

ISM-50-R-V01 measurement device for light reflection as per DIN-5036 T3

Light reflectance measurement in 8/d geometry

The ISM-50-R-V01 integrating sphere light meter is used for measurement of light reflectance, the degree of the scattered reflectance and calculation of the regular reflectance proportion. Sample illumination is done from an 8° angle. The regular or scattered reflected light from the sample is captured by the integrated sphere. This 8/d geometry corresponds to the specifications in DIN 5036 section 3. The light source is set to a 2856 K color temperature (standard illuminant type A). The high-quality silicon photodiode of the photometric detector is carefully matched onto the $V(\lambda)$ responsivity function through a multi-layer spectral correction filter.

Integrating sphere with a 50cm diameter

Integrating spheres with a large diameter such as the ISM-50-R offer a wide detection angle for scattered reflected light. The measurement ports are additionally designed with knife-edges. The sphere is coated with Gigahertz-Optik's self-manufactured diffusely reflective coating made of barium sulfate. The multi-layered coating ensures magnificent levels of diffuse reflection over the entire usable spectral range.

Correction of self-absorption effects by the samples

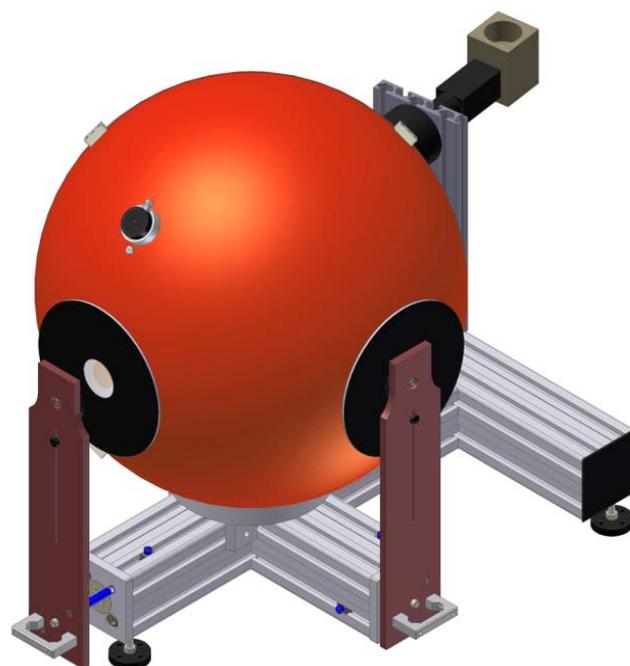
The integrating sphere has two measurement ports onto which samples and reflection standards can be interchangeably placed. Self-absorption effects by the samples and calibration standards can thereby be compensated. The sample holders are attached onto the socket in the sphere and enable measurement of extensive samples.

ED-ISM-100-VL control electronics

The light source is operated with constant current through a 16-bit DA-converter and hence ensures light stability. The ramp function of the power adapter minimizes stress on the lamps while switching on/off. The photometric detector light meter of the integrating sphere allows for measurement routines for the calibration, substitution correction, measurement of both the entire and regular reflectance as well as calculation of the scattered reflectance proportion.

Diffuse reflection standards

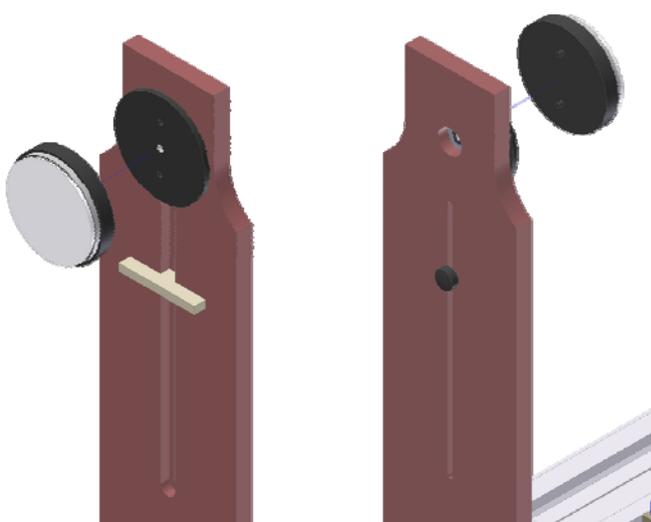
Gigahertz-Optik offers its self-manufactured diffuse reflection standards with traceable calibrations.



ISM-50-R-V01 light meter for light transmission factor and corresponding directed and scattered proportions



The quick-change holder on the 8° port enables fast exchange of plugs and light traps



Sample holder with height-adjustable sample support for attachment of calibration standards

Specifications: ISM-50-R-V01 measurement device

Measurement range	0.5% to 100% with 0.01% measurement value resolution
Dynamic range	200 (dark signal measurement 0.5% with -8° and a very low scattering mirror at the measurement port)
Measurement uncertainty	± 0.5% incl. the uncertainty of the calibration standards
Reproducibility/repeatability	± 0.1*[1-log ₁₀ ρ _g]; ρ _g = regular/hemispherical
CE conformity	The device conforms with the requirements of the member states specified in the council directive for harmonization of the laws relating to electromagnetic compatibility (89/336/EEC). For assessment of the electromagnetic compatibility, the following standards were applied: EN 61326-1 - Class B
Rohs	Compatible
Guarantee	12 months
Manual	English

Accessories - calibration standards

BN-R98-D2C-PP	± 0.6% (k=2), diffuse reflection (ODM98)
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Specifications : integrating sphere device

Integrating sphere	500mm diameter with barium sulfate coating (ODP97)
Measurement ports	50mm diameter with knife-edge
Substitution port	50mm diameter with knife-edge. 90° position for the measurement port
Sample holder	With pull springs. Shadowing of the measurement port from ambient light. Attachment of the calibration standard
-8° port	25mm diameter. 8° alignment to the measurement port. Slide&Fix holder for fast exchange of port plugs (reflectance measurement) and light traps with 10mm aperture (scattered transmission measurement)
+8° port	50mm diameter. 8° alignment to the measurement port
Detector	Photometric detector head with 1cm ² light-sensitive surface
Photometric matching	f ₁ ' uncertainty <6% (DIN 5052 T7 class B)
Measurement signal	approx. 20.3nA with BN-R98-D2 reflection standard. 8° port with port plug
Light source	Radiation bundle with -8° direct alignment to the center of the measurement port and alignment of the reflection rays -8° port
Color temperature	2856K +/-20K (Standard illuminant A)
Lamp	LH-100-UV, 100W/12V quartz halogen lamp
Cooling	Cooling of the lamp holder through active air circulation using a fan
Connection	Laboratory cables with banana plugs
Light bundle	Approximate 18mm diameter on the sample and approx. 9mm on the -8° port
Stabilization time	Approximate 10min

Specifications: ED-ISM-50-R-V01 electronic device

Optometer	Similar to the X1-RM optometer. ISM-50-R-V01 Firmware.
Functions	Calibration, substitution correction, measurement of the transmission degree, measurement of the scattered light proportion, calculation of the directed light proportion, display in % Remote control of the lamp power supply unit
Display	LCD graphic display 97x32 pixel Active size 14.3mm x 35.8mm LED backlight can be switched on/off Text display 4 rows, 14 characters per row
Operation buttons on the front control panel	Three
Temperature	Operation: 5 to 40°C Storage: -10 to 50° C
Lamp power supply unit	Similar design to the LPS-100-RM.
Output power	100W / 0 - 10A / max. 13.5V
Current resolution	0.2mA
Temperature coefficient	+0.3mA/°K
Long-term stability	+1mA over 8 hours, 60 min after switch on in a constant environment
Interface	RS232 / RS485: 19200 Bd, 8D, 1S, N
Temperature range	Operation: 10 - 30°C (with free air circulation) Storage: 5 - 50°C
Housing	
Power supply	120 to 230 VAC, 50 to 60Hz
Dimensions	3/4 19" broad bench-top housing similar to the BTH-19-3-4

Purchasing information

Model	Item number	Description
ISMP-50-R-V01	102731	Light meter with integrating sphere measurement device and control electronics. Handbook.
BN-R98-D2C-PP	102697-1	Diffuse reflection standard with calibration certificate