Instrument Systems
KONICA MINOLTA Group

Optronik Line

AMS 200

Goniophotometer for small to medium-sized lamps and modules

Goniophotometer system AMS 200 (rack version).

Key features at a glance

- CIE Type A goniometer for small to medium-sized lamps and modules
- High-precision photometric measurement compliant with DIN 5032-7 and EN 13032-1
- Compact solution for limited laboratory space
- Data export in IES, KRS, CSV formats
- Conformity with GTB and SAE J1330 photometry precision requirements for type testing of vehicle lamps

01 \\ Compact measurement solution at an attractive price

AMS 200 (desk top version).

The AMS 200 of the Optronik line is a Type A goniophotometer conforming to CIE 121-1996 and IES LM-75-01. It is suitable for measuring the photometric and colorimetric data of small to medium-sized lamps and modules with directed radiation distribution, e.g. signal lamps, vehicle, bicycle and motorcycle headlamps or headlamp modules and reflectors of all kinds.

Thanks to its compact dimensions, the AMS 200 goniophotometer is ideal for light laboratories with limited installation space. It also offers an attractive price-performance ratio.

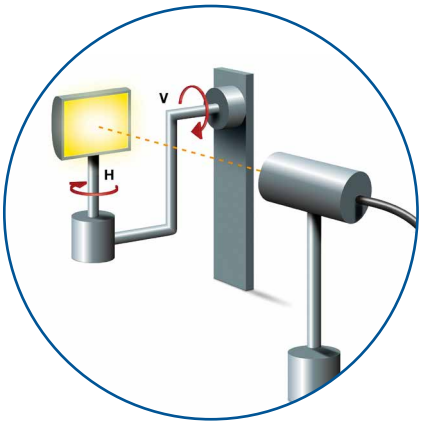
The system fulfills all requirements of EN, DIN, CIE, SAE, UN-ECE and other standards committees for all type tests of vehicle headlamps.

02 \\ Equipment and function

The AMS 200 goniophotometer consists of a goniometer mechanism with a 200 mm x 200 mm sample stage and the AMS controller, the central control system. In combination with the fast DSP 200 photometer the light distribution can be scanned “on-the-fly” at a high angle resolution and speed. Compared to conventional goniophotometer systems, a far higher number of tests is possible within the working day.

High reproducibility and absolute accuracy

The test sample is moved in a horizontal and vertical direction relative to the fixed detector. Both axes can be operated simultaneously and positioned vibration-free, even when samples with the permissible maximum weight are quickly rotated. The extremely torsion-resistant frame and high-precision transmission bearings guarantee a high degree of reproducibility and an absolute positioning accuracy better than 0.05°. This applies to all samples with a maximum weight of 8 kg.



Direction of rotation of a Type A goniometer.

03 \\ Components and connections of the sample stages

The sample stage for clamping test samples has 3 x 3 grooves of size 6. Four 8 mm fitting bushes enable reproducible fastening of the sample holder.

The AMS 200 is designed for the measurement of samples in the low voltage range up to 50 V. Two socket pairs for power supply and sensor lines lead directly to the sample stage. The test sample can be connected with short cables; voltage and power measurement and their stabilization are virtually direct on the sample. During operation, the electric supply lines move synchronously with the sample. The power supply and collection of electric data are via SNT 10 power supplies. A pulse width modulator can optionally be used for LED lamps.

Sample stage with electrical connections.

04 \\ Sample positioning

An adjustment laser at the center of rotation of the V-axis facilitates alignment of the sample.

The test object is secured in a suitable holder on the sample stage so that its reference point lies at the intersection of the horizontal and vertical axis. An optional RecoCAN remote control can be used for manual quick positioning of the drives and fine adjustment in 0.01° increments.

The traversing range of the H-axis is ± 160°, the traversing range of the V-axis ± 130°.
For aligning the sample, the angle positions can also be entered manually on the numerical keypad. Positions frequently needed in set-up operation, such as ± 90° and 0° horizontal, can thus be moved to directly.

RecoCAN remote control – Enables rapid movement as well as fine adjustment with 0.01° accuracy.

Optional 19'' switch cabinet with space for further source meters and measuring instruments.

05 \\ Carrying out the measurement

The AMS controller is the central control unit of the goniophotometer and has diverse functions:

- Display of angle positions of the goniometer
- Manual input of an angle position via the keypad
- Display of the photometric readings of the connected DSP 200 photometer
- Switching between different measurement distances
- Switching between units of measure (lx; cd; cd/m²)

Safety edges ensure the required safety when operating the system. If they come into contact with an obstruction during the measurement procedure, the drives will be shut down.

Depending on the available space, the AMS controller can be integrated into a base unit (AMS 200-110) or separate 19” rack (AMS 200-100). The latter also has three additional slot spaces. Optionally, a large 19” cabinet with a height of 170 cm can be supplied for accommodating further power supplies or measuring instruments.

AMS controller display showing angle position and active measuring channel with unit.

AMS 200-110: integrated rack version.

06 \\ The goniophotometer as the core piece of the light laboratory

The AMS 200 goniophotometer can be combined with different devices, and is thus able to cover all required measurement tasks in the light laboratory. The accessory range of the Optronik product line is ideally matched to the requirements of the automotive industry in the light channel and it fulfills all the pertinent standards.

Classical configuration with the DSP 200 photometer

Normally, the AMS 200 is operated in combination with the fast DSP 200 photometer of the Optronik line, which is particularly suitable for scanning “on-the-fly” measurements at various distances. Like other detectors, depending on the measurement task, it can be configured for various distances outside the photometric limiting distance. A stray light tube protects the detector from any unwanted stray light that might cause false results.

DSP 200 photometers use very fast silicon photodiodes with a broad measuring range. With a V(λ) filter these are precisely adjusted to the spectral luminous efficiency of the human eye. This allows measurement of all traditional light sources such as halogen, incandescent and discharge lamps. Thanks to adaptive filtering and digital signal processing of the DSP 200 photometer pulse-width modulated LED light sources with PWM frequencies of 80 Hz to 10 kHz can also be measured.

DSP 200 with photometer head.

Stand for stray light tube, detector and DSP 200.

Integrated power supply with sensor lines

To meet the high-precision requirements of the automotive and similar industries, a DC power supply integrated in the system via CAN bus was developed. Two SNT 10 power supply units can be connected. The sample is connected to the sample stage, electrical operating data is collected and the test sample stabilized. This ensures that precisely the electric current and voltage programmed by the user is applied.

Photometric limiting distance

According to the definition, the light intensity distribution in the far field must be measured at a distance at which the test sample can be seen as a point light source. The distance of the detector from the test sample from which this criterion is fulfilled is called the photometric limiting distance. It depends on the size of the light source to be measured and the light-sensitive surface of the detector, as well as the required measurement deviation.

The minimum distance to be observed between test sample and detector is often stated as being a multiple of the maximum expansion of the sample and varies depending on the normative rule applied. As a rule of thumb, it is ten times the greatest expansion of the illuminated surface of the sample. For very directional sources such as vehicle headlights, a significantly greater distance should be selected. The distances we recommend are consistent with standard practice in the relevant laboratories that carry out product approval tests.

Recommended measurement distances for automotive and similar applications:

- Signal lamps: ≥ 3 m
- Gradient measurement low beam: 10 m
- Main headlamps: 25 m
- Retroreflection (SAE): 30.48 m (100 ft)
- Retroreflection (ECE): 10 m or 30.48 m
- Retroreflection (ISO 20471 and road construction): 15 m
- Measurements of the color space of the cut-off line: 10 m or 25 m
- Measurement of the light color of signal lamps: ≥ 3 m

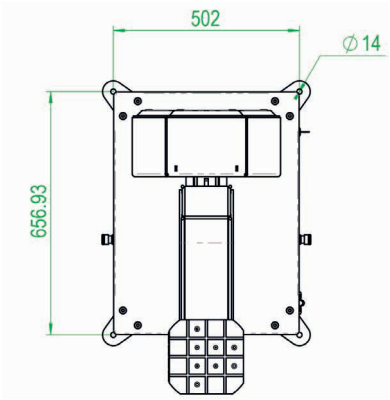
07 \\ Service and after-sales support

The Instrument Systems customer service supports customers in all phases of laboratory planning and implementation. Our extensive service portfolio features the following services:

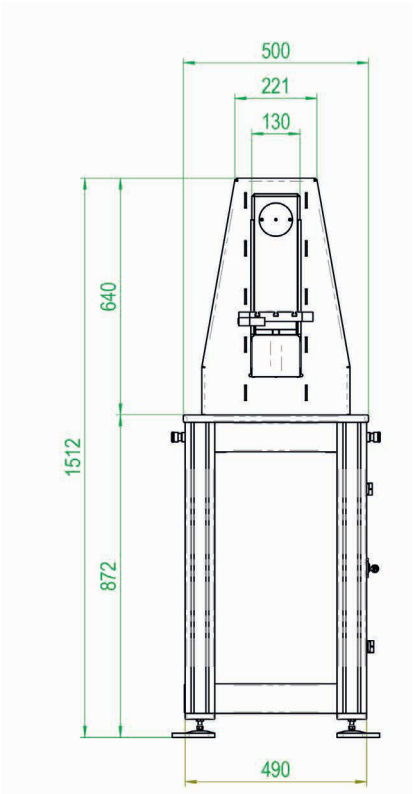
- Support in the preparation of construction plans for a light laboratory
- Installation services on site
- User training sessions, optionally in partnership with accredited certification labs
- Re-calibrations in our own calibration laboratory or at the installation site
- Conformity tests
- Repair and hardware upgrades as well as software updates with standard support
- Maintenance contracts

Example of a light channel.

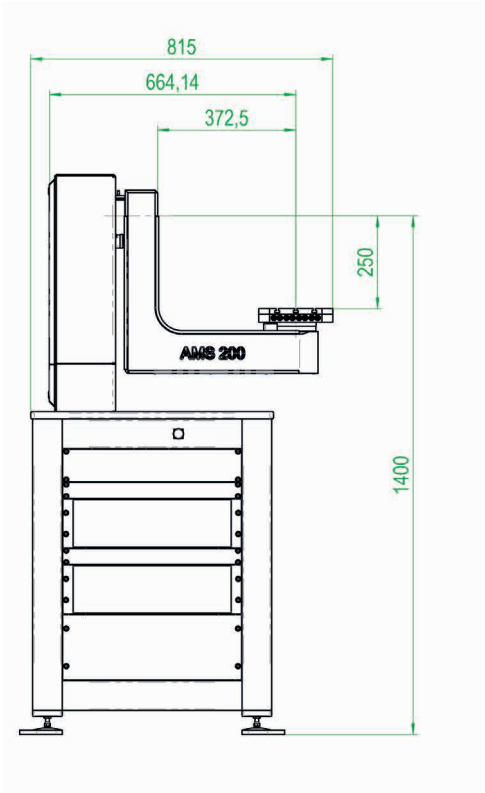
08 \\ AMS 200 Goniophotometer – Dimensions of the rack version



Dimensions of AMS 200-110 – top view.

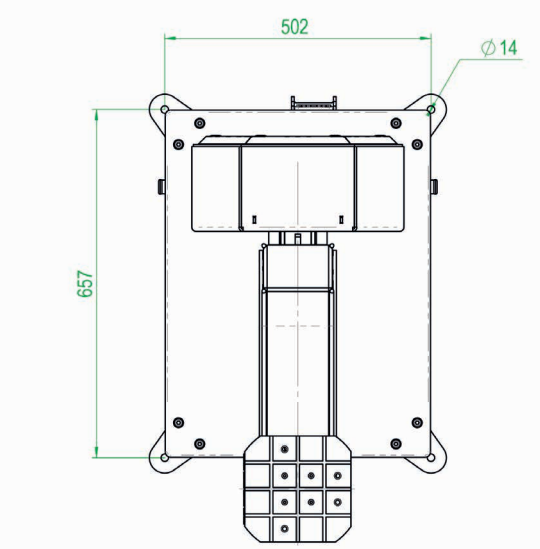


Dimensions of AMS 200-110 – front view.

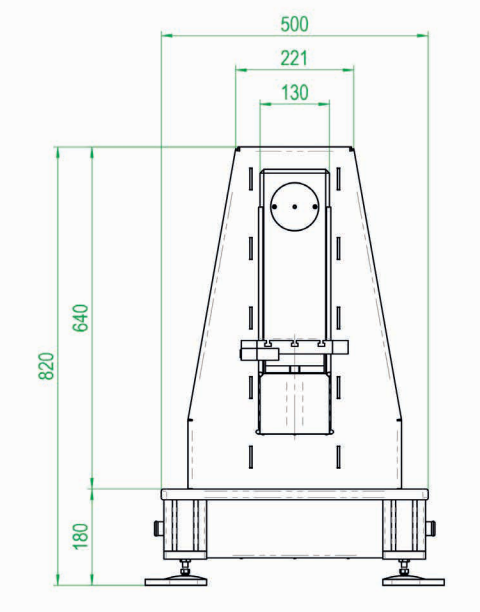


Dimensions of AMS 200-110 – side view.

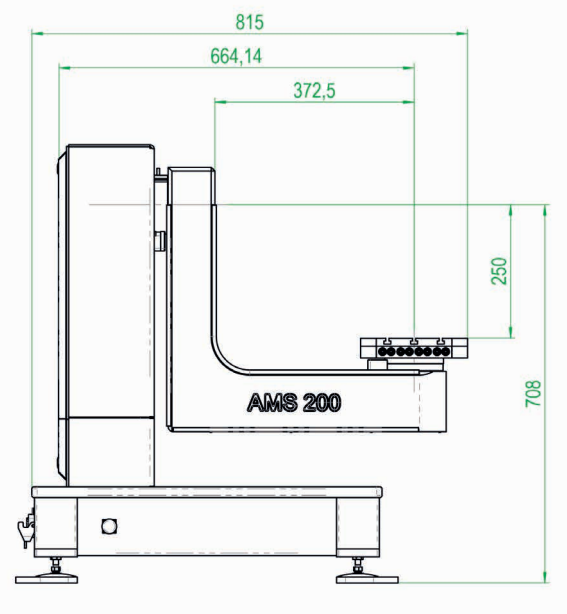
09 \\ AMS 200 Goniophotometer – Dimensions of the desk top version



Dimensions of AMS 200-100 – top view.



Dimensions of AMS 200-100 – front view.



Dimensions of AMS 200-100 – side view.

10 \\ Technical specifications

Model	AMS200-110 / AMS200-130	AMS200-100
Device configuration	Rack version with integral AMS controller	Desk top version with AMS controller in separate control cabinet
Height	1512 mm	820 mm
Width	657 mm	657 mm
Depth	500 mm	500 mm
Weight	approx. 95 kg	approx. 69 kg
Height of optical axis	1400 mm ± 5 mm	708 mm ± 5 mm (above installation surface)
Height of sample stage	1150 mm	458 mm (above installation surface)
Goniometer		
CIE goniometer type	Type A in H-/V- coordinate system according to IES LM-75-01	
Drive	stepper motors	
Travel range of H-axis	± 160° with end switches	
Travel range V-axis	± 130° with end switches	
Resolution of angle display	0.01°	
Reproducibility H-axis	≤ 0.05° (under max. sample weight)	
Reproducibility V-axis	≤ 0.05° (under max. sample weight)	
Traversing speed of H-axis	16 speeds of 2.5°/s to 46°/s	
Traversing speed of V-axis	16 speeds of 1.0°/s to 14°/s	
Clear width	370 mm (distance from center of rotation H-axis to swivel arm V-axis)	
Adjustment laser	Integrated in V-axis for alignment of sample	
Machine safety	Emergency stop button on goniometer and AMS controller, safety sensor edges on goniometer arm	
Sample stage		
Mounting plate	200 mm x 200 mm with 3 x 3 size 6 mounting grooves for slot nuts and 4 x 8 mm fitting bushes for locating pins	
Maximum sample size (HxWxD)	approx. 600 mm x 600 mm x 200 mm with central mounting	
Maximum sample weight	8 kg	
Electrical connection	Configured for low voltages with 2 channels and 2 sensor lines for 50 V, 20 A	
AMS controller		
Functions	Control of goniometer drives, display of angle positions, display of photometric measured value in lx, cd, cd/m² for use of a DSP 200 photometer	
Interfaces	RS232-C for connecting a PC, CAN bus for DSP 200 photometer, SNT 10 power supply and RecoCAN remote control	
Power supply	230 V, 50 Hz (optional 115 VAC)	
Power consumption	120 W	
Dimensions (HxWxD); weight	133 mm x 482 mm x 370 mm plus 130 mm for rear connectors; approx. 7 kg	

Model	AMS200-110 / AMS200-130	AMS200-100
AMS motion driver		
Functions	Power electronics for goniometer, main switch for goniometer power supply, start button for unlocking drives, emergency stop switch, laser on/off switch, connector for RecoCAN remote control	
Connections	Round plug for stepper motors, CAN bus for AMS controller, Sub-D connection for goniometer control signal. Connection for AMS controller power supply	
Power supply	230 V, 50 Hz (optional 115 VAC)	
Power consumption	720 W	
Dimensions (HxWxD); weight	133 mm x 482 mm x 370 mm plus 130 mm for rear connections; approx. 7 kg	
Applicable standards	EN 61326-1, EN 61000-3-2, EN 61000-3-3, EN 60204-1, EN 61010-1, EN 13032-1, DIN 5032-7	
Conformity	CE 3874 (2005) GTB Photometry Accuracy Guidelines, SAE J1330	

Instrument Systems is constantly striving to develop and improve its products. Technical changes, errors or printing mistakes do not justify claims for damages. In all other cases, our terms and conditions shall apply.

11 \\ Ordering information

Order number	Description
AMS200-100	Two-axis goniometer, Type A with angle measurement system and separate stage switch panel
AMS200-110	Two-axis goniometer, Type A with angle measurement system with integral rack for 19” slots
AMS200-130	Two-axes goniometer, with angular measurement system, integrated rack and separate control rack 33 height units for 19” slide in units.
AMS200-300	Optional 115 VAC power supply
AMS200-320	Remote control for AMS 200
AMS-210	Relay option, two independently controlled switch contacts for controlling lab lighting and warning lamps, etc., switching capacity 230 VAC / 6 A each
AMS-220	Acoustic warning signal in the event of movement of the goniometer
AMS-480	PWM generator
SW-610	LightCon Software AMS 200 for Windows

An extensive additional accessory range is available for the AMS goniophotometer.

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Instrument Systems

KONICA MINOLTA Group

Instrument Systems GmbH
Optronik Line
Kaiserin-Augusta-Allee 16-24
D-10553 Berlin, Germany
ph: +49 (0)30 34 99 41-0
fax: +49 (0)30 34 55 504
info_berlin@instrumentsystems.com
www.instrumentsystems.com/optronik

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