

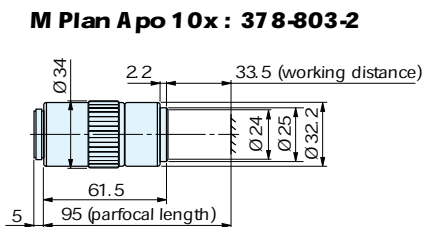
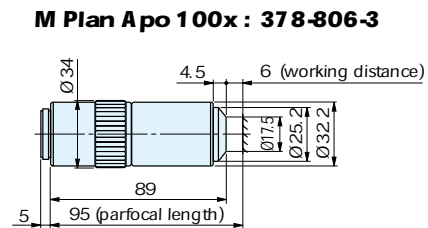
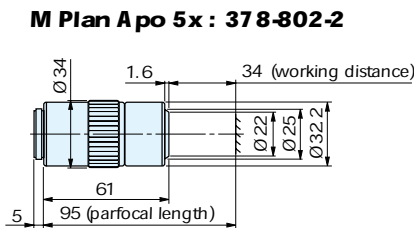
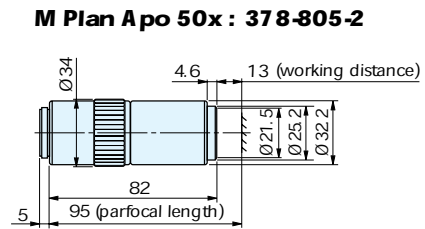
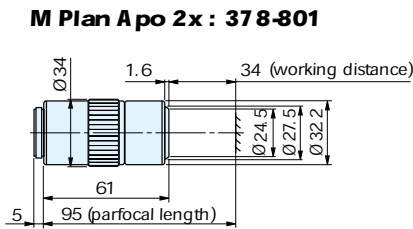
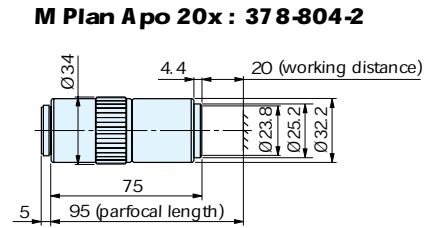
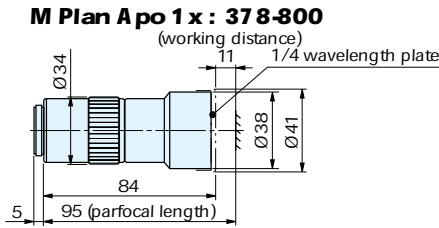
M Plan Apo

■ FEATURES

1. A specimen with steps, which cannot be focused on with the conventional short working distance objectives, can be easily observed with the use of Mitutoyo long working distance objectives (M Plan Apo 100x: 6mm).
2. The M Plan Apo (Achromat) is an excellent optical system, with the flat and chromatic aberration free image over the entire field of view.

■ DIMENSIONS

* Mounting screws 26, thread 36 (see P.30.)



Unit mm

■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-800*	1x	0.025	11.0	200	11.0	440	Ø24	4.8x6.4	300
378-801	2x	0.055	34.0	100	5.0	91	Ø12	2.4x3.2	220
378-802-2	5x	0.14	34.0	40	2.0	14.0	Ø4.8	0.96x1.28	230
378-803-2	10x	0.28	33.5	20	1.0	3.5	Ø2.4	0.48x0.64	230
378-804-2	20x	0.42	20.0	10	0.7	1.6	Ø1.2	0.24x0.32	370
378-805-2	50x	0.55	13.0	4	0.5	0.9	Ø0.48	0.10x0.13	290
378-806-3	100x	0.70	6.0	2	0.4	0.6	Ø0.24	0.05x0.06	320

* M Plan Apo 1x (378-800) should be used together with an appropriate polarizer for the microscope used.

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

M Plan Apo SL

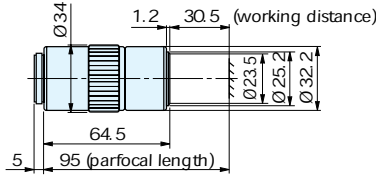
■ FEATURES

1. Super-long working distance objectives (M Plan Apo SL200x: 13mm) for bright field observation.
2. The M Plan Apo (Apochromat) is an excellent optical system, with the flat and chromatic aberration free image over the entire field of view.

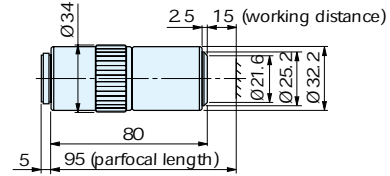
■ DIMENSIONS

*Mounting screws 26, thread 36 (see P.30.)

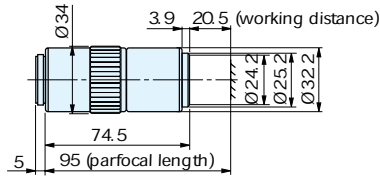
M Plan Apo SL20x : 378-810-3



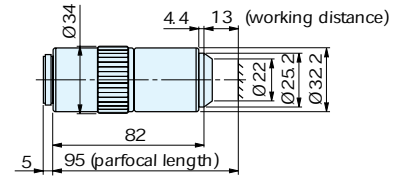
M Plan Apo SL80x : 378-812-3



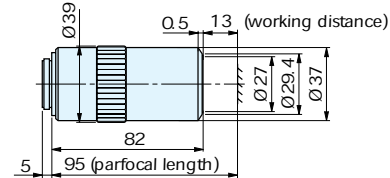
M Plan Apo SL50x : 378-811-3



M Plan Apo SL100x : 378-813-3



M Plan Apo SL200x : 378-816-3



Unit mm

■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-810-3	20x	0.28	30.5	10	1.0	3.5	Ø1.2	0.24x0.32	240
378-811-3	50x	0.42	20.5	4	0.7	1.6	Ø0.48	0.10x0.13	280
378-812-3	80x	0.50	15.0	2.5	0.6	1.1	Ø0.30	0.06x0.08	280
378-813-3	100x	0.55	13.0	2	0.5	0.9	Ø0.24	0.05x0.06	290
378-816-3	200x	0.62	13.0	1	0.4	0.7	Ø0.12	0.025x0.03	490

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

High-resolving power objectives for bright field

M Plan Apo

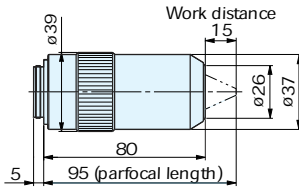
■ FEATURES

1. High resolving power objectives (M Plan Apo 100x: N.A. 0.90) for bright field observation.
2. The M Plan Apo (Apochromat) is an excellent optical system, with the flat and chromatic aberration free image over the entire field of view.

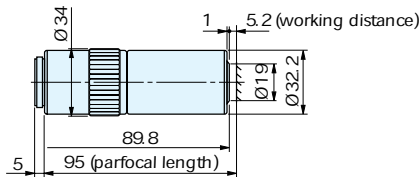
■ DIMENSIONS

* Mounting screws 26, thread 36 (see P.30.)

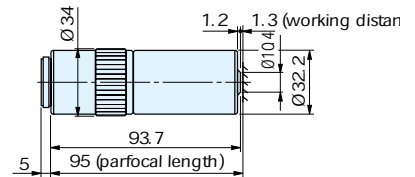
M Plan Apo HR 10x : 378-788-4



M Plan Apo 50x : 378-814-4



M Plan Apo 100x : 378-815-4



Unit mm

■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-788-4	10x	0.42	15	20	0.6	1.55	Ø2.4	0.48x0.64	460
378-814-4*	50x	0.75	5.2	4	0.4	0.48	Ø0.48	0.10x0.13	400
378-815-4*	100x	0.90	1.3	2	0.3	0.34	Ø0.24	0.05x0.06	410

* Available on "made-to-order" basis.

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

Objectives with glass-thickness compensation for bright field

G Plan Apo

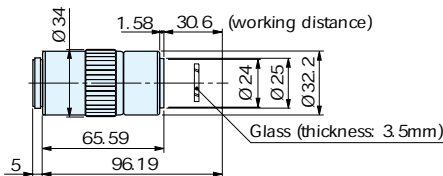
■ FEATURES

1. Long working distance objectives (G Plan Apo 50x: 13.89mm) for bright field observation. These objectives allow observation of a specimen through a glass; they can be used to observe a specimen in a laboratory dish, a vacuum furnace, or various glass chambers.
2. Designed to correct a glass thickness of 3.5mm*.
3. The M Plan Apo (Apochromat) is an excellent optical system, with the flat and chromatic aberration free image over the entire field of view.

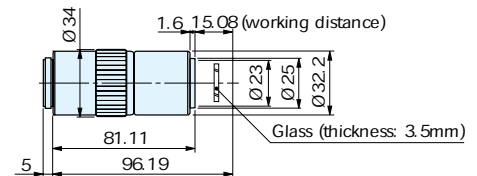
■ DIMENSIONS

* Mounting screws 26, thread 36 (see P.30.)

G Plan Apo 20x : 378-847



G Plan Apo 50x : 378-848-3



Unit mm

■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D.** (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-847*	20x	0.28	29.42	10	1.0	3.5	Ø1.2	0.24x0.32	270
378-848-3	50x	0.50	13.89	4	0.6	1.1	Ø0.48	0.10x0.13	320

* Available on "made-to-order" basis.

** Air conversion

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

Objectives with near-infrared radiation correction for bright field

M Plan Apo NIR

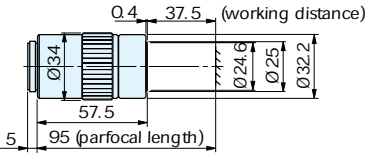
FEATURES

1. Long working distance objectives (M Plan Apo NIR 100x: 12mm) for bright field in laser cutting.
2. Designed to focus within the depth of focus, even when the laser wavelength used changes from the visible radiation (general inspection range) to the near-infrared radiation range (wavelength 1800nm).
3. Designed to improve the spectral transmission factor within near-infrared radiation. Most ideal when attached to the FS70L, VMJ-L, or VMZ40 and used together with YAG laser (wavelength 1064nm), for cutting semiconductor circuits.

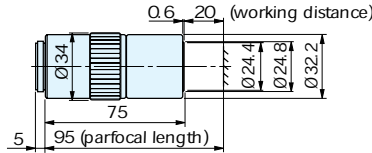
DIMENSIONS

*Mounting screws 26, thread 36 (see P.30)

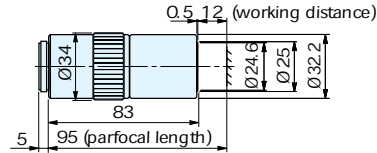
M Plan Apo NIR 5x : 378-822-4



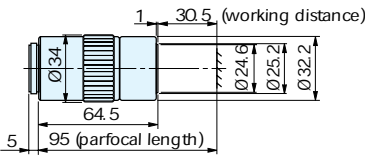
M Plan Apo NIR 20x : 378-824-4



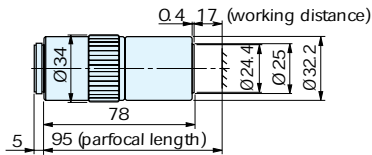
M Plan Apo NIR 100x : 378-826-5



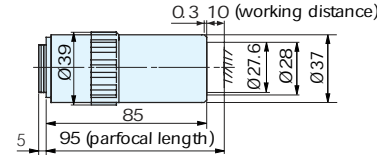
M Plan Apo NIR 10x : 378-823-5



M Plan Apo NIR 50x : 378-825-5



M Plan Apo NIR-HR 50X/100X : 378-863-5/864-5



*Depending on the focal point of the visible ray, when the wavelength exceeds 1100nm, a glass variance or an error that occurs in a measurement of the refractive index may cause the focus to shift.

SPECIFICATIONS

Unit: mm

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-822-4	5x	0.14	37.5	40	2.0	14.0	Ø4.8	0.96x1.28	220
378-823-5	10x	0.26	30.5	20	1.1	4.1	Ø2.4	0.48x0.64	250
378-824-4	20x	0.40	20.0	10	0.7	1.7	Ø1.2	0.24x0.32	300
378-825-5	50x	0.42	17.0	4	0.7	1.6	Ø0.48	0.10x0.13	315
378-826-5	100x	0.50	12.0	2	0.6	1.1	Ø0.24	0.05x0.06	335
378-863-5	50x	0.65	10.0	4	0.42	0.65	Ø0.48	0.10x0.13	450
378-864-5	100x	0.70	10.0	2	0.39	0.56	Ø0.24	0.05x0.06	450

* The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

Objectives with near-infrared radiation correction, for bright field through liquid crystal

LCD Plan Apo NIR

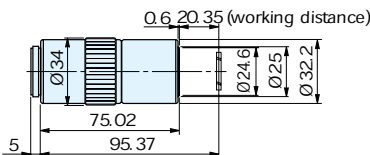
FEATURES

1. Long working distance objectives (LCD Plan Apo NIR 50x/t0.7: 17.26mm) designed for bright field observation through a glass in laser cutting.
2. These objectives correct the near-infrared radiation to be used for observation through a liquid crystal (thickness 1.1mm or 0.7mm) or for repair with a laser. Design and production of this type of lens with different glass thickness are also available.

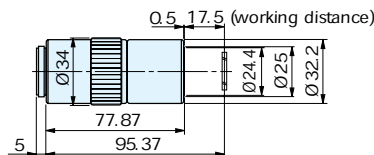
DIMENSIONS

*Mounting screws 26, thread 36 (see P.30)

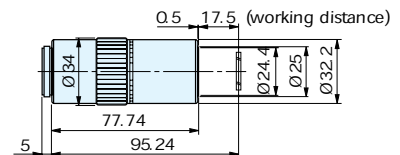
LCD Plan Apo NIR 20x/t1.1 : 378-827-4



LCD Plan Apo NIR 50x/t1.1 : 378-828-5



LCD Plan Apo NIR 50x/t0.7 : 378-829-5



SPECIFICATIONS

Unit: mm

Order No.	Magnification/glass thickness	N.A.	W.D.** (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-827-4	20x/t1.1	0.40	19.98	10	0.7	1.7	Ø1.2	0.24x0.32	305
378-828-4	50x/t1.1	0.42	17.13	3.9	0.7	1.6	Ø0.48	0.10x0.13	320
378-829-5*	50x/t0.7	0.42	17.26	3.9	0.7	1.6	Ø0.48	0.10x0.13	320
378-754-5*	100x/t0.7	0.50	11.76	2	0.6	1.1	Ø0.24	0.05x0.06	335

* Available on "made-to-order" basis.

** Air conversion

* The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

Objectives with near-ultraviolet radiation correction for bright field

M Plan Apo NUV

Objectives with near-ultraviolet radiation correction for bright field through liquid crystal

LCD Plan Apo NUV

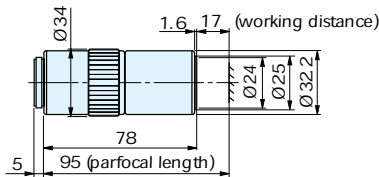
FEATURES

1. Long working distance objectives (M Plan Apo NUV 100x: 11mm) for bright field observation.
2. Designed to focus within the depth of focus, even when the laser wavelength used changes from the visible radiation (general inspection range) to the near-ultraviolet radiation range (wavelength 355nm).
3. These objectives correct the near-ultraviolet radiation to be used for observation or for repair with a laser through a liquid crystal (thickness 0.7mm).
4. Designed to improve the spectral transmission factor within near-ultraviolet radiation range. Most ideal when attached to the FS70L and used together with YAG laser (wavelength 355nm), for cutting semiconductor circuits, as well as repairing liquid crystal color filters.

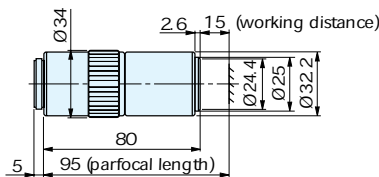
DIMENSIONS

*Mounting screws 26, thread 36 (see P.30)

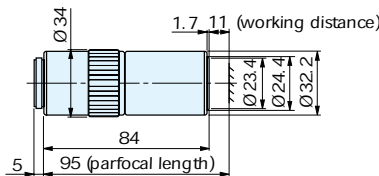
M Plan Apo NUV 20x : 378-817-4



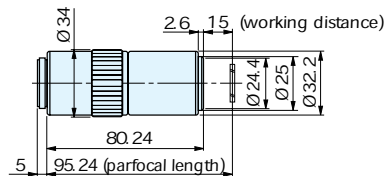
M Plan Apo NUV 50x : 378-818-4



M Plan Apo NUV 100x : 378-819-4



LCD Plan Apo NUV 50x/t0.7 : 378-820-4



SPECIFICATIONS

Unit: mm

Order No.	Magnification/ glass thickness	N.A.	W.D.** (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-817-4	20x	0.40	17.0	10	0.7	1.7	Ø1.2	0.24x0.32	340
378-818-4	50x	0.42	15.0	4	0.7	1.6	Ø0.48	0.10x0.13	350
378-819-4	100x	0.50	11.0	2	0.6	1.1	Ø0.24	0.05x0.06	380
378-820-4*	50x/t0.7	0.42	14.76	4	0.7	1.6	Ø0.48	0.10x0.13	310
378-753-4	50x/t1.1	0.42	14.53	4	0.7	1.6	Ø0.48	0.10x0.13	310
378-751-4*	100x/t1.1	0.50	11.03	2	0.6	1.1	Ø0.24	0.05x0.06	380

* Available on "made-to-order" basis.

** For 378-820, 378-753, 378-751 are "Air conversion".

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

M Plan UV

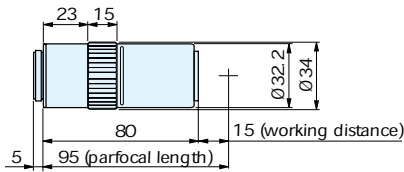
■ FEATURES

1. Long working distance objectives (M Plan UV 80x: 10mm) for bright field observation.
2. Designed to focus within the depth of focus, when either laser wavelength of the visible radiation (550nm) or ultraviolet radiation (266nm) is used. Improves the spectral transmission factors: 20x and 50x objectives by 80%, and 80x objective by 60% ultraviolet radiation.
3. Powerful when attached to the FS70L4, VMU-L4, VMZ 40R-L4, or -BL4 and used together with YAG laser (wavelengths 532nm or 266nm), for cutting microscopic workpieces that require high-accuracy cutting, such as semiconductor protective film or semiconductor circuits.

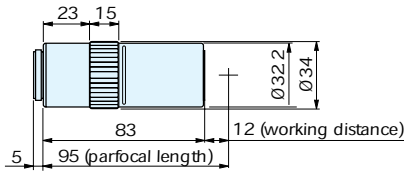
■ DIMENSIONS

*Mounting screws 26, thread 36 (see P.30)

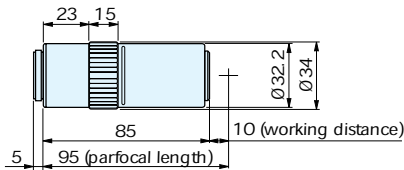
M Plan UV 20x : 378-837-5



M Plan UV 50x : 378-838-5



M Plan UV 80x : 378-839-5



Unit mm

■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-837-5	20x	0.36	15.0	10	0.8	2.1	Ø1.2	0.24x0.32	330
378-838-5	50x	0.40	12.0	4	0.7	1.7	Ø0.48	0.10x0.13	400
378-839-5	80x	0.55	10.0	2.5	0.5	0.9	Ø0.30	0.06x0.08	380

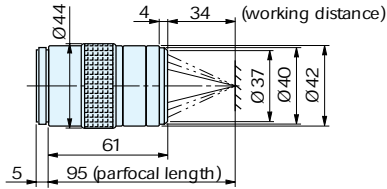
• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

BD Plan Apo

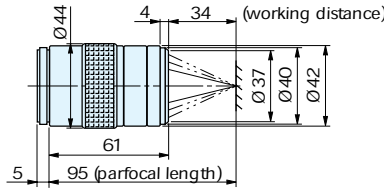
■ DIMENSIONS

*Mounting screws 26, thread 36 (see P.30)

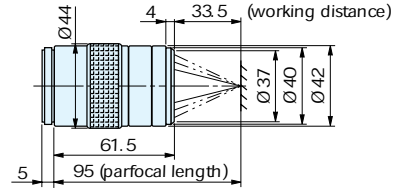
BD Plan Apo 2x : 378-831-4



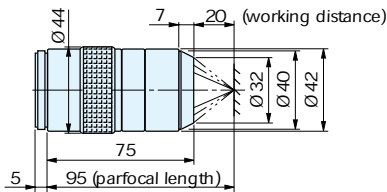
BD Plan Apo 5x : 378-832-4



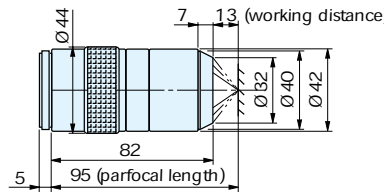
BD Plan Apo 10x : 378-833-4



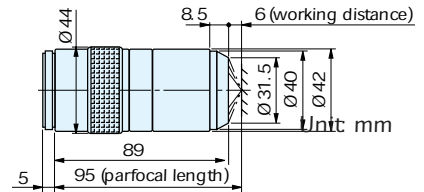
BD Plan Apo 20x : 378-834-4



BD Plan Apo 50x : 378-835-4



BD Plan Apo 100x : 378-836-5



■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-831-4	2x	0.055	34.0	100	5.0	91	Ø12	2.4x3.2	230
378-832-4	5x	0.14	34.0	40	2.0	14.0	Ø4.8	0.96x1.28	240
378-833-4	10x	0.28	33.5	20	1.0	3.5	Ø2.4	0.48x0.64	240
378-834-4	20x	0.42	20.0	10	0.7	1.6	Ø1.2	0.24x0.32	300
378-835-4	50x	0.55	13.0	4	0.5	0.9	Ø0.48	0.10x0.13	320
378-836-5	100x	0.70	6.0	2	0.4	0.6	Ø0.24	0.05x0.06	320

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

■ FEATURES

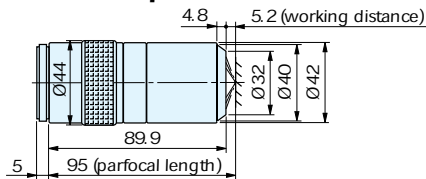
1. Long working distance objectives (BD Plan Apo 100x: 6mm) for both bright and dark field observations.
2. The special lenses and mirror in the optical tube make the ray of light fall obliquely on the specimen. Most ideal for observation of scratches and dents on the specimen surface.
3. The BD Plan Apo (Apochromat) is an excellent optical system, with the flat and chromatic aberration free image over the entire field of view.

BD Plan Apo HR

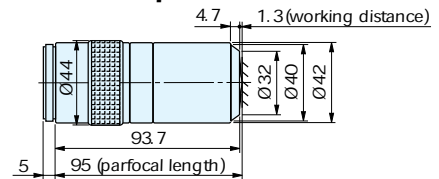
■ DIMENSIONS

*Mounting screws 40, thread 36 (see P.30)

BD Plan Apo HR 50x : 378-845



BD Plan Apo HR 100x : 378-846



Unit mm

■ SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-845*	50x	0.75	5.2	4	0.4	0.48	Ø0.48	0.10x0.13	420
378-846*	100x	0.90	1.3	2	0.3	0.24	Ø0.24	0.05x0.06	435

* Available on "made-to-order" basis.

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

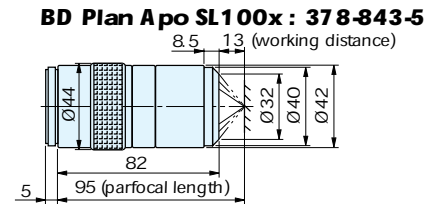
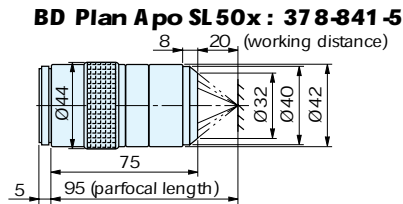
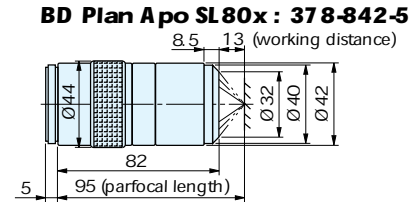
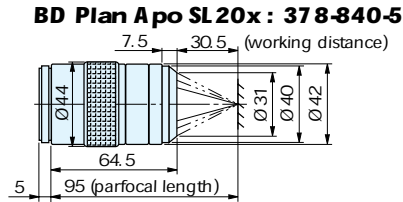
BD Plan Apo SL

■ FEATURES

1. Super-long working distance (BD Plan Apo SL100x: 13mm) objectives for both bright and dark field observations.
2. The special lenses and mirror in the optical tube make the ray of light fall obliquely on the specimen. Most ideal for observation of scratches and dents on the specimen surface.
3. The M Plan Apo (Apochromat) is an excellent optical system, with the flat and chromatic aberration free image over the entire field of view.

■ DIMENSIONS

*Mounting screws 40, thread 36 (see P.30.)



Unit mm

■ SPECIFICATIONS

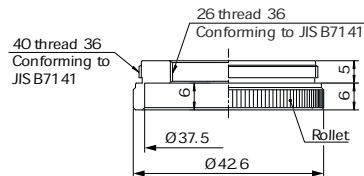
Order No.	Magnification	N.A.	W.D. (mm)	S (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
378-840-5	20x	0.28	30.5	10	1.0	3.5	Ø1.2	0.24x0.32	240
378-841-5	50x	0.42	20.5	4	0.7	1.6	Ø0.48	0.10x0.13	310
378-842-5	80x	0.50	15.0	2	0.6	1.1	Ø0.30	0.06x0.08	310
378-843-5	100x	0.55	13.0	2	0.5	0.9	Ø0.24	0.05x0.06	320

• The resolving power and focal depth of the discrete objective are values determined based on the reference wavelength.

Objective attachment adapter

This attachment adapter allows the bright-field objective to be attached to the bright/dark field switching revolver. The microscope assures parfocality even if the objective is used with a bright- and dark-field objective on the revolver.

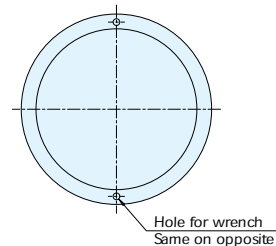
■ DIMENSIONS



Mass: 14g

■ SPECIFICATIONS

Order No.	378-026-1
Compatible models	Microscope series equipped with a bright/dark field manual switching revolver or powered switching revolver. (FS300D/DT/D2/DT2, FS110/T series, MF-A/UA (THD type) series)
Compatible objectives	M Plan Apo series, M Plan Apo SL series, G Plan Apo series



Hole for wrench
Same on opposite

Standard objectives for finity correction system

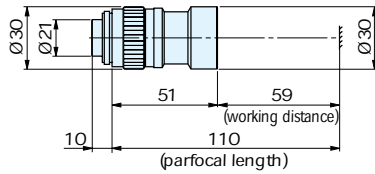
FEATURES

- Objectives for measuring applications. Employing the telecentric system (1x, 3x, 5x, and 10x lenses only) that minimizes lateral aberrations and prevents the image size from varying when the focus is lost.
- Employing finity correction system.
(Distance between specimen and image: 280mm)
(Distance between the lens mounting surface and the workpiece surface: 110mm)
- Long working distance (1x objective: 59mm) makes these lenses ideal for integration into a measuring system.

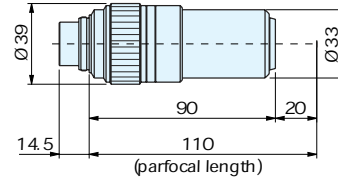
DIMENSIONS

*Mounting screws 26, thread 36 (see P.30.)

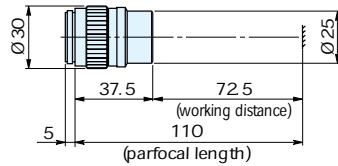
Objective 1x : 375-036



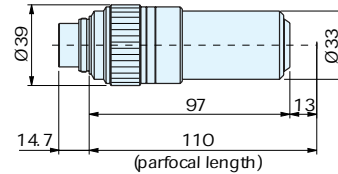
Objective 20x : 375-051



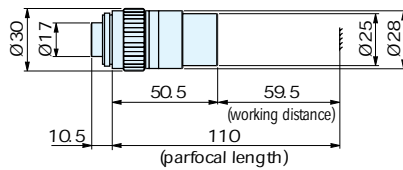
Objective 3x : 375-037



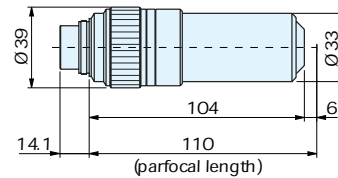
Objective 50x : 375-052



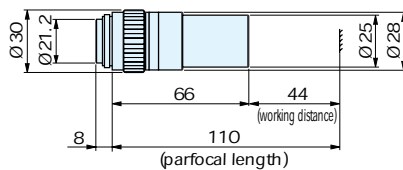
Objective 5x : 375-034



Objective 100x : 375-053



Objective 10x : 375-035



Unit mm

SPECIFICATIONS

Order No.	Magnification	N.A.	W.D. (mm)	R (μm)	DOF (μm)	Real FOV (mm) (Ø24 eyepiece)	Real FOV (VxH, mm) (1/2" CCD camera)	Mass (g)
375-036	1x	0.03	59.0	9.2	306	Ø24	4.8x6.4	110
375-037	3x	0.07	72.5	3.9	56	Ø8	1.6x2.1	45
375-034	5x	0.11	59.5	2.5	23	Ø4.8	0.96x1.28	80
375-035	10x	0.18	44.0	1.5	8.0	Ø2.4	0.48x0.64	100
375-051	20x	0.42	20.0	0.7	1.6	Ø1.2	0.24x0.32	310
375-052	50x	0.55	13.0	0.5	0.9	Ø0.48	0.10x0.13	350
375-053	100x	0.70	6.0	0.4	0.6	Ø0.30	0.06x0.08	380