



Handheld Code Reader

HR-100B HR-101B Series

Instruction Manual

Communication Unit

HR-UC1

Desktop holder

HR-PU1

Introduction

Read this instruction manual before using the product in order to achieve maximum performance. Keep this instruction manual in a safe place after reading it so that it can be used at any time.

Symbols

The following symbols alert you to important messages. Be sure to read these messages carefully.

	It indicates a hazardous situation which, if not avoided, will result in death or serious injury.
	It indicates a hazardous situation which, if not avoided, could result in death or serious injury.
	It indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
	It indicates a situation which, if not avoided, could result in product damage as well as property damage.

It indicates cautions and limitations that must be followed during operation.

It indicates additional information on proper operation.

It indicates tips for better understanding or useful information.

indicates the reference pages in this manual or the reference pages in separate manuals.

Trademarks

- Microsoft, Windows, Windows Vista/7/8 and Excel are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

Safety Precautions

General cautions

	- This product is only intended to detect object(s). Do not use this product for the purpose to protect a human body or a part of human body. - This product is not intended for use as an explosion-proof product. Do not use this product in a hazardous location and/or potentially explosive atmosphere.
	- At startup and during operation, be sure to monitor the functions and performance of this product and confirm normal operation. - Take substantial safety measures to avoid any damage in the event that this product malfunctions. - Using this product in applications other than specified in this manual is prohibited. Fire, electric shock or product failure may occur.
	- KEYENCE cannot guarantee the functionality or performance of units that have been modified or used with specifications other than those described in this manual. - When the KEYENCE products are used in combination with other devices, functions and performance may be degraded, depending on the operating conditions and surrounding environment.

Precautions on LED products

	Controls or adjustments other than those specified in this manual may result in a hazardous amount of LED exposure. Make sure to observe the following instructions. Otherwise, injury to the human body (eyes, skin, etc.) may result. - Do not directly stare into the laser beams or specularly reflected light. - This product is not equipped with a mechanism to stop laser emission when disassembled. Never disassemble this product. - Do not directly stare into the laser beams using an optical apparatus. If you observe the laser beams with certain types of optical apparatus (e.g. loupe, magnifying glass, microscope) within the distance of 100 mm, injury to eyes may result.
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Precautions on Proper Use

	When using the HR-UC1/PU1, make sure to use the optional AC adaptor (OP-87530/88046). Using AC adaptors other than these may result in fire, electric shock, or product failures.
	- Do not disassemble or modify the HR-100B Series. Doing so may damage the unit. - The HR-100B Series is a precision instrument. Dropping this product or subjecting it to shock may cause damage. Be careful when carrying or using this unit. - Do not allow water, oil, dust, or other foreign substances to stick to the scanner of the HR-100B Series. This may cause read errors. Use a soft, dry cloth to wipe any substance from the scanner. (Do not use a cloth dipped in alcohol or other cleaning substance.) - Place cables as far away as possible from high-voltage lines and power lines. Otherwise, generated noise may cause product failure or operation errors. - Do not hold the HR-100B Series by its cable. The main unit may strike the wall and may be damaged. Also due to the stress on the cables, the wires may break. - Be sure to periodically clean the power connection part of AC adaptor connected to the OP-87530/88046 as it tends to catch dust. Tracking phenomenon may result in fire. Also, disconnect the AC adaptor from the outlet if not using for a long period of time. - Use AC power cords that fit shapes of plugs used in each country and/ or region. Also, check if such cords comply with the relevant regulations and standards in each country and/ or region.

Precautions on regulations and Standards

CE Marking

Keyence Corporation has confirmed that this product complies with the essential requirements of the applicable EC Directive(s), based on the following specifications. Be sure to consider the following specifications when using this product in the Member States of European Union.

R&TTE Directive



HR-100B, HR-101B and HR-UC1 comply with the requirements of the R&TTE Directive

- Declaration of Conformity for each country in accordance with the R&TTE Directive are listed at the end of this document.

Precautions on Bluetooth

	Remove the main battery of HR-100B Series near locations where using wireless devices is banned at medical institutions or near electric devices for medical purposes. Carry and use the product away from an implanted cardiac pacemaker.
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- Depending on the environment, communication may be impossible. Before starting actual operation, be sure to test the operation.
- If this product is used near devices with the same frequency band, such as a wireless LAN device, microwave oven, heating equipment for industrial use, high-frequency equipment for medical use, etc., radio wave interference may occur and the communication speed will become slow or communication may become impossible.
 - Communication may be impossible at locations near metallic objects, locations surrounded with metallic walls or where there is a lot of metallic powder.
 - Possible communication distance is approx. 10 m of vision, however, even within 10 m, communication may become impossible depending on the environment. Check the communication availability before using.
 - With the frequency band for this unit, premise radio stations (license required), specified low power radio stations (license not required) and amateur radio stations (license required) for identifying mobile objects are operating. Those mobile objects are used for industrial, scientific and medical equipment, and also used for factory production lines.
 - Before using this unit, be sure to check that premise radio stations, specified low power radio stations and amateur radio stations for identifying mobile objects are not operating in the vicinity.
 - If radio wave interference occurs from the this unit against premise radio stations for identifying mobile objects, change the usable frequency immediately or stop the electric wave generation, and then contact the below phone number in regard to taking necessary measures (e.g. setting a partition) to avoid interference.

[Japan]

- Never disassemble or modify this unit as this conduct is prohibited by the Radio Act. This unit is specified radio equipment based on Japan's Radio Act, and has obtained a certification of construction type according to the standard specified by the Radio Act.

[China]

1.

- 使用频率: 2.4 - 2.4835 GHz
- 等效全向辐射功率(EIRP):
天线增益<10dBi时: ≤ 100 mW 或 ≤ 20 dBm
- 最大功率谱密度:
天线增益<10dBi时: ≤ 20 dBm / MHz(EIRP)
- 载频容限: 20 ppm
- 杂散发射(辐射)功率(对应载波 ± 2.5 倍信道带宽以外):
 ≤ -36 dBm / 100 kHz (30 - 1000 MHz)
 ≤ -33 dBm / 100 kHz (2.4 - 2.4835 GHz)
 ≤ -40 dBm / 1 MHz (3.4 - 3.53 GHz)
 ≤ -40 dBm / 1 MHz (5.725 - 5.85 GHz)
 ≤ -30 dBm / 1 MHz (其它1 - 12.75 GHz)

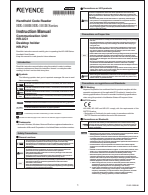
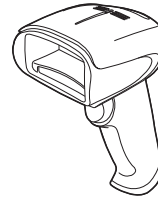
2. 不得擅自更改发射频率、加大发射功率(包括额外加装射频功率放大器), 不得擅自外接天线或改用其它发射天线;
3. 使用时不得对各种合法的无线电通信业务产生有害干扰; 一旦发现有害干扰现象时, 应立即停止使用, 并采取有效措施消除干扰后方可继续使用;
4. 使用微功率无线电设备, 必须忍受各种无线电业务的干扰或工业、科学及医疗应用设备的辐射干扰;
5. 不得在飞机和机场附近使用。

[Thai]

This telecommunication equipment conforms to NTC technical requirement.

Checking the Package

- Main unit (HR-100B or HR-101B) ... 1
- Instruction manual ... 1



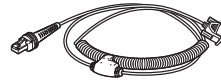
Options

Communication cable

- HR-1C3UN
USB 3 m straight
- HR-1C3UC
USB 3 m curl type
- HR-1C5UC
USB 5 m curl type

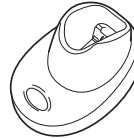


- HR-1C3RB
RS-232C type for HR-UC1



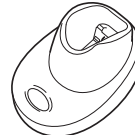
Communication unit

- HR-UC1



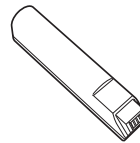
Desktop holder

- HR-PU1



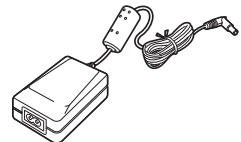
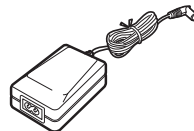
Battery pack

- HR-B1



AC adapter

- OP-87530
- OP-88046



Explanation of symbols

- DC Mark



This symbol indicates a direct current.

- WEEE



This symbol indicates a separate collection for WEEE.

- AC adapter polarity mark



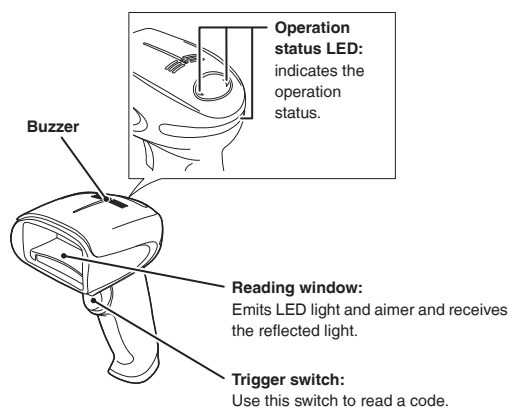
This symbol indicates the polarity of the power plug.

- Mark for opening and closing the lid.



This symbol indicates the rotation direction to open or close the battery lid.

Part Names and Functions



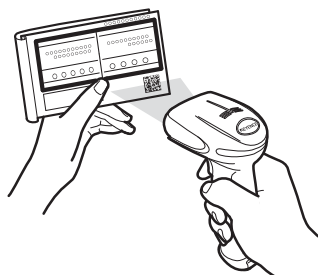
■ Operation status LED

The operation status LED lights up as below according to the operation status.

LED color	LED light-up timing
Green	- When a code is read - When a setting code is read in the setting mode
Red	- When an operation error occurs when an operation is specified - When an invalid setting code is read while reading a setting code

Basic Operations

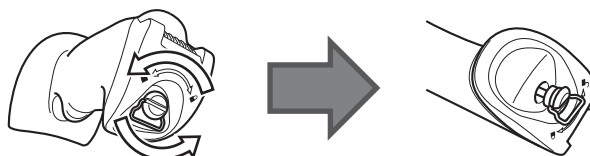
Bring the reading window to the code and press the trigger switch. The LED light and the aimer indicating the reading position are emitted, and the code is read.



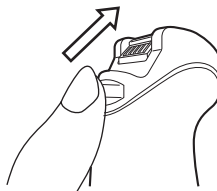
- When the code is read, the operation status LED (green) lights up and the buzzer sounds.
(The operation status LED and the buzzer can be disabled.)
- The read code data is sent to the connected PC or other equipment.

Removing the battery cover

- 1 Rotate the screw counterclockwise to loosen it.

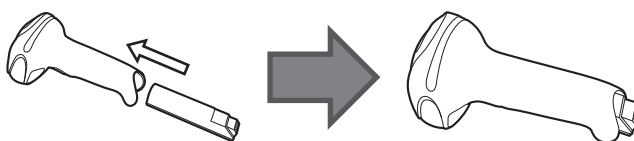


- 2 Push the cover up and at an angle with your thumb to remove it.



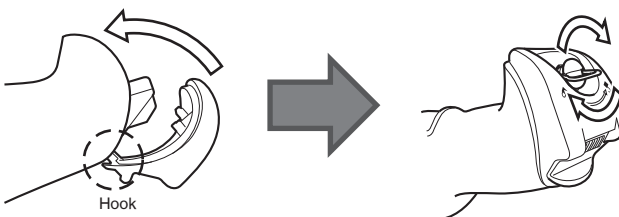
Inserting the battery and securing the cover

- 1 Insert the battery straight in as shown in the figure below.

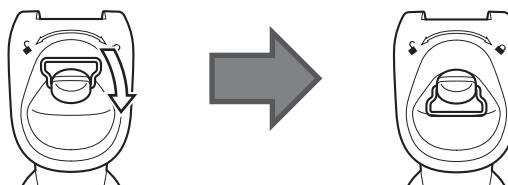


- 2 Attach the cover to the hook and close it.

Rotate the screw clockwise to secure the cover.

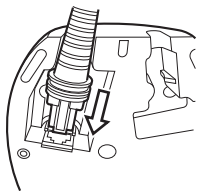


- 3 Return the metal loop used to rotate the screw to the flat position.



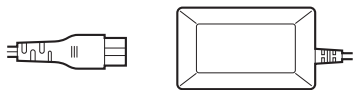
[Communication unit] Connecting the communication cable

- 1 Insert the connector straight in with the tab facing outward.

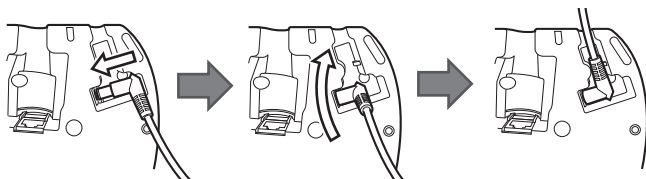


[Communication unit/Desktop holder] Connecting the power cable

- 1 Insert the AC cable into the AC adapter.



- 2 Insert the connector of the AC adapter as shown in the figure below.



Pairing

- 1 Read the barcode on the back of the communication unit.

After a series of short beeps, a tone sounds if pairing is successful.



■ FCC Regulations

HR-100B, HR-101B and HR-UC1 comply with the following regulations specified by the FCC.

- Applicable regulation
 - FCC Part 15 Subpart B ClassB
 - FCC Part 15 Subpart C
- This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

- This equipment complies with FCC radiation exposure limits set forth for an controlled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment has very low levels of RF energy that is deemed to comply without testing of specific absorption rate(SAR).

	• When using the HR-UC1, be sure to attach the ferrite core the nearest position of HR-UC1 to the communication cable and AC adapter. * Please use the following product for the ferrite core. Ferrite core(Manufacturer) : ZCAT3035-1330(TDK) The number of times of the turn : 2 turns • When using the HR-UC1, be sure to provide Class D ground for installation location. • FCC CAUTION Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
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■ IC (Industry Canada) Regulations

The HR-100B, HR-101B and HR-UC1 comply with the following regulations specified by the IC.

- Applicable regulation
 - ICES-003
- This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
- This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment has very low levels of RF energy that are deemed to comply without testing of specific absorption rate (SAR).
- Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement émet une énergie RF très faible qui est considérée comme conforme sans évaluation du débit d'absorption spécifique (DAS).

General specifications

■ Handheld Code Reader

Model			HR-100B		HR-101B	
Type			Standard type		High resolution type	
Light-receiving part	Sensor		CMOS image sensor			
	Number of pixels		838×640 pixels			
Light-emitting part (light and aimer)	Light source		Red LED			
	LED class		Exempt group (IEC62471)			
Reading specifications	Supported symbol	2D Code	QR, MicroQR, DataMatrix (ECC200) PDF417, MicroPDF417, GS1 Composite (CC-A/CC-B/CC-C), MaxiCode, AztecCode			
		Barcode	CODE39, ITF, 2of5 (Industrial 2of5), NW-7 (Codabar), CODE128, GS1-128, GS1 DataBar, CODE93, JAN/EAN/UPC, MSI, Postal, CODE11, 2of5			
	Minimum resolution	2D code	0.169 mm		0.127 mm	
		Barcode	0.127 mm		0.076 mm	
	Reading distance (Typical examples)	2D code	15 mm to 180 mm (Cell size: 0.254 mm)		0 mm to 114 mm (Cell size: 0.254 mm)	
		Barcode	25 mm to 115 mm (Narrow bar width: 0.127 mm)		0 mm to 96 mm (Narrow bar width: 0.127 mm)	
	Focal distance		100 mm		50 mm	
	Field of view in focal distance		106 mm × 80 mm		64 mm × 49 mm	
Wireless	Standard		Bluetooth Ver 2.1			
	Frequency		2.4 GHz bandwidth			
	Broadcast output		Class 2			
	Communication distance		Approx. 10 m with few obstructions			
	Baud rate		Max 1 Mbps			
Environmental resistance	Ambient temperature		0°C to 50°C			
	Ambient storage temperature		-40°C to 70°C			
	Ambient humidity		5 to 95% (No condensation)			
	Storage ambient humidity		5 to 95% (No condensation)			
	Ambient luminance		Sunlight: 10,000 lx, fluorescent lamp: 2,000 lx			
	Drop impact resistance		Concrete 1.8 m, 50 times			
	Operating environment		No dust or corrosive gas present			
	Enclosure rating		IP41			
Battery	Model		HR-B1			
	Continuous usage time (typical value:1scan/s)		14 hours			
	Charging time		Approx. 4.5 hours with AC adapter Approx. 9 hours through USB bus power			
Dimension			161 mm × 86 mm (Head) × 71 mm (Head)			
Weight			Approx. 225 g			

■ Communication unit/Desktop holder

Model			HR-UC1	HR-PU1
Type			Communication unit	Desktop holder
Wireless	Standard		Bluetooth Ver 2.1	_____
	Frequency		2.4 GHz bandwidth	_____
	Broadcast output		Class 2	_____
	Communication distance		Approx. 10 m with few obstructions	_____
	Baud rate		Max 1 Mbps	_____
Communication	USB	Standard	USB Ver 1.1 (USB-HID, USB-COM)	_____
		Supported OS	Windows 8, 7, Vista, XP	_____
	RS-232C	Synchronization method	Asynchronous	_____
		Transmission code	ASCII code	_____
		Baud rate	300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps	_____
		Data length	7/8 bit	_____
		Parity check	None/Odd/Even	_____
		Stop bit length	1/2 bit	_____
Charging time			Approx. 4.5 hours with AC adapter Approx. 9 hours through USB connection (HR-UC1 only)	
Environmental resistance	Ambient temperature (When not charging)		0°C to 50°C	
	Ambient temperature (When charging)		5°C to 40°C	
	Ambient storage temperature		-40°C to 70°C	
	Ambient humidity		5 to 95% (No condensation)	
	Storage ambient humidity		5 to 95% (No condensation)	
	Drop impact resistance		Concrete 1 m, 50 times	
	Operating environment		No dust or corrosive gas present	
	Enclosure rating		IP41	
Rating	Power supply voltage		DC 4.5 V to 5.5 V	
	Current consumption (USB)		500 mA	_____
	Current consumption (AC adapter)		1000 mA	
Dimension			81 mm × 132 mm × 101 mm	
Weight			Approx. 180 g	

■ Battery pack

Model		HR-B1
Type		Lithium ion rechargeable battery
Nominal output voltage		3.75 V
Nominal capacity		2400 mAh
Environmental resistance	Ambient storage temperature	-20°C to 60°C
	Storage ambient humidity	45 to 85% (No condensation)
Dimension		21 mm x 22 mm x 100 mm
Weight		Approx. 65 g

■ Communication cable

Model	HR-1C3UN	HR-1C3UC	HR-1C5UC	HR-1C3RB
Cable type	Straight	Curl		
Cable length	Approx. 3 m		Approx. 5 m	Approx. 3 m
Interface	USB			RS-232C
Connector	USB (A type)			D-sub 9 pin (female)
Weight	Approx. 130 g	Approx. 130 g	Approx. 200 g	Approx. 160 g

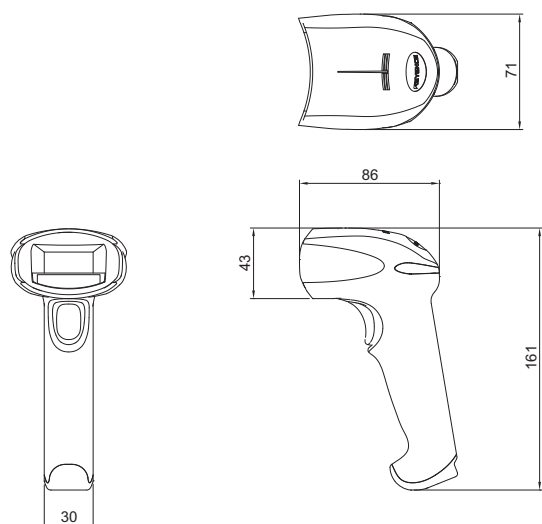
■ AC adapter

Model		OP-87530	OP-88046
Rating	Input	AC100 to 240 V 50/60 Hz 0.27 to 0.17 A	
	Output	DC5 V Max. 2 A	DC5 V Max. 2.5 A
Ambient temperature		0°C to 40°C	
Ambient storage temperature		-20°C to 60°C	-10°C to 70°C
Dimension		72 mm x 47 mm x 27 mm (excluding cables)	81 mm x 50 mm x 31 mm (excluding cables)
Weight		Approx. 140 g	Approx. 175 g

Dimensional Outline Drawings

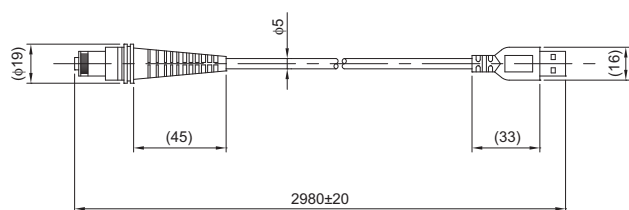
■ HR-100B/101B

(Unit: mm)



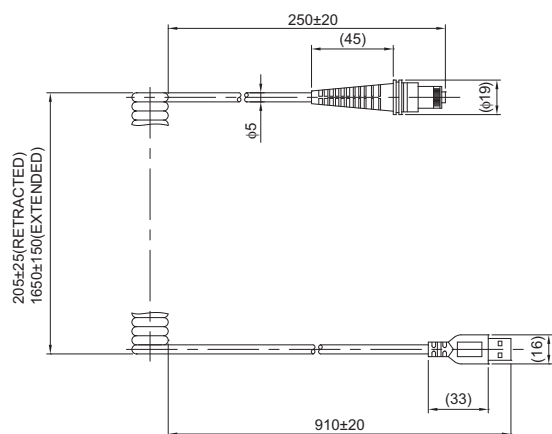
■ HR-1C3UN

(Unit: mm)



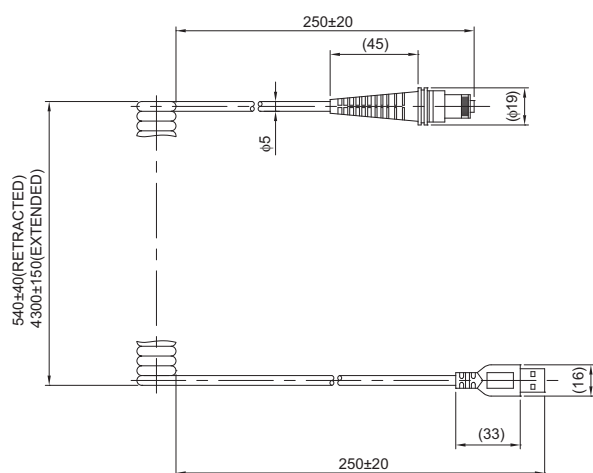
■ HR-1C3UC

(Unit: mm)



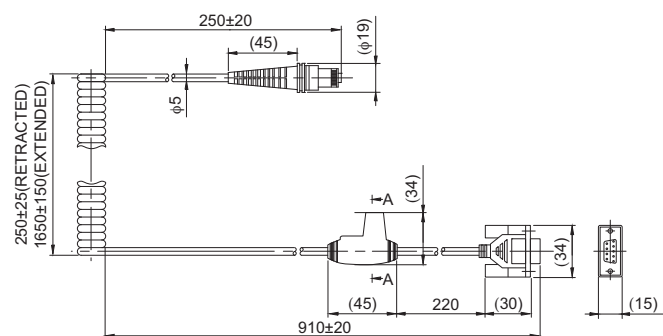
■ HR-1C5UC

(Unit: mm)



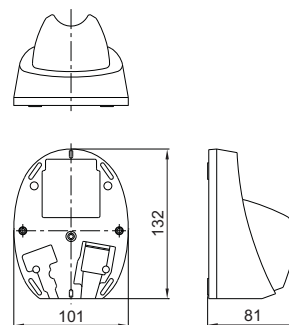
■ HR-1C3RB

(Unit: mm)



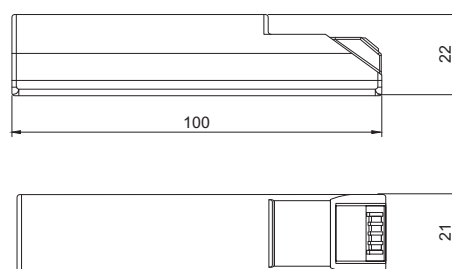
■ HR-UC1/PU1

(Unit: mm)



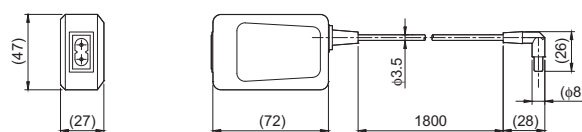
■ HR-B1

(Unit: mm)



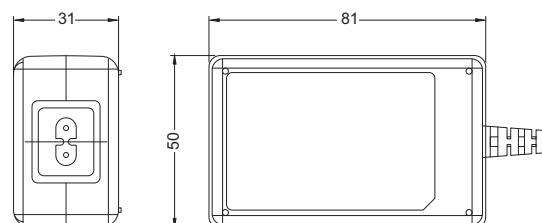
■ OP-87530

(Unit: mm)



■ OP-88046

(Unit: mm)



Declaration of Conformity for Each Country in Accordance with the R&TTE Directive

[cs] Česky [Czech]	KEYENCE CORPORATION tímto prohlašuje, že tento HR-100B/HR-101B/HR-UC1 je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
[da] Dansk [Danish]	Undertegnede KEYENCE CORPORATION erklærer herved, at følgende udstyr HR-100B/HR-101B/HR-UC1 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
[de] Deutsch [German]	Hiermit erkläre KEYENCE CORPORATION, dass sich das Gerät HR-100B/HR-101B/HR-UC1 in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
[et] Eesti [Estonian]	Käesolevaga kinnitab KEYENCE CORPORATION seadme HR-100B/HR-101B/HR-UC1 vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
[en] English	Hereby, KEYENCE CORPORATION, declares that this HR-100B/HR-101B/HR-UC1 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
[es] Español [Spanish]	Por medio de la presente KEYENCE CORPORATION declara que el HR-100B/HR-101B/HR-UC1 cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
[el] Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ KEYENCE CORPORATION ΔΗΛΩΝΕΙ ΟΤΙ ΗΡ-100Β/ΗΡ-101Β/ΗΡ-UC1 ΣΥΜΜΟΡΦΟΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
[fr] Français [French]	Par la présente KEYENCE CORPORATION déclare que l'appareil HR-100B/HR-101B/HR-UC1 est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
[it] Italiano [Italian]	Con la presente KEYENCE CORPORATION dichiara che questo HR-100B/HR-101B/HR-UC1 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
[lv] Latviski [Latvian]	Ar šo KEYENCE CORPORATION deklarē, ka HR-100B/HR-101B/HR-UC1 atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
[lt] Lietuvių [Lithuanian]	Šiuo KEYENCE CORPORATION deklaruoją, kad šis HR-100B/HR-101B/HR-UC1 atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
[nl] Nederlands [Dutch]	Hierbij verklaart KEYENCE CORPORATION dat het toestel HR-100B/HR-101B/HR-UC1 in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
[mt] Malti [Maltese]	Hawn hekk, KEYENCE CORPORATION, jiddikjara li dan HR-100B/HR-101B/HR-UC1 jikkonforma mal-htigijiet essenzzjali u ma provwedimenti oħrajn relevanti li hemm fid-Direttiva 1999/5/EC.
[hu] Magyar [Hungarian]	Alulírott, KEYENCE CORPORATION nyilatkozom, hogy a HR-100B/HR-101B/HR-UC1 megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
[pt] Português [Portuguese]	KEYENCE CORPORATION declara que este HR-100B/HR-101B/HR-UC1 está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
[sl] Slovensko [Slovenian]	KEYENCE CORPORATION izjavlja, da je ta HR-100B/HR-101B/HR-UC1 v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
[sk] Slovensky [Slovak]	KEYENCE CORPORATION týmto vyhlasuje, že HR-100B/HR-101B/HR-UC1 spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
[fi] Suomi [Finnish]	KEYENCE CORPORATION vakuuttaa täten että HR-100B/HR-101B/HR-UC1 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
[sv] Svenska [Swedish]	Härmed intygar KEYENCE CORPORATION att denna HR-100B/HR-101B/HR-UC1 står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
[is] Íslenska [Icelandic]	Hér með lýsir KEYENCE CORPORATION yfir því að HR-100B/HR-101B/HR-UC1 er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
[no] Norsk [Norwegian]	KEYENCE CORPORATION erklærer herved at utstyret HR-100B/HR-101B/HR-UC1 er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

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