


CONTOUR MEASUREMENT

PRE 1163 (5)



Quality assurance with profile:
Contour measuring machines from Mitutoyo

Mitutoyo



Quality testing without ifs and buts...

...just winners and losers.

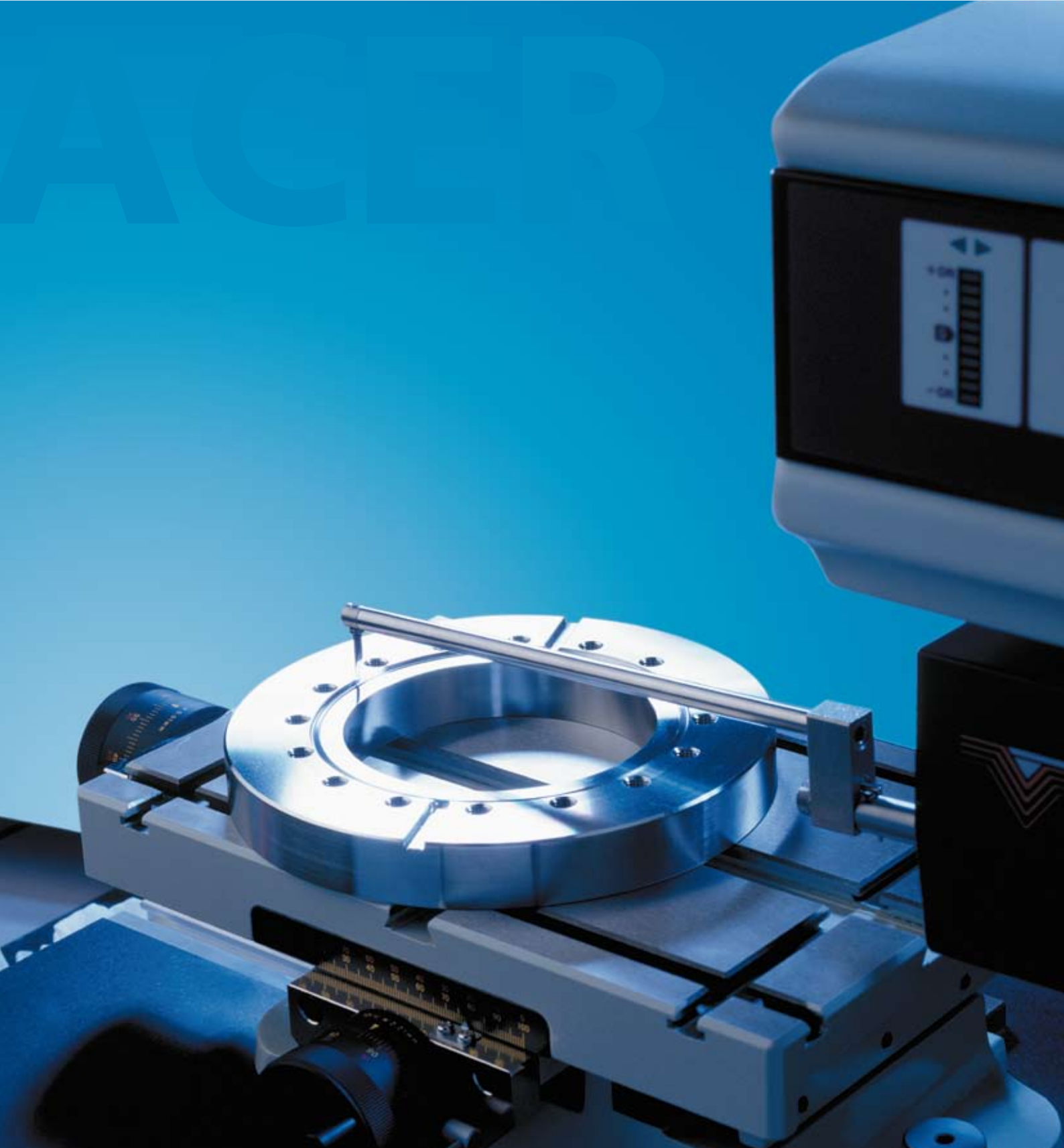
Anyone who is unable to guarantee compliance with the most stringent standards will soon find themselves without a future in this competitive world. Absolutely perfect measurement technology is therefore essential for lasting success.

The detection and evaluation of contours is particularly demanding work. As the most versatile supplier of production measuring technology in the world, Mitutoyo sets the standard in know-how and experience – with an intelligently-structured range of sophisticated solutions for modern contour measurement. Here users seeking high performance results will find a tailor-made configuration for the perfect evaluation of profiles in production and in the laboratory.

This brochure gives you an overview of the Mitutoyo range of contour measurement machines – from practical mobile devices through to high-end systems with holoscale technology for automatic high-volume measurement. You will quickly be able to focus in on the best solution for you and your own particular measurement tasks. You can then request to see more detailed brochures on the configuration of your choice, together with the varied range of accessories and software available.

Whatever you choose: with a Mitutoyo contour measuring system, you will secure the experience, competence and performance of an international technology leader, and customer-oriented service worth getting excited about.

CONTOUR MEASURING
MACHINES



Individual solutions, sophisticated technologies, convincing concepts: contour measurement with Mitutoyo competence.

Model

Description

CONTRACER CV-1000

Transportable device with digital glass scale, also in the Z axis. For portable high precision contour measurement. Digital recording of measured values in the X and Z axes – the only system in its class.



CONTRACER CV-1000

CONTRACER CV-2000

Economic stationary contour measurement in production and in the laboratory. Compact, robust desk-top machine available in manual or automatic versions.



CONTRACER CV-2000

CONTRACER CV-3100

Powerful system for automatic high-volume measurement. With even greater precision in all axes for difficult stationary contour testing in the production environment or in the test room.



CONTRACER CV-3100

CONTRACER CV-4100

This system has a highly accurate laser holoscale in the Z1 axis. The length measurement deviation is $\pm (0.8 + 0.5H / 25\mu\text{m})$.



CONTRACER CV-4100

Combined measurement machines:

FORMTRACER

The machines in Mitutoyo's Formtracer series combine the technologies of surface and contour measurement in a single space-saving system. In this way you obtain the capabilities of both processes, even where space is restricted. All information on these efficient, economical systems can be found in the separate Formtracer brochure.



FORMTRACER

Mitutoyo offers a wide range of models for various applications.

Device-specific features

- High resolution throughout the measuring range
- Comes as standard with FORMPAK software and PC connection
- Digital recording of measured values in the X and Z axes

- Comes as standard with FORMPAK software and PC connection
- Digital recording of measured values in the X and Z axes
- Feed inclination adjustment $\pm 45^\circ$

- Motorised Z axis
- Digital recording of measured values in the X and Z1 axes
- USB interface for rapid data transmission to the PC
- Including FORMPAK measurement and analytical software
- Feed inclination adjustment $\pm 45^\circ$
- ABS scale in the Z2 axis

- Motorised Z axis
- Digital recording of measured values in the X and Z1 axes
- USB interface for rapid data transmission to the PC
- Including FORMPAK measurement and analytical software
- Feed inclination adjustment $\pm 45^\circ$
- Laser holoscale in the Z1 axis
- ABS scale in the Z2 axis

Model	Measuring range X/Z axis	Height adjustment	Base plate dimensions
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CV-1000 N2	50 / 25 mm	optional	optional
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CV-2000 M4	100 / 40 mm	320 mm	man.	600x450 mm
CV-2000 S4	100 / 40 mm	320 mm	mot.	600x450 mm

CV-3100 S4	100 / 50 mm	300 mm	mot.	600x450 mm
CV-3100 H4	100 / 50 mm	500 mm	mot.	600x450 mm
CV-3100 W4	100 / 50 mm	500 mm	mot.	1000x450 mm
CV-3100 S8	200 / 50 mm	300 mm	mot.	600x450 mm
CV-3100 H8	200 / 50 mm	500 mm	mot.	600x450 mm
CV-3100 W8	200 / 50 mm	500 mm	mot.	1000x450 mm

CV-4100 S4	100 / 50 mm	300 mm	mot.	600x450 mm
CV-4100 H4	100 / 50 mm	500 mm	mot.	600x450 mm
CV-4100 W4	100 / 50 mm	500 mm	mot.	1000x450 mm
CV-4100 S8	200 / 50 mm	300 mm	mot.	600x450 mm
CV-4100 H8	200 / 50 mm	500 mm	mot.	600x450 mm
CV-4100 W8	200 / 50 mm	500 mm	mot.	1000x450 mm

Man: manual
Mot: motorised

Contracer CV-1000

Mobile contour measurement with stand-alone performance.

CV-1000

Measuring range:

X	50 mm
Z	25 mm

Resolution:

X axis	0.2 μm
Z axis	0.4 μm

Length measurement deviation:

X axis	(3.5+0.02L) μm
Z axis	$\pm 3.5 + 14\text{HI} / 25$ μm

Contracer CV-1000

Sophisticated digital technology for portable recording and evaluation of profiles – with the precision and performance of stationary systems.

- Simple, rapid measurement and evaluation and printing of the measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Straightness deviation of the X axis 3.5 $\mu\text{m}/50$ mm
- Glass scale in the X axis
- Glass scale also in the Z axis
- Glass scale on Z axis for optimised accuracy adapted to radial movement of the probe arm
- FORMPAK powerful measurement and analytical software
- Integral interface on the measurement system
- Data transmission via USB interface
- Display unit for interim storage of recorded contours in mobile use (optional)
- Optional stand for stationary use
- Wide range of accessories



FORMPAK software: measurement screen



FORMPAK software: evaluation screen



mobile



Contracer CV-2000

The state of the art in economical measuring.

CV-2000

Measuring range:

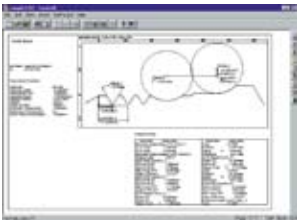
X	100 mm
Z	40 mm

Resolution:

X axis	0.2 μm
Z axis	0.5 μm

Length measurement deviation:

X axis	$(3.5+0.02L) \mu\text{m}$
Z axis	$\pm(3.5+14HI/25) \mu\text{m}$



FORMPAK software: report editor

Contracer CV-2000:

Stand-alone contour measuring machine with convincing price-performance ratio. Efficient in production or the laboratory, in every respect.

- Simple, rapid measurement and evaluation and printing of the measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Feed inclination $\pm 45^\circ$
- Rapid adjustment of the X axis (feed)
- Straightness deviation of the X axis $3.5 \mu\text{m}/100 \text{ mm}$
- Glass scale in the X axis
- Glass scale also in the Z axis
- Glass scale on Z axis for optimised accuracy adapted to radial movement of the probe arm
- FORMPAK powerful measurement and analytical software
- Integral interface on the measurement system
- Data transmission via USB interface
- Wide range of accessories
- Manual or motorised versions



Mitutoyo

precise



CONTRACER CV-3100

Top technology for automatic contour measurement.

CV-3100

Measuring range:

X	100/200 mm
Z1	50 mm
Range of travel	Z2 300/500 mm

Resolution:

X axis	0.05 μm
Z1 axis	0.2 μm
Z2 axis	1.0 μm

Length measurement deviation:

X axis	$\pm(1+0.01L)$ μm
Z1 axis	$\pm(2+ 4H /100)$ μm

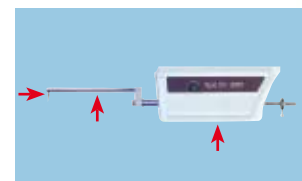


FORMPAK software: graphic setpoint/actual comparison

CONTRACER CV-3100:

Powerful stand-alone system for automatic high-volume use in measuring room and laboratory. With motorised Z column, ceramic straightness guide on the X axis and automatic raising and lowering of the probe tip.

- Simple, rapid measurement and evaluation and printing of the measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Feed inclination $\pm 45^\circ$
- Ceramic straightness guide on the X axis
- Straightness deviation of the X axis (0.8 $\mu\text{m}/100$ mm)
- Glass scale in the X axis
- Glass scale also in the Z1 axis (probe stroke)
- Motorised Z column
- Automatic raising and lowering of the probe tip
- Joystick
- FORMPAK powerful measurement and analytical software
- Data transmission via USB interface
- Wide range of accessories
- ABS scale in the Z2 axis
- Rapid traversing speed
- Automatic calibration function
- Collision prevention
- Supports CNC functions



Collision prevention



Mitutoyo

automatic

ABSOLUTE™

Absolute System Patented by MITUTOYO



™ see page 16

CONTRACER CV-4100

No compromise.

maxim

CV-4100

Measuring range:

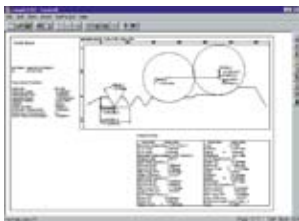
X	100/200 mm
Z	50 mm
Range of travel Z2	300/500 mm

Resolution:

X axis	0.05 μm
Z1 axis	0.05 μm
Z2 axis	1.0 μm

Length measurement deviation:

X axis	$\pm(0.8+0.01L)$ μm
Z1 axis	$\pm(0.8+ 0.5H /25)$ μm

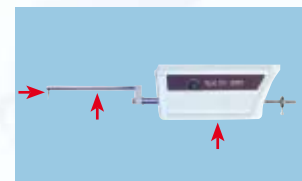


Software FORMPAK: Protokoll-Editor

CONTRACER CV-4100:

This stationary high-end system has a laser holoscale in the Z1 axis that enables a length measurement tolerance of just $\pm(0.8+ 0.5H H/25)$ μm .

- Simple, rapid measurement and evaluation and printing of the measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Feed inclination $\pm 45^\circ$
- Ceramic straightness guide on the X axis (feed)
- Straightness deviation of the X axis 0.8 $\mu\text{m}/100$ mm
- Glass scale in the X axis
- Laser holoscale in the Z1 axis
- Motorised Z column
- Automatic raising and lowering of the probe tip
- Joystick
- FORMPAK powerful measurement and analytical software
- Data transmission via USB interface
- Wide range of accessories
- ABS scale in the Z2 axis
- Automatic calibration function
- Fast traversing speed
- Collision prevention
- Supports CNC functions



Collision protection



Mitutoyo

num precision

ABSOLUTE™
Absolute System Patented by MITUTOYO



™ see page 16



MiCAT

Mitutoyo Intelligent Computer Aided Technology

the standard in world metrology software

FORM

Professional Software



Expansion module

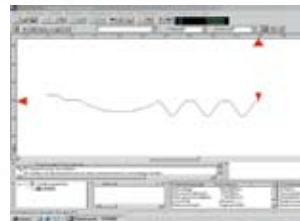
MeasurLink

Module for statistical measurement data processing and analysis, and storage of measured data.

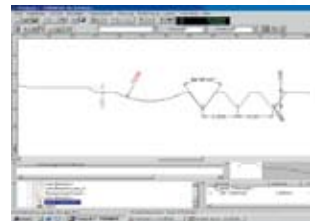
- Runs under MS Windows
- Reading in of DXF and IGES formats is possible
- Outputting of DXF and IGES formats is possible
- Graphic setpoint/actual comparison
- Evaluation of measured data against DXF or IGES setpoint contours
- Individual preparation of reports
- Reading in of bitmap files
- Automatic parts program sequence
- Editing of parts programs
- User-defined settings
- Graphic representation during contour detection
- Control of the measurement system using software and joystick
- Individual outputting of results (report, ASCII, CSV)
- Linking of individual contours
- Representation and evaluation of several contours on one screen
- Best fit function for graphic setpoint/actual comparisons and parts program measurement

FORMPAK

Measuring, evaluation and complete documentation: with FORMPAK, the high-end software from Mitutoyo. Comes as standard with all CONTRACER systems, at no extra cost and with impressive range of features - a real bonus. For professional contour measurement with best results.



Contour recording during measurement



Evaluation



Report editor



Mitutoyo

Optional accessories

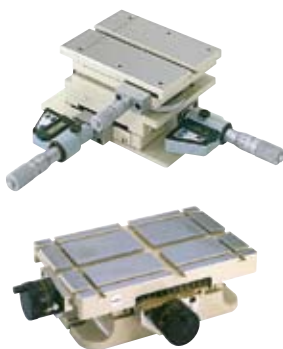
Optional

Measuring arms		CV-1000	CV-2000	CV-3100	CV-4100
Straight					
Angled					
For small diameters		—	—		
For small diameters				—	—

Measuring probes

Flattened on one side	Cross-grinding	Conical				
Knife-edge	Ball	Diamond tip				
For small diameters			—	—		
			—	—		
					—	—

Crossed table



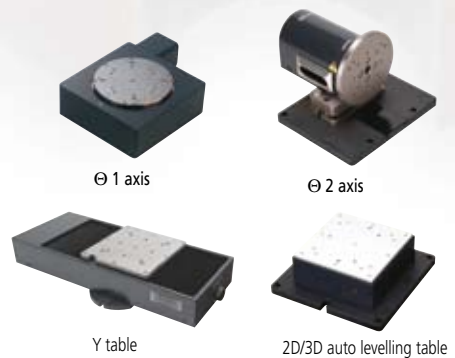
Vices



Calibration set



Accessories for supporting CNC functions of CV3100/CV4100



Please ask for our other general brochures!



ROUNDFORM MEASUREMENT

Individual solutions for perfect measurement of rotationally-symmetrical workpieces – from particularly easy-to-operate compact instruments with an integral printer through to the high-accuracy class reference model.



SURFACE MEASUREMENT

Mitutoyo presents an intelligently structured product range of sophisticated solutions for modern surface testing. Discerning clients will find here the configuration to meet their needs, for thoroughly perfect roughness and waviness measurements – both in production and in the laboratory.



CONTOUR AND SURFACE MEASUREMENT

The machines in the Formtracer series combine the technologies of contour and surface measurement in a single space, time and cost saving system. This reaps the benefits of both methods, even where space is limited, with efficiency and economy in perfect combination.

ABSOLUTE™

Absolute System Patented by MITUTOYO

Not only has Mitutoyo developed, patented and perfected its ABSOLUTE System. Mitutoyo is the only supplier in the world to translate original Absolute technology into calliper gauges, dial gauges, touch probes and numerous external screw type micrometers.

Devices fitted with this system will operate without constantly having to start back at zero. Reference back to zero is automatic and the absolute value of the length being measured can therefore be indicated at any point. This means that you only once start at zero, which the instrument automatically remembers, even when it is switched off. When it is reactivated, you can continue measuring from any point – without having to restart from zero – absolutely error-free.

To put it more simply, Absolute instruments don't count. They always "know" where they are at any one point. They don't "traverse" a length to be measured in the way that conventional instruments do. Rather, they "see" them. This ensures precise, convenient and time-saving work in every situation.

Registered Mitutoyo patents					
Patent no.	US4879508	US4878013	US5053715	US6329813	US6400138
	JP1783035	JP1783036	JP1745485	JP3436510	JP1745486
	EP0248165	EP0404980	EP0240020	EP1014041	
	CN87102580	CN87102624	CN89106051		

Mitutoyo patents applied for

Patent no. CN1272620

* Correct at time of printing: May 2006

Note:

All our product details, in particular the illustrations, drawings, dimensional and performance details and other technical specifications contained in this publication are to be considered to be approximate average values. To this extent, we reserve the right to make changes in design, technical data, dimensions and weight. Our specified standards, similar technical rules and technical specifications, descriptions and illustrations of the products are correct at the time of printing. The current version of our general terms and conditions also apply. Only offers which we have submitted can be considered to be definitive.

Coordinate Measuring Machines	=====
Vision Measuring Systems	=====
Form Measurement	=====
Optical Measuring	=====
Sensor Systems	=====
Test Equipment and Seismometers	=====
Digital Scale and DRO Systems	=====
Small Tool Instruments and Data Management	=====

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