

ZE064W Series

Handling Manual



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1. SCOPE

This harness operation manual describes the procedures for wiring, assembling and disassembling the ZE064W connectors.

It also details the crimping information and common practices of general crimps for the ZE064 terminals.

All measurements are in millimeters and Forces in Newtons unless otherwise specified.

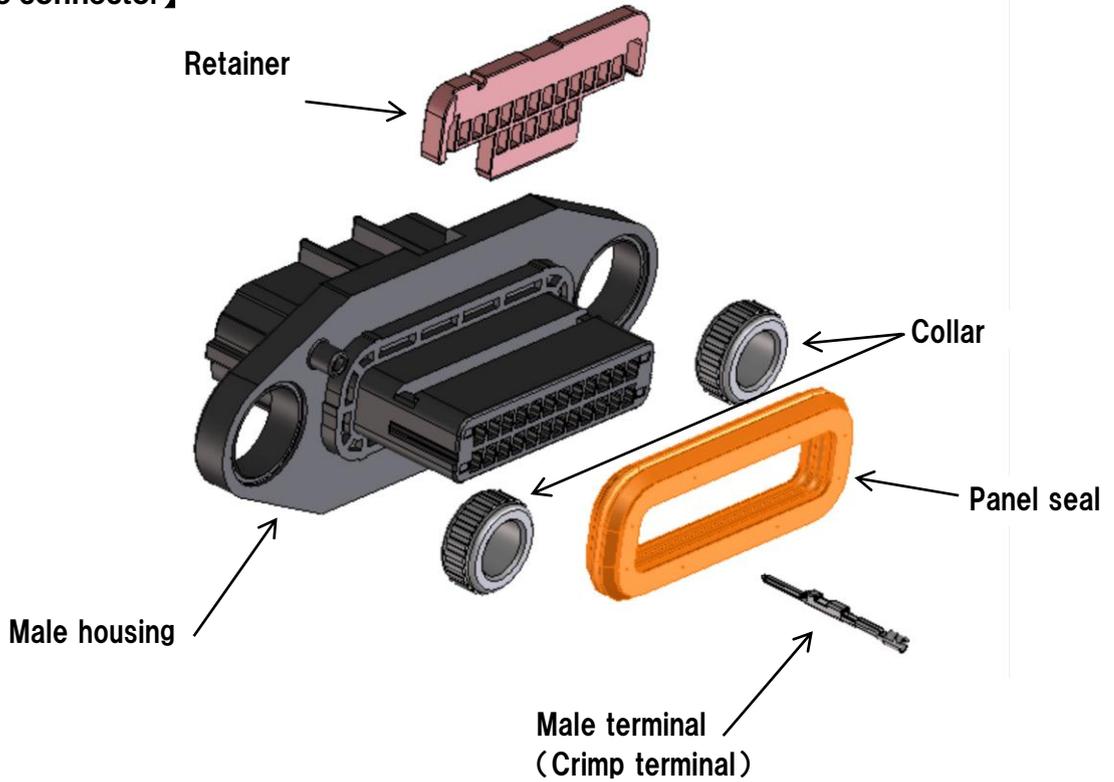
In addition, photographs and illustrations described are representative products of HRS ZE064W series, so they differ depending on products.

Information of this manual is subject to change without notices.

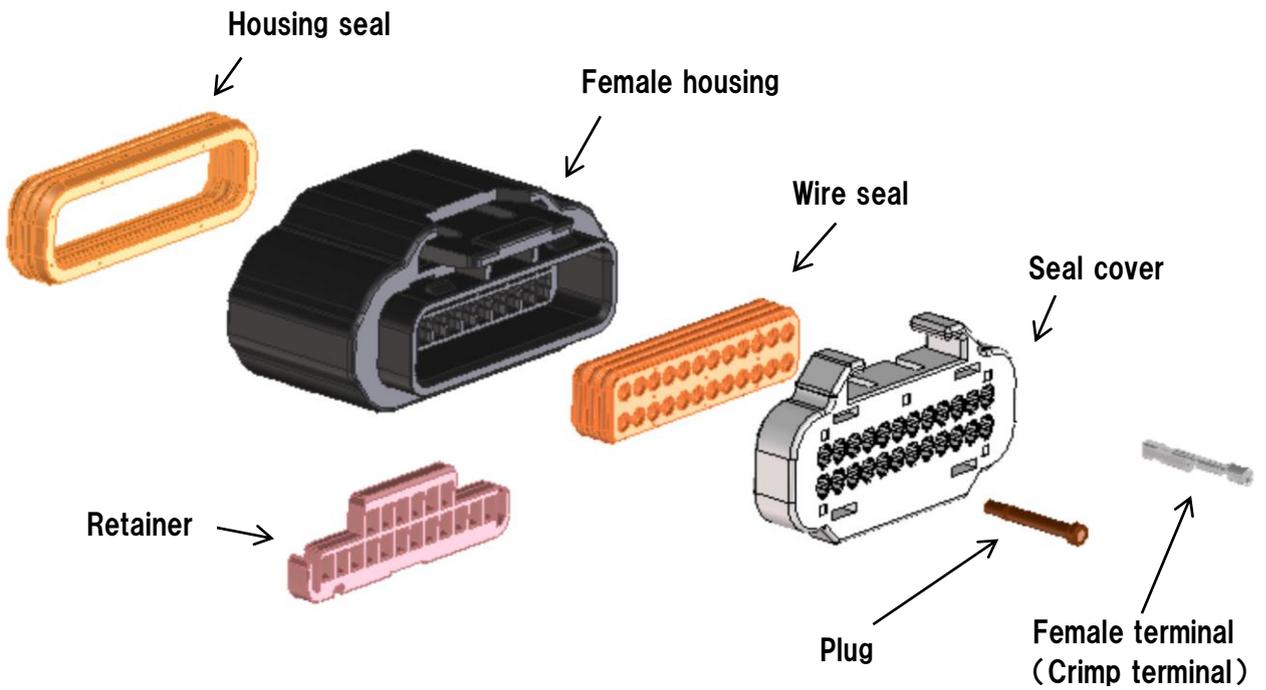
2. PARTS DESCRIPTION

2.1 DESCRIPTION

【Male connector】



【Female connector】



2.2 PART NUMBERS

Description	Part Number
Male terminal	ZE064-2022PCF
Female terminal	ZE064-2022SCF
Female connector X positions (coding A or B)	ZE064W- <u>X</u> DS-HU/R(Y)
Male connector X positions (coding A or B)	ZE064W- <u>X</u> DP-HU/R(Y)
Plug	ZE064W-WCP(2022)

Note 1: please check with Hirose Sales department for the availability of all part numbers.

2.3 MATERIALS

Part	Sub part	Material
Female connector	Female housing	PA
	Retainer	PA
	Housing seal	Silicone
	Wire seal	Silicone
	Seal cover	PBT
Male connector	Housing	PA
	Retainer	PA
	Panel seal	Silicone
	Collar	Carbon steel Surface: Nickel plating: 5μm min
Female terminal		Metal thickness: 0.2±0.05 mm Copper alloy Surface: Tin plating: 1μm min Under: Copper plating: .0.3μm min
Male terminal		Metal thickness: 0.2±0.05 mm Copper alloy Surface: Tin plating: 1μm min Under: Copper plating: .0.3μm min
Plug		PBT

3. PACKAGING

Designation	HRS P/N	Carton box dimensions LxWxH (mm)	Type of packaging	Quantity of parts per unit
Female connector 8P	ZE064W-8DS-HU/R (A) or (B)	495 x 315 x 200	Tray	120 pcs/tray x 5 layers = 600 pcs
Female connector 14P	ZE064W-14DS-HU/R (A) or (B)	495 x 315 x 200	Tray	96 pcs/tray x 5 layers = 480 pcs
Female connector 24P	ZE064W-24DS-HU/R (A) or (B)	495 x 315 x 200	Tray	55 pcs/tray x 5 layers = 275 pcs
Male connector 8P	ZE064W-8DP-HU/R (A) or (B)	495 x 315 x 200	Tray	70 pcs/tray x 5 layers = 350 pcs
Male connector 14P	ZE064W-14DP-HU/R (A) or (B)	495 x 315 x 200	Tray	60 pcs/tray x 5 layers = 300 pcs
Male connector 24P	ZE064W-24DP-HU/R (A) or (B)	495 x 315 x 200	Tray	50 pcs/tray x 5 layers = 250 pcs
Male terminal	ZE064-2022PCF	570 x 570 x 55	Reel	15000 pcs/reel
Female terminal	ZE064-2022SCF	570 x 570 x 55	Reel	13000 pcs/reel
Plug	ZE064W-WCP(2022)	According number of plugs to be sent	Bag	1000 pcs/bag

4. MECHANICAL PERFORMANCES

The main mechanical characteristics are as follow:

Test	Value
Tensile strength of the Wire-Terminal link	AWG20: 70N min
	AWG22: 50N min
Terminal insertion force	4N max for female terminals 3N max for male terminals
Terminal polarization force	9N min for female terminals 30N min for male terminals
Terminal retention force with TPA inactive	25N min
Terminal retention force with TPA active	85N min for female terminals 86N min for male terminals
Connector mating force	27.5N ~ 31.3N (8 terminals)
	44.3N ~ 48.0N (14 terminals)
	78.4N ~ 85.0N (24 terminals)
Connector unmating force	15.0N ~ 22.4N (8 terminals)
	34.0N ~ 40.4N (14 terminals)
	50.0N ~ 55.5N (24 terminals)
Connector retention force	230N min
Connector polarization force	150N min
Mating / unmating cycles number	30 times
TPA insertion force with all terminals fully inserted	20N max
TPA insertion force with one terminal incorrectly positioned	70N min
TPA opening force	10N min
TPA pull-out force	10N min

③ Note. The values indicated in this paragraph are for reference only and orders of magnitude to be considered for your information.

5. STORAGE - HANDLING OF COMPONENTS

5.1 STORAGE CONDITIONS

- Store in a well ventilated environment with the following relative temperature and humidity range: -10° to 60°C ; 85% HR maximum.
- Store without contact with the ground, on a pallet or platform, a clean dry surface until the packages are retrieved for production.
- Store packages away from water and direct UV rays.
- Store packages away from heat and areas with high temperature variations.
- Keep away from high temperature or hygrometry variations to avoid condensation inside the packages.
- Store packages away from dust to keep the components clean.
- Keep packages as they are delivered, without undoing the adhesive ribbon until use.
- Do not walk or place heavy objects on packages.
- Where packages are stored in racks, place the heavier cartons below and the lighter ones above not to damage the parts.

5.2 HANDLING OF COMPONENTS

- Do not touch the terminal contact points or the interior of the barrel.
- In the event that the terminal must be handled, please wear gloves in order to prevent corrosion.
- Placing items on top of a terminal or dropping a terminal may result in shape deformities or contamination. Please handle terminals with care.
- In the event of terminals becoming tangled, please do not forcibly pull or bend them apart, but disentangle them carefully.
- Use caution when handling terminals so as to avoid deformation.
- Make sure that the terminals of crimped cables do not become entangled. When bundling or stacking cables, please prevent the terminals from being subjected to any external force.
- Use caution to ensure that the part is not subjected to any large impacts.

- Do not place wire harnesses on the floor.
- Refrain from any handling that may result in terminal damage or deformation.
- Do not use the housing in case it drops.

6. ASSEMBLY PROCESS

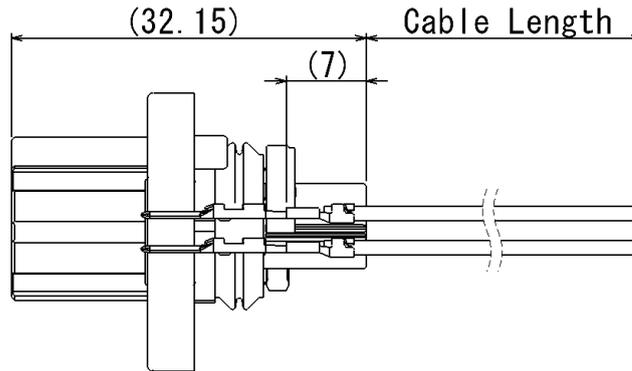
6.1 CRIMPING OF TERMINALS

1 – Cut the cable

Set the cable length with reference to the dimensions shown below.

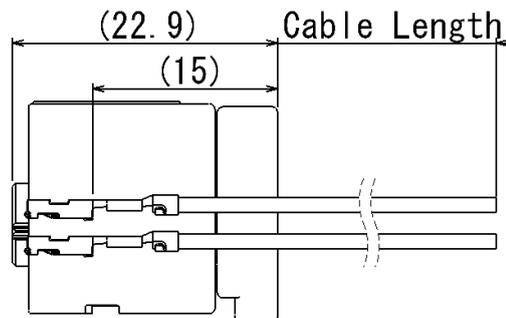


Male connector:



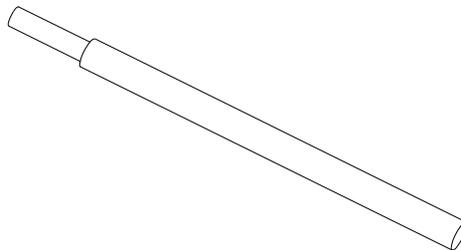
Approximate cable cut length = above cable length + 7mm

Female connector:



Approximate cable cut length = above cable length + 15mm

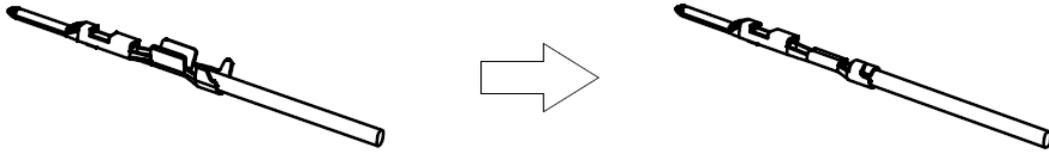
2 - Strip the cable



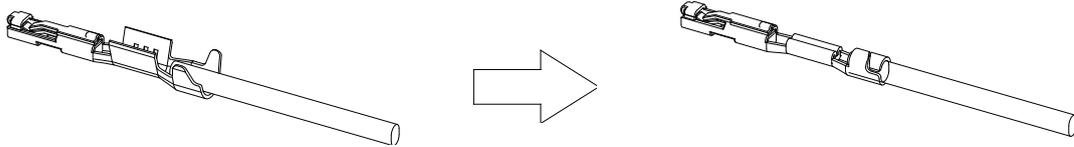
Please refer to the Crimp Quality Standard (§13) for details on strip length.

3 – Crimp wire in terminal

Male terminal:



Female terminal:



Note 1: Please use the Hirose crimp tool.



Note 2: Please refer to the Crimp Quality Standard (§13) to confirm terminal compatibility and check crimp condition.



Note 3: Please refer to the Crimp parameters (§14) for the crimp parameters to be used.

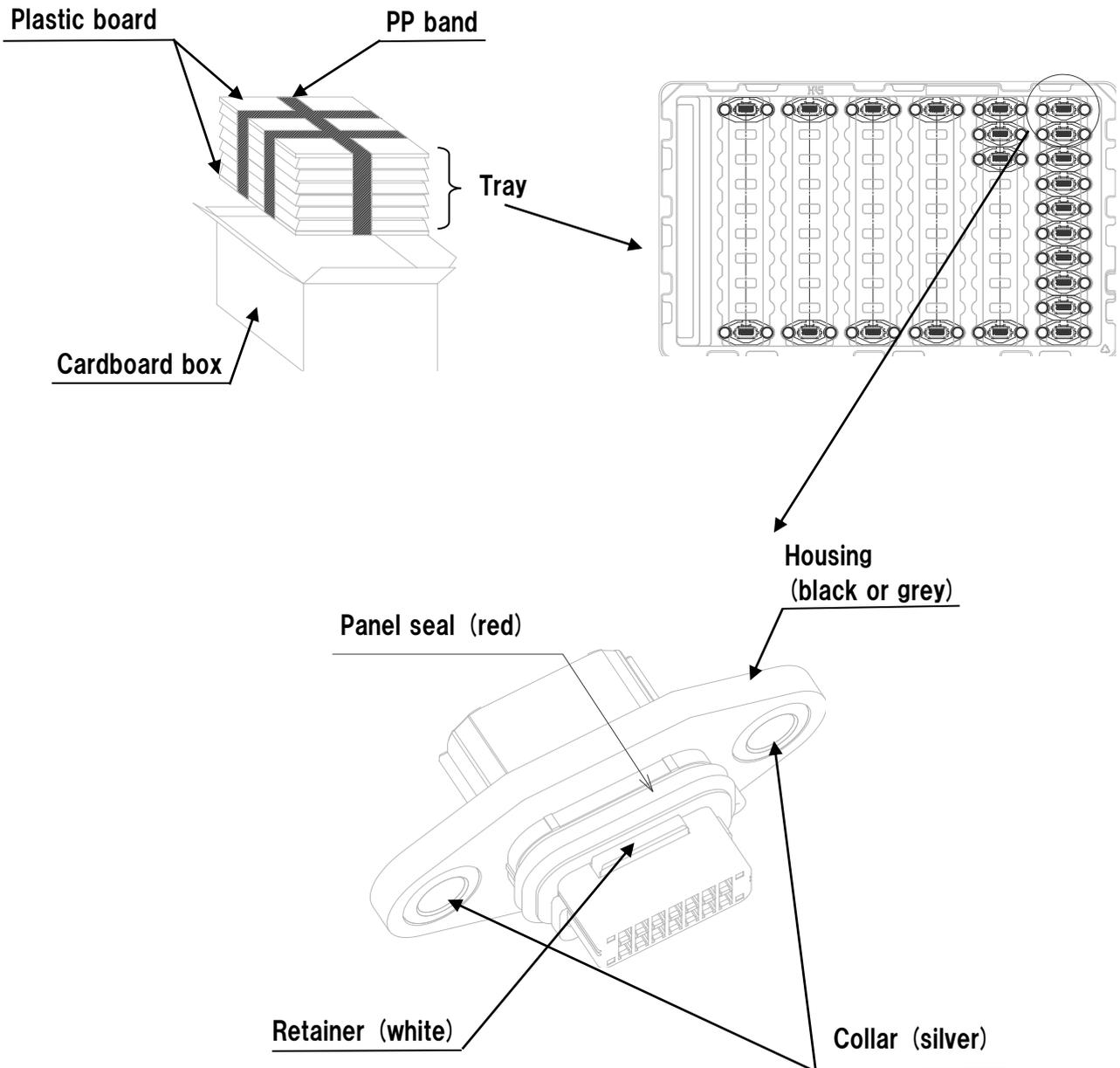
6.2 CONNECTOR ASSEMBLY INSTRUCTIONS

Male connector:

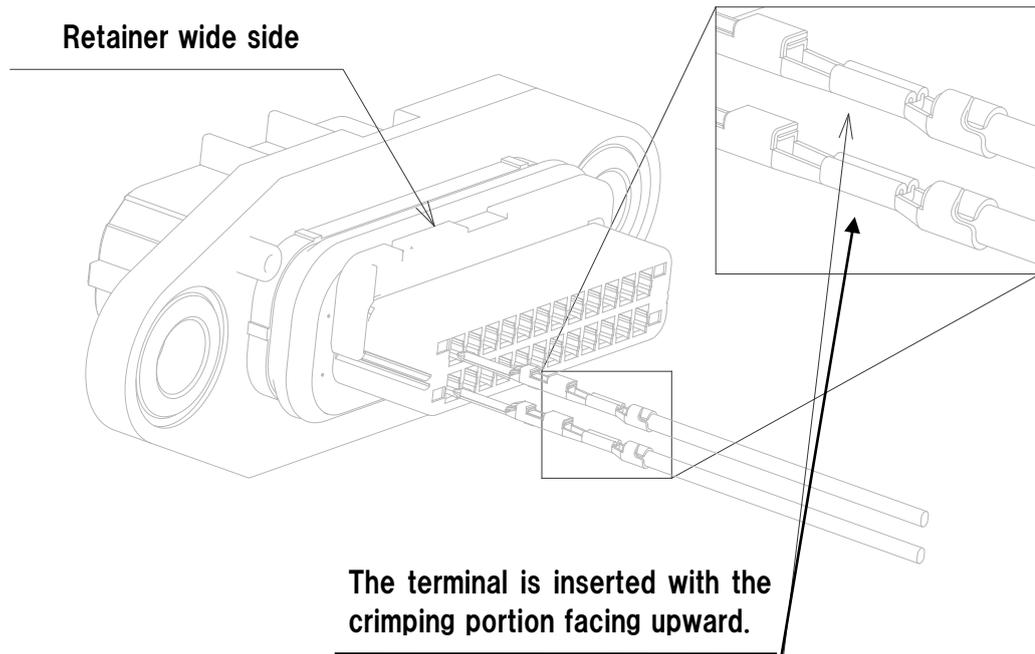
1 – Pick a connector from the tray.

Please hold connectors except panel seal part.

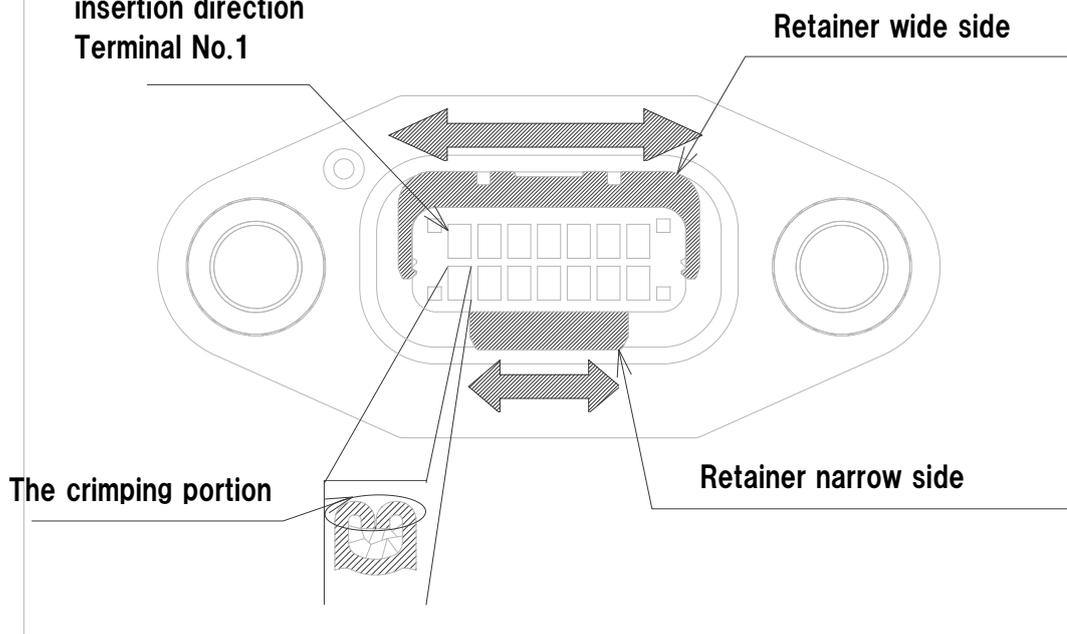
And also be careful that the oil of the panel seal not to be touched with other objects except connector housing and retainer.



2 - Insert the terminal straight to the housing (refer to below direction) until a click by the lance is heard.

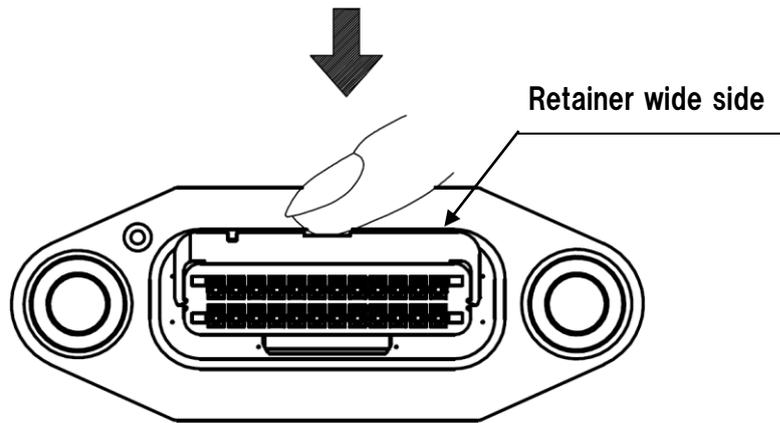


Supplementary figure of terminal
insertion direction
Terminal No.1

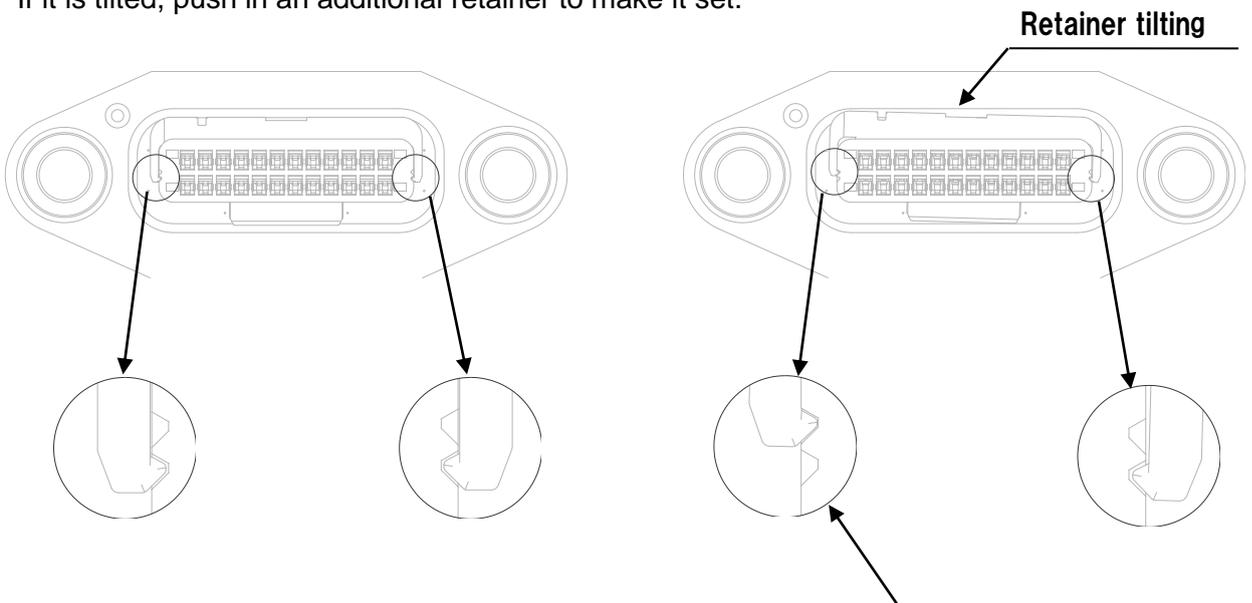


3 – Push the pre-set retainer from wide side until it clicks.

Please don't touch the panel seal more than necessary.



After setting the retainer, please make sure the retainer is not inclined as seen from the front. If it is tilted, push in an additional retainer to make it set.



*Set condition of retainer

OK

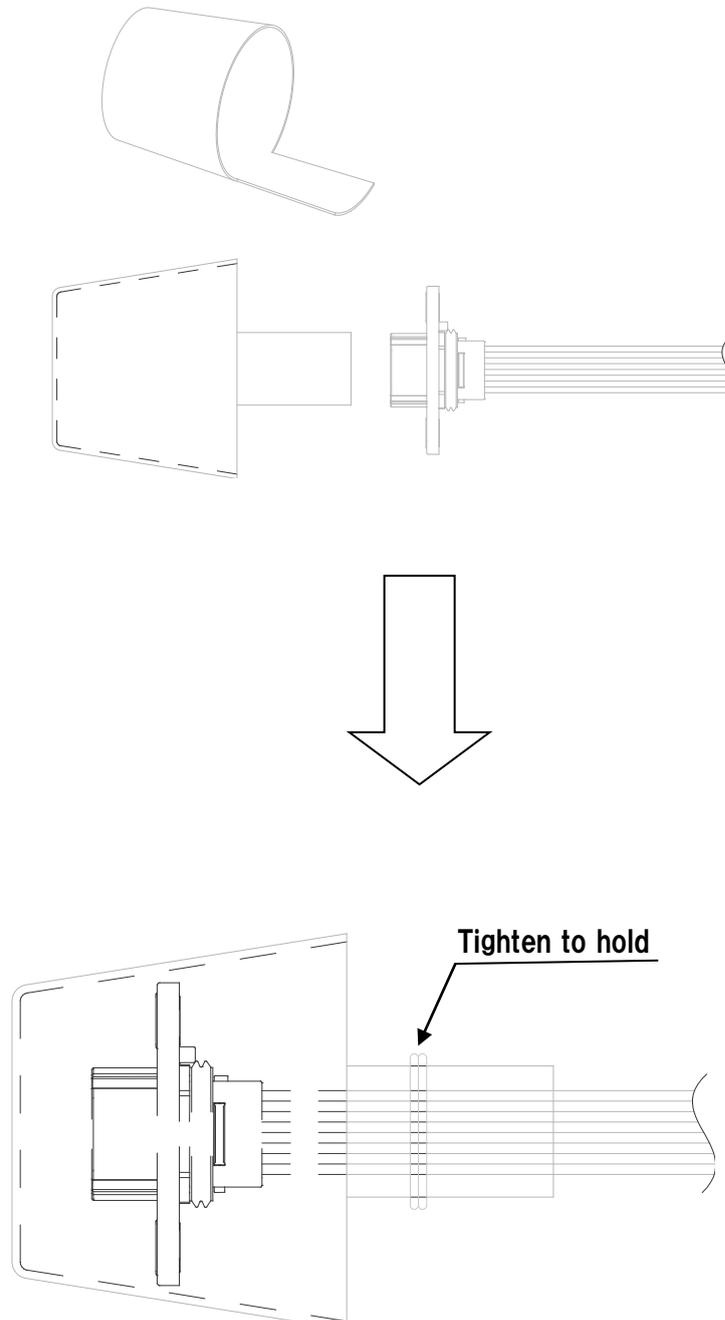
*One side of the retainer not installed.
(Even in the case of this left-right reversal.)

NG

4 – Please protect the panel seal not to be touched with other objects.

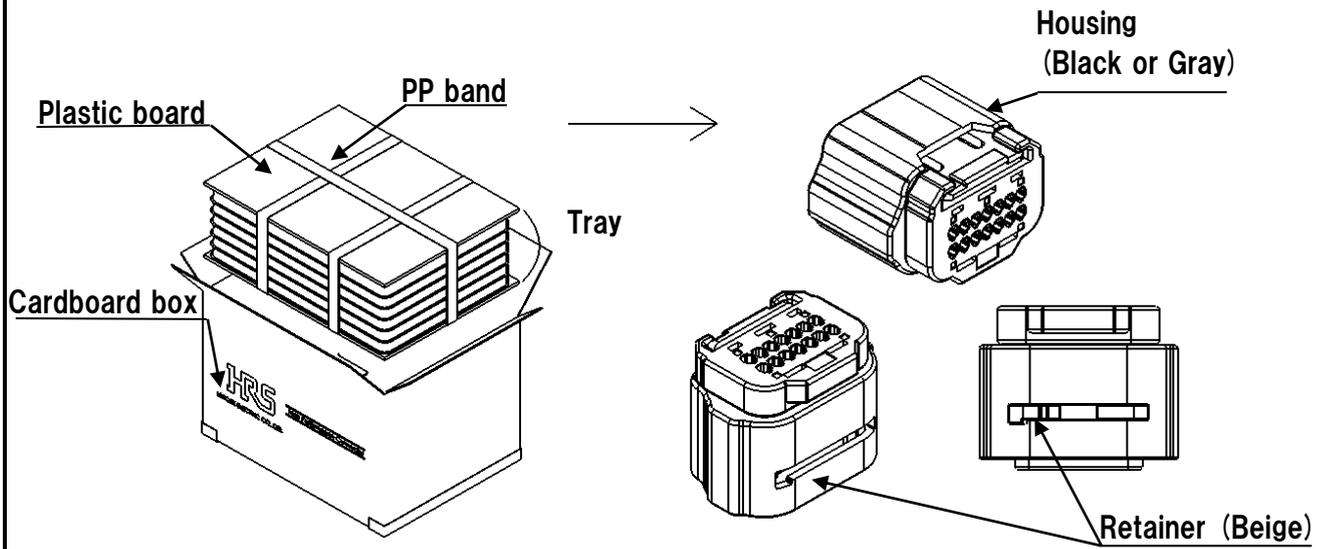
The protector is required not to be deformed excessively during packaging, shipping and being stored.

e.x.) Cover the whole part of connector with plastic cup and tighten the cables to hold.

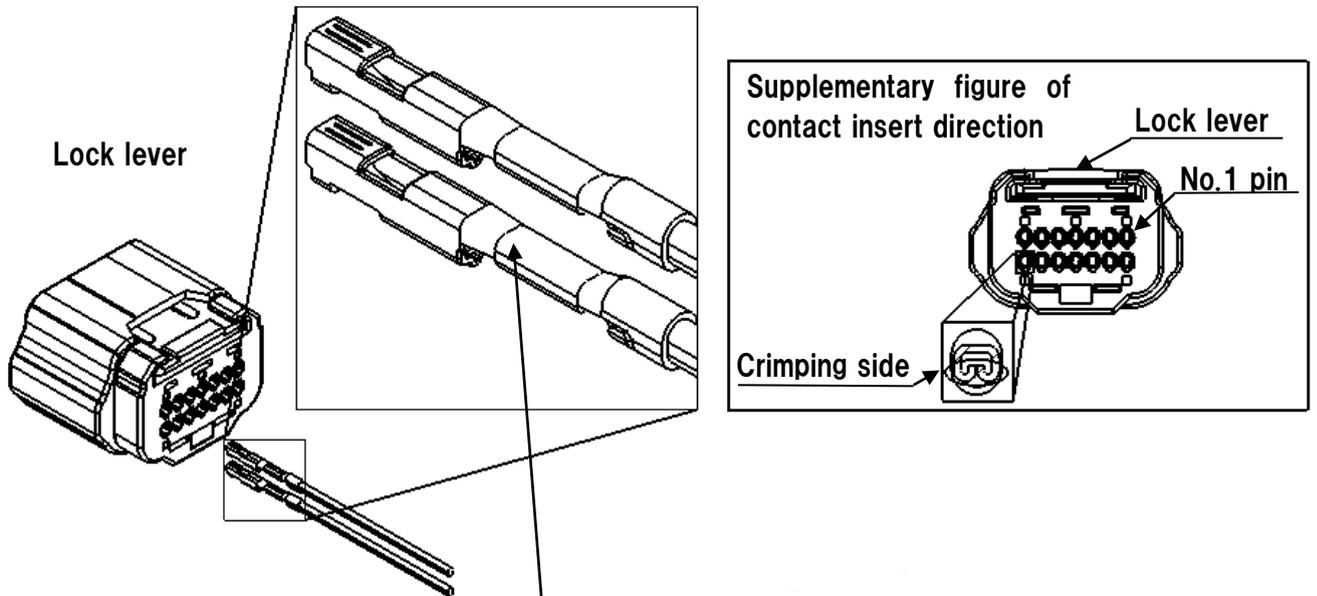


3 Female connector:

1 – Pick a connector from the tray.



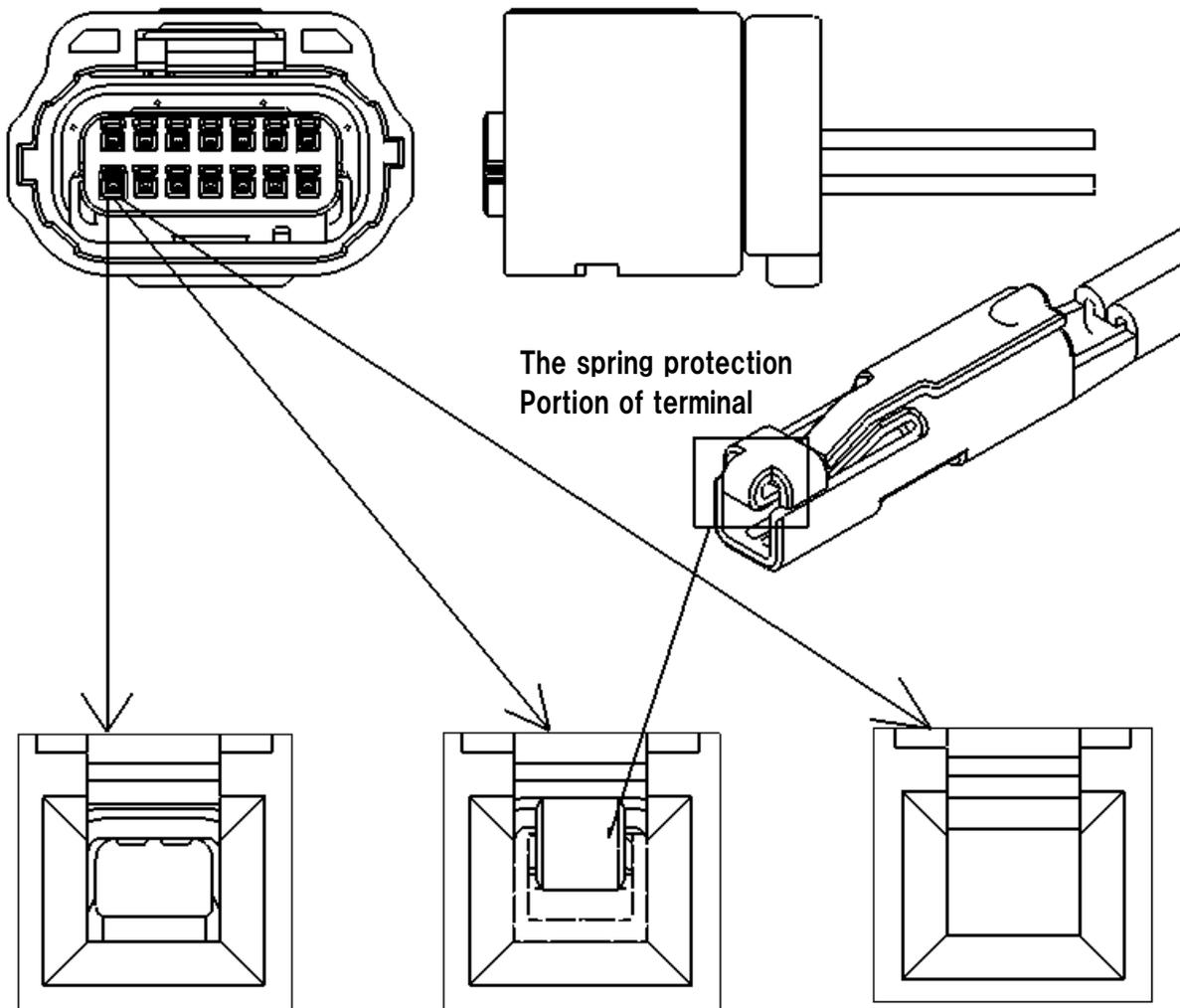
2 - Insert the terminal straight to the housing (refer to below direction.)



The terminal is inserted with the crimping portion facing opposite side of lock lever.

Note: Please hold the cable and insert it straight.

⚠ 3 – After inserting the terminals, check the terminals are correctly inserted from the mating side of connector.



【OK】 The terminal is correctly inserted.
 Appearance: The frame of the female terminal looks almost square.

【NG】 The terminal is inserted upside down.
 Appearance: The spring protection portion of terminal shows at lock lever side.
 ⇒At this condition, the terminal is locked in the housing, the terminal cannot remove from the housing.
 Please replace new housing and new terminal.
 In addition, if you try to insert the terminal in this direction, the terminal insertion force will be higher than the normal direction.

【NG】 The terminal is not fully inserted.
 Appearance: The terminal is not clearly visible.
 ⇒Please insert the terminal fully until visible.

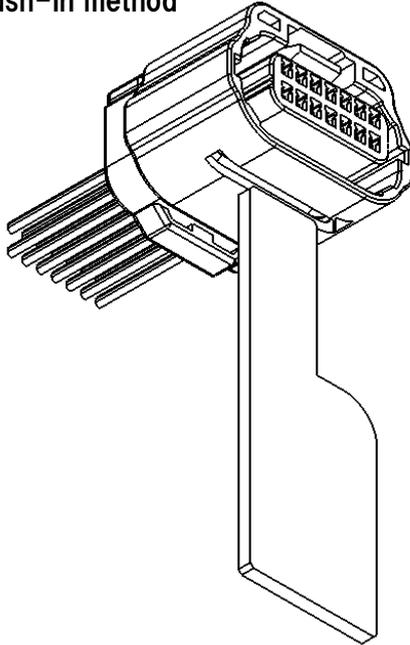
③ 4 – Push the pre-set retainer until it clicks.

As shown in the figure below, please push the center of preset retainer to use the flat part of dedicated tool until you hear locked sound.

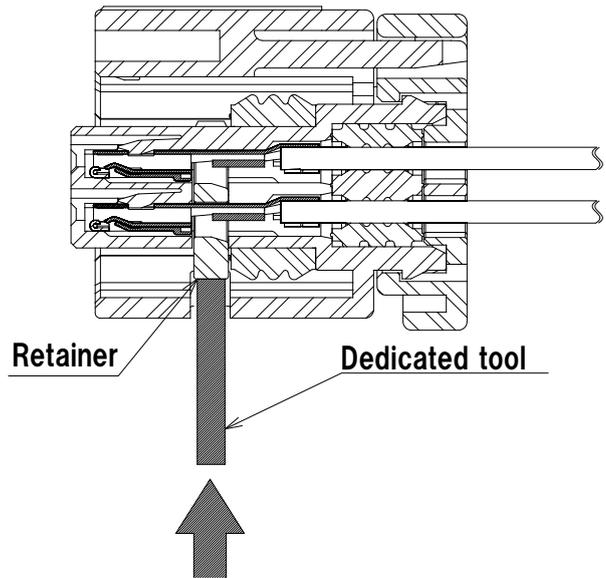
When the terminal is inserted correctly, the insertion force of retainer is under 20N.

Please do not exceed the insertion force more than 29.4N, or the terminal or housing might be deformed and you can not detect partial insertion of terminal or terminal insert upside down.

Schematic diagram of retainer push-in method

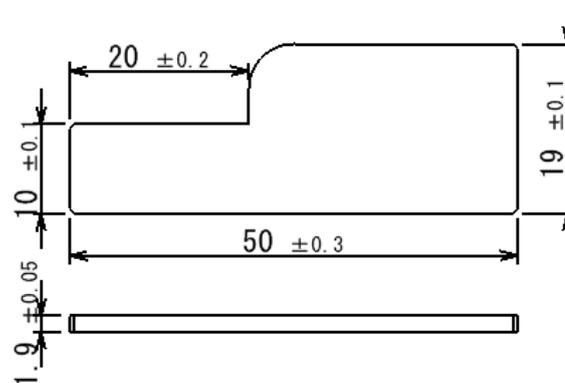


Connector cross section



Push the dedicated tool in the direction of the arrow.

Dedicated tool
Appearance and dimensions (mm)



Dedicated tool information for pushing and releasing the retainer

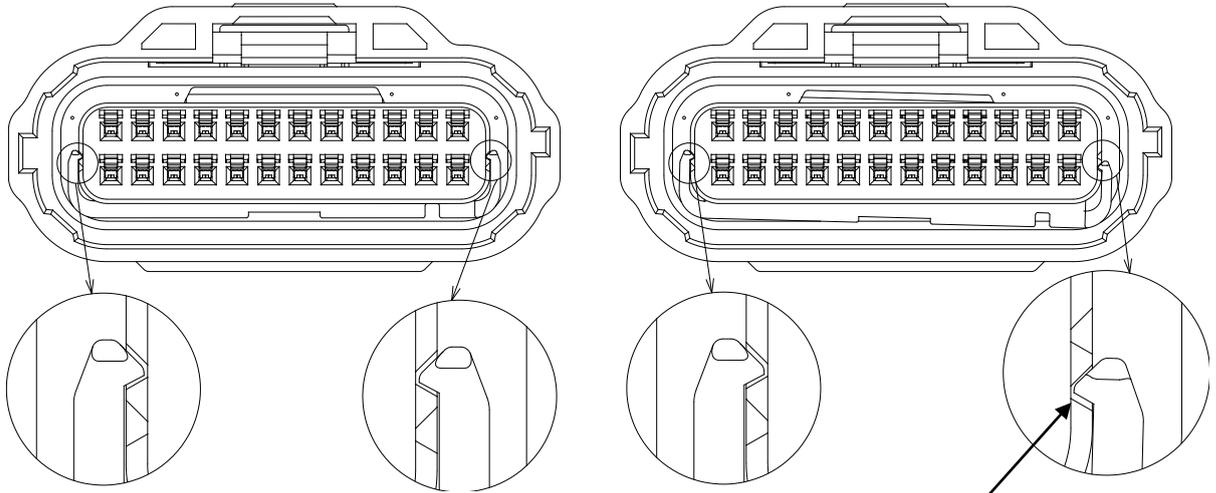
Applicable products	Product name	Part number
ZE064W-*S-HU/R (*)	ZE064W-*DS-HU/R/CV-MD	CL0902-5151-0-00

⚠ 5 – After setting the retainer, please make sure the retainer is not tilted as seen from the front.

The retainer does not set because it is conflict with terminal when the terminal is not inserted completely or the terminal is upside down.

If so, the retainer pops up approx. 0.4 mm.

Please run again process 3 and 4, when the retainer does not set up correctly.



*Set condition of retainer

OK

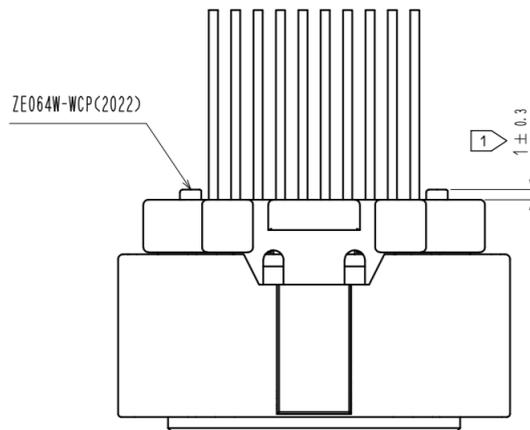
*One side of the retainer not installed.
(Even in the case of this left-right reversal.)

NG

In case of cavities where terminals are not inserted, please use plugs to ensure waterproofness of connectors.

The waterproof pin does not have rotational direction of restriction.

Below dimension should be respected to ensure correct position of plugs:



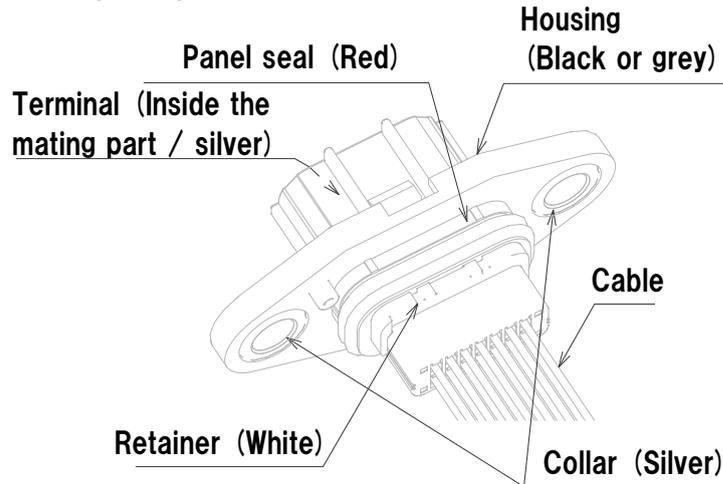
7. WIRING HARNESS ASSEMBLY RECOMMENDATIONS

- Deformed or damaged parts have to be replaced by a new one.
- Apply tape so that every individual wire is subjected to an equal amount of tensile force to avoid any effect on terminals (like disengagement).
- The distance to apply tape from the end of connector is 35mm minimum.
- The bending radius for wires should be at minimum 3 times its outer radius to ensure normal use of our connectors.

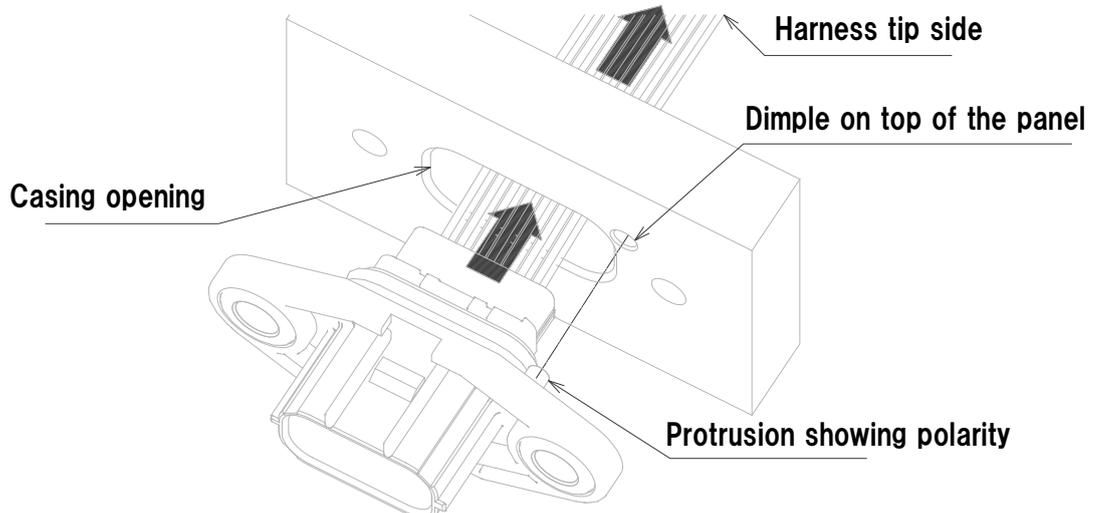
8. ASSEMBLY PROCESS TO THE PANEL

1 – Pick a harness assembly from packaging.

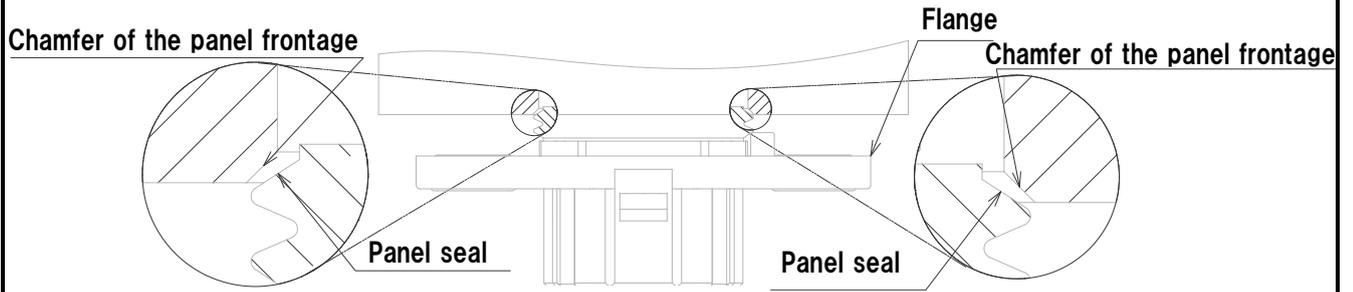
In the harness state, it is recommended to hold the cable and housing. Do not touch the terminals or the male connector panel seal or retainer. Also, make sure that oil is smeared over the entire surface of the panel seal. Excessive loss of oil on the surface of the panel seal will result in insufficient slippage when installed on the panel, causing it to not install properly and compromising air tightness.



2 – With the orientation of the polarity protrusions on the housing aligned with the indentations on the enclosure, insert the harness end side through the enclosure opening until the male connector panel seal touches the enclosure opening.



3 – Lightly press the panel seal against the chamfer of the panel frontage to position the male connector.



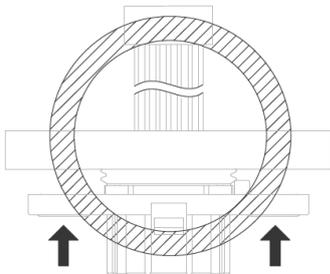
While in this position, press on the male connector housing or collar and push the male connector straight into the enclosure opening. Push straight in until the male connector flange touches the panel.

⚠️ ❌ Pushing the male connector diagonally or pulling the harness side into the enclosure opening may cause excessive load on the male connector, which may result in damage.

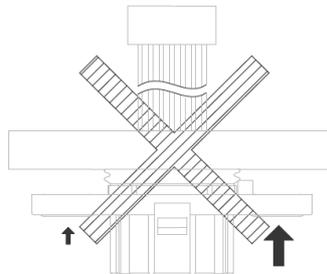
❌ If the above insertion force exceeds 60N, please do not use the connector because the lubricant oil on the surface of the panel seal might not be enough.

It can cause panel seal deformation and increase the risk of air leak.

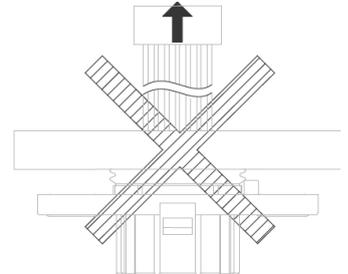
OK: Press both sides of the collar evenly



NG1: Press the collar unevenly



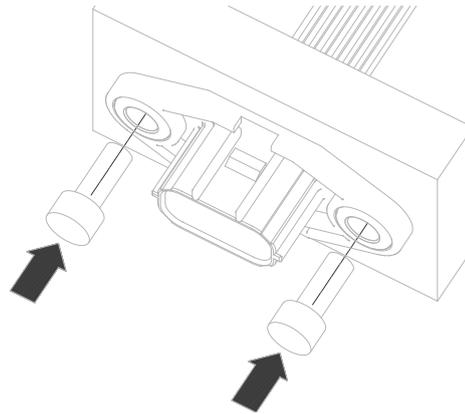
NG2: Pull on the end of the harness



4 – Remove your hand from the male connector. Insert M5 size screws through the two collars and tighten the screws to a tightening torque of 5.5Nm max to secure the unit to the panel.

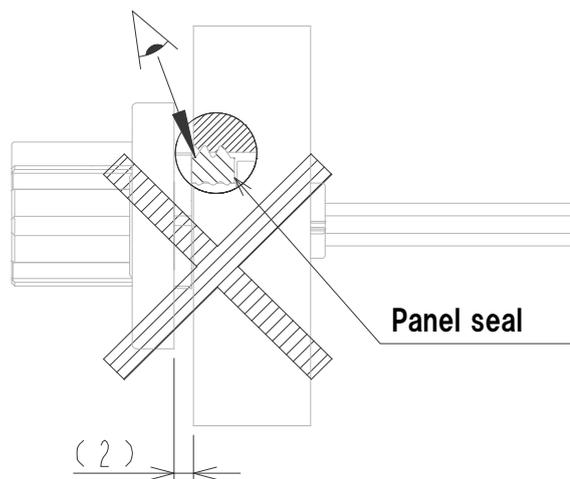
⚠️ ※Any type of M5 screw can be used to install to the panel.(Hex Socket Bolt, Hex Flange Bolt, etc.)

※Only the upper tightening torque limit is defined in order to prevent connector damage and no recommendation or minimum value is specified. Please define them according to each company rule.



Make sure that the male connector does not rise excessively above the surface of the panel when you take your hand off the male connector. If it floats up excessively, something may have gone wrong. In that case, pull the male connector out of the panel and start the process all over again.

Approximate amount of lift: 2mm or less or no panel seal is visible through the gap.



Do not reattach the male connector to the panel more than once and only do so consecutively to the same panel.

Before reattaching the harness, check the appearance of the panel seal and if it is damaged or deformed, use a new harness.

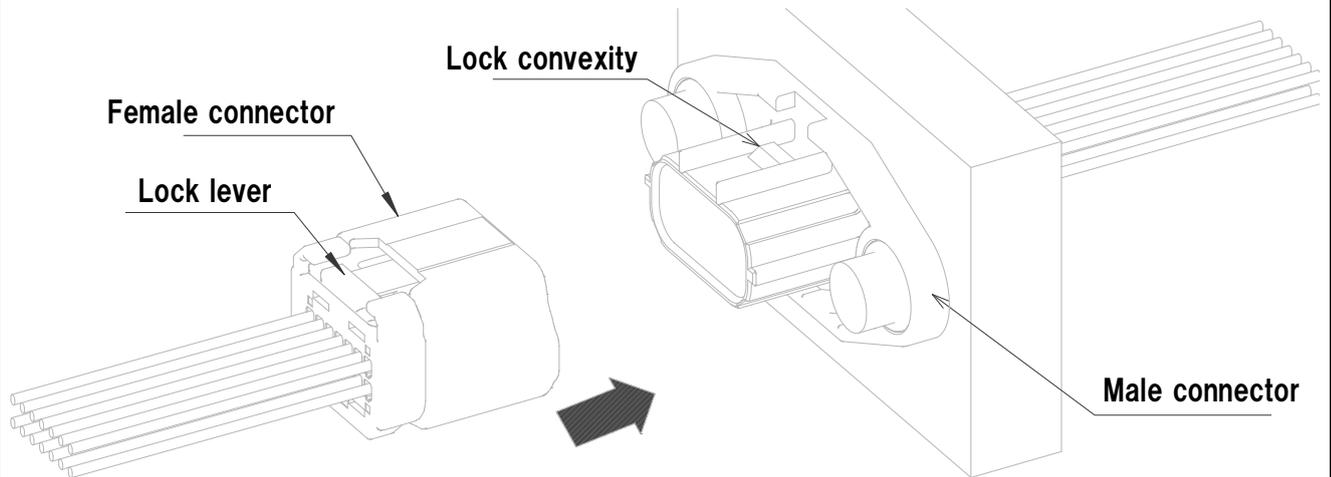
Also, reattaching the male connector more than once or reattaching it to a different panel may cause excessive load on the panel seal, so please use a new harness in such cases.

9. MATING OPERATING PROCESS

1 – Prepare a panel with a male connector attached and a female connector harness product.

Make sure that the male and female connector key codings are the same.

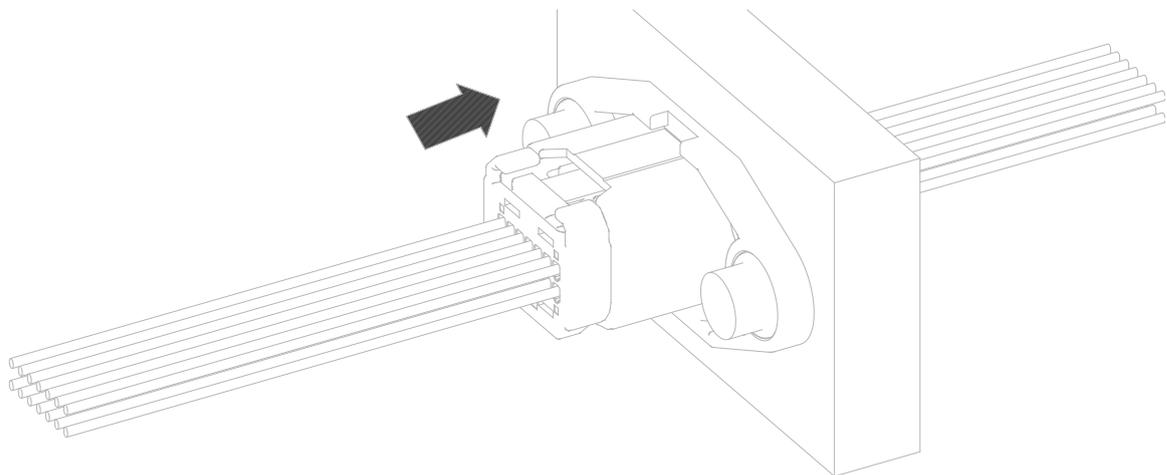
Align the locking direction of the male and female connectors and insert them straight along the mating direction.



2 – Please insert the connectors until they butt against each other. The connector will be locked.

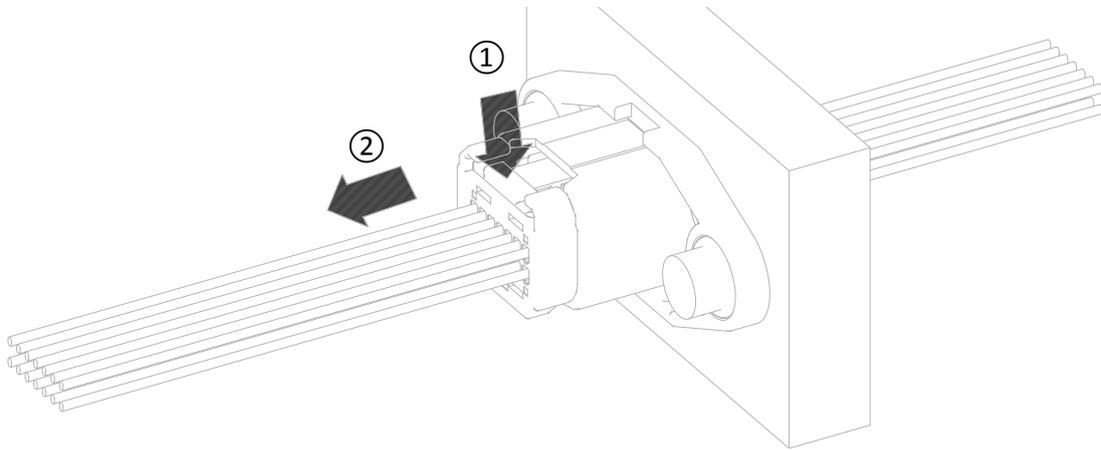
Do not touch the female connector lock lever when inserting the connector.

This makes it difficult to recognize the lock feeling and may cause half insertion.



3 – When disconnecting the connector, push down the female connector until the locking lever of the female connector is pushed against it, then grasp the female connector housing and pull it straight against the mating direction.

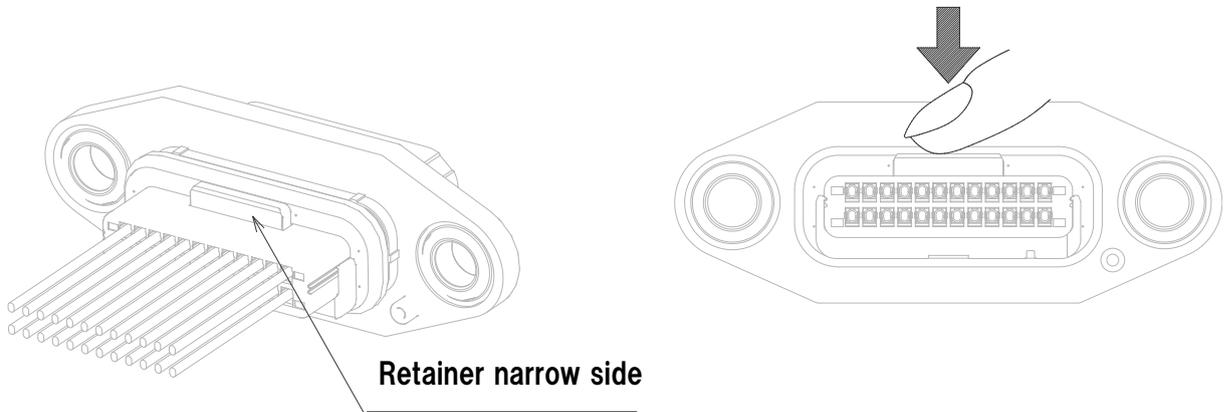
If the female connector is removed while the lock lever is not pushed down enough, it may cause damage to the lock lever.



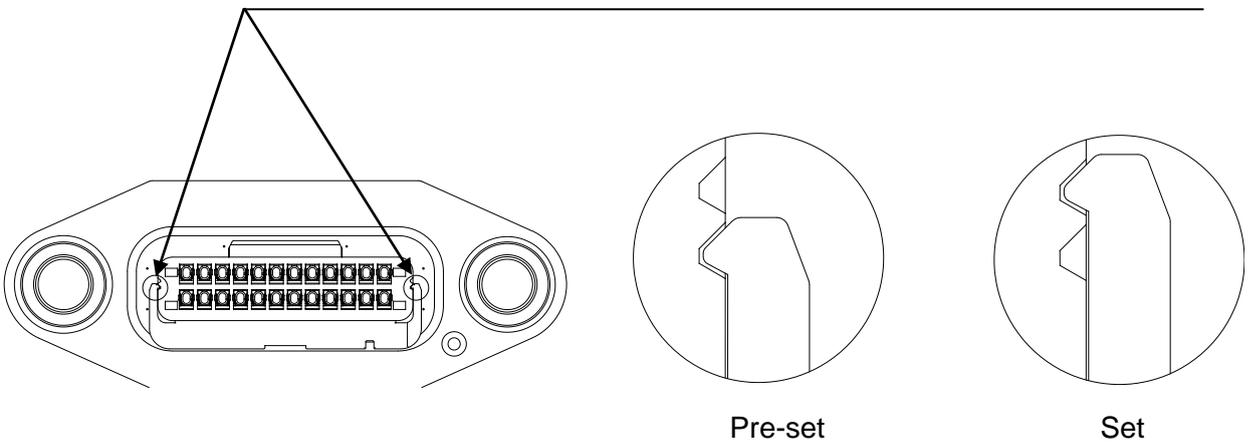
10. REPAIR PROCESS

Male connector:

1 – Release the retainer with your fingers, to return to the pre-set state.



Make sure that the retainer is in the pre-set state for both left and right.

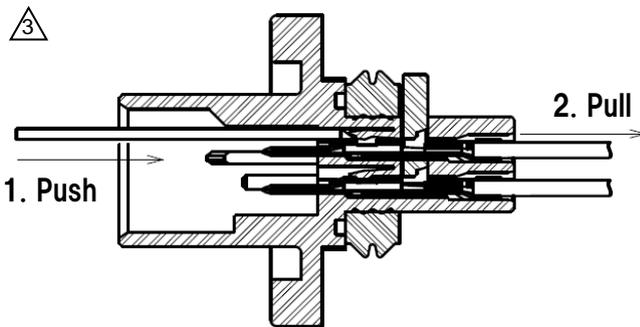
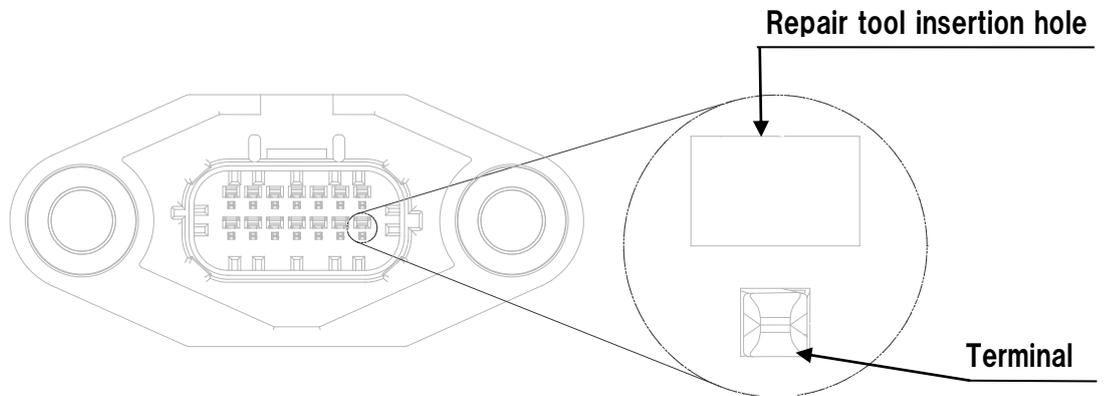
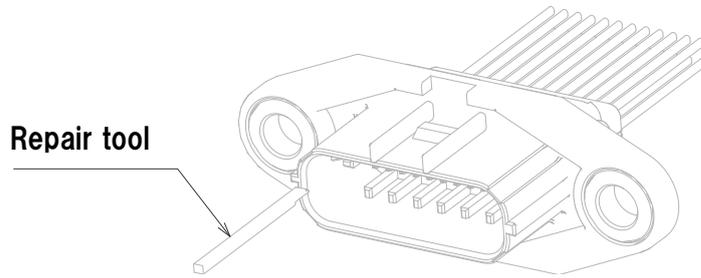


Note: Please return to the pre-set state position from retainer wide side when the retainer drops out.

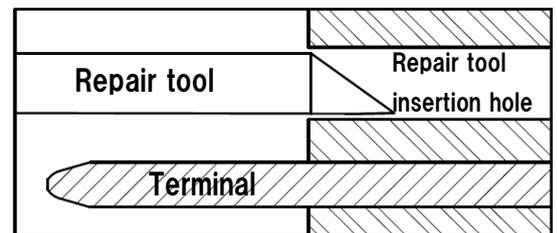
2 – Insert the repair tool into the terminal hole, and push until it hits.
After pushing in, please remove the terminal while maintaining that state.



Note: Please refer to the next section (§11) for details on the repair tool.



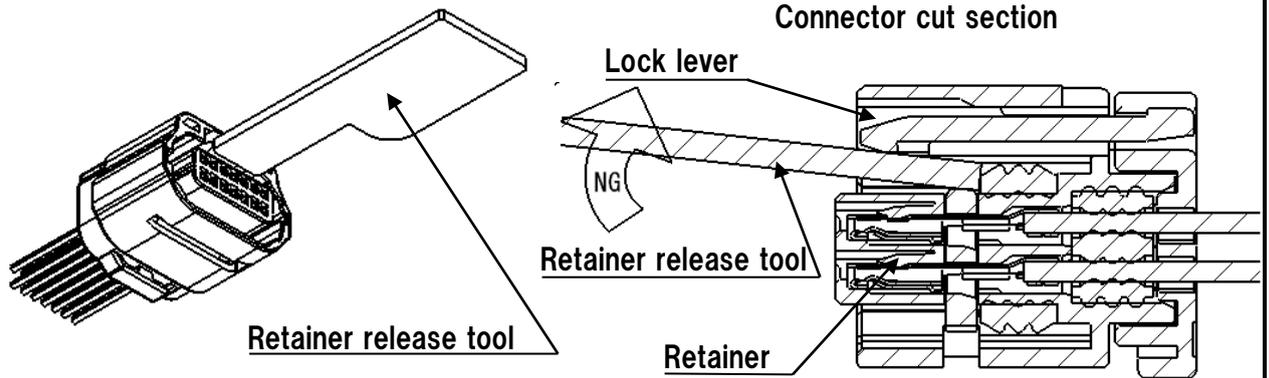
Supplemental figure for
repair tool direction



Note: Please be careful not to touch the terminal when inserting a repair tool.
Note: Repaired connector cannot be used. Please replace it with new one.

3 Female connector:

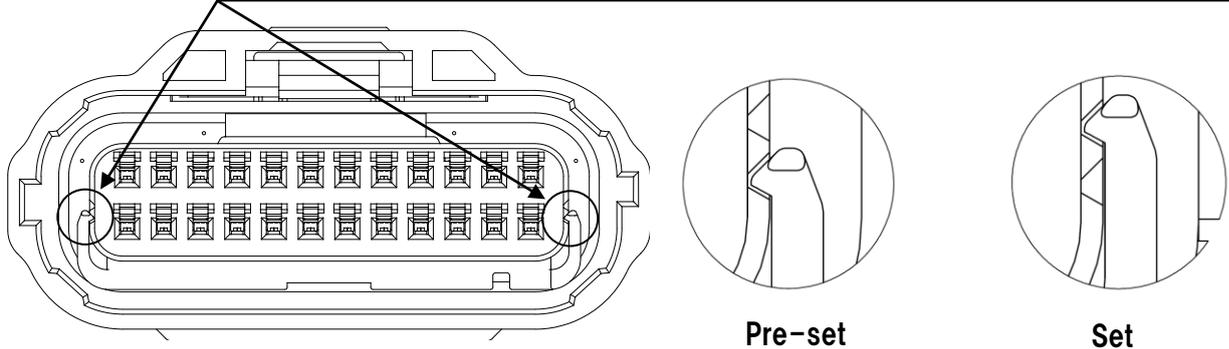
1 – Use the retainer release tool to unlock the retainer and return it to the preset condition.



The retainer release tool into the housing (lock lever side), push down the retainer. Please be careful not damage or deform the housing seal.

Please do not tilt the retainer release tool in the direction shown above to prevent an excessive deformation of lock lever.

Make sure that the retainer is in the pre-set state for both left and right.

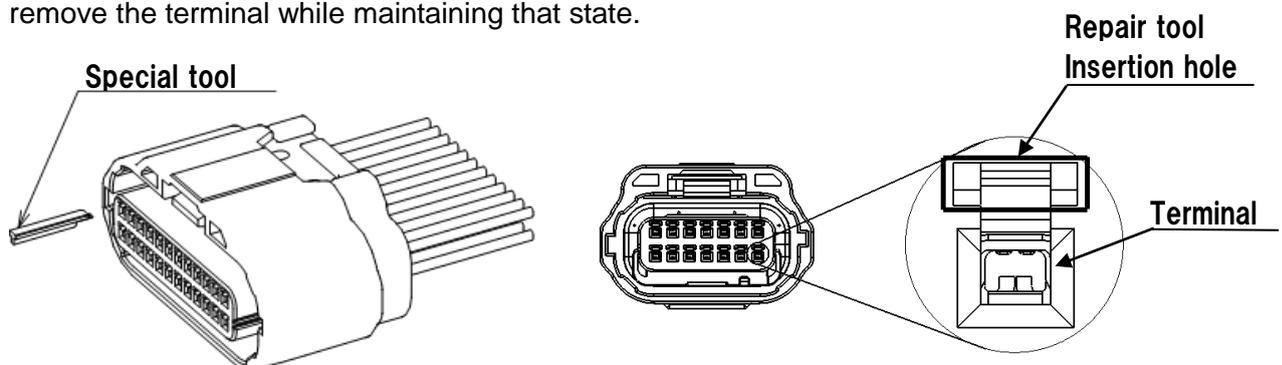


Note: If the retainer is dropped out, please return the pre-set position.

Dedicated tool information for pushing and releasing the retainer.

Applicable products	Product name	Part number
ZE064W-*S-HU/R(*)	ZE064W-DS-HU/R/CV/MD	CL0902-5151-0-00

2- Insert the repair tool into the repair tool insertion hole, and push until it hits. And then, please remove the terminal while maintaining that state.



Note: The number of insertions into the same terminal hole is up to 2 times. Exceed 2 times, please replace new housing.

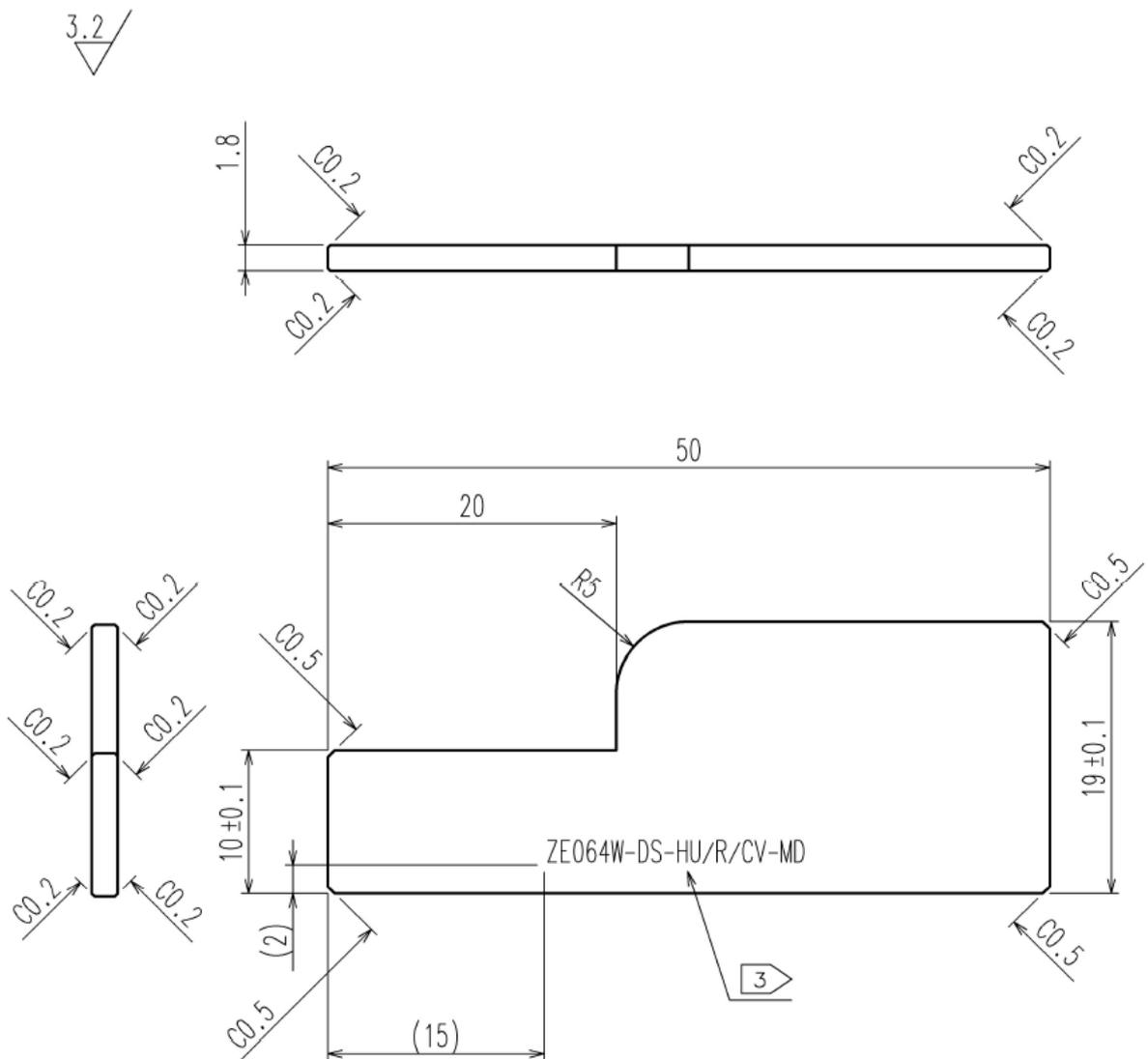
11. REPAIR TOOLS

11.1 REPAIR TOOL FOR RETAINER

Part number summary for retainer repair tools:

Applicable parts	Repair tool name	Repair tool part number
ZE064W-XDS-HU/R(Y)	ZE064W-DS-HU/R/CV-MD	902-5151-0

The following drawing shows definition of tool for retainer release for female connector.



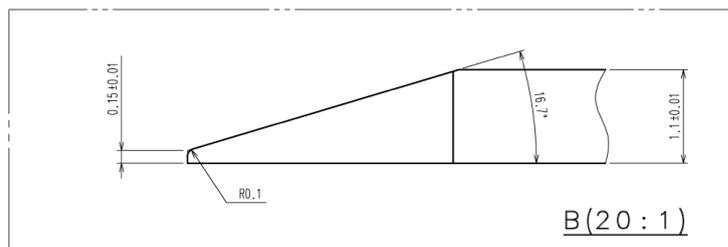
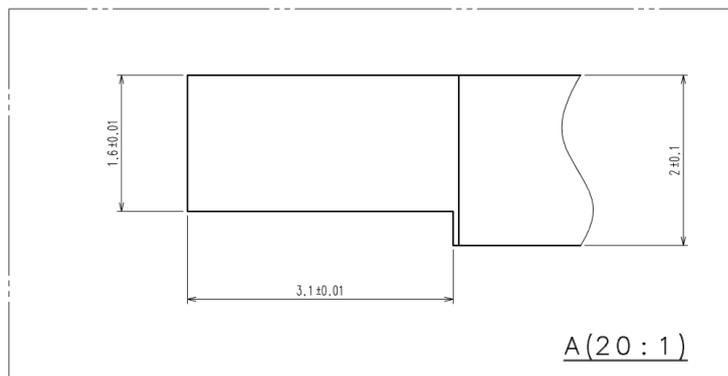
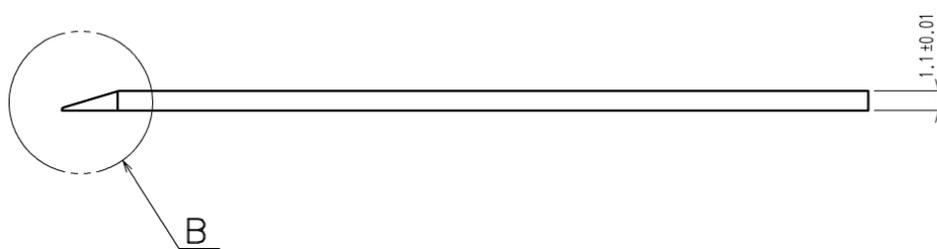
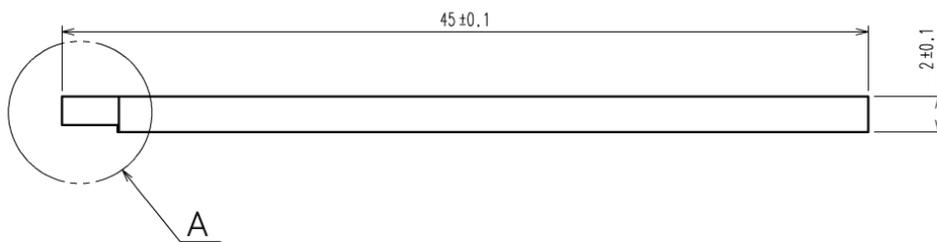
11.2 REPAIR TOOL FOR TERMINAL

Part number summary for terminal repair tool:

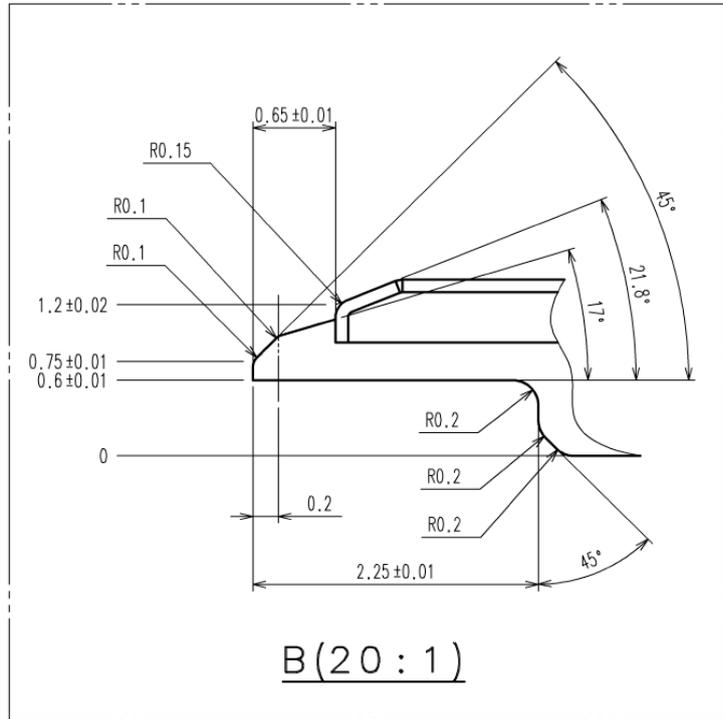
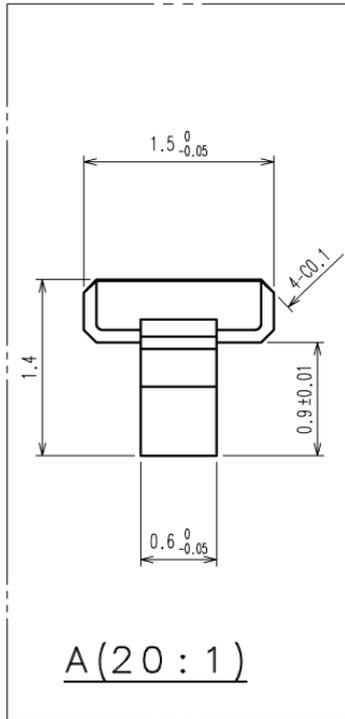
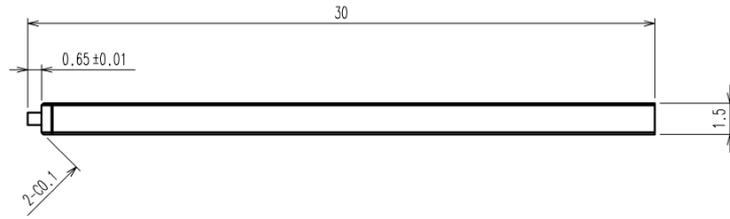
Applicable part	Repair tool name	Repair tool part number
ZE064-2022PCF	ZE064-P/RE-MD	902-5150-0
ZE064-2022SCF	ZE064-S/RE-MD	902-5149-0

The following drawings show definition of tools for terminal repair.

Terminal repair tool for ZE064-2022PCF:



Terminal repair tool for ZE064-2022SCF:

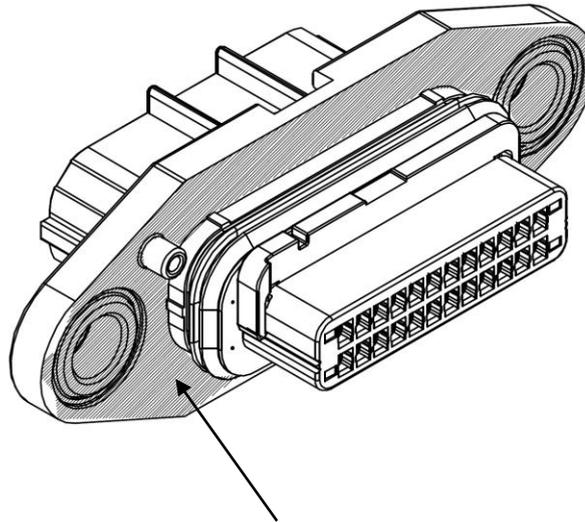


12. ELECTRICAL TEST

12.1 CLAMPING AREAS OF CONNECTORS

During electrical tests, connectors can be clamped in the following areas: (examples with ZE064W-24DP-HU/R(A) and ZE064W-24DS-HU/R(A))

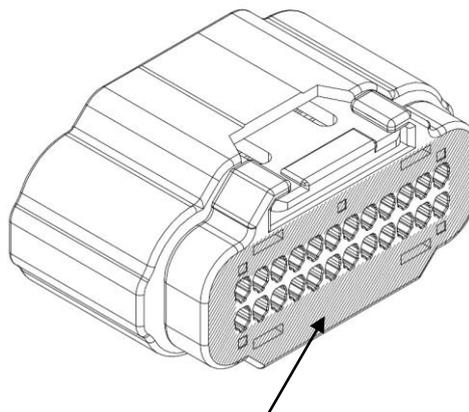
Male connector: (example with ZE064W-24DP-HU/R(A))



Areas to clamp the male connector

Note: Please pay attention to not touch panel seal

Female connector: (example with ZE064W-24DS-HU/R(A))

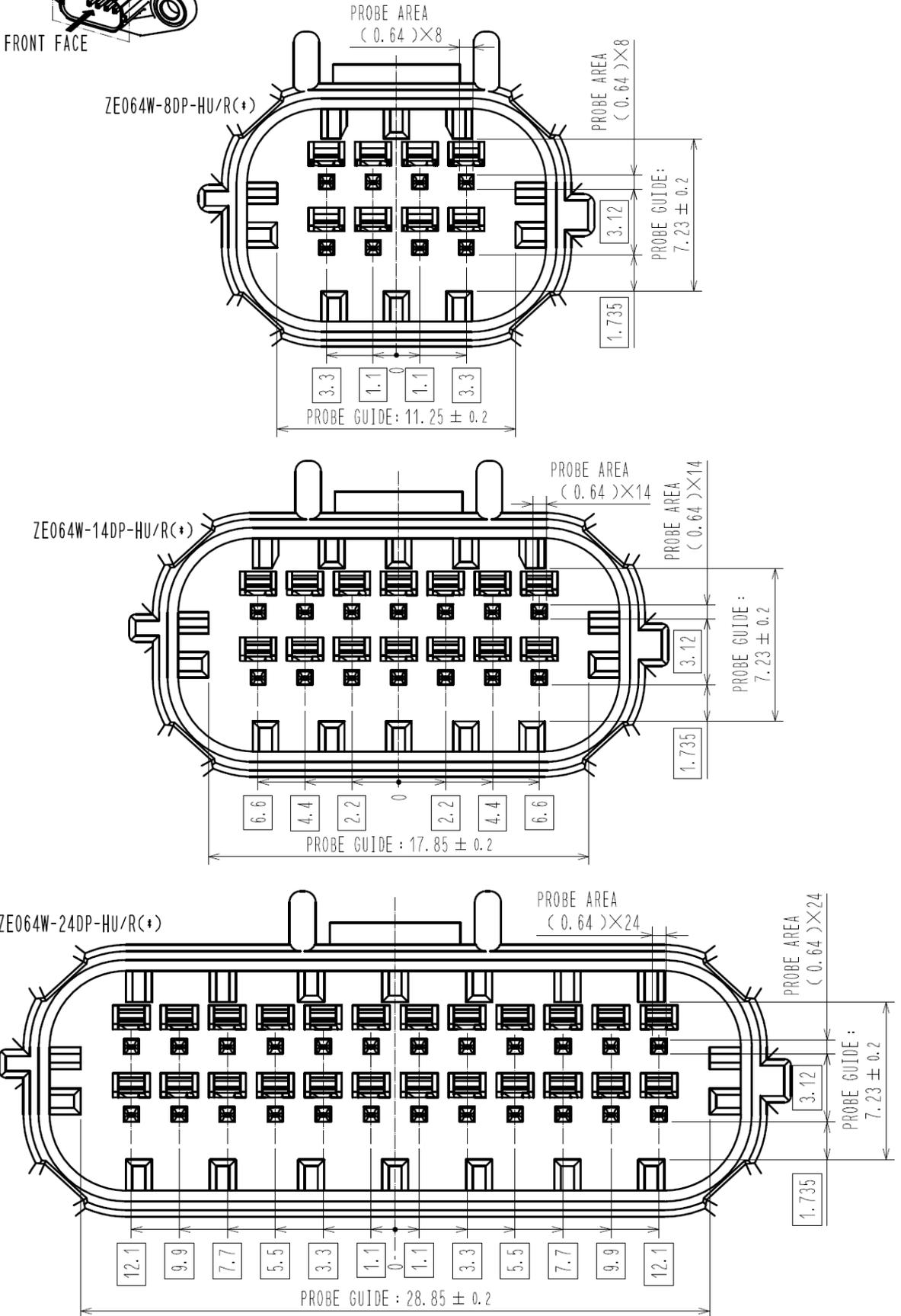
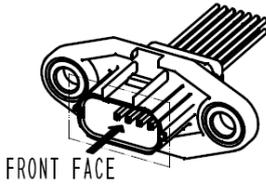


Areas to clamp the female connector (around cavities)

12.2 LOCATION OF TEST PROBES

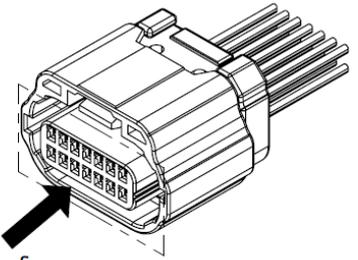
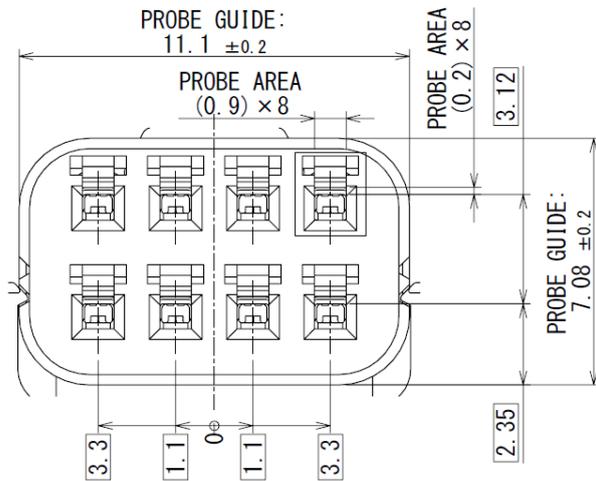
The test probes should be located in front face as described below:

Male connector:



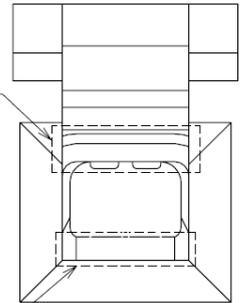
3 **Female connector:**

ZE064W-8DS-HU/R(*)



Front face

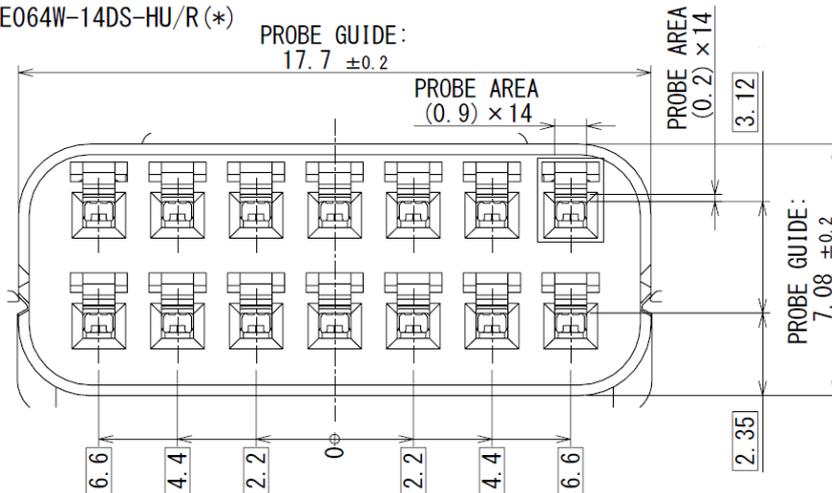
PROBE AREA:
 0.9×0.2



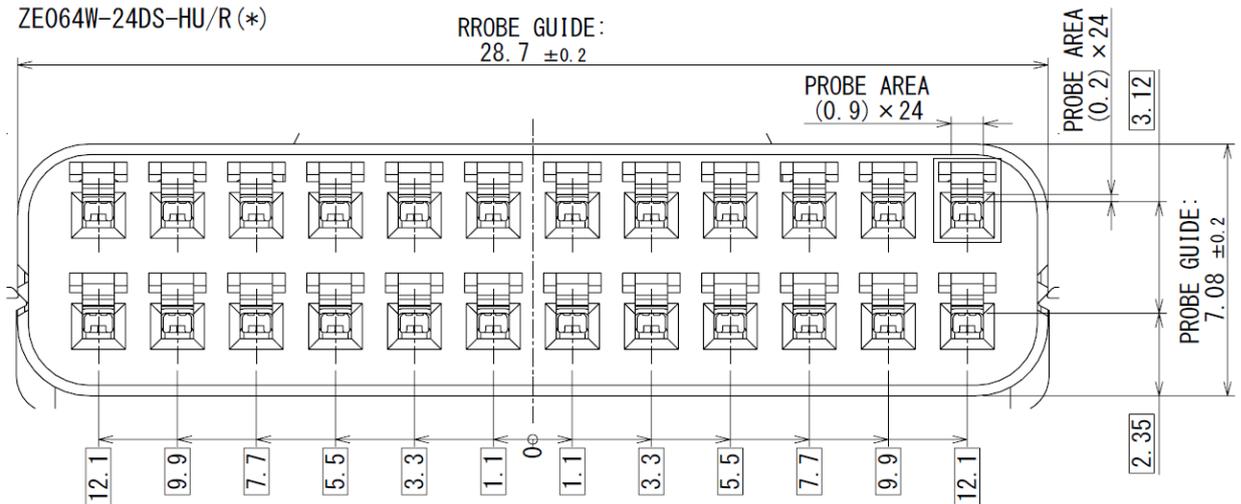
Terminal spring
(Do not touch)

Enlarged of PROBE AREA

ZE064W-14DS-HU/R(*)



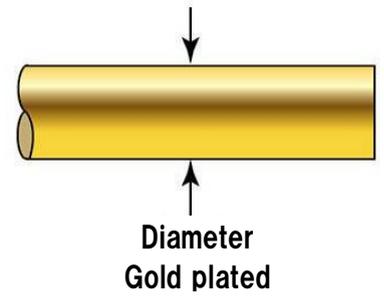
ZE064W-24DS-HU/R(*)



12.3 DEFINITION OF TEST PROBES

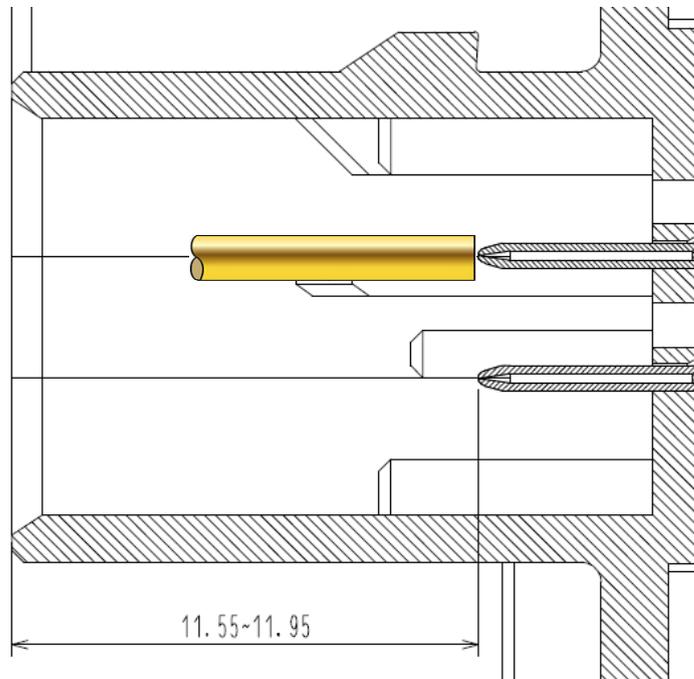
The recommended probe should have the following characteristics:

- ③ • Touch Surface: Flat
- Plating: Gold plated
- Spring force: 1N maximum
- Stroke: see section below



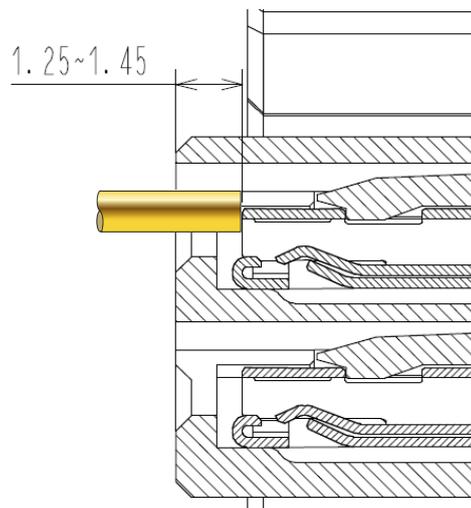
Male connector:

- ③ • Diameter: $\varnothing 0.6 \sim 1.2 \text{mm}$



Female connector:

- ③ • Diameter: $\varnothing 0.3 \sim 0.6 \text{mm}$



12.4 RECOMMENDATIONS FOR ELECTRICAL TESTS

- Perform test after insertion of terminals and closing of retainer.
- Avoid any deformation on housing or terminal during electrical test.
- Replace any damaged housing or terminal or panel seal with a new one.

13. CRIMP QUALITY STANDARD

13.1 SCOPE

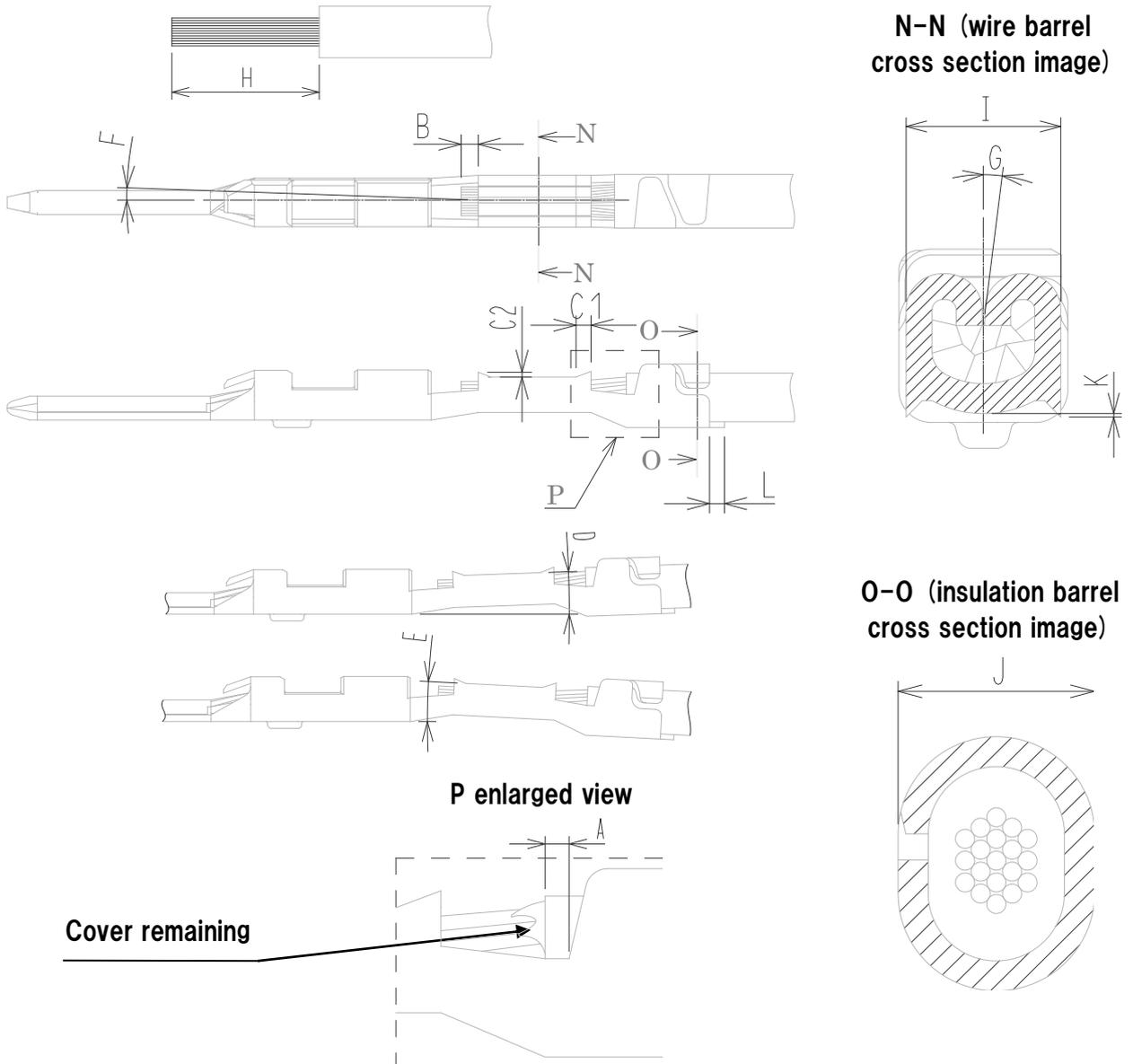
This technical specification prescribes crimp condition of ZE064-2022PCF and ZE064-2022SCF.

13.2 APPLICABLE WIRE

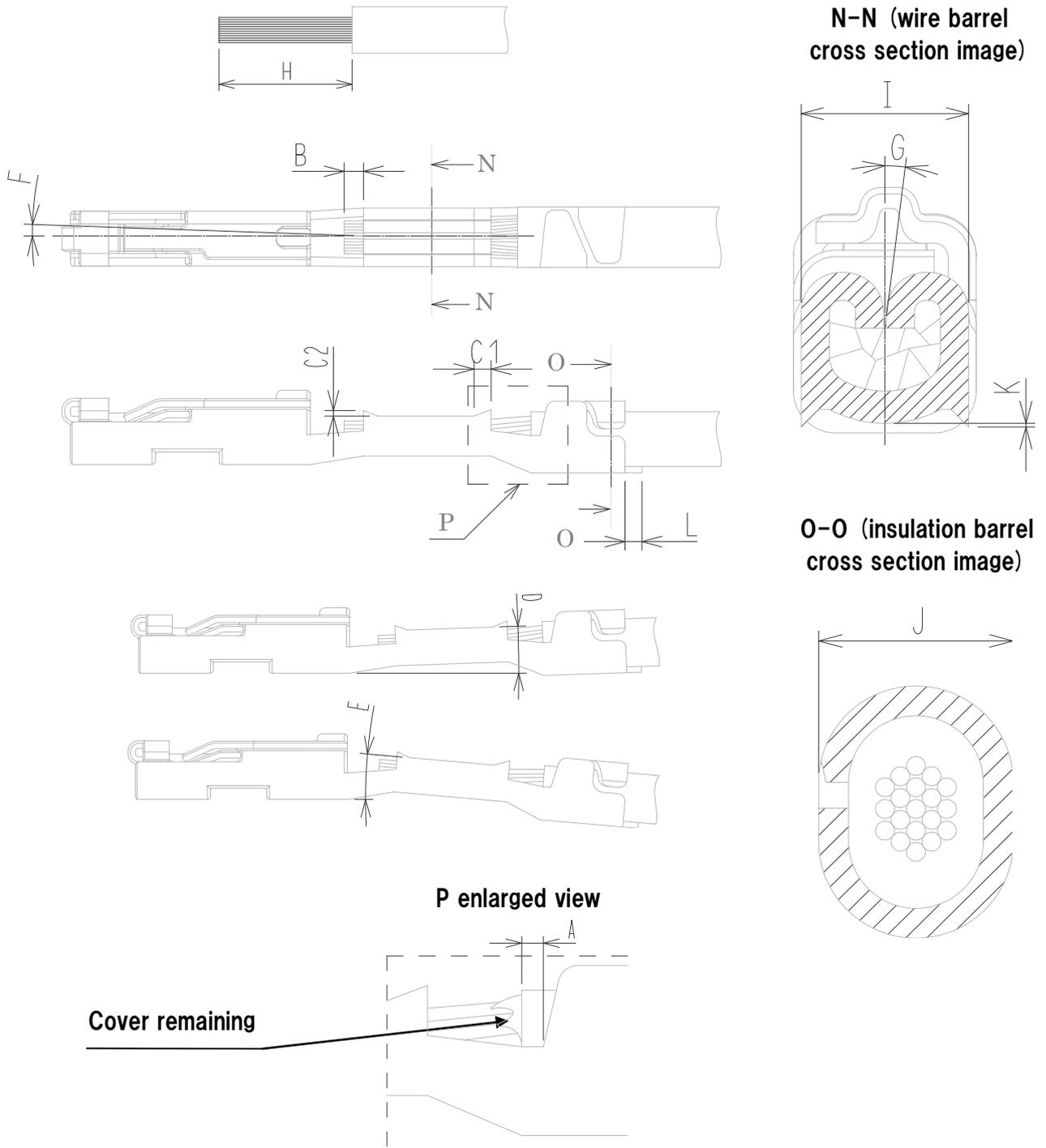
- Applicable wire size: 0.3mm² ~ 0.5mm²
- Applicable insulation size: ϕ 1.4mm ~ ϕ 1.7mm

13.3 QUALITY STANDARD

Related dimensions for ZE064-2022PCF:



Related dimensions for ZE064-2022SCF:



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CHECK POINT		MEASURE (mm)	
Cover location		A	0.3 ~ 0.8
Location of tip of the core		B	0.1 ~ 0.6
Bell-mouth		C1	0.1 ~ 0.5
		C2	0.5 max
Bend-up		D	2° max
Bend-down		E	3° max
Twist		F	±2° max
Rolling		G	±5° max
Strip length		H	4.0 ~ 4.3
Width	Wire barrel	I	1.5 max
	Insulation barrel	J	1.8 max
Height of metal cut-out teeth		K	0.12 max
Cut-off tab		L	0.1 max

Note 1: Refer to a Crimping condition list for the crimp height.

Note 2: There is a possibility that a terminal is involved in covering and crowded by the crimping, but it's no problem on the product function.

Note 3: Please confirm that the terminal which did crimp enters a housing.

14. CRIMP PARAMETERS

Crimp parameters for terminal ZE064-2022PCF:

WIRE TYPE	SEC AREA (mm ²) / AWG	CONDUCTOR		INSULATION		Tensile strength of the wire-terminal link (minimum)
		C/H	C/W	C/H	C/W	
AESSX0.3f	0.3821 / 22	0.83 ~0.89	1.5 max	1.90 ~ 2.00	1.8 max	50N
AESSX0.5f	0.5387 / 20	0.90 ~0.96	1.5 max	2.00 ~ 2.10	1.8 max	70N

Crimp parameters for terminal ZE064-2022SCF:

WIRE TYPE	SEC AREA (mm ²) / AWG	CONDUCTOR		INSULATION		Tensile strength of the wire-terminal link (minimum)
		C/H	C/W	C/H	C/W	
AESSX0.3f	0.3821 / 22	0.84 ~0.90	1.5 max	1.90 ~ 2.00	1.8 max	50N
AESSX0.5f	0.5387 / 20	0.92 ~0.98	1.5 max	2.00 ~ 2.10	1.8 max	70N