PH-3515F

SERIES 172 – Profile Projector

- Bench-top model based on a horizontal optical system.
- Suitable for thread pitch measurements – blurred or distorted images will not be produced when workpiece is angled.
- Erect image on the day-bright screen.
- 353 mm diameter protractor screen with cross hairs and staggered lines for easy alignment.
- Digital angle measurement to 1' or 0.01°.
- Heavy-duty XY stage incorporates linear scales for fast, accurate measurement.

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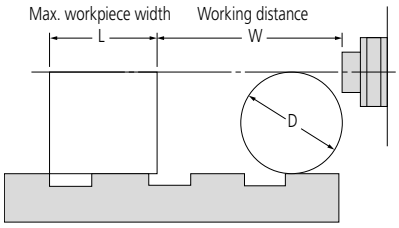
172-868E

Technical Data

Projected image:	Erect
Protractor screen	
Effective diameter:	353 mm (13.9")
Screen material:	Fine-ground glass
Screen rotation:	±360°, fine feed and clamp
Angle reading:	Digital counter (LED) Resolution: 1′ or 0.01° (switchable) Range: ±370° ABS/INC mode switching, Zero Set
Reference lines:	Cross hairs
Projection lens:	10X (**172-184**) Optional: 5X, 20X, 50X, 100X
Magnification accuracy	
Contour illumination:	±0.1% or better
Surface illumination:	±0.15% or better
Maximum workpiece height:	Refer to *Projection Capacity* below
Power supply:	240VAC ±10%, 50/60Hz

Projection Capacity



D: Max. workpiece diameter whose peripheral line can be focussed on the screen centre

Unit: mm

	Magnification				
	5X	10X	20X	50X	100X
View field	ø70.6	ø35.3	ø17.65	ø7.06	ø3.5
W	160 (64)	93 (35)	40	14.6	9.5
H	175	235		80	109
D	152.4		116	30.4	19

( ): When using surface illumination.

Optional Accessories

Code No.	Description	
172-000-100	Stand for PH-3515F	
172-116	Standard scale (50 mm)	
172-117	Standard scale (2")	
172-118	Reading scale (200 mm)	
172-119	Reading scale (8")	
172-145	5X projection lens set	
172-161	Reading scale (300 mm)	
172-162	Reading scale (12")	
172-165	50X projection lens set	
172-166	100X projection lens set	
172-173	20X projection lens set	
172-184	10X projection lens set	
172-286	Green filter	
172-423	Illumination unit	
332-151	OPTOEYE-200 image edge sensor*	
011534	MC special cleaner	
383228	Vinyl cover	
512305	Halogen bulb (24V, 150W)	
12AAA807D	RS-232C cable	
12AAF182	Digital counter stand	
12BAA637	Halogen bulb (24V, 200W)	

Fixture and stage accessories refer to page J-30.
QM-Data200 2D data processing unit refer to page J-28.
KA Counter digital counter refer to page H-10.

* For details refer to page J-29.

Specifications

Model		PH-3515F
Code No.		**172-868E**
XY stage travel range		254 x 152 mm
Measurement method		Linear encoder
Resolution		0.001 mm or .0001" / 0.001 mm (using optional KA counter)
Focussing method		Manual
Quick-release mechanism		X axis
XY stage top size		450 x 146 mm
Swivel function		±10°
Maximum stage loading		45 kg
Contour illumination	Light source	Halogen bulb (24V, 150W)
	Optical system	Telecentric
	Functions	2-step (high/low) brightness switch, heat-absorbing filter, cooling fan
Surface illumination	Light source	Halogen bulb (24V, 200W)
	Optical system	Vertical illumination
	Functions	Adjustable condenser lens, vertical/ oblique surface illumination selectable, heat-absorbing filter, cooling fan
Mass		150 kg

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Optional Accessories

SERIES 264 – QM-Data200 2D Data Processing Unit for Profile Projectors

- The QM-Data200 is a geometric readout/analysis unit for optical instruments such as profile projectors and measuring microscopes.
- This unit features powerful 2D coordinate measurement capabilities with easy-to-use key operation.
- The QM-Data200 improves operator productivity, minimizes errors and saves total measurement time and production cost.
- Informative graphic displays on the large LCD screen make for easy measurement operations.
- One-key operation for combined measurements that are often used (circle-circle distance, etc.).
- The AI measurement function (Automatic Identification of measuring item) eliminates switching between the measurement command keys.
- Equipped with a measurement procedure teaching function and measuring position navigation in Repeat mode.
- The user-menu function allows the user to store measurement commands or part programs to create custom menus.
- Tolerance zone measurement of data processing results and various statistical processing routines for each item are available.
- Measurement result output in spreadsheet (CSV) format.
- Two models are available for profile projectors: a stand mounted type with a tilt system and a flexible-arm type that attaches to the side of the instrument next to the screen.

Technical Data

Program functions:	Part program creation, execution, editing
Statistical processing:	Number of data, maximum value, minimum value, mean value, standard deviation, range, histogram
Element memory:	Maximum of 1000 elements
Element recall:	Point, line, circle, distance, ellipse, rectangular hole, slotted hole, intersection and intersecting angle
Element key-in:	Point, line, circle
Display system:	Colour graphic TFT LCD
Measurement result file output:	RS-232C output (CSV format, MUX-10F format)
Display language:	Japanese/English/German/French/ Italian/Spanish/Portuguese/Cheskey/ Chinese (simplified/traditional), Korean
Data input:	RS-232C, X/Y/Z-axis signal, footswitch
Data output:	RS-232C, printer
Power supply:	240VAC ±10%, 50/60Hz

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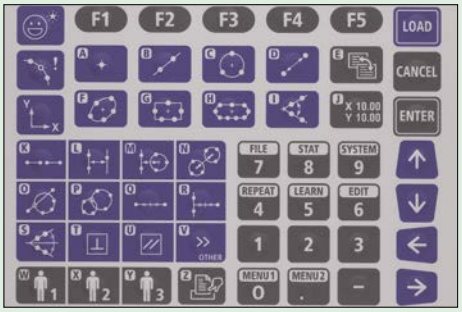
264-156E Flexible-arm type.

264-155E Stand mounted type

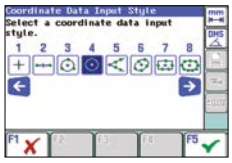


Intuitive panel design
The QM-Data200 employs Geometry Keys to accelerate the measurement process. The routine of probing geometric features and combinations is implemented from these dedicated keys on the front panel. Simply clicking a key and then capturing the feature coordinates means you can complete the measurement quickly and accurately. This improves operator productivity, reduces errors and saves operation time and cost.

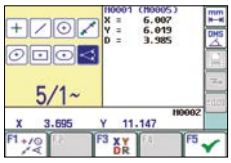
Specifications

Model No.		QM-Data200	
Code No.		264-155E	264-156E
Type		Stand mount	Flexible arm
Unit of measurement	Length	mm	
	Angle	Switchable between decimal degree and sexagesimal notation	
Resolution		0.1 µm	
Display unit		Colour graphic LCD (equipped with a backlight)	
External dimensions (W x H x D)		260 x 242 x 310 mm (including the stand section)	318 x 153 x 275 mm (when the arm is horizontal)
Mass		Approx. 2.9 kg	Approx. 2.8 kg

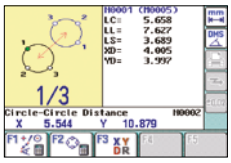
Graphic display
Measurement information and data are visualized on the back-lit LCD colour display with graphical interfaces. The geometric feature selected is displayed with the probing navigator. The measurements map and blink indication show the probing points and sequences. Simply probe points and click by following the blink indicator. Measurements can be easily completed even by a beginner. This improves operation accuracy and reduces errors and measurement time.



Clear function icons.



Coloured LCD display with backlight.



Guided measurements.

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Optional Accessories

SERIES 332 – OPTOEYE-200 Image Edge Sensor for Profile Projectors

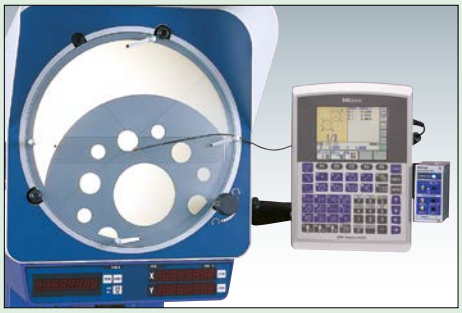
- The OPTOEYE-200 Image Edge Sensor eliminates the human error that can occur with visual alignment when using the cross hairs for edge location, thus ensuring speedy, accurate, and consistent measurements, regardless of the operator's skill level.
- Bright and dark buttons allow easy calibration.
- A thin fibre-optic cable for the detector connection allows easy set-up and use without obstructing the operator's vision.
- OPTOEYE is conveniently powered from the QM-Data200 via the connecting cable.

332-151

Detector attachment (optional)

Optional Accessories

Code No.	Description	
12AAE671	Sensor attachment A (for ø250 to ø350 mm screen of PJ-A3000 and PH-3515)	
12AAE672	Sensor attachment B (for ø500 to ø600 mm screen of PV-5110)	



Locating the edge of a hole.

Specifications

Code No.		332-151
Image detection	Directivity	Non-directional
	Minimum diameter	ø2 mm on the screen
	Minimum width	1 mm on the screen
	Maximum capture speed	1000 mm/s
Illumination	Type	Surface/Contour
	Range	30 to 1500 Lux on the screen
Brightfield/darkfield difference		20 Lux
Repeatability		1 µm in contour illumination mode
Function		Creating, performing, and editing measuring procedures

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Scales for Profile Projectors

Standard Scales

Used for checking magnification accuracy in conjunction with a reading scale.

172-116

Metric

Code No.	172-116	172-330
Graduation	0.1 mm	
Range	50 mm	80 mm
Accuracy (20°C)*	±(3+5L/1000) µm	

* L = measured length (mm).

Inch

Code No.	172-117
Graduation	.01"
Range	2"
Accuracy (20°C)	±.00013"

Reading Scales

Specially designed for inspecting the magnified image of a standard scale on the projection screen.

172-161

172-118

Metric

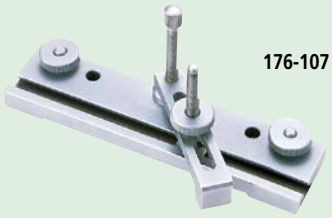
Code No.	172-118	172-161	172-329
Graduation	0.5 mm		
Range	200 mm	300 mm	600 mm
Accuracy (20°C)*	±(15+15L/1000) µm		

* L = measured length (mm).

Inch

Code No.	172-119	172-162
Graduation	.02"	
Range	8"	12"
Accuracy (20°C)	±.00071"	

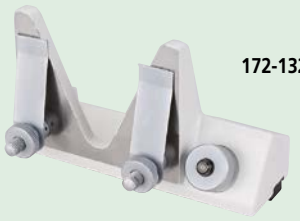
Holder with Clamp



176-107

Code No.	176-107
Max. workpiece height	35 mm
Mass	0.42 kg

Vertical Holder

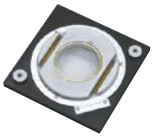


172-132

Code No.	172-132
Mass	1.3 kg

Workpiece Fixtures for Profile Projectors

Rotary Tables



176-106

172-198

176-305

176-306

Code No.	176-106	172-198	176-305	176-306
Effective glass diameter	66 mm	96 mm	182 mm	238 mm
Angular resolution	6′	2′	—	
Fine feed	—	Available		
Mass	1.7 kg	2.4 kg	5.5 kg	6.5 kg

Centre Support and Centre Support Riser

172-142

172-143

Code No.	172-142	172-143
Description	Centre support	Centre support riser
Max. workpiece height	120 mm (240 mm*)	60 mm
Mass	3.3 kg	2.2 kg

* When using a centre support riser (172-143).

Swivel Centre Supports

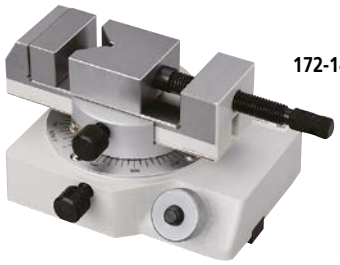
176-105

172-197

Code No.	176-105	172-197
Max. workpiece diameter	70 mm (45 mm*)	80 mm (65 mm*)
Max. workpiece length	140 mm	
Swivel range	±10°	
Mass	2.4 kg	2.5 kg

* When swivelled 10°.

Rotary Vice



172-144

Code No.	172-144
Rotation range	360°
Maximum workpiece height	60 mm
Width of jaws	40 mm
Angle graduations	5°
Mass	2.8 kg

V-Block with Clamp

172-234

172-378

Code No.	172-234	172-378
Maximum workpiece diameter	50 mm	25 mm
Width of block	60 mm	41 mm
Mass	1.24 kg	0.8 kg

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