

## INSTRUCTION MANUAL **HORIBA** HANDY GLOSS CHECKER IG-331



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#### ● PREFACE

The handy gloss checker, IG-331, quantifies gloss levels, which were measured by visual check.  
Before using the Gloss Checker, thoroughly read this manual for the proper usage. The instruction manual should be carefully stored.

#### ● PRECAUTIONS

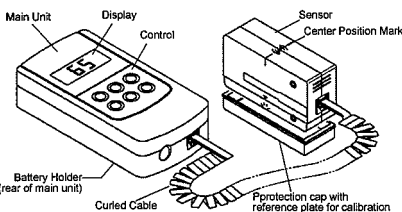
- The sensor is not scratch resistant.
- Take care not to scratch or scrub the sensor.
- The protection cap contains a reference plate for calibration. Never touch this plate and the lens with bare hands or any dirty item.
- Dirtiness on the reference plate for calibration or lens may cause inaccurate measurement. Clean these parts by wiping them with a clean dry soft cloth.
- Do not handle the main unit and the protection cap roughly.
- Never leave the Gloss Checker under direct sunlight for long hours.
- Do not store the Gloss Checker in areas with high humidity or excessive dust.
- After using the Gloss Checker, be sure to turn it off. If the Gloss Checker will not be used for a long time, remove the batteries.

#### ● CHECKING THE CONTENTS

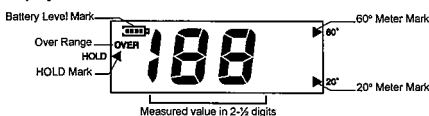
- Check that all of the items listed below are included in the carton:
- Main unit with battery holder lid ..... 1 pc.
  - Sensor ..... 1 pc.
  - protection cap with reference plate for calibration ..... 1 pc.
  - Curled cable ..... 1 pc.
  - #AA battery (1 pack) ..... 4 pcs.
  - Instruction Manual ..... 1 copy

**Note**  
The batteries included in the carton may have a shorter life.

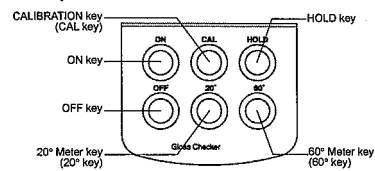
#### ■ NAMES OF VARIOUS PARTS



#### ● Display



#### ● Control pad

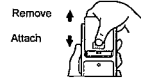


#### ■ PREPARATIONS

##### ● Loading the batteries

Load the batteries with the following procedure.  
The Gloss Checker uses four #AA batteries.

1. Remove the battery lid.
2. Load new batteries. Check polarities.



##### 3. Attach the battery lid.

Make sure to fit the lid securely.

##### ● Caution on batteries

- Use #AA manganese or alkaline batteries. Rechargeable batteries such as NiH<sub>2</sub> batteries can not be used.
- Remove the batteries if the Gloss Checker will not be used a long period.
- If Battery Level Mark ( ) blinks, replace with new batteries.

#### ■ MEASUREMENTS

Be sure to perform calibration before starting measurement.

##### ● Power ON

1. Press the ON key.  
The power turns on and enters measurement mode.

##### ● Power OFF

1. Press the OFF key.  
The power turns off.

##### ● Calibration

- Both 20° and 60° meters can be calibrated at the same time.
1. Properly set the protection cap to the sensor part.
2. Place the sensor on a flat surface and lightly press the center position mark on the sensor with a finger during calibration.
3. Press the CAL key for more than 2 seconds.  
CAL display appears and automatic calibration starts.
4. After calibration is finished, measurement mode starts.
4. Check if the reading meets the specified calibration value (±1%).  
The specified calibration value is indicated on the reference plate for calibration.

If calibration error occurs ("Err" shows on the display):  
Calibration data will not be renewed.

Go through the calibration steps carefully again.

##### ● Note

- Be sure to perform calibration:
- when working temperature excessively changes.
  - after replacement of batteries.

##### ● Measurement

1. Remove the protection cap.
2. Place the sensor as close to the measuring object and lightly press the center position mark with a finger.  
The displayed value shows the gloss level.

#### ■ CHECKS AND STORAGE AFTER USE

After the measurement, store the Gloss Checker according to the instructions below.

- Attach the protection cap to the sensor.
- If the Gloss Checker is not going to be used for a long period, remove the batteries.

##### ● Note

- Make sure not to use any organic solvents such as thinner.
- The Gloss Checker is not water-proof. Never wash the unit with water.

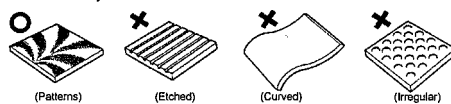
#### ■ USEFUL INFORMATION

##### ● How should the 60° and 20° meters be used?

The Gloss Checker uses two optical systems for different measurement angles of 60° and 20°. This allows for efficient measurements of gloss levels over a wide range. The 60° meter covers a wide range from low to high gloss levels. The 20° meter should be used to measure high gloss levels which are more than 70 on the 60° meter.  
(The 20° meter is more sensible to surface conditions and the tilt of the sensor.)

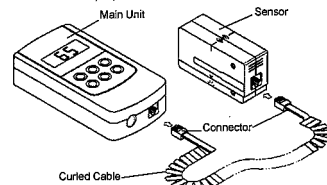
##### ● What materials can be measured?

Since the Gloss Checker uses two optical systems for measurement angles of 60° and 20°, it is suitable for quality control use of various materials such as coatings on painted plates, plastics, stones, tiles, and enamel. However, some materials, such as ground metallic surfaces, cannot be measured because their gloss levels are too high. Besides, the surface to be measured must be flat. Therefore, those objects which have a rough or curved surface may not be measured properly. Measured values for transparent objects are also affected by reflections from the bottom surface.



#### ● CONNECTING THE CABLES

1. Insert the connectors on the Curled Cable to the connector ports of the Main unit and Sensor.  
A click sound assures proper connection.



**Note**  
Use only the Curled Cable included. Do not use a normal telephone curled cable as proper readings cannot be taken.

#### ● Function and display during measurement

##### Select 20° meter/60° meter

Press the 20° key and enter the 20° measurement mode. The 20° meter mark lights on the display.  
Press the 60° key and enter the 60° measurement mode. The 60° meter mark lights on the display.

##### Data Hold

When you wish to hold a reading on the display, press the HOLD key. The reading will freeze and HOLD mark blinks.  
Press the HOLD key again to release the reading and return to normal operation.

##### Auto-Power OFF

If no key is pressed for approximately 5 minutes, the power will automatically turn OFF.  
To restart measurement, press the ON key and enter the measurement mode. Make sure to calibrate before measuring.

##### OVER range display

If measurement value amounts over 199, OVER appears on the display and value of 199 blinks.

##### Measurement of high-gloss objects

If high-gloss objects are measured with the 60° meter, the gloss level difference may be difficult to detect compared to human eyes. In this case, the measurement should be made with the 20° meter for more precise readings. (Switch the mode if the gloss level is greater than 70 when measured with the 60° meter.)

##### ● Note

The Gloss Checker, a practical tool for quality control is suitable for measuring the difference between objects with similar surface materials. However, it may show different results from existing gloss checkers for the same materials, especially those which have complex surface textures, such as paint and ink.

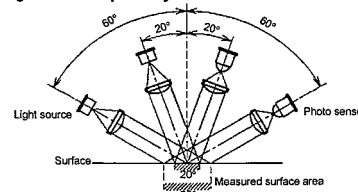
#### ● Wipe with a dry soft cloth in the following situations:

- For heavy contamination, use a mild detergent such as liquid cleaners available in markets. Take a little drop of mild detergent on the cloth and lightly wipe the contaminated part.
- The main unit is wet.
- The sensor tip is dirty.
- The lens part is dusty.
- The reference plate for calibration which is placed on the protection cap is dirty.

#### ● What is the reference of gloss levels?

The gloss level measures the reflection when a beam of light is shined on a surface. It is determined by the ratio of the intensity of the light reflected of the measured spot to that from the reference plate. JIS 28741 specifies that the gloss level on the surface of glass with a refractive index of 1.567 should have a reference level of 100. However, since this glass is chemically unstable, the Gloss Checker uses a black glass plate with a gloss level of 90 on the 60° meter and 84 on the 20° meter, as the reference plate for calibration. (JIS : Japanese Industrial Standard)

#### ● Configuration of Optical Systems



#### ■ TROUBLESHOOTING

After checking the contents below and still the problem exists, contact the Service Department or the dealer where you purchased the Gloss Checker.

##### ● The readout displays nothing

The power is off	⇒ Press the ON key.
The batteries are not installed	⇒ Install the batteries.
The batteries have run out	⇒ Replace the batteries.
The batteries is set with the polarities reverse	⇒ Reinstall the batteries in the correct position.

##### ● The reading is abnormal / The reading does not change

The measured surface is rough	⇒ Measure a flat surface.
The sensor part is floating	⇒ Ensure the sensor makes a tight fit with the spot to be measured.
The lens is dirty	⇒ Wipe the lens with dry soft cloth or the like.
The reference plate for calibration is dirty	⇒ Clean the reference plate for calibration with dry soft cloth or the like.
The batteries have run out	⇒ Check the Battery Level Mark which shows the batteries have run out. If Battery Level Mark ( ) blinks, replace with new batteries.
The protection cap is on	⇒ Take off the protection cap.
In the State of HOLD condition	⇒ Press the HOLD key.
Shows abnormal figure or "Err" shows on the display	⇒ Take out the batteries, wait for about 10 seconds and then reload the batteries and perform the calibration.

##### ● "199" blinks on the display

The gloss level is too high	⇒ Can not measure because of too high-gloss level.
Bad calibration	⇒ Carefully perform the proper calibration.

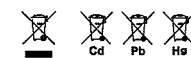
#### ■ SPECIFICATIONS

Measurable range	0 to 100
Optical systems	60°: 60° Optical Range 20°: 20° Optical Range
Measurable spot	60°: Oval Size of 6 mm x3 mm 20°: Oval Size of 4 mm x3 mm
Light source	LED (wavelength 890 nm)
Display	LCD for digital display in 2-1/2 digits in the range of 0 to 199.
Sensor	Silicon Photo Diode
Accuracy	±5% of full scale ±1 digit (60° meter) ±20% of full scale ±1 digit (20° meter)
Repeatability	±5% of full scale ±1 digit (On black reference plate for calibration)
Power source	9 V DC (Four #AA batteries)
Battery life	Continuous Operation: 50 hours (R6P battery type at 25°C ambient temp.)
Ambient temperature range	10°C to 40°C without condensation
Features	• HOLD key can retain the measurement value • Measurement mode selection between 60°/20° meter • Battery level warning • Auto calibration • Automatic power-off mechanism after about 5 minutes
Mass	Approx. 350 g (including battery)

• This equipment conforms to the following directive(s) and standard(s);

- CE**
- Directive(s): The EMC Directive 2004/108/EC in accordance with the Article 10(1) of the Directive
- Standard(s): EN61326-1:2006 Emission: Class B, Immunity: Portable test and measurement equipment
- Information on Disposal of Electrical and Electronic Equipment and Disposal of Batteries and Accumulators

The crossed out wheeled bin symbol with underbar shown on the product or accompanying documents indicates the product requires appropriate treatment, collection and recycle for waste electrical and electronic equipment (WEEE) under the Directive 2002/96/EC, and/or waste batteries and accumulators under the Directive 2006/66/EC in the European Union. The symbol might be put with one of the chemical symbols below. In this case, it satisfies the requirements of the Directive 2006/66/EC for the object chemical. This product should not be disposed of as unsorted household waste. Your correct disposal of WEEE, waste batteries and accumulators will contribute to reducing wasteful consumption of natural resources, and protecting human health and the environment from potential negative effects caused by hazardous substance in products. Contact your supplier for information on applicable disposal methods.



• Note:  
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:  
• Reorient or relocate the receiving antenna.  
• Increase the separation between the equipment and receiver.  
• Consult the dealer or an experienced radio/TV technician for help.