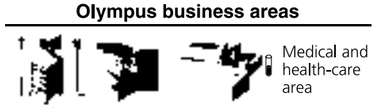
Web site address: http://www.olympus.com

ISO 9001 Certification
Certificate No.69372
Design and production adheres to ISO9001 international quality standard.

ISO 14001 Certification
Certificate No. 961049
Design and production at the Olympus Optical Co. Ltd. Ina Plant conforms with ISO14001 specifications for environmental management systems.

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

## Olympus business areas



Medical and health-care area

Imaging and information area

Industrial applications area

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FOCUS ON LIFE


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INVERTED METALLURGICAL MICROSCOPES

# GX SERIES

UIS
UNIVERSAL INFINITY SYSTEM

# Advanced Imaging System Plus
# Versatile Modular Design

Both of these new GX series microscopes feature Olympus' world-renowned UIS infinity-corrected optical system for ultra-clear images, no matter what observation method is used. In addition they are built to a modular design which enables the user to match selected image recording equipment (video, digital or large-format/35mm cameras) to the microscope body and attach them singly or in multiple configurations — along with calibration scales that are recorded directly with the image.
Together with these sophisticated functions and performance features, the GX71 also allows erect image observation. The GX series represents a highly advanced imaging system with the flexibility to meet the diverse needs of current and future materials research and inspection applications.

GX71

GX51

# Improved optical performance sets new standards of image clarity for inverted metallurgical microscopes

### Getting the full picture with any observation method

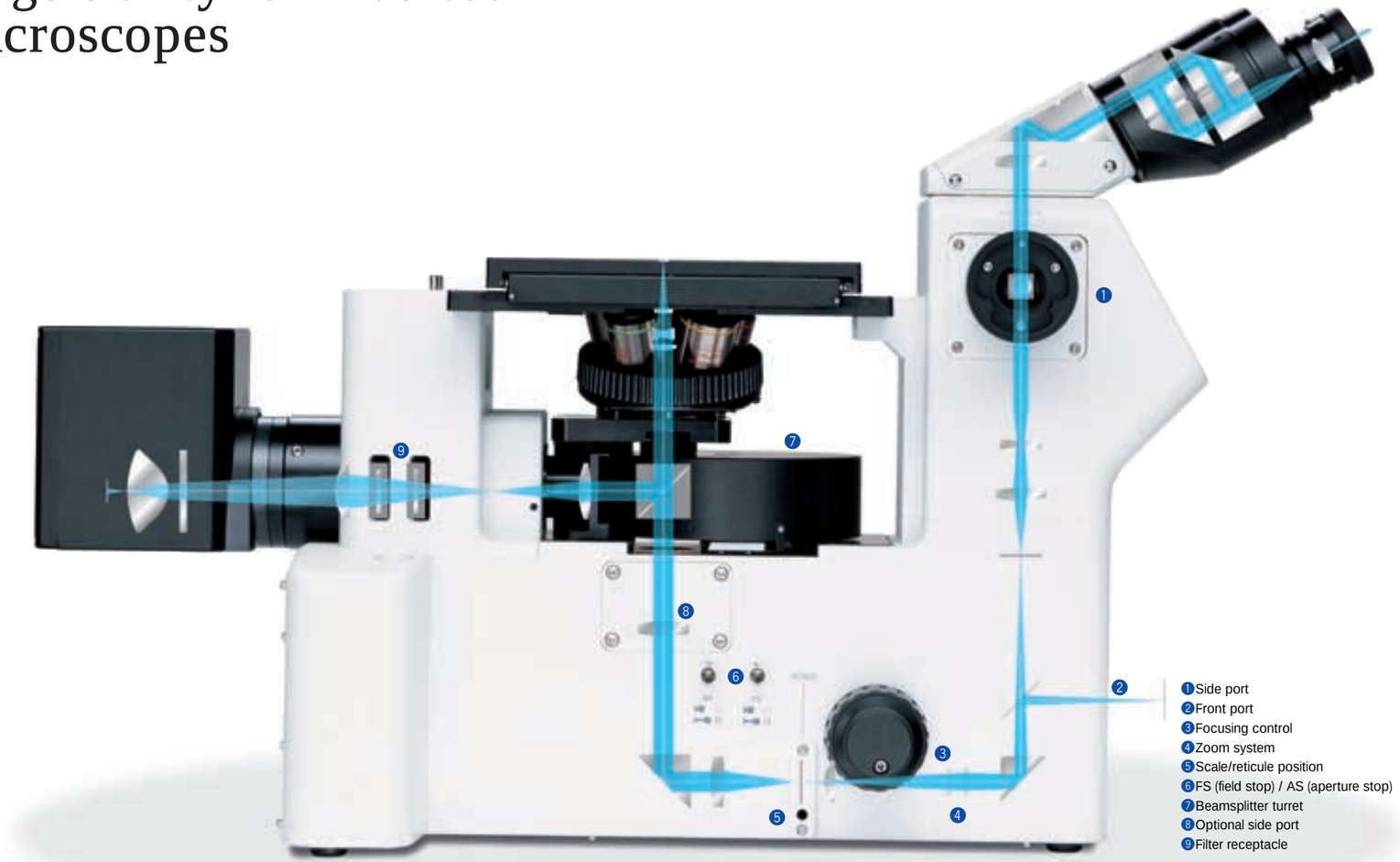
The UIS infinity-corrected optical system was developed with Olympus' original technological know-how — and the GX series is designed to maximize its performance in the context of inverted metallurgical microscopes. The result are sharp, detailed images with excellent contrast and consistently high clarity with any and all observation methods. Equipped with extra-bright 100W halogen lamps and newly improved light collecting efficiency, the GX series microscopes provide the intense and even illumination that contemporary applications demand.

### Ergonomic layout of control elements allows a natural working posture

Numerous refinements are included to ensure that the user can adopt a natural posture and work in comfort. They include an ergonomic control layout that places the field stop (FS), aperture stop (AS), focus control and light adjustment dial close to the users hand. The introduction of a flexible stage handle further contributes to the work comfort.

### Computer-designed frame with more rigidity and higher reliability

Computer simulations have been used to further improve the rigidity and low center of gravity design of the frame, which is the key to greater stability and a more flexible system structure.




1. Side port
2. Front port
3. Focusing control
4. Zoom system
5. Scale/reticule position
6. FS (field stop) / AS (aperture stop)
7. Beamsplitter turret
8. Optional side port
9. Filter receptacle

### Adjusting the image to suit the specimen — Nomarski DIC observation

To obtain the ideal combination of resolution and contrast to suit the nature of each specimen, three different Nomarski DIC prisms are provided: The U-DICR prism serves all imaging applications with a balance of contrast enhancement and resolution. For very densely structured specimen the U-DICRH prism provides an additional resolution level. The U-DICRHC prism greatly emphasizes the contrast and detection of minute surface gradients that may otherwise remain unseen. All three are slider-operated, so that the operator can make smooth transitions to different magnifications and can easily switch between observation methods.

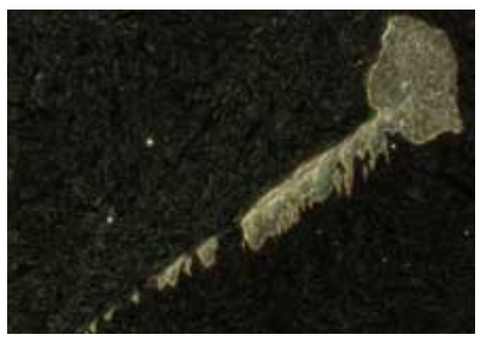

### A select range of filters

The GX series comes with a select range of filters, including neutral density, color temperature conversion and green filters. Two slider slots are provided, each allowing introduction of up to three filters.

## *Brightfield*

UMPlanFL100xBDP Brightfield observation*

## *Darkfield*

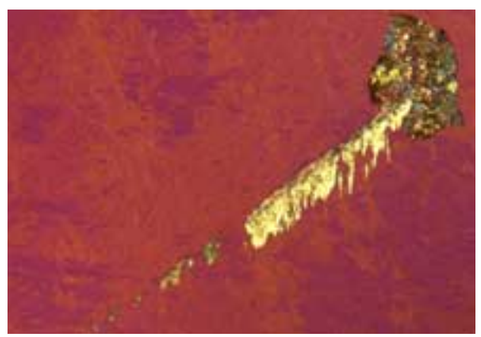


UMPlanFL100xBDP Darkfield observation*

## *Nomarski DIC*

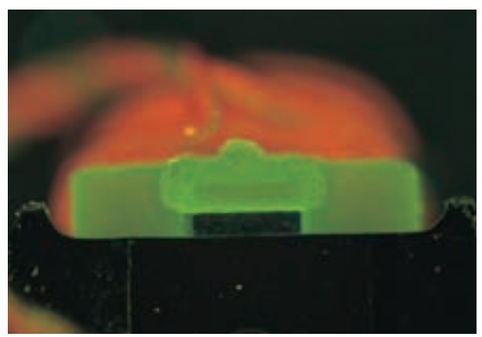
UMPlanFL100xBDP Nomarski DIC observation*

## *Simple Polarized Light*



UMPlanFL100xBDP Simple polarized light observation*

## *Fluorescence*



UMPlanFL5x Fluorescence observation

**Sample provided by Prof. Kenji Abiko, doctor of engineering, Institute for materials research, Tohoku university*

# Modular design for flexible system configuration from digital recording to conventional photography

**Greater freedom to select and combine image recording equipment**
The GX series' modular construction maximizes the flexibility to mix and match image recording devices on the microscope body. Digital, video and conventional still cameras (large-format or 35mm) can be attached to the front port, while the side port accepts digital and video cameras. When both ports are used simultaneously, up to 3 camera backs can be attached, providing ample system variation.

**High-precision, high-sensitivity digital images at 5.8 million* pixels via personal computer.**
Combined with a DP50 digital camera, the GX series displays its potential by recording microscope images in exceptionally sharp detail. The DP50 camera excels in all imaging modes, recording images from brightfield to fluorescence, in each case offering a truthful representation of the original specimen. Advanced software and an intuitive graphic user interface make both the capture and filing of images easy and effortless.

* Special technology is used to derive a 5.8 million-pixel equivalent image from the 1.5 million pixel CCD.

GX71+GX-PHU+DP50


**Easy image capture via control unit with LCD monitor**
With a DP12 digital camera attached, microscope images can be captured directly (without a personal computer) and recorded/stored to SmartMedia. The DP12 has a 1/1.8 inch, 3.34 million-pixel CCD and provides sharp, high-precision results with both full-size images and detailed, individually-selected areas. Its 3.5-inch TFT color LCD monitor is directly attached to the control unit. The operator can freely place the control unit for easy viewing, framing and focusing.

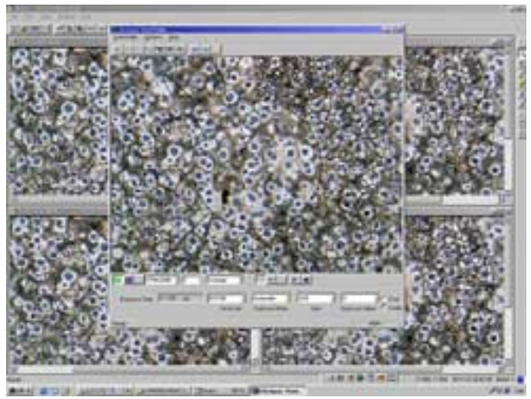
GX51+DP12

**GX photo unit for simultaneous attachment of 35mm and large-format camera backs**
Specifically designed for integration with GX microscopes, the photo unit GX-PHU enables attachment of both 35mm and large-format camera backs simultaneously. The compact controller is easy to use, with only essential operating control buttons, but offers a full range of features including 1% spot and 30% averaging light metering, AE lock and multiple exposures.

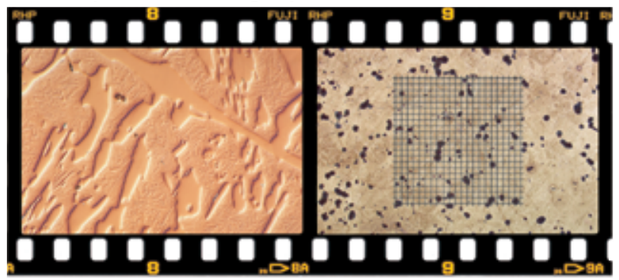
# Scale printing and zoom magnification* from all ports

*GX71 only

*Digital image*



*35mm photo micrographs*



(Right) UMPlanFL5xBDP Brightfield observation*

*Large-format photo micrographs*

UMPlanFL20xBDP
Nomarski DIC observation*
**Sample provided by*
*Prof. Kenji Abiko,*
*doctor of engineering,*
*Institute for materials research,*
*Tohoku university*


Scale

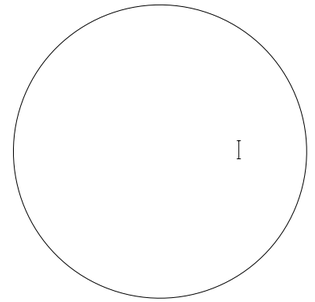
**All-camera compatibility**
The GX series allows scale imprinting for all ports and with any kind of camera, including digital, 35mm and large-format.

**Accurate photo micrographs of any user-selected area**
A large-format camera will record any given image (or part of an image) at the same magnification as is used for observation*. With the GX71's free-framing and 1x-2x zoom magnification capabilities, user-selected areas of the image can be easily and accurately recorded.

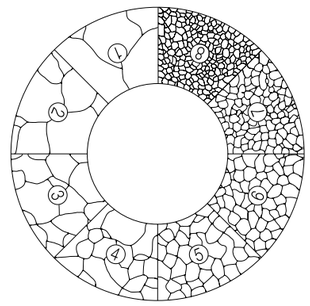
*When using 10x eyepieces.

**A full range of scales**
In addition to the calibration scales for each objective, grain size reticules and square scales can also be recorded. Up to 3 scales can be freely combined in a single slider.

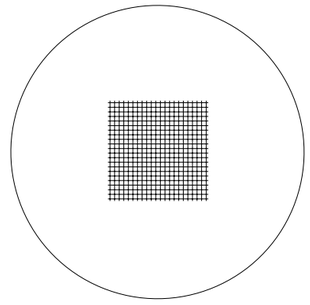
Scale



Grain Size Scale



Square Scale



TOP-OF-THE-LINE INVERTED
METALLURGICAL SYSTEM MICROSCOPE

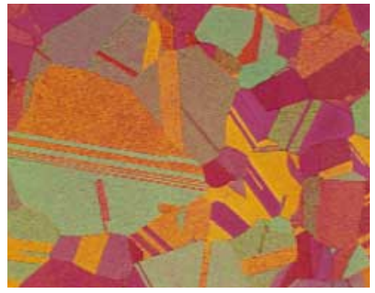
# GX71

BF DF DIC POL FL F.N. 26.5 MAX 4 Port 2x ZOOM

## All the quality that today's advanced research demands

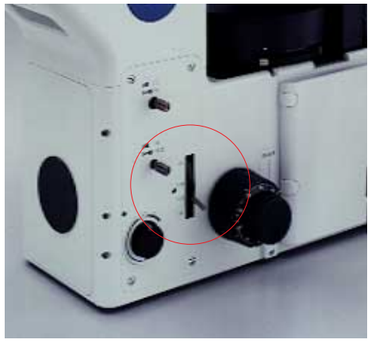

### Ideal for every observation method from brightfield to fluorescence

Simply by changing the position of the GX71's beamsplitter turret, it is quick and easy to alternate between brightfield, darkfield, Nomarski DIC, simple polarized light and fluorescence observation. The Olympus universal objectives accommodate all observation methods. There is no need to change the objective type each time the observation method is changed.
The GX71 also employs super widefield eyepieces (F.N.26.5), for an efficient orientation and observation process.



### Zoom function for easy framing

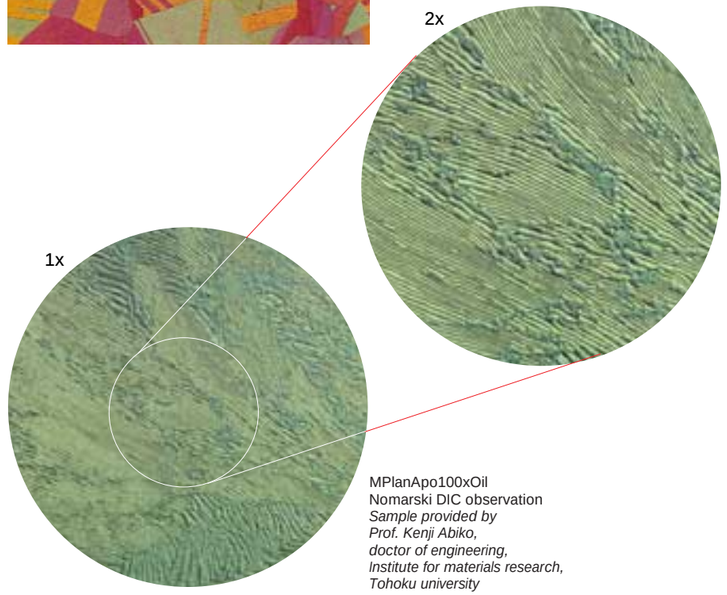
The 1x-2x zoom facility acts on all ports, shows critical specimen detail more clearly and makes accurate framing especially easy. Photomicrography with a large-format camera allows image capture at the same magnification as the visual observation.



### Erect images* — observation and recording of the specimen "as is"

Since observation images are not reversed, the specimen's positional characteristics (right/left, up/down) are the same in a photomicrograph as they are in the real-time observation of the viewing field. This makes it easier to compare the two, and presents specimen movement in an intuitive, natural way.

* Digital images are reversed.


MPlanApo100xOil
Nomarski DIC observation
*Sample provided by*
*Prof. Kenji Abiko,*
*doctor of engineering,*
*Institute for materials research,*
*Tohoku university*

INVERTED METALLURGICAL SYSTEM MICROSCOPE

# GX51

BF DF DIC POL F.N. 22 MAX 3 Port

## Superb performance and reliability for all kinds of routine observation and documentation

### Single lever switchover for brightfield/darkfield observation

The versatile GX51 performs brightfield, darkfield, Nomarski DIC and simple polarized light observations. Switching between brightfield and darkfield observation is done with a single lever, located close to the operator's hand. Changing to Nomarski DIC observation is a simple matter of inserting the DIC-slider.

### Expandable functionality

A wide variety of optional units can be easily attached to the GX51, allowing such system upgrades as linking to a digital or video camera via an intermediate tube (GX-SPU).

### Improved operating convenience

Since the GX51 was especially developed for routine inspection applications, it's design pays close attention to operating convenience. All frequently used operating functions are accessed from the front, and the design makes it easy to use whether the operator is working in a seated or standing position.



# GX71/GX51 ACCESSORIES

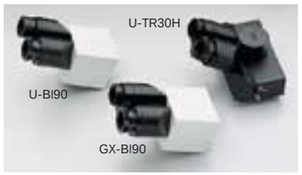
GX71


**GX71 observation tubes**
The super widefield binocular observation tube (U-SWBI30) and super widefield trinocular observation tube (U-SWTR2) are provided for the GX71.

GX71 GX51


**Revolving nosepieces**
Sextuple revolving nosepieces and quintuple revolving nosepieces with DIC slider compatibility are also provided.

GX51




**GX51 observation tubes**
The GX51 microscope employs a widefield trinocular observation tube (U-TR30H) and a widefield binocular observation tube (GX-BI90). Another widefield binocular observation tube (U-BI90) can also be used when combined with an eyepoint adjuster.

GX71 GX51


**Motorized revolving nosepieces**
The motorized sextuple revolving nosepiece and quintuple revolving nosepiece enable the user to change magnifications directly by means of a hand switch.

GX51


**Intermediate tubes**
Other high-performance accessories are available to meet a variety of applications. Included are an intermediate tube (IX-ATU), which allows attachment of a trinocular observation tube, a side port intermediate tube (GX-SPU) and an eyepoint adjuster (IX-EPA).

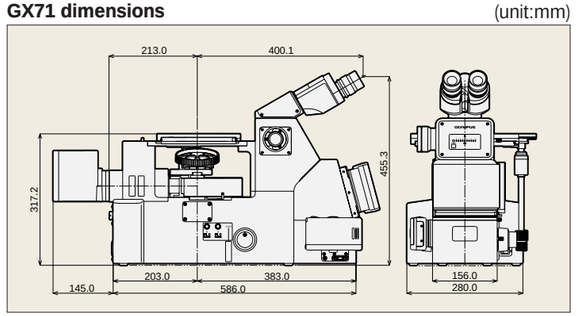
GX71 GX51

**Transmitted light illuminator/**
This illuminator can be attached to the back of the microscope body, enabling observation of transparent specimens and powders.

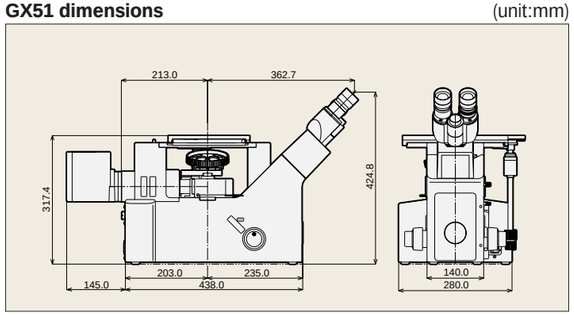
### GX series specifications

| | | GX71 | GX51 |
|---|---|---|---|
| Optics | | UIS optical system (infinity-corrected) | |
| | Objective | UIS objectives | |
| | Eyepiece | UIS eyepiece (F.N. 26.5) | UIS eyepiece (F.N. 22) |
| Microscope body | Intermediate magnification | Zoom incorporated (1x - 2x) | — |
| | Imprinting of scale | All ports | |
| | Power source | Power source for illuminator (12V100 halogen) incorporated | |
| | Photo frame | Incorporated (IN/OUT) | — |
| | Output port | Side port: video system | Side port (optional): video system |
| Observation tube | Super widefield | U-SWBI30, U-SWTR-2 | — |
| | Widefield | — | U-BI90, GX-BI90, U-TR30H |
| Illuminator | Observation method | Brightfield, darkfield, simple polarized light, DIC, fluorescence | Brightfield, darkfield, simple polarized light, DIC |
| | Illuminator diaphragm | FS/AS manually controlled, with centering adjustment | |
| | Light source | 100W halogen (standard), 100W mercury, 75W xenon, 50W metal halide (optional) | |
| Revolving nosepiece | Manual operation | Sextuple for BF/DIC, quintuple for BF/DF, quintuple for BF/DF/DIC | |
| | Motorized operation | Sextuple for BF/DIC, quintuple for BF/DF/DIC | |
| Stage | | Flexible right handle stage, exclusively for GX series microscopes (teardrop, cicular stage insert plate) | |
| Image recording equipment | Photomicrographic system | 35mm/large-format camera (simultaneously mountable), 1% spot/average measuring area (switchable), auto/manual exposure, exposure time adjustment, automatic ISO setting, AE lock, multiplex exposure, etc. | |
| | Digital camera | Olympus DP series, etc. | |
| | Video camera | Mountable, using video adapters | |

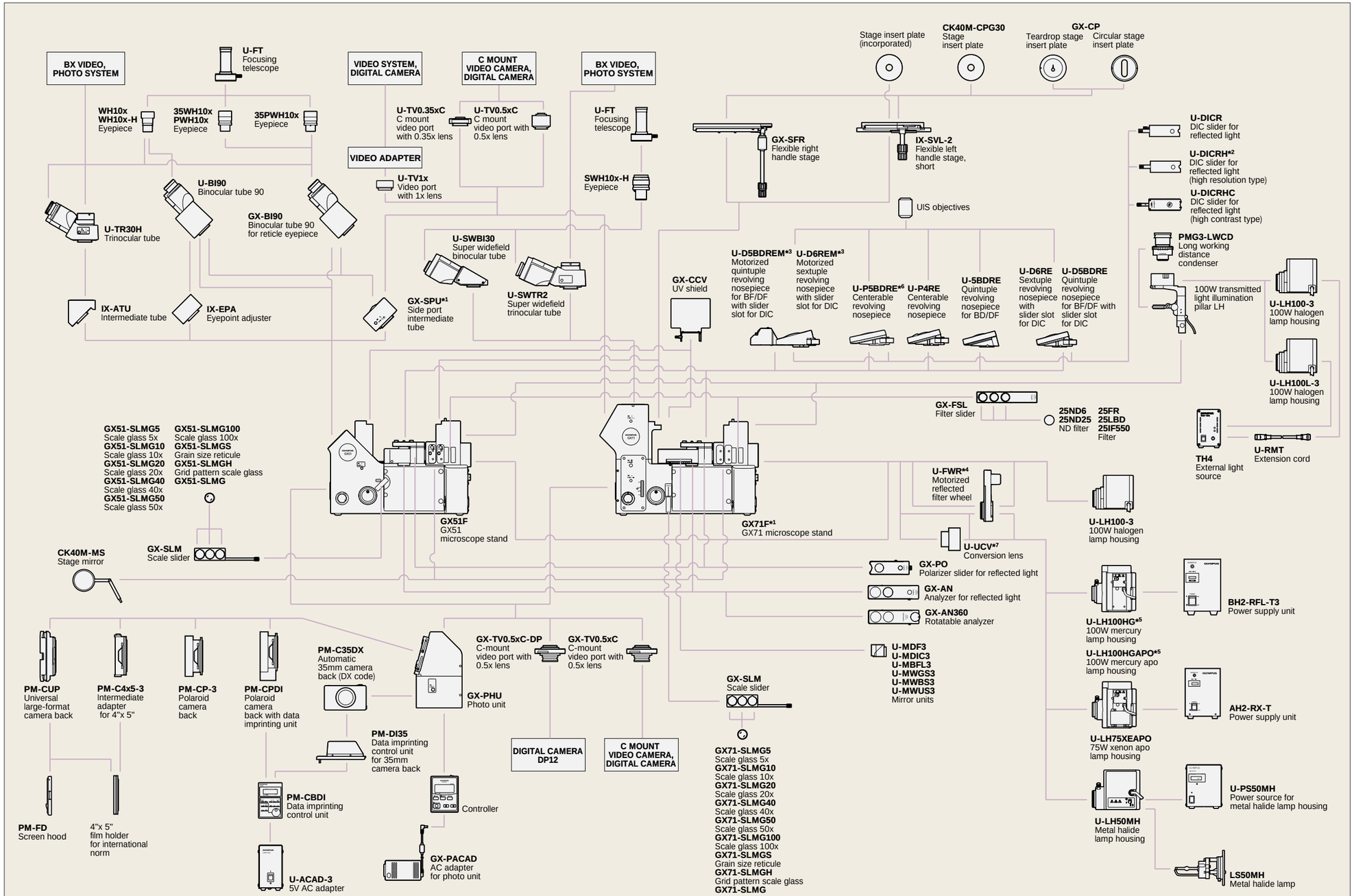
### GX71 dimensions (unit:mm)




### GX51 dimensions (unit:mm)



# SYSTEM DIAGRAM




*1 Please consult your nearest Olympus dealer for cameras compatible with the GX71F side port and GX-SPU. The PM series photomicrographic system cannot be attached. *2 Sensitive tint observation cannot be accomplished with U-DICRH. *3 U-REMPS-2 power supply unit is required for U-D6REM and U-D5BDREM.
*4 IX-UCB control unit is required for U-FWR. *5 25L42 filter is needed for polarized light and Nomarski DIC observation using high intensity lamps such as U-LH100HG. *6 Objectives may touch the stage when revolving the U-P5BDRE incorrectly. *7 U-UCV can be used in for fluorescence observation.

# Objective specifications

| Objectives | Magnifi-cations | N.A. | W.D. (mm) | Cover Glass Thickness (mm) | Reso-*2 lution (µm) |
|---|---|---|---|---|---|
| UMPlanFL | 5x | 0.15 | 20.0 | — | 2.24 |
| | 10x | 0.30 | 10.1 | — | 1.12 |
| | 20x | 0.46 | 3.1 | 0 | 0.73 |
| | 40x | 0.75 | 0.63 | 0 | 0.45 |
| | 50x | 0.80 | 0.66 | 0 | 0.42 |
| | 100x | 0.95 | 0.31 | 0 | 0.35 |
| UMPlanFL-BD | 5x | 0.15 | 12.0 | — | 2.24 |
| | 10x | 0.30 | 6.5 | — | 1.12 |
| | 20x | 0.46 | 3.0 | 0 | 0.73 |
| | 50x | 0.80 | 0.66 | 0 | 0.42 |
| | 100x | 0.90 | 0.31 | 0 | 0.35 |
| UMPlanFL-BDP | 5x | 0.15 | 12.0 | — | 2.24 |
| | 10x | 0.25 | 6.5 | — | 1.34 |
| | 20x | 0.40 | 3.0 | 0 | 0.84 |
| | 40x | 0.75 | 0.6 | 0 | 0.45 |
| | 50x | 0.75 | 0.66 | 0 | 0.45 |
| | 100x | 0.90 | 0.31 | 0 | 0.37 |
| LMPlanApo | 150x | 0.9 | 1.0 | 0 | 0.37 |
| | 250x | 0.9 | 0.80 | 0 | 0.37 |
| LMPlanApo-BD | 150x | 0.9 | 1.0 | 0 | 0.37 |
| | 250x | 0.9 | 0.80 | 0 | 0.37 |
| LMPlanFL | 5x | 0.13 | 22.5 | — | 2.58 |
| | 10x | 0.25 | 21.0 | — | 1.34 |
| | 20x | 0.40 | 12.0 | 0 | 0.84 |
| | 50x | 0.50 | 10.6 | 0 | 0.67 |
| | 100x | 0.80 | 3.4 | 0 | 0.42 |
| LMPlanFL-BD | 5x | 0.13 | 15.0 | — | 2.58 |
| | 10x | 0.25 | 10.0 | — | 1.34 |
| | 20x | 0.40 | 12.0 | 0 | 0.84 |
| | 50x | 0.50 | 10.6 | 0 | 0.67 |
| | 100x | 0.80 | 3.4 | 0 | 0.42 |
| MPlanApo | 20x | 0.60 | 0.9 | 0 | 0.56 |
| | 50x | 0.95 | 0.3 | 0 | 0.35 |
| | 100x | 0.95 | 0.35 | 0 | 0.35 |
| | 100xOil | 1.40 | 0.1 | 0 | 0.24 |
| MPlanApo-BD | 100x | 0.9 | 0.31 | 0 | 0.37 |
| MPlan*3 | 5x | 0.12 | 19.6 | — | 3.36 |
| | 10x | 0.25 | 10.6 | — | 1.34 |
| | 20x | 0.40 | 1.3 | 0 | 0.84 |
| | 40x | 0.65 | 0.63 | 0 | 0.52 |
| | 50x | 0.75 | 0.38 | 0 | 0.45 |
| | 100x | 0.90 | 0.21 | 0 | 0.37 |
| MPlan-BD*1*3 | 5x | 0.10 | 12.0 | — | 3.36 |
| | 10x | 0.25 | 7.0 | — | 1.34 |
| | 20x | 0.40 | 1.3 | 0 | 0.84 |
| | 50x | 0.75 | 0.38 | 0 | 0.45 |
| | 100x | 0.90 | 0.21 | 0 | 0.37 |
| SLMPlan | 20x | 0.35 | 21.0 | 0 | 0.58 |
| | 50x | 0.45 | 15.0 | 0 | 0.75 |
| LCPlanApo | 20x | 0.40 | 8.8 | 0/0.7/1.1 | 0.84 |
| | 50x | 0.60 | 3.1 | 0/0.7/1.1 | 0.56 |
| LCPlanFL-LCD | 100x | 0.80 | 0.95/1.1/1.143 | 0.6—1.2 | 0.42 |
| LMPlan-IR | 5xIR | 0.10 | 20.0 | — | — |
| | 10xIR | 0.25 | 18.5 | — | — |
| | 20xIR | 0.40 | 8.1 | — | — |
| | 50xIR | 0.55 | 6.0 | — | — |
| | 100xIR | 0.80 | 3.4 | — | — |
| MPlan-IR*3 | 100xIR | 0.95 | 0.3 | — | — |

"BD" refers to brightfield and darkfield objectives

*1 Slight vignetting may occur in the periphery of the field when MPlan-BD series objectives are used with high-intensity light sources such as mercury and xenon for darkfield observation.
*2 Resolution values are calculated with the aperture diaphragm fully opened.
*3 Field numbers are limited (up to F.N.22). Not compatible with F.N.26.5.