PalmSecure

U3PS-LB33-01ENZ3

FUJITSU Biometric Authentication

PalmSecure™ SDK V02

Hardware Drawings

for PalmSecure™ Sensor V2

FUJITSU

◆ Revision History

Revision	Issued Date	Revised Page	Modification Details
Rev. 1	Jul 2020	Entire document	Newly created

◆ Introduction

Thank you for purchasing PalmSecure™ SDK V02 (hereinafter called “this product”).

This document contains labeled drawings of the Sensor. This document also describes how to integrate the Sensor into the target hardware such as an information provision terminal (Kiosk) and how to create your own Palm guide.

July 2020 : Rev. 1

Caution for This Manual

You are required to use this product within the specifications described in this document.

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This Product is designed, developed and manufactured as contemplated for general use, including without limitation, general office use, personal use, household use, and ordinary industrial use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss (hereinafter “High Safety Required Use”), including without limitation, nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system. You shall not use this Product without securing the sufficient safety required for the High Safety Required Use. If you wish to use this Product for High Safety Required Use, please consult with the sales representatives in charge before such use.

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◆ Composition of This Document

This document consists of the following three chapters.

Chapter Title	Descriptions
Chapter 1 The Drawings of the Sensor	Contains labeled drawings of the Sensor.
Chapter 2 Integrating the Sensor into the Target Hardware	Describes how to integrate the Sensor into the target hardware, such as an information provision terminal (Kiosk).
Chapter 3 Creating Your Own Palm Guide	Describes how to create your own Palm guide.

◆ Abbreviations and Common Terms

Abbreviations and common terms used in this document are as follows:

Abbreviations/ Common Term	Description
This product	Abbreviation for “PalmSecure™ SDK V02”.
Sensor	Abbreviation for “PalmSecure Sensor V2”.
Authentication library	Abbreviation for “Authentication library V34”.
“Sensor Instruction Manual”	Abbreviation for “Sensor Instruction Manual for PalmSecure Sensor V2”.

◆ Notations

The following symbols are used in this document.

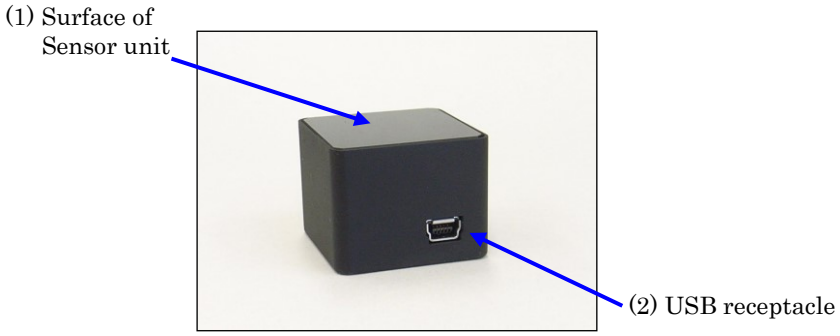
Symbol	Description
!Caution	Describes things that you have to look out for. You must read it.
★Tip	Provides reference information. Read it as necessary.
>See>	Indicates an item to be referred.

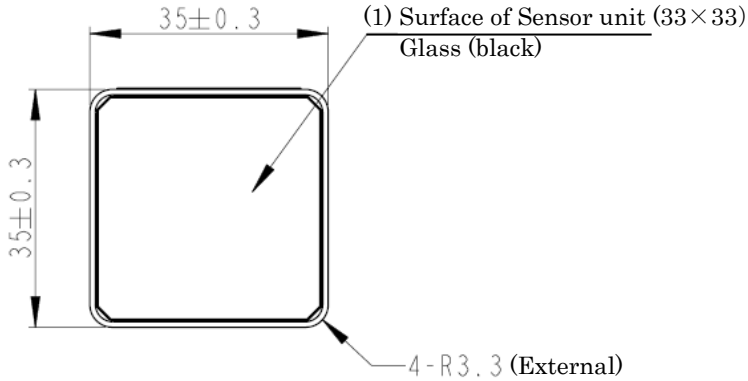
◆ Table of Contents

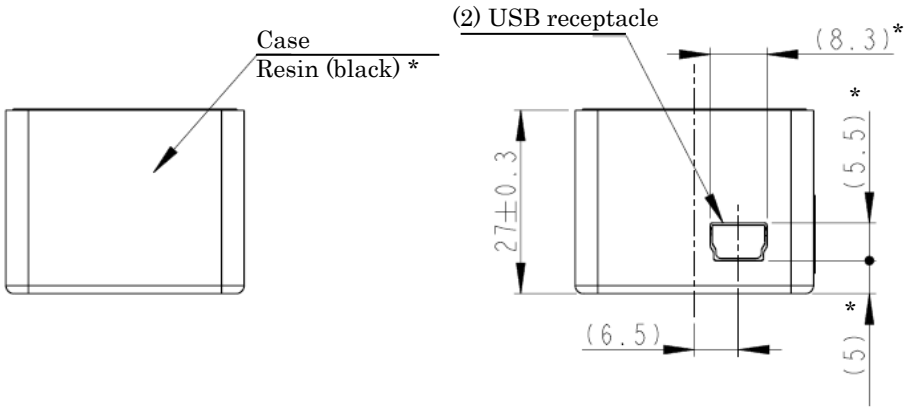
Chapter1 The Drawings of the Sensor

1.1 Sensor Unit

The following illustrations show the physical view and drawings of the Sensor unit.



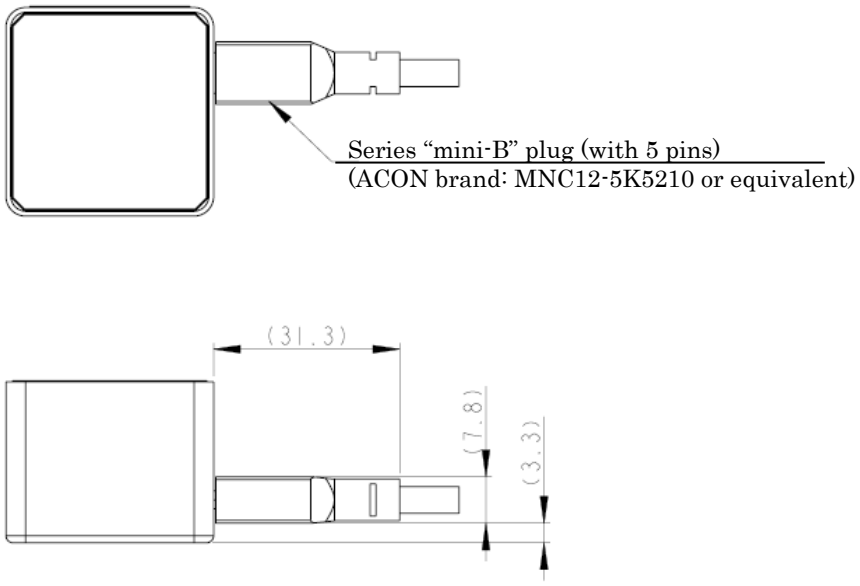




[Unit: ㎜]

★Tip **Dimensions of the Sensor unit when connected to the USB receptacle**

The following shows the dimensions of the Sensor unit when connected to the USB receptacle.



[Unit: mm]

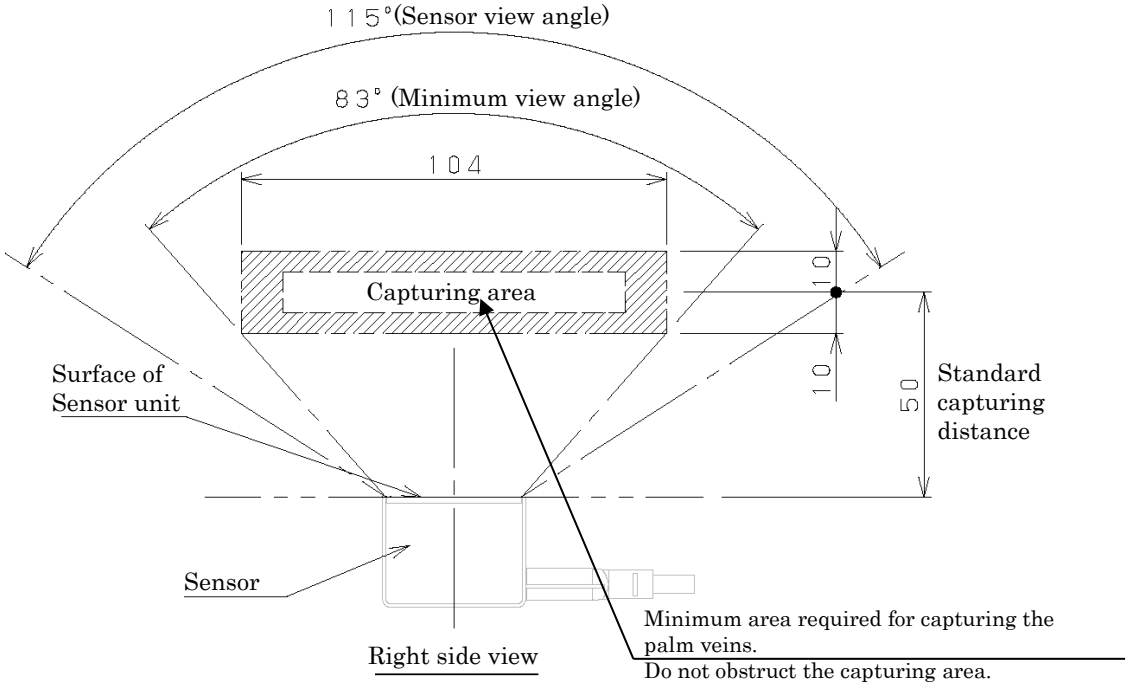
>See> For information on Series “mini-B” plug (with 5 pins), refer to “1.3 USB Interface Cable”.

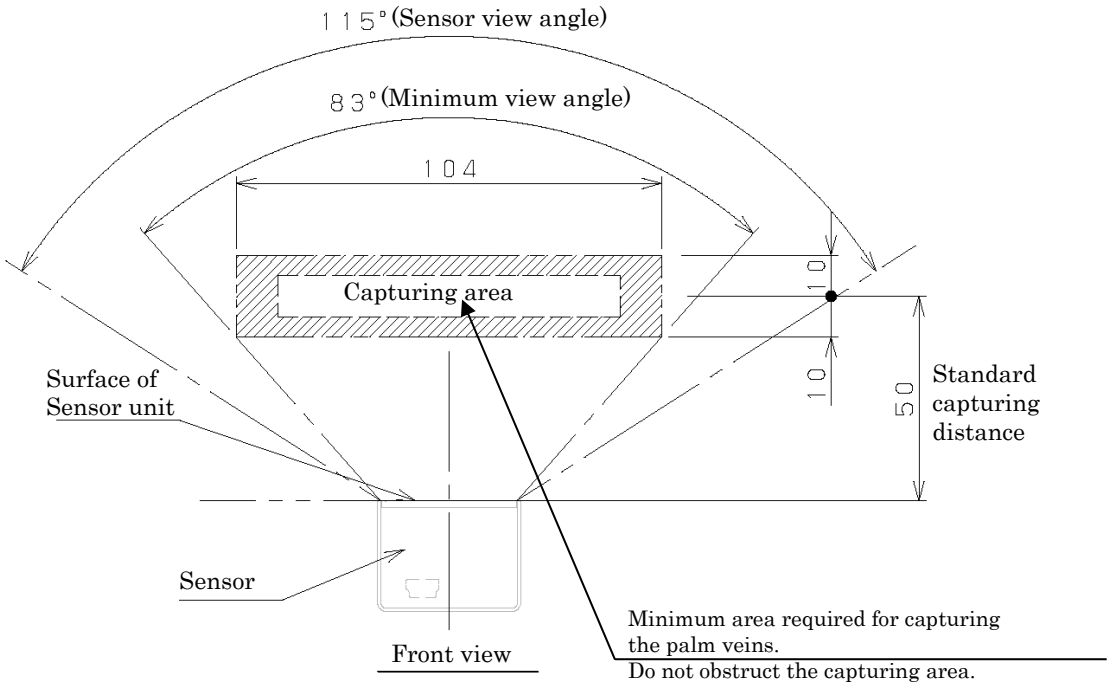
!Caution Viewing angle range of the Sensor

The following illustrations show the viewing angle range of the Sensor. Be sure to secure the minimum view angle as illustrated below.

>See> For information on the minimum view angle, refer to "3.1.3 Capturing Area and Minimum View Angle".

<When using with guide mode>

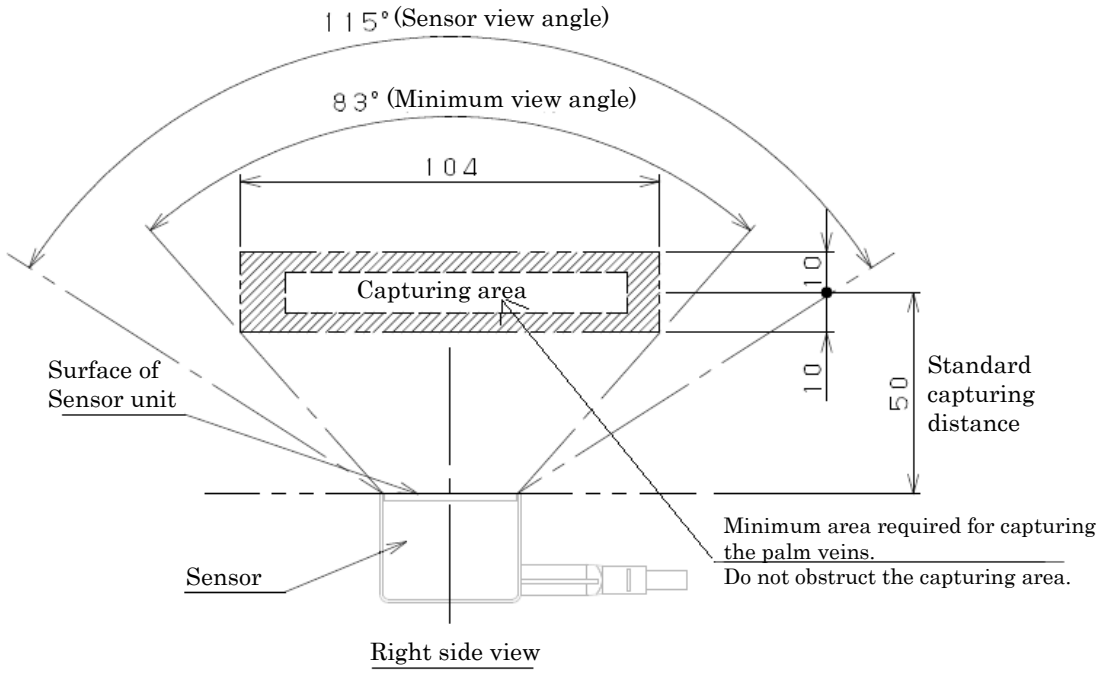


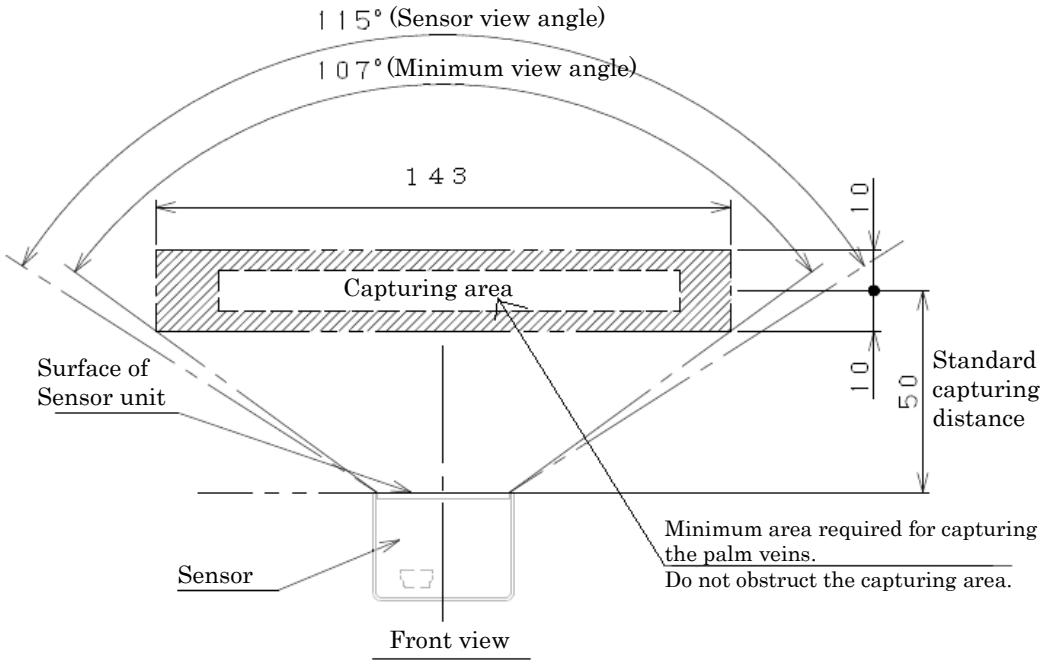


[Unit: mm]

>See> For with guide mode, refer to the "System Development Guide".

<When using without guide mode (In enrollment of palm vein data)>

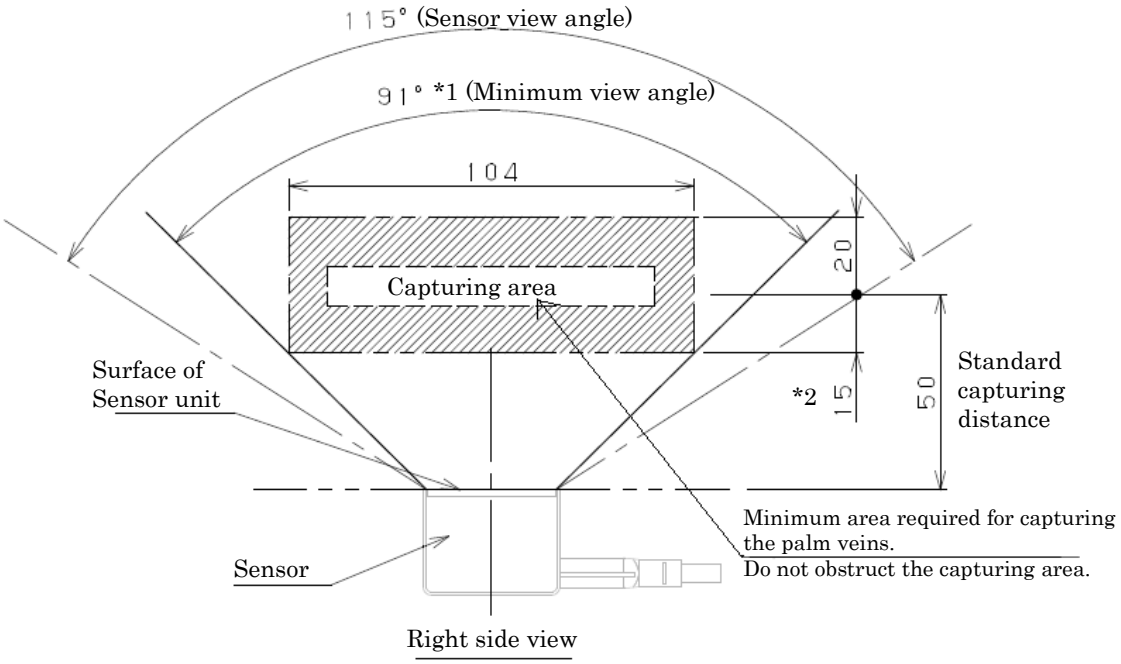


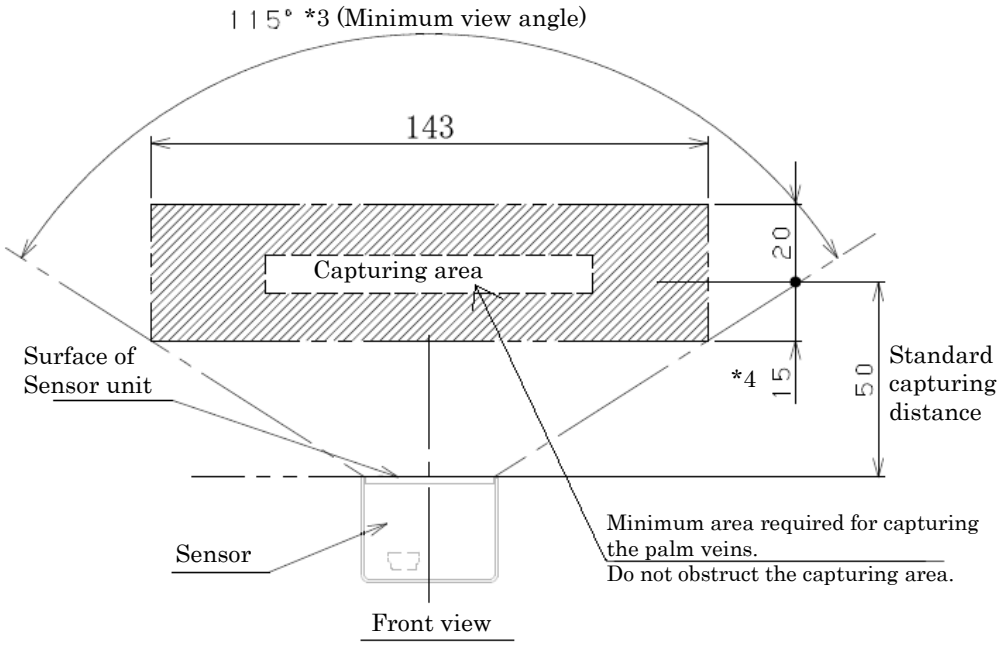


[Unit: ㎜]

>See> For without guide mode, refer to the “System Development Guide”.

<When using without guide mode (In authentication)>





[Unit: mm]

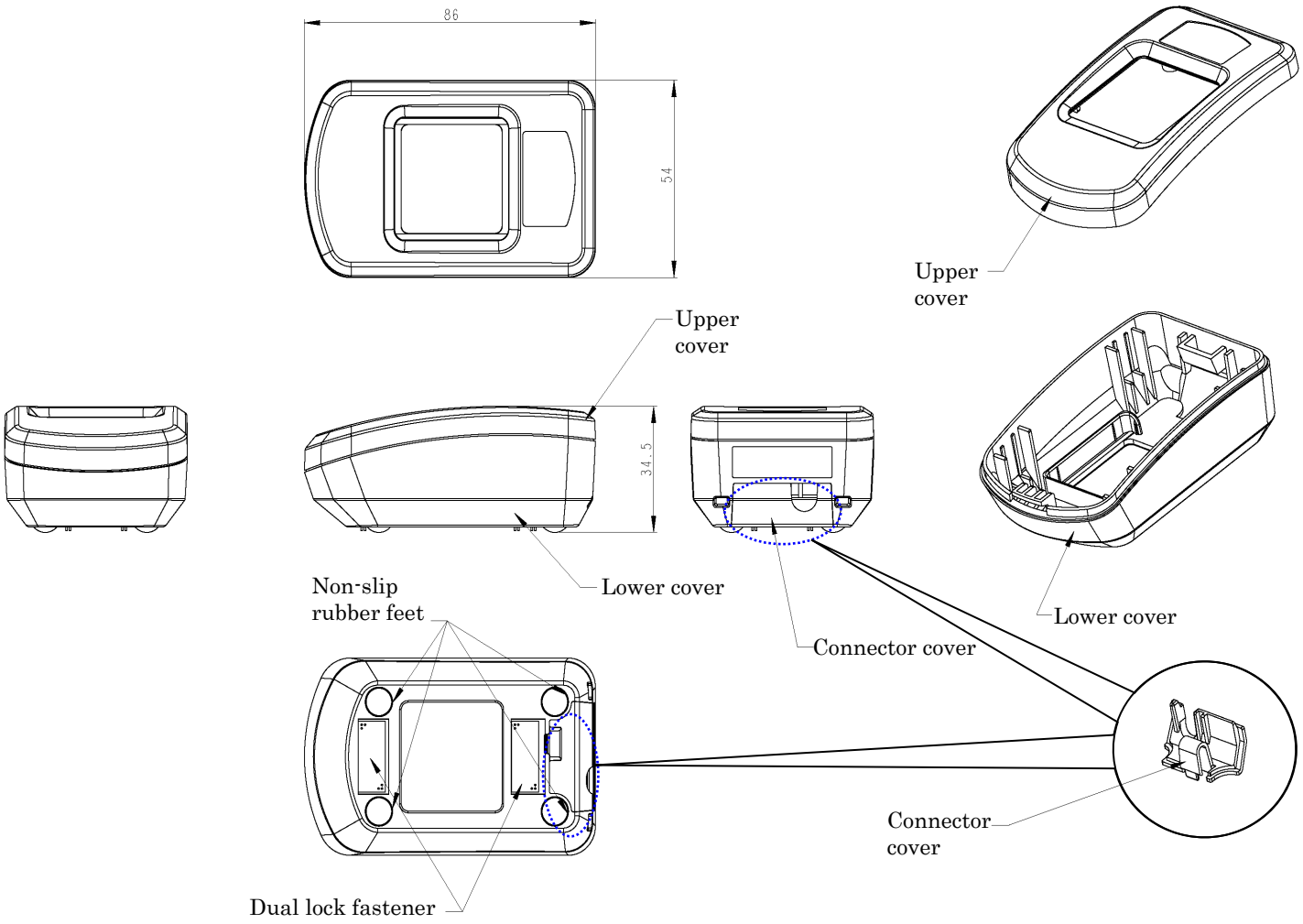
Remark1. If the length of “*2” is 10mm, the angle of “*1” is 83°. This angle is the same as “When using with guide mode” and “When using without guide mode (In enrollment of palm vein data)”.

Remark2. If the length of “*4” is 10mm, the angle of “*3” is 107°. This angle is the same as “When using without guide mode (In enrollment of palm vein data)”.

>See> For without guide mode, refer to the “System Development Guide”.

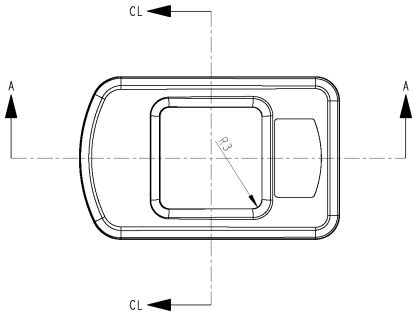
1.2 Holder

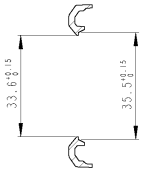
The following illustrations show the physical view and drawings of the Holder.
You also can create your own Holder by referring to this drawing.



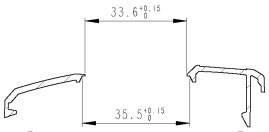
[Unit: ㎜]

<Upper cover>





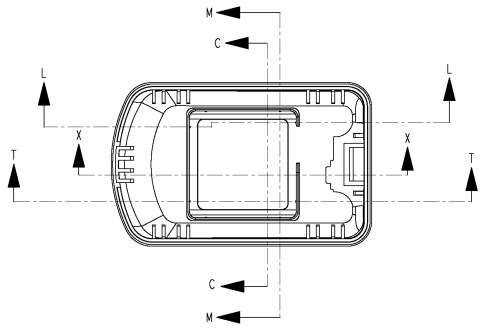
[Cross Section: CL-CL]

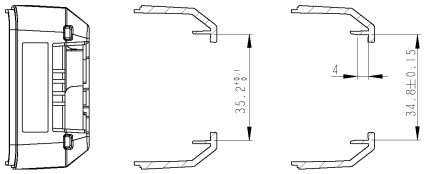


[Cross Section: A-A]

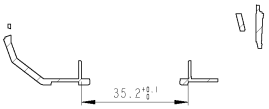
[Unit: ㎜]

<Lower cover>

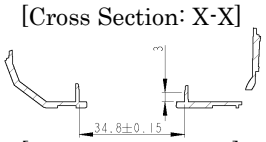




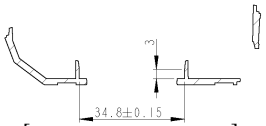
[Cross Section: C-C] [Cross Section: M-M]



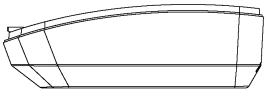
[Cross Section: X-X]



[Cross Section: L-L]



[Cross Section: T-T]

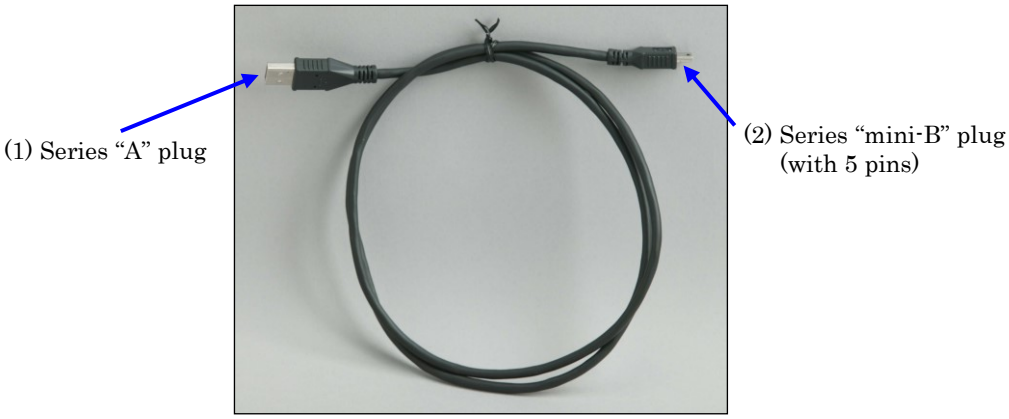


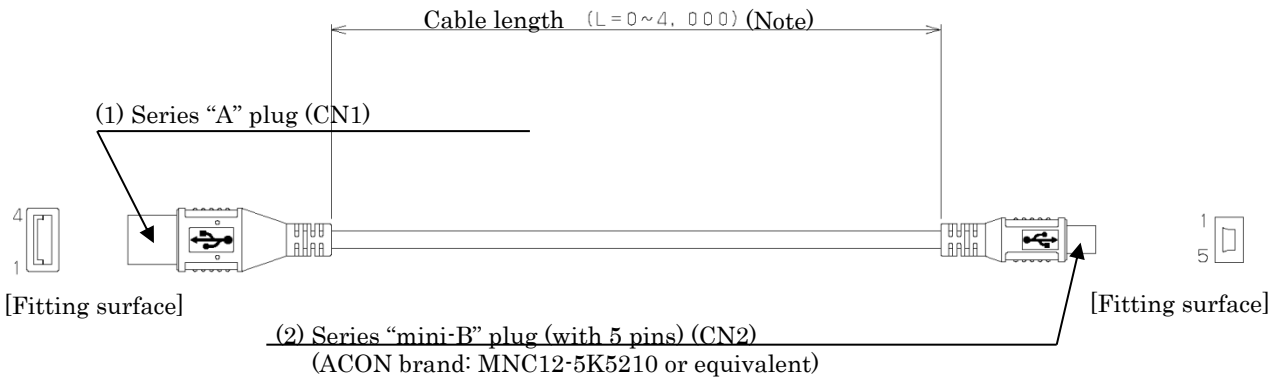
[Unit: ㎜]

1.3 USB Interface Cable

The following illustrations show the physical view and drawings of the USB Interface cable.

You also can create your own USB Interface cable by referring to this drawing.





[Unit: ㎜]

Note) The length of the cable enclosed with this product is 1 m. The maximum operable cable length is 4 m. The cable length does not include the length of the connecter section.

<Wiring diagram>

Pin No. at CN1 Side	Pin No. at CN2 Side	Cable Color	Note
1	1	Red	VBUS
2	2	White	-DADA
3	3	Green	+DATA
4	5	Black	GND
Shell	Shell	Shield	FG

<Material of cable>

- Please use the cable with a shield conforming to the USB2.0 standard.
- The following table shows the recommended cable conductor size.

Item	Description
Signal line (-DATA/+DATA)	28AWG
Power wire (VBUS/GND)	Cable length 4.0m or less, 20AWG or more Cable length 3.3m or less, 22AWG or more Cable length 2.0m or less, 24AWG or more Cable length 1.3m or less, 26AWG or more Cable length 0.8m or less, 28AWG or more

!Caution **USB port of the target hardware to which the USB Interface cable is connected**

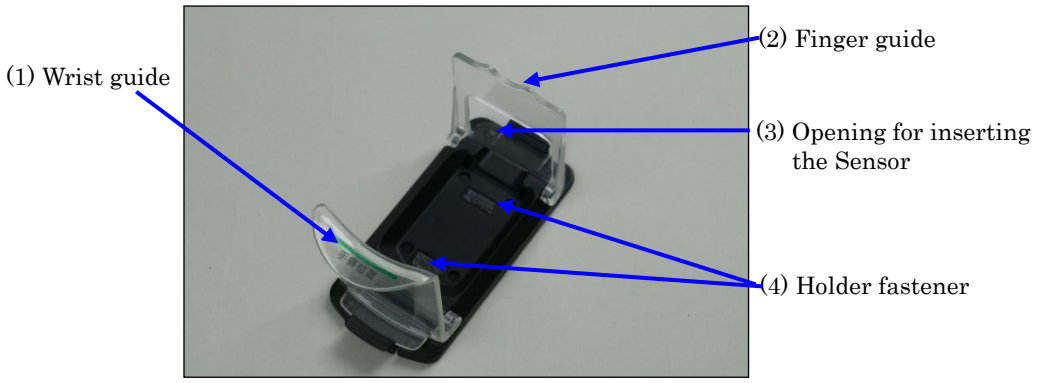
It is recommended that you select the USB port of the target hardware to which the USB Interface cable is connected using direct-mounting to the controller board.
In the case of a USB port that is connected to the controller section in the target hardware by an internal cable, there may be rare occasions (depending on the length of the internal cable and the piece-to-piece variation of the assembly) when a communication error occurs.

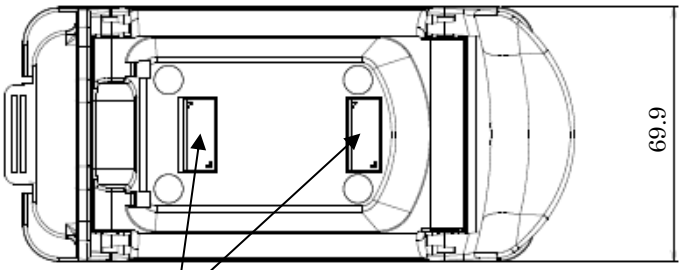
1.4 Palm Guide

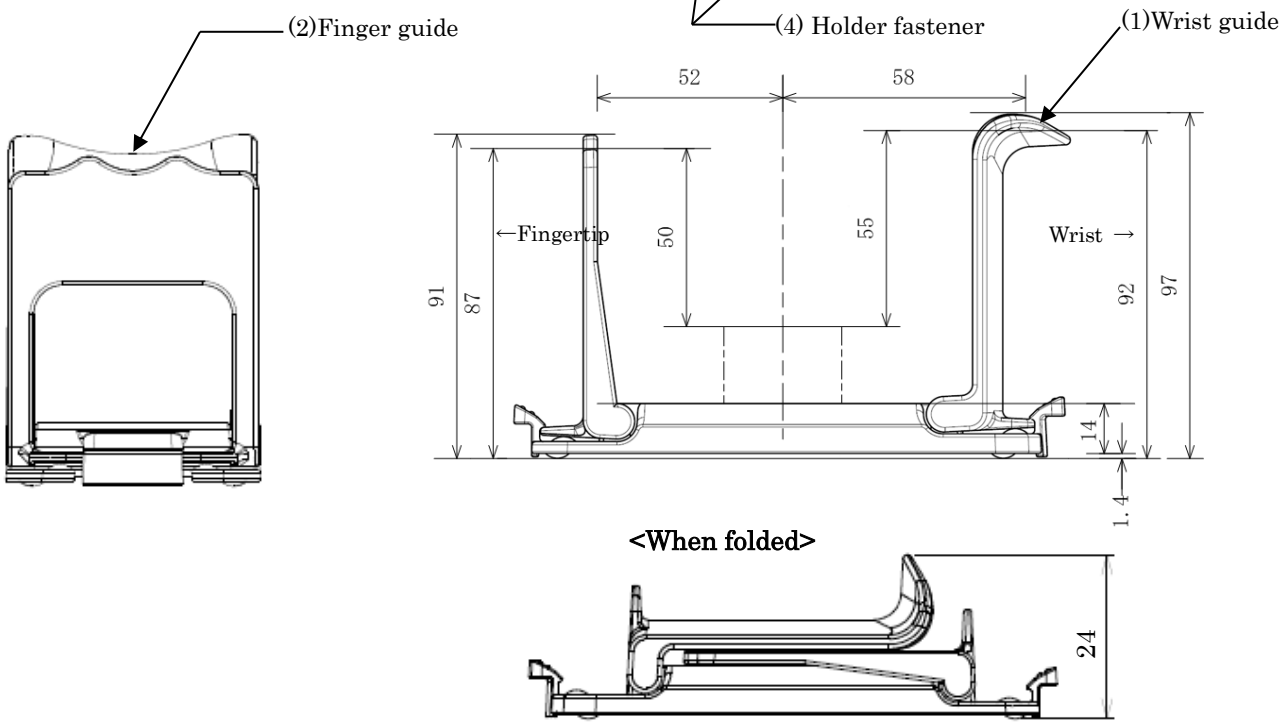
The following illustrations show the physical view and drawings of the Folding guide.

You also can create your own Palm guide by referring to this drawing.

>See> For information on how to create your own Palm guide, refer to "Chapter3 Creating Your Own Palm Guide".

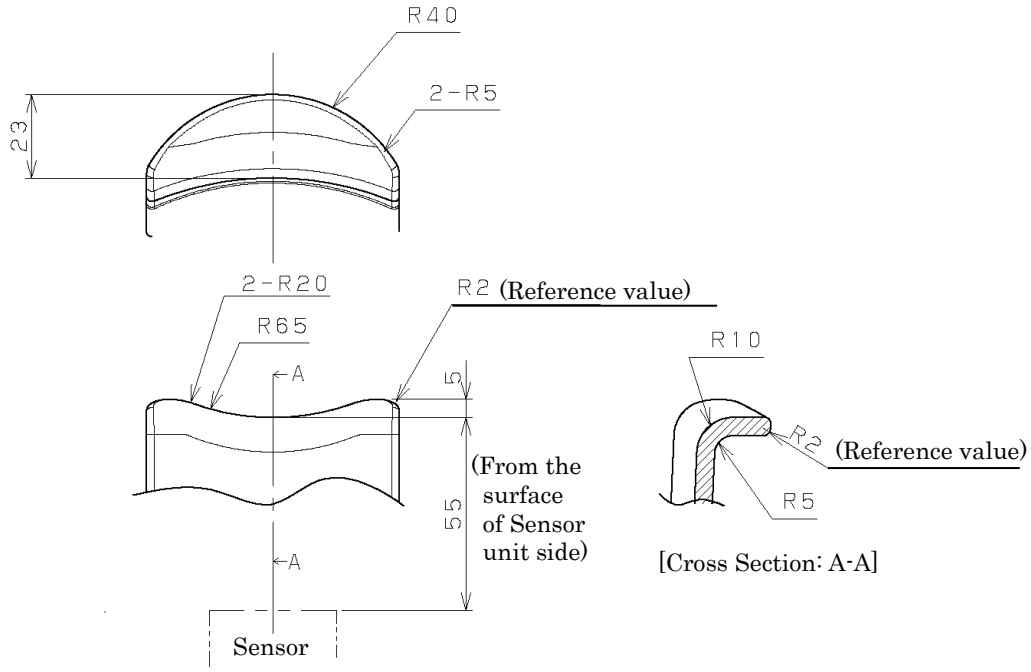






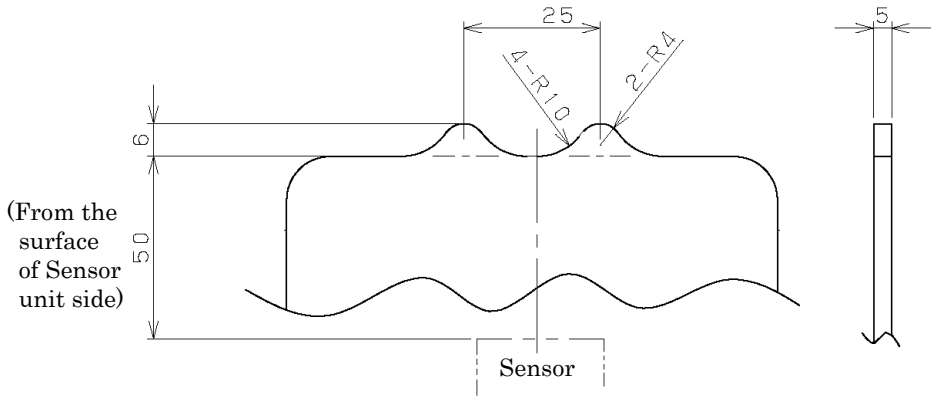
[Unit: ㎜]

<The dimensions of the Wrist guide>



[Unit: ㎜]

<The dimensions of the Finger guide>



[Unit: ㎜]

★Tip **The minimum view angle for the Folding guide**

The Folding guide is designed to secure the minimum view angle for not only without guide mode but also with guide mode.

>See> For information on minimum view angle, refer to "!Caution Viewing angle range of the Sensor" of "1.1 Sensor Unit".

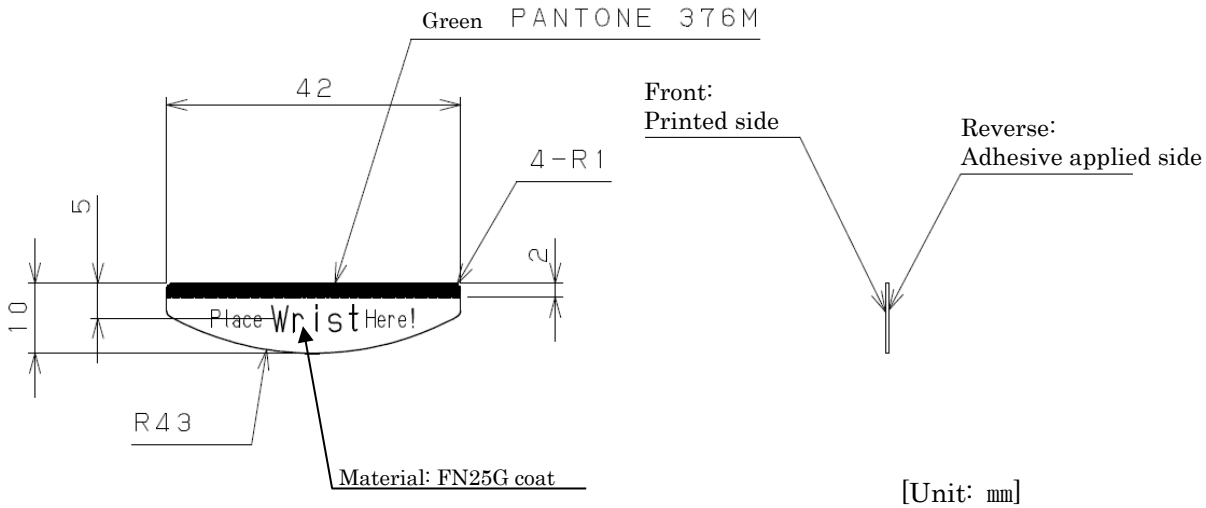
>See> For information on guide mode (with guide mode / without guide mode), refer to the "System Development Guide".

★Tip **Applicable ages for the Folding guide**

The Folding guide is suitable for 7 years old and older.
It is recommended to make a Palm guide for children of 5 to 6 years designed for their palm size.
The Palm guide for children is not provided by Fujitsu Frontech Ltd.

★Tip **Wrist position sticker**

The following illustrations show the wrist position sticker (a sticker to indicate the correct position to place the wrist on the wrist guide).
You can create your own sticker by referring to this drawing.



[Unit: mm]

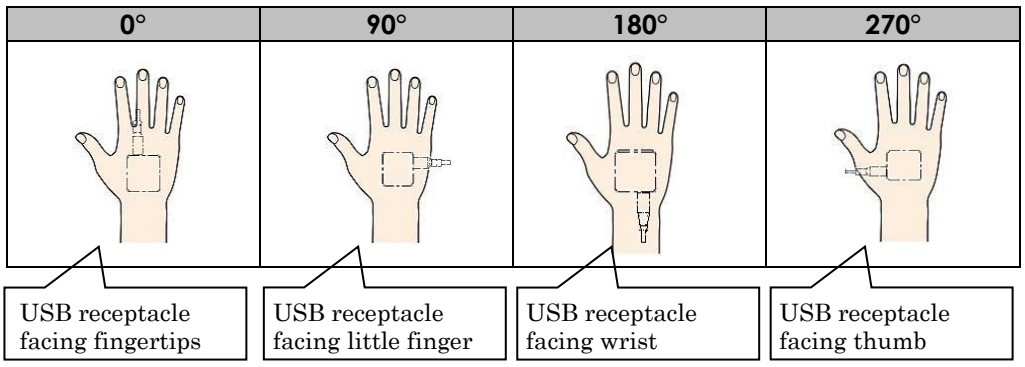
Chapter2 Integrating the Sensor into the Target Hardware

2.1 Requirements for Integrating the Sensor

2.1.1 Angle of the Hand Placement against the Sensor

Make the angle of the hand against the Sensor (capturing angle) 0° in general when integrating the Sensor into a device.

However, one of the following can be selected only when you are using I-format type and with guide mode.



★Tip **Capturing angle for enrollment of palm vein data and authentication**
It is recommended that the capturing angle for enrolling vein data be 0°, and the same capturing angle should be used for authentication with the enrollment. If the capturing angle is different, it may result in lower authentication accuracy compared to the case in which the capturing angle is the same.

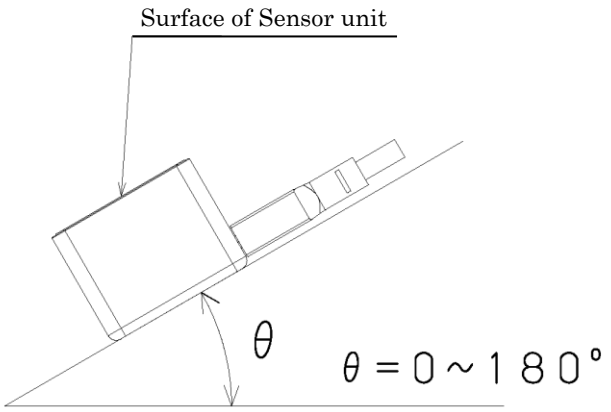
>See> For information on I-format type and without guide mode, refer to the "System Development Guide".

★Tip **About capturing angles in the case of developing the application**
Capturing angle should be also considered in the case of developing the application.

>See> For information on capturing angle in the case of developing the application, refer to the "System Development Guide" and "Authentication Library Reference Guide".

2.1.2 Pitch of the Sensor

The Sensor can be integrated with full direction pitch (0° to 180°).



!Caution **When you would like the Sensor pitched**
Please consider the pitch of the Sensor and the height of the integrated Sensor so that the wrist can be placed without awkwardness.

2.1.3 Anti-Static(ESD)

The anti-static of the Sensor is 8kV.
In the case that anti-static of over 8kV is required, please consider the anti-static on the side of the target hardware chassis to which the Sensor is integrated.

2.1.4 Preventing the USB Interface Cable from Detaching

To ensure that the USB Interface cable does not detach from the Sensor, it is recommended that the USB Interface cable be secured with a nylon clamp, etc. as necessary.

2.1.5 Considerations for External Lights

Install a sunshade where the amount of external light (Natural light is over 3,000 lux for authentication, or over 2,000 lux for enrollment) may affect the operation.

When creating a sunshade, please keep the following points in mind:

- The height of the sunshade should be 200mm above the Surface of sensor unit.
- The material of the sunshade should not transmit near-infrared light (wavelength: 700 to 1,100nm).
- The inside of the sunshade should have the same surface finish as the structure opening area.

  >See> For information on the surface finish of the structure opening area, refer to "2.1.7 Surface Finish of the Structure Opening Area".

- The sunshade should be designed to cover all of Sensor view angle.

  >See> For information on Sensor view angle, refer to "!Caution Viewing angle range of the Sensor" of "1.1 Sensor Unit".

!Caution **Using the without guide mode**

Do not attach the following shade.
Palm veins cannot be captured if a shade like ones illustrated below is attached since the horizontal minimum view angle cannot be secured.

<View from the side>

<View from above>

>See> For information on without guide mode, refer to the "System Development Guide".

>See> For information on minimum view angle, refer to "!Caution Viewing angle range of the Sensor" of "1.1 Sensor Unit".

2.1.6 Considerations for Integrating the Sensor in a Keyboard

Use separate ports for the Keyboard and the Sensor. The port for the Sensor should supply 500 mA.

2.1.7 Surface Finish of the Structure Opening Area

For coating, a matt black finish is recommended in order to suppress reflection of light.
In the case of molded resin, it is recommended to use black resin and matt grain finish (TANAZAWA HAKKOSHA CO. LTD. (Note 1): TH-138A or equivalent, or MOLD TECH JAPAN CO. LTD. (Note 2): MTJ-104 or equivalent) to suppress reflection of light.
Reflection of light interferes with extracting palm veins; therefore, palm veins cannot be captured correctly.

Note 1) For information on TANAZAWA HAKKOSHA CO. LTD., refer to the URL below. (E-mail inquiry)
URL: http://www.tanazawa.co.jp/

Note 2) For information on MOLD TECH JAPAN CO. LTD, refer to the URL below.
URL: https://www.mold-tech.com/

2.1.8 Vandal Glass

Vandal glass is not supported when integrating the Sensor in automatic teller machines (ATM).
If required, please use anti-vandal doors.

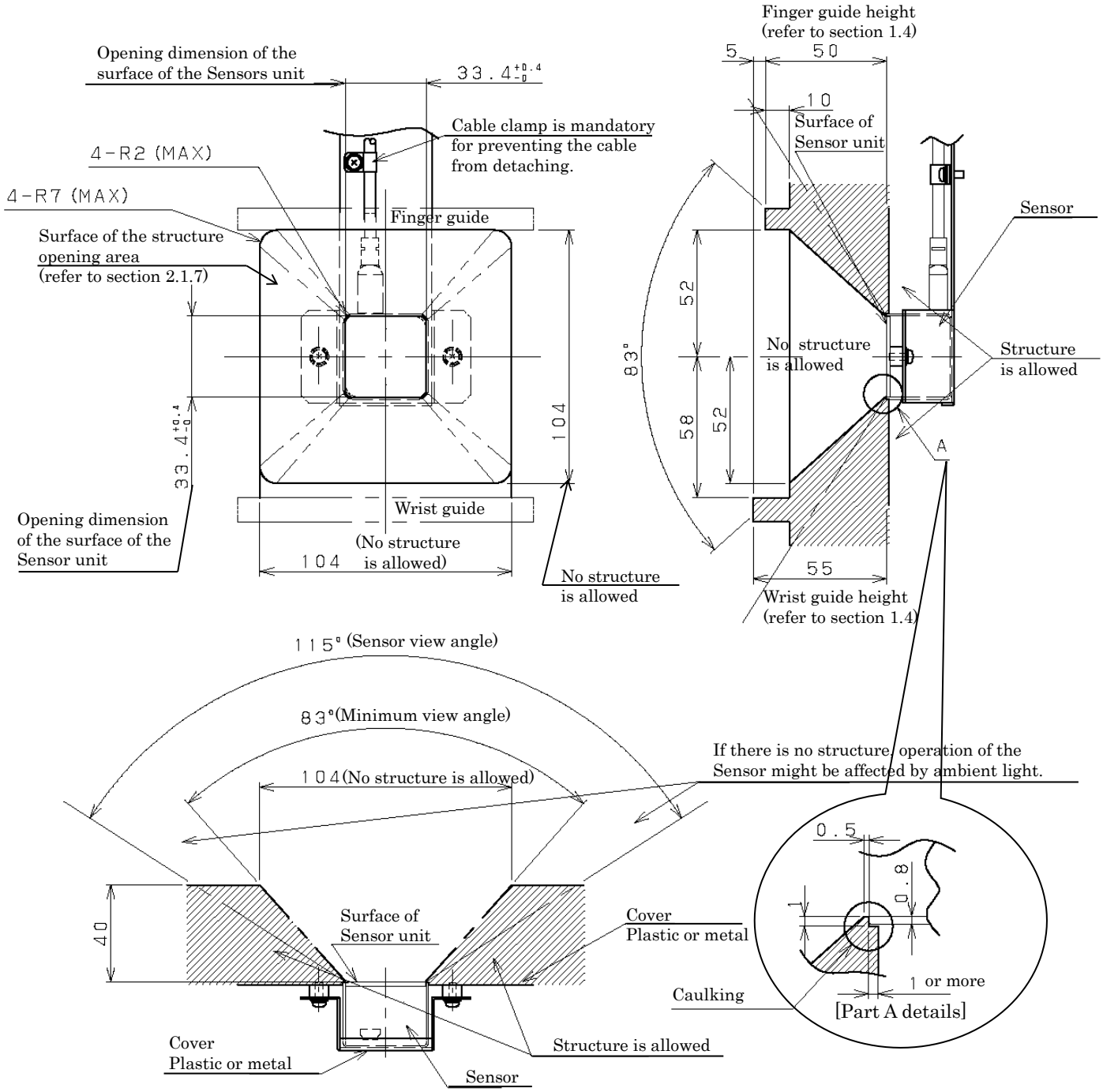
2.1.9 Other Considerations

When integrating the Sensor, do not place a protective glass over the Sensor.
The palm vein cannot be captured correctly when a protective glass is inserted between the Sensor and the palm.

2.2 Example of Integrating the Sensor

Following diagrams illustrate an example of embedding the Sensor in order to reduce the effects of outside light.

This example assumes with guide mode.



[Unit: mm]

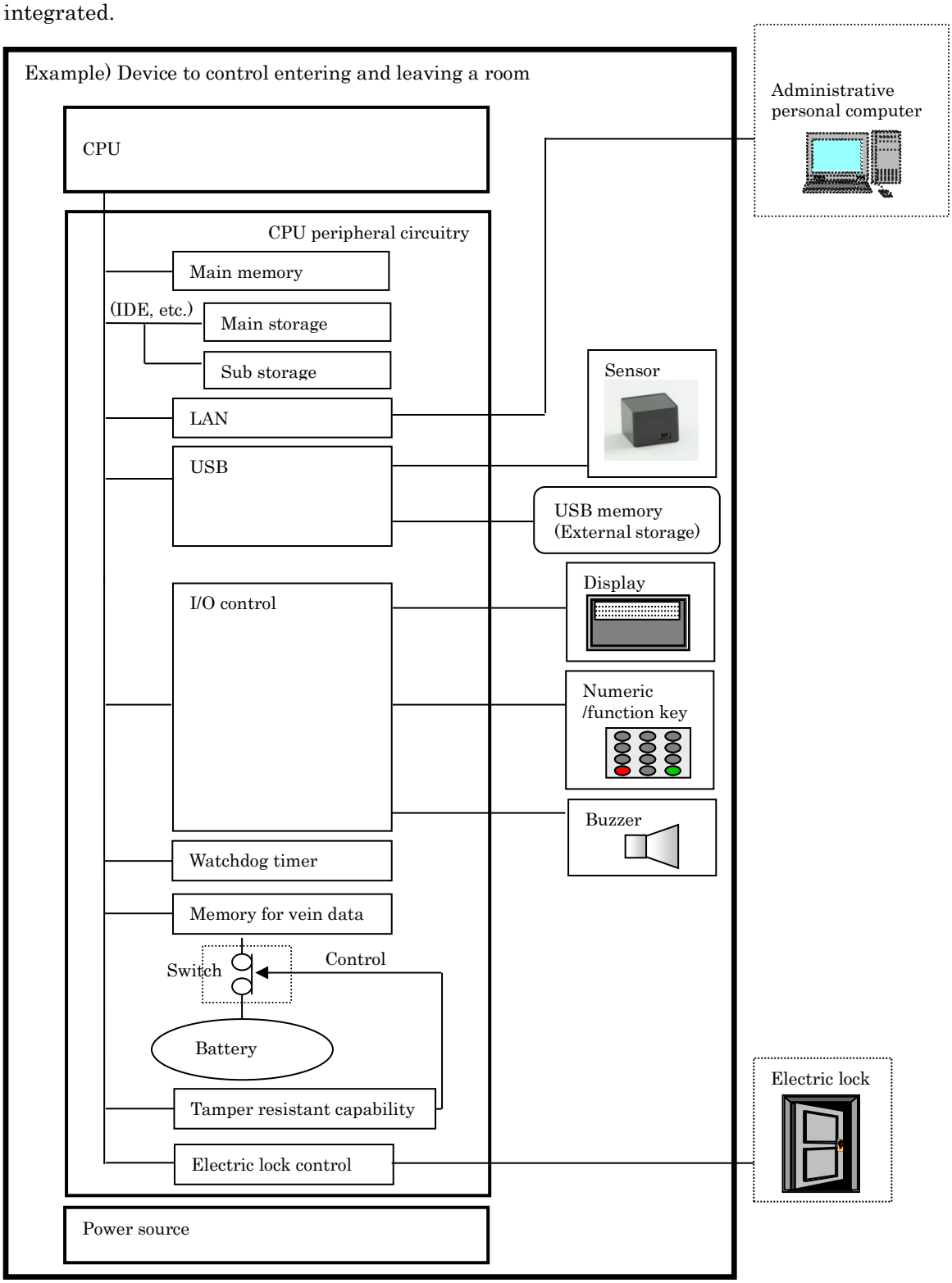
>See> For information on with guide mode, refer to the “System Development Guide”.

>See> For information on the Wrist guide and Finger guide, refer to <The dimensions of the Wrist guide> and <The dimensions of the Finger guide> in “1.4 Palm Guide”, or “3.2.1 Palm Guide for Better Hand Positioning”.

>See> For information on Sensor view angle and minimum view angle, refer to “!Caution Viewing angle range of the Sensor” of “1.1 Sensor Unit”.

2.3 Hardware Configuration Example for a Unit with the Sensor Integrated

The following shows a sample hardware configuration for a unit with the Sensor integrated.



Item	Requested Specifications	Note
CPU	Refer to the “System Development Guide”.	Before starting development, it is recommended that you verify the processing speed of the Sample application when it operates on the target equivalent hardware (CPU, memory).
Main memory	Where the OS, Authentication library, drivers, and applications reside	
Main storage	Make Read-only Stores/boots OS, Authentication library, Storage of Application/boot. * If the hardware does not have backup for a power outage (such as UPS and Super Capacitor), read/write files are stored separately from the Main storage to prevent the system from being crushed as a result of destroyed files due to a power cut.	Consists of Flash ROM bare chip, CF card, etc.
Sub storage	Read/write Stores log information and vein data, etc. * If the hardware does not have backup for a power outage (such as UPS and Super Capacitor), read/write files are stored separately from the Main storage to prevent the system from being crushed as a result of destroyed files due to a power cut.	Consists of Flash ROM bare chip, CF card, etc. If the hardware has backup for power outage (such as UPS and Super Capacitor), Sub storage is unnecessary because all data are stored in the Main storage.
LAN	Connects to the Administrative personal computer.	
USB	USB 2.0 only. It is recommended that more than two ports be implemented.	
External storage (USB memory)	Ability to connect to USB memory sticks, etc. is recommended.	Uses to collect vein data backup and log information and to modify the system.
I/O control	Display/numeric/functionkey/buzzer should be implemented as required.	Implements interface according to the I/O specifications.
Watchdog timer	Implementation is recommended for automatic recovery in the event of an unexpected system hang-up.	For 24 hours unattended operation
Memory for vein data	To implement this and next functionality if vein data must be completely protected from being leaked externally.	Loads battery for backup in the event of a power outage. Memory capacity depends on the amount of vein data and the number of people who can enroll.
Tamper resistant capability	Detects unauthorized physical access (destroy and disassemble the units, etc.) to the devices that contain vein data for the purpose of stealing vein data. When there is unauthorized access, the tamper resistant capability deletes all vein data automatically.	
Electric lock control	Loads the electric lock control function.	Electric lock direct control Standard interface such as Weigand

Chapter3 Creating Your Own Palm Guide

3.1 Conditions for Creating a Palm Guide

3.1.1 Heights of the Wrist Guide and Finger Guide

Heights of the Wrist guide and Finger guide are important when creating your own Palm guide. The heights of the Wrist guide and Finger guide must be adjusted to allow the palm to be placed parallel to the Sensor.
For example, the height of the Wrist guide is adjusted 55mm and the Finger guide to 50mm for the Folding guide to ensure that the palm is parallel to the Sensor.

>See> For information on the Folding guide, refer to “1.4 Palm Guide”.

Palm veins cannot be captured correctly and completely if the heights of the Wrist guide and Finger guide are not appropriate, or the palm is not placed parallel to the Sensor. The use of inappropriately designed Palm guide will result in poor authentication accuracy.

3.1.2 Distance between the Wrist Guide and Finger Guide

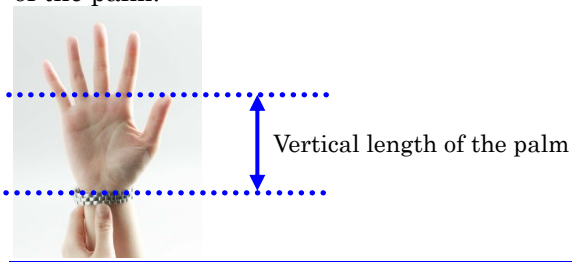
If you are creating your own Palm guide, it must be designed to suit the user's palm size (vertical length of the palm). Therefore, the distance between the Wrist guide and Finger guide becomes important. The distance between the Wrist guide and Finger guide must be adjusted to allow the center of the palm to be placed above the Sensor.

For example, the distance between the Wrist guide and Finger guide is 110mm for the Folding guide to match position the center of the palm above the Sensor.

〉See〉 For information on the Folding guide, refer to "1.4 Palm Guide".

★Tip **Vertical length of the palm**

The following illustrates the range which signifies the vertical length of the palm.



Palm veins cannot be captured correctly and completely if the distance between Wrist guide and Finger guide does not match the palm size of the user or the center of the palm is not placed above the Sensor. The use of inappropriately designed Palm guide will result in poor authentication accuracy.

3.1.3 Capturing Area and Minimum View Angle

The capturing area is the minimum necessary area for capturing palm veins. You must not allow any part of the structure to obstruct the capturing area when creating your own Palm guide. Securing the minimum view angle of the Sensor is important to achieve the clear capturing area.

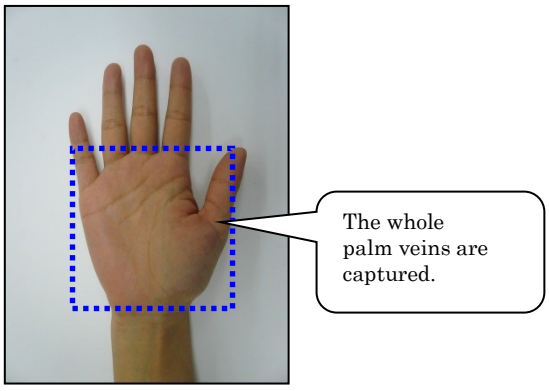
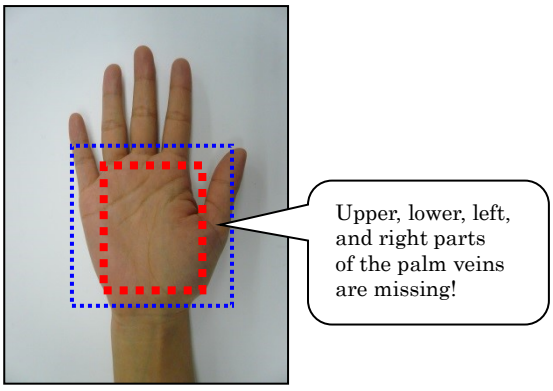
>See> For information on capturing area and minimum view angle, refer to "!Caution Viewing angle range of the Sensor" of "1.1 Sensor Unit".

!Caution Minimum view angle and guide mode

The required minimum view angle is different between with guide mode and without guide mode. Therefore, you must determine the guide mode before creating your own Palm guide.

>See> For information on guide mode (with guide mode / without guide mode), refer to the "System Development Guide".

Palm veins cannot be captured correctly and completely if the minimum view angle is not secured because the upper, lower, left, or right part of the palm veins will be missing. The use of inappropriately designed Palm guide will result in poor authentication accuracy.

Minimum view angle is secured	Minimum view angle is not secured
[Captured area of palm veins (blue square)]	[Captured area of palm veins (red square)] * Blue square is the correct capturing area
	

3.1.4 Surface Finish for the Palm Guide Opening Area

Apply a process equivalent to the surface finish of the structure opening area on the Palm guide opening area to suppress light reflections when creating your own Palm guide.

>See> For information on the Palm guide opening area, refer to "!Caution Palm guide opening area" on the next page.

>See> For information on surface finish of the structure opening area, refer to "2.1.7 Surface Finish of the Structure Opening Area".

Reflection of light interferes with extracting palm veins; therefore, palm veins cannot be captured correctly.

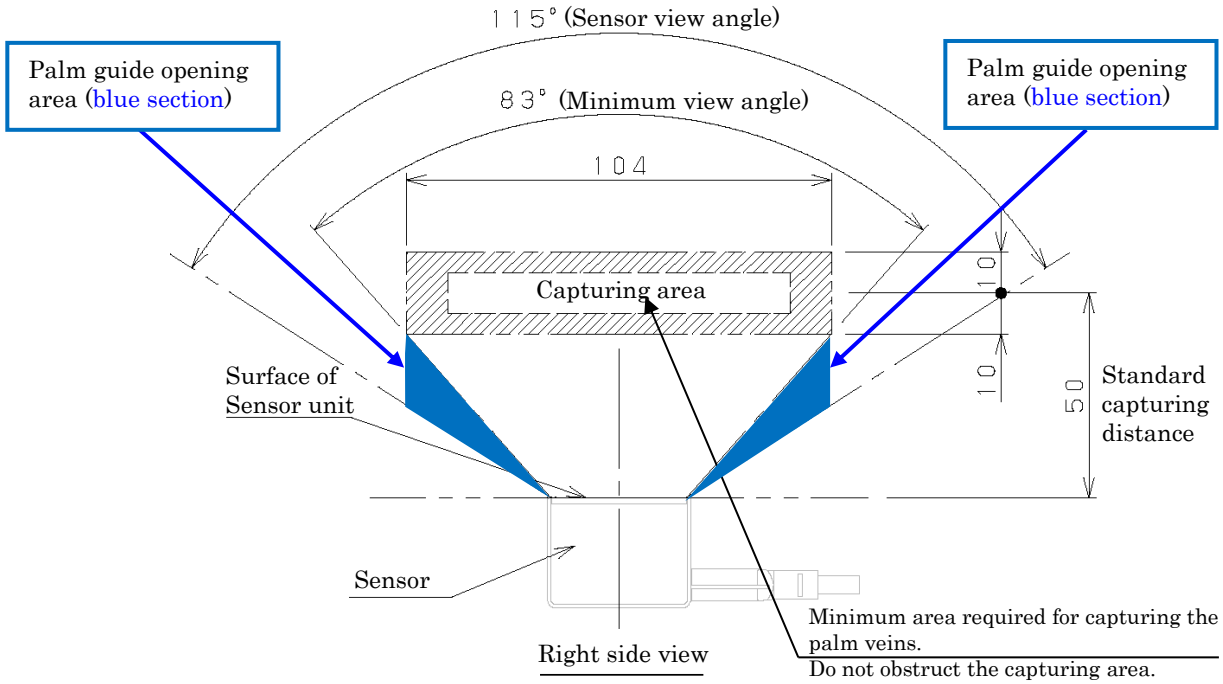
The process equivalent to surface finish of the structure opening area is not applied to the Folding guide since it is designed in the way where no part of the structure obstructs the Palm guide opening area.

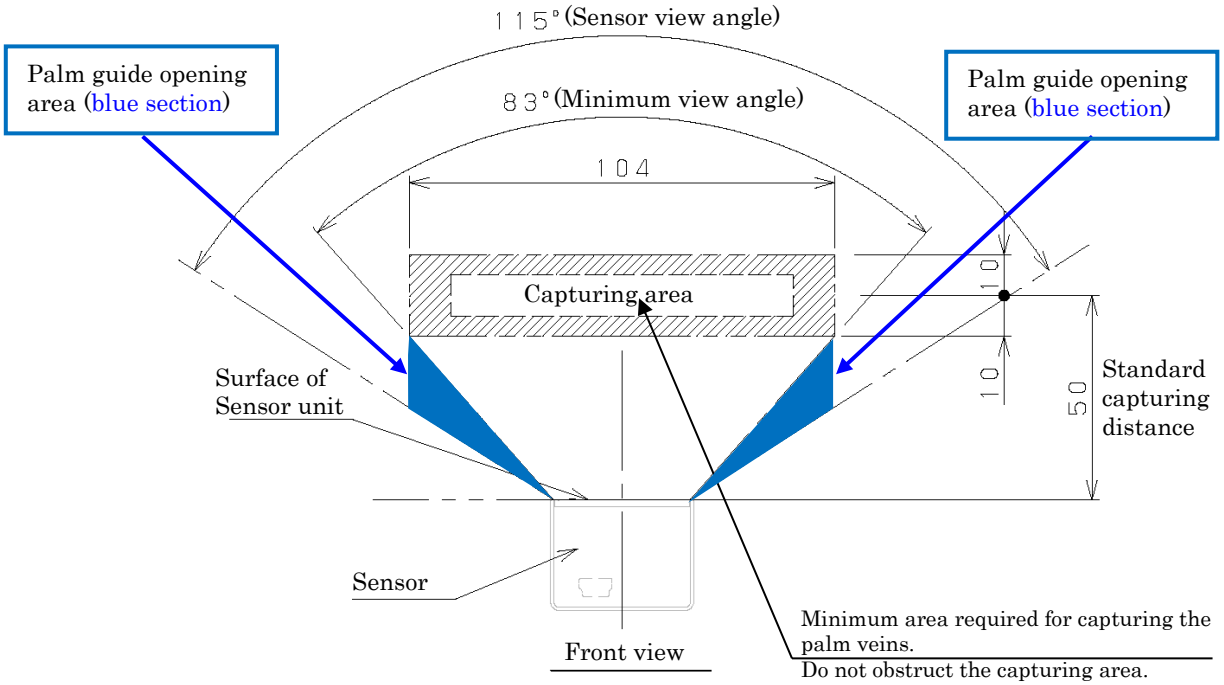
>See> For information on the Folding guide, refer to "1.4 Palm Guide".

!Caution Palm Guide Opening Area

The following indicates the Palm guide opening area. Be sure to secure the opening area of the Palm guide as illustrated below.

<When using with guide mode>

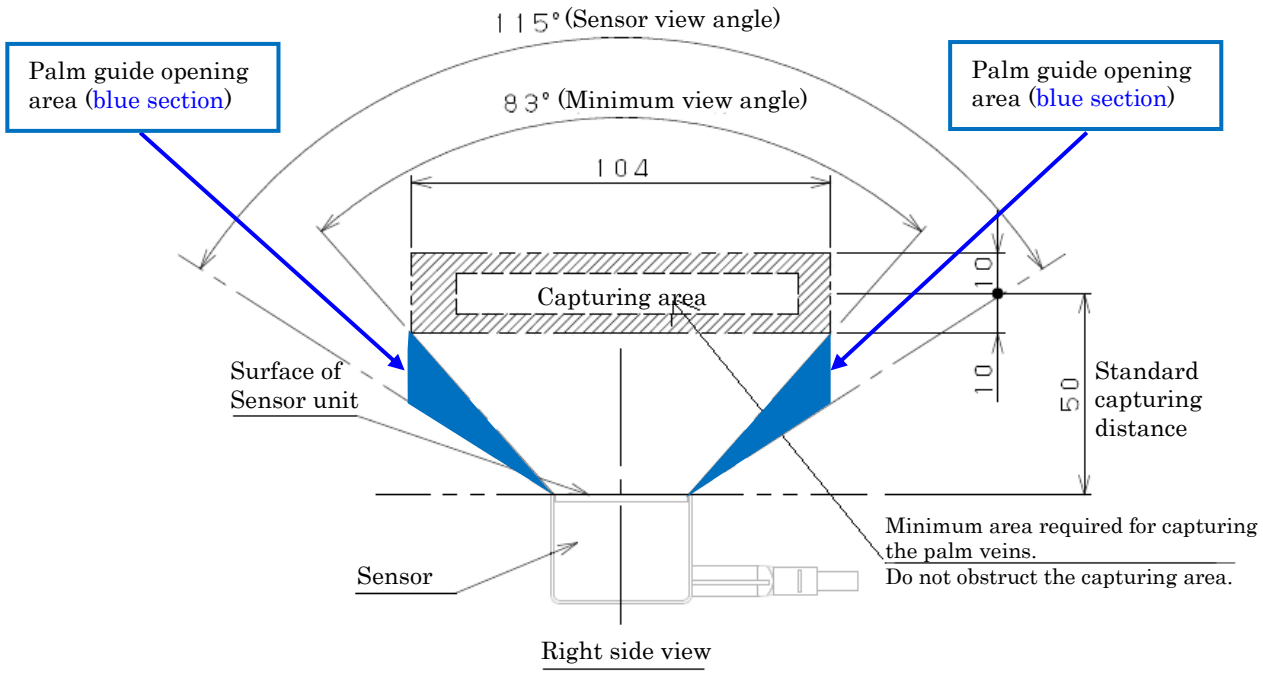


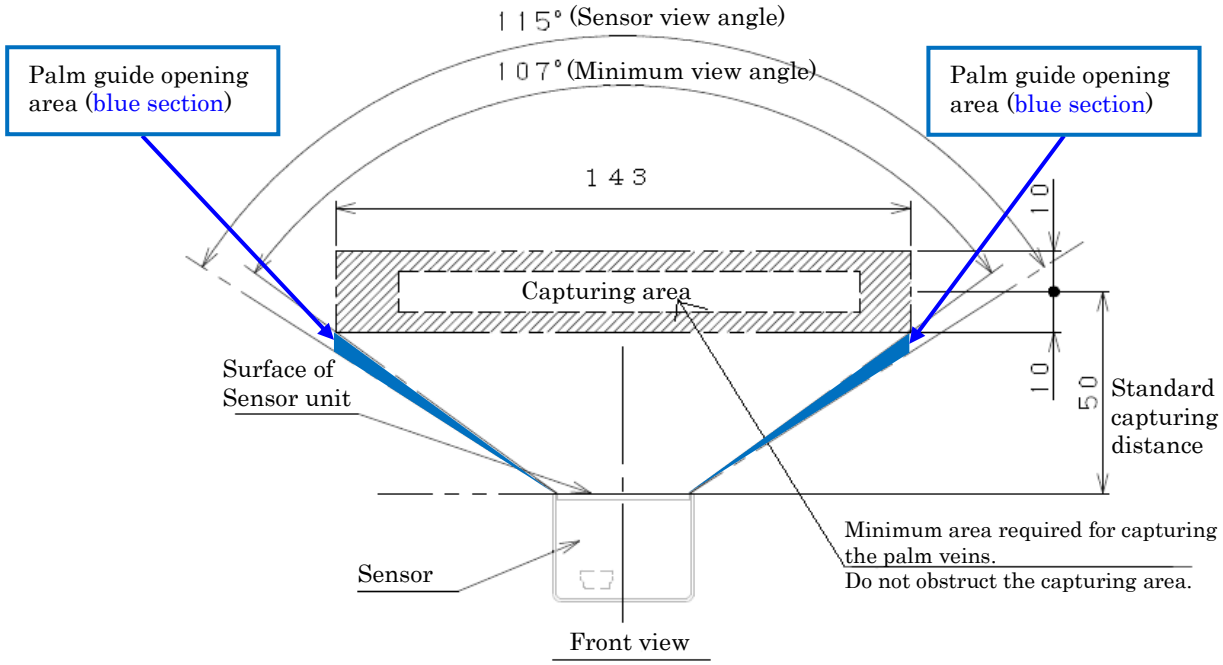


[Unit: mm]

>See> For with guide mode, refer to the “System Development Guide”.

<When using without guide mode (In enrollment of palm vein data)>

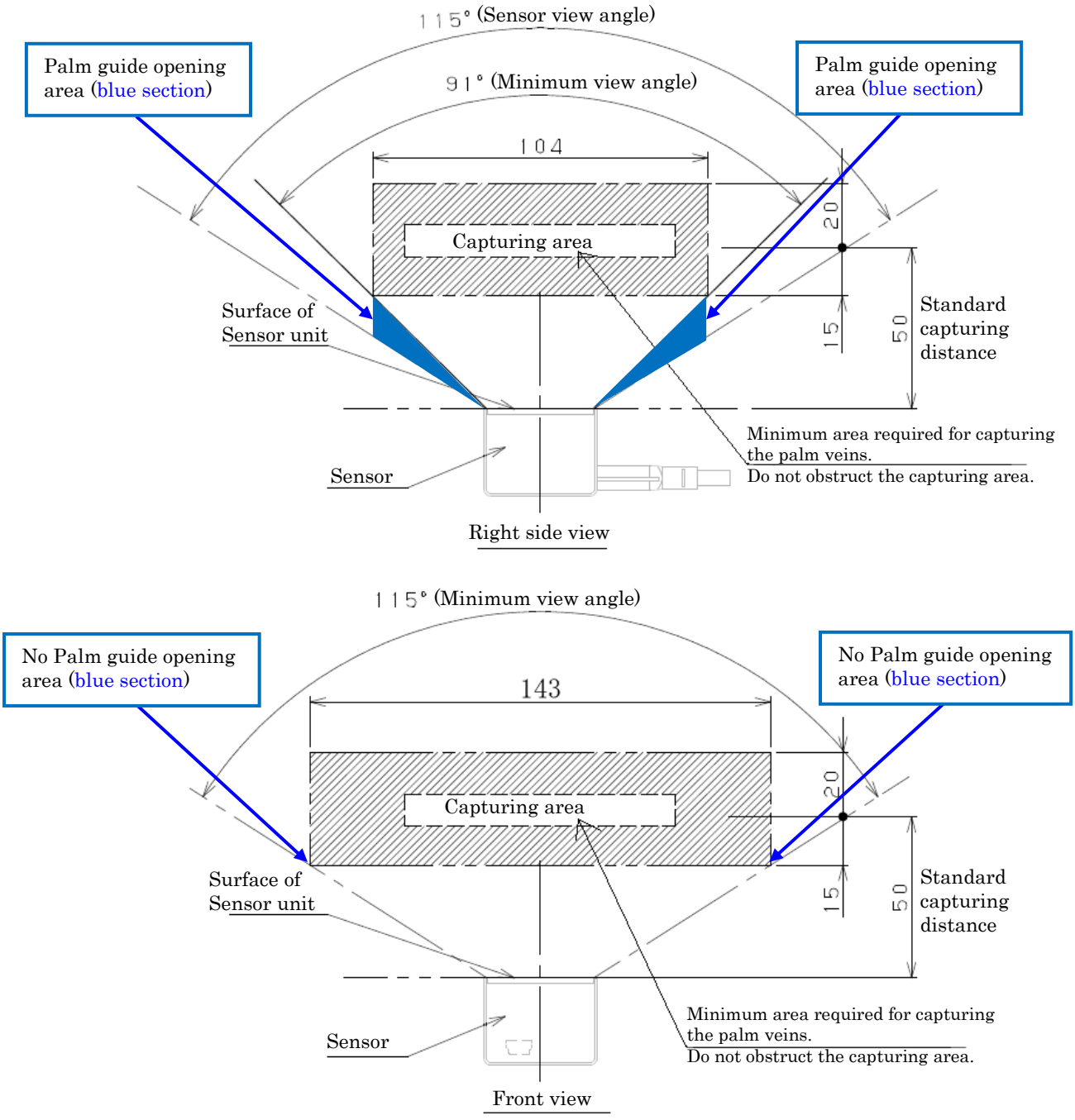




[Unit: mm]

>See> For without guide mode, refer to the “System Development Guide”.

<When using without guide mode (In authentication)>



[Unit: mm]

>See> For without guide mode, refer to the “System Development Guide”.

3.1.5 Assistance in Hand Positioning

It is important to design your own Palm guide to enable the users to place their hands correctly. Placing the hand correctly improves the authentication accuracy.

>See> For information on correct hand positioning, refer to the "Sensor Instruction Manual".

When creating your own Palm guide, it is recommended to consider the following points to provide assistance in correct hand positioning than the Folding guide.

- Design the Wrist guide to fit the user's wrist and prevent shifting (U-shaped Wrist guide).
- Prevent the thumb and little finger from hanging (Hanging proof wings on the right and left).
- Prevent fingers from closing and encourage them to slightly open (Finger closing proof guide).

>See> For information on the Palm guide with the above considerations, refer to "3.2.1 Palm Guide for Better Hand Positioning".

3.1.6 Palm Guide for Palm Vein Data Enrollment and Authentication

It is recommended to use Palm guide of the same shape, the same style of the Wrist guide and Finger guide for enrolling palm vein data and authenticating. If the Palm guide used for authentication is differently shaped from the one used for enrollment, the hand will be placed differently and subsequently will compromise the authentication accuracy.

3.2 Example Illustration for Creating Your Own Palm Guide

3.2.1 Palm Guide for Better Hand Positioning

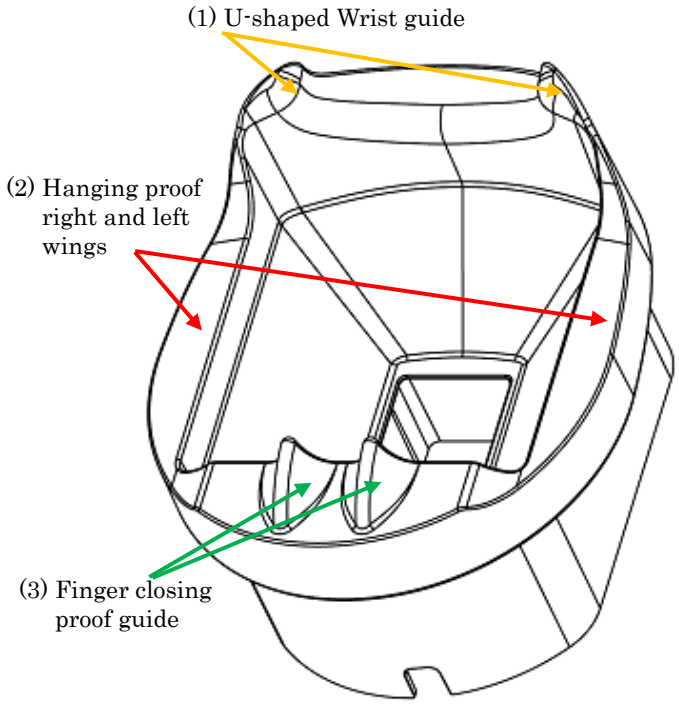
The following is an example of a Palm guide which is designed to assist the correct hand positioning than the Folding guide.
This example drawing assumes with guide mode.

This example implements the U-shaped Wrist guide, hanging proof right and left wings, and finger closing proof guide.
We recommend you to create and deploy your own Palm guide based on this example in cases where authentication is infrequent and the users have difficulties in placing their hands correctly.

>See> For information on correct hand positioning, refer to the "Sensor Instruction Manual".

A Palm guide which offers assistance in correct hand positioning, called a "U guide" is also available from Fujitsu Frontech Ltd. Please purchase a U guide for PalmSecure Sensor V2 if necessary.

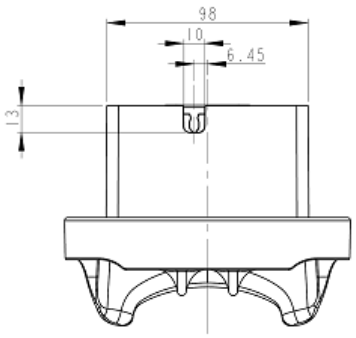
<External view>

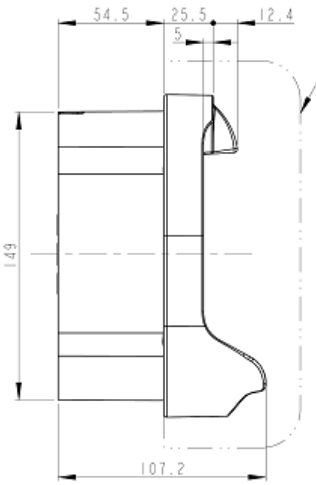


Part Name		Description (effects)
(1)	U-shaped Wrist guide	The U-shaped Wrist guide stabilizes the user's wrist and prevents shifting.
(2)	Hanging proof right and left wings	The hanging proof wings on the right and left prevents the thumb and little finger from hanging.
(3)	Finger closing proof guide	2 peaks prevent fingers from closing and encourage them to slightly open.

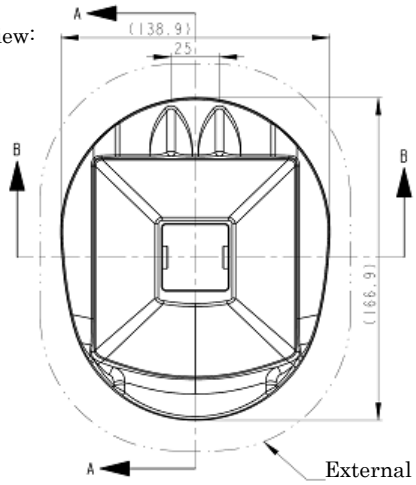
>See> For details on the effects of the each part, refer to "Effects of the U-shaped Wrist guide", "Effects of the hanging proof right and left wings", and "Effects of the finger closing proof guide" later in this document.

<Overview>

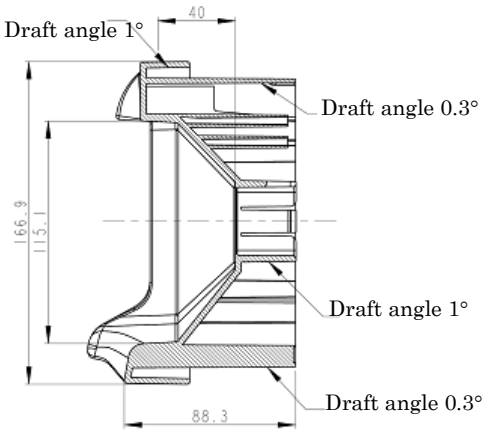




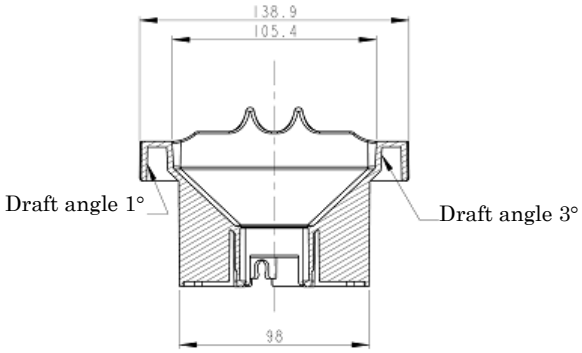
External view:
Range A



External view:
Range A



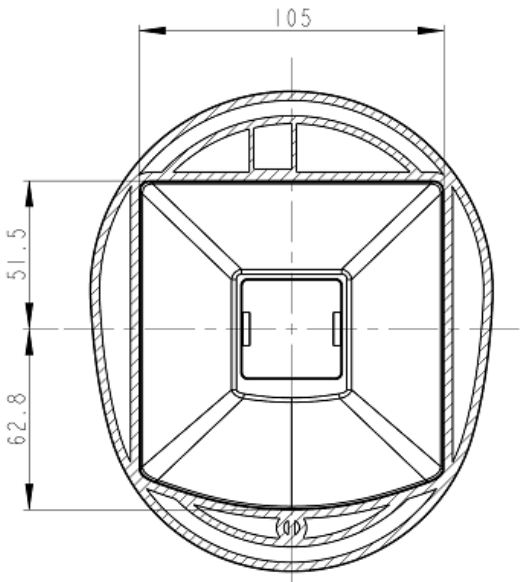
[Cross Section: A-A]



[Cross Section: B-B]

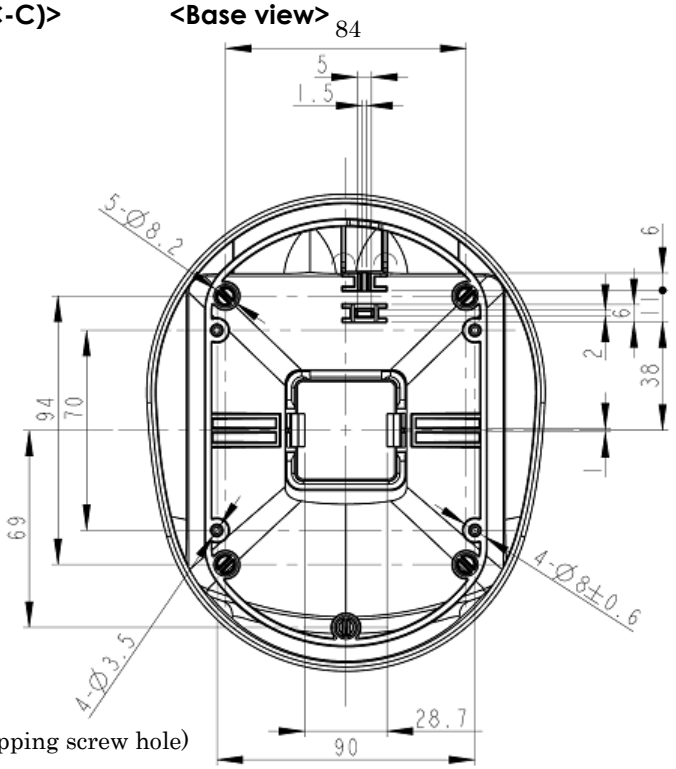
[Unit: ㎜]

<2D drawing (Cross Section: C-C)>



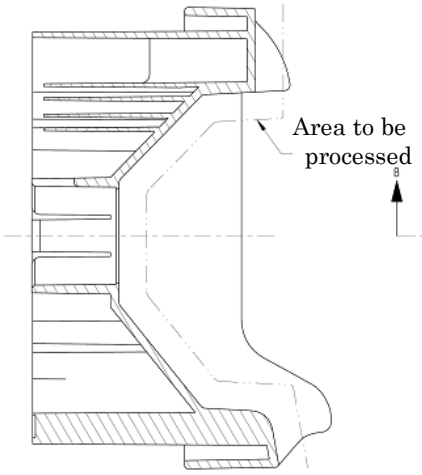
[Cross Section: C-C]

<Base view>

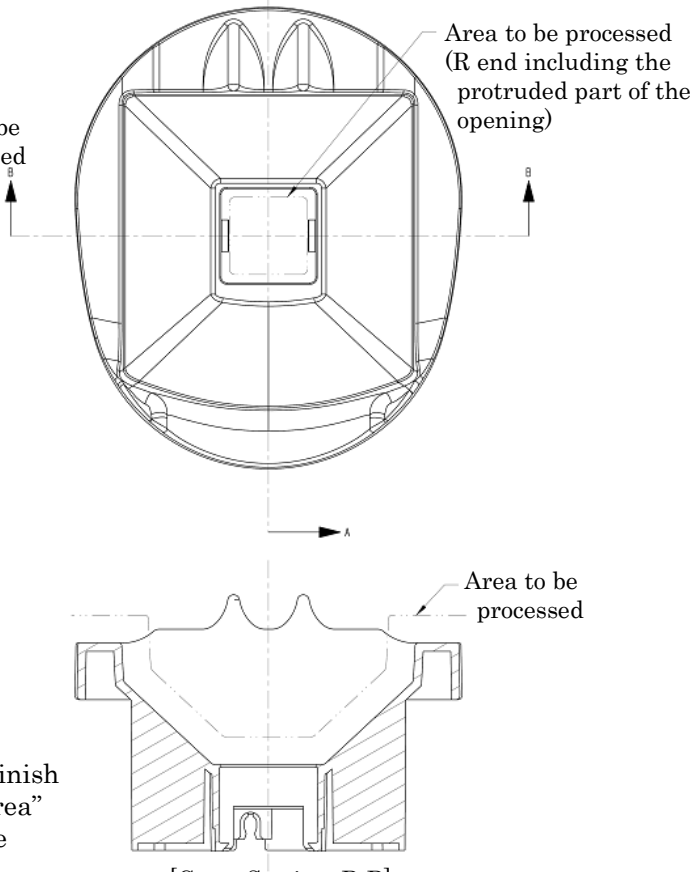


(4-M tapping screw hole)

<Matt grain finish>



[Cross Section: A-A]



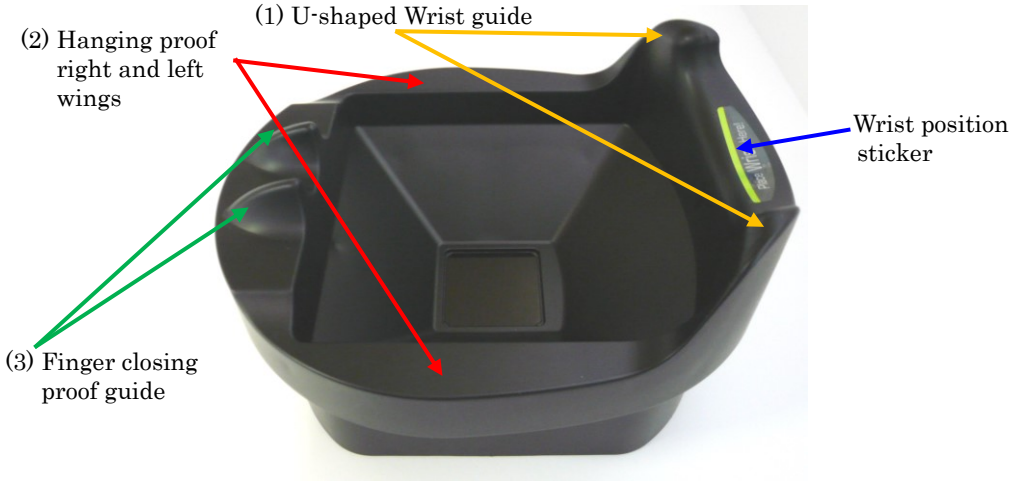
[Cross Section: B-B]

[Unit: ㎜]

>See> For information on matt grain finish, refer to "3.1.4 Surface Finish for the Palm Guide Opening Area" and "2.1.7 Surface Finish of the Structure Opening Area".

★Tip **An example of the Palm guide for hand positioning**

The following shows a Palm guide for hand positioning created by Fujitsu Frontech Ltd. based on the diagrams on the previous pages. A Palm guide which offers assistance in correct hand positioning, called a "U guide" is also available from Fujitsu Frontech Ltd. Please purchase a U guide for PalmSecure Sensor V2 if necessary.



>See> For information on the wrist position sticker, refer to "Tip Wrist position sticker" in "1.4 Palm Guide".

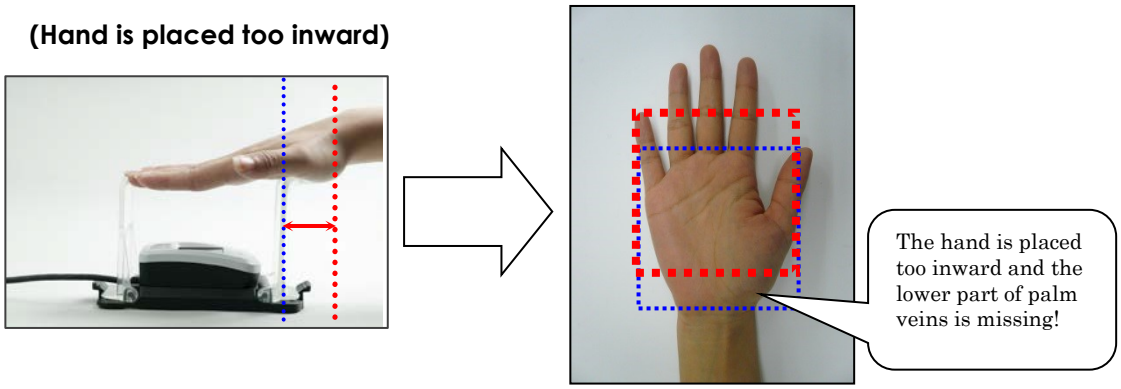
◆ Effects of the U-shaped Wrist guide

●When using the Folding guide

[Placing the hand] [Captured area of palm veins (red square)]

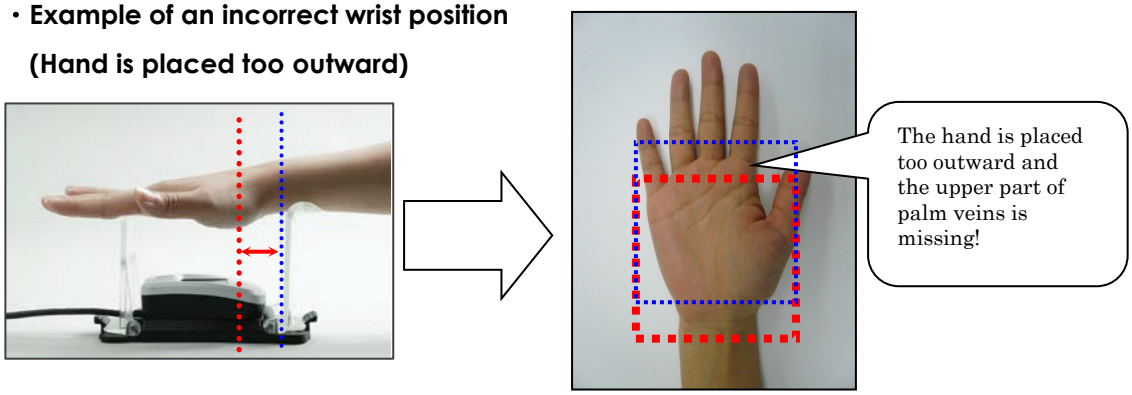
・**Example of an incorrect wrist position** * Blue square is the correct capturing area

(Hand is placed too inward)



・**Example of an incorrect wrist position**

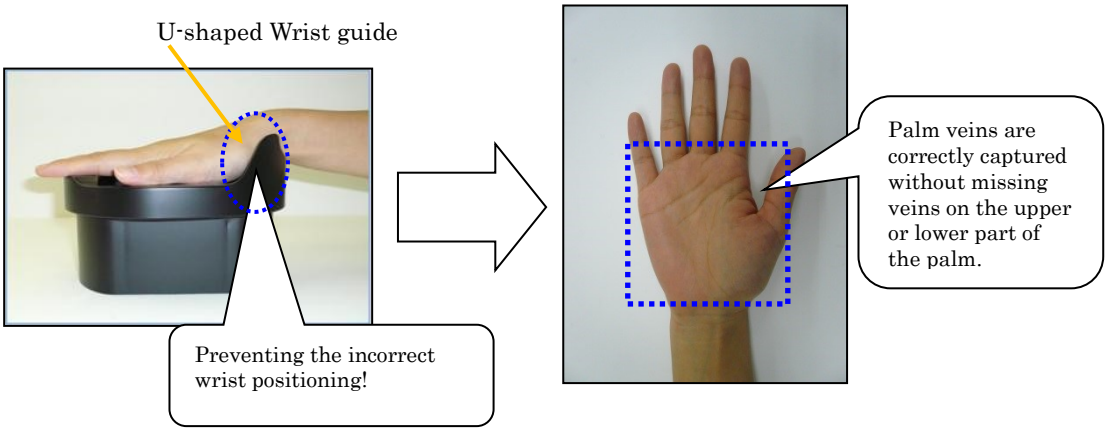
(Hand is placed too outward)



Users who are unfamiliar with the hand placing operation may place their hands too inward or too outward (incorrect position) when the Folding guide is used. Palm veins cannot be captured correctly if the hand is placed the incorrect part of palm veins are missed.

●When using the Palm guide for hand positioning

[Placing the hand] [Captured area of palm veins (blue square)]



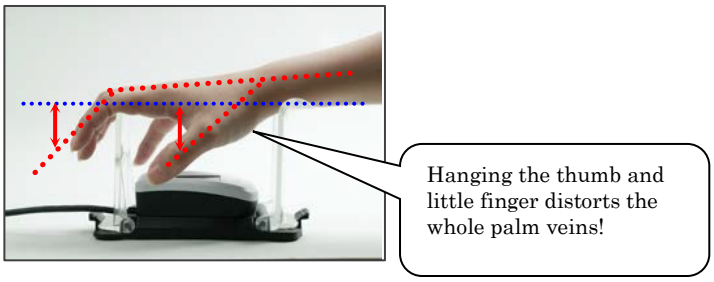
The Palm guide for hand positioning is equipped with the U-shaped Wrist guide which stabilizes the user's wrist and prevents shifting.
This enables palm veins to be captured correctly without missing veins on the upper or lower part of the palm.

◆ Effects of the hanging proof right and left wings

●When using the Folding guide

[Placing the hand]

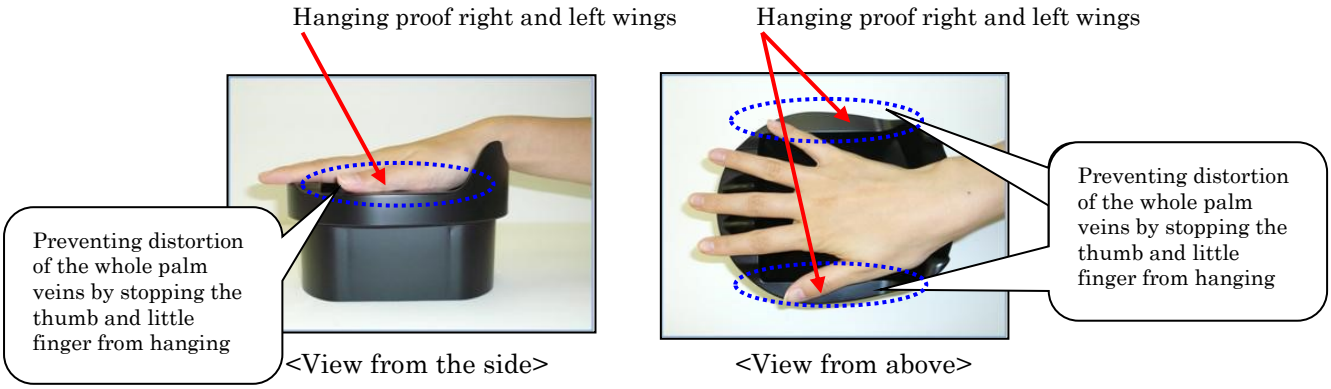
・Example of hanging fingers



Users who are unfamiliar with the hand placing operation may place their hands with the thumb and little finger hanging (hanging fingers) when the Folding guide is used.
The whole palm veins as well as the veins of the thumb and little finger are distorted if the thumb and little finger are hanging.

●When using the Palm guide for hand positioning

[Placing the hand]



<View from the side> <View from above>

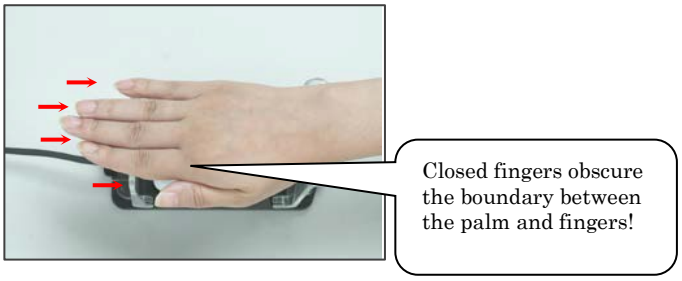
The Palm guide for hand positioning is equipped with the hanging proof wings on the right and left which prevents the thumb and little finger from hanging.
This prevents distortion of the whole palm veins.

◆ Effects of the finger closing proof guide

●When using the Folding guide

[Placing the hand]

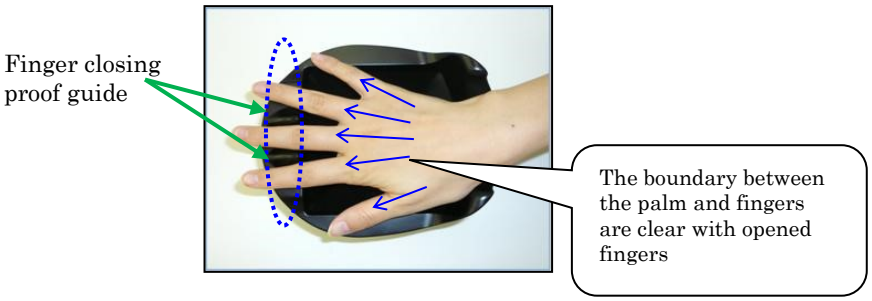
・Example of closed fingers



Users who are unfamiliar with the hand placing operation may place their hands with the fingers closed (closed fingers) when the Folding guide is used.
The palm area cannot be correctly identified if the fingers are closed because the boundary between the palm and fingers are obscured.

●When using the Palm guide for hand positioning

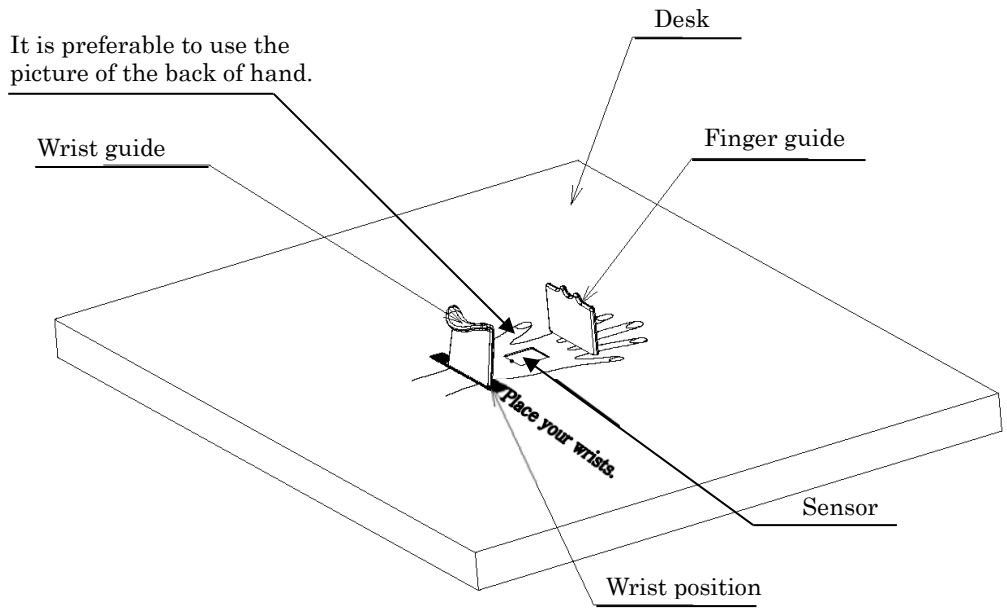
[Placing the hand]

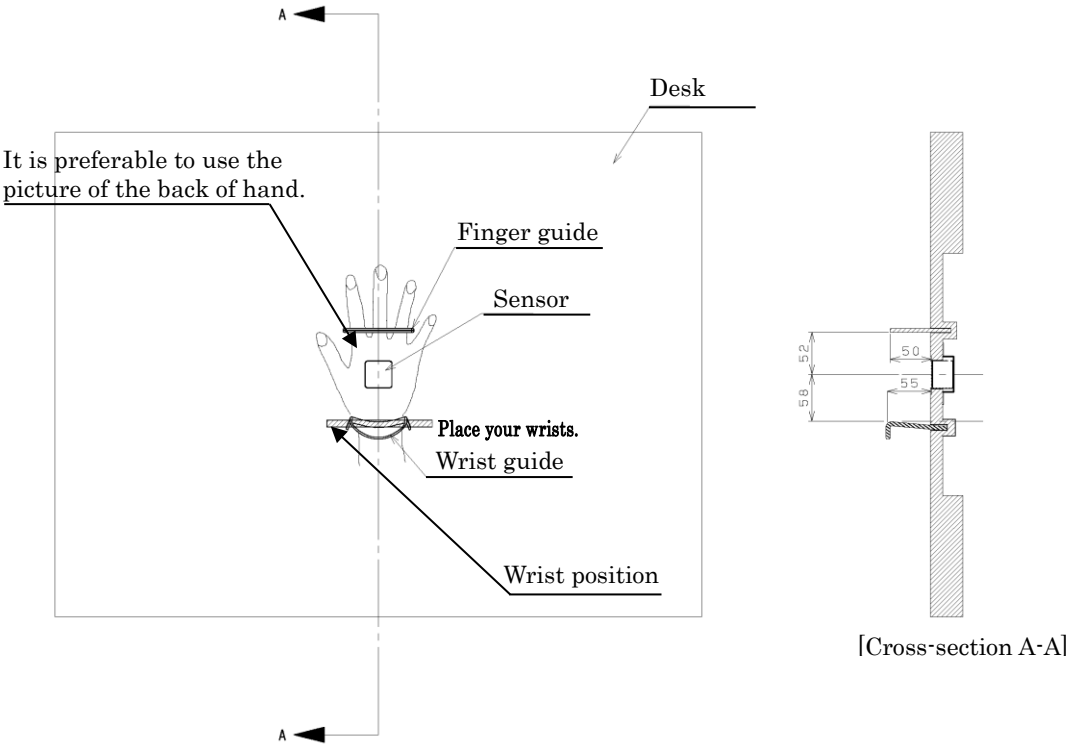


The Palm guide for hand positioning is equipped with 2 peaks which prevent fingers from closing and encourage them to slightly open.
This enables the palm area to be correctly identified because the boundary between the palm and fingers are clear.

3.2.2 Desk Embedded Palm Guide

The following illustrates an example how to naturally guide the palm to the correct position when the Palm guide is embedded in a desk.





[Cross-section A-A]

[Unit: ㎜]

★Tip **When using in with guide mode**
You can purchase a U guide and fix it with screws on the desk.

>See> For information on with guide mode, refer to the “System Development Guide”.

>See> For information on the U guide, refer to “Tip　An example of the Palm guide for hand positioning” in “3.2.1 Palm Guide for Better Hand Positioning”.

3.3 Check Points for Creating Your Own Palm Guide

>See> For check points for creating your own Palm guide, refer to V02_CheckListForPalmGuideDesign_E.pdf.


PalmSecure