

FORMTRACER CS-3000



One system, dual performance – combined surface contour and roughness measurement from Mitutoyo

- Coordinate Measuring Machines
- Vision Measuring Systems
- Surface-, Form- and Contour-Measurement
- Optical Measuring
- Sensor Systems
- Hardness Measuring
- Digital Scale and DRO Systems
- Small Tool Instruments and Data Management

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Mitutoyo

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Mitutoyo

Twice as useful, half as expensive. Surface contour and roughness measurement in a single cycle.

Increase efficiency and reduce costs

Formtracer CS-3000 combines the technologies of surface contour and surface roughness measurement in a single space, time and cost saving system. Get all the benefits of being able to make both types of measurement, even where space is restricted. Formtracer CS-3000 – the perfect combination of efficiency and economy.

With an exceptionally advantageous price/performance ratio, Formtracer CS-3000 is liable to completely change your view of cost-effective quality assurance for these types of measurement. For the first time, surface contour and roughness measurement becomes a serious consideration for the production line, as well as the laboratory.

But that isn't all: by choosing Formtracer CS-3000 from Mitutoyo, you know you have chosen an instrument created and supported by the experience, competence and performance of a world-leading measuring technology specialist. And we know you will be delighted with our customer service.

Mitutoyo

■ Single alignment – dual measurement

Mitutoyo's Formtracer CS-3000 couldn't be easier to set up because the workpiece only has to be aligned once before making contour *and* roughness measurements. This means maximum efficiency with minimum expenditure.

■ High measuring speed

Time is money: but Formtracer CS-3000 achieves a remarkably high measuring speed because different ranges can be specified for surface contour evaluation and surface roughness analysis.

■ Resolution in the nm range

To be precise: Formtracer CS-3000 enables reliable surface contour and roughness analysis with ultra-high resolution – up to 0.8 nm in the Z axis.

■ Reducing running costs

And another good thing: with the Formtracer CS-3000 only one measuring system has to be calibrated instead of two – in contrast to using separate instruments for roughness and contour measurement. This reduces the running costs as significantly as it does the time spent on servicing and updating software.

■ One stylus for both kinds of measurement

Less is often more: on the Formtracer CS-3000 a single stylus perfectly measures surface roughness as well as surface contour – one more significant economy feature. Just as easy is how quick it is to change styli for individual measurement tasks.

■ Automated measuring cycles

Why complicate matters when there's an easy way. From contour tracing and evaluation through to roughness analysis and documentation of the results, Formtracer CS-3000 allows the whole measurement sequence to be fully automated, without any potentially confusing programming work being necessary. It's easy, logical and quick.

■ Ideal for production and laboratory

Multi-talented: most modern, separate systems designed for surface roughness and contour measurement are designed purely as laboratory systems – with a level of investment to match. In contrast, the favourable price/performance ratio of the Formtracer CS-3000 makes it ideal for use on the production line as well as for analytical purposes in the test room.

■ Standard software

Hard facts: the Formtracer CS-3000 is supplied with highly sophisticated FORMTRACEPAK software as standard with extensive functions for professional evaluation and documentation of surface roughness and contour measurement tasks.

■ Compliance to standards

Formtracer CS-3000 guarantees evaluation of surface roughness parameters in accordance with ISO EN DIN 4287, 3274 and 13565-1/2.

Dual measurement – versatile evaluation.

An example of a typical application of the Formtracer CS-3000: measuring and recording roughness and contour characteristics in a single, combined measurement cycle. Evaluation and documentation can be kept separate or combined.



• Standard configuration



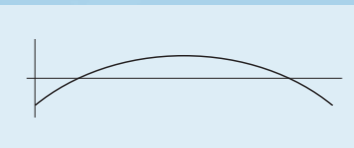
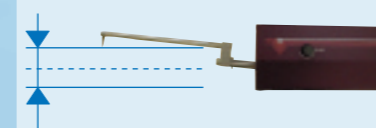
• Optional extension adaptor (12AAD564)
Used for measuring an internal surface of a large workpiece



• Control box for remote operation

**Contracer
CV-3000**

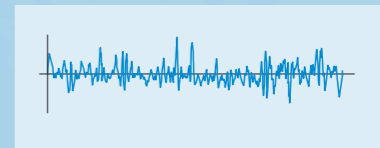
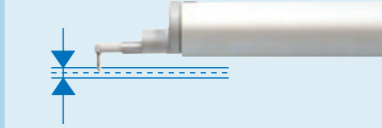
Z axis range: 50 mm (2")
Resolution: 0.2 μ m (8 microinch)



Contour

**Surftest
SV-3000**

Z axis range: 0.8 mm (0.03")
Resolution: 0.0001 μ m (0.004 microinch)



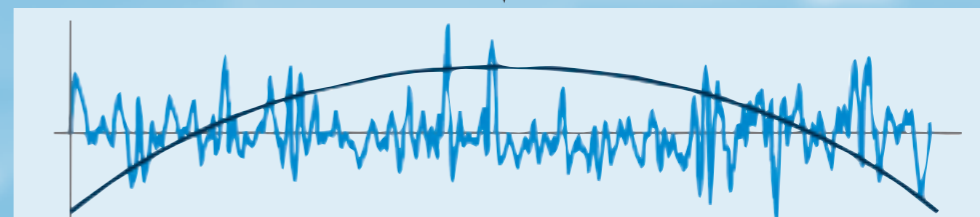
Roughness

FORMTRACER CS-3000

Contour and roughness

Z axis range:
5 mm (0.2")
0.5 mm (0.02")
0.05 mm (0.002")

Resolution:
0.08 μ m (3 microinch)
0.008 μ m (0.3 microinch)
0.0008 μ m (0.03 microinch)



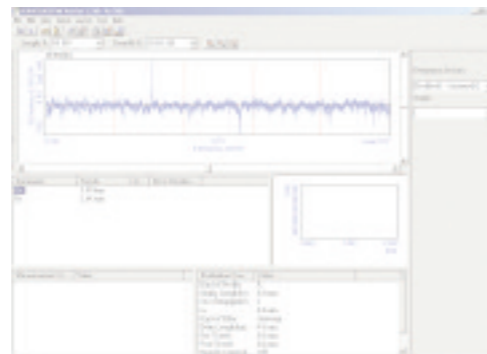
FORMTRACEPAK

Extra powerful standard software.

The complete program: surface roughness and contour analysis at a glance

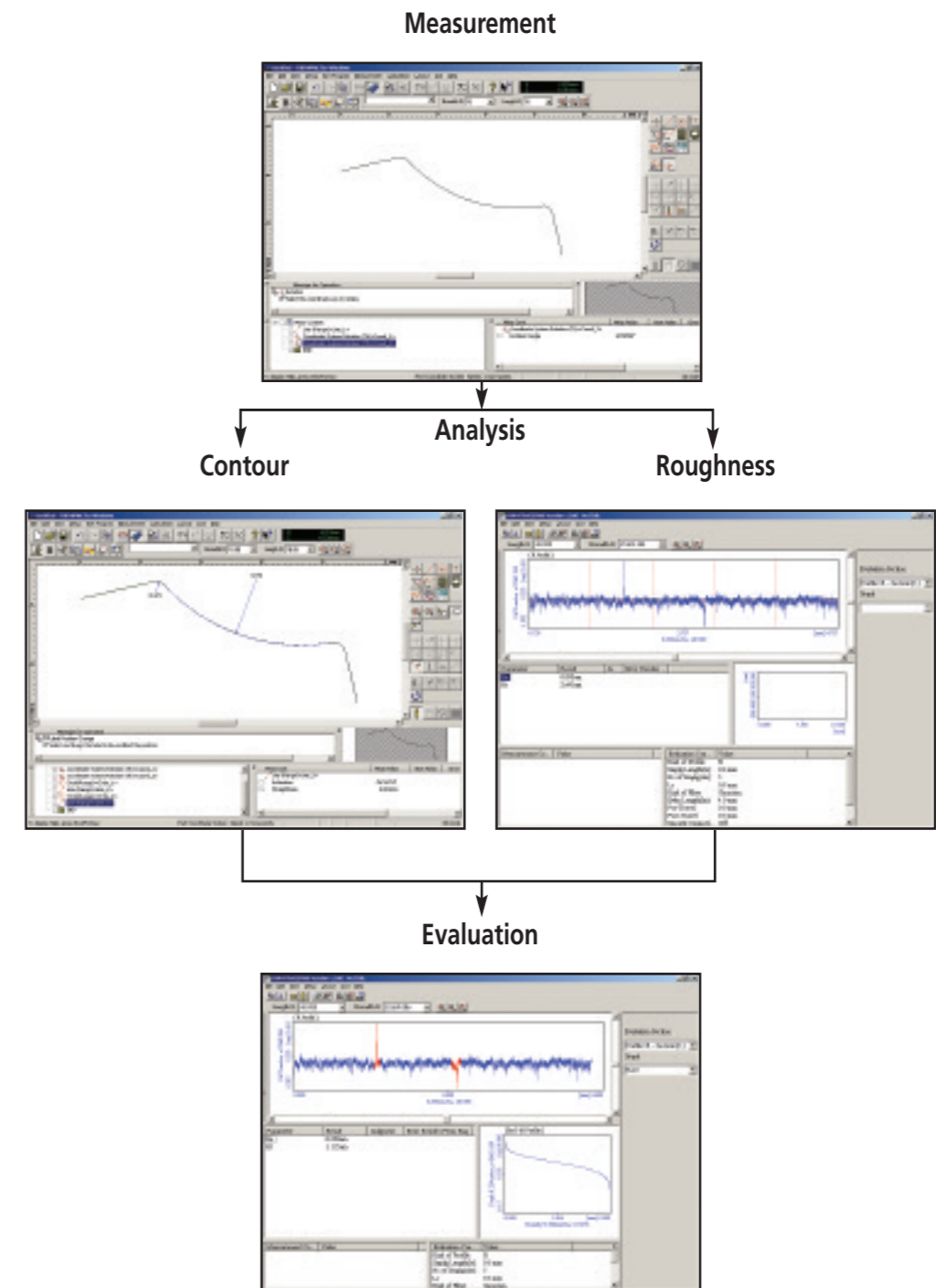
Easy to use, versatile, highly practical: with FORMTRACEPAK standard analysis software, the Formtracer CS-3000 becomes a real all-round star performer in terms of user-friendly operation and professional evaluation. FORMTRACEPAK combines the functions and capabilities of the tried and tested Mitutoyo FORMPAK software for surface contour measurement and SURFPAK for surface roughness analysis.

FORMTRACEPAK stores results and creates displays separately for roughness and contour measurements but presents a combined evaluation of both in a single report. Of course, with FORMTRACEPAK you can also create your own customised layouts and report headers as well as include bitmap files – your company logo, for example.



Features & Benefits

- Operation under MS Windows®
- Reads DXF and IGES format files
- Exports DXF and IGES format files
- Graphic setpoint/actual value comparison
- Evaluates measured data for DXF or IGES specified contours
- Creates customised reports
- Runs part programs
- Edits part programs
- Allows user-defined settings
- Displays informative graphics during measurement
- Controls measuring system by software and joystick
- Outputs in user-definable format (report, ASCII, CSV)
- Combines individual measurements
- Represents and evaluates several contours and surfaces on one screen
- Best-fit function for setpoint/actual value comparison and part program measurement
- Complies with international standards
- Easy-to-use calibration
- Straightness compensation
- Post-calculation function
- Data compensation
- Contour tolerance function
- Icon processing
- Clear, highly practical data management

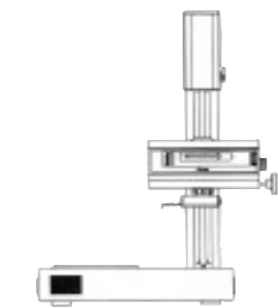


Technical Data.

Code No.	inch / mm	525-790E*
Measuring range/resolution	X axis	100 mm (4") / 0.05 μm (2 microinch)
	Z axis	5 mm (0.2") / 0.08 μm (3 microinch); 0.5 mm (0.02") / 0.008 μm (0.3 microinch); 0.05 mm (0.002") / 0.0008 μm (0.03 microinch)
Accuracy (at 20°C)	X axis	± (1 + 2L / 100) μm, ± (40 + 20L) microinch, L= measuring length in mm
	Z axis	±3 μm (120 microinch) / 5 mm (0.2")
Straightness tolerance	X axis	0.2 μm (8 microinch) / 100 mm (4")
Measuring system	Measuring speed	Surface: 0.02 mm/s (0.0008 inch/s), 0.05 mm/s (0.002 inch/s), 0.1 mm/s (0.004 inch/s), 0.2 mm/s (0.008 inch/s); 4 steps
		Contour: 0.02 mm/s (0.0008 inch/s), 0.05 mm/s (0.002 inch/s), 0.1 mm/s (0.004 inch/s), 0.2 mm/s (0.008 inch/s), 0.5 mm/s (0.02 inch/s), 1.0 mm/s (0.04 inch/s); 6 steps
	Traverse speed	0.1 mm/s (0.004 inch/s) to 1.5 mm/s (0.06 inch/s)
	Column range	300 mm (12"), motorised
	Inclining range	±45°
Stylus system	Measuring method	Differential inductive
	Measuring force	0.75 mN
	Standard stylus roughness	Radius: 2 μm (80 microinch) Angle: 60° Material: diamond
	Standard stylus contour	Radius: 25 μm (0.001") Angle: 30° Material: sapphire
Data communication		via RS-232C interface
Working temperature		15 to 25 °C
Power supply		100 - 240 VAC
Power consumption		150 VA maximum (not including PC and printer)
Mass	Measuring unit	140 kg
	Control unit	6.5 kg
	Control box	0.8 kg

Note: To specify the line voltage required add the following suffixes (e.g. 525-780A). A for 120 VAC, C for 110 VAC, D for 220 VAC, E for 240 VAC. No suffix is required for 100 VAC.

* Not using the extension adaptor (12AAD564).



Measuring unit:
710 x 450 x 905 mm



Control box:
245 x 116 x 78 mm

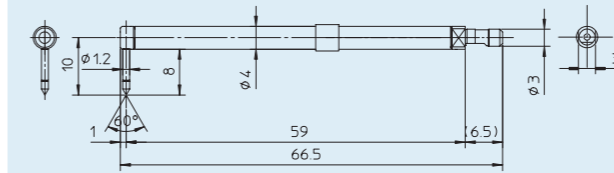


Control unit:
180 x 380 x 300 mm

Standard stylus: Code No. 12AAD554

(Unit: mm)

Radius: 2 μm (80 microinch)
Angle: 60°
Material: diamond

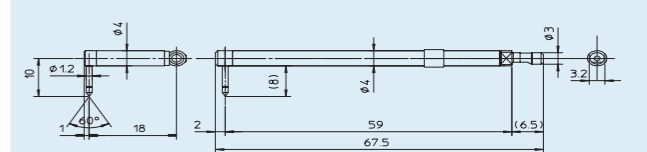


For contour and roughness measurement
Maximum measurable depth: 7 mm (0.27")

Eccentric stylus: Code No. 12AAD558

(Unit: mm)

Radius: 2 μm (80 microinch)
Angle: 60°
Material: diamond

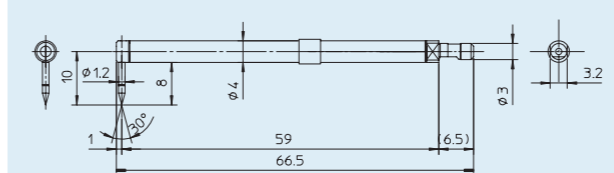


For contour and roughness measurement
Maximum eccentricity: 18 mm (0.7")

Conical stylus: Code No. 12AAD552

(Unit: mm)

Radius: 25 μm (0.001")
Angle: 30°
Material: sapphire

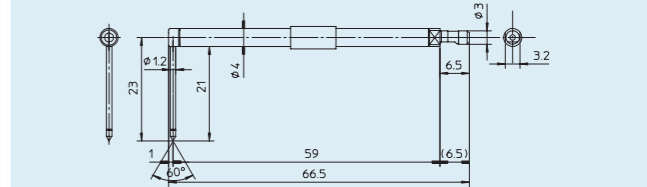


For contour measurement
Maximum measurable depth: 7 mm (0.27")

Stylus for grooves: Code No. 12AAD560

(Unit: mm)

Radius: 2 μm (80 microinch)
Angle: 60°
Material: diamond

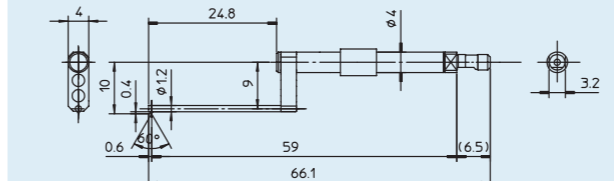


For contour and roughness measurement
Maximum measurable depth: 15 mm (0.59")

Stylus for bores: Code No. 12AAD556

(Unit: mm)

Radius: 2 μm (80 microinch)
Angle: 60°
Material: diamond

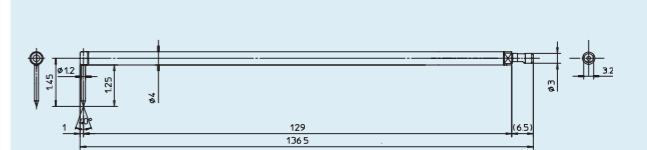


For contour and roughness measurement
Minimum bore diameter: 2 mm (0.079")

Double-length stylus: Code No. 12AAD562

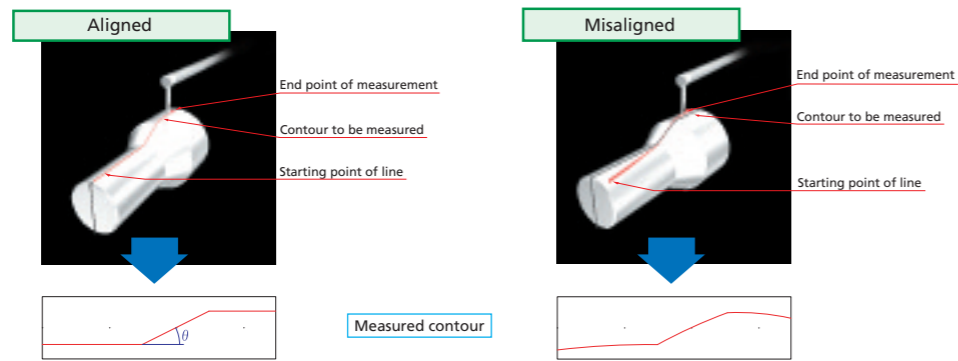
(Unit: mm)

Radius: 5 μm (200 microinch)
Angle: 40°
Material: diamond



For contour and roughness measurement
Maximum measurable depth: 20 mm (0.39")

Levelling tables.



Manual levelling 3-axis adjustment table (Level, swivel, Y axis)

This table easily allows you to make small corrections to the alignment of the workpiece manually, so that the measurement error which would otherwise occur due to misalignment is avoided. Prior to making the actual measurement, the precise position of the workpiece is first determined by the measuring system and then you manually adjust the integrated Digimatic micrometers until the workpiece is aligned with the machine axes. The software provides guidance on which micrometers to turn, the direction of turn and the amount of turn needed to produce the necessary corrections in levelling, swivel and Y axis displacement for perfect workpiece alignment on the Formtracer CS-3000.

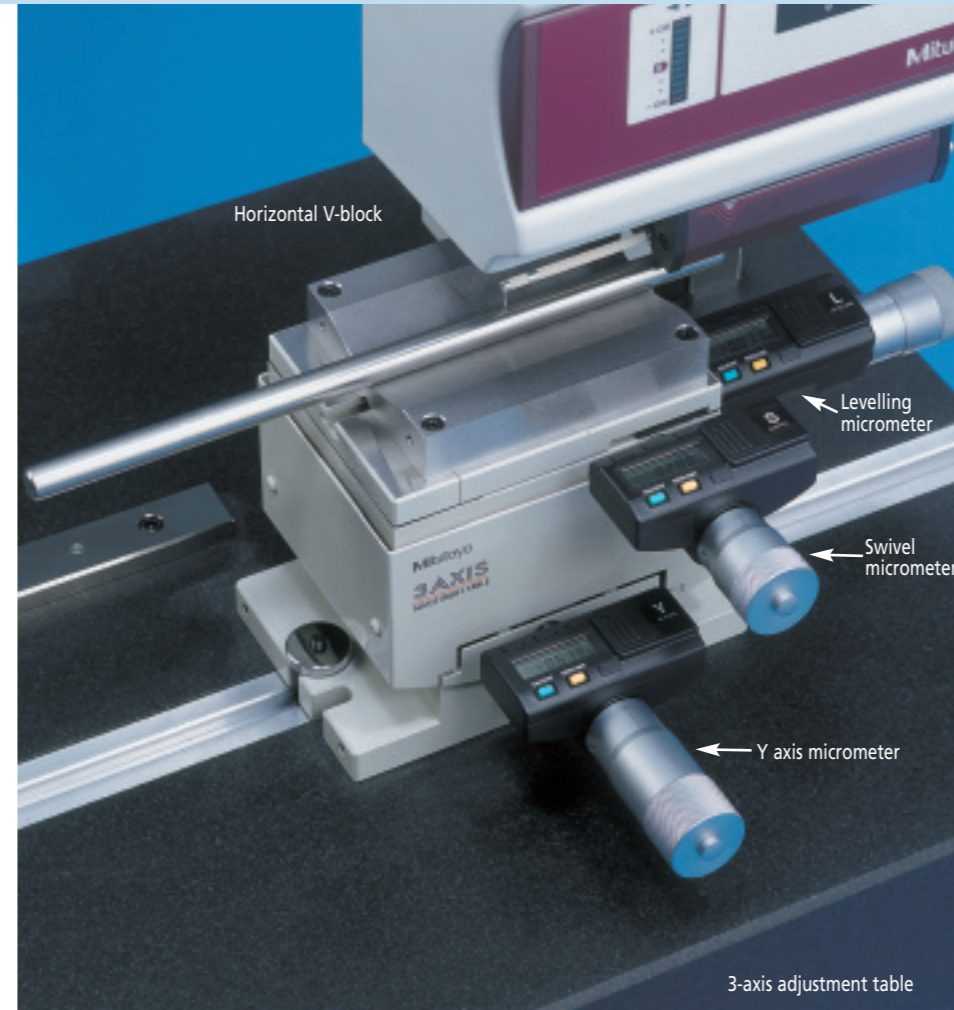
Code No.	178-047
Table surface size	130 x 100 mm
Maximum loading	15 kgf
Workpiece diameter	1 to 160 mm
Pitch adjustment	±1.5°
Tilt adjustment	±2°
Y axis adjustment	±12.5 mm
Height	152.5 mm
Mass	9 kg
Note	V-block (Code No. 998291) is supplied as standard equipment

Automatic levelling table (Only auto levelling)

This table makes small corrections to the alignment of the workpiece automatically, so that the measurement error which would otherwise occur due to misalignment is avoided. It uses innovative Mitutoyo technology, patented in Japan, to produce perfect workpiece alignment. In operation, the precise position of the workpiece is first determined by the measuring system and then the software automatically calculates and implements the adjustments needed prior to making the actual measurement. This unique system ensures optimum workpiece alignment and positioning within the measuring range of the Formtracer CS-3000. The table is available in two sizes.



Code No.	178-027	178-028
Table surface size	130 x 100 mm	280 x 250 mm
Levelling range	±2°	±2°
Maximum loading	7 kgf	20 kgf
Dimensions (W x D x H)	135 x 105 x 57 mm	287 x 252 x 85 mm



Rotary vice Code No. 218-003

- Simultaneous sliding-jaw type
- Capacity: 60 mm
- Graduation: 1°



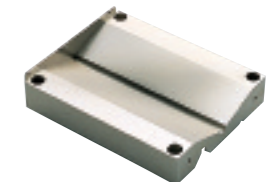
V-block with clamp Code No. 172-234

- For use with a cross-traverse table or a fixed table
- Maximum workpiece diameter: 50 mm



XY levelling table (Digimatic version) Code No. 178-042-1

- Table surface: 130 x 100 mm
- Levelling range: ±1.5°
- XY travel range: ±12.5 mm
- Maximum loading: 15 kgf



Horizontal V-block Code No. 998291

- Workpiece diameter: 1 to 160 mm
- Can be mounted on a levelling table
- Mass: 1.2 kg



Step-height reference specimen Code No. 178-611

- Steps: 2 µm, 10 µm



Cross-traverse table Code No. 218-001

- Table surface: 280 x 180 mm
- XY travel range: 100 x 50 mm
- Maximum loading: 30 kgf



Precision vice Code No. 178-019

- Capacity: 36 mm (1.42")
- Can be mounted on a levelling table
- Mass: 1.2 kg



Vibration isolator Code No. 178-025

- Dimensions (W x D x H): 750 x 550 x 59 mm
- A stand for the vibration isolator is available (Code No. 178-024)