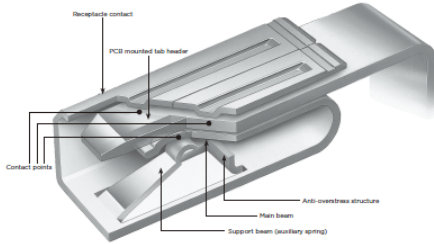


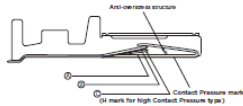
Contact Features (Example of the D-3000 Series)



(Illustration of D-3 Connector)

Contact Pressure Adjustment Method

- Gold plated and tin-plated contacts are available. Adjustable gaps for the auxiliary spring (at positions of A, C) to get the optimum contact pressure. For gold-plated product, both High Contact Pressure and standard contact pressure are available in accordance with the intended use.
- Anti-overshoot structure prevents damage to the main beam which might be caused by insertion of foreign objects or twisting. (Receptacle contact type of D-2.5, M/D-2.5, M, L, 2L, 3L/D-2.5, M)



Plating	Type	Contact Pressure	Position	Contact Pressure mark	Applicable unit	Specifications	Application	Mating Cycles
Gold plated	Standard Contact Pressure	1.0N	A	—	1-100	Standard	Used for applications: Motor car position and high mating cycle circuits	500
	High Contact Pressure	2.45N	B	H	1-200	Vibration/High current	Used for signal/Power supply/Print Applications for high vibration use	500
Tin plated	High Contact Pressure	3.92N	C	H	1-10	High Current	Used for Signal/Power supply Circuits low mating cycle	100

Contact Features (Example of D-3000 Series)

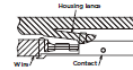
Tab/Receptacle Contact

Male side is tab while female side is receptacle contact so as to avoid twisting. (Refer to Figure on the left). Highly reliable 3-point contacts are used.



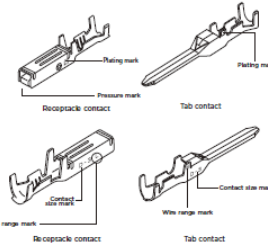
Housing Lance

The housing lance is used to secure the contact in place. The lance ensures the contact legs secure in the housing and helps prevent damage during contact mating. In addition to these protective features the housing lance produces an audible "click" ensuring the contact is securely locked in the housing. The contact can still be easily removed securely with specialized tooling.



Confirmation Marks

- Contact Pressure marks... "H" mark on the bottom of the contact for high contact pressure product (standard Contact Pressure for those without the marks. Only for D-3 connector)
- Plating marks... to show plating types and thickness of the plating, following numbers will be marked on the side of the contact. This number is consistent with the additional number of contacts part model number.
 - 1... Gold plating 0.05µm Thickness
 - 2... Gold plating 0.70µm Thickness
 - 3... Tin plating
- Shaded marks on the contact and the tool to avoid misuse of hand tools and extraction tools wire range marks (S, L, M, U) will be used to differentiate the contact size marks (D-1/D-2/D-3/D-4/D-5)



Wire range marks

- D-1 S AWG20-28
- M AWG28-22
- L AWG28-22
- 2L AWG22-18
- S AWG28-24
- M AWG22-18
- D-2 S AWG28-24
- M AWG24-20
- L AWG20-16
- 2L AWG16-14
- U AWG16-14

D-4 M

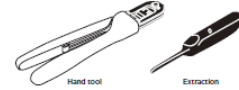
D-1/D-5 S

S

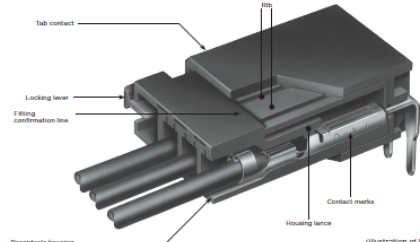
M

L

2L



Housing Features (Example of D-3000 Series)

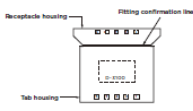


(Illustration of D-3000 Series)

Easy to insert and extract the connector

- When you insert or extract the connector, a clear "lock" sound will be heard. A fitting confirmation line is provided to confirm the operation both with your ears and eyes.
- Pinch 2 locks on both sides of the housing to easily extract the connector (D-3100/D-3200/D-4000/D-5200 Series)
- For safety consideration, well rounded corners will be used

to prevent hand injuries when inserting or extracting the connector



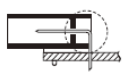
Vertical-type header

To avoid mis-installation or mis-alignments of the boards, keep in mind the direction (Concave) of Vertical-type Header (only available for D-3000 Series)



Housing to protect tine part

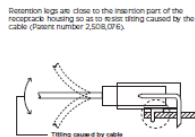
For protecting the solder time, horizontal-type header will be fully applied to cover type.



Features of the housing (Example of D-3000 Series)

Retention legs for board mounting

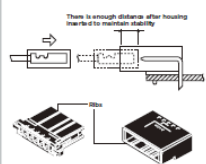
For robotic automatic implementation, the retention legs will be provided for both the vertical-type and the horizontal-type header. Especially for the horizontal-type header, it is possible to mount to the bottom of the housing and it will not take up as wide a space as the conventional system.



Note: Retention legs are used for board with 1.6mm thickness. If used for board with 2.0mm thickness, strength will be reduced.

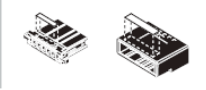
Twisting Prevention Structure

The ribs are used in both the receptacle housing and tab housing. This safety design can be used to avoid any backlashes between housings after the receptacle housing has been completely inserted into tab housing.



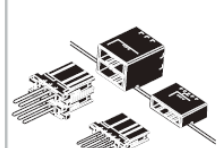
Label Mark

A flat size portion is provided in the housing for custom labels.



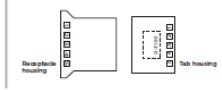
Misinsertion Preventing Mechanism

Part of the products (D-1000/D-2100/D-2100G/D-3100/D-3100M/D-3200/D-3200M/D-4000/D-5200/D-5200M) is provided with latching to prevent incorrect insertion. By using this plug, it also makes it easier to prevent incorrect insertion of other items. (Refer to P104, only available for D-3000 Series)



Easy-to-read circuit number

To facilitate cable assembly, tab and receptacle housings will be marked with circuit numbers.



Guideline for selecting plating (These guidelines apply to the D-3000 series only. Please refer to the D-3000 series manual for more details.)

Whether to use gold or tin plating varies depending on the voltage, current, environment (vibration, temperature, gas, etc.), number of contact positions, and other variables. Gold plating is recommended for general

industrial machinery but in reality cost considerations are also a factor. To help in this selection, these guidelines have been put together for the Dynamic Series as a reference in the selection process.

1) Selection based on voltage and current

Voltage	Gold-plated	Undetermined zone	Tin-plated	No plating (reference)
Below 3 V	Below 1 A	3 to 30 V	30 to 300 N	Over 300 V
Current	Below 1 A	1 to 10 A	Over 10 A	Over 0.01 A

(Table 1)

Table 1 shows us that gold should always be used for applications under 3 volts and 1 ampere. When the voltage is over 30 and amperage is over 1, tin plating can be used. The most difficult area to make a selection is in the undetermined zone in this zone either gold or tin plating can be used, but

the environment cause extensive variation. In a clean environment tin plating is acceptable. However, use gold plating if the environment is bad, such as in high heat or humidity, the presence of gas is possible, vibration is extreme, mating and demating are excessive, or other factors.

2) Selection based on number of contact positions (selection based on contact pressure)

Selecting based on the number of contact positions is often forgotten. The higher the contact pressure the more possible it is to use tin plating or no plating, regardless of the voltage or current mentioned in section 1. However, if they are too high, mating and demating become impossible so the connector function is lost. To get around this, we can drive the voltage and current down into a workable zone, but then we run into the problem of oxidation. Then, to prevent oxidation, we use tin (at approximately 234 N optimum contact pressure) or gold (approximately 138 N) plating. But, the contact pressure increases proportionally as we increase the number of contact positions, causing mating and demating to become difficult. Generally speaking, given a 392 N limit for mating/demating by hand, it becomes difficult without

using leverage, such as a lever or jack screw. The Dynamic D-3000 series has a maximum of 20 contact positions. That means the contact pressure with tin plating is 392 N, and with gold plating is 245 N and 147 N (high pressure types and standard types are available for some applications). For instance, given 392 N for tin plating, we can calculate insertion and extraction forces of 588 N and 430 N, which is difficult because it exceeds the range for one-handed work. Once we understand this, we see that as contact positions increase we must use gold plating regardless of the voltage and current conditions mentioned in section 1. Table 2 shows the applicable maximum number of contact positions as a reference.

Contact pressure	Applicable maximum number of contact positions
(1) Gold plating Standard contact pressure: 147N	20
(2) Gold plating High contact pressure: 245N	20
(3) Tin plating High contact pressure: 392N	12

(Table 2) Note: Insertion force and extraction force are not the same as contact pressure.

3) Environment (vibration, humidity, gas, etc.)

Although the environment was discussed in section 1 about voltage and current, it is summarized again here. Use gold plating in a bad environment, particularly for high vibration or heat. The presence of gas or other bad conditions. Gold is a noble metal. This means that gold does not react easily with other materials, which means that its surface does not oxidize or tarnish when exposed to air. Of all metals, only gold has this property. Other metals, noble metals except

gold, such as platinum or rhodium for example, do not produce an obviously no oxide film. This is a very important property for contacts. In consideration of this, there is no better material than gold plating if the environment is bad. Also, if vibration is an issue, there is the risk of fretting corrosion (micro-abrasion). Always use gold plating. If possible, high contact pressure connectors are recommended.

Guideline for selecting plating (These guidelines apply to the D-3000 series only. Please refer to the D-3000 series manual for more details.)

4) Other considerations

■ Contact between dissimilar metals
Combining tin and gold tends to create a lot of ionization, producing electrolytes from condensation so corrosion is likely to occur. This combination is not recommended because it could produce worse results than a combination of just tin.

■ Being consistent within an application
We recommend that, as much as possible, the same type of plating be used within an application. This is to prevent connectors being made between dissimilar metals, gold and tin as mentioned above, during assembly and maintenance. And for the same reason, we recommend using the same plating in factories or workplaces where assembly or harness production is done.

The above information has been summarized in "Plating selection at a glance" for your convenience.

- ★★★★ Best
- ★★★ Good
- ★★ Usable
- Not usable

Plating selection at a glance

Voltage/current	Application	Tin-plated	Gold-plated			
			D-38R		D-76R	
			Standard pressure	High pressure	Standard pressure	High pressure
Below 3 V Below 1 A	Standard specifications	—	★★	★★	★★★★	★★★★
	Vibration	—	*	★★	*	★★★★
	Bad environment	—	*	*	*	★★★★
	Inter-se mating/unmating	—	★★	*	★★★★	★★
3 to 30 V 1 to 10 A	Many contact positions	—	★★★★	★★	★★★★	★★
	Standard specifications	—	★★	★★	★★★★	★★★★
	Vibration	—	*	★★	*	★★★★
	Bad environment	—	★★	★★	★★★★	★★★★
Over 30 V Over 1 A	Inter-se mating/unmating	—	★★	*	★★★★	★★
	Standard specifications	★★	★★★★	★★★★	★★★★	★★★★
	Vibration	—	★★	★★	★★	★★★★
	Bad environment	—	★★	★★	★★★★	★★★★
Over 30 V Over 1 A	Inter-se mating/unmating	—	★★★★	★★	★★★★	★★
	Standard specifications	—	★★★★	★★	★★★★	★★
	Vibration	—	★★	★★	★★	★★★★
	Bad environment	—	★★	★★	★★★★	★★★★

The above table is basically for industrial machinery and was made with a wide margin. This table is not applicable for every situation as there are many combinations depending on the application. It is intended to be used as a guideline only.