

Magnifiers
Pocket Magnifiers

Centering Microscopes

Stereo Microscopes MSM-400

Stereo Microscope DV 4
and Accessories

Measuring Microscope TM-500
and Accessories

Measuring Microscope Hyper MF / MF-U

Measuring Microscope MF-A Model

Measuring Projector PJ-A3000
and Accessories

Measuring Projector PJ-H3000
and Accessories

Measuring Projector PV-5110

Measuring Projector PH-A14

Measuring Projector PH-3515 F

Accessories for Projectors

Data processor QM-Data 200

Edge sensor "OPTOEYE 200"

Clamping system "OPTI-FIX"



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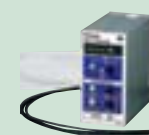
Pages 380-387



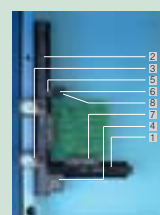
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Pages 412-413

Precision Magnifier

- For measuring length, angles, diameters, line thickness, thread pitches, etc.
- Quick replacement of the measuring plates.
- Easy measurement.

Series 183

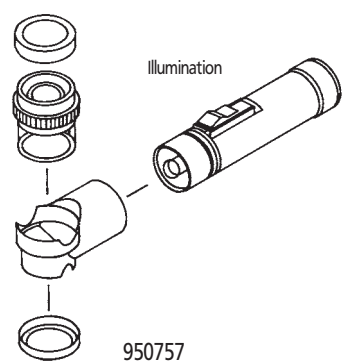
Magnifier



No.	Magnification	Image field mm	Mass g	Dimensions mm
183-101	8 x	24,5	40	Ø 37 x 48
183-131	10 x	24,5	42	Ø 37 x 45

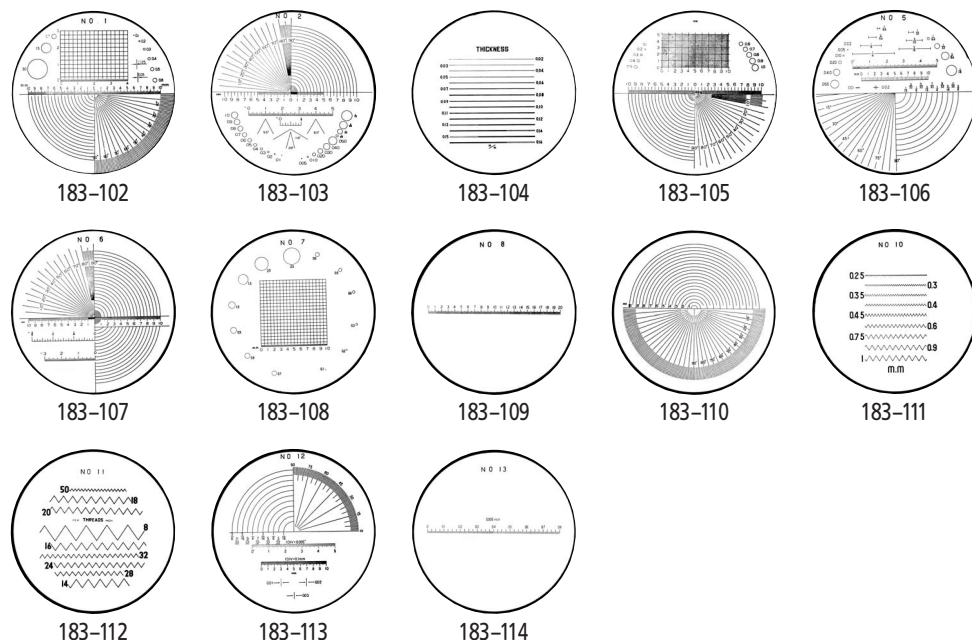
Sets (including magnifier and measuring plates)

No.	Set combination
183-902	183-101, 183-102, 183-106, 183-107, 183-112, 183-113, 183-114
183-903	183-101, 183-102, 183-106, 183-107, 183-109, 183-113, 183-115
183-904	183-101, 183-102



Series 183

Measuring plates



- No. 183-102 Polar net, angle, radius
- No. 183-103 Angle, radius, length, bores
- No. 183-104 Thickness
- No. 183-105 Angle, radius, bores, length, polar net in mm
- No. 183-106 Angle, radius, bores, length
- No. 183-107 Angle, radius, length
- No. 183-108 Polar net, bores

- No. 183-109 Length in mm
- No. 183-110 Angle, radius
- No. 183-111 Thread pitches (metric)
- No. 183-112 Thread pitches (inch)
- No. 183-113 Angle, radius, length
- No. 183-114 Length in inch
- No. 183-115 ISO- thread pitches
0,25/0,3/0,35/0,4/0,45/0,5/0,7/0,8/1,0

Specifications

Measuring plate diameter: 30 mm
Including box

Optional accessories

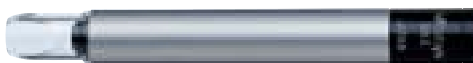
- No. 950757 Magnifier holder with illumination (without battery)
- No. 353489 Battery LR14

Pocket Magnifier

- Stable design, safe hold.
- Easy handling.
- Including box and cleaning cloth.

Series 183

Pin version



183-201

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-201	25 x	3,4	17	Ø 14,5 x 125

Series 183

Stand version

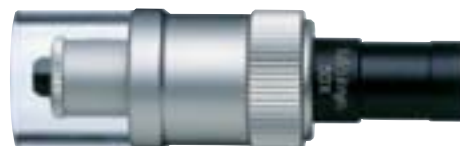


183-202

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-202	25 x	3,3	90	Ø 31,5 x 115

Series 183

Stand version



183-203

No.	Magnification	Image field mm	Mass g	Dimensions mm
183-203	50 x	1,6	82	Ø 31,5 x 100

Pocket Magnifier

- Draw tube enables clear imaging of the workpiece.

Series 183



183-301

No.	Magnification	Image field-Ø mm	Mass g	Dimensions mm
183-301	7 x	25	17	Ø 32 x 43

Series 183



183-302

No.	Magnification	Image field-Ø mm	Mass g	Dimensions mm
183-302	10 x	24	18	Ø 32 x 40

Series 183



183-303

No.	Magnification	Image field-Ø mm	Mass g	Dimensions mm
183-303	15 x	10	23	Ø 32 x 30

Centering Microscope CF 10

Series 375

Centering microscope CF 10 base body in set



375-101

Specifications

Cylindrical stem receiver: Ø 14 mm

Contents:

- No. 375-021 Eyepiece 10 x, integrated reticle with cross lines and radius
- No. 939080 Incident illumination
- No. 02AKD500 Transformator

Lens systems not included in the set.

Series 375

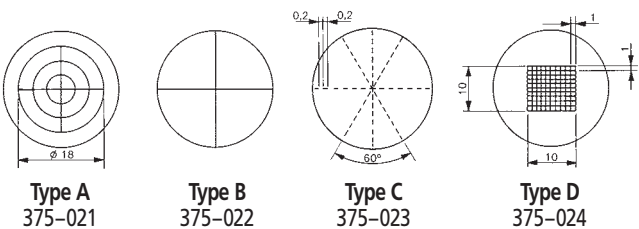
Lens systems



Objective	No.	Working distance mm	Image field-Ø mm	Magnification
1 x	375-031	40	22,0	10 x
2 x	375-032	60	11,0	20 x
3 x	375-033	45	7,3	30 x
5 x	375-034	26	4,4	50 x
10 x	375-035	11	2,2	100 x

Series 375

Eyepieces with integrated reticle



Specifications

Magnification: 10 x
Image field: Ø 22 mm

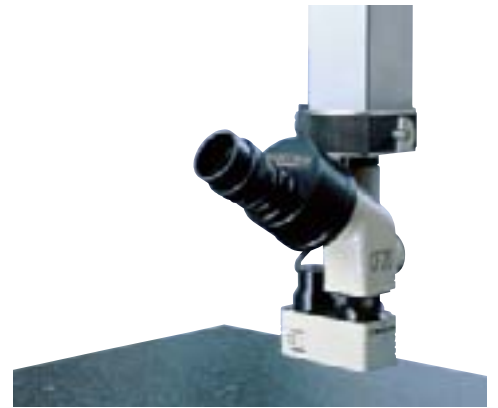
Centering Microscope CF 20

Series 375

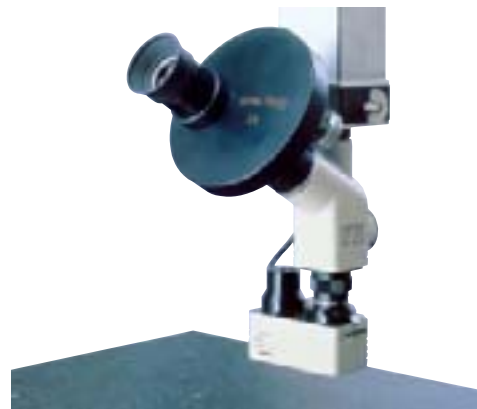
Sets



375-202



375-204



375-205

Set consisting of	375-012	375-041	375-042	375-043	375-044	375-045	02AKD500	939080
No. 375-201	●	●					●	●
No. 375-202	●		●				●	●
No. 375-203	●			●			●	●
No. 375-204	●				●		●	●
No. 375-205	●					●	●	●

No. 375-031 to

No. 375-035 for objectives, see above.

No. 375-012 Centering microscope with cylindrical stem receiver \varnothing 14 mm

No. 375-011 Centering microscope without cylindrical stem receiver

Lens systems not included in the set.

No. 375-041 Eyepiece 10 x

No. 375-042 Binocular 10 x, pupillary distance: 51-76 mm

No. 375-043 Protractor eyepiece 10 x, rotation: 360° , graduation: scale 1° , nonius $5'$

No. 375-044 Double image eyepiece 10 x

No. 375-045 Eyepiece with rotatable reticle (for use with objective 3 x only)

No. 375-041
Eyepiece 10 x
(No. 375-201)

No. 375-042
Binocular 10 x
(No. 375-202)

No. 375-043
Protractor eyepiece 10 x
(No. 375-203)

No. 375-044
Double image
eyepiece 10 x
(No. 375-204)

No. 375-045
Eyepiece with
rotatable reticle
(for use with
3 x objective only)
(No. 375-205)

No. 939083
C Mount adapter

No. 375-012

1 x No. 375-031 2 x No. 375-032 3 x No. 375-033 5 x No. 375-034 10 x No. 375-035

No. 02AKD500

No. 939080

Stereo Microscope MSM-400

- Bright, sharp images with real depth are recreated with high resolution and excellent faithfulness to color, thus minimizing eye fatigue while increasing inspection efficiency and productivity.
- The magnification can be adjusted depending on type of instrument with a user-friendly magnification switch (MSM-412, -465) or a zoom objective (MSM-Z414L) to the appropriate requirements.
- Continuous zooming, a standard feature, allows you to enlarge the object by 10 to 40 times in total magnification.
- Using the horizontal focusing handles mounted on both sides of the unit, you can quickly bring the object into focus regardless of whether you're right- or left-handed. The handles are also used for coarse and fine focusing controls. The MSM-465 comes with a focusing-torque adjustment mechanism.
- The microscopes can be connected to a digital camera or CCD camera to save captured images of the object or for simultaneous observation through different media.

Series 377



377-925 K (MSM-412)



377-946 D (MSM-Z414 L)

Model No.	MSM-412 377-925 K	MSM-Z414 L 377-946 D
Optical System	Greenough Type, erect, unreversed image, inward inclination angle 12°	
Optical Tube	Binocular, viewing angle 45°, adjustable interpupillary distance between 54 and 76 mm, adjustable dioptre balancing (left eyepiece only)	Binocular, viewing angle 45°, adjustable interpupillary distance between 54 and 76 mm, adjustable dioptre balancing (right and left eyepieces)
Magnification switch system	Turret, two stage	Magnification variation by zoom
Lens systems	1x, 2x (turret)	1x to 4x (zoom ratio: 4)
Auxiliary lens systems (optional)	—	0,5x, 0,75x, 1,5x
Eyeiece	WF10x (Visual field no.: 20, standard), WF5x (Visual field no.: 22), WF15x (Visual field no.: 13), WF20x (Visual field no.: 10)	
Total magnification	10x, 20x (with 10x Standard eyepiece)	10x to 40x (with 10x Standard eyepiece)
Working distance	95 mm	80 mm
Height adjustment range	44 mm	
Transmitted illumination	Light source: Halogen lamp (12 V, 10 W), with color filter	
Reflected illumination	Light source: Halogen lamp (12 V, 15 W)	
Power supply	220 V AC, 50/60 Hz	
Power consumption	20 W	
Total weight	4,7 kg	5,1 kg

Standard accessory

Two eye shades, dust cover

Consumable Spares

No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

More detailed information on these and other products can be found in the product brochures.

Stereo Microscope MSM-400

Series 377

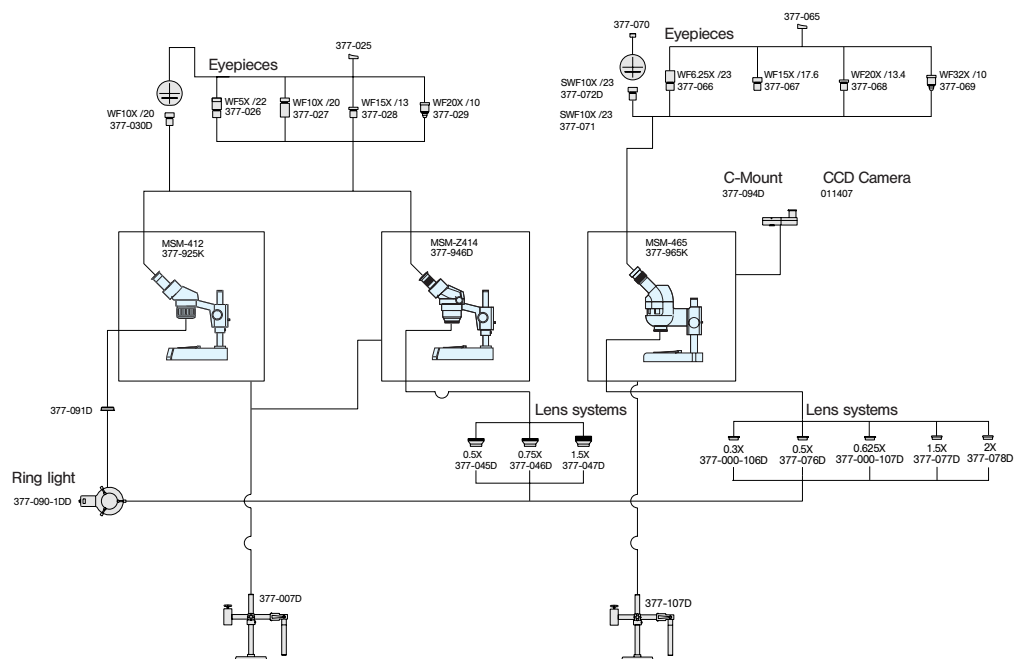
Standard accessory

Two eye shades, dust cover



377-965 K (MSM-465)

Model	MSM-465
No.	377-965 K
Optical System	Parallel System, erect, unreversed image
Optical Tube	Binocular, viewing angle 45°, adjustable interpupillary distance between 54 and 76 mm, adjustable dioptre balancing (left eyepiece only)
Magnification switch system	Turret, four stage
Lens systems	0,6x, 1,2x, 2,5x, 5x (turret)
Auxiliary lens systems (optional)	0,5x, 1,5x, 2x
Eyepiece	WF10x (Visual field no.: 23, standard), WF6,25x (Visual field no.: 23), WF15x (Visual field no.: 17,6), WF20x (Visual field no.: 13,4), WF32x (Visual field no.: 10)
Total magnification	6x, 12x, 25x, 50x (with 10x Standard eyepiece)
Working distance	89 mm
Height adjustment range	50 mm
Total weight	6,3 kg

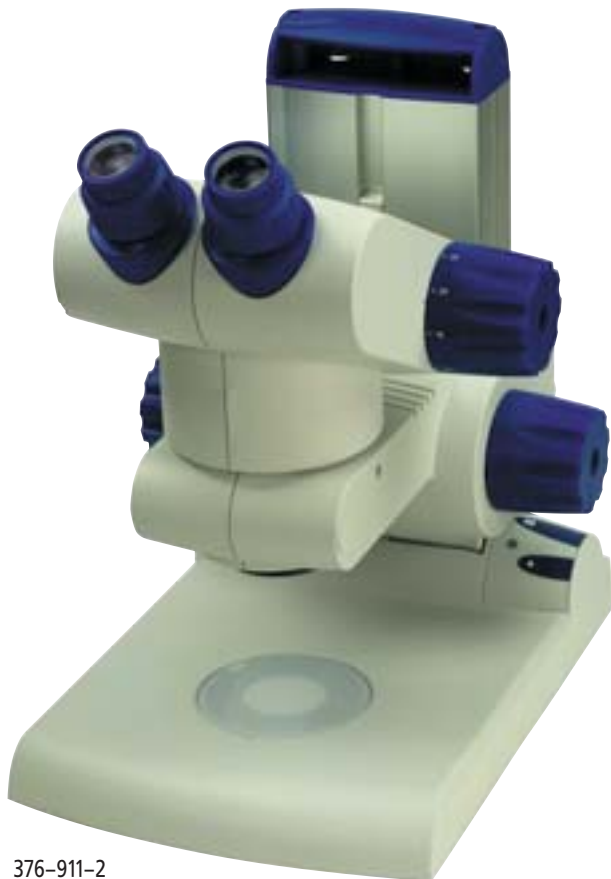


Stereo Microscope "DV 4"

- Stereo Microscope with stepless magnification changer.
- For the use in laboratories and workshop control.
- Built-in, adjustable eyepieces W 10 x / 20 Br foc.
- Viewing is no problem for spectacle wearers.

Series 376

Inspection microscope



376-911-2

Specifications

Magnification range: 8 x to 32 x (main unit)
Incident light: 12 V, 20 W
Transmitted light: 12 V, 10 W
Mixed light
Mass: 5 kg
Stepless lighting adjustment

Standard accessory

Stereo microscope DV 4 with eyepieces 10 x/20 Br foc
Eyecup

No. 011381 Halogen lamp 12 V, 20 W

No. 011382 Halogen lamp 12 V, 10 W

Consumable Spares

No. 011298 MC Special cleaner for laboratory and
photo optics, microscopes (120 ml)



011298

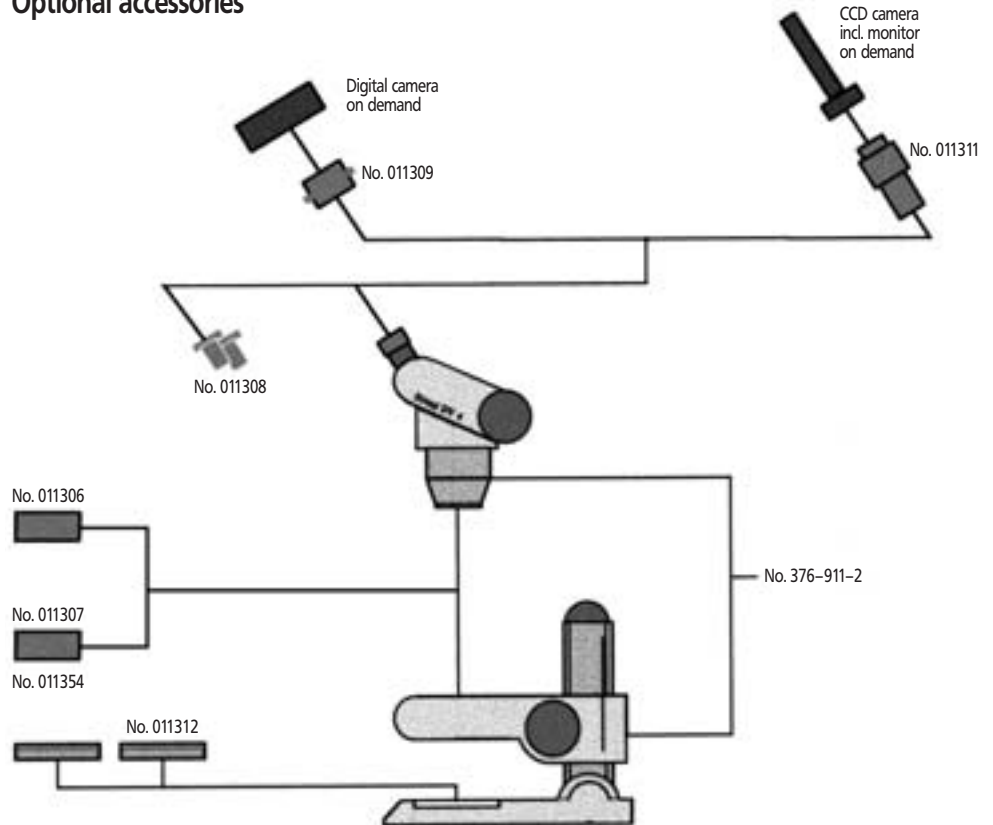
Stereo Microscope "DV 4"

Optional accessories

- No. 011306** Auxiliary lens system 5x ... 20,2x
- No. 011307** Auxiliary lens system 16x ... 64x
- No. 011308** Eyepiece graticule 8x ... 32x
- No. 011309** Eyepiece adapter video M37 / M 52 x 0,75 for digital camera
- No. 011311** Eyepiece adapter video Video C 0,8x for video camera
- No. 011312** Supplement for transmitted light DF on stand
- No. 011354** Opal glass dia Ø = 84 mm with diaphragm 40 mm

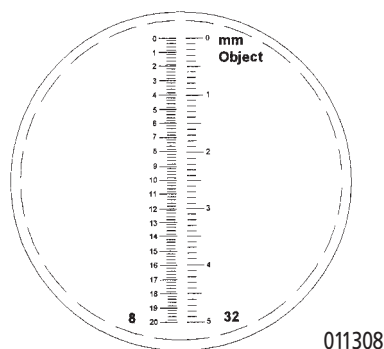
Series 376

Optional accessories



Series 376

Auxiliary lens systems for variation of working distance and magnification range (Optional accessory)



No. 011306 Auxiliary lens system 0,63x (FFA: 130 mm)

No. 011307 Auxiliary lens system 2x (FFA: 31 mm)

No.	Eyepiece	Auxiliary lens systems mm	Manification mm	Working distance mm	Image field
Eyepiece graticul					
011308	10x/20 Br foc	without	8x ... 32x	92	25.0 ... 6.3
Auxiliary lens systeme					
011306	10x/20 Br foc	0,63 x	5x ... 20,2x	130	40.0 ... 9.9
011307	10x/20 Br foc	2 x	16x ... 64x	31	12.5 ... 3.1

Br = Eyepiece for spectacle wearers, large distance between exit pupil and eye lens
foc = Focusable, for reception of eyepiece graticules

Measuring Microscope "TM-500"

Series 176



176-811 CED
with integrated micrometers
(152-390 / 152-389 Optional accessories)
(see page 99, 102 onwards for other integrated micrometers)

Model	TM-505	TM-510
No.	176-811 CED	176-812 CED
XY measuring range	50 x 50 mm	100 x 50 mm
Measuring system	Integrated micrometers	
Max. workpiece height	115 mm	107 mm
Max. workpiece weight	5 kg	
Angle reading	360° (Graduation 6' via nonius)	
Eyeiece	15 x	
Objective	2 x	
Magnification	30 x	
Transillumination	24 V, 2 W intensity adjustable	
Incident illumination	24 V, 2 W intensity adjustable	
Dimensions	210 x 333 x 391 mm	240 x 333 x 391 mm
Mass	13,5 kg	14,5 kg

Standard accessory

- No. 176-116 Eyepiece 15 x
- No. 176-138 Objective 2 x
- No. 176-206 Cross slide table 50 x 50 (176-811 CED)
- No. 176-207 Cross slide table 100 x 50 (176-812 CED)
- Pre-installed cross slide table, without integrated micrometers

Optional accessories

see page 381-383

Consumable Spares

- No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Series 176

Objective

Objective	Eyeiece 10 x (176-115)	Eyeiece 15 x (176-116)*	Eyeiece 20 x (176-117)
2 x (176-138)*	20 x (6,5 mm)	30 x (6,5 mm)	40 x (5,0 mm)
5 x (176-139)	50 x (2,6 mm)	75 x (2,6 mm)	100 x (2,0 mm)
10 x (176-137)	100 x (1,3 mm)	150 x (1,3 mm)	200 x (1,0 mm)

* = Standard accessory

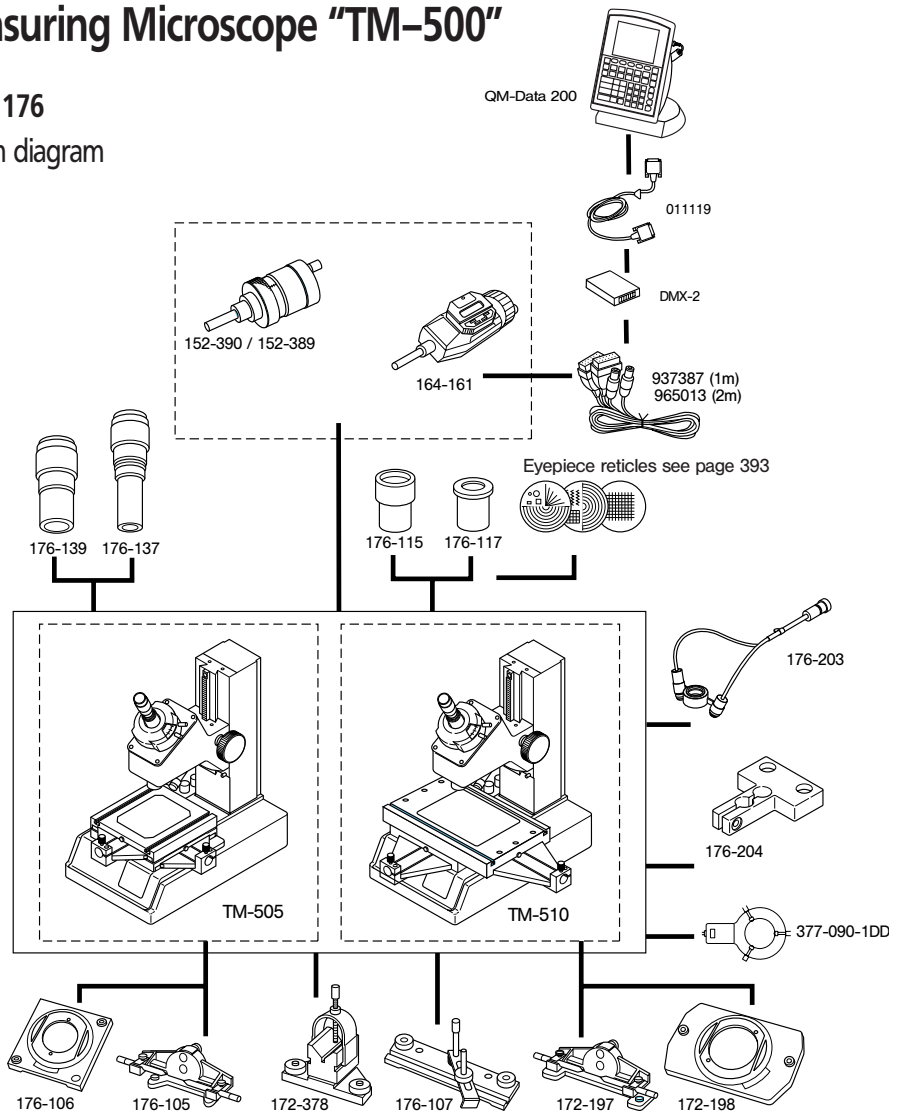
The values in brackets refer to the field size.

Please order our brochure about the Fixture System "optifix".

Measuring Microscope "TM-500"

Series 176

System diagram

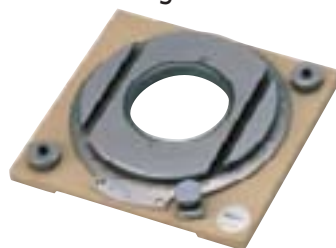


Measuring Microscope "TM-500"

Optional accessories

Series 176

Optional accessory for TM-505
Rotatable stage



176-106

Series 176

Optional accessory for TM-510
Rotatable stage



172-198

Please order our brochure about the Fixture System "optifix".

Specifications

Rotation: 360°
Graduation: 1°
Nonius: 6'
Stage size: Ø 112 mm
Effective Ø 66 mm glass (No. 200662)
Height: 22 mm
Mass: 1,7 kg

Specifications

Rotation: 360°
Graduation: 1°
Nonius: 2'
Stage size: Ø 146 mm
Effective Ø 100 mm glass (No. 200667)
Height: 20,5 mm
Mass: 2,5 kg

Measuring Microscope "TM-500"

Optional accessories

Series 176

Optional accessory for TM-505
Swivel center support



176-105

Series 176

Optional accessory for TM-510
Swivel center support



172-197

Series 176

Holder with clamp



176-107

Series 176

V-block and clamp



172-378

Series 176

Vertical measuring device



176-204

Please order our brochure about the Fixture System "optifix".

Specifications

Angular adjustment: $\pm 10^\circ$
 Graduation: 1°
 Max. workpiece size: Vertical:
 $\varnothing 70 \text{ mm} \times 140 \text{ mm}$
 at $\pm 10^\circ$ inclination:
 $\varnothing 45 \text{ mm} \times 140 \text{ mm}$
 Mass: 2,4 kg

Specifications

Angular adjustment: $\pm 10^\circ$
 Graduation: 1°
 Max. workpiece size: Vertical:
 $\varnothing 80 \text{ mm} \times 140 \text{ mm}$
 at $\pm 10^\circ$ inclination:
 $\varnothing 65 \text{ mm} \times 140 \text{ mm}$
 Mass: 2,5 kg

Specifications

Max. workpiece height: 35 mm
 T-slot length: 152 mm
 Bore distance: 84 mm and 120 mm
 Mass: 0,42 kg

Specifications

Max. workpiece size: $\varnothing 25 \text{ mm}$
 Dimensions: $90 \times 65 \times 100 \text{ mm}$
 Mass: 0,8 kg

Specifications

Receiver bore: $\varnothing 8 \text{ mm}$ for dial indicators

Measuring Microscope "TM-500"

Optional accessories

Series 176

Micrometer head with rotating spindle and data output



350-271

Series 176

Micrometer head with stationary spindle and data output



350-272

Series 176

Micrometer head with stationary measuring surface



152-389 / -390 (Y- and X-axis)

Series 176

Micrometer head with non-rotating spindle and data output



164-161

Micrometer heads

- Mechanical micrometer heads
- Elektronical micrometer heads
- "DIGIMATIC" micrometer heads

Refer to page 99 and 102

Series 176

Eyepiece reticles

- No. 176-109** Metric thread
pitch 0,25 – 1,0 mm
- No. 176-110** Metric thread
pitch 1,25 – 2,0 mm
- No. 176-111** Circles \varnothing 0,05 – \varnothing 4,00 mm
- No. 176-112** Involute module 0,1–1,0 mm
Pressure angle 20°
- No. 176-113** Angle 55°
- No. 176-114** Angle 60°
- No. 176-120** Whitworth thread
60 turns/inch – 26 turns/inch
- No. 176-121** Whitworth thread
24 turns/inch – 18 turns/inch
- No. 176-122** Whitworth thread
16 turns/inch – 11 turns/inch
- No. 176-123** UNC thread
80 turns/inch – 28 turns/inch

- No. 176-124** UNC thread
24 turns/inch – 14 turns/inch
- No. 176-125** UNC thread
13 turns/inch – 10 turns/inch
- No. 176-126** Cross lines (standard accessory)
- No. 176-127** NF thread
80 turns/inch – 28 turns/inch
- No. 176-128** NF thread
24 turns/inch – 14 turns/inch
- No. 176-129** F thread
13 turns/inch – 10 turns/inch
- No. 176-130** Involute module 0,1 – 1,0 mm
Pressure angle 14° 30'
- No. 176-140** ISO thread
pitch 0,075 – 0,7 mm
- No. 176-141** ISO thread
pitch 0,75 – 2,0 mm

Please order our brochure about the Fixture System "optifix".

Cold-light Illuminator

Cold-light Illuminator



011079-1
with 011080-1

Specifications

No. 011079-1	Cold-light Illuminator
Power consumption:	50 VA
Output:	35 W
Light brightness control:	stepless
Filter insertion:	lateral
Dimensions:	168 x 120 x 268 mm
Mass:	1,3 kg

Consumable Spares

No. 011315 Lamp 8 V, 30 W

Swan neck light conductor



011080-1

Specifications

No. 011080-1	Swan neck light
Swan neck light conductor:	with 2 arms, with focusing attachment
Arm length:	550 mm
Arm diameter:	4 mm

Flexible light conductor



011336

Specifications

No. 011336	Light conductor
Flexible light conductor:	one arm
Arm length:	1200 mm
Light conductor diameter:	7 mm

Hyper MF / MF-U High End Measuring Microscope

Very low uncertainty of length measurement.

- All 3 axes motor-driven.
- Max. workpiece weight 30 kg.
- Eyepiece with visual field no. 24.
- Large selection of objectives and accessories.

Specifications

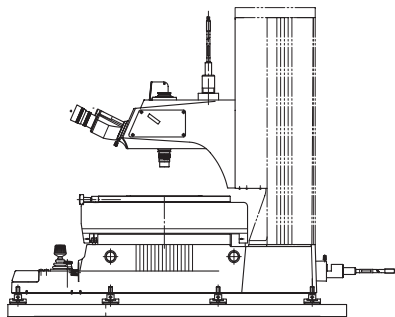
Length measurement tolerance: X – Y $(0,9 + 0,3L/100) \mu\text{m}$
Z (with LAF) $(1,5 + L/100) \mu\text{m}$
Scale resolution: 0,00001 mm
Measuring range: 250 x 150 x 150 mm



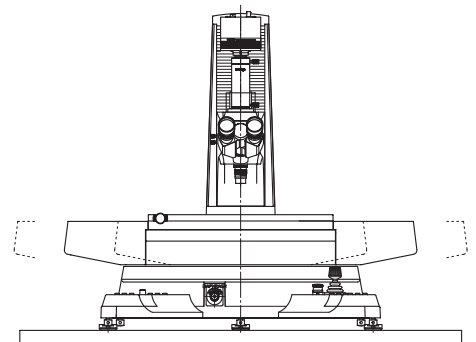
Hyper MF-U



Hyper MF with VISION UNIT and PC



Hyper MF side view



Hyper MF-U front view

Specifications

Model	Hyper MF	Hyper MF-U
Measuring range (mm)	250 (X-axis) x 150 (Y-axis) x 150 (Z-axis)	
Resolution	0,00001 mm	
Uncertainty of length measurement	X – Y-axis	$(0,9 + 0,3L/100) \mu\text{m}$
	Z-axis	$(1,5 + L/100) \mu\text{m}$
Axial movement	Motor driven	
Max. workpiece weight	30 kg	
Illumination	Transmitted light	12 V 50 W Cold light fibreoptic with integral aperture
	Incident light	12 V 100 W Cold light fibreoptic with integral aperture
Objective	1, 3, 5, 10, 20, 50, 100x	1, 2, 5, 10, 20, 50, 100x
Eyepieces	10, 15, 20 x	
Method of viewing	Bright field	Bright / dark field

Please order our brochure about the Fixture System "optifix".

Measuring Microscopes Model MF-A

- The Mitutoyo measuring microscopes series MF-A provide an outstanding image quality combined with high ease-of-operation based on ergonomics.
- The newly developed optical system minimizes the flare thus improving image quality.
- The absolute magnification from 10x up to 2000x allows for clear images over an extraordinary large view field. The operating elements, such as hand wheels, have been arranged to make operation easier. This reduces fatigue and allows for comfortable operation even for an extended period of time.
- TV-System/Photomicrography: Connectable to all models (C-Mount Adapter)
- Coarse and fine adjustment for quick and precise focussing
- Aperture stop: Unique for measuring microscopes in this price category
- Wide range of accessories: Fibre-optic ring light for difficult-to-view workpieces such as rubber and plastics. Wide angle adapter unit with a 0,5x magnification to widen the video camera range when using a TV- or photosystem.
- H models with 3-axis display.

Series 176



MF-A 1720 H

Model No.	MF-A1010 / H 176-522 D / 176-526 D	MF-A1020 / H 176-529 D / 176-530 D	MF-A1720 / H 176-523 D / 176-527 D	MF-A1730 / H 176-524 D / 176-528 D
XY adjusting range of stage	100x100 mm	200x100 mm	200x170 mm	300x170 mm
Eyeiece	At the user's discretion: Monocular or binocular			
Resolution XY display	Switchable 0,001 mm, 0,0005 mm, 0,0001 mm			
Number of axis display	2 (H models with 3-axis display)			
Display functions	Zero-setting, resolution, counting direction, data output via RS-232 C interface			
Uncertainty of length measurement	XY: (3 + 0,02 L) µm / Z: ((5 + 0,04 L) µm for model H) L = measuring length (mm)			
Focussing range	150 mm	150 mm	220 mm	220 mm
		Coarse and fine focussing by hand wheel		
Measuring stage dimensions	280x280 mm	350x280 mm	410x342 mm	510x342 mm
Effective size of stage glass	180x180 mm	250x150 mm	270x240 mm	370x240 mm
Rotation range	-	-	± 5°	± 5°
Max. workpiece height	150 mm	150 mm	220 mm	220 mm
Max. workpiece weight	5 kg	10 kg	20 kg	20 kg
Total dimensions (WxDxH)	555x741x630 mm	618x741x630 mm	626x887x750 mm	676x887x750 mm
Mass	55 kg	59 kg	130 kg	138 kg

Specifications

Model:	MF-A Model
Optical Tubus Type:	Monocular or binocular (optional accessories)
Image:	Non reversed (with crosshair reticle angle 25°)
Camera mount:	Provided
Objectives	
Magnification:	3 x (standard accessory), 1 x, 5 x, 10 x, 20 x, 50 x, 100 x
Eyeiece	
Magnification:	At the user's discretion: Monocular 1 piece 10 x, Binocular 2 pcs. 10 x, optional accessory included optical tube
Image field:	24 mm (View field Ø 8 mm when using 3 x objective)
Transmitted light	
Illumination method:	Koehl lighting
Light illuminator:	Halogen (12 V, 50 W), Lamp life appr. 50 hours (513667)
Light intensity:	Dimming adjustable
Remarks:	With aperture diaphragm, green filter (938905)

Incident light

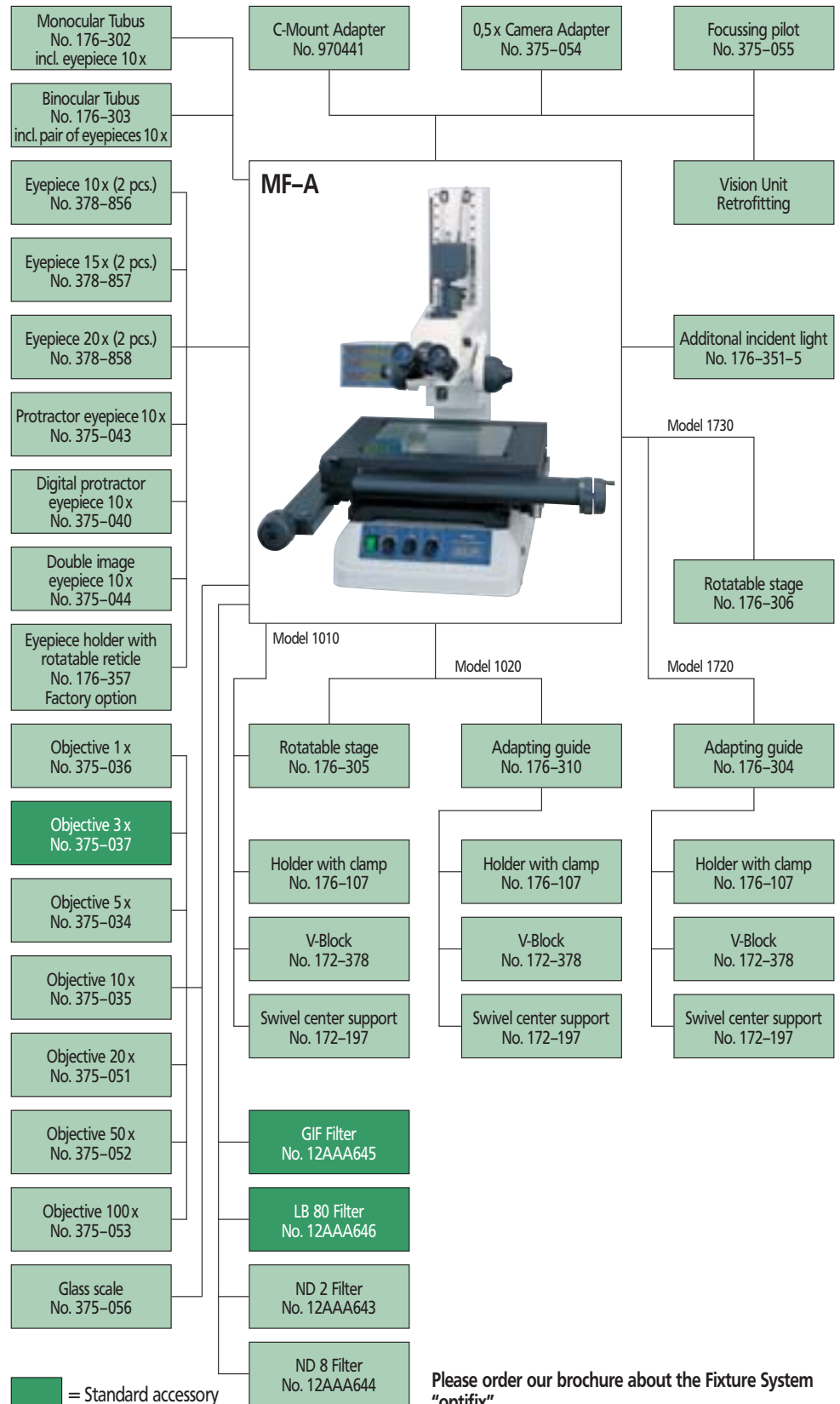
Illumination method:	Telecentric
Light illuminator:	Halogen (12 V, 50 W), Lamp life appr. 50 hours (513667)
Light intensity:	Dimming adjustable
Remarks:	With aperture diaphragm

Please order our brochure about the Fixture System "optifix".

Measuring Microscopes MF-A Model

Series 176

System diagram



Please order our brochure about the Fixture System "optifix".

Profile Projector PJ-A3000

- Table instrument for testing small and medium sized workpieces.
- Vertical, rotatable cross lines screen.
- Easy to operate coordinate measuring stage with coarse and fine adjustment.
- Direct and clear, easy to read XY digital display at eye level ensures safe and faultless measurement.
- Halogen transillumination and incident illumination are integrated into the housing.
- Provided with a protractor as standard.

Series 302



302-701 D

Direct reading of measurement data on the 6 digit digital display enables safe and faultless measuring.
Built in protractor, switchable for reading in degrees or decimal reading.
Resolution: 1' or 0,01°.

Model		PJ-A3000 Series
Screen	Diameter	315 mm
	Protractor	Switchable degree/decimal, Resolution: switchable 0,01°/ 1' Display range: $\pm 360^\circ$ (count up to $\pm 370^\circ$)
Functions		ABS/INC switch, ZERO
Uncertainty of Magnification		0,1 % transillumination, 0,15 % incident illumination
Illumination	Lamps	Halogen lamp (24 V, 150 W)
	Illumination system	Telecentric
Power supply		230 V, 50/60 Hz
Mass		PJ-A3005 F-150: 116 kg; PJ-A3010 F-200: 140 kg

Specifications Coordinate measuring stage

Model	PJ-A3005 F-150	PJ-A3010 F-200
No.	302-702 D	302-701 D
Measuring range XY axes	150 x 50 mm	200 x 100 mm
Resolution	0,001 mm	
Measuring system	Built in glass scale	
Stage size	280 x 152 mm	380 x 250 mm
Max. workpiece height	up to 103,5 mm	up to 92,5 mm
Max. workpiece weight	5 kg	
Functions	ZERO setting +/- direction choice RS-232 C interface	
X axes displacement		XY axes displacement

Please order our brochure about the Fixture System "optifix".

Standard accessory

No. 172-202	10 x Objectives
No. 12AAD990	Measuring stage (PJ-A3005 F-150)
No. 319-225-1	Measuring stage (PJ-A3010 F-200)
No. 515530	3 x Halogen lamps (24 V/150 W)
No. 383876	Protective hood
No. 930919	Light shield

Consumable Spares

No. 011298	MC Special cleaner for laboratory and photo optics, microscopes (120 ml)
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011298

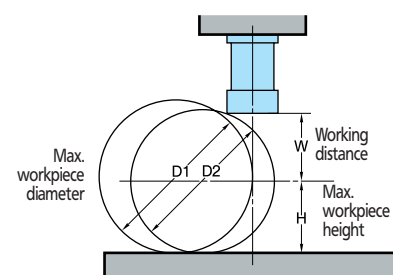
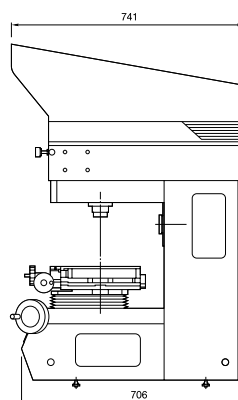
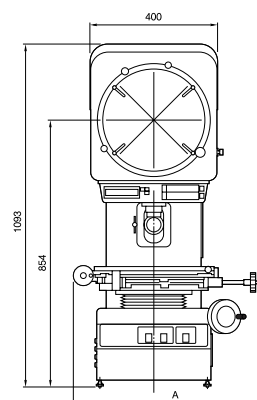
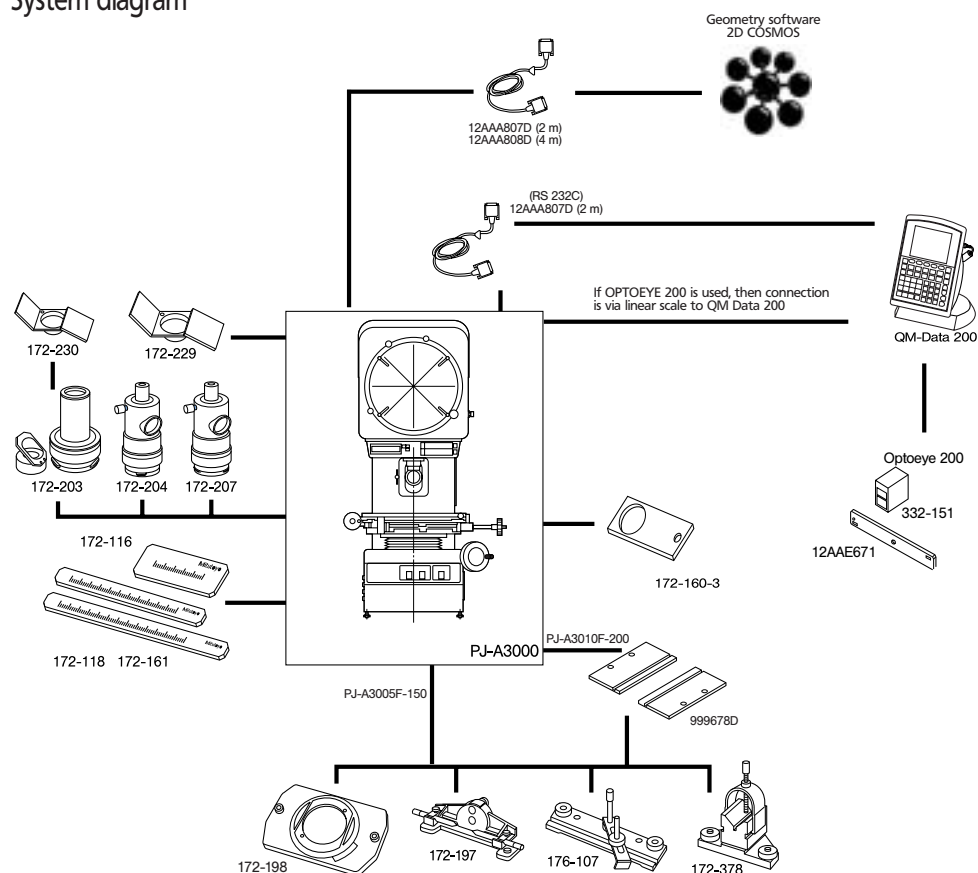
Profile Projectors PJ-A3000

Series 302

System diagram

Standard accessory

No. 172-202 Objectives 10 x



Magnification	Transillumination				Incident illumination			
	10 x	20 x	50 x	100 x	10 x	20 x	50 x	100 x
Image field (mm)								
PJ-A3005F-150								
PJ-A3010F-200	31,5	15,7	6,3	3,1	31,5	15,7	6,3	3,1
W (mm)								
PJ-A3005F-150	66	32,5	12,6	5	20	2	12,6	5
PJ-A3010F-200								
H (mm)								
PJ-A3005F-150	103,5	103,5	103,5	103,5	103,5	103,5	103,5	103,5
PJ-A3010F-200	92,5	92,5	92,5	92,5	92,5	92,5	92,5	92,5
D1 (mm)								
PJ-A3005F-150	207	87	27	10	198	61	27	10
PJ-A3010F-200	185	87	27	10	185	61	27	10
D2 (mm)								
PJ-A3005F-150	154	69	25	10	120	23	25	10
PJ-A3010F-200								

Profile Projectors PJ-A3000

Optional accessories

Series 172

Objectives for PJ-A3000 Series

All objectives are supplied with a semitransmitting mirror.
The reflectors are integrated into the 50x and 100x lens systems



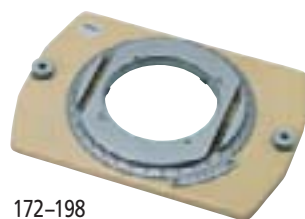
Standard accessory

No. 172-292 Semitransmitting mirror
for 10x objectives

No. 172-293 Semitransmitting mirror
for 20x objectives

Series 176 / Series 172

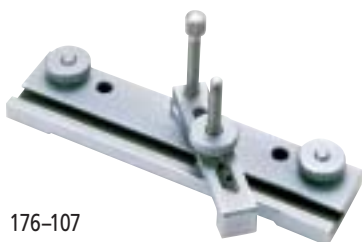
Rotatable stage



No.	Rotation mm	Graduation	Vernier reading	Contact surface Ø mm	Effective Ø mm	Height mm	Mass kg
172-198	360°	1°	2'	146	100	20,5	2,5

Series 176

Clamping holder



Specifications

Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and 120 mm
Mass: 0,42 kg

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-A3000

Optional accessories

Series 172

Swivel center support



172-197

No.	Angular adjustment	Graduation	Max. workpiece Ø mm	Max. workpiece length mm	Mass kg
172-197	± 10°	1°	80 (65)	140	2,5

() If angle adjustment 10°

Adapter plates

Adapter plate for fixing the rotatable stage, clamping holder and center support (only for PJ-A3010 F-200)



999678D

Series 172

V-block with clamping device



172-378

Please order our brochure about the Fixture System "optifix".

Specifications

Mass: 2 kg

Specifications

Max. workpiece size: Ø 25 mm
Dimensions: 90 x 65 x 100 mm
Mass: 0,8 kg

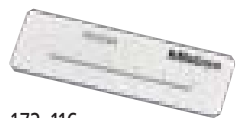
Profile Projectors PJ-A3000

Optional accessories

Series 172

Glass scale

For testing the magnification

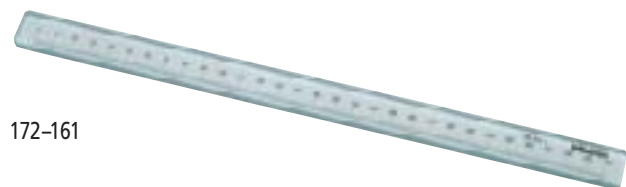


172-116

Series 172

Glass scale

For testing the magnification and measurement on the screen.

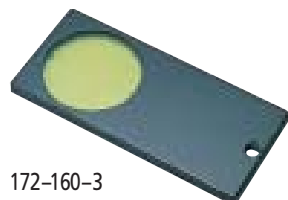


172-161

Series 172

Greenfilter

For increasing the acutance



172-160-3

Series 172

Incident light mirror

For observation by incident light of poorly reflecting workpieces



172-230

172-229

Objective	No.	Series
10x	172-229	PJ-A3000
20x	172-230	PJ-A3000

Specifications

Accuracy:	Factory specification
Measuring range:	50 mm
Graduation:	0,1 mm
Error limits:	$(3 + 5 L/1000) \mu m$
	L = measuring length in mm

Specifications

Accuracy:	Factory specification
Measuring range:	No. 172-161 = 300 mm
	No. 172-118 = 200 mm
Graduation:	0,5 mm
Error limits:	$(15 + 15 L/1000) \mu m$
	L = measuring length in mm

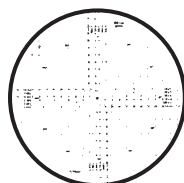
Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-A3000

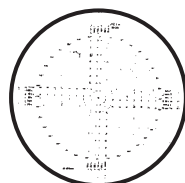
Optional accessories

Standard Overlay Charts

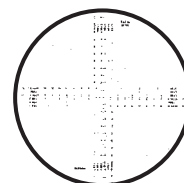
see page 409



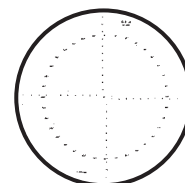
Type RE
Square line net



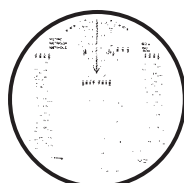
Type PO
Polar line net



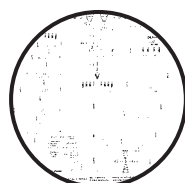
Type RA
Radii



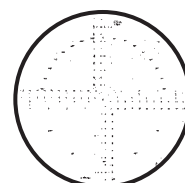
Type GO
Angle



Type M
Metrical ISO thread



Type DE
Involute toothing



Type CO
Combination of square line
and polar

For	Grid rectangular (Type RE)	Grid polar (Type PO)	Radius (Type RA)	Angle (Type GO)	Metric ISO thread (Type M)	Involute gearing (Type DE)	Combination (RE and PO) (Type CO)
PJ-A3000	No. 201386	No. 201387	No. 201388	No. 201389	No. 201390	No. 201391	No. 512652

Specifications

Stage size: 440 x 830 mm
Height: 660 mm

Series 172

Sub case for profile projector



172-269

MC Special cleaner

for laboratory and photo optics, microscopes (120 ml)



011298

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

• Incident illumination with variable incident light adjustment

By rotating the condenser lens and changing the angle of the semitransmitting mirror in the objective, even poorly reflecting surfaces can be represented optimally.

• Built in automatic edge detector OPTOEYE (Type T4 only)

The Optoeye allows for automatic edge detection during measurement without influence of the user.

• Motoric focussing

The motoric focussing facilitates measuring. The focussing speed is progressively adjustable.

• Newly developed objectives

Newly developed objectives with improved lens systems provide a bright and clear workpiece representation on the screen.

• Large measuring range

The measuring projectors PJ-H3010FT2-300 and PJ-H3010FT4-300 offer a max. measuring range of 300 mm in X and 100 mm in Y direction. Additionally, these stages are suited with a Quick release system which allows for easy and rapid execution of large displacements.

• Non reversed representation

The large screen diameter (306 mm) facilitates observation of large workpieces. Representation on the screen is non reversed.

• 3 faced turret head

The 3 faced turret head enables easy interchanging of objectives during measurement. The objectives are parfocal and can be interchanged without re-focussing.

	303-985 CED 303-988 CED	303-986 CED 303-989 CED
Functions	Type T2	Type T4
Zero-setting for any axis	●	●
+/- direction choice	●	●
DIGIMATIC XY coordinate data output	●	●
Angle DIGIMATIC data output	●	●
Edge sensor (Optoeye)		●
Motoric focussing	●	●

Standard accessories

- No. 172-472 10 x Objective
- No. 515530 2 x Halogen lamps (24 V/150 W)
- No. 383876 Protective hood
- No. 172-201 Light shield

Optional accessories

- No. 172-271 5 x Objective
- No. 172-473 20 x Objective
- No. 172-474 50 x Objective
- No. 172-275 100 x Objective

See page 397 onwards for further optional accessories

Consumable Spares

- No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Series 303



303-986 CED (Illustration with optional accessory)

Please order our brochure about the Fixture System "optifix".



Motoric focussing





Automatic edge detector (Type T4)

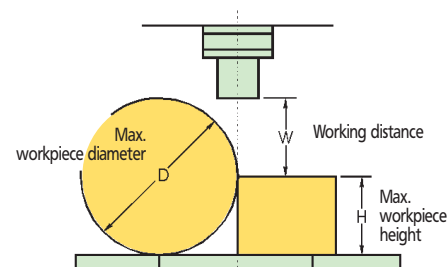
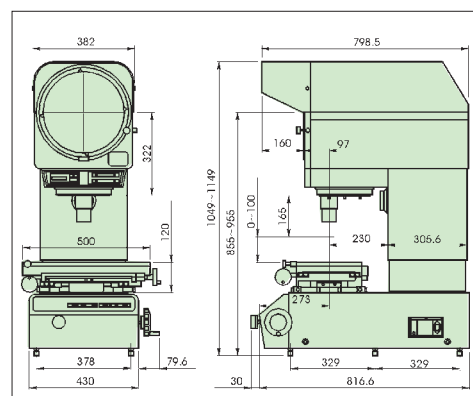
Profile Projectors PJ-H3000 Type T2; T4

Model		PJ-H3000 Series
Screen	Diameter	306 mm
	Protractor	Switchable degree/decimal, Resolution: switchable 0,01°/ 1'
Functions		ABS/INC switch, ZERO, data output,
Objective receiver		3 faced turret head
Uncertainty of magnification		0,1% for transillumination, 0,15% for incident illumination
Illumination	Lamps	Halogen lamps (No. 515530), (24 V, 150 W)
	Illumination system	Telecentric (24 V, 150 W)
Power supply		230 V, 50/60 Hz
Mass		PJ-H3010FT4-200: 188 kg; PJ-H3010FT4-300: 189 kg; PJ-H3010FT2-200: 187 kg; PJ-H3010FT2-300: 188 kg

Specifications Coordinate measuring stage

	No.	303-985 CED	303-988 CED
Type T2	Model	PJ-H3010FT2-200	PJ-H3010FT2-300
	No.	303-986 CED	303-989 CED
Type T4	Model	PJ-H3010FT4-200	PJ-H3010FT4-300

			
Measuring range X/Y axis	200 / 100 mm	300 / 100 mm	
Resolution	0,001 mm	0,001 mm	
Measuring system	Built in glass scales	Built in glass scales	
Stage size	430 x 254 mm	500 x 254 mm	
Stage glass size	280 x 180 mm	364 x 180 mm	
Max. workpiece weight	20 kg	20 kg	



Magnification	No.	Image field Ø mm	Measuring W mm	Measuring H mm	Measuring D mm
5 x	172-271	61,2	66,0	105	188
10 x*	172-472	30,6	70,5	105	206
20 x	172-473	15,3	56,5	105	186
50 x	172-474	6,0	50,0	105	177
100 x	172-275	3,0	50,0	105	182

* Standard accessory

Consumable Spares:

No. 011298 MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



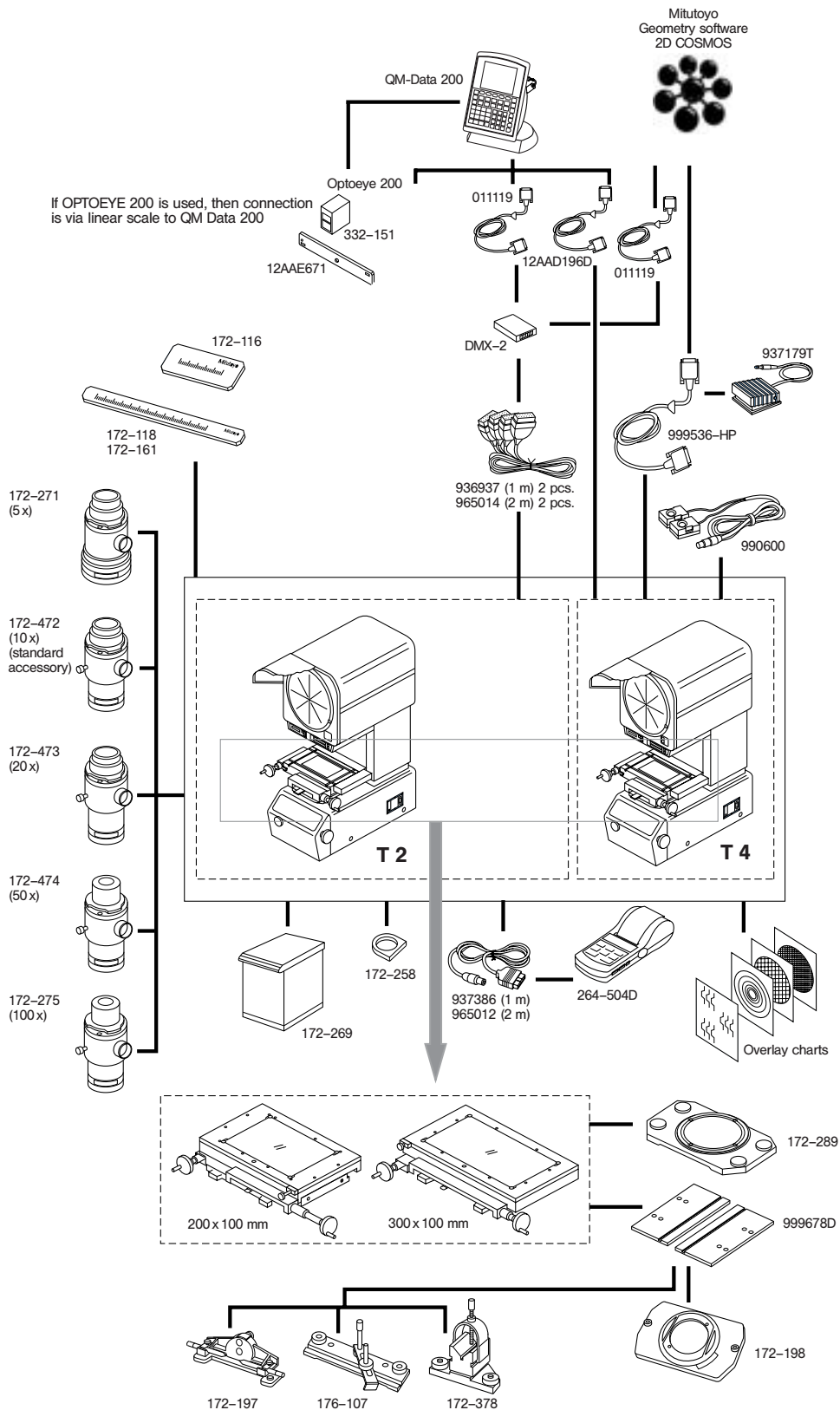
011298

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

Series 302

System diagram



Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

Optional accessory

Series 172

Objectives for series PJ-H3000

All objectives are supplied with a built in semitransmitting mirror.



5x
172-271



10x
172-472
(standard
accessory)



20x
172-473



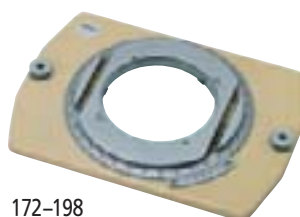
50x
172-474



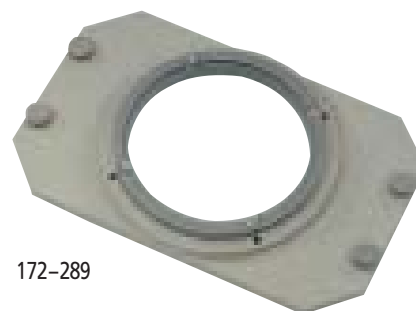
100x
172-275

Series 172

Rotatable stage



172-198



172-289

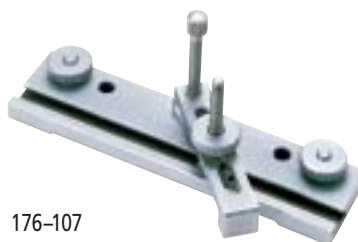
No.	Rotation mm	Graduation	Vernier reading	Contact surface Ø mm	Effective Ø mm	Height mm	Mass kg
172-198	360°	1°	2'	146	100	20,5	2,5
172-289	360°	—	—	—	200	33,0	14,0

Specifications

Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and 120 mm
Mass: 0,42 kg

Series 176

Holder with clamp



176-107

Please order our brochure about the Fixture System "optifix".

Profile Projectors PJ-H3000 Type T2; T4

Optional accessories

Series 172

Swivel center support



172-197

No.	Angular adjustment	Graduation	Max. workpiece Ø mm	Max. workpiece length mm	Mass kg
172-197	± 10°	1°	80 (65)	140	2,5

() If angle adjustment 10°

Adapter plates

Adapter plate for fixing the rotatable stage (172-196),
clamping holder, center support and V-block with clamping device.



999678D

Series 172

V-block with clamping device



172-378

Please order our brochure about the Fixture System "optifix".

Specifications

Mass: 2 kg

Specifications

Max. workpiece size: Ø 25 mm
Dimensions: 90 x 65 x 100 mm
Mass: 0,8 kg

Profile Projectors PJ-H3000 Type T2; T4

Optional accessories

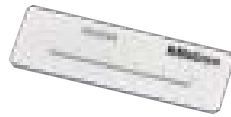
Specifications

Accuracy: Factory specification
 Measuring range: 50 mm
 Graduation: 0,1 mm
 Error limits: $(3 + 5L/1000) \mu\text{m}$
 L = measuring length in mm

Series 172

Glass scale

For testing the magnification

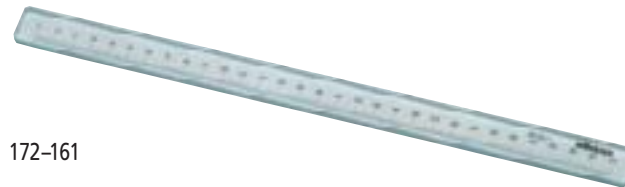


172-116

Series 172

Glass scale

For testing the magnification and measurement on the screen.



172-161

Series 172

Greenfilter

For increasing the acutance



172-258

Series 172

Sub case for measuring projector



172-269

Specifications

Accuracy: Factory specification
 Measuring range: No. 172-161 = 300 mm
 No. 172-118 = 200 mm
 Graduation: 0,5 mm
 Error limits: $(15 + 15L/1000) \mu\text{m}$
 L = measuring length in mm

Specifications

Stage size: 440 x 830 mm
 Height: 660 mm

Further optional accessories such as QM-Data 200 and Optoeye 200 (Type T2 only) see page 406 and 408

Please order our brochure about the Fixture System "optifix".

Profile Projector PV-5110

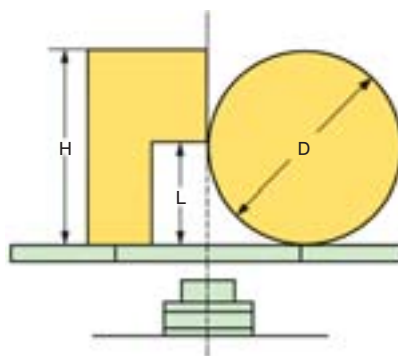
- The measuring projector PV-5110 is a robust stand alone device.
- The large rotatable screen guarantees good observation and easy measuring.

Series 304



No. 304-909 D (PV-5110)
with KA Counter (optional accessory)

No.	304-909 D
Model	PV-5110
XY measuring range	X 200 mm, Y 100 mm
Measuring system	"Linear Scale"
Resolution	1 µm
Angle reading	0,01° or 1'
Screen diameter	508 mm
Max. workpiece weight	5 kg
Measuring range	200 x 100 mm
Table glass size	280 x 180 mm
Objective	10 x (standard accessory)
Transillumination	24 V, 150 W
Incident illumination	24 V, 150 W
Dimensions	620 x 1073 x 1627 mm
Mass	190 kg
Projection laterally	reversed
Height adjustment	160 mm



H = maximum workpiece height
L = maximum focussing range for step height
D = maximum focussing range for cylinder diameter
with an edge projected onto the screen center.

Projection objective	Viewing field Ø mm	Projection method	H mm	L mm	D mm
5 x	100	Transillumination	125	60,0	120,0
5 x	100	Incident illumination	125	27,0	–
10 x	50	Transillumination	181	60,0	120,0
10 x	50	Incident illumination	181	60,0	–
20 x	25	Transillumination	206	60,0	120,0
20 x	25	Incident illumination	206	60,0	–
50 x	10	Transillumination	87	32,4	64,8
100 x	5	Transillumination	87	22,5	45,0

Please order our brochure about the Fixture System "optifix".

Standard accessory

- Measuring stage (200 x 100 mm)
- Incident illumination (Halogen)
24 V, 150 W for 5 x, 10 x and 20 x
- No. 172-402** Objective set, 10 x
- No. 512089** Receiver for display unit
- No. 512305** Halogen lamp, 24 V, 150 W
- Protective hood

Consumable Spares

- No. 011298** MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Further optional accessory: QM-Data 200
see page 406 and 407

Profile Projector PV-5010

Series 304

System diagram

Optional accessories

Objectives

No. 172-401 5x Objective set including:
No. 172-406 Objective
No. 172-407 Condenser
No. 932602 Adapter for objective
(Incident illumination)

No. 172-402 10x Objective set
(standard accessory) including:
No. 172-409 Objective
No. 172-410 Condenser

No. 172-403 20x Objective set including:
No. 172-411 Objective
No. 172-412 Condenser

No. 172-404 50x Objective set including:
No. 172-413 Objective
No. 172-414 Condenser

No. 172-405 100x Objective set including:
No. 172-415 Objective
No. 172-414 Condenser

No. 999678 D Adapter for *

* **No. 172-198** Rotatable stage
Rotation 360°, scale 1°, nonius 2'
Stage size: Ø 146 mm
Glass plate: Ø 100 mm (No. 200667)
Mass: 2,5 kg

* **No. 172-197** Swivel center support
Angle adjustment: ± 10°,
Reading: 1°
Max. workpiece size:
vertical: Ø 80 mm x 140 mm
at ± 10° inclination:
Ø 65 mm x 140 mm
Mass: 2,5 kg

* **No. 176-107** Clamping holder
Max. workpiece height: 35 mm
T-slot length: 152 mm
Bore distance: 84 mm and
120 mm
Mass: 0,42 kg

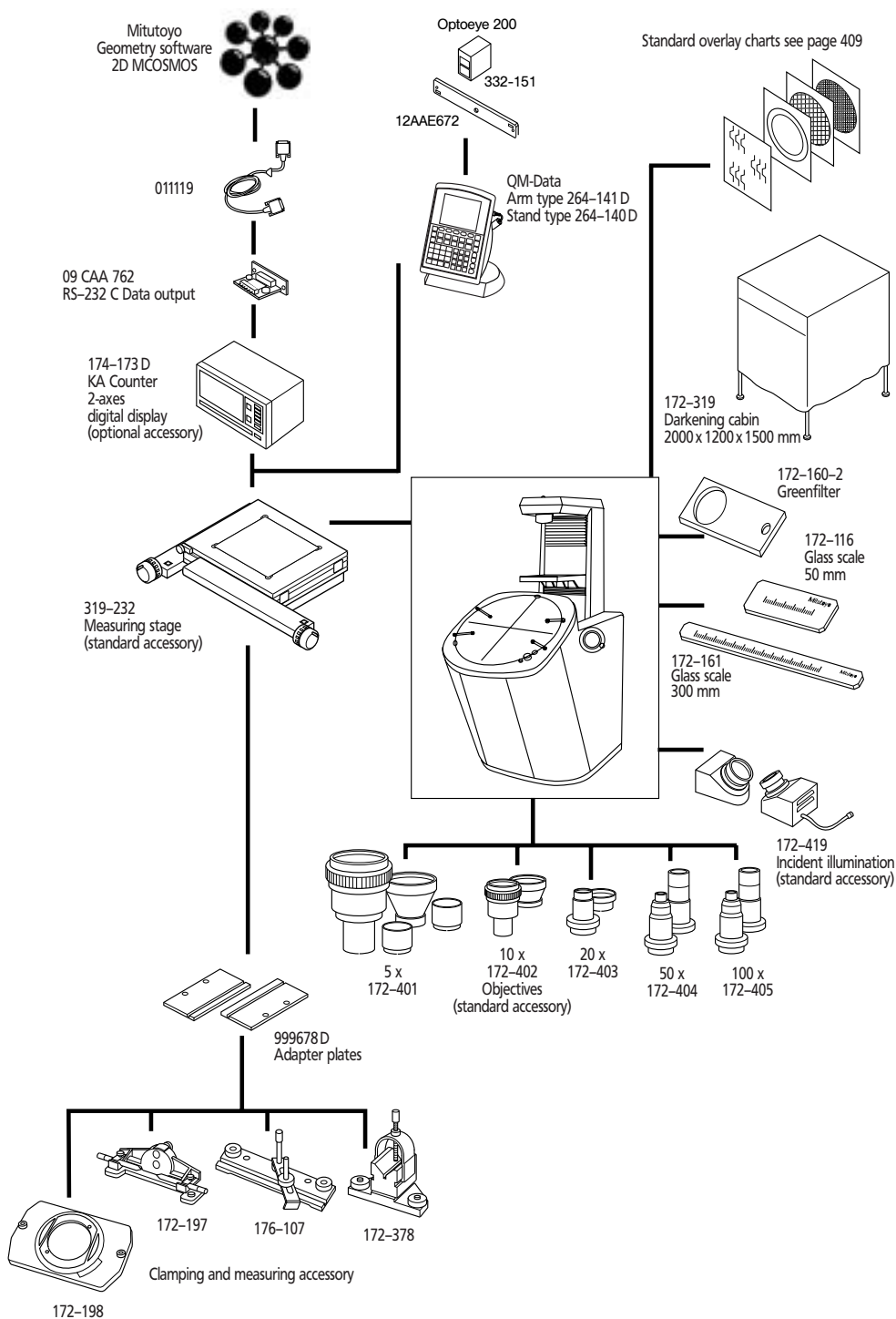
* **No. 172-378** V-Block with clamps
Max. workpiece size: Ø 25 mm
Dimensions: 90 x 65 x 100 mm
Mass: 0,8 kg

No. 172-319 Protective cabin to darken
the screen
2000 x 1200 x 1500 mm

No. 172-116 Glass scale
Length 50 mm, graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

No. 172-161 Glass scale
Length 300 mm, graduation 0,5 mm
Accuracy (15 + 15L/1000) µm

No. 172-160-2 Colorfilter (green)



Please order our brochure about the Fixture System "optifix".

Profile Projector PH-A14

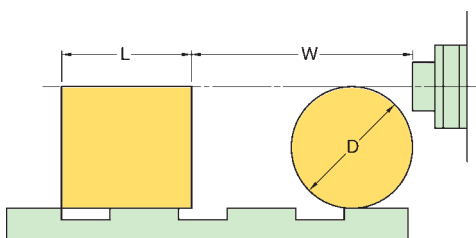
- The profile projector PH-A14 is a device in horizontal design.
- It is suited for measuring and observing of larger workpieces as e.g. toothed racks, punching tools, etc.
- Max. workpiece mass 45 kg.

Series 172



No. 172-810 DM (PH-A14)
with optional evaluation unit
QM-Data 200 (264-141 D)

No.	172-810DM
Model	PH-A14
XY measuring range	X 200 mm, Y 100 mm
Measuring system	"Linear Scale"
Resolution	0,001 mm
Screen diameter	356 mm (rotatable)
Angle reading	2'
Max. workpiece weight	45 kg
Stage size	407x153 mm
Objective	10x
Transillumination:	24, 150 W Telecentric
Incident illumination:	24 V, 150 W (Two separate light guides)
Dimensions	612x1240x1158 mm
Mass	ca. 140 kg
Focussing range:	50,8 mm



Magnification	No.	Image field Ø mm	Measuring W mm	Measuring L mm	Measuring D mm
10 x*	172-011	35,60	93	235	130
20 x	172-012	17,80	40	235	116
50 x	172-013	7,12	14,6	109	31,3
100 x	172-014	3,56	9,5	109	19,2

* Standard accessory

Standard accessories

No. 172-011 10 x Objective

No. 512305 Halogen lamp 24 V, 150 W

Consumable Spares

No. 011298 MC Special cleaner for laboratory and
photo optics, microscopes (120 ml)



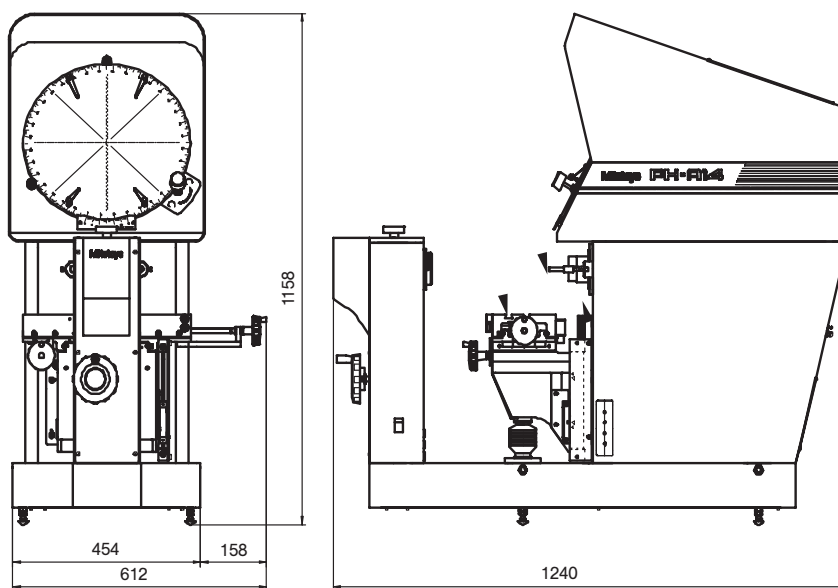
011298

Please order our brochure about the Fixture System "optifix".

Profile Projector PH-A14

Series 172

Dimensions



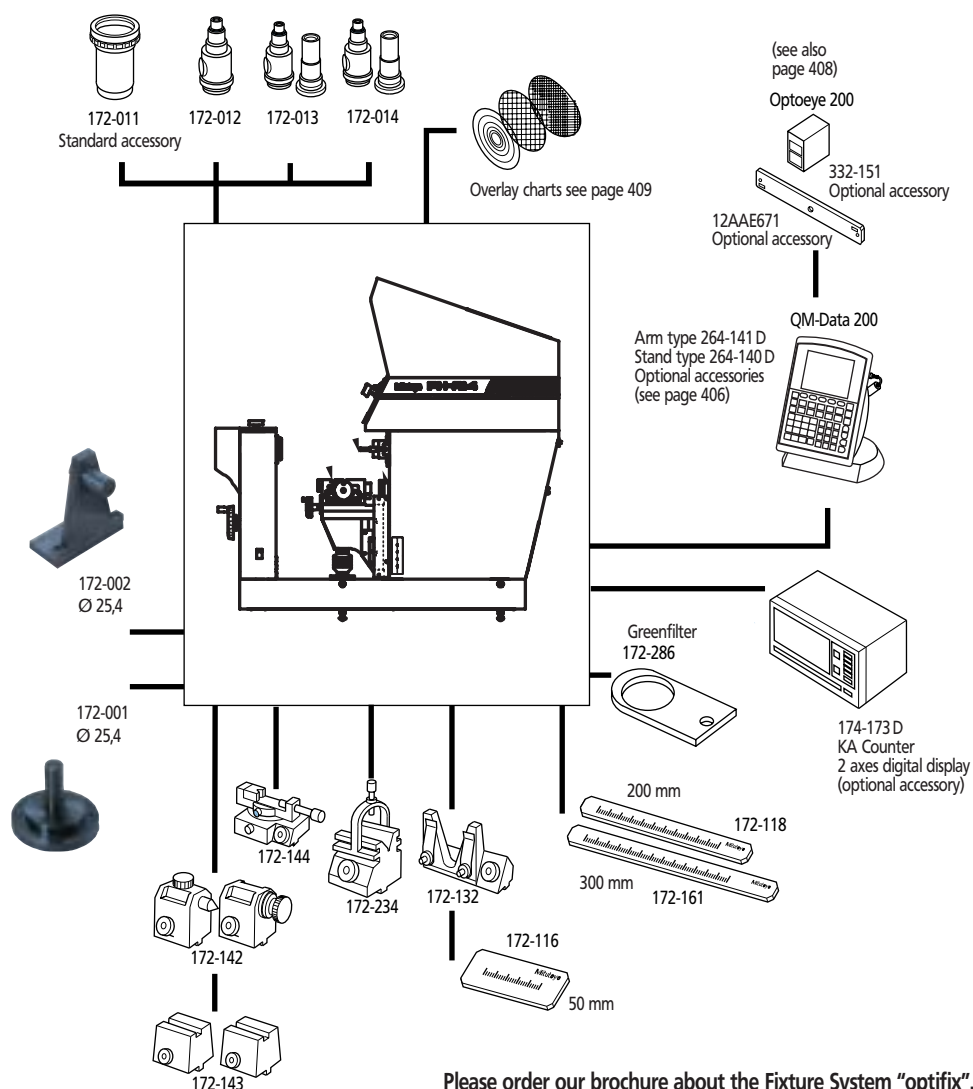
Optional accessories

Objectives

- No. 172-011 10x Objective (standard accessory)
- No. 172-012 20x Objective
- No. 172-013 50x Objective
- No. 172-014 100x Objective
- No. 172-142 Tailstocks, locator dia. 120 mm, (Ø 240 mm with 172-143)
Mass: 3,3 kg
- No. 172-143 Support frames for 172-142
Mass: 2,2 kg
- No. 172-132 Workpiece locator
Mass: 1,3 kg
- No. 172-144 Rotatable vice
Rotation range 360°,
Max. aperture 76 mm
Mass: 2,8 kg
- No. 172-234 V block
Max. workpiece size: Ø 50 mm
Mass: 1,24 kg
- No. 172-001 Workpiece locator for e.g. saw blades, disc milling cutters
- No. 172-002 Workpiece locator for e.g. saw blades, disc milling cutters
- No. 172-116 Glass scale
Length 50 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm
- No. 172-118 Glass scale
Length 200 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm
- No. 172-161 Glass scale
Length 300 mm,
graduation 0,5 mm
Accuracy (15 + 15L/1000) µm
- No. 172-286 Colorfilter (green)
- No. 174-173D KA display
2 axes
- No. 58AAA407 Locator for KA display

Series 172

System diagram



Please order our brochure about the Fixture System "optifix".

Profile Projector PH-3515 F

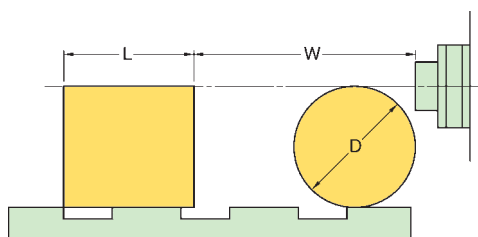
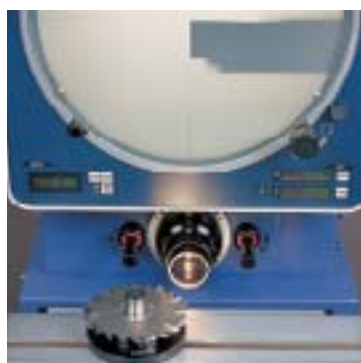
- The profile projector PH-3515 F is a device in horizontal design.
- It is suited for measuring and observing of larger workpieces as e.g. toothed racks, punching tools, etc.
- Max. workpiece mass 45 kg.

Series 172



No. 172-847 (PH-3515 F)

No.	172-847
Model	PH-3515 F
XY measuring range	X 254 mm, Y 152 mm
Measuring system	"Linear Scale"
Resolution	0,001 mm
Angle reading	0,01° oder 1'
Screen diameter	353 mm
Max. workpiece weight	45 kg
Stage size	450 x 146 mm
Objective	10 x
Transillumination:	24, 150 W Rotatable screen. Built in XY digital display
Incident illumination:	24 V, 200 W (Twin cold-light illumination)
Dimensions	460 x 1115 x 1150 mm
Mass	150 kg
Focussing range:	50 mm



Magnification	No.	Image field Ø mm	Measuring W mm	Measuring L mm	Measuring D mm
5 x	172-145	71,20	160,0	175	152,4
10 x*	172-184	35,60	93,0	235	152,4
20 x	172-173	17,80	40,0	235	116,0
50 x	172-165	7,12	14,6	80	30,4
100 x	172-166	3,50	9,5	109	19,0

* Standard accessory

Please order our brochure about the Fixture System "optifix".

Specifications

Built in digital display for angle measurement

Standard accessory

- No. 172-184** 10 x Objective
- No. 383228** Protective hood
- No. 515530** Halogen lamp 24 V, 150 W (1 pcs.)
- No. 12BAA637** Halogen lamp 24 V, 200 W (1 pcs.)

Consumable Spares

- No. 011298** MC Special cleaner for laboratory and photo optics, microscopes (120 ml)



011298

Profile Projector for Heavy Workpieces PH-3515 F

Optional accessories

Objectives

No. 172-145 5 x Objective
No. 172-295 10 x Objective
(standard accessory)

No. 172-173 20 x Objective

No. 172-165 50 x Objective

No. 172-166 100 x Objective

No. 172-142 Tailstocks, locator dia. 120 mm,
(Ø 240 mm with 172-143)
Mass: 3,3 kg

No. 172-143 Support frames for 172-142
Mass: 2,2 kg

No. 172-132 Workpiece locator
Mass: 1,3 kg

No. 172-133 Incident illumination

No. 172-144 Rotatable vice
Rotation range 360°,
Max. aperture 76 mm
Mass: 2,8 kg

No. 172-234 V block
Max. workpiece size: Ø 50 mm
Mass: 1,24 kg

No. 172-001 Workpiece locator for e.g.
saw blades, disc milling cutters

No. 172-002 Workpiece locator for e.g.
saw blades, disc milling cutters

No. 172-116 Glass scale
Length 50 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

No. 172-118 Glass scale
Länge 200 mm,
graduation 0,1 mm
Accuracy (3 + 5L/1000) µm

No. 172-161 Glass scale
Länge 300 mm,
graduation 0,5 mm
Accuracy (15 + 15L/1000) µm

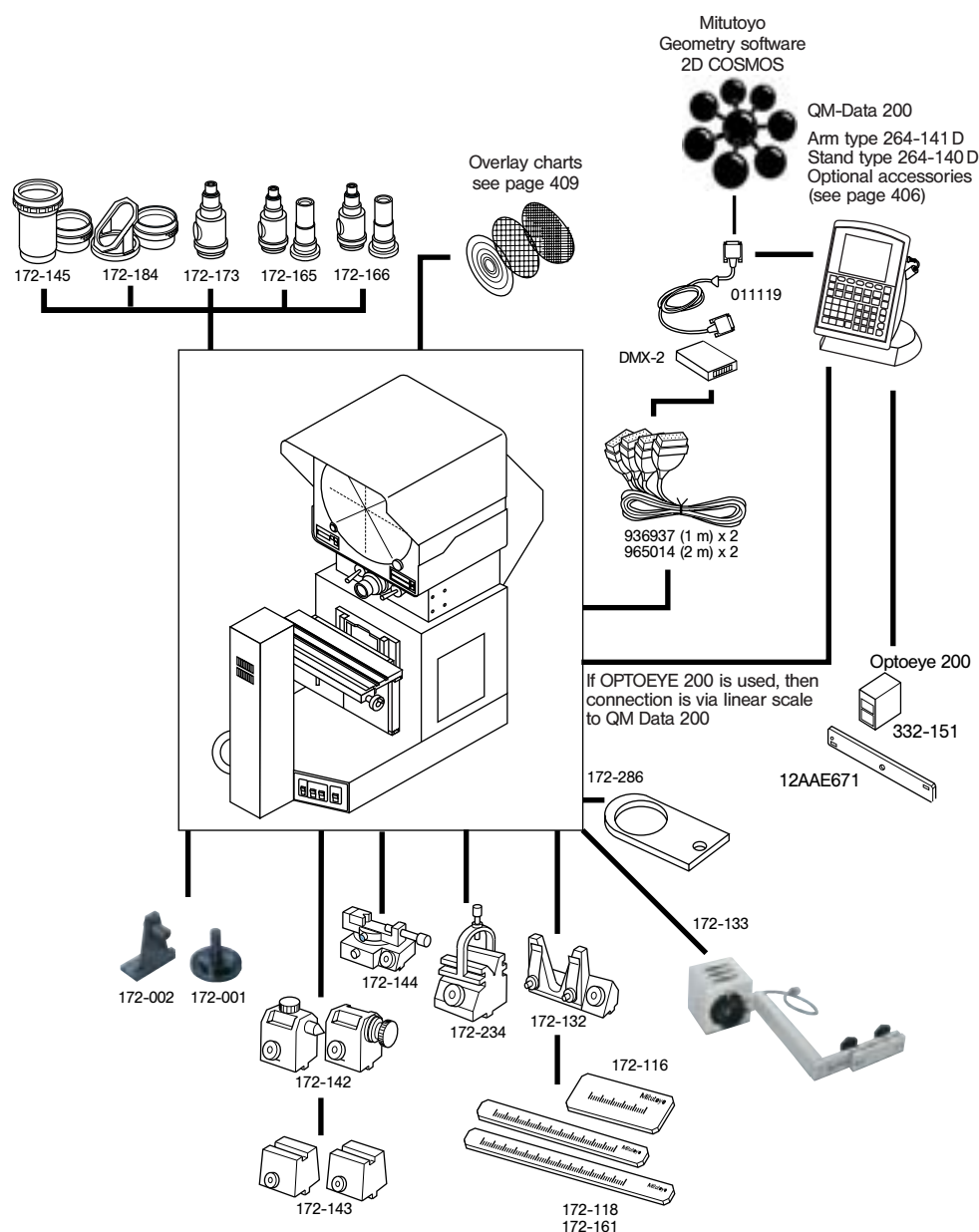
No. 172-286 Colorfilter (green)

No. 174-173D KA display
2 axes

No. 58AAA407 Locator for KA display

Series 172

System diagram



Please order our brochure about the Fixture System "optifix".

Data Processing Unit QM-Data 200

No. 264-140 D QM-Data 200 (Table-top version)

No. 264-141 D QM-Data 200 (Built-on version)

- The Data Processing Unit QM 200 has been especially developed to process measuring data generated by a profile projector or a measuring microscope.
- Measuring instructions, measuring values and calculation results for various operations shown on the back-lit LCD are easy to grasp and comprehend.
- Measuring results can also be printed, either by a small and convenient receipt printer (available as special option) or on ESC/P printer and continuous paper.
- By connecting the optional floppy disk drive newly created part programs, measuring values as well as calculation results may be stored and/or loaded.

Series 264

Table-top type



No. 264-140 D

Series 264

Built-on type



No. 264-141 D

Specifications

Screen:	Graphic LCD (320 x 240 dot; with background lighting)
Power supply:	AC adapter
Power consumption:	max. 24 W (accessories not included)
Dimensions (W x D x H):	200 x 90 x 280 mm
Mass:	1,2 kg (Data Processing Unit); approx. 1,0 kg (Stand, optionally available)

Optional accessories

No. 12AAD033	Printer (with cable)
No. 908353-1	Printer paper (1 roll)
No. I-1525612	Printer cable for ESC/P (Page)-Printer (2 m)
No. 12AAA799	Diskdrive
No. 937179T	Foot switch

Functions:

Multiple Language Display

For convenient operation the user may choose from nine languages: German, English, French, Italian, Spain, Portuguese, Japanese, Chinese, and Korean.

Measuring of Geometric Elements

In addition to measuring basic elements like point, circle, line, ellipse, rectangular hole, slot, distance, and point & angle a number of functions for evaluation, e.g. perpendicularity, parallelism etc. are being provided.

Mitutoyo's AI Function

The AI function (AI = Artificial Intelligence) renders choosing the element type before measuring obsolete. Measured points are analysed by the QM Data and the results for basic elements calculated, thus facilitating the measuring procedure.

Customized Operation

Macro functions and the creation of part programs speed up single and serial measurements. Additionally macro commands, part programs as well as frequently used standard operations can be registered as user's menus.

Statistical Processing

Basic statistical calculations (range, mean values, standard deviation) and graphic functions like histograms are realised.

Environmental conditions

Due to a specially developed technology the processor is protected against vibrations and shock. The dust-proof key panel allows for convenient installation even on the shop floor.

Data Processing Unit QM-Data 200

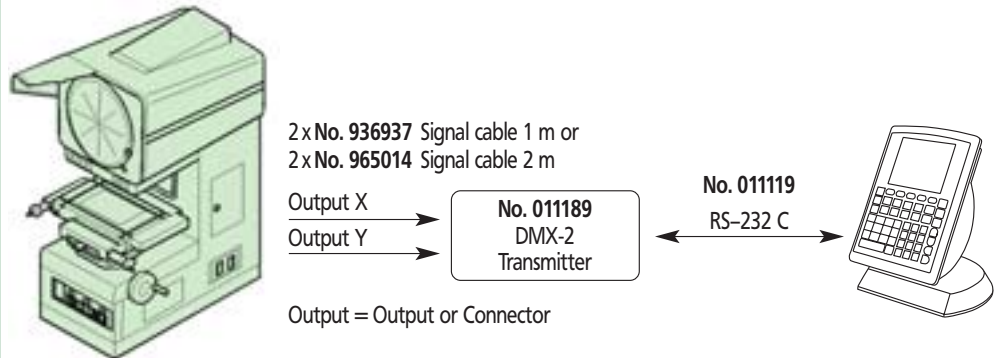
Series 264

Possible connectors

(other device-specific connectors can be found in the system diagrams for the appropriate devices)

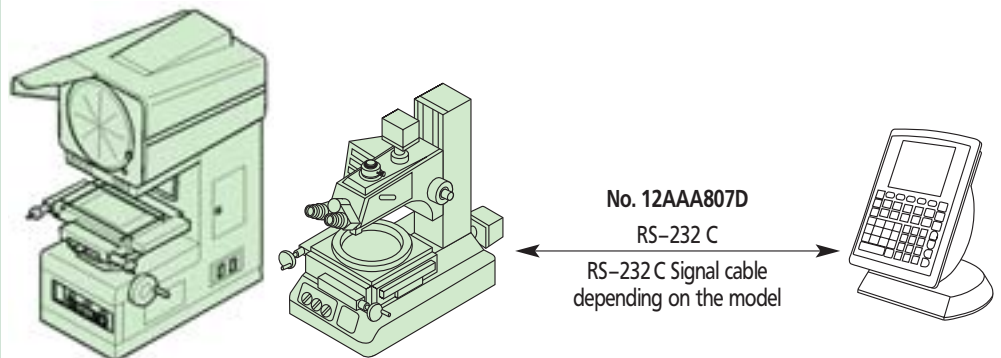
Example 1: DIGIMATIC Data output

e.g. PJ-H3000 without Optoeye / PH-3515 F



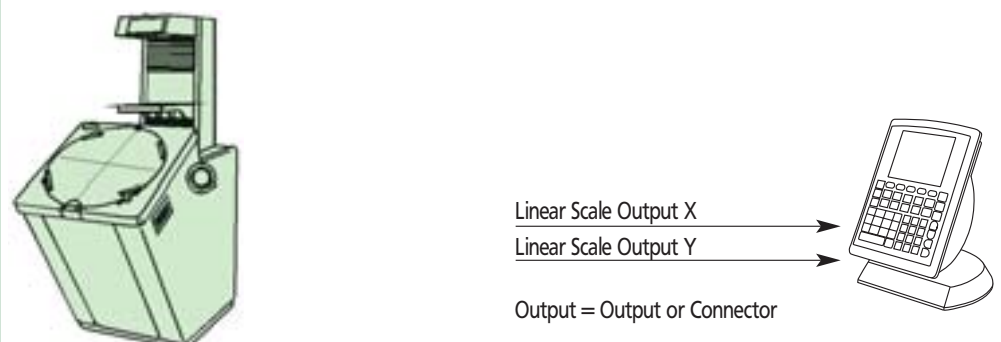
Example 2: RS-232 C Data output

e.g. PJ-A3000 / MF-Microscope



Example 3: Linear Scale Connector

e.g. PV-5110



Edge Sensor "OPTOEYE 200"

- Optoeye 200 reduces the human influence during measurement by automatic edge detection.

No. 332-151 "OPTOEYE 200"

Series 332

For measuring projectors only in combination with QM-Data 200



Specifications

Angle characteristic:	no direction select
Minimum image diameter:	2 mm on the screen
Minimum image width:	1 mm on the screen
Brightness:	30 to 500 Lux Min. brightness difference bright to dark 20 Lux
Repeatability:	$s = 1 \mu\text{m}$

Optional accessories

- 12AAE671** Sensor holder for
PJ-A3000, PJ-H3000,
PH-3515F, PH-A14
- 12AAE672** Sensor holder for
PV-5000, PV-5010, PV-5110



Note:

- If Optoeye 200 is used, the measuring projector must be connected via the linear scale to the QM-Data 200.

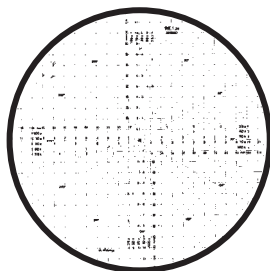
Specifications

Line width:	0,05, 0,08, 0,1 and 0,12 mm
Graduation lines, linear:	Error limits: (0,04 + L/3000) mm
Graduation lines, angular:	Error limits: 25 angular seconds
Thermal extension coefficient of plastics:	$2,7 \times 10^{-5} \text{ K}^{-1}$

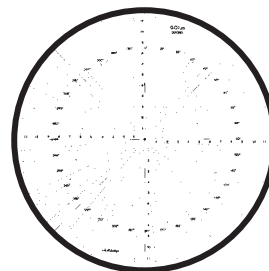
Standard Overlay Charts

- The reference drawings of the standard overlay charts increase the range of application and the efficiency of Mitutoyo profile projectors.
 - The charts are supplied in the sizes \varnothing 250, 300, 340 and 500 mm so that they are suited for the screens of Mitutoyo projectors.
- This offers a large range of scales and profiles which can be tested quickly and easily. Length, height, parallelism, angle, radius, taper, bore position, diameter, as well as all standardized thread and tooth profiles can be tested.
- All charts are made of distortion free special plastics compound and are provided with a protective coating.

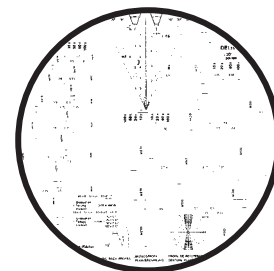
For measuring on measuring projectors



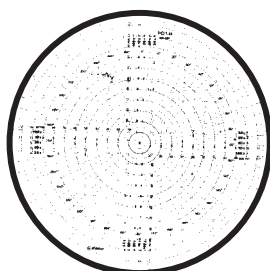
Type RE
Square line net



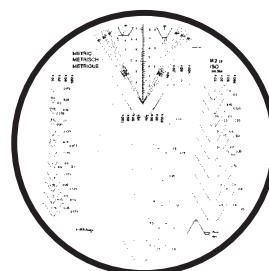
Type GO
Angle



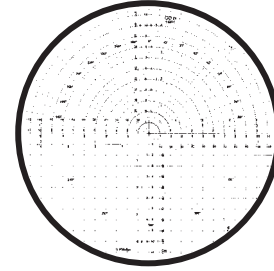
Type DE
Involute toothing



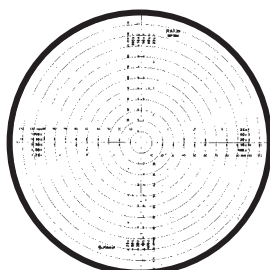
Type PO
Polar line net



Type M
Metrical ISO thread



Type CO
Combination of square line and polar



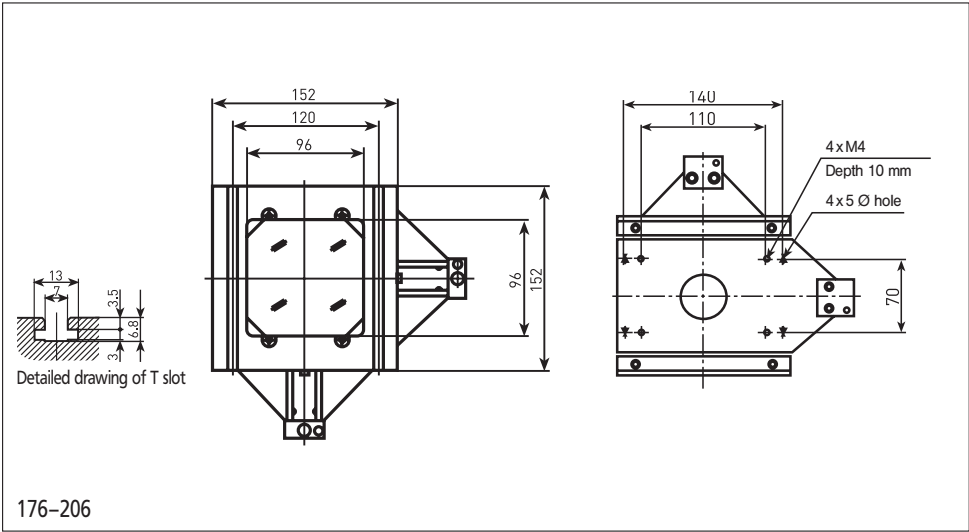
Type RA
Radii

No.	\varnothing mm
Square line net Type RE	
201380	250
201386	300
201392	340
512621	500
Polar line net Type PO	
201381	250
201387	300
201393	340
512622	500
Radii Type RA	
201382	250
201388	300
201394	340
512623	500
Angle Type GO	
201383	250
201389	300
201395	340
512624	500

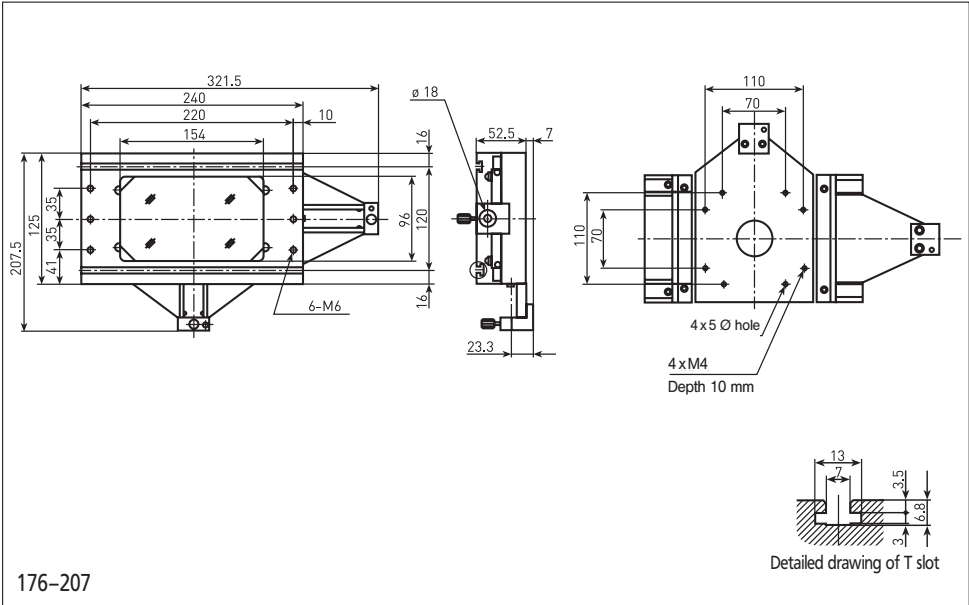
No.	\varnothing mm
Metrical ISO thread Type M	
201384	250
201390	300
201396	340
512625	500
Involute toothing Type DE	
201385	250
201391	300
201397	340
512626	500
Combination (RE and PO) Type CO	
512651	250
512652	300
512653	340
512654	500

Measurement table dimensions

For TM-500



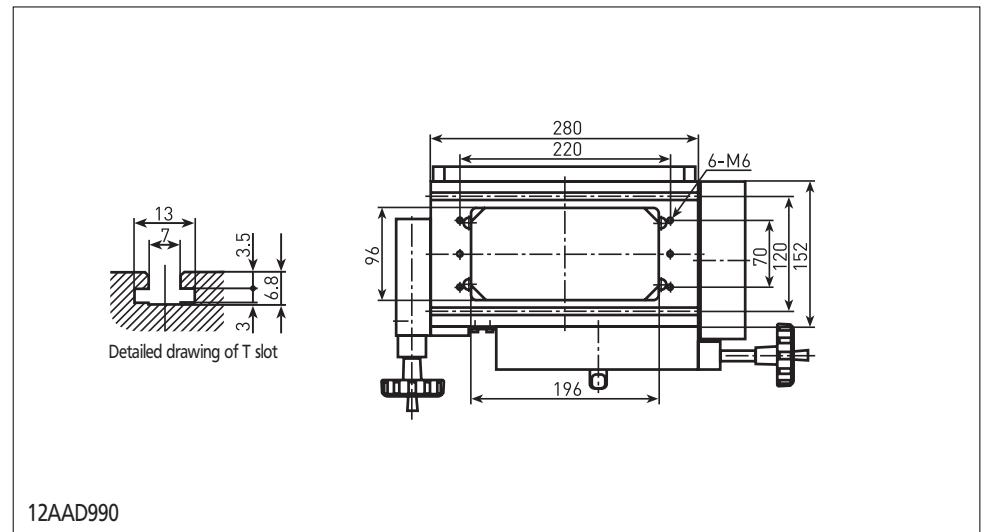
For TM-500



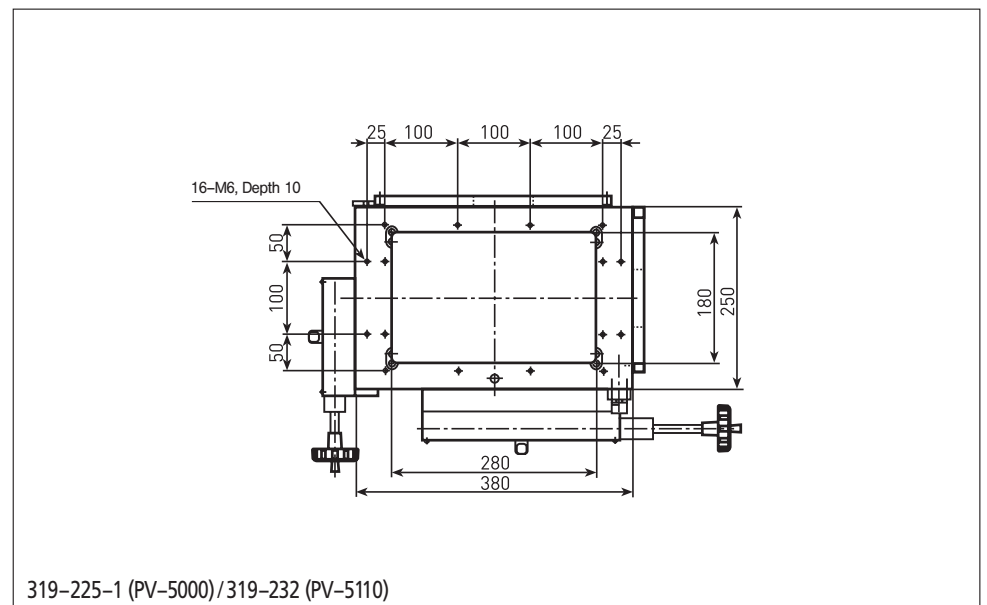
No.	176-206	176-207
Adjustment range	50 x 50 mm	100 x 50 mm
Measurement table dimensions	152 x 152 mm	240 x 152 mm
Glass plate dimensions	96 x 96 mm	154 x 96 mm
Glass plate order no.	380405	510408
Max. workpiece weight	5 kg	5 kg
Measuring methods	Integral micrometer	Integral micrometer
Installation diameter	18 mm	18 mm
Table height	44,5 mm	52,5 mm
Bore pattern for table installation	100 x 70 mm	100 x 70 mm
T slot distance	120 mm	120 mm
Mass	2,72 kg	4,17 kg
For measuring instruments	TM-500	TM-500

Measurement table dimensions

For PJ-A3000



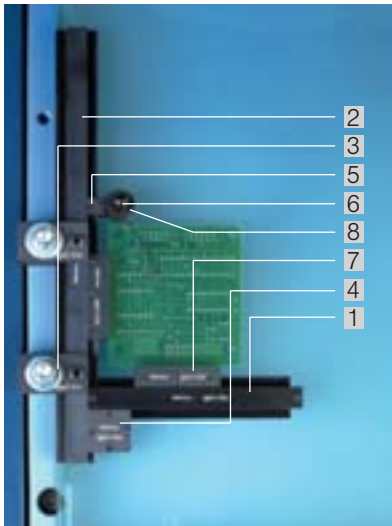
For PJ-A3000 / PV-5000



No.	12AAD990	319-225-1 (319-232)
Adjustment range	150 x 50 mm	200 x 100 mm
Measurement table dimensions	280 x 152 mm	380 x 250 mm
Glass plate dimensions	196 x 96 x 5 mm	280 x 180 x 6 mm
Glass plate order no.	981349	382762
Max. workpiece weight	5 kg	5 kg
Measuring methods	Linear Scale	Linear Scale
Installation diameter	-	-
Table height	52,5 mm	75 mm
Bore pattern for table installation	100 x 70 mm	210 x 140 mm
T slot distance	120 mm	-
Mass	16 kg	18,5 kg
For measuring instruments	PJ-A3000	PJ-A3000 / PV-5000 (PV-5110)

"OPTI-FIX" clamping system

- "OPTI-FIX", a modular, flexible clamping system for profile projectors, measuring microscopes and vision measuring instruments
- Consisting of remarkably few components, it will also fix difficult to hold pieces in the required position for the measuring process.
- "OPTI-FIX" has proven itself to be particularly rational and reliable for repeat and series tests.



"Basic-Set" Order No.: 011323

Item no.	"Basis-Set" consisting of:	Piece	Dimensions
M550838	1. Clamping profile strip with connecting slot	1	100 mm
M550857	2. Clamping profile strip without connecting slot	1	200 mm
M550846*	3. Fixing plate	2	–
M550842	4. Connecting piece with connecting slot	1	–
M550853	5. Clamping bracket	1	–
M550891	6. Cylindrical pin with thread	1	30 mm
M550845	7. Ridged seat with longitudinal slot	2	40/10 mm
M550849	8. Sprung clip, long 15°	1	–

* Other sizes available on request



All components are anodised matt black in order to avoid disruptive reflections from the ambient lighting or the illumination.

Assembly of the clamping components on the measuring table either uses an installation frame on a fixing plate or can be fixed using vacuum clamping plates that can be placed anywhere on the measuring table.

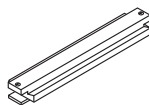
"OPTI-FIX" clamping system

Optional accessories

Clamping profile strips with rear connecting slot

M550838	100/19,6 mm
M550859	200/19,6 mm
M550835	240/19,6 mm
M550836	250/19,6 mm

Other lengths on request
(adaptable to table dimensions)



Telescope holder

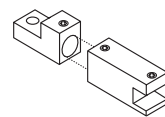
–End piece

M550852

–Slider

M550839

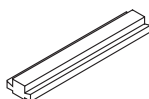
Used with threadless cylindrical pin.



Clamping profile strips without rear connecting slot

M550861	100/19,6 mm
M550857	200/19,6 mm
M550854	250/19,6 mm
M550834	310/19,6 mm

Other lengths on request
(adaptable to table dimensions)



Dowel pin Ø 6 mm

For telescope holders (threadless)

M550887 10 mm

M550888 20 mm

M550889 30 mm

M550890 40 mm

For press pads (with M4 thread)

M550891 30 mm



Fixing plate with longitudinal hole for fixing clamping profile strips

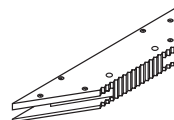
M550846

Other lengths on request
(adaptable to table dimensions)



Ridged seat 30°/45°

M550837 250/20 mm



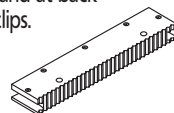
Ridged seat 100/20 mm

M550843

With connection slots along length and at back and M4 locating thread for spring clips.

Ridged seat 40/10 mm

M550845 With longitudinal slot only

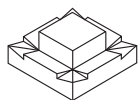


Ridged seat 100/20 mm

M550858 nur With longitudinal slot only

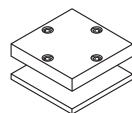
20/20 Connector with dove-tailed connection

M550841



20/20 Connector with connecting slots

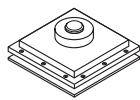
M550842



Vacuum adhesion plate as docking element on table

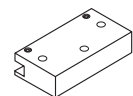
M550844

If no threaded holes are available for fixing plates.



Spring clip holder

M550850



Swivel component with cylindrical pin

M550847



Swivel component with blade

M550851

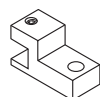


Clamp with M4 thread

M550853

For insertion of spring clips

Can also be used as a connecting element when building-on.



Spring clip 15°

M550870 (short)

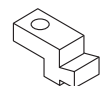
M550849 (long)



Joint with dovetail connection

M550840

Used with M550853.



Spring clip 30°

M550848 (short)

M550869 (long)

