Precautions regarding use

Precautions regarding use　For safety reasons, be sure to observe these precautions

- To ensure safe use of ceramic hermetic parts (hereinafter referred as to the "products"), please read these "Precautions regarding use" when selecting and before using them.
- The content in this section is applicable only to products whose models (excluding some that have specific instructions) are listed in the catalog (including the web site). For products that are not listed in the catalog, please check the delivered specifications, or negotiate the delivered specification drawings.
- The content presented here is important for safety, so be sure to observe it.
- If you are going to use the product under special conditions (such as situations where the ceramic brazing section will get wet or where pressure will be applied), please ask us to consider detailed specifications, excluding matters that are clearly stated in the catalog specifications.

(Explanatory notes)

Danger	Cases where improper handling could have serious consequences such as death or serious injury, and where it is highly urgent that people be warned in the event that a hazard occurs.
Warning	・Cases where there is a substantial risk that improper handling could have serious consequences such as death or serious injury.
Caution	・Cases where there is a substantial risk that improper handling could have serious consequences depending on the circumstances.

1. When selecting

(1) Voltage

Danger	There are two voltage specifications: withstand voltage (test voltage) and rated (use) voltage. However, owing to the nature of the applications, the information listed in the product specifications is the withstand voltage (test voltage). It is not the rated (use) voltage. Please use the product in accordance with the laws and regulations that apply to the device you are using, and at a voltage that has a margin for safety. An excessively high voltage could cause an electric shock or fire due to electrical discharge, or cause the product or a device to break, etc.
Danger	The products' voltage specifications have been designed so that they can be used under atmospheric pressure (the pressure at sea level), and under high-vacuum conditions with a pressure of $1x10^{-1}$ Pa or less. Please note that the withstand voltage may drop if you use the product under low-vacuum conditions, and depending on the type of the gas you use. A drop in the withstand voltage may cause an electric shock or fire due to electrical discharge, or cause problems such as breakage of the product or a device.

(2) Electric current

Danger	The products' allowable (rated) currents have been designed so that the amount of heat generated from the wiring is less than or equal to the amount of heat generated from the product, and so that the temperature of the product will not rise owing to heat input from the wiring. Alternatively, they have been designed on the basis of the allowable temperature of commercial connectors, etc. Please decide the wiring specifications in such a way that the product temperature will not rise as a result of heat generated from the wiring. Although it will vary depending on the type of cable, a guide for the temperature rise of wiring when carrying a current is 40°C or less. Excessive generation of heat may cause burns or fire, or cause problems such as breakage of the product or a device.

Precautions regarding use

1. When selecting (Continued)

(3) Operating environment / operating pressure

⚠ Caution	The products are designed to be used in an operating environment where they are installed in a clean indoor location at a normal temperature and a normal humidity, and to be used under vacuum conditions (unless clearly stated in the catalog specifications).
	If you use the products in a corrosive environment (including water, both inside and outside the product), it may cause the products themselves or a device to break as a result of corrosion of connecting parts, sealing materials, etc. Also, applying pressure may cause problems such as breakage of the product or a device.

⚠ Caution	The products' heat-resistance temperature is 200°C in the case of continuous use and 350°C for baking. In both cases, increase or decrease the temperature at a slower rate than 15°C/min. The design atmosphere is atmosphere on one side and vacuum on the other side. Baking is performed for the purpose of degassing the products, and the heating service life of the products has been set to 10 times. Heating will cause discoloration of the brazing filler metals, etc.
	Excessive heating, rapid heating and rapid cooling may result in ceramic breakage which leads to leakage, etc., causing problems such as breakage of the product or a device.

2. When using

(1) When you receive the products

⚠ Warning	Check the products when you open the packaging. Check to make sure that the products' specifications and quantities match what you ordered, and check for faults such as damage caused during transportation.
	If you use a faulty product, it may cause problems such as electrical discharge and generation of heat, which in turn lead to electric shock or burns, and problems such as breakage of the product or a device.

(2) When installing, handling, and using

⚠ Warning	When handling and using the products, do not subject them to impacts (such as from dropping), excessive force, thermal shock, etc.
	Also, do not use products with faults such as deformation or damage to the ceramics. Deformation and damage may cause problems such electrical discharge and generation of heat, which in turn lead to electric shock or burns, and problems such as breakage of the product or a device.

⚠ Warning	If you want to connect a cable and product using bolts, nuts, etc., do so in such a way that no force is applied to the brazing section, for example by applying a stopper spanner.
	Missing and deformed electrodes may cause problems such as generation of heat due to a short circuit and faulty current flow, which in turn cause electric shock, burns, and problems such as breakage of the product or a device.

⚠ Warning	The copper materials used for the products' electrodes, etc. become softened as a result of heating during brazing. When you handle them, be careful not to deform them
	Deformation and damage may cause problems such as generation of heat due to a short circuit or faulty current flow, which in turn cause electric shock, burns, or problems such as breakage of the product or a device due to leakage, etc.

⚠ Caution	If you are going to use flux to solder electrodes and wiring, etc., use a non-halogen, non-corrosive flux.
	Halogens may corrode connecting parts and sealing metals, resulting in problems such as breakage of the product or a device.

⚠ Caution	Do not apply loads to the products, such as loads from wiring and bus bars, or tension loads when installing wiring and bus bars. Support the load and tension of wiring and bus bars outside the products, for example by providing supports and using flexible wires.
	Loads may cause deformation of and damage to the product, resulting in problems such as breakage of the product or a device.

⚠ Caution	Do not use the products to support a load. In particular, if there are flanges at both ends of the product as is the case for electrical isolators, avoid fixing both ends in place without leaving any margin, and provide cushioning, for example by installing bellows. The products and flanges are only strong enough to ensure vacuum hermeticity. They are not designed to support any other loads.
	Loads may cause deformation of and damage to the product, resulting in problems such as breakage of the product or a device.

Precautions regarding use

2. When selecting (Continued)

(2) When installing, handling, and using

⚠ Caution	The products are designed to be used in an operating environment where they are installed in a clean indoor location at a normal temperature and a normal humidity, and to be used under vacuum conditions (unless clearly stated in the catalog specifications). Excessive heat input may cause the ceramics to break, resulting in problems such as breakage of the product or a device.
⚠ Caution	Handle the products carefully, so that you will not damage their sealing surfaces. Leakage, etc. due to scratches may cause problems such as breakage of the product or a device.
⚠ Danger	Do not plug/unplug connectors or attach/detach wiring while current is flowing. Handle the products only after turning off the power and releasing the charge voltage. Failure to do so may lead to electric shock, etc. due to energizing voltage or charge voltage.
⚠ Danger	Take safety measures such as attaching protective covers, so that no one will touch live parts or insulation parts while current is flowing. Failure to do so may lead to electric shock, etc. due to energizing voltage or charge voltage.
⚠ Warning	Do not clean the product with chemicals or water. Clean with a noncorrosive solvent such as alcohol or acetone, and dry the product thoroughly after cleaning. Chemical cleaning, residue from chemical cleaning, chemicals that have penetrated into gaps, residual water, etc. (insufficient drying) may cause corrosion both quickly and over time, resulting in problems such as breakage of the product or a device.
⚠ Warning	Do not clean resin mold products (such as epoxy products) using solvents such as alcohols and acetone. Penetration of solvent between metal and resin or ceramic and resin, and melting and swelling of resin caused by the solvents may lead to deterioration and breakage of the insulation, resulting in problems such as breakage of the product or a device.
⚠ Warning	If there is any condensation on the product, dry it off before using it. Water on the insulation parts may cause deterioration of withstand voltage and electrical discharge, which in turn lead to electric shock and problems such as breakage of the product or a device. If a product always has water on it, it may cause corrosion of connecting parts and sealing materials, resulting in problems such as breakage of the product or a device.
⚠ Caution	If dust builds up on the product, remove the dust regularly. Dust and water absorbed in dust may cause things like deterioration of the withstand voltage and electrical discharge, resulting in problems such as breakage of the product or a device.

(3) When inspecting

⚠ Warning	Stop the operation of the relevant devices, remove the charge voltage applied to the product, and wait until the temperature and pressure reach normal levels before performing the inspection. Charge voltage, high temperature and pressurization may cause problems such as electric shock, burns, and breakage of the product or a device.

(4) When storing

⚠ Caution	Store the product in a clean room with low humidity. If you are not going to use the product immediately, we recommend that you store it in a sealed plastic bag with a dehumidifying agent. Failure to do so may cause corrosion, resulting in problems such as breakage of the product or a device.

3. Safe export management

Based on our company's own judgment, the products listed in this catalog do not fall under the List Rules (clauses 1 to 15 of Appended Table 1 of the Export Trade Control Order, clauses 1 to 15 of the appended table of the Foreign Exchange Control Order) and EAR regulations. However, we are unable to judge whether export permission will be required with regard to your intended applications and users.
If you are going to export any of the products in this catalog as they are or incorporated in a device, please make your own judgments, and comply with the regulations.

4. General matters

It is prohibited to use or have a third party use our products for purposes such as developing, designing, manufacturing, storing or using weapons of mass destruction (such as nuclear weapons, chemical weapons, biological weapons, and missile weapons), for military purposes, or for the purpose of obstructing the maintenance of international peace and safety. Furthermore, it is prohibited to sell, transfer, export, lend or license the products to a party who has the above purposes.