

TITLE: <b>ZE05 Series Design Guideline</b>		REVISION DATE: Version 1
OBJECT PRODUCT: <b>ZE05 SERIES</b>		PAGE: 1 OF 21

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COUNT	DESCRIPTION OF REVISIONS	DESIGNED	CHECKED	DATE
0				
TITLE		<b>HRS</b>		
ZE05 SERIES DESIGN GUIDELINE		APPROVED	HK. UMEHARA	20220523
		CHECKED	HH. TSUKUMO	20220523
		DESIGNED	DK. YAMASUSO	20220523
		WRITTEN	DK. YAMASUSO	20220523
TECHICAL SPECIFICATION		ETAD-T0863-00		

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## 1. INTRODUCTION

### 1.1 PURPOSE OF THE GUIDELINE

The ZE05 Series guideline is prepared to provide information on the product features and handling of the ZE05 connectors. This guideline is aimed to provide general information about the design and operation of the ZE05 products.

These guidelines are to provide general information only and are not intended to limit your design or guarantee results under any circumstances.

If your design does not conform to these guidelines, please contact us for a consultation.

Please note that the photographs and illustrations shown in this document are of our representative products and may vary depending on the product types.

The guideline information is subject to change without notice.

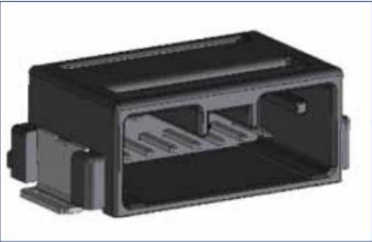
### 1.2 BASIC SPECIFICATIONS

- Terminal size: 0.5 mm (Width) x 0.4 mm (Thickness)
- Terminal pitch: 2 mm
- Part types: Right angle, straight
- Type of mounting : SMT
- Rated current: 2A/pin
- Rated voltage: AC/DC 60V
- Operating temperature range: -40 ° C to 125 ° C
- Mating durability : 30 times
- Applicable wire: 0.3 to 0.5SQ mm (mm<sup>2</sup>)  
Insulation outer diameter:  $\Phi$ 1.7 mm max.
- Number of pins : 2, 4, 5, 8, 12, 16, 20, 24

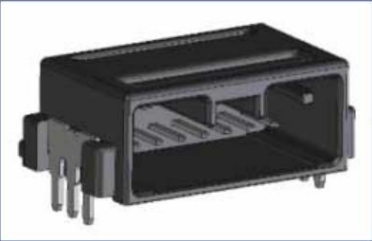
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1.3 CONFIGURATION LIST

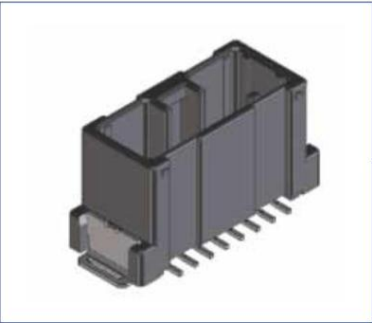
●Receptacle



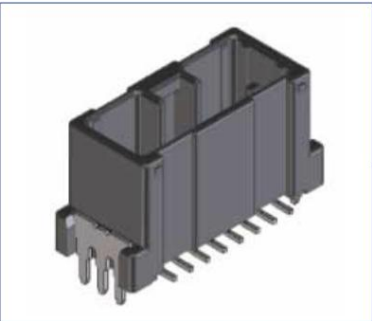
ZE05H-\*\*-P-2H



ZE05-\*\*-P-2H

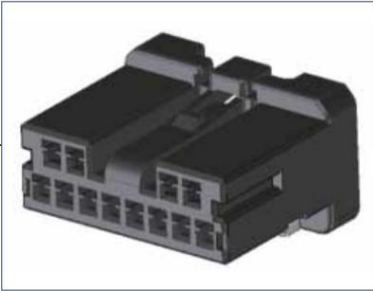


ZE05H-\*\*-P-2V



ZE05-\*\*-P-2V

●Plug



ZE05-\*\*-S-HU/R

●Crimp Contact



ZE05-2022SCF

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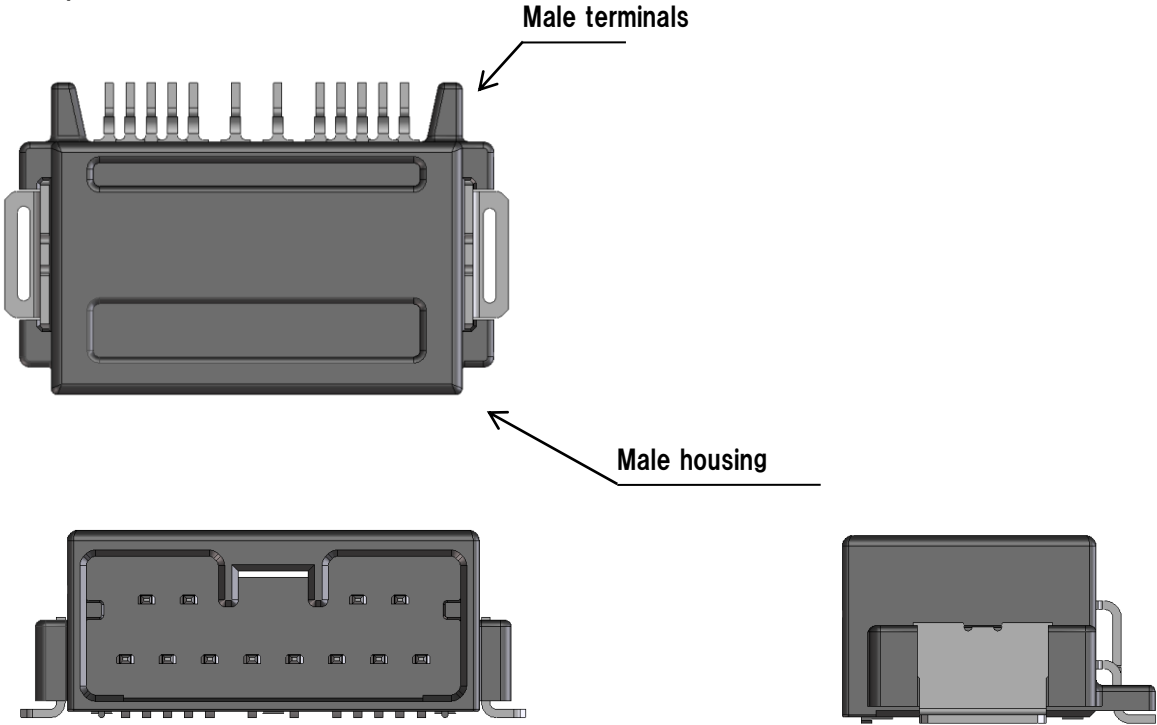
Product code	Product name	Type	Packing specifications	Quantity of packs
CL752-2001-0-00	ZE05-2022SCF	Crimped Terminals	Reels	10000 pcs.
CL752-2109-0-00	ZE05H-2P-2H	Receptacles Right Angle SMT Fittings	Reels	300 pieces
CL752-2110-0-00	ZE05H-4P-2H			
CL752-2120-0-00	ZE05H-5P-2H			
CL752-2112-0-00	ZE05H-8DP-2H			
CL752-2113-0-00	ZE05H-12DP-2H			
CL752-2114-0-00	ZE05H-16DP-2H			
CL752-2115-0-00	ZE05H-20DP-2H			
CL752-2116-0-00	ZE05H-24DP-2H			
CL752-2100-0-00	ZE05-2P-2H	Receptacles Right Angle THT Fittings		
CL752-2101-0-00	ZE05-4P-2H			
CL752-2121-0-00	ZE05-5P-2H			
CL752-2103-0-00	ZE05-8DP-2H			
CL752-2104-0-00	ZE05-12DP-2H			
CL752-2105-0-00	ZE05-16DP-2H			
CL752-2106-0-00	ZE05-20DP-2H			
CL752-2107-0-00	ZE05-24DP-2H			
CL752-2309-0-00	ZE05H-2P-2V	Receptacles Straight SMT Fittings		
CL752-2310-0-00	ZE05H-4P-2V			
CL752-2312-0-00	ZE05H-8DP-2V			
CL752-2313-0-00	ZE05H-12DP-2V			
CL752-2316-0-00	ZE05H-24DP-2V	Receptacles Straight THT Fittings		
CL752-2300-0-00	ZE05-2P-2V			
CL752-2301-0-00	ZE05-4P-2V			
CL752-2303-0-00	ZE05-8DP-2V			
CL752-2304-0-00	ZE05-12DP-2V			
CL752-2307-0-00	ZE05-24DP-2V	Plugs		Tray
CL752-2200-0-00	ZE05-2S-HU/R			
CL752-2201-0-00	ZE05-4S-HU/R			
CL752-2211-0-00	ZE05-5S-HU/R			
CL752-2203-0-00	ZE05-8DS-HU/R			
CL752-2204-0-00	ZE05-12DS-HU/R			
CL752-2205-0-00	ZE05-16DS-HU/R			
CL752-2206-0-00	ZE05-20DS-HU/R			
CL752-2207-0-00	ZE05-24DS-HU/R			350 pieces
				350 pieces
				350 pieces
				385 pieces
				350 pieces
				280 pieces
				245 pieces
				210 pieces

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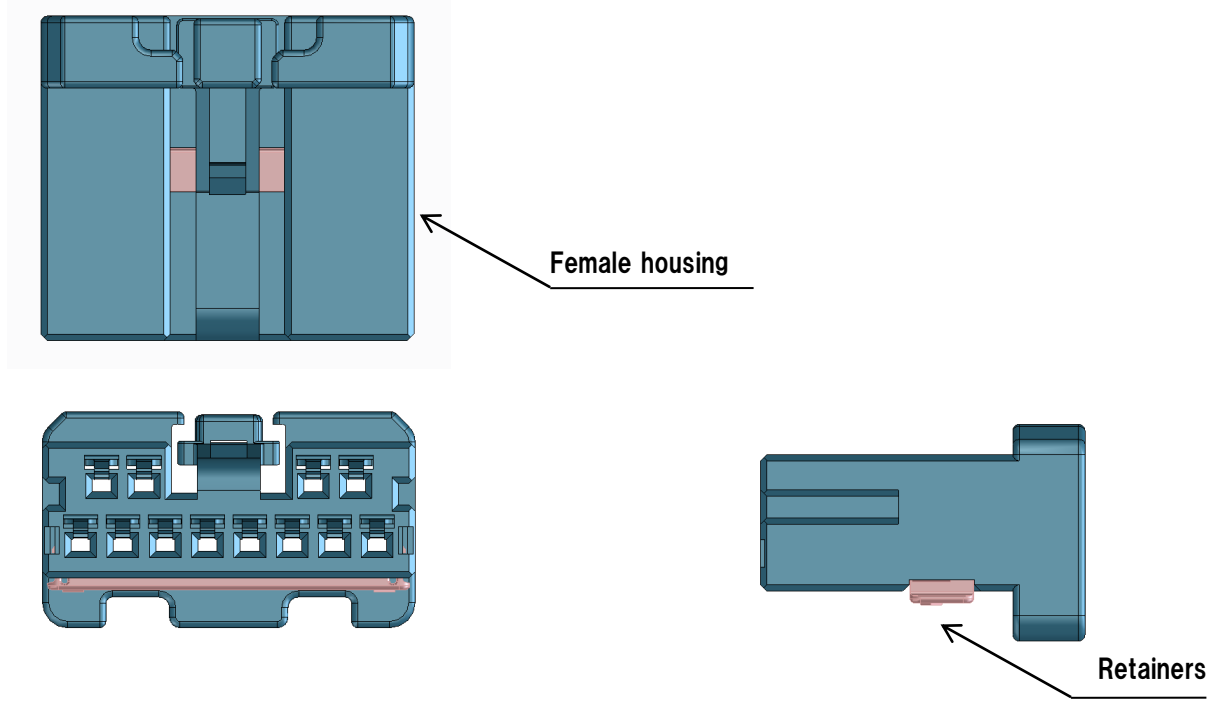
**1.4 PRODUCT NAME**

Please refer to the description below for the names of the parts of the connectors used in these guidelines.

**Receptacle**

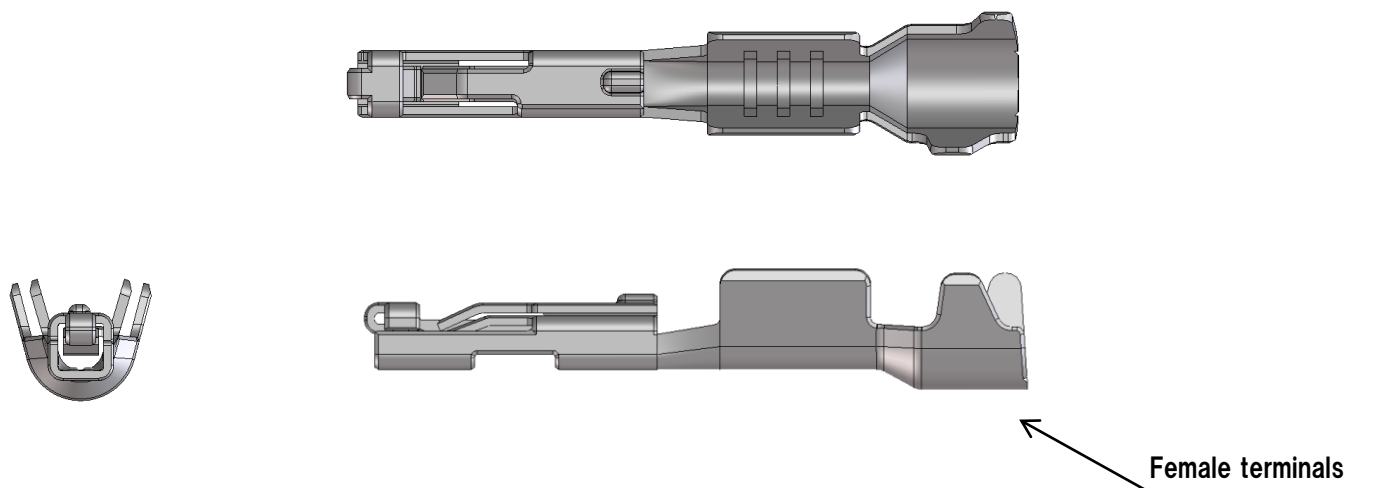


**Plug**



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## Crimp terminals



## 1.5 TOOL LIST

### Crimping tools part-numbers

Applicable products	Applicator/tool part-numbers		Product Code
ZE05-2022SCF	Applicator	AP105-ZE05-2022S	CL901-5239-0
		CHX022700H	Manufactured by Nippon Automatic Corporation (Note 1)
	Hand tools (Note 2)	HT802/ZE05-2022S	CL780-0045-0

(Note 1) Please contact J.A.M. if you have any questions about crimping problems or applicators manufactured by J.A.M. (Hereinafter referred to as J.A.M.), please contact J.A.M. via their website.

(Note 2) The hand tool has been developed as a tool for prototyping samples of ZE05 during product development of a project. Please use the applicator for mass production

### List of retainer release jig tools

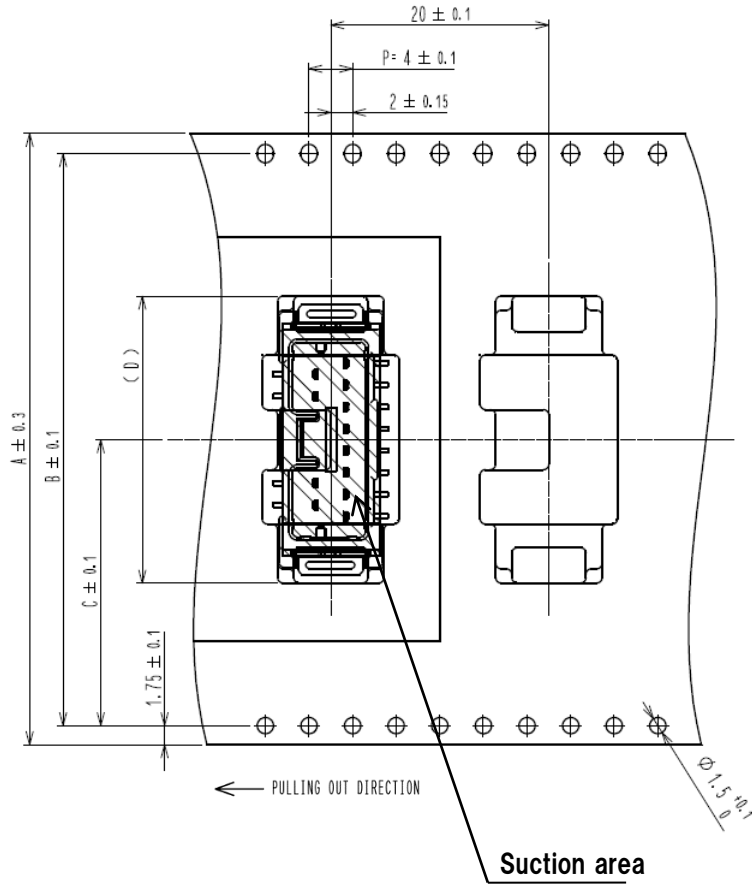
Applicable products	Name of repair tool	Repair tool part number
ZE05-2S-HU/R	ZE05-2DC-HU/R/RE-MD	CL902-5144-0
ZE05-4S-HU/R		
ZE05-5S-HU/R		
ZE05-8DS-HU/R	ZE05-12DC-HU/R/RE-MD	CL902-5143-0
ZE05-12DS-HU/R		
ZE05-16DS-HU/R		
ZE05-20DS-HU/R	ZE05-20-24DC-HU/R/RE-MD	CL902-5160-0
ZE05-24DS-HU/R		

### Crimp Terminal Repair Tool Part Number

Applicable products	Name of repair tool	Repair tool part number / code
ZE05-2022SCF	ZE05/RE-MD	CL902-5145-0

	2 pins	4 pins	5 pins	8 pins	12 pins	16 pins	20 pins	24 pins
<b>A</b>	44					56		72
<b>B</b>	40.4					52.4		68.4
<b>C</b>	20.2					26.2		34.2
<b>D</b>	16.1	20.1	22.1	22.3	26.3	32.3	38.3	42.3

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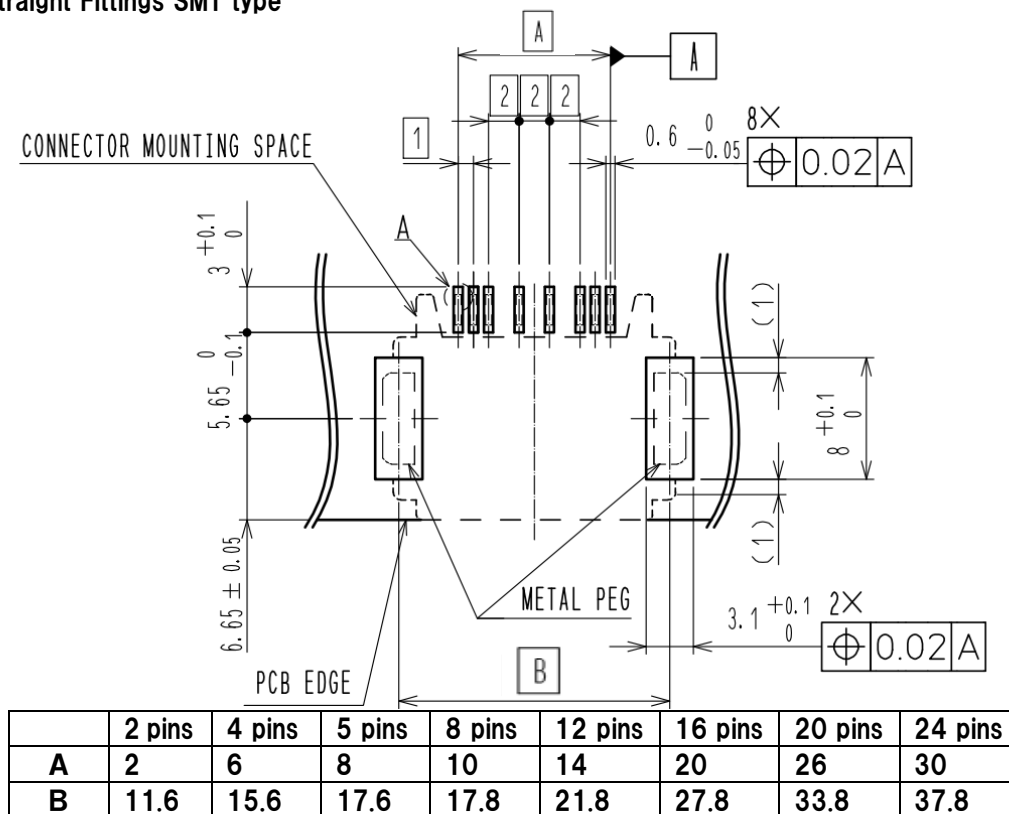


	2 pins	4 pins	8 pins	12 pins	24 pins
<b>A</b>	44	44	44	56	72
<b>B</b>	40.4	40.4	40.4	52.4	68.4
<b>C</b>	20.2	20.2	20.2	26.2	34.2
<b>D</b>	24.02	21	22.3	26.3	42.2

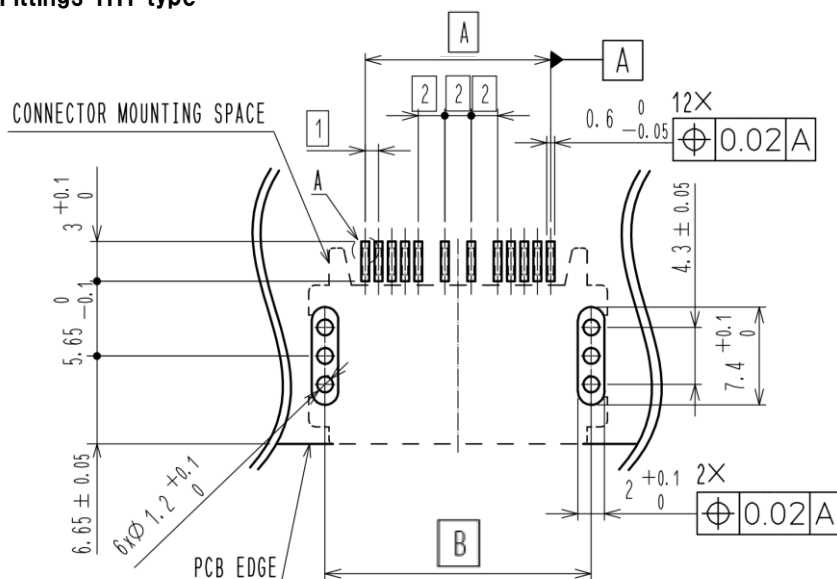
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## 2.2 RECOMMENDED PCB PATTERN

### Straight Fittings SMT type



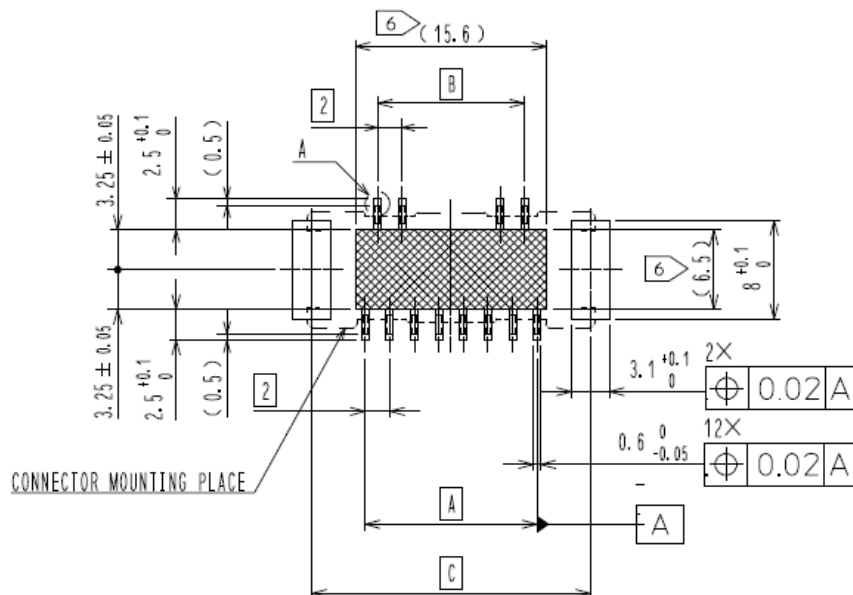
### Straight Fittings THT type



	2 pins	4 pins	5 pins	8 pins	12 pins	16 pins	20 pins	24 pins
A	2	6	8	10	14	20	26	30
B	9.9	13.9	15.9	16.1	20.1	26.1	32.1	36.1

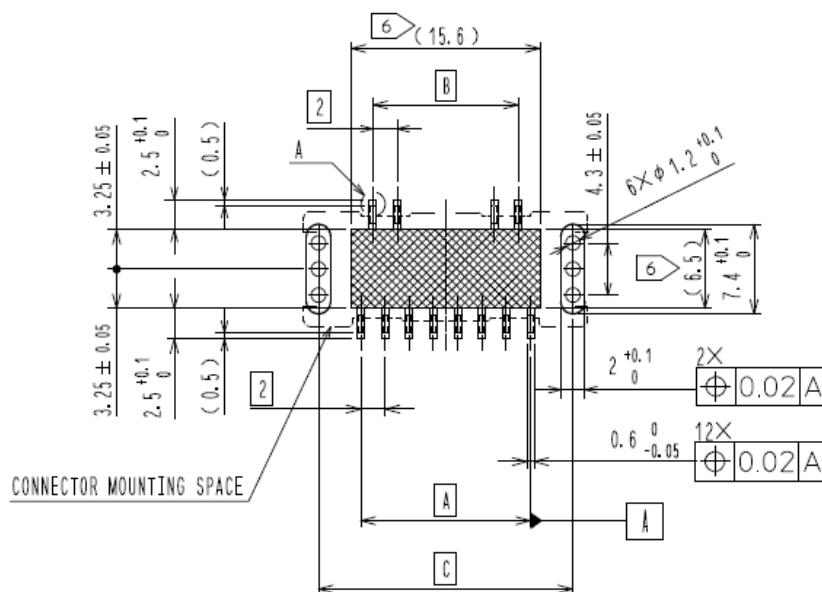
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### Vertical Fittings SMT type



	2 pins	4 pins	8 pins	12 pins	24 pins
<b>A</b>	2	6	10	14	30
<b>B</b>	-	-	8	12	28
<b>C</b>	12.5	16.5	18.7	22.7	38.7

### Vertical Fittings THT type



	2 pins	4 pins	8 pins	12 pins	24 pins
<b>A</b>	2	6	10	14	30
<b>B</b>	-	-	8	12	28
<b>C</b>	10.8	14.8	17	21	37

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## 2.3 RECOMMENDED PROFILE FOR REFLOW

This temperature profile is only for reference under the following setting conditions. It may vary depending on the type of solder paste, manufacturer, board size, and other mounting conditions.

### NOTE 1. RECOMMENDED TEMPERATURE PROFILE FOR REFLOW

(REFER TO RIGHT FIG.)

USED REFLOW SYSTEM

: IR IN THE AIR OR NITROGEN

NO. OF CYCLES : 2 MAX

PEAK : 250°C

OVER 230°C : 20~40s

PREHEAT : 150~180°C

90~120s

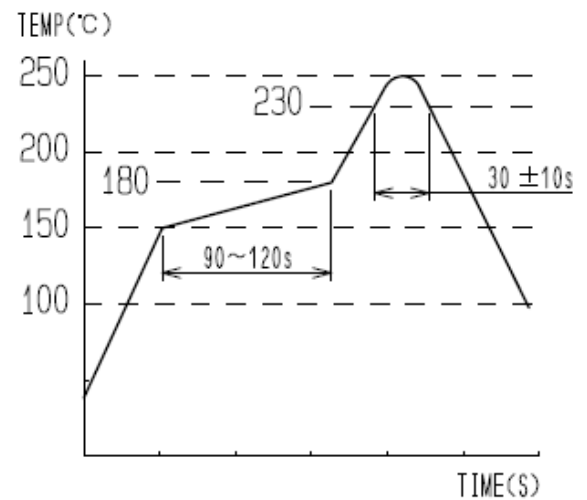
2. TEMPERATURE FOR SOLDERING IRON

:280~300°C WITHIN 2s

3. CO-PLANARITY SHALL BE 0.1mm MAX.

4. RECOMMENDED PCB THICKNESS IS 1.6mm.

5. RECOMMENDED SOLDER THICKNESS IS 0.15mm.



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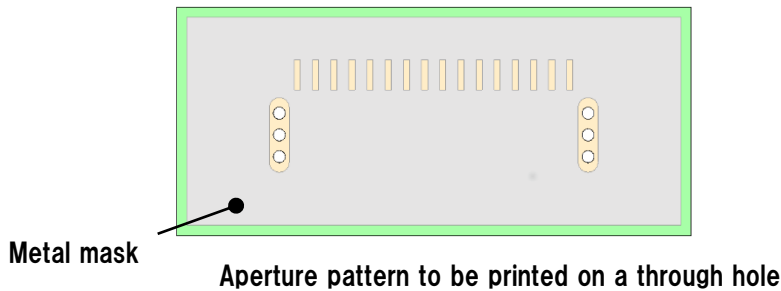
## 2.4 METAL MASK DESIGN

### ◆Solder paste used

- Manufacturer: Senju Metal Industry Co.
- Model : M705-GRN360-K2-V
- Composition : Sn96.5/Ag3.0/Cu0.5 Flux content 11.5wt%.

### ◆Additional information on metal mask aperture shapes

The metal mask apertures in this series are used to print solder paste on the board through holes. on the board through-hole.



The through-hole reflow of the ZE05 reinforcement is a type of reflow where solder paste is drawn in from the surrounding area.

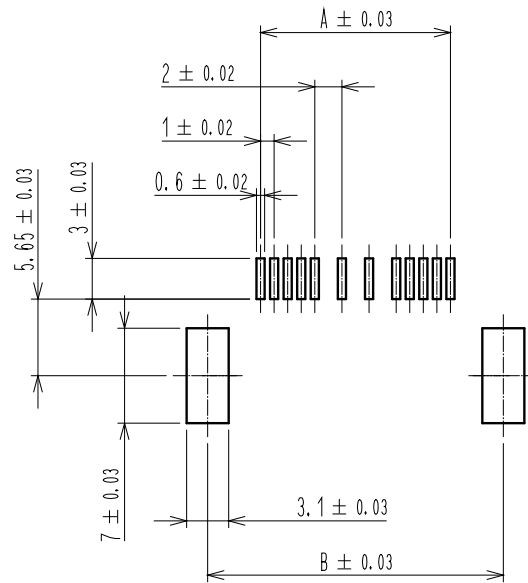
This guideline is based on the results of our own (HRS) experiments, but is not a guarantee of mounting under any circumstances. When using through-hole reflow for reinforcement fittings, please refer to these guidelines and check that there are no mounting problems.

### Points to note:

1. The dimensions of the metal mask are based on our recommended land pattern dimensions for mounting.
2. Avoid excessive penetration of solder paste into the through-hole.
3. Please note that the amount of solder required will change if the through-hole diameter/board thickness/metal mask thickness is different from that specified in the guidelines.
4. The amount of solder is based on the solder paste described in section 2-4. Please note that the amount of solder required may vary depending on the composition of the solder used.

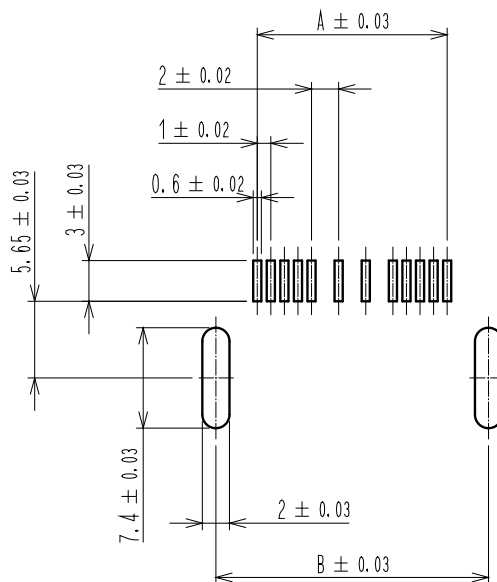
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◆Recommended metal mask dimensions  
【Metal mask thickness: 0.15mm】



**Straight Fittings SMT type**

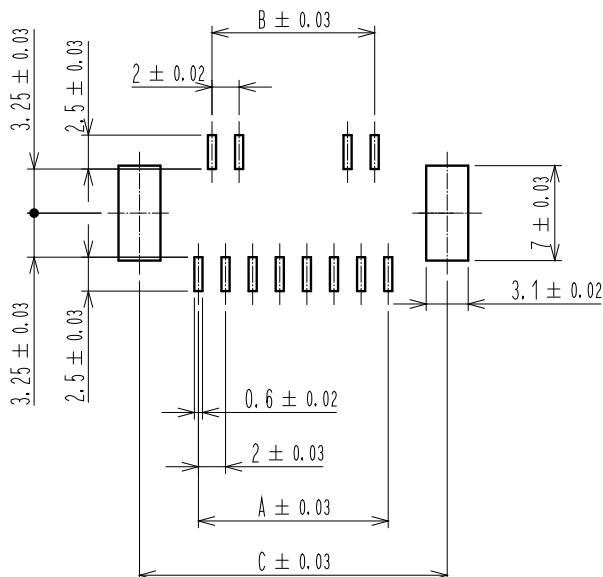
	2 pins	4 pins	5 pins	8 pins	12 pins	16 pins	20 pins	24 pins
A	2	6	8	10	14	20	26	30
B	11.6	15.6	17.6	17.8	21.8	27.8	33.8	37.8



**Straight Fittings THT type**

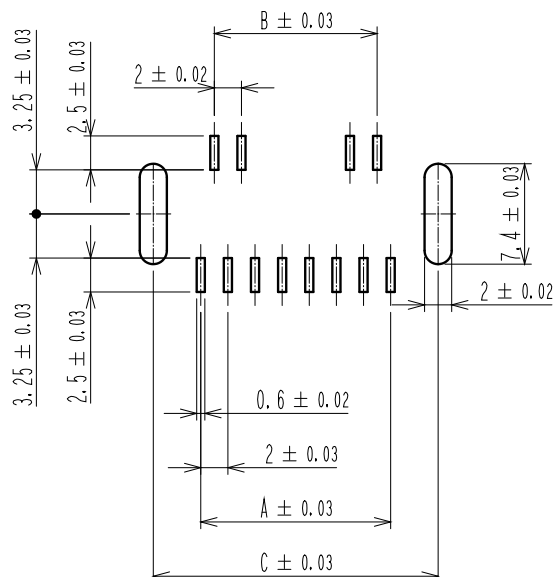
	2 pins	4 pins	5 pins	8 pins	12 pins	16 pins	20 pins	24 pins
A	2	6	8	10	14	20	26	30
B	9.9	13.9	15.9	16.1	20.1	26.1	32.1	36.1

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**Vertical Fittings SMT type**

	2 pins	4 pins	8 pins	12 pins	24 pins
<b>A</b>	2	6	10	14	30
<b>B</b>	-	-	8	12	28
<b>C</b>	12.5	16.5	18.7	22.7	38.7



**Vertical Fittings THT type**

	2 pins	4 pins	8 pins	12 pins	24 pins
<b>A</b>	2	6	10	14	30
<b>B</b>	-	-	8	12	28
<b>C</b>	10.8	14.8	17	21	37

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## 2.5 PROCEDURE FOR CHECKING TERMINALS, REINFORCING FITTINGS, AND MOUNTING STATE

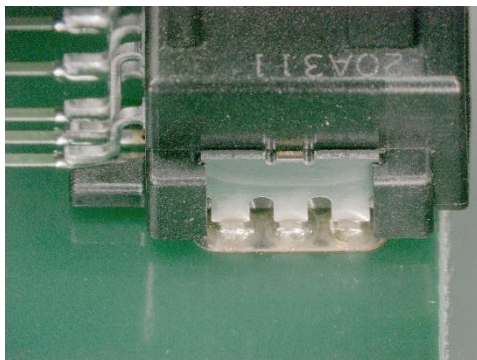
The criteria for determining the mounting status of ZE05 in THT fittings are as follows:

PLEASE CHECK:

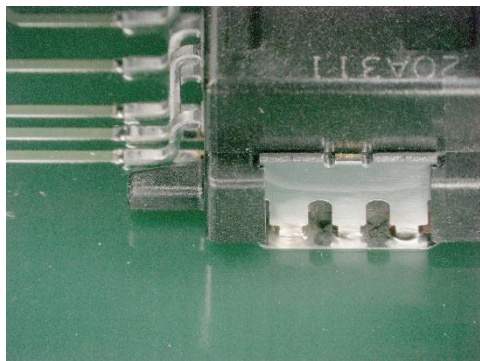
- ◆Is the fillet formed on the connector mounting side?
- ◆Is the through-hole filled with solder when viewed from the back of the board?

【Example of a decision】

◆OK products



◆NG (NOK) products



Insufficient fillet formation



Insufficient solder filling

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## 2.6 OTHER NOTES

### 2.6.1 The use of potting materials and adhesives.

When using potting materials and adhesives for receptacles, leads and reinforcement fittings:

- Before the use, please make sure that there is no creeping effect/seepage or penetration in the mating port.
- If there is any seepage or penetration in the mating port, there is a risk of poor contact or mating.

### 2.6.2 Substrate cleaning

Please control the cleaning solution to avoid cross-contamination of the connector contact area by the cleaning solution.

Cross-contamination may result in contact failure.

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**3 HANDLING NOTES**

**3.1 APPLICABLE CABLES AND CRIMP TERMINALS**

Applicable cable: 0.3 to 0.5sq mm O.D.  $\phi$  1.7mm MAX  
Crimping terminal: ZE05-2022SCF

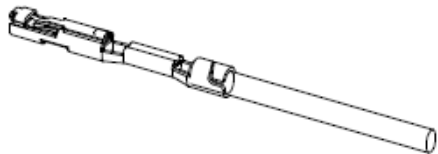
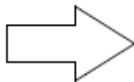
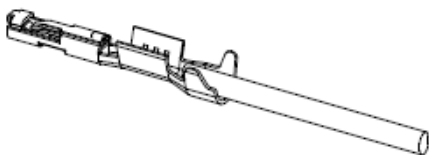
**3.2 THE CRIMPING OPERATION**

①Strip the cable

Note: Please refer to the Crimp Quality Standard  
for details on strip length.



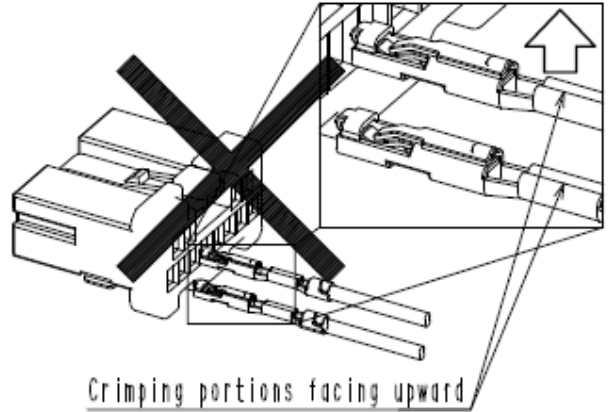
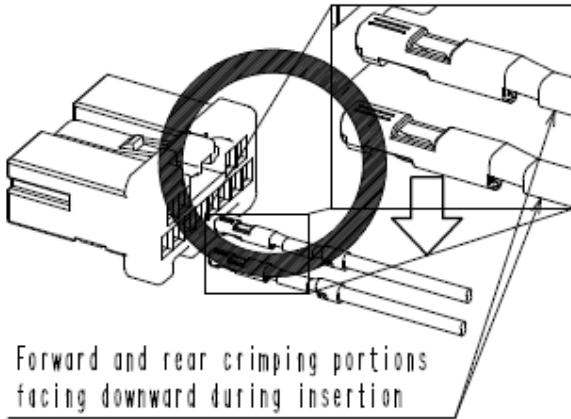
②Crimp wire in terminal



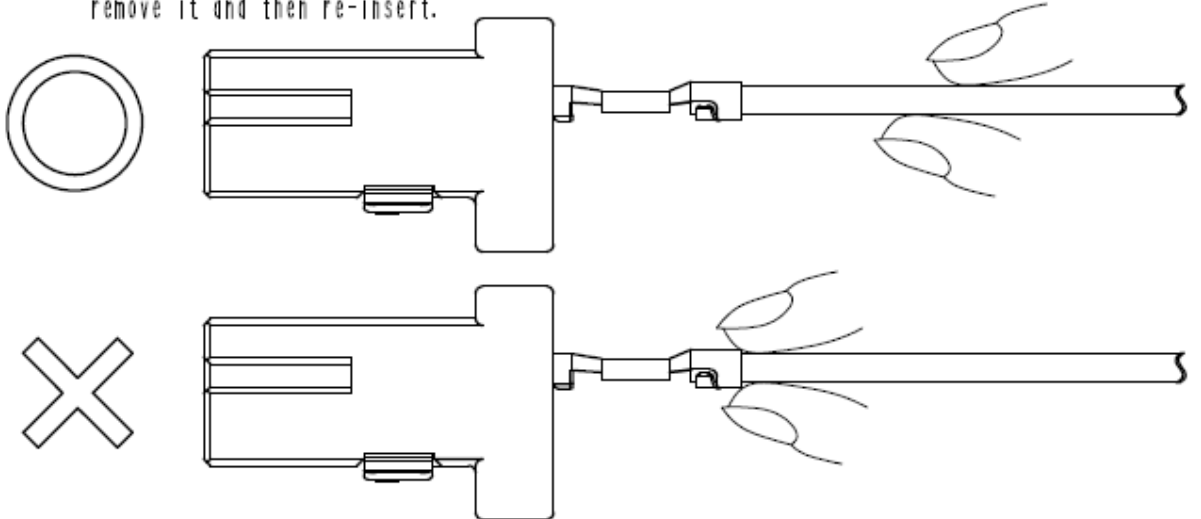
NOTE 1: Please use the Hirose crimp tool.  
NOTE 2: Please refer to the Crimp Quality Standard  
to confirm terminla compatibility and check crimp condition.

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- ③Insert contact and push until a click is heard.  
 ※Please take care to ensure that the terminal is inserted in the correct orientation.



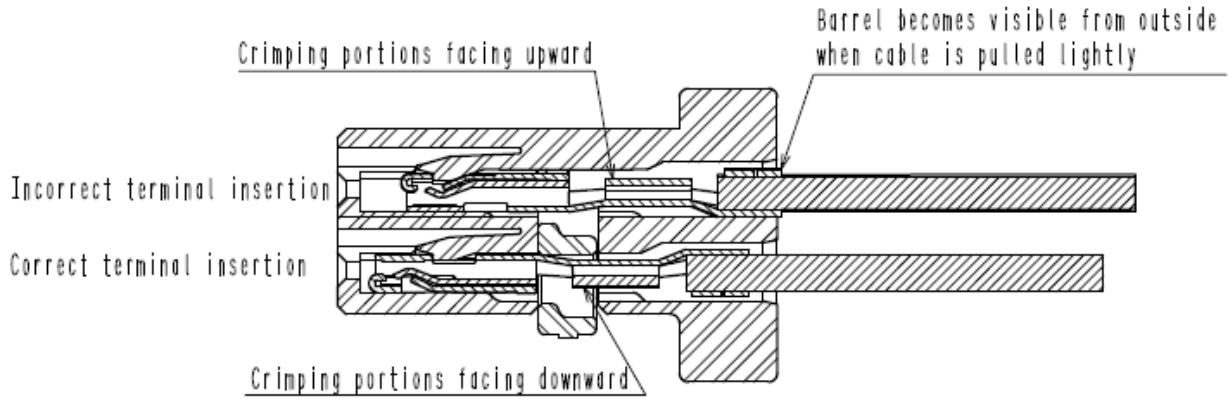
- NOTE 1: Holding the cable, please insert straight into the housing.  
 Do not use more than 10N of force during this process.  
 ※Even in the incorrect orientation, holding the cable at the crimped terminal and applying a force in excess of 10N can result in insertion.  
 NOTE 2: If the crimped terminal does not enter the housing smoothly the first time, remove it and then re-insert.



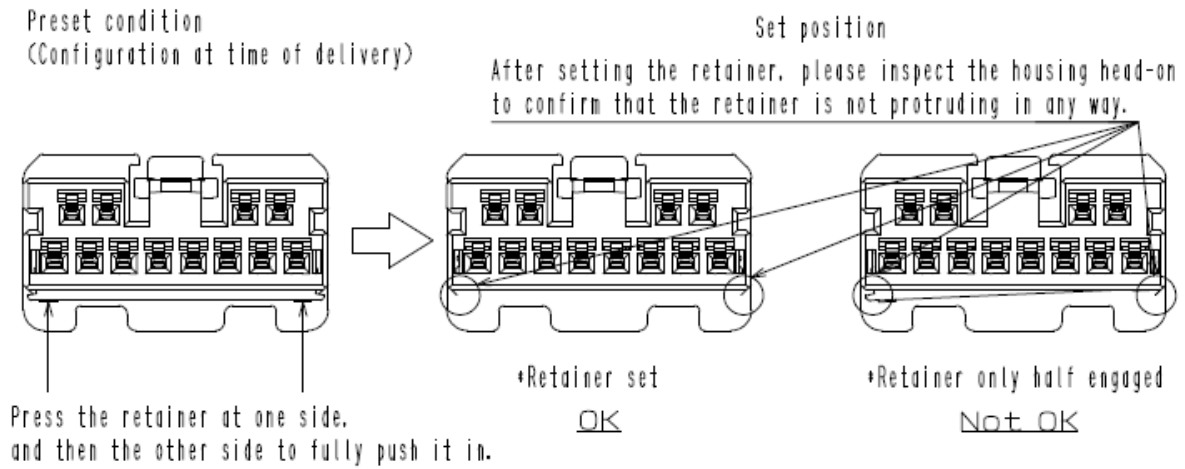
- NOTE 3: Do not bend or twist the cable.  
 Doing so may cause damage or deformation of the female housing and/or terminal.

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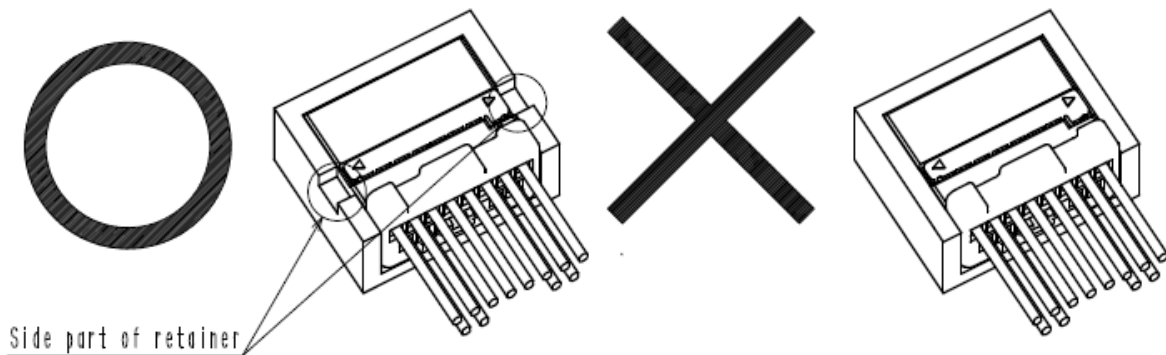
④After insertion, confirm that the terminal has been inserted correctly by pulling lightly on the cable.



⑤Press preset retainer until a click is heard.  
Please press the retainer at one side, and then the other side to fully push it in.



In the event that a jig will be used for setting of the retainer, please ensure that there is clearance on either side of the retainer. Using a jig that does not allow such clearance may result in damage to the female housing of the time of retainer insertion.

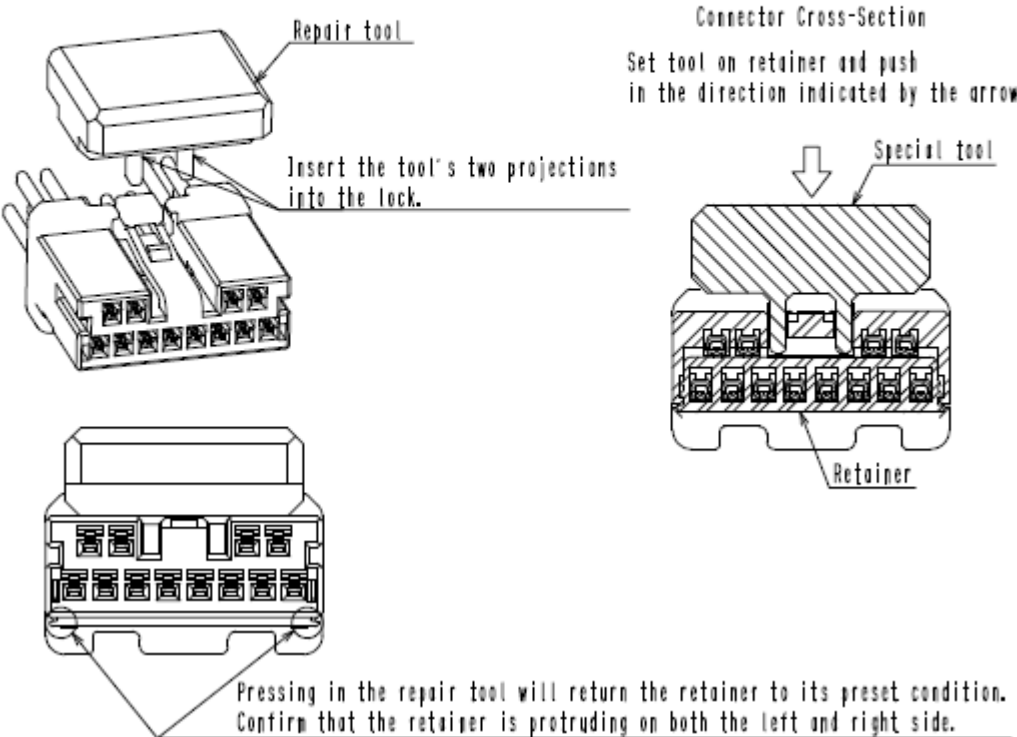


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### 3.3 THE REPAIR OPERATION

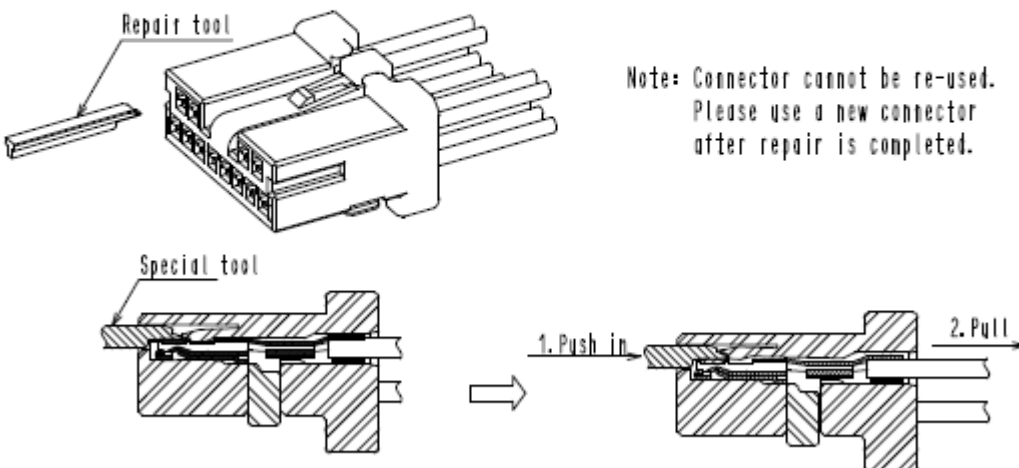
①Using the special repair tool, disengage the retainer lock and return the retainer to the preset condition.

Note: Please refer to the following section (p.6) for details on the special tool.



②Insert the tool into the terminal cavity and push until contact with the terminal is made. Maintain this position and remove the terminal.

Note: Please refer to the following section (p.6) for details on the special tool.



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### 3.4 OTHER NOTES

1. Do not touch the terminal contact area or the inside of the barrel.
2. When touching the terminals, be sure to wear gloves to prevent corrosion/ contamination.
3. There is a risk of deformation or contamination if you put something on the terminal or drop the terminal.  
Please handle with care.
4. If the terminals become tangled, do not pull them forcibly, but unwind them carefully so as not to deform them.
5. When you touch the terminal, please be careful not to deform the terminal.
6. After crimping is completed, be careful not to tangle the terminals with each other, and do not apply external force to the terminals when bundling or piling them up.
7. Please be careful not to give a big shock to the terminal.
8. Avoid storing in dusty places.
9. Do not place the wire harness on the floor.
10. Avoid handling the connector in such a way as to cause deformation, scratches or deformation of the terminals.
11. If the retainer has been removed from the housing, do not use either the housing or the retainer.
12. Do not use the housing if it has been dropped.

## 4 OTHER PRECAUTIONS

### 4.1 ABOUT THE CONNECTOR STORAGE

- ① When storing the connectors, please avoid storing them under high humidity conditions. When storing the connectors for a long period of time, please keep them in a place where humidity can be controlled.  
Storage temperature: -10° C to +60° C Storage humidity: 85%RH or less Storage period: 6 months  
- the term "storage" refers to the long-term storage of unused products before they are mounted on the board.
- ② We recommend that you avoid storing the product in dusty areas, as this may cause contact problems.