



Roll Alignment

Parallelism measurement and alignment of rolls and other objects

E970 / E975



ROLL ALIGNMENT THE EASY WAY

EASY AND RELIABLE

The Easy-Laser® alignment systems makes measuring and aligning rolls and other objects an easy job. The alignment of the rolls can be made in live mode with instant feedback. You can add, remove and remeasure objects any time during measurement. The tolerance value can be set separately for horizontal and vertical angle. The result is displayed both graphically and digitally in a table, and a PDF report can be produced directly on-site.

TWO SYSTEMS ARE AVAILABLE

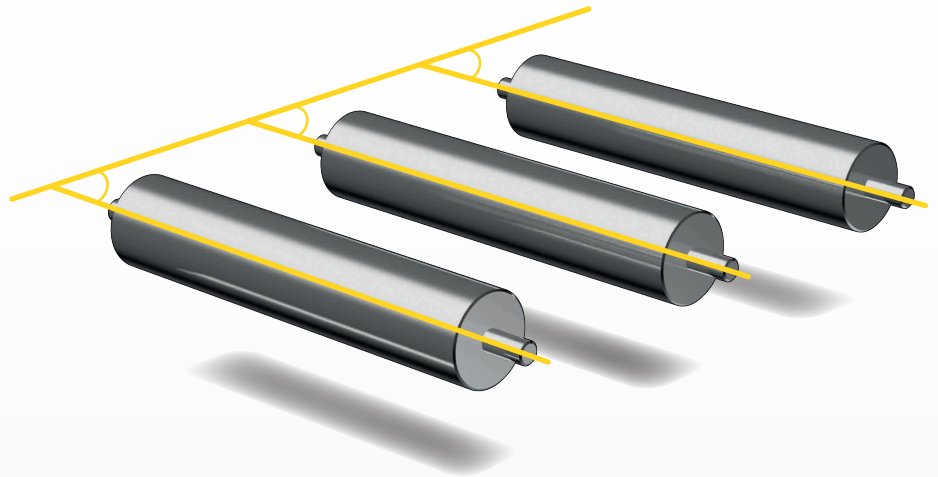
Two systems are available, Easy-Laser® E970 Parallelism and Easy-Laser® E975 Roll alignment. Which one you should choose depends on what kind of machines you mainly align. It is of course possible to add detectors and other units from one system to the other, to cover both applications. Both systems can also be expanded with the rest of the Easy-Laser® product range, for example measuring units for shaft alignment. This will give a very cost effective solution for all maintenance departments and service companies.

SYSTEM E970

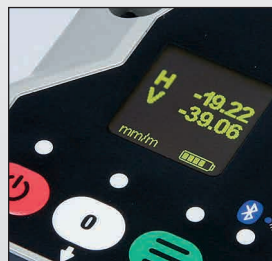
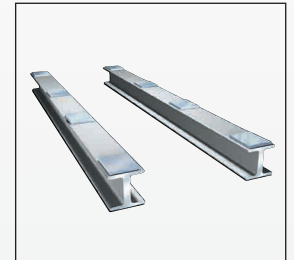
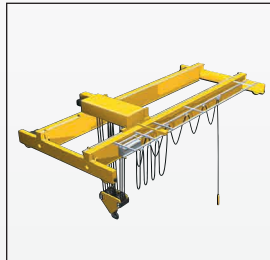
For traditional parallelism measurement of rolls, rails, overhead tracks, gantries, metal sheet cutters, production lines, etc. The E970 is especially suitable when many objects are to be measured and aligned, and when the distances are long. With the standard components of this system you can also measure level and flatness of suction boxes and foundations.

SYSTEM E975

This system is well suited when just one or two rolls are to be replaced or adjusted at the same time. Because the system is so quick to set up on the machine also a short planned production stop or downtime can be utilized to measure a roll, and maybe replace or adjust too. Where more advanced methods might require that the measuring service is scheduled some time in advance and use contracted personnel, with Easy-Laser® E975 you can do the job yourself. You quite simply have better control over your machine time and increase productivity using Easy-Laser® E975.



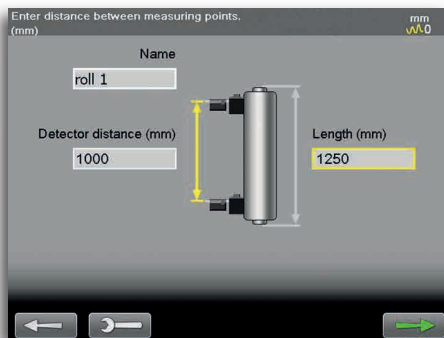
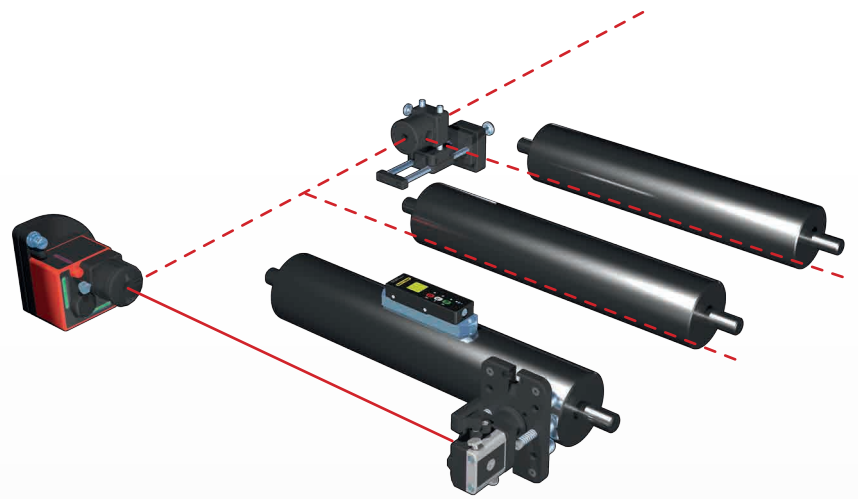
Rolls is the most common example of objects where parallelism measurement is crucial for highest machine performance. Some other examples are shown below.



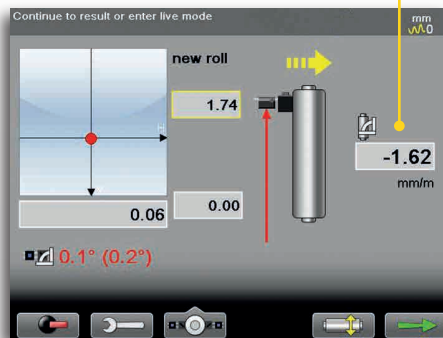
System E975 allows you to follow the alignment not only from the separate display unit but also from the built-in OLED displays. This is preferred for some applications.

SYSTEM E970 – METHOD

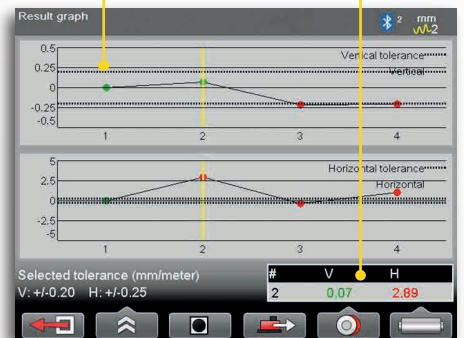
This system use the traditional method where the laser beam (reference) is pointed alongside the machine, and then deflected 90° towards the detector on the measurement object by a penta prism. Measurement values for the horizontal position are registered in both ends of the object. The included precision level is used for the vertical position. Machines with a length of up to 80 metres can be measured. The base line or any other measured object can be used as reference.



1. Enter the distance between the measurement points and adjustment points of the roll, and give it a suitable name.



2. Register values in both ends. After second point the angular value is displayed live (A) for easy adjustment, if needed.

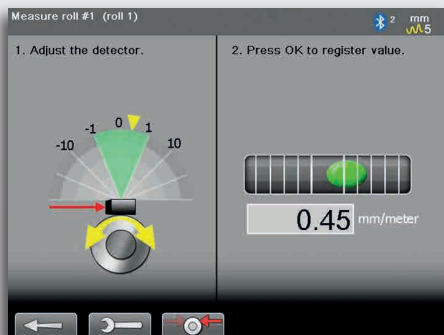
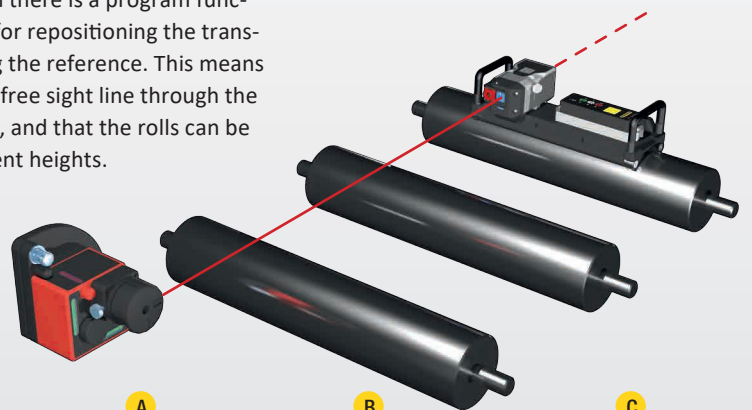


3. The results for all measured rolls are displayed graphically or in a table. Tolerance line (B). Angular value (C). (Also see below result for E975 for another example of display.)

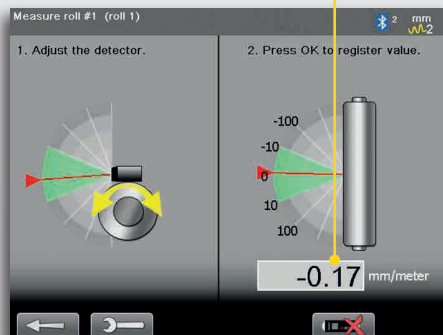
SYSTEM E975 – METHOD

This system use a new revolutionary detector, and a digital precision level. The measuring principle is easy: Place the laser transmitter so that the beam is pointing across the rolls, onto the detector. First you measure the vertical angle, then the horizontal. Then move the detector to the roll to be adjusted, alternatively to the new roll which replaces the old one. Aim the beam at the detector again, then adjust the roll to the correct value. Finished! Maximum distance between transmitter and detector is 20 metres. If something in the machine is obstructing the beam from the

first position to reach any following measurement objects, then there is a program function which allows for repositioning the transmitter and keeping the reference. This means you do not need a free sight line through the complete machine, and that the rolls can be mounted at different heights.



1. Register the vertical angle (pitch) with the digital precision level.



2. Measure the horizontal angle (yaw) with the detector, register the value and/or adjust the roll to the correct value (A).

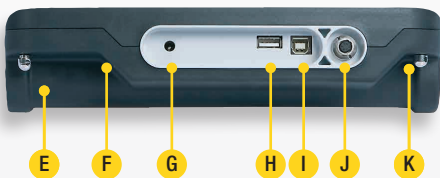


3. The results for all measured rolls are displayed graphically or in a table. Reference object marking (B). Graphical representation of the roll position (C). (Also see above result for E970 for another example of display.)

THE PARTS OF THE SYSTEM



- A. Two Enter buttons, for left and right-handed users
- B. Large, easy to read colour display
- C. Proper buttons for clear feedback
- D. Thin profile gives a perfect grip for your hands



- E. Battery compartment
 - F. Robust, rubber coated design
 - G. Connection for charger
 - H. USB A
 - I. USB B
 - J. Easy-Laser® measurement equipment
 - K. Mounting for shoulder strap
- Note: Dust and splash guards for connectors removed on picture.

DISPLAY UNIT

The display unit for the E series enables you to work more efficiently and for longer than ever before thanks to several innovative solutions. It is also ergonomically designed with easy-to-grip rubber cladding and robust construction.

NEVER LOSE POWER!

The display unit is equipped with our Endurio™ Power management system. This ensures that you never have to stop in the middle of a measurement because the battery has run out.



LANGUAGE SELECTION

You can choose the language that you want to appear on screen. English, German, French, Spanish, Portuguese, Swedish, Finnish, Russian, Polish, Dutch, Italian, Japanese, Korean and Chinese are available. More languages to follow.

ERGONOMIC

The display unit has a thin, easy-to-grip and rubber coated profile that ensures a secure grip. It has large well-spaced buttons that give clear feedback when pushed. In addition, the two Enter buttons make the system suitable for both right and left-handed users. The display screen has clear graphics that guide you through the measurement process.

PERSONAL SETTINGS

You can create a user profile where you can save your personal settings. You can also have different settings for different types of measurements, and save them as Favorites, for quick access from the main menu.

VALUES PROGRAM

All our measurement systems come with the universal Values program. It works like digital dial indicators. With this, you can, in principle, measure any type of geometry. Many Easy-Laser® users therefore end up using the measurement system in many more places in their operation, than they first intended!

DOCUMENTATION

SAVE TO USB MEMORY

You can easily save desired measurements on your USB memory. This enables you to take it to your computer to print reports whilst leaving the measurement system in place to continue measuring.

SAVING IN THE BUILT-IN MEMORY

You can, of course, save all measurements in the display unit's internal memory. You can then open an old measurement and remeasure those objects you adjusted.

CONNECT TO PRINTER

Connect a thermal printer (accessory) and print locally. Good for example when you want to see the values before and after adjustment, or want to leave a documentation of the measurement on site.

CONNECT TO YOUR COMPUTER

The display unit is connected to the computer via the USB port. It then appears on the desktop as a "Mass Storage Device" which you can easily transfer files to and from.

CREATE A PDF REPORT DIRECTLY

When measurement is complete it is possible to generate a PDF report containing graphs and measurement data directly in the measurement system's display unit. All the information about the measurement object is documented, and you can add your company's logo and address details if you so wish.

EASYLINK™ PC SOFTWARE

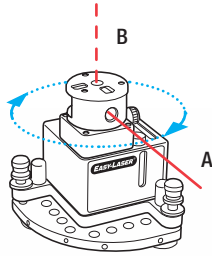
With the EasyLink™ database program you can save and organise all your measurements in one place, produce reports with both data and images and export to your maintenance systems. You can customise what your Excel reports should look like and what data should be visible and where it should be positioned. The program has a clear folder structure, where you drag and drop files from the display unit to the database. Create your own structure with folders for manufacturer, department or machine type for example. The database can also be located on a common server and shared with other users. For extra safety you can use EasyLink™ to make backups of what you have saved in the display unit.



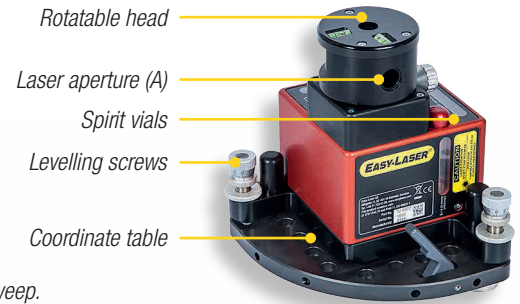
LASER TRANSMITTER

Laser transmitter D22 offers several mounting possibilities to make measurement possible in the most varying applications. It can be used to measure flatness, straightness, squareness and parallelism. For example flatness of wire sections. The laser beam can sweep 360° with a measurement distance of up to 40 metres [130'] in radius. The laser beam can be deflected 90° to the sweep, within 0.01 mm/m [0.05 mils/inch]. Included with both systems. Part No. 12-0022

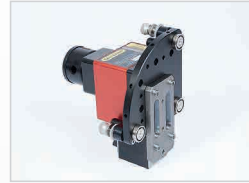
E970/E975: LASER TRANSMITTER D22



Option A: the laser beam is used for a 360° sweep.
Option B: the laser beam is angled at 90° to the sweep.



D22 mounted on tripod, as used mostly with system E970.



D22 mounted on magnet base, as used mostly with system E975.



Three super magnets for direct mounting on flat surfaces. Safety strap attached.

DETECTORS

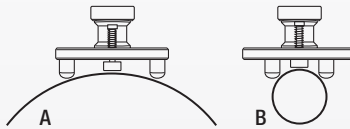
System E970 comes with a 2 axis wireless positional detector (E7) placed on the roll with a sliding bracket with rotatable head. The bracket is kept in place with heavy duty, spring loaded magnets. For small roll diameters (<math>< \varnothing 85 \text{ mm [3.3"]}</math>) the included magnet base with rotatable head is used instead.

System E975 has an angle detector (E2) which is mounted on a special roll centering bracket. The standard bracket can be used for diameters 80–400 mm [3.1–15.8"], and a minimum length of 300 mm [11.8"]. Accessory brackets for other dimensions are available on request. Depending on situation the units can be mounted in different ways on the bracket to allow for measurement (see illustration to the right).

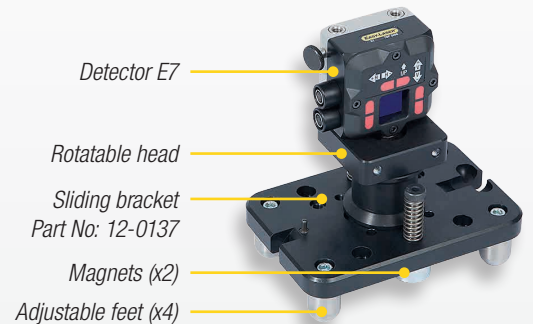
The vertical angle (pitch) is measured with a digital precision level (E290). Both the detector and the precision level has built-in OLED displays where the adjustment can be followed in live, as well as on the separate display unit.

The digital precision level E290 is also included with system E970.

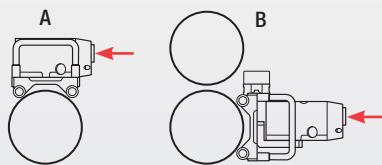
E970: DETECTOR E7 WITH SLIDING BRACKET



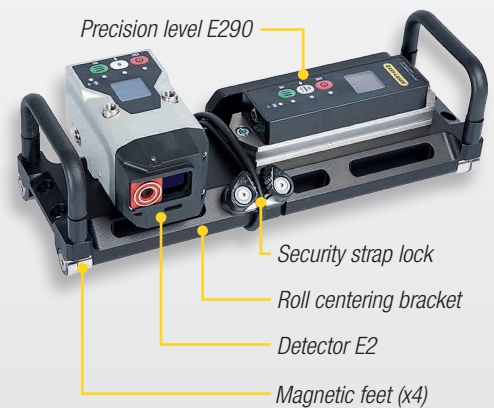
Adjustable feet:
A: Large diameters
B: Small diameters



E975: DETECTOR E2 WITH ROLL CENTERING BRACKET



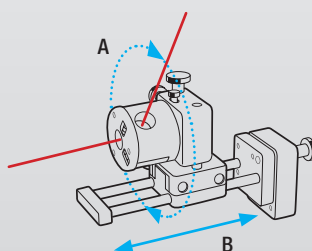
Alternative mounting of units:
A: Top attachment
B: Front attachment. If space on top is limited.



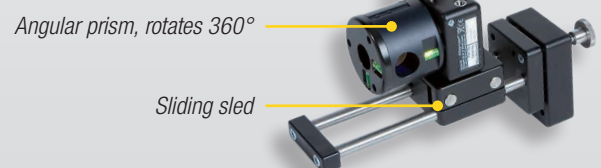
ANGULAR PRISM

The angular prism (penta prism) deflects the laser beam exactly 90°. Part No. 12-0046

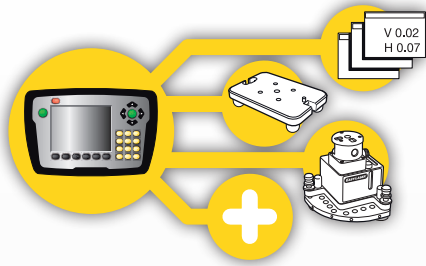
E970: ANGULAR PRISM D46



A. With the rotatable angular prism you can reach the detector almost anywhere on the machine.
B. It is quick and easy to align the beam with the detector using the sled.



ACCESSORIES AND EXPANDABILITY



A FUTURE PROOF CHOICE

Easy-Laser® measurement systems are already extremely flexible in their standard form. By using clever accessories, you can adapt the systems for your own needs, now and in the future as your measurement requirements change. It is cost-effective.

SHAFT ALIGNMENT MEASURING UNITS

An example of expandability: Align shafts and couplings with combined laser-/detector units that are mounted on each side of the coupling. The shaft alignment software is included as standard in the system. Add the S- and M-units, V-brackets with rods and chains, as well as cables or Bluetooth® units. Several models available. Ask your dealer for more information.



Measuring units for shaft alignment are available in several models. Shown here are 2 axis point laser units.



ROLL ALIGNMENT KIT



Complete kit with bracket, detector E2, digital precision level E290, charger and carrying case. Part No. 12-0856

LARGE ROLL KIT



Accessories for roll diameter 400–1300 mm [15.7–51.2"]. Note: does only include the legs pictured. Part No. 12-0885

MEASURING UNIT HOLDER



Makes it possible to mount a detector in front of the angular prism D46. Part No. 12-0709

PROTECTIVE COVER



Protective case for display unit. With shoulder strap. Part No. 01-1379

EXTENSION CABLES



Length 5 m [16.4'], Part No. 12-0108
Length 10 m [32.8'], Part No. 12-0180

TRIPOD



Tripod for D46 and D22. Height 500–2730 mm [19.7–107.5"]. Part No. 12-0269

CHARGER 12–36 V



To charge the display unit via 12–36 V socket, for example in a car. Part No. 12-0585

PRINTER



Compact thermal printer. Connected in the USB port. Part No. 03-1004

TECHNICAL DATA

System	
Relative humidity	10–95%
E970: Weight	18.9 kg [41.7 lbs] (complete system, tripods excluded)
E970: Carrying case	WxHxD: 620x490x220 mm [24.4x19.3x8.7"]
E975: Weight	15.0 kg [33.1 lbs] (complete system)
E975: Carrying case	WxHxD: 550x450x210 mm [21.6x17.7x8.3"]
Carrying cases	Drop tested. Water and dust tight.

Laser transmitter D22 (included in system E970 and E975)	
Type of laser	Diode laser
Laser wavelength	635–670 nm, visible red light
Laser Safety Class	Class 2
Output	< 1 mW
Beam diameter	6 mm [1/4"] at aperture
Working area, range	40-metre radius [130']
Type of battery	1 x R14 (C)
Operating time/battery	approx. 24 hours
Operating temperature	0–50 °C
Levelling range	± 30 mm/m [± 1.7"]
3 x spirit vials' scaling	0.02 mm/m
Squareness between laser beams	0.01 mm/m [2 arc sec.]
Flatness of sweep	0.02 mm
Fine turning	0.1 mm/m [20 arc sec.]
2 x spirit vials for rotation	5 mm/m
Housing material	Aluminium
Dimensions	WxHxD: 139x169x139 mm [5.47x6.64x5.47"]
Weight	2650 g [5.8 lbs]

Detector E2 (included in system E975)	
Type of detector	2 axis PSD 20x20 mm [0.78" sq]
Type of display	OLED
Wireless communication	Class I Bluetooth® wireless technology
Resolution	0.01 mm/m (0.001°)
Measurement error	Better than ± 0.02 mm/m
Inclinometers	0.1° resolution
Environmental protection	IP Class 67
Operating temperature	-10–50 °C
Internal battery	Li Po
Housing material	Anodized aluminium
Dimensions	WxHxD: 116x60x57 mm [4.6x2.4x2.2"]
Weight	530 g [18.7oz]

Detector E7 (included in system E970)	
Type of detector	2 axis PSD 20x20 mm [0.78" sq]
Resolution	0.001 mm [0.05 mils]
Measurement error	± 1% + 1 digit
Inclinometers	0.1° resolution
Thermal sensors	± 1° C accuracy
Environmental protection	IP Class 66 and 67
Operating temperature	-10–50 °C
Internal battery	Li Po
Housing material	Anodized aluminium
Dimensions	WxHxD: 60x60x42 mm [2.36x2.36x1.65"]
Weight	186 g [6.6 oz]

Precision level E290 (included in system E970 and E975)	
Resolution	0.01 mm/m (0.001°)
Range	± 2 mm/m
Measurement error	Better than ± 0.02 mm/m
Type of display	OLED
Wireless communication	Class I Bluetooth® wireless technology
Environmental protection	IP Class 67
Operating temperature	-10–50 °C
Internal battery	Li Po
Material	Hardened tempered steel, ABS plastics
Dimensions	WxHxD: 149x40x35 mm [5.9x1.6x1.4"]
Weight	530 g [18.7 oz]

Extension kit for E290 (included in system E970)	
For roll diameters	55–800+ mm [2.16–31.50+ "]
Weight	430 g [15.2 oz]

Wireless connection unit (For detector E7 in system E970)	
Wireless communication	Class I Bluetooth® Wireless Technology
Operating temperature	-10–50 °C
Environmental protection	IP Class 66 and 67
Housing material	ABS
Dimensions	53x32x24 mm [2.1x1.2x0.9"]
Weight	25 g [0.9 oz]

Angular prism D46 (included in system E970)	
Deflection	2 arc sec. [± 0.01 mm/m]
Turning range	360°
Fine turning	0.1 mm/m [20 arc sec.]
Sliding range	± 50 mm [± 2"]
Horizontal range	± 5 mm [± 3/16"]
Vertical range	± 5 mm [± 3/16"]
Tilting range	± 2°
Aperture size	∅ 20 mm [3/4"]
Vials scaling	0.3° [5 mm/m]
Threads	M6 and 5/8 UNC
Housing material	Aluminium, steel
Dimensions	WxHxD: 240x155x77 mm [9.4x6.1x3.0"]
Weight	1800g [63.5 oz]

Display unit E51 (included in system E970 and E975)	
Type of display/size	VGA 5.7" colour
Displayed resolution	0.001 mm / 0.05 thou
Power management	Endurio™ system
Internal battery (stationary)	Li Ion
Battery compartment	For 4 pcs R 14 (C)
Operating time	Appr. 30 hours (Normal operating cycle)
Operating temperature	-10–50 °C
Connections	USB A, USB B, Easy-Laser® units
Wireless communication	Class I Bluetooth® Wireless Technology
Storage memory	>100,000 measurements
Help functions	Calculator, Unit converter
Environmental protection	IP Class 65
Housing material	PC/ABS + TPE
Dimensions	WxHxD: 250x175x63 [9.8x6.9x2.5"]
Weight (without batteries)	1030 g [2.3 lbs]

Roll centering bracket (included in system E975)	
Measurement diameters	∅ 80–400 mm [2.8"–14.1"]
	Larger diameters possible with custom bracket (accessories)
Roll length	Min. 300 mm [11.8"]
Material	Anodized aluminium
Dimensions	WxHxD: 300x100x90 mm [11.8x3.9x3.5"]
Weight	1250 g [44.0 lbs]

Sliding bracket for E7 (included in system E970)	
Measurement diameters	∅ 80–500 mm [2.8"–17.6"]
Material	Anodized aluminium, Stainless steel
Dimensions	WxHxD: 150x100x95 mm [5.9x3.9x3.7"]
Weight	1700 g [59.9oz]

Tripod	
Mounting thread	5/8 UNC
Transport dimension	1110 mm [44"]
Height, Min. – Max.	500–2730 mm [19.7–107.5"]
Weight	7.9 kg [17.4 lbs]

Cables	
Type	With Push/Pull connectors
System cable	Length 2 m [78.7"]
Extension system cable	Length 5 m [196.8"]
USB cable	Length 1.8 m [70.8"]

Rods	
Length (extendable)	60/120/240 mm [2.36"/4.72"/9.44"]
Material	Stainless steel

EasyLink™ Data base software	
System requirements	Windows® XP, Vista, 7, 8, 10. For the export functions, Excel 2003 or newer must be installed on the PC.

CUSTOM DESIGN

In addition to our already versatile standard system we can also specially adapt measurement systems to suit your needs. Using our own CNC machines we can quickly manufacture brackets just for you. This means for example that brackets for other diameters than mentioned on this page can be manufactured on request.

EASY-LASER® E970 PARALLELISM

For parallelism measurement of rolls and other objects in numerous applications. The E970 is especially suitable when many objects are to be measured and aligned, and when the distances are long. Any chosen object or the baseline can be used as a reference. For rolls with diameter 40 mm [1.6"] and larger. Maximum measurement distance with a standard system is 80 metres [260 feet]. Easy-Laser® E970 is a very versatile system. You can also use it to measure level, straightness and flatness on wire sections (suction boxes), flatness on bases and straightness on rolls. With a few accessories you can also perform shaft alignment. This makes Easy-Laser® a very cost effective solution for your maintenance department.



A complete system contains

- 1 Display unit E-series E51
- 1 Laser transmitter D22 incl. tilt table
- 1 Detector E7
- 1 Bluetooth® unit for E7
- 1 Digital Precision Level E290
- 1 Extension kit for E290
- 1 Cable 2 m
- 1 Cable 5 m, extension
- 1 Angular prism
- 1 Parallelity kit
- 2 Tripods
- 1 Set of Rods 4x240 mm
- 1 Set of Rods 4x60 mm
- 1 Safety strap for laser transmitter
- 1 Manual
- 1 Measuring tape 5 m
- 1 USB memory stick with documentation
- 1 USB cable
- 1 Battery charger (100–240 V AC)
- 1 DC charging cable
- 1 DC to USB adapter
- 1 Hexagon wrench set
- 1 Shoulder strap for Display unit
- 1 Cleaning cloth for optics
- 1 Carrying case

System Easy-Laser® E970, Part No. 12-0853

EASY-LASER® E975 ROLL ALIGNMENT

System E975 is designed mainly for roll alignment. It is well suited when just one or two rolls are to be replaced or adjusted at the same time. For rolls with diameters 80–400 mm [3.1–15.8"], and a minimum length of 300 mm [11.8"] (accessory brackets for other dimensions available on request). Measurement distance between transmitter and detector up to 20 m (in each direction) [66 feet].

The system can be expanded with other detectors and brackets for more geometric measurement possibilities.

Note: The E2 detector that is included reads angles, not positions. This means that if you want to take full advantage of the measurement program package of system E975, you will also need a positional detector like e.g. the E7.



A complete system contains

- 1 Display unit E-series E51
- 1 Laser transmitter D22 incl. tilt table
- 1 Detector E2
- 1 Roll bracket
- 1 Digital Precision Level E290
- 1 Magnet base
- 1 Adapter plate for tilt table to magnet base
- 2 Rods 240 mm
- 2 Rods 120 mm
- 2 Rods 60 mm
- 1 Safety strap for laser transmitter
- 1 Manual
- 1 Measuring tape 5 m
- 1 USB memory stick with documentation
- 1 USB cable
- 1 Battery charger (100–240 V AC)
- 1 DC charging cable
- 1 DC to USB adapter
- 1 Hexagon wrench set
- 1 Shoulder strap for Display unit
- 1 Cleaning cloth for optics
- 1 Carrying case

System Easy-Laser® E975, Part No. 12-0854

WARRANTY AND SERVICE CONCEPT

The Easy-Laser® systems have evolved over decades, through field experience in solving measurement and alignment problems. The

systems come with a 3 year limited warranty. The manufacturing and quality systems are ISO9001 approved. If an incident should occur, our service department normally

handles repairs and calibrations within five working days. This combination makes Easy-Laser® a reliable partner for your business.

Easy-Laser® is manufactured by Easy-Laser AB, Alfagatan 6, SE-431 49 Mölndal, Sweden
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 This product complies with: EN60825-1, 21 CFR 1040.10 and 1040.11.
 Contains FCC ID: PVH0925, IC: 5325A-0925.
 Publication ID05-0759 Rev4

