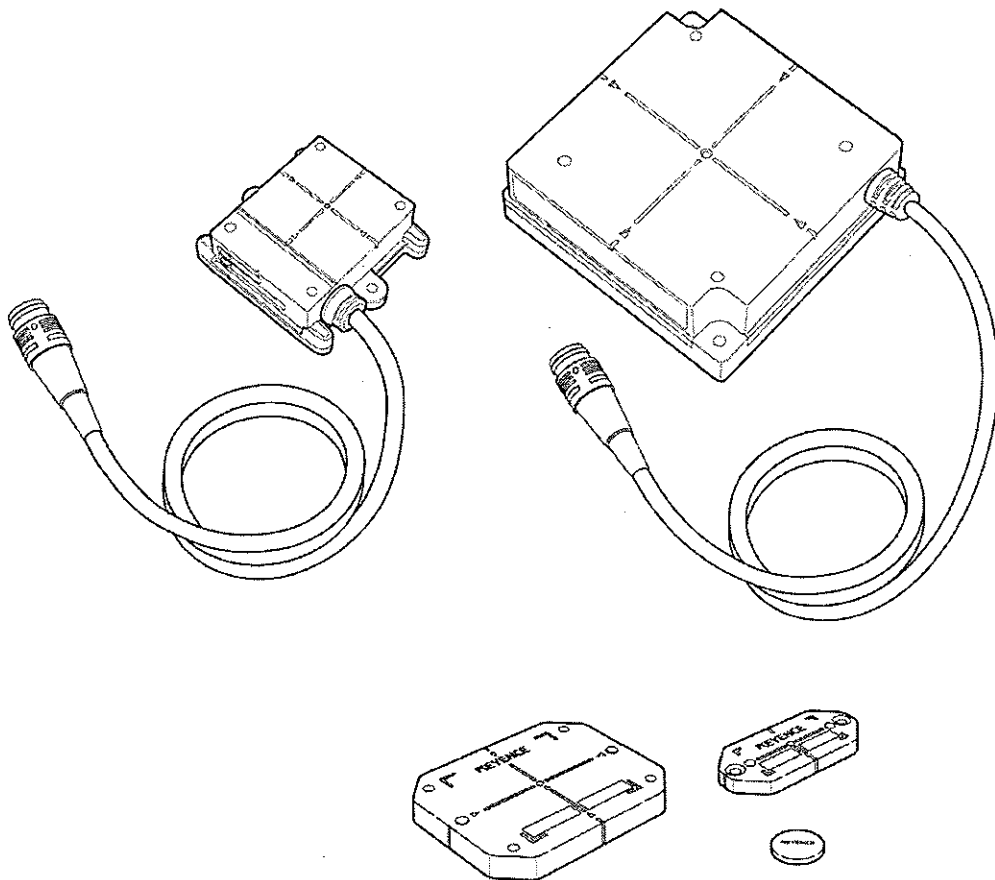# KEYENCE

Advanced-Function RFID System
RF-500 Series

RFID Head/IC Tag
Instruction Manual

KEYENCE CORPORATION

For Safe Usage

This manual describes the connections, wiring, handling, setup, and precautions to observe regarding the head and IC tags used on the advanced-function RFID system RF-500 Series. Before you start to use the advanced-function RFID system, be sure to thoroughly read this manual so that you can make full use of the advanced-function RFID system RF-500 Series' performance. Also, store this document in a safe place so that you can retrieve it whenever necessary.

* Company names, product names, and model names used in this manual are trademarks or registered trademarks of their respective companies.

■This manual's format

This manual uses the following symbols to alert you to important information.

⚠CAUTION Failure to follow these instructions may lead to physical damage (product malfunction, etc.).

Note This heading is used to indicate cautions relating to device operation where operator error is likely.

📖 Indicates a reference item or page to be referred to in this manual and a separate manual.

■General Precautions

- Verify that this device is operating normally in terms of functionality and performance before the start of work and when operating the device.
- We recommend that you take substantial safety measures to avoid any damage in the event that a problem occurs.
- Proceed with care when modifying the RF-500 Series, or when using it in a manner that falls outside of the ranges indicated in its specifications, since KEYENCE is unable to guarantee device functionality or performance in such situations.
- Use this product in combination with other devices only after careful consideration, since the RF-500 Series may fail to satisfy its functionality and performance capabilities as a result of the conditions and environment in which it is used.
- Do not use the RF-500 Series with the purpose of protecting human beings.
- This equipment is for indoor use only, and for use up to 2,000m attitude.

■Operating Precautions

⚠CAUTION
- Do not use the system in environments where flammable, explosive or corrosive gas is present.
- Firmly tighten all screws.
- Use only crimped terminals of the specified size for wiring.
- Use the head with only the power supply described in this document. Do not use it with other power supplies. Doing so might cause the head to break down.
- Do not disassemble or modify the head or IC tags. Doing so might cause them to break down.
- Keep cables as far away from high-voltage lines and power lines as possible. Noise from these lines might cause the system to break down or malfunction.
- The head and IC tags are precision devices. Take care not to subject them to impact or drop them. Take particular care when carrying them or installing them.
- Do not carry heads by holding their cables. This may cause the heads to bump against each other, which may damage them.
- Observe other warnings, cautions and precautions presented in this document during use of the system. Otherwise, the protection provided may be impaired.

●Operating environment precautions

The components used in the RF-500 Series use the 13.56 MHz frequency band to perform communication with IC tags. As 13.56 MHz is also used as an ISM band (one of frequencies allocated to heating equipment used for medicine and industry and that normally requires an official application at installation), communication with IC tags is sometimes affected and IC tags are sometimes broken if this equipment is located near the system. Before using the system near this equipment, check for adverse influence. Also, observe the following instructions during use of the system to minimize general noise:

- Ground metal objects located in the vicinity of the system according to Class D earthing regulations.
- Avoid wiring near high voltages or heavy currents.

Precautions for the regulations and standards for radio communications equipment

■Japan

●Precautions relating to the Radio Law

RF-500 and RF-550 comply with technical criteria as laid down by Japan's Radio Law as follows, and have received a model specification from the Minister of Internal Affair and Communications based on the regulations of the Radio Law Implementation Rules Clause 44-2 (current as of 2005).

- Applicable regulation Ordinance Concerning Technical Regulations Conformity Certification of Specified Radio Equipment Clause 46-2 "Conduction-type Read/Write Communication Facilities"
- Applicable standard ARIB STD - T82 Conduction-type Read/Write Communication Facilities
- Ministry of Internal Affairs and Communications specified No.

■Europe (EU)

### ●Precautions for R&TTE Directive (1999/5/EEC)

C E 0560

RF-500 and RF-550 comply with the requirements of the R&TTE Directive,
and have been examined by Telefication B.V., a European Notified Body.

- Applicable standards EN 300 330-1
                        EN 300 330-2
                        EN61010-1

- Overvoltage category Ⅰ
- Pollution degree 2

- The RF-500 and RF-550 can be used in the following countries within the EU region:

Austria	Belgium	Denmark	Estonia
Finland	France	Germany	Greece
Iceland	Ireland	Italy	Liechtenstein
Luxembourg	Holland	Norway	Portugal
Spain	Sweden	Switzerland	United Kingdom

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

When using the RF-550, be sure to attach the ferrite core (supplied).

Ferrite core

3
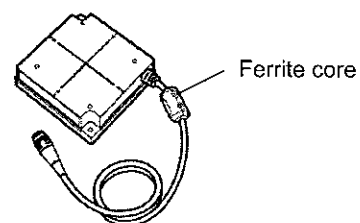
■U.S.A.

●Precautions for FFC

RF-500 and RF-550 comply with the following FCC Rules, and have acquired certification.

- Applicable regulation FCC Part 15 Subpart B - Unintentional Radiator,
  Class A digital device

  FCC Part 15 Subpart C - Intentional Radiator
  13.11 MHz to 14.01 MHz device

- FCC ID RF-550: RF40773A / RF-500: RF40773B

- 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.

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

- 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

When using the RF-550, be sure to attach the ferrite core (supplied).

Ferrite core
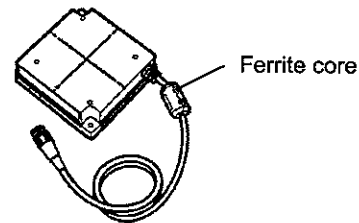
●Precautions for UL Approval

The RF-500 and RF-550 complies with the following UL/CSA standards and has acquired UL/C-UL certification.

- Applicable standards UL508, Enclosure Type 4X (Indoor Use Only), 12 and 13
  CAN/CSA C22.2 No. 14-M95
- UL File No. E207185
- UL Category NRAQ, NRAQ7

- Be sure to use a power supply having a Class 2 output as stipulated in NFPA70 (NEC: National Electrical Code).

c(UL)us
LISTED

■Canada

●Precautions relating to Canada IC (Industry Canada) regulations

The RF-500 and RF-550 comply with Canadian radio communications Act and technical requirements as follows, and have acquired certification.

- Applicable regulation   RSS-210 - Low Power License-Exempt Radiocommunication Devices
                        ICES-003 - Digital Apparatus, Class A Digital Apparatus

- IC No.   5798A-0773

- 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.

- This class A digital apparatus complies with Canadian ICES-003.

When using the RF-550, be sure to attach the ferrite core (supplied).

Ferrite core
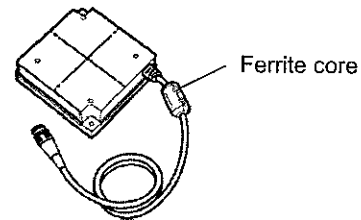
■China

●Precautions relating to China radio communication regulations (SRRC regulations)

The RF-500 and RF-550 comply with China radio communication regulations as follows, and have acquired SRRC certification.

- Applicable regulation   The People's Republic of China Wireless Control Laws and Regulations

- SRRC Certification No.

■Taiwan

●Restrictions relating to Taiwan radio communication regulations (DGT regulations)

The RF-500 and RF-550 comply with Taiwan radio communication regulations as follows, and have acquired DGT certification.

- Applicable regulation   LP002-Low-Power Radio-Frequency Devices Technical Regulations

- DGT Certification No.

■Korea

●Precautions relating to Korea radio communication regulations (MIC regulations)

The RF-500 and RF-550 comply with Korea radio communication regulations as follows, and acquired MIC certification.

- Applicable regulation   Rules on Enforcement Regulations of Radio wave Act

- MIC Certification No.

■Singapore

●Precautions relating to Singapore radio-communication regulations (IDA regulations)

The RF-500 and RF-550 comply with Singapore telecommunications (radio-communication) regulations as follows, and have acquired IDA certification.

> **Complies with**
> **IDA Standards**
> **DA123456**

- Applicable regulation   IDA TS10 - Type Approval for Radio Detection and Alarm Systems

■Malaysia

●Precautions relating to Malaysia radio communication regulations (SIRIM regulations)

The RF-500 and RF-550 comply with Malaysia radio communication regulations as follows, and have acquired SIRIM certification.

- Applicable regulation   Communications and Multimedia Act/Regulation

■Thailand

●Precautions relating to Thailand radio communication regulations (PTD regulations)

It is not mandatory for RF-500 and RF-550 to apply for the type-approval in accordance with Thailand radio communication regulations (PTD regulations) because they are the exempted radio equipment defined in PTD regulations.
Accordingly, the RF-500 and RF-550 can be used in Thailand without PTD certification.

■Hong Kong

●Precautions relating to Hong Kong radio communication regulations (OFTA regulations)

It is not mandatory for RF-500 and RF-550 to apply for the type-approval in accordance with Hong Kong radio communication regulations (OFTA regulations) because they are the exempted radio equipment defined in OFTA regulations.
Accordingly, the RF-500 and RF-550 can be used in Hong Kong without OFTA certification.

# Contents

Chapter 1   FEATURES & SYSTEM CONFIGURATION

1-1   Features

The head and IC tag are collectively called the "advanced-function RFID system RF-500 Series." The RF-500 Series enables IC tags of differing shape and memory size to be used at high speed.
The following components are used on the RF-500 Series.

■Head

Radio waves are used to read and write information to and from IC tags.
The following different shaped heads are available:

- **RFID compact head (RF-500)**   - **RFID standard head (RF-500)**
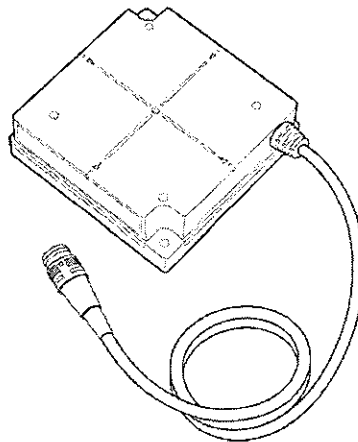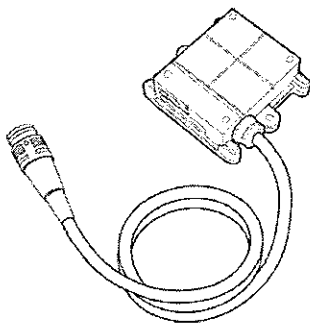
■IC tag

An IC tag is a tag that has memory to which information can be read and written. Information is read and written to IC tags by the head.
The following three types of IC tag of differing shape and memory size are available:
<Environmentally resistant IC tag for RF-500 Series>
- Coin-shaped IC tag (256 bytes):   RF-T5P10
- Compact IC tag (2000 bytes):   RF-T5F20
- Standard IC tag (2000 bytes):   RF-T5F30

1-2   Example of System Configuration

The following shows an example of a system configuration when the head and IC tag are used.

●When the dedicated power supply unit is used

| IC tag | Head | Dedicated power supply unit (BL-U1/BL-U2) | PC/PLC, etc. |

RS-232C   RS-232C
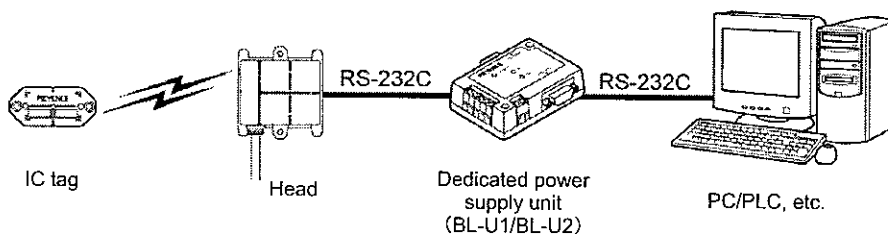
Note
We recommend using the compact head RF-500 together with coin-shaped tags RF-T5P10 and compact tags RF-T5F20, and the standard head RF-550 together with standard tags RF-T5F30.

Chapter 2   SPECIFICATIONS & PERFORMANCE

2-1   Head

■ Names and functions of parts

● RFID compact head (RF-500)

- **Front**

Transceiver
Sends and receives radio waves.

Center guides (side)
Indicate the center of the receiver.
Provided at 4 locations (top/bottom/left/right) of head.
Serve as a reference when adjusting the position with
the IC tag to the top/bottom/left/right.

Center guide (front)
Indicates the center of the receiver.
Serves as a reference when adjusting the position
with the IC tag.

RS-232C round connector
This connector is connected to the
jack end of the D-Sub conversion
cable (0.2 m) (RF-CM2D).

- **Side**

Status LED (OK/NG/ERROR)
Indicates the reading status of
the IC tag.
For details on the indication,
📖 "About LEDs" (page 10).

Power LED (POWER)
Lights when the power is ON.

Center guides (side)
Indicate the center of the receiver.
Serve as a reference when adjusting the
position with the IC tag from the side.

●RFID standard head (RF-550)

- Front

Center guide (front)
Indicates the center of the receiver.
Serves as a reference when adjusting the position with the IC tag.

Transceiver
Sends and receives radio waves.

Center guides (side)
Indicate the center of the receiver.
Provided at 4 locations (top/bottom/left/right) of head.
Serve as a reference when adjusting the position with the IC tag to the top/bottom/left/right.

RS-232C round connector
This connector is connected to the jack end of the D-Sub conversion cable (0.2 m) (RF-CM2D).

- Top

Status LED (OK/NG/ERROR)
Indicates the reading status of the IC tag.
For details on the indication, see 📖 "About LEDs" below.

Center guide (top)
Indicates the center of the receiver.
Serve as a reference when adjusting the position with the IC tag from the top.

Power LED (POWER)
Lights when the power is ON.

●About LEDs

The following table summarizes the color of LEDs and the meaning of LED states:

Name	State		Description
Power LED	Green	Lit	Power ON
		Out	Power OFF
Status LED	Red	Lit	Lights at ERROR output.
	Green	Lit	Lights at OK output.
		Blinking	Blinks in the CONFIG mode.
	Orange	Lit	Lights at NG output.
		Out	Power OFF

■Specifications

●General specifications

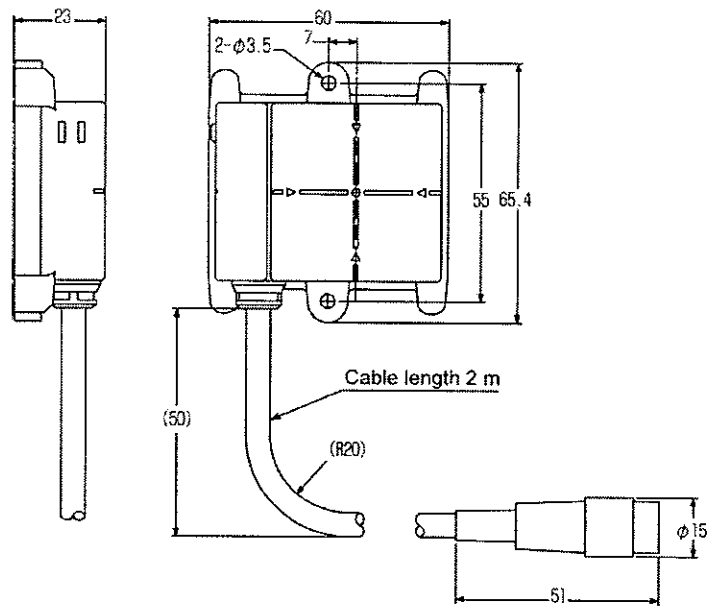| Item		Specification	
Model		RF-500	RF-550
Power supply voltage		5 VDC±10%: cable length 2 m or less	
		5 VDC±5%: cable length 10 m or less	
Current consumption		300 mA or less	
Operating ambient temperature		0 to +60°C	
Operating ambient humidity		35 to 95%RH (condensation not allowed)	
Storage ambient temperature		-20 to +75°C	
Storage ambient humidity		35 to 95%RH (condensation not allowed)	
Insulation resistance		100 MΩ or more (across the power terminal and I/O terminals, and across all external terminals and case at 500 VDC)	
Withstand voltage		1500 VAC for 1 minute (across the power terminal and I/O terminals, and across all external terminals and case at 500 VDC)	
Oil resistance		Water-soluble coolant, non-water-soluble coolant	
Chemical resistance		Industrial cleaning agent, disinfectant (sodium hypochlorite)	
Vibration resistance		10 to 55 Hz: 1.5 mm, 55 to 500 Hz: 10 G, 3 directions, 3 hours	
Impact		500 m/s^2 6 directions, 10 times	
Materials		PPS (body case), oil- and heat-resistant PVC (cable)	
Cable length		2 m	
Connector		12-pin round connector	
LED indication	Power LED	Power ON: green, power OFF: out	
	Status LED	Green: Lit for fixed period of time during OK output Blinking in CONFIG mode	
		Red: Lit for fixed period of time during ERROR output	
		Orange: Lit for fixed period of time during NG output	
Weight (including cable)		Approx. 185g	Approx. 325g

●Communication specifications

Item		Specification
Communication specifications	Communication method	Electromagnetic conductive method
	Protocol	ISO15693 (ISO18000-3)
	Compatible IC tags	I-code SLI, MB89R118, Tag-it HFI, my-d
	Radio wave restrictions	Radio wave Act (Japan), R&TTE Directive (CE), FCC, Radio wave Acts of other countries
Serial specifications	Communication method	EIA/TIA-232-E
	Baud rate (bps)	9600, 19200, 38400, 76800, 115200
	Synchronization method	Start-stop
	Data length (bit)	7/8
	Parity	None/even/odd
	Stop bit (bit)	1/2

●I/O specifications

Item		Specification
Input terminal	Input type	No-voltage input, TTL input (minus logic)
	Max. ON voltage	0.8 V
	Min. OFF voltage	2.0 V
Output terminal	Output type	NPN open collector system
	Rated load	Max. 24 VDC 30mA
	Current leakage	0.1 mA or less
	Residual voltage	0.8 V or less

■External dimensions

●RFID compact head (RF-500)

Cable length 2 m

(50)

(R20)

2-φ3.5

55 65.4

φ15

51

●RFID standard head (RF-550)

30

103.2

90

2-φ4.5

103.2

90

Cable length 2 m

(R20)

(50)

φ15

51
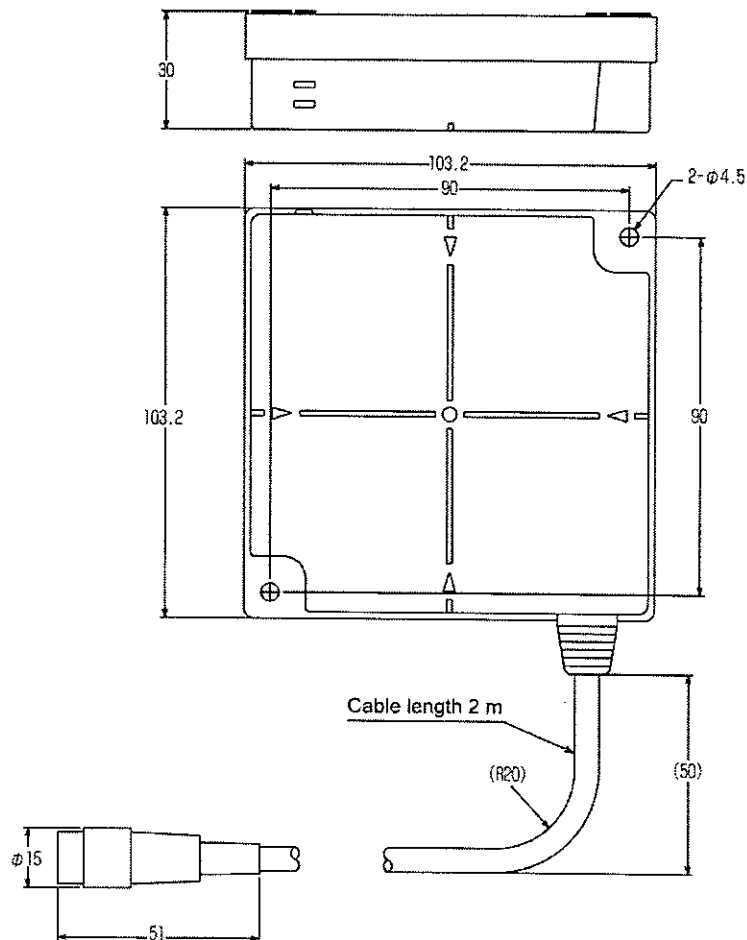
2-2   IC tag

■General specifications

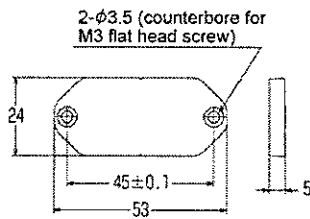| Item	Specification		
Model	RF-T5P10	RF-T5F20	RF-T5F30
Protocol	ISO15693 (ISO18000-3)		
Communication error detection	CRC 16-bit-based error detection		
User memory size	256 bytes	2000 bytes	
Memory type	EEPROM	FeRAM	
Memory life (+25°C)	Number of writes: 100, 000 times	Number of accesses*: 10 billion	
Data retention time (+55°C)	10 years		
Operating ambient temperature	-10°C to +60°C	-20°C to +85°C	
Storage ambient temperature	-10°C to +60°C	-20°C to +85°C	
Operating ambient humidity	35 to 95%RH		
Protective structure	IP68 and IP67g	IP67 and IP67g	
Materials	PPS	PPS + epoxy resin	PPS + epoxy resin
Oil resistance	Water-soluble coolant, non-water-soluble coolant		
Chemical resistance	Industrial cleaning agent, disinfectant (sodium hypochlorite)		
Weight	1.6g	8g	41g

* The "number of accesses" refers to the total number of read or write communications.
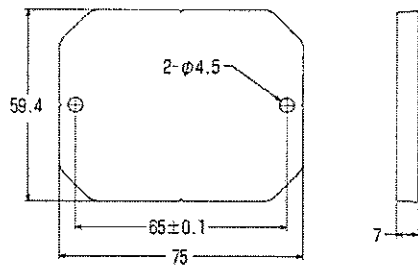
■External dimensions

●Coin-shaped IC tag (256 bytes): RF-T5P10

(φ22)

(3)

●Compact IC tag (2000 bytes): RF-T5F20

2-φ3.5 (counterbore for
M3 flat head screw)

24

45±0.1

53

5

●Standard IC tag (2000 bytes): RF-T5F30

2-φ4.5

59.4

65±0.1

75

7
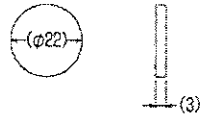
■Memory map

The following table shows the memory map of IC tags:

Item	Specification		
Model	RF-T5P10	RF-T5F20	RF-T5F30
Memory size	256 bytes	2000 bytes	
Configuration	4 bytes/page, 64 pages	8 bytes/page, 250 pages	

●About UID code

The number unique to an IC tag is called the "UID code" and different numbers are assigned to all IC tags.
UID codes are assigned to IC tags before shipment from the factory and cannot be changed by the user.

2-3　Cable

■D-Sub conversion cable (0.2 m) (RF-CM2D)

This cable is used for connecting to the dedicated power supply unit (BL-U2/BL-U1), and converts a round connector to a D-Sub 9-pin connector.

●Specifications

Item	Specification
Model	RF-CM2D
Name	D-Sub conversion cable
Length	0.2 m
Connector	Jack (RP17-13JA-12SC)
	D-Sub (JEZ-9S)
Insulation resistance	100 MΩ or more (at 500 VDC)
Withstand voltage	1500 VAC, 1 minute, 1 mA or less
Max. operating temperature	+60°C
Other	Connectors not waterproof

* Shielded lead is connected directly to common GND.
* When leads are connected individually, connect the shield to common GND.

●Cable pin assignments

Cable connector surface　　　　　　　　　　　　　　　Cable connector surface

Pin No.	Lead Color	Symbol	Description
1	White	OK	OK output
2	Gray	NG	NG output
3	Purple	TxD	RS-232C send
4	Blue	CTS	RS-232C clear to send
5	Light blue	ENABLE	ENABLE output
6	Green	PRESET	PRESET input
7	Brown	RxD	RS-232C receive
8	Pink	RTS	RS-232C ready to send
9	Orange	ERR	ERR output
10	Yellow	TIM	TIMING input
11	Red	+5V	+5V power supply
12	Black	GND(SG)	Common GND

Pin No.	Lead Color	Symbol	Description
1	Yellow	TIM	TIMING input
2	Brown	RxD	RS-232C receive
3	Purple	TxD	RS-232C send
4	White	OK	OK output
5	Black	GND(SG)	Common GND
6	Gray	NG	NG output
7	Pink	RTS	RS-232C ready to send
8	Blue	CTS	RS-232C clear to send
9	Red	+5V	+5V power supply

* When leads are connected individually, connect the shield to common GND.

■Head extension cable (8 m) (NX-C08R)

Use this cable for extending the RS-232C round connector on the head.
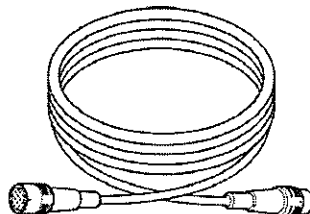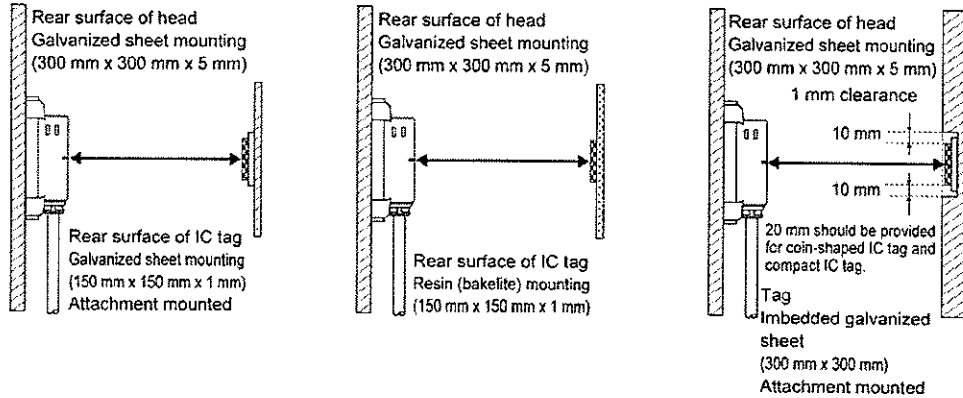
2-4 Communication Performance

■Communication range

The communication range differs according to the environment. Refer to the reference data below and use the advanced-function RFID system in an appropriate environment.

●Communication distance (guaranteed value)

The communication distance differs according to the combination of head and IC tag, and the rear side mounting environment of the tag.

The following shows three examples of installation environments:

Rear surface of head
Galvanized sheet mounting
(300 mm x 300 mm x 5 mm)

Rear surface of IC tag
Galvanized sheet mounting
(150 mm x 150 mm x 1 mm)
Attachment mounted

Rear surface of head
Galvanized sheet mounting
(300 mm x 300 mm x 5 mm)

Rear surface of IC tag
Resin (bakelite) mounting
(150 mm x 150 mm x 1 mm)

Rear surface of head
Galvanized sheet mounting
(300 mm x 300 mm x 5 mm)
1 mm clearance
10 mm
10 mm
20 mm should be provided
for coin-shaped IC tag and
compact IC tag.
Tag
Imbedded galvanized
sheet
(300 mm x 300 mm)
Attachment mounted

- RF-T5P10

Head	Tag Rear Side Mounting Conditions	Possible Communication Distance
RF-500	Galvanized sheet	0 to 24 mm
	Imbedded galvanized sheet	0 to 23 mm
	Bakelite	0 to 29 mm
RF-550	Galvanized sheet	0 to 24 mm
	Imbedded galvanized sheet	0 to 19 mm
	Bakelite	0 to 35 mm

- RF-T5F20

Head	Tag Rear Side Mounting Conditions	Possible Communication Distance
RF-500	Galvanized sheet	0 to 19 mm
	Imbedded galvanized sheet	0 to 18 mm
	Bakelite	0 to 24 mm
RF-550	Galvanized sheet	0 to 27 mm
	Imbedded galvanized sheet	0 to 22 mm
	Bakelite	0 to 34 mm

- RF-T5F30

Head	Tag Rear Side Mounting Conditions	Possible Communication Distance
RF-500	Galvanized sheet	0 to 41 mm
	Imbedded galvanized sheet	0 to 38 mm
	Bakelite	0 to 41 mm
RF-550	Galvanized sheet	0 to 58 mm
	Imbedded galvanized sheet	0 to 50 mm
	Bakelite	0 to 71 mm

* The "possible communication distances" in the above tables are guaranteed values that factor in temperature characteristics and product disparity.
  Axis deviation is assumed to be within ±10 mm.

Chapter 3 SETTINGS & MOUNTING

3-1 Head Installation Environment

■Precautions

Avoid installing the head in the following locations:

- Locations whose ambient temperature exceeds the 0 to +60°C range, or locations subject to condensation caused by sudden changes in temperature
- Locations whose ambient temperature exceeds the 35 to 95%RH range
- Locations subject to corrosive and flammable gasses
- Locations subject to large amounts of dirt and dust, salt, iron and oil smoke
- Locations directly subject to vibration and shock
- Locations that may be splashed with highly acidic or highly alkaline chemicals
- Locations within 100 mm of power lines (Electromagnetic fields are radiated from power lines (lines along which large current for motor drive, for example, flows) and adversely influence communication.)
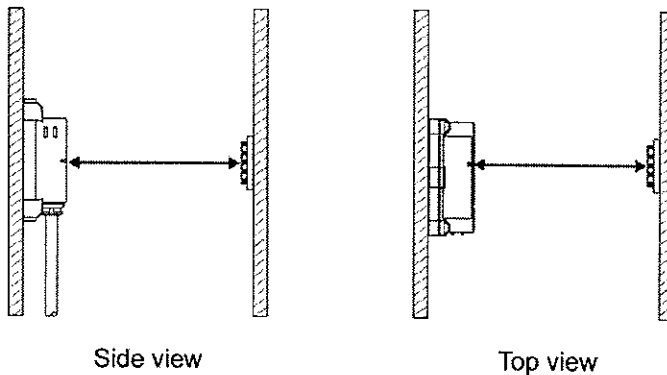
Note
Mounting the head with metal at its rear side is effective in shielding noise magnetic fields.

■Mount the head at an ideal possible where the IC tag can be correctly read.

Reading by the head is influenced by its mounting position and environment. Mount the head at an appropriate position paying attention to the following points.

- Make sure that the top surface of the IC tag is parallel to the top surface of the head.
- Using the center guides on the head as a reference, make sure that the center of the IC tag is aligned with the head.

Side view   Top view

Note
Coin-shaped IC tags, compact IC tags and standard IC tags are provided with a center guide that indicates the center of the IC tag.
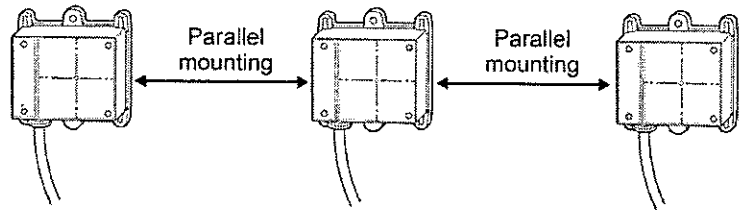
- Adjust the distance between the IC tag and head.
Referring to 📖 "2-4 Communication Performance" (page 17), mount the head while ensuring an ideal distance between the IC tag and head that allows the IC tag to be properly read. The mounting distance is sometimes shorter than that indicated on page 17 depending on the mounting environment.

When mounting the head, sufficiently test communication to ensure that communication can be performed successfully.

●When mounting multiple heads

Data is communicated between heads and IC tags by radio waves. Referring to the following table, make sure that there is sufficient distance between heads so that data communication is not adversely affected.
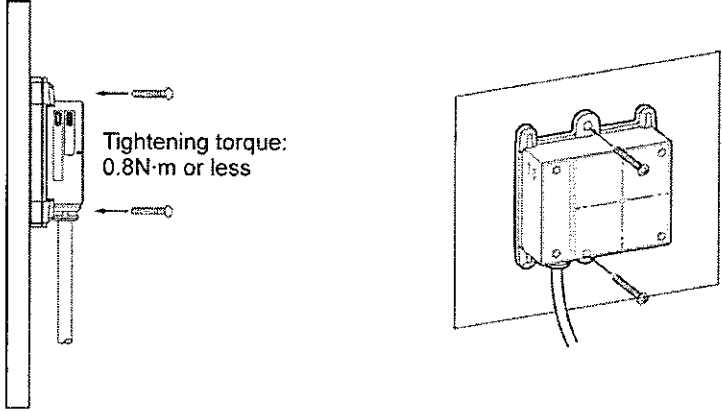
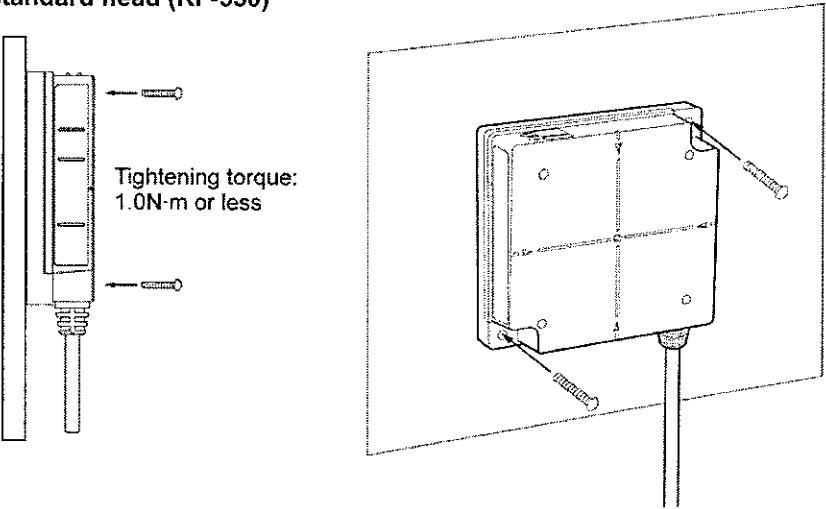| Model	RF-500	RF-550
Parallel mounting	500 mm	750 mm

3-2　How to Mount the Head

●Mounting method

- **RFID compact head (RF-500)**

Tightening torque:
0.8N·m or less

- **RFID standard head (RF-550)**

Tightening torque:
1.0N·m or less
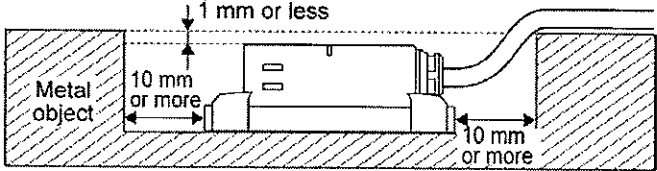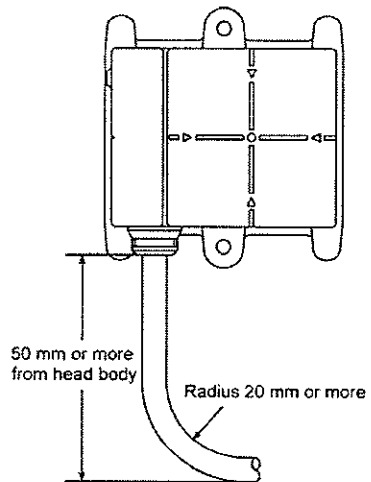
Note

When mounting the advanced-function RFID system imbedded in a metal block, allow 1 mm or less between the top of the head and the surface of the metal block and at least 10 mm around the head.
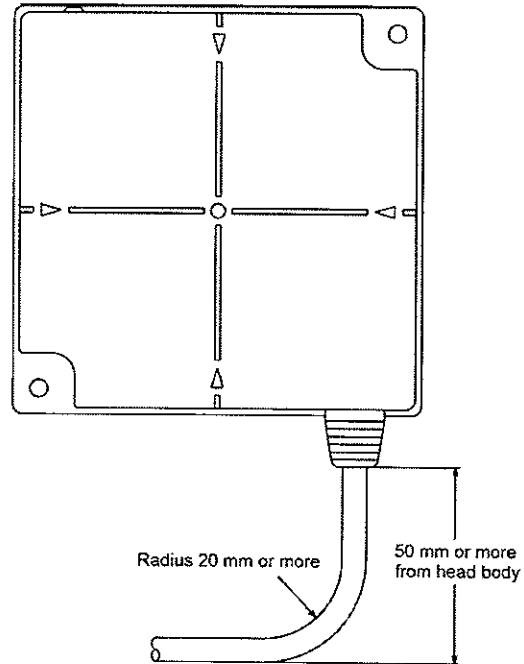
1 mm or less

Metal object

10 mm or more

10 mm or more

20

●Bending the cable

When bending the cable, observe the following bending radii.

- **RFID compact head (RF-500)**

50 mm or more
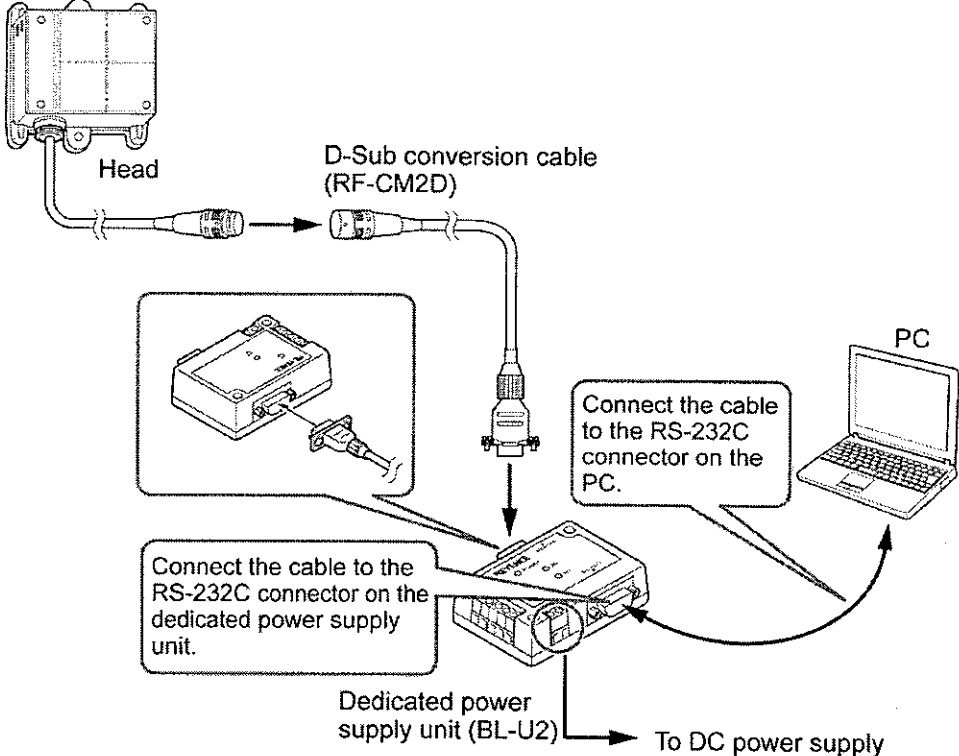from head body

Radius 20 mm or more

- **RFID standard head (RF-550)**

Radius 20 mm or more

50 mm or more
from head body

3-3 Connections (wiring)

■Connecting the head and dedicated power supply unit (BL-U1/BL-U2)

Head

D-Sub conversion cable
(RF-CM2D)

PC

Connect the cable
to the RS-232C
connector on the
PC.

Connect the cable to the
RS-232C connector on the
dedicated power supply
unit.

Dedicated power
supply unit (BL-U2)

To DC power supply

3-4 IC Tag Installation Environment

Avoid installing IC tags in the following locations:

- Locations where corrosive or flammable gas, and iron powder is present
- Locations whose ambient temperature exceeds the storage temperature range, or locations subject to condensation caused by sudden changes in temperature
- Inside microwave ovens

## 3-5 How to Mount IC Tags

■Precautions

Pay attention to the following points when mounting IC tags:

- Do not machine IC tags. For example, do not grind or drill the IC tag body.
- Do not apply excessive force to the IC tag body, for example, by mounting them on curved surfaces.
- Avoid mounting IC tags in contact with metal objects or near metal objects.

IC tags may warp in environments subject to repeated temperature change to and from low and high temperatures. This, however, does not affect their functions.

■IC tag mounting direction

Mount IC tags so that its front surface is parallel to the front surface of the head.

Side view
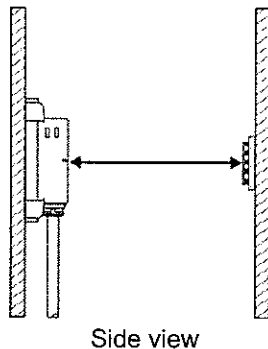
IC tags can be mounted on metal objects. However, the attachment is needed as its communication distance is impaired. IC tags can be mounted with metal objects on its rear side or imbedded in metal objects.

When mounting an IC tag in a metal object, allow at least the following distances around the tag.

Model	Distance
RF-T5P10	20 mm
RF-T5F20	20 mm
RF-T5P30	10 mm

The following table summarizes the tightening torque when mounting IC tags.

Model	Tightening Torque
RF-T5P10	0.3 to 0.5 N·m (when attachment is used)
RF-T5F20	0.3 to 0.5 N·m
RF-T5F30	0.5 to 1.0 N·m

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

cs Česky [Czech]	KEYENCE CORPORATION tímto prohlašuje, že tento RF-500/RF-550 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 RF-500/RF-550 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt KEYENCE CORPORATION, dass sich das Gerät RF-500/RF-550 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 RF-500/RF-550 vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, KEYENCE CORPORATION, declares that this RF-500/RF-550 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 RF-500/RF-550 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 RF-500/RF-550 ΣΥΜΜΟΡΦΩΝΕΤΑΙ 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 RF-500/RF-550 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 RF-500/RF-550 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 RF-500/RF-550 atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
lt Lietuvių [Lithuanian]	Šiuo KEYENCE CORPORATION deklaruoja, kad šis RF-500/RF-550 atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl Nederlands [Dutch]	Hierbij verklaart KEYENCE CORPORATION dat het toestel RF-500/RF-550 in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt Malti [Maltese]	Hawnhekk, KEYENCE CORPORATION, jiddikjara li dan RF-500/RF-550 jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, KEYENCE CORPORATION nyilatkozom, hogy a RF-500/RF-550 megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

[pt] Português [Portuguese]	KEYENCE CORPORATION declara que este RF-500/RF-550 está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
[sl] Slovensko [Slovenian]	KEYENCE CORPORATION izjavlja, da je ta RF-500/RF-550 v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
[sk] Slovensky [Slovak]	KEYENCE CORPORATION týmto vyhlasuje, že RF-500/RF-550 spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
[fi] Suomi [Finnish]	KEYENCE CORPORATION vakuuttaa täten että RF-500/RF-550 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 RF-500/RF-550 står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Íslenska [Icelandic]	Hér með lýsir KEYENCE CORPORATION yfir því að RF-500/RF-550 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 RF-500/RF-550 er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

KEYENCE

KEYENCE CORPORATION
1-3-14, Higashi-Nakajima, Higashi-Yodogawa-ku,
Osaka, 533-8555, Japan
PHONE: 81-6-6379-2211 FAX: 81-6-6379-2131

株式会社 キーエンス

〒533-8555　大阪市東淀川区東中島1-3-14
Tel 06-6379-1121　Fax 06-6379-1120

お問い合わせ窓口 📞**0120-66-3000***
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AFFILIATED COMPANIES

KEYENCE CORPORATION OF AMERICA
PHONE: 201-930-0100
FAX: 201-930-0099

KEYENCE DEUTSCHLAND GmbH
PHONE: 06102-36 89-0
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