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IND

# SMZ171 SERIES

FLEXIBLE STEREO MICROSCOPE SOLUTION



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The SMZ171 model terminates Motic's SMZ stereo microscope line by using modern ESD resistant materials and optimized LED illuminations for a wide range of biomedical and material science applications. The optical performance with improved transmission rates in higher magnifications is combined with reliable mechanics for daily usage. The SMZ171 is an advanced stereo microscope for biomedical work and industrial quality control.

The Greenough optical system delivers crisp and clear images. Parfocality is ensured while running through the large zoom range of 6,7:1.

5 click-stops within the smooth zoom allow a precise reproduction of magnifications for measuring purposes. A large Field of View is ensured by the standard 10X/23 eyepieces. The large working distance of 110mm gives sufficient space for preparation and repair work, using the stunning depth of view for a convincing 3D upright image.

The SMZ171 stereo microscope may come as a predefined package solution ready for advanced demands in both routine and research fields. The flexibility of the system allows more complex setups with boom stands, external light sources and an upgrade to a complete documentation station.

*Your Motic Europe Team*



# SMZ171

FLEXIBLE STEREO MICROSCOPE SOLUTION



# THE MECHANICS

STANDS | OPTICAL HEADS



INTRODUCTION

THE MECHANICS

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## FLEXIBILITY FOR A LARGE VARIETY OF SAMPLES

The 4 basic packages of the SMZ171 represent the entry level of the SMZ171 stereo line. The compact Plain stands are meant for incident light applications only. Here an external illumination is needed: a ring light may give a shadow-free image, a cold light source with light guides will supply an oblique illumination. The SMZ171 BLED/TLED packages come with built-in 3Watt LED illumination for transmitted and incident light. Both incident and transmitted light can be activated simultaneously and adjusted separately. A reflecting device built into the microscope base allows an oblique transmitted illumination, resulting in an impressive topographic image for transparent samples. For electrostatic sensitive samples, a variety of ESD stands are available.

Motic's SMZ171 optical heads come as binocular or trinocular versions with 45° viewing angle, 10X/23 eyepieces and built-in 1X objective. The trinocular versions got a permanent 50:50 light split for the visual/photo port combination. The interpupillary distance can be varied from 48-75mm. A diopter adjustment is possible on both eyepieces, facilitating the usage of reticles. The anti-fungus treatment of inner lens surfaces allows to work in humid environments.

Extraordinary requirements for workplace are fulfilled by the boom stands of the SMZ-171 system. These stands are meant for larger samples, offering more handling freedom. All boom stands require a separate illumination following the sample characteristics.



# THE OPTICS

OBJECTIVES | EYEPIECES



## IMPROVED RESOLUTION AND TRANSMISSION

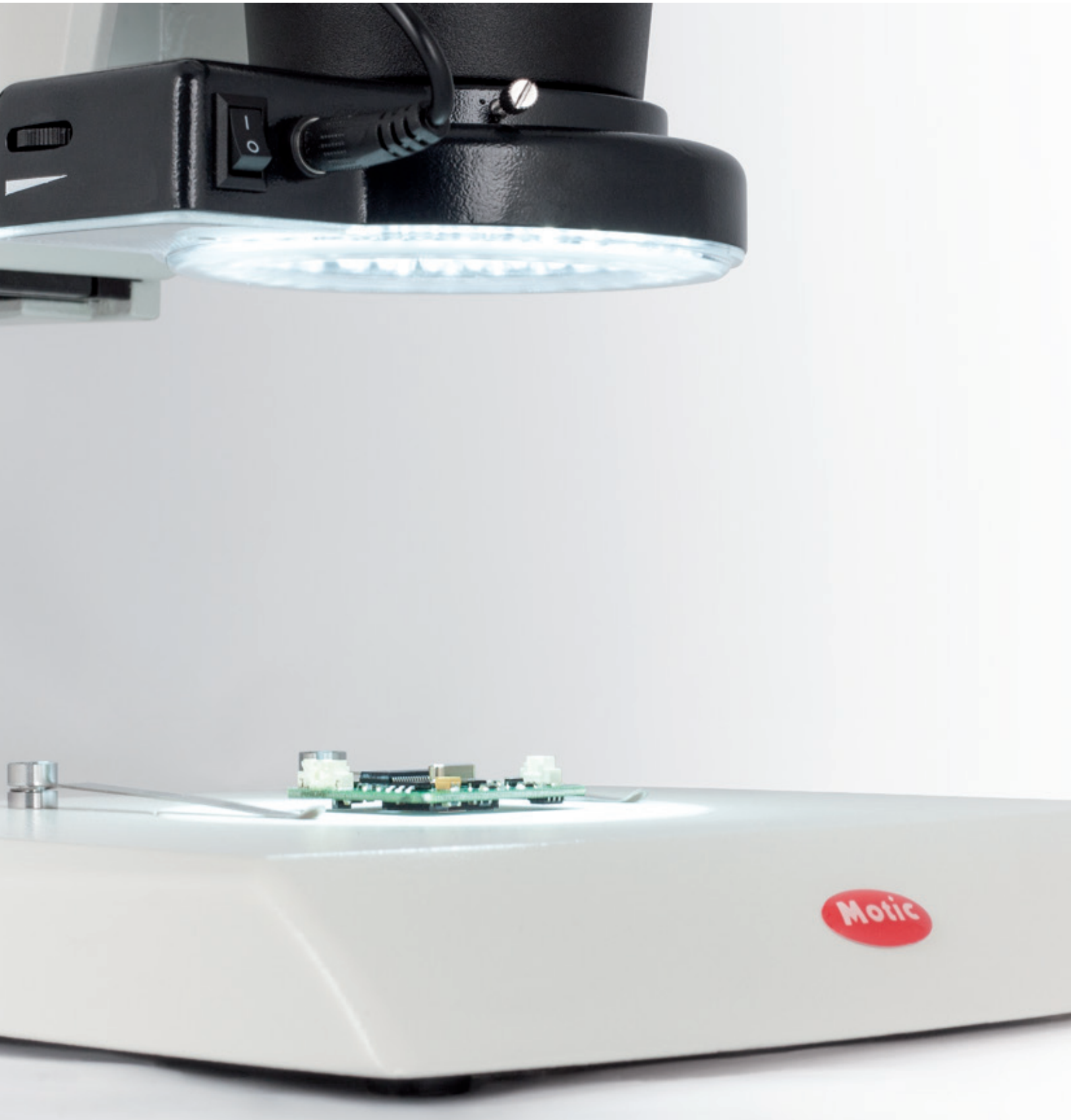
Working with the SMZ171, it is quite easy to drive down from sample overview to tiny structures. One rotation of the zoom knob gives access to the full zoom range of 6,7:1, resulting in a magnification range of 7.5X-50X with standard WF10X/23mm eyepieces. The extended Field of View (23mm) is helpful for an easy sample overview, displaying one great feature of the SMZ171 optics. Improved transmission rates of the lenses allow the usage of auxiliary objectives without restrictions. Thanks to the parfocal optical design, a re-adjustment of the focus position is not necessary while zooming. Five defined click-stop positions within the continuous zoom allow an exact reproduction of the magnification, a necessary precondition for reproducible measurements.

To vary the model's magnification range, a set of auxiliary objectives and eyepieces can be supplied, extending the total magnification range of the SMZ171 from 2.25X up to 200X. The eyepieces N-WF 15X/16 and N-WF 20X/13 help to increase the visual magnification while keeping the basic working distance of 110mm. Auxiliary objectives with < 1X magnification may be screwed onto the optical body for treating larger samples, while increasing the working distance. Magnification and resolution will be increased with objectives > 1X factor.



# THE ILLUMINATION

LIGHT SOURCES | INCIDENT AND TRANSMITTED LIGHT







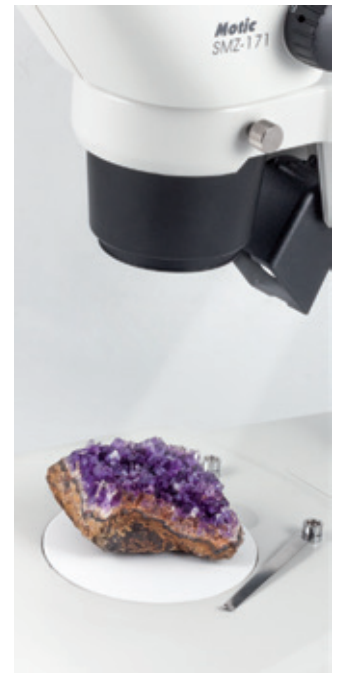
## FLEXIBILITY FOR OPAQUE AND TRANSPARENT SAMPLES

Illumination is the key issue when using a stereo microscope. To reveal all information from the sample, the characteristics of the different light sources and illumination methods have to be understood.

Motic offers a wide range of illumination options to be combined with the SMZ171 optics. The built-in illumination of the basic LED-stands provide the most compact solution for small footprint demands. Especially for biological samples, an LED light source is highly appreciated due to its negligible heat development. The tilting device of the transmitted light stand offers oblique illumination to work out topographic details of transparent specimen.

However, a different illumination will be necessary for opaque samples. A ring light solution is always recommended for a shadow-free image as the sample is illuminated from all directions.

MLC-150 FIBER OPTIC ILLUMINATOR



# THE ACCESSORIES

STAGES | OPTICAL COMPONENTS



## FOR EASY HANDLING AND ADDITIONAL CONTRAST METHODS

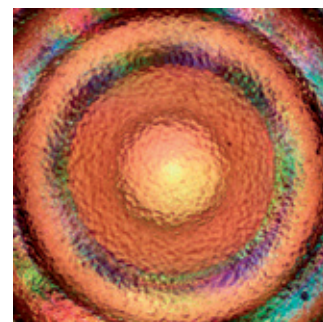
Especially when working with higher magnifications, handling of samples becomes more sensitive to vibrations. An exact positioning for manipulation work with tweezers and needles may also become difficult. Appropriate solutions to increase the working comfort are offered with the SMZ171's optional stage accessories.

The Gliding Stage has to be placed onto the base plate of the stand and allows a smooth multidirectional movement and rotation of the sample. The attachable X/Y-stage with 76x54mm travel range enables a precise bidirectional movement. A rotatable stage insert can be added. For transparent samples, the black/white stage insert is replaced by a glass insert.

To analyze the birefringence of transparent materials, a polarizing set-up is required. The polarizer is placed on the base of the transmitted light stand, the respective analyzer is clamped onto the objective. Rotation of the polarizer and analyzer is possible for maximum extinction.

For darkfield applications, a special DF insert is mounted on top of the light exit of the transmitted light stand. The iris diaphragm allows a variation of the illumination angle following the Numerical Aperture of the objective in use.

POLARIZING SET-UP



GLIDING STAGE



# DOCUMENTATION

STANDARD PHOTOMICROGRAPHY | DIGITAL DOCUMENTATION



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 THE MECHANICS  
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 THE ILLUMINATION  
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MOTICAM S3



## FLEXIBLE DOCUMENTATION OPTIONS

For a long time, accurate documentation has been established as an important part in natural sciences and industrial quality control. The SMZ171 models offer a choice of different imaging options.

**Standard Photomicrography |** The traditional use of a single lens reflex camera requires a Trinocular version of the SMZ171. In this case there is a fixed light split visual/photo of 50:50. The adaptation of the camera consists of a mechanical adapter combined with a photo eyepiece. The necessary T2 adapter specifically fits to the camera model and is supplied by photo specialist shops. This setup delivers high resolution images of small fields.

**Digital Documentation |** The Moticam series of digital C-Mount cameras delivers excellent live images, ready for presentations and further storage. All Motic cameras come equipped with proprietary software to transform the SMZ171 into an analysis and documentation station. For limited top landing bench, Moticam 1080 is ideal for the presentation of High Resolution images on an HDMI screen or video projector without computer. The wireless models are dedicated to run under tablet and smartphone control through our "MotiConnect" App. Our tablet cameras with touch screen in first instance work as a fixed monitor solution, but may also create a hotspot for remote tablet/smartphone access.



### MOTIC IMAGES PLUS 3.0

Image analysis software for computers



### MOTICONNECT APP

View, edit, capture and store your images in the blink of an eye



# SPECIFICATIONS

## SMZ171 | OPTICAL DATA

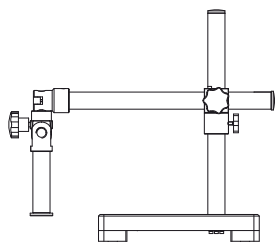
	Standard Objective	2X Auxiliar Objective
Max. Resolution	220 lp/mm	440 lp/mm
Maximum N.A	0.08	0.15
DOF	0.09 mm	0.023 mm

Eyepiece	Magnification (X)	Standard Objectives		Auxiliary Objectives											
		WD 110mm		0.3X		0.5X		0.63X		0.75X		1.5X		2X	
		Mag.(X)	F.N.(mm)	Mag.(X)	F.N.(mm)	Mag.(X)	F.N.(mm)	Mag.(X)	F.N.(mm)	Mag.(X)	F.N.(mm)	Mag.(X)	F.N.(mm)	Mag.(X)	F.N.(mm)
10X/23 high eyepoint eyepiece	0.75	7.50	30.67	2.25	102.22	3.75	61.33	4.73	48.68	5.63	40.89	11.25	20.44	15.00	15.33
	1	10.00	23.00	3.00	76.67	5.00	46.00	6.30	36.51	7.50	30.67	15.00	15.33	20.00	11.50
	2	20.00	11.50	6.00	38.33	10.00	23.00	12.60	18.25	15.00	15.33	30.00	7.67	40.00	5.75
	3	30.00	7.67	9.00	25.56	15.00	15.33	18.90	12.17	22.50	10.22	45.00	5.11	60.00	3.83
	4	40.00	5.75	12.00	19.17	20.00	11.50	25.20	9.13	30.00	7.67	60.00	3.83	80.00	2.88
	5	50.00	4.60	15.00	15.33	25.00	9.20	31.50	7.30	37.50	6.13	75.00	3.07	100.00	2.30
15X/16 high eyepoint eyepiece	0.75	11.25	21.33	3.38	71.11	5.63	42.67	7.09	33.86	8.44	28.44	16.88	14.22	22.50	10.67
	1	15.00	16.00	4.50	53.33	7.50	32.00	9.45	25.40	11.25	21.33	22.50	10.67	30.00	8.00
	2	30.00	8.00	9.00	26.67	15.00	16.00	18.90	12.70	22.50	10.67	45.00	5.33	60.00	4.00
	3	45.00	5.33	13.50	17.78	22.50	10.67	28.35	8.47	33.75	7.11	67.50	3.56	90.00	2.67
	4	60.00	4.00	18.00	13.33	30.00	8.00	37.80	6.35	45.00	5.33	90.00	2.67	120.00	2.00
	5	75.00	3.20	22.50	10.67	37.50	6.40	47.25	5.08	56.25	4.27	112.50	2.13	150.00	1.60
20X/13	0.75	15.00	17.33	4.50	57.78	7.50	34.67	9.45	27.51	11.25	23.11	22.50	11.56	30.00	8.67
	1	20.00	13.00	6.00	43.33	10.00	26.00	12.60	20.63	15.00	17.33	30.00	8.67	40.00	6.50
	2	40.00	6.50	12.00	21.67	20.00	13.00	25.20	10.32	30.00	8.67	60.00	4.33	80.00	3.25
	3	60.00	4.33	18.00	14.44	30.00	8.67	37.80	6.88	45.00	5.78	90.00	2.89	120.00	2.17
	4	80.00	3.25	24.00	10.83	40.00	6.50	50.40	5.16	60.00	4.33	120.00	2.17	160.00	1.63
	5	100.00	2.60	30.00	8.67	50.00	5.20	63.00	4.13	75.00	3.47	150.00	1.73	200.00	1.30



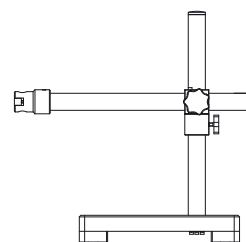
# SPECIFICATIONS

## SMZ171 | BOOM STANDS



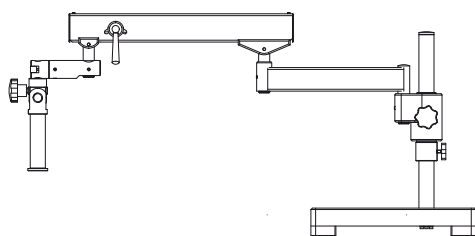
Special Universal stand (squared base)

Base: 300x300x50 mm  
 Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Focusing pole: Ø32mm  
 Max. distance from pole to optical centre: 566mm



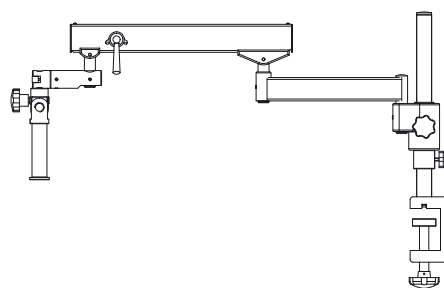
Industrial arm boom stand

Base: 300x300x50 mm  
 Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Industrial arm: Ø16mm  
 Max. distance from pole to optical centre: 566mm  
 Connected with the industrial arm directly without focusing connector



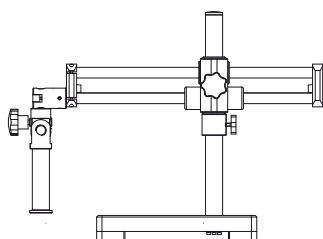
Articulating boom stand

Base: 350x350x58 mm  
 Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Focusing pole: Ø32mm  
 Max. distance from pole to optical centre: 985mm



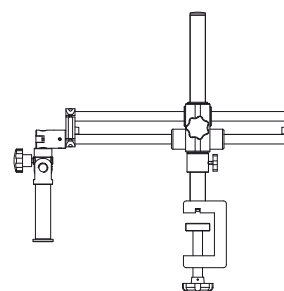
Articulating boom stand (clamp version)

Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Focusing pole: Ø32mm  
 Maximum thickness of table: 75mm  
 Max. distance from pole to optical centre: 985mm



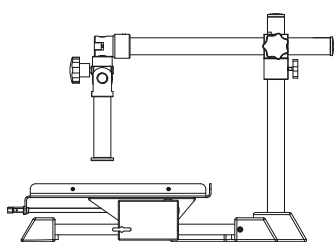
Ball bearing boom stand

Base: 300x300x50 mm  
 Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Focusing pole: Ø32mm  
 Max. distance from pole to optical centre: 605mm



Ball bearing boom stand (clamp version)

Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Focusing pole: Ø32mm  
 Maximum thickness table: 75mm  
 Max. distance from pole to optical centre: 605mm



Manual movement stand

Surface perimeter: 450mm x 350mm  
 X movement: 410mm / Y movement: 220mm  
 Vertical pole: Ø32mm  
 Height of vertical pole: 400mm (optional: 600mm)  
 Focusing pole: Ø32mm

# SPECIFICATIONS

## SMZ171 COMPARISON TABLE



SMZ171-BP

SMZ171-TP

SMZ171-BLED

SMZ171-TLED

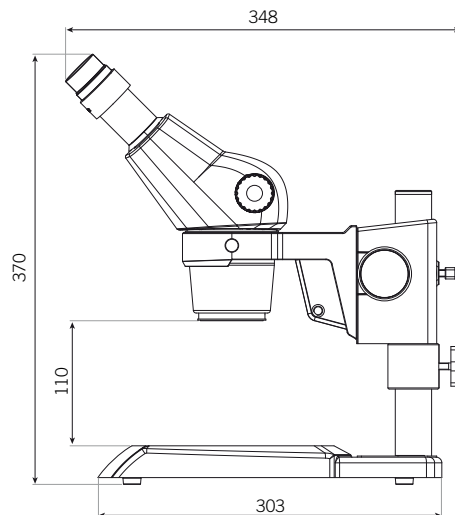
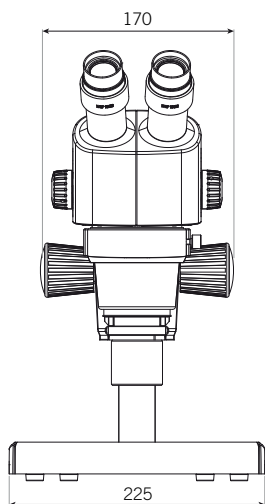
<b>Greenough Optical System</b>	•	•	•	•
<b>Observation tube</b>				
Binocular head with diopter adjustment on both eyepieces	•		•	
Trinocular head with diopter adjustment on both eyepieces		•		•
<b>Interpupillary distance:</b> 52-75mm	•	•	•	•
<b>Trinocular light split:</b> fixed optical split 50:50	•	•	•	•
<b>Inclination:</b> 45°	•	•	•	•
<b>Eyepieces:</b> N-WF10X/23mm	•	•	•	•
<b>Objectives system:</b> Zoom system, ratio 1:6, 7	•	•	•	•
<b>Objectives magnification:</b> 0,75X ~ 5X	•	•	•	•
<b>Working distance:</b> 110mm	•	•	•	•
<b>Stand</b>				
Pole type stand without illumination	•	•		
Pole type stand with transmitted illumination and cold light port			•	•
<b>Base:</b> 303x239mm	•	•	•	•
<b>Column / Arm</b>				
Ø 32mm, 232mm height			•	•
Ø 32mm, 290mm height	•	•		
<b>Head holder</b>				
for Ø 32mm column and Ø 76mm head without illumination	•	•		
for Ø 32mm column and Ø 76mm head with incident illumination			•	•
<b>Coarse focusing system with tension adjustment</b>	•	•	•	•
<b>Focusing stroke:</b> 49mm	•	•	•	•
<b>Incident illumination:</b> 3W LED with intensity control			•	•
<b>Transmitted illumination:</b> 3W LED with reflector and intensity control			•	•
<b>Internal transformer</b>			•	•
<b>Power supply:</b> 100-240V (CE)			•	•
<b>Accessories included:</b>				
Black and white stage plates and dust cover	•	•		
Black, white and frosted stage plates and dust cover			•	•
<b>Dimensions</b>				
303x225x370mm	•	•		
303x239x405mm			•	•



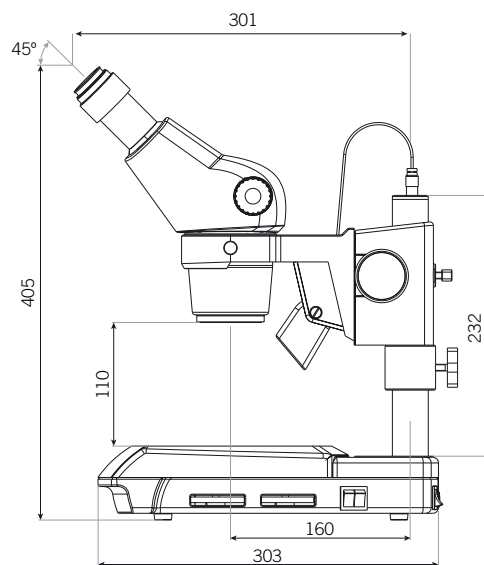
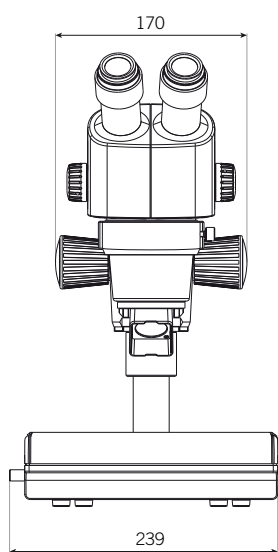
# SPECIFICATIONS

## SMZ171 SCHEMATIC DIAGRAMS

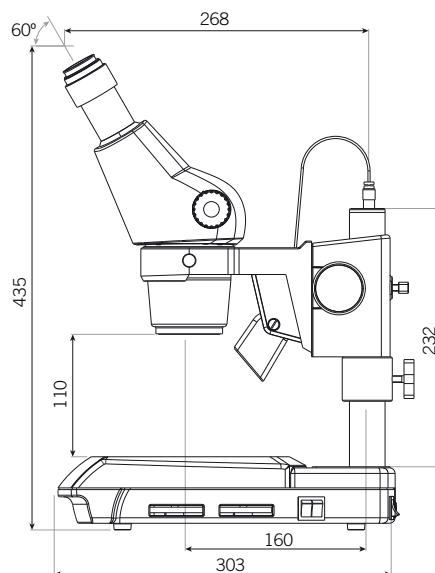
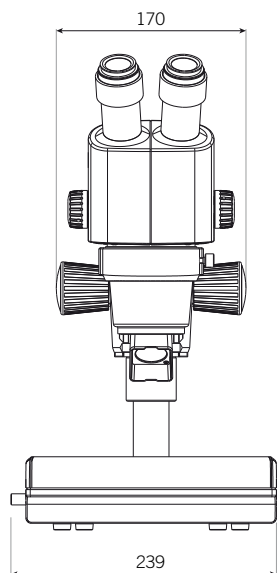
SMZ171-BP



SMZ171-BLED

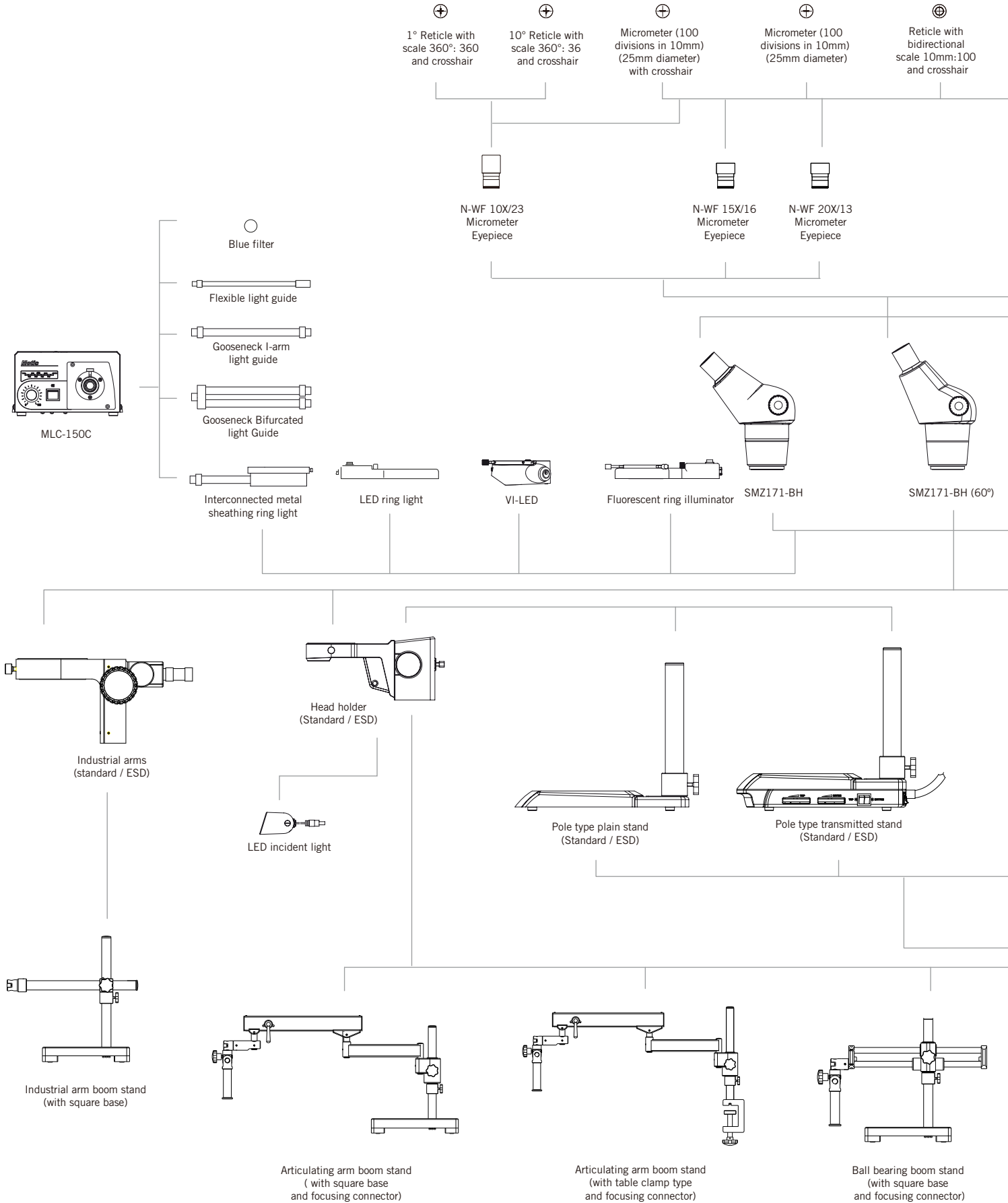


SMZ171-BLED (60°)



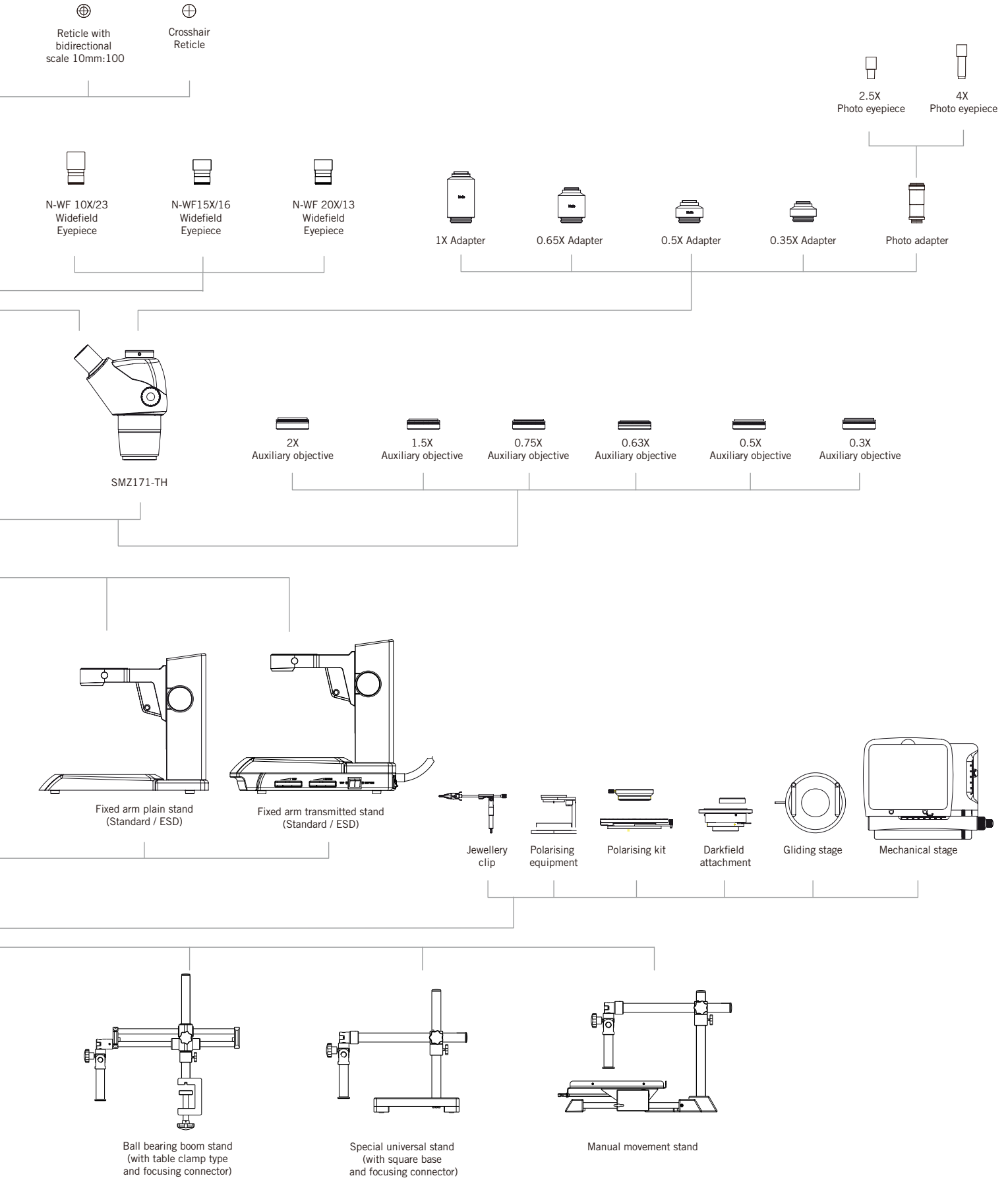
# SPECIFICATIONS

## SMZ171 SYSTEM DIAGRAM



# SPECIFICATIONS

## SMZ171 SYSTEM DIAGRAM



# Motic®

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Design Change: The manufacturer reserves the right to make changes in instrument design in accordance with scientific and mechanical progress, without notice and without obligation.

Designed in Barcelona (Spain)

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Official Distributor: