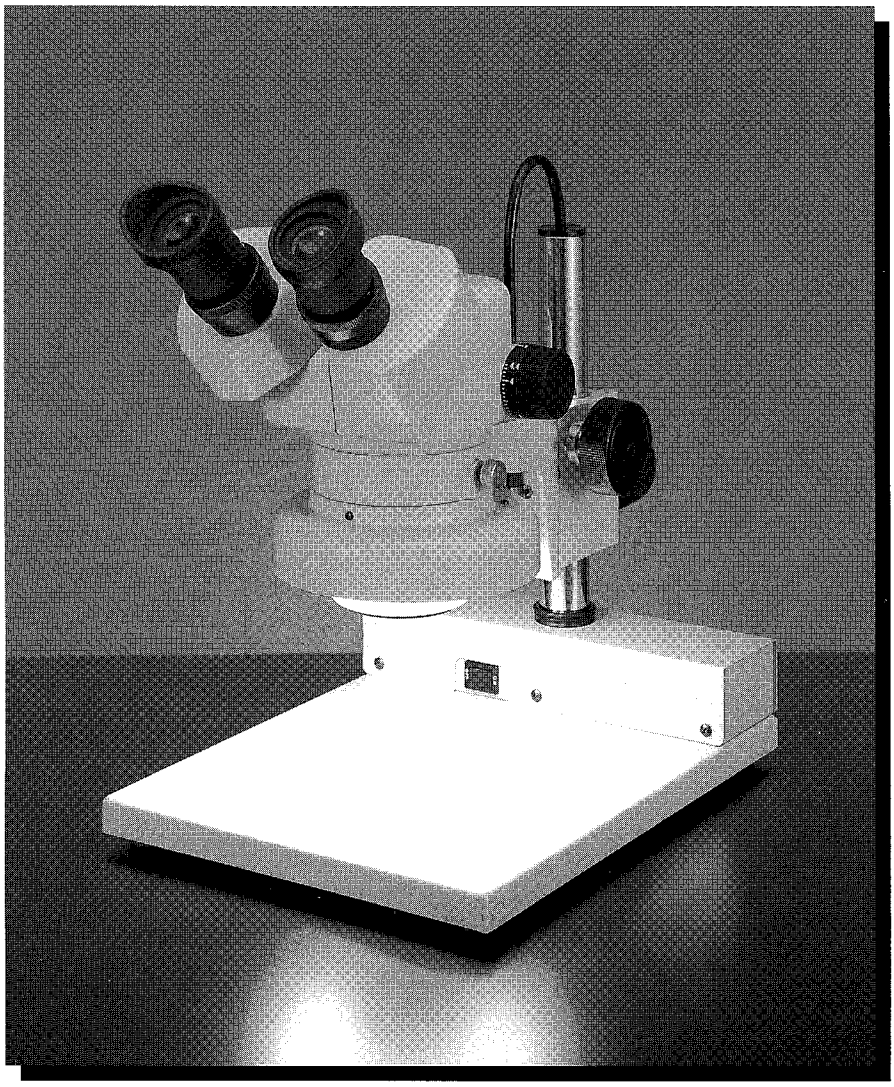
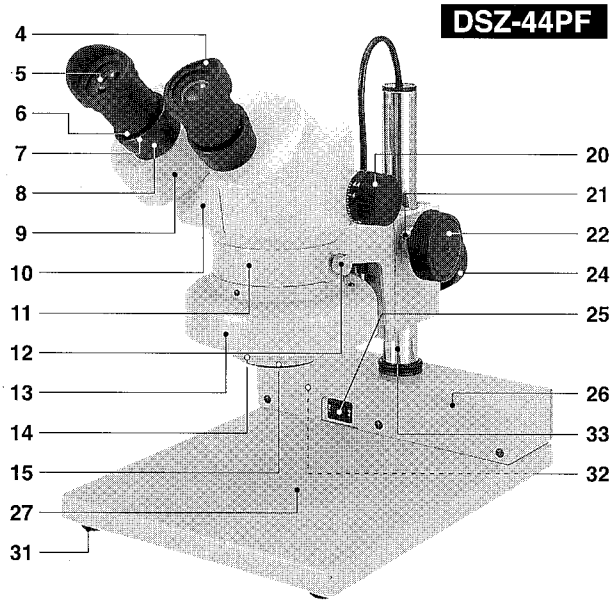
Zoom Stereo Microscopes

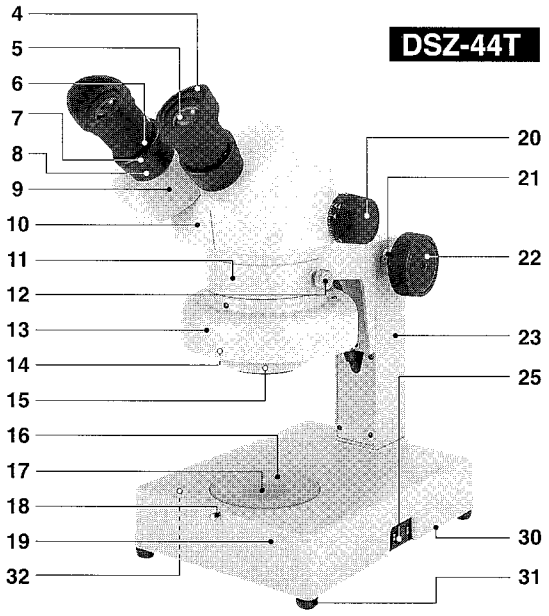
Model DSZ series

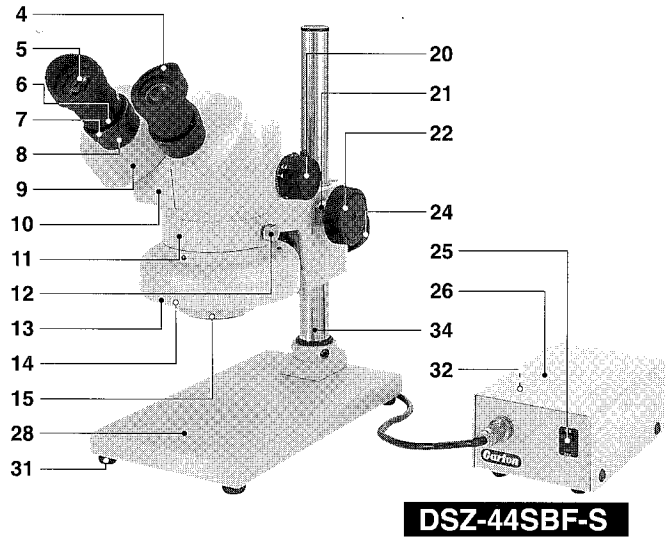


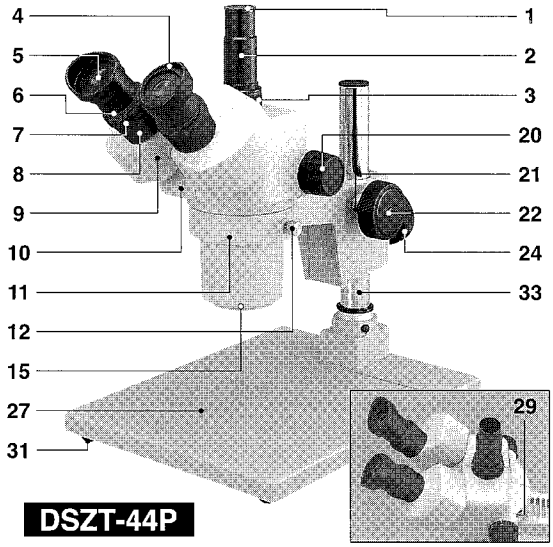
Instruction Manual

COMPONENTS









STANDARD SPECIFICATIONS

- Total magnifications ---------- 10x to 44x (zoom)
- Eyepieces (field number) ---------- DSW10x (F.N.23)
- Objectives ---------- 1.0x to 4.4x
- Zoom ratio ---------- 4.4 : 1
- Interpupillary distance ---------- Adjustable from 52mm to 75mm
- Eyepiece tube inclination ---------- 45 degree
- Diopter adjustment
  on both eyepiece tubes ---------- -5.6D to +7.2D
  on vertical tube of trinocular body ---------- -4.3D to +4.3D
- Convergent angle ---------- 12 degree
- Working distance ---------- 90mm
- Packing ---------- Styrofoam container

Models	DSZ-44T	DSZ-44PF	DSZ-44SBF-S	DSZ-44P
Body	Binocular type 360° rotatable	Binocular type 360° rotatable	Binocular type 360° rotatable	Binocular type 360° rotatable
Stand	Regular type	Pole type (250mm)	Pole type (303mm)	Pole type (250mm)
Incident light	Fluorescent 120V or 230V	Fluorescent 120V or 230V	Fluorescent 120V or 230V	Nil
Transmitted light	Tungsten 120V or 230V 20W	Nil	Nil	Nil
Stage plate	Frosted glass plate (80mm dia.) and frosted blue filter (37mm dia.)	Nil	Nil	Nil
Base size	160mm x 219mm	220mm x 284mm	144mm x 260mm	220mm x 284mm
Height	352mm	327mm	328mm	327mm
Accessories	Rubber eyeguards, Tension control pin, Dust cover, Spare bulb(Tungsten lamp only)	Rubber eyeguards, Tension control pin, Dust cover	Rubber eyeguards, Tension control pin, Dust cover	Rubber eyeguards, Tension control pin, Dust cover

GENERAL GUIDE

1.Photo tube cup
This cap should be put onto the photo tube to prevent dust when observing without camera.

2.Photo tube
This tube is used for photomicrograph or viewing through a monitor.

3.Diopter adjustment ring for Photo tube
This ring adjusts a focus of camera.

4.Rubber eye guards
Rubber eye guards protect against incident light around the eye-pieces, for improved visibility.

5.Eyepiece lenses
DSW10x (field number 23) supplied as standard. DSW5x (F.N.22.5), DSW15x (F.N.15) and DSW20x (F.N.11.4) available as options.

6.Eyepiece locking screws
These screws are used for locking eyepieces to prevent an accidental drop. When eyepieces are replaced, please loosen the screws.

7.Diopter adjustment rings
These rings adjust a dioptric difference between eyes.

8.Eyepiece tubes
Both tubes move synchronously, for quick and easy adjustment of interpupillary distance. It is adjustable within the range of 52mm to 75mm.

9.Prism housing
When adjusting interpupillary distance, please grasp the right and left housings instead of eyepiece tubes.

10.Body
The tip of the body is threaded (ϕ=49mm), which allows screw-on installation of an optional auxiliary lens or an optional cover glass.

11.Body holder
The holder accepts binocular or trinocular body.

12.Body locking thumb screw
Loosening the screw makes it possible to rotate the body a full 360° to any viewing position. Before using the microscope, be sure to secure the body in place using this screw.

13.Fluorescent lamp housing

14.Circular fluorescent lamp 9W

15.Objective lenses
Its magnification can be adjusted within the range of 1.0x through 4.4x (zoom ratio = 4.4 : 1)

16.Glass stage plate

17.Frosted blue filter (under the glass stage plate)
This blue filter makes transmitted light close to daylight.

18.Stage plate locking thumb screw
This screw locks the stage plate. Please loosen it when replacing stage plate or blue filter.

19.Base with transmitted illuminator
The transmitted illuminator is built in the base.

20.Zooming knob
This knob adjusts the magnification of the objective lenses from 1.0x to 4.4x.

21.Tension control ring of focusing
This ring controls the rotary torque of the focusing handle with the pin provided.

22.Focusing handle
This handle is used for focus-adjustment.

23 & 33.Stand
In addition to regular & pole types, universal boom stand is available as option.

24.Clamp screw
You can adjust the height of the body coarsely by loosing this clamp.

25.On-off switch for illuminator

26.Power supply box

27.Base
A large base provides easiness to work.

28.Small base

29.Sliding knob
The right optical path is switched to photo tube by pushing this knob. You should push the knob for observation without camera.

30.Bottom plate
When replacing a bulb of the transmitted illuminator or glow lamp for fluorescent illuminator, please take the plate off according to instructions written hereby (except DSZ-44PF & DSZT-44PF).

31.Rubber feet
Rubber feet are provided for the stability required for comfortable observation.

32.Glow lamp
Glow lamp is accessible from the bottom of the base.

OPTICAL DATA FOR DSZ-44 SERIES (Auxi. lenses are not available for stand type T.)

Eyepiece	DSW5x (F.N.22.5)			DSW10x (F.N.23)			DSW15x (F.N.15)			DSW20x (F.N.11.4)		
Auxiliary Lens	Nil	W/0.5x	W/1.6x	Nil	W/0.5x	W/1.6x	Nil	W/0.5x	W/1.6x	Nil	W/0.5x	W/1.6x
Magnifications	5x-22x	2.5x-11x	8x-35.2x	10x-44x	5x-22x	16x-70.4x	15x-66x	7.5x-33x	24x-105.6x	20x-88x	10x-44x	32x-140.8x
Working Distance	90mm	150mm	45mm	90mm	150mm	45mm	90mm	150mm	45mm	90mm	150mm	45mm
Field of view	22.5-5.1mm	45-10.2mm	14-3.1mm	23-5.2mm	46-10.4mm	14.3-3.2mm	15-3.4mm	30-6.8mm	9.3-2.1mm	11.4-2.5mm	22.8-5.1mm	7.1-1.6mm

Models	DSZT-44T	DSZT-44PF	DSZT-44SBF-S	DSZT-44P
Body	Trinocular type 360° rotatable	Trinocular type 360° rotatable	Trinocular type 360° rotatable	Trinocular type 360° rotatable
Stand	Regular type	Pole type (250mm)	Pole type (303mm)	Pole type (250mm)
Incident light	Fluorescent 120V or 230V	Fluorescent 120V or 230V	Fluorescent 120V or 230V	Nil
Transmitted light	Tungsten 120V or 230V 20W	Nil	Nil	Nil
Stage plate	Frosted glass plate (80mm dia.) and frosted blue filter (37mm dia.)	Nil	Nil	Nil
Base size	160mm x 219mm	220mm x 284mm	144mm x 260mm	220mm x 284mm
Height	379mm	353mm	354mm	353mm
Accessories	Rubber eyeguards, Tension control pin, Dust cover, Spare bulb(Tungsten lamp only), Photo-eyepiece with ring	Rubber eyeguards, Tension control pin, Dust cover, Photo-eyepiece with ring	Rubber eyeguards, Tension control pin, Dust cover, Photo-eyepiece with ring	Rubber eyeguards, Tension control pin, Dust cover, Photo-eyepiece with ring

SETTING UP YOUR MICROSCOPE

After opening the styrofoam container, check that you have the following parts and accessories.

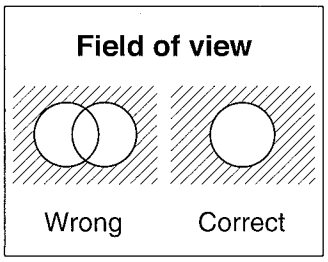
- **Microscope body**
- **Stand with body holder**
- **DSW10x Eyepiece lenses (pair)**
- **Rubber eye guard (pair)**
- **Glass stage plate (for -44T only)**
- **Frosted blue filter (for -44T only)**
- **Spare Tungsten bulb (for -44T only)**
- **Photo-eyepiece with ring (for trinocular models only)**
- **Tension control pin**
- **Dust cover**
- **Instruction manual**

1) Place the stand on a level, stable surface. The stand is easiest to use when the stand is situated with the stage towards you.
2) Loosen the body locking thumb screw provided on the side of the body holder, and insert microscope body into the body holder vertically. The body can turn full 360° inside the holder. This permits observation from any direction. Tighten the thumb screw to fix the body in any position you desire.
3) Unpack the rubber eye guards and put them onto the eyepieces, being careful not to touch the lenses. The rubber eye guards are common to both the eyepieces.
4) Place the specimen you want to view in the center of the stage and illuminate it if necessary.

USING AND ADJUSTING YOUR MICROSCOPE

Interpupillary Adjustment

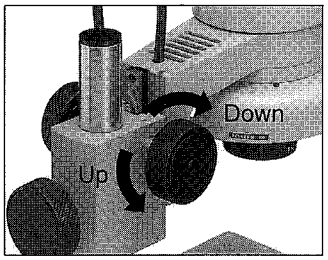
The interpupillary adjustment involves adjustment of the spacing between the two eyepiece lenses so that they are aligned with the centers of your pupiles. Failure to make this adjustment properly can result in deterioration of incident luminosity and deviation from the optical axis. Looking into the eyepiece lenses, grasp prism housings to move the eyepiece tubes to the right and left until the circular fields overlap. The setting is proper for you when the two fields appear as a single circle.



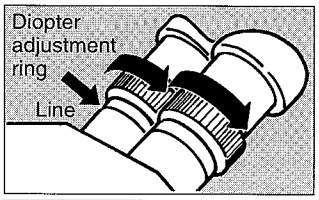
Note)Both the right and left eyepiece tubes move synchronously in this adjustment.
Be sure to use both hands when changing the eyepiece width.

Focusing and Changing Magnifications

While looking through the eyepiece lenses, slowly turn the focusing handles until the specimen focuses clearly. Careful use of the focusing handles will produce satisfactory sharp images.

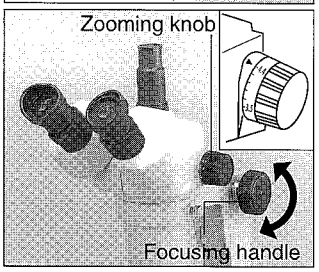


Diopter Adjustment

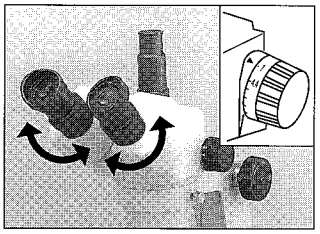


Be sure to make the following procedure to ensure correct diopter adjustment between eyes.

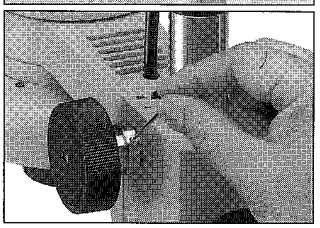
(1) Place a specimen onto the stage.
(2) Rotate the right and left diopter adjustment rings to the left (counter -clockwise) until you can see the lines inscribed on the outside of the eyepiece tubes. Adjust both the diopter adjustment rings so that their bottom edges are aligned with these lines.
(3) Rotate the zooming knobs and set it at maximum.
(4) Looking through the eyepiece lenses, rotate the focusing knobs until the specimen is in focus.
(5) Change the zooming knobs setting to minimum.
(6) Look through the eyepiece lenses again and check the focus. If the image is not clear, you should use the right and left diopter adjustment rings only to correct it.
(7) Return the zooming knobs to the maximum setting and look through the eyepiece lenses to check the focus. If the image is still not clear, you should repeat the operations in step (3) through (7).



Focusing Tension Control



A focusing tension control ring is provided on the left shaft of the focusing handle. Turn the tension control ring to obtain the desired degree of tightness on the focusing handle. This is an infrequent adjustment.



MAINTENANCE AND GENERAL CARE OF YOUR MICROSCOPE

Lamp Replacement

DISCONNECT ELECTRIC SUPPLY BEFORE REPLACEMENT. To replace the fluorescent lamp of the incident illuminator, take the fluorescent lamp off the lamp housing, and then, detach the lamp from the lamp socket. It will be easier to replace if you remove the body from the body holder and lift the body holder up to maximum by turning the focusing handles. You can access a glow lamp (starter lamp) from the bottom of the base. To replace the Tungsten bulb of the transmitted illuminator, take off the smaller bottom plate underneath the base. The bottom plate to replace the bulb is fixed with two screws with rubber feet, so unscrew the screws using a screw driver.

Keep away from dust

Always cover the microscope with the dust cover, and place it in a covered storage cabinet or return it to the styrofoam container when not in use. If the lenses get dusty, blow off the dust with a rubber syringe or a camel's hair brush. Because they are soft glass, optical lenses can easily be scratched by dust particles.

Do not tough the lenses

Fingerprints are difficult to remove. If necessary, clean the lenses with a lint free cloth moistened with xylene.

Keep moisture away

Moisture is the worst enemy of the lenses. If growth of fungus occurs, the lenses cannot be returned to their original condition. Keep the microscope in a dry place and store with a desiccant like silica gel.

Handle with care

The optical parts in this microscope are delicate and may be damaged by dropping. The mechanical parts may also be damaged by abuse or dropping.

Do not disassemble

Because the assembly of all parts has been done by skilled optical craftmen at the factory, you should not attempt disassembly. You may disturb the smoothness of moving parts or clarity of the optics if you disassemble the microscope yourself. Contact the dealer where you purchase the microscope for serving assistance.

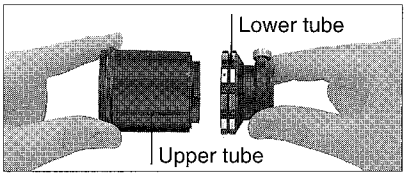
PHOTOMICROGRAPHY

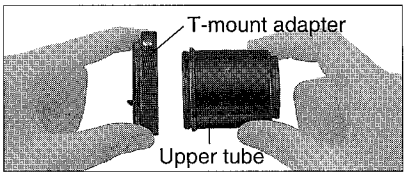
You can take microscopic photographs with trinocular models by using your 35mm SLR camera or digital still camera. You should prepare a suitable lighting system such as fiber illuminator if necessary.

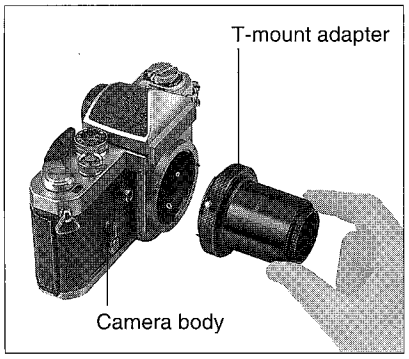
To use your 35mm SLR camera, a microscope camera adapter and T-mount adapters are optionally available. Different kinds of T-mount adapter are available according to the model of the 35mm SLR camera being used.

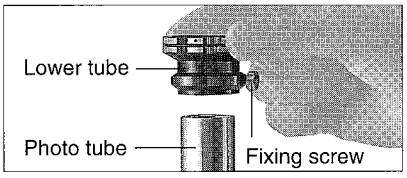
How to use the microscope camera adapter and the T-mount adapter

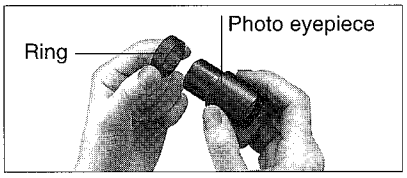
1) Separate the microscope camera adapter into two pieces, the upper tube and lower tube (mounting flange).
2) Screw the T-mount adapter on to the upper tube of the camera adapter.
3) Remove the lens from your 35mm SLR camera and attach the T-mount adapter with the upper tube to the camera body.
4) Place the lower tube of the camera adapter onto the microscope photo tube.
5) Put a photo eyepiece with ring into the photo tube. The ring brings the eyepiece lenses on the eyepiece tubes into parfocus with the camera's viewfinder. This makes it possible to focus using the eyepiece lenses instead of the viewfinder. Diopter adjustment is necessary for parfocus. However, final focusing must be done while looking trough the viewfinder.
6) Join the upper tube with camera to the lower tube mounted on the microscope by aligning the red dot on both tubes and turning about 90 degrees.
7) Position the camera for most convenient use and tighten the fixing screw of the camera adapter.
8) To prevent the body from the falling down by the weight of the camera, tighten the tension control ring using the tension control pin. When viewing from the focusing handle side, rotate the ring clockwise.
9) After you finish focusing, push the sliding knob to switch the right optical path to the camera (photo tube), and release the shutter. We recommend that you use a shutter release cable to protect against unintentional movement caused by pressing the shutter button.
10) While looking through the camera's viewfinder, sharpen the focus and make exposure time adjustments based on the camera's exposure meter. You will find that relatively low shutter speeds or time exposure will be necessary. Be sure to cover the camera's viewfinder to prevent light entering and causing erroneous exposure readings.

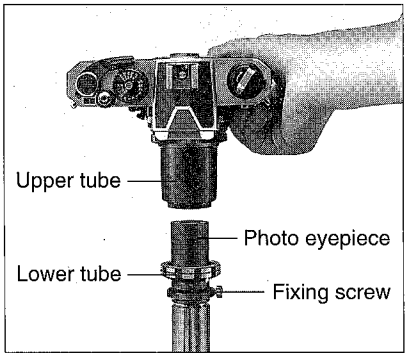


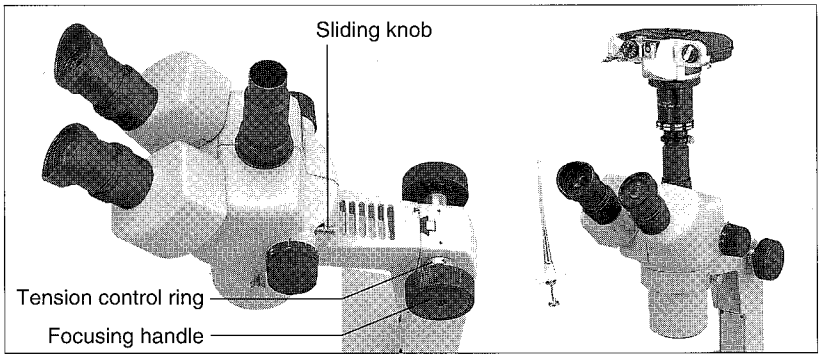










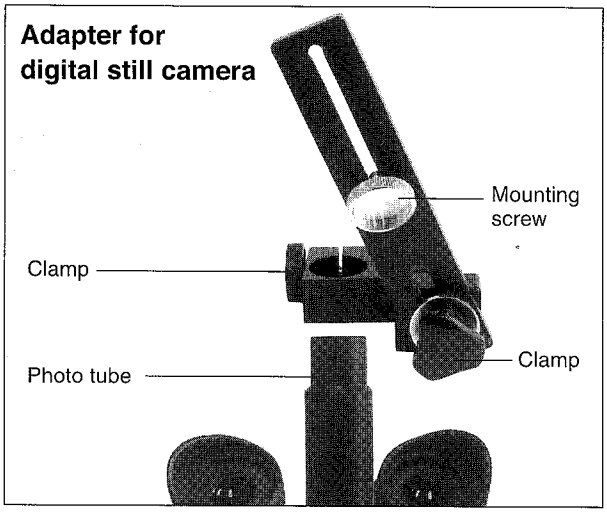


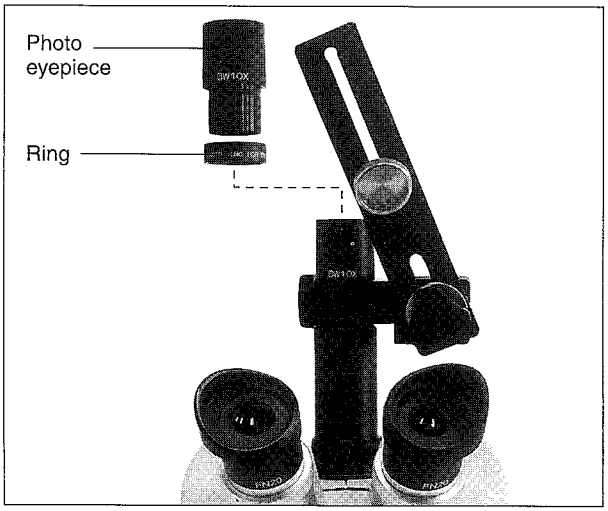
To use your digital still camera, an adapter for digital still camera is optionally available.

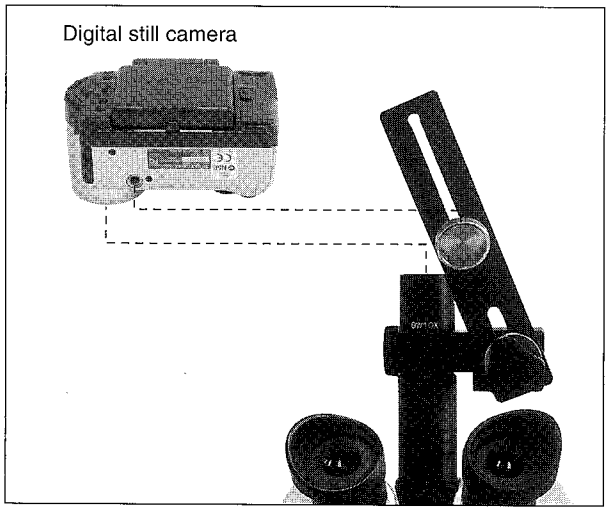
How to use the adapter for digital still camera

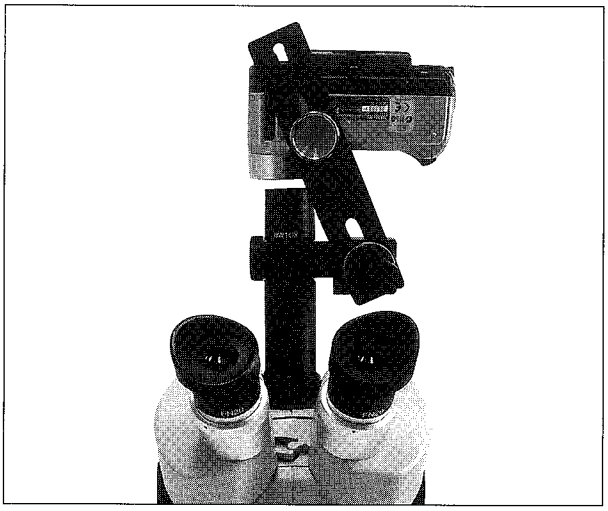
1) Place the adapter onto the photo tube of the microscope, and put a photo eyepiece with ring into the photo tube.
2) Mount the digital still camera to the mounting screw of the adapter. Adjust the position of the camera so that the lens of the camera is placed at the center of the photo tube. After the adjustment, tighten each clamp to fix the camera.
3) Switch the camera on, and make sure that you can see the image on the viewfinder of the camera properly. If necessary, readjust the position of the camera.
4) Focus the image with the focusing handles of the microscope. The focusing can be also done with a diopter adjustment ring on the photo tube.

Note) The adapter can not necessarily fit to all of digital still cameras. Please contact the dealer of your microscope to make sure of the available models.









TV MICROSCOPY

An optional TV camera adapter is prepared to connect a CCD camera to the photo tube. The TV camera adapter has its own built-in reply lens (0.56x), so a photo eyepiece is not required. You should prepare a suitable lighting system such as fiber illuminator if necessary.

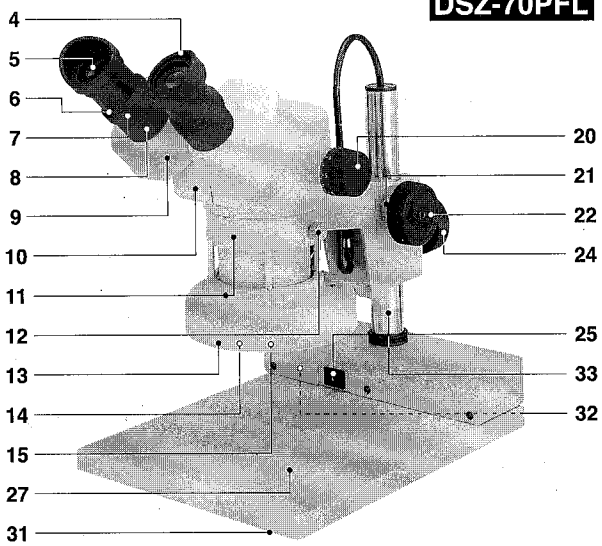
OPTIONAL AND SPARE PARTS

Model	Descriptions
DSW5x	Eyepiece 5x (pair)
DSW10x	Eyepiece 10x (pair)
DSW15x	Eyepiece 15x (pair)
DSW20x	Eyepiece 20x (pair)
SW-REG	Rubber Eyeguard (pair)
DFSW10x10/100	Focusing Eyepiece 10x with 10:100mm scale
DFSW10x5/100	Focusing Eyepiece 10x with 5:100mm scale
DFSW10xH10/20	Focusing Eyepiece 10x with 20x20 0.5mm squares
DFSW10xH10/10	Focusing Eyepiece 10x with 10x10 1mm squares
DFSW10xH5/5	Focusing Eyepiece 10x with 5x5 1mm squares
DFSW10xCROSS	Focusing Eyepiece 10x with 10:100mm scale w/cross line
DFSW10xLINE	Focusing Eyepiece 10x with cross line
NSAL0.5x	Auxiliary Objective Lens 0.5x (not available for stand type T)
NSAL1.6x	Auxiliary Objective Lens 1.6x (not available for stand type T)
NSCG49	Cover Glass (Protection) for objective lenses.
M300-C	Gliding Stage with attachments for micrometers, range of movement: 25mm x 25mm
M300-G	Gliding Stage with attachments for micrometers, range of movement: 50mm x 50mm
M300-E	Gliding Stage, range of movement: 94mm x 66mm
M300-R	Rotatable Gliding Stage, range of movement: 25mm x 25mm
150-192	Micrometer for M300-C
151-256	Micrometer for M300-G
TB-20/12020	Spare Tungsten Bulb 120V 20W
TB-20/23020	Spare Tungsten Bulb 230V 20W
FCL9EX-N	Spare Circular Fluorescent Lamp 9W
SW-GS	Frosted Glass Stage
SW-BF	Frosted Blue Filter
UN-S100	Universal Boom Stand, without holder
SCW-PA	Holder (to be used with UN-S100 stand)
XR723	Large Gliding Stage, range of movement: 360mm x 418mm
XR724	Large Gliding Stage, range of movement: 170mm x 170mm
HDR61	White LED Illuminator
MEGALIGHT 100 / FGR8F1000D55RN-SA	Optical Fiber Illuminator, with Ring Type Light Guide
MEGALIGHT 100 / LFGB6S500-SA	Optical Fiber Illuminator, with Branch Type Light Guide
MEGALIGHT 100 / FGS6S500-SA	Optical Fiber Illuminator, with Single Type Light Guide
XR9507E	CCD Camera with USB, including Capturing, Processing & Measuring Software
EP25-C10/100	Calibration Scale 25mm dia., cross 10/100mm for XR9507E
XR9508E	"IMAGE-M" Measuring Software, without camera

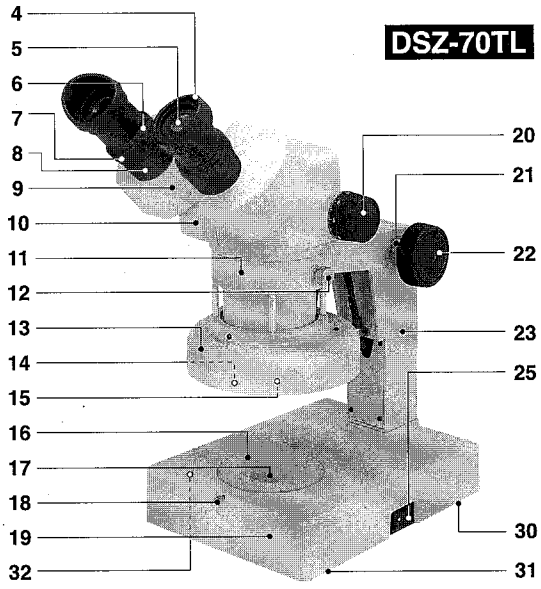
DSZ-70 SERIES

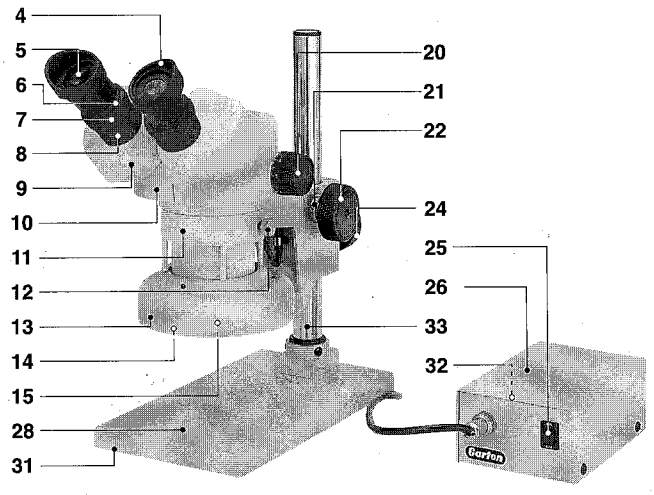
COMPONENTS

DSZ-70PFL

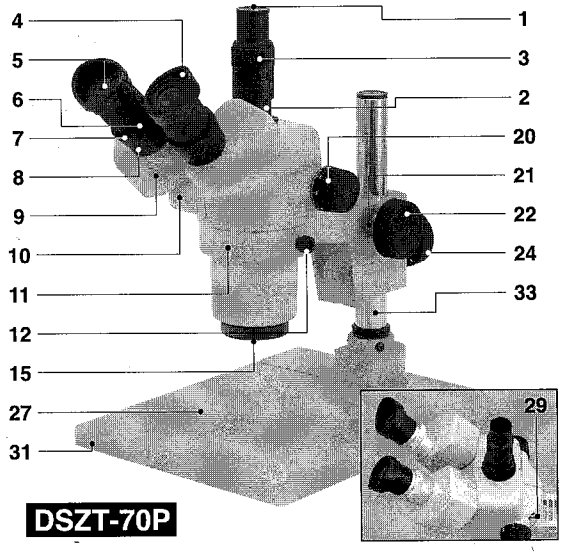


DSZ-70TL





DSZ-70SBF-SL



DSZT-70P

GENERAL GUIDE

1. Photo tube cap
2. Photo tube
3. Diopter adjustment ring for photo tube
4. Rubber eyeguards
5. Eyepieces
6. Eyepiece locking screws
7. Diopter adjustment rings
8. Eyepiece tubes
9. Prism housing
10. Body
11. Body holder
12. Body locking thumb screw
13. Fluorescent lamp housing
14. Circular fluorescent lamp 9W
15. Objectives
16. Glass stage plate
17. Frosted blue filter (under the glass stage plate)
18. Stage plate locking thumb screw
19. Base with transmitted illuminator
20. Zooming knob
21. Tension control ring of focusing handle
22. Focusing handle

23&33. Stand

24. Clamp screw
25. On-off switches for illuminator
26. Power supply box
27. Base (without transmitted illuminator)
28. Small base (without transmitted illuminator)
29. Sliding knob
30. Bottom plate
31. Rubber feet
32. Glow lamp

SETTING UP YOUR MICROSCOPE

After opening the styrofoam container, check that you have the following parts and accessories.

- Microscope body
- Stand with body holder
- DSW10xZ Eyepiece (pair)
- Rubber eyeguard (pair)
- Circular Fluorescent Lamp 9W (for PFL,SBF-SL & TL stands only)
- Glass stage plate (for TL stand only)
- Frosted blue filter (for TL stand only)
- Spare Tungsten bulb (for TL stand only)
- Photo-eyepiece with ring (for trinocular models only)
- Tension control pin
- Dust cover
- Instruction manual

MAINTENANCE AND GENERAL CARE OF YOUR MICROSCOPE

Lamp Replacement

DISCONNECT ELECTRIC SUPPLY BEFORE REPLACEMENT.

To replace the fluorescent lamp of the incident illuminator, take the fluorescent lamp off the lamp housing, and then, detach the lamp from the lamp socket. It will be easier to replace if you remove the body from the body holder and lift the body holder up to maximum by turning the focusing handles.

To replace the Tungsten bulb and glow(starter) lamp of TL stand, take off the smaller bottom plate underneath the base. The bottom plate is fixed with 2 screws with rubber feet, so unscrew them using a screw driver.

To replace the glow(starter) lamp in the power supply box of SBF-SL stand, loosening 4 screws on both sides to open the box. In case of PFL stand, you can access a glow(starter) lamp from the bottom of the base.

OPTICAL DATA FOR DSZ-70/DSZT-70 (Auxiliary Objectives are not available for TL stand.)

Eyepiece	Auxiliary Objective	Magnifications	Working Distance	Field of View
DSW5xZ(FN=20)	Nil	10x-35x	80mm	10-2.9mm
	w/0.5x	5x-17.5x	120mm	20-5.7mm
	w/0.75x	7.5x-26.25x	85mm	13.3-3.8mm
	w/1.6x	16x-56x	41mm	6.2-1.7mm
DSW10xZ(FN=20)	Nil	20x-70x	80mm	10-2.8mm
	w/0.5x	10x-35x	120mm	20-5.7mm
	w/0.75x	15x-52.5x	85mm	13.3-3.8mm
	w/1.6x	32x-112x	41mm	6.2-1.7mm
DSW15x(FN=15)	Nil	30x-105x	80mm	7.5-2.1mm
	w/0.5x	15x-52.5x	120mm	15-4.2mm
	w/0.75x	22.5x-78.75x	85mm	10-2.8mm
	w/1.6x	48x-168x	41mm	4.6-1.3mm
DSW20x(FN=11.4)	Nil	40x-140x	80mm	5.7-1.6mm
	w/0.5x	20x-70x	120mm	11.4-3.2mm
	w/0.75x	30x-105x	85mm	7.6-2.1mm
	w/1.6x	64x-224x	41mm	3.5-1mm

Models	**DSZ-70PFL**	**DSZ-70SBF-SL**	**DSZ-70TL**	**DSZT-70P**
Body	360° rotatable			
	Binocular type			Trinocular type
Stand	Pole type(250mm)	Pole type(303mm)	Regular type	Pole type(250mm)
Incident light	Fluorescent lamp 9W (FCL9EX-N)			Nil
Transmitted light	Nil	Nil	Tungsten 120V or 230V 20W	Nil
Stage plate	Nil	Nil	Frosted glass plate(80mm dia.) & frosted blue filter(37mm dia.)	Nil
Base size	220mmx284mm	144mmx260mm	160mmx219mm	220mmx284mm
Height	325mm	325mm	352mm	365mm
Accessories	Rubber eyeguards, Tension control pin, Dust cover		Rubber eyeguards, Tension control pin, Dust cover, Spare bulb(Tungsten lamp only)	Photo-eyepiece with ring

FOR OTHERS, PLEASE REFER TO THIS BOOKLET.