

# For Industrial Use



# Comfort for your eyes — precision for your work

The human eye is a wonderful instrument, catching images of every moment of our lives.

At the same time it is extremely sensitive, and can become exhausted if it is not treated with care.

OLYMPUS has therefore made every possible effort to develop new optical systems that allow the human eye to feel comfortable and relaxed while working with stereo microscopes.

This not only protects the eyes but also leads to much more precise and consistent results in daily work. All three models — the SZX7 with its advanced Galilean optical system, the full-featured SZ61 and the versatile SZ51 — provide 3D images with true color, high resolution and no distortion. Welcome to the comfort zone.



**SZ61** 

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SZX7

**SZX7**: Galilean optical system using parallel light paths for outstanding performance and easy expandability.

**SZ61**: Top-of-the-line optical performance, with zoom ratio of 6.7:1. Model variations: SZ61TR (with trinocular tube), SZ61-60 (with 60 degree observation tube inclination).

**SZ51**: Versatile, cost-efficient, ideal in all line inspection applications.

# Optical excellence and system expandability — SZX7 with Galilean optics

"Providing the optimal image for any specimen" by the adoption of the Galilean optical system and the DF (Distortion Free) objective lens series with maximum N.A. (Numerical Aperture).

#### 7:1 the best zoom ratio of the class

With a magnification range of 8x-56x (using 1x objective lens/10x eyepiece), the SZX7 offers a maximum zoom ratio of 7:1. This is the best in its class, and allows any given specimen to be observed at the most appropriate magnification.

#### The best resolving power in this class

Superior quality objective lenses deliver accurate, high resolution observation images which show every specimen in minute detail.

# A range of objective lenses to suit every specimen and everyapplication

#### • Superior image flatness:

The DFPlan objective lens series accurately reproduces the original shape of the specimen.

## • Longest working distance (W.D.) in this class:

The objective lenses range from the SZX-ACH1x (90mm W.D.) to the DFPL0.5x (198mm W.D.). As a result, even specimen surfaces which are difficult to access can be observed easily.

#### • Ideal for high magnification:

Superior quality image is ensured up to 336x, by combining a 2x objective lens with 30x eyepieces. Also available is an excellent apochromatic objective lens DFPLAPO1.25x, which reaches the higher zoom range of 1x through 7x.



Galilean optics feature two (right/left) independent and parallel zoom optical paths to produce the focal point with one objective lens. The system enables high optical performance as well as functional modularity.



# "Comfort View" eyepieces for greater comfort and faster work

Quick, comfortable observation and documentation are ensured by this completely new eyepiece design featuring Pupil Aberration Control and Appropriate Positioning in the eye point.

#### **Accurate color reproduction**

The careful selection of lens surface coating and glass materials in the entire optical system make it possible to observe and document specimens in their original, authentic colors.

# Sharp, clear, high-contrast images

The low, suppressed field curvature ensures accurate reproduction of original specimen shapes.

# A wide variety of observation tubes and intermediate tubes enable operators to obtain precisely the right image

Various different types of tubes are available, and can be freely combined to create the ideal system for any specified purpose.

#### SZX7 tubes:

- Aperture diaphragm unit / SZX-AS Macro tube / SZX-DA
- Beam splitter / SZX2-LBS
- Eyepoint adjuster / SZX-EPA
- Filter adapter / SZX-FAD
- Photo adapter / SZX-PHA
- Side by side discussion tube / SZX-SDO
- Coaxial reflected light illuminator / SZX2-ILLC10



Aperture diaphragm unit / SZX-AS



① 45 degree binocular head / SZX-BI45 ② Tilting trinocular head / SZX2-TTR 3 30 degree trinocular head / SZX-TR30

# Precise, functional and compact — SZ61/SZ51

"A practical range of functions for observation and documentation in a compact stereo microscope body" The SZ61/SZ51, incorporating the Greenough optical system.

#### 6.7:1 the best zoom ratio of the class

The SZ61's class-leading magnification range extends from 6.7 through 45x (using 10x eyepiece), with the zoom ratio of 6.7:1. This derives from the newly developed optical system and allows quick, comfortable observations at the most appropriate magnification. The SZ51 provides a magnification range from 8x through 40x (using 10x eyepiece), with the zoom ratio of 5:1.

#### Outstanding depth of focus and flatness

The 10-degree angle convergence of the image forming path in the Greenough optical system secures excellent image flatness with deep depth of focus.

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The Greenough optical system has two zoom optical paths inclined at an inward angle. This enables a more compact microscope design while maintaining high performance.



### Five zoom body variations with high performance

The SZ61 and SZ51 zoom bodies provide two different magnification ranges. They are available with an ergonomically designed 45-degree inclination tube for the use on the standard stands. For special applications where the zoom body has to be tilted for use with other equipment or mounting on a universal stand, models with 60-degree inclination tube (SZ61-60/SZ51-60) are available. For documentation purposes, OLYMPUS also offers the SZ61TR, which incorporates a trinocular tube for easy attachment of digital and video cameras.

# Wide choice of auxiliary objective lenses

A wide choice of auxiliary objective lenses enables observations at magnifications from 2x to 270x and W.D. up to 350mm to comply with every application purpose.







# Work more comfortably...and more productively

The Olympus approach to ergonomic design seeks to achieve improvements that make work easier, more comfortable, and more productive, all at the same time. That means applying advanced technological methods to maximizing operability, reducing factors that contribute to operator fatigue, and building in effective safety features like ESD design.

## Ergonomic design based on 3D CAD analysis

The microscope body and stand feature a design of precisely curved contours developed through careful 3D CAD analysis. Key ergonomic features include an all-round finish that's smooth to the touch and helps to reduce fatigue in long period observations.

## Convenient front-access operation

Improved ease of access to the most frequently used knobs and switches maximizes operator comfort and reduces back strain.

## Tilting binocular tube for comfortable observations (SZX7)

A comfortable position that minimizes the risk of back strain and muscle tension promotes productivity and quality in routine inspection tasks. The continuously adjustable tilting binocular tube helps the operator to quickly find the most comfortable eyepoint position.

# Precise recall of specific magnification settings via integrated click-stop mechanism (SZX7) or zoom knob stopper (SZ61/SZ51)

Many inspection tasks require the use of the same zoom magnification setting to ensure consistent and comparable results. The integrated click-stop mechanism provides quick and easy access to this important function. The zoom knob stopper allows the user to choose magnification that can be quickly repeated, and the setting in use is clearly displayed on the front control panel.

## New eyepiece reduces fatigue and excludes dust

This eyepiece features a pupillary aberration control mechanism whereby the image remains visible even if the operator's eyes move. This has been found to lessen operator fatigue in long lasting observations. The unique eyepiece mounting design excludes dust particles and keep the eyepiece firmly in place ensuring clear images and best eyepiece position.

### ESD safety design

The increasing miniaturization and complexity of electronic devices raises the risk of damage by electric shock caused by electrostatic discharge. For this reason, OLYMPUS has taken special measures to design its stereo microscope bodies and main accessories to discharge static electricity from 1000V down to 100V in less than 0.2 seconds, protecting the equipment and preventing damage to samples.





LED Transmitted / Reflected Light Illumination Stand



Tilting trinocular / binocular head (SZX7)



Zoom handle











Eyepiece lock



Ground wire connection (back side)

# **OLYMPUS** light solutions maximizes visibility in different tasks

OLYMPUS offers a range of light solutions perfectly tuned to the optical system of the zoom stereo microscope, to maximize the visibility of even minute characteristics.

# The new LED integrated reflected/transmitted illumination stand

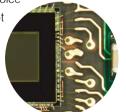
The world's first universal reflected/transmitted light LED illumination stand brings together all the advantages of LED technology. It allows the simultaneous use of reflected and transmitted illumination, and can alter their respective intensities continuously and separately by means of convenient dials on the stand. The use of super slim, high-brightness LED's successfully integrates transmitted illumination in a very slim base just 25mm thick that allows easy specimen access and manipulation. The complete microscope including LED integrated stand is extremely lightweight, compact and easy to carry.

## Universal reflected illumination systems

Fiber optic illumination systems offer the highest illumination quality and flexibility. OLYMPUS offers a compact, cost effective 22W light source (SZ2-LGB) and a 100W light source (LG-PS2\*) for professional use. Homogeneous illumination can be achieved by a ring light. For special contrast effects on free

form 3D shapes, OLYMPUS offers a choice of single and double self supporting spot illumination fiber guides and precisely adjustable flexible fiber guides.

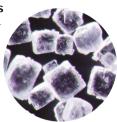
\*An equivalent model may be offered in some areas.



Homogeneous light

#### Transmitted light illumination systems

For all transparent materials as well as for background illumination for the inspection of through holes, the OLYMPUS choice of illumination stands ranges from simple brightfield/simple oblique (SZX2-ILLK) up to brightfield/darkfield (SZX2-ILLD) and brightfield/



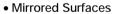
Darkfield light

oblique Koehler (SZX2-ILLB) illumination models. Also available is a brightfield/oblique illumination attachment (SZ2-ILA) that can accommodate various light sources including a 100W halogen lamp housing.

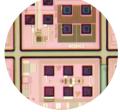
#### **Special Illumination Techniques**

## Looking into holes

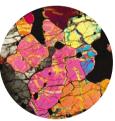
OLYMPUS offers effective coaxial illuminators for the SZX7 (SZX2-ILLC10) and the SZ61/SZ51 (SZ2-ILLC) which direct the light through the microscope's optical axis onto the specimen.



The illumination of highly reflective specimens needs special techniques in order to avoid disturbing light reflections. For spot and ring light illuminators as well as for coaxial



Coaxial light



Polarized light



Flexible angle of LED light source



Homogeneous illuminations fiber optic systems



Intelligent LED ring illumination

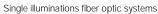


Double spot illuminations fiber optic systems















Transmitted and coaxial illuminations with fiber optic systems High power fiber optic illumination system

# **Digital imaging**



SZX7 in combination with DP71 digital camera system

# **Ultra-high Resolution Digital Camera DP71**

Thanks to its high-speed hardware technology, images equivalent to 12.5 million pixels can be captured in about three seconds. The live images is displayed in 15 fps (frames per second) at maximum. The camera's high sensitivity (ISO1600) clearly detects slight differences of color and microscopic defects.

# **Digital Camera DP25**

This outstanding, high-resolution 5 megapixel color CCD camera includes accurate color reproduction and advanced color control among a wealth of features. It's also versatile enough for work with all types of samples. Includes image acquisition software analySIS getIT for a PC controller.



DP20 digital camera mounting on the SZ61

## High-speed, Compact Digital Camera DP20

Image display, storage, and simple measurement can be done from a compact, palm-size control unit. The outstanding operation with the functional key layout allows starting up quickly and continuously shoot images at 1 second intervals. The UXGA (1600 x 1200 pixel) compatible monitor enables real-time 15 fps display, and the system is also ideal for high-resolution monitoring applications without a PC.

# Wide range of accessories to meet the needs of every application

#### Easy mounting with other equipment (bonder and prober arms)

The SZX7, SZ61 and SZ51 are designed to be integrated into process equipment. OLYMPUS offers various bonder and prober arms for all common brands.



① B & L style bonder arm / SZ2-STB1 ② Bonder arm / SZ2-STB2 ③ Bonder arm / SZ2-STB3 ④ Prober arm / SZ2-STP ⑤ Arm for SZX stand /SZ2-STS ⑥ Adapter for B & L bonder arm / SZ-BLAD



# Ergonomic low positioned focus handle and more stage adapters

With the focusing unit SZ2-FO, focus adjustment can be done with the hands resting on the work surface. The action of focusing requires minimal force as the microscope zoom body does not need to be moved. This allows prolonged work on difficult samples without fatigue. There are also more stage

adapters including the cup stage SZH-SC which gives the specimen a slant angle till 30 degrees from the level.



#### Various universal stands

A variety of universal stands are available for the observation of large size specimens. No matter how big the samples are or how much they vary in size, OLYMPUS has the right choice of stands to suit any requirements.



SZX7+SZ2-STU2



SZ61+SZ2-STU3

# ■ SZX7 specifications

Item		Specifications					
Zoom microscope body SZX-ZB7		Zoom drive: Horizontal knob system Click stop for each zoom magnification: ON-OFF switching possible Zoom ratio values: 7:1 (0.8x to 5.6) Zoom magnification indication: 0.8, 1, 1.25, 1.6, 2, 2.5, 3.2, 4, 5, 5.6 Objective lens mouting: Screw mounting into thread Lead-free materials used					
		Aperture iris diaphragm control: The AS u	nit (SZX-AS) is mounta	ble			
Observation t	ube	SZX-BI45	SZX-TBI /		SZX2-TR30		
SZX-BI45 SZX-TBI SZX2-TTR SZX2-TR30		Binocular tube View inclination angle 45° Lead-free materials used	Tilting binocular (trin View tilting angle 5°				
		Interpupillary distance adjustable range: 5 Eyepiece clamping knob provided	2 to 76 mm				
Stand		SZ2-ST			SZ2-ILST		
SZ2-ST		Standard stand		LED reflected/transmitted illumination stand			
SZ2-ILST	Frame installation		Mounting dia	meter 76mm			
	Focusing adjustment			ension adjustment troke 120mm			
	Stage plate	SZ2-SPBW (Black & white) SP-C (Glass clear transparer		The dedicated glass plate in 100mm dia. included			
	Light source	Fiber optic illumination syste SZ2-LGB mountable (optior Transmitted light illumination attachment (SZ2-ILA) mountable (	n) า	Transmitted illumination: LED Reflected illumination: LED Average LED life span: 6000 hrs. Input rating: 100-120V/200-240V  0.15/0.1A, 50/60Hz			
Objective len	s	Model		Working distance			
*1 The SZ2-ET auxiliary sleeve is required when the SZ2-ST/SZ2-ILST is used.		DFPL0.5x-4*1 DFPL0.75x-4 DFPLAPO1x-4 SZX-ACH1x DFPLAPO1.25x SZX-ACH1.25x-2 DFPL1.5x-4 DFPL2x-4 All objective lenses: lead-free materials		171mm 116mm 81mm 90mm 60mm 68mm 45.5mm 33.5mm			
Eyepeices			"Comfort <i>View</i> " All eyepieces: lea				
Weight	Configuration 1	4,360g	5,40	0g	5,200g		
3	Configuration 2	5,160g	6,20	-	6,000,a		

Configuration 1: SZX-ZB7 + DFPLAPO1x-4 + individual observation tube + WHSZ10x-H (2) + SZ2-ST Configuration 2: SZX-ZB7 + DFPLAPO1x-4 + individual observation tube + WHSZ10x-H (2) + SZ2-ILST

# ■ SZ61/SZ51 specifications

Item		Specifications						
Microscope body		SZ61	SZ61-60	SZ6	1TR	SZ51	SZ51-60	
SZ61	Magnification	0.67x to 4.5x			0.8x to 4x			
SZ61-60	Zoom ratio			5	: 1			
SZ61TR SZ51	Working distance		mm					
SZ51-60	Tube inclination angle	45°	60°		45°		60°	
	Interpupillary distance adjustment	Left/right interlocked Adjustment range: 5.	2 to 76 mm (using the W	/HSZ10X eye	epieces)			
	Video camera adaptability	-	_	C-mount (C	).5x built in)	-	_	
	Zoom adjustment knob	Left/right single-shaft horizontal knob Interpupillary distance high/low magnification stopper incorporated.						
	Optical components	Lead-free materials (	used					
Auxilliary objective I	ens	Mounting by screwing into the thread at the bottom of frame (M48 thread x0.75)						
Eyepiece		"Comfort View" WHS Lead-free materials (						
Stand		SZ2-ST				SZ2-ILST		
SZ2-ST		Standard stand			LED reflected/transmitted illumination stand			
SZ2-ILST	Frame installation	Mounting diameter: 76mm						
	Focusing adjustment		Focusing stroke: 120mm					
	Stage plate	SZ2-SPBW (Black & white for anti-ESD) SP-C (Clear glass plate)			The dedicated glass plate in 100mm dia. included			
	Light source	Fiber optic illumination system SZ2-LGB mountable (option ) Transmitted light illumination attachment (SZ2-ILA) mountable (option)			Ave	ransmitted illuminat Reflected illumination erage LED life spanut rating: 100-120V ~0.15/0.1A, 50/	on: LED : 6000 hrs. //200-240V	
Weight	Zoom body only	1,3	300g	1,500g		1,300g		
	Configuration 3	3,520g		3,720g		3,5:	20g	

Configuration3: Zoom body + WHSZ10X-H(2) + SZ2-ST

# ■ "Comfort View" WHSZ eyepiece

	F.N.	Diopter adjustment	Reticle	Focal magnification
WHSZ10x	22	_	N.A.	_
WHSZ20x	12.5	_	N.A.	_
WHSZ10x-H	22	-8-+5	Yes*2	_
WHSZ15x-H	16	-8-+5	Yes*2	_
WHSZ20x-H	12.5	-8-+5	Yes*2	1.3x
WHSZ30x-H	7	-8-+5	Yes*2	2x

<sup>\*2</sup>Applicable reticle size: 24mm diameter, t1.5

# ■ Auxiliary objective lens for SZ61/SZ51

	Working distance (mm)
110ALK0.3x	250-350
110ALK0.4x	180-250
110AL0.5x	200
110AL0.62x*3	160
110AL0.75x	130
110AL1.5x	61
110AL2x	38

<sup>\*3</sup>Upon special order basis

# ■ SZX7 optical performance

Eyepiece			WHSZ15x-H		WHSZ20X-H WHSZ20x		WHSZ30x-H	
F.N.	2	2	16		12.5		7	
Objective lens	Total magnification	Field of view (mm)	Total magnification	Field of view (mm)	Total magnification	Field of view (mm)	Total magnification	Field of view (mm)
0.5x	4x-28x	55-7.8	6x-42x	40.0-5.7	8x-56x	31.3-4.5	12x-84x	17.5-2.5
0.75x	6x-42x	36.7-5.2	9x-63x	26.7-3.8	12x-84x	20.8-3.0	18x-126x	11.7-1.7
1x	8x-56x	27.5-3.9	12x-84X	20.0-2.9	16x-112X	15.6-2.2	24x-168x	8.8-1.3
1.25x	10x-70x	22-3.1	15x-105x	16.0-2.3	20x-140x	12.5-1.8	30x-210x	7.0-1.0
1.5x	12x-84x	18.3-2.6	18x-126x	13.3-1.9	24x-168x	10.4-1.5	36x-252x	5.8-0.83
2x	16x-112x	13.8-1.9	24x-168x	10.0-1.4	32x-224x	7.8-1.1	48x-336x	4.4-0.63

# ■ SZ61/SZ51 optical performance

Microscope	Zoom	m WHSZ10x-H WHSZ10x		WHSZ15x-H		WHSZ20x-H WHSZ20x		WHSZ30x-H	
Body	magnification	F.N	. 22	F.N. 16		F.N. 12.5		F.N. 7	
		Total magnification	Field of view (mm)	Total magnification	Field of view (mm)	Total magnification	Field of view (mm)	Total magnification	Field of view (mm)
	0.67x	6.7	32.8	10.1	23.9	13.4	18.7	20.1	10.4
	1x	10	22	15	16	20	12.5	30	7.0
SZ61	2x	20	11	30	8	40	6.3	60	3.5
	3x	30	7.3	45	5.3	60	4.2	90	2.3
	4.5x	45	4.9	67.5	3.6	90	2.8	135	1.6
	0.8x	8	27.5	12	20	16	15.6	24	8.8
	1x	10	22	15	16	20	12.5	30	7.0
SZ51	2x	20	11	30	8.0	40	6.3	60	3.5
	3x	30	7.3	45	5.3	60	4.2	90	2.3
	4x	40	5.5	60	4.0	80	3.1	120	1.8

<sup>\*</sup> No auxiliary objective lens is attached

# **■** Fiber optic illumination system

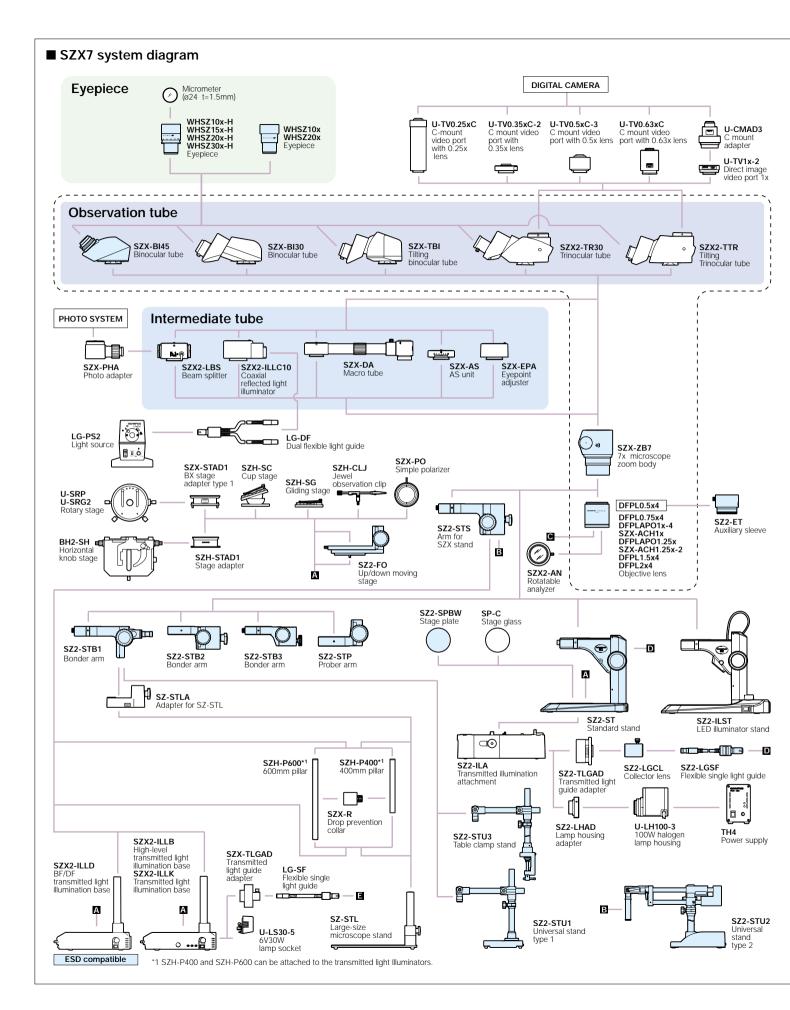
Item		Specifications	Specifications							
Type of fiber optic SZ2-LGR SZ2-LGDI SZ2-LGDF SZ2-LGSI						SZ2-LGSF				
Type of illumination	method	Homogenous	Double spot	Double spot	Single spot	Single spot				
Tube	Type Flexible Interlocked (self supporting) Flexible		Flexible	Interlocked (self supporting)	Flexible					
	Length	800mm	500mm	400mm	500mm	400mm				
Fiber	Туре		Multi-component LB56N equivalent, 50mm diameter							
	N.A.	0.56								
Bundle diameter	Input end	8mm	5.65mm	5.65mm	4mm	4mm				
	Output end	70 x 0.22t mm	4mm	4mm	4mm	4mm				
Minimum bending ra	adius	30mm	65mm	30mm	65mm	30mm				

# ■ Compact halogen light source SZ2-LGB

<u> </u>	3 3
Item	Specifications
Dimensions and weight	90(W) x 153 (H) x 100(D) mm, 600g (AC adapter 200g)
Rated voltage	AC adapter: input/100-240V/50/60Hz, output/ 12VDC2A
Power consumption	22W
Bulb type	12V22W halogen bulb with mirror
Bulb model	12V22WHAL (Philips JCR12V22WA/3)
Average life span of bulb	2000 hours (STEP1, Min.), 580 hours (STEP2, Middle), 100 hours (STEP3, Max.)
Light intensity adjustment	Voltage adjustment (3 steps)
Applicable stand	SZ2-ST

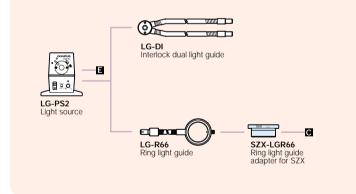
# ■ LED ring illumination SZX2-ILR66

Item	Specifications
Features	4-part LED ring illumination 4-part independent ON/OFF available
Illumination	Operation modes : rotary, mirror ESD compatible, Clean class 1
Light source	17-step light intensity adjustable AC100-240V
Others	SZX-LGR66/SZ-LGR66 adapters are required for SZX7/SZ61 respectively



# Compact fiber optics system/SZ2-LGB SZ2-LGSF Flexible single light guide SZ2-LGHL Light guide holder SZ2-LGB Lightguide illuminator SZ2-LGSI Interlock light guide SZ2-LGCL Collector lens D SZ2-LGDI Interlock dual light guide SZ2-LGBST LGB stand С SZ2-LGR Ring light guide SZX-LGR66 Ring light guide adapter for SZX

# High power fiber optics system/LG-PS2

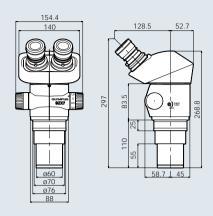


# LED ring light illumination system

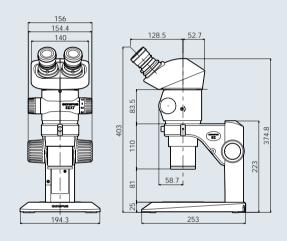


## ■ SZX7 dimensions

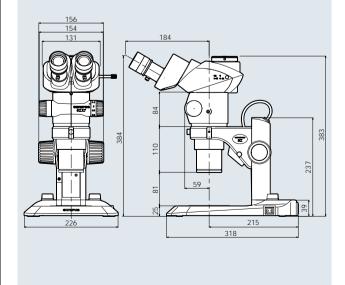
#### SZX7

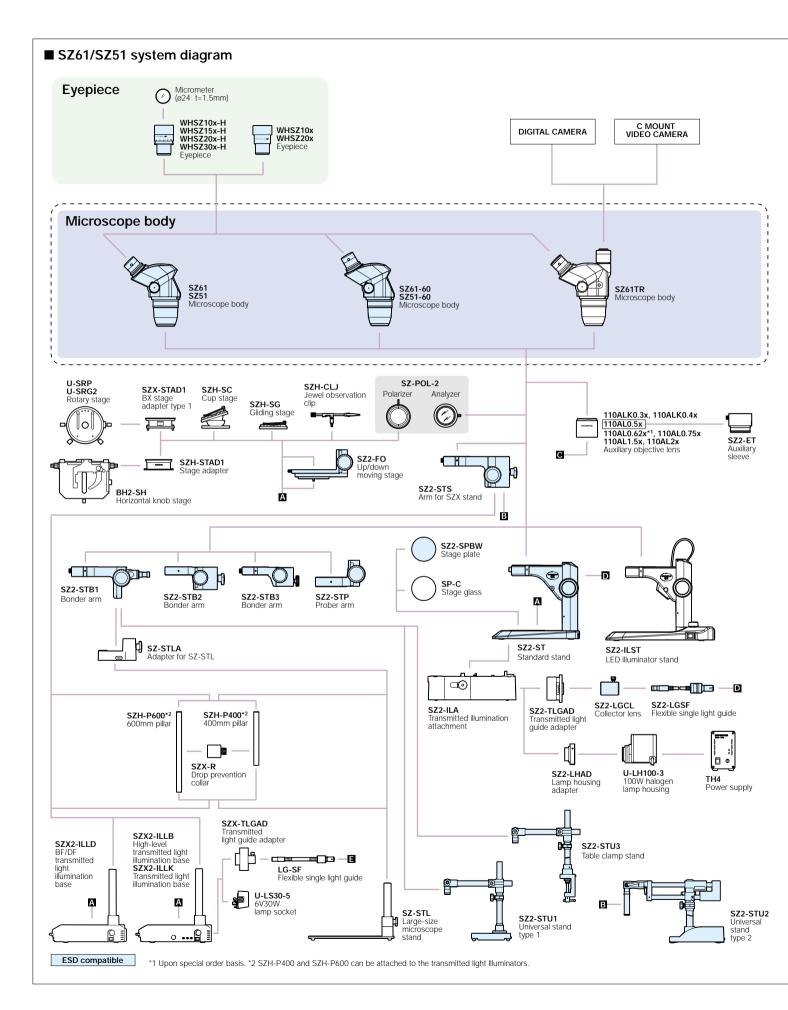


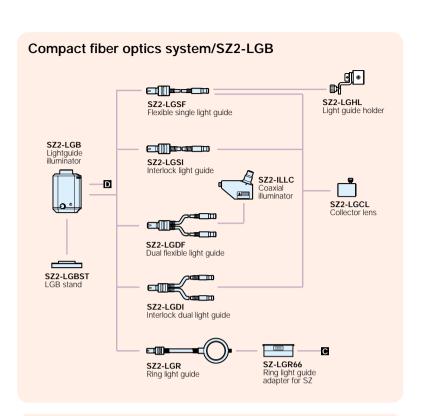
#### SZX7+SZ2-ST



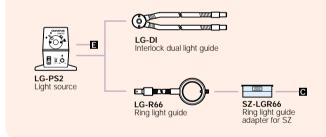
#### SZX7 (SZX2-TR30 configuration) +SZ2-ILST







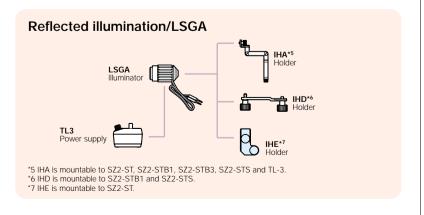
# High power fiber optics system/LG-PS2



# Fluorescence illumination

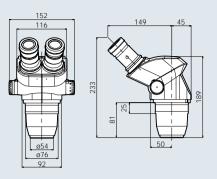


\*4 Other systems are offered in some areas.

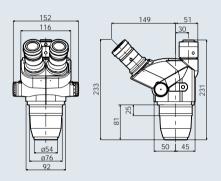


## ■ SZ61/SZ51 dimensions

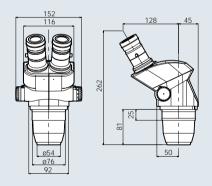
#### SZ61/SZ51



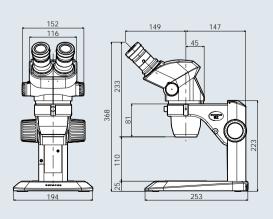
#### SZ61TR



# SZ61-60/SZ51-60



## SZ61+SZ2-ST/SZ51+SZ2-ST



•OLYMPUS CORPORATION has obtained ISO9001/ISO14001.

Specifications are subject to change without any obligation on the part of the manufacturer.

