



# Operating Microscope OM-9

*Serving Your Vision*



Operating Microscope

# OM-9

Compact operating microscope with outstanding optical performance and functionality



TAKAGI has been serving the vision of the global eye-care industry since 1955.

TAKAGI brand products are developed, designed and manufactured in Nagano, a region famed for its thriving precision manufacturing industry. Protecting eye health means protecting opportunities to see the beautiful things in the world. It is based on this belief that we take great joy and pride in making our instruments beautiful as well as functional. Our world-class technological capabilities, assured quality and outstanding service, make us trusted by ophthalmic professionals in more than 80 countries worldwide.

TAKAGI's operating microscopes have achieved clear resolution through a process of development focused on "visibility" and by leveraging their optical performance. In addition to a wide and bright field of view, light intensity can be adjusted to suit each particular case and the surgeon's own preference, and the interface is intuitive and easy to use.

The OM-9 is a high-performance operating microscope that offers a wide range of advanced functions all contained within a compact package. Using an illumination system and apochromatic lens that ensure the highest level of optical performance, this microscope provides users with a contrast-rich view that is bright and has a 3D appearance.

A new red reflex illumination mechanism capable of capturing outstanding red reflex images and high-intensity LED are combined to achieve a clear and wide field of view and excellent colour reproduction. The OM-9 is designed with all needs in mind, including use in outpatient procedures, and is available in three configurations according to usage requirements.

# Optics

## New optics for retina and vitreous surgery

The new optical system for the OM-9 offers the highest level of optical performance that can be used not only for cataract surgery, but also for retina and vitreous surgery procedures.

An objective lens of  $F = 200$  mm provides ample working distance and the observation optics realise bright and sharp observation images with deep depth of focus.

The new red reflex illumination mechanism that is incorporated into coaxial illumination means that there is good reflection from the fundus, providing a good red reflex image with a 3D appearance, both of which are indispensable for cataract surgery. When red reflex illumination is switched on, the light source switches to a dual source, making it easier to attain red reflex illumination.

The OM-9 reproduces natural colours by using an apochromatic lens that has high light transmittance and also corrects chromatic aberration in red, blue, and green wavelengths to successfully eliminate colour blurring. With the OM-9 TAKAGI has aimed to achieve a view that is clear, contrast-rich and has a 3D appearance, ideal for conducting surgical procedures.



Cataract surgery image 1

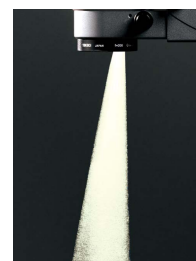


Cataract surgery image 2



Retina and vitreous surgery image

OM-9 red reflex illumination mechanism



Red Reflex OFF



Red Reflex ON

# LED

## High-intensity LED technology

The combination of the red reflex illumination mechanism that ensures good reflection from the fundus and high-intensity LED ensures a red reflex image that is bright and natural, with a 3D appearance and high colour reproducibility. The difference in colour between the affected areas is clear and easy to see, enabling the surgeon to operate safely and accurately.

## High level of cost-performance

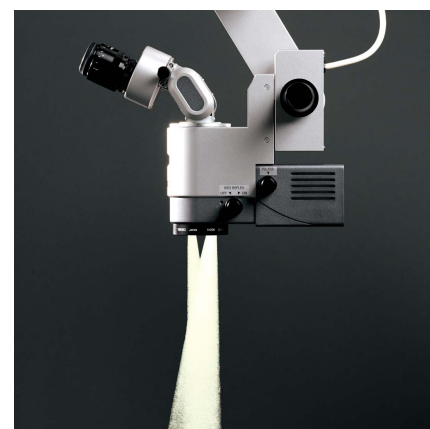
On the OM-9, using an LED light source with an operating life of approximately 40,000 hours reduces the need for bulb changes and keeps power consumption low, ensuring a high degree of cost performance.

\* LED operating life is defined as a state when light intensity drops to 70%. The operating life of the LED used in OM-9 is approximately 40,000 hours, although this is not guaranteed.

## Wide range of filters to protect patients' eyes fitted as standard

While LEDs have advantages such as high illumination intensity and long life, they also pose a risk of causing blue light-induced eye hazard when shone on the retina for extended periods. The OM-9 comes with filters included as standard to protect patients' eyes from harmful light while leveraging the merits of LEDs.

A heat-absorbing filter that protects the eye from LED heat is permanently installed. In order to prevent damage from harmful light, in addition to a retinal protection filter and a blue correction filter that produces a colour tone similar to that of a halogen lamp, a blue cut filter is fitted that blocks blue wave lengths, further enhancing retina safety. The filter switching knob makes it easy to switch between each filter.



# Design

## Three microscope specification configurations enable flexible choice

There are three types of specification configurations for the OM-9 depending on the combination of coupling, microscope and binocular tubes, making it possible to configure the optimal device for your specific needs.

All configurations are suitable for general ophthalmic surgery and ophthalmic procedures, including cataract surgery, and can also be used for retina and vitreous surgery. With all configurations there is no difference in the clear, natural and 3D appearance of the view. Differences in function relate to small adjustments to X-Y axis movements, the method of changing the microscope magnification, and the binocular tubes (whether tiltable or fixed).

We accept orders based on the configuration numbers detailed in the table below. Other than coupling, microscope and binocular tubes, all other product specifications are the same for all configurations.

Configuration no.	Coupling	Microscope	Binocular tube
XZ	X-Y coupling	Motorised zoom magnification	Tiltable
XE	X-Y coupling	5 step motorised magnification	Fixed at 45° angle
SM	Straight coupling	5 step manual magnification	Fixed at 45° angle

\*Configurations may be possible other than the three listed above. For further details please contact our Sales Department.



### XZ configuration (Motorised zoom microscope specification)

Equipped with tiltable binocular tubes that move more than 90° in parallel view, and with fine adjustments possible in X-Y axis movement, this configuration offers the highest degree of convenience with the comfort of the surgeon in mind. With a continuously variable motorised zoom, magnification can be adjusted using the footswitch.



### XE configuration (Motorised 5 step magnification specification)

Equipped with binocular tubes fixed at a 45° angle and with fine adjustments possible in X-Y axis movement, this configuration features 5 step motorised magnification that can be controlled by the footswitch. It offers a good balance of convenience and cost-performance.



### SM configuration (Manual 5 step magnification specification)

This is the most economical of the three configurations, ideal for use in outpatient procedures, while still boasting the same outstanding optical performance as the XZ and XE configurations. Featuring basic functionality, magnification is adjusted manually.

## Tiltable binocular tubes

To ensure optimal comfort for operating posture, on the XZ configuration tiltable binocular tubes that move 90° (from 0° in direct view to 90° in inclined view) are equipped as standard, helping to reduce fatigue during surgical procedures.

High-eyepoint eyepieces with a high-grade, multi-coating ensure a sharp and bright observation image.

## Microscope head tilting mechanism

The OM-9 is equipped with a microscope head tilting mechanism to enable ease of use for glaucoma surgery. Equipped with a movement interlock system and a movement range of  $\pm 30^\circ$ , various aspects of the design focus on ease of operation.

## Compact and clean appearance

A design that reduces cable exposure to an absolute minimum prevents dust and dirt from adhering to instrumentation, thereby lowering the risk of faults or interference. Cables remain unexposed even when the imaging system is connected, assisting with hygiene management and helping to create a clean surgical environment.





# Usability

## Easy-to-use operating functions

The operation panel is installed on the microscope arm, ensuring that it remains unobtrusive during surgery. From the operation panel it is possible to adjust illumination light intensity and switch the device and illumination on/off.

The foot controller can be used to switch illumination on/off, adjust focus (all configurations), and change X-Y axis movement and magnification (XZ and XE configurations). Also, in order to realise comfortable operations, the pedal configuration for adjusting focus and magnification can be changed according to surgical requirements and individual preference.

A waterproof and dustproof rating of IPX6 greatly reduces the risk of damage or failure caused by liquids or cleaning materials getting inside.



## Safety during surgery and during transportation

The swivel locks on the microscope, balance arm, and support arm can be used to hold the microscope in the proper position for safe and secure surgery. It can also be folded away compactly for safe transportation. The casters have two stoppers to firmly secure the OM-9 in place.

# Rich variety of options

The OM-9 features a rich variety of options to respond to a diverse range of needs. Combining these various options with the microscope helps to realise an optimal and flexible operating environment.

## Assistant microscope

Two types of assistant microscope are available for the OM-9.

On the binocular stereoscopic assistant microscope (O06-20SE) set at an angle of 26° to the main microscope, the focus function, which is separate to the main microscope, allows for independent focus adjustment, enabling the assistant to set and attain the optimal view.

In cases such as temporal incision cataract surgery when it is necessary to switch from side to side frequently, the assistant microscope can be simply rotated round to the required side, helping to facilitate surgery by ensuring ease of movement for the surgeon, and eliminating the risk of damage due to the repeated attachment/detachment of equipment.

If the coaxial assistant microscope (O06-19SE) is attached to the main microscope the assistant can see the same image as the surgeon, making it easier to follow and understand the status of surgery. With a rotation mechanism and an image rotation mechanism it can easily be set in the optimal position.



Foot controller

Total magnifications	7.8x
Field of view (diameter)	25.6

When O06-20SE attached

Total magnifications	3.7x ~ 18.7x
Field of view (diameter)	53.3 ~ 10.7

When attached to the XZ configuration (motorised zoom magnification)

Total magnifications	3.1x	4.7x	7.8x	12.5x	19.5x
Field of view (diameter)	64	42.7	25.6	16	10.2

When attached to the XE configuration (5 step motorised magnification) and SM configuration (5 step manual magnification)

## Digital imaging accessories

By using the optional beam splitter (O11-03) and camera adapter (O08-11) a C-mount compatible CCD camera system can be connected. (Please use commercially available products for the CCD camera system.)

Speedy switching is enabled by the IN/OUT switching lever on the beam splitter.

The camera adapter is fitted with an aperture as standard, which can be used to regulate light coming through the lens to suit the subject being photographed. When connected with imaging equipment it is possible to record images during surgical procedures. Please contact our Sales Department for details about compatible equipment.

## Monitor arm and Camera control rack

An LCD monitor can be attached to the microscope arm, integrating the monitor with the operating microscope in a space-saving configuration that leaves floor space free. Also, the camera control unit can be stowed on the camera control rack, helping to maintain a safe environment and prevent accidents. The large-diameter casters with stoppers are fitted as standard and ensure stability of the main unit, making moving and fixing both easy and worry-free.

## Fundus observation device adapter

The OM-9 features high-performance optics that can be used to perform retina and vitreous surgery. In such cases it is necessary to attach a fundus observation device.

OCULUS BIOM and Haag-Streit EIBOS devices can be attached.

\* Please contact our Sales Department for further details.

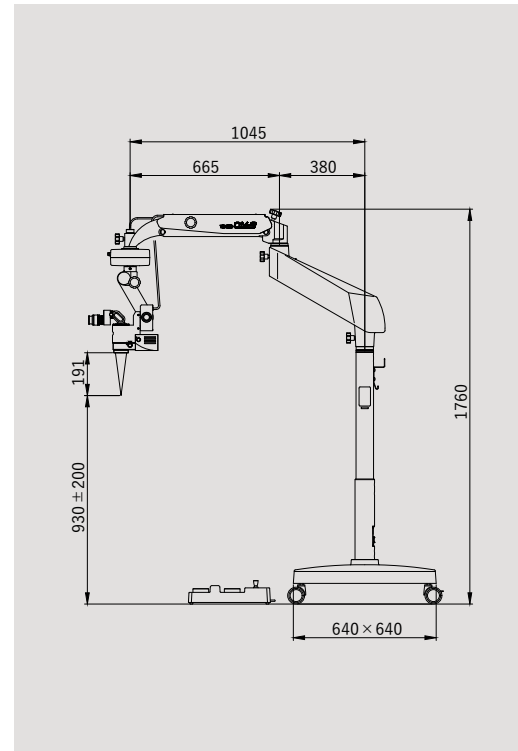


\*The monitor screen image is a composite image. Actual image quality may differ from the illustration.

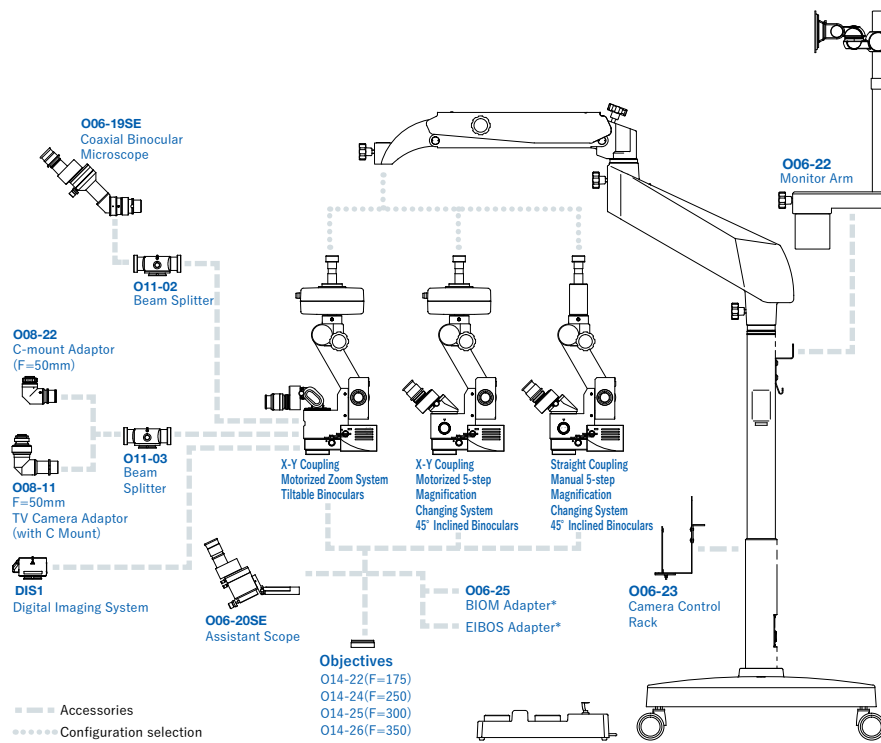
## Major Specifications

Model name		OM-9 Operating Microscope		
		XZ	XE	SM
Microscope	Magnification changer	5x motorised zoom magnification	5x motorised	5x manual magnification
	Objective lens	F = 200 mm (apochromate correction optical system)		
	Eyepieces	10x (high-eyepoint & wide-field) 16x (high-eyepoint & wide-field)		
	Field of view (diameter)	49 mm - 9.8 mm	56 mm / 37.3 mm / 22mm / 4mm / 14mm / 9mm	
	Binocular tube	Tiltable binocular tubes F = 170 mm	45° inclined binocular tubes F = 125 mm	
	Total magnifications	4.1x - 20.4x	4x / 6x / 10x / 16x / 25x	
Illumination	Focusing	30 mm with motorised centring switch		
	X-Y movement	± 25 mm in each direction with motorised speed and centring control		
	Method	Direct illumination		
	Light intensity adjustment	9 steps (5 level display on gauge)		
	Light source	LED		
	Filters	Heat-absorbing / Blue correction/ Blue cut / Retina shield		
Arm & Base	Type	Floor stand with 4 casters and 2 stoppers		
	Balance arm stroke	400 mm (vertical)		
	Maximum arm reach	1045 mm		
	Maximum load tolerance on arm	Up to 3.2 kg of accessories		
	Control panel	Brightness display, light intensity control, illumination ON/OFF switch, power switch		
Others	Footswitch	Wired 8 function control with IPX6 waterproof and dustproof performance		
	Weight	90.5 kg (excluding options)	89.5 kg (excluding options)	
	Power input	70 VA		
	Power supply	AC 100-230 V, 50/60 Hz		
Electrical protection class	Class 1			

## Dimensions



## System Chart



## Accessories

Model number	Detailed information
DIS1	Beam splitter with built-in camera (possible to view images by connecting to a monitor)
O06-19SE	Coaxial assistant microscope
O06-20SE	Assistant microscope capable of binocular stereoscopic viewing at 26° to the main microscope
O06-22	Image display monitor mounting arm
O06-23	Camera control unit storage rack
O06-25	OCULUS BIOM mounting adapter for retina and vitreous surgery Haag-Streit EIBOS mounting adapter for retina and vitreous surgery
O08-11	TV camera mounting adapter with C-mount F = 50 mm (Adjustable aperture equipped)
O08-22	TV camera mounting adapter with C-mount F = 50 mm
O11-02	Beam splitter for mounting a camera or an assistant monocular microscope (spectroscopic ratio 60 : 40)
O11-03	Beam splitter for mounting a camera or an assistant monocular microscope (spectroscopic ratio 20 : 80)
O14-22	Objective lens F = 175
O14-24	Objective lens F = 250
O14-25	Objective lens F = 300
O14-26	Objective lens F = 350

\*Please contact our Sales Department for details about BIOM and EIBOS adapters.

**Caution** To ensure safe and correct handling please read the user manual before using.

- Description and appearance as detailed in this brochure may be subject to change as improvements are made to products.
- Colours as they appear in brochure photographs may be slightly different to actual products due to lighting conditions when photographs were taken, or print colours.



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