

INNOVATORS TO THE WORLD

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TALYVEL/CLINOMETERS

Angular measurement
from Taylor Hobson

Taylor Hobson
PRECISION

TALYVEL 4 ELECTRONIC LEVEL

Fast, Accurate and Versatile

Universally accepted as the best in their field, Taylor Hobson's Talyvel Electronic Level systems provide versatile and precise measurement for a wide variety of industrial, optical alignment (when used with Taylor Hobson Micro Alignment Telescope), civil, marine and construction engineering applications. They combine exceptionally high accuracy and repeatability with fast response and operational convenience.

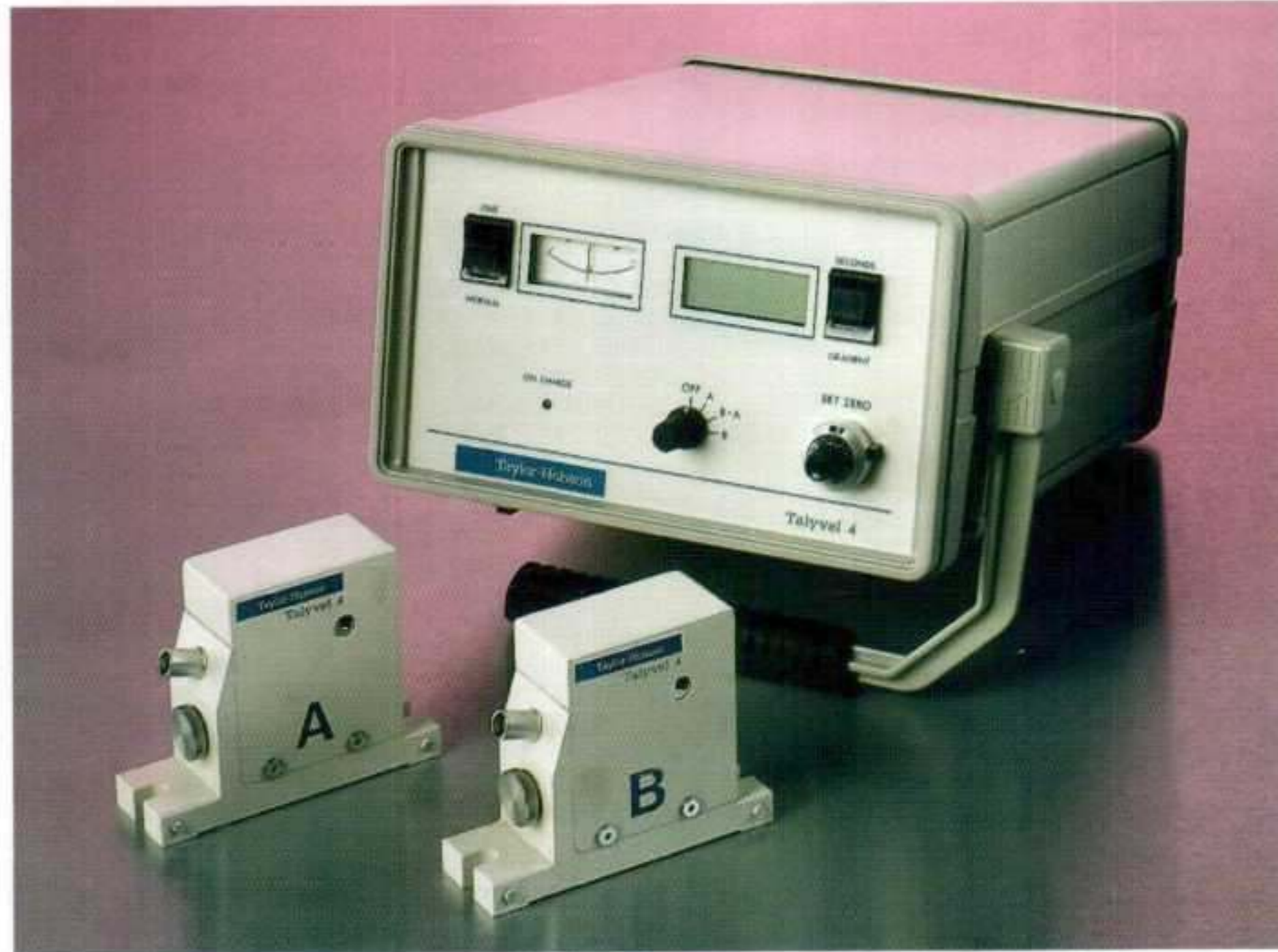
Used for measuring straightness, flatness or absolute level, Talyvel 4 can also function as a comparator to detect departures from a preset attitude, which may not necessarily be level.

Incorporating its world renowned, compact, highly stable, pendulum transducer in the Level Unit and a rechargeable battery or mains powered Display Unit, Talyvel 4 provides rapid and simple reading of angle of tilt and measurement relative to gravity. It is simple to calibrate and operate, with a fast measurement response time.

The Talyvel's Level Unit can be positioned remotely from the Display Unit - for instance in hard to see or confined places with the Display Unit located where it can be easily read.

Measurement results from the basic Talyvel 4 system are displayed on a digital LCD screen. In addition, the Talyvel 4 system capability can be significantly enhanced by interfacing to a personal computer, or simply used with a suitable printer for hard copy printout of measurement results.

Talyvel systems can also be used as complementary equipment with laser interferometers where precise flatness plots are required.



TALYVEL 4 OFFERS:

- Quick, accurate and simple setting to gravity, or measurement of level
- Small Level Unit, enabling the system to be used in difficult to reach locations
- Adaptability to existing Talyvel 1, 2 and 3 level units
- RS232 and analogue as standard output from the Display Unit
- Fine ± 10 second range available on the built in analogue meter
- Unmatched stability of measurements
- Unrivalled accuracy of 0.2 arc second over the centre measuring region
- Readout in gradient (mm/m or 0.001in/in) or seconds of arc

Some applications for which Talyvel systems have become universally accepted:

CIVIL ENGINEERING

- Remotely monitoring the tilt movement of structures
- Checking bridge arches for movement before and after construction
- Checking foundation settlement and levelling foundation pads (eg on power stations)
- Levelling radar, gyro and weapon platforms
- Checking level and straightness of space vehicle rails

MACHINE TOOLS

- Checking slideways for straightness and twist
- Checking columns for squareness to slideways
- Checking surface plates for flatness
- Monitoring the settlement of large machinery
- Measuring the camber on rolls

MARINE ENGINEERING

- Checking the twist of marine engine bed plates
- Alignment of weapon mountings to reference platforms on naval ships
- Checking the parallelism of crankpins to main bearings on marine crankshafts

OPTICAL ALIGNMENT

- Mounted on a Micro Alignment Telescope to establish a truly horizontal line of sight

TALYVEL 4 BASIC SYSTEM (Code S112/2584-01)

Comprising:

1 - Talyvel 4 Level Unit (Code 112/2584) with 3.5 metre cable.

1 - Display Unit (Code 112/2574) including rechargeable batteries, and built-in charger unit.

LEVEL UNIT (Code 112/2584)

This compact unit offers high accuracy measurement and long term stability.

Its pendulum type transducer is suspended on fine wires and is silicon oil damped to reduce the effects of slight mechanical vibration during measurements.

The Level Unit incorporates a clamp knob which, when screwed in, secures the pendulum against movement during transport.

DISPLAY UNIT (Code 112/2574)

The Display Unit is powered by mains or rechargeable batteries.

Measurements are clearly displayed with decimal point and polarity indication. A selector switch allows results to be displayed as an angle in arc seconds or as a gradient in mm/metre or 0.001in/in. The display also flashes to indicate an offscale condition. An analogue meter indicates the direction of tilt of the Level Unit (eg for setting Micro Alignment Telescope line of sight horizontal) and can be switched to a fine ± 10 second range, which is very practical when setting to gravity. A "Low Bat" signal indicates the need to recharge the batteries.

Standard 3.5m cables are supplied with Talyvel 4; optional extension cables enable Talyvel 4 to be used at distances up to 100 metres (300 feet) from the Level Unit. This distance can be further extended to 800 metres (1/2 mile) by using cables with a built-in signal strengthening amplifier.

The front panel also incorporates an adjuster to set the display reading to zero for one Level Unit (A). The adjustment operates over approximately ± 60 seconds. For absolute level indication the adjustment is set to zero.

At the rear of the Display Unit are sockets for connection to two Level Units, mains input, RS232 Interface, an Analogue Output and remote switch input. This also allows easy connection between the Display Unit and a computer system or suitable printer.

Adaptor equipment is available to enable existing Talyvel 1, 2, 3 and early Talyvel 4 (112/2232) Meter Units to be used in conjunction with Talyvel 4 Level Units.

DIFFERENTIAL SYSTEM (Code S112/2584-02)

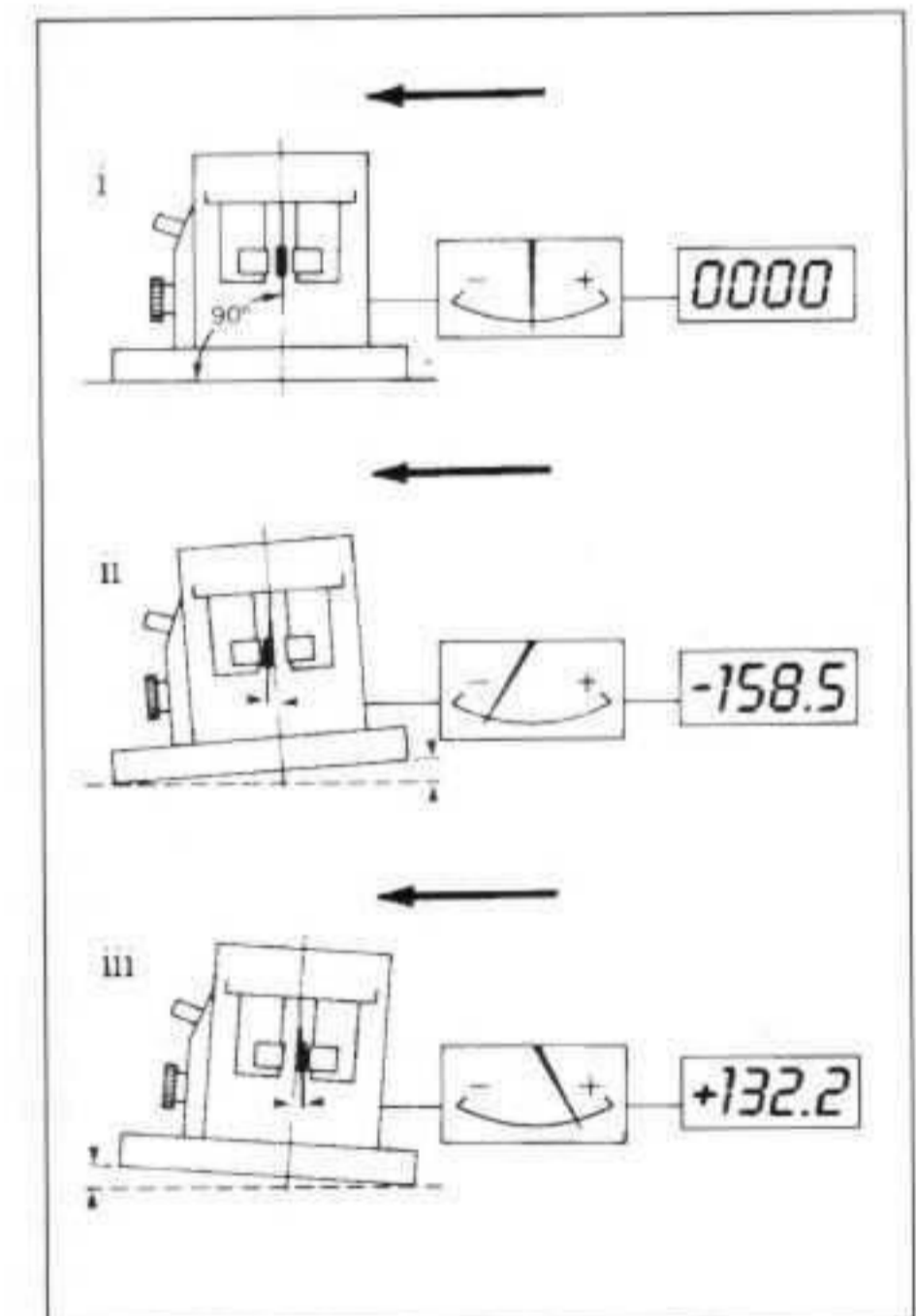
Comprises:

2 - Talyvel 4 Level Units (Code 112/2584) each with 3.5 metre cables.

1- Display Unit (Code 112/2574), including rechargeable batteries, and built-in charger unit.

Two Level Units (A and B) can be controlled from the single Display Unit to provide a differential system for measuring the difference in inclination of two surfaces, as well as their departure from absolute level. Display of results from each Level Unit and their differential value are determined by switch selection of A, B or A-B.

The differential Talyvel is of particular value in applications such as measuring the relative deflections in buildings, in the production and assembly of precision machinery and for monitoring twist or deflection on slowly tilting surfaces, eg ship's engines or machinery on oil rig platforms.



The electrical zero adjustment operates on the display from Level Unit A and therefore, also on differential A-B.

Meter and digital indication of Level Unit inclination.

- Level Unit Level - Zero inclination
- Level Unit inclined anti-clockwise - negative indication
- Level Unit inclined clockwise - positive indication.

TALYVEL COMPUTER PROCESSING

SOFTWARE PROGRAM 112/2337

A full "Windows 95" based software package is available to support Talyvel. The package includes flatness measurement Union Jack (moody) or grid, straightness measurement (including twist and squareness) and the polygon angular indexing program. Statistical filtering and edit facilities add to user confidence and flexibility of approach.

FLATNESS PROGRAM DESCRIPTION

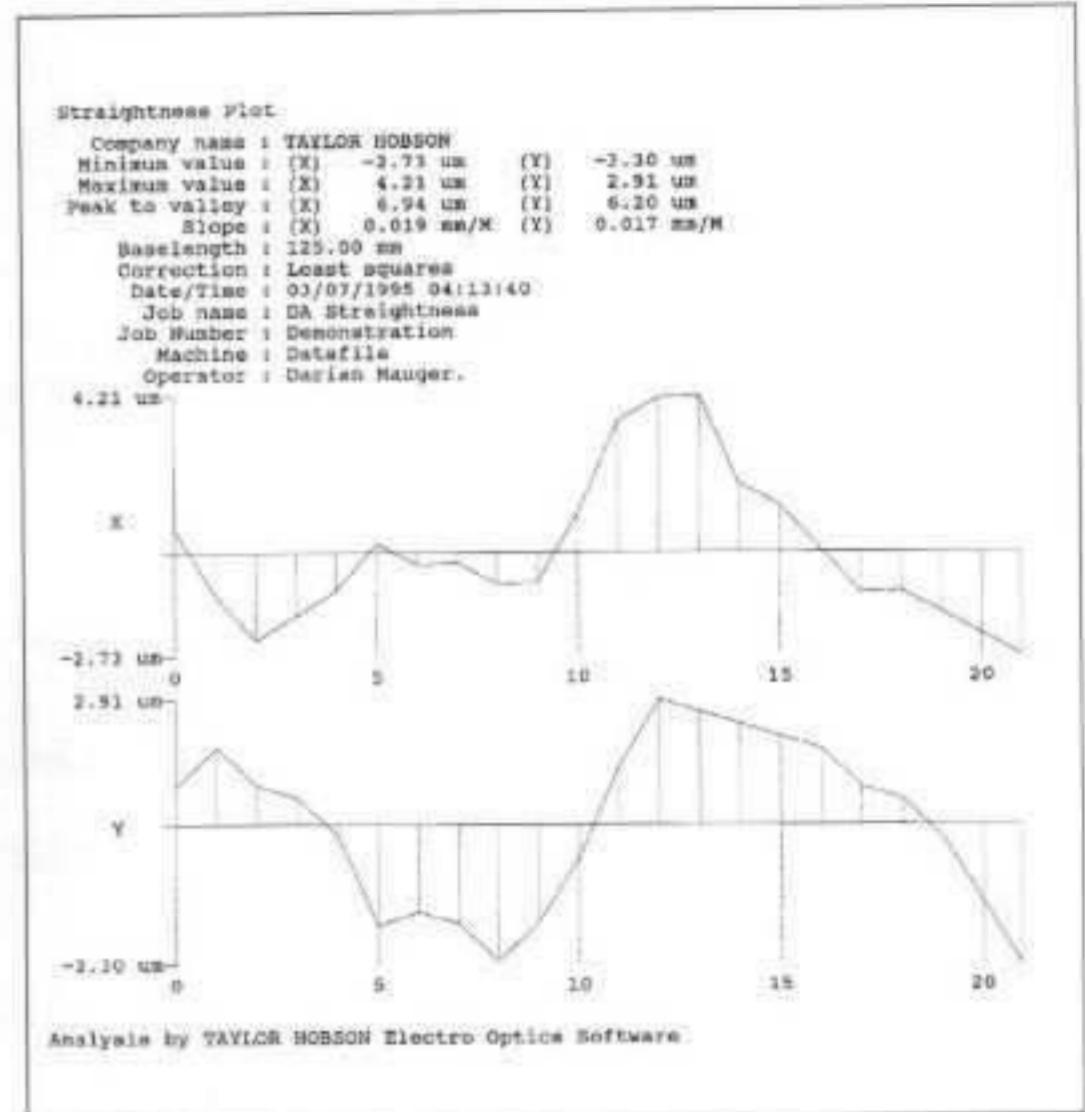
Flatness can be measured using either Grid or Union Jack (Moody) methods. Simple, interactive menu driven software displays an initial diagram of the surface to be measured, together with surface generator lines and instructions on the method of entering surface data. Multiple measuring steps can be taken along each generator line.

After the selected number of measuring steps have been entered, the program calculates and displays the shape of each generator line and the flatness of the surface.

During measurement, readings can be automatically entered into the computer, using the remote data entry lead. This is particularly useful when measuring large surfaces. Once the computer has accepted the Talyvel readings, these values are displayed initially as arc seconds and then converted to micrometers or millionths of an inch units for printout (μm or 0.000001in units).

Measurement results of flatness are displayed and printed out as an isometric diagram, certificate or results list.

In addition, the display/printout gives the maximum deviation from flatness over the entire surface. To comply with international standards a minimum zone calculation is used to generate flatness errors.



STRAIGHTNESS PROGRAM

The straightness program will permit straightness measurement on components such as machine tool slideways, shafting and rolls. The methods and procedure for use are similar to those described for flatness measuring.

Results are presented in both tabular form and also as a straightness graph. Twist and squareness measurement is also available in this package. Analysis is to LSL or ENDS ZERO, with appropriate graphical representation of results.

TWIST PROGRAM

This program combines a single line straightness measurement with a number of radial or cross measurements. All programs have the option of single, average or statistically filtered inputs.

Union Jack data table

Company name : Taylor Hobson
Machine name : 15.81 mm
Date/Time : 01/04/98 11:00:00
Job name : Union Jack
Job Number : 104001
Machine : 12343
Material :
Finish :
Temperature :
Operator : J Wood
Measured area : 1200.00 mm x 1000.00 mm
Baselength (X,Y,Z) : 300.00 mm
Baselength (A,B,C) : 450.00 mm
Baselength (M,N,O) : 300.00 mm
Closing error in X : -0.10 μm
Closing error in Y : -0.01 μm

Table graph :
Dimension of table :
Uncertainty of measurement :

Station	Angle	Height	Station	Angle	Height	Station	Angle	Height
AN 01	0.00	5.64	DN 01	0.00	7.62	HN 01	0.00	15.84
AN 12	4.60	10.11	DN 12	3.19	9.09	HN 12	3.30	15.61
AN 23	2.40	13.31	DN 23	4.40	9.48	HN 23	-6.47	7.40
AN 34	-2.40	15.67	DN 34	6.20	7.00	HN 34	0.50	4.95
AN 45	-2.40	15.65	DN 45	3.80	4.29	HN 45	6.40	12.12
AN 56	0.00	12.49	DN 56	0.00	1.44	HN 56	0.00	13.11
AN 67	4.70	22.39	DN 67	1.43	8.39	HN 67	-3.40	1.65
AN 78	3.40	11.12	DN 78	3.20	15.84	HN 78	-7.10	0.00
AN 89	1.40	7.25	DN 89	-0.20	10.45	HN 89	4.50	2.95
AN 90	4.00	8.89	DN 90	-0.20	7.62	HN 90	5.30	2.48
AN 00	0.00	1.44	DN 00	0.00	12.44			
AN 11	1.80	4.45	DN 11	0.20	5.83			
AN 22	-3.20	4.02	DN 22	4.20	6.07			
AN 33	4.40	13.87	DN 33	-2.40	11.44			
AN 44	-6.20	8.89	DN 44	2.10	7.62			

Analysis by TAYLOR HOBSON Electro Optics Software V4.1.03

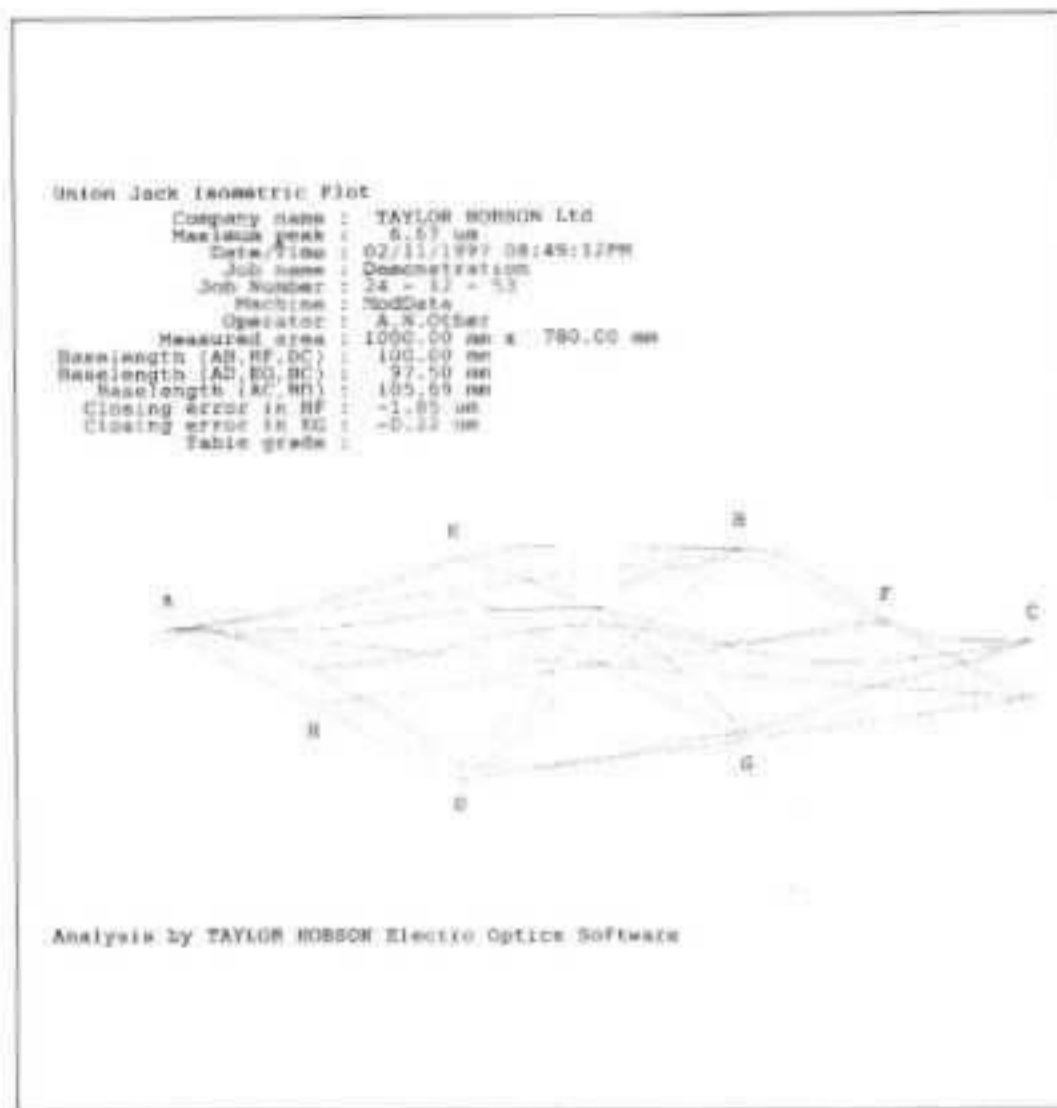
COMPUTERISED FLATNESS MEASUREMENT KITS

(Code S112/2246-01)

Comprises:

- Software on 3 1/2in disc, (Code 112/2337)
- Adjustable Base for Level Unit (Code 112/2316)
- Portable computer (Code 112/2234)
- Printer (Code 112/2325)
- Remote data entry lead (Code 112/1952)

Alternative flatness measurement kits can be supplied without the computer and printer under Code S112/2246-02.



COMPUTER

(Code 112/2234)

IBM compatible portable computer with colour screen. Supplied with Windows 95.

Screen displays guide and prompt the operator through straightness and flatness measurement sequences. Results are entered into the computer directly through the interface unit, initiated by the remote data entry lead or commanded directly via the keyboard.

Measurement results are calculated and then displayed in isometric form for flatness measurement or as a straightness graph on the computer screen.



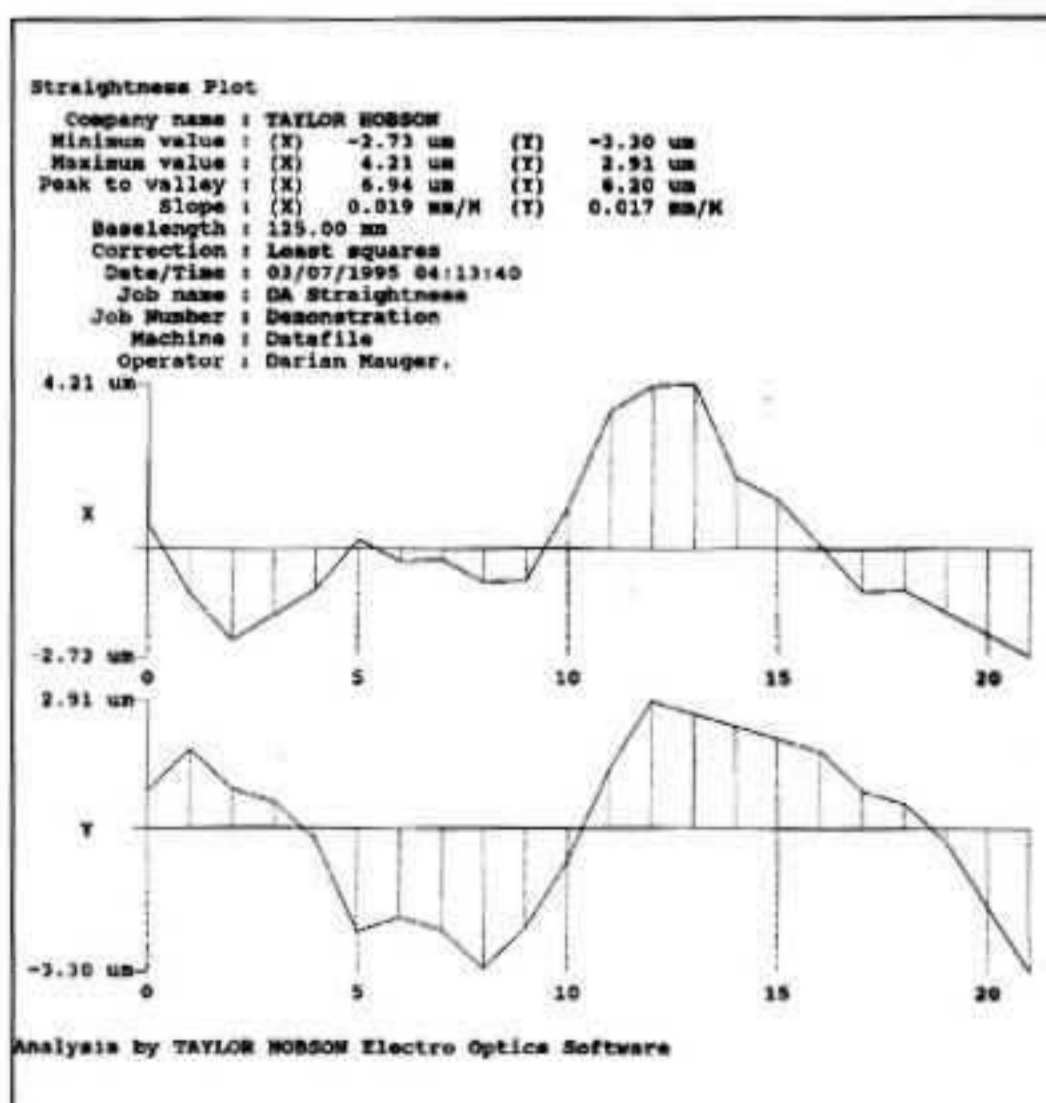
PRINTER

(Code 112/2325)

This unit will print out all numeric and graphical data so that a permanent record of measurement data can be maintained.

Note: Taylor Hobson products are tested for operation only on computers and peripherals supplied by ourselves. The company can not be responsible for problems arising due to:

- The use of hardware not supplied by Taylor Hobson
- The use of software other than the Taylor Hobson programs and its recommended operating environment.



Taylor Hobson



ELECTRO-OPTICAL
METROLOGY

Talyvel Accessories

150mm RIGHT ANGLE BASE (Code 112/2317)

An economical accessory for the measurement of vertical surfaces.

All bearing faces are ground to a flatness within $2.5\mu\text{m}$ ($100\mu\text{in}$) and the two faces forming the right angle are square to within 5 seconds of arc ($0.025\text{mm}/\text{metre}$ $25\mu\text{in}/\text{in}$). These also have 120° vee bearing faces.

Adjustment for setting the Level Unit to absolute horizontal within the frame is provided, as well as adjustment for roll errors.

ANALOGUE METER (Code 112/2238)

This is an analogue meter which connects directly to the analogue output port on the Talyvel Display Unit. The needle position equates directly to the level unit tilt.

ADAPTOR EQUIPMENT (Code B237/845)

With the appropriate adaptor equipment, the existing Talyvel 1 and 2 Level Units can be used in conjunction with the Talyvel 4 Display Unit (Talyvel 3 Level Units do not require any adaptor but may require a modification to the lead). Please note: the Talyvel must be returned to the service department for refit.

EXTENSION LEADS (Code 112/1949 without drum) (Code 112/1948 with drum)

Extension cables to connect the Talyvel 4 Level Unit to the Meter Unit are available up to 100 metres (300 feet) in length. For distances in excess of 100 metres (300 feet) special cables are required with electronic compensation. These are available upon request.

BLOCK BASE (Code 112/2314)

This 300mm (12in) long base allows the Level Unit to be positioned along cylindrical objects, ie for the measurement of large bearings, mill rolls and shafting, in addition to straightness checks.

The block base has 120° vee bearing faces, all bearing faces are ground to a flatness within $2.5\mu\text{m}$ ($100\mu\text{in}$).



Adjustment for setting the Level Unit to absolute horizontal is provided. A transverse bubble level checks that the Level Unit is vertical. A further adjustment for eliminating roll errors, which can be significant, is also included.

BOX FRAME (Code 112/2313)

Measurement of inverted or vertical surfaces is facilitated by this 200mm (8in) square box frame.



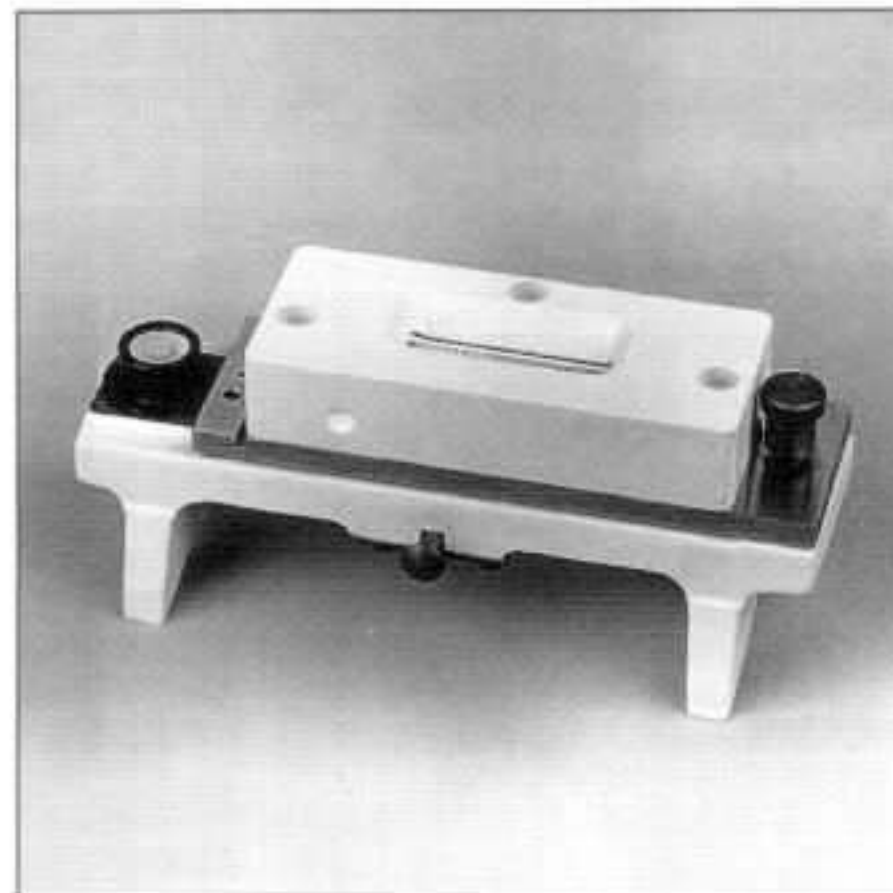
All bearing faces are ground to a flatness within $2.5\mu\text{m}$ ($100\mu\text{in}$) and adjacent faces are square to within 5 seconds of arc ($0.025\text{mm}/\text{metre}$ $25\mu\text{in}/\text{in}$). A pair of 120° vee bearing faces are provided on adjacent faces and these are parallel to the base within the same tolerance.

Adjustment for setting the Level Unit to absolute horizontal within the frame is provided with adjustment for roll errors.

STRIDE BASE (Code 112/2315)

This accessory allows Talyvel 4 to be mounted on the Taylor Hobson Micro Alignment Telescope to establish a truly horizontal line of sight.

The stride base incorporates a transverse bubble and an adjustment for absolute horizontal.



ADJUSTABLE BASE (Code 112/2316)

This accessory can be set to the appropriate step interval length up to 200mm (8in) for flatness measurement by the "Grid" or "Union Jack" method and for straightness measurement.



It provides a base for the Talyvel 4 Level Units with self aligning seating pads adjustable to a graduated scale. Adjustment is provided for setting the Level Unit to absolute horizontal.

This base can also be used for mounting an Autocollimator Reflector.

PRECISION BLOCK LEVELS

Taylor Hobson Block Levels provide a simple, rapid and accurate method of checking:

Straightness
Parallelism
Flatness
Squareness
Level

In workshops and inspection rooms, Block Levels are extensively used for general level checking applications during the assembly, testing and installation of machine tools and other precision equipment. They are also invaluable instruments for on-site civil engineering and construction applications and in the ship-building and aerospace industries. Maximum accuracy and repeatability are ensured by the distortion free mounting of the bubble vial.

200mm SQUARE BOX LEVEL (Code S112/2313)

Technical Data

Sensitivity: 5 seconds
(0.025mm/m, 25 μ in/in) per division.
Dimensions: 203 x 203 x 43mm
(8 x 8 x 1.7in)
Weight: 4.5kg (9.81b)

BUBBLE VIAL (Code 112/2318)

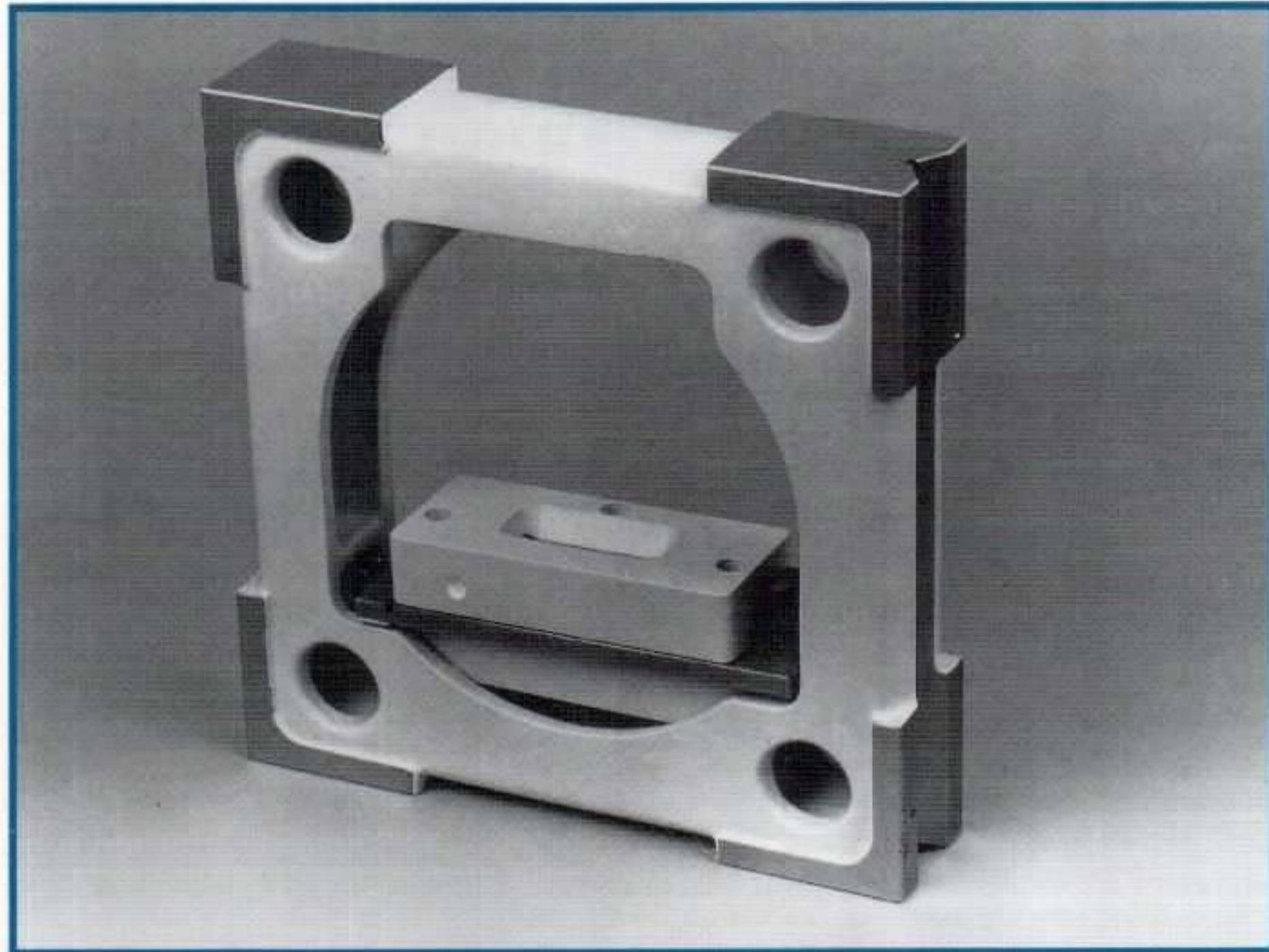
This robust bubble vial can be mounted on any of the accessory bases listed on this page in place of the Talyvel level unit, to provide a simple, cost effective method of setting and checking angle and level.

It has a sensitivity of 5 seconds
(0.025mm/metre, 25 μ in/in) per division.

300mm HORIZONTAL BLOCK LEVEL (Code S112/2314)

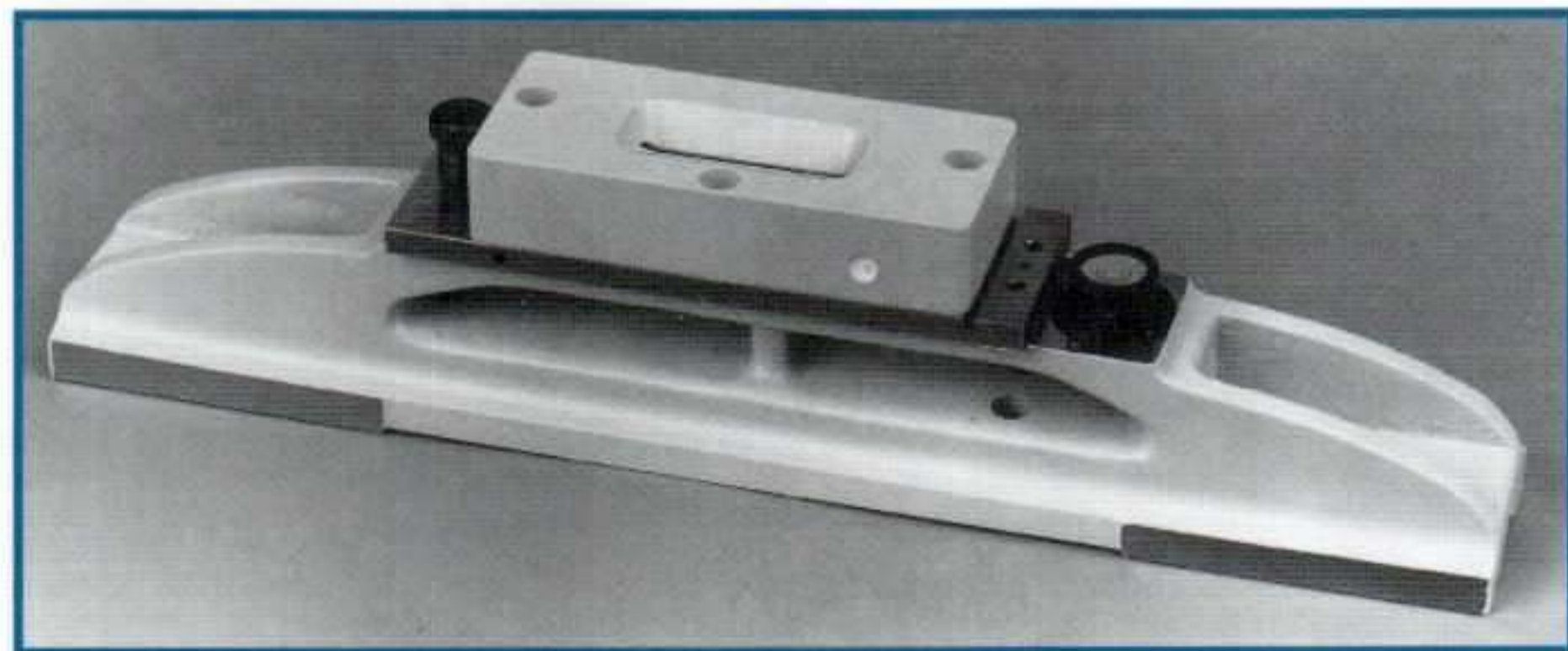
Technical Data

Sensitivity: 5 seconds
(0.025mm/m, 25 μ in/in)
per division.
Dimensions: 303 x 43 x 46mm
(11.9x1.7x1.8in)
Weight: 2.2kg (4.91b)



200mm square box level

This versatile level is designed for both horizontal and vertical applications. Each pair of adjacent faces is mutually square to within 5 seconds (0.025mm/metre, 25 μ in/in), and two of the adjacent sides have a 120° vee bearing face for checking and setting either flat or cylindrical surfaces. All bearing faces are ground to a flatness within 2.5 μ m (100 μ in). The bubble vial is adjustable for level and roll relative to the base.



300mm block level

Similar to 112/2314 Block Base with the bubble vial easily adjusted for level and roll relative to the base with a transverse bubble level to provide a check that the bubble vial is vertical.

CLINOMETERS

Precision in Angular Measurement, Checking and Setting out

Clinometers are valuable for simple, speedy and accurate measurement, checking and setting-out of angles.

The Taylor Hobson range extends from Workshop Clinometers for general purpose and heavy duty applications to precise Microptic Clinometers for use in workshops, tool rooms and inspection departments.

WORKSHOP CLINOMETERS

Workshop Clinometers are robustly constructed instruments, with scales designed for clear, simple reading. Two types are available - Pendulum Clinometers and a Bubble-referenced Clinometer, both ideal for angular settings, checking and inspection of machine tools and fixtures.

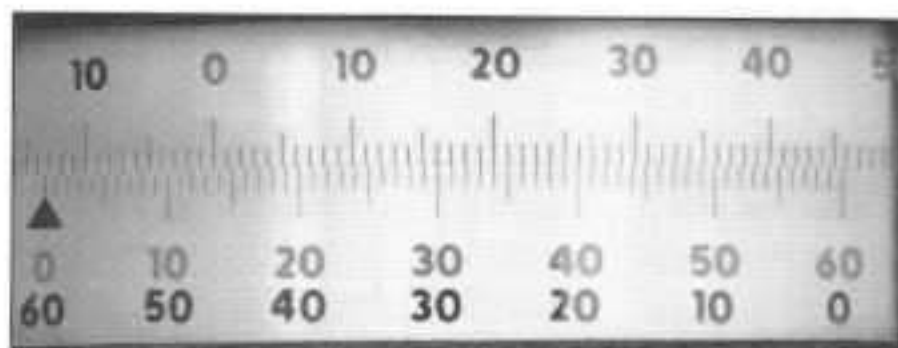
MICROPTIC CLINOMETERS

Microptic Clinometers have been designed for operational convenience, simplicity and consistent high accuracy. The Clinometer uses precisely divided circular glass scale, mounted on a spindle that rotates in a high quality bearing. At the end of the spindle is a sensitive bubble vial, which acts as a horizontal reference.

Two models are available - TB80 and TB100 - both reading over a range 0°-360°.

Dual purpose

In addition to functioning as clinometers, both Microptic Clinometers can be used either vertically or horizontally as circular measuring tables. For this purpose the bubble unit is replaced by an



Vernier Scale reading=13 degrees 25 minutes right hand high.



(Clockwise from bottom left): TB107 Pendulum Clinometer, TB121 Bubble Clinometer, TB100 Microptic Clinometer and TB80 Microptic Clinometer.

optional worktable, which allows a maximum symmetrical load of 2.25 kg (5 lb). A reflector can also be fitted for use in conjunction with an autocollimator.



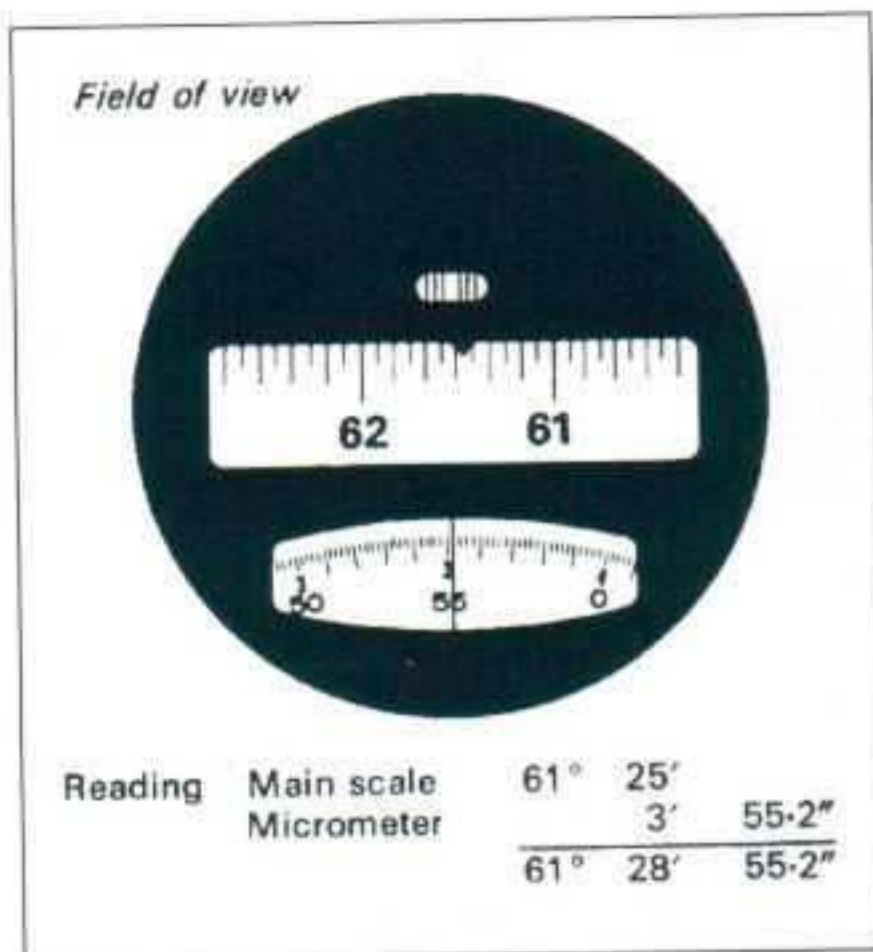
Checking workpiece angle using TB121 clinometer

TB80 MICROPTIC CLINOMETER (Code 142/44)

Features include:-

- Direct reading to 1/2 second of arc.
- Microptic, two-sided circle reading system designed to minimise scale centring errors.
- A coincidence-reading bubble unit.
- Hardened and lapped steel locating faces on the base, one adjacent side, and the back.

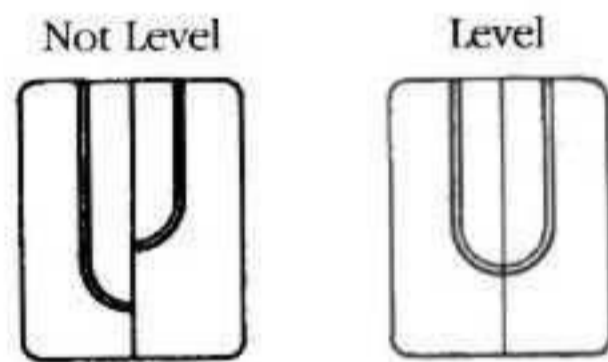
To determine the inclination of the clinometer, the bubble unit is levelled and the scales read through the reading eyepiece. Fine setting of the bubble is achieved by a slow-motion drive to the totally enclosed glass circle.



TB80 eyepiece field of view

The bubble unit incorporates a prismatic coincidence reader that presents both ends of the bubble as adjacent images in a split field of view. Precise levelling is indicated when the two ends are coincident.

Readings from the graduated circle and the micrometer scale are given in two separate apertures seen through the eyepiece.



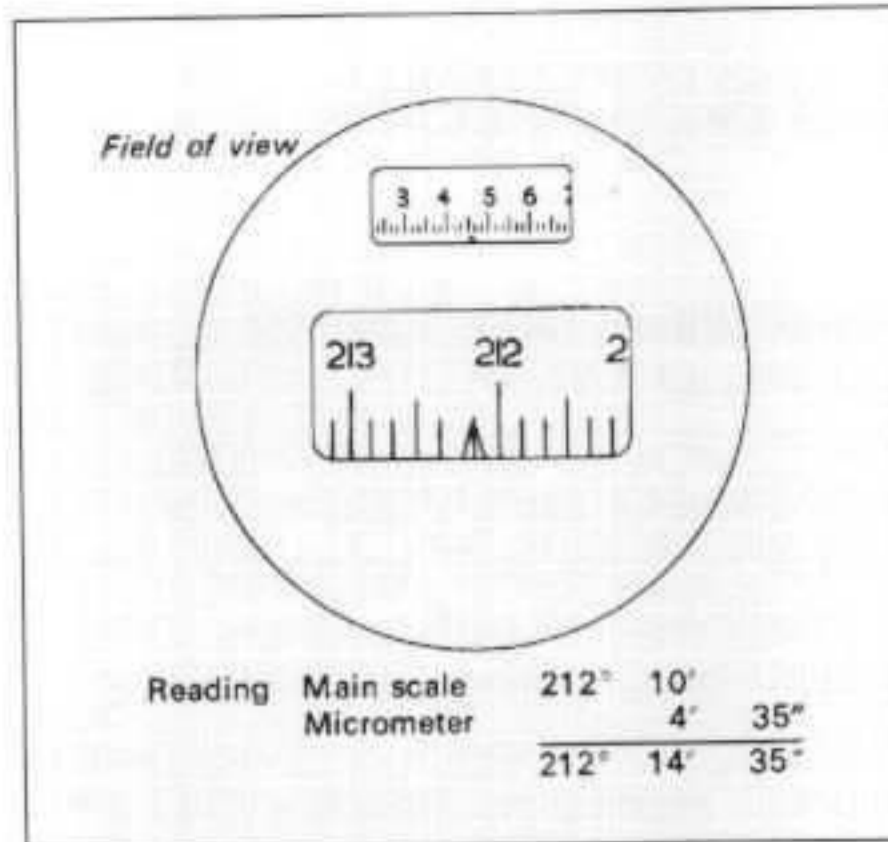
TB100 MICROPTIC CLINOMETER (Code 142/43)

The TB100 Microptic Clinometer offers half the accuracy of the TB80 system.

Its features include:

- Direct reading to 10 seconds of arc.
- Estimation to within 2 seconds of arc.
- Hardened ground steel base.

The field of view visible in the eyepiece contains two scales. The lower one is the main scale, figured in degrees with 10 minute sub-divisions; above it is the scale of the optical micrometer, figured in minutes with 10 sub-divisions.



TB100 eyepiece field of view

PENDULUM CLINOMETERS

Type TB107 (Code 142/41)
-356mm (14in) Base

Type TB108 (Code 142/40)
-152mm (6in) Base

Type TB109 (Code 142/40 - PL8083)
-TB108 with Adjustable Base

Of simple design, the pendulum clinometer is easy to use and invaluable for use in awkward locations. The pendulum of this type of clinometer is in the form of a drum, engraved in degrees, whose centre of gravity is off-centre. The angular relationship between the drum and the instrument casing is read from a vernier scale. The instrument incorporates a drum locking device which enables the operator to secure the indication of angle before the clinometer is removed from the surface. This value can subsequently be read through an integral magnifier. All models have ground steel bases.



TB108

The TB109 Clinometer is identical to the TB108 with the addition of a central fixed support, adjustable for height, and two laterally adjustable feet which can be set from approx 160mm (6.3in) to 340mm (13.3in) apart, to suit specific checking requirements. A typical application for this clinometer is the checking of aircraft or marine propeller blades.



TB109

BUBBLE CLINOMETER

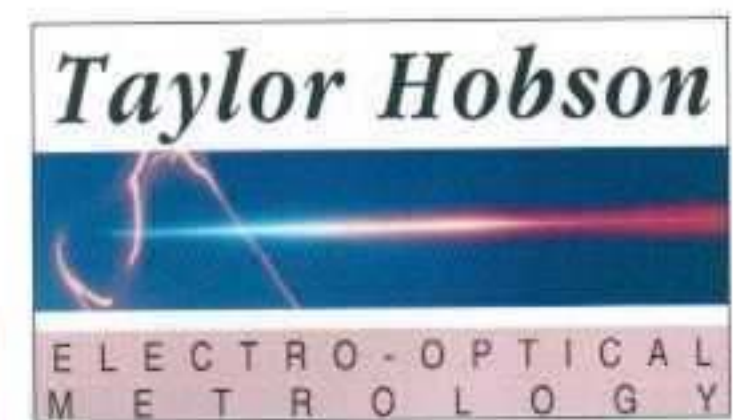
Type TB121 (Code 142/42)

The bubble-referenced clinometer is provided with fine and coarse adjustment via a micrometer thimble attached to worm-wheel and gear, the latter having a main scale mounted on it. A bubble level is contained in the knurled head on the front of the clinometer. By depressing the micrometer thimble, the worm gear on the main scale is disengaged from the gear wheel drive and allows the bubble vial housing to be freely turned for coarse adjustments. When the micrometer thimble is subsequently released, the worm gear is reengaged and fine adjustment can be made through the micrometer thimble.

SPECIAL PURPOSE CLINOMETERS

The TB9008-90° Clinometer is of similar construction to the TB121 and is particularly suited to shipboard applications. The main features of this instrument are a long bubble vial and a dual micrometer and main scale which can be read from either side of the instrument. For military requirements the TB100 Clinometer is available with graduations in mils* and designated Type TB9045. The TB121 Clinometer is also available with mils graduations as Type SS24.

Note: * 1mil(military) = $360^\circ/6400 = 202.50$ seconds of arc or 3.375 minutes of arc



Clinometer Accessories

Worktable

Available on request

Interchangeable with the bubble unit, enabling small components to be attached to the clinometer spindle.

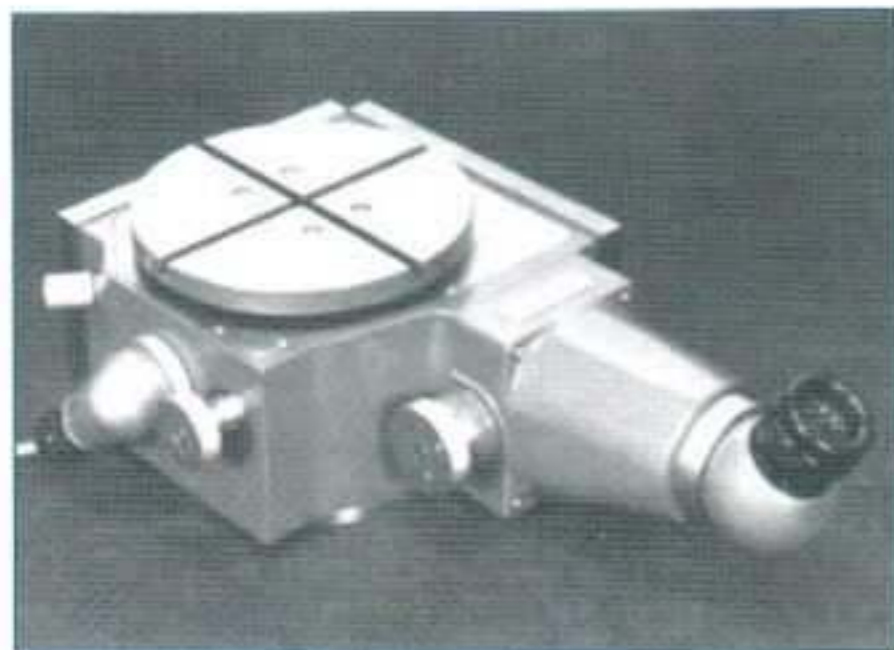


Table diameter is 120mm (4.75in). With the clinometer horizontal, the table will carry a symmetrically placed maximum load of 2.5kg (5lb).

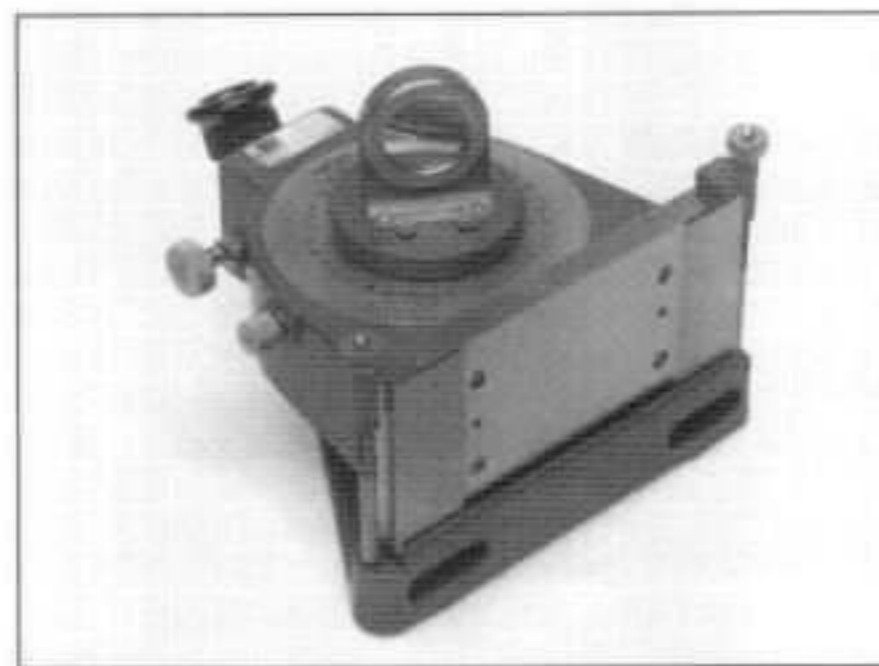
Horizontal Base

Available on request

Supports the clinometer in a horizontal position when it is used with the worktable or reflector.

Transformer, Code 120/309 (TB80 and TB100)

Variable power supply 0-12V, input 120V-240V; for use with illuminator 142/48, or the in-built illuminator of the TB80 Clinometer. Incorporates potentiometer adjustment to vary the intensity of illumination. If ordering for use with existing equipment a 12V bulb is required,



Adjustable Reflector

Available on request

Replaces the bubble unit to enable the clinometer to be used with an autocollimator for setting-out angles.



Adjustable Base, Code PL8083 (TB108 only)

Provides an alternative base for the TB108 clinometer, converting it into a TB109. This requires the existing base to be removed by simply unscrewing the 6 securing screws and using the same screws to secure the TB109 base plate (preferably carried out as a factory retro-fit).

Electric Illuminator

Available on request

For use in poor ambient lighting conditions or when the clinometer is used horizontally. It has a 6.5V, 2W lamp (Code 242/103) and replaces the clinometer mirror.

SOME TYPICAL APPLICATIONS FOR CLINOMETERS:

Measuring and checking:

- Angular faces
- Gauges
- Relief angles on large cutting tools
- Jigs and fixtures
- Level and perpendicularity of machine ways and bed plates

Setting out:

- Inclination tables on jig boring machines
- Adjustable angle plates
- Angular work on grinding and lapping machines

NAMAS Certificate

Clinometers and Talyvels can be supplied with a National Accreditation of Measurement and Sampling (NAMAS) Certificate, which gives an independent and authoritative traceable guarantee of instrument performance and accuracy. Regular servicing and NAMAS calibration will guarantee that the performance specification is maintained.

For further technical information please contact either your **Taylor Hobson** representative or our technical support centre, **Spectrum Metrology** on,
Tel: +44 116 235 8355
Fax: +44 116 235 8344
e-mail: spectrummetrology@compuserve.com

TECHNICAL DATA:TALYVEL 4

Measurement Range

Angle:	±600 seconds
Gradient:	±3mm/metre ±0.003in/inch
Readout Display:	4 digit LCD with polarity, decimal point and low battery indication. Analogue meter indicating tilt direction and indication of position in the range. With ±10 seconds fine range switchable.
System Accuracy:	within 0.2 second ±3% of reading
Response Time:	Settling time of display 2 seconds.
Battery Life:	Not less than 40 hours continuous use from fully charged state.
Working Temperature Range:	-5°C to +40°C
Ambient Storage Temperature (Instrument without batteries):	-20°C to +70°C
Standard Cable Length:	3.5metres (11.65ft)
Maximum Distance between Display Unit and Level Unit:	100m (300ft) or 800m (1/2 mile) with special leads. Standard lead 3.5m
Computer Compatibility:	RS232 and analogue output as standard
Power Supply: Meter and Level Unit:	Internally rechargeable
Mains Power:	110v, 120v, 220v, 240v. 50/60Hz selectable

Overall Dimensions

Level Unit:	Base 100mm x 32mm (4in x 1.25in) Height 80mm (3.2in)
Display Unit:	260mm x 135mm x 285mm (10.2in x 5.3in x 11.2in)
Approx Weight of Total System Level Unit:	1kg(2.2lbs)
Display Unit:	5kg (11.0lbs)

TECHNICAL DATA:CLINOMETERS

Measurement Range

TYPE Code	TB107 142/41	TB108 142/40	TB109 142/42 - PL8083	TB121 142/42	TB80 142/44	TB100 142/43
Angular Range	±180°	± 180°	±180°	0-360°	0-360°	0-360°
Reading to	1 min	1 min	1 min	1 min	0.2 sec	10 sec
The maximum permissible error between any 2 readings shall not exceed	2 min	2 min	2 min	1.5 min	5 sec	10 sec
Repetition of Fiducial Setting	Pendulum 1 min	Pendulum 1 min	Pendulum 1 min	Bubble 0.5 min	Bubble 0.2 sec	Bubble 2 sec
Illumination	Independent External	Independent External	Independent External	Independent External	Lamp	Independent External or Lamp

Overall Dimensions

	TB107 142/41	TB108 142/40	TB109 142/42 - PL8083	TB121 142/42	TB80 142/44	TB100 142/43
Length of Base	356mm (14 in)	152mm (6 in)	356mm (14 in)	143mm (5.6 in)	165mm (6.5 in)	165mm (6.5in)
Width of Base	38mm (1.5 in)	38mm (1.5 in)	38mm (1.5 in)	38mm (1.5 in)	70mm (2.75in)	76mm (3 in)
Overall Height	160mm (6.3 in)	160mm (6.3 in)	203mm (8 in)	147mm (5.8 in)	285mm (11.25 in)	215mm (8.5 in)
Weight	1.3kg (2.8 lb)	0.8kg (1.8 lb)	0.9kg (2 lb)	1.3kg (2.8 lb)	5.4kg (12 lb)	3.4kg (7.5 lb)

Taylor Hobson



ELECTRO-OPTICAL
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ELECTRO OPTICAL METROLOGY

Taylor Hobson has been selling electro-optical metrology products since the late 1930's and the range includes Micro Alignment Telescopes (used for checking and setting straightness and alignment) Autocollimators (for accurate measurement of small angular displacements), clinometers and "Talyvel" electronic levels. Used in a range of applications in industries such as machine tools, aerospace, marine and steel rolling, the Taylor Hobson range combines high accuracy and repeatability with fast response and operational convenience.

To provide focused technical support to all its electro-optical metrology customers, Taylor Hobson has a dedicated technical and marketing support centre:

Spectrum Metrology Ltd

Customers with electro-optical measurement needs often require not only equipment but also advice on solving a specific manufacturing or calibration problem. With many years experience in electro-optical metrology, Spectrum Metrology provides rapid technical and application support via phone, fax, e-mail or on-site visits. A full demonstration and training facility is available either on-site or in Spectrum Metrology's demonstration room.

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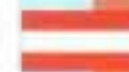
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