KEYENCE

96M11490

* 9 6 M 1 1 4 9 0 - 1 *

2D Code Reader (Fixed Type)
SR-600 Series
Instruction Manual

Read this manual before use.
Keep this manual in a safe place for future reference.

⚠ DANGER	Failure to follow instructions may lead to death or serious injury.
⚠ WARNING	Failure to follow instructions may lead to injury.
⚠ CAUTION	Failure to follow instructions may lead to product damage or malfunctions.
Note	Provides additional information on proper operations that can be easily mistaken.
Reference	Provides advanced and useful information for operation.

Safety Information for SR-600 Series

■ General cautions

- Take substantial safety measures to avoid any damage in the unlikely event of a problem occurring.
- 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 SR-600 Series is used in combination with other devices, functions and performance may be degraded, depending on the operating conditions and surrounding environment.
- Parts of this manual may not be used or duplicated without express permission.
- The contents of his manual are subject to change without notice.
- This product is just intended to detect the 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 explosion-proof product. Do not use this product in hazardous location and/or potentially explosive atmosphere.

■ Safety precautions for laser product

The SR-600 Series uses a visible semiconductor laser, with wavelength of 660 nm, as a target pointer for adjusting the reading position.

⚠ CAUTION	Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

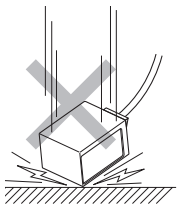
	Laser pointer
Wavelength	660 nm
Output	90 μW
Pulse width	200 μs
Laser class	Class 1 laser product IEC60825-1

⚠ WARNING	Follow the instructions mentioned in this manual. Otherwise, injury to the human body (eyes and skin) may result. Precautions on class 1 laser products • Do not stare into the beam. • Do not disassemble this product. Laser emission from this product is not automatically stopped when it is disassembled.

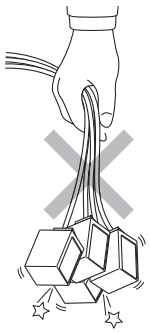
Operating Precautions

⚠ CAUTION

- Do not use a voltage other than 5VDC with the SR-600 Series. Doing so may lead to damage on the unit.
- When using the dedicated communication units (NX-50 Series, N-R2/R4/UB/L1, or DV-90 Series), use a power supply within the appropriate range for each unit.
- Be sure to turn the power off to devices attached to the SR-600 series when you plug or unplug the cables. Failure to do so may cause damage to the SR-600 Series.
- Do not disassemble or modify the SR-600 Series. Doing so may lead to damage on the unit.
- Keep the cables away from high-tension cables or power sources. Otherwise, noise could cause malfunctions or accidents.
- The SR-600 Series is a precision instrument. Do not apply shock to the instrument or drop it. Be especially careful when transporting or installing the unit.



- Do not hold the SR-600 Series by its cable. The units may become damaged if they strike each other.



- Do not allow water, oil, dust, or other foreign substances to stick to the scanner. This may cause read errors. Use a soft, dry cloth to wipe any substances from the scanner. (Do not use a cloth dipped in alcohol or other cleaning substance.)

Regulations and Standards

■ UL Certifications

The SR-600 Series is an UL/C-UL Listed/Recognized product.
- File No.: E207185, Category: NRAQ/NRAQ7, Applicable standard: UL508
- File No.: E167973, Category: NWGQ2/NWGQ8, Applicable standard: UL60950-1

Be sure to follow the specification below.
- Use a power supply that provides Class 2 output defined in NEPA70 (NEC: National Electrical Code).
- Pollution degree: 2
- Overvoltage category: I

■ FDA (CDRH) Regulations

The SR-600 Series complies with the following FDA (CDRH) regulations.

Applicable regulations: 21 CFR Part 1040.10, Class 1 Laser Product

The classification is based on IEC60825-1 according to the Laser Notice No. 50 issued by FDA (CDRH).

■ CE Marking

The SR-600 Series complies with the essential requirements of EMC Directive and Low-voltage Directive.
The following harmonized standards are applied.

Applicable standards (EMI):		EN55011, Class A
		EN55022, Class A
	(EMS):	EN61000-6-2
		EN61000-6-1
	(LVD):	EN60825-1, Class 1 Laser Product

* We conducted the test on the combination with the SR-600 series and the communication units (N-R2/UB/R4/L1) to confirm the conformity.

■ FCC Regulations

The SR-600 Series complies with the following FCC EMI regulations.
- FCC 47 CFR Part 15, Subpart B, Class A, Digital devices

■ Canada IC (Industry Canada) Regulations

The SR-600 Series complies with the following IC EMI regulations.
- ICES-003, Class A, Digital apparatus

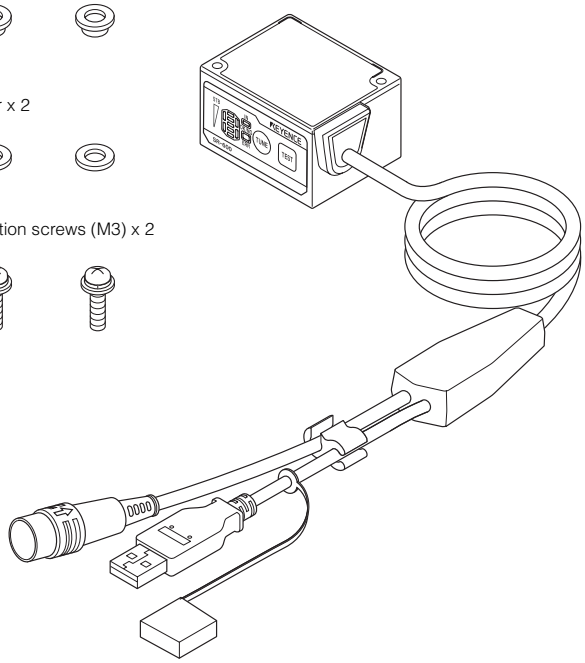
Checking the Package Contents

Insulating spacer x 2

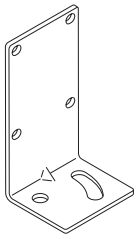
Main unit (SR-600/610/600HA)

Washer x 2

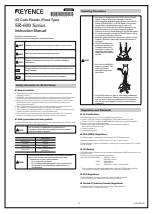
Installation screws (M3) x 2



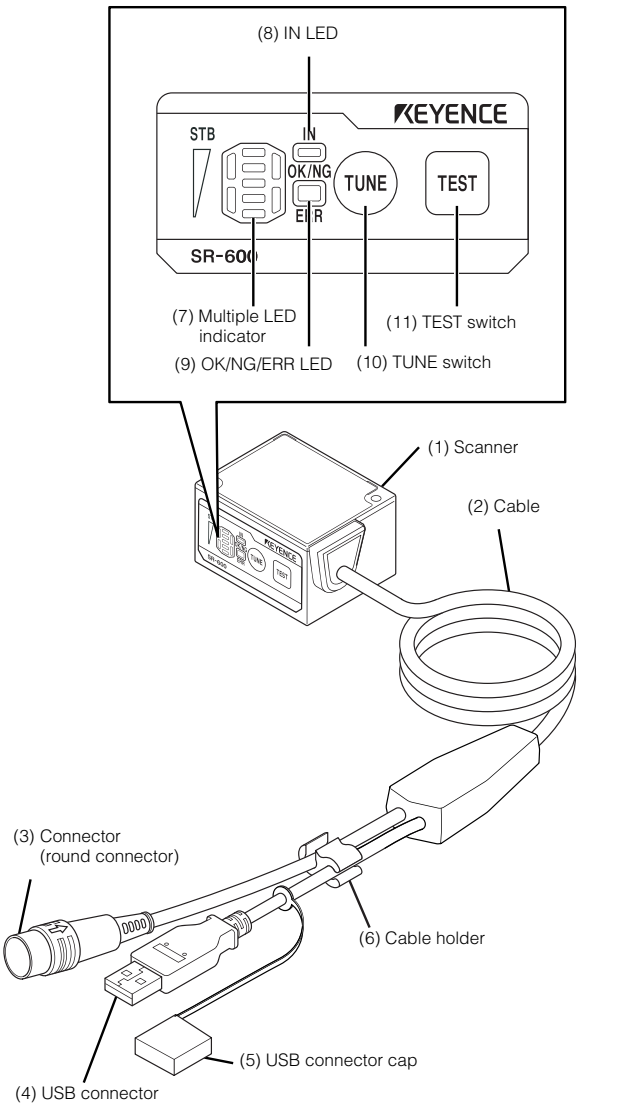
Mounting bracket x 1



Instruction Manual



Part Names and Functions

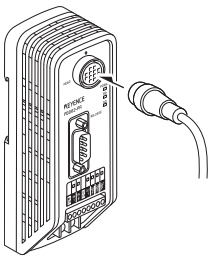


(1)	Scanner:	Reads 2D codes and barcodes.
(2)	Cable:	Cable length is 1.8 m.
(3)	Connector (Round connector):	Connects to the power supply and communication unit (N-R2/UB/R4/L1). The connector can be used for serial communications with external devices.
(4)	USB Connector:	Connects to a PC to change settings with AutoID Navigator. The connector is type A. Cable length is 130 mm from the section where the cable splits.
(5)	USB connector cap:	When the USB connector is not in use, place the cap on the connector to prevent the entry of dust and contact with surrounding metal objects.
(6)	Cable holder:	When the USB connector is not in use, place the USB cable in the cable holder so that it does not move around.
(7)	Multiple LED indicator:	Displays the operation status including the bank number upon successful decoding, reading stability and operation mode.
(8)	IN LED:	Lights up when an input terminal is on. (Default settings: Displays the Input terminal 1 state)
(9)	OK/NG/ERR LED:	• Lights green when a OK signal is output. • Lights orange when an NG signal is output. • Lights red when an ERROR signal is output.
(10)	TUNE switch:	Use this switch to perform the following operations. Refer to the user manual for more details. • Turn on the laser pointer for reading position adjustment • Display registered parameter banks (Up to16 banks can be registered.) • Start parameter tuning • Read all of the program codes • Reset errors
(11)	TEST switch:	Use this switch to perform the following operations. Refer to the user manual for more details. • Start and stop test mode • Run 1 reading operation • Run the multi-reading mode • Fix the communication settings to the default values when sending and receiving the settings

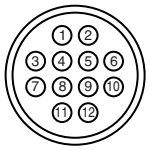
Connection and Wiring Method

■ Connection to the communication unit

Connect the connector to the communication unit (N-R2/UB/R4/L1).
Refer to the communication unit instruction manual for more details.



■ Connector pin alignment



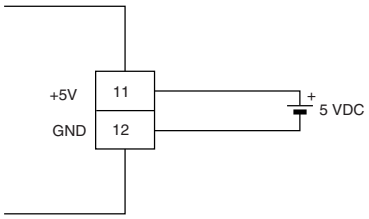
RP17-13PA-12PC plug (male)

Made by Hirose Electric Co., Ltd.

Pin no.	Wire color	Symbol name	Description	Signal direction
1	Transparent	OUT1	Output terminal 1 (Default value: OK output)	Output
2	Gray	OUT2	Output terminal 2 (Default value: NG/ERROR output)	Output
3	Purple	TxD	RS-232C send	Output
4	Blue	CTS	RS-232C send OK	Input
5	Lt. blue	OUT4	Output terminal 4 (Default value: BUSY output)	Output
6	Yellow green	IN2	Input terminal 2 (Default value: PRESET input)	Input
7	Brown	RxD	RS-232C receive	Input
8	Pink	RTS	RS-232C receive OK	Output
9	Orange	OUT3	Output terminal 3 (Default value: ERROR output)	Output
10	Yellow	IN1	Input terminal 1 (Default value: TIMING input)	Input
11	Red	5 V	5 V Power	–
12	Black	GND (SG)	Power GND/Signal GND	–

* The shielded wire is connected to a signal ground.
It is possible to change the functions of the input terminals and output terminals. Refer to the user's manual for making these changes.

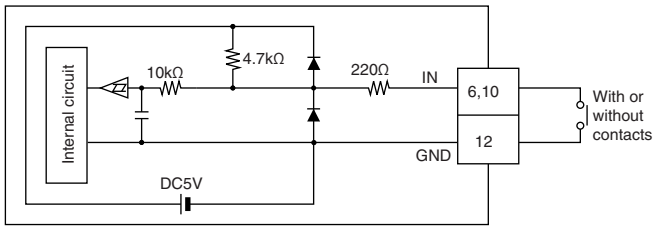
■ Connecting the power



⚠ CAUTION	• Do not use a reverse connection for the power supply. Doing so may damage the unit. • Use a stable power supply that is 5 VDC +5%, -10%. Using a power supply that exceeds this range may damage the unit.

■ Input terminal 1 and Input terminal 2 wiring

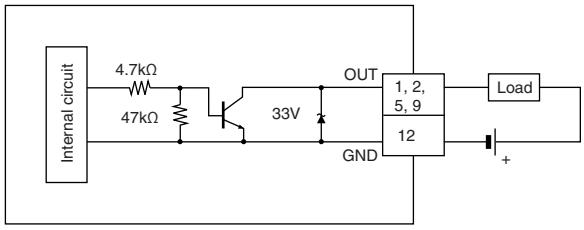
These are non-voltage inputs. Connect relay contacts or NPN open collector outputs.
- The TIMING and PRESET inputs are non-voltage inputs.



- TIMING (Input terminal 1) is input to initiate the 2D code and barcode reading.
- PRESET (Input terminal 2) is input to preset (register) the 2D code and barcode data on the SR-600 Series.

■ Output terminal 1, Output terminal 2, Output terminal 3 and Output terminal 4 wiring

These are NPN open collector outputs.

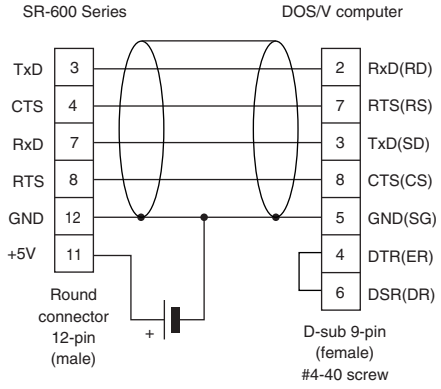


* Rated load: 24VDC (30mA) or less

- OK (Output terminal 1) is output for a successful reading when a check against preset data is successful.
- NG/ERROR output (Output terminal 2) is output for an unsuccessful reading when a check against preset data fails.
- ERROR (Output terminal 3) is output for an unsuccessful reading.
- BUSY (Output terminal 4) is output when preset data registration has been completed and internal processing is taking place.
  When BUSY is output, TIMING (Input terminal 1) cannot be input.

■ RS-232C wiring

Use the following wiring when connecting to a PC or a PLC.

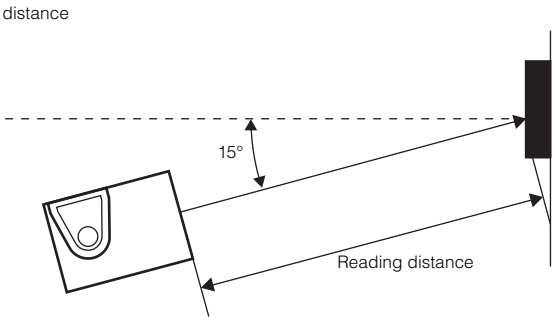


Installing the SR-600 Series

Install the SR-600 Series as shown below to ensure reading stability.

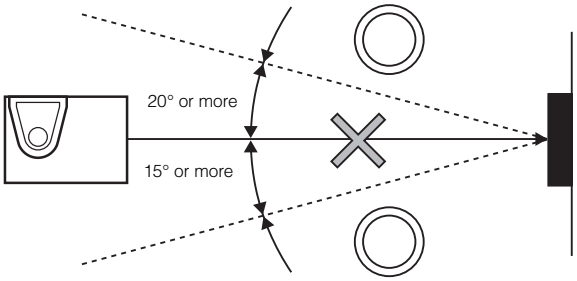
■ Installation angle

The scanner of the SR-600 Series should be positioned at an angle of 15° in relation to the 2D code or barcode surface when carrying out reading.



Note

- Do not position the scanner to face directly at 2D codes or barcodes. Doing so may cause instability in reading due to mirror reflection.

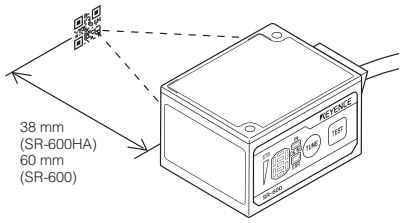


■ Adjusting the installation position and distance

1 Press the TUNE switch on the SR-600 Series. The laser pointer will emit a laser beam.
Adjust the installation position and distance so that the laser pointer intersection point (the center point between the laser pointers for the SR-610) and the center of the barcode line up.

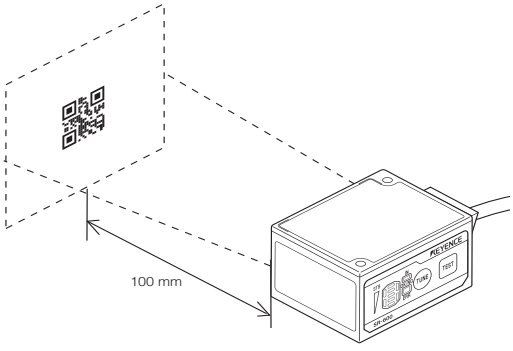
For the SR-600/600HA

The distance where the left and right laser beams intersect is the optimal reading distance.
Adjust the laser pointer's intersection point so that it lies directly in the middle of the 2D code or the barcode.



For the SR-610

The two laser pointers indicate the reading width. Adjust the laser pointers so that the 2D code or the barcode lies directly in the middle.



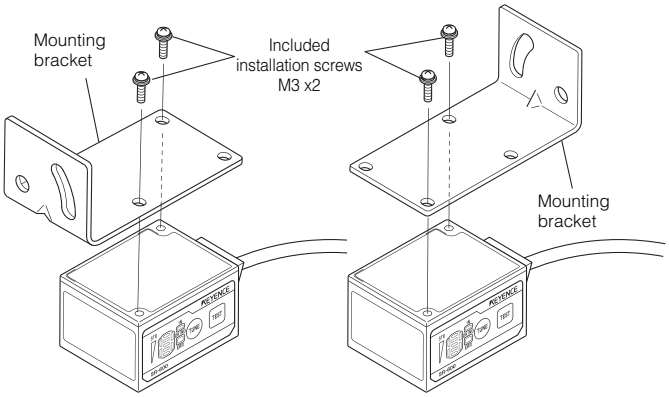
Refer to the user's manual for tuning and confirming reading stability.

- The reading distance and angle differ depending on conditions such as the size and the print quality of the 2D code or the barcode. Carry out reading tests using the 2D code or barcode to be used and make adjustments.

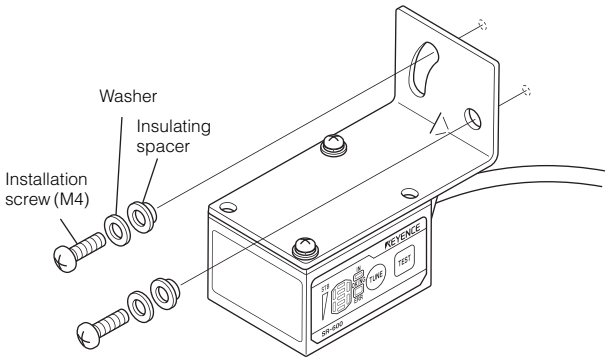
Mounting the SR-600 Series

■ Using the included mounting bracket

1 Attach the SR-600 Series to the mounting bracket.
Secure the mounting bracket with the included M3 screws.



2 Secure the mounting bracket to the device.
Secure the mounting bracket to the device using the installation screws, purchased separately, with the included insulating spacers and washers. The installation screws should be at least 3.7 mm (thickness of the bracket, washer, etc.) + 3 mm long.

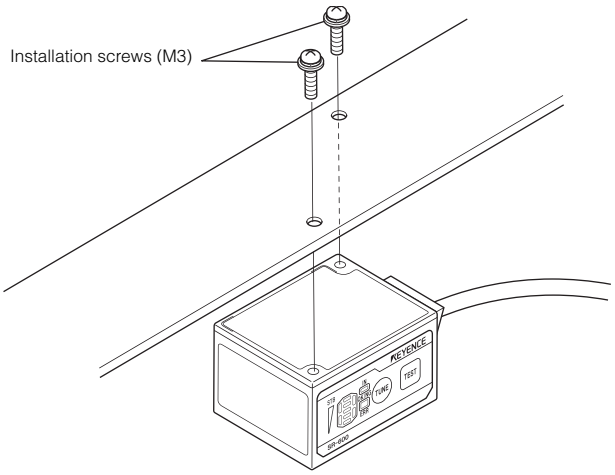


⚠ CAUTION	• Make sure to attach the included insulating spacers to prevent excessive noise from the device. • Reading errors may occur if the insulating spacers are not attached.

■ Attaching directly to the device

Secure the SR-600 Series with screws (M3).

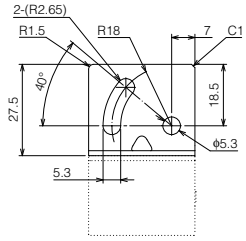
Note The installation screws, purchased separately, should not be any longer than the length of the plate thickness + 4 mm.

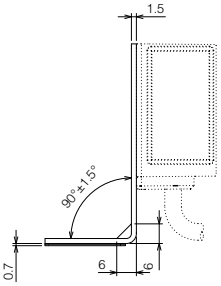


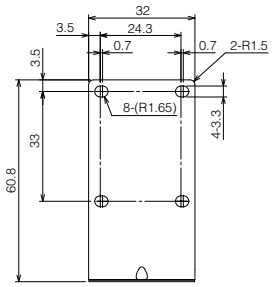
⚠ CAUTION	• Use insulating material when installing the SR-600 Series to prevent excessive noise from the device. • Reading errors may occur if the insulating material is not attached.

■ Mounting bracket

* An insulating sheet is affixed to the bottom surface of the mounting bracket. Do not remove the sheet.

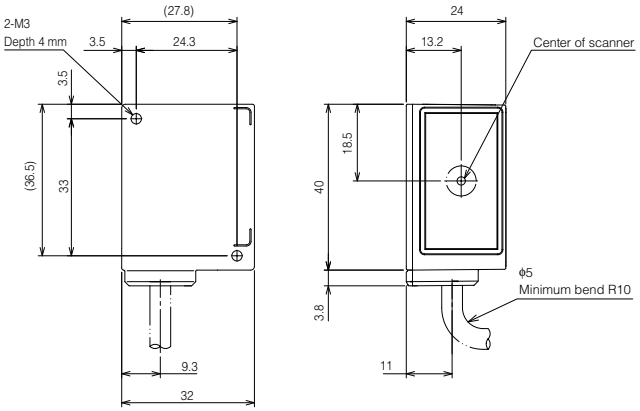


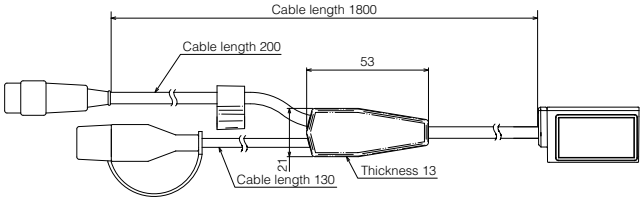




Dimensions

■ Main unit (SR-600/610/600HA)





Specifications

Model			SR-600	SR-610	SR-600HA
Type			Short-range	Mid-range	High resolution
Laser pointer	Light source		Visible semiconductor laser (660 nm)		
	Output		90 μW		
	Pulse width		200 μs		
	Laser class		Class 1 (IEC60825-1, FDA CDRH Part 1040.10)		
Light	Light source		High intensity red LED		
	LED class		Class 1 (IEC60825-1)		
Reading	Supported code	Barcode	Code 39, ITF, Industrial 2of5, COOP 2of5, NW-7 (Codabar), Code 128, GS1-128 (EAN-128), GS1-DataBar (RSS), Code 93, JAN/EAN/UPC, Trioptic Code 39		—
		2D Code	QR, MicroQR, DataMatrix, PDF417, MicroPDF, MaxiCode, GS1-Composite		
	Focal distance		60 mm	100 mm	38 mm
	Minimum resolution	Barcode	0.127 mm	0.127 mm	—
		2D Code	0.127 mm	0.25 mm	0.082 mm
	Reading time (typical examples)		21 ms (focal distance, QR code 21 x 21)		
	Reading distance (typical examples)	DataMatrix	35 to 95 mm (Cell size 0.339 mm)	40 to 173 mm (Cell size 0.508 mm)	19 to 51 mm (Cell size 0.254 mm)
		QR	31 to 97 mm (Cell size 0.339 mm)	35 to 188 mm (Cell size 0.508 mm)	17 to 54 mm (Cell size 0.254 mm)
		Barcode	29 to 106 mm (Narrow bar width 0.339 mm)	44 to 205 mm (Narrow bar width 0.508 mm)	—
	Reading view range (focal distance)		42.5 mm x 27.1 mm	70.6 mm x 45.0 mm	26.6 mm, x 17.0 mm
Input/output	Control input		2 non-voltage inputs (IN1, IN2)		
	Control output		4 NPN open collector outputs (OUT1 to OUT4) 30 mA max. (24 V or less) Residual voltage 0.8 V or less, leakage current 0.1 mA or less		
	RS-232C	Communication method	RS-232C standards		
		Transmission speed	9600, 19200, 38400, 57600, 115200 bit/s		
		Synchronization method	Asynchronous		
		Data bit length	7/8 bits		
		Stop bit length	1/2 bits		
		Parity check	None/Even/Odd		
	USB		Full-speed USB 2.0 interface		

Model		SR-600	SR-610	SR-600HA
Type		Short-range	Mid-range	High resolution
Environment resistance	Enclosure rating	IP65		
	Ambient temperature	0 to +45°C		
	Storage temperature	-10 to +50°C		
	Relative humidity	35 to 95% RH (No condensation)		
	Ambient luminance	Sunlight: 10,000lx, incandescent lamp 6,000lx, fluorescent lamp: 2,000lx		
	Operating environment	Location without dust or corrosive gas		
	Vibration	10 to 55 Hz: double amplitude 1.5 mm in the X, Y and Z directions. 3 hours respectively.		
Rating	Power supply voltage	5 VDC +5%, -10%		
	Current consumption	630 mA or less		
Weight		Approx. 160 g (including the cable)		

* Use the Limited Power Source defined in UL/IEC60950-1 to comply with UL/IEC60950-1.

Warranty

KEYENCE products are strictly factory-inspected. However, in the event of a failure, contact your nearest KEYENCE office with details of the failure.

1. Warranty period
   The warranty period shall be for one year from the date that the product has been delivered to the location specified by the purchaser.
2. Warranty scope
   (1) If a failure attributable to KEYENCE occurs within the above mentioned warranty period, we will repair the product, free of charge. However, the following cases shall be excluded from the warranty scope.
   - Any failure resulting from improper conditions, improper environments, improper handling, or improper usage other than described in the instruction manual, the user's manual, or the specifications specifically arranged between the purchaser and KEYENCE.
   - Any failure resulting from factors other than a defect of our product, such as the purchaser's equipment or the design of the purchaser's software.
   - Any failure resulting from modifications or repairs carried out by any person other than KEYENCE staff.
   - Any failure that can certainly be prevented when the expendable part(s) is maintained or replaced correctly as described in the instruction manual, the user's manual, etc.
   - Any failure caused by a factor that cannot be foreseen at a scientific/technical level at the time when the product has been shipped from KEYENCE.
   - Any disaster such as fire, earthquake, and flood, or any other external factor, such as abnormal voltage, for which we are not liable.

   (2) The warranty scope is limited to the extent set forth in item (1), and KEYENCE assumes no liability for any purchaser's secondary damage (damage of equipment, loss of opportunities, loss of profits, etc.) or any other damage resulting from a failure of our product.
3. Product applicability
   KEYENCE products are designed and manufactured as general-purpose products for general industries.
   Therefore, our products are not intended for the applications below and are not applicable to them. If, however, the purchaser consults with us in advance regarding the employment of our product, understands the specifications, ratings, and performance of the product on their own responsibility, and takes necessary safety measures, the product may be applied. In this case, the warranty scope shall be the same as above.
   - Facilities where the product may greatly affect human life or property, such as nuclear power plants, aviation, railroads, ships, motor vehicles, or medical equipment
   - Public utilities such as electricity, gas, or water services
   - Usage outdoors, under similar conditions or in similar environments

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