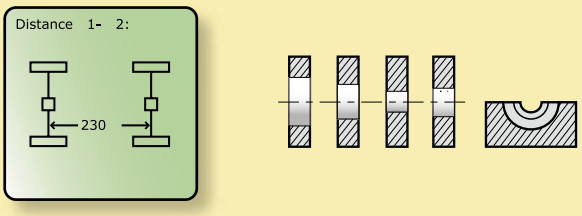
DETECTOR FIXTURE

The rigid detector fixture comes with extension beams for large diameters and extension rods for the measurement probe. The detector is rotated and moved with the Detector slide. The adjustable magnet attachment and the over all versatile design makes the fixture very easy to handle during the measurement, when journals of different diameters have to be measured.

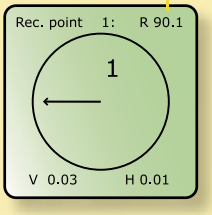


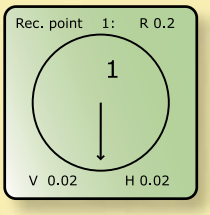
MEASUREMENT PROCEDURE

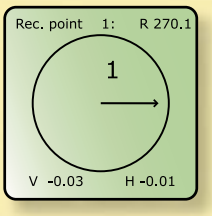
Half-Circle program: enter the number of measurement points and the distance between them. The display guides the user where to point the measurement probe. Record the values at each point (9–6–3). The electronic inclinometer assures an exact positioning of the detector unit.



ANGULAR VALUE

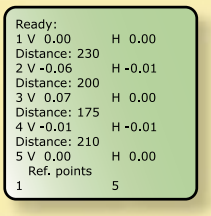


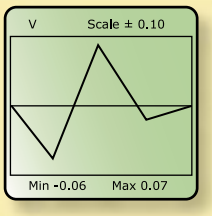




MEASUREMENT RESULT

After finishing the measurement the result is displayed, digitally and graphically.





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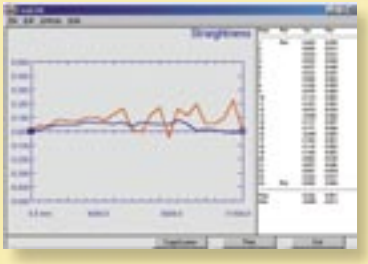
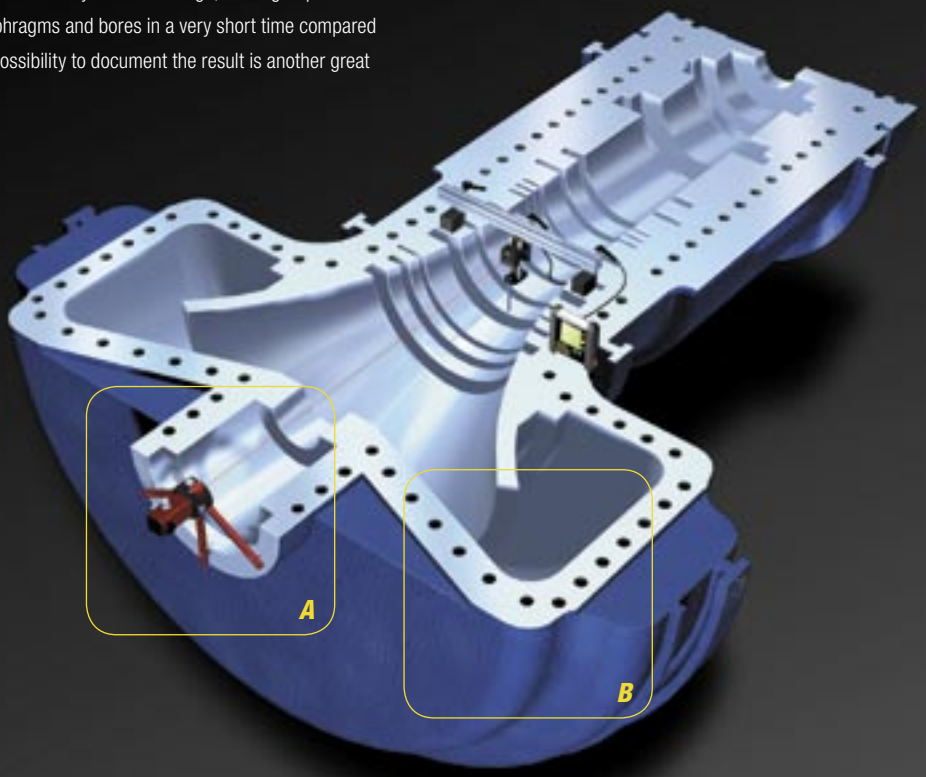


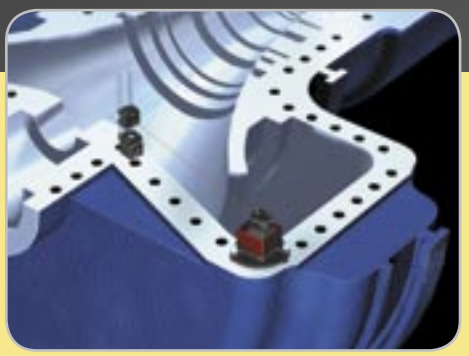
Free Database software !

D660 TURBINE SYSTEM

The Easy-Laser® D660 Turbine system has a very versatile design, making it quick and easy to measure a large number of diaphragms and bores in a very short time compared to older methods with e.g. string. The possibility to document the result is another great advantage.



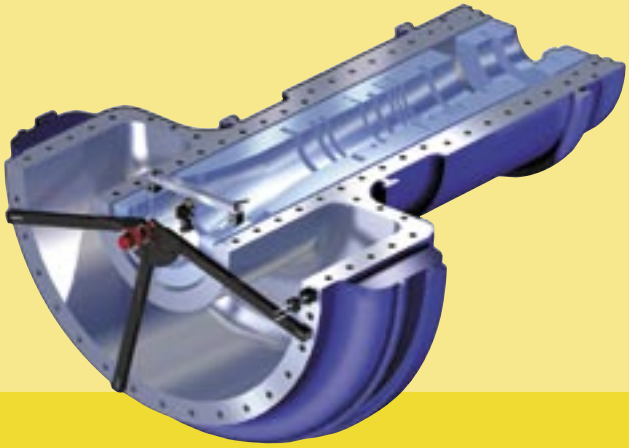
A. Measuring the diapraghms and bearing journals in a turbine.



B. Measuring flatness on a turbine with the D22 Laser transmitter (optional).

AXIAL FLANGE AS REFERENCE

The D665 System is a special version (made on request) for measurement when the axial flange and the centerline of the turbine housing is the reference to which the journals and diaphragms are adjusted.



Easy-Laser®
Measurement and Alignment Systems

D650 D660

TECHNICAL SPECIFICATIONS

System	
Weight complete system	D650: 13 kg [28 lbs], D660: 15 kg [32 lbs]
Carrying case	WxHxD: 660x350x160 mm [26”x14”x6”]
Display unit	
Type of display	Backlit dot matrix LCD
Display size	73x73 mm [2.87”x2.87”]
Displayed resolution	Changeable: 0.1, 0.01, 0.001mm; 5, 0.5, 0.05 mils/thou
Max. displayed error	±1% +1 digit
Battery	4 x 1.5 V R14 (C)
Operating time	48 hours appr.
Output port	RS232 for printer and PC communication
Keyboard	Membrane alphanumeric multi function
Memory	Storage for 7000 measurement positions
Settings	Value filtering, contrast and unit (mil/thou/mm)
Housing material	Anodized aluminum / ABS-plastics
Dimensions	WxHxD: 180x180x45 mm [7.1”x7.1”x1.8”]
Weight	1250 g [2.8 lbs]
Laser transmitter D75 with offset hub	
Measurement distance	Up to 40 m [132 feet]
Measurement diameters	Ø 100–500 mm [3.93”–19.68”]
Type of laser	Diode laser
Laser wavelength	635–670 nm, visible red light
Laser safety class	Class 2
Laser output power	<1 mW
Temperature range	0–50°C [32–122°F]
Relative humidity	10–95%
Laser adjustment	±5 mm in two axes
Battery	1 x 1.5 V R14 (C)
Operating time	15 hours appr.
Housing material	Anodized aluminum
Dimensions	Ø 99 mm [3 7/8”] (without arms), Depth 182 mm [7.17”]
Weight	1.7 kg (without arms)
Detector unit D5	
Type of detector	2 axis PSD 18x18 mm [0.71” sq]
Resolution	0.001 mm [0.05 mils]
Spirit vials	Resolution 0.5°
Inclinometer	0.1° resolution
Thermal sensor	± 1° C accuracy
Protection	No influence from ambient light
Housing material	Anodized aluminum
Dimensions	WxHxD: 60x60x50 mm [2.36”x2.36”x1.97”]
Weight	198 g [7 oz]
Detector fixture Turbine	
Beam material	Anodized aluminum
Magnet bases	Holding power 800 N each
Measurement diameters	Ø 150–1700 mm [5.90”–66.9”]
Detector Linebore	
Type of detector	2 axis PSD 18x18 mm [0.71” sq]
Resolution	0.001 mm [0.05 mils]
Spirit vials	Resolution 0.5°
Inclinometer	0.1° resolution
Thermal sensor	± 1° C accuracy
Protection	No influence from ambient light
Housing material	Anodized aluminum
Dimensions	Ø 99 mm [3 7/8”] (without arms), Depth 60 mm [2.36”]
Measurement diameters	Ø 100–500 mm [3.93”–19.68”]
Weight	400 g [13 oz] (without arms)
Cables	
Type	With Push/Pull connectors
Length	2 m [6.5 feet], 5m [16 feet]

(The measurement diameters mentioned above are for the standard systems. Fixtures for smaller and larger diameters can be manufactured on request.)

D650 LINEBORE Part Nr. 12-0034

1 Display unit D279 with 23 programs
2 Cables with Push/Pull-connection (2m, 5m)
1 Lasertransmitter D75 with offset hub
1 Detector Linebore
1 Set of attachment items
1 Set of arms for diameters 100–500 mm [3.93”–19.68”].

D660 TURBINE Part Nr. 12-0185

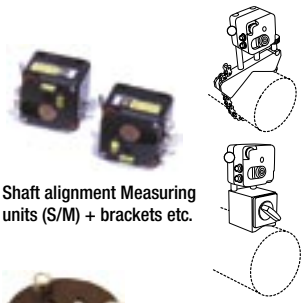
1 Display unit D279 with 23 programs
2 Cables with Push/Pull-connection (2m, 5m)
1 Lasertransmitter D75 with offset hub
1 Detector unit D5
1 Detector fixture with magnet bases and extension beams
For diameters 150–1700 mm [5.90”–66.9”]
1 Set of extension rods
1 Rough alignment target.
For diameters 150–800 mm [5.90”–31.44”]

ALWAYS IN THE PACKAGE

Both systems are delivered in a robust lockable aluminium framed carrying case* with contoured foam insert. Also included are: Manual, Measuring tape, Protective case for display unit, EasyLink™ Windows® program, PC cable, Printer with cable and charger.

**Size and design depending on system.*

ACCESSORIES (EXAMPLES)



Shaft alignment Measuring units (S/M) + brackets etc.

Laser Transmitter D22.
For Flatness measurement etc.
Part Nr: 12-0022

Bracket for lasertransmitter D75.
Part Nr: 01-0187

Extension cable. Length 5 m [16 feet].
Part Nr: 12-0108

CE
05-0149 Rev1

These products comply with:
SS-EN60825-1-1994,
21 CFR 1040.10 and 1040.11

CAUTION
LASER RADIATION
DO NOT STARE INTO BEAM
DIODE LASER
1 mW MAX OUTPUT AT 670 nm
CLASS II LASER PRODUCT

Authorized dealer